

Installation devices



Catalogue

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Powering Business Worldwide



An Eaton Brand

Contents

Business information

| | |
|--|-----|
| Residual Current Devices | |
| Residual Current Devices PF7 | 5 |
| Residual Current Devices dRCM Digital | 9 |
| Residual Current Relays PFR, Core Balance Transformers Z-WFR | 11 |
| Residual Current Devices PHF7 | 13 |
| Residual Current Devices PFDM | 15 |
| Residual Current Devices PF6 | 17 |
| PDIM Leakage Current Monitor | 19 |
| Add-on Residual Current Protection Unit PBHT | 21 |
| Combined RCD/MCB Devices PFL7, 1+N-pole | 23 |
| Combined RCD/MCB Devices PFL6, 1+N-pole | 27 |
| Combined RCD/MCB Devices mRB6, 3+N-pole | 29 |
| Miniature Circuit Breakers | |
| Miniature Circuit Breakers PL7 | 31 |
| Miniature Circuit Breakers PL7-DC | 36 |
| Miniature Circuit Breakers PL6 | 37 |
| Miniature Circuit Breakers PLHT and Accessories | 41 |
| Other Devices, Accessories | |
| Main Switch Disconnecter IS, Switch Disconnectors ZP-A | 46 |
| Accessories for MCBs and RCDs | 47 |
| Other installation devices, relays | 50 |
| Measuring Instruments and Accessories | 60 |
| Manual Motor Starters Z-MS | 65 |
| Busbar Systems | 67 |
| Fuse-links and Fuse Disconnectors | |
| Fuse-links D II, D III, D IV | 74 |
| Cylindrical Fuse-links Z-C | 76 |
| Fuse-Links Photovoltaic application | 78 |
| Fuse-Links D0 | 79 |
| NH-Fuse-Links | 85 |
| Circuit Breakers LZM and Switch Disconnectors LN | 91 |
| Surge Arresters | 97 |
| Photovoltaic - Inverter | 105 |
| Control Relays EASY | 107 |

Contents

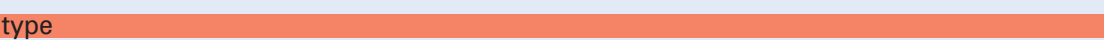
Technical Data

| | |
|--|-----|
| Types and Characteristics of Residual Current Devices | 110 |
| Residual Current Devices PF7 | 113 |
| Residual Current Devices dRCM Digital | 115 |
| Residual Current Relays PFR, Core Balance Transformers Z-WFR | 117 |
| Residual Current Devices PHF7 | 119 |
| Residual Current Devices PFDM | 121 |
| Residual Current Devices PF6 | 122 |
| PDIM Leakage Current Monitor | 126 |
| Add-on Residual Current Protection Unit PBHT | 125 |
| Combined RCD/MCB Devices PFL7, 1+N-pole | 128 |
| Combined RCD/MCB Devices PFL6, 1+N-pole | 132 |
| Combined RCD/MCB Devices mRB6, 3+N-pole | 136 |
| Miniature Circuit Breakers PL7 | 137 |
| Miniature Circuit Breakers PL7-DC | 137 |
| Miniature Circuit Breakers PL6 | 144 |
| Miniature Circuit Breakers PLHT and Accessories | 150 |
| Main Switch Disconnecter IS | 155 |
| Switch Disconnectors ZP-A | 156 |
| Accessories for MCBs and RCDs | 158 |
| Other installation devices, relays | 169 |
| Impulse Relays Z-S | 179 |
| Installation Relays Z-R, Z-TN | 189 |
| Installation contactors Z-SCH | 191 |
| Digital Timers | 200 |
| Measuring Instruments and Accessories | 201 |
| Manual Motor Starters Z-MS | 213 |
| Busbar Systems | 218 |
| Fuse-links and Fuse Disconnectors | 224 |
| Circuit Breakers LZM and Switch Disconnectors LN | 273 |
| Surge Arresters | 276 |
| Photovoltaic - Inverter | 297 |

Pictures used inside of this catalogue are illustrative, they need not to correspond to actual product version.


Explanatory notes to used marking

New item 

Phase-out type 

Change in type designation or in article number 

Residual current devices PF7

- A complete spectrum of compact residual current devices up to 100 A
- Rated short circuit strength 10 kA
- Especially for protection against accidents caused by current and property protection
- Wide variety of types (G, S, A, G/A, S/A, R, U, ...)
- Special type U for frequency converter applications with high surge current proof
- Accessories suitable for subsequent installation
-  Frost resistance

SG 05506



Residual Current Devices PF7

- Can be used as an additional protection against dangerous contact with live parts ($I_{\Delta n} \leq 30 \text{ mA}$), as a protection against dangerous contact with exposed conductive parts ($I_{\Delta n} > 30 \text{ mA}$) or as a fire protection ($I_{\Delta n} \leq 300 \text{ mA}$)
- Rated short circuit strength 10 kA
- Busbar positioning for input optionally above or below
- The device function irrespective of the position of installation
- Contact position indicator red-green
- Twin purpose terminal (lift/open – mouthed) above or below
- Free terminal space despite installed busbar
- 4-pole device can also be used for 2-pole or 3-pole connection
- Test key "T" must be pressed once a month
- Additional protection against overload must be used for devices with rated current 80 A and 100 A
- Terminal capacity 1.5 – 35 mm²

Surge current proof 250 A



- Type AC – sensitive to residual AC
- Without time delay – surge current-proof 250 A

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 2-pole | | | |
| 25/0.03 | PF7-25/2/003 | 263577 | 1/60 |
| 25/0.10 | PF7-25/2/01 | 263578 | 1/60 |
| 40/0.03 | PF7-40/2/003 | 263579 | 1/60 |
| 40/0.10 | PF7-40/2/01 | 263580 | 1/60 |
| 63/0.03 | PF7-63/2/003 | 263581 | 1/60 |
| 63/0.10 | PF7-63/2/01 | 263582 | 1/60 |
| 63/0.30 | PF7-63/2/03 | 263583 | 1/60 |

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| | | | |
|---------------|---------------|--------|------|
| 4-pole | | | |
| 25/0.03 | PF7-25/4/003 | 263584 | 1/30 |
| 25/0.10 | PF7-25/4/01 | 263585 | 1/30 |
| 40/0.03 | PF7-40/4/003 | 263586 | 1/30 |
| 40/0.10 | PF7-40/4/01 | 263587 | 1/30 |
| 40/0.30 | PF7-40/4/03 | 263588 | 1/30 |
| 40/0.50 | PF7-40/4/05 | 263589 | 1/30 |
| 63/0.03 | PF7-63/4/003 | 263590 | 1/30 |
| 63/0.10 | PF7-63/4/01 | 263591 | 1/30 |
| 63/0.30 | PF7-63/4/03 | 263592 | 1/30 |
| 63/0.50 | PF7-63/4/05 | 263593 | 1/30 |
| 80/0.03 | PF7-80/4/003 | 263594 | 1/30 |
| 80/0.10 | PF7-80/4/01 | 263595 | 1/30 |
| 80/0.30 | PF7-80/4/03 | 263596 | 1/30 |
| 80/0.50 | PF7-80/4/05 | 263597 | 1/30 |
| 100/0.03 | PF7-100/4/003 | 102925 | 1/30 |
| 100/0.10 | PF7-100/4/01 | 102926 | 1/30 |
| 100/0.30 | PF7-100/4/03 | 102927 | 1/30 |
| 100/0.50 | PF7-100/4/05 | 102928 | 1/30 |

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Surge current proof 250 A, sensitive also to pulsating DC



- Type A – sensitive to residual AC and residual pulsating DC
- Without time delay – surge current-proof 250 A

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 2-pole | | | |
| 16/0.01 | PF7-16/2/001-A | 263598 | 1/60 |
| 25/0.03 | PF7-25/2/003-A | 263599 | 1/60 |
| 25/0.10 | PF7-25/2/01-A | 263600 | 1/60 |
| 25/0.30 | PF7-25/2/03-A | 263601 | 1/60 |
| 40/0.03 | PF7-40/2/003-A | 263602 | 1/60 |
| 40/0.10 | PF7-40/2/01-A | 263603 | 1/60 |
| 40/0.30 | PF7-40/2/03-A | 263604 | 1/60 |
| 63/0.03 | PF7-63/2/003-A | 263605 | 1/60 |
| 63/0.10 | PF7-63/2/01-A | 263606 | 1/60 |
| 63/0.30 | PF7-63/2/03-A | 263607 | 1/60 |

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4-pole

| | | | |
|----------|-----------------|--------|------|
| 25/0.03 | PF7-25/4/003-A | 263608 | 1/30 |
| 25/0.10 | PF7-25/4/01-A | 263609 | 1/30 |
| 25/0.30 | PF7-25/4/03-A | 263610 | 1/30 |
| 40/0.03 | PF7-40/4/003-A | 263611 | 1/30 |
| 40/0.10 | PF7-40/4/01-A | 263612 | 1/30 |
| 40/0.30 | PF7-40/4/03-A | 263613 | 1/30 |
| 63/0.03 | PF7-63/4/003-A | 263614 | 1/30 |
| 63/0.10 | PF7-63/4/01-A | 263615 | 1/30 |
| 63/0.30 | PF7-63/4/03-A | 263616 | 1/30 |
| 80/0.03 | PF7-80/4/003-A | 263617 | 1/30 |
| 80/0.30 | PF7-80/4/03-A | 263618 | 1/30 |
| 100/0.03 | PF7-100/4/003-A | 102929 | 1/30 |
| 100/0.10 | PF7-100/4/01-A | 102930 | 1/30 |
| 100/0.30 | PF7-100/4/03-A | 102931 | 1/30 |
| 100/0.50 | PF7-100/4/05-A | 102932 | 1/30 |

Surge current-proof 3 kA, type G



- Type AC – sensitive to residual AC
- G with time delay – surge current-proof 3 kA

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
|------------------------|------------------|-------------|-------------------|

2-pole

| | | | |
|---------|----------------|--------|------|
| 25/0.03 | PF7-25/2/003-G | 263619 | 1/60 |
| 25/0.10 | PF7-25/2/01-G | 263620 | 1/60 |
| 40/0.03 | PF7-40/2/003-G | 263621 | 1/60 |
| 40/0.10 | PF7-40/2/01-G | 263622 | 1/60 |

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4-pole

| | | | |
|---------|----------------|--------|------|
| 40/0.03 | PF7-40/4/003-G | 263623 | 1/30 |
| 40/0.10 | PF7-40/4/01-G | 263624 | 1/30 |
| 63/0.03 | PF7-63/4/003-G | 263625 | 1/30 |
| 63/0.10 | PF7-63/4/01-G | 263627 | 1/30 |

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Surge current-proof 3 kA, for x-rays – R



- Type A – sensitive to residual AC and residual pulsating DC
- R – for x-rays – surge current-proof 3 kA

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
|------------------------|------------------|-------------|-------------------|

4-pole

| | | | |
|----------|-----------------|--------|------|
| 63/0.03 | PF7-63/4/003-R | 263628 | 1/30 |
| 100/0.03 | PF7-100/4/003-R | 102935 | 1/30 |

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Selective, surge current-proof 5 kA, type S



- Type AC – sensitive to residual AC
- S selective with time delay – surge currentproof 5 kA

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 2-pole | | | |
| 40/0.10 | PF7-40/2/01-S | 263629 | 1/60 |
| 40/0.30 | PF7-40/2/03-S | 263630 | 1/60 |
| 4-pole | | | |
| 80/0.10 | PF7-80/4/01-S | 263636 | 1/30 |

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Selective, surge current-proof 5 kA, sensitive also to pulsating DC



- Type A – sensitive to residual AC and residual AC and residual pulsating DC
- S selective with time delay – surge currentproof 5 kA

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 4-pole | | | |
| 25/0.10 | PF7-25/4/01-S/A | 263631 | 1/30 |
| 40/0.10 | PF7-40/4/01-S/A | 263632 | 1/30 |
| 40/0.30 | PF7-40/4/03-S/A | 263633 | 1/30 |
| 63/0.10 | PF7-63/4/01-S/A | 263634 | 1/30 |
| 63/0.30 | PF7-63/4/03-S/A | 263635 | 1/30 |
| 80/0.30 | PF7-80/4/03-S/A | 263637 | 1/30 |
| 100/0.30 | PF7-100/4/03-S/A | 292494 | 1/30 |

SG05506



Selective, surge current-proof 5 kA, frequency converter-proof, type U



- Type A – sensitive to residual AC and residual pulsating DC
- U – for frequency converter applications
- S selective with time delay – surge currentproof 5 kA

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 4-pole | | | |
| 40/0.10 | PF7-40/4/01-U | 263638 | 1/30 |
| 40/0.30 | PF7-40/4/03-U | 263639 | 1/30 |
| 63/0.10 | PF7-63/4/01-U | 263640 | 1/30 |
| 63/0.30 | PF7-63/4/03-U | 263641 | 1/30 |
| 80/0.30 | PF7-80/4/03-U | 292495 | 1/30 |
| 100/0.30 | PF7-100/4/03-U | 292496 | 1/30 |

Compact residual current devices type U – see page 12.

Sealing Cover Set Z-RC/AK

- For PF7, PFR (not to use for PFDM)

| | Type Designation | Article No. | Units per package |
|------------|------------------|-------------|-------------------|
| for 2-pole | Z-RC/AK-2TE | 285385 | 10/30 |
| for 4-pole | Z-RC/AK-4TE | 101062 | 10/600 |

Z-HWS




Notification label Z-HWS-FI

- Notification of operator of responsibility to check functionality of residual current devices regularly (once a month)
- Languages: D, E, I, F, CZ, RUS, PL, H

| | Type Designation | Article No. | Units per package |
|--------------------|------------------|-------------|-------------------|
| Notification label | Z-HWS-FI | 236980 | 100 |

Residual Current Devices dRCM Digital

- Line voltage independent RCCB for fault or additional protection with additional digital features.
- Rated short circuit strength 10 kA
- System Monitoring: Preventive information / warning before the RCD trips in case of leakage currents.
 - Integrated auxiliary contact
 - Local Indication
- New level of accuracy -> Reduced unwanted tripping
- No monthly test required
- Contact position indicator
- Fault current tripping indicator
- Transparent designation plate
- Accessories suitable for subsequent installation
-  Frost resistance

SG01509



Residual Current Devices dRCM

- Can be used as an additional protection against dangerous contact with live parts ($I_{\Delta n} \leq 30$ mA), as a protection against dangerous contact with exposed conductive parts ($I_{\Delta n} > 30$ mA) or as a fire protection ($I_{\Delta n} \leq 300$ mA)
- Rated short circuit strength 10 kA
- Busbar positioning for input optionally above or below
- The device function irrespective of the position of installation
- Protection functions voltage independent
- Contact position indicator red-green
- Fault current tripping indicator (blue / white)
- Twin purpose terminal (lift/open – mouthed) above or below
- Free terminal space despite installed busbar
- 4-pole device can also be used for 2-pole or 3-pole connection
- Test key "T" must be pressed once a month
- Integrated overload protection
- Terminal capacity 1.5 – 35 mm²

Surge current-proof 3 kA



- Type A – sensitive to residual AC and residual pulsating DC
- G with time delay 10 ms – surge current-proof 3 kA

SG01509



| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|--------------------|-------------|-------------------|
| 4-pole | | | |
| 25/0.03 | dRCM-25/4/003-G/A+ | 120834 | 1/30 |
| 25/0.30 | dRCM-25/4/03-G/A+ | 120835 | 1/30 |
| 40/0.03 | dRCM-40/4/003-G/A+ | 120836 | 1/30 |
| 40/0.30 | dRCM-40/4/03-G/A+ | 120837 | 1/30 |
| 63/0.03 | dRCM-63/4/003-G/A+ | 120838 | 1/30 |
| 63/0.30 | dRCM-63/4/03-G/A+ | 120839 | 1/30 |
| 80/0.03 | dRCM-80/4/003-G/A+ | 120840 | 1/30 |
| 80/0.30 | dRCM-80/4/03-G/A+ | 120841 | 1/30 |

Surge current-proof 3 kA, X-ray application, type R



- Type A – sensitive to residual AC and residual pulsating DC
- X-ray application, type R – surge current-proof 3 kA

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 4-pole | | | |
| 63/0.03 | dRCM-63/4/003-R+ | 120842 | 1/30 |

Selective + surge current-proof typ. 5 kA, sensitive to residual pulsating DC, type S/A



- Type A – sensitive to residual AC and residual pulsating DC
- S with time delay 40 ms – surge current-proof 5 kA

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|-------------------|-------------|-------------------|
| 4-pole | | | |
| 40/0.30 | dRCM-40/4/03-S/A+ | 120843 | 1/30 |
| 63/0.30 | dRCM-63/4/03-S/A+ | 120844 | 1/30 |
| 80/0.30 | dRCM-80/4/03-S/A+ | 120845 | 1/30 |


Frequency converter-proof, type U



- Type A – sensitive to residual AC and residual pulsating DC
- Version with residual current 300 mA – S selective with initial insensitiveness 40 ms – surge current-proof typ. 5 kA
- Version with residual current 30 mA – G with initial insensitiveness 10 ms – surge current proof 3 kA

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 4-pole | | | |
| 40/0.03 | dRCM-40/4/003-U+ | 120850 | 1/30 |
| 40/0.3 | dRCM-40/4/03-U+ | 120851 | 1/30 |
| 63/0.03 | dRCM-63/4/003-U+ | 120846 | 1/30 |
| 63/0.3 | dRCM-63/4/03-U+ | 120847 | 1/30 |
| 80/0.3 | dRCM-80/4/03-U+ | 120848 | 1/30 |

Residual Current Relays PFR Core Balance Transformers Z-WFR

- Especially matched residual current relays and core balance transformers intended for RCD set with indirect releasing
- Rated current up to 400 A
- Rated residual/fault currents 0.3 A and 1 A
- Standard S/A for usual installations
- Type U – frequency converter-proof
-  Frost resistance

SG05606



420801f



Residual Current Relays PFR

- Can be used as an additional protection against dangerous contact with exposed conductive parts ($I_{\Delta n} > 30 \text{ mA}$) or as a fire protection ($I_{\Delta n} \leq 300 \text{ mA}$)
- Contact position indicator red-green
- A pair of NC contacts
- Rated current of relay contacts 25 A / 400 V DC, 16 A / 230 V AC

Selective, surge current-proof 5 kA, sensitive also to residual pulsating DC, type S/A

- Type A – sensitive to residual AC and residual pulsating DC
- S selective with time delay – surge currentproof 5 kA
- PFR2-..-S/A can be combined only with Z-WFR 2-S/A
- PFR3-..-S/A can be combined only with Z-WFR 3-S/A

SG05606



| $I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|--------------------|------------------|-------------|-------------------|
| 0.30 | PFR2-03-S/A | 235864 | 1/30 |
| 0.30 | PFR3-03-S/A | 235865 | 1/30 |
| 1.0 | PFR2-1-S/A | 235866 | 1/30 |
| 1.0 | PFR3-1-S/A | 235867 | 1/30 |

Core Balance Transformers Z-WFR for PFR-S/A

420801



| Maximum cable lead-through diameter | Type Designation | Article No. | Units per package |
|-------------------------------------|------------------|-------------|-------------------|
| 60 mm | Z-WFR 2-S/A | 236981 | 1 |
| 130 mm | Z-WFR 3-S/A | 236982 | 1 |

Selective, surge current-proof 5 kA, frequency converter-proof, type U

- Type A – sensitive to residual AC and residual pulsating DC
- U – for frequency converter applications
- S selective with time delay – surge current-proof 5 kA
- PFR2-..-U can be combined only with Z-WFR 2-U
- PFR3-..-U can be combined only with Z-WFR 3-U

SG05606



| $I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|--------------------|------------------|-------------|-------------------|
| 0.30 | PFR2-03-U | 235868 | 1/30 |
| 0.30 | PFR3-03-U | 235869 | 1/30 |
| 1.0 | PFR2-1-U | 235870 | 1/30 |
| 1.0 | PFR3-1-U | 235871 | 1/30 |


Core Balance Transformers Z-WFR for PRF-U

420801



| Maximum cable lead-through diameter | Type Designation | Article No. | Units per package |
|-------------------------------------|------------------|-------------|-------------------|
| 60 mm | Z-WFR 2-U | 104386 | 1 |
| 130 mm | Z-WFR 3-U | 104387 | 1 |

Residual Current Devices PHF7

- Residual current devices with high operational reliability
- High reliability against unwanted tripping – type G, S, G/A
- Regular monthly testing of the device functionality is not necessary
- Integrated overload protection
-  Frost resistance

SG5602



Residual Current Devices PHF7

- Can be used as an additional protection against dangerous contact with live parts ($I_{\Delta n} \leq 30$ mA), as a protection against dangerous contact with exposed conductive parts ($I_{\Delta n} > 30$ mA) or as a fire protection ($I_{\Delta n} \leq 300$ mA)
- Rated short circuit strength 10 kA
- Integrated overload protection
- High reliability – testing of device need not be proven every month
- Test key "T" must be pressed once a year
- Busbar positioning optionally above or below
- The device function irrespective of the position of installation
- Contact position indicator red-green
- Twin purpose terminal (lift/open – mouthed) above or below
- Free terminal space despite installed busbar

SG5502



Surge current-proof 3 kA, type G



- Type AC – sensitive to residual AC
- G with time delay – surge current-proof 3 kA

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 2-pole | | | |
| 25/0.03 | PHF7-25/2/003-G | 263642 | 1/60 |
| 40/0.03 | PHF7-40/2/003-G | 263643 | 1/60 |

SG5602



4-pole

| | | | |
|---------|-----------------|--------|------|
| 25/0.03 | PHF7-25/4/003-G | 263644 | 1/30 |
| 40/0.03 | PHF7-40/4/003-G | 263645 | 1/30 |
| 63/0.03 | PHF7-63/4/003-G | 263646 | 1/30 |

SG20902



Surge current-proof 3 kA, sensitive also to residual pulsating DC, type G/A



- Type A – sensitive to residual AC and residual pulsating DC
- G with time delay – surge current-proof 3 kA

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|-------------------|-------------|-------------------|
| 4-pole | | | |
| 40/0.03 | PHF7-40/4/003-G/A | 263647 | 1/30 |
| 63/0.03 | PHF7-63/4/003-G/A | 263648 | 1/30 |

SG21002




Surge current-proof 5 kA, type S



- Type AC – sensitive to residual AC
- S selective with time delay – surge current-proof 5 kA

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 4-pole | | | |
| 40/0.10 | PHF7-40/4/01-S | 263649 | 1/30 |
| 40/0.30 | PHF7-40/4/03-S | 263650 | 1/30 |
| 63/0.10 | PHF7-63/4/01-S | 263651 | 1/30 |
| 63/0.30 | PHF7-63/4/03-S | 263652 | 1/30 |

Residual Current Devices PFDM

- Residual current devices PFDM for the 125 A rated current range
- Suitable also for additional protection against dangerous contact with live parts
- Auxiliary contact for subsequent installation
- Special devices for variety of applications – types AC, A, and S/A
-  Frost resistance

SG0802



Residual Current Devices PFDM

- Can be used as an additional protection against dangerous contact with live parts ($I_{\Delta n} \leq 30 \text{ mA}$), as a protection against dangerous contact with exposed conductive parts ($I_{\Delta n} > 30 \text{ mA}$) or as a fire protection ($I_{\Delta n} \leq 300 \text{ mA}$)
- Rated short circuit strength 10 kA
- Busbar positioning optionally above or below
- The device function irrespective of the position of installation
- Contact position indicator red-green
- Twin-purpose terminal (lift/open – mouthed) above and below
- Free terminal space despite installed busbar
- Test key "T" must be pressed once a month
- Terminal capacity 1.5–50 mm²



SG0802



Conditionally surge current-proof (0.5 μs / 100 kHz)

- Type AC – sensitive to residual AC
- Without time delay

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 4-pole | | | |
| 125/0.03 | PFDM-125/4/003 | 235916 | 1/30 |
| 125/0.10 | PFDM-125/4/01 | 235917 | 1/30 |
| 125/0.30 | PFDM-125/4/03 | 235918 | 1/30 |
| 125/0.50 | PFDM-125/4/05 | 235919 | 1/30 |

- Type A – sensitive to residual AC and residual pulsating DC
- Without time delay



| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 4-pole | | | |
| 125/0.03 | PFDM-125/4/003-A | 235920 | 1/30 |
| 125/0.10 | PFDM-125/4/01-A | 235921 | 1/30 |
| 125/0.30 | PFDM-125/4/03-A | 235922 | 1/30 |
| 125/0.50 | PFDM-125/4/05-A | 235923 | 1/30 |

- Type S/A – sensitive to residual AC and residual pulsating DC
- Selective – with time delay 40 ms

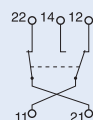


| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|-------------------|-------------|-------------------|
| 4-pole | | | |
| 125/0.30 | PFDM-125/4/03-S/A | 285639 | 1/30 |


Accessories for protective devices PFDM

| Description | Contacts | Type Designation | Article No. | Units per package |
|---|-------------|------------------|-------------|-------------------|
| Auxiliary contacts 6 A (AC11) 230 V AC | 1 NO + 1 NC | Z-HD | 265620 | 1 |

Connection diagram



Residual Current Devices PF6

- Economy series of RCD
- Rated short circuit strength 6 kA
- For fault current/residual current protection and additional protection
- Accessories suitable for subsequent installation
-  Frost resistance

SG05506



Residual Current Devices PF6

- Can be used as an additional protection against dangerous contact with live parts ($I_{\Delta n} \leq 30$ mA), as a protection against dangerous contact with exposed conductive parts ($I_{\Delta n} > 30$ mA) or as a fire protection ($I_{\Delta n} \leq 300$ mA)
- Rated short circuit strength 6 kA
- Busbar positioning optionally above or below
- The device function irrespective of the position of installation
- Contact position indicator red-green
- Twin-purpose terminal (lift/open – mouthed) above and below
- Possibility of using of busbar
- 4-pole device can also be used for 2-pole or 3-pole connection
- Test key "T" must be pressed once a month
- Terminal capacity 1.5–35 mm²

Surge current-proof 250 A



- Type AC – sensitive to residual AC
- Without time delay – surge current-proof 250 A

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 2-pole | | | |
| 25/0.03 | PF6-25/2/003 | 286492 | 1/60 |
| 40/0.03 | PF6-40/2/003 | 286496 | 1/60 |
| 40/0.30 | PF6-40/2/03 | 286498 | 1/60 |

SG05406



4-pole

| | | | |
|---------|--------------|--------|------|
| 25/0.03 | PF6-25/4/003 | 286504 | 1/30 |
| 40/0.03 | PF6-40/4/003 | 286508 | 1/30 |
| 40/0.30 | PF6-40/4/03 | 286510 | 1/30 |
| 63/0.03 | PF6-63/4/003 | 286512 | 1/30 |
| 63/0.30 | PF6-63/4/03 | 286514 | 1/30 |

SG 05506



PDIM Leakage Current Monitor

- Reliable, universal monitoring of residual current - EN 62020
- Without main contacts
- Conditional rated short circuit strength 10 kA
- Rated residual current adjustable in steps 30, 100, 300, 500 and 1000 mA
- Type A – sensitive to residual AC and residual pulsating DC
- Possibility to set delay: undelayed – delayed G type – selective S type
- Local status indication of residual current through 3 LEDs
- 2 potential-free signalling contacts

SG05807



PDIM Leakage Current Monitor

- Devices for monitoring of residual currents acc. to EN 62020
- Without main contacts
- Conditional rated short circuit strength 10 kA
- Rated residual current adjustable in steps 30, 100, 300, 500 and 1000 mA
- Type A – sensitive to residual AC and residual pulsating DC
- Possibility to set delay: undelayed – delayed G type – selective S type
- Local indication of residual current level with LED
- Remote indication of residual current level with two free-potential auxiliary contacts 10 A / 230 V AC
- Busbar positioning optionally above or below
- The device function irrespective of the position of installation
- Twin purpose terminal (lift/open – mouthed) above or below
- Free terminal space despite installed busbar
- Terminal capacity 1.5–35 mm²

sg05807



| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per Package |
|----------------------------|------------------|-------------|-------------------|
| 4-pole | | | |
| 40/0.03; 0.1; 0.3; 0.5; 1 | PDIM-40/4 | 111760 | 1/30 |
| 100/0.03; 0.1; 0.3; 0.5; 1 | PDIM-100/4 | 111761 | 1/30 |

Add-on Residual Current Protection Unit PBHT

- For combination with miniature circuit breaker PLHT
- Add-on residual current unit (screw connection)
- 4-pole
- High flexibility and ease of installation thanks to variable wiring
- Auxiliary switch 1 NO contact included as standard in all PBHT versions
- The screw connection to the PLHT-device can be unscrewed at any time. Consequently, in case of modifications of the systems to be protected, the installation can be adapted to new requirements at any time.
- Permits combinations with a variety of characteristics thanks to the different rated currents and characteristics of the miniature circuit breakers PLHT which can be connected

SG6002



Add-on Residual Current Protection UNIT PBHT

- For mounting onto PLHT MCBs
- Rated conditional short circuit strength PBHT + PLHT given by PLHT (15–25 kA)
- Build-in auxiliary NO switch
- Wires for connection with PLHT as well as mounting screws are included in standard delivery
- 4-pole

- Type A sensitive to residual AC and pulsating residual DC
- Surge current-proof 250 A

SG6002



| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|------------------|-------------|-------------------|
| 80/0.03 | PBHT-80/4/003-A | 248827 | 1/4 |
| 80/0.30 | PBHT-80/4/03-A | 248829 | 1/4 |
| 80/0.50 | PBHT-80/4/05-A | 248832 | 1/4 |
| 80/1.00 | PBHT-80/4/1-A | 248835 | 1/4 |
| 125/0.03 | PBHT-125/4/003-A | 248808 | 1/4 |
| 125/0.30 | PBHT-125/4/03-A | 248810 | 1/4 |
| 125/0.50 | PBHT-125/4/05-A | 248813 | 1/4 |
| 125/1.00 | PBHT-125/4/1-A | 248816 | 1/4 |

- Type A sensitive to residual AC and pulsating residual DC
- S selective with time delay – surge currentproof 5 kA

SG6002



| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|------------------------|-------------------|-------------|-------------------|
| 80/0.30 | PBHT-80/4/03-S/A | 248830 | 1/4 |
| 80/0.50 | PBHT-80/4/05-S/A | 248833 | 1/4 |
| 80/1.00 | PBHT-80/4/1-S/A | 248836 | 1/4 |
| 125/0.30 | PBHT-125/4/03-S/A | 248811 | 1/4 |
| 125/0.50 | PBHT-125/4/05-S/A | 248814 | 1/4 |
| 125/1.00 | PBHT-125/4/1-S/A | 248817 | 1/4 |

Technical information p. 125

Shunt trip release for residual protection unit PBHT


| Operational voltage range | Type Designation | Article No. | Units per package |
|-----------------------------|------------------|-------------|-------------------|
| 110–415 V AC / 110–230 V DC | Z-BHASA/230 | 248445 | 8 |
| 12–60 V AC/DC | Z-BHASA/24 | 248444 | 8 |

SG9998



Technical information p. 127

Combined RCD/MCB Devices PFL7, 1+N-pole

- Residual current device / miniature circuit breaker combination
- Tripping characteristics of MCB B, C
- Rated breaking capacity 10 kA
- Rated currents up to 40 A
- Contact position indicator red-green
- Guide for secure terminal connection
- 3-position DIN rail clip, permits removal from existing busbar system
- Accessories suitable for subsequent installation
-  Frost resistance

SG4202



Combined RCD/MCB Devices PFL7

- Can be used as an additional protection against dangerous contact with live parts ($I_{\Delta n} \leq 30 \text{ mA}$)
- Rated breaking capacity 10 kA
- Busbar positioning optionally above or below
- The device function irrespective of the position of installation
- Contact position indicator red-green
- Twin-purpose terminal (lift/open – mouthed) above and below
- Free terminal space despite installed busbar
- Test key "T" must be pressed once a month
- Terminal capacity 1–25 mm²

Surge current-proof 250 A

Rated breaking capacity of MCB 10 kA, 1+N-pole

- Type AC – sensitive to residual AC
- Without time delay – surge current-proof 250 A

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|-------------------------|------------------|-------------|-------------------|
| Characteristic B | | | |
| 6/0.03 | PFL7-6/1N/B/003 | 263430 | 1/60 |
| 10/0.03 | PFL7-10/1N/B/003 | 263434 | 1/60 |
| 13/0.03 | PFL7-13/1N/B/003 | 263518 | 1/60 |
| 16/0.03 | PFL7-16/1N/B/003 | 263534 | 1/60 |
| 20/0.03 | PFL7-20/1N/B/003 | 263540 | 1/60 |
| 25/0.03 | PFL7-25/1N/B/003 | 263546 | 1/60 |
| 32/0.03 | PFL7-32/1N/B/003 | 263552 | 1/60 |
| 40/0.03 | PFL7-40/1N/B/003 | 263558 | 1/60 |

Characteristic C

| | | | |
|---------|------------------|--------|------|
| 6/0.03 | PFL7-6/1N/C/003 | 263432 | 1/60 |
| 10/0.03 | PFL7-10/1N/C/003 | 263516 | 1/60 |
| 13/0.03 | PFL7-13/1N/C/003 | 263531 | 1/60 |
| 16/0.03 | PFL7-16/1N/C/003 | 263537 | 1/60 |
| 20/0.03 | PFL7-20/1N/C/003 | 263543 | 1/60 |
| 25/0.03 | PFL7-25/1N/C/003 | 263549 | 1/60 |
| 32/0.03 | PFL7-32/1N/C/003 | 263555 | 1/60 |
| 40/0.03 | PFL7-40/1N/C/003 | 263561 | 1/60 |

SG4202



Surge current-proof 250 A, sensitive also to residual pulsating DC

Rated breaking capacity of MCB 10 kA, 1+N-pole

- Type A – sensitive to residual AC and residual pulsating DC
- Without time delay – surge current-proof 250 A

| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|-------------------------|--------------------|-------------|-------------------|
| Characteristic B | | | |
| 6/0.03 | PFL7-6/1N/B/003-A | 263431 | 1/60 |
| 10/0.03 | PFL7-10/1N/B/003-A | 263435 | 1/60 |
| 13/0.03 | PFL7-13/1N/B/003-A | 263519 | 1/60 |
| 16/0.03 | PFL7-16/1N/B/003-A | 263535 | 1/60 |

Characteristic C

| | | | |
|---------|--------------------|--------|------|
| 6/0.03 | PFL7-6/1N/C/003-A | 263515 | 1/60 |
| 10/0.03 | PFL7-10/1N/C/003-A | 263517 | 1/60 |
| 13/0.03 | PFL7-13/1N/C/003-A | 263532 | 1/60 |
| 16/0.03 | PFL7-16/1N/C/003-A | 263538 | 1/60 |

SG4202



Surge current-proof 3 kA, type G ☒

Rated breaking capacity of MCB 10 kA, 1+N-pole

- Type AC – sensitive to residual AC
- Type G with time delay min. 10 ms – surge current-proof 3 kA


| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|-------------------------|--------------------|-------------|-------------------|
| Characteristic B | | | |
| 13/0.03 | PFL7-13/1N/B/003-G | 263530 | 1/60 |
| 16/0.03 | PFL7-16/1N/B/003-G | 263536 | 1/60 |
| 20/0.03 | PFL7-20/1N/B/003-G | 263542 | 1/60 |
| 25/0.03 | PFL7-25/1N/B/003-G | 263548 | 1/60 |

| | | | |
|-------------------------|--------------------|--------|------|
| Characteristic C | | | |
| 13/0.03 | PFL7-13/1N/C/003-G | 263533 | 1/60 |
| 16/0.03 | PFL7-16/1N/C/003-G | 263539 | 1/60 |
| 20/0.03 | PFL7-20/1N/C/003-G | 263545 | 1/60 |
| 25/0.03 | PFL7-25/1N/C/003-G | 263551 | 1/60 |

SG4202



Combined RCD/MCB Devices PFL6, 1+N-pole

- Economy series mainly for house installations
- Residual current device / miniature circuit breaker combination
- Tripping characteristics of MCB B, C
- Rated breaking capacity 6 kA
- Rated residual current 30 mA
- Contact position indicator red-green
- Accessories suitable for subsequent installation
-  Frost resistance

wa_sg16604



Combined RCD/MCB Devices PFL6

- Can be used as an additional protection against dangerous contact with live parts ($I_{\Delta n} \leq 30 \text{ mA}$)
- Rated breaking capacity 6 kA
- Busbar positioning optionally above or below
- The device function irrespective of the position of installation
- Contact position indicator red-green
- Twin-purpose terminal (lift/open – mouthed) above and below
- Possibility to use busbar
- Test key "T" must be pressed once a month
- Terminal capacity 1–25 mm²

Surge current-proof 250 A

Rated breaking capacity of MCB 6 kA, 1+N-pole

- Type AC – sensitive to residual AC
- Without time delay – surge current-proof 250 A

wa_sg16604



wa_sg16604



| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|-------------------------|------------------|-------------|-------------------|
| Characteristic B | | | |
| 6/0.03 | PFL6-6/1N/B/003 | 286428 | 1/60 |
| 10/0.03 | PFL6-10/1N/B/003 | 286429 | 1/60 |
| 13/0.03 | PFL6-13/1N/B/003 | 286430 | 1/60 |
| 16/0.03 | PFL6-16/1N/B/003 | 286431 | 1/60 |
| 20/0.03 | PFL6-20/1N/B/003 | 286432 | 1/60 |
| 25/0.03 | PFL6-25/1N/B/003 | 286433 | 1/60 |
| Characteristic C | | | |
| 6/0.03 | PFL6-6/1N/C/003 | 286464 | 1/60 |
| 10/0.03 | PFL6-10/1N/C/003 | 286465 | 1/60 |
| 13/0.03 | PFL6-13/1N/C/003 | 286466 | 1/60 |
| 16/0.03 | PFL6-16/1N/C/003 | 286467 | 1/60 |
| 20/0.03 | PFL6-20/1N/C/003 | 286468 | 1/60 |
| 25/0.03 | PFL6-25/1N/C/003 | 286469 | 1/60 |

Combined RCD/MCB Devices mRB6, 3+N-pole

- Residual current device / miniature circuit breaker combination
- Tripping characteristics of MCB B, C, D
- Rated breaking capacity 6 kA
- Rated currents up to 16 A
- Contact position indicator red-green
- Tripping indicator white - blue
- Guide for secure terminal connection
- 3-position DIN rail clip, permits removal from existing busbar system
- Accessories suitable for subsequent installation
- Suitable mainly for applications with high demand on installation-space savings, e.g. industrial ones (machinery installations, ...)

sg12309



Combined RCD/MCB Devices mRB6



- Can be used as an additional protection against dangerous contact with live parts ($I_{\Delta n} \leq 30 \text{ mA}$), as a protection against dangerous contact with exposed conductive parts ($I_{\Delta n} > 30 \text{ mA}$) or as a fire protection ($I_{\Delta n} \leq 300 \text{ mA}$)
- Rated breaking capacity 6 kA
- Busbar positioning optionally above or below
- Contact position indicator red-green
- Tripping indicator white - blue
- Twin-purpose terminal (lift/open - mouthed) above and below
- Free terminal space despite installed busbar
- Test key "T" must be pressed once a month
- Terminal capacity 1-25 mm²

Conditionally surge current-proof 250 A

- Type A – sensitive to residual AC and residual pulsating DC
- Without time delay – surge current-proof 250 A

sg12309



| $I_n/I_{\Delta n}$ [A] | Type Designation | Article No. | Units per package |
|-------------------------|--------------------|-------------|-------------------|
| Characteristic B | | | |
| 13/0.03 | mRB6-13/3N/B/003-A | 120651 | 1/30 |
| 13/0.1 | mRB6-13/3N/B/01-A | 120653 | 1/30 |
| 13/0.3 | mRB6-13/3N/B/03-A | 120655 | 1/30 |
| 16/0.03 | mRB6-16/3N/B/003-A | 120652 | 1/30 |
| 16/0.1 | mRB6-16/3N/B/01-A | 120654 | 1/30 |
| 16/0.3 | mRB6-16/3N/B/03-A | 120656 | 1/30 |
| Characteristic C | | | |
| 6/0.03 | mRB6-6/3N/C/003-A | 120657 | 1/30 |
| 6/0.1 | mRB6-6/3N/C/01-A | 120661 | 1/30 |
| 6/0.3 | mRB6-6/3N/C/03-A | 120665 | 1/30 |
| 10/0.03 | mRB6-10/3N/C/003-A | 120658 | 1/30 |
| 10/0.1 | mRB6-10/3N/C/01-A | 120662 | 1/30 |
| 10/0.3 | mRB6-10/3N/C/03-A | 120666 | 1/30 |
| 13/0.03 | mRB6-13/3N/C/003-A | 120659 | 1/30 |
| 13/0.1 | mRB6-13/3N/C/01-A | 120663 | 1/30 |
| 13/0.3 | mRB6-13/3N/C/03-A | 120667 | 1/30 |
| 16/0.03 | mRB6-16/3N/C/003-A | 120660 | 1/30 |
| 16/0.1 | mRB6-16/3N/C/01-A | 120664 | 1/30 |
| 16/0.3 | mRB6-16/3N/C/03-A | 120668 | 1/30 |
| Characteristic D | | | |
| 6/0.03 | mRB6-6/3N/D/003-A | 120669 | 1/30 |
| 6/0.1 | mRB6-6/3N/D/01-A | 120673 | 1/30 |
| 10/0.03 | mRB6-10/3N/D/003-A | 120670 | 1/30 |
| 10/0.1 | mRB6-10/3N/D/01-A | 120674 | 1/30 |
| 13/0.03 | mRB6-13/3N/D/003-A | 120671 | 1/30 |
| 13/0.1 | mRB6-13/3N/D/01-A | 120675 | 1/30 |
| 16/0.03 | mRB6-16/3N/D/003-A | 120672 | 1/30 |
| 16/0.1 | mRB6-16/3N/D/01-A | 120676 | 1/30 |

Miniature Circuit Breakers PL7

- MCB for protection against overload and short circuit current in installations
- Tripping characteristics B, C, D
- Rated breaking capacity 10 kA
- Rated currents up to 63 A
- Contact position indicator red-green
- Guide for secure terminal connection
- 3-position DIN rail clip, permits removal from existing busbar system
- Accessories suitable for subsequent installation

wa_sg00808



Miniature Circuit Breakers PL7

- Rated voltage 230/400V AC; 48 V DC
- Selectivity class 3 – high capacity to limit short circuit currents
- Maximum back-up fuse 125 A gL
- Degree of protection IP20
- Contact position indicator red-green
- Terminal capacity 1–25 mm²
- Accessories suitable for subsequent installation
- The device function irrespective of the position of installation

Characteristic B, rated breaking capacity 10 kA

- For socket and light applications with low surge currents

| Rated Current I _n [A] | Type Designation | Article No. | Units per package |
|----------------------------------|------------------|-------------|-------------------|
|----------------------------------|------------------|-------------|-------------------|

1-pole

| | | | |
|----|-----------|--------|--------|
| 2 | PL7-B2/1 | 264839 | 12/120 |
| 4 | PL7-B4/1 | 264850 | 12/120 |
| 6 | PL7-B6/1 | 262673 | 12/120 |
| 10 | PL7-B10/1 | 262674 | 12/120 |
| 13 | PL7-B13/1 | 262675 | 12/120 |
| 16 | PL7-B16/1 | 262676 | 12/120 |
| 20 | PL7-B20/1 | 262677 | 12/120 |
| 25 | PL7-B25/1 | 262678 | 12/120 |
| 32 | PL7-B32/1 | 262679 | 12/120 |
| 40 | PL7-B40/1 | 262690 | 12/120 |
| 50 | PL7-B50/1 | 262691 | 12/120 |
| 63 | PL7-B63/1 | 262692 | 12/120 |

1+N-pole 1.5 MU

| | | | |
|----|------------|--------|------|
| 6 | PL7-B6/1N | 262727 | 8/80 |
| 10 | PL7-B10/1N | 262728 | 8/80 |
| 13 | PL7-B13/1N | 262729 | 8/80 |
| 16 | PL7-B16/1N | 262740 | 8/80 |
| 20 | PL7-B20/1N | 262741 | 8/80 |
| 25 | PL7-B25/1N | 262742 | 8/80 |
| 32 | PL7-B32/1N | 262743 | 8/80 |

2-pole 2 MU

| | | | |
|----|-----------|--------|------|
| 6 | PL7-B6/2 | 262761 | 6/60 |
| 10 | PL7-B10/2 | 262762 | 6/60 |
| 13 | PL7-B13/2 | 262764 | 6/60 |
| 16 | PL7-B16/2 | 262765 | 6/60 |
| 20 | PL7-B20/2 | 262766 | 6/60 |
| 25 | PL7-B25/2 | 262767 | 6/60 |
| 32 | PL7-B32/2 | 262768 | 6/60 |
| 40 | PL7-B40/2 | 262769 | 6/60 |
| 50 | PL7-B50/2 | 263350 | 6/60 |
| 63 | PL7-B63/2 | 263351 | 6/60 |

3-pole

| | | | |
|----|-----------|--------|------|
| 6 | PL7-B6/3 | 263386 | 4/40 |
| 10 | PL7-B10/3 | 263387 | 4/40 |
| 13 | PL7-B13/3 | 263388 | 4/40 |
| 16 | PL7-B16/3 | 263389 | 4/40 |
| 20 | PL7-B20/3 | 263390 | 4/40 |
| 25 | PL7-B25/3 | 263391 | 4/40 |
| 32 | PL7-B32/3 | 263392 | 4/40 |
| 40 | PL7-B40/3 | 263393 | 4/40 |
| 50 | PL7-B50/3 | 263400 | 4/40 |
| 63 | PL7-B63/3 | 263401 | 4/40 |

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wa_sg00808



wa_sg01008



3+N-pole 4 MU

| | | | |
|----|------------|--------|------|
| 6 | PL7-B6/3N | 263982 | 3/30 |
| 10 | PL7-B10/3N | 263983 | 3/30 |
| 13 | PL7-B13/3N | 263984 | 3/30 |
| 16 | PL7-B16/3N | 263985 | 3/30 |
| 20 | PL7-B20/3N | 263986 | 3/30 |
| 25 | PL7-B25/3N | 263987 | 3/30 |
| 32 | PL7-B32/3N | 263988 | 3/30 |
| 40 | PL7-B40/3N | 263989 | 3/30 |
| 50 | PL7-B50/3N | 263990 | 3/30 |
| 63 | PL7-B63/3N | 263991 | 3/30 |

Characteristic C, rated breaking capacity 10 kA

- For applications with motors and applications with higher surge currents

wa_sg00608



| Rated Current I _n [A] | Type Designation | Article No. | Units per package |
|----------------------------------|------------------|-------------|-------------------|
| 1-pole | | | |
| 0.16 | PL7-C0,16/1 | 262693 | 12/120 |
| 0.25 | PL7-C0,25/1 | 262694 | 12/120 |
| 0.5 | PL7-C0,5/1 | 262695 | 12/120 |
| 0.75 | PL7-C0,75/1 | 262696 | 12/120 |
| 1 | PL7-C1/1 | 262697 | 12/120 |
| 1.6 | PL7-C1,6/1 | 262698 | 12/120 |
| 2 | PL7-C2/1 | 262699 | 12/120 |
| 4 | PL7-C4/1 | 262700 | 12/120 |
| 6 | PL7-C6/1 | 262701 | 12/120 |
| 10 | PL7-C10/1 | 262702 | 12/120 |
| 13 | PL7-C13/1 | 262703 | 12/120 |
| 16 | PL7-C16/1 | 262704 | 12/120 |
| 20 | PL7-C20/1 | 262705 | 12/120 |
| 25 | PL7-C25/1 | 262706 | 12/120 |
| 32 | PL7-C32/1 | 262707 | 12/120 |
| 40 | PL7-C40/1 | 262708 | 12/120 |
| 50 | PL7-C50/1 | 262709 | 12/120 |
| 63 | PL7-C63/1 | 262710 | 12/120 |

wa_sg01108



1+N-pole 1.5 MU

| | | | |
|----|------------|--------|------|
| 2 | PL7-C2/1N | 262744 | 8/80 |
| 4 | PL7-C4/1N | 262745 | 8/80 |
| 6 | PL7-C6/1N | 262746 | 8/80 |
| 10 | PL7-C10/1N | 262747 | 8/80 |
| 13 | PL7-C13/1N | 262748 | 8/80 |
| 16 | PL7-C16/1N | 262749 | 8/80 |
| 20 | PL7-C20/1N | 262750 | 8/80 |
| 25 | PL7-C25/1N | 262751 | 8/80 |
| 32 | PL7-C32/1N | 262752 | 8/80 |

wa_sg00708



| Rated Current I_n [A] | Type Designation | Article No. | Units per package |
|-------------------------|------------------|-------------|-------------------|
| 2-pole | | | |
| 0.5 | PL7-C0,5/2 | 263352 | 6/60 |
| 1 | PL7-C1/2 | 263353 | 6/60 |
| 2 | PL7-C2/2 | 263354 | 6/60 |
| 4 | PL7-C4/2 | 263355 | 6/60 |
| 6 | PL7-C6/2 | 263356 | 6/60 |
| 10 | PL7-C10/2 | 263357 | 6/60 |
| 13 | PL7-C13/2 | 263358 | 6/60 |
| 16 | PL7-C16/2 | 263359 | 6/60 |
| 20 | PL7-C20/2 | 263360 | 6/60 |
| 25 | PL7-C25/2 | 263361 | 6/60 |
| 32 | PL7-C32/2 | 263362 | 6/60 |
| 40 | PL7-C40/2 | 263363 | 6/60 |
| 50 | PL7-C50/2 | 263364 | 6/60 |
| 63 | PL7-C63/2 | 263365 | 6/60 |

wa_sg00808



| | | | |
|---------------|------------|--------|------|
| 3-pole | | | |
| 0.5 | PL7-C0,5/3 | 263402 | 4/40 |
| 1 | PL7-C1/3 | 263403 | 4/40 |
| 2 | PL7-C2/3 | 263404 | 4/40 |
| 4 | PL7-C4/3 | 263405 | 4/40 |
| 6 | PL7-C6/3 | 263406 | 4/40 |
| 10 | PL7-C10/3 | 263407 | 4/40 |
| 13 | PL7-C13/3 | 263408 | 4/40 |
| 16 | PL7-C16/3 | 263409 | 4/40 |
| 20 | PL7-C20/3 | 263410 | 4/40 |
| 25 | PL7-C25/3 | 263411 | 4/40 |
| 32 | PL7-C32/3 | 263412 | 4/40 |
| 40 | PL7-C40/3 | 263413 | 4/40 |
| 50 | PL7-C50/3 | 263414 | 4/40 |
| 63 | PL7-C63/3 | 263415 | 4/40 |

wa_sg01008



| | | | |
|----------------------|------------|--------|------|
| 3+N-pole 4 MU | | | |
| 6 | PL7-C6/3N | 263992 | 3/30 |
| 10 | PL7-C10/3N | 263993 | 3/30 |
| 13 | PL7-C13/3N | 263994 | 3/30 |
| 16 | PL7-C16/3N | 263995 | 3/30 |
| 20 | PL7-C20/3N | 263996 | 3/30 |
| 25 | PL7-C25/3N | 263997 | 3/30 |
| 32 | PL7-C32/3N | 263998 | 3/30 |
| 40 | PL7-C40/3N | 263999 | 3/30 |
| 50 | PL7-C50/3N | 264000 | 3/30 |
| 63 | PL7-C63/3N | 264001 | 3/30 |

Characteristic D, rated breaking capacity 10 kA

• For applications with high surge currents

wa_sg00608



| Rated Current I_n [A] | Type Designation | Article No. | Units per package |
|-------------------------|------------------|-------------|-------------------|
| 1-pole | | | |
| 2 | PL7-D2/1 | 262711 | 12/120 |
| 4 | PL7-D4/1 | 262712 | 12/120 |
| 6 | PL7-D6/1 | 262713 | 12/120 |
| 10 | PL7-D10/1 | 262714 | 12/120 |
| 13 | PL7-D13/1 | 262715 | 12/120 |
| 16 | PL7-D16/1 | 262716 | 12/120 |
| 20 | PL7-D20/1 | 262717 | 12/120 |
| 25 | PL7-D25/1 | 262718 | 12/120 |
| 32 | PL7-D32/1 | 262719 | 12/120 |
| 40 | PL7-D40/1 | 262720 | 12/120 |

wa_sg00708



| | | | |
|---------------|-----------|--------|------|
| 2-pole | | | |
| 4 | PL7-D4/2 | 263367 | 6/60 |
| 6 | PL7-D6/2 | 263368 | 6/60 |
| 10 | PL7-D10/2 | 263369 | 6/60 |
| 13 | PL7-D13/2 | 263380 | 6/60 |
| 16 | PL7-D16/2 | 263381 | 6/60 |
| 20 | PL7-D20/2 | 263382 | 6/60 |
| 25 | PL7-D25/2 | 263383 | 6/60 |
| 32 | PL7-D32/2 | 263384 | 6/60 |
| 40 | PL7-D40/2 | 263385 | 6/60 |

wa_sg00808



| | | | |
|---------------|-----------|--------|------|
| 3-pole | | | |
| 6 | PL7-D6/3 | 263418 | 4/40 |
| 10 | PL7-D10/3 | 263419 | 4/40 |
| 13 | PL7-D13/3 | 263420 | 4/40 |
| 16 | PL7-D16/3 | 263421 | 4/40 |
| 20 | PL7-D20/3 | 263422 | 4/40 |
| 25 | PL7-D25/3 | 263423 | 4/40 |
| 32 | PL7-D32/3 | 263424 | 4/40 |
| 40 | PL7-D40/3 | 263425 | 4/40 |

wa_sg01008



| | | | |
|----------------------|------------|--------|------|
| 3+N-pole 4 MU | | | |
| 6 | PL7-D6/3N | 264002 | 3/30 |
| 10 | PL7-D10/3N | 264003 | 3/30 |
| 13 | PL7-D13/3N | 264004 | 3/30 |
| 16 | PL7-D16/3N | 264005 | 3/30 |
| 20 | PL7-D20/3N | 264006 | 3/30 |
| 25 | PL7-D25/3N | 264007 | 3/30 |
| 32 | PL7-D32/3N | 264008 | 3/30 |
| 40 | PL7-D40/3N | 264009 | 3/30 |

Miniature Circuit Breakers PL7 – DC for all types of current

Characteristic C, rated breaking capacity 10 kA (EN 60947-2)

- For applications with DC
- Rated voltage 230/400 V AC; 250 V DC
- Take into account polarity!

wa_sg01508



| Rated Current I_n [A] | Type Designation | Article No. | Units per package |
|-------------------------|------------------|-------------|-------------------|
| 1-pole | | | |
| 1 | PL7-C1/1-DC | 264851 | 12/120 |
| 2 | PL7-C2/1-DC | 264883 | 12/120 |
| 3 | PL7-C3/1-DC | 264884 | 12/120 |
| 4 | PL7-C4/1-DC | 264885 | 12/120 |
| 6 | PL7-C6/1-DC | 264886 | 12/120 |
| 10 | PL7-C10/1-DC | 264887 | 12/120 |
| 13 | PL7-C13/1-DC | 264888 | 12/120 |
| 16 | PL7-C16/1-DC | 264889 | 12/120 |
| 20 | PL7-C20/1-DC | 264890 | 12/120 |
| 25 | PL7-C25/1-DC | 264891 | 12/120 |
| 32 | PL7-C32/1-DC | 264892 | 12/120 |
| 40 | PL7-C40/1-DC | 264893 | 12/120 |
| 50 | PL7-C50/1-DC | 264894 | 12/120 |

wa_sg01608



| | | | |
|---------------|--------------|--------|------|
| 2-pole | | | |
| 1 | PL7-C1/2-DC | 264895 | 6/60 |
| 2 | PL7-C2/2-DC | 264896 | 6/60 |
| 3 | PL7-C3/2-DC | 264897 | 6/60 |
| 4 | PL7-C4/2-DC | 264898 | 6/60 |
| 6 | PL7-C6/2-DC | 264899 | 6/60 |
| 10 | PL7-C10/2-DC | 264900 | 6/60 |
| 13 | PL7-C13/2-DC | 264901 | 6/60 |
| 16 | PL7-C16/2-DC | 264902 | 6/60 |
| 20 | PL7-C20/2-DC | 264903 | 6/60 |
| 25 | PL7-C25/2-DC | 264904 | 6/60 |
| 32 | PL7-C32/2-DC | 264905 | 6/60 |
| 40 | PL7-C40/2-DC | 264906 | 6/60 |
| 50 | PL7-C50/2-DC | 264907 | 6/60 |

Miniature Circuit Breakers PL6

- Economy series suitable for house installations
- Tripping characteristics B, C, D
- Rated breaking capacity 6 kA
- Rated currents up to 63 A
- Contact position indicator red-green
- Accessories suitable for subsequent installation

wa_sg16804



Miniature Circuit Breakers PL6

- Rated voltage 230/400V AC; 48 V DC
- Selectivity class 3 – high capacity to limit shortcircuit currents
- Maximum back-up fuse 100 A gL
- Degree of protection IP20
- Contact position indicator red-green
- Terminal capacity 1–25 mm²
- The device function irrespective of the position of installation
- Accessories suitable for subsequent installation

Characteristic B, rated breaking capacity 6 kA

- For socket and light applications with low surge currents

wa_sg16704



| Rated Current I _n [A] | Type Designation | Article No. | Units per package |
|----------------------------------|------------------|-------------|-------------------|
| 1-pole | | | |
| 2 | PL6-B2/1 | 286516 | 12/120 |
| 4 | PL6-B4/1 | 286517 | 12/120 |
| 6 | PL6-B6/1 | 286518 | 12/120 |
| 10 | PL6-B10/1 | 286519 | 12/120 |
| 13 | PL6-B13/1 | 286520 | 12/120 |
| 16 | PL6-B16/1 | 286521 | 12/120 |
| 20 | PL6-B20/1 | 286522 | 12/120 |
| 25 | PL6-B25/1 | 286523 | 12/120 |
| 32 | PL6-B32/1 | 286524 | 12/120 |
| 40 | PL6-B40/1 | 286525 | 12/120 |
| 50 | PL6-B50/1 | 286526 | 12/120 |
| 63 | PL6-B63/1 | 286527 | 12/120 |

wa_sg16504



| | | | |
|---------------|-----------|--------|------|
| 2-pole | | | |
| 2 | PL6-B2/2 | 286550 | 6/60 |
| 4 | PL6-B4/2 | 286551 | 6/60 |
| 6 | PL6-B6/2 | 286552 | 6/60 |
| 10 | PL6-B10/2 | 286553 | 6/60 |
| 13 | PL6-B13/2 | 286554 | 6/60 |
| 16 | PL6-B16/2 | 286555 | 6/60 |
| 20 | PL6-B20/2 | 286556 | 6/60 |
| 25 | PL6-B25/2 | 286557 | 6/60 |
| 32 | PL6-B32/2 | 286558 | 6/60 |
| 40 | PL6-B40/2 | 286559 | 6/60 |
| 50 | PL6-B50/2 | 286560 | 6/60 |
| 63 | PL6-B63/2 | 286561 | 6/60 |

wa_sg16804



| | | | |
|---------------|-----------|--------|------|
| 3-pole | | | |
| 2 | PL6-B2/3 | 286584 | 4/40 |
| 4 | PL6-B4/3 | 286585 | 4/40 |
| 6 | PL6-B6/3 | 286586 | 4/40 |
| 10 | PL6-B10/3 | 286587 | 4/40 |
| 13 | PL6-B13/3 | 286588 | 4/40 |
| 16 | PL6-B16/3 | 286589 | 4/40 |
| 20 | PL6-B20/3 | 286590 | 4/40 |
| 25 | PL6-B25/3 | 286591 | 4/40 |
| 32 | PL6-B32/3 | 286592 | 4/40 |
| 40 | PL6-B40/3 | 286593 | 4/40 |
| 50 | PL6-B50/3 | 286594 | 4/40 |
| 63 | PL6-B63/3 | 286595 | 4/40 |

Characteristic C, rated breaking capacity 6 kA

- For applications with motors and applications with higher surge currents

| Rated Current I_n [A] | Type Designation | Article No. | Units per package |
|-------------------------|------------------|-------------|-------------------|
| 1-pole | | | |
| 2 | PL6-C2/1 | 286528 | 12/120 |
| 4 | PL6-C4/1 | 286529 | 12/120 |
| 6 | PL6-C6/1 | 286530 | 12/120 |
| 10 | PL6-C10/1 | 286531 | 12/120 |
| 13 | PL6-C13/1 | 286532 | 12/120 |
| 16 | PL6-C16/1 | 286533 | 12/120 |
| 20 | PL6-C20/1 | 286534 | 12/120 |
| 25 | PL6-C25/1 | 286535 | 12/120 |
| 32 | PL6-C32/1 | 286536 | 12/120 |
| 40 | PL6-C40/1 | 286537 | 12/120 |
| 50 | PL6-C50/1 | 286538 | 12/120 |
| 63 | PL6-C63/1 | 286539 | 12/120 |

wa_sg16704



| | | | |
|---------------|-----------|--------|------|
| 2-pole | | | |
| 2 | PL6-C2/2 | 286562 | 6/60 |
| 4 | PL6-C4/2 | 286563 | 6/60 |
| 6 | PL6-C6/2 | 286564 | 6/60 |
| 10 | PL6-C10/2 | 286565 | 6/60 |
| 13 | PL6-C13/2 | 286566 | 6/60 |
| 16 | PL6-C16/2 | 286567 | 6/60 |
| 20 | PL6-C20/2 | 286568 | 6/60 |
| 25 | PL6-C25/2 | 286569 | 6/60 |
| 32 | PL6-C32/2 | 286570 | 6/60 |
| 40 | PL6-C40/2 | 286571 | 6/60 |
| 50 | PL6-C50/2 | 286572 | 6/60 |
| 63 | PL6-C63/2 | 286573 | 6/60 |

wa_sg16504



| | | | |
|---------------|-----------|--------|------|
| 3-pole | | | |
| 2 | PL6-C2/3 | 286596 | 4/40 |
| 4 | PL6-C4/3 | 286597 | 4/40 |
| 6 | PL6-C6/3 | 286598 | 4/40 |
| 10 | PL6-C10/3 | 286599 | 4/40 |
| 13 | PL6-C13/3 | 286600 | 4/40 |
| 16 | PL6-C16/3 | 286601 | 4/40 |
| 20 | PL6-C20/3 | 286602 | 4/40 |
| 25 | PL6-C25/3 | 286603 | 4/40 |
| 32 | PL6-C32/3 | 286604 | 4/40 |
| 40 | PL6-C40/3 | 286605 | 4/40 |
| 50 | PL6-C50/3 | 286606 | 4/40 |
| 63 | PL6-C63/3 | 286607 | 4/40 |

wa_sg16804



Characteristic D, rated breaking capacity 6 kA

• For applications with high surge currents

| Rated Current I_n [A] | Type Designation | Article No. | Units per package |
|-------------------------|------------------|-------------|-------------------|
| 1-pole | | | |
| 2 | PL6-D2/1 | 286540 | 12/120 |
| 4 | PL6-D4/1 | 286541 | 12/120 |
| 6 | PL6-D6/1 | 286542 | 12/120 |
| 10 | PL6-D10/1 | 286543 | 12/120 |
| 13 | PL6-D13/1 | 286544 | 12/120 |
| 16 | PL6-D16/1 | 286545 | 12/120 |
| 20 | PL6-D20/1 | 286546 | 12/120 |
| 25 | PL6-D25/1 | 286547 | 12/120 |
| 32 | PL6-D32/1 | 286548 | 12/120 |
| 40 | PL6-D40/1 | 286549 | 12/120 |

wa_sg16704



| | | | |
|---------------|-----------|--------|------|
| 2-pole | | | |
| 2 | PL6-D2/2 | 286574 | 6/60 |
| 4 | PL6-D4/2 | 286575 | 6/60 |
| 6 | PL6-D6/2 | 286576 | 6/60 |
| 10 | PL6-D10/2 | 286577 | 6/60 |
| 13 | PL6-D13/2 | 286578 | 6/60 |
| 16 | PL6-D16/2 | 286579 | 6/60 |
| 20 | PL6-D20/2 | 286580 | 6/60 |
| 25 | PL6-D25/2 | 286581 | 6/60 |
| 32 | PL6-D32/2 | 286582 | 6/60 |
| 40 | PL6-D40/2 | 286583 | 6/60 |

wa_sg16504



| | | | |
|---------------|-----------|--------|------|
| 3-pole | | | |
| 2 | PL6-D2/3 | 286608 | 4/40 |
| 4 | PL6-D4/3 | 286609 | 4/40 |
| 6 | PL6-D6/3 | 286610 | 4/40 |
| 10 | PL6-D10/3 | 286611 | 4/40 |
| 13 | PL6-D13/3 | 286612 | 4/40 |
| 16 | PL6-D16/3 | 286613 | 4/40 |
| 20 | PL6-D20/3 | 286614 | 4/40 |
| 25 | PL6-D25/3 | 286615 | 4/40 |
| 32 | PL6-D32/3 | 286616 | 4/40 |
| 40 | PL6-D40/3 | 286617 | 4/40 |

wa_sg16804



Miniature Circuit Breakers PLHT and Accessories

- MCBs for higher rated currents suitable also for industrial applications
- Tripping characteristics B, C, D
- Rated breaking capacity from 15 to 25 kA - EN 60947-2
- Rated breaking capacity from 15 to 20 kA - EN 60898-1
- Rated current up to 125 A
- Contact position indicator red-green
- Accessories suitable for subsequent installation
- Mounting onto DIN rail

SG13102



Miniature Circuit Breakers PLHT

- Rated voltage 230/400V AC; 60 V DC
- Selectivity class 3
- Maximum back-up fuse 200 A gL
- Contact position indicator red-green
- Terminal capacity 2.5–50 mm²
- The device function irrespective of the position of installation
- Accessories suitable for subsequent installation

Characteristic B, breaking capacity 15 ... 25 kA (according to rated current)

- For socket and light applications with low surge currents
- Rated breaking capacity for B characteristic:

| | |
|--------------------------|-------|
| $I_n = 20-63 \text{ A}$ | 25 kA |
| $I_n = 80-100 \text{ A}$ | 20 kA |
| $I_n = 125 \text{ A}$ | 15 kA |

| Rated Current I_n [A] | Type Designation | Article No. | Units per package |
|-------------------------|------------------|-------------|-------------------|
|-------------------------|------------------|-------------|-------------------|

1-pole 1.5 MU

| | | | |
|-----|-----------|--------|----|
| 20 | PLHT-B20 | 247972 | 12 |
| 25 | PLHT-B25 | 247973 | 12 |
| 32 | PLHT-B32 | 247974 | 12 |
| 40 | PLHT-B40 | 247975 | 12 |
| 50 | PLHT-B50 | 247976 | 12 |
| 63 | PLHT-B63 | 247977 | 12 |
| 80 | PLHT-B80 | 247978 | 12 |
| 100 | PLHT-B100 | 247979 | 12 |
| 125 | PLHT-B125 | 247980 | 12 |

SG12902



2-pole 3 MU

| | | | |
|-----|-------------|--------|---|
| 20 | PLHT-B20/2 | 247998 | 6 |
| 25 | PLHT-B25/2 | 247999 | 6 |
| 32 | PLHT-B32/2 | 248000 | 6 |
| 40 | PLHT-B40/2 | 248001 | 6 |
| 50 | PLHT-B50/2 | 248002 | 6 |
| 63 | PLHT-B63/2 | 248003 | 6 |
| 80 | PLHT-B80/2 | 248004 | 6 |
| 100 | PLHT-B100/2 | 248005 | 6 |
| 125 | PLHT-B125/2 | 248006 | 6 |

SG13002



3-pole 4.5 MU

| | | | |
|-----|-------------|--------|---|
| 20 | PLHT-B20/3 | 248024 | 4 |
| 25 | PLHT-B25/3 | 248025 | 4 |
| 32 | PLHT-B32/3 | 248026 | 4 |
| 40 | PLHT-B40/3 | 248027 | 4 |
| 50 | PLHT-B50/3 | 248028 | 4 |
| 63 | PLHT-B63/3 | 248029 | 4 |
| 80 | PLHT-B80/3 | 248030 | 4 |
| 100 | PLHT-B100/3 | 248031 | 4 |
| 125 | PLHT-B125/3 | 248032 | 4 |

SG13102



3+N-pole 6 MU

| | | | |
|-----|--------------|--------|---|
| 20 | PLHT-B20/3N | 248050 | 3 |
| 25 | PLHT-B25/3N | 248051 | 3 |
| 32 | PLHT-B32/3N | 248052 | 3 |
| 40 | PLHT-B40/3N | 248053 | 3 |
| 50 | PLHT-B50/3N | 248054 | 3 |
| 63 | PLHT-B63/3N | 248055 | 3 |
| 80 | PLHT-B80/3N | 248056 | 3 |
| 100 | PLHT-B100/3N | 248057 | 3 |
| 125 | PLHT-B125/3N | 248058 | 3 |

SG13202



Characteristic C, breaking capacity 15 ... 25 kA (according to rated current)

• For applications with motors and applications with higher surge currents

• Rated breaking capacity for C characteristic:

| | |
|--------------------------|-------|
| $I_n = 20-63 \text{ A}$ | 25 kA |
| $I_n = 80-100 \text{ A}$ | 20 kA |
| $I_n = 125 \text{ A}$ | 15 kA |

| Rated Current I_n [A] | Type Designation | Article No. | Units per package |
|-------------------------|------------------|-------------|-------------------|
|-------------------------|------------------|-------------|-------------------|

1-pole 1.5 MU

| | | | |
|-----|-----------|--------|----|
| 20 | PLHT-C20 | 247981 | 12 |
| 25 | PLHT-C25 | 247982 | 12 |
| 32 | PLHT-C32 | 247983 | 12 |
| 40 | PLHT-C40 | 247984 | 12 |
| 50 | PLHT-C50 | 247985 | 12 |
| 63 | PLHT-C63 | 247986 | 12 |
| 80 | PLHT-C80 | 247987 | 12 |
| 100 | PLHT-C100 | 247988 | 12 |
| 125 | PLHT-C125 | 247989 | 12 |

SG12902



2-pole 3 MU

| | | | |
|-----|-------------|--------|---|
| 20 | PLHT-C20/2 | 248007 | 6 |
| 25 | PLHT-C25/2 | 248008 | 6 |
| 32 | PLHT-C32/2 | 248009 | 6 |
| 40 | PLHT-C40/2 | 248010 | 6 |
| 50 | PLHT-C50/2 | 248011 | 6 |
| 63 | PLHT-C63/2 | 248012 | 6 |
| 80 | PLHT-C80/2 | 248013 | 6 |
| 100 | PLHT-C100/2 | 248014 | 6 |
| 125 | PLHT-C125/2 | 248015 | 6 |

SG13002



3-pole 4.5 MU

| | | | |
|-----|-------------|--------|---|
| 20 | PLHT-C20/3 | 248033 | 4 |
| 25 | PLHT-C25/3 | 248034 | 4 |
| 32 | PLHT-C32/3 | 248035 | 4 |
| 40 | PLHT-C40/3 | 248036 | 4 |
| 50 | PLHT-C50/3 | 248037 | 4 |
| 63 | PLHT-C63/3 | 248038 | 4 |
| 80 | PLHT-C80/3 | 248039 | 4 |
| 100 | PLHT-C100/3 | 248040 | 4 |
| 125 | PLHT-C125/3 | 248041 | 4 |

SG13102



3+N-pole 6 MU

| | | | |
|-----|--------------|--------|---|
| 20 | PLHT-C20/3N | 248059 | 3 |
| 25 | PLHT-C25/3N | 248060 | 3 |
| 32 | PLHT-C32/3N | 248061 | 3 |
| 40 | PLHT-C40/3N | 248062 | 3 |
| 50 | PLHT-C50/3N | 248063 | 3 |
| 63 | PLHT-C63/3N | 248064 | 3 |
| 80 | PLHT-C80/3N | 248065 | 3 |
| 100 | PLHT-C100/3N | 248066 | 3 |
| 125 | PLHT-C125/3N | 248067 | 3 |

SG13202



Characteristic D, breaking capacity 15 ... 25 kA (according to rated current)

• For applications with high surge currents

• Rated breaking capacity for D characteristic:

| | |
|---------------------------|-------|
| $I_n = 20 - 63 \text{ A}$ | 25 kA |
| $I_n = 80 \text{ A}$ | 20 kA |
| $I_n = 100 \text{ A}$ | 15 kA |

SG12902



| Rated Current I_n [A] | Type Designation | Article No. | Units per package |
|-------------------------|------------------|-------------|-------------------|
| 1-pole 1.5 MU | | | |
| 20 | PLHT-D20 | 247990 | 12 |
| 25 | PLHT-D25 | 247991 | 12 |
| 32 | PLHT-D32 | 247992 | 12 |
| 40 | PLHT-D40 | 247993 | 12 |
| 50 | PLHT-D50 | 247994 | 12 |
| 63 | PLHT-D63 | 247995 | 12 |
| 80 | PLHT-D80 | 247996 | 12 |
| 100 | PLHT-D100 | 247997 | 12 |

SG13002



| | | | |
|--------------------|-------------|--------|---|
| 2-pole 3 MU | | | |
| 20 | PLHT-D20/2 | 248016 | 6 |
| 25 | PLHT-D25/2 | 248017 | 6 |
| 32 | PLHT-D32/2 | 248018 | 6 |
| 40 | PLHT-D40/2 | 248019 | 6 |
| 50 | PLHT-D50/2 | 248020 | 6 |
| 63 | PLHT-D63/2 | 248021 | 6 |
| 80 | PLHT-D80/2 | 248022 | 6 |
| 100 | PLHT-D100/2 | 248023 | 6 |

SG13102



| | | | |
|----------------------|-------------|--------|---|
| 3-pole 4.5 MU | | | |
| 20 | PLHT-D20/3 | 248042 | 4 |
| 25 | PLHT-D25/3 | 248043 | 4 |
| 32 | PLHT-D32/3 | 248044 | 4 |
| 40 | PLHT-D40/3 | 248045 | 4 |
| 50 | PLHT-D50/3 | 248046 | 4 |
| 63 | PLHT-D63/3 | 248047 | 4 |
| 80 | PLHT-D80/3 | 248048 | 4 |
| 100 | PLHT-D100/3 | 248049 | 4 |

SG13202



| | | | |
|----------------------|--------------|--------|---|
| 3+N-pole 6 MU | | | |
| 20 | PLHT-D20/3N | 248068 | 3 |
| 25 | PLHT-D25/3N | 248069 | 3 |
| 32 | PLHT-D32/3N | 248070 | 3 |
| 40 | PLHT-D40/3N | 248071 | 3 |
| 50 | PLHT-D50/3N | 248072 | 3 |
| 63 | PLHT-D63/3N | 248073 | 3 |
| 80 | PLHT-D80/3N | 248074 | 3 |
| 100 | PLHT-D100/3N | 248075 | 3 |

Technical information p. 150

Accessories for Miniature Circuit Breakers PLHT

SG25702



Z-LHASA

SG25802



Z-LHK

| Description | Type Designation | Article No. | Units per package |
|------------------------------------|------------------|-------------|-------------------|
| Shunt Trip Release | | | |
| 110–415 V | Z-LHASA/230 | 248442 | 8 |
| 12–60 V | Z-LHASA/24 | 248441 | 8 |
| Auxiliary Switch | | | |
| 1NC + 1NO contact | Z-LHK | 248440 | 10/100 |
| Busbar blocks Z-SV (1.5 MU) | | | |
| 16 mm ² (up to 80 A) | Z-SV-16/3P | 271072 | 20 |
| End cover | Z-AK-16/2+3P | 271070 | 10/600 |
| 35 mm ² (up to 110 A) | Z-SV-35/PLHT-V | 264939 | 4 |
| End cover | Z-V-35/AK/3P | 264932 | 10/600 |

Note: Residual Currents Blocks PBHT see page 21

Technical information p. 154

Other Devices, Accessories

- Disconnecter switch
 - Auxiliary switch
 - Shunt trip release
 - Relays
 - Pushbuttons with signalisation
 - Motor starters
 - Measuring devices
-
- Utility design
 - Universal utilization
 - Easy mounting

SG13805



SG11402



SG17902



Main Switch Disconnecter IS

- Can be used as a main switch disconnector of distribution board
- Rated voltage 240 / 415 V AC
- Rated short circuit strength 12.5 kA (for $I_n = 16-80$ A) and 6 kA (for $I_n = 100-125$ A)
- Busbar positioning optionally above or below
- Utilization category AC-22
- Degree of protection IP10
- Terminal capacity 2.5–50 mm²
- The device function irrespective of the position of installation

SG14205



SG14305



SG14405



SG14505



| Rated Current [A] | Poles | Type Designation | Article No. | Units per package |
|----------------------------|-------|------------------|-------------|-------------------|
| 16 | 1 | IS-16/1 | 276254 | 12/120 |
| 16 | 2 | IS-16/2 | 276255 | 1/60 |
| 16 | 3 | IS-16/3 | 276256 | 1/40 |
| 16 | 4 | IS-16/4 | 276257 | 1/30 |
| 20 | 1 | IS-20/1 | 276258 | 12/120 |
| 20 | 2 | IS-20/2 | 276259 | 1/60 |
| 20 | 3 | IS-20/3 | 276260 | 1/40 |
| 20 | 4 | IS-20/4 | 276261 | 1/30 |
| 25 | 1 | IS-25/1 | 276262 | 12/120 |
| 25 | 2 | IS-25/2 | 276263 | 1/60 |
| 25 | 3 | IS-25/3 | 276264 | 1/40 |
| 25 | 4 | IS-25/4 | 276265 | 1/30 |
| 32 | 1 | IS-32/1 | 276266 | 12/120 |
| 32 | 2 | IS-32/2 | 276267 | 1/60 |
| 32 | 3 | IS-32/3 | 276268 | 1/40 |
| 32 | 4 | IS-32/4 | 276269 | 1/30 |
| 40 | 1 | IS-40/1 | 276270 | 12/120 |
| 40 | 2 | IS-40/2 | 276271 | 1/60 |
| 40 | 3 | IS-40/3 | 276272 | 1/40 |
| 40 | 4 | IS-40/4 | 276273 | 1/30 |
| 63 | 1 | IS-63/1 | 276274 | 12/120 |
| 63 | 2 | IS-63/2 | 276275 | 1/60 |
| 63 | 3 | IS-63/3 | 276276 | 1/40 |
| 63 | 4 | IS-63/4 | 276277 | 1/30 |
| 80 | 1 | IS-80/1 | 276278 | 12/120 |
| 80 | 2 | IS-80/2 | 276279 | 1/60 |
| 80 | 3 | IS-80/3 | 276280 | 1/40 |
| 80 | 4 | IS-80/4 | 276281 | 1/30 |
| 100 | 1 | IS-100/1 | 276282 | 12/120 |
| 100 | 2 | IS-100/2 | 276283 | 1/60 |
| 100 | 3 | IS-100/3 | 276284 | 1/40 |
| 100 | 4 | IS-100/4 | 276285 | 1/30 |
| 125 | 1 | IS-125/1 | 276286 | 12/120 |
| 125 | 2 | IS-125/2 | 276287 | 1/60 |
| 125 | 3 | IS-125/3 | 276288 | 1/40 |
| 125 | 4 | IS-125/4 | 276289 | 1/30 |
| Accessories | | | | |
| Locking set (without lock) | | IS/SPE-1TE | 101911 | 5/30 |
| Terminal cover | | Z-IS/AK-1TE | 276290 | 10/600 |

Technical information p. 155

Switch Disconnectors ZP-A..

- Can be used as a main switch disconnector of distribution board
- Rated voltage 230 / 400 V AC
- Rated short circuit strength 3 kA (with back-up fuse 63 A gL)
- Degree of protection IP20
- Terminal capacity 1.5–25 mm²
- The same accessories as for MCBs PL6, PL7 can be used (auxiliary switch, shunt trip release, undervoltage release etc.)

SG23602



| Rated Current [A] | Poles | Type Designation | Article No. | Units per package |
|-------------------|-------|------------------|-------------|-------------------|
| 40 | 1 | ZP-A40/1 | 248263 | 12/120 |
| 40 | 2 | ZP-A40/2 | 248264 | 1/60 |
| 40 | 3 | ZP-A40/3 | 248265 | 1/40 |
| 40 | 3+N | ZP-A40/3N | 248266 | 1/30 |
| 63 | 1 | ZP-A63/1 | 284906 | 12/120 |
| 63 | 2 | ZP-A63/2 | 284907 | 1/60 |
| 63 | 3 | ZP-A63/3 | 284908 | 1/40 |
| 63 | 3+N | ZP-A63/3N | 284909 | 1/30 |

Technical information p. 156



Z-D63 Z-D63/P

Lead-through terminal

- For interconnection between top and bottom busbar system
- Rated current 63 or 80 A
- Version Z-D63/P with test socket
- Degree of protection IP20
- Terminal capacity 1–25 mm² (or 2.5–50 mm² for Z-D80)

| Rated Current [A] | Type Designation | Article No. | Units per package |
|----------------------|------------------|-------------|-------------------|
| 63 | Z-D63 | 248267 | 12/120 |
| 63, with test socket | Z-D63/P | 248268 | 12/120 |
| 80 | Z-D80 | 248269 | 12/120 |

Technical information p. 156

MCBs for Auxiliary Circuits PL7-B4/.-HS

Characteristic B, rated breaking capacity 10 kA

- For protection of contacts of auxiliary circuits
- Strongly reduced value of I²t decreases worn-out of contacts in auxiliary circuits
- Rated voltage 230/400 V AC
- Rated current 4 A
- Degree of protection IP20
- Terminal capacity 1.5–25 mm²



Technical information p. 157

| Poles | Breaking capacity | Type Designation | Article No. | Units per package |
|-------|-------------------|------------------|-------------|-------------------|
| 1 | 10 kA | PL7-B4-HS | 264908 | 2/120 |
| 1N | 10 kA | PL7-B4/1N-HS | 264909 | 1/80 |
| 2 | 10 kA | PL7-B4/2-HS | 264910 | 1/60 |

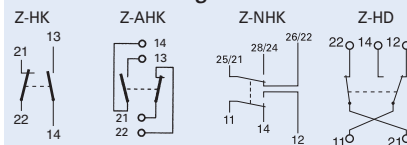
Auxiliary Switch Z-HK, Z-AHK, Tripping Signal Switch Z-NHK, Z-HD

- Design according to EN 60947-5-1, EN 62019
- Mounting by means of screws
- **Z-AHK, Z-NHK:** Contact function with relative movement (self-cleaning contacts)
- Contact material and design particularly suitable for extra low voltage
- **Z-HK:** only for RCDs PF7, PFR, PHF7-4p, PF6
- **Z-AHK:** for PHF7-2p
- **Z-NHK:** Universal design for PF7, PHF7, PFR, PF6
- The function of one of the two change-over contacts (25/21, 26/22, 28/24) can be switched from "auxiliary switch" to "tripping signal switch" by means of SEL driver
- Auxiliary switch (11, 12, 14; 21, 22, 24) is active with both electrical and mechanical tripping
- Tripping signal switch (25, 26, 28) is active with electrical tripping only
- Contact position indicator blue-white
- **Z-HD:** for PFDM RCDs



Z-HK

Connection diagrams



| For Protective Device | Rated Current [A] | Type Designation | Article No. | Units per package |
|------------------------|----------------------|------------------|-------------|-------------------|
| PF7, PF6, PHF7-4p, PFR | 8 | Z-HK | 248432 | 4/120 |
| PHF7-2p | 4 | Z-AHK | 248433 | 4/120 |
| PF7, PHF7, PF6 | 4 | Z-NHK | 248434 | 4/120 |
| PFDM | 6 A AC11 1 A DC11 | Z-HD | 265620 | 1 |

Technical information p. 158, 121



ZP-NHK

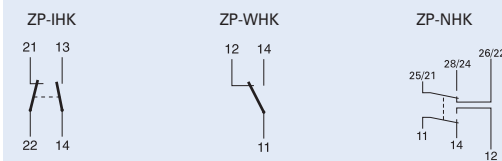


ZP-IHK

Auxiliary Switch ZP-IHK, ZP-WHK, Tripping Signal Switch ZP-NHK

- Design according to EN 62019
- Snap-on mounting, can be mounted onto PL7, PFL7, PL6, PFL6, ZP-A40, ZP-A63, Z-MS a mRB6
- **ZP-NHK:** Contact function with relative movement (self-cleaning contacts)
- Contact material and design particularly suitable for extra low voltage
- **ZP-IHK, ZP-WHK:** 2 switches can be mounted onto itself thanks to mechanical design (2 x ZP-IHK or 2 x ZP-WHK or alternatively 1 x ZP-IHK + 1 x ZP-WHK)
- **ZP-NHK:** Universal design for PL7, PFL7. The function of one of the two change-over contacts (25/21, 26/22, 28/24) can be switched from "auxiliary switch" to "tripping signal switch" by means of SEL driver
- Auxiliary switch (11, 12, 14; 21, 22, 24) is active with both electrical and mechanical tripping
- Tripping signal switch (25, 26, 28) is active with electrical tripping only

Connection diagram



| Function | Rated Current [A] | Type Designation | Article No. | Units per package |
|-------------|-------------------|------------------|-------------|-------------------|
| 1 NO + 1 NC | 6 | ZP-IHK | 286052 | 4/120 |
| 1 CO | 6 | ZP-WHK | 286053 | 4/120 |
| 2 CO | 4 | ZP-NHK | 248437 | 4/120 |

Technical information p. 160



ZP-ASA

Shunt Trip Release ZP-ASA

- Shunt trip release for subsequent mounting onto PL7, PL6, PFL7, PFL6, ZP-A40, ZP-A63, Z-MS, mRB6
- Width 1 MU
- Additional installation of standard auxiliary switch is possible
- Position indicator red - green
- Snap-on mounting

| Operational voltage range | Type Designation | Article No. | Units per package |
|-----------------------------|------------------|-------------|-------------------|
| 12–110 V AC / 12–60 V DC | ZP-ASA/24 | 248438 | 1/60 |
| 110–415 V AC / 110–220 V DC | ZP-ASA/230 | 248439 | 1/60 |

Technical information p. 161

Additional terminal

- For connection of conductors up to 35 mm²

| Description | Type Designation | Article No. | Units per package |
|--|------------------|-------------|-------------------|
| Additional terminal 35 mm ² | Z-HA-EK/35 | 263960 | 12/720 |

Switching interlocks

- Sets for locking of toggle in ON or OFF position
- If locked in ON position, the function of electrical tripping of a breaker is not affected, mechanical operation is blocked only
- Delivered without lock

| For device | Type Designation | Article No. | Units per package |
|---|------------------|-------------|-------------------|
| IS, PF7, PF6, PHF7, dRCM, PFL7, PFL6, mRB6, PFR | IS/SPE-1TE | 101911 | 5/30 |
| PL7, PL6, ZP-A, Z-MS | Z-IS/SPE-1TE | 274418 | 5/30 |

Undervoltage release Z-USA, Z-USD

- Undervoltage releases:
without delay Z-USA
delayed Z-USD with delay 0.4 s
- Release position indicator blue / white
- Test button for checking of proper function
- Can be mounted onto PL7, ZP-A40, ZP-A63, Z-MS, PL6 and mRB6
- Screws mounting
- Switch on limit 80 % U_n
- Lowest switch off limit 50 % U_n

SG12702



| Voltage AC [V] / Function | Type Designation | Article No. | Units per package |
|---------------------------|------------------|-------------|-------------------|
| 115 / without delay | Z-USA/115 | 248288 | 1/60 |
| 230 / without delay | Z-USA/230 | 248289 | 1/60 |
| 400 / without delay | Z-USA/400 | 248290 | 1/60 |
| 115 / delayed 0.4 s | Z-USD/115 | 248292 | 1/60 |
| 230 / delayed 0.4 s | Z-USD/230 | 248291 | 1/60 |

Technical information p. 162

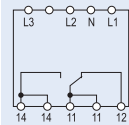
Undervoltage relay Z-UR/400

- Relay is switched on by connection of voltage to terminals L1, L2, L3 and neutral conductor to N-terminal. LED is switched on. On condition that voltage at one, two, or three phases is below than U_s ($U_s = U_n \times 0.85$), the relay and LED are switched off.
- One-phase applications: interconnection of L1-L2-L3 terminals.

SG2002



Connection diagram



| Switching Voltage U_s | Rated Current | Type Designation | Article No. | Units per package |
|----------------------------------|---------------|------------------|-------------|-------------------|
| $U_n \times 0.85$ 230 / 400 V AC | 5 A | Z-UR/400 | 248252 | 1 |

Technical information p. 163

RCD Tripping Module Z-AM

- For remote breaking of RCDs
- Rated voltage 230/400 V AC
- Degree of protection IP20
- Terminal capacity 2 x 2.5 mm²

SG12102



Z-FAM

SG13405



Z-KAM

| For device | Type Designation | Article No. | Units per package |
|---------------------|------------------|-------------|-------------------|
| PF7, PF6, PHF7-4p | Z-FAM | 248293 | 1/60 |
| PFL7, PFL6, PHF7-2p | Z-KAM | 248294 | 1/60 |

Technical information p. 164

SG13905



SG13705



Technical information p. 165

SG12202



Technical information p. 166

SG07708



Technical information p. 167

SG09906



FFS/16

SG09708



Z-NKA-SCH

Technical information p. 169

Automatic Switching Device Z-FW

- For automatic or remote control of hardly accessible distribution rooms or distribution rooms without supervisor
- For subsequent mounting onto PL7, PL6, PF7, PF6, PHF7-4p, ZP-A40, ZP-A63, PFR, Z-MS, dRCM, mRB6
- **Z-FW-LP** for automatic repeated switching, supply voltage 230 V AC
- **Z-FW-LPD** for automatic repeated switching, supply voltage 24–48 V DC

- **Z-FW-LP(D)/MO** pre-mounted set consisting of Z-FW-LP(D) and remote control Z-FW-MO
- Mechanical interlock, can be sealed with leads
- Mechanical switching capability up to max. PF7-100/4p, PF6-63/4p, PL7-63/4p, PL6 all types
- Operating and alarm display by green and red LED
- Module for remote testing Z-FW of residual current devices PF7 a PF6

| Function | Supply voltage | Type Designation | Article No. | Units per package |
|---|----------------|------------------|-------------|-------------------|
| Without remote control | 230 V AC | Z-FW-LP | 248296 | 1/20 |
| Without remote control | 24–48 V DC | Z-FW-LPD | 265244 | 1/20 |
| Set with remote control | 230 V AC | Z-FW-LP/MO | 290171 | 1/12 |
| Set with remote control | 24–48 V DC | Z-FW-LPD/MO | 290172 | 1/12 |
| Remote control ON/OFF/TEST (only in connection with Z-FW-LP, -LPD from delivery date 2006!) | | | | |
| | | Z-FW-MO | 284730 | 1 |

Module for remote testing

| Residual current [A] | Type Designation | Article No. | Units per package |
|----------------------|------------------|-------------|-------------------|
| 0.01 | Z-FW/001 | 248297 | 4/120 |
| 0.03 | Z-FW/003 | 248298 | 4/120 |
| 0.1 | Z-FW/010 | 248299 | 4/120 |
| 0.3 | Z-FW/030 | 248300 | 4/120 |
| 0.5 | Z-FW/050 | 248301 | 4/120 |

Communication Center Z-CC/2CO

- Universal GSM device for monitoring as well as controlling of devices via SMS
- Integrated 4-band GSM modem
- 4 digital inputs
- 2 relay outputs
- Activation of inputs generates sending of SMS up to 3 telephone numbers and 1 e-mail address
- Actual device status can be checked via SMS anytime
- Possibility of connection to local network

| Description | Type Designation | Article No. | Units per package |
|----------------------------------|--------------------------------------|-------------|-------------------|
| Communication Center | Z-CC/2CO | 119383 | 1 |
| Power supply unit (24 V / 0.2 A) | EASYPOW200 | 229424 | 1 |
| Temperature sensor | Z-CC/2CO-SE | 119430 | 1 |
| Patch cord 2.0 m | DNW-PX/0200/RJ45/RJ45/5E/CSUTP/GR/PV | 237271 | 1 |

Bio-switch FFS/16

- For automatic disconnection from supply voltage in time without current consumption
- 2 NO contacts 16 A / 250 V
- Line voltage LED
- Not suitable for consumers with electronic control
- Detecting voltage about 4 V DC in controlled circuit during off state
- For consumers with extremely low consumption, it is necessary to use basic load Z-NHK-SCH to ensure start up current for proper function (basic load is automatically disconnected after 5 minutes)

| Description | Rated Current [A] | Type Designation | Article No. | Units per package |
|-------------|-------------------|------------------|-------------|-------------------|
| Bio-switch | 16 | FFS/16 | 107325 | 1/60 |
| Basic load | | Z-NKA-SCH | 120890 | 1/12 |

SG12502



Front Plate Tripping Device Z-MFPA

- To switch off connected device if front plate is removed
- Mechanical breaker for ZP-A40, ZP-A63, PL7, PL6, PFL7, PFL6
- Trips connected device when front plate is taken out
- Maximum tripped capacity: 4 + 4 poles symmetrically (4 left, 4 right)
- Can be interlocked by twisting when the tripping pin is in the pressed position
- Meets requirements of standards for automatic disconnection from power supply if front plate of distribution box is removed (see HD 60364-4-41 cl. A.2.4)

| | Type Designation | Article No. | Units per package |
|-----------------------------|------------------|-------------|-------------------|
| Front plate tripping device | Z-MFPA | 248302 | 6/60 |

Technical information p. 170

SG4100



Protective Earth Socket for DIN rail Z-SD..

- Meets requirements of VDE, ÖVE, ČSN
- Possibility of screw mounting
- Width 2.5 MU
- Design -BS with child protection device

| Design | Type Designation | Article No. | Units per package |
|--|------------------|-------------|-------------------|
| Protective earth socket with child protection device | Z-SD230-BS | 266876 | 10/50 |
| Protective earth socket in Schuko design | Z-SD230 | 266875 | 10/50 |

SG4100



Technical information p. 170

Priority-(Current) Relay Z-LAR/..

- For simple priority connection of important consumers
- Wide range of currents
- Expensive peak loads are avoided efficiently (staggered heating)
- Integrated auxiliary switch, 1 NC or 1 NO or 1 CO contact
- NC and NO contact are potential free
- Rated current 8, 16, 32 A
- Rated voltage 250 V AC

SG11702



| Contacts | Rated Current [A] | Type Designation | Article No. | Units per package |
|----------|-------------------|------------------|-------------|-------------------|
| 1 NC | 3–8 | Z-LAR/8-O | 248256 | 1/60 |
| 1 NC | 10–16 | Z-LAR/16-O | 248257 | 1/60 |
| 1 NC | 15–32 | Z-LAR/32-O | 248258 | 1/60 |
| 1 NO | 3–8 | Z-LAR/8-S | 248259 | 1/60 |
| 1 NO | 10–16 | Z-LAR/16-S | 248260 | 1/60 |
| 1 NO | 15–32 | Z-LAR/32-S | 248261 | 1/60 |
| 1 CO | 3–8 | Z-LAR/8-W | 248262 | 1/60 |

Technical information p. 171

Signal Lamps Z-EL, Z-DLD, Z-UEL, Z-UDL, Z-BEL

- Rated voltage 24 V AC/DC or 230 V AC/DC
- Colour red/green, can be selected by alternative wiring
- Flash option by usage of different terminals only, changeover option
- Terminal capacity 1–10 mm²
- Twin lamp means 50 % saving of space in comparison to a pair of individual lamps

SG12003



| LED colour | Rated voltage LED | Type Designation | Article No. | Units per package |
|---|-------------------|------------------|-------------|-------------------|
| Single Lamp | | | | |
| Z-EL | | | | |
| orange | 24 V AC/DC | Z-EL/OR24 | 275444 | 2/120 |
| red | 230 V AC/DC | Z-EL/R230 | 284921 | 2/120 |
| green | 230 V AC/DC | Z-EL/G230 | 284922 | 2/120 |
| orange | 230 V AC/DC | Z-EL/OR230 | 275865 | 2/120 |
| blue | 230 V AC/DC | Z-EL/BL230 | 103131 | 2/120 |
| Twin Lamp | | | | |
| Z-DLD | | | | |
| red + green | 24 V AC/DC | Z-DLD/2/24 | 284926 | 2/120 |
| red + green | 230 V AC/DC | Z-DLD/2/230 | 284925 | 2/120 |
| Universal Single Lamp - changeover function | | | | |
| Z-UEL | | | | |
| red / green | 24 V AC/DC | Z-UEL24 | 284924 | 2/120 |
| red / green | 230 V AC/DC | Z-UEL230 | 284923 | 2/120 |
| Universal Twin Lamp - changeover function | | | | |
| Z-UDL | | | | |
| red / green | 24 V AC/DC | Z-UDL24 | 284928 | 2/120 |
| red / green | 230 V AC/DC | Z-UDL230 | 284927 | 2/120 |
| Signal Lamp - with integrated flash function | | | | |
| Z-BEL | | | | |
| red | 24 V AC/DC | Z-BEL/R24 | 284931 | 2/120 |
| green | 24 V AC/DC | Z-BEL/G24 | 284932 | 2/120 |
| red | 230 V AC/DC | Z-BEL/R230 | 284929 | 2/120 |
| green | 230 V AC/DC | Z-BEL/G230 | 284930 | 2/120 |

Technical information p. 172

Pushbutton Unit Z-PU, Pushbutton Unit with LED Z-PUL

- Rated voltage of LED 24 V AC/DC or 230 V AC/DC
- Rated current of contacts 16 A 250 V AC
- Low power consumption of LED
- Terminal capacity 1–10 mm²
- LED colour orange
- Pushbutton colour
 - NO contact green
 - NC contact red
 - NO + NC contact black

SG12203



| Rated voltage LED | Contacts | Type Designation | Article No. | Units per package |
|-------------------|-------------|------------------|-------------|-------------------|
| - | 1 NO | Z-PU/S | 276291 | 2/120 |
| - | 2 NO | Z-PU/SS | 276292 | 2/120 |
| - | 1 NO + 1 NC | Z-PU/SO | 276293 | 2/120 |
| - | 2 NC | Z-PU/OO | 276294 | 2/120 |
| 24 V AC/DC | 2 NO | Z-PUL24/SS | 276295 | 2/120 |
| 24 V AC/DC | 1 NO + 1 NC | Z-PUL24/SO | 276296 | 2/120 |
| 230 V AC/DC | 2 NO | Z-PUL230/SS | 276297 | 2/120 |
| 230 V AC/DC | 1 NO + 1 NC | Z-PUL230/SO | 276298 | 2/120 |
| 230 V AC/DC | 2 NC | Z-PUL230/OO | 276299 | 2/120 |

Technical information p. 172

Switch Z-SW and Switch with LED Z-SWL

- Rated voltage of LED 24 V AC/DC or 230 V AC/DC
- Rated current of contacts 16 A, 250 V AC
- Low power consumption of LED
- Standard colour of LED orange, standard colour of pushbutton black
- Terminal capacity 1–10 mm²

SG12103



| Rated voltage LED | Contacts | Type Designation | Article No. | Units per package |
|-------------------|-------------|------------------|-------------|-------------------|
| - | 1 NO | Z-SW/S | 276300 | 2/120 |
| - | 2 NO | Z-SW/SS | 276301 | 2/120 |
| - | 1 NO + 1 NC | Z-SW/SO | 276302 | 2/120 |
| - | 1 CO | Z-SW/W | 276303 | 2/120 |
| 24 V AC / DC | 2 NO | Z-SWL24/SS | 276304 | 2/120 |
| 24 V AC / DC | 1 NO + 1 NC | Z-SWL24/SO | 276305 | 2/120 |
| 230 V AC / DC | 2 NO | Z-SWL230/SS | 276306 | 2/120 |
| 230 V AC / DC | 1 NO + 1 NC | Z-SWL230/SO | 276307 | 2/120 |
| 230 V AC / DC | 1 NO | Z-SWL230/S | 292300 | 2/120 |

Technical information p. 172

Pushbutton Z-T

- Rated voltage 230 V AC
- Rated current of contacts 16 A
- Terminal capacity 1–10 mm²

SG18502



| Filter/push button | Contacts | Type Designation | Article No. | Units per package |
|--------------------|-------------|------------------|-------------|-------------------|
| - / green | 4 NO | Z-T/4S-G | 248328 | 12/120 |
| - / black | 3 NO + 1 NC | Z-T/3S10 | 248330 | 12/120 |

Technical information p. 173

Switch Z-S

- Rated voltage 230 V AC
- Rated current of contacts 16; 32 A
- Terminal capacity 1–10 mm²

SG18702



| Rated Current | Contacts | Type Designation | Article No. | Units per package |
|---------------|-------------|------------------|-------------|-------------------|
| 16 A | 3 NO | Z-S/3S | 248334 | 12/120 |
| 16 A | 4 NO | Z-S/4S | 248335 | 12/120 |
| 16 A | 2 NO + 2 NC | Z-S/SSOO | 248337 | 12/120 |
| 16 A | 3 NO + 1 NC | Z-S/3S10 | 248338 | 12/120 |
| 32 A | 1 NO | Z-S32/S | 248339 | 12/120 |
| 32 A | 2 NO | Z-S32/SS | 248340 | 12/120 |
| 32 A | 3 NO | Z-S32/3S | 248341 | 12/120 |
| 32 A | 4 NO | Z-S32/4S | 248342 | 12/120 |

Technical information p. 173

Changeover Switch Z-S/W..

- Rated voltage 230 V AC
- Rated current of contacts 16 A
- Degree of protection IP20
- Terminal capacity 1–10 mm²

SG18602



| Contacts | Type Designation | Article No. | Units per package |
|-------------|------------------|-------------|-------------------|
| 2 CO | Z-S/2WE | 248344 | 12/120 |
| 1 CO I-0-II | Z-S/WM | 248345 | 12/120 |
| 2 CO I-0-II | Z-S/2WM | 248346 | 12/120 |

Technical information p. 173

Rotary Switch Z-DS

- Suitable for direct switching of motors, lighting, heating system or as instrument switches
- Degree of protection IP20
- Rated voltage 690 V AC
- Terminal capacity 2 x 0.75–1.5 mm²
- Rated current 20 A

SG3602



Z-DSU1-102

SG3702



Z-DSA2-01-SL

| Function | Description | Type Designation | Article No. | Units per package |
|---------------------------|---------------|------------------|-------------|-------------------|
| 1pole OFF | 0 - 1 | Z-DSA1-01 | 248868 | 1/40 |
| 1pole CHANGE | 1 - 0 - 2 | Z-DSU1-102 | 248869 | 1/40 |
| 2pole OFF | 0 - 1 | Z-DSA2-01 | 248872 | 1/40 |
| 2pole OFF with lock *) | 0 - 1 | Z-DSA2-01-SL | 248873 | 1/40 |
| 2pole CHANGE | 1 - 2 | Z-DSU2-12 | 248874 | 1/40 |
| 2pole CHANGE | 1 - 0 - 2 | Z-DSU2-102 | 248875 | 1/40 |
| 2pole CHANGE | HA - 0 - AU | Z-DSU2-H0A | 248876 | 1/40 |
| 3pole CHANGE | 1 - 0 - 2 | Z-DSU3-102 | 248877 | 1/40 |
| Voltmeter L-N | L1 - N... | Z-DSV-LN | 248878 | 1/40 |
| Voltmeter L-L | L1 - L2... | Z-DSV-LL | 248879 | 1/40 |
| Voltmeter L+N | L1 - N3... | Z-DSV-LLLN | 248880 | 1/40 |
| Amperemeter | 0 - 1 - 2 - 3 | Z-DSAM-0123 | 129712 | 1/40 |

*) Key can be pulled out in both positions "0" and "1".

Technical information p. 174

Time-Lag Relay ZR

- Driving voltage 24 – 240 V AC/DC
- Rated switching capacity for AC-1 2000 VA
- Rated current of output contacts 8 A at 250 V AC
- Terminal capacity 2 x 0.5–2.5 mm²

SG09807



ZRMF1/W

SG09907



ZRMF2/WW

| Function | Contacts | Type Designation | Article No. | Units per package |
|--------------------------|----------|------------------|-------------|-------------------|
| E, R | 1 CO | ZRER/W | 110405 | 2/120 |
| E, R, Ws, Wa, Es, Wu, Bp | 1 CO | ZRMF1/W | 110406 | 2/120 |
| E, R, Ws, Wa, Es, Wu, Bp | 2 CO | ZRMF2/WW | 110408 | 1/60 |
| Ip, li | 1 CO | ZRTAK/W | 110747 | 2/120 |

Technical information p. 177

Impulse Relays Z-S...

- Suitable for switching electrical consumers in impulse operation
- Rated control voltage 12 V, 24 V, 48 V, 230 V AC; 12 V, 24 V DC
- Rated current of output contacts 16 A at 230 V AC
- Rated switching capacity for AC-1 2000 VA
- Degree of protection IP20
- Terminal capacity 0.5–10 mm²

WA_SG12802



Z-S24/SO

Type Z-S for local control

- with pushbutton

| Control voltage | Contacts | Width MU | Type Designation | Article No. | Units per package |
|---------------------|-------------|----------|------------------|-------------|-------------------|
| 230 V AC | 1 NO | 1 | Z-S230/S | 265262 | 2/120 |
| 230 V AC | 2 NO | 1 | Z-S230/SS | 265271 | 2/120 |
| 230 V AC | 1 CO | 1 | Z-S230/W | 265290 | 2/120 |
| 230 V AC | 2 CO | 2 | Z-S230/WW | 265312 | 1/60 |
| 230 V AC | 1 NO + 1 NC | 1 | Z-S230/SO | 265283 | 2/120 |
| 230 V AC | 2 NO + 2 NC | 2 | Z-S230/2S2O | 265305 | 1/60 |
| 48 V AC / 24 V DC*) | 1 NO | 1 | Z-S48/S | 265534 | 2/120 |
| 48 V AC / 24 V DC*) | 2 NO | 1 | Z-S48/SS | 265536 | 2/120 |
| 48 V AC / 24 V DC*) | 1 NO + 1 NC | 1 | Z-S48/SO | 265538 | 2/120 |
| 48 V AC / 24 V DC*) | 2 NO + 2 NC | 2 | Z-S48/2S2O | 265540 | 1/60 |
| 48 V AC / 24 V DC*) | 1 CO | 1 | Z-S48/W | 265544 | 2/120 |
| 48 V AC / 24 V DC*) | 2 CO | 2 | Z-S48/WW | 265542 | 1/60 |
| 24 V AC / 12 V DC*) | 1 NO | 1 | Z-S24/S | 265535 | 2/120 |
| 24 V AC / 12 V DC*) | 2 NO | 1 | Z-S24/SS | 265537 | 2/120 |
| 24 V AC / 12 V DC*) | 1 NO + 1 NC | 1 | Z-S24/SO | 265539 | 2/120 |
| 24 V AC / 12 V DC*) | 2 NO + 2 NC | 2 | Z-S24/2S2O | 265541 | 1/60 |
| 24 V AC / 12 V DC*) | 1 CO | 1 | Z-S24/W | 265545 | 2/120 |
| 24 V AC / 12 V DC*) | 2 CO | 2 | Z-S24/WW | 265543 | 1/60 |
| 12 V AC | 2 NO | 1 | Z-S12/SS | 265278 | 2/120 |

*) Possibility of AC/DC control

WA_SG13002



Type Z-SB for local control

- with pushbutton and LED

| Control voltage | Contacts | Width MU | Type Designation | Article No. | Units per package |
|-----------------|----------|----------|------------------|-------------|-------------------|
| 230 V AC | 2 NO | 1 | Z-SB230/SS | 265301 | 2/120 |
| 24 V AC | 2 NO | 1 | Z-SB24/SS | 265302 | 2/120 |
| 24 V DC | 2 NO | 1 | Z-SB23/SS | 265303 | 2/120 |

WA_SG13102



Z-SC230/S

Type Z-SC for central control

- with pushbutton

| Control voltage | Contacts | Width MU | Type Designation | Article No. | Units per package |
|-----------------|-------------|----------|------------------|-------------|-------------------|
| 230 V AC | 1 NO | 1 | Z-SC230/S | 265299 | 2/120 |
| 230 V AC | 1 NO + 1 CO | 2 | Z-SC230/1S1W | 265324 | 1/60 |
| 230 V AC | 2 NO + 1 NC | 2 | Z-SC230/2S1O | 265327 | 1/60 |
| 230 V AC | 3 NO | 2 | Z-SC230/3S | 265321 | 1/60 |
| 24 V AC | 1 NO | 1 | Z-SC24/S | 265300 | 2/120 |

Accessories for impulse relays

| | | | | | |
|---------------|--|---|---------|--------|-------|
| Compensator | | 1 | Z-S/KO | 270588 | 2/120 |
| Group block | | 1 | Z-SC/GP | 270587 | 2/120 |
| Spacer 0.5 MU | | | Z-DST | 248949 | 10 |

Note:

Spacer is designed for separation of a pair of impulse relays with air gap – duty of inputs of relays with spacer is higher (of order of hours, < 100 %). In continual regime of operation (long control pulse), surface temperature of a relay can be increased in accordance with EN 60669.

sg 12705



TLK

Technical information p. 182

Staircase Switch TL.

- Rated permanent current 16 A AC
- Switching capacity 4000 VA / AC1
- Adjustment range 0.5–15 min
- Terminal capacity 1 x 4 mm²
2 x 2.5 mm²

- Type TLE – with switchoff warning and stop function
- Type TLK – with additional control input for central control, zero-voltage proof

| Function | Type Designation | Article No. | Units per package |
|---|------------------|-------------|-------------------|
| Staircase switch with STOP and alarm | TLE | 101064 | 2/120 |
| As TLE with central control input, zero-voltage proof | TLK | 101066 | 2/120 |

SG11207



SG11107



DS-TA/WA

DS-TD/WA

Technical information p. 183

Light Intensity Switch for wall mounting DS-T.

- For automatic control of lighting systems with respect to light intensity at sensor
- Wall-mounted
- Rated voltage 230 V AC
- Rated current 10 - 16 A (AC-1)

- 1 NO contact
- DS-TD with integrated timer
- With internal light sensor
- Terminal capacity 1-4 mm²

| Light intensity [Lux] | Type Designation | Article No. | Units per package |
|-----------------------|------------------|-------------|-------------------|
| 5 – 200 | DS-TA/WA | 111454 | 1/40 |
| 2 – 2000 | DS-TA/VWA | 111455 | 1/40 |
| 2 – 200 | DS-TD/WA | 111456 | 1/40 |

SG11807



DS-TA/1S

SG11607

SG11507



Z-DS/S-A



DS-TD/1W

Technical information p. 185

Light Intensity Switch for support rail assembly DS-T.

- For automatic switching of lights with respect to light intensity at the sensor
- Mounting onto device rail
- Rated voltage 230 V AC
- Rated current 10 - 16 A (AC-1)

- DS-TD with integrated timer
- With external light sensor
- Terminal capacity 1-4 mm²

| Switching contact | Light intensity [Lux] | Type Designation | Article No. | Units per package |
|-------------------|-----------------------|------------------|-------------|-------------------|
| 1 NO | 2 - 100 | DS-TA/1S | 111451 | 1/40 |
| 1 CO | 2 - 2000 | DS-TA/1W | 111452 | 1/40 |
| 1 CO | 2 - 2000 | DS-TD/1W | 111453 | 1/40 |

Accessories

| Description | Type Designation | Article No. | Units per package |
|-----------------------------|------------------|-------------|-------------------|
| Spare Built-in Light Sensor | Z-DS/S-E | 111457 | 1/40 |
| Spare External Light Sensor | Z-DS/S-A | 111458 | 1/40 |

SG07003



TR-G/8

SG07103



TR-G2/63-SF

Technical information p. 187, 188

Bell Transformers TR-G

- Rated primary voltage 230 V AC

- ...-SF types safety transformers with separate windings for continual duty, the other types with reduced duty

| MU | Rated output [VA] | Sec. voltage [V] | Sec. current [A] | Type Designation | Article No. | Units per package |
|----|-------------------|------------------|------------------|------------------|-------------|-------------------|
| 2 | 8 | 8 | 1 | TR-G/8 | 272480 | 1 |
| 2 | 8 | 4-8-12 | 1-1-0,67 | TR-G3/8 | 272481 | 1 |
| 2 | 18 | 4-8-12 | 2-2-1,5 | TR-G3/18 | 272483 | 1 |
| 3 | 24 | 12-24 | 2-1 | TR-G2/24 | 272484 | 1 |
| 5 | 63 | 12-24 | 5,2-2,6 | TR-G2/63-SF | 272485 | 1 |
| 3 | 24 | 8-12 | 2-2 | TR-G2/24-SF | 272486 | 1 |
| 5 | 24 | 12-24 | 2-1 | TR-G2/24-SF2 | 272487 | 1 |

Sets for surface mounting of transformers TR-G

- Accessories for surface mounting

- 1 Set = Mounting plate + 2 Terminal covers

| For width [MU] | Type Designation | Article No. | Units per package |
|----------------|------------------|-------------|-------------------|
| 2 MU | Z-TR/AP-2TE | 272488 | 1/28 |
| 3 MU | Z-TR/AP-3TE | 272489 | 1/28 |
| 5 MU | Z-TR/AP-5TE | 272500 | 1/28 |

Installation Relays Z-R.., Z-TN

- Suitable for switching 1-phase or 3-phase consumers
- Rated current up to 20 A / 250 V AC
- Suitable for mounting into distribution boxes

WA_SG12402



Z-R230/2S2O

Type Z-R

- With pushbutton

| Control voltage | Contacts | Width MU | Type Designation | Article No. | Units per package |
|-----------------|-------------|----------|------------------|-------------|-------------------|
| 230 V AC | 1 NO | 1 | Z-R230/S | 265149 | 2/120 |
| 230 V AC | 2 NO | 1 | Z-R230/SS | 265168 | 2/120 |
| 230 V AC | 4 NO | 2 | Z-R230/4S | 265226 | 1/60 |
| 230 V AC | 1 NO + 1 NC | 1 | Z-R230/SO | 265181 | 2/120 |
| 230 V AC | 2 NC | 1 | Z-R230/OO | 265188 | 2/120 |
| 230 V AC | 2 NO + 2 NC | 2 | Z-R230/2S2O | 265215 | 1/60 |
| 24 V AC | 1 NO | 1 | Z-R24/S | 265160 | 2/120 |
| 24 V AC | 2 NO | 1 | Z-R24/SS | 265173 | 2/120 |
| 24 V AC | 1 NO + 1 NC | 1 | Z-R24/SO | 265183 | 2/120 |
| 24 V AC | 2 NO + 2 NC | 2 | Z-R24/2S2O | 265218 | 1/60 |
| 24 V AC | 2 NC | 1 | Z-R24/OO | 265189 | 2/120 |
| 24 V DC | 2 NO | 1 | Z-R23/SS | 265174 | 2/120 |
| 24 V DC | 2 NO + 2 NC | 2 | Z-R23/2S2O | 265219 | 1/60 |
| 12 V AC | 2 NO | 1 | Z-R12/SS | 265175 | 2/120 |
| 8 V AC | 2 NO | 1 | Z-R8/SS | 265177 | 2/120 |

WA_SG12302a



Z-RE24/SO

Type Z-RE

- With LED
- Rated current 20 A / 250 V AC

| Control voltage | Contacts | Width MU | Type Designation | Article No. | Units per package |
|-----------------|-------------|----------|------------------|-------------|-------------------|
| 230 V AC | 1 NO | 1 | Z-RE230/S | 265190 | 2/120 |
| 230 V AC | 2 NO | 1 | Z-RE230/SS | 265193 | 2/120 |
| 230 V AC | 1 NO + 1 NC | 1 | Z-RE230/SO | 265197 | 2/120 |
| 24 V AC | 2 NO | 1 | Z-RE24/SS | 265194 | 2/120 |
| 24 V AC | 1 NO + 1 NC | 1 | Z-RE24/SO | 265198 | 2/120 |
| 24 V DC | 2 NO + 2 NC | 2 | Z-RE23/2S2O | 265232 | 1/60 |

WA_SG12702a



Z-RK230/SS

Type Z-RK

- With pushbutton and LED
- Rated current 20 A / 250 V AC

| Control voltage | Contacts | Width MU | Type Designation | Article No. | Units per package |
|-----------------|-------------|----------|------------------|-------------|-------------------|
| 230 V AC | 1 NO | 1 | Z-RK230/S | 265200 | 2/120 |
| 230 V AC | 2 NO | 1 | Z-RK230/SS | 265203 | 2/120 |
| 230 V AC | 1 NO + 1 NC | 1 | Z-RK230/SO | 265208 | 2/120 |
| 24 V AC | 2 NO | 1 | Z-RK24/SS | 265205 | 2/120 |
| 24 V AC | 1 NO + 1 NC | 1 | Z-RK24/SO | 265209 | 2/120 |
| 24 V DC | 2 NO + 2 NC | 2 | Z-RK23/2S2O | 271464 | 1/60 |

SG01603



Z-TN230/4S

Type Z-TN

- With mechanical pre-selection ON / AUT / OFF
- Rated current 20 A / 250 V AC

| Control voltage | Contacts | Width MU | Type Designation | Article No. | Units per package |
|-----------------|-------------|----------|------------------|-------------|-------------------|
| 230 V AC | 2 NO | 1 | Z-TN230/SS | 265574 | 2/120 |
| 230 V AC | 3 NO | 2 | Z-TN230/3S | 265576 | 1/60 |
| 230 V AC | 4 NO | 2 | Z-TN230/4S | 265579 | 1/60 |
| 230 V AC | 1 NO + 1 NC | 1 | Z-TN230/1S1O | 267975 | 2/120 |
| 24 V AC | 2 NO | 1 | Z-TN24/SS | 267976 | 2/120 |
| 24 V AC | 3 NO | 2 | Z-TN24/3S | 267977 | 1/60 |
| 24 V AC | 4 NO | 2 | Z-TN24/4S | 267978 | 1/60 |
| 24 V AC | 1 NO + 1 NC | 1 | Z-TN24/1S1O | 267979 | 2/120 |

Accessories for installation relays Z-R..

| | | | |
|---------------|-------|--------|----|
| Spacer 0.5 MU | Z-DST | 248949 | 10 |
|---------------|-------|--------|----|

Note:

Spacer is designed for separation of a pair of installation relays with air gap in case of ambient temperature over 40 °C or in case of full current load of all contacts.

SG0102



Z-SCH230/25-40

SG0502



Z-SCH230/63-40

SG0602



Z-SC

Technical information p. 191

Installation contactors Z-SCH

- Designed for switching 1-phase or 3-phase consumers up to 63 A AC. Suitable for installation in modular distribution boxes.
- Coil voltage 24 V, 230 V 50 Hz
- Rated current of contacts 25 to 63 A 250 V AC for AC-1
- Rated voltage of contacts 440 V; 50 Hz
- Terminal capacity 2.5–25 mm²

| Coil voltage | Rated current | Contacts | Type Designation | Article No. | Units per package |
|-----------------|---------------|-------------|-------------------------|---------------|-------------------|
| 24 V AC | 25 A | 4 NO | Z-SCH24/25-40 | 248851 | 1/40 |
| 24 V AC | 25 A | 2 NO + 2 NC | Z-SCH24/25-22 | 248850 | 1/40 |
| 230 V AC | 25 A | 2 NO | Z-SCH230/1/25-20 | 120853 | 2/120 |
| 230 V AC | 25 A | 4 NO | Z-SCH230/25-40 | 248847 | 1/60 |
| 230 V AC | 25 A | 4 NC | Z-SCH230/25-04 | 248848 | 1/60 |
| 230 V AC | 25 A | 3 NO + 1 NC | Z-SCH230/25-31 | 248846 | 1/60 |
| 230 V AC | 25 A | 2 NO + 2 NC | Z-SCH230/25-22 | 248849 | 1/60 |
| 230 V AC | 40 A | 4 NO | Z-SCH230/40-40 | 248852 | 1/40 |
| 230 V AC | 40 A | 3 NO + 1 NC | Z-SCH230/40-31 | 248854 | 1/40 |
| 230 V AC | 40 A | 2 NO + 2 NC | Z-SCH230/40-22 | 248853 | 1/40 |
| 230 V AC | 40 A | 2 NO | Z-SCH230/40-20 | 248855 | 1/40 |
| 230 V AC | 63 A | 4 NO | Z-SCH230/63-40 | 248856 | 1/40 |
| 230 V AC | 63 A | 4 NC | Z-SCH230/63-04 | 285735 | 1/40 |
| 230 V AC | 63 A | 3 NO + 1 NC | Z-SCH230/63-31 | 248858 | 1/40 |
| 230 V AC | 63 A | 2 NO + 2 NC | Z-SCH230/63-22 | 248857 | 1/40 |
| 230 V AC | 63 A | 2 NO | Z-SCH230/63-20 | 248859 | 1/40 |

Accessories

| Description | Function | Type Designation | Article No. | Units per package |
|---------------------------|-----------------------|------------------|-------------|-------------------|
| Auxiliary switch | 1 NO + 1 NC | Z-SC | 248862 | 3 |
| Spacer | 0.5 MU | Z-DST | 248949 | 10 |
| Suppressor RC-Combination | 12 - 250 V AC | Z-RC/230 | 101428 | 2/120 |
| Sealing cover | for 25 A versions | Z-SCHAK-2TE | 248860 | 10 |
| Sealing cover | for 40, 63 A versions | Z-SCHAK-3TE | 248861 | 10 |

Relay for low-level signals RE

- Electronic relays, noiseless
- Single device contains 2 independent relays with 1 CO contact (i.e. configuration 1 CO + 1 CO)
- For switching of low levels signals from 10 mV / 1 µA
- Universal control voltage 24 – 230 V AC/DC
- Width 1 MU

Obr. SG06709



| Rat. op. voltage U_e / rat. op. current I_e | U_{min} / I_{min} | Type Designation | Article No. | Units per package |
|---|---------------------|------------------|-------------|-------------------|
| 30 V DC / 2 A, 220 V DC / 0.3 A, 250 V AC / 5 A, 30 V DC / 5 A, 300 V DC / 0.25 A | 10mV / 10µA | RELLVA | 120854 | 1/40 |
| 30 V DC / 2 A, 220 V DC / 0.3 A, 250 V AC / 5 A, 30 V DC / 5 A, 300 V DC / 0.25 A | 10mV / 10µA | REHLVA | 120855 | 1/40 |
| Contact 11/12/14 30 V DC / 2 A, 220 V DC / 0.3 A, Contact 21/22/24 250 V AC / 5 A, 30 V DC / 5 A, 300 V DC / 0.25 A | 100mV / 10mA | REMLVA | 120856 | 1/40 |

Technical information p. 197

SG11907



Technical information p. 198

Astronomical, Digital Timer SA-TD/1W

- Digital timers with quartz control
- Automatic or manual control
- Automatic change summer/winter time
- Automatic leap year adjustment
- Daily program
- 1 channel, 1 CO contact
- Power reserve (Li battery, lifetime 10 years)
- Rated current 16 A (AC-1)
- Terminal capacity 1-4 mm²

| Description | Type Designation | Article No. | Units per package |
|-------------|------------------|-------------|-------------------|
| Timer | SA-TD/1W | 111450 | 1/40 |

SG12107



SU-TQ/1W-TA

SG12407



SU-TQ/TA

Technical information p. 199

Timers analogue SU-T

- Synchronous drive with accuracy of frequency of net system, without power reserve
- System Quartz with quartz accuracy, with power reserve
- Rated current 16 A (AC-1)
- Terminal capacity 1-4 mm²

| Drive | Programme | Channels/ /contacts | Type Designation | Article No. | Units per package |
|-----------|-----------|------------------------|------------------|-------------|-------------------|
| Synchron. | Day | 1 / 1 NO | SU-TS/TA | 111442 | 1/120 |
| Synchron. | Day | 1 / 1 CO | SU-TS/1W-TA | 111443 | 1/40 |
| Synchron. | Week | 1 / 1 NO | SU-TS/WO | 111444 | 1/40 |
| Quartz | Day | 1 / 1 NO | SU-TQ/TA | 111445 | 1/120 |
| Quartz | Day | 1 / 1 CO | SU-TQ/1W-TA | 111446 | 1/40 |
| Quartz | Week | 1 / 1 CO | SU-TQ/1W-WO | 111447 | 1/40 |
| Quartz | Week | 2 / 2 CO | SU-TQ/2W-TW | 111448 | 1/40 |

Digital Timers Z-SDM

- Digital timer with quartz control
- Automatic or manual control
- Automatic change summer/winter time
- Automatic leap year adjustment
- Single channel
- Power reserve (NiMH battery, EEPROM memory)
- Rated current 16 A (AC-1)
- Terminal capacity 1,5-4 mm²

| Programme | Contacts | Type Designation | Article No. | Units per package |
|-----------|----------|------------------|-------------|-------------------|
| Day | 1 CO | Z-SDM/1K-TA | 248210 | 1 |
| Week | 1 CO | Z-SDM/1K-WO | 248211 | 1 |
| Week | 2 CO | Z-SDM/2K-WO | 248212 | 1 |

Accessories

| Description | Type Designation | Article No. | Units per package |
|--------------------|------------------|-------------|-------------------|
| Terminal cover 2MU | Z7-SDM/AK-2TE | 850000317 | 6 |
| Mounting plate 2MU | Z7-SDM/MP-2TE | 850000318 | 24 |



Technical information p. 200

Measuring Instruments Z-MG

• For measuring of 1-phase voltage and current

SG2802



Technical information p. 201

Analogue Ammeter and Voltmeter

Analogue instruments Z-MG/AA; Z-MG/VA

• Accuracy class 1.5
• Measuring range for direct measuring up to 40 A

• Type Z-MG/AA5-WS with exchangeable scale for indirect measuring up to 600 A
• Terminal capacity 4 mm² or 8 mm² for Z-MG/AA-40

| Function | Range | Type Designation | Article No. | Units per package |
|--------------------------------|-----------|------------------|-------------|-------------------|
| Ammeter | 0–10 A | Z-MG/AA-10 | 248228 | 1 |
| Ammeter | 0–40 A | Z-MG/AA-40 | 248229 | 1 |
| Ammeter with exchangeable dial | 0–600/5 A | Z-MG/AA5-WS | 248227 | 1 |
| Voltmeter | 0–250 V | Z-MG/VA-250 | 248223 | 1 |
| Voltmeter | 0–500 V | Z-MG/VA-500 | 248224 | 1 |

Digital Ammeter and Voltmeter

Digital instruments Z-MG/AD; Z-MG/VD

• Accuracy class 1; + 1 digit
• Measuring range for direct measuring up to 20 A

• Type Z-MG/AD-999 for indirect measuring up to 1000 A
• Terminal capacity 4 mm²

SG11402



Technical information p. 202

| Function | Range | Type Designation | Article No. | Units per package |
|--|-------------------------|------------------|-------------|-------------------|
| Ammeter | 0–20 A | Z-MG/AD-20 | 248225 | 1 |
| Ammeter | 0–999/5 A | Z-MG/AD-999 | 248226 | 1 |
| Voltmeter | 0–600 V | Z-MG/VD-600 | 248222 | 1 |
| Ammeter + Voltmeter | 0–8 kA / 5 A | Z-MG/VD+AD | 263140 | 1 |
| | 0–600 V | | | |
| Ammeter + Voltmeter with 2 programmable contacts | 0–8 kA / 5 A 0–600 V | Z-MG/VD+AD+S | 263141 | 1 |

Accessories

Measuring current transformers Z-MG/WAS., Z-MG/WAK.; Exchangeable scales Z7-MG/WS. for Z-MG/AA5-WS

Exchangeable Scales for Z-MG/AA5-WS

SG8897



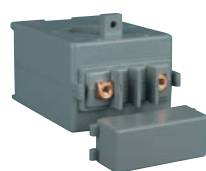
| | | | |
|-----------------------------|--------------|-----------|---|
| Exchangeable scales / 0-50 | Z7-MG/WS-50 | 850001066 | 1 |
| Exchangeable scales / 0-60 | Z7-MG/WS-60 | 850001086 | 1 |
| Exchangeable scales / 0-80 | Z7-MG/WS-80 | 850001087 | 1 |
| Exchangeable scales / 0-100 | Z7-MG/WS-100 | 850001067 | 1 |
| Exchangeable scales / 0-150 | Z7-MG/WS-150 | 850001068 | 1 |
| Exchangeable scales / 0-200 | Z7-MG/WS-200 | 850001069 | 1 |
| Exchangeable scales / 0-250 | Z7-MG/WS-250 | 850001070 | 1 |
| Exchangeable scales / 0-300 | Z7-MG/WS-300 | 850001088 | 1 |
| Exchangeable scales / 0-400 | Z7-MG/WS-400 | 850001089 | 1 |
| Exchangeable scales / 0-500 | Z7-MG/WS-500 | 850001092 | 1 |
| Exchangeable scales / 0-600 | Z7-MG/WS-600 | 850001093 | 1 |

Current Transformers Z-MG/WA

• Current transformers with ratio x/5 A intended e.g. for measuring devices of line Z-MG
• Z-MG/WAK for cable with max. diameter 21 mm

• Z-MG/WAS for busbars up to 30 x 10 mm, 40 x 10 mm, 50 x 12 mm or cable with max. diameter 23/30 mm, acc. to type
• Without possibility of calibration

SG8797



Technical information p. 203

| For / Measuring range | Type Designation | Article No. | Units per package |
|--|------------------|-------------|-------------------|
| Cable Ø 21 mm / 40/5 | Z-MG/WAK-40 | 101619 | 1 |
| Cable Ø 21 mm / 50/5 | Z-MG/WAK-50 | 101620 | 1 |
| Cable Ø 21 mm / 60/5 | Z-MG/WAK-60 | 101621 | 1 |
| Cable Ø 21 mm / 80/5 | Z-MG/WAK-80 | 101622 | 1 |
| Busbar 30 x 10 mm, cable Ø 21 mm / 100/5 | Z-MG/WAS-100 | 101623 | 1 |
| Busbar 30 x 10 mm, cable Ø 21 mm / 150/5 | Z-MG/WAS-150 | 101625 | 1 |
| Busbar 30 x 10 mm, cable Ø 21 mm / 200/5 | Z-MG/WAS-200 | 101626 | 1 |
| Busbar 30 x 10 mm, cable Ø 21 mm / 250/5 | Z-MG/WAS-250 | 101627 | 1 |
| Busbar 30 x 10 mm, cable Ø 21 mm / 300/5 | Z-MG/WAS-300 | 101628 | 1 |
| Busbar 30 x 10 mm, cable Ø 21 mm / 400/5 | Z-MG/WAS-400 | 101629 | 1 |
| Busbar 40 x 10 mm, cable Ø 30 mm / 500/5 | Z-MG/WAS-500 | 101630 | 1 |
| Busbar 40 x 10 mm, cable Ø 30 mm / 600/5 | Z-MG/WAS-600 | 101631 | 1 |
| Busbar 50 x 12 mm / 800/5 | Z-MG/WAS-800 | 101632 | 1 |
| Busbar 50 x 12 mm / 1000/5 | Z-MG/WAS-1000 | 101624 | 1 |



Technical information p. 204

1-phase Power Meters KWZ-230, without calibration

- Power meter for measuring of active energy
- With electromechanic counter
- 1-phase power meter for direct measuring
- Maximum current 40 A
- Rated voltage 230 V
- Resolution 0.1 kWh
- Accuracy class 1
- Power meter according EN 61036 for sub-measurement
- Device cannot be calibrated

| Range [digit] | Rated / max. current [A] | Type Designation | Article No. | Units per package |
|---------------|--------------------------|------------------|-------------|-------------------|
| 5+1 | 10 / 40 | KWZ-230 | 286839 | 1/60 |

SG10007



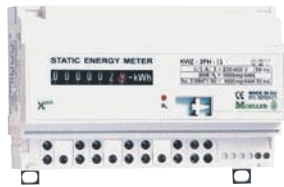
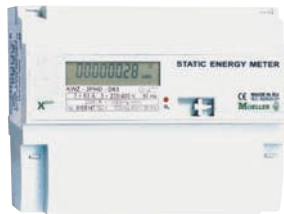
KWZ-3PH-63

Technical information p. 205

3-phase Power Meters KWZ-3PH, without calibration

- Power meters for measuring of active energy
- With digital display
- 3-phase
- Rated voltage 230/400 V
- Accuracy class 1
- Programmable impulse output S0 (110 V / 50 mA)
- Power meter acc. to EN 62053 for sub-measurement
- Device cannot be calibrated

| Measuring | Rated / max. current [A] | Type Designation | Article No. | Units per package |
|------------|--------------------------|------------------|-------------|-------------------|
| Semidirect | 5 / 6 | KWZ-3PH | 110825 | 1/30 |
| Direct | 10 / 63 | KWZ-3PH-63 | 110826 | 1/30 |



3-phase Power Meters KWZ-3PH., calibrated

- Power meters for measuring of active energy EN 62053-21
- KWZ-3PH with electromechanical counter
- KWZ-3PHD with digital display
- KWZ-3PH(D)-D63 for direct measuring up to 63 A, accuracy class 2
- Verze KWZ-3PH(D)-I5 for semidirect measuring with ratio X/5 A, accuracy class 1
- S0 test input as a standard for all types
- Digital version KWZ-3PHD in 1-tariff up to 4-tariff configuration
 - version -R with relay output,
 - version -C with communication module RS-485 (MODBUS RTU)
 - version -M with communication module M-BUS
- Type approval and calibration for Czech Rep.

| Measuring / tariffs | Rated / max. current [A] | Output | Type Designation | Article No. | Units per package |
|---------------------|--------------------------|--------|------------------|-------------|-------------------|
|---------------------|--------------------------|--------|------------------|-------------|-------------------|

With electromechanical counter

| | | | | | |
|----------------|--------|----|-------------|-----------|---|
| Direct / 1 | 5 / 63 | S0 | KWZ-3PH-D63 | 999201153 | 1 |
| Semidirect / 1 | 5 / 6 | S0 | KWZ-3PH-I5 | 999201156 | 1 |

With digital display, 1-tariff version

| | | | | | |
|----------------|--------|--------|----------------|-----------|---|
| Direct / 1 | 5 / 63 | S0 | KWZ-3PHD-D63 | 999201172 | 1 |
| Semidirect / 1 | 5 / 6 | S0 | KWZ-3PHD-I5 | 999201175 | 1 |
| Direct / 1 | 5 / 63 | relay | KWZ-3PHD-D63-R | 999201414 | 1 |
| Semidirect / 1 | 5 / 6 | relay | KWZ-3PHD-I5-R | 999201415 | 1 |
| Direct / 1 | 5 / 63 | RS-485 | KWZ-3PHD-D63-C | 999201417 | 1 |
| Semidirect / 1 | 5 / 6 | RS-485 | KWZ-3PHD-I5-C | 999201418 | 1 |
| Direct / 1 | 5 / 63 | M-BUS | KWZ-3PHD-D63-M | 999201694 | 1 |
| Semidirect / 1 | 5 / 6 | M-BUS | KWZ-3PHD-I5-M | 999201695 | 1 |

With digital display, 2-tariff version

| | | | | | |
|----------------|--------|--------|-----------------|-----------|---|
| Direct / 2 | 5 / 63 | S0 | KWZ-3PHD-D63-D | 999201420 | 1 |
| Semidirect / 2 | 5 / 6 | S0 | KWZ-3PHD-I5-D | 999201421 | 1 |
| Direct / 2 | 5 / 63 | relay | KWZ-3PHD-D63-DR | 999201423 | 1 |
| Semidirect / 2 | 5 / 6 | relay | KWZ-3PHD-I5-DR | 999201424 | 1 |
| Direct / 2 | 5 / 63 | RS-485 | KWZ-3PHD-D63-DC | 999201426 | 1 |
| Semidirect / 2 | 5 / 6 | RS-485 | KWZ-3PHD-I5-DC | 999201427 | 1 |
| Direct / 2 | 5 / 63 | M-BUS | KWZ-3PHD-D63-DM | 999201696 | 1 |
| Semidirect / 2 | 5 / 6 | M-BUS | KWZ-3PHD-I5-DM | 999201697 | 1 |

Terminal cover KWZ-SCOV

- For power meters KWZ-3PH(D)-D63(I5)
- Can be sealed

| Description | Type Designation | Article No. | Units per package |
|-------------------------|------------------|-------------|-------------------|
| Sealable terminal cover | KWZ-SCOV | 999201447 | 2 |

Technical information p. 207

Measuring modules NZM-XMC

- Measuring modules for net analysis
- Possibility of direct mounting onto NZM circuit breaker cables or onto mounting panel
- Versions – MB: possibility to display data at NZM-XMC-DISP or via MODBUS at other device (e.g. touch panels XV100)
- Display NZM-XMC-DISP with standard frame 96x96 mm
- Version with S0 output, or with MODBUS (one slot for external communication, the other for connection of NZM-XMC-DISP)
- Voltage measurement up to 690 V, accuracy 0,5 %
- Current measurement up to 500 A, accuracy 0,5 %
- Active and inductive reactive energy measurement including component analysis, accuracy 1 % and 2 %, respectively
- Temperature measurement
- Extension cards (measurement of residual currents, analogue output, digital I/O), in preparation
- Version NZM2-... with distance for cables connected to NZM2 circuit breaker
- Version NZM3-... with distance for cables connected to NZM3 circuit breaker
- All MODBUS versions can operate as a slave on PROFIBUS-DP via adapter

NZM-XMC-DISP_HPL-2



NZM-XMC-DISP

NZM2-XMC-MB



NZM2-XMC-MB

| Description | Number of poles | Rated current [A] | Type Designation | Article No. | Units per package |
|---|-----------------|-------------------|------------------|-------------|-------------------|
| Module with 1 output S0 | 3 | 300 | NZM2-XMC-S0 | 129839 | 1 |
| Module with 1 output S0 | 3 | 500 | NZM3-XMC-S0 | 129960 | 1 |
| Module with MODBUS, bus for DISP and 2 x S0 | 3 | 300 | NZM2-XMC-MB | 129961 | 1 |
| Module with MODBUS, bus for DISP and 2 x S0 | 3 | 500 | NZM3-XMC-MB | 129962 | 1 |
| Module with output S0 | 4 | 300 | NZM2-4-XMC-S0 | 129963 | 1 |
| Module with output S0 | 4 | 500 | NZM3-4-XMC-S0 | 129964 | 1 |
| Module with MODBUS, bus for DISP and 2 x S0 | 4 | 300 | NZM2-4-XMC-MB | 129965 | 1 |
| Module with MODBUS, bus for DISP and 2 x S0 | 4 | 500 | NZM3-4-XMC-MB | 129966 | 1 |
| Display for versions - MB | - | - | NZM-XMC-DISP | 129967 | 1 |
| Power supply | - | - | NZM-XMC-AC | 129968 | 1 |

Current Transformers MAK

- Current transformers for cables and busbars
- Versions "cej" with type approval and calibration for Czech Rep.
- Other types see Pricelist



MAK 45/21



MAK 62/30



MAK 62/40



MAK 62/WS



MAK 62/R



MAK 74/40



MAK 74/50

| Description (Max. busbar dimensions) | Type Designation | Article No. | Units per pack. |
|--------------------------------------|-------------------------------|----------------------------|-----------------|
| For cable max. \varnothing 20 mm | MAK 45/21 50/5A 1VA 1% | 999201706 | 1 |
| | MAK 45/21 100/5A 2,5VA 1% | 999201060 | 1 |
| | MAK 45/21 150/5A 2,5VA 1% | 999201061 | 1 |
| | MAK 45/21 250/5A 5VA 1% | 999201062 | 1 |
| | MAK 45/21 400/5A 5VA 1% | 999201063 | 1 |
| For busbar 20 x 10 mm | MAK 62/20 100/5A 5VA 1% | 999201064 | 1 |
| | MAK 62/20 150/5A 7,5VA 1% | 999201066 | 1 |
| | MAK 62/20 200/5A 10VA 1% | 999201068 | 1 |
| For busbar 30 x 10 mm | MAK 62/30 50/5A 1,5VA 1% | 999201306 | 1 |
| | MAK 62/30 75/5A 1,5VA 1% | 999201307 | 1 |
| | MAK 62/30 100/5A 2,5VA 1% | 999201072 | 1 |
| | MAK 62/30 150/5A 5VA 1% | 999201073 | 1 |
| | MAK 62/30 200/5A 5VA 0,5% | 999201074 | 1 |
| | MAK 62/30 250/5A 5VA 0,5% | 999201076 | 1 |
| | MAK 62/30 300/5A 10VA 1% | 999201078 | 1 |
| | MAK 62/30 300/5A 5VA 0,5% | 999201080 | 1 |
| | MAK 62/30 300/5A 5VA 0,5%cej. | 999201081 | 1 |
| | MAK 62/30 400/5A 5VA 0,5% | 999201084 | 1 |
| | MAK 62/30 600/5A 5VA 0,5% | 999201092 | 1 |
| | MAK 62/30 600/5A 10VA 1% | 999201090 | 1 |
| | For busbar 40 x 10 mm | MAK 62/40 200/5A 3,75VA 1% | 999201095 |
| MAK 62/40 250/5A 2,5VA 0,5% | | 999201096 | 1 |
| MAK 62/40 250/5A 5VA 1% | | 999201310 | 1 |
| MAK 62/40 300/5A 5VA 0,5% | | 999201097 | 1 |
| MAK 62/40 300/5A 5VA 1% | | 999201099 | 1 |
| MAK 62/40 400/5A 5VA 0,5% | | 999201100 | 1 |
| MAK 62/40 400/5A 5VA 1% | | 999201102 | 1 |
| MAK 62/40 500/5A 7,5VA 1% | | 999201103 | 1 |
| MAK 62/40 500/5A 5VA 0,5% | | 999201104 | 1 |
| MAK 62/40 600/5A 5VA 0,5% | | 999201105 | 1 |
| With primary winding, connection M8 | MAK 62/WS 75/5A 5VA 0,5% | 999201109 | 1 |
| | MAK 62/WS 75/5A 5VA 0,5%cej. | 999201110 | 1 |
| | MAK 62/WS 100/5A 5VA 0,5%cej. | 999201112 | 1 |
| | MAK 62/WS 125/5A 5VA 0,5%cej. | 999201114 | 1 |
| | MAK 62/WS 150/5A 5VA 0,5%cej. | 999201116 | 1 |
| For cable max. \varnothing 22 mm | MAK 62/R 150/5A 5VA 1% | 999201311 | 1 |
| | MAK 62/R 250/5A 5VA 1% | 999201117 | 1 |
| | MAK 62/R 400/5A 5VA 1% | 999201118 | 1 |
| | MAK 62/R 600/5A 5VA 1% | 999201119 | 1 |
| For busbar 40 x 12 mm | MAK 74/40 200/5A 5VA 0,5% | 999201120 | 1 |
| | MAK 74/40 300/5A 5VA 0,5% | 999201121 | 1 |
| | MAK 74/40 400/5A 5VA 0,5% | 999201122 | 1 |
| For busbar 50 x 12 mm | MAK 74/50 400/5A 5VA 0,5% | 999201126 | 1 |
| | MAK 74/50 600/5A 5VA 0,5% | 999201127 | 1 |
| | MAK 74/50 1000/5A 5VA 0,5% | 999201129 | 1 |

Current Transformers - continuation



MAK 86/50



MAK 86/60



MAK 104/80



MAK 140/100/H

| Busbar dimensions | Type Designation | Article No. | Units per pack. |
|------------------------|---------------------------------|-------------|-----------------|
| For busbar 40 x 10 mm | MAK 86/40 300/5A 10VA 0,5% | 999201133 | 1 |
| | MAK 86/40 400/5A 10VA 0,5% | 999201134 | 1 |
| For busbar 50 x 12 mm | MAK 86/50 400/5A 10VA 0,5% | 999201135 | 1 |
| | MAK 86/50 500/5A 10VA 0,5% | 999201136 | 1 |
| | MAK 86/50 600/5A 10VA 0,5% | 999201137 | 1 |
| | MAK 86/50 600/5A 15VA 0,5% | 999201138 | 1 |
| | MAK 86/50 800/5A 15VA 0,5% | 999201139 | 1 |
| | MAK 86/50 1000/5A 10VA 0,5% | 999201140 | 1 |
| | MAK 86/50 1000/5A 15VA 0,5% | 999201141 | 1 |
| For busbar 60 x 12 mm | MAK 86/60 600/5A 10VA 0,5% | 999201142 | 1 |
| | MAK 86/60 600/5A 15VA 1% | 999201143 | 1 |
| | MAK 86/60 1000/5A 15VA 0,5% | 999201144 | 1 |
| For busbar 80 x 12 mm | MAK 104/80 1500/5A 30VA 1% | 999201145 | 1 |
| For busbar 100 x 30 mm | MAK 140/100/H 1500/5A 45VA 0,5% | 999201146 | 1 |
| | MAK 140/100/H 1500/5A 45VA 1% | 999201147 | 1 |
| | MAK 140/100/V 1500/5 0,5% | 999201711 | 1 |
| | MAK 140/100/V 1500/5 1% | 999201712 | 1 |
| | MAK 140/100/H 1600/5A 15VA 1% | 999201148 | 1 |
| | MAK 140/100H 2000/5 1% | 999201198 | 1 |

Technical information p. 210

Operating Hours Counter BSZ, Pulse Counter Z-IMZ

- For gathering operating time data of machines
- Terminal capacity 0.14–4 mm²
- Rated voltage 230 V or 24 V, 50 Hz
- With electromechanical counter without possibility of zeroing

SG15805



Technical information p. 212

| Range [digit] | Rated voltage (AC) | Type Designation | Article No. | Units per package |
|---------------|--------------------|------------------|-------------|-------------------|
| 5+2 | 230 V | BSZ/230 | 276309 | 1/60 |
| 5+2 | 24 V | BSZ/24 | 276308 | 1/60 |
| 7 | 230 V | Z-IMZ/230 | 248206 | 1/60 |
| 7 | 24 V | Z-IMZ/24 | 248207 | 1/60 |

Buzzer Z-SUM, Bell Z-GLO

- Without sparking
- Degree of protection IP20
- Terminal capacity max. 10 mm²

SG1902



Technical information p. 212

| Function | Rated voltage AC | Type Designation | Article No. | Units per package |
|----------|------------------|------------------|-------------|-------------------|
| Buzzer | 230 V | Z-SUM230 | 270584 | 2/120 |
| Buzzer | 24 V | Z-SUM24 | 270583 | 2/120 |
| Buzzer | 12 V | Z-SUM12 | 271087 | 2/120 |
| Bell | 230 V | Z-GLO230 | 270586 | 2/120 |
| Bell | 24 V | Z-GLO24 | 270585 | 2/120 |
| Bell | 12 V | Z-GLO12 | 271088 | 2/120 |

Manual Motor Starters Z-MS

- Reliable protection in case of thermal overload and short circuit
- Magnetic short-circuit tripping fixed
- Thermal overload tripping adjustable
- Suitable for small distribution boxes
- Contact position indicator red-green
- Busbar positioning optionally above or below
- Main application fields: switching and protection of 3-phase motors up to 15 kW (380/400 V) or other consumers up to 40 A
- Also suitable as main switch
- Isolating characteristics according to EN 60947
- Accessories compatible with PL7, PL6 etc.

SG17802



SG17902



| Num. of poles | Range [A] | Type Designation | Article No. | Units per package |
|---------------|-----------|------------------|-------------|-------------------|
| 2 | 0.10–0.16 | Z-MS-0,16/2 | 248389 | 1/60 |
| 2 | 0.16–0.25 | Z-MS-0,25/2 | 248390 | 1/60 |
| 2 | 0.25–0.40 | Z-MS-0,40/2 | 248391 | 1/60 |
| 2 | 0.40–0.63 | Z-MS-0,63/2 | 248392 | 1/60 |
| 2 | 0.63–1.00 | Z-MS-1,0/2 | 248393 | 1/60 |
| 2 | 1.00–1.60 | Z-MS-1,6/2 | 248394 | 1/60 |
| 2 | 1.60–2.50 | Z-MS-2,5/2 | 248395 | 1/60 |
| 2 | 2.50–4.00 | Z-MS-4,0/2 | 248396 | 1/60 |
| 2 | 4.00–6.30 | Z-MS-6,3/2 | 248397 | 1/60 |
| 2 | 6.30–10.0 | Z-MS-10/2 | 248398 | 1/60 |
| 2 | 10.0–16.0 | Z-MS-16/2 | 248399 | 1/60 |
| 2 | 16.0–25.0 | Z-MS-25/2 | 248400 | 1/60 |
| 2 | 25.0–40.0 | Z-MS-40/2 | 248401 | 1/60 |
| 3 | 0.10–0.16 | Z-MS-0,16/3 | 248402 | 1/40 |
| 3 | 0.16–0.25 | Z-MS-0,25/3 | 248403 | 1/40 |
| 3 | 0.25–0.40 | Z-MS-0,40/3 | 248404 | 1/40 |
| 3 | 0.40–0.63 | Z-MS-0,63/3 | 248405 | 1/40 |
| 3 | 0.63–1.00 | Z-MS-1,0/3 | 248406 | 1/40 |
| 3 | 1.00–1.60 | Z-MS-1,6/3 | 248407 | 1/40 |
| 3 | 1.60–2.50 | Z-MS-2,5/3 | 248408 | 1/40 |
| 3 | 2.50–4.00 | Z-MS-4,0/3 | 248409 | 1/40 |
| 3 | 4.00–6.30 | Z-MS-6,3/3 | 248410 | 1/40 |
| 3 | 6.30–10.0 | Z-MS-10/3 | 248411 | 1/40 |
| 3 | 10.0–16.0 | Z-MS-16/3 | 248412 | 1/40 |
| 3 | 16.0–25.0 | Z-MS-25/3 | 248413 | 1/40 |
| 3 | 25.0–40.0 | Z-MS-40/3 | 248414 | 1/40 |

Accessories

| Function | Type Designation | Article No. | Units per package |
|--|------------------|-------------|-------------------|
| Shunt trip release 24 V | ZP-ASA/24 | 248438 | 6/60 |
| Shunt trip release 230 V | ZP-ASA/230 | 248439 | 6/60 |
| Undervoltage release 230 V | Z-USA/230 | 248289 | 6/60 |
| Undervoltage release 400 V | Z-USA/400 | 248290 | 6/60 |
| Delayed undervoltage release 230 V | Z-USD/230 | 248291 | 6/60 |
| Auxiliary switch | ZP-IHK | 286052 | 4/120 |
| Aux. and tripping sig. switch | ZP-NHK | 248437 | 4/120 |
| Remote control switching dev. | Z-FW-LP | 248296 | 1/20 |
| Moisture-proof enclosure | Z-MFG | 248383 | 1 |
| Moisture-proof encl. N-cond. | Z-MFG/NL | 248384 | 1 |
| Moisture-proof encl. EM.-OFF | Z-MFG/NOT | 248385 | 1 |
| Additional terminal 35 mm ² | Z-HA-EK/35 | 263960 | 12/720 |
| Switching interlock without lock | Z-IS/SPE-1TE | 274418 | 5/30 |

Technical information p. 213

Moisture-Proof Enclosure Z-MFG, IP 54

- Design according to EN 50298
- Suitable for motor starters Z-MS, e.g. 3-pole (+Z-USA), MCBs, switches etc.
- Earth conductor connection integrated in all types
- Delivered with 4 grommets PG 16
- Enclosure cover can be sealed with leads in 2 locations
- Scope of delivery for Z-MFG/NOT: 4 entry bushes, 1 mushroom-shaped pushbutton (red) + 1 NC contact for undervoltage release
- Turning handle, can be locked in the OFF-position by means of 3 padlocks, max. ø 6 mm

SG0600



| Function | Type Designation | Article No. | Units per package |
|-------------------------------------|------------------|-------------|-------------------|
| ON/OFF | Z-MFG | 248383 | 1 |
| ON/OFF N-terminal | Z-MFG/NL | 248384 | 1 |
| ON/OFF + EMERGENCY OFF + N-terminal | Z-MFG/NOT | 248385 | 1 |

Note: Designed for MCBs, switches and motor starters Moeller

Technical information p. 216

VT4900



Compact Enclosure KLV-TC

- Degree of protection IP30
- Without door
- For 45 mm devices for modular installation
- Can be sealed

| Width MU | Type Designation | Article No. | Units per package |
|---|------------------|-------------|-------------------|
| 1+1 Enclosure without terminal | KLV-TC-2 | 276240 | 1 |
| 3+1 Enclosure without terminal | KLV-TC-4 | 276241 | 1 |
| 6+2 Enclosure without terminal | KLV-TC-8 | 276242 | 1 |
| 3+1 Enclosure with terminal | KLV-TC-4-TB | 276243 | 1 |
| 6+2 Enclosure with terminal | KLV-TC-8-TB1 | 276244 | 1 |
| 6+2 Enclosure with double-length terminal | KLV-TC-8-TB2 | 276245 | 1 |
| Terminal for KLV-TC-4 | KLV-TC-TB-4/4 | 276246 | 1 |
| Terminal for KLV-TC-8 | KLV-TC-TBC-4/4 | 276247 | 1 |
| Double-length terminal for KLV-TC-8 | KLV-TC-TBC-4/4+4 | 276248 | 1 |

Technical information p. 217

1442



Enclosure ISO

- Plastic enclosure with terminal and busbar
- 1-row
- 45 mm device cut-out
- Terminal included
- ISO 0 - KL7 (7 x 16 mm²)
- ISO 1 - KL15 (15 x 16 mm²)

| Width MU | Type Designation | Article No. | Units per package |
|----------|------------------|-------------|-------------------|
| 7 | ISO 0 | 770502401 | 1 |
| 15 | ISO 1 | 770502402 | 1 |

Technical information p. 217

1434



Universal Enclosure

- For devices with frame size 45 mm
- Side boards and profiled strips are connected with glue
- KLV-LV-SP-45 – side boards
- KLV-LV-PL-45 – profiled strips 2 m

| Description | Type Designation | Article No. | Units per package |
|--------------------|------------------|-------------|-------------------|
| Side board | KLV-LV-SP-45 | 279265 | 2 |
| Profiled strip 2 m | KLV-LV-PL-45 | 279266 | 1 |

373703



Marking Tables GR

- Sticky labels for clear assign accessories of devices to circuits
- Pre-printed marks for usual circuits

| Num. of labels / Dimension | Type Designation | Article No. | Units per package |
|----------------------------|------------------|-------------|-------------------|
| 30 210x120 mm | GR-2 | 138103900 | 1 |
| 90 210x300 mm | GR-3 | 138104100 | 1 |

SG01006



Plastic Box Z-BOX

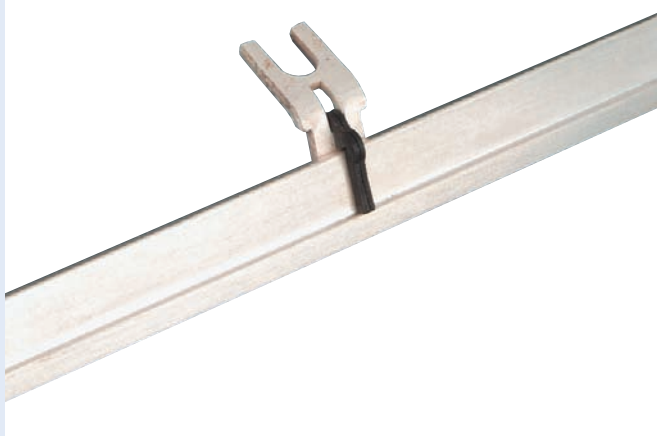
- Empty boxes for mounting onto device rail
- Dimensions 45 x 54 x 75 mm
- For frontplates with device cutout 45 mm
- Draw-out design
- Suitable for spare parts (e.g. fuse links)

| Colour | Type Designation | Article No. | Units per package |
|--------|------------------|-------------|-------------------|
| violet | Z-BOX/VIO | 286056 | 12/120 |
| pink | Z-BOX/ROS | 286057 | 12/120 |
| brown | Z-BOX/BRA | 286058 | 12/120 |
| green | Z-BOX/GRU | 286059 | 12/120 |
| red | Z-BOX/ROT | 286060 | 12/120 |
| grey | Z-BOX/GRA | 286061 | 12/120 |
| blue | Z-BOX/BLA | 286062 | 12/120 |
| yellow | Z-BOX/GEL | 286063 | 12/120 |
| black | Z-BOX/SCH | 286064 | 12/120 |
| white | Z-BOX/WEI | 286065 | 12/120 |
| copper | Z-BOX/KUP | 286066 | 12/120 |

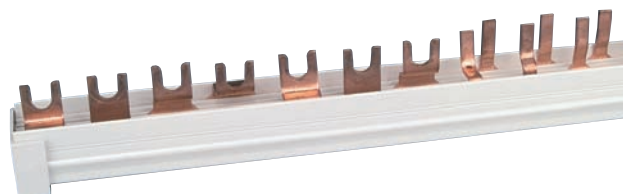
Busbar Systems

- For simple connection of Moeller devices
- Easy mounting
- Rated cross-section 10, 16, 35 mm²

SG7997

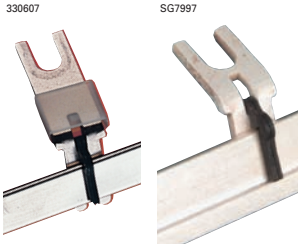


SG4700



Universal busbar system ZV

- Universal busbar system
- For installation devices series Moeller line Xpole (PL7, PL6, PF7, PF6, PHF7, dRCM, PFL7, PFL6, PFR,...)
- Rated current 50 and 80 A
- Optional placing of connection points of particular phases, arbitrary combinations can be created
- Connection modules Z-D63 and Z-D80 can be used for power supply

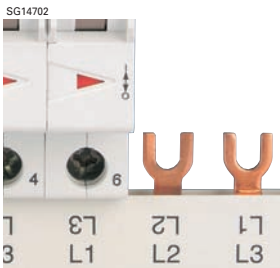


Technical information p. 218

| Description | Current | Type Designation | Article No. | Units per package |
|---------------------------|---------|------------------|-------------|-------------------|
| Conn. angle L1, N | 50 A | ZV-L1/N-10 | 263941 | 10/600 |
| Conn. angle L2, L3 | 50 A | ZV-L2/L3-10 | 263944 | 10/600 |
| Conn. angle N (0.5 MU) | 50 A | ZV-N-05TE-10 | 263947 | 10/600 |
| Busbar 1 m | 50 A | ZV-SS | 263956 | 1/10 |
| Conn. angle L1, N | 80 A | ZV-L1/N-80A-10 | 263950 | 10/600 |
| Conn. angle L2, L3 | 80 A | ZV-L2/L3-80A-10 | 263953 | 10/600 |
| Busbar 1 m | 80 A | ZV-SS-80A | 263957 | 1/10 |
| Cover section 1 m | 50+80 A | ZV-ADP | 263958 | 1/10 |
| End caps for busbar cover | | ZV-AEK | 263959 | 1/600 |

Busbar Block Z-GV general length

- Busbar system with fixed spacing and position of terminals
- For installation devices series Moeller line Xpole (PL7, PL6, PF7, PF6, PHF7, dRCM, PFL7, PFL6, PFR,...), without auxiliary contacts
- Cross section 10 and 16 mm² for rated currents 63 A and 80 A, respectively
- Connection modules Z-D63 and Z-D80 can be used for power supply
- Length 1 m
- End caps must be ordered separately
- Version with step 1.5 MU and 3x1+0.5 MU can be used for devices equipped with auxiliary contact (not connected to busbar)
- Terminal shape - pin

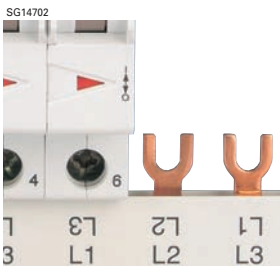


Technical information p. 219

| Description | Rated Current [A] | Type Designation | Article No. | Units per package |
|-------------------------------|-------------------|-------------------|-------------|-------------------|
| 10 mm² | | | | |
| Busbar 1p, 1 MU | 63 | Z-GV-10/1P-1TE | 270339 | 50 |
| Busbar 3p, 3x1 MU | 63 | Z-GV-10/3P-3TE | 271060 | 20 |
| End cap 1p | - | Z-V-AK/1P | 104905 | 10/600 |
| End cap 3p | - | Z-AK-10/2+3P | 271069 | 10/600 |
| 16 mm² | | | | |
| Busbar 1p, 1 MU | 80 | Z-GV-16/1P-1TE | 271061 | 50 |
| Busbar 1p, 1,5 MU | 80 | Z-GV-16/1P+HS | 271062 | 50 |
| Busbar 2p, 2x1 MU | 80 | Z-GV-16/1P+N-2TE | 271063 | 20 |
| Busbar 3p, 3x1 MU | 80 | Z-GV-16/3P-3TE | 271064 | 20 |
| Busbar 3p, 3x1+0,5 MU | 80 | Z-GV-16/3P+HS | 271065 | 20 |
| Busbar 4p, 4x1 TMUE | 80 | Z-GV-16/3P+N-4TE | 271066 | 15 |
| Busbar 4p (3p+3N), 3x(1+1) MU | 80 | Z-GV-16/3P+3N-6TE | 263142 | 15 |
| End cap 1p | - | Z-V-AK/1P | 104905 | 10/600 |
| End cap 2 a 3p | - | Z-AK-16/2+3P | 271070 | 10/600 |
| End cap 4p | - | Z-AK-16/4P | 271071 | 10/600 |

Busbar Block Z-GV shortened

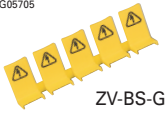
- Busbar system with fixed spacing and position of terminals
- For installation devices series Moeller line Xpole (PL7, PL6, PF7, PF6, PHF7, dRCM, PFL7, PFL6, PFR,...), without auxiliary contacts
- Cross section 16 mm² for rated current 80 A
- Connection modules Z-D80 can be used for power supply
- Including end caps
- Terminal shape - fork



Technical information p. 219

| Description | Total length | Rated Current [A] | Type Designation | Article No. | Units per package |
|--------------------------|--------------|-------------------|---------------------|-------------|-------------------|
| 16 mm² | | | | | |
| Busbar 1p, 16 x (1 MU) | 16 MU | 80 | Z-GV-16/1P-1TE/16 | 271074 | 50 |
| Busbar 2p, 16 x (2x1 MU) | 16 MU | 80 | Z-GV-16/1P+N-2TE/16 | 271075 | 20 |
| Busbar 3p, 2 x (3x1 MU) | 8 MU | 80 | Z-GV-16/3P-3TE/8 | 271073 | 40 |
| Busbar 3p, 5 x (3x1 MU) | 16 MU | 80 | Z-GV-16/3P-3TE/16 | 271076 | 20 |
| Busbar 4p, 4 x (4x1 MU) | 16 MU | 80 | Z-GV-16/3P+N-4TE/16 | 271078 | 15 |

SG05705



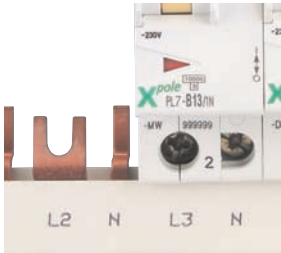
ZV-BS-G

Busbar Tag Shrouds ZV-BS-G

- For shrouding of unused terminals Z-GV-1TE
- 1 pc = 5-shroud set

| Description | Type Designation | Article No. | Units per package |
|--------------------|------------------|-------------|-------------------|
| Busbar Tag Shrouds | ZV-BS-G | 104903 | 10/600 |

SG14602



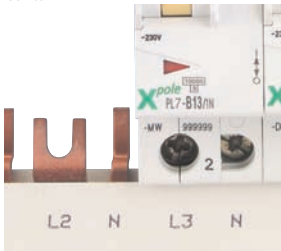
Busbar Block Z-GSV general length

- Busbar system with fixed spacing and position of terminals
- For 1+N-pole circuit breakers PL7 (1.5 MU), without auxiliary contacts
- Versions for combination with other devices of series Moeller Xpole (PL7, PL6, PF7, PF6, PHF7, dRCM, PFL7, PFL6, PFR,...)
- Cross section 16 mm² for rated current 80 A
- Connection modules Z-D80 can be used for power supply
- Length 1 m
- End caps must be ordered separately
- Terminal shape – fork (phase, N-pole 1 MU), pin (N-pole 0.5 MU)

| Description | Rated Current [A] | Type Designation | Article No. | Units per package |
|---|-------------------|---------------------------|-------------|-------------------|
| 16 mm² | | | | |
| Busbar 2p (1p+N), 1+0,5 MU | 80 | Z-GSV-16/1P+N | 271067 | 10 |
| Busbar 4p (3p+3N), 3x(1+0,5) MU | 80 | Z-GSV-16/3P+3N | 271068 | 10 |
| Busbar 3x4p + 30x2p (1p+N), 3x(4x1)+30x(1+0,5) MU | 80 | Z-GSV-16/FI-EH+KR+30XLS1N | 113137 | 7 |
| End cap 2p | - | Z-AK-16/2+3P | 271070 | 10/600 |
| End cap 4p | - | Z-AK-16/4P | 271071 | 10/600 |
| End cap (4p+2p) | - | Z-V-AK/4P | 264931 | 10/600 |

Technical information p. 220

SG14602



Busbar Block Z-GSV shortened

- Busbar system with fixed spacing and position of terminals
- For 1+N-pole circuit breakers PL7 (1.5 MU), without auxiliary contacts
- Versions for combination with other devices of series Moeller Xpole (PL7, PL6, PF7, PF6, PHF7, dRCM, PFL7, PFL6, PFR,...)
- Cross section 10 and 16 mm² for rated currents 63 and 80 A, respectively
- Connection modules Z-D63 and Z-D80 can be used for power supply
- Including end caps
- Terminal shape – fork (phase), pin (N-pole 0.5 MU)

| Description | Rated Current [A] | Type Designation | Article No. | Units per package |
|---|-------------------|-----------------------|-------------|-------------------|
| 10 mm² | | | | |
| Busbar 2x4p + 2x2p (1p+N), 2x(4x1)+2x(1+0,5) MU | 63 | Z-GSV-10/FI+EH+2XLS1N | 113138 | 10 |
| Busbar 2x4p + 4x2p (1p+N), 2x(4x1)+4x(1+0,5) MU | 63 | Z-GSV-10/FI+EH+4XLS1N | 113139 | 10 |
| 16 mm² | | | | |
| Busbar 2p (1p+N), 9 x (1+0,5) MU | 80 | Z-GSV-16/1P+N/9 | 271077 | 15 |
| Busbar 4p (3p+3N), 3 x (3x(1+0,5)) MU | 80 | Z-GSV-16/3P+3N/9 | 271079 | 15 |

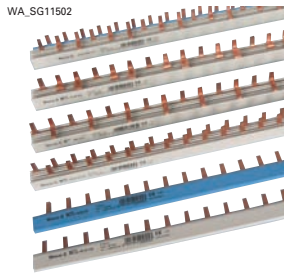
Technical information p. 220

Busbar Block Z-SV...-SD for device rail mounted sockets

- Special busbars for sockets Z-SD... (placing of sockets one besides the other)
- Cross section 10 mm² for rated current 50 A
- Length 1 m

| Description | Rated Current [A] | Type Designation | Article No. | Units per package |
|--------------------------|-------------------|------------------|-------------|-------------------|
| 10 mm² | | | | |
| Busbar 2p (1p+N) | 50 | Z-SV-10/1P+N-SD | 269526 | 10 |
| End cap | - | Z-V-AK/2+3P | 264930 | 10/600 |

Technical information p. 221



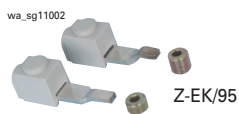
Busbar Block Z-SV (1.5 MU)

- Busbar system with fixed spacing and position of terminals
- For circuit breakers PLHT, fuse switch disconnectors and fuse bases Z-SLS, D0.-SO/..
- Cross section 16 and 35 mm² for rated currents 80 and 110 A, respectively
- Length 1 m
- End caps must be ordered separately (type Z-SV-35/3P+N-6TE delivered with end caps)
- Terminal shape – pin

| Description | Rated Current [A] | Type Designation | Article No. | Units per package |
|----------------------------|-------------------|------------------|-------------|-------------------|
| 16 mm² | | | | |
| Busbar 3p, 3x1,5 MU | 80 | Z-SV-16/3P | 271072 | 20 |
| End cap | - | Z-AK-16/2+3P | 271070 | 10/600 |
| 35 mm² | | | | |
| Busbar 1p, 1,5 MU | 110 | Z-SV-35/1P | 113135 | 1 |
| Busbar 3p, 3x1,5 MU | 110 | Z-SV-35/3P | 264938 | 4 |
| Busbar 3p, 3x1,5 MU | 110 | Z-SV-35/PLHT-V | 264939 | 4 |
| Busbar 4p (3p+N), 4x1,5 MU | 110 | Z-SV-35/3P+N-6TE | 263110 | 4 |
| End cap | - | Z-V-35/AK/3P | 264932 | 10/600 |

Extension terminal Z-EK

- Z-EK/50 for conductors 6-50 mm²
- Z-EK/95 for solid and multi wired conductors 25-70 mm² and fine wired conductors with ferrule 16-70 mm²
- For possible configuration see e.g. p. 248



| For device on rail | Type Designation | Article No. | Units per package |
|--------------------|------------------|-------------|-------------------|
| Z-SV-16/3P | Z-EK/50 | 264934 | 3/180 |
| Z-SV-35/1P | Z-EK/95-1 | 113136 | 3/90 |
| Z-SV-... 3P | Z-EK/95 | 264933 | 3/90 |
| Z-SV-35/3P+N | Z-EK/95-3N | 264911 | 4/120 |

Euro-Vario-Busbar EVG

- Busbar system with fixed spacing and position of terminals
- For installation devices series Moeller line Xpole (PL7, PL6, PF7, PF6, PHF7, dRCM, PFL7, PFL6, PFR,...)
- Versions for device without or with auxiliary contact (not connected to busbar)
- 3-pole version for combination with 4-pole RCD when N-conductor is not connected to busbar
- Connection modules Z-D63 and Z-D80 can be used for power supply
- Various length, cannot be cut
- End-cap-less design
- Terminal shape – fork

Version for devices with 1 MU step without auxiliary contacts

| Description | Total length | Rated Current [A] | Type Designation | Article No. | Units per package |
|-------------------------------|--------------|-------------------|----------------------|-------------|-------------------|
| 10 mm² | | | | | |
| Busbar 1p, 1 MU | 2 MU | 63 | EVG-1PHAS/2MODUL | 215646 | 40/800 |
| Busbar 1p, 1 MU | 6 MU | 63 | EVG-1PHAS/6MODUL | 215638 | 40/800 |
| Busbar 1p, 1 MU | 12 MU | 63 | EVG-1PHAS/12MODUL | 215637 | 40/400 |
| Busbar 2p (1p+N), 2x1 MU | 4 MU | 63 | EVG-2PHAS/4MODUL | 268220 | 20/400 |
| Busbar 2p (1p+N), 2x1 MU | 6 MU | 63 | EVG-2PHAS/6MODUL | 215642 | 20/400 |
| Busbar 2p (1p+N), 2x1 MU | 12 MU | 63 | EVG-2PHAS/12MODUL | 215641 | 20/200 |
| Busbar 3p, 3x1 MU | 6 MU | 63 | EVG-3PHAS/6MODUL | 215640 | 20/400 |
| Busbar 3p, 3x1 MU | 9 MU | 63 | EVG-3PHAS/9MODUL | 215645 | 20/200 |
| Busbar 3p, 3x1 MU | 12 MU | 63 | EVG-3PHAS/12MODUL | 215639 | 20/200 |
| Busbar 3p, 3x1 MU | 16 MU | 63 | EVG-3PHAS/16MODUL | 285381 | 20 |
| Busbar 3p, 3x1 MU | 20 MU | 63 | EVG-3PHAS/20MODUL | 285383 | 20/180 |
| Busbar 4p (3p+3N), 3x(1+1) MU | 16 MU | 63 | EVG-3P+3N/16MODUL | 105215 | 20 |
| Busbar 4p (3p+3N), 3x(1+1) MU | 18 MU | 63 | EVG-3P+3N/18MODUL | 274161 | 20 |
| Busbar 4p (3p+N), 4x1 MU | 8 MU | 63 | EVG-4PHAS/8MODUL | 215644 | 10/100 |
| Busbar 4p (3p+N), 4x1 MU | 12 MU | 63 | EVG-4PHAS/12MODUL | 215643 | 10/100 |
| 16 mm² | | | | | |
| Busbar 1p, 1 MU | 2 MU | 80 | EVG-16/1PHAS/2MODUL | 291464 | 40/800 |
| Busbar 1p, 1 MU | 6 MU | 80 | EVG-16/1PHAS/6MODUL | 291465 | 40/800 |
| Busbar 1p, 1 MU | 12 MU | 80 | EVG-16/1PHAS/12MODUL | 291466 | 40/400 |
| Busbar 2p (1p+N), 2x1 MU | 4 MU | 80 | EVG-16/2PHAS/4MODUL | 291467 | 20/400 |
| Busbar 2p (1p+N), 2x1 MU | 6 MU | 80 | EVG-16/2PHAS/6MODUL | 291468 | 20/400 |
| Busbar 2p (1p+N), 2x1 MU | 12 MU | 80 | EVG-16/2PHAS/12MODUL | 291469 | 20/200 |
| Busbar 3p, 3x1 MU | 6 MU | 80 | EVG-16/3PHAS/6MODUL | 291470 | 20/400 |
| Busbar 3p, 3x1 MU | 9 MU | 80 | EVG-16/3PHAS/9MODUL | 291471 | 20/200 |
| Busbar 3p, 3x1 MU | 12 MU | 80 | EVG-16/3PHAS/12MODUL | 291472 | 20/200 |
| Busbar 3p, 3x1 MU | 16 MU | 80 | EVG-16/3PHAS/16MODUL | 291473 | 20/80 |
| Busbar 3p, 3x1 MU | 20 MU | 80 | EVG-16/3PHAS/20MODUL | 291474 | 10/100 |
| Busbar 4p (3p+N), 4x1 MU | 8 MU | 80 | EVG-16/4PHAS/8MODUL | 291475 | 10/100 |
| Busbar 4p (3p+N), 4x1 MU | 12 MU | 80 | EVG-16/4PHAS/12MODUL | 291476 | 10/100 |

WA_SG02902



Version for devices with 1 MU step without auxiliary contacts in combination with 4-pole RCD when N-conductor is not connected to busbar

| Description | Total length | Rated Current [A] | Type Designation | Article No. | Units per package |
|---------------------------|--------------|-------------------|--------------------------|-------------|-------------------|
| 10 mm² | | | | | |
| Busbar 3p, (3+1) + 5x1 MU | 9 MU | 63 | EVG-3PHAS/N/5MODUL/LS | 215659 | 20/200 |
| Busbar 3p, (3+1) + 8x1 MU | 12 MU | 63 | EVG-3PHAS/N/8MODUL/LS | 215660 | 20/200 |
| 16 mm² | | | | | |
| Busbar 3p, (3+1) + 5x1 MU | 9 MU | 80 | EVG-16/3PHAS/N/5MODUL/LS | 291477 | 20/200 |
| Busbar 3p, (3+1) + 8x1 MU | 12 MU | 80 | EVG-16/3PHAS/N/8MODUL/LS | 291478 | 20/200 |

Version for devices with 1 MU step with auxiliary contact (not connected to busbar)

| Description | Total length | Rated Current [A] | Type Designation | Article No. | Units per package |
|-------------------------------------|--------------|-------------------|--------------------------|-------------|-------------------|
| 10 mm² | | | | | |
| Busbar 1p, 2x(1+0,5) MU | 2,5 MU | 63 | EVG-1PHAS/2MODUL/HI | 215655 | 40/200 |
| Busbar 1p, 9x(1+0,5) MU | 13 MU | 63 | EVG-1PHAS/9MODUL/HI | 215656 | 40 |
| Busbar 2p (1p+N), 2x(1+1+0,5) MU | 4,5 MU | 63 | EVG-2PHAS/4MODUL/HI | 219573 | 20/400 |
| Busbar 2p (1p+N), 5x(1+1+0,5) MU | 12 MU | 63 | EVG-2PHAS/10MODUL/HI | 215657 | 20 |
| Busbar 3p, 2x(3x1+0,5) MU | 6,5 MU | 63 | EVG-3PHAS/6MODUL/HI | 216411 | 20/200 |
| Busbar 3p, 4x(3x1+0,5) MU | 13,5 MU | 63 | EVG-3PHAS/12MODUL/HI | 215658 | 20 |
| 16 mm² | | | | | |
| Busbar 1p, 2x(1+0,5) MU | 2,5 MU | 80 | EVG-16/1PHAS/2MODUL/HI | 291479 | 40/800 |
| Busbar 1p, 6x(1+0,5) MU | 8,5 MU | 80 | EVG-16/1PHAS/6MODUL/HI | 291480 | 40/400 |
| Busbar 1p, 9x(1+0,5) MU | 13 MU | 80 | EVG-16/1PHAS/9MODUL/HI | 291481 | 40/160 |
| Busbar 2p (1p+N), 2x(1+1+0,5) MU | 4,5 MU | 80 | EVG-16/2PHAS/4MODUL/HI | 291482 | 20/400 |
| Busbar 2p (1p+N), 3x(1+1+0,5) MU | 7 MU | 80 | EVG-16/2PHAS/6MODUL/HI | 291483 | 20/200 |
| Busbar 2p (1p+N), 5x(1+1+0,5) MU | 12 MU | 80 | EVG-16/2PHAS/10MODUL/HI | 291484 | 20/200 |
| Busbar 3p, 2x(3x1+0,5) MU | 6,5 MU | 80 | EVG-16/3PHAS/6MODUL/HI | 291485 | 20/200 |
| Busbar 3p, 4x(3x1+0,5) MU | 13,5 MU | 80 | EVG-16/3PHAS/12MODUL/HI | 291486 | 20/80 |
| Busbar 3p, 2x3x(1+0,5) MU | 8,5 MU | 80 | EVG-16/3x1PHAS/6MODUL/HI | 291487 | 20/200 |
| Busbar 3p, (2+2/3)x3x(1+0,5) MU | 11,5 MU | 80 | EVG-16/3x1PHAS/8MODUL/HI | 291488 | 20/200 |
| Busbar 3p, 3x3x(1+0,5) MU | 13 MU | 80 | EVG-16/3x1PHAS/9MODUL/HI | 291489 | 20/80 |

Fuse-links and Fuse Disconnectors

- Fuse-links D II, D III, D IV up to 100 A and accessories
- Fuse disconnectors VLC for cylindrical fuse-links up to 100 A
- Cylindrical fuse-links up to 100 A
- Fuse disconnectors for cylindrical fuse links for photovoltaic applications
- Fuse systems and fuse links D0
- NH fuse links
- Fuse systems for NH fuse links



Fuse-links D II, D III, D IV

- Design according to EN 60269-1, EN 60269-3
- For fuse bases DII-SO..., DIII-SO...
- Delayed fuse links gG (gL)
- Standard fuse links DZ
- Rated voltage of fuse links DII, DIII 500 V AC / 400 V DC
- Rated voltage of fuse links DIV 500 V AC

SG19007



SG19107



| Type | Characteristic | Rated current [A] | Type Designation | Article No. | Units per package |
|----------|----------------|-------------------|------------------|-------------|-------------------|
| DII E27 | delayed gG | 2 | Z-DII/SE-2A/GG | 112125 | 5/500 |
| DII E27 | delayed gG | 4 | Z-DII/SE-4A/GG | 112126 | 5/500 |
| DII E27 | delayed gG | 6 | Z-DII/SE-6A/GG | 112127 | 5/500 |
| DII E27 | delayed gG | 10 | Z-DII/SE-10A/GG | 112128 | 5/500 |
| DII E27 | delayed gG | 16 | Z-DII/SE-16A/GG | 112129 | 5/500 |
| DII E27 | delayed gG | 20 | Z-DII/SE-20A/GG | 112130 | 5/500 |
| DII E27 | delayed gG | 25 | Z-DII/SE-25A/GG | 112131 | 5/500 |
| DII E27 | standard DZ | 2 | Z-DII/SE-2A/DZ | 112028 | 5/500 |
| DII E27 | standard DZ | 4 | Z-DII/SE-4A/DZ | 112029 | 5/500 |
| DII E27 | standard DZ | 6 | Z-DII/SE-6A/DZ | 112120 | 5/500 |
| DII E27 | standard DZ | 10 | Z-DII/SE-10A/DZ | 112121 | 5/500 |
| DII E27 | standard DZ | 16 | Z-DII/SE-16A/DZ | 112122 | 5/500 |
| DII E27 | standard DZ | 20 | Z-DII/SE-20A/DZ | 112123 | 5/500 |
| DII E27 | standard DZ | 25 | Z-DII/SE-25A/DZ | 112124 | 5/500 |
| DIII E33 | delayed gG | 35 | Z-DIII/SE-35A/GG | 112135 | 5/500 |
| DIII E33 | delayed gG | 50 | Z-DIII/SE-50A/GG | 112136 | 5/500 |
| DIII E33 | delayed gG | 63 | Z-DIII/SE-63A/GG | 112137 | 5/500 |
| DIII E33 | standard DZ | 35 | Z-DIII/SE-35A/DZ | 112132 | 5/500 |
| DIII E33 | standard DZ | 50 | Z-DIII/SE-50A/DZ | 112133 | 5/500 |
| DIII E33 | standard DZ | 63 | Z-DIII/SE-63A/DZ | 112134 | 5/500 |
| DIV | delayed gG | 80 | D IV-80 A gG | 852314401 | 25/500 |
| DIV | delayed gG | 100 | D IV-100 A gG | 852314402 | 25/500 |
| DIV | standard | 80 | D IV-80 A | 852314101 | 25/500 |
| DIV | standard | 100 | D IV-100 A | 852314102 | 25/500 |

Technical information p. 224

Screw-in Gauge Ring Z-DII./PS

| For size | Rated current [A] | Type Designation | Article No. | Units per package |
|----------|-------------------|------------------|-------------|-------------------|
| DII E27 | 2 | Z-DII/PS-2A | 112138 | 25/1500 |
| DII E27 | 4 | Z-DII/PS-4A | 112139 | 25/1500 |
| DII E27 | 6 | Z-DII/PS-6A | 112140 | 25/1500 |
| DII E27 | 10 | Z-DII/PS-10A | 112141 | 25/1500 |
| DII E27 | 16 | Z-DII/PS-16A | 112142 | 25/1500 |
| DII E27 | 20 | Z-DII/PS-20A | 112143 | 25/1500 |
| DII E27 | 25 | Z-DII/PS-25A | 112144 | 25/1500 |
| DIII E33 | 35 | Z-DIII/PS-35A | 112145 | 25/850 |
| DIII E33 | 50 | Z-DIII/PS-50A | 112146 | 25/850 |
| DIII E33 | 63 | Z-DIII/PS-63A | 112147 | 25/850 |

SG19207



Gauge Ring Z-DII./PE

| For size | Rated current [A] | Type Designation | Article No. | Units per package |
|----------|-------------------|------------------|-------------|-------------------|
| DII E27 | 2 | Z-DII/PE-2A | 110396 | 50 |
| DII E27 | 4 | Z-DII/PE-4A | 110397 | 50 |
| DII E27 | 6 | Z-DII/PE-6A | 110398 | 50 |
| DII E27 | 10 | Z-DII/PE-10A | 110399 | 50 |
| DII E27 | 16 | Z-DII/PE-16A | 110790 | 50 |
| DII E27 | 20 | Z-DII/PE-20A | 110791 | 50 |
| DIII E33 | 2 | Z-DIII/PE-2A | 110792 | 50 |
| DIII E33 | 4 | Z-DIII/PE-4A | 110793 | 50 |
| DIII E33 | 6 | Z-DIII/PE-6A | 110794 | 50 |
| DIII E33 | 10 | Z-DIII/PE-10A | 110795 | 50 |
| DIII E33 | 16 | Z-DIII/PE-16A | 110796 | 50 |
| DIII E33 | 20 | Z-DIII/PE-20A | 110797 | 50 |
| DIII E33 | 25 | Z-DIII/PE-25A | 110798 | 50 |
| DIII E33 | 35 | Z-DIII/PE-35A | 110799 | 50 |
| DIII E33 | 50 | Z-DIII/PE-50A | 110800 | 50 |

wa_sg05908



Technical information p. 226

Screw Caps Z-DII./SK

SG07608



| For size | Rated voltage AC [V] | Type Designation | Article No. | Units per package |
|----------|----------------------|------------------|-------------|-------------------|
| DII E27 | 500 | Z-DII/SK | 112148 | 50/600 |
| DIII E33 | 500 | Z-DIII/SK | 112149 | 30/360 |
| DIII E33 | 690 | Z-DIII/SK-690 | 118904 | 3 |

Technical information p. 226

Fuse Bases for standard mounting

- Fuse bases for fuse links DII and with thread E27 to 25 A
- Fuse bases for fuse links DIII and with thread E33 to 63 A
- For mounting onto device rail,, types ..-MP for mounting onto panel
- Delivered without screw caps



| Poles / mounting | Rated current [A] | Type Designation | Article No. | Units per package |
|---------------------|-------------------|------------------|-------------|-------------------|
| Size DII E27 | | | | |
| 1 / On DIN rail | 25 | DII-SO/25/1 | 112151 | 1 |
| 1 / On panel | 25 | DII-SO/25/1-MP | 112150 | 1 |
| 3 / On DIN rail | 25 | DII-SO/25/3 | 112154 | 1 |



| | | | | |
|----------------------|----|-----------------|--------|---|
| Size DIII E33 | | | | |
| 1 / On DIN rail | 63 | DIII-SO/63/1 | 112153 | 1 |
| 1 / On panel | 63 | DIII-SO/63/1-MP | 112152 | 1 |
| 3 / On DIN rail | 63 | DIII-SO/63/3 | 112155 | 1 |

Technical information p. 227

Fuse Bases for direct mounting onto busbars

- Fuse bases for fuse links DII and with thread E27 to 25 A
- Fuse bases for fuse links DIII and with thread E33 to 63 A
- For mounting onto 60 mm busbar systems e.g. SASY 60i
- Suitable for busbars 12 x 5/10, 20 x 5/10, 25 x 5/10, 30 x 5/10, with double T profile
- Including shock hazard protection cover, front and bottom plate and description label
- Delivered empty without screw caps
- 3-pole
- Width 45 mm (DII) and 54 mm (DIII)
- Version -R for gauge rings Z-DII./PE
- Version -R-PS for screw/in gauge rings Z-DII./PS

SG12506



| Rated current [A] / Size | Rated voltage U _g AC [V] | Type Designation | Article No. | Units per package |
|--------------------------|-------------------------------------|-------------------|-------------|-------------------|
| 25 / DII E27 | 500 | DII-SO/25/3-R | 107965 | 10 |
| 25 / DII E27 | 500 | DII-SO/25/3-R-PS | 110394 | 10 |
| 63 / DIII E33 | 690 | DIII-SO/63/3-R | 107966 | 10 |
| 63 / DIII E33 | 690 | DIII-SO/63/3-R-PS | 110395 | 10 |

SG12606



Cover

- Side cover for DII-SO...3-R and DIII-SO...3-R

SG04407



| Description | Type Designation | Article No. | Units per package |
|-------------|------------------|-------------|-------------------|
| Side cover | SBS-RS60 | 60541 | 10 |

Technical information p. 228

Cylindrical Fuse-links Z-C10, Z-C14, Z-C22

- Fuse-links suitable for fuse disconnectors C10-SLS, VLC14 a VLC22
- Rated voltage 690, 500, 400 V, 50 Hz (according to I_n)
- High breaking capacity 100 kA
- Low let-through energy
- Characteristic gG suitable for protection of electrical lines, cables
- Characteristic AM suitable for protection of circuits with motors

SG20607



SG20507



SG20407



SG20607



SG20507



| Type size | Rated current [A] | Rated voltage AC [V] | Type Designation | Article No. | Units per package |
|-------------------------------|-------------------|----------------------|------------------|-------------|-------------------|
| Characteristic gG (gL) | | | | | |
| 10x38 | 1 | 500 | Z-C10/SE-1A/GG | 112156 | 10/500 |
| 10x38 | 2 | 500 | Z-C10/SE-2A/GG | 112157 | 10/500 |
| 10x38 | 4 | 500 | Z-C10/SE-4A/GG | 112158 | 10/500 |
| 10x38 | 6 | 500 | Z-C10/SE-6A/GG | 112159 | 10/500 |
| 10x38 | 8 | 500 | Z-C10/SE-8A/GG | 112160 | 10/500 |
| 10x38 | 10 | 500 | Z-C10/SE-10A/GG | 112161 | 10/500 |
| 10x38 | 12 | 500 | Z-C10/SE-12A/GG | 112162 | 10/500 |
| 10x38 | 16 | 500 | Z-C10/SE-16A/GG | 112163 | 10/500 |
| 10x38 | 20 | 500 | Z-C10/SE-20A/GG | 112164 | 10/500 |
| 10x38 | 25 | 500 | Z-C10/SE-25A/GG | 112165 | 10/500 |
| 10x38 | 32 | 400 | Z-C10/SE-32A/GG | 112166 | 10/500 |
| | | | | | |
| 14x51 | 2 | 690 | Z-C14/SE-2A/GG | 112167 | 10/200 |
| 14x51 | 4 | 690 | Z-C14/SE-4A/GG | 112168 | 10/200 |
| 14x51 | 6 | 690 | Z-C14/SE-6A/GG | 112169 | 10/200 |
| 14x51 | 8 | 690 | Z-C14/SE-8A/GG | 112170 | 10/200 |
| 14x51 | 10 | 690 | Z-C14/SE-10A/GG | 112171 | 10/200 |
| 14x51 | 12 | 690 | Z-C14/SE-12A/GG | 112172 | 10/200 |
| 14x51 | 16 | 690 | Z-C14/SE-16A/GG | 112173 | 10/200 |
| 14x51 | 20 | 690 | Z-C14/SE-20A/GG | 112174 | 10/200 |
| 14x51 | 25 | 690 | Z-C14/SE-25A/GG | 112175 | 10/200 |
| 14x51 | 32 | 690 | Z-C14/SE-32A/GG | 112176 | 10/200 |
| 14x51 | 40 | 500 | Z-C14/SE-40A/GG | 112177 | 10/200 |
| 14x51 | 50 | 500 | Z-C14/SE-50A/GG | 112178 | 10/200 |
| | | | | | |
| 22x58 | 16 | 690 | Z-C22/SE-16A/GG | 112179 | 10/480 |
| 22x58 | 20 | 690 | Z-C22/SE-20A/GG | 112180 | 10/480 |
| 22x58 | 25 | 690 | Z-C22/SE-25A/GG | 112181 | 10/480 |
| 22x58 | 32 | 690 | Z-C22/SE-32A/GG | 112182 | 10/480 |
| 22x58 | 40 | 690 | Z-C22/SE-40A/GG | 112183 | 10/480 |
| 22x58 | 50 | 500 | Z-C22/SE-50A/GG | 112184 | 10/480 |
| 22x58 | 63 | 500 | Z-C22/SE-63A/GG | 112185 | 10/480 |
| 22x58 | 80 | 500 | Z-C22/SE-80A/GG | 112186 | 10/480 |
| 22x58 | 100 | 500 | Z-C22/SE-100A/GG | 112187 | 10/480 |
| Characteristic aM | | | | | |
| 10x38 | 1 | 500 | Z-C10/SE-1A/AM | 112188 | 10/500 |
| 10x38 | 2 | 500 | Z-C10/SE-2A/AM | 112189 | 10/500 |
| 10x38 | 4 | 500 | Z-C10/SE-4A/AM | 112190 | 10/500 |
| 10x38 | 6 | 500 | Z-C10/SE-6A/AM | 112191 | 10/500 |
| 10x38 | 8 | 500 | Z-C10/SE-8A/AM | 112192 | 10/500 |
| 10x38 | 10 | 500 | Z-C10/SE-10A/AM | 112193 | 10/500 |
| 10x38 | 12 | 500 | Z-C10/SE-12A/AM | 112194 | 10/500 |
| 10x38 | 16 | 500 | Z-C10/SE-16A/AM | 112195 | 10/500 |
| 10x38 | 20 | 400 | Z-C10/SE-20A/AM | 112196 | 10/500 |
| 10x38 | 25 | 400 | Z-C10/SE-25A/AM | 112197 | 10/500 |
| 10x38 | 32 | 400 | Z-C10/SE-32A/AM | 112198 | 10/500 |
| | | | | | |
| 14x51 | 2 | 690 | Z-C14/SE-2A/AM | 112199 | 10/200 |
| 14x51 | 4 | 690 | Z-C14/SE-4A/AM | 112200 | 10/200 |
| 14x51 | 6 | 690 | Z-C14/SE-6A/AM | 112201 | 10/200 |
| 14x51 | 8 | 690 | Z-C14/SE-8A/AM | 112202 | 10/200 |
| 14x51 | 10 | 690 | Z-C14/SE-10A/AM | 112203 | 10/200 |
| 14x51 | 12 | 690 | Z-C14/SE-12A/AM | 112204 | 10/200 |
| 14x51 | 16 | 690 | Z-C14/SE-16A/AM | 112205 | 10/200 |
| 14x51 | 20 | 690 | Z-C14/SE-20A/AM | 112206 | 10/200 |
| 14x51 | 25 | 690 | Z-C14/SE-25A/AM | 112207 | 10/200 |
| 14x51 | 32 | 500 | Z-C14/SE-32A/AM | 112208 | 10/200 |
| 14x51 | 40 | 500 | Z-C14/SE-40A/AM | 112209 | 10/200 |
| 14x51 | 50 | 500 | Z-C14/SE-50A/AM | 112210 | 10/200 |

SG20407



| Type size | Rated current [A] | Rated voltage AC [V] | Type Designation | Article No. | Units per package |
|-----------|-------------------|----------------------|------------------|-------------|-------------------|
| 22x58 | 16 | 690 | Z-C22/SE-16A/AM | 112211 | 10/480 |
| 22x58 | 20 | 690 | Z-C22/SE-20A/AM | 112212 | 10/480 |
| 22x58 | 25 | 690 | Z-C22/SE-25A/AM | 112213 | 10/480 |
| 22x58 | 32 | 690 | Z-C22/SE-32A/AM | 112214 | 10/480 |
| 22x58 | 40 | 690 | Z-C22/SE-40A/AM | 112215 | 10/480 |
| 22x58 | 50 | 690 | Z-C22/SE-50A/AM | 112216 | 10/480 |
| 22x58 | 63 | 500 | Z-C22/SE-63A/AM | 112217 | 10/480 |
| 22x58 | 80 | 500 | Z-C22/SE-80A/AM | 112218 | 10/480 |
| 22x58 | 100 | 500 | Z-C22/SE-100A/AM | 112219 | 10/480 |

Technical information p. 229

Fuse Disconnectors C10-SLS, VLC

- For cylindrical fuse-links Z-C10, 14, 22
 - Mainly for industrial distributions
 - Meets requirements EN 60947-3
 - Rated voltage 690 V, 50 Hz
 - Utilization category AC-22B (C10-SLS, VLC14),
- AC-21B (VLC22)
 - Design ...L with lighting indication of tripping of fuse-links
 - Sealable

Fuse Disconnectors 10x38 C10-SLS up to 32 A

- For cylindrical fuse-links Z-C10

SG06508



| Num. of poles | For fuse-link | Type Designation | Article No. | Units per package |
|--|---------------|------------------|-------------|-------------------|
| without Visual Tripping Indicator | | | | |
| 1 | 10x38 | C10-SLS/32/1 | 112220 | 12/108 |
| 1+N | 10x38 | C10-SLS/32/1N | 112221 | 12/108 |
| 2 | 10x38 | C10-SLS/32/2 | 112222 | 6/54 |
| 3 | 10x38 | C10-SLS/32/3 | 112223 | 4/36 |
| 3+N | 10x38 | C10-SLS/32/3N | 112224 | 4/36 |
| with Visual Tripping Indicator | | | | |
| 1 | 10x38 | C10-SLS/32/1-L | 112225 | 12/108 |
| 1+N | 10x38 | C10-SLS/32/1N-L | 112226 | 12/108 |
| 2 | 10x38 | C10-SLS/32/2-L | 112227 | 6/54 |
| 3 | 10x38 | C10-SLS/32/3-L | 112228 | 4/36 |
| 3+N | 10x38 | C10-SLS/32/3N-L | 112229 | 4/36 |

Fuse Disconnectors 14x51 VLC14 up to 50 A

- For cylindrical fuse-links Z-C14

SG00205



| Num. of poles | For fuse-link | Type Designation | Article No. | Units per package |
|--|---------------|------------------|-------------|-------------------|
| without Visual Tripping Indicator | | | | |
| 1 | 14x51 | VLC14-1P | 285361 | 12/96 |
| 1+N | 14x51 | VLC14-1P+N | 285362 | 6/48 |
| 2 | 14x51 | VLC14-2P | 285363 | 6/48 |
| 3 | 14x51 | VLC14-3P | 285364 | 4/32 |
| 3+N | 14x51 | VLC14-3P+N | 285365 | 3/24 |
| with Visual Tripping Indicator | | | | |
| 1 | 14x51 | VLC14-1P/L | 285371 | 12/96 |
| 1+N | 14x51 | VLC14-1P+N/L | 285372 | 6/48 |
| 2 | 14x51 | VLC14-2P/L | 285373 | 6/48 |
| 3 | 14x51 | VLC14-3P/L | 285374 | 4/32 |
| 3+N | 14x51 | VLC14-3P+N/L | 285375 | 3/24 |

Fuse Disconnectors 22x58 VLC22 up to 100 A

- For cylindrical fuse-links Z-C22

SG00105



| Num. of poles | For fuse-link | Type Designation | Article No. | Units per package |
|--|---------------|------------------|-------------|-------------------|
| without Visual Tripping Indicator | | | | |
| 1 | 22x58 | VLC22-1P | 285366 | 3/105 |
| 1+N | 22x58 | VLC22-1P+N | 285367 | 2/48 |
| 2 | 22x58 | VLC22-2P | 285368 | 2/48 |
| 3 | 22x58 | VLC22-3P | 285369 | 1/35 |
| 3+N | 22x58 | VLC22-3P+N | 285370 | 1/24 |
| with Visual Tripping Indicator | | | | |
| 1 | 22x58 | VLC22-1P/L | 285376 | 3/105 |
| 1+N | 22x58 | VLC22-1P+N/L | 285377 | 2/48 |
| 2 | 22x58 | VLC22-2P/L | 285378 | 2/48 |
| 3 | 22x58 | VLC22-3P/L | 285379 | 1/35 |
| 3+N | 22x58 | VLC22-3P+N/L | 285380 | 1/24 |

Technical information p. 234

Fuse-Links Z-C10../PV Photovoltaic application

- Fuse links for fuse disconnectors FCFDC10DI...-SOL
- For photovoltaic and similar DC applications
- Rated voltage 1000, 900 V DC (acc. to rated current)
- Maximum DC Operating voltage of the fuse-link must be 1,2 multiple of U_{oc} of string
- Rated current I_n of the fuse-link must be higher or equal than 1,5 multiple of short circuit current I_{sc} of a PV panel

SG11008



| Type size | Rated current [A] | Rated voltage AC [V] | Type Designation | Article No. | Units per package |
|-----------|-------------------|----------------------|------------------|-------------|-------------------|
| 10x38 | 2 | 1000 | Z-C10/SE-2A/PV | 131700 | 10/500 |
| 10x38 | 4 | 1000 | Z-C10/SE-4A/PV | 131701 | 10/500 |
| 10x38 | 6 | 1000 | Z-C10/SE-6A/PV | 122009 | 10/500 |
| 10x38 | 8 | 1000 | Z-C10/SE-8A/PV | 122070 | 10/500 |
| 10x38 | 10 | 1000 | Z-C10/SE-10A/PV | 122071 | 10/500 |
| 10x38 | 12 | 1000 | Z-C10/SE-12A/PV | 131702 | 10/500 |
| 10x38 | 16 | 1000 | Z-C10/SE-16A/PV | 122072 | 10/500 |
| 10x38 | 20 | 1000 | Z-C10/SE-20A/PV | 122073 | 10/500 |
| 10x38 | 25 | 900 | Z-C10/SE-25A/PV | 131703 | 10/500 |

Technical information p. 235

Fuse disconnectors FCFDC10DI...-SOL for photovoltaic applications

- Fuse disconnectors for PV strings
- For use with fuse links Z-C10/SE..PV
- Rated operational voltage 1000 V DC
- Rated current 25 A DC
- Utilization category DC-20B
- Version with visual tripping indicator:
 - 50-400 V flashing
 - 400-1000 V permanent light
- Sealable

wa_sg06209



| Poles | For fuse links | Type Designation | Article No. | Units per package |
|--|----------------|------------------|-------------|-------------------|
| without Visual Tripping Indicator | | | | |
| 1 | 10x38 | FCFDC10DI-1-SOL | 137256 | 12/108 |
| 2 | 10x38 | FCFDC10DI-2-SOL | 137257 | 6/54 |
| with Visual Tripping Indicator | | | | |
| 1 | 10x38 | FCFDC10DI-1L-SOL | 137258 | 12/108 |
| 2 | 10x38 | FCFDC10DI-2L-SOL | 137259 | 6/54 |

Technical information p. 236

Fuse-Links D0, Z-D0../SE

SG02905



- Fuse links for systems D01 and D02
- Rated voltage 400 V AC, 220 V DC
- Rated short-circuit breaking capacity 50 kA AC, 8 kA DC

- Characteristic gG
- Supplied in a box for mounting onto device rail, colour acc. to rated current

| Size | Rated current [A] | Type Designation | Article No. | Units per package |
|------|-------------------|------------------|-------------|-------------------|
| D01 | 2 | Z-D01/SE-2 | 288934 | 12/288 |
| D01 | 4 | Z-D01/SE-4 | 288935 | 12/288 |
| D01 | 6 | Z-D01/SE-6 | 288936 | 12/288 |
| D01 | 10 | Z-D01/SE-10 | 288937 | 12/288 |
| D01 | 13 | Z-D01/SE-13 | 288938 | 12/288 |
| D01 | 16 | Z-D01/SE-16 | 288939 | 12/288 |
| D02 | 20 | Z-D02/SE-20 | 288940 | 12/144 |
| D02 | 25 | Z-D02/SE-25 | 288941 | 12/144 |
| D02 | 32 | Z-D02/SE-32 | 288942 | 12/144 |
| D02 | 35 | Z-D02/SE-35 | 288943 | 12/144 |
| D02 | 40 | Z-D02/SE-40 | 288944 | 12/144 |
| D02 | 50 | Z-D02/SE-50 | 288945 | 12/144 |
| D02 | 63 | Z-D02/SE-63 | 288946 | 12/144 |

SG02905



Cartridge-Ring Adapter Insert Z-D0../PE

SG03105



- Cartridge ring adapter inserts for rated current coding
- For fuse links Z-D01/SE and Z-D02/SE

- Supplied in a box for mounting onto device rail, colour acc. to rated current

| Size | For rated current [A] | Type Designation | Article No. | Units per package |
|------|-----------------------|------------------|-------------|-------------------|
| D01 | 2 | Z-D01/PE-2 | 288909 | 12/288 |
| D01 | 4 | Z-D01/PE-4 | 288910 | 12/288 |
| D01 | 6 | Z-D01/PE-6 | 288911 | 12/288 |
| D01 | 10, 13 | Z-D01/PE-10 | 288912 | 12/288 |
| D02 | 20 | Z-D02/PE-20 | 288913 | 12/288 |
| D02 | 25 | Z-D02/PE-25 | 288914 | 12/288 |
| D02 | 35, 32 | Z-D02/PE-35 | 288915 | 12/288 |
| D02 | 40 | Z-D02/PE-40 | 288916 | 12/288 |
| D02 | 50 | Z-D02/PE-50 | 288917 | 12/288 |

Cartridge-Ring Adapter Insert Z-D02-D01/PE

SG03005



- D01 for Fuse-Base D02 and Fuse-Switch-Disconnecter D02

- In practical plastic box in the color of the visual tripping indicator - to snap on DIN-rail

| Size | For rated current [A] | Type Designation | Article No. | Units per package |
|---------|-----------------------|------------------|-------------|-------------------|
| D02-D01 | 2 | Z-D02-D01/PE-2 | 263112 | 12/288 |
| D02-D01 | 4 | Z-D02-D01/PE-4 | 263113 | 12/288 |
| D02-D01 | 6 | Z-D02-D01/PE-6 | 263150 | 12/288 |
| D02-D01 | 10, 13 | Z-D02-D01/PE-10 | 263151 | 12/288 |
| D02-D01 | 16 | Z-D02-D01/PE-16 | 263152 | 12/288 |

Cartridge-Ring Adapter Insert Plier Z-D0-PE-Z

SG19707



- For easy mounting of cartridge ring adapter inserts

| Size | Type Designation | Article No. | Units per package |
|-------------------------------------|------------------|-------------|-------------------|
| Cartridge-Ring Adapter Insert Plier | Z-D0-PE-Z | 114324 | 1/10 |

SG11205



Technical information p. 238

Screw Caps Z-D0./SK

- Screw caps for systems D01 and D02

| Size | For rated current [A] | Type Designation | Article No. | Units per package |
|------|-----------------------|------------------|-------------|-------------------|
| D01 | max. 16 | Z-D01/SK | 100650 | 20 |
| D02 | max. 63 | Z-D02/SK | 100651 | 20 |

WA_SG02502



Adapter Spring

- Enable use of fuse links of size D01 in crew caps of size D02

| Size | Type Designation | Article No. | Units per package |
|---------|------------------|-------------|-------------------|
| D02-D01 | Z-D02/SIKA-HF | 263149 | 50/3000 |

SG11605



SG11505



Technical information p. 239

Fuse-Base D01 and D02 for mounting onto device rail

- Fuse bases for systems D01 and D02
- Delivered empty, without screw caps

| Size | Poles / Width | Rated current [A] | Type Designation | Article No. | Units per package |
|------|---------------|-------------------|------------------|-------------|-------------------|
| D01 | 1 / 27 mm | 16 | D01-SO/16/1 | 102752 | 9/216 |
| D01 | 3 / 81 mm | 16 | D01-SO/16/3 | 102674 | 3/72 |
| D02 | 1 / 27 mm | 63 | D02-SO/63/1 | 102675 | 9/216 |
| D02 | 3 / 81 mm | 63 | D02-SO/63/3 | 102676 | 3/72 |

SG15007



Slide Fuse-Base D02 (+D01) for direct mounting onto busbars

- Fuse bases for fuse links Z-D02/SE (Z-D01/SE with reduction)
- For mounting onto 60 mm busbar systems e.g. SASY 60i
- Suitable for busbars 12 x 5/10, 20 x 5/10, 25 x 5/10, 30 x 5/10, with double T profile
- Including shock hazard protection cover, front and bottom plate and description label
- Delivered empty without screw caps
- 3-pole
- Rated current 63 A
- Rated voltage U_e 400 V AC

| Size | Width [mm] | Type Designation | Article No. | Units per package |
|------|------------|------------------|-------------|-------------------|
| D02 | 27 | D02-SO/63/3-R-27 | 114315 | 10 |
| D02 | 36 | Z-D02/R/3-36 | 100663 | 60 |
| D02 | 54 | Z-D02/R/3-54 | 100664 | 40 |

SG15205



Technical information p. 240

Cover

- For covering busbar support
- Suitable for D02-SO/63/3-R-27
- Set

| Size | Width [mm] | Type Designation | Article No. | Units per package |
|------|------------|------------------|-------------|-------------------|
| D02 | 36 | Z-D02-S-AB-SET | 100662 | 10 |

SG18705



Switch-Disconnecter-Fuse D02-S for direct mounting onto busbars

- Switch disconnectors with fuses
- For fuse links Z-D02/SE and Z-D01/SE (with cartridge-ring adapter insert Z-D02-D01/PE... and adapter spring Z-D02/SIKA-HF)
- For mounting onto 60 mm busbar systems e.g. SASY 60i
- Suitable for busbars 20 x 5/10, 30 x 5/10, with double T profile
- Rated current 63 A
- Rated operational voltage 400 V AC
- Utilization category AC-23B
- Including shock hazard protection cover, front and bottom plate and description label
- Delivered empty without screw caps
- 3-pole
- Width 36 mm

| Num. of poles | Rated current [A] | Type Designation | Article No. | Units per package |
|---------------|-------------------|------------------|-------------|-------------------|
| 3 | 63 | D02-S/63/3-RS | 284649 | 10 |

Technical information p. 241

SG16007



SG15107



Switch-Disconnecter-Fuse D02-LTS for direct mounting onto busbars

- Switch disconnectors with fuses
- For fuse links Z-D02/SE and Z-D01/SE (with cartridge-ring adapter insert Z-D02-D01/PE... and adapter spring Z-D02/SIKA-HF) and cylindrical fuse links Z-C10/SE (with adapter Z-D02-LTS-HF)
- For mounting onto 60 mm busbar systems e.g. SASY 60i
- Suitable for busbars 12 x 5/10, 15 x 5/10, 20 x 5/10, 25 x 5/10, 30 x 5/10, with double T profile
- Rated current 63 A
- Rated operational voltage 400 V AC
- Utilization category AC-22B
- Visual tripping indicator (flashing)
- Contact position indicator red - green
- Delivered empty
- Including adapter Z-D02-LTS-HF
- 3-pole
- Width 27 mm
- Version -HK with auxiliary contact
- Can be sealed with leads, lockable

| Num. of poles | Rated current [A] | Type Designation | Article No. | Units per package |
|---------------|-------------------|--------------------|-------------|-------------------|
| 3 | 63 | D02-LTS/63/3-R | 114316 | 3 |
| 3 | 63 | D02-LTS/63/3-R-HK | 114318 | 3 |
| 3+N | 63 | D02-LTS/63/3N-R | 114317 | 3 |
| 3+N | 63 | D02-LTS/63/3N-R-HK | 114319 | 3 |

Technical information p. 242

SG18907



Adapter Spring Z-D02-LTS-HF

- For use of fuse links D01 and cylindrical fuse links Z-C10 in fuse switch disconnectors D02-LTS

| For fuse links | Type Designation | Article No. | Units per package |
|----------------|------------------|-------------|-------------------|
| D01, Z-C10 | Z-D02-LTS-HF | 114323 | 12/288 |

WA_SG03202



Switch-Disconnecter-Fuse Z-SLS/D01

- Switch-Disconnecter-Fuse for fuse links Z-D01/SE
- Visual tripping indicator
- Delivered without fuse links
- Rated current 16 A
- Rated operational voltage 230/400 V AC, 60 V DC (1-pole), 110 V DC (2-pole)
- Utilization category AC-22B, DC-21B
- Mechanical current coding is integrated
- Can be sealed
- Supply side from top or bottom

| Num. of poles | Rated current [A] | Type Designation | Article No. | Units per package |
|---------------|-------------------|------------------|-------------|-------------------|
| 1 | 16 | Z-SLS/D01/1 | 263155 | 18/180 |
| 1+N | 16 | Z-SLS/D01/1+N | 263158 | 9/90 |
| 2 | 16 | Z-SLS/D01/2 | 263156 | 9/90 |
| 3 | 16 | Z-SLS/D01/3 | 263157 | 6/60 |
| 3+N | 16 | Z-SLS/D01/3+N | 263159 | 4/40 |

Technical information p. 243

SG3302



Fuse-Switch-Disconnectors Z-SLS/NEOZ

- Fuse switch disconnector for fuse links size D01 and D02
- Empty
- Rated current 63 A
- Rated operational voltage 230/400 V AC, 110 V DC (1-pole), 220 V DC (2-pole)
- Utilization category AC-22B, DC-21B
- Mechanical current coding with Fuse-link set
- Can be sealed
- Supply side from top or bottom

| Num. of poles | Rated current [A] | Type Designation | Article No. | Units per package |
|---------------|-------------------|------------------|-------------|-------------------|
| 1 | 63 | Z-SLS/NEOZ/1 | 248235 | 12/120 |
| 1+N | 63 | Z-SLS/NEOZ/1+N | 248237 | 6/60 |
| 2 | 63 | Z-SLS/NEOZ/2 | 248233 | 6/60 |
| 3 | 63 | Z-SLS/NEOZ/3 | 248234 | 4/40 |
| 3+N | 63 | Z-SLS/NEOZ/3+N | 248236 | 3/30 |

Technical information p. 244

SG00709



Fuse-Switch-Disconnectors Z-SLS/CEK

- Fuse switch disconnector for fuse links size D01 and D02
- Integrated mechanical current coding
- Rated current up to 63 A acc. to mech. coding
- Rated operational voltage 60-230 V AC (1-pole); 60-400 V AC (1+N, 2, 3, 3+N pole)
- Utilization category AC-22B
- Mechanical current coding by means of fuse link set
- Can be sealed
- Supply side from top or bottom
- Version Z-SLS/CEK without visual tripping indicator
- Version Z-SLS/CEK...-SP with visual tripping indicator, with neutral lead through terminal, and with Integrated switch-locking

| Num. of poles | Rated current [A] | Type Designation | Article No. | Units per package |
|---------------|-------------------|------------------|-------------|-------------------|
|---------------|-------------------|------------------|-------------|-------------------|

without Visual Tripping Indicator

| | | | | |
|---|----|---------------|--------|--------|
| 1 | 10 | Z-SLS/CEK10/1 | 272587 | 12/120 |
| 1 | 16 | Z-SLS/CEK16/1 | 263135 | 12/120 |
| 1 | 25 | Z-SLS/CEK25/1 | 263136 | 12/120 |
| 3 | 16 | Z-SLS/CEK16/3 | 248243 | 4/40 |
| 3 | 25 | Z-SLS/CEK25/3 | 248244 | 4/40 |
| 3 | 35 | Z-SLS/CEK35/3 | 248245 | 4/40 |
| 3 | 50 | Z-SLS/CEK50/3 | 248246 | 4/40 |
| 3 | 63 | Z-SLS/CEK63/3 | 263160 | 4/40 |

SG08705



with Visual Tripping Indicator

| | | | | |
|-----|------|------------------|--------|------|
| 1+N | 10 A | Z-SLS/CEK10/1-SP | 100652 | 6/60 |
| 1+N | 16 A | Z-SLS/CEK16/1-SP | 100653 | 6/60 |
| 1+N | 25 A | Z-SLS/CEK25/1-SP | 100654 | 6/60 |
| 3+N | 16 A | Z-SLS/CEK16/3-SP | 100655 | 3/30 |
| 3+N | 25 A | Z-SLS/CEK25/3-SP | 100656 | 3/30 |
| 3+N | 35 A | Z-SLS/CEK35/3-SP | 100657 | 3/30 |
| 3+N | 50 A | Z-SLS/CEK50/3-SP | 100658 | 3/30 |
| 3+N | 63 A | Z-SLS/CEK63/3-SP | 100659 | 3/30 |

Technical information p. 245

SG3402



Fuse switch disconnectors Z-SLK with electronic fuse monitoring

- Fuse switch disconnectors for fuse links size D01 and D02
- With fuse monitoring (HS)
- Rated current 63 A
- Utilization category AC-22B, DC-21B
- Mechanical current coding with fuse-link set
- Can be sealed
- Supply side from top or bottom
- Version Z-SLK/NEOZ for rated operational voltage 60-230 V AC, 60-110 V DC (1-pole); 60-400 V AC, 60-220 V DC (2-pole); 60-400 V AC (1+N, 3, 3+N-pole)
- Version Z-SLK/D0 for rated operational voltage 24-60 V AC/DC (1, 2-pole); 24-60 V AC (3-pole)

| Number of poles | Rated oper. voltage AC/DC [V] | Rated current [A] | Type Designation | Article No. | Units per package |
|-----------------|-------------------------------|-------------------|------------------|-------------|-------------------|
| 1+HS | 63 | 60-230/60-110 | Z-SLK/NEOZ/1 | 248238 | 6/60 |
| 1+N+HS | 63 | 60-400/- | Z-SLK/NEOZ/1+N | 248242 | 4/40 |
| 2+HS | 63 | 60-400/60-220 | Z-SLK/NEOZ/2 | 248239 | 4/40 |
| 3+HS | 63 | 60-400/- | Z-SLK/NEOZ/3 | 248240 | 3/30 |
| 3+N+HS | 63 | 60-400/- | Z-SLK/NEOZ/3+N | 248241 | 2/20 |
| 1+HS | 63 | 24-60/24-60 | Z-SLK/D0/1 | 114325 | 6/60 |
| 2+HS | 63 | 24-60/24-60 | Z-SLK/D0/2 | 114326 | 4/40 |
| 3+HS | 63 | 24-60/- | Z-SLK/D0/3 | 114327 | 3/30 |

Technical information p. 246

Fuse-link sets complete

- 1 set consists of 3 fuse-links, 3 gauge-pieces, 1 plastic box in the color of the visual tripping indicator - to snap on DIN-rail
- For Z-SLS/NEOZ, Z-SLS/CEK, Z-SLK/NEOZ, Z-SLK/D0

SG01105



| Rated Current [A] | Type Designation | Article No. | Units per package |
|--|------------------|-------------|-------------------|
| With visual tripping indicator, rated operational voltage 60-400 V AC / 60-220 V DC | | | |
| 1 | Z-SLS/B-1A | 268983 | 1/12/120 |
| 2 | Z-SLS/B-2A | 268984 | 1/12/120 |
| 4 | Z-SLS/B-4A | 268985 | 1/12/120 |
| 6 | Z-SLS/B-6A | 268986 | 1/12/120 |
| 10 | Z-SLS/B-10A | 268987 | 1/12/120 |
| 13 | Z-SLS/B-13A | 289972 | 1/12/120 |
| 16 | Z-SLS/B-16A | 268988 | 1/12/120 |
| 20 | Z-SLS/B-20A | 268989 | 1/12/120 |
| 25 | Z-SLS/B-25A | 268990 | 1/12/120 |
| 32 | Z-SLS/B-32A | 289973 | 1/12/120 |
| 35 | Z-SLS/B-35A | 268991 | 1/12/120 |
| 40 | Z-SLS/B-40A | 289974 | 1/12/120 |
| 50 | Z-SLS/B-50A | 268992 | 1/12/120 |
| 63 | Z-SLS/B-63A | 268993 | 1/12/120 |
| With visual tripping indicator, rated operational voltage 24-60 V AC / DC | | | |
| 1 | Z-SLS/B/24-1A | 268994 | 1/12/120 |
| 2 | Z-SLS/B/24-2A | 268995 | 1/12/120 |
| 4 | Z-SLS/B/24-4A | 268996 | 1/12/120 |
| 6 | Z-SLS/B/24-6A | 268997 | 1/12/120 |
| 10 | Z-SLS/B/24-10A | 268998 | 1/12/120 |
| 13 | Z-SLS/B/24-13A | 289975 | 1/12/120 |
| 16 | Z-SLS/B/24-16A | 268999 | 1/12/120 |
| 20 | Z-SLS/B/24-20A | 269000 | 1/12/120 |
| 25 | Z-SLS/B/24-25A | 269001 | 1/12/120 |
| 32 | Z-SLS/B/24-32A | 289976 | 1/12/120 |
| 35 | Z-SLS/B/24-35A | 269002 | 1/12/120 |
| 40 | Z-SLS/B/24-40A | 289977 | 1/12/120 |
| 50 | Z-SLS/B/24-50A | 269003 | 1/12/120 |
| 63 | Z-SLS/B/24-63A | 269004 | 1/12/120 |
| Without visual tripping indicator, rated operational voltage 400 V AC / 220 V DC | | | |
| 2 | Z-SLS/E-2A | 263147 | 1/12/120 |
| 4 | Z-SLS/E-4A | 263148 | 1/12/120 |
| 6 | Z-SLS/E-6A | 269005 | 1/12/120 |
| 10 | Z-SLS/E-10A | 269006 | 1/12/120 |
| 13 | Z-SLS/E-13A | 289978 | 1/12/120 |
| 16 | Z-SLS/E-16A | 269007 | 1/12/120 |
| 20 | Z-SLS/E-20A | 269008 | 1/12/120 |
| 25 | Z-SLS/E-25A | 269009 | 1/12/120 |
| 32 | Z-SLS/E-32A | 289979 | 1/12/120 |
| 35 | Z-SLS/E-35A | 269010 | 1/12/120 |
| 40 | Z-SLS/E-40A | 289990 | 1/12/120 |
| 50 | Z-SLS/E-50A | 269011 | 1/12/120 |
| 63 | Z-SLS/E-63A | 269012 | 1/12/120 |

Solid-link Set complete

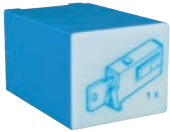
- 1 set consists of 3 solid-link inserts, 3 gauge-pieces, 1 plastic box to be snapped onto DIN rail
- For Z-SLS/NEOZ, Z-SLS/CEK, Z-SLK/NEOZ, Z-SLK/D0

SG01105



| Rated Current [A] | Type Designation | Article No. | Units per package |
|-------------------|------------------|-------------|-------------------|
| 63 | Z-SLS/TR-SET | 100660 | 1/12/120 |

SG9197



Switch-on-locking

- Only one lock per device required
- For Z-SLS/NEOZ, Z-SLS/CEK, Z-SLK/NEOZ, Z-SLK/D0

| Description | Type Designation | Article No. | Units per package |
|--------------|------------------|-------------|-------------------|
| Metal lock | Z-SLZ/SC | 268980 | 1/12/120 |
| Plastic lock | Z-SLZ/SP | 268981 | 1/12/120 |

SG3102



Fuse-Switch-Disconnecter Z-SLS/CB

- For fuse links Z-D01/SE and Z-D02/SE
- Installation of fuse links D01 by means of cartridge ring adapter insert Z-D02-D01/PE and adapter Z-SLS/CB-HF
- Installation of fuse links D02 by means of cartridge ring adapter insert D02 Z-D02/PE
- With visual tripping indicator
- Rated current up to 63 A acc. to cartridge ring insert
- Rated operational voltage 400 V AC, 110 V DC (1-pole), 220 V DC (2-pole)
- Utilization category AC-22B
- Can be sealed

| Num. of poles | Rated current [A] | Type Designation | Article No. | Units per package |
|---------------|-------------------|------------------|-------------|-------------------|
| 1 | 63 | Z-SLS/CB/1 | 248247 | 12/120 |
| 2 | 63 | Z-SLS/CB/2 | 248248 | 6/60 |
| 3 | 63 | Z-SLS/CB/3 | 248249 | 4/40 |

Technical information p. 248

WA_SG02602



Adapter Spring Z-SLS/CB-HF

- For Z-SLS/CB/ for the use of fuse-links size D01

| Size | Type Designation | Article No. | Units per package |
|------|------------------|-------------|-------------------|
| D01 | Z-SLS/CB-HF | 263154 | 12/288 |

46383A



Double Terminal Z-SLS/KL

- Adapter for doubling of terminals
- For Z-SLS/NEOZ, Z-SLS/CEK, Z-SLK/NEOZ, Z-SLK/D0, Z-SLS/CB
- Connection cross section 2 x 3 x 35 mm²
- 3-pole

| Description | Type Designation | Article No. | Units per package |
|-----------------|------------------|-------------|-------------------|
| Double Terminal | Z-SLZ/KL | 268982 | 15/150 |

SG00809



Switch-Disconnecter-Fuse with visual tripping indicator and thermal monitoring D02-LTS

- For Z-D01/SE and Z-D02/SE
- Thermal monitoring with integrated thermo switch
- Installation of fuse links D01 by means of cartridge-ring adapter insert Z-D02-D01/PE... and adapter spring Z-D02-LTS-HF
- Installation of fuse links D02 by means of cartridge-ring adapter insert Z-D02/PE
- Installation of cylindrical fuse links Z-C10/SE by means of adapter Z-D02-LTS -HF
- With visual tripping indicator
- Rated current up to 63 A acc. to cartridge ring insert
- Rated operational voltage 400 V AC
- Utilization category AC-22B
- Can be sealed
- Version D02-LTS/63-3-HK with integrated auxiliary contact
- Including adapter Z-D02-LTS -HF for fuse links D01 or cylindrical fuse links Z-C10/S
- Delivered without fuse links

| Num. of poles | Rated current [A] | Type Designation | Article No. | Units per package |
|---------------|-------------------|------------------|-------------|-------------------|
| 3 | 63 | D02-LTS/63-3 | 114320 | 3/30 |
| 3 | 63 | D02-LTS/63-3-HK | 114322 | 3/30 |
| 3N | 63 | D02-LTS/63-3N | 114321 | 3/30 |

Technical information p. 249

SG18907



Adapter Spring Z-D02-LTS-HF

- For use of fuse links D01 and cylindrical fuse links Z-C10 in disconnectors D02-LTS

| Size | Type Designation | Article No. | Units per package |
|------------|------------------|-------------|-------------------|
| D01, Z-C10 | Z-D02-LTS-HF | 114323 | 12/288 |

Technical information p. 194

NH-Fuse-Links

- System of NH fuse links
- Type sizes 00, 1, 2, 3, 4a
- Rated voltage 500 V, 50 Hz

- Characteristic gG suitable for cables

370096



371325



372240



373063



374216



| Size | Rated Current [A] | Type Designation | Article No. | Units per package |
|------|-------------------|------------------|-------------|-------------------|
| 00 | 6 | NH-00/6 | 850000760 | 3 |
| 00 | 10 | NH-00/10 | 850000761 | 3 |
| 00 | 16 | NH-00/16 | 850000762 | 3 |
| 00 | 20 | NH-00/20 | 850000763 | 3 |
| 00 | 25 | NH-00/25 | 850000660 | 3 |
| 00 | 32 | NH-00/32 | 850000764 | 3 |
| 00 | 35 | NH-00/35 | 850000661 | 3 |
| 00 | 40 | NH-00/40 | 850000765 | 3 |
| 00 | 50 | NH-00/50 | 850000662 | 3 |
| 00 | 63 | NH-00/63 | 850000663 | 3 |
| 00 | 80 | NH-00/80 | 850000664 | 3 |
| 00 | 100 | NH-00/100 | 850000665 | 3 |
| 00 | 125 | NH-00/125 | 850000666 | 3 |
| 00 | 145 | NH-00/145 | 999201402 | 3 |
| 00 | 160 | NH-00/160 | 850000667 | 3 |
| 1 | 32 | NH-1/32 | 850000769 | 3 |
| 1 | 35 | NH-1/35 | 850000770 | 3 |
| 1 | 40 | NH-1/40 | 850000771 | 3 |
| 1 | 50 | NH-1/50 | 850000670 | 3 |
| 1 | 63 | NH-1/63 | 850000671 | 3 |
| 1 | 80 | NH-1/80 | 850000672 | 3 |
| 1 | 100 | NH-1/100 | 850000673 | 3 |
| 1 | 125 | NH-1/125 | 850000674 | 3 |
| 1 | 160 | NH-1/160 | 850000675 | 3 |
| 1 | 200 | NH-1/200 | 850000677 | 3 |
| 1 | 224 | NH-1/224 | 850000766 | 3 |
| 1 | 250 | NH-1/250 | 850000678 | 3 |
| 2 | 35 | NH-2/35 | 850000772 | 3 |
| 2 | 50 | NH-2/50 | 850000774 | 3 |
| 2 | 63 | NH-2/63 | 850000775 | 3 |
| 2 | 80 | NH-2/80 | 850000778 | 3 |
| 2 | 100 | NH-2/100 | 850000695 | 3 |
| 2 | 125 | NH-2/125 | 850000696 | 3 |
| 2 | 160 | NH-2/160 | 850000682 | 3 |
| 2 | 200 | NH-2/200 | 850000683 | 3 |
| 2 | 224 | NH-2/224 | 850000767 | 3 |
| 2 | 250 | NH-2-250 | 850000684 | 3 |
| 2 | 300 | NH-2-300 | 999201403 | 3 |
| 2 | 315 | NH-2/315 | 850000685 | 3 |
| 2 | 355 | NH-2/355 | 850000768 | 3 |
| 2 | 400 | NH-2/400 | 850000686 | 3 |
| 3 | 100 | NH-3/100 | 999201404 | 3 |
| 3 | 125 | NH-3/125 | 999201405 | 3 |
| 3 | 160 | NH-3/160 | 999201406 | 3 |
| 3 | 200 | NH-3/200 | 850000776 | 3 |
| 3 | 224 | NH-3/224 | 999201407 | 3 |
| 3 | 250 | NH-3/250 | 850000777 | 3 |
| 3 | 300 | NH-3/300 | 999201408 | 3 |
| 3 | 315 | NH-3/315 | 850000691 | 3 |
| 3 | 355 | NH-3/355 | 999201409 | 3 |
| 3 | 400 | NH-3/400 | 850000692 | 3 |
| 3 | 425 | NH-3/425 | 999201410 | 3 |
| 3 | 500 | NH-3/500 | 850000693 | 3 |
| 3 | 630 | NH-3/630 | 850000694 | 3 |
| 4a | 800 | NH-4a/800 | 999201698 | 3 |
| 4a | 1000 | NH-4a/1000 | 999201703 | 3 |
| 4a | 1250 | NH-4a/1250 | 999201052 | 3 |
| 4a | 1600 | NH-4a/1600 | 999201053 | 3 |

WA_SG02402



Solid-Links Z-NH-../TR

- Solid links for NH fuse disconnectors
- Convert fuse switch disconnector to switch disconnector

| Size | Type Designation | Article No. | Units per package |
|------|------------------|-------------|-------------------|
| 00 | Z-NH-00/TR | 263114 | 3/180 |
| 1 | Z-NH-1/TR | 263115 | 6/60 |
| 2 | Z-NH-2/TR | 263116 | 6/60 |
| 3 | Z-NH-3/TR | 263117 | 3/30 |

wa_sg09203



Fuse Disconnectors LTS

- For power fuse-links of type sizes NH 00, 1, 2 and 3
- Delivered without NH fuse-links
- Version LTS intended for mounting onto panel or onto 100 mm busbar systems (with adapter Z-LTS...SAD/100-KR), connection with screws M8 (size 00), lift terminals (size 00 version .../3E), M10 (size 1, 2), M12 (size 3)
- Version LTS...R for direct mounting onto 60 mm busbar systems
 - Size 000 for busbars 20 x 5/10, 30 x 5/10, double T
 - Size 00 for busbars 12 x 5/10, 15 x 5/10, 20 x 5/10, 25 x 5/10, 30 x 5/10, double T
- Size 1 and 2 for busbars 20 x 5/10, 25 x 5/10, 30 x 5/10
- Version LTS...ES with electronic signalisation of fuse-link status, for mounting onto panel or 100 mm busbar systems (with adapter Z-LTS...SAD/100-KR), connection with screws M8 (size 00), M10 (size 1, 2), M12 (size 3)
- Meets requirements of EN 60947-3
- Whole cover can be demounted at off state
- Hinged windows for measuring of fuse-links voltage

| Size | Rated current [A] max. fuse link 500 V/ max. fuse link 690 V | Num. of poles | Type Designation | Article No. | Units per package |
|------|--|---------------|------------------|-------------|-------------------|
|------|--|---------------|------------------|-------------|-------------------|

Mounting on panel

| | | | | | |
|----|-----------------|---|---------------|--------|------|
| 00 | 160 / 160 / 125 | 1 | LTS-160/00/1 | 263120 | 1/14 |
| 00 | 160 / 160 / 125 | 3 | LTS-160/00/3E | 120602 | 1/6 |
| 1 | 250 / 250 / 200 | 3 | LTS-250/1/3 | 269140 | 1/42 |
| 2 | 400 / 400 / 315 | 3 | LTS-400/2/3 | 284647 | 1/25 |
| 3 | 630 / 630 / 500 | 3 | LTS-630/3/3 | 284691 | 1/20 |

Mounting on 60 mm busbar system

| | | | | | |
|-----|-----------------|---|-----------------|--------|------|
| 000 | 100 / 100 / - | 3 | LTS-100/C00/3-R | 284690 | 1 |
| 00 | 160 / 160 / 100 | 3 | LTS-160/00/3E-R | 120603 | 1/3 |
| 1 | 250 / 250 / 200 | 3 | LTS-250/1/3-R | 269348 | 1/32 |
| 2 | 400 / 400 / 315 | 3 | LTS-400/2/3-R | 284648 | 1/20 |

With electronic signalisation, mounting onto panel

| | | | | | |
|----|-----------------|---|-----------------|-----------|---|
| 00 | 160 / 160 / 125 | 3 | LTS-160/00/3-ES | 999201395 | 1 |
| 1 | 250 / 250 / 200 | 3 | LTS-250/1/3-ES | 999201396 | 1 |
| 2 | 400 / 400 / 315 | 3 | LTS-400/2/3-ES | 999201448 | 1 |
| 3 | 630 / 630 / 500 | 3 | LTS-630/3/3-ES | 999201449 | 1 |

Z-LTS-160/00/1

wa_sg09003



Z-LTS-160/00/3

Technical information p. 253, 260

SG07808



Busbar Adapter 3-pole, Z-LTS-...-SAD/100-KR

- Enable mounting of LTS disconnectors onto 100 mm busbar systems
- For busbars 15 x 5/10, 20 x 5/10, 25 x 5/10, 30 x 5/10, 40 x 5/10, 50 x 5/10, 60 x 5/10
- Connection top or bottom
- Drill-less mounting onto busbars
- 3-pole

| For disconnector | Type Designation | Article No. | Units per package |
|------------------|----------------------|-------------|-------------------|
| LTS-250/1/3 | Z-LTS-250-SAD/100-KR | 120604 | 1 |
| LTS-400/2/3 | Z-LTS-400-SAD/100-KR | 120605 | 1 |
| LTS-630/3/3 | Z-LTS-630-SAD/100-KR | 120606 | 1 |

Technical information p. 264



Accessories for Fuse Disconnectors LTS

| Description | Type Designation | Article No. | Units per package |
|--|------------------|-------------|-------------------|
| Size 00 | | | |
| Terminal covers, 1-pole | Z-LTS-00/1-KA | 263125 | 2/120 |
| Terminal cover, 3-pole | Z-LTS-00/3-KA | 263126 | 4/80 |
| Shock Hazard Protection Set, 3-pole | Z-LTS-00/3-R-AB | 263124 | 2/30 |
| Screws M8, 16-70 mm ² Cu, 16-95 mm ² Al | Z-LTS-SC | 263119 | 3/180 |
| Front Frame for 3p disconnector | Z-LTS-00/3-R-FR | 263123 | 1/200 |
| Busbar for 3 3p disconnectors, 35 mm ² Cu | Z-LTS-00/3-SV | 264929 | 4 |
| Extension Terminal 25-95 mm ² Cu | Z-LTS-EK/95 | 269522 | 3/90 |
| Cu Clamp Straps 4-70 mm ² | Z-LTS-160-BK | 286812 | 3/180 |
| V-shaped terminal lug | Z-LTS-00-V-LA | 263130 | 3/180 |
| V-shaped terminal 70 mm ² Sm, 95 mm ² Se | Z-LTS-00-V-KL | 263128 | 3/180 |
| V-cover cap | Z-LTS-00-V-KLA | 263132 | 3/180 |
| Cover level to Cu-front distance: 70 mm (2 per device) | Z-LTS-160-AB/70 | 288901 | 1 |
| Cover level to Cu-front distance: 90 mm (2 per device) | Z-LTS-160-AB/90 | 288904 | 2 |
| Size 1 | | | |
| Al/Cu Clamp Straps 70-150 mm ² Al/Cu, 18x10 mm Cu | Z-LTS-250-BK | 286813 | 3/180 |
| Cover level to Cu-front distance: 70 mm (2 per device) | Z-LTS-250-AB/70 | 288902 | 2 |
| Cover level to Cu-front distance: 90 mm (2 per device) | Z-LTS-250-AB/90 | 288905 | 2 |
| Size 2 | | | |
| Cover level to Cu-front distance: 70 mm (2 per device) | Z-LTS-400-AB/70 | 288903 | 2 |
| Cover level to Cu-front distance: 90 mm (2 per device) | Z-LTS-400-AB/90 | 288906 | 2 |
| Size 3 | | | |
| Cover level to Cu-front distance: 90 mm (2 per device) | Z-LTS-630-AB/90 | 288907 | 2 |
| Size 1, 2, 3 | | | |
| V-shaped terminal lug, max. 500A | Z-LTS-V-LA | 263129 | 3/180 |
| V-shaped terminal 185 mm ² Sm, 240 mm ² Se, max. 500A | Z-LTS-V-KL | 263127 | 3/180 |
| V-shaped terminal 240 mm ² Sm, 240 mm ² Se, max. 500A | Z-LTS-VV-KL | 999201714 | 3/180 |
| V-cover cap | Z-LTS-V-KLA | 263131 | 3/180 |
| Size 00, 1, 2, 3 | | | |
| In connection with the compensation covers they serve as support for the front plate, as well as electric shock protection | Z-LTS-SAB/70-90 | 288908 | 2 |

Vertical Fuse Disconnectors LTS-L.

- For power fuse-links of type sizes NH 00, 1, 2 and 3
- Delivered without NH fuse-links
- Size 00, version 160/00 for mounting onto busbar systems with spacing 100 mm, or 185 mm, version 160/00-60-10-R for mounting onto busbar systems with spacing 60 mm (20x10, 25x10, 30x10)
- Sizes 1, 2, 3 and 4a for mounting onto busbar systems with spacing 185 mm
- Version –ES.. with electronic signalisation of fuse-link status

| Description | Rated current [A] max. fuse link 500 V/ max. fuse link 690 V | Type Designation | Article No. | Units per package |
|-------------|--|------------------|-------------|-------------------|
|-------------|--|------------------|-------------|-------------------|

Size 00

3 screws M8 with cover

+ terminal clips,
for 100 mm busbars

| | | | |
|-------------|--------------|--------|-------|
| 160/160/160 | LTS-L/160/00 | 269349 | 1/100 |
|-------------|--------------|--------|-------|

3 lift terminals,
for 100 mm busbars

| | | | |
|-------------|------------------|--------|-------|
| 160/160/160 | LTS-L/160/00/3-L | 120600 | 1/100 |
|-------------|------------------|--------|-------|

3 Al/Cu clamps
with cover,
for 100 mm busbars

| | | | |
|-------------|------------------|-----------|-------|
| 160/160/160 | LTS-LG 160/00-E1 | 872002052 | 1/100 |
|-------------|------------------|-----------|-------|

3 screws M8,
for 60 mm busbars

| | | | |
|-------------|----------------------|--------|-------|
| 160/160/100 | LTS-L/160/00-60-10-R | 289997 | 1/100 |
|-------------|----------------------|--------|-------|

3 screws M8,
for 185 mm busbars

| | | | |
|-------------|------------------|-----------|-------|
| 160/160/160 | LTS-L/160/00-2N1 | 999201374 | 1/100 |
|-------------|------------------|-----------|-------|

3 screws M8,
for 100 mm busbars,
el. signalisation

| | | | |
|-------------|-------------------|-----------|---|
| 160/160/160 | LTS-L/160/00-ES11 | 999201462 | 1 |
|-------------|-------------------|-----------|---|

3 screws M8,
for 185 mm busbars,
el. signalisation

| | | | |
|-------------|------------------|-----------|---|
| 160/160/160 | LTS-L/160/00-ES1 | 999201463 | 1 |
|-------------|------------------|-----------|---|

Size 1

M10 screw connection,
3-pole control
(parallel)

| | | | |
|-------------|-------------|--------|---|
| 250/250/200 | LTS-L/250/1 | 269350 | 1 |
|-------------|-------------|--------|---|

V-shaped busbar, 3-pole
control (parallel)

| | | | |
|-------------|------------------|-----------|---|
| 250/250/200 | LTS-LG 250/1-V11 | 999201032 | 1 |
|-------------|------------------|-----------|---|

M10 screw connection,
3-pole control
(parallel),
el. signalisation

| | | | |
|-------------|------------------|-----------|---|
| 250/250/200 | LTS-L/250/1-ES11 | 999201666 | 1 |
|-------------|------------------|-----------|---|

Size 2

M12 screw connection,
3-pole control
(parallel)

| | | | |
|-------------|-------------|--------|---|
| 400/400/315 | LTS-L/400/2 | 269351 | 1 |
|-------------|-------------|--------|---|

V-shaped busbar
(35 – 240 mm²),
fixed handle, 3x1-pole
control

| | | | |
|-------------|-----------------|-----------|---|
| 400/400/315 | LTS-LG 400/2-V1 | 872005100 | 1 |
|-------------|-----------------|-----------|---|

V-shaped busbar
(35 – 240 mm²),
3-pole control
(parallel)

| | | | |
|-------------|------------------|-----------|---|
| 400/400/315 | LTS-LG 400/2-V11 | 872005800 | 1 |
|-------------|------------------|-----------|---|

M12 screw connection,
3-pole control
(parallel),
el. signalisation

| | | | |
|-------------|------------------|-----------|---|
| 400/400/315 | LTS-L/400/2-ES11 | 999201667 | 1 |
|-------------|------------------|-----------|---|

Double parallel
disconnecter,
M12 screw connection

| | | | |
|-----------------|--------------|-----------|---|
| 2 x 400/400/315 | LTS-LG 800/2 | 999201041 | 1 |
|-----------------|--------------|-----------|---|

wa_sg02705



SG11108



Vertical Fuse Disconnectors LTS-L. - continued

| Description | Rated current [A] max. fuse link 500 V/ max. fuse link 690 V | Type Designation | Article No. | Units per package |
|-------------|--|------------------|-------------|-------------------|
|-------------|--|------------------|-------------|-------------------|

Size 3

| | | | | |
|--|-------------|------------------|-----------|---|
| M12 screw connection, 3-pole control (parallel) V-shaped busbar (35 – 240 mm ²), 3-pole control (parallel) | 630/630/500 | LTS-L/630/3 | 269352 | 1 |
| | 500/500/500 | LTS-LG 630/3-V11 | 999201033 | 1 |

| | | | | |
|---|-------------|------------------|-----------|---|
| M12 screw connection, 3-pole control (parallel), el. signalisation | 630/630/500 | LTS-L/630/3-ES11 | 999201668 | 1 |
|---|-------------|------------------|-----------|---|

| | | | | |
|--|-----------------|---------------|-----------|---|
| Double parallel disconnecter, M12 screw connection | 2 x 630/630/500 | LTS-LG 1260/3 | 999201042 | 1 |
|--|-----------------|---------------|-----------|---|

Size 4a

| | | | | |
|--------------------------------------|-----------|------------------|-----------|---|
| Bottom connection with screws M16 | 1250/1250 | LTS-LG 1250/4a-B | 999201043 | 1 |
| Top connection with screws M16 | 1250/1250 | LTS-LG 1250/4a-T | 999201044 | 1 |

| | | | | |
|--|-----------|------------------|-----------|---|
| Bottom connection with screws 2xM16 | 1600/1600 | LTS-LG 1600/4a-B | 999201045 | 1 |
|--|-----------|------------------|-----------|---|

| | | | | |
|-------------------------------------|-----------|------------------|-----------|---|
| Top connection with screws 2xM16 | 1600/1600 | LTS-LG 1600/4a-T | 999201046 | 1 |
|-------------------------------------|-----------|------------------|-----------|---|

1 000 095



Technical information p. 266, 271

Vertical Fuse Disconnectors for Busbars Splitting

Size 2 and 3, rated current 400 A and 630, busbar separation 185 mm

| Design | Type Designation | Article No. | Units per package |
|--------|------------------|-------------|-------------------|
|--------|------------------|-------------|-------------------|

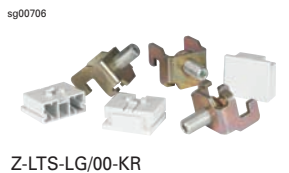
| | | | |
|--|-----------------|-----------|---|
| Vertical disconnector to 400 A, hinged handle, size 2 | LTS-LG 400/2-S2 | 872002057 | 1 |
|--|-----------------|-----------|---|

| | | | |
|---|-----------------|-----------|---|
| Vertical disconnector to 630 A, fixed handle, size 3 | LTS-LG 630/3-S1 | 872006000 | 1 |
|---|-----------------|-----------|---|



Technical information p. 272

Accessories for Vertical Fuse Disconnectors LTS-L



| Description | Type Designation | Article No. | Units per package |
|--|-----------------------|-------------|-------------------|
| Size 00 | | | |
| Connection screws M8, 16-70 mm ² Cu, 16-95 mm ² Al, suitable also for mounting onto Z-LTS-L...-SAD.. | Z-LTS-SC | 263119 | 3/180 |
| Cu Clamp Straps 4-70 mm ² | Z-LTS-160-BK | 286812 | 3/180 |
| Terminal clips, 3 pcs | Z-LTS-LG/00-KR | 263153 | 3/180 |
| Signal switch 5 A, 250 V (1 NO / 1 NC) | ZLTS-M/DOHD | 872002054 | 1 |
| Adapter 100/185 mm | Z-LTS-LG/00-SAD | 263118 | 1 |
| Double adapter for conversion from busbars 100 to 185 mm | Z-LTS-L/160-SADD | 286815 | 1 |
| Adapter for conversion from busbars 100 to 185 mm, drill-less mounting | Z-LTS-L/160-SAD-KR | 286814 | 1 |
| Double adapter for conversion from busbars 100 to 185 mm, drill-less mounting | Z-LTS-L/160-SADD-KR | 286816 | 1 |
| Current transformer: | | | |
| - 3-phase measuring to 100 A | ZLTS-MO/SW100 | 872002055 | 1 set *) |
| - 3-phase measuring to 150 A | ZLTS-MO/SW150 | 872002056 | 1 set *) |
| Al/Cu clamps 4-70 mm ² | Z-LTS-160-BK | 286812 | 3/180 |
| V-shaped busbar | Z-LTS-00-V-LA | 263130 | 3/180 |
| V-shaped clamp 70 mm ² Sm, 95 mm ² Se | Z-LTS-00-V-KL | 263128 | 3/180 |
| Cover for V-shaped clamp | Z-LTS-00-V-KLA | 263132 | 3/180 |
| Cover level to Cu-front distance: 70 mm (2 per device) | Z-LTS-L/160-AB/70-SET | 289995 | 1 |
| Cover level to Cu-front distance: 90 mm (2 per device) | Z-LTS-L/160-AB/90-SET | 289996 | 1 |
| Terminal cover/size compensation for disconnectors size 1, 2, 3 | Z-LTS-L-KA | 286817 | 2/40 |
| Size 1 | | | |
| Al/Cu clamps 70-150 mm ² Al/Cu, 18x10 mm Cu | Z-LTS-250-BK | 286813 | 3/180 |
| Cover level to Cu-front distance: 70 mm (2 per device) | Z-LTS-250-AB/70 | 288902 | 2 |
| Cover level to Cu-front distance: 90 mm (2 per device) | Z-LTS-250-AB/90 | 288905 | 2 |
| Current transformer for 3-phase measuring to 250 A for size 1 | ZLTS-M3/W250 | 872006700 | 1 set *) |
| Size 2 | | | |
| Cover level to Cu-front distance: 70 mm (2 per device) | Z-LTS-400-AB/70 | 288903 | 2 |
| Cover level to Cu-front distance: 90 mm (2 per device) | Z-LTS-400-AB/90 | 288906 | 2 |
| Current transformer for 3-phase measuring to 400 A for size 2 | ZLTS-M3/W400 | 872006900 | 1 set *) |
| Size 3 | | | |
| Cover level to Cu-front distance: 90 mm (2 per device) | Z-LTS-630-AB/90 | 288907 | 2 |
| Current transformer for 3-phase measuring to 600 A for size 3 | ZLTS-M3/W600 | 872007100 | 1 set *) |
| Size 1, 2, 3 | | | |
| Terminal clips | Z-LTS-L-KR | 269353 | 3/90 |
| Extension for mounting of 2 cable lugs 240 mm ² phase L3 | Z-NH-AE | 120601 | 1 |
| V-shaped busbar, max. 500 A | Z-LTS-V-LA | 263129 | 3/180 |
| V-shaped clamp 185 mm ² Sm, 240 mm ² Se, max. 500A | Z-LTS-V-KL | 263127 | 3/180 |
| V-shaped clamp 240 mm ² Sm, 240 mm ² Se, max. 500A | Z-LTS-VV-KL | 999201714 | 3/180 |
| Cover for V-shaped clamp | Z-LTS-V-KLA | 263131 | 3/180 |
| Terminal cover bottom, length 190 mm | ZLTS-M/KHO | 872006400 | 1 |
| Terminal cover top, length 145 mm | ZLTS-M/KHU | 872006500 | 1 |
| Size 00, 1, 2, 3 | | | |
| In connection with the compensation covers they serve as support for the front plate, as well as electric shock protection | Z-LTS-SAB/70-90 | 288908 | 2 |
| *) 1 set = 3 pcs | | | |

Circuit Breakers LZM and Switch Disconnectors LN

- Economic line of moulded case circuit breakers and disconnectors for rated currents 63 to 1600 A
 - Rated breaking capacity I_{cu} kA 36 kA (LZM1, LZM2) and 50 kA (LZM3 and LZM4) (415 V 50/60 Hz)
 - Rated operating voltage U_e 415 V AC
 - Circuit breakers for protection of cables and circuits
 - 3-pole versions
 - Fixed design
 - Compatible with basic accessories of circuit breakers NZM
 - Sets for easy mounting into distribution boards
- Moeller / Eaton



Circuit Breakers LZM1

• Rated breaking capacity I_{cu} 36 kA (415 V 50/60 Hz) • Thermo-magnetic releases



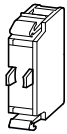
| Rated current $I_n = I_u$ [A] | Overcurrent release I_r [A] | Short circuit current release I_i [A] | Type Designation | Article No. | Units per package |
|----------------------------------|----------------------------------|---|------------------|-------------|-------------------|
| 20 | 15-20 | 350 | LZMC1-A20-I | 111888 | 1 |
| 25 | 20-25 | 350 | LZMC1-A25-I | 111889 | 1 |
| 32 | 25-32 | 350 | LZMC1-A32-I | 111890 | 1 |
| 40 | 32-40 | 320-400 | LZMC1-A40-I | 111891 | 1 |
| 50 | 40-50 | 300-500 | LZMC1-A50-I | 111892 | 1 |
| 63 | 50-63 | 380-630 | LZMC1-A63-I | 111893 | 1 |
| 80 | 63-80 | 480-800 | LZMC1-A80-I | 111894 | 1 |
| 100 | 80-100 | 600-1000 | LZMC1-A100-I | 111895 | 1 |
| 125 | 100-125 | 750-1250 | LZMC1-A125-I | 111896 | 1 |
| 160 | 125-160 | 1280 | LZMC1-A160-I | 111897 | 1 |

Switch Disconnectors LN1

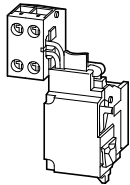


| Rated current $I_n = I_u$ [A] | Type Designation | Article No. | Units per package |
|-------------------------------|------------------|-------------|-------------------|
| 63 | LN1-63-I | 111994 | 1 |
| 100 | LN1-100-I | 111995 | 1 |
| 125 | LN1-125-I | 111996 | 1 |
| 160 | LN1-160-I | 111997 | 1 |

Accessories of Circuit Breakers LZM1 and Switch Disconnectors LN1



M22-K10



NZM1-XHIV



NZM1-XDV



NZM1-XTVDVR

| Description | Type Designation | Article No. | Units per package |
|--|------------------------|-------------|-------------------|
| Auxiliary contacts 10 | M22-K10 | 216376 | 1 |
| Auxiliary contacts 01 | M22-K01 | 216378 | 1 |
| Early-make auxiliary contacts (with clamp terminal) | NZM1-XHIV | 259426 | 1 |
| Undervoltage release 24 V AC | NZM1-XU24AC | 259434 | 1 |
| Undervoltage release 240 V AC | NZM1-XU208-240AC | 259442 | 1 |
| Undervoltage release 440 V AC | NZM1-XU380-440AC | 259444 | 1 |
| Undervoltage release with two early-make auxiliary contacts 24 V AC | NZM1-XUHIV24AC | 259531 | 1 |
| Shunt trip release with auxiliary contact 240 V AC / DC | NZM1-XUHIV208-240AC | 259539 | 1 |
| Shunt trip release with auxiliary contact 440 V AC / DC | NZM1-XUHIV380-440AC | 259541 | 1 |
| Shunt trip release 24 V AC / DC | NZM1-XA24AC/DC | 259708 | 1 |
| Shunt trip release 250 V AC / DC | NZM1-XA208-250AC/DC | 259726 | 1 |
| Shunt trip release 440 V AC / DC | NZM1-XA380-440AC/DC | 259728 | 1 |
| Shunt trip release with auxiliary contact 24 V AC / DC | NZM1-XAHIV24AC/DC | 259774 | 1 |
| Shunt trip release with auxiliary contact 250 V AC / DC | NZM1-XAHIV208-250AC/DC | 259782 | 1 |
| Shunt trip release with auxiliary contact 440 V AC / DC | NZM1-XAHIV380-440AC/DC | 259784 | 1 |
| Lockable rotary drive with rotary handle, black colour | NZM1-XDV | 260125 | 1 |
| Lockable rotary drive with rotary handle, red/yellow colour | NZM1-XDVR | 260135 | 1 |
| Lockable door coupling rotary handle, black colour | NZM1-XTVD | 260166 | 1 |
| Lockable rotary drive with rotary handle, red/yellow colour | NZM1-XTVDVR | 260178 | 1 |
| Extension shaft for mounting depth 400 mm | NZM1/2-XV4 | 261232 | 1 |
| Extension shaft for mounting depth 600 mm | NZM1/2-XV6 | 260191 | 1 |
| Insulating surround | NZM1-XBR | 260195 | 1 |
| Toggle lever locking device | NZM1-XKAV | 260199 | 1 |
| Spacer (height 17.5 mm) | NZM1/2-XAB | 260203 | 1 |
| Clip plate for mounting onto DIN rail | NZM1-XC35 | 260213 | 1 |
| Exchangeable tunnel (lift) terminal | NZM1-XKC | 260015 | 1 |
| Terminal clip for screw connection | NZM1-XKS | 260019 | 1 |
| Terminal cover | NZM1-XKSA | 260021 | 1 |

Circuit Breakers LZM2

• Rated breaking capacity I_{cu} 36 kA (415 V 50/60 Hz) • Thermo-magnetic releases



| Rated current $I_n = I_u$ [A] | Overcurrent release I_r [A] | Short circuit current release I_i [A] | Type Designation | Article No. | Units per package |
|----------------------------------|----------------------------------|---|------------------|-------------|-------------------|
| 160 | 125-160 | 960-1600 | LZMC2-A160-I | 111938 | 1 |
| 200 | 160-200 | 1200-2000 | LZMC2-A200-I | 111939 | 1 |
| 250 | 200-250 | 1500-2500 | LZMC2-A250-I | 111940 | 1 |
| 300 | 240-300 | 1500-2500 | LZMC2-A300-I | 111941 | 1 |

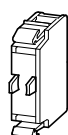
Switch Disconnectors LN2



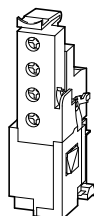
| Rated current $I_n = I_u$ [A] | Max. back-up protection (short circuit) fuse gG/gL [A] | Type Designation | Article No. | Units per package |
|----------------------------------|---|------------------|-------------|-------------------|
| 160 | 250 | LN2-160-I | 112002 | 1 |
| 200 | 250 | LN2-200-I | 112003 | 1 |
| 250 | 250 | LN2-250-I | 112004 | 1 |

Accessories of Circuit Breakers LZM2 and Switch Disconnectors LN2

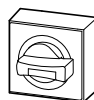
| Description | Type Designation | Article No. | Units per package |
|---|--------------------------|-------------|-------------------|
| Auxiliary contacts 10 | M22-K10 | 216376 | 1 |
| Auxiliary contacts 01 | M22-K01 | 216378 | 1 |
| Early-make auxiliary contacts | NZM2/3-XHIV | 259430 | 1 |
| Undervoltage release 24 V AC | NZM2/3-XU24AC | 259491 | 1 |
| Undervoltage release 240 V AC | NZM2/3-XU208-240AC | 259499 | 1 |
| Undervoltage release 440 V AC | NZM2/3-XU380-440AC | 259501 | 1 |
| Undervoltage release with two early-make auxiliary contacts 24 V AC | NZM2/3-XUHIV24AC | 259583 | 1 |
| Undervoltage release with two early-make auxiliary contacts 240 V AC | NZM2/3-XUHIV208-240AC | 259591 | 1 |
| Undervoltage release with two early-make auxiliary contacts 440 V AC | NZM2/3-XUHIV380-440AC | 259594 | 1 |
| Shunt trip release 24 V AC / DC | NZM2/3-XA24AC/DC | 259754 | 1 |
| Shunt trip release 240 V AC / DC | NZM2/3-XA208-250AC/DC | 259763 | 1 |
| Shunt trip release 440 V AC / DC | NZM2/3-XA380-440AC/DC | 259766 | 1 |
| Shunt trip release with auxiliary contact 24 V AC / DC | NZM2/3-XAHIV24AC/DC | 259810 | 1 |
| Shunt trip release with auxiliary contact 250 V AC / DC | NZM2/3-XAHIV208-250AC/DC | 259818 | 1 |
| Shunt trip release with auxiliary contact 440 V AC / DC | NZM2/3-XAHIV380-440AC/DC | 259820 | 1 |
| Lockable rotary drive with rotary handle, black colour | NZM2-XDV | 260127 | 1 |
| Lockable rotary drive with rotary handle, red colour | NZM2-XDVR | 260137 | 1 |
| Lockable door coupling rotary handle, black colour | NZM2-XTVD | 260168 | 1 |
| Lockable door coupling rotary handle, red/yellow colour | NZM2-XTVDVR | 260180 | 1 |
| Extension shaft for mounting depth 400 mm | NZM1/2-XV4 | 261232 | 1 |
| Extension shaft for mounting depth 600 mm | NZM1/2-XV6 | 260191 | 1 |
| Insulating surround | NZM2-XBR | 260197 | 1 |
| Toggle lever locking device | NZM2/3-XKAV | 260201 | 1 |
| Spacer (height 17.5 mm) | NZM1/2-XAB | 260203 | 1 |
| Clip plate for mounting onto DIN rail | NZM2-XC75 | 260215 | 1 |
| Motor drive 240 V AC | NZM2-XR208-240AC | 259832 | 1 |
| Motor drive 24 V DC | NZM2-XR24-30DC | 259836 | 1 |
| Exchangeable tunnel (lift) terminal | NZM2-160-XKC | 262240 | 1 |
| Terminal clip for screw connection | NZM2-XKS | 260030 | 1 |
| Terminal cover | NZM2-XKSA | 260038 | 1 |



M22-K10



NZM2/3-XHIV



NZM2-XDV



NZM2-XTVDVR



Circuit Breakers LZM3

- Rated breaking capacity I_{cu} 50 kA (415 V 50/60 Hz)
- Thermo-magnetic releases, for $I_n = 630$ A electronic releases

| Rated current $I_n = I_u$ [A] | Overcurrent release I_r [A] | Short circuit current release I_i [A] | Type Designation | Article No. | Units per package |
|----------------------------------|----------------------------------|---|------------------|-------------|-------------------|
| 320 | 250-320 | 1920-3200 | LZMN3-A320-I | 111966 | 1 |
| 400 | 320-400 | 2400-4000 | LZMN3-A400-I | 111967 | 1 |
| 500 | 400-500 | 3000-5000 | LZMN3-A500-I | 111968 | 1 |
| 630 | 315-630 | 1260-5040 | LZMN3-AE630-I | 111969 | 1 |

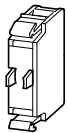


Switch Disconnectors LN3

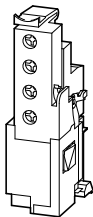
| Rated current $I_n = I_u$ [A] | Max. back-up protection (short circuit) fuse gG/gL [A] | Type Designation | Article No. | Units per package |
|----------------------------------|---|------------------|-------------|-------------------|
| 400 | 630 | LN3-400-I | 112008 | 1 |
| 630 | 630 | LN3-630-I | 112009 | 1 |

Accessories of Circuit Breakers LZM3 and Switch Disconnectors LN3

| Description | Type Designation | Article No. | Units per package |
|---|--------------------------|-------------|-------------------|
| Auxiliary contacts 10 | M22-K10 | 216376 | 1 |
| Auxiliary contacts 01 | M22-K01 | 216378 | 1 |
| Early-make auxiliary contacts | NZM2/3-XHIV | 259430 | 1 |
| Undervoltage release 24 V AC | NZM2/3-XU24AC | 259491 | 1 |
| Undervoltage release 240 V AC | NZM2/3-XU208-240AC | 259499 | 1 |
| Undervoltage release 440 V AC | NZM2/3-XU380-440AC | 259501 | 1 |
| Undervoltage release with two early-make auxiliary contacts 24 V AC | NZM2/3-XUHIV24AC | 259583 | 1 |
| Undervoltage release with two early-make auxiliary contacts 240 V AC | NZM2/3-XUHIV208-240AC | 259591 | 1 |
| Undervoltage release with two early-make auxiliary contacts 440 V AC | NZM2/3-XUHIV380-440AC | 259594 | 1 |
| Shunt trip release 24 V AC / DC | NZM2/3-XA24AC/DC | 259754 | 1 |
| Shunt trip release 240 V AC / DC | NZM2/3-XA208-250AC/DC | 259763 | 1 |
| Shunt trip release 440 V AC / DC | NZM2/3-XA380-440AC/DC | 259766 | 1 |
| Shunt trip release with auxiliary contact 24 V AC / DC | NZM2/3-XAHIV24AC/DC | 259810 | 1 |
| Shunt trip release with auxiliary contact 250 V AC / DC | NZM2/3-XAHIV208-250AC/DC | 259818 | 1 |
| Shunt trip release with auxiliary contact 440 V AC / DC | NZM2/3-XAHIV380-440AC/DC | 259820 | 1 |
| Lockable rotary drive with rotary handle, black colour | NZM3-XDV | 260129 | 1 |
| Lockable rotary drive with rotary handle, red colour | NZM3-XDVR | 260140 | 1 |
| Lockable door coupling rotary handle, black colour | NZM3-XTVD | 260170 | 1 |
| Lockable door coupling rotary handle, red/yellow colour | NZM3-XTVDVR | 260182 | 1 |
| Extension shaft for mounting depth 400 mm | NZM3/4-XV4 | 261234 | 1 |
| Extension shaft for mounting depth 600 mm | NZM3/4-XV6 | 260193 | 1 |
| Toggle lever locking device | NZM2/3-XKAV | 260201 | 1 |
| Motor drive 240 V AC | NZM3-XR208-240AC | 259850 | 1 |
| Motor drive 24 V DC | NZM3-XR24-30DC | 259854 | 1 |
| Exchangeable tunnel (lift) terminal | NZM3-XKC | 260042 | 1 |
| Terminal clip for screw connection | NZM3-XKS | 260039 | 1 |
| Terminal cover | NZM3-XKSA | 260045 | 1 |



M22-K10



NZM2/3-XHIV



NZM3-XDV



NZM3-XTVDVR

Circuit Breakers LZM4

• Rated breaking capacity I_{cu} 50kA (415 V 50/60 Hz) • Electronic releases



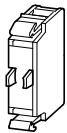
| Rated current $I_n = I_u$ [A] | Overcurrent release I_r [A] | Short circuit current release I_i [A] | Type Designation | Article No. | Units per package |
|----------------------------------|----------------------------------|---|------------------|-------------|-------------------|
| 800 | 400-800 | 1600-9600 | LZMN4-AE800-I | 111978 | 1 |
| 1000 | 500-1000 | 2000-12000 | LZMN4-AE1000-I | 111979 | 1 |
| 1250 | 630-1250 | 2500-15000 | LZMN4-AE1250-I | 111980 | 1 |
| 1600 | 800-1600 | 3200-19200 | LZMN4-AE1600-I | 111981 | 1 |

Switch Disconnectors LN4

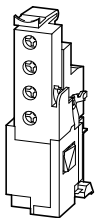


| Rated current $I_n = I_u$ [A] | Max. back-up protection (short circuit) fuse gG/gL [A] | Type Designation | Article No. | Units per package |
|----------------------------------|---|------------------|-------------|-------------------|
| 800 | 1600 | LN4-800-I | 112012 | 1 |
| 1000 | 1600 | LN4-1000-I | 112013 | 1 |
| 1250 | 1600 | LN4-1250-I | 112014 | 1 |
| 1600 | 1600 | LN4-1600-I | 112015 | 1 |

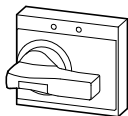
Accessories of Circuit Breakers LZM4 and Switch Disconnectors LN4



M22-K10



NZM4-XHIV



NZM4-XDV



NZM4-XTVDVR

| Description | Type Designation | Article No. | Units per package |
|---|-----------------------|-------------|-------------------|
| Auxiliary contacts 10 | M22-K10 | 216376 | 1 |
| Auxiliary contacts 01 | M22-K01 | 216378 | 1 |
| Early-make auxiliary contacts | NZM4-XHIV | 266172 | 1 |
| Undervoltage release 24 V AC | NZM4-XU24AC | 266189 | 1 |
| Undervoltage release 240 V AC | NZM4-XU208-240AC | 266193 | 1 |
| Undervoltage release 440 V AC | NZM4-XU380-440AC | 266194 | 1 |
| Undervoltage release with two early-make auxiliary contacts 240 V AC | NZM4-XUHIV208-240AC | 266221 | 1 |
| Undervoltage release with two early-make auxiliary contacts 240 V AC | NZM4-XUHIV20208-240AC | 266248 | 1 |
| Shunt trip release 24 V AC / DC | NZM4-XA24AC/DC | 266447 | 1 |
| Shunt trip release 250 V AC / DC | NZM4-XA208-250AC/DC | 266451 | 1 |
| Shunt trip release 440 V AC / DC | NZM4-XA380-440AC/DC | 266452 | 1 |
| Lockable rotary drive with rotary handle, red colour | NZM4-XDVR | 266610 | 1 |
| Lockable rotary drive with rotary handle, red colour | NZM4-XTVDVR | 266618 | 1 |
| Extension shaft for mounting depth 400 mm | NZM3/4-XV4 | 261234 | 1 |
| Extension shaft for mounting depth 600 mm | NZM3/4-XV6 | 260193 | 1 |
| Motor drive 240 V AC | NZM4-XR208-240AC | 266685 | 1 |
| Motor drive 24 V DC | NZM4-XR24-30DC | 266691 | 1 |
| Module plate | NZM4-XKM2 | 266820 | 1 |
| Flat cable terminal | NZM4-XKB | 266829 | 1 |
| Tunnel (lift) terminal | NZM4-XKA | 266836 | 1 |
| Terminal for back connection | NZM4-XKR | 266842 | 1 |
| Terminal cover | NZM4-XKSA | 266846 | 1 |

Surge Protection

- Protection of low-voltage installations against direct or near strokes of lighting or against surges from switching of consumers
- Surge protection devices class T1 (I, B) as capsulated version
- Surge arresters class T2 (II, C) and T3 (III, D) protection of sensitive electronic devices
- Easy function check of arresters class T2 (II, C) and T3 (III, D) – fault indication
- Reliable protection against overvoltage in case of use of a complete cascade of three classes (T1, T2, T3)
- Surge protection devices for photovoltaic applications

U1202



Surge Arresters class T1 (I, B)

- For the protection of low voltage distribution systems against direct lightning stroke into the overhead power supply line or devices
- Capsulated version - during the discharge process, the device does not issue any hot ionised gases. Therefore, there is no need for keeping a safety distance to flammable materials.

Lighting Current Arresters SPI

- For coordination of arresters class T1 (I, B) (SPI series) and arresters class T2 (II, C) it is necessary to keep recommended length of electric line min. 10 m between arresters or to use arrester class T2 (II, C) with a maximum continuous operating voltage U_c of 460 V AC with higher protection level
- Voltage protection level 1.5 kV
- Surge arrester SPI-35/440 is phase arrester for connection between L and N (PE)
- Surge arresters SPI-.../NPE are sum spark gaps for connection between N and PE e.g. in connection 3+1 for TN-S system

SG13005



SPI-35/440

SG14605



SPI-3+1

| Imp. current I_{imp} (10/350) μ s | Type Designation | Article No. | Units per package |
|---|------------------|-------------|-------------------|
| 35 kA capsulated | SPI-35/440 | 263137 | 6/120 |
| 50 kA capsulated | SPI-50/NPE | 263138 | 2/120 |
| 100 kA capsulated | SPI-100/NPE | 263139 | 1/60 |
| Surge arrester set for TN-C | SPI-35/440/3 | 267487 | 1/40 |
| Surge arrester set for TN-S, TT | SPI-3+1 | 267488 | 1/20 |

Technical information p. 276

U0302



Lead-through Terminal for T1 (I, B) class arresters, SPB-D-125

| Rated Current | Type Designation | Article No. | Units per package |
|---------------|------------------|-------------|-------------------|
| 125 A | SPB-D-125 | 248145 | 2 |

Technical information p. 277

Busbars Z-GV-U for SPB, SPI, SP-B+C

| Num. of poles | Type Designation | Article No. | Units per package |
|---------------|------------------|-------------|-------------------|
| 2 | Z-GV-U/2 | 272588 | 20/1200 |
| 3 | Z-GV-U/3 | 272589 | 20/1200 |
| 4 | Z-GV-U/4 | 274080 | 20/1200 |
| 5 | Z-GV-U/5 | 274081 | 20/1200 |
| 6 | Z-GV-U/6 | 274082 | 20/400 |
| 8 | Z-GV-U/8 | 274083 | 20/200 |
| 9 | Z-GV-U/9 | 274084 | 20/200 |



Z-GV-U/9

Technical information p. 277

SG01804



SPB-12/280/3

SPD class T1+T2 (I+II, B+C), SPB-12/280

- Big saving of space inside a distribution board
 - two classes of SPD integrated in a single module
- Recommended for buildings supplied with underground cable

| Version | Type Designation | Article No. | Units per package |
|---|------------------|-------------|-------------------|
| SPD class T1+T2 (I+II, B+C) | SPB-12/280 | 284698 | 12/120 |
| Lightning current arrester 100 kA | SPB-100/NPE | 105194 | 1/60 |
| 2-pole set 1+1 for TN-S/TT net | SPB-1+1 | 105196 | 1/40 |
| 2-pole set for TN-S net | SPB-12/280/2 | 285081 | 1/60 |
| 3-pole set for TN-C net | SPB-12/280/3 | 284699 | 1/40 |
| 4-pole set for TN-S net | SPB-12/280/4 | 285082 | 1/30 |
| 4-pole set 3+1 for TN-S/TT net | SPB-3+1 | 105195 | 1/24 |
| 2-pole set 1+1 for TN-S/TT net with aux. switch | SPB-1+1-HK | 112373 | 1/30 |
| 3-pole set for TN-C net with aux. switch | SPB-12/280/3-HK | 285083 | 1/24 |
| 4-pole set for TN-S net with aux. switch | SPB-12/280/4-HK | 285084 | 1/20 |
| 4-pole set 3+1 for TN-S/TT net with aux. switch | SPB-3+1-HK | 112376 | 1 |

Accessories

| | | | |
|------------------|----------|--------|-------|
| Auxiliary switch | SPB-HK-W | 105197 | 4/120 |
| Busbar | ZV-KSBI | | |

Note:

Max. impulse current SPD class T1 (I, B) is 12.5 kA (10/350) μ s. Maximum discharge current of T2 (II, C) class SPD is 25 kA (8/20) μ s.

Technical information p. 280

WA_SG01203



SP-B+C/3

Pre-mounted Set SPD class T1+T2 (I+II, B+C), SP-B+C/3

- Complete set SPD class T1 (I, B) of type SPI and SPD class T2 (II, C) of type SPC-S-20/460/3
 - it is not necessary to use decoupling coil
- Saving of space inside distribution board

| Version | Type Designation | Article No. | Units per package |
|-------------------|------------------|-------------|-------------------|
| For TN-C nets | SP-B+C/3 | 267489 | 1 |
| For TN-S, TT nets | SP-B+C/3+1 | 267510 | 1 |
| Auxiliary switch | SPC-S-HK | 248203 | 8/80 |

Note:

For type SP-B+C/3 surge protection devices class T1 (I, B) of type SPI are capsulated with impulse current 35 kA (10/350) μ s. For type SP-B+C/3+1 surge protection devices class T1 (I, B) of type SPI are capsulated with impulse current 35 kA (10/350) μ s; as a sum spark gap type SPI-100/NPE with impulse current 100 kA (10/350) μ s is used. There is used type SPC-S-20/460/3 as T2 (II, C) class SPD for both SP-B+C/3 and SP-B+C/3+1.

Technical information p. 281

SPD class T2 (II, C)

• For protection of consumers against overvoltage or switching processes caused by distant lightning strokes

U1302



SPC-E-280

Technical information p. 282

Surge arresters class T2 (II, C), SPC-E

| Max. cont. op. volt. U_c | I_n (8/20) μ s | Type Designation | Article No. | Units per package |
|----------------------------|----------------------|------------------|-------------|-------------------|
| 280 V AC | 20 kA | SPC-E-280 | 248150 | 12/120 |
| N-PE 260 V AC | 20 kA | SPC-E-N/PE | 248157 | 12/120 |

Note: Type SPC-E-N/PE is intended as a sum spark gap for connection 1+1 or 3+1.

SG14902



SPC-S-20/280

Plug-in surge arrester class T2 (II, C), SPC-S

| Max. cont. op. volt. U_c | I_n (8/20) μ s | Type Designation | Article No. | Units per package |
|----------------------------|----------------------|------------------|-------------|-------------------|
|----------------------------|----------------------|------------------|-------------|-------------------|

Insert 1 MU

| | | | | |
|----------------------|-------|--------------|--------|-------|
| Insert 280 V AC | 20 kA | SPC-S-20/280 | 248161 | 4/120 |
| Insert 460 V AC *) | 20 kA | SPC-S-20/460 | 248164 | 4/120 |
| Insert N-PE 260 V AC | 30 kA | SPC-S-N/PE | 248166 | 4/120 |

*) Spare insert for SP-B+C/3

Inserts 1 MU for special voltage

| | | | | |
|-----------------|-------|--------------|--------|-------|
| Insert 75 V AC | 15 kA | SPC-S-15/75 | 248158 | 4/120 |
| Insert 130 V AC | 20 kA | SPC-S-20/130 | 248159 | 4/120 |
| Insert 175 V AC | 20 kA | SPC-S-20/175 | 248160 | 4/120 |
| Insert 335 V AC | 20 kA | SPC-S-20/335 | 248162 | 4/120 |
| Insert 385 V AC | 20 kA | SPC-S-20/385 | 248163 | 4/120 |
| Insert 580 V AC | 20 kA | SPC-S-20/580 | 248165 | 4/120 |

Base 1- to 4-pole

| | | | |
|------------------|--------------|--------|--------|
| Base 1-pole | SPC-S-S1 | 248167 | 12/120 |
| Base 1+1, 2-pole | SPC-S-S2-1+1 | 248201 | 6/60 |
| Base 2-pole | SPC-S-S2 | 248168 | 6/60 |
| Base 3-pole | SPC-S-S3 | 248169 | 4/40 |
| Base 4-pole | SPC-S-S4 | 248170 | 3/30 |
| Base 3+1, 4-pole | SPC-S-S4-3+1 | 248171 | 3/30 |

Complete 1- to 4-pole

• base, insert, and busbar

| | | | | |
|--------|------------------|----------------|--------|--------|
| 1-pole | 280 V AC 1x20 kA | SPC-S-20/280/1 | 248172 | 12/120 |
| 2-pole | 280 V AC 2x20 kA | SPC-S-20/280/2 | 248173 | 1/60 |
| 3-pole | 280 V AC 3x20 kA | SPC-S-20/280/3 | 248174 | 1/40 |
| 4-pole | 280 V AC 4x20 kA | SPC-S-20/280/4 | 248175 | 1/30 |

| | | | | |
|-------------|-----------------------|----------------|--------|--------|
| 4-pole, 3+1 | 280 V AC 3x20+1x30 kA | SPC-S-3+N/PE | 115795 | 1/30 |
| 1-pole | 460 V AC 1x20 kA | SPC-S-20/460/1 | 248184 | 12/120 |
| 2-pole | 460 V AC 2x20 kA | SPC-S-20/460/2 | 248185 | 1/60 |
| 3-pole | 460 V AC 3x20 kA | SPC-S-20/460/3 | 248186 | 1/40 |
| 4-pole | 460 V AC 4x20 kA | SPC-S-20/460/4 | 248187 | 1/30 |

Complete 1- to 4-pole for special voltage

| | | | | |
|--------|------------------|----------------|--------|--------|
| 1-pole | 130 V AC 1x20 kA | SPC-S-20/130/1 | 248188 | 12/120 |
| 1-pole | 175 V AC 1x20 kA | SPC-S-20/175/1 | 248189 | 12/120 |
| 2-pole | 175 V AC 2x20 kA | SPC-S-20/175/2 | 248190 | 1/60 |
| 1-pole | 335 V AC 1x20 kA | SPC-S-20/335/1 | 248176 | 12/120 |
| 2-pole | 335 V AC 2x20 kA | SPC-S-20/335/2 | 248177 | 1/60 |
| 3-pole | 335 V AC 3x20 kA | SPC-S-20/335/3 | 248178 | 1/40 |
| 4-pole | 335 V AC 4x20 kA | SPC-S-20/335/4 | 248179 | 1/30 |
| 1-pole | 385 V AC 1x20 kA | SPC-S-20/385/1 | 248180 | 12/120 |
| 2-pole | 385 V AC 2x20 kA | SPC-S-20/385/2 | 248181 | 1/60 |
| 3-pole | 385 V AC 3x20 kA | SPC-S-20/385/3 | 248182 | 1/40 |
| 4-pole | 385 V AC 4x20 kA | SPC-S-20/385/4 | 248183 | 1/30 |
| 1-pole | 580 V AC 1x20 kA | SPC-S-20/580/1 | 248191 | 12/120 |

Auxiliary switch

| | | |
|----------|--------|------|
| SPC-S-HK | 248203 | 8/80 |
|----------|--------|------|

Utilization: Remote signalisation of malfunction of SPD of series SPC-S and SPD-S (light or acoustic warning).

SG14802



SPC-S-S3

U1202



SPC-S-HK

U1402



Technical information p. 283, 284

U1002

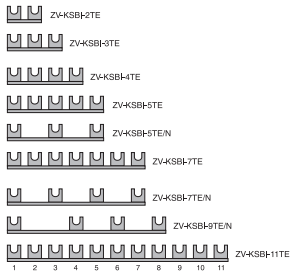


Lead-through Terminal for SPD class T2 (II, C), Z-D63

| Rated Current | Type Designation | Article No. | Units per package |
|---------------|------------------|-------------|-------------------|
| 63 A | Z-D63 | 248267 | 12/120 |

Technical information p. 286

Busbars for SPC ZV-KSBI



| | Type Designation | Article No. | Units per package |
|-------|------------------|-------------|-------------------|
| 2 MU | ZV-KSBI-2TE | 263961 | 10/600 |
| 3 MU | ZV-KSBI-3TE | 263962 | 10/600 |
| 4 MU | ZV-KSBI-4TE | 263964 | 10/600 |
| 5 MU | ZV-KSBI-5TE | 263965 | 10/200 |
| 5 MU | ZV-KSBI-5TE/N | 263966 | 10/200 |
| 7 MU | ZV-KSBI-7TE | 263967 | 50/500 |
| 7 MU | ZV-KSBI-7TE/N | 263969 | 10/100 |
| 9 MU | ZV-KSBI-9TE/N | 266874 | 50/500 |
| 11 MU | ZV-KSBI-11TE | 263970 | 50/500 |

Technical information p. 286

SPD Class T3 (III, D)

- Surge arresters for protection of consumers against overvoltage
- Effectiveness of surge arrester up to 5 m of cable to both sides; for longer distances it is necessary to use another surge arrester class T3 (III, D)

U1602



SPD-S-1+1

Technical information p. 287

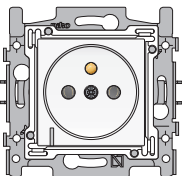
Overvoltage protection for installing into distribution board SPD-S

| Version | Type Designation | Article No. | Units per package |
|------------------|------------------|-------------|-------------------|
| Complete | SPD-S-1+1 | 248202 | 1/60 |
| Base 1+1, 2-pole | SPC-S-S2-1+1 | 248201 | 6/60 |
| Insert N-PE | SPD-S-N/PE | 248199 | 4/120 |
| Insert L-N | SPD-S-L/N | 248200 | 4/120 |
| Auxiliary switch | SPC-S-HK | 248203 | 8/80 |

Surge protective device for IT-, TT-systems (3-phase 3-wire)

| Version | Type Designation | Article No. | Units per package |
|------------------|------------------|-------------|-------------------|
| Complete | SPD-S-280/2 | 269088 | 1/60 |
| Insert | SPD-S-280 | 269087 | 4/120 |
| Base, 2-pole | SPC-S-S2 | 248168 | 6/60 |
| Auxiliary switch | SPC-S-HK | 248203 | 8/80 |

Sockets with surge protection for designs Original, Intense, Pure



| Version | Type Designation | Article No. | Units per package |
|---|------------------|-------------|-------------------|
| Single socket 10/16 A 250 V with cover | | | |
| Colour: | | | |
| cream | 100-66604 | 117106 | 6 |
| white | 101-66604 | 117282 | 6 |
| silver | 121-66604 | 117772 | 6 |
| Frame | | | |
| Colour: | | | |
| cream Original | 100-76100 | 117141 | 50 |
| white Original | 101-76100 | 117322 | 50 |
| white Intense | 120-76100 | 117685 | 1 |
| silver Intense | 121-76100 | 117789 | 1 |

Surge Protection module for installation in flush box VDK 280

- Clustered surge protection for a few sockets for distances up to 5 m
- Can be combined with arbitrary standard system of covers

U0797



VDK 280 ES

| Version | Type Designation | Article No. | Units per package |
|-----------------------------------|------------------|-------------|-------------------|
| Complete, without frame and cover | VDK280ES | 215893 | 1 |

Technical information p. 288

SG00306



Plug-in Surge Arrester SPD-STC

- Rated voltage 230 V AC
- Rated current 16 A
- Signalisation function / malfunction with LED
- Maximum back-up fuse 16 A gL/gG

| Version | Type Designation | Article No. | Units per package |
|--------------------------------|------------------|-------------|-------------------|
| SPD without filter, FR version | SPD-STC | 105949 | 1/20 |
| SPD without filter, „Schuko“ | SPD-ST | 105948 | 1/20 |

Technical information p. 289

SG00306

SG00106



Plug-in Surge Arrester with ISDN S0 Protection SPD-STC/ISDN

- Rated voltage 230 V AC
- Rated current 16 A
- Signalisation function / malfunction with LED
- Maximum back-up fuse 16 A gL/gG

| Version | Type Designation | Article No. | Units per package |
|-----------------------------|------------------|-------------|-------------------|
| Mains + ISDN-S0, FR version | SPD-STC/ISDN | 294124 | 1/20 |
| Mains + ISDN-S0, „Schuko“ | SPD-ST/ISDN | 294121 | 1/20 |

Technical information p. 290

SG00306

SG00206



Plug-in Surge Arrester with TV Protection SPD-STC/TV-SAT

- Rated voltage 230 V AC
- Rated current 16 A
- Signalisation function / malfunction with LED
- Maximum back-up fuse 16 A gL/gG

| Version | Type Designation | Article No. | Units per package |
|-------------------------------|------------------|-------------|-------------------|
| Mains + TV or SAT, FR version | SPD-STC/TV-SAT | 294126 | 1/20 |
| Mains + TV or SAT, „Schuko“ | SPD-ST/TV-SAT | 294123 | 1/20 |

Technical information p. 291

N01104



Multiple Socket Ledges 19" with SPD

- Design for 19" enclosures
- Rated current 16 A
- Signalisation function / malfunction with LED
- Maximum back-up fuse 16 A gL/gG

| Version | Type Designation | Article No. | Units per package |
|--|------------------------|-------------|-------------------|
| Without filter, 7 outlets, with switch, FR version | SPD-STL/19/7F-S/BL/UTE | 290032 | 1 |
| Without filter, 7 outlets, with switch, „Schuko“ | SPD-STL/19/7F-S/BL | 283449 | 1 |

Technical information p. 292

SG06706



Surge Protective Device SP-MS/SAT

- Protection for antenna distributors/multi-switches
- Suitable for analog or digital satellite receiving facilities as well as for terrestrial TV and radio antennas
- Protection of 5 independent channels
- Design according to EN 61643-21

| Description | Type Designation | Article No. | Units per package |
|---------------------|------------------|-------------|-------------------|
| For 5 antenna lines | SP-MS/SAT | 107500 | 1/20 |

Technical information p. 293

Surge arresters for photovoltaic applications

SG11009



SG11309



Surge arresters class T2 (II, C)

- Special line of arresters for photovoltaic and other DC applications
- For voltage systems up to 600 or 1000 V DC
- With exchangeable inserts
- For earthed and unearthed systems
- Rated discharge current 15 kA (8/20 μ s)

| Max. continuous operating voltage UC | Type Designation | Article No. | Units per package |
|--------------------------------------|------------------|-------------|-------------------|
|--------------------------------------|------------------|-------------|-------------------|

For unearthed systems

| | | | |
|-----------------------------------|---------------------|--------|------|
| 600 V DC | SPPT2PA-600-2PE | 132663 | 1/60 |
| 1000 V DC | SPPT2PA-1000-2PE | 132664 | 1/60 |
| 1000 V DC, with auxiliary contact | SPPT2PA-1000-2PE-AX | 132666 | 1/60 |

For unearthed systems

| | | | |
|-----------------------------------|-----------------------|--------|------|
| 600 V DC | SPPT2PA-600-2+1PE | 132661 | 1/40 |
| 1000 V DC | SPPT2PA-1000-2+1PE | 132662 | 1/40 |
| 1000 V DC, with auxiliary contact | SPPT2PA-1000-2+1PE-AX | 132665 | 1/40 |

Technical information p. 294, 295

Inserts

| Description | Type Designation | Article No. | Units per package |
|--|------------------|-------------|-------------------|
| For version 600 V DC | SPPT2PA-600 | 132667 | 1 |
| For version 1000 V DC | SPPT2PA-1000 | 132668 | 1 |
| Sum spark gap for unearthed systems, 1100 V DC | SPPT2PA-1100 | 132669 | 1 |

General accessories for surge protection

SG07306



Equipotential Bonding Bar PAS

- For main equipotential bonding
- Cross section of connected conductors 7 x 2.5 – 16 mm²
- Earthing strip up to 30 x 3.5 / Round conductor 7 - 10 mm
- With plastic cover

| Description | Type Designation | Article No. | Units per package |
|---------------------------|------------------|-------------|-------------------|
| Equipotential Bonding Bar | PAS-7x16 | 107945 | 10/50 |

SG07206



Earthing Bar for Antenna Lines PAS-HF

- Earthing equipotential bar
- Suitable e.g. for antenna systems (for connection of surge protection)
- For 6 HF-cable shields
- Earthing conductor 6 – 25 mm²

| Description | Type Designation | Article No. | Units per package |
|--------------------------------|------------------|-------------|-------------------|
| Earthing Bar for Antenna Lines | PAS-HF-6 | 107946 | 10/100 |

SG07406



Earth Clips EBS

- For copper and galvanized steel/stainless steel tubes
- Cross-section for connection 1 x 2.5 mm² to 2 x 16 mm²
- Two sizes acc. to pipeline diameter

| For pipeline diameter | Type Designation | Article No. | Units per package |
|-----------------------|------------------|-------------|-------------------|
| 1/8" - 1½" | EBS-210mm | 107947 | 20/80 |
| 1/8" - 4" | EBS-430mm | 107948 | 20/80 |

Technical information p. 296

Photovoltaic - Inverter

- Inverters for household photovoltaic systems
- Single phase design
- Output AC power 1500 to 4600 W
- Transformerless design
- Without fans – quiet cooling
- High efficiency
- Indoor line with degree of protection IP43
- Outdoor line with degree of protection IP65, inverter must not be exposed to rain (necessary to place e.g. under a roof)

wa_sg00709



wa_sg00709



PV-Inverter Grid connected ISG

- Equipped with MC3 plugs
- LCD display
- With integrated protection against earth residual current
- Works with monitoring software
- Two independent main monitoring units with all-pole disconnecter (ENS) acc. to VDE 0126-1-1

| AC Output [W] | MC3 | Type Designation | Article No. | Units per package |
|---------------|---------|------------------|-------------|-------------------|
| IP43 | | | | |
| 1500 W | 1 pair | ISG1I-1500/1 | 134753 | 1/14 |
| 2000 W | 1 pair | ISG1I-2000/1 | 134754 | 1/14 |
| 2800 W | 1 pair | ISG1I-2800/1 | 134755 | 1/12 |
| 3300 W | 2 pairs | ISG1I-3300/1 | 135522 | 1/12 |
| 4000 W | 2 pairs | ISG1I-4000/1 | 134756 | 1/12 |
| IP65 | | | | |
| 4000 W | 3 pairs | ISG1O-4000/1 | 134757 | 1/12 |
| 4600 W | 3 pairs | ISG3O-4600/1 | 134758 | 1/6 |

Control Relays EASY

- Enable simple controlling of lighting systems, heating etc.
- Front dimension for installation into installation distribution board
- Programming by means of pushbuttons and LCD or with help of Software (PC)
- 12-language menu
- 128/256 current paths
- 3/4 NC or NO contact in serial connection plus 1 coil per a row of program
- Complete information can be found in Catalogue "Elektronická a řídicí relé" (in Czech) or in or "Main Catalogue Industrial Switchgear"



Control Relays EASY

- Wide range of temperatures -25 °C – +55 °C
- Front dimension for installation into installation distribution board, width in multiples of 18 mm
- Programming by means of pushbuttons and LCD or with PC software
- Intern and extern program back-up in EEPROM memories
- 3 contacts (EASY500, EASY700), 4 contacts (EASY800, MFD-Titan) (NC or NO) in serial plus 1 coil per a row of program (current line)
- Serial and parallel connection
- 128 current lines (EASY500, EASY700)
- 256 current lines (EASY800, MFD)
- Integrated protection by means of password for switching diagram, function relay and actual values of relays
- Representation of current flow for checking of program (types with LCD)
- Menu in 12 languages: D, GB, F, I, E, P, NL, S, PL, TR, CZ, H
- Possibility to store program on memory card for types with LCD (X version: read only)
- 8 / 12 digital inputs, 2 / 4 can be used as analogous



24 V AC

| Dig. inputs | Outputs | Type Designation | Article No. | Units per package |
|-------------|---------------|------------------|-------------|-------------------|
| 8 (2) | 4 relay (8 A) | EASY512-AB-RC | 274101 | 1 |
| 12 (4) | 6 relay (8 A) | EASY719-AB-RC | 274113 | 1 |

115/230 V AC

| Dig. inputs | Outputs | Type Designation | Article No. | Units per package |
|-------------|---------------|------------------|-------------|-------------------|
| 8 | 4 relay (8 A) | EASY512-AC-RC | 274104 | 1 |
| 12 | 6 relay (8 A) | EASY719-AC-RC | 274115 | 1 |
| 12 | 6 relay (8 A) | EASY819-AC-RC | 256267 | 1 |

12 V AC

| Dig. inputs | Outputs | Type Designation | Article No. | Units per package |
|-------------|---------------|------------------|-------------|-------------------|
| 8 (2) | 4 relay (8 A) | EASY512-DA-RC | 274106 | 1 |
| 12 (4) | 6 relay (8 A) | EASY719-DA-RC | 274117 | 1 |

24 V DC

| Dig. inputs | Outputs | Type Designation | Article No. | Units per package |
|-------------|----------------------|------------------|-------------|-------------------|
| 8 (2) | 4 relay (8 A) | EASY512-DC-RC | 274109 | 1 |
| 8 (2) | 4 transistor (0.5 A) | EASY512-DC-TC | 274111 | 1 |
| 12 (4) | 6 relay (8 A) | EASY719-DC-RC | 274119 | 1 |
| 12 (4) | 8 transistor (0.5 A) | EASY721-DC-TC | 274121 | 1 |
| 12 (4) | 6 relay (8 A) | EASY819-DC-RC | 256269 | 1 |
| 12 (4) | 8 transistor (0.5 A) | EASY821-DC-TC | 256273 | 1 |
| 12 (4) | 6 relay (8 A) | EASY820-DC-RC | 256271 | 1 |
| 12 (4) | 8 transistor (0.5 A) | EASY822-DC-TC | 256276 | 1 |



Expansion units

| Inputs | Outputs | Type Designation | Article No. | Units per package |
|--------------------|----------------------|------------------|-------------|-------------------|
| 12 (115/230 V AC) | 6 relay (8 A) | EASY618-AC-RE | 212314 | 1 |
| 12 (24 V DC) | 6 relay (8 A) | EASY618-DC-RE | 232112 | 1 |
| 12 (24 V DC) | 8 transistor (0.5 A) | EASY620-DC-TE | 212313 | 1 |
| 6 (24 V DC) | 4 relay (8 A) | EASY410-DC-RE | 114293 | 1 |
| 6 (24 V DC) | 4 transistor (0.5 A) | EASY410-DC-TE | 114294 | 1 |
| 0 (without supply) | 2 relay (8 A) | EASY202-RE | 232186 | 1 |

Programming software

| Suitable for | Type Designation | Article No. | Units per package |
|-------------------------------|------------------|-------------|-------------------|
| EASY500/700 | EASY-SOFT-BASIC | 284545 | 1 |
| EASY500/700/800 and MFD-Titan | EASY-SOFT-PRO | 266040 | 1 |

Programming cables

| Suitable for | Type Designation | Article No. | Units per package |
|-----------------------|------------------|-------------|-------------------|
| EASY500/700 | EASY-USB-CAB | 107926 | 1 |
| EASY800 and MFD-Titan | EASY800-USB-CAB | 106408 | 1 |

Technical Data

Types and Characteristics of Residual Current Devices

Number of poles:

- 2-pole for 1-phase circuits
- 4-pole for 3-phase circuits

Release time-dependence:

- □ non-delayed release – for general use
- G with inactivity period of min. 10 ms – with increased resistance against unwanted tripping
- S selective, with inactivity period of min. 40 ms

Sensitivity to various current types:

- AC-type – sensitive to residual AC
- A-type – sensitive to residual AC and residual pulsating DC

Note: Besides the AC and A-types, there is also a B-type, which is sensitive to residual pulsating DC and residual smooth DC. Due to very limited number of applications and therefore a high price, this type is not in basic Eaton / Moeller offer.

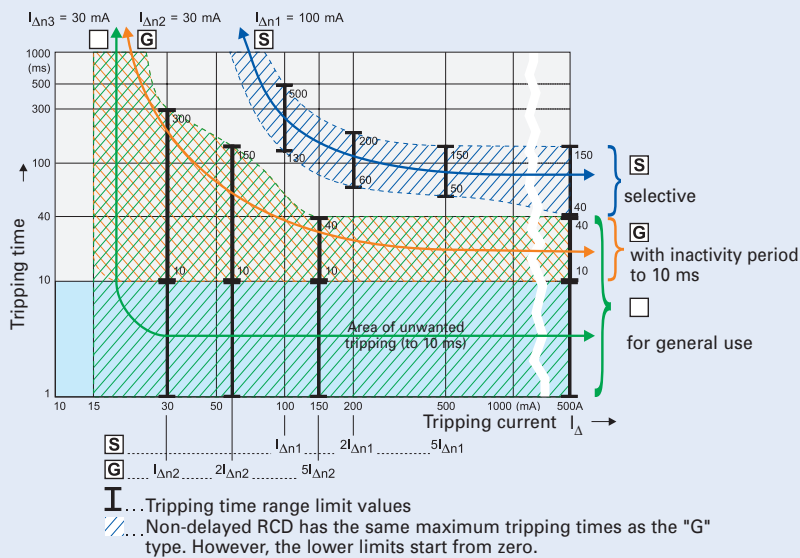
Overload protection:

- without overload protection (according to EN 61008)
- with integrated overload protection (according to EN 61009) – PFL6 and PFL7 types with integrated circuit breaker in offer

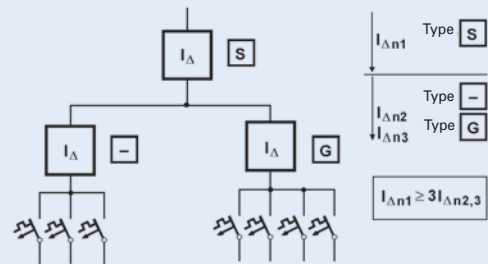
Way of tripping in case of emergence of residual current:

- direct tripping – compact version (usual types)
- indirect tripping – combination of independent devices (residual current relay, core balanced transformer, power switchgear)

Tripping characteristics and selectivity of RCDs types □, G a S



Conditions for RCD selective sequencing



To meet selectivity requirement, the rated residual current of the selective RCD must be at least 3-multiple of the rated residual current of downstream placed RCDs of □ or G type.

Measurement of Residual Current Devices

RCDs with "G" and "S" tripping characteristics must be measured with instruments, which are designed for these RCD types. Tripping time measurement is carried out at $I_{\Delta n}$ value. An instrument with sufficiently long measurement period (see upper tripping time limits) must be used for this measurement. Measurement at the constant value of the residual current ($I_{\Delta n}$, $2I_{\Delta n}$, $5I_{\Delta n}$) enables to find out the tripping times, which must not exceed the limits given in the picture. Value of the actual minimum RCD's release current ranges from 50 to 100 % $I_{\Delta n}$. Commercially available measurement instruments use different characteristics of the current rise (continuous, stepped). Therefore the observed results can slightly differ from the results obtained in the laboratory according to EN 61008 measurement methodology. Measurement at $I_{\Delta n}$ together with the tripping time measurement verifies RCD functionality. Measurement at $5I_{\Delta n}$ (mandatory for RCDs with $I_{\Delta n} \leq 30$ mA) simulates condition of the contact with a live part.

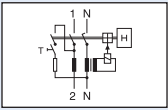
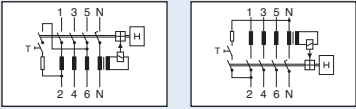



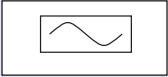
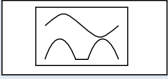


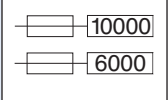
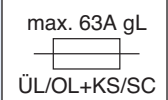

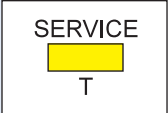

Note:

Tripping time limits (see the picture) are given for the particular residual current values ($I_{\Delta n}$, $2I_{\Delta n}$, $5I_{\Delta n}$), which are listed in the RCD standards (EN 61008, etc.). Tripping times given in HD 60364-4-41 (0.2 sec., 0.4 sec., and 5 sec.) are related to a fault, when the fault current is a multiple of the rated residual current! Mandatory requirements on RCDs can differ in each country, national standards and regulations must be fulfilled!

Surge current-proof

Surge current during switching processes can cause release of RCD although the residual current has not arisen. The reason is that a certain wire asymmetry in the summary transformer exists, which at peak current actuates the magnetic flow in the transformer. Higher resistance can be achieved by means of delay components (delayed RCDs). Release resistance is tested by means of the $8/20 \mu s$ impulse. In the special cases $0.5 \mu s/100$ kHz sinusoidal damped wave is used (for characteristics see e.g. EN 61008).

Symbols on RCDs

| Symbol | Description |
|---|---|
|  | 2-pole device for 1-phase circuits. |
|  | 4-pole device for 3-phase circuits. Internal connection of the residual current devices can vary, therefore be aware of correct connection of the service key in circuits with incomplete number of conductors (e.g. asynchronous motors). To ensure the faultless functioning, connection of the whole number of the working conductors on the RCD input is recommended. |
|  | Non-delayed RCD, conditionally surge current-proof up to 250 A (8/20 μs). For general use. The most often used types. |
|  | RCD with delayed tripping (inactivity period of min. 10 ms) and high surge current-proof (up to 3 kA). The maximum tripping times are coincident with the times of RCDs for general use. It eets conditions of additional protection by means of $I_{\Delta n} = 30 \text{ mA}$ RCD in case of direct contact with a live part. It is also suitable for devices with high induction and capacity to earth. 4-pole version is even sensitive to the residual pulsating DC. |
|  | Selective RCD with delayed tripping (inactivity period of min. 40 ms), with high surge current-proof (usually up to 5 kA). Particularly suitable as the main RCD and for combination with surge arrester devices. |
|  | RCD of AC-type for circuits with residual AC. The most usual type. |
|  | RCD of A-type for circuits with possibility of occurrence of pulsating residual DC. Utilisation in industrial installations with power switches (thyristors), in TT or IT systems (not necessary for protection of exposed conductive parts in TN systems). |
|  | Decreases the number of unwanted releases caused by frequency converters (influence of leakage currents of filters). |
|  | Frost-proof (up to -25 °C). Suitable for outdoor installation – in appropriate cover. Standard for all Moeller RCDs. |
|  | Conditional short circuit strength 10 kA (6 kA) with pre-described back-up fuse. For example, the combination of the 63 A fuse and PF7 RCD can be used in a circuit with expected short-circuit current of 10 kA. This 63 A fuse can be placed anywhere in the installation. Instead of fuses, installation circuit breakers can be used in conventional installations. |
|  | Integrated overload protection ensures overload protection of the contacts of PHF7 RCDs. UL/OL = Overload protected KS/SC = Short Current protected |
|  | |
|  | Service key serves for verification of the PHF7 RCD functionality only when put into operation and then once a year. It is not necessary to carry out the regular verification of the PHF7 RCD functionality, unless certain verification period is laid down in the relevant local operational regulations (construction industry, health service). |
|  | |

Selection of selectivity of RCD

$I_{\Delta n} \leq 30 \text{ mA}$

Additional protection of live parts according to HD 60364-4-41. It protects even in case of direct contact with the live part. Till sconnection, the entire body current flows through the human body. However, the RCD tripping becomes before the fatal accident can occur (obligation of tripping time measurement). Sensitivity of 10 mA does not bring significant safety enhancement, problems with leakage currents of electric appliances arise.

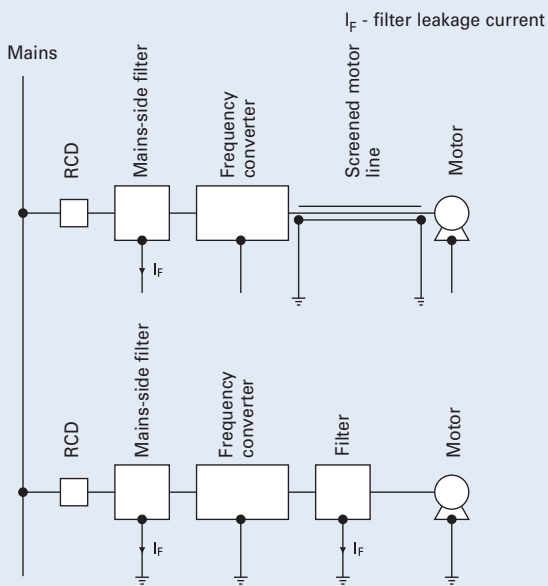
$I_{\Delta n} > 30 \text{ mA}$ (100, 300 mA, 1 A)

Protection against dangerous contact with exposed conductive parts, protection in case of failure according to HD 60364-4-41. During the failure, the fault current flows through the protective earth conductor to the source and contact voltage originates on the appliance. In TN systems, the RCD sensitivity is not critical, because the contact voltage is small. The most used value is $I_{\Delta n} = 300 \text{ mA}$.

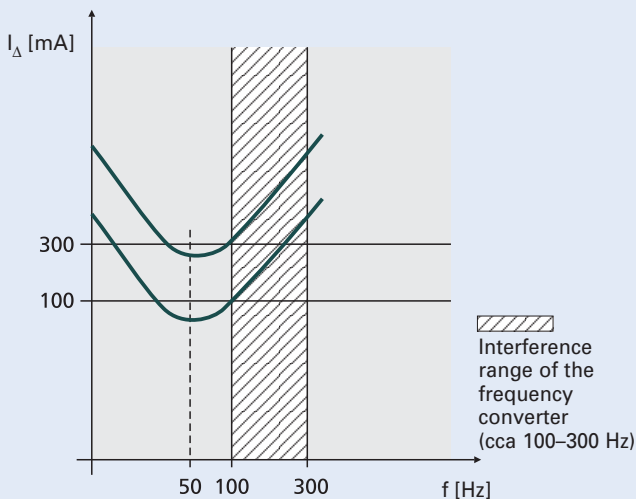
$I_{\Delta n} = 300 \text{ mA}$

Fire protection according to HD 60364-4-482 a HD 60364-7-... Sensitivity of 300 mA is prescribed in all cases, where a fire danger caused by crawl currents exists (warehouse, agricultural complex, wood structure, loft, museum, gallery, etc.).

RCDs for Circuits with Frequency Converters – U-version



Tripping characteristic



Frequency converters are used in a wide variety of systems and equipment requiring variable speed, such as lifts, escalators, conveyor belts, and large washing machines. Using RCDs for protection of exposed conductive parts causes frequent problems with unwanted tripping. Using U-version, both operational reliability and high safety can be ensured.

Why it is necessary to use U-type RCDs?

Earth discharge currents I_f flowing off through the filter into the earth conductor cause that the sum of current vectors in the working conductors is not exactly zero. Therefore, unwanted tripping of the RCD can occur.

The technical root of the above described phenomenon can be derived from the pictures on this page. Fast switching operations of semiconductor switching devices (thyristors, transistors) involving high voltages cause high interference levels which propagate through the lines on the one hand, and in the form of interfering radiation on the other. In order to eliminate this problem, a mains-side filter (also referred to as input filter or EMC-filter) is connected between the RCD and motor. The antiinterference capacitors in the filters produce discharge currents against earth which may cause unwanted tripping of the RCD due to the apparent residual currents. Since the conventional RCDs are designed for relatively wide frequency range (from tens up to hundreds of Hz), satisfactory operation without unwanted tripping in wide range of revolution regulation cannot be ensured.

Tripping characteristic of the U-type RCD in the usual frequency range of 50 – 300 Hz explains the main advantage of this type. RCDs with sensitivity of 100 or 300 mA show the rated sensitivity at 50 Hz. In case of higher frequency (see dashed 100–300 Hz range in the picture), the RCD sensitivity decreases.

Regarding the type classification, G-type is a selective type in combination with A-type (sensitivity also to pulsating residual DC).

RCDs for Circuits with X-ray Equipment – R-version

Why it is necessary to use R-version RCDs?

Utilisation of sensitive RCDs ($I_{\Delta n} \leq 30$ mA) in circuits with X-rays is prescribed in standards. When the X-ray is switched on, big peak currents originate and cause unwanted tripping of conventional RCDs (surge current-proof up to 250 A). To ensure high operational reliability, it is necessary to install at least G-type (surge current-proof up to 3 kA). However, the best solution is to use R-version, which is derived from G-type, and has been developed especially for the circuits with X-ray equipment. The practice proves that using R-version RCDs has totally eliminated unwanted tripping problem.

Note: The problem of unwanted tripping of X-ray equipment circuits must not be underestimated, since if the RCD causes the X-ray equipment tripping, the examination will have to be postponed because of limitation of the patient exposure to the X-ray.

Residual Current Device PF7

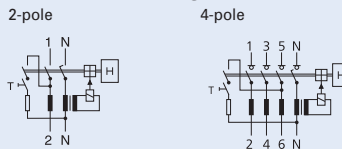
- Twin-purpose terminal (lift/open-mouthed) above and below
- Free terminal space despite installed busbar
- Busbar positioning optionally above or below
- Auxiliary switch and tripping signal contact Z-NHK can be mounted subsequently
- Auxiliary switch Z-HK can be mounted subsequently
- Contact position indicator red - green
- Delayed types suitable for being used with standard fluorescent tubes with or without electrical ballast (30mA-RCD: 30 units per phase conductor, 100mA-RCD: 90 units per phase conductor)
- The device functions irrespective of the position of installation
- Mains connection at either side
- Can be used as additional protection of live parts against dangerous contact
- Types with 80 a 100 A permissible short-circuit back-up fuse (PF7-80, PF7-100): Take into account overload protection
- The 4-pole device can also be used for 3-pole connection. For this purpose use terminals 1-2, 3-4, and 5-6 (+ cable link).
- The 4-pole device can also be used for 2-pole connection. For this purpose use terminals 5-6 and N-N.
- **The test key "T" must be pressed every month. The system operator must be informed of this obligation and his responsibility in a way that can be proven (self-adhesive RCD-label enclosed).**
- **It is recommended to use notification label Z-HWS, warn about a necessity of regular testing**
- Pressing the test key "T" serves the only purpose of function testing the residual current device (RCD). This test does not make earthing resistance measurement (RE), or proper checking of the earth conductor condition redundant, which must be performed separately.
- **Type -A:** Protects against special forms of residual pulsating DC which have not been smoothed
- **Type -G:** High reliability against unwanted tripping. Compulsory for any circuit where personal injury or damage to property may occur in case of unwanted tripping (ÖVE E 8601).

- **Type -G/A:** Additionally protects against special forms of residual pulsating DC which have not been smoothed.
- **Type -R:** Special types for X-ray application
- **Type -S:** Selective residual current device sensitive to AC, type -S
- **Type -S/A:** Additionally protects against special forms of residual pulsating DC which have not been smoothed. Mandatory for instruments with surge arresters installed downstream to RCD.
- **Type -U:** Suitable for speed-controlled drives with frequency converters in household, trade, and industry. Unwanted tripping is avoided thanks to a tripping characteristic designed particularly for frequency converters. See also explanation "Why it is necessary to use U-type RCDs?"

Accessories:

| | | |
|--|-------------|--------|
| Auxiliary switch for subsequent installation to the left | Z-HK | 248432 |
| Tripping signal contact for subsequent installation to the right | Z-NHK | 248434 |
| Remote control and automatic switching device | Z-FW-LP | 248296 |
| Compact enclosure | KLV-TC-2 | 276240 |
| | KLV-TC-4 | 276241 |
| Notification label | Z-HWS-FI | 236980 |
| Sealing cover set | Z-RC/AK-2TE | 285385 |
| | Z-RC/AK-4TE | 101062 |
| Switching interlock | IS/SPE-1TE | 101911 |

Connection diagrams



Technical Data:

Electrical:

| | | |
|---|--|---|
| Design according to | EN 61008 Type G acc. to ÖVE E 8001-1 | |
| Current test marks as printed onto the device | Tripping - instantaneous | |
| | Type G, R | 10 ms delay |
| | Type S, U | 40 ms delay with selective disconnecting function |
| Rated voltage U_n | 230/400 V, 50 Hz | |
| Rated tripping current $I_{\Delta n}$ | 10, 30, 100, 300, 500 mA | |
| Sensitivity | AC and pulsating DC | |
| Rated short circuit strength I_{nc} | 10 kA | |
| Rated insulation voltage U_i | 440 V | |
| Rated impulse withstand voltage U_{imp} | 4 kV | |
| Maximum back-up fuse | Overload | Short circuit |
| | $I_n = 25-40$ A | 25 A gG/gL 63 A gG/gL |
| | $I_n = 63$ A | 40 A gG/gL 63 A gG/gL |
| | $I_n = 80$ A | 50 A gG/gL 80 A gG/gL |
| | $I_n = 100$ A | 63 A gG/gL 100 A gG/gL |
| Voltage range of test button | 184 - 250 V AC (2-pole) 184 - 440 V AC (4-pole) | |

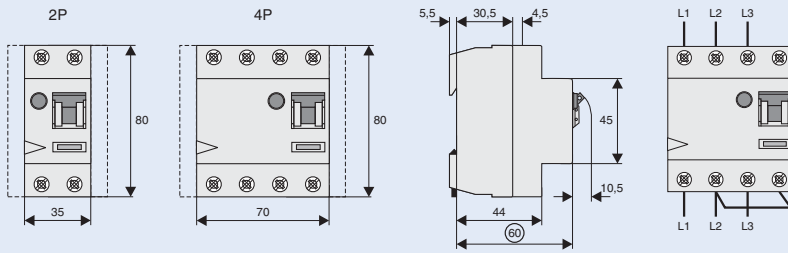
| | | |
|----------------------------------|--|--------------------------------|
| Rated breaking capacity I_m or | Rated fault breaking capacity $I_{\Delta m}$ | |
| | $I_n = 16-40$ A | 500 A |
| | $I_n = 63$ A | 630 A |
| | $I_n = 80$ A | 800 A |
| | $I_n = 100$ A | 1000 A |
| Endurance | electrical comp. | ≥ 4.000 operating cycles |
| | mechanical comp. | ≥ 20.000 operating cycles |

Mechanical:

| | |
|-----------------------------------|--|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 35 mm (2 MU), 70 mm (4 MU) |
| Mounting | na přístrojovou lištu EN 60715 |
| Terminals | open mouthed/lift terminals |
| Terminal protection | finger and hand touch safe |
| Terminal capacity | 1 x (1,5-35) mm ² 2 x (1,5-16) mm ² |
| Busbar thickness | 0,8 to 2 mm |
| Tripping temperature | -25 °C to +40 °C |
| Resistance to climatic conditions | acc. to EN 61008 |

Note: Instead of pre-described back-up fuses standard installation circuit breakers can be used (limiting circuit breakers PL7, PLHT, PL6).

Dimensions [mm]



RCD PF7 in a 3-Phase AC Network without Neutral Conductor

The N-terminal must be connected by a cable link with the phase L2 (or L1), so that the test loop is supplied with current and the RCD is tested correctly.

Influence of the ambient temperature to the maximum continuous current [A]

| Ambient temperature | 16 A | | 25 A | | 40 A | | 63 A | | 80 A | | 100 A | |
|---------------------|------|------|------|----|------|----|------|----|------|----|-------|----|
| | 2p | 4p | 2p | 4p | 2p | 4p | 2p | 4p | 4p | 4p | 4p | 4p |
| 40° | 16 | 25 | 25 | 40 | 40 | 63 | 63 | 80 | 100 | | | |
| 45° | 14 | 21 | 22 | 37 | 37 | 59 | 59 | 76 | 95 | | | |
| 50° | 11 | 18 | 19 | 33 | 34 | 55 | 55 | 72 | 90 | | | |
| 55° | 9 | 14 | 16 | 30 | 31 | 50 | 50 | 68 | 85 | | | |
| 60° | – *) | – *) | – *) | 26 | 27 | 45 | 45 | 64 | 80 | | | |

Annotation: It has to be ensured that the values in the table are not exceeded and the back-up fuse/thermal protection works properly.

*) not applicable

Residual Current Devices dRCM - digital

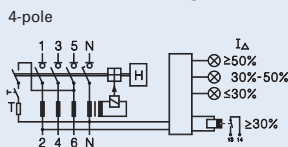
- Residual current breakers with voltage independent protection functions and supplementary digital functions with rated current up to 80 A
- Conditional short circuit strength 10 kA
- System monitoring – pre-warning functions in case of residual current
 - local signalisation of actual level of residual currents by means of three LEDs
 - remote signalization with auxiliary contact
- A new technology enables reduction of unwanted tripping
- Regular testing recommended once a year
- Transparent window for marking labels
- Accessories can be mounted subsequently
- Shape compatible with other devices of P-line Moeller, easy connect by means of busbars
- Twin-purpose terminal (lift/open-mouthed) above and below
- Free terminal space despite installed busbar
- Busbar positioning optionally above or below
- Integrated overload protection
- Auxiliary switch and tripping signal contact Z-NHK can be mounted subsequently
- Auxiliary switch Z-HK can be mounted subsequently
- Contact position indicator red - green
- Tripping indicator white - blue
- Additional Safety
 - possibility to seal
 - possibility to lock in ON and OFF position
- Delayed types suitable for being used with standard fluorescent tubes with or without electrical ballast (30mA-RCD: 30 units per phase conductor, 100mA-RCD: 90 units per phase conductor)
- The device functions irrespective of the position of installation
- Tripping is line voltage-independent
- Mains connection at either side
- The 4-pole device can also be used for 3-pole connection: See connection possibilities.
- The 4-pole device can also be used for 2-pole connection: See connection possibilities.
- The test key "T" must be pressed every year. The system operator must be informed of this obligation and his responsibility in a way that can be proven. The yearly test interval is only valid for residential and similar applications. Under all other conditions (e.g. damply or dusty environment), it's recommended to test in shorter intervals (e.g. monthly).
- A test is further needed if red and yellow LED are on together.
- Pressing the test key "T" serves the only purpose of function testing the residual current device (RCD). This test does not make earthing resistance

- measurement (RE), or proper checking of the earth conductor condition redundant, which must be performed separately.
- Functioning
 - The green LED becomes active at 0-30 % $I_{\Delta n}$
 - The yellow LED becomes active at 30-50 % $I_{\Delta n}$
 - The red LED becomes active at > 50 % $I_{\Delta n}$
- Potential-free relay (NO contact, in parallel with the yellow LED, up to 1 A ohmic load / 230 V~) for external prewarning function. Bistable, means the warning stays on also when the breaker trips, until reset.
- Type -A:** Protects against special forms of residual pulsating DC which have not been smoothed
- Type -G:** High reliability against unwanted tripping. Compulsory for any circuit where personal injury or damage to property may occur in case of unwanted tripping (ÖVE/ÖNORM E 8001-1 § 12.1.6).
- Type -G/A:** Additionally protects against special forms of residual pulsating DC which have not been smoothed
- Type -R:** To avoid unwanted tripping due to X-ray devices
- Type -S:** Selective residual current device sensitive to AC, type -S.
- Type -S/A:** Additionally protects against special forms of residual pulsating DC which have not been smoothed.
- Type -U:** Suitable for speed-controlled drives with frequency converters in household, trade, and industry. Unwanted tripping is avoided thanks to a tripping characteristic designed particularly for frequency converters. See also explanation "Frequency Converter-Proof RCDs - What for?"

Accessories:

| | | |
|--|-------------|--------|
| Auxiliary switch for subsequent installation to the left | Z-HK | 248432 |
| Tripping signal contact for subsequent installation to the right | Z-NHK | 248434 |
| Remote control and automatic switching device | Z-FW-LP | 248296 |
| Compact enclosure | KLV-TC-4 | 276241 |
| Sealing cover set | Z-RC/AK-4TE | 101062 |
| Switching interlock | IS/SPE-1TE | 101911 |

Connection diagram



Technical Data:

Electrical:

| | |
|---|---|
| Design according to | EN 61008, type G acc. to ÖVE E 8601 |
| Current test marks as printed onto the device | |
| Tripping | instantaneous |
| G, R | 10 ms delay |
| S | 40 ms delay - with selective disconnecting function |
| U (30 mA) | 10 ms delay |
| U (300 mA) | 40 ms delay - with selective disconnecting function |
| Rated voltage U_n | 230/400 a 240/415 V AC, 50 Hz |
| Operation voltage protection functions | voltage independent |
| electronic | 50 – 254 V AC |
| test circuit | 184 – 440 V AC |
| Rated tripping current $I_{\Delta n}$ | 30, 300 mA |
| Sensitivity | AC and pulsating DC |
| Rated short circuit capacity I_{nc} | 10 kA |
| Rated insulation voltage U_i | 440 V |
| Rated impulse withstand voltage U_{imp} | 4 kV (1,2/50 μ s) |
| Peak withstand current | |
| Type G/A, R, U (30 mA) | 3 kA (8/20 μ s) |
| Type S/A, U (300 mA) | 5 kA (8/20 μ s) |
| Electrical isolation | > 4 mm |
| Maximum back-up fuse | Short circuit and overload protection |
| $I_n = 16-63$ A | 63 A gG/gL |
| $I_n = 80$ A | 80 A gG/gL |

Endurance

| | |
|------------------|--------------------------------|
| electrical comp. | $\geq 4,000$ operating cycles |
| mechanical comp. | $\geq 20,000$ operating cycles |

Mechanical:

| | |
|--|--|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 70 mm (4 MU) |
| Mounting | quick fastening with 2 lock-in positions on DIN rail EN 60715 |
| Degree of protection, built-in | IP40 |
| Upper and lower terminals | open mouthed/lift terminals |
| Terminal protection | finger and hand touch safe, |
| Terminal capacity | 1 x (1.5 – 35) mm ² 2 x (1.5 – 16) mm ² |
| Terminal screw | M5 (Pozidriv PZ2) |
| Terminal torque | 2 – 2.4 Nm |
| Terminal capacity warning contact > 30 % | 0.25 – 1.5 mm ² (plug in terminals) |
| Busbar thickness | 0,8 – 2 mm |
| Tripping temperature | -25 °C to +40 °C |
| Resistance to climatic conditions | acc. to EN 61008 |
| Contact position indicator | red / green |
| Tripping indicator | white / blue |

For types and art. numbers see page 10

Local Indication RCCB

Status indication LED

Permanent light green



red / yellow / green

Normal operation

Permanent light yellow



The measured residual current is bigger than 30% of the nominal tripping value.

Permanent light red



The measured residual current is bigger than 50% of the nominal tripping value.

Remote Indication

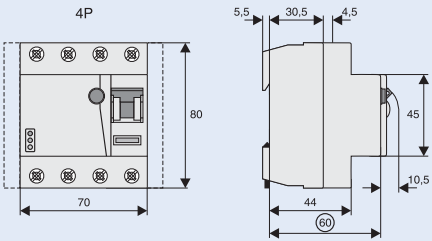
Signalisation contact:

1 contact NO up to 230V AC, 2 terminals, 1 A ohmic load

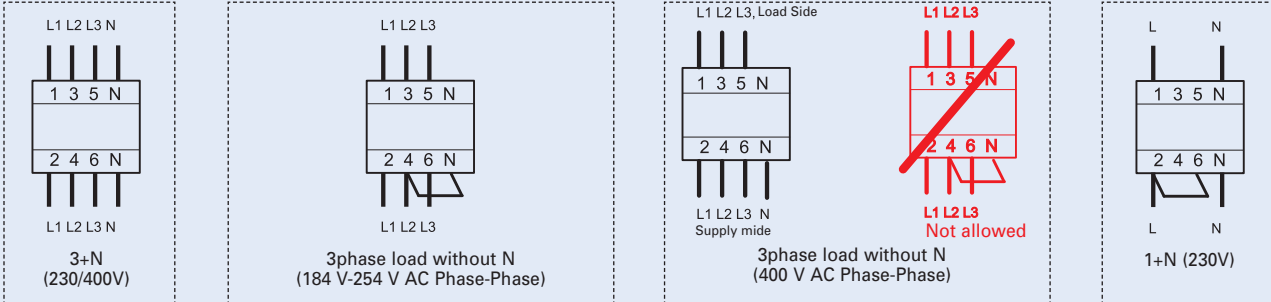
Terminal capacity of contacts:

0.25 – 1.5 mm² (screw-less spring terminals)

Dimensions [mm]



Correct connection



Test button works within 184 – 440 V AC. Electronic works within 50 – 254 V AC. Protection functions voltage independent.

Residual Current Relays PFR, Core Balance Transformers Z-WFR

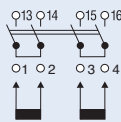
- Identical type of auxiliary and tripping signal switch Z-NHK for PF7, PHF7
- Auxiliary switch Z-HK can be mounted subsequently
- Contact position indicator red-green
- 2 NO (breaking) contacts
- Delayed types suitable for being used with standard fluorescent tubes with or without electronical ballast (30 mA-RCD: 30 units per phase conductor, 100 mA-RCD: 90 units per phase conductor)
- **Type -U:** Suitable for speed-controlled drives with frequency converters in household, trade, and industry. Unwanted tripping is avoided thanks to a tripping characteristic designed particularly for frequency converters. See also explanation "Frequency Converter-Proof RCDs - What for?"
- **Type -S/A:** selective, sensitive to residual AC and residual pulsating DC

Accessories:

| | | |
|--|-------------|--------|
| Auxiliary switch for subsequent installation to the left | Z-HK | 248432 |
| Tripping signal contact for subsequent installation to the right | Z-NHK | 248434 |
| Compact enclosure | KLV-TC-4 | 276241 |
| Notification label | Z-HWS-FI | 236980 |
| Sealing Cover Set | Z-RC/AK-4TE | 101062 |
| Switching interlock | IS/SPE-1TE | 101911 |

Connection diagrams

Relay



Core balance transformer



Terminals 1, 2: secondary winding
Terminals 3, 4: test circuit (actuating winding)

Technical Data

Electrical:

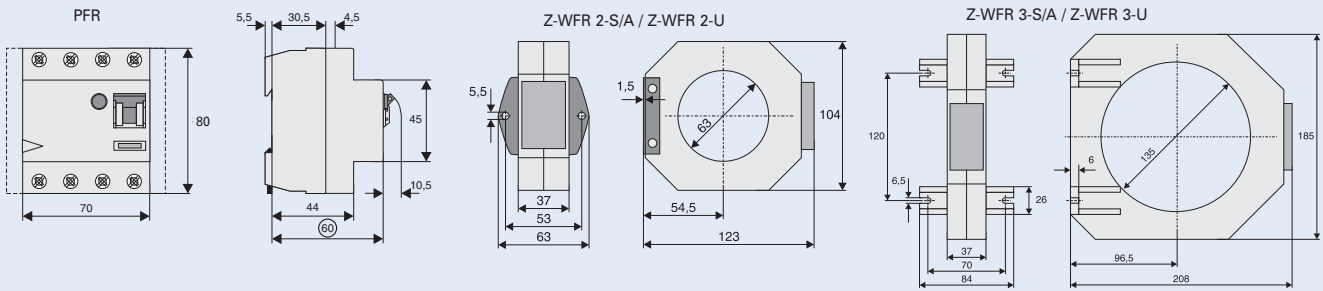
| | |
|--|---|
| Design according to | EN 61008 |
| Tripping | 40 ms delay with selective disconnecting function |
| Rated voltage U_n | 230/400 V; 50 Hz |
| Rated tripping current $I_{\Delta n}$ | (0.1)*, 0.3 and 1 A |
| Rated current of relay contacts | 25 A / 400 V~, 16 A / 230 V AC-15 |
| Maximum nominal current | 400 A |
| Sensitivity | residual AC and residual pulsating DC |
| Rated peak withstand voltage U_{imp} | 4 kV (1.2/50 μ s) |
| Voltage range of test button | 184–440 V AC |
| Endurance | electrical comp. \geq 4,000 operating cycles mechanical comp. \geq 20,000 operating cycles |

Mechanical:

| | |
|-----------------------------------|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 70 mm (4 MU) |
| Mounting | quick fastening with 2 lock-in positions on DIN rail EN 60715 |
| Upper and lower terminals | open mouthed/lift terminals |
| Terminal protection | finger and hand touch safe |
| Terminal capacity | 1 x (1.5–35) mm ² 2 x (1.5–16) mm ² |
| Busbar thickness | 0.8–2 mm |
| Control line | 1.5–2.5 mm ² |
| Tripping temperature | -25 °C to +40 °C |
| Resistance to climatic conditions | acc. to EN 61008 |

*) see Important Information for Installation

Dimensions [mm]

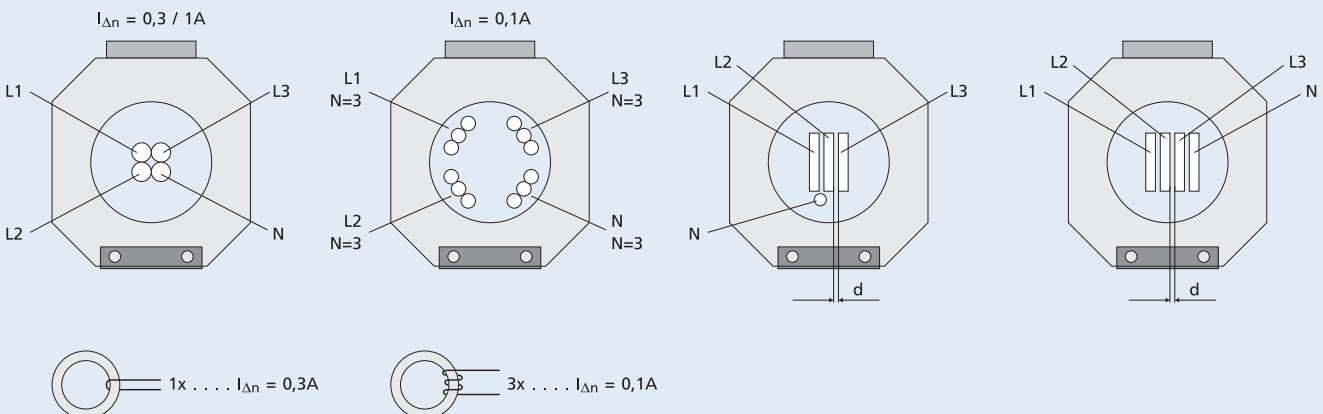


Important Information for Installation

All lines required for operation, L1, L2, and L3 including neutral N, must be routed through the transformer as follows:

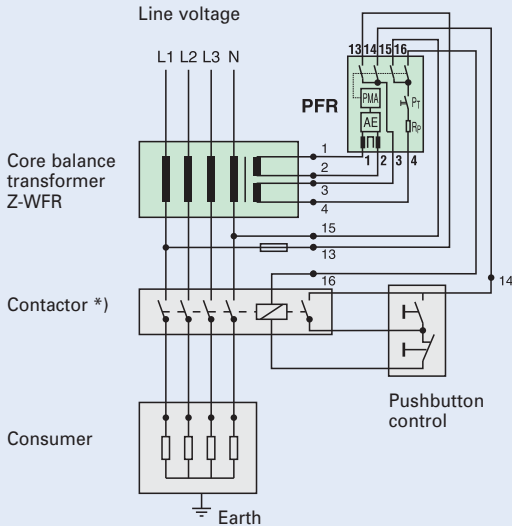
Insulated lines must be laid bunched

Copper rails - Maximum distance d between copper rails 1 cm

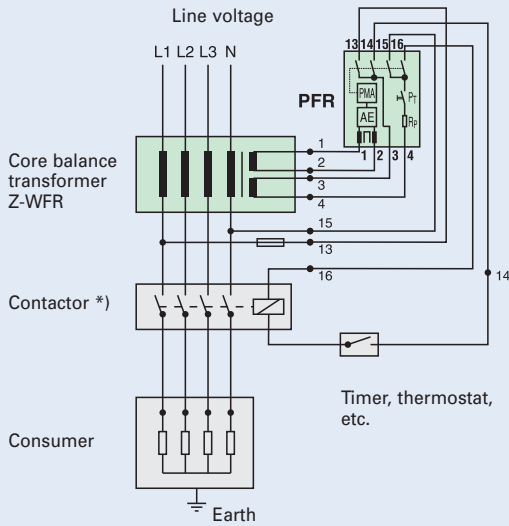


For types and art. numbers see page 12

Impulse Contact Control



Continuous Contact Control



*) contactor, circuit breaker or switch with undervoltage release

Similar in TN and IT systems – there is difference in connection of PE conductor.

- Upozornění:**
- Connect terminals 1-4 of the relay to the terminals 1-4 of the transformer (see switching examples)!
 - 1+2: secondary winding; 3+4: test winding
 - Supply terminals 13 and 15 as shown, so that the test circuit can work correct!

Rated Tripping Current Matching

Matching of the rated tripping current, 0.1 or 0.3 A, is achieved by the number of turns in the primary winding of the transformer (in PFR2-03-S/A, PFR3-03-S/A, PFR2-03-U and PFR3-03-U).

| Residual Current Relay | Transformer | Rated tripping current $I_{\Delta n}$ [A] | Number of primary turns | Maximum cable diameter [mm] | Maximum primary current [A] |
|------------------------|-------------|---|-------------------------|-----------------------------|-----------------------------|
| PFR2-03-U (S/A) | Z-WFR2 | 0.1 | 3 | 60 | 150 |
| | | 0.3 | 1 | 60 | 400 |
| PFR3-03-U (S/A) | Z-WFR3 | 0.1 | 3 | 130 | 65 |
| | | 0.3 | 1 | 130 | 400 |
| PFR2-1-U (S/A) | Z-WFR2 | 1.0 | 1 | 60 | 400 |
| PFR3-1-U (S/A) | Z-WFR3 | 1.0 | 1 | 130 | 400 |

Residual Current Device PHF7

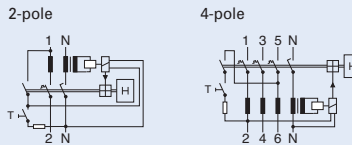
- **Integrated overload protection O. L. P.**
- **Service key, need not be pressed every month**
- Twin-purpose terminal (lift/open-mouthed) above and below
- Free terminal space despite installed busbar
- Busbar positioning optionally above or below
- Identical type of auxiliary and tripping signal switch Z-NHK for PF7, PFR
- Auxiliary switch Z-HK can be mounted subsequently
- Remote switch-off (2p) by means of Z-ASA
- Contact position indicator red-green
- The device functions irrespective of the position of installation
- **Type -A:** Protects against special forms of residual pulsating DC which have not been smoothed
- **Type -G:** High reliability against unwanted tripping
- **Type -S:** Selective residual current device



Accessories:

| | | |
|--|-------------|--------|
| Auxiliary switch for | | |
| subsequent installation to the left (2p) | Z-AHK | 248433 |
| subsequent installation to the left (4p) | Z-HK | 248432 |
| Tripping signal contact for | | |
| subsequent installation to the right | Z-NHK | 248434 |
| Remote control | Z-FW-LP | 248296 |
| Compact enclosure | KLV-TC-2 | 276240 |
| | KLV-TC-4 | 276241 |
| Additional terminal 35 mm ² (2 units) | Z-HA-EK/35 | 263960 |
| Remote tripping module | | |
| for PHF7-4p | Z-FAM | 248293 |
| for PHF7-2p | Z-KAM | 248294 |
| Sealing Cover Set | Z-RC/AK-4TE | 101062 |
| Switching interlock | IS/SPE-1TE | 101911 |

Connection diagrams



Technical Data

Electrical:

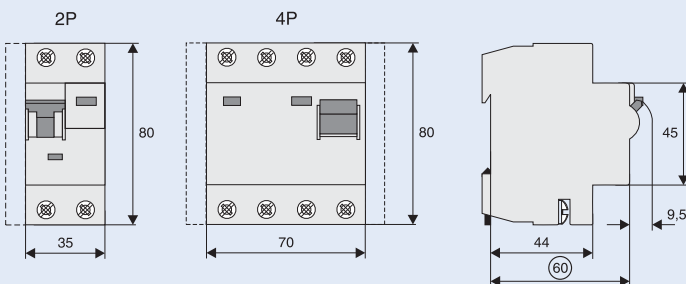
| | |
|---|---|
| Design according to | EN 61008 |
| | Type G acc. to ÖVE E 8601 |
| Tripping | G, R 10 ms delay |
| | S 40 ms delay - with selective disconnecting function |
| Rated voltage U_n | 230/400 V; 50 Hz |
| Rated tripping current $I_{\Delta n}$ | 30, 100, 300 mA |
| Sensitivity | AC and pulsating DC |
| Rated short circuit strength I_{nc} | 10 kA |
| Maximum back-up fuse for overload and short circuit protection | 63 A gG/gL |
| Rated breaking capacity I_m or Rated fault breaking capacity $I_{\Delta m}$ | |
| $I_n = 25-40$ A | 500 A |
| $I_n = 63$ A | 630 A |
| Voltage range of test button | 195.5-253 V AC |
| Endurance | electrical comp. $\geq 4,000$ operating cycles |
| | mechanical comp. $\geq 20,000$ operating cycles |

Mechanical:

| | |
|-----------------------------------|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 35 mm (2 MU), 70 mm (4 MU) |
| Mounting | quick fastening with 2 lock-in positions on DIN rail EN 60715 |
| Degree of protection, built-in | IP20 |
| Upper and lower terminals | open mouthed/lift terminals |
| Terminal capacity | 2p: 1-25 mm ² |
| | 4p: 1.5-35 mm ² |
| Busbar thickness | 0.8-2 mm |
| Resistance to climatic conditions | acc. to EN 61008 |

Note: Instead of pre-described back-up fuses standard installation circuit breakers with similar let-through energy I^2t can be used without any significant change (limiting circuit breakers PL7, PLHT, PL6).

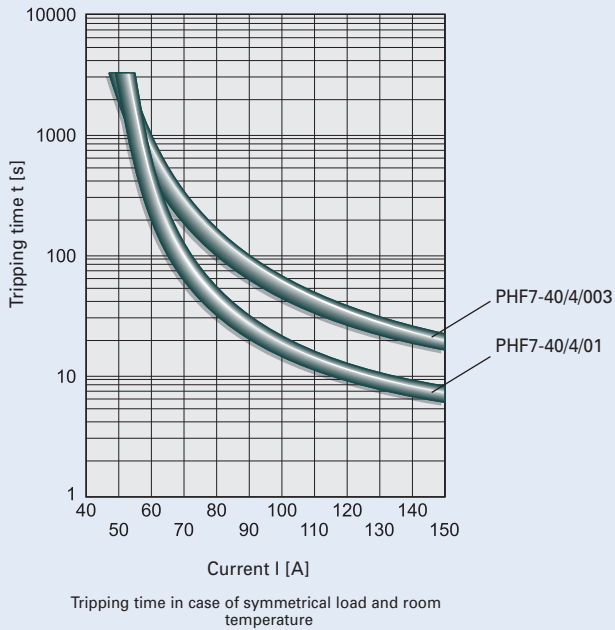
Dimensions [mm]



For types and art. numbers see page 14

Overload Tripping Characteristics

Typical example



Each PHF7 RCD is protected against contact overload by means of integrated thermal protection. Regarding the PHF7 RCDs, protection from short-circuit is only required, e.g. with a fuse or restrictive circuit breaker of rated value.

Note to the overload protection

Contacts of switching devices (e.g. circuit breaker, contactor, relay, RCD) are tested according to corresponding standards for their rated current I_n . If long-lasting contact overload is expected, this possibility must be guaranteed by the device manufacturer – e.g. by means of permanent overload with certain multiple of the rated current. The rated current of the contacts is the value of current, which must be transmitted by these contacts during the continuous operation. However, in all common events it is necessary to take into account the possibility of overload (unless the circuit guarantees that the overload is impossible – resistance device, furnace, etc.).

Protection of RCDs without built-in overload protection must ensure that the current in the circuit downstream to the RCD will not exceed the value of the rated current of the contact. When using an overload protection device (fuse, circuit breaker), one must take into account that even current higher than rated current of the fuse/circuit breaker can flow through the circuit for some time.

Therefore concerning the circuit breakers, we have to consider value of the conventional non-tripping current (for circuit breakers $1.13 I_n$) and conventional tripping current (for circuit breakers of B, C, and D type up to $1.45 \times I_n$, for gG/gL fuse $1.6 \times I_n$). For this reason it is necessary to ensure timely overload disconnection by means of either pre-placed circuit breaker with smaller value of the rated current or to use RCD with protection against contact overload (PHF7, PFL7) instead.

Matching of the circuit breakers to the RCDs in the rated current ratio of 1:1 is only possible when this arrangement is required by the manufacturer (higher rated currents) or when the coincidence of the current consumption is not high and longer overload of contact is not imminent (short-period overload by switch peak currents is tolerated).

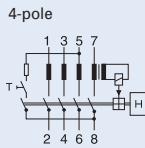
Residual Current Device PFDM

- Can be used as additional protection of live parts against dangerous contact
- Twin-purpose terminal (lift/open-mouthed) above and below
- Busbar positioning optionally above or below
- Free terminal space despite installed busbar
- Auxiliary switch Z-HD can be mounted subsequently
- Contact position indicator red-green
- The device functions irrespective of the position of installation
- **Type AC:** Sensitive to residual AC
- **Type -A:** Additionally protects against special forms of residual pulsating DC which have not been smoothed
- **Type S/A:** for protection in case of extraordinary non-damped DC.
Mandatory for applications with surge protection devices downstream to RCDs.

Accessories:

| | | |
|--|------|--------|
| Auxiliary switch for subsequent installation to the left | Z-HD | 265620 |
|--|------|--------|

Connection diagram



Technical Data

Electrical:

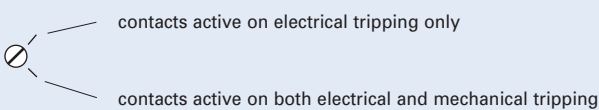
| | |
|---|--|
| Design according to | EN 61008 |
| Tripping | - instantaneous |
| | S/A 40 ms delay - with selective disconnecting function |
| Rated voltage U_n | 230/400 V; 50 Hz |
| Rated current I_n | 125 A |
| Rated tripping current $I_{\Delta n}$ | 30, 100, 300, 500 mA |
| Surge current-proof non-delayed version | > 200 A |
| | (test with damped sinusoidal wave 0.5 μ s/100 kHz) |
| version S/A | > 3000 A |
| Sensitivity | AC and pulsating DC |
| Rated short circuit strength I_{nc} | 10 kA |
| Rated breaking capacity I_m or Rated fault breaking capacity $I_{\Delta m}$ | 1250 A |
| Maximum back-up fuse | Overload Short circuit 80 A gG/gL 125 A gG/gL |
| Voltage range of test button | 185–440 V AC |
| Endurance electrical comp. | \geq 4,000 operating cycles |
| mechanical comp. | \geq 20,000 operating cycles |

Mechanical:

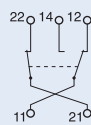
| | |
|-----------------------------------|--------------------------------------|
| Frame size | 45 mm |
| Device height | 85 mm |
| Device width | 35 mm (2 MU), 70 mm (4 MU) |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection, built-in | IP20 |
| Upper and lower terminals | open mouthed/lift terminals |
| Terminal capacity | 1.5–50 mm ² |
| Busbar thickness | 0.8–2 mm |
| Tripping temperature | -25 °C to +40 °C |
| Resistance to climatic conditions | acc. to EN 61008 |

Auxiliary Switch Z-HD

- Subsequent mounting onto RCD PFDM with screws
- Function selector



Connection diagram



Technical Data

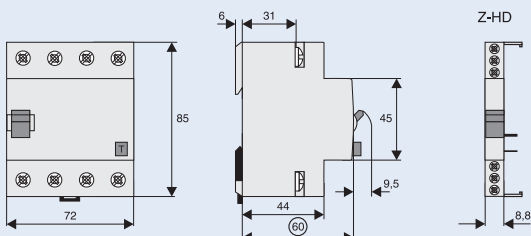
Electrical:

| | |
|-------------|----------------|
| Contacts | 1CO + 1NC |
| Load rating | |
| AC-11 | 6 A / 230 V AC |
| DC-11 | 1 A / 230 V DC |

Mechanical:

| | |
|-------------------|---------------------|
| Terminal capacity | 2.5 mm ² |
|-------------------|---------------------|

Dimensions [mm]



For types and art. numbers see page 16

Residual Current Device PF6

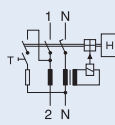
- Twin-purpose terminal (lift/open-mouthed) above and below
- Free terminal space despite installed busbar
- Busbar positioning optionally above or below
- Possibility to use auxiliary and tripping signal switch Z-NHK
- Auxiliary switch Z-HK can be mounted subsequently
- Contact position indicator red - green
- Suitable for being used with standard fluorescent tubes with or without electronical ballast (typically up to 20 units per phase conductor)
- The device functions irrespective of the position of installation
- Mains connection at either side
- Can be used as additional protection of live parts against dangerous contact
- The 4-pole device can also be used for 3-pole connection. For this purpose use terminals 1-2, 3-4, and 5-6 (+ cable link).
- The 4-pole device can also be used for 2-pole connection. For this purpose use terminals 5-6 and N-N.
- The test key "T" must be pressed every month. The system operator must be informed of this obligation and his responsibility in a way that can be proven (self-adhesive RCD-label enclosed)
- It is recommended to use notification label Z-HWS, warn about a necessity of regular testing
- Pressing the test key "T" serves the only purpose of function testing the residual current device (RCD). This test does not make earthing resistance measurement (RE), or proper checking of the earth conductor condition redundant, which must be performed separately.

Accessories:

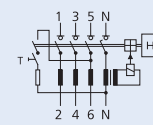
| | | |
|--|------------|--------|
| Auxiliary switch for subsequent installation to the left | Z-HK | 248432 |
| Tripping signal contact for subsequent installation to the right | Z-NHK | 248434 |
| Remote control | Z-FW-LP | 248296 |
| Compact enclosure | KLV-TC-2 | 276240 |
| | KLV-TC-4 | 276241 |
| Notification label | Z-HWS-FI | 236980 |
| Tripping module | Z-FAM | 248293 |
| Tripping module | Z-KAM | 248294 |
| Switching interlock without lock | IS/SPE-1TE | 101911 |

Connection diagrams

2-pole



4-pole



Technical Data:

Electrical:

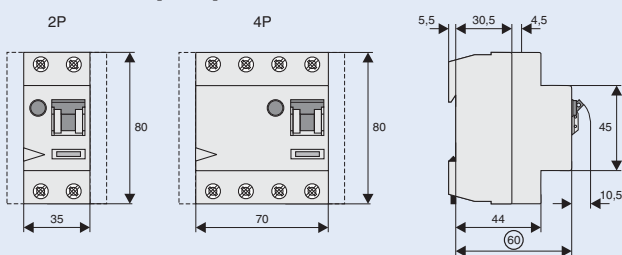
| | | |
|--|--|--------------------------------|
| Design according to | EN 61008 | |
| Tripping | instantaneous | |
| Rated voltage U_n | 230/400 V, 50 Hz | |
| Rated tripping current $I_{\Delta n}$ | 30, 300 mA | |
| Sensitivity | AC and pulsating DC | |
| Rated insulation voltage U_i | 440 V | |
| Rated impulse withstand voltage U_{imp} | 4 kV (1.2/50 μ s) | |
| Rated short circuit strength I_{nc} | 6 kA | |
| Maximum back-up fuse | overload | short-circuit |
| $I_n = 25-40$ A | 25 A gG/gL | 63 A gG/gL |
| $I_n = 63$ A | 40 A gG/gL | 63 A gG/gL |
| Rated breaking capacity I_m or | | |
| Rated fault breaking capacity $I_{\Delta m}$ | | |
| $I_n = 16-40$ A | 500 A | |
| $I_n = 63$ A | 630 A | |
| Voltage range of test button | 184-250 V AC (2-pole) 184-440 V AC (4-pole) | |
| Endurance | electrical comp. | $\geq 4,000$ operating cycles |
| | mechanical comp. | $\geq 20,000$ operating cycles |

Mechanical:

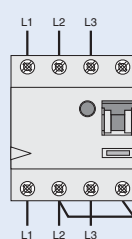
| | |
|-----------------------------------|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 35 mm (2 MU), 70 mm (4 MU) |
| Mounting | quick fastening with 2 lock-in positions on DIN rail EN 60715 |
| Lower terminals | open-mouthed/lift terminals |
| Terminal protection | finger and hand touch safe |
| Terminal capacity | 1 x (1.5-35) mm ² 2 x (1.5-16) mm ² |
| Busbar thickness | 0.8 - 2 mm |
| Tripping temperature | -25 °C to +40 °C |
| Resistance to climatic conditions | acc. to EN 61008 |

Note: Instead of pre-described back-up fuses standard installation circuit breakers can be used (limiting circuit breakers PL7, PLHT, PL6).

Dimensions [mm]



RCD PF6 in a Three-Phase AC Network without Neutral Conductor



The N-terminal must be connected by a cable link with the phase L2 (or L1), so that the test loop is supplied with current and the RCD is tested correctly.

Influence of the ambient temperature to the maximum continuous current [A]

| Ambient temperature | 25 A | | 40 A | | 63 A |
|---------------------|------|------|------|----|------|
| | 2p | 4p | 2p | 4p | 4p |
| 40° | 25 | 25 | 40 | 40 | 63 |
| 45° | 21 | 22 | 37 | 37 | 59 |
| 50° | 18 | 19 | 33 | 34 | 55 |
| 55° | 14 | 16 | 30 | 31 | 50 |
| 60° | – *) | – *) | 26 | 27 | 45 |

Annotation: It has to be ensured that the values in the table are not exceeded and the back-up fuse/thermal protection works properly.

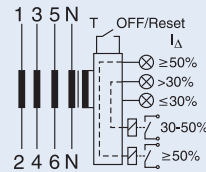
*) not applicable

Leakage current monitor PDIM

- Without main contacts
- Conditional short circuit strength 10 kA
- Rated residual current adjustable in step 30, 100, 300, 500 and 1000 mA
- Version A – Sensitive to special forms of residual pulsating DC which have not been smoothed
- Tripping behaviour adjustable: instantaneous – delayed G type – selective S type
- Local signalisation of level of residual current by means of LEDs
- Remote signalisation of level of residual current with two potential-free auxiliary contacts 10 A / 230 V AC
- Mains connection at either side
- The device works irrespective of the position of installation
- Twin-purpose terminal (lift/open-mouthed) above and below
- Free terminal space despite installed busbar

Connection diagram

4-pole



Technical Data:

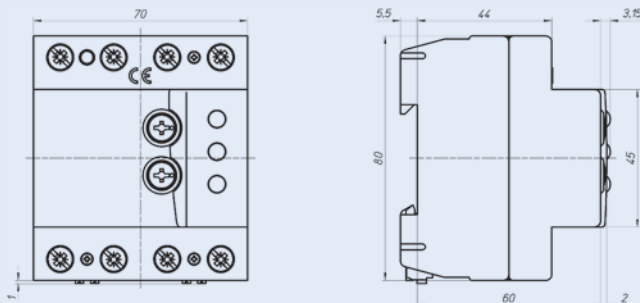
Electrical:

| | |
|---|---|
| Design similar to | EN 62020 |
| Current test marks as printed onto the device | |
| Tripping behaviour (adjustable) | instantaneous |
| Type G | 10 ms delay |
| Type S | 40 ms delay - selective |
| Rated voltage U_n | 230/400 V, 50/60 Hz, 240/415 V, 50/60 Hz |
| Rated current I_n | nastavitelný 30, 100, 300, 500, 1000 mA |
| Sensitivity | AC and pulsating DC |
| Rated insulation voltage U_i | 440 V |
| Rated short circuit resistance I_{nc} | 10 kA |
| Max. back-up fuse admitted | Short-circuit Overload |
| $I_n = 40$ A | 40 A gG/gL 63 A gG/gL |
| $I_n = 100$ A | 63 A gG/gL 100 A gG/gL |
| Endurance electrical comp. | ≥ 4,000 operating cycles |
| mechanical comp. | ≥ 20,000 operating cycles |

Mechanical:

| | |
|---|--|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 70 mm (4 MU) |
| Mounting | Quick fastening with 2 lock-in positions on DIN rail EN 50022 |
| Upper and lower terminals | Open-mouthed/lift terminals |
| Degree of protection of terminals | IP20 |
| Cross section of connected conductor (main terminals) | 1 x (1.5–35) mm ² , solid conductor 2 x (1.5–16) mm ² , multi-wired conductor |
| Cross section of connected conductor (contacts) | 0,25 -1,5 mm ² |
| Busbar thickness | 0.8 – 2 mm |
| Admitted ambient temperature range | -25 °C to +40 °C |
| Resistance to climatic conditions | podle EN 61008 |

Dimensions [mm]



Add-on Residual Current Protection Unit PBHT

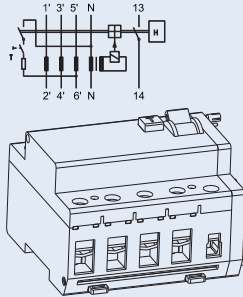
- By combination with miniature circuit breaker PLHT
- Add-on residual current unit (screw connection) for 80 or 125 A
- High flexibility and ease of installation thanks to variable wiring (400 mm flexible connection wires included in the set)
- Free selection of main power supply
- Auxiliary switch 1 NO included as standard in all PBHT versions
- For subsequent mounting onto 3, 3+N-miniature circuit breakers PLHT
- Toggle (serves as switch position- and tripping indicator)
- The screw connection to the PLHT-device can be unscrewed at any time. Consequently, in case of modifications of the systems to be protected, the installation can be adapted to new requirements at any time.

Accessories:

Flexible connection wires (connection to PLHT) are included in the standard set:

| | |
|---------------------|--------------------------------------|
| 4-pole 80 A | 4 x 16 mm ² (400 mm each) |
| 4-pole 125 A | 4 x 35 mm ² (400 mm each) |
| Switching interlock | IS/SPE-1TE 101911 |

Connection diagram



Technical Data:

Electrical:

| | |
|--|--|
| Design according to | EN 60947-2 |
| Current flow paths | |
| Rated voltage U_e | 230/400 V AC |
| Operational voltage range | 196–440 V |
| Rated frequency | 50 Hz |
| Rated current I_n | 80 A, 125 A |
| Rated tripping current $I_{\Delta n}$ | 30, 300, 500, 1000 mA |
| Rated non-tripping current $I_{\Delta no}$ | $0.5 I_{\Delta n}$ |
| Sensitivity | AC and pulsating DC |
| Tripping characteristic | instantaneous |
| | Type S 40 ms with selective disconnecting function |
| Rated service short circuit breaking capacity I_{cn} | same as connected PLHT |
| Rated ultimate circuit breaking capacity I_{cu} | same as connected PLHT |
| Rated fault short circuit breaking capacity $I_{\Delta in} = I_{cu}$ | |
| Rated peak withstand voltage U_{imp} | 4 kV (1.2/50 μ s) |
| Endurance mechanical comp. | |
| PBHT-80 | >10000 operating cycles |
| PBHT-125 | >8000 operating cycles |
| Endurance electrical comp. | |
| PBHT-80 | >1500 operating cycles |
| PBHT-125 | >1000 operating cycles |

Auxiliary Contact

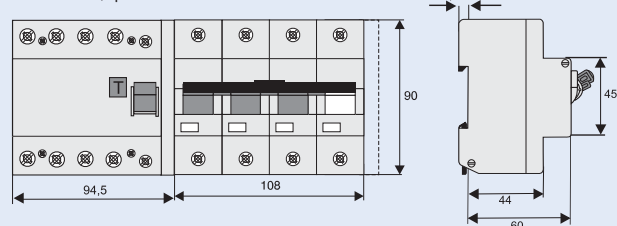
| | |
|---------------------------------|----------|
| Utilisation category AC15 | |
| Rated voltage U_e | 250 V AC |
| Rated operational current I_e | 16 A AC |

Mechanical:

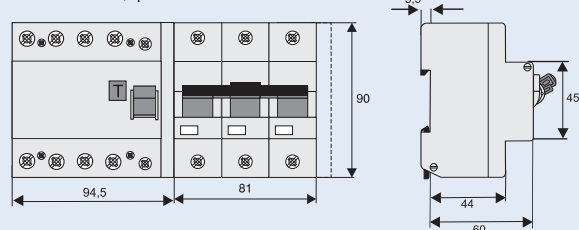
| | |
|---------------------------------------|--|
| Frame size | 45 mm |
| Device height | 90 mm |
| Device width | 95 mm (5.5 MU) |
| Mounting | screwed onto PLHT |
| | 3-, 4-pole |
| Upper and lower terminals | třmenové |
| Ochrana svorek | finger and hand touch safe |
| Terminal capacity | |
| Main conductor | 2.5–50 mm ² |
| Auxiliary switch | 1–25 mm ² |
| Degree of protection, built-in | IP40 |
| Permissible ambient temperature range | -25 °C to +40 °C |
| Resistance to climatic conditions | acc. to IEC 60068-2 (25...55 °C/90...95 % relative humidity) |

Dimensions [mm]

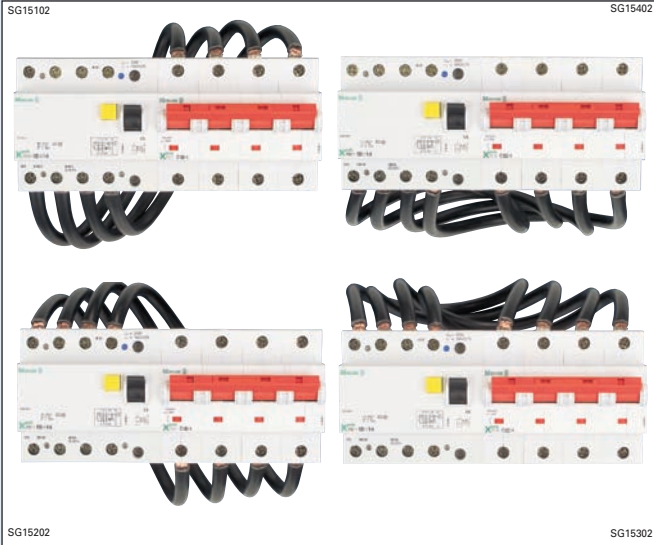
PBHT + PLHT/3p+N



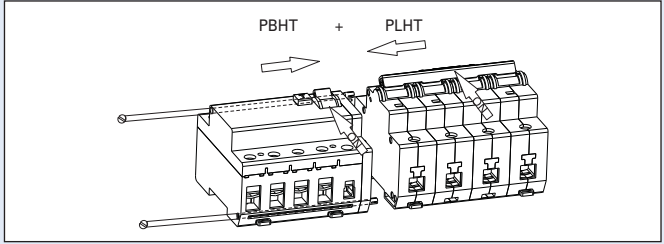
PBHT + PLHT/3p



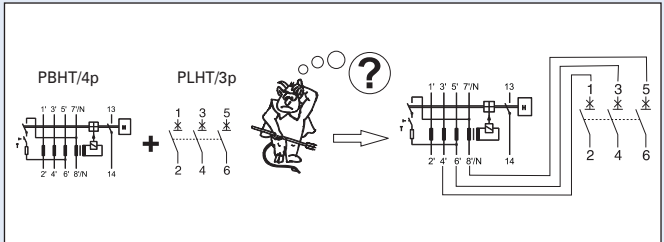
Wiring options



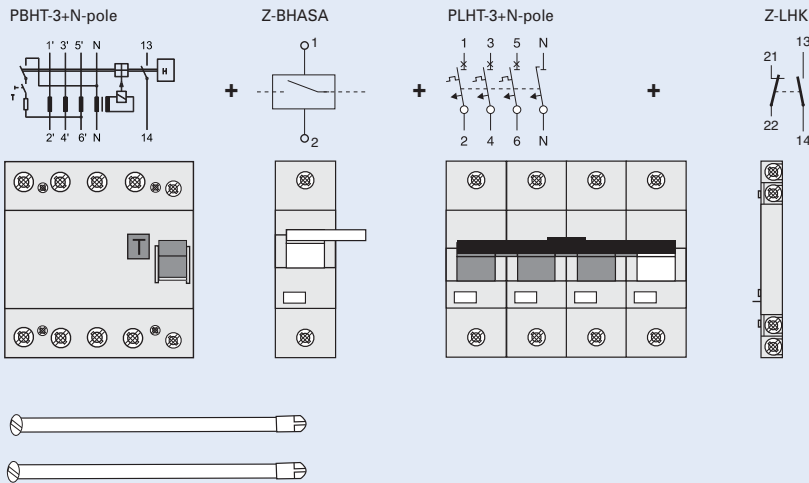
Mounting PBHT + PLHT



Connection PBHT/4p + PLHT/3p



Mounting arrangement residual current protection unit - shunt trip release - miniature circuit breaker - auxiliary contact

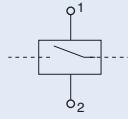


Accessories for PBHT

Shunt Trip Release Z-BHASA

- Can be mounted subsequently
- Contact position indicator red-green
- Marking labels can be fitted
- Wide operational voltage range
- Sufficient power of extra low voltage source must be ensured
Z-BHASA/24: min. 90 VA
- Screws for mounting included PBHT (PBHT => Z-BHASA => PLHT)

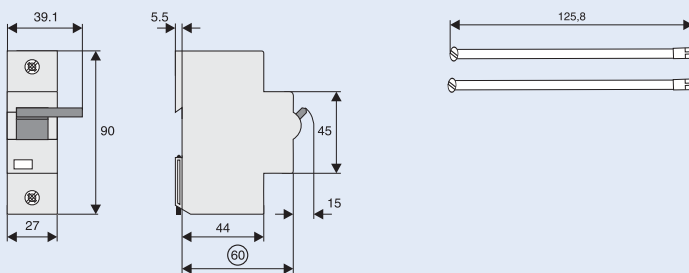
Connection diagram



Technical Data

| | Z-BHASA/24 | Z-BHASA/230 |
|---|--------------------------------------|-------------------------|
| Electrical: | | |
| Minimum pulse duration | 15 ms | 10 ms |
| Internal resistance | 2 Ω | 130 Ω |
| Duty | 100 % | 100 % |
| Tripping time | < 20 ms | < 20 ms |
| Peak withstand voltage (1.2/50 μs) | 2 kV | 2 kV |
| Endurance | > 4000 operating cycles | > 4000 operating cycles |
| AC voltage range: | | |
| Responding limit | 8 V | 70 V |
| Operational voltage range | 12–60 V | 110–415 V |
| Maximum current consumption during switch-on | 1.4–7 A | 3.4 A (at 230 V) |
| Current flow time at max. current consumption | 4.0 ms | 4.5 ms |
| DC voltage range: | | |
| Responding limit | 11 V | 90 V |
| Operational voltage range | 12–60 V | 110–230 V |
| Maximum current consumption during switch-on | 1,7 A typ. | 1,7 A typ. |
| Current flow time at max. current consumption | 2 ms | 4 ms |
| Mechanical: | | |
| Frame size | 45 mm | 45 mm |
| Device height | 90 mm | 90 mm |
| Device width | 27 mm | 27 mm |
| Mounting | quick fastening on DIN rail EN 60715 | |
| Degree of protection, built-in | IP40 | IP40 |
| Upper and lower terminal screws | lift terminals | lift terminals |
| Terminal capacity | 2.5–30 mm ² | 2.5–30 mm ² |
| Fastening torque of terminal screws | 4 Nm | 4 Nm |

Dimensions [mm]



Combined RCD/MCB Devices PFL7, 1+N-pole

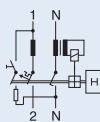
- Can be used as additional protection of live parts against dangerous contact
- Twin-purpose terminal (lift/open-mouthed) above and below
- Free terminal space despite installed busbar
- Busbar positioning optionally above or below
- Guide for secure terminal connection
- Switching toggle (MCB component) in colour designating the rated current
- Contact position indicator red - green
- Comprehensive range of accessories suitable for subsequent installation
- **Type -A:** Protects against special forms of residual pulsating DC which have not been smoothed
- **Type -G:** 10 ms time delay in order to avoid unwanted tripping (e.g. during thunderstorms).
- **The test key "T" must be pressed every month**

Accessories:

| | | |
|--|------------|----------------|
| Auxiliary switch for subsequent installation | ZP-IHK | 286052 |
| | ZP-WHK | 286053 |
| Tripping signal switch for subsequent installation | ZP-NHK | 248437 |
| Shunt trip release | ZP-ASA/.. | 248438, 248439 |
| Tripping module | Z-KAM | 248294 |
| Terminal cover cap | KLV-TC-2 | 276240 |
| Additional terminal 35 mm ² (2 units) | Z-HA-EK/35 | 263960 |
| Notification label | Z-HWS-FI | 236980 |
| Switching interlock | IS/SPE-1TE | 101911 |

Connection diagram

1+N-pole



Technical Data

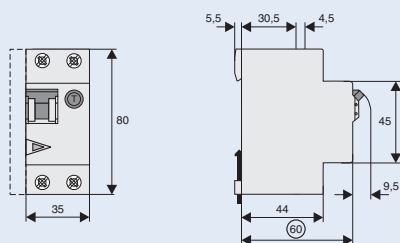
Electrical:

| | |
|--|---|
| Design according to | EN 61009 |
| Tripping | - instantaneous 250 A (8/20 μs) (surge current-proof); G 10 ms delay 3kA (8/20 μs) surge current-proof |
| Rated voltage U_e | 230 V; 50 Hz |
| Operational voltage range | 196–253 V |
| Rated tripping current $I_{\Delta n}$ | 30 mA |
| Rated non-tripping current $I_{\Delta no}$ | 0.5 $I_{\Delta n}$ |
| Sensitivity | AC and pulsating DC |
| Selectivity class | 3 |
| Rated breaking capacity | 10 kA |
| Rated current | 6 – 40 A |
| Rated peak withstand voltage U_{imp} | 6 kV (1.2/50 μs) |
| Characteristic | B, C |
| Maximum back-up fuse (short circuit) | 100 A gL (>10 kA) |
| Endurance | electrical comp. ≥ 4,000 operating cycles mechanical comp. ≥ 20,000 operating cycles |

Mechanical:

| | |
|-----------------------------------|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 35 mm (2 MU) |
| Mounting | quick fastening on DIN rail EN 60715 |
| Upper and lower terminals | open mouthed/lift terminals |
| Terminal capacity | 1–25 mm ² |
| Busbar thickness | 0.8–2 mm |
| Degree of protection switch | IP20 |
| Tripping temperature | -25 °C to +40 °C |
| Resistance to climatic conditions | acc. to EN 61009 |

Dimensions [mm]

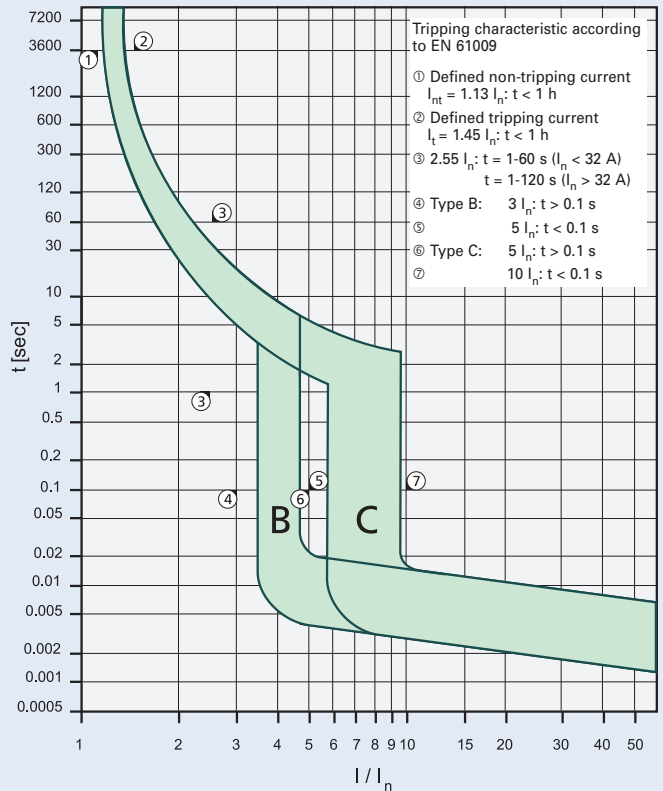


Load Capacity PFL7../1N/

Effect of ambient temperature (MCB component)

| I _n [A] | Ambient temperature T [°C] | | | | | | | | |
|--------------------|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| | -25 | -20 | -10 | 0 | 10 | 20 | 30 | 35 | 40 |
| 6 | 7,4 | 7,2 | 7,0 | 6,7 | 6,5 | 6,3 | 6,0 | 5,9 | 5,8 |
| 10 | 12 | 12 | 12 | 11 | 11 | 10 | 10 | 9,9 | 9,7 |
| 13 | 16 | 16 | 15 | 15 | 14 | 14 | 13 | 13 | 13 |
| 16 | 20 | 19 | 19 | 18 | 17 | 17 | 16 | 16 | 15 |
| 20 | 25 | 24 | 23 | 22 | 22 | 21 | 20 | 20 | 19 |
| 25 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 25 | 24 |
| 32 | 40 | 38 | 37 | 36 | 35 | 33 | 32 | 32 | 31 |
| 40 | 49 | 48 | 47 | 45 | 43 | 42 | 40 | 39 | 39 |

Tripping Characteristic PFL7../1N/, Characteristics B and C



Short Circuit Selectivity PFL7... towards DIAZED

In case of short circuit, there is selectivity between the combined RCD/MCB devices PFL7../1N/ and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s, only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

Short circuit selectivity **characteristic B** towards fuse link **DIAZED*** [kA]

| PFL7 | DIAZED DII-DIV gL/gG | | | | | | | | |
|--------------------|----------------------|--------------------|-----|-----|-----|-----|--------------------|--------------------|--------------------|
| I _n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| 6 | | <0.5 ¹⁾ | 0.7 | 1.0 | 2.9 | 6.9 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 10 | | | 0.6 | 0.9 | 1.9 | 3.3 | 7.0 | 10.0 ²⁾ | 10.0 ²⁾ |
| 13 | | | 0.5 | 0.7 | 1.6 | 2.8 | 5.7 | 9.0 | 10.0 ²⁾ |
| 16 | | | | 0.7 | 1.4 | 2.4 | 4.4 | 7.0 | 10.0 ²⁾ |
| 20 | | | | | 1.3 | 2.2 | 4.0 | 6.3 | 10.0 ²⁾ |
| 25 | | | | | 1.3 | 2.1 | 3.8 | 5.8 | 10.0 ²⁾ |
| 32 | | | | | | 2.0 | 3.5 | 5.2 | 9.5 |
| 40 | | | | | | | 3.1 | 4.5 | 8.1 |

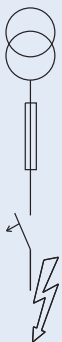
Short circuit selectivity **characteristic C** towards fuse link **DIAZED*** [kA]

| PFL7 | DIAZED DII-DIV gL/gG | | | | | | | | |
|--------------------|----------------------|--------------------|------|-----|-----|-----|--------------------|--------------------|--------------------|
| I _n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| 6 | | <0.5 ¹⁾ | 0.6 | 1.0 | 2.9 | 5.8 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 10 | | | <0.5 | 0.7 | 1.5 | 2.6 | 5.3 | 9.0 | 10.0 ²⁾ |
| 13 | | | | | 1.4 | 2.3 | 4.6 | 7.6 | 10.0 ²⁾ |
| 16 | | | | | 1.2 | 1.8 | 3.4 | 5.5 | 10.0 ²⁾ |
| 20 | | | | | 1.2 | 1.7 | 3.1 | 5.0 | 10.0 ²⁾ |
| 25 | | | | | | 1.6 | 2.9 | 4.6 | 10.0 ²⁾ |
| 32 | | | | | | | 2.3 | 3.4 | 7.7 |
| 40 | | | | | | | | 2.9 | 6.2 |

¹⁾ Selectivity limit current I_s under 0.5 kA

²⁾ Selectivity limit current I_s = rated breaking capacity I_{cn} of the RCD/MCB device

Darker areas: no selectivity



Short Circuit Selectivity PFL7../1N/ towards NEOZED

In case of short circuit, there is selectivity between the combined RCD/MCB devices PFL7../1N/ and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

Short circuit selectivity **characteristic B** towards fuse link **NEOZED*** [kA]

| PFL7 | NEOZED D01-D03 gL/gG | | | | | | | | | |
|-----------|----------------------|--------------------|-----|-----|-----|-----|--------------------|--------------------|--------------------|--|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 | |
| 6 | | <0.5 ¹⁾ | 0.5 | 0.8 | 2.4 | 8.2 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | |
| 10 | | | 0.5 | 0.8 | 1.6 | 3.7 | 6.0 | 10.0 ²⁾ | 10.0 ²⁾ | |
| 13 | | | 0.6 | 0.7 | 1.4 | 3.0 | 4.7 | 9.0 | 10.0 ²⁾ | |
| 16 | | | | 0.6 | 1.2 | 2.6 | 3.9 | 7.0 | 10.0 ²⁾ | |
| 20 | | | | | 1.2 | 2.5 | 3.6 | 6.2 | 10.0 ²⁾ | |
| 25 | | | | | 1.2 | 2.3 | 3.3 | 5.7 | 10.0 ²⁾ | |
| 32 | | | | | | 2.3 | 3.1 | 5.1 | 10.0 ²⁾ | |
| 40 | | | | | | | 2.8 | 4.5 | 9.5 | |

Short circuit selectivity **characteristic C** towards fuse link **NEOZED*** [kA]

| PFL7 | NEOZED D01-D03 gL/gG | | | | | | | | | |
|-----------|----------------------|--------------------|--------------------|-----|-----|-----|--------------------|--------------------|--------------------|--|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 | |
| 6 | | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.8 | 2.3 | 6.5 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | |
| 10 | | | <0.5 | 0.6 | 1.3 | 2.9 | 4.5 | 8.9 | 10.0 ²⁾ | |
| 13 | | | | | 1.2 | 2.5 | 3.9 | 7.6 | 10.0 ²⁾ | |
| 16 | | | | | 1.0 | 2.1 | 3.0 | 5.5 | 10.0 ²⁾ | |
| 20 | | | | | 1.0 | 2.0 | 2.7 | 5.0 | 10.0 ²⁾ | |
| 25 | | | | | | 1.9 | 2.6 | 4.5 | 10.0 ²⁾ | |
| 32 | | | | | | | 2.1 | 3.4 | 10.0 ²⁾ | |
| 40 | | | | | | | | 3.0 | 8.7 | |

Short Circuit Selectivity PFL7../1N/ towards NH-00

In case of short circuit, there is selectivity between the combined RCD/MCB devices PFL7../1N/ and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

Short circuit selectivity **characteristic B** towards fuse link **NH-00*** [kA]

| PFL7 | NH-00 gL/gG | | | | | | | | | | | | |
|-----------|--------------------|--------------------|--------------------|-----|-----|-----|-----|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| I_n [A] | 16 | 20 | 25 | 32 | 35 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | |
| 6 | <0.5 ¹⁾ | 0.5 | 0.8 | 1.4 | 2.2 | 3.3 | 7.0 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | |
| 10 | | <0.5 ¹⁾ | 0.7 | 0.9 | 1.5 | 2.1 | 3.4 | 4.3 | 7.3 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | |
| 13 | | | <0.5 ¹⁾ | 0.6 | 0.8 | 1.4 | 1.8 | 2.8 | 3.6 | 5.7 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 16 | | | | 0.6 | 0.7 | 1.2 | 1.5 | 2.4 | 3.0 | 4.5 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 20 | | | | | 0.7 | 1.1 | 1.5 | 2.2 | 2.8 | 4.2 | 9.2 | 10.0 ²⁾ | 10.0 ²⁾ |
| 25 | | | | | 0.7 | 1.1 | 1.4 | 2.1 | 2.6 | 4.0 | 8.2 | 10.0 ²⁾ | 10.0 ²⁾ |
| 32 | | | | | | 1.0 | 1.4 | 2.0 | 2.5 | 3.7 | 7.1 | 10.0 ²⁾ | 10.0 ²⁾ |
| 40 | | | | | | | | 2.3 | 3.4 | 6.2 | 8.8 | 10.0 ²⁾ | |

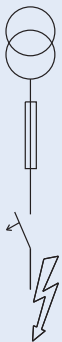
Short circuit selectivity **characteristic C** towards fuse link **NH-00*** [kA]

| PFL7 | NH-00 gL/gG | | | | | | | | | | | | |
|-----------|--------------------|--------------------|-----|-----|-----|-----|-----|-----|--------------------|--------------------|--------------------|--------------------|--|
| I_n [A] | 16 | 20 | 25 | 32 | 35 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | |
| 6 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.7 | 1.3 | 2.2 | 3.3 | 5.9 | 8.0 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | |
| 10 | | | 0.5 | 0.8 | 1.2 | 1.7 | 2.7 | 3.4 | 5.5 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | |
| 13 | | | | | 1.1 | 1.5 | 2.3 | 2.9 | 4.7 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | |
| 16 | | | | | 1.0 | 1.3 | 1.8 | 2.3 | 3.7 | 8.7 | 10.0 ²⁾ | 10.0 ²⁾ | |
| 20 | | | | | 0.9 | 1.1 | 1.7 | 2.2 | 3.4 | 8.0 | 10.0 ²⁾ | 10.0 ²⁾ | |
| 25 | | | | | | 1.6 | 2.1 | 3.2 | 7.2 | 10.0 ²⁾ | 10.0 ²⁾ | | |
| 32 | | | | | | | 1.7 | 2.6 | 5.3 | 9.0 | 10.0 ²⁾ | | |
| 40 | | | | | | | | 2.4 | 4.5 | 7.5 | 10.0 | | |

¹⁾ Selectivity limit current I_s under 0.5 kA

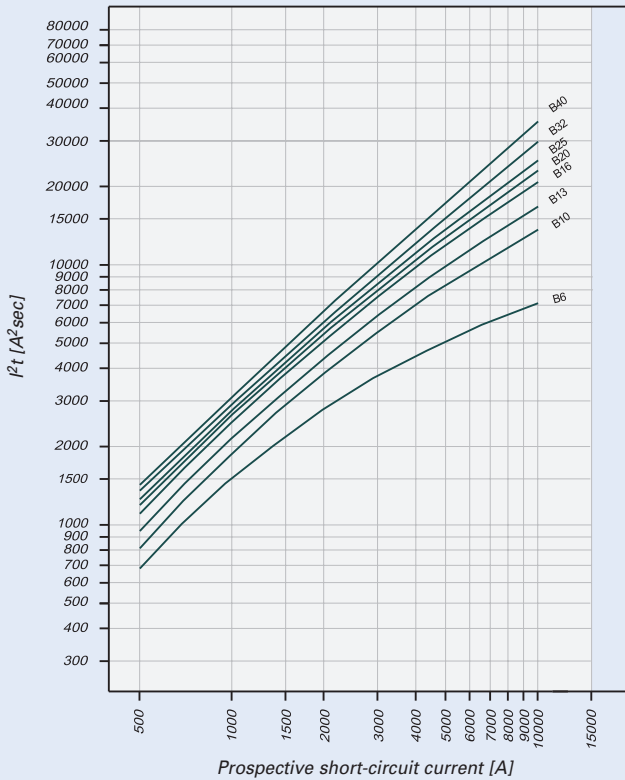
²⁾ Selectivity limit current I_s = rated breaking capacity I_{cn} of the RCD/MCB device

Darker areas: no selectivity

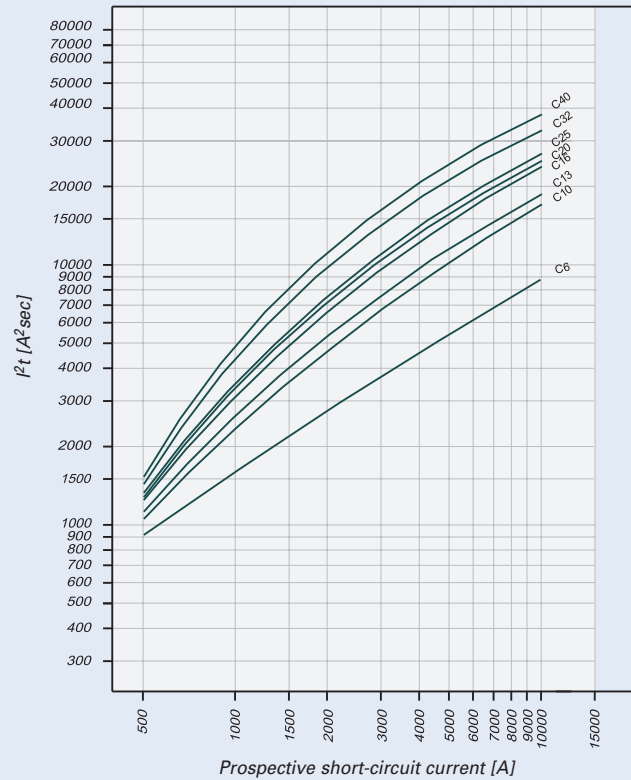


Let-through Energy I^2t PFL7

Let-through energy I^2t PFL7, characteristic B, 1+N-pole

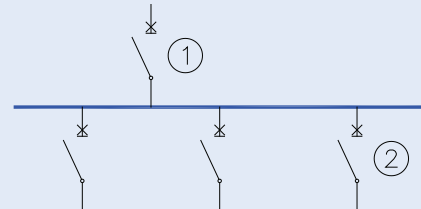


Let-through energy I^2t PFL7, characteristic C, 1+N-pole



Cascading of PFL7 and NZM circuit breakers

- Cascading ensures proper function of downstream circuit breaker in circuits where prospective short circuit current exceeds breaking capacity of this breaker
- Effective system-based solution
- Cost and space saving
- Conditional breaking capacity acc. to EN 60947-2
- Values for 400 V AC



| Downstream breaker PFL7 characteristics B and C ② | Upstream breaker ① | | | | | | |
|---|--|------------|---------|---------|------------|---------|---------|
| | I_n [A] | ≤ 160 | | | ≤ 250 | | |
| | Type | NZMB1-A | NZMN1-A | NZMH1-A | NZMB2-A | NZMN2-A | NZMH2-A |
| | I_{cu} [kA] 415 V AC | 25 | 50 | 100 | 25 | 50 | 150 |
| $I_n \leq 16$ A | Conditional breaking capacity of PFL7 [kA] | 25 | 35 | 35 | 25 | 50 | 50 |
| $I_n > 16$ A | Conditional breaking capacity of PFL7 [kA] | 25 | 35 | 35 | 25 | 30 | 50 |

Combined RCD/MCB Devices PFL6, 1+N-pole

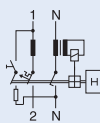
- Can be used as additional protection of live parts against dangerous contact
- Twin-purpose terminal (lift/open-mouthed) above and below
- Free terminal space despite installed busbar
- Busbar positioning optionally above or below
- Guide for secure terminal connection
- Contact position indicator red-green
- Comprehensive range of accessories suitable for subsequent installation
- **The test key "T" must be pressed every month**

Accessories:

| | | |
|--|------------|----------------|
| Auxiliary switch for subsequent installation | ZP-IHK | 286052 |
| | ZP-WHK | 286053 |
| Tripping signal switch for subsequent installation | ZP-NHK | 248437 |
| Shunt trip release | ZP-ASA/.. | 248438, 248439 |
| Tripping module | Z-KAM | 248294 |
| Terminal cover cap | KLV-TC-2 | 276240 |
| Additional terminal 35 mm ² (2 units) | Z-HA-EK/35 | 263960 |
| Notification label | Z-HWS-FI | 236980 |
| Switching interlock | IS/SPE-1TE | 101911 |

Connection diagram

1+N-pole



Technical Data

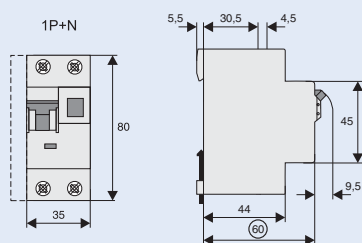
Electrical:

| | |
|--|---|
| Design according to | EN 61009 |
| Tripping | - instantaneous 250 A (8/20 μs) (surge current-proof) |
| Rated voltage U_e | 230 V; 50 Hz |
| Operational voltage range | 196–253 V |
| Rated tripping current $I_{\Delta n}$ | 30 mA |
| Rated non-tripping current $I_{\Delta no}$ | 0.5 $I_{\Delta n}$ |
| Sensitivity | residual AC |
| Selectivity class | 3 |
| Rated breaking capacity | 6 kA |
| Rated current | 6–25 A |
| Rated peak withstand voltage U_{imp} | 4 kV (1.2/50 μs) |
| Characteristic | B, C |
| Maximum back-up fuse (short circuit) | 100 A gL (>6 kA) |
| Endurance | electrical comp. ≥ 4,000 operating cycles mechanical comp. ≥ 20,000 operating cycles |

Mechanical:

| | |
|-----------------------------------|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 35 mm (2 MU) |
| Mounting | quick fastening on DIN rail EN 60715 |
| Upper and lower terminals | open mouthed/lift terminals |
| Terminal capacity | 1–25 mm ² |
| Busbar thickness | 0.8–2 mm |
| Degree of protection switch | IP20 |
| Tripping temperature | -25 °C to +40 °C |
| Resistance to climatic conditions | acc. to EN 61009 |

Dimensions [mm]

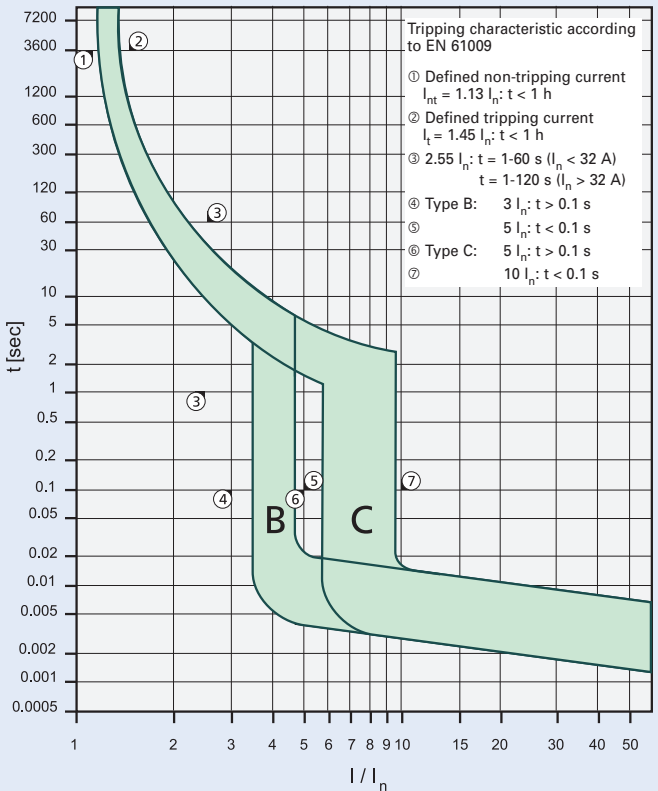


Load Capacity PFL6../1N/

Effect of ambient temperature (MCB component)

| I _n [A] | Ambient temperature T [°C] | | | | | | | | |
|--------------------|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| | -25 | -20 | -10 | 0 | 10 | 20 | 30 | 35 | 40 |
| 6 | 7,4 | 7,2 | 7,0 | 6,7 | 6,5 | 6,3 | 6,0 | 5,9 | 5,8 |
| 10 | 12 | 12 | 12 | 11 | 11 | 10 | 10 | 9,9 | 9,7 |
| 13 | 16 | 16 | 15 | 15 | 14 | 14 | 13 | 13 | 13 |
| 16 | 20 | 19 | 19 | 18 | 17 | 17 | 16 | 16 | 15 |
| 20 | 25 | 24 | 23 | 22 | 22 | 21 | 20 | 20 | 19 |
| 25 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 25 | 24 |

Tripping Characteristic PFL6../1N/, Characteristics B and C



Short Circuit Selectivity PFL6../1N/ towards DIAZED

In case of short circuit, there is selectivity between the combined RCD/MCB devices PFL6../1N/ and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s, only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

Short circuit selectivity **characteristic B** towards fuse link **DIAZED*** [kA]

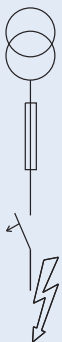
| PFL6 | DIAZED DII-DIV gL/gG | | | | | | | | |
|--------------------|----------------------|--------------------|-----|-----|-----|-------------------|-------------------|-------------------|-------------------|
| I _n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| 6 | | <0.5 ¹⁾ | 0.7 | 1.0 | 2.9 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | 0.6 | 0.9 | 1.9 | 3.3 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | 0.5 | 0.7 | 1.6 | 2.8 | 5.7 | 6.0 ²⁾ | 6.0 ²⁾ |
| 16 | | | | 0.7 | 1.4 | 2.4 | 4.4 | 6.0 ²⁾ | 6.0 ²⁾ |
| 20 | | | | | 1.3 | 2.2 | 4.0 | 6.0 ²⁾ | 6.0 ²⁾ |
| 25 | | | | | 1.3 | 2.1 | 3.8 | 5.8 | 6.0 ²⁾ |

Short circuit selectivity **characteristic C** towards fuse link **DIAZED*** [kA]

| PFL6 | DIAZED DII-DIV gL/gG | | | | | | | | |
|--------------------|----------------------|--------------------|------|-----|-----|-----|-------------------|-------------------|-------------------|
| I _n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| 6 | | <0.5 ¹⁾ | 0.6 | 1.0 | 2.9 | 5.8 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | <0.5 | 0.7 | 1.5 | 2.6 | 5.3 | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | | | 1.4 | 2.3 | 4.6 | 6.0 ²⁾ | 6.0 ²⁾ |
| 16 | | | | | 1.2 | 1.8 | 3.4 | 5.5 | 6.0 ²⁾ |
| 20 | | | | | 1.2 | 1.7 | 3.1 | 5.0 | 6.0 ²⁾ |
| 25 | | | | | | 1.6 | 2.9 | 4.6 | 6.0 ²⁾ |

¹⁾ Selectivity limit current I_s under 0.5 kA

²⁾ Selectivity limit current I_s = rated breaking capacity I_{cn} of the RCD/MCB device
Darker areas: no selectivity



Short Circuit Selectivity PFL6../1N/ towards NEOZED

In case of short circuit, there is selectivity between the combined RCD/MCB devices PFL6../1N/ and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

Short circuit selectivity **characteristic B** towards fuse link **NEOZED***) [kA]

| PFL6 | NEOZED D01-D03 gL/gG | | | | | | | | |
|-----------|----------------------|--------------------|-----|-----|-----|-------------------|-------------------|-------------------|-------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| 6 | | <0.5 ¹⁾ | 0.5 | 0.8 | 2.4 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | 0.5 | 0.8 | 1.6 | 3.7 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | 0.6 | 0.7 | 1.4 | 3.0 | 4.7 | 6.0 ²⁾ | 6.0 ²⁾ |
| 16 | | | | 0.6 | 1.2 | 2.6 | 3.9 | 6.0 ²⁾ | 6.0 ²⁾ |
| 20 | | | | | 1.2 | 2.5 | 3.6 | 6.0 ²⁾ | 6.0 ²⁾ |
| 25 | | | | | 1.2 | 2.3 | 3.3 | 5.7 | 6.0 ²⁾ |

Short circuit selectivity **characteristic C** towards fuse link **NEOZED***) [kA]

| PFL6 | NEOZED D01-D03 gL/gG | | | | | | | | |
|-----------|----------------------|--------------------|--------------------|-----|-----|-------------------|-------------------|-------------------|-------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| 6 | | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.8 | 2.3 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | <0.5 | 0.6 | 1.3 | 2.9 | 4.5 | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | | | 1.2 | 2.5 | 3.9 | 6.0 ²⁾ | 6.0 ²⁾ |
| 16 | | | | | 1.0 | 2.1 | 3.0 | 5.5 | 6.0 ²⁾ |
| 20 | | | | | 1.0 | 2.0 | 2.7 | 5.0 | 6.0 ²⁾ |
| 25 | | | | | | 1.9 | 2.6 | 4.5 | 6.0 ²⁾ |

Short Circuit Selectivity PFL6../1N/ towards NH-00

In case of short circuit, there is selectivity between the combined RCD/MCB devices PFL6../1N/ and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

Short circuit selectivity **characteristic B** towards fuse link **NH-00***) [kA]

| PFL6 | NH-00 gL/gG | | | | | | | | | | | |
|-----------|--------------------|--------------------|--------------------|-----|-----|-----|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| I_n [A] | 16 | 20 | 25 | 32 | 35 | 40 | 50 | 63 | 80 | 100 | 125 | 160 |
| 6 | <0.5 ¹⁾ | 0.5 | 0.8 | 1.4 | 2.2 | 3.3 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | <0.5 ¹⁾ | 0.7 | 0.9 | 1.5 | 2.1 | 3.4 | 4.3 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | <0.5 ¹⁾ | 0.6 | 0.8 | 1.4 | 1.8 | 2.8 | 3.6 | 5.7 | 6.0 ²⁾ | 6.0 ²⁾ |
| 16 | | | | 0.6 | 0.7 | 1.2 | 1.5 | 2.4 | 3.0 | 4.5 | 6.0 ²⁾ | 6.0 ²⁾ |
| 20 | | | | | 0.7 | 1.1 | 1.5 | 2.2 | 2.8 | 4.2 | 6.0 ²⁾ | 6.0 ²⁾ |
| 25 | | | | | 0.7 | 1.1 | 1.4 | 2.1 | 2.6 | 4.0 | 6.0 ²⁾ | 6.0 ²⁾ |

Short circuit selectivity **characteristic C** towards fuse link **NH-00***) [kA]

| PFL6 | NH-00 gL/gG | | | | | | | | | | | |
|-----------|--------------------|--------------------|-----|-----|-----|-----|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
| I_n [A] | 16 | 20 | 25 | 32 | 35 | 40 | 50 | 63 | 80 | 100 | 125 | 160 |
| 6 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.7 | 1.3 | 2.2 | 3.3 | 5.9 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | 0.5 | 0.8 | 1.2 | 1.7 | 2.7 | 3.4 | 5.5 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | | | 1.1 | 1.5 | 2.3 | 2.9 | 4.7 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 16 | | | | | 1.0 | 1.3 | 1.8 | 2.3 | 3.7 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 20 | | | | | 0.9 | 1.1 | 1.7 | 2.2 | 3.4 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 25 | | | | | | 1.6 | 2.1 | 3.2 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |

¹⁾ Selectivity limit current I_s under 0.5 kA

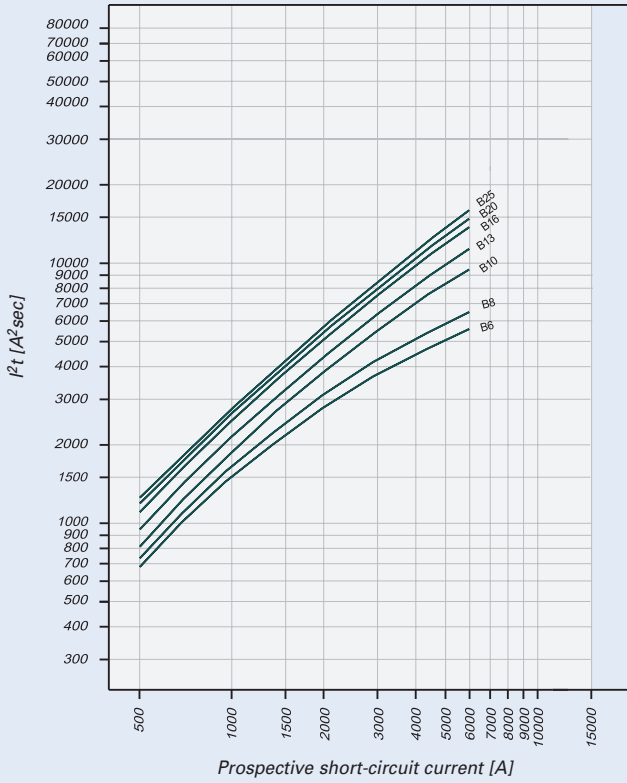
²⁾ Selectivity limit current I_s = rated breaking capacity I_{cn} of the RCD/MCB device

Darker areas: no selectivity

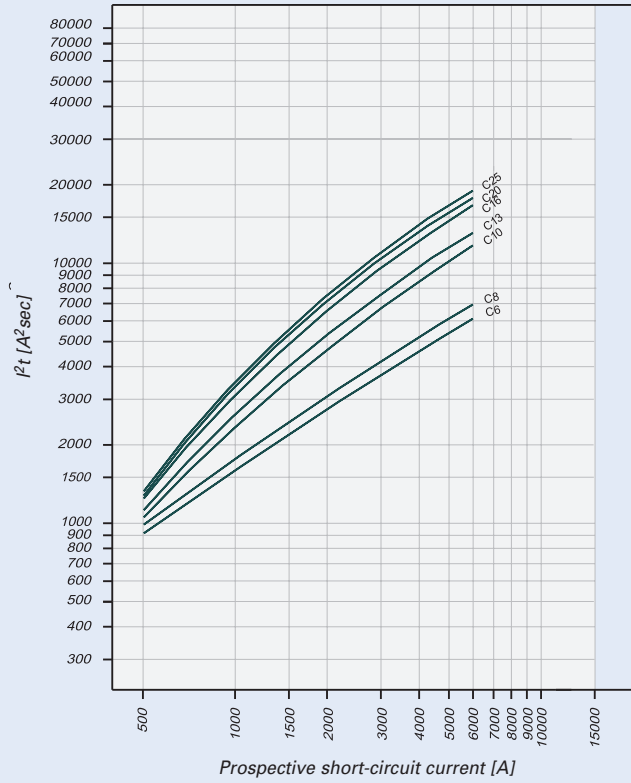


Let-through Energy I^2t PFL6

Let-through energy I^2t PFL6, characteristic B, 1+N-pole



Let-through energy I^2t PFL6, characteristic C, 1+N-pole



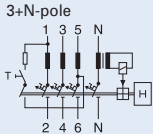
Combined RCD/MCB Devices mRB6, 3+N-pole

- Combined RCD/MCB device
- Line voltage-independent tripping
- Compatible with standard busbar
- Twin-purpose terminal (lift/open-mouthed) above and below
- Busbar positioning optionally above or below
- Free terminal space despite installed busbar
- Guide for secure terminal connection
- Switching toggle (MCB component) in colour designating the rated current
- Contact position indicator red - green
- Fault current tripping indicator white - blue
- Type -A: Protects against special forms of residual pulsating DC which have not been smoothed
- Tripping characteristic of circuit breaker B, C, D
- Breaking capacity 6 kA
- Rated current to 16 A

Accessories:

| | | |
|--|------------|----------------|
| Auxiliary switch for subsequent installation | ZP-IHK | 286052 |
| | ZP-NHK | 248437 |
| | ZP-WHK | 286053 |
| Shunt trip release | ZP-ASA/.. | 248438, 248439 |
| Switching interlock | IS/SPE-1TE | 101911 |

Connection diagram



Technical Data

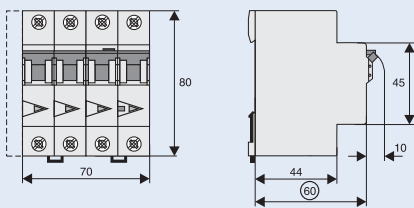
Electrical:

| | |
|--|--|
| Design according to | EN 61009 |
| Tripping | line voltage-independent instantaneous 250 A (8/20 μs) surge current-proof |
| Operating voltage range | 196 – 253 V |
| Rated voltage U_e | 230/400 V; 50 Hz |
| Rated tripping current $I_{\Delta n}$ | 30, 100, 300 mA |
| Rated non-tripping current $I_{\Delta no}$ | 0.5 $I_{\Delta n}$ |
| Sensitivity | AC and pulsating DC |
| Selectivity class | 3 |
| Rated breaking capacity | 6 kA |
| Rated current | 6 – 16 A |
| Rated peak withstand voltage U_{imp} | 4 kV (1,2/50 μs) |
| Characteristic | B, C, D |
| Maximum back-up fuse (short circuit) | 100 A gL |
| Endurance electrical comp. | ≥ 4,000 operating cycles |
| mechanical comp. | ≥ 20,000 operating cycles |

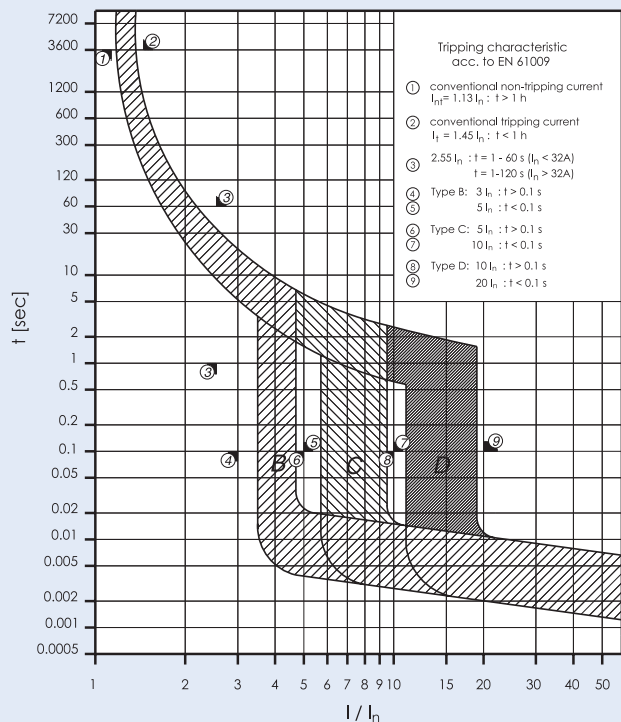
Mechanical:

| | |
|-----------------------------------|--|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 70 mm (4 MU) |
| Mounting | onto device rail acc. to EN 60715 |
| Upper and lower terminals | open mouthed/lift terminals |
| Terminal capacity | 1 – 25 mm ² |
| Busbar thickness | 0.8 – 2 mm |
| Degree of protection switch | IP20 (built-in IP40) |
| Tripping temperature | -25 °C to +40 °C |
| Resistance to climatic conditions | acc. to IEC 68-2 (25 – 55 °C / 90 – 95 % RH) |

Dimensions [mm]



Tripping Characteristic mRB6, Characteristics B, C and D



For types and art. numbers see page 30

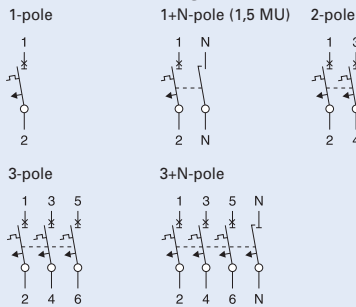
Circuit Breakers PL7...

- High selectivity between MCB and back-up fuse due to low let-through energy
- Twin-purpose terminal (lift/open-mouthed) above and below
- Busbar positioning optionally above or below
- Meets the requirements of insulation co-ordination, distance between contacts 4 mm, for secure isolation
- Suitable for applications up to 48 V DC (use PL7-DC for higher DC voltages)
- PL7-DC: Rated breaking capacity 10 kA according to EN 60947-2
Rated voltage 250 V (per pole), t = 4 ms
Take into account polarity!

Accessories:

| | | |
|---|--------------|----------------|
| Auxiliary switch for subsequent installation | ZP-IHK | 286052 |
| | ZP-WHK | 286053 |
| Tripping signal contact for subsequent installation | ZP-NHK | 248437 |
| Remote control | Z-FW-LP | 248296 |
| Shunt trip release | ZP-ASA/.. | 248438, 248439 |
| Undervoltage release | Z-USA/.. | 248289, 248291 |
| Compact enclosure | KLV-TC-2 | 276240 |
| | KLV-TC-4 | 276241 |
| Additional terminal 35 mm ² (2 units) | Z-HA-EK/35 | 263960 |
| Switching interlock without lock | Z-IS/SPE-1TE | 274418 |

Connection diagrams



Technical Data

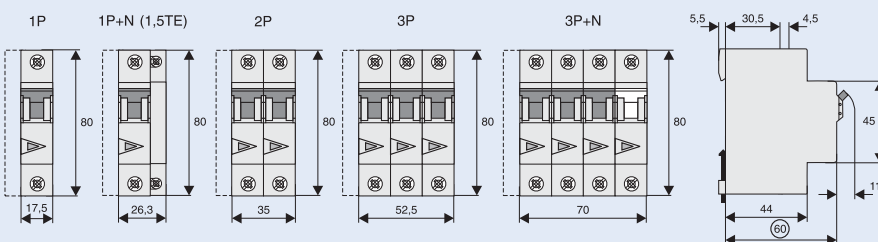
Electrical:

| | |
|--|---|
| Design according to | EN 60898 (PL7) EN 60947-2 (PL7-DC) |
| Rated voltage | |
| PL7 | AC: 230/400 V |
| PL7 | DC: 48 V (per pole) |
| PL7-DC | DC: 250 V (per pole) |
| Rated frequency | 50/60 Hz |
| Rated breaking capacity | |
| PL7 (EN 60898) | 10 kA |
| PL7-DC (EN 60947-2) | 10 kA |
| Characteristic | B, C, D |
| Back-up fuse | max. 125 A gL |
| Selectivity class | 3 |
| Rated peak withstand voltage U_{imp} | 4 kV (1.2/50 μ s) |
| Endurance | electrical comp. \geq 4,000 operating cycles mechanical comp. \geq 20,000 operating cycles |
| Line voltage connection | optional (above/below) |

Mechanical:

| | |
|--|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 17.5 mm per pole (1 MU) 26.3 mm: device 1P+N (1,5 MU) |
| Mounting | quick fastening with 3 lock-in positions on DIN rail EN 60715 |
| Degree of protection | IP20 |
| Upper and lower terminals | open mouthed/lift terminals |
| Terminal protection | finger and hand touch safe |
| Terminal capacity (1p, 2p, 3p,3+N) | 1–25 mm ² |
| (1p+N, 1,5 TE) | 1–25 mm ² / 1–2x10 mm ² (N) |
| Terminal fastening torque (1p+N, 1,5 TE) | 2–2.4 Nm |
| (1p+N, 1,5 TE) | 2–2.4 Nm / 1.2–1.5 Nm (N) |
| Busbar thickness | 0.8–2 mm |
| Mounting | independent of position |

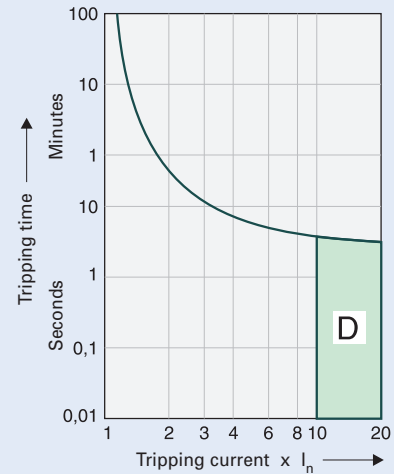
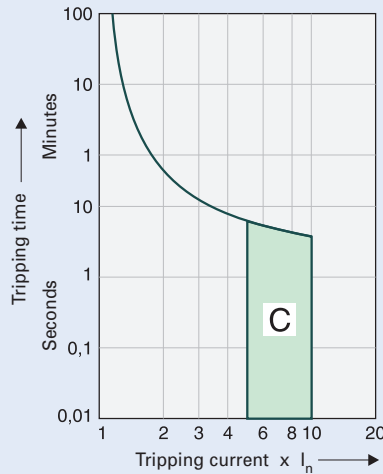
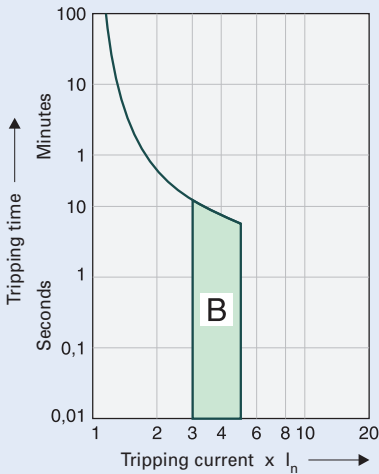
Dimensions [mm]



For types and art. numbers see page 32

Tripping Characteristics (EN 60898)

Tripping characteristic B (short circ. release 3–5 I_n) Tripping characteristic C (short circ. release 5–10 I_n) Tripping characteristic D (short circ. release 10–20 I_n)



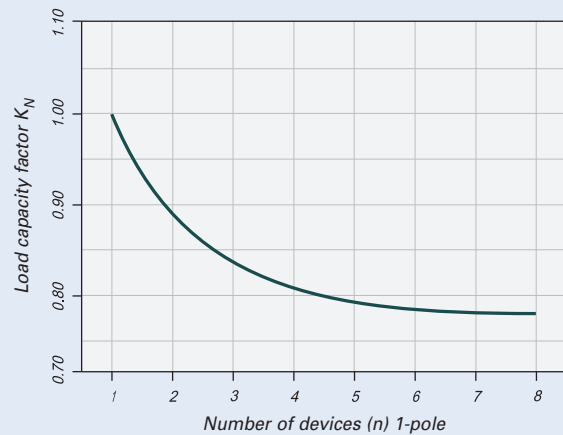
For electric lines (B), for circuits with motors (C) and for circuit with high surge currents, e.g. transformers (D).

Effect of the Ambient Temperature on Thermal Tripping Behaviour

Reference temperature according to EN 60898 is 30 °C.
Revised values of rated current as a dependence on ambient temperature.

| I_n [A] | Ambient temperature T [°C] | | | | | | | | | | | | | | | |
|-----------|----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | -25 | -20 | -10 | 0 | 10 | 20 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 |
| 0.16 | 0.20 | 0.19 | 0.19 | 0.18 | 0.17 | 0.17 | 0.16 | 0.16 | 0.15 | 0.15 | 0.15 | 0.14 | 0.14 | 0.14 | 0.14 | 0.13 |
| 0.25 | 0.31 | 0.30 | 0.29 | 0.28 | 0.27 | 0.26 | 0.25 | 0.25 | 0.24 | 0.24 | 0.23 | 0.23 | 0.22 | 0.22 | 0.21 | 0.21 |
| 0.5 | 0.61 | 0.60 | 0.58 | 0.56 | 0.54 | 0.52 | 0.50 | 0.49 | 0.48 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 |
| 0.75 | 0.92 | 0.90 | 0.87 | 0.84 | 0.81 | 0.78 | 0.75 | 0.74 | 0.73 | 0.71 | 0.69 | 0.68 | 0.66 | 0.65 | 0.64 | 0.62 |
| 1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 | 0.99 | 0.97 | 0.95 | 0.93 | 0.90 | 0.89 | 0.87 | 0.85 | 0.83 |
| 1.6 | 2.0 | 1.9 | 1.9 | 1.8 | 1.7 | 1.7 | 1.6 | 1.6 | 1.5 | 1.5 | 1.5 | 1.4 | 1.4 | 1.4 | 1.4 | 1.3 |
| 2 | 2.4 | 2.4 | 2.3 | 2.2 | 2.2 | 2.1 | 2.0 | 2.0 | 1.9 | 1.9 | 1.9 | 1.8 | 1.8 | 1.7 | 1.7 | 1.7 |
| 4 | 4.9 | 4.8 | 4.7 | 4.5 | 4.3 | 4.2 | 4.0 | 3.9 | 3.9 | 3.8 | 3.7 | 3.6 | 3.5 | 3.5 | 3.4 | 3.4 |
| 6 | 7.3 | 7.2 | 7.0 | 6.7 | 6.5 | 6.3 | 6.0 | 5.9 | 5.8 | 5.7 | 5.6 | 5.4 | 5.3 | 5.2 | 5.1 | 5.0 |
| 10 | 12 | 12 | 12 | 11 | 11 | 10 | 10 | 9.9 | 9.7 | 9.5 | 9.3 | 9.0 | 8.9 | 8.7 | 8.5 | 8.3 |
| 13 | 16 | 16 | 15 | 15 | 14 | 14 | 13 | 13 | 13 | 12 | 12 | 12 | 12 | 11 | 11 | 11 |
| 16 | 20 | 19 | 19 | 18 | 17 | 17 | 16 | 16 | 15 | 15 | 15 | 14 | 14 | 14 | 14 | 13 |
| 20 | 24 | 24 | 23 | 22 | 22 | 21 | 20 | 20 | 19 | 19 | 19 | 18 | 18 | 17 | 17 | 17 |
| 25 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 25 | 24 | 24 | 23 | 23 | 22 | 22 | 21 | 21 |
| 32 | 39 | 38 | 37 | 36 | 35 | 33 | 32 | 32 | 31 | 30 | 30 | 29 | 28 | 28 | 27 | 26 |
| 40 | 49 | 48 | 47 | 45 | 43 | 42 | 40 | 39 | 39 | 38 | 37 | 36 | 35 | 35 | 34 | 33 |
| 50 | 61 | 60 | 58 | 56 | 54 | 52 | 50 | 49 | 48 | 47 | 46 | 45 | 44 | 43 | 42 | 41 |
| 63 | 77 | 76 | 73 | 71 | 68 | 66 | 63 | 62 | 61 | 60 | 58 | 57 | 56 | 55 | 53 | 52 |

Load Capacity of Series Connected Miniature Circuit Breakers



Effect of Power Frequency

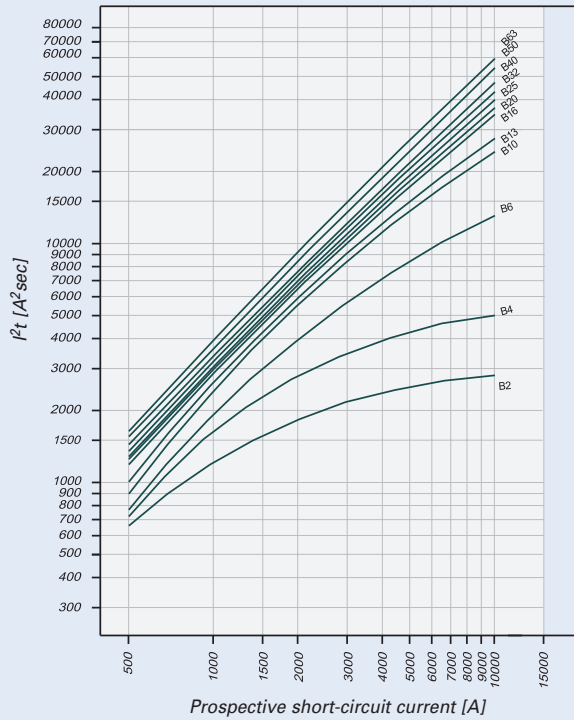
Effect of power frequency on the tripping behaviour I_{MA} of the quick release

| $I_{MA}(f)/I_{MA}(50\text{Hz})$ [%] | Power frequency f [Hz] | | | | | | |
|-------------------------------------|------------------------|-----|-----|-----|-----|-----|-----|
| | $16^{2/3}$ | 50 | 60 | 100 | 200 | 300 | 400 |
| | 91 | 100 | 101 | 106 | 115 | 134 | 141 |

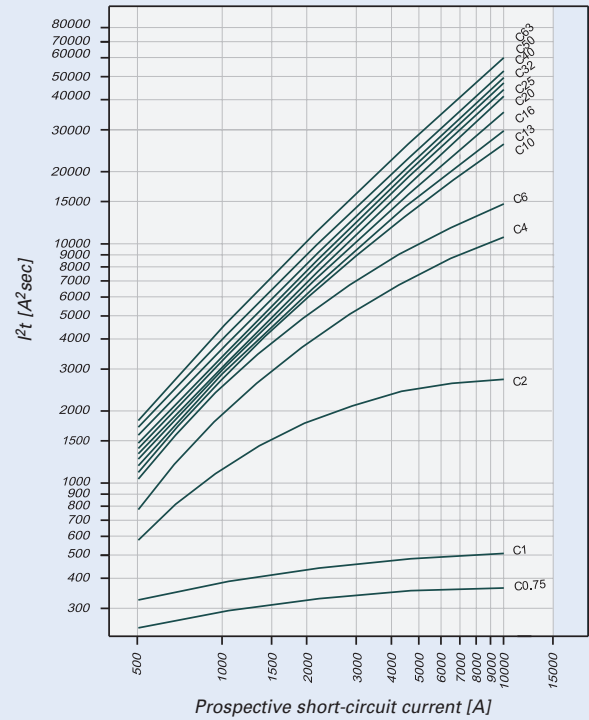
There is no significant impact of change of temperature on tripping current of thermal release.

Let-through Energy I^2t PL7

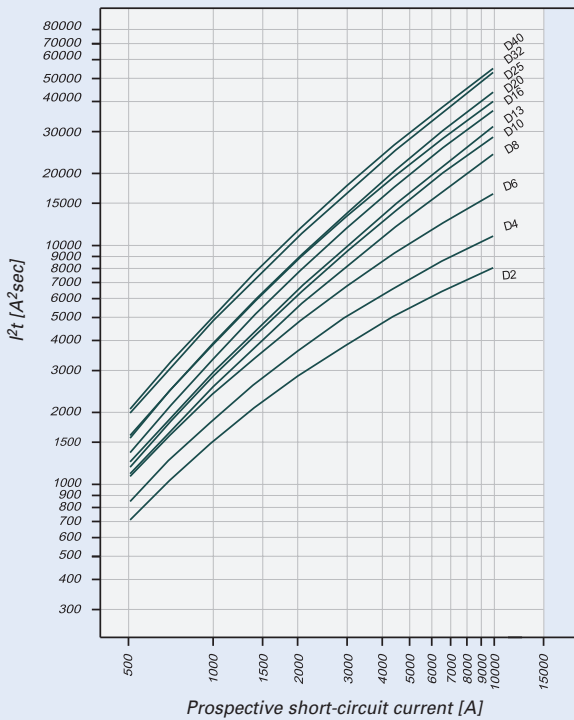
Let-through energy I^2t , characteristic B, 1-pole



Let-through energy I^2t , characteristic C, 1-pole



Let-through energy I^2t , characteristic D, 1-pole



For types and art. numbers see page 32

Short Circuit Selectivity PL7 towards DIAZED Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PL7 and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

Short circuit selectivity **characteristic B** towards fuse link **DIAZED*** [kA]

| PL7 | DIAZED DII-DIV gL/gG | | | | | | | | | |
|-----------|----------------------|--------------------|-----|-----|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 | |
| 2 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.8 | 1.6 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.6 | 1.0 | 3.6 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 6 | | <0.5 ¹⁾ | 0.6 | 0.9 | 1.8 | 3.2 | 7.4 | 10.0 ²⁾ | 10.0 ²⁾ | |
| 10 | | | 0.5 | 0.8 | 1.4 | 2.2 | 3.9 | 6.0 | 10.0 ²⁾ | |
| 13 | | | 0.5 | 0.7 | 1.3 | 2.0 | 3.6 | 5.4 | 10.0 ²⁾ | |
| 16 | | | | 0.6 | 1.2 | 1.9 | 3.2 | 4.6 | 8.4 | |
| 20 | | | | | 1.2 | 1.8 | 3.1 | 4.4 | 7.8 | |
| 25 | | | | | 1.2 | 1.8 | 3.0 | 4.2 | 7.3 | |
| 32 | | | | | | 1.7 | 2.8 | 3.9 | 6.8 | |
| 40 | | | | | | | 2.7 | 3.8 | 6.5 | |
| 50 | | | | | | | 2.5 | 3.5 | 5.7 | |
| 63 | | | | | | | | | 5.3 | |

Short circuit selectivity **characteristic C** towards fuse link **DIAZED*** [kA]

| PL7 | DIAZED DII-DIV gL/gG | | | | | | | | | |
|-----------|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 | |
| 0.75 | 1.0 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 1.0 | <0.5 ¹⁾ | 1.2 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 1.6 | <0.5 ¹⁾ | <0.5 ¹⁾ | 1.0 | 2.2 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 2 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.8 | 1.6 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.6 | 0.8 | 1.8 | 3.6 | 9.7 | 10.0 ²⁾ | 10.0 ²⁾ | |
| 6 | | <0.5 ¹⁾ | 0.5 | 0.6 | 1.4 | 2.4 | 5.5 | 10.0 ²⁾ | 10.0 ²⁾ | |
| 10 | | | <0.5 ¹⁾ | 0.6 | 1.3 | 2.0 | 3.6 | 5.4 | 10.0 ²⁾ | |
| 13 | | | | | 1.3 | 1.9 | 3.3 | 5.0 | 9.4 | |
| 16 | | | | | 1.2 | 1.8 | 3.2 | 4.4 | 8.0 | |
| 20 | | | | | 1.2 | 1.8 | 3.1 | 4.1 | 7.0 | |
| 25 | | | | | | 1.7 | 2.8 | 3.8 | 6.5 | |
| 32 | | | | | | | 2.7 | 3.7 | 6.2 | |
| 40 | | | | | | | | 3.5 | 5.9 | |
| 50 | | | | | | | | | 5.5 | |
| 63 | | | | | | | | | | |

Short circuit selectivity **characteristic D** towards fuse link **DIAZED*** [kA]

| PL7 | DIAZED DII-DIV gL/gG | | | | | | | | | |
|-----------|----------------------|--------------------|-----|-----|-----|-----|--------------------|--------------------|--------------------|--|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 | |
| 2.0 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.6 | 1.0 | 2.8 | 5.8 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | |
| 4 | | <0.5 ¹⁾ | 0.6 | 0.9 | 2.0 | 3.8 | 9.5 | 10.0 ²⁾ | 10.0 ²⁾ | |
| 6 | | | 0.5 | 0.7 | 1.5 | 2.6 | 5.3 | 9.1 | 10.0 ²⁾ | |
| 10 | | | | 0.7 | 1.2 | 1.9 | 3.4 | 5.0 | 9.5 | |
| 13 | | | | | 1.2 | 1.8 | 3.2 | 4.6 | 8.6 | |
| 16 | | | | | | 1.6 | 2.7 | 4.0 | 7.4 | |
| 20 | | | | | | 1.5 | 2.5 | 3.5 | 6.7 | |
| 25 | | | | | | | 2.4 | 3.4 | 6.2 | |
| 32 | | | | | | | | 2.8 | 5.0 | |
| 40 | | | | | | | | | 4.8 | |



¹⁾ Selectivity limit current I_s under 0.5 kA.

²⁾ Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB

no selectivity

*) DIAZED fuse-links: DII (E27)
DIII (E33)
DIV (G1¹/₄)

Short Circuit Selectivity PL7 towards NEOZED Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PL7 and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

Short circuit selectivity **characteristic B** towards fuse link **NEOZED*** [kA]

| PL7 | NEOZED D01-D03 gL/gG | | | | | | | | |
|-----------|----------------------|--------------------|--------------------|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| 2 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.6 | 1.0 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.5 | 0.9 | 2.5 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 6 | | <0.5 ¹⁾ | 0.5 | 0.8 | 1.6 | 3.6 | 6.0 | 10.0 ²⁾ | 10.0 ²⁾ |
| 10 | | | 0.5 | 0.7 | 1.3 | 2.4 | 3.4 | 6.0 | 10.0 ²⁾ |
| 13 | | | <0.5 ¹⁾ | 0.7 | 1.2 | 2.3 | 3.2 | 5.3 | 10.0 ²⁾ |
| 16 | | | | 0.6 | 1.1 | 2.2 | 2.9 | 4.6 | 10.0 |
| 20 | | | | | 1.1 | 2.1 | 2.8 | 4.4 | 9.3 |
| 25 | | | | | 1.1 | 2.0 | 2.7 | 4.2 | 8.7 |
| 32 | | | | | | 2.0 | 2.6 | 4.0 | 8.0 |
| 40 | | | | | | | 2.5 | 3.8 | 7.5 |
| 50 | | | | | | | 2.3 | 3.4 | 6.7 |
| 63 | | | | | | | | | 6.2 |

Short circuit selectivity **characteristic C** towards fuse link **NEOZED*** [kA]

| PL7 | NEOZED D01-D03 gL/gG | | | | | | | | |
|-----------|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| 0,75 | <0.5 ¹⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 1,0 | <0.5 ¹⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 1,6 | <0.5 ¹⁾ | 0.5 | 0.6 | 0.9 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 2 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.5 | 0.7 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.6 | 1.6 | 4.0 | 7.6 | 10.0 ²⁾ | 10.0 ²⁾ |
| 6 | | <0.5 ¹⁾ | <0.5 ¹⁾ | <0.5 ¹⁾ | 1.2 | 2.7 | 4.5 | 10.0 ²⁾ | 10.0 ²⁾ |
| 10 | | | <0.5 ¹⁾ | <0.5 ¹⁾ | 1.2 | 2.3 | 3.1 | 5.4 | 10.0 ²⁾ |
| 13 | | | | | 1.1 | 2.2 | 3.0 | 4.9 | 10.0 ²⁾ |
| 16 | | | | | | 1.1 | 2.1 | 2.8 | 4,4 |
| 20 | | | | | | 1.0 | 2.0 | 2.6 | 4.0 |
| 25 | | | | | | | 1.9 | 2.5 | 3.8 |
| 32 | | | | | | | | 2.5 | 3.7 |
| 40 | | | | | | | | | 3.5 |
| 50 | | | | | | | | | 6.5 |
| 63 | | | | | | | | | |

Short circuit selectivity **characteristic D** towards fuse link **NEOZED*** [kA]

| PL7 | NEOZED D01-D03 gL/gG | | | | | | | | |
|-----------|----------------------|--------------------|--------------------|-----|-----|-----|-----|--------------------|--------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| 4 | | <0.5 ¹⁾ | 0.5 | 0.7 | 1.7 | 4.6 | 7.7 | 10.0 ²⁾ | 10.0 ²⁾ |
| 6 | | | <0.5 ¹⁾ | 0.5 | 1.3 | 2.9 | 4.5 | 9.0 | 10.0 ²⁾ |
| 10 | | | | 0.5 | 1.1 | 2.2 | 3.0 | 5.0 | 10.0 ²⁾ |
| 13 | | | | | 1.1 | 2.1 | 2.9 | 4.6 | 10.0 ²⁾ |
| 16 | | | | | | 1.9 | 2.6 | 3.9 | 9.0 |
| 20 | | | | | | 1.7 | 2.3 | 3.5 | 8.0 |
| 25 | | | | | | | 2.2 | 3.4 | 7.5 |
| 32 | | | | | | | | 2.9 | 6.0 |
| 40 | | | | | | | | | 5.7 |



¹⁾ Selectivity limit current I_s under 0.5 kA.

²⁾ Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB

no selectivity

*) NEOZED fuse-links: D01 (E14)
D02 (E18)
D03 (M30x2)

Short Circuit Selectivity PL7 towards NH-00 Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PL7 and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

Short circuit selectivity **characteristic B** towards fuse link **NH-00*** [kA]

| PL7 | NH-00 gL/gG | | | | | | | | | | | |
|-----------|--------------------|--------------------|-----|-----|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| I_n [A] | 16 | 20 | 25 | 32 | 35 | 40 | 50 | 63 | 80 | 100 | 125 | 160 |
| 2 | <0.5 ¹⁾ | 0.5 | 1.0 | 2.5 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.8 | 1.3 | 2.3 | 4.3 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 6 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.7 | 1.1 | 1.5 | 2.0 | 3.3 | 4.3 | 7.6 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 10 | | <0.5 ¹⁾ | 0.6 | 0.9 | 1.2 | 1.5 | 2.2 | 2.7 | 4.0 | 9.0 | 10.0 ²⁾ | 10.0 ²⁾ |
| 13 | | <0.5 ¹⁾ | 0.6 | 0.8 | 1.1 | 1.4 | 2.1 | 2.6 | 3.8 | 7.9 | 10.0 ²⁾ | 10.0 ²⁾ |
| 16 | | | 0.5 | 0.7 | 1.0 | 1.3 | 1.9 | 2.4 | 3.4 | 6.4 | 9.3 | 10.0 ²⁾ |
| 20 | | | | 0.7 | 1.0 | 1.3 | 1.9 | 2.4 | 3.3 | 6.0 | 8.7 | 10.0 ²⁾ |
| 25 | | | | 0.7 | 1.0 | 1.3 | 1.8 | 2.3 | 3.2 | 5.7 | 8.0 | 10.0 ²⁾ |
| 32 | | | | | 0.9 | 1.2 | 1.7 | 2.2 | 3.1 | 5.4 | 7.6 | 10.0 ²⁾ |
| 40 | | | | | | | | 2.1 | 3.0 | 5.1 | 7.2 | 10.0 ²⁾ |
| 50 | | | | | | | | 1.9 | 2.8 | 4.7 | 6.6 | 9.5 |
| 63 | | | | | | | | | | 4.4 | 6.3 | 8.6 |

Short circuit selectivity **characteristic C** towards fuse link **NH-00*** [kA]

| PL7 | NH-00 gL/gG | | | | | | | | | | | |
|-----------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| I_n [A] | 16 | 20 | 25 | 32 | 35 | 40 | 50 | 63 | 80 | 100 | 125 | 160 |
| 0,75 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 1,0 | 0.9 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 1,6 | <0.5 ¹⁾ | 0.6 | 1.3 | 4.2 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 2 | <0.5 ¹⁾ | 0.6 | 1.0 | 2.5 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.7 | 1.0 | 1.5 | 2.1 | 3.6 | 5.0 | 10.0 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 6 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.5 | 0.8 | 1.2 | 1.5 | 2.5 | 3.3 | 5.7 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 10 | | | 0.5 | 0.7 | 1.0 | 1.4 | 2.0 | 2.5 | 3.8 | 8.0 | 10.0 ²⁾ | 10.0 ²⁾ |
| 13 | | | | | 1.0 | 1.3 | 1.9 | 2.4 | 3.6 | 7.0 | 10.0 ²⁾ | 10.0 ²⁾ |
| 16 | | | | | | 1.0 | 1.3 | 1.8 | 2.3 | 3.3 | 6.0 | 8.8 |
| 20 | | | | | | | 1.0 | 1.2 | 1.7 | 2.2 | 3.2 | 5.5 |
| 25 | | | | | | | | 1.6 | 2.1 | 3.0 | 5.2 | 7.3 |
| 32 | | | | | | | | | 2.1 | 2.9 | 5.0 | 7.0 |
| 40 | | | | | | | | | | 2.8 | 4.8 | 6.7 |
| 50 | | | | | | | | | | | 4.5 | 6.3 |
| 63 | | | | | | | | | | | | 5.9 |

Short circuit selectivity **characteristic D** towards fuse link **NH-00*** [kA]

| PL7 | NH-00 gL/gG | | | | | | | | | | | |
|-----------|--------------------|--------------------|-----|-----|-----|-----|-----|-----|------|--------------------|--------------------|--------------------|
| I_n [A] | 16 | 20 | 25 | 32 | 35 | 40 | 50 | 63 | 80 | 100 | 125 | 160 |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.7 | 1.0 | 1.6 | 2.2 | 3.8 | 5.2 | 10.0 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 5 | | <0.5 ¹⁾ | 0.6 | 0.9 | 1.4 | 1.9 | 3.2 | 4.1 | 7.1 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 6 | | <0.5 ¹⁾ | 0.5 | 0.8 | 1.2 | 1.6 | 2.6 | 3.3 | 5.5 | 10.0 ²⁾ | 10.0 ²⁾ | 10.0 ²⁾ |
| 8 | | | 0.5 | 0.8 | 1.1 | 1.5 | 2.2 | 2.7 | 4.1 | 8.7 | 10.0 ²⁾ | 10.0 ²⁾ |
| 10 | | | 0.5 | 0.7 | 1.0 | 1.3 | 1.9 | 2.5 | 3.6 | 7.2 | 10.0 ²⁾ | 10.0 ²⁾ |
| 13 | | | | | 1.0 | 1.3 | 1.9 | 2.3 | 3.4 | 6.5 | 9.5 | 10.0 ²⁾ |
| 16 | | | | | | 1.1 | 1.6 | 2.0 | 3.0 | 5.5 | 8.0 | 10.0 ²⁾ |
| 20 | | | | | | | 1.4 | 1.8 | 2.8 | 5.0 | 7.5 | 10.0 ²⁾ |
| 25 | | | | | | | | 1.8 | 2.7 | 4.8 | 7.0 | 10.0 ²⁾ |
| 32 | | | | | | | | | 2.4 | 4.1 | 6.2 | 9.3 |
| 40 | | | | | | | | | | 4.0 | 6.0 | 9.0 |

¹⁾ Selectivity limit current I_s under 0.5 kA

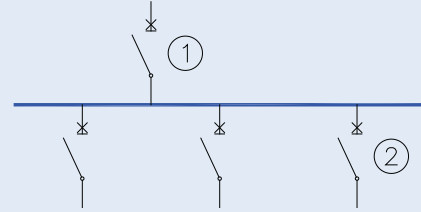
²⁾ Selectivity limit current $I_s =$ rated breaking capacity I_{cn} of the MCB

no selectivity



Cascading of PL7 and NZM circuit breakers

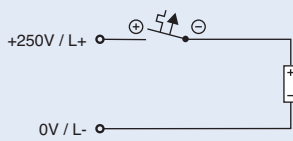
- Cascading ensures proper function of downstream circuit breaker in circuits where prospective short circuit current exceeds breaking capacity of this breaker
- Effective system-based solution
- Cost and space saving
- Conditional breaking capacity acc. to EN 60947-2
- Values for 400 V AC



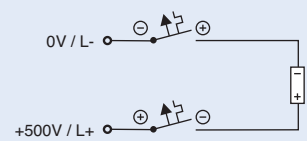
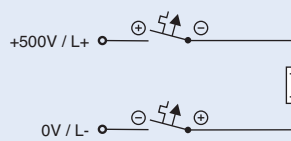
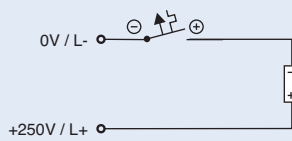
| Downstream breaker PL7 characteristics B and C ② | Upstream breaker ① | | | | | | |
|--|---|---------|---------|---------|---------|---------|---------|
| | I_n [A] | ≤ 160 | | | ≤ 250 | | |
| | Type | NZMB1-A | NZMN1-A | NZMH1-A | NZMB2-A | NZMN2-A | NZMH2-A |
| | I_{cu} [kA] 415 V AC | 25 | 50 | 100 | 25 | 50 | 150 |
| $I_n = 0,16 - 10$ A | Conditional breaking capacity of PL7 [kA] | 25 | 25 | 25 | 25 | 50 | 50 |
| $I_n = 13 - 16$ A | Conditional breaking capacity of PL7 [kA] | 25 | 25 | 25 | 20 | 30 | 30 |
| $I_n = 20 - 32$ A | Conditional breaking capacity of PL7 [kA] | 20 | 20 | 20 | 20 | 30 | 30 |
| $I_n = 40$ A | Conditional breaking capacity of PL7 [kA] | 20 | 20 | 20 | 15 | 20 | 20 |
| $I_n = 50 - 63$ A | Conditional breaking capacity of PL7 [kA] | 15 | 15 | 15 | 15 | 20 | 20 |

Miniature Circuit Breakers PL7-DC for AC/DC, Characteristic C

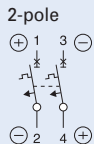
Connection example at 250 V=, 1-pole



Connection example at 500 V=, 2-pole



Connection diagrams PL7-DC



Note:

For proper function of MCBs PL7-DC it is necessary to connect terminals correctly with respect to polarity sign placed near terminals. A way of grounding of DC circuit (i.e. grounding of positive or negative pole) or its connection to another circuit has no effect of MCB functionality.

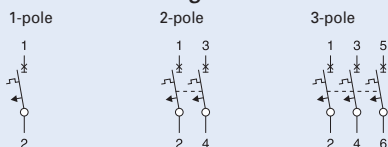
Circuit Breaker PL6...

- High selectivity between MCB and back-up fuse due to low let-through energy
 - Twin-purpose terminal (lift/open-mouthed) above and below
 - Busbar positioning optionally above or below
 - Meets the requirements of insulation co-ordination, distance between contacts 4 mm, for secure isolation
 - Distance between contacts more than 4 mm for safety electrical disconnection
- Suitable for applications up to 48 V DC

Accessories:

| | | |
|---|--------------|----------------|
| Auxiliary switch for subsequent installation | ZP-IHK | 286052 |
| | ZP-WHK | 286053 |
| Tripping signal contact for subsequent installation | ZP-NHK | 248437 |
| Remote control and automatic switching device | Z-FW-LP | 248296 |
| Shunt trip release | ZP-ASA/.. | 248438, 248439 |
| Undervoltage release | Z-USA/.. | 248289-248291 |
| Compact enclosure | KLV-TC-2 | 276240 |
| | KLV-TC-4 | 276241 |
| Additional terminal 35 mm ² (2 units) | Z-HA-EK/35 | 263960 |
| Switching interlock without lock | Z-IS/SPE-1TE | 274418 |

Connection diagrams



Technical Data

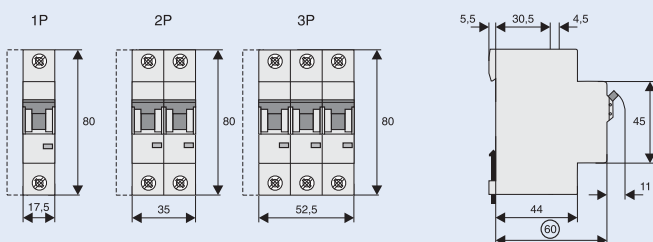
Electrical:

| | |
|--|--------------------------------|
| Design according to | EN 60898 |
| Rated voltage | |
| PL6 | AC: 230/400 V |
| PL6 | DC: 48 V (per pole) |
| Rated frequency | 50/60 Hz |
| Rated breaking capacity according to | EN 60898 |
| PL6 | 6 kA |
| Characteristic | B, C, D |
| Back-up fuse | |
| > 6 kA | max. 100 A gL |
| Selectivity class | 3 |
| Rated peak withstand voltage U_{imp} | 4 kV (1.2/50 μ s) |
| Endurance | |
| elektrická | $\geq 4,000$ operating cycles |
| mechanická | $\geq 20,000$ operating cycles |
| Line voltage connection | optional (above/below) |
| Min. voltage | 12 V AC/DC |

Mechanical:

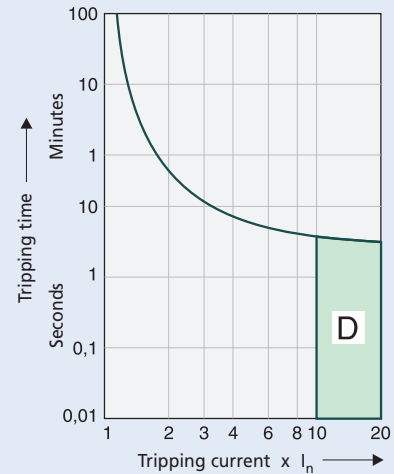
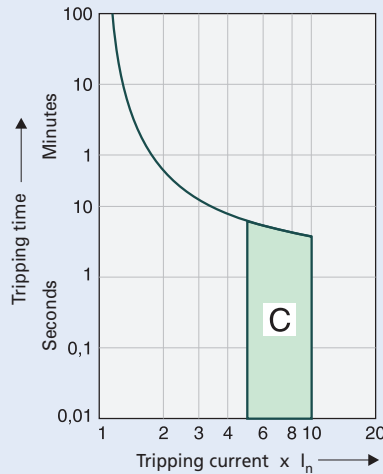
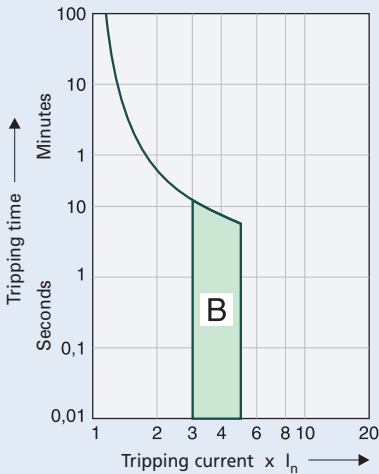
| | |
|---------------------------------|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 17.5 mm per pole (1 MU) |
| Mounting | quick fastening with 3 lock-in positions on DIN rail EN 60715 |
| Degree of protection | IP20 |
| Upper and lower terminals | open mouthed/lift terminals |
| Terminal protection | finger and hand touch safe |
| Terminal capacity (1p, 2p, 3p,) | 1–25 mm ² |
| Terminal fastening torque | 2–2.4 Nm |
| Busbar thickness | 0.8–2 mm |
| Mounting | independent of position |

Dimensions [mm]



Tripping Characteristics (IEC/EN 60898)

Tripping characteristic B (short circ. release 3–5 I_n) Tripping characteristic C (short circ. release 5–10 I_n) Tripping characteristic D (short circ. release 10 - 20 I_n)



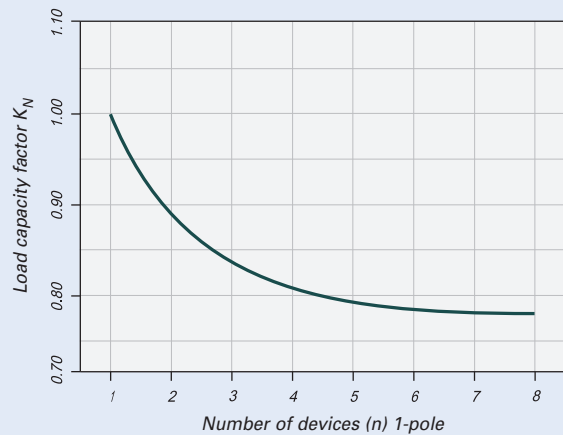
For electric lines (B), for circuits with motors (C) and for circuit with high surge currents, e.g. transformers (D).

Effect of the Ambient Temperature on Thermal Tripping Behaviour

Reference temperature according to EN 60898 is 30 °C.
Revised values of rated current as a dependence on ambient temperature.

| I_n [A] | Ambient temperature T [°C] | | | | | | | | | | | | | | | |
|-----------|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | -25 | -20 | -10 | 0 | 10 | 20 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 |
| 2 | 2,4 | 2,4 | 2,3 | 2,2 | 2,2 | 2,1 | 2,0 | 2,0 | 1,9 | 1,9 | 1,9 | 1,8 | 1,8 | 1,7 | 1,7 | 1,7 |
| 4 | 4,9 | 4,8 | 4,7 | 4,5 | 4,3 | 4,2 | 4,0 | 3,9 | 3,9 | 3,8 | 3,7 | 3,6 | 3,5 | 3,5 | 3,4 | 3,4 |
| 6 | 7,3 | 7,2 | 7,0 | 6,7 | 6,5 | 6,3 | 6,0 | 5,9 | 5,8 | 5,7 | 5,6 | 5,4 | 5,3 | 5,2 | 5,1 | 5,0 |
| 10 | 12 | 12 | 12 | 11 | 11 | 10 | 10 | 9,9 | 9,7 | 9,5 | 9,3 | 9,0 | 8,9 | 8,7 | 8,5 | 8,3 |
| 13 | 16 | 16 | 15 | 15 | 14 | 14 | 13 | 13 | 13 | 12 | 12 | 12 | 12 | 11 | 11 | 11 |
| 16 | 20 | 19 | 19 | 18 | 17 | 17 | 16 | 16 | 15 | 15 | 15 | 14 | 14 | 14 | 14 | 13 |
| 20 | 24 | 24 | 23 | 22 | 22 | 21 | 20 | 20 | 19 | 19 | 19 | 18 | 18 | 17 | 17 | 17 |
| 25 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 25 | 24 | 24 | 23 | 23 | 22 | 22 | 21 | 21 |
| 32 | 39 | 38 | 37 | 36 | 35 | 33 | 32 | 32 | 31 | 30 | 30 | 29 | 28 | 28 | 27 | 26 |
| 40 | 49 | 48 | 47 | 45 | 43 | 42 | 40 | 39 | 39 | 38 | 37 | 36 | 35 | 35 | 34 | 33 |
| 50 | 61 | 60 | 58 | 56 | 54 | 52 | 50 | 49 | 48 | 47 | 46 | 45 | 44 | 43 | 42 | 41 |
| 63 | 77 | 76 | 73 | 71 | 68 | 66 | 63 | 62 | 61 | 60 | 58 | 57 | 56 | 55 | 53 | 52 |

Load Capacity of Series Connected Miniature Circuit Breakers



Effect of Power Frequency

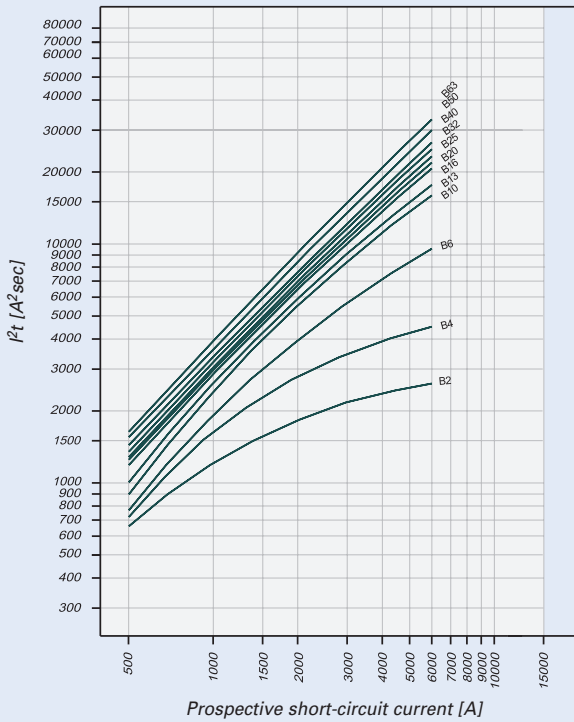
Effect of power frequency on the tripping behaviour I_{MA} of the quick release

| $I_{MA}(f)/I_{MA}(50\text{Hz})$ [%] | Power frequency f [Hz] | | | | | | |
|-------------------------------------|--------------------------------|-----|-----|-----|-----|-----|-----|
| | 16 ² / ₃ | 50 | 60 | 100 | 200 | 300 | 400 |
| | 91 | 100 | 101 | 106 | 115 | 134 | 141 |

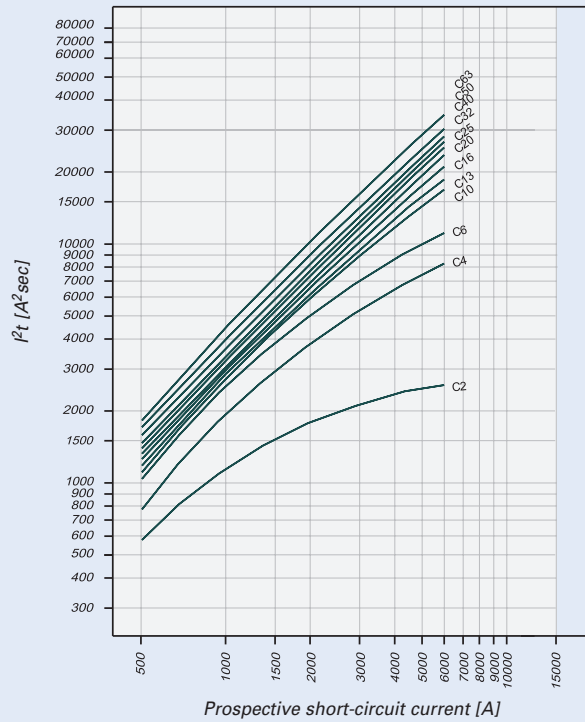
There is no significant impact of change of temperature on tripping current of thermal release.

Let-through Energy I^2t PL6

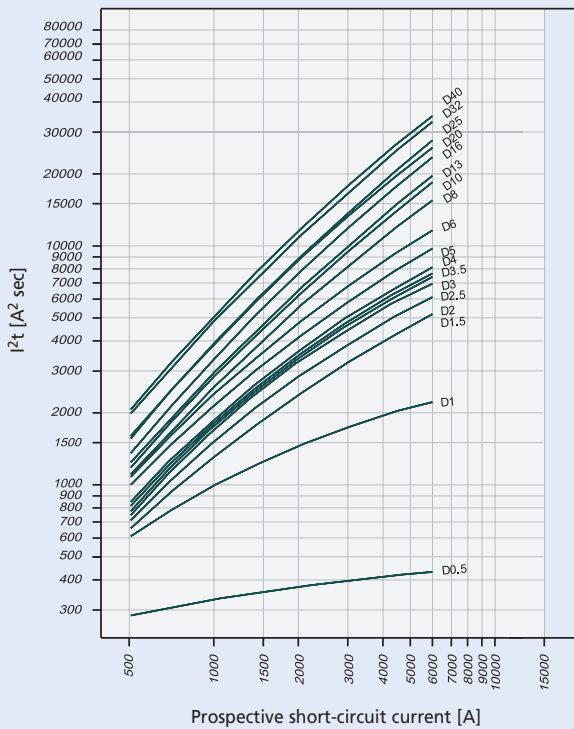
Let-through energy PL6, characteristic B, 1-pole



Let-through energy PL6, characteristic B, 1-pole



Let-through energy PL6, characteristic D, 1-pole



Short Circuit Selectivity PL6 towards DIAZED Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PL6 and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

Short circuit selectivity **characteristic B** towards fuse link **DIAZED*** [kA]

| PL6 | DIAZED DII-DIV gL/gG | | | | | | | | |
|-----------|----------------------|--------------------|-----|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| 2 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.8 | 1.6 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.6 | 1.0 | 3.6 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 6 | | <0.5 ¹⁾ | 0.6 | 0.9 | 1.8 | 3.2 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | 0.5 | 0.8 | 1.4 | 2.2 | 3.9 | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | 0.5 | 0.7 | 1.3 | 2.0 | 3.6 | 5.4 | 6.0 ²⁾ |
| 16 | | | | 0.6 | 1.2 | 1.9 | 3.2 | 4.6 | 6.0 ²⁾ |
| 20 | | | | | 1.2 | 1.8 | 3.1 | 4.4 | 6.0 ²⁾ |
| 25 | | | | | | 1.2 | 1.8 | 3.0 | 4.2 |
| 32 | | | | | | | 1.7 | 2.8 | 3.9 |
| 40 | | | | | | | | 2.7 | 3.8 |
| 50 | | | | | | | | 2.5 | 3.5 |
| 63 | | | | | | | | | 5.3 |

Short circuit selectivity **characteristic C** towards fuse link **DIAZED*** [kA]

| PL6 | DIAZED DII-DIV gL/gG | | | | | | | | |
|-----------|----------------------|--------------------|--------------------|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| 2 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.8 | 1.6 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.6 | 0.8 | 1.8 | 3.6 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 6 | | <0.5 ¹⁾ | 0.5 | 0.6 | 1.4 | 2.4 | 5.5 | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | <0.5 ¹⁾ | 0.6 | 1.3 | 2.0 | 3.6 | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | | | 1.3 | 1.9 | 3.3 | 5.0 | 6.0 ²⁾ |
| 16 | | | | | | 1.2 | 1.8 | 3.2 | 4.4 |
| 20 | | | | | | | 1.2 | 1.8 | 3.1 |
| 25 | | | | | | | | 1.7 | 2.8 |
| 32 | | | | | | | | | 2.7 |
| 40 | | | | | | | | | 3.5 |
| 50 | | | | | | | | | 5.5 |

Short circuit selectivity **characteristic D** towards fuse link **DIAZED*** [kA]

| PL6 | DIAZED DII-DIV gL/gG | | | | | | | | |
|-----------|----------------------|--------------------|-----|-----|-----|-----|-------------------|-------------------|-------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| 2 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.6 | 1.0 | 2.8 | 5.8 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 4 | | <0.5 ¹⁾ | 0.6 | 0.9 | 2.0 | 3.8 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 6 | | | 0.5 | 0.7 | 1.5 | 2.6 | 5.3 | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | | 0.7 | 1.2 | 1.9 | 3.4 | 5.0 | 6.0 ²⁾ |
| 13 | | | | | 1.2 | 1.8 | 3.2 | 4.6 | 6.0 ²⁾ |
| 16 | | | | | | 1.6 | 2.7 | 4.0 | 6.0 ²⁾ |
| 20 | | | | | | | 1.5 | 2.5 | 3.5 |
| 25 | | | | | | | | 2.4 | 3.4 |
| 32 | | | | | | | | | 2.8 |
| 40 | | | | | | | | | 4.8 |



¹⁾ Selectivity limit current I_s under 0.5 kA

²⁾ Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB

no selectivity

*) DIAZED fuse-links: DII (E27)
DIII (E33)
DIV (G1^{1/4})

Short Circuit Selectivity PL6 towards NEOZED Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PL6 and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

Short circuit selectivity **characteristic B** towards fuse link **NEOZED***) [kA]

| PL6 | NEOZED D01-D03 gL/gG | | | | | | | | | |
|-----------|----------------------|--------------------|--------------------|-----|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 | |
| 2 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.6 | 1.0 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.5 | 0.9 | 2.5 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 6 | | <0.5 ¹⁾ | 0.5 | 0.8 | 1.6 | 3.6 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | 0.5 | 0.7 | 1.3 | 2.4 | 3.4 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | <0.5 ¹⁾ | 0.7 | 1.2 | 2.3 | 3.2 | 5.3 | 6.0 ²⁾ | 6.0 ²⁾ |
| 16 | | | | 0.6 | 1.1 | 2.2 | 2.9 | 4.6 | 6.0 ²⁾ | 6.0 ²⁾ |
| 20 | | | | | 1.1 | 2.1 | 2.8 | 4.4 | 6.0 ²⁾ | 6.0 ²⁾ |
| 25 | | | | | 1.1 | 2.0 | 2.7 | 4.2 | 6.0 ²⁾ | 6.0 ²⁾ |
| 32 | | | | | | 2.0 | 2.6 | 4.0 | 6.0 ²⁾ | 6.0 ²⁾ |
| 40 | | | | | | | 2.5 | 3.8 | 6.0 ²⁾ | 6.0 ²⁾ |
| 50 | | | | | | | 2.3 | 3.4 | 6.0 ²⁾ | 6.0 ²⁾ |
| 63 | | | | | | | | | 6.0 ²⁾ | 6.0 ²⁾ |

Short circuit selectivity **characteristic C** towards fuse link **NEOZED***) [kA]

| PL6 | NEOZED D01-D03 gL/gG | | | | | | | | | |
|-----------|----------------------|--------------------|--------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 | |
| 2 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.5 | 0.7 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.6 | 1.6 | 4.0 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 6 | | <0.5 ¹⁾ | <0.5 ¹⁾ | <0.5 ¹⁾ | 1.2 | 2.7 | 4.5 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | <0.5 ¹⁾ | <0.5 ¹⁾ | 1.2 | 2.3 | 3.1 | 5.4 | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | | | 1.1 | 2.2 | 3.0 | 4.9 | 6.0 ²⁾ | 6.0 ²⁾ |
| 16 | | | | | 1.1 | 2.1 | 2.8 | 4.4 | 6.0 ²⁾ | 6.0 ²⁾ |
| 20 | | | | | 1.0 | 2.0 | 2.6 | 4.0 | 6.0 ²⁾ | 6.0 ²⁾ |
| 25 | | | | | | 1.9 | 2.5 | 3.8 | 6.0 ²⁾ | 6.0 ²⁾ |
| 32 | | | | | | | 2.5 | 3.7 | 6.0 ²⁾ | 6.0 ²⁾ |
| 40 | | | | | | | | 3.5 | 6.0 ²⁾ | 6.0 ²⁾ |
| 50 | | | | | | | | | 6.0 ²⁾ | 6.0 ²⁾ |

Short circuit selectivity **characteristic D** towards fuse link **NEOZED***) [kA]

| PL6 | NEOZED D01-D03 gL/gG | | | | | | | | | |
|-----------|----------------------|--------------------|--------------------|-----|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
| I_n [A] | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 | |
| 2 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.6 | 0.8 | 2.2 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 4 | | <0.5 ¹⁾ | 0.5 | 0.7 | 1.7 | 4.6 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 6 | | | <0.5 ¹⁾ | 0.5 | 1.3 | 2.9 | 4.5 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | | 0.5 | 1.1 | 2.2 | 3.0 | 5.0 | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | | | 1.1 | 2.1 | 2.9 | 4.6 | 6.0 ²⁾ | 6.0 ²⁾ |
| 16 | | | | | | 1.9 | 2.6 | 3.9 | 6.0 ²⁾ | 6.0 ²⁾ |
| 20 | | | | | | 1.7 | 2.3 | 3.5 | 6.0 ²⁾ | 6.0 ²⁾ |
| 25 | | | | | | | 2.2 | 3.4 | 6.0 ²⁾ | 6.0 ²⁾ |
| 32 | | | | | | | | 2.9 | 6.0 ²⁾ | 6.0 ²⁾ |
| 40 | | | | | | | | | 5.7 | 6.0 ²⁾ |



¹⁾ Selectivity limit current I_s under 0.5 kA

²⁾ Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB

no selectivity

*) NEOZED fuse-links: D01 (E14)
D02 (E18)
D03 (M30x2)

Short Circuit Selectivity PL6 towards NH-00 Fuses

In case of short circuit, there is selectivity between the miniature circuit breakers PL6 and the upstream fuses up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond).

*) basically in accordance with EN 60898 D.5.2.b

Short circuit selectivity **characteristic B** towards fuse link **NH-00*** [kA]

| PL6 | NH-00 gL/gG | | | | | | | | | | | |
|-----------|--------------------|--------------------|-----|-----|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| I_n [A] | 16 | 20 | 25 | 32 | 35 | 40 | 50 | 63 | 80 | 100 | 125 | 160 |
| 2 | <0.5 ¹⁾ | 0.5 | 1.0 | 2.5 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.8 | 1.3 | 2.3 | 4.3 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 6 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.7 | 1.1 | 1.5 | 2.0 | 3.3 | 4.3 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | <0.5 ¹⁾ | 0.6 | 0.9 | 1.2 | 1.5 | 2.2 | 2.7 | 4.0 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | <0.5 ¹⁾ | 0.6 | 0.8 | 1.1 | 1.4 | 2.1 | 2.6 | 3.8 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 16 | | | 0.5 | 0.7 | 1.0 | 1.3 | 1.9 | 2.4 | 3.4 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 20 | | | | 0.7 | 1.0 | 1.3 | 1.9 | 2.4 | 3.3 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 25 | | | | 0.7 | 1.0 | 1.3 | 1.8 | 2.3 | 3.2 | 5.7 | 6.0 ²⁾ | 6.0 ²⁾ |
| 32 | | | | | 0.9 | 1.2 | 1.7 | 2.2 | 3.1 | 5.4 | 6.0 ²⁾ | 6.0 ²⁾ |
| 40 | | | | | | | | 2.1 | 3.0 | 5.1 | 6.0 ²⁾ | 6.0 ²⁾ |
| 50 | | | | | | | | 1.9 | 2.8 | 4.7 | 6.0 ²⁾ | 6.0 ²⁾ |
| 63 | | | | | | | | | 4.4 | 6.0 ²⁾ | 6.0 ²⁾ | |

Short circuit selectivity **characteristic C** towards fuse link **NH-00*** [kA]

| PL6 | NH-00 gL/gG | | | | | | | | | | | |
|-----------|--------------------|--------------------|-----|-----|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| I_n [A] | 16 | 20 | 25 | 32 | 35 | 40 | 50 | 63 | 80 | 100 | 125 | 160 |
| 2 | <0.5 ¹⁾ | 0.6 | 1.0 | 2.5 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.7 | 1.0 | 1.5 | 2.1 | 3.6 | 5.0 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 6 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.5 | 0.8 | 1.2 | 1.5 | 2.5 | 3.3 | 5.7 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | 0.5 | 0.7 | 1.0 | 1.4 | 2.0 | 2.5 | 3.8 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | | | 1.0 | 1.3 | 1.9 | 2.4 | 3.6 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 16 | | | | | | 1.0 | 1.3 | 1.8 | 2.3 | 3.3 | 6.0 ²⁾ | 6.0 ²⁾ |
| 20 | | | | | | 1.0 | 1.2 | 1.7 | 2.2 | 3.2 | 5.5 | 6.0 ²⁾ |
| 25 | | | | | | | 1.6 | 2.1 | 3.0 | 5.2 | 6.0 ²⁾ | 6.0 ²⁾ |
| 32 | | | | | | | | 2.1 | 2.9 | 5.0 | 6.0 ²⁾ | 6.0 ²⁾ |
| 40 | | | | | | | | | 2.8 | 4.8 | 6.0 ²⁾ | 6.0 ²⁾ |
| 50 | | | | | | | | | | 4.5 | 6.0 ²⁾ | 6.0 ²⁾ |
| 63 | | | | | | | | | | | 5.9 | 6.0 ²⁾ |

Short circuit selectivity **characteristic D** towards fuse link **NH-00*** [kA]

| PL6 | NH-00 gL/gG | | | | | | | | | | | |
|-----------|--------------------|--------------------|-----|-----|-----|-----|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| I_n [A] | 16 | 20 | 25 | 32 | 35 | 40 | 50 | 63 | 80 | 100 | 125 | 160 |
| 2 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.8 | 1.3 | 2.1 | 3.1 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 4 | <0.5 ¹⁾ | <0.5 ¹⁾ | 0.7 | 1.0 | 1.6 | 2.2 | 3.8 | 5.2 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 6 | | <0.5 ¹⁾ | 0.5 | 0.8 | 1.2 | 1.6 | 2.6 | 3.3 | 5.5 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 10 | | | 0.5 | 0.7 | 1.0 | 1.3 | 1.9 | 2.5 | 3.6 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 13 | | | | | 1.0 | 1.3 | 1.9 | 2.3 | 3.4 | 6.0 ²⁾ | 6.0 ²⁾ | 6.0 ²⁾ |
| 16 | | | | | | 1.1 | 1.6 | 2.0 | 3.0 | 5.5 | 6.0 ²⁾ | 6.0 ²⁾ |
| 20 | | | | | | | 1.4 | 1.8 | 2.8 | 5.0 | 6.0 ²⁾ | 6.0 ²⁾ |
| 25 | | | | | | | | 1.8 | 2.7 | 4.8 | 6.0 ²⁾ | 6.0 ²⁾ |
| 32 | | | | | | | | | 2.4 | 4.1 | 6.0 ²⁾ | 6.0 ²⁾ |
| 40 | | | | | | | | | | 4.0 | 6.0 ²⁾ | 6.0 ²⁾ |



¹⁾ Selectivity limit current I_s under 0.5 kA

²⁾ Selectivity limit current I_s = rated breaking capacity I_{cn} of the MCB

no selectivity

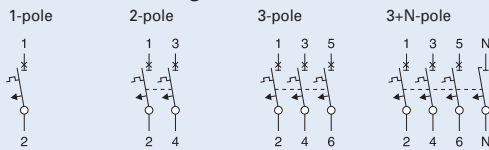
Miniature Circuit Breakers PLHT

- Miniature circuit breaker for higher rated current with high breaking capacity
- Double interruption of switching contact
- Very low let-through energy in case of short circuit
- With isolator function, meets the requirements of insulation co-ordination, distance between contacts ≥ 4 mm, for secure isolation

Accessories:

| | | |
|---|---------------------------|------------------|
| Auxiliary switch for subsequent installation (0.5 MU) | Z-LHK | 248440 |
| Shunt trip release for subsequent installation (1.5 MU) | Z-LHASA/230 Z-LHASA/24 | 248442 248441 |
| Busbar 35 mm ² Rated current 110 A in case of back side connection of supply, 220 A in case of central feeding | Z-SV-35/PLHT-V | 264939 |
| End cap | Z-V-35/AK/3P | 264333 |

Connection diagrams



Technical Data

Electrical:

| | |
|---------------------|-----------------|
| Design according to | EN 60947-2 |
| Rated voltage | |
| AC | 230/400 V |
| DC | 60 V (per pole) |

Ultimate short circuit breaking capacity acc. to EN 60947-2

| | | |
|---------------------|------------------|-------|
| Characteristics B,C | $I_n = 20-63$ A | 25 kA |
| | $I_n = 80-100$ A | 20 kA |
| Characteristic D | $I_n = 125$ A | 15 kA |
| | $I_n = 20-63$ A | 25 kA |
| | $I_n = 80$ A | 20 kA |
| | $I_n = 100$ A | 15 kA |

Rated short circuit breaking capacity acc. to EN 60898-1

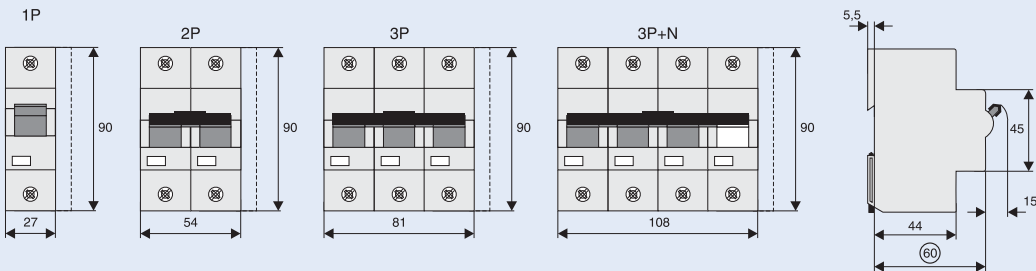
| | |
|---|-------|
| Characteristics B,C (1-, 2-, 3-, 3N-pole) | |
| $I_n = 20-63$ A | 20 kA |
| $I_n = 80-100$ A | 15 kA |

| | |
|----------------------------------|--------------------------------|
| Characteristic | B, C, D |
| Back-up fuse | max. 200 A gL |
| Rated insulation voltage | 440 V |
| Peak withstand voltage U_{imp} | 4 kV |
| Selectivity class | in acc. with class 3 |
| Endurance | $\geq 20,000$ operating cycles |

Mechanical:

| | |
|--------------------------------|---|
| Frame size | 45 mm |
| Device height | 90 mm |
| Device width | 27 mm (1.5 MU) per pole |
| Mounting | quick fastening with 2 lock-in positions on lift terminals DIN rail EN 60715 |
| Upper and lower terminals | lift terminals |
| Terminal protection | finger and hand touch safe |
| Degree of protection, built-in | IP40 |
| Terminal capacity | 2.5-50 mm ² |

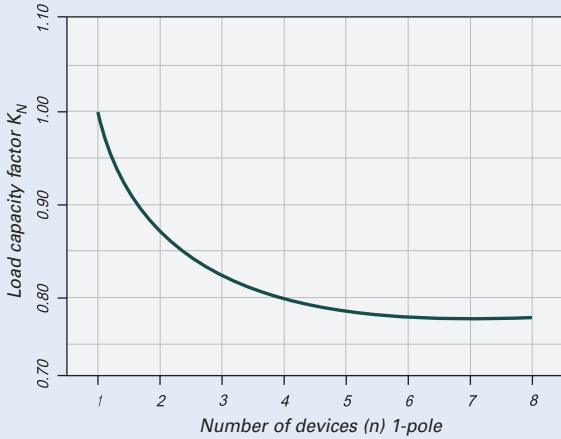
Dimensions [mm]



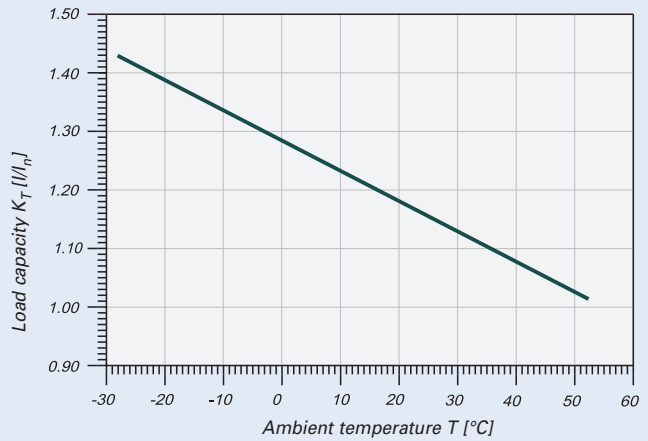
For types and art. numbers see page 42

Load Capacity

Load capacity in case of block installation



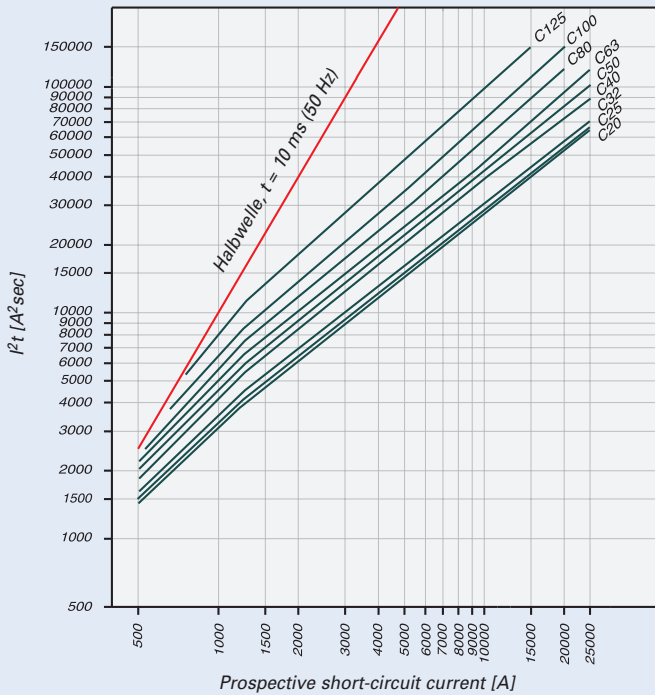
Effect of ambient temperature



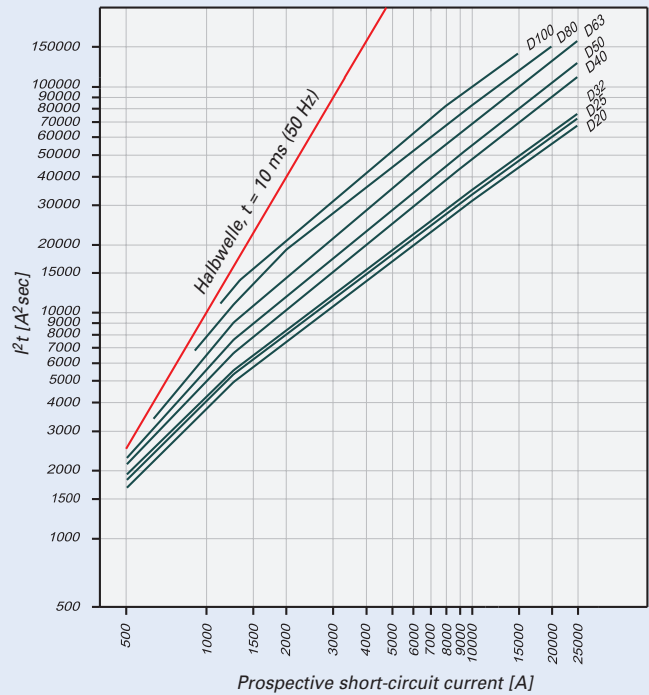
Non-tripping current of circuit breaker in case of N installed MCBs in one beside another and ambient temperature T: $I_{DL} = I_n \cdot K_T(T) \cdot K_N(N)$.
Note: Conventional non-tripping current of MCB according to EN 60898 is $1.13 I_n$ at reference temperature +30 °C.

Let-through Energy I^2t

Maximum let-through energy I^2t PLHT, characteristic C, 1-pole



Maximum let-through energy I^2t PLHT, characteristic D, 1-pole



Determined according to EN 60898.

Short Circuit Selectivity PLHT

- Short circuit selectivity (in kA) between PLHT and upstream fuse D0 or NH, operating class gL/gG
- 1,4 . . . selectivity up to 1.4 kA; . . . no selectivity

Selectivity towards back-up fuses D01, D02, D03 [kA]

| Rated current I_n PLHT [A] | Rated current of the back-up fuse [A] | | | | | | |
|---------------------------------|---------------------------------------|-----|-----|-----|-----|-----|-----|
| | 25 | 35 | 50 | 63 | 80 | 100 | |
| C-Characteristic | 20 | 0.5 | 1.0 | 2.0 | 2.9 | 3.9 | 7.6 |
| | 25 | | 1.0 | 1.9 | 2.8 | 3.8 | 7.3 |
| | 32 | | 1.0 | 1.8 | 2.7 | 3.6 | 7.0 |
| | 40 | | | 1.6 | 2.2 | 3.0 | 5.6 |
| | 50 | | | | 2.1 | 2.8 | 5.2 |
| | 63 | | | | | 2.7 | 4.8 |
| | 80 | | | | | | 4.3 |
| | 100 | | | | | | |
| | 125 | | | | | | |
| D-Characteristic | 20 | 0.5 | 0.9 | 1.7 | 2.5 | 3.4 | 6.7 |
| | 25 | | 0.9 | 1.6 | 2.3 | 3.2 | 6.2 |
| | 32 | | 0.9 | 1.5 | 2.3 | 3.0 | 6.0 |
| | 40 | | | 1.4 | 2.0 | 2.6 | 4.7 |
| | 50 | | | | 1.8 | 2.3 | 4.3 |
| | 63 | | | | | 2.1 | 3.7 |
| | 80 | | | | | | 3.1 |
| | 100 | | | | | | |

Selectivity towards back-up fuses NH Size 00 [kA]

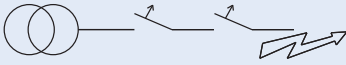
| Rated current I_n PLHT [A] | Rated current of the back-up fuse [A] | | | | | | | | | | |
|---------------------------------|---------------------------------------|------|-----|-----|-----|-----|-----|-----|------|------|------|
| | 25 | 35 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | |
| C-Characteristic | 20 | 0.5 | 1.0 | 1.3 | 1.9 | 2.7 | 3,7 | 6.7 | 17.0 | 25.0 | 25.0 |
| | 25 | | 0.9 | 1.3 | 1.8 | 2.6 | 3,5 | 6.5 | 17.0 | 25.0 | 25.0 |
| | 32 | | 0.9 | 1.2 | 1.7 | 2.4 | 3,3 | 6.0 | 15.0 | 23.0 | 25.0 |
| | 40 | | | | 1.4 | 2.1 | 2.9 | 4.8 | 12.0 | 18.0 | 25.0 |
| | 50 | | | | | 1.9 | 2.7 | 4.5 | 11.0 | 17.0 | 25.0 |
| | 63 | | | | | | | 4.2 | 10.0 | 15.0 | 25.0 |
| | 80 | | | | | | | 3.8 | 8.5 | 12,0 | 25.0 |
| | 100 | | | | | | | | 7.0 | 10.0 | 25.0 |
| | 125 | | | | | | | | | 7.5 | 25.0 |
| D-Characteristic | 20 | <0.5 | 0.8 | 1.1 | 1.5 | 2.3 | 3.1 | 5.6 | 16.0 | 25.0 | 25.0 |
| | 25 | | 0.7 | 1.0 | 1.4 | 2,1 | 3.0 | 5.3 | 14.0 | 23.0 | 25.0 |
| | 32 | | 0.7 | 1.0 | 1.3 | 2.1 | 2.9 | 5.0 | 13.0 | 22.0 | 25.0 |
| | 40 | | | | 1.1 | 1.8 | 2.5 | 4.2 | 10.0 | 15.0 | 25.0 |
| | 50 | | | | | 1.6 | 2.3 | 3.8 | 8.5 | 13.0 | 22.0 |
| | 63 | | | | | | 2.1 | 3.2 | 7.0 | 10.5 | 18.0 |
| | 80 | | | | | | | 2.8 | 5.5 | 8.4 | 15.0 |
| | 100 | | | | | | | | 4.8 | 7.5 | 12.5 |

For types and art. numbers see page 42

Short Circuit Selectivity PLHT towards NZM 1

In case of short circuit, there is selectivity between the miniature circuit breakers PLHT and the upstream NZM up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond). Overload and short-circuit release unit NZM at max. value.

*) basically in accordance with EN 60898 D.5.2.b



Short circuit selectivity **characteristic C** towards NZM*) [kA]

| PLHT | NZM...1-A gL/gG | | | | | |
|-----------|-----------------|-----|-----|------|------|------|
| I_n [A] | 40 | 50 | 63 | 80 | 100 | 125 |
| 20 | 0.3 | 0.4 | 0.5 | 0.75 | 0.9 | 1.25 |
| 25 | 0.3 | 0.4 | 0.5 | 0.7 | 0.9 | 1.2 |
| 32 | | 0.4 | 0.5 | 0.7 | 0.85 | 1.2 |
| 40 | | | 0.5 | 0.6 | 0.85 | 1.1 |
| 50 | | | | 0.6 | 0.85 | 1.1 |
| 63 | | | | | 0.8 | 1 |
| 80 | | | | | | 1 |
| 100 | | | | | | |
| 125 | | | | | | |

Short circuit selectivity **characteristic D** towards NZM*) [kA]

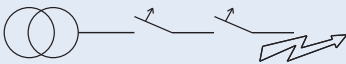
| PLHT | NZM...1-A gL/gG | | | | | |
|-----------|-----------------|----|----|----|-----|-----|
| I_n [A] | 40 | 50 | 63 | 80 | 100 | 125 |
| 50 | | | | | | |
| 63 | | | | | | |
| 80 | | | | | | |
| 100 | | | | | | |

no selectivity

Short Circuit Selectivity PLHT towards NZM 2

In case of short circuit, there is selectivity between the miniature circuit breakers PLHT and the upstream NZM up to the specified values of the selectivity limit current I_s [kA] (i. e. in case of short-circuit currents I_{ks} under I_s , only the MCB will trip, in case of short circuit currents above this value both protective devices will respond). Overload and short-circuit release unit NZM at max. value.

*) basically in accordance with EN 60898 D.5.2.b



Short circuit selectivity **characteristic C** towards NZM*) [kA]

| PLHT | NZM...2-A gL/gG | | | | | | | | |
|-----------|-----------------|-----|-----|------|------|------|------|-----|-----|
| I_n [A] | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 |
| 20 | 0.3 | 0.4 | 0.5 | 0.75 | 0.9 | 1.25 | 1.8 | 2.5 | 3.5 |
| 25 | 0.3 | 0.4 | 0.5 | 0.7 | 0.9 | 1.2 | 1.7 | 2.4 | 3.3 |
| 32 | | 0.4 | 0.5 | 0.7 | 0.85 | 1.2 | 1.65 | 2.3 | 3.2 |
| 40 | | | 0.5 | 0.6 | 0.85 | 1.1 | 1.5 | 2.1 | 2.9 |
| 50 | | | | 0.6 | 0.85 | 1.1 | 1.5 | 2 | 2.8 |
| 63 | | | | | 0.8 | 1 | 1.4 | 1.8 | 2.5 |
| 80 | | | | | | 1 | 1.4 | 1.8 | 2.4 |
| 100 | | | | | | | 1.3 | 1.7 | 2.3 |
| 125 | | | | | | | | 1.6 | 2.1 |

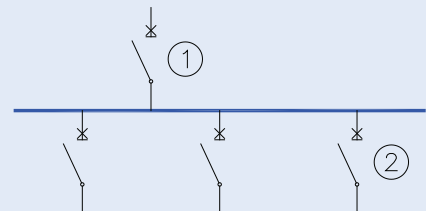
Short circuit selectivity **characteristic D** towards NZM*) [kA]

| PLHT | NZM...2-A gL/gG | | | | | | | | |
|-----------|-----------------|----|----|----|-----|-----|-----|-----|-----|
| I_n [A] | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 |
| 50 | | | | | | | 1 | 1.4 | 2.6 |
| 63 | | | | | | | 1 | 1.3 | 2.3 |
| 80 | | | | | | | | | 2.1 |
| 100 | | | | | | | | | |

no selectivity

Cascading of PLHT and NZM circuit breakers

- Cascading ensures proper function of downstream circuit breaker in circuits where prospective short circuit current exceeds breaking capacity of this breaker
- Effective system-based solution
- Cost and space saving
- Conditional breaking capacity acc. to EN 60947-2
- Values for 400 V AC



| Downstream breaker PLHT characteristics B, C, D ② | Upstream breaker ① | | | | | | |
|---|--|---------|---------|---------|---------|---------|---------|
| | I_n [A] | ≤ 160 | | | ≤ 250 | | |
| | Type | NZMB1-A | NZMN1-A | NZMH1-A | NZMB2-A | NZMN2-A | NZMH2-A |
| | I_{cu} [kA] 415 V AC | 25 | 50 | 100 | 25 | 50 | 150 |
| $I_n = 20 - 125$ A | Conditional breaking capacity of PLHT [kA] | 25 | 50 | 80 | 25 | 50 | 65 |

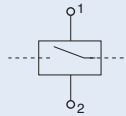
For types and art. numbers see page 42

Accessories for PLHT

Shunt Trip Release Z-LHASA

- Can be mounted subsequently onto MCB PLHT
- Contact position indicator red-green
- Marking labels can be fitted
- Wide range of operational voltage

Connection diagram



Technical Data

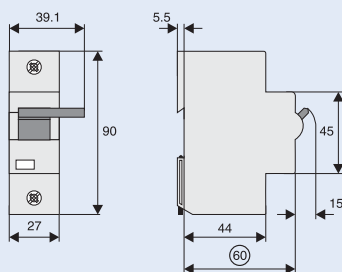
Electrical:

| | |
|--|------------|
| Operational voltage range | |
| Z-LHASA/230: | 110–415 V~ |
| Z-LHASA/24: | 12–60 V~ |
| Operational frequency | 50–60 Hz |
| Max. current consumption at point of switching on at U_n | |
| Z-LHASA/230: | 2 A |
| Z-LHASA/24: | 18 A |
| Minimum power consumption for Z-LHASA/24 | 90 VA |

Mechanical:

| | |
|---------------------------|--------------------------------------|
| Frame size | 45 mm |
| Device height | 90 mm |
| Device width | 27 mm |
| Mounting | quick fastening on DIN rail EN 60715 |
| Upper and lower terminals | lift terminals |

Dimensions [mm]



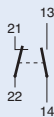
Note

Tripping release is equipped with auxiliary switch. The release is automatically disconnected from supply after tripping. That means that there can be continual voltage at the terminals 1 – 2 without risk of release damage.

Auxiliary Switch Z-LHK

- Auxiliary switch according to EN 60947-5-1
- Can be mounted subsequently

Connection diagram



Technical Data

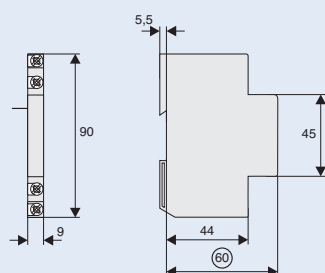
Electrical:

| | |
|----------------------------------|---|
| Rated operational current | (250 V~) 6 A/AC13 |
| Minimum operational voltage | 24 V each line |
| Rated thermal current I_{th} | 8 A |
| Rated insulation voltage (50 Hz) | 440 V~ |
| Maximum back-up fuse | 6 A gL or PL7-4./B-HS |
| Contacts | 1 NO + 1 NC |
| Utilisation category AC-13 | 6 A/250 V AC 2 A/440 V AC |
| Utilisation category DC-13 | 4 A/60 V DC 2 A/110 V DC 0.5 A/230 V DC |

Mechanical:

| | |
|--------------------------------|--|
| Frame size | 45 mm |
| Device height | 90 mm |
| Device width | 9 mm |
| Mounting | mounted onto protective devices |
| Degree of protection, built-in | IP40 |
| Upper and lower terminals | lift terminals |
| Terminal capacity | 1 x 1mm ² to 2 x 2.5mm ² |

Dimensions [mm]

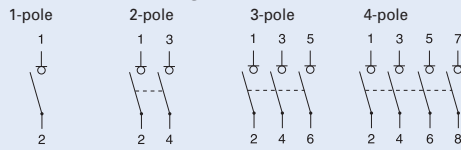


For types and art. numbers see page 44

Main Load Disconnecter Switch (Isolator) IS

- Can be used as a main switch of distribution boards

Connection diagram



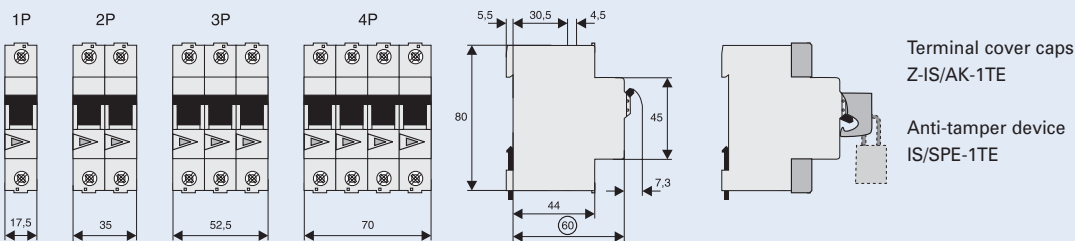
Technical Data

| | IS-16 | IS-20 | IS-25 | IS-32 | IS-40 | IS-63 | IS-80 | IS-100 | IS-125 |
|---|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Electrical: | | | | | | | | | |
| Design according to | EN 60947-3 | | | | | | | | |
| Rated voltage U_n | 240 / 415 V | | | | | | | | |
| Frequency | 50 / 60 Hz | | | | | | | | |
| Rated insulation voltage U_i | 690 V~ | | | | | | | | |
| Rated peak withstand voltage U_{imp} | 6 kV | | | | | | | | |
| Pollution degree | 3 | | | | | | | | |
| Rated short-time withstand current I_{cw} | 2 kA | | | | | | | | |
| Rated short-circuit making capacity I_{cm} | 2.8 kA | | | | | | | | |
| Rated current I_n | | | | | | | | | |
| 240/415 V, AC 21 B | 16 A | 20 A | 25 A | 32 A | 40 A | 63 A | 80 A | 100 A | 125 A |
| 240/415 V, AC 22 A | 16 A | 20 A | 25 A | 32 A | 40 A | 63 A | 80 A | 100 A | 125 A |
| 240/415 V, AC 23 A | 16 A | 20 A | 25 A | 32 A | 40 A | 63 A | 80 A | 100 A | 125 A |
| Number of poles | 1-, 2-, 3-, 4-pole | | | | | | | | |
| Maximum back-up fuse | 125 A gG | | | | | | | | |
| Short circuit strength - with back-up fuse acc. to the applicable rules | | | | | | | | | |
| EN 60947-3 | 12.5 kA | 12.5 kA | 12.5 kA | 12.5 kA | 12.5 kA | 12.5 kA | 12.5 kA | 6 kA | 6 kA |
| Endurance | | | | | | | | | |
| electrical comp. op. cycles | ≥ 3,000 | ≥ 3,000 | ≥ 3,000 | ≥ 3,000 | ≥ 3,000 | ≥ 3,000 | ≥ 3,000 | ≥ 3,000 | ≥ 2,000 |
| mechanical comp. op. cycles | ≥ 16,000 | ≥ 16,000 | ≥ 16,000 | ≥ 16,000 | ≥ 16,000 | ≥ 16,000 | ≥ 16,000 | ≥ 16,000 | ≥ 14,000 |

Mechanical:

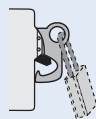
| | |
|-------------------------------------|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 17.5 mm / pole |
| Mounting | quick fastening with 2 lock-in positions on DIN rail EN 60715 |
| Degree of protection | IP10, with cover IP40 |
| Terminals | Twin-purpose terminals |
| Terminal capacity | 2.5–50 mm ² |
| Busbar thickness | 0.8–1 mm |
| Fastening torque of terminal screws | 2.5–5 Nm |
| Function | irrespective of the position of installation |
| Climatic endurance | IEC 60058 |

Dimensions [mm]



Switching interlock IS/SPE-1TE

- Without lock
- Also suitable for IS, PF7, PF6, PHF7, dRCM, PFL7, PFL6, mRB6, PFR

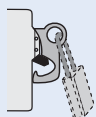


Terminal Cover Caps Z-IS/AK-1TE

- Can be sealed
- Modular design, width 1 MU

Switching interlock Z-IS/SPE-1TE

- Without lock
- Also suitable for PL7, PL6, Z-MS, ZP-A

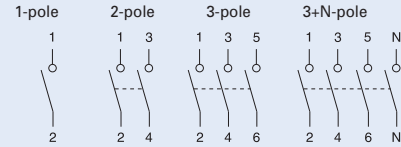


For types and art. numbers see page 46

Circuit Breaker ZP-A

- Design according to EN 60947-1, -3
- Number of poles: 1, 2, 3, 3N
- Rated current: 40 A, 63 A

Connection diagrams



Accessories:

| | | |
|---|------------|----------------|
| Auxiliary switch for subsequent installation | ZP-IHK | 286052 |
| | ZP-WHK | 286053 |
| Tripping signal contact for subsequent installation | ZP-NHK | 248437 |
| Shunt trip release | ZP-ASA/.. | 248438, 248439 |
| Undervoltage release | Z-USA/.. | 248289-248291 |
| Compact enclosure | KLV-TC-2 | 276240 |
| | KLV-TC-4 | 276241 |
| Additional terminal 35 mm ² | Z-HA-EK/35 | 263960 |
| Switching interlock Z-IS/SPE-1TE | 274418 | |

Technical Data

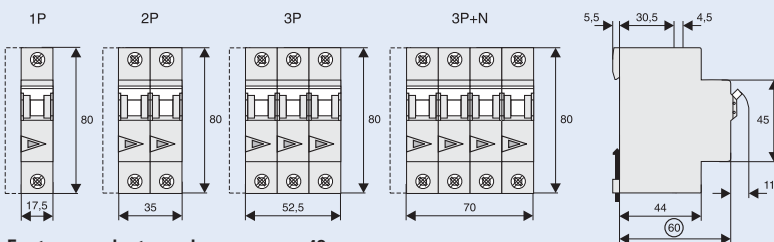
Electrical:

| | |
|--|--------------------------------------|
| Rated operational voltage U_e | 230/400 V AC |
| Rated frequency | 50 Hz |
| Rated insulation voltage U_i | 440 V AC |
| Rated peak withstand voltage U_{imp} | 4 kV (1.2/50 μ s) |
| Conventional thermal current I_{th} | |
| ZP-A40 | 40 A |
| ZP-A63 | 63 A |
| Utilisation category AC-22A | |
| Rated operational current I_e | 40 A AC, 63 A AC |
| Utilisation category AC-23A | |
| Rated operational current I_e | 16 A AC |
| Short circuit strength | |
| with back-up fuse 63 A gL | 3 kA (240 V, $\cos \varphi = 0,87$) |
| Endurance electrical comp. | $\geq 8,000$ operating cycles |
| mechanical comp. | $\geq 20,000$ operating cycles |

Mechanical:

| | |
|--------------------------------------|--------------------------------------|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 17.5 mm (1 MU) |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection | IP20 |
| Terminals | lift |
| Terminal protection | finger and hand touch safe |
| Terminal capacity | 1.5–25 mm ² |
| Terminal screws | M5 (PoziDrive) Z2 |
| Tightening torque of terminal screws | max. 2.4 Nm |

Dimensions [mm]



For types and art. numbers see page 42

Neutral Terminal, Feder Block Z-D..

- Compatible with all installation devices

Technical Data

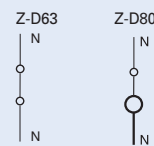
Electrical:

| | Z-D63 | Z-D63/P | Z-D80 |
|-----------------------|----------|--------------------------|----------|
| Rated current | 63 A | 63 A | 80 A |
| Frequency | 50–60 Hz | 50–60 Hz | 50–60 Hz |
| N-conductor test bush | - | 10 A, \varnothing 4 mm | - |

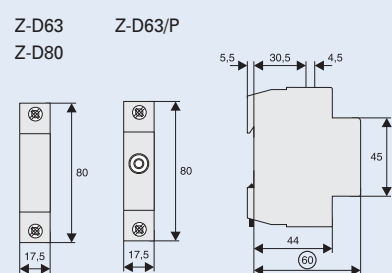
Mechanical:

| | |
|--------------------------------|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 17.5 mm (1 MU) |
| Mounting | quick fastening with 2 lock-in positions on DIN rail EN 60715 |
| Degree of protection, built-in | IP40 |
| Terminals | Twin-purpose (lift/open-mouthed) |
| Terminal capacity | |
| above | 1–25 mm ² |
| below | 1–25 mm ² |
| Terminal protection | finger and hand touch safe |
| Busbar thickness | 0.8–2 mm |

Connection diagrams



Dimensions [mm]



For types and art. numbers see page 46

MCB for Auxiliary Switch Circuits PL7-B4/-HS

- Design according to EN 60898
- Rated current 4 A, tripping characteristic B
- Very low let-through energy in order to prevent contact welding in auxiliary switches
- Suitable for auxiliary switches of all devices thermostats, control devices, timers, etc.
- Busbar connection to PL7, PL6, PF7, dRCM, PF6, PFL7, PFL6, mRB6

Connection diagram



Technical Data

PL7-B4/-HS

Electrical:

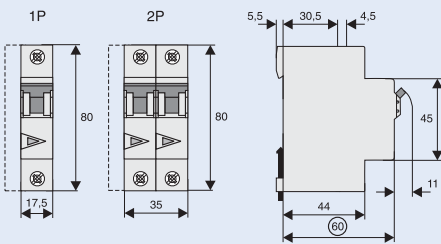
| | |
|-------------------------|------------|
| Number of poles | 1-, 2-pole |
| Rated voltage | 230/400 V |
| Frequency | 50/60 Hz |
| Rated current | 4 A |
| Rated breaking capacity | 10 kA |

Mechanical:

| | |
|-------------------------------------|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 17.5 mm (1 MU) |
| Mounting | quick fastening with 2 lock-in positions on DIN rail EN 60715 |
| Degree of protection, built-in | IP40 |
| Terminal protection | finger and hand touch safe |
| Terminals | Twin-purpose terminals |
| Terminal capacity | 1–25 mm ² |
| Terminal screws | M3 (Pozidrive) |
| Fastening torque of terminal screws | 0.8 – 1.0 Nm |
| Busbar thickness | 0.8 – 2 mm |

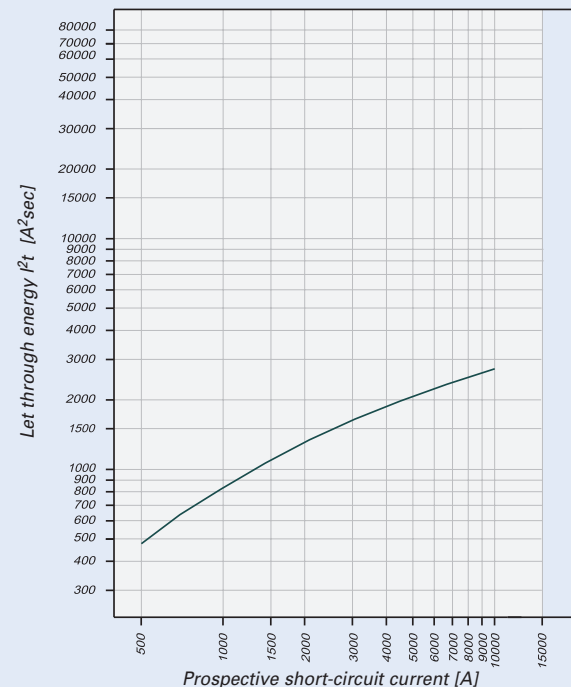
Dimensions [mm]

PL7-B4/-HS



Let-through Energy PL7-B4-HS

Characteristic B, 1-pole



For types and art. numbers see page 47

Note

MCB PL7-B4-HS is designed for protection of contacts of auxiliary switches and auxiliary circuits that must not be damaged with overloads. With respect to requirements of EN 60947-5, protection of auxiliary circuit must be ensured in order to prevent short circuit currents to be up 1000 A.

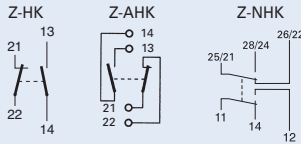
Suitable for:

- protection of auxiliary contacts of contactors
- protection of signaling circuits
- protection of electrical tripping contacts of power protective and switching devices

Auxiliary Switch Z-HK, Z-AHK; Tripping Signal Switch Z-NHK

- Design according to EN 60947-5-1, EN 62019
- Can be mounted subsequently (screws)
- The specified minimum voltages are per contact
Take into account particularly in case of series connection!
- **Z-AHK, Z-NHK:** Contact function with relative movement (self-cleaning contacts)
- Contact material and design particularly suitable for extra low voltage
- **Z-HK:** only for PF7, PFR, PHF7-4p, PF6 series
- **Z-AHK:** for devices PHF7-2p
- **Z-NHK:** Universal design for PHF7, PFR, PF7, PF6, dRCM
The function of one of the two change-over contacts (25/21, 26/22, 28/24) can be switched from "auxiliary switch" to "tripping signal switch" by means of SEL driver.
- Auxiliary switch (11, 12, 14; 21, 22, 24) is active with both electrical and mechanical tripping
- Tripping signal switch (25, 26, 28) is active with electrical tripping only
- Test key for check of proper function of tripping signal contacts
- Contact position indicator blue-white

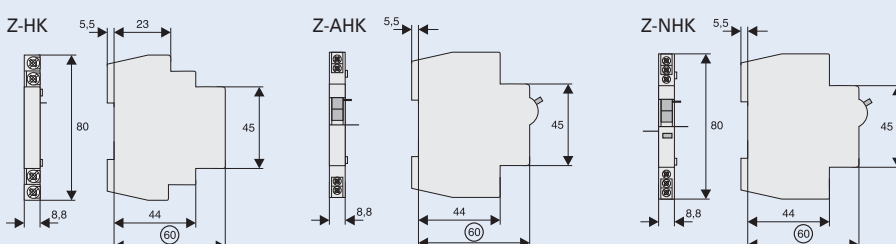
Connection diagrams



Technical Data

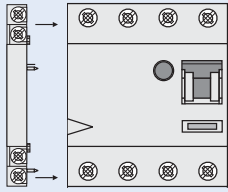
| | Z-HK | Z-AHK | Z-NHK |
|---|---|-------------------------|---------------------------|
| Electrical: | | | |
| Can be mounted from the left onto | PF7, PF6, PFR, PFH7-4p, dRCM | PHF7-2p | – |
| Can be mounted from the right onto | – | – | PF7, PF6, PFR, PHF7, dRCM |
| Contact function | 11 | 11 | 2 CO |
| Rated voltage | 250 V | 250 V | 250 V |
| Frequency | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Rated current | 8 A | 4 A | 4 A |
| Rated thermal current I_{th} | 8 A | 4 A | 4 A |
| Utilisation category AC-13 | | | |
| Rated operational current I_e | 6 A/250 V AC 2 A/440 V AC | 3 A/250 V AC – | 3 A/250 V AC – |
| Utilisation category AC-15 | | | |
| Rated operational current I_e | – | 2 A/250 V AC | 2 A/250 V AC |
| Utilisation category DC-12 | | | |
| Rated operational current I_e | – | 0.5 A/110 V DC | 0.5 A/110 V DC |
| Utilisation category DC-13 | | | |
| Rated operational current I_e | 0.5 A/230 V DC 2 A/110 V DC 4 A/60 V DC | – – – | – – – |
| Rated insulation voltage U_i | 250 V AC | 250 V AC | 250 V AC |
| Minimum operational voltage per contact U_{min} | 24 V AC/DC | 5 V DC | 5 V DC |
| Minimum operational current I_{min} | 50 mA AC/DC | 10 mA DC | 10 mA DC |
| Rated peak withstand voltage U_{imp} (1,2/50µs) | 2.5 kV | 2.5 kV | 2.5 kV |
| Conditional short circuit current I_k | | | |
| with back-up fuse 6 A or PL7-B4-HS | – | 1 kA | 1 kA |
| Max. back-up fuse, overload and short circuit | 8 A gL / PL7../B-HS | 6 A gL / PL7../B-HS | 6 A gL / PL7../B-HS |
| Mechanical: | | | |
| Tripping indicator "electrical tripping" | – | – | blue/white |
| Frame size | 45 mm | 45 mm | 45 mm |
| Device height | 80 mm | 80 mm | 80 mm |
| Device width | 8.8 mm (0.5 MU) | 8.8 mm (0.5 MU) | 8.8 mm (0.5 MU) |
| Mounting | onto switching dev. onto switching dev. onto switching dev. | | |
| Degree of protection, built-in | IP40 | IP40 | IP40 |
| Terminal protection | finger and hand touch safe | | |
| Terminals | lift terminals | lift terminals | lift terminals |
| Terminal capacity | 0.5–2.5 mm ² | 0.5–2.5 mm ² | 0.5–2.5 mm ² |
| Terminal screws | M3 (Pozidrive Z0) | M3 (Pozidrive Z0) | M3 (Pozidrive Z0) |
| Fastening torque of terminal screws | max. 0.8–1.0 Nm | max. 0.8–1.0 Nm | max. 0.8–1.0 Nm |

Dimensions [mm]



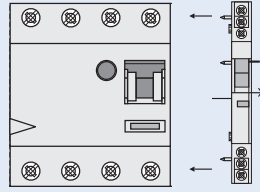
For types and art. numbers see page 47

Example: Z-HK + PF7



1+1 24 V 50 mA min.

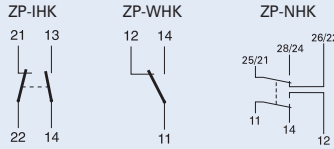
Example: PF7 + Z-NHK



Auxiliary Switch ZP-IHK, ZP-WHK, Tripping Signal Switch ZP-NHK

- Design according to EN 62019
- Snap-on mounting, can be mounted onto PL7, PFL7, PL6, PFL6 and mRB6 subsequently
- The specified minimum voltages are per contact. Take into account particularly in case of series connection!
- **ZP-NHK:** Contact function with relative movement (self-cleaning contacts)
- Contact material and design particularly suitable for extra low voltage
- **ZP-IHK, ZP-WHK:** 2 switches can be mounted onto itself thanks to mechanical design (2 x ZP-IHK, 2 x ZP-WHK or 1 x ZP-IHK + 1xZP-WHK)
- **ZP-NHK:** Universal design for PL7, PFL7, PL6, PFL6 and mRB6. The function of one of the two change-over contacts (21/25, 22/26, 24/28) can be switched from "auxiliary switch" to "tripping signal switch" by means of SEL driver.
- Auxiliary switch (11, 12, 14; 21, 22, 24) is active with both electrical and mechanical tripping
- Tripping signal switch (25, 26, 28) is active with electrical tripping only
- Test key for check of proper function of tripping signal contacts

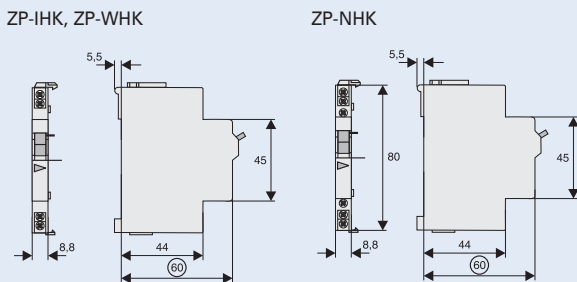
Connection diagrams



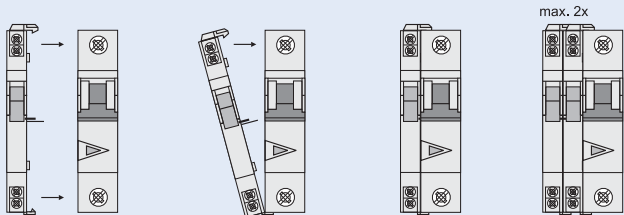
Technical Data

| | ZP-IHK | ZP-WHK | ZP-NHK |
|--|--|--|--|
| Electrical: | | | |
| Can be mounted from the left onto | PFL7, PFL6, PL7, PL6, mRB6 ZP-A.., ZP-ASA, Z-MS 1xZP-IHK, 1xZP-WHK | PFL7, PFL6, PL7, PL6, mRB6 ZP-A.., ZP-ASA, Z-MS 1xZP-IHK, 1xZP-WHK | PL7, PFL7, PL6, PFL6, mRB6, ZP-A.., ZP-ASA Z-MS, 1xZP-IHK, 1xZP-WHK |
| Contact function | 1 NO + 1 NC | 1 CO | 2 CO |
| Rated voltage | 250 V | 250 V | 250 V |
| Frequency | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Rated current | 6 A | 6 A | 4 A |
| Rated thermal current I_{th} | 6 A | 6 A | 4 A |
| Utilisation category AC-13 | | | |
| Rated operational current I_e | 3 A/250 V AC | 3 A/250 V AC | 3 A/250 V AC |
| Utilisation category AC-15 | | | |
| Rated operational current I_e | 2 A/250 V AC | 2 A/250 V AC | 2 A/250 V AC |
| Utilisation category DC-12 | | | |
| Rated operational current I_e | 0.5 A/110 V DC | 0.5 A/110 V DC | 0.5 A/110 V DC |
| Rated insulation voltage U_i | 250 V AC | 250 V AC | 250 V AC |
| Minimum operational voltage per contact U_{min} | 5 V DC | 5 V DC | 5 V DC |
| Minimum operational current I_{min} | 10 mA DC | 10 mA DC | 10 mA DC |
| Rated peak withstand voltage U_{imp} (1,2/50 μ s) | 2.5 kV | 2.5 kV | 2.5 kV |
| Conditional short circuit current I_k with back-up fuse 6A or PL7-B4-HS | 1 kA | 1 kA | 1 kA |
| Max. back-up fuse, overload and short circuit | 6 A gL / PL7-B4-HS | 6 A gL / PL7-B4-HS | 6 A gL / PL7-B4-HS |
| Mechanical: | | | |
| Tripping indicator "electrical tripping" | - | - | blue/white |
| Frame size | 45 mm | 45 mm | 45 mm |
| Device height | 80 mm | 80 mm | 80 mm |
| Device width | 8,8 mm (0.5 MU) | 8,8 mm (0.5 MU) | 8.8 mm (0.5 MU) |
| Mounting | onto DIN rail EN 60715 | | |
| Degree of protection, built-in | IP40 | IP40 | IP40 |
| Terminal protection | finger and hand touch safe | | |
| Terminals | lift terminals | lift terminals | lift terminals |
| Terminal capacity | 0.5–2.5 mm ² | 0.5–2.5 mm ² | 0.5–2.5 mm ² |
| Terminal screws | M4 (Pozidrive Z2) | M4 (Pozidrive Z2) | M3 (Pozidrive Z2) |
| Fastening torque of terminal screws | max. 1.2 Nm | max. 1.2 Nm | max. 0.8–1.0 Nm |

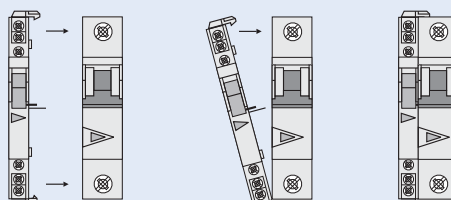
Dimensions [mm]



Example: ZP-IHK (ZP-WHK) + PL7



Example: ZP-NHK + PL7



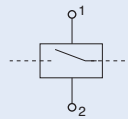
For types and art. numbers see page 48

Shunt Trip Release ZP-ASA

- Remote release for subsequent mounting onto PL7, PFL7, PL6, PFL6, mRB6, ZP-A40, ZP-A63, Z-MS
- Module width 1 MU
- Additional installation of standard auxiliary switch is possible
- Tripping release is equipped with auxiliary switch. The release is automatically disconnected from supply after tripping. That means that there can be continual voltage at the terminals 1 – 2 without risk of release damage.

- Position indicator red - green
- Type ZP-ASA for snap-on mounting

Connection diagram

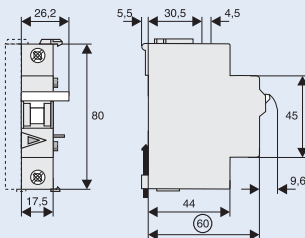


Technical Data

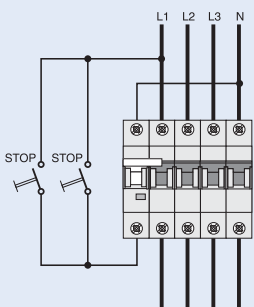
| | ZP-ASA/24 | ZP-ASA/230 |
|------------------------------------|---|---|
| Electrical: | | |
| Can be mounted onto: | PL7, PFL7, PL6, PFL6, mRB6 ZP-A., Z-MS | PL7, PFL7, PL6, PFL6, mRB6 ZP-A., Z-MS |
| Operational voltage range | 12–110 V AC 12–60 V DC | 110–415 V AC 110–220 V DC |
| Frequency | 50/60 Hz | 50/60 Hz |
| Tripping time | < 20 ms | < 20 ms |
| Min. length of pulse | 15 ms | 10 ms |
| Internal resistance | 2.2 Ω | 215 Ω |
| Max. back-up fuse | 16 A gL | 16 A gL |
| Max. tripping current AC / DC [A] | 15 / 21 | 2.1 / 1 |
| Possible standard auxiliary switch | ZP-NHK | ZP-NHK |
| Mechanical: | | |
| Frame size | 45 mm | 45 mm |
| Device height | 80 mm | 80 mm |
| Device width | 17.5 mm (1 MU) | 17.5 mm (1 MU) |
| Mounting | quick fastening with 2 lock-in positions | on DIN rail EN 60715 |
| Degree of protection, built-in | IP40 | IP40 |
| Terminal protection | finger and hand touch safe | |
| Terminals | open mouthed/lift + guide | open mouthed/lift + guide |
| Terminal capacity | 1–25 mm ² | 1–25 mm ² |

Dimensions [mm]

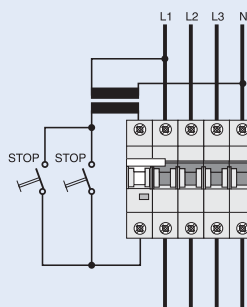
ZP-ASA



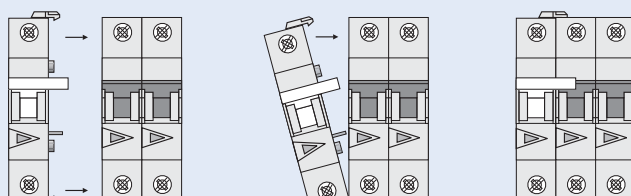
Connection Example 230 V



Connection Example 24 V



Example: ZP-ASA + PL7

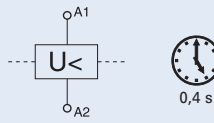


For types and art. numbers see page 48

Undervoltage Release Z-USA, Z-USD

- Tripping:
 - Instantaneous Z-USA
 - Delayed Z-USD typ. 0.4 s
- Voltage control indicator blue/white
- Service key for zero voltage switch-on for testing purposes
- Can be used with PL7, ZP-A40, Z-MS and PL6
- Screw mounting

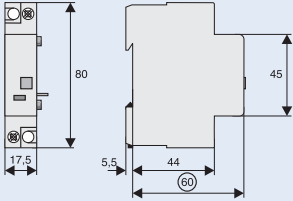
Connection diagram



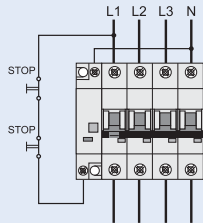
Technical Data

| | Z-US./115 | Z-US./230 | Z-US./400 |
|--------------------------------|--------------------------------------|-------------------------|---------------------------|
| Electrical: | | | |
| Rated voltage U_n | 115 V AC | 230 V AC | 400 V AC |
| Frequency | 50–60 Hz | 50–60 Hz | 50–60 Hz |
| Making threshold | 80 % of U_n | 80 % of U_n | 80 % of U_n |
| Tripping threshold | 50 % of U_n | 50 % of U_n | 50 % of U_n |
| Mechanical: | | | |
| Frame size | 45 mm | 45 mm | 45 mm |
| Device height | 80 mm | 80 mm | 80 mm |
| Device width | 17.5 mm (1 MU) | 17.5 mm (1 MU) | 17.5 mm (1 MU) |
| Mounting | quick fastening on DIN rail EN 60715 | | |
| Degree of protection, built-in | IP40 | IP40 | IP40 |
| Terminals | open mouthed/lift | open mouthed/lift | open mouthed/lift |
| Terminal capacity | 1–2x2.5 mm ² | 1–2x2.5 mm ² | 1 - 2x2.5 mm ² |
| Terminal protection | finger and hand touch safe | | |

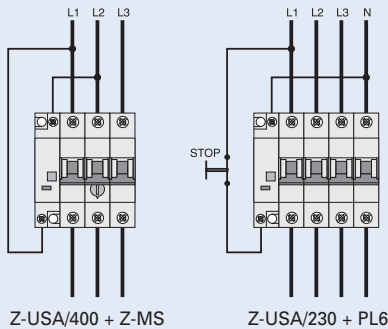
Dimensions [mm]



Connection Example Release



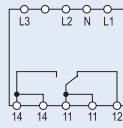
Connection Examples 400 V and 230 V



Undervoltage Relay Z-UR/400

- When the connection to the three phases and neutral is made the relay picks up in case there is no fault and the LED lights. If the monitored nominal voltage U_n drops under the release value U_s , in one, two or all three phases the relay reverts to its open position. The LED extinguishes.
- Single-phase operation: bridge L1-L2-L3.

Connection diagram



Technical Data

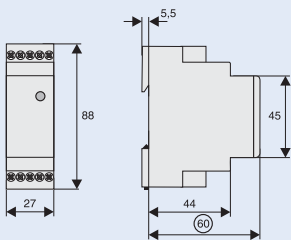
Electrical:

| | |
|---------------------------------|---------------------------------------|
| Rated operational voltage | 230/400 V AC |
| Rated frequency | 50–60 Hz |
| Switching voltage U_s (fixed) | $U_n \times 0.85$ (for $U_n = 230$ V) |
| Power consumption | < 3 VA |
| Power loss | 0.5 W |
| Operational again after | approx. 200 ms |
| Responding delay | approx. 400 ms |
| Switching contact | 1 CO |
| Rated insulation voltage U_i | 250 V AC |
| Rated current I_e | 5 A, AC-11, AC-12 |
| Switching capacity | 2000 VA |
| Rated impulse withstand voltage | 4 kV |
| Duty | 100 % |
| Overvoltage category | III |
| Test voltage | |
| Feed - relay (1.2/50) μ s | 4 kV |
| Relay - relay (1.2/50) μ s | 2.5 kV |

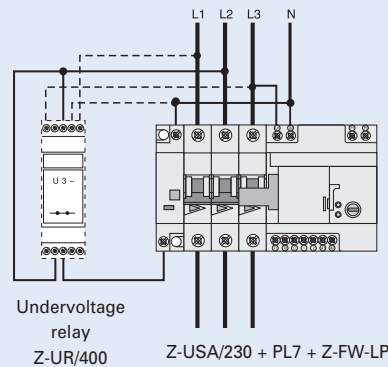
Mechanical:

| | |
|--------------------------------------|--------------------------------------|
| Frame size | 45 mm |
| Device height | 88 mm |
| Device width | 27 mm |
| Weight | 95 g |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection | IP40 |
| Upper and lower terminals | lift terminals |
| Terminal capacity | |
| rigid | 0.14–4 mm ² |
| flexible | 0.14–2.5 mm ² |
| Tightening torque of terminal screws | 0.5–0.7 Nm |
| Resistance to climatic conditions | F/DIN 40040 |
| Perm. ambient temperature range | -25 to +60 °C |
| Flame class | V0, glow wire 960 °C |
| Pollution degree (EN 60947) | 2 |

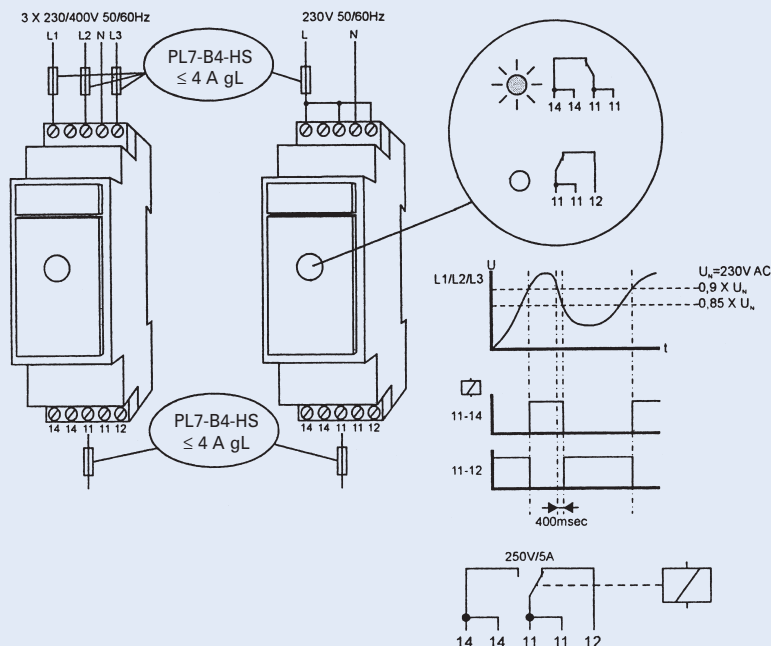
Dimensions [mm]



Connection Example



Switching Status Diagramm

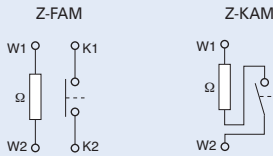


For types and art. numbers see page 49

RCD Tripping Module Z-FAM, Z-KAM

- For remote switch-off of RCDs, standard and electronic combined RCD/MCB devices
- Remote switch-off by one or several parallel potential-free contacts, e.g. pushbutton max. rated current 3 A at 250 V
- Can be mounted subsequently
- No undesired voltage rise in the consumer system during remote switch-off thanks to integrated breaker contact K1-K2

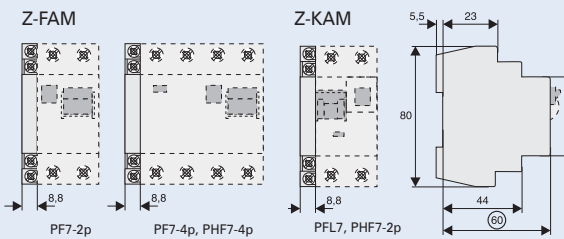
Connection diagram



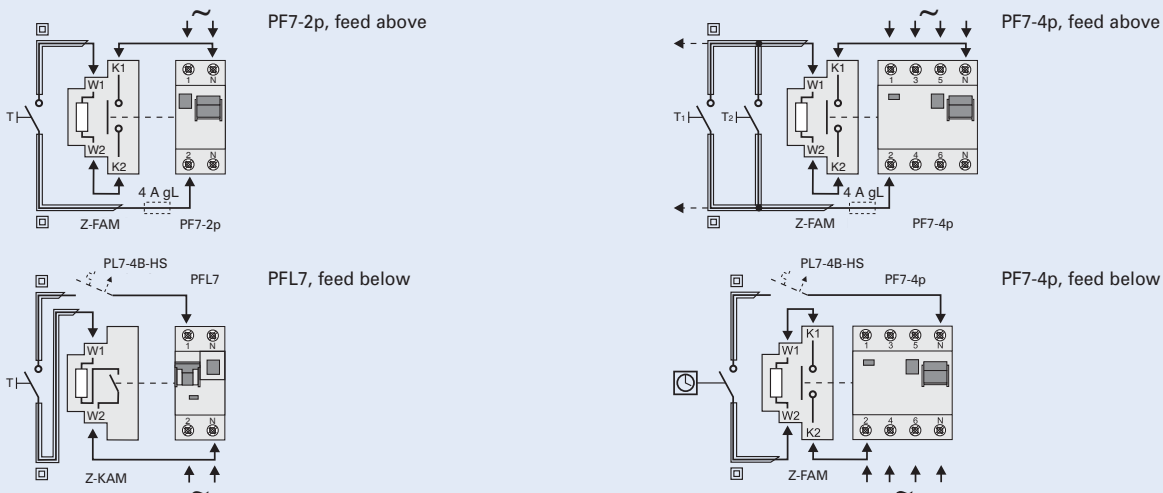
Technical Data

| | Z-FAM | Z-KAM |
|---------------------------------------|----------------------------|-------------------------|
| Electrical: | | |
| Tripping module for | PF6, PF7, PHF7-4p | PFL6, PFL7, PHF7-2p |
| Rated voltage | 230 (400) V AC | 230 (400) V AC |
| Frequency | 50–60 Hz | 50–60 Hz |
| Rated tripping current $I_{\Delta n}$ | 0.01–0.3 A | 0.01–0.3 A |
| Function | 1 NO | 1 NO |
| Mechanical: | | |
| Frame size | 45 mm | 45 mm |
| Device height | 80 mm | 80 mm |
| Device width | 8.8 mm (0.5 MU) | 8.8 mm (0.5 MU) |
| Degree of protection, built-in | IP40 | IP40 |
| Terminal capacity | 1–2x2.5 mm ² | 1–2x2.5 mm ² |
| Terminal protection | finger and hand touch safe | |

Dimensions (mm)



Connection examples: Lay lines to the switching devices with double insulation and overload protection, e.g. 4A gL or CLS6-4...HS

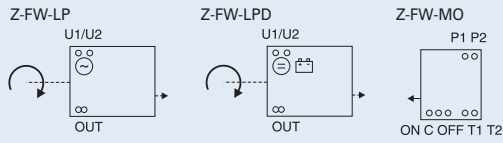


For types and art. numbers see page 49

Automatic Switching Device Z-FW-LP, Z-FW-LPD, Remote Control Module Z-FW-MO

- Shape compatible switching device suitable for subsequent installation for automatic re-setting and remote control of PL6, PF6, PL7, PF7, PHF7-4p, ZP-A40, ZP-A63, PFR, Z-MS, dRCM and mRB6
- **Z-FW-LP, Z-FW-LPD** for automatic repeated switching
- Mechanical interlock, can be sealed with leads
- Mechanical switching capability up to max. PF7-100/4p, PL7-63/3p+N, PL6-63/3p
- Operating and alarm display by green and red LED
- **Z-FW-MO**: remote control module for automatic switching device. Enables also remote testing of RCDs.
- **Z-FW-MO**: supplied as pre-mounted sets with Z-FW-LP(D)

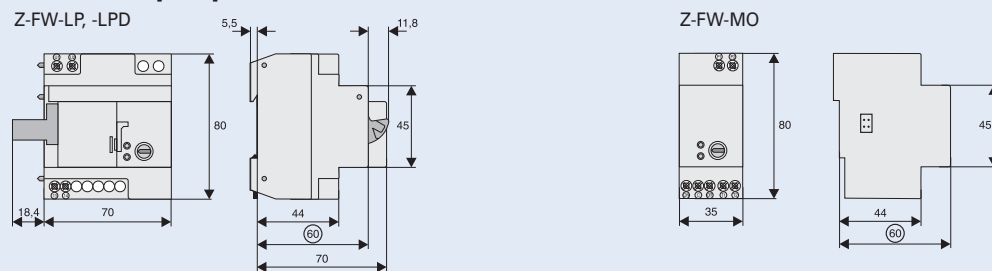
Connection diagrams



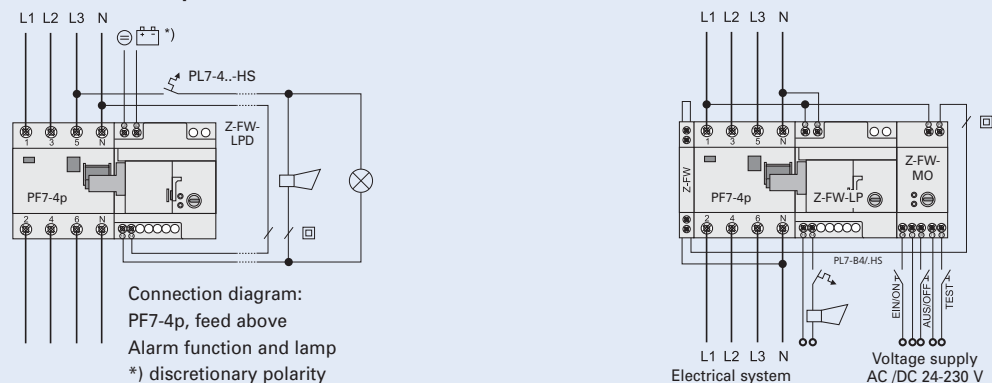
Technical Data

| | Z-FW-LP | Z-FW-LPD | Z-FW-MO |
|--|---|--|----------------|
| Electrical: | | | |
| Possible operating voltages | 220–240 V AC | 24–48 V DC | – |
| Frequency | 50/60 Hz | – | – |
| Control voltage for remote control | – | – | 24–230 V AC/DC |
| Relay output for tripping test with Z-FW | – | – | 400 V AC max. |
| Relay output for alarm, potential-free | 5 A/250 V AC | 5 A/250 V AC | – |
| Functions | automatic restarting | automatic restarting | +ON/OFF/TEST |
| Function selector | Automatic 5x OFF/RESET | Automatic 5x OFF/RESET | ON, OFF/RESET |
| Min. pulse duration | 1 s: 50 Hz, 3 s: < 50 Hz | | |
| Resetting times | ≤ 20 s; 30 s; 70 s; 10 min.; 1 hod | | |
| Switching delay time after command | ≤ 25 s | | |
| Ready for receiving switching command | 40 s after switching on power supply voltage | | |
| Max. current consumption | 35 mA ^{*)} | 380 mA / 24 V ^{*)} 140 mA / 48 V ^{*)} | 3,5 mA |
| Power consumption | 3.5 W ^{*)} | 0.8 W ^{*)} | 17 mW |
| ^{*)} In set with Z-FW-MO | | | |
| Mechanical: | | | |
| Frame size | 45 mm | 45 mm | 45 mm |
| Device height | 80 mm | 80 mm | 80 mm |
| Device width | 70 mm | 70 mm | 35 mm |
| Mounting | quick fastening with 2 lock-in positions on DIN rail EN 60715 | | |
| Degree of protection, built-in | IP40 | IP40 | IP40 |
| Terminal protection | finger and hand touch safe | | |
| Terminals | lift terminals | | |
| Terminal capacity | 2 x 1.5 mm ² oder 1 x 2.5 mm ² | | |
| Scope of delivery | – | – | Coupling plug |
| Range of operation temperatures | -25 to +40 °C | -25 to +40 °C | -25 to +40 °C |

Dimensions [mm]

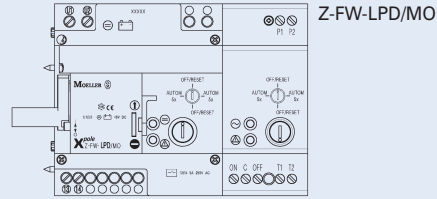
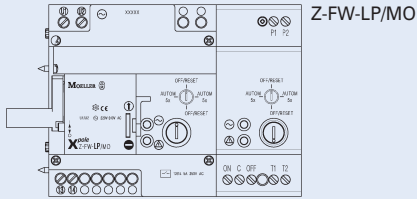


Connection examples



For types and art. numbers see page 50

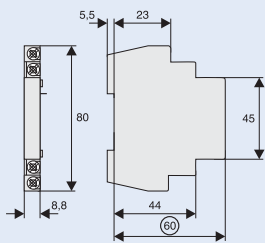
Pre-mounted Sets



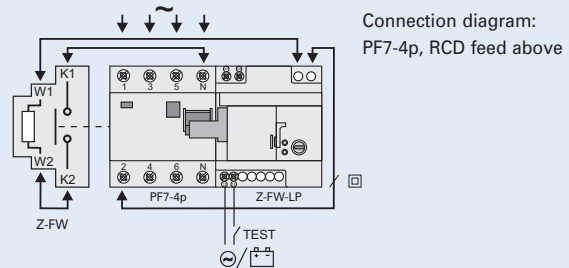
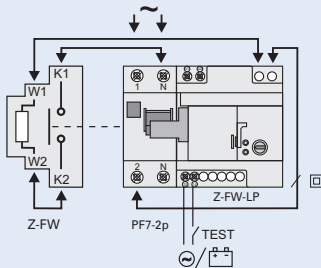
Remote Testing Module Z-FW (for Z-FW-LP)

- External testing module with testing resistor for RCDs
- Proper "external" test key function according to the applicable rules thanks to design adapted to the rated tripping current
- For remote testing with remote control and automatic switching device Z-FW-LP
- No undesired voltage rise in the consumer system during remote switch-off thanks to integrated breaker contact K1-K2
- Can also be used as a remote tripping module for PF, PHF7

Dimensions [mm]



Connection examples



Communication Center Z-CC

- Compact remote monitoring and controlling unit
- The Communication Center keeps you informed for example, when the RCD has tripped or when the room temperature in your weekend cottage is too low.
- Connect your alarm lines from fire detectors or security systems to the Communication Center directly.
- Switch pumps, heating systems or other devices with your mobile phone by SMS.
- The device can be fully configured via SMS (optionally it can be configured via the Web-Browser of a connected PC)
- Integrated quad-band GSM modem
- 4 Digital inputs
- 2 Relay outputs
- Activated inputs triggers sending of SMS messages and e-mails up to 3 phone numbers and one e-mail address
- Controlling outputs via SMS
- The current status can be checked by SMS anytime
- Compatible with SIM cards of all common mobile communication providers (no SIM lock)
- It is also possible to check the current credit available on prepaid phone cards
- Connection to customer's network is possible
- Permanent intern control of the modem - functions are shown on the front LEDs

Accessories:

| | |
|--|--------|
| Power supply unit 24 V EASY200-POW | 229424 |
| Temperature sensor Z-CC/2CO-SE | 119430 |
| Cross-over patch cord | |
| CAT5e 2 m DNW-PX/0200/RJ45/RJ45/5E/CSUTP/GR/PV | 237271 |

Technical Data

Electrical:

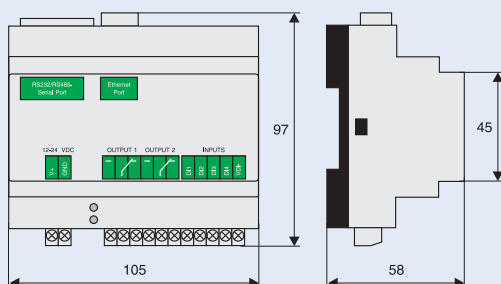
| | |
|--------------------|---|
| Power supply | 12 – 24 V DC (min. 10 V DC up to a max. of 30 VDC) |
| Power consumption | 1.5 W up to a max. of 6 W |
| Temperature sensor | d = 15.8 mm, length 106mm, cable of 1.4 m length incl. 9-pole sub-D-plug for RS232 connector |
| Measuring range | -10 °C to +50 °C |
| Accuracy | +/- 2 °C |
| Outputs | 2 potential-free relay outputs AC: 5 A at 250 V AC DC: 5 A up to 30 V DC, 0.3 A up to 110 V DC, 0.12 A up to 220 V DC Max. switching capacity AC15 at 230 V AC: 500 VA |
| Inputs | 4, max. 24 V DC galvanically separated (optical coupler) |
| Ethernet interface | For parameterization via a PC (Web-Browser). Connection to the PC by means of a cross-over network cable (DNWPX/0200/RJ45/RJ45) |
| RS232 interface | 9-pole sub-D-plug; for connecting an external temperature sensor |
| Green LED ON | Modem Status LED (LED flashes every 3 seconds during registration at the GSM-net) |
| Red LED ON | Modem Activity LED (LED flashes when a SMS is sended or received) |

Mechanical:

| | |
|--------------------------------|--|
| Frame size | 45 mm |
| Device height | 97 mm |
| Device width | 105 mm |
| Mounting | Quick-fastening for DIN rail EN 60715 |
| Degree of protection, built-in | IP40 |

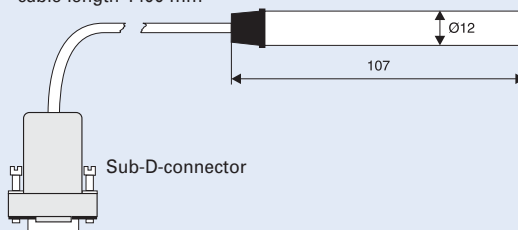
Dimensions [mm]

Communication Center Z-CC/2CO



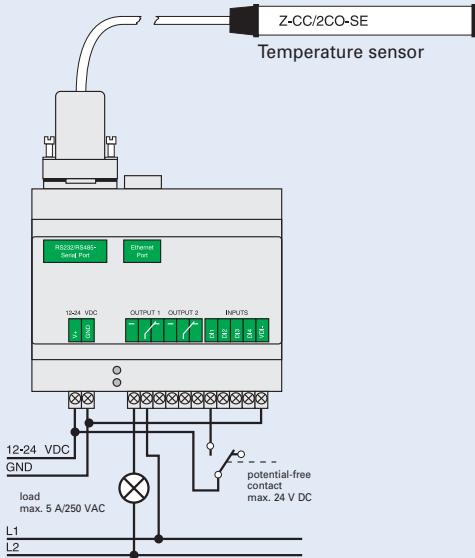
Temperature sensor Z-CC/2CO-SE

cable length 1400 mm



For types and art. numbers see page 50

Basic circuit



PC configuration

Message settings

| | |
|--------------------------------------|-----------------------|
| Input 1 sends the following message: | RCD has tripped! |
| Input 2 sends the following message: | Smoke detector alert! |
| Input 3 sends the following message: | Door contact alert! |
| Input 4 sends the following message: | Water detector alert! |

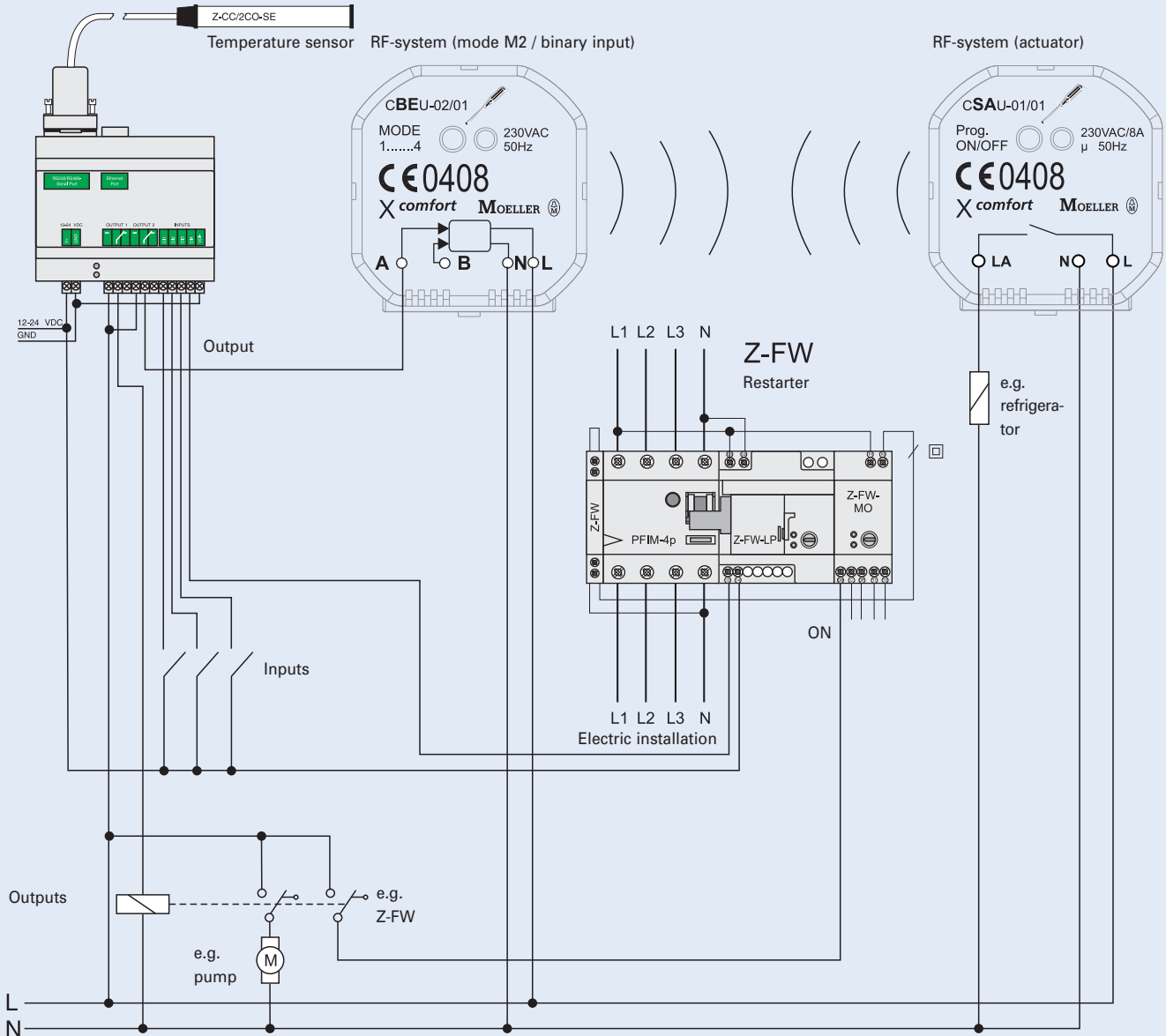
The above-listed messages will be sent to the following phone numbers, for example (max. 3):
+436501234567, +436761234567, +436641234567

The above-listed messages will be sent to the following e-mail address, for example:

john.smith@chello.at

Save

Application example

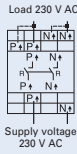


For types and art. numbers see page 50

Bioswitch FFS/16

- Line voltage LED
- AUTOMATIC ON/OFF switch
- All-pole disconnection
- 2 contacts NO
- Not suitable for consumers with electronic control

Connection diagram



Technical Data

Electrical:

| | |
|-----------------------|--|
| Rated voltage | 230 V AC |
| Tolerance | -15% to +10% |
| Rated frequency | 48 - 63 Hz |
| Rated consumption | 11 VA (1.6 W) |
| Duration of operation | 100% |
| Detecting voltage | 200 - 250 mV DC |
| Current consumption | 32 mA |
| Making current | 5 - 200 mA |
| Breaking current | fix, approx. 70% of making current |
| Drop-out voltage | > 10% of the rated voltage |
| Tripping delay | fixed, approx. 6 s |
| Rise time | fixed, approx. 0.5 s |
| Base accuracy | ±10% (of max. scale value) |
| Green LED ON | indication of supply voltage |
| Yellow LED ON | indication of relay output |
| Output circuit | 2 potentialfree contacts NO |
| Switching capacity | 4000 VA (16 A / 250 V AC) |
| Back-up fuse | 16 A |
| Mechanical life | 30 x 10 ⁶ operations |
| Electrical life | 2 x 10 ⁵ operations at 1000 VA resistive load |

Mechanical:

| | |
|--------------------------------|--|
| Frame size | 45 mm |
| Device height | 87 mm |
| Device width | 35 mm |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection, built-in | IP40 |
| Installation | in any position |
| Terminal protection | finger and hand touch safe |
| Torque | max. 1 Nm |
| Terminal capacity | 1 x 0.5-4 mm ² 2 x 0.5-2.5 mm ² |
| Ambient temperature | -25 °C to +55 °C |
| Storage temperature | -25 °C to +70 °C |
| Relative humidity | 15 % to 85 % acc. to IEC 721-3-3 class 3K3 |
| Degree of pollution | 2 |
| If built-in | 3 (acc. to IEC 664-1) |

Switching frequency
 at 100 VA resistive load max. 60/min
 at 1000 VA resistive load max. 6/min
 (according to IEC 664-1)

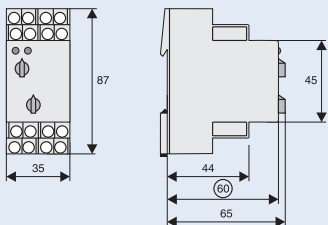
Rated insulating voltage 250 V AC
 (according to IEC 664-1)

Rated surge voltage 4 kV

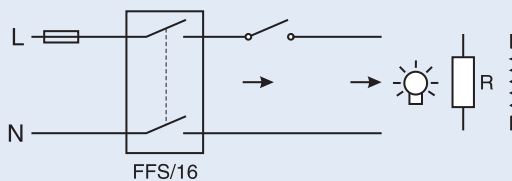
Overvoltage cat. III
 (according to IEC 664-1)

Base load resistor Z-NKA... if high-impedance consumers are connected to a "Bio-switch", the ZNKA... is needed. By pressing the button, the Z-NKA... is activated for 5 minutes. As long as any consumer is still switched on, the automatic deactivating of the Z-NKA... will have no effect.

Dimensions [mm]

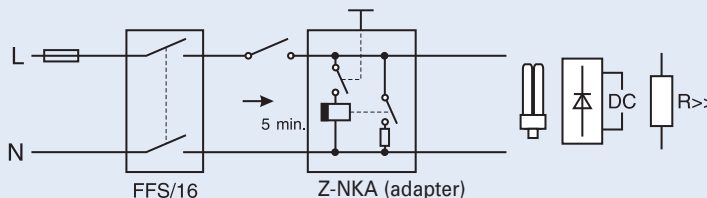


Connection Example



The Z-NKA... is only necessary for electronic loads with inrush currents below the adjusted I_{ON} of the FFS/16 (high-impedance consumers).

Note: The base load resistor has to be connected in parallel to the load.



I_{ON} = 5 mA ... 200 mA ~ μ 230 V ~ 16 A ~
 I_{OFF} = 0,7 x I_{ON} max. 1000 W ☼

For types and art. numbers see page 50

Front Plate Tripping Device Z-MFPA

- Mechanical tripping device for PL6, PFL6, ZP-A40, ZP-A63, PL7, PFL7
- Responds when the front plate of a distribution box is removed
- Maximum tripping capacity: 4 + 4 poles symmetrically (4 left + 4 right)
- Can be interlocked by twisting when the tripping pin is in the pressed position (service works)
- Meets requirements of standards for automatic disconnection from power supply if front plate of distribution box is removed (see HD 60364-4-41, cl. 412.2.4, EN 60439-1, cl. 7.4.2.2.3b)

Function Diagram

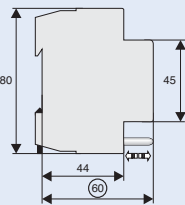
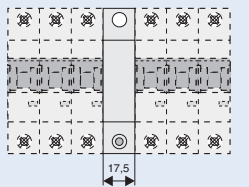


Technical Data

Mechanical:

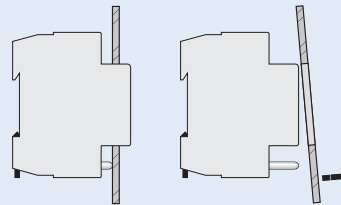
| | |
|--------------------------------|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 17.5 mm |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection, built-in | IP40 |

Dimensions [mm]



max. 4 poles max. 4 poles

Function



mechanical tripping of connected devices

Protective Earth Socket Z-SD230

- Design according to VDE, ÖVE, ČSN
- Screw fastening is possible
- Width 2.5 MU
- Model -BS with child protection device and earth pin

Connection diagram



Technical Data

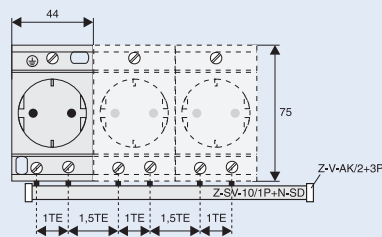
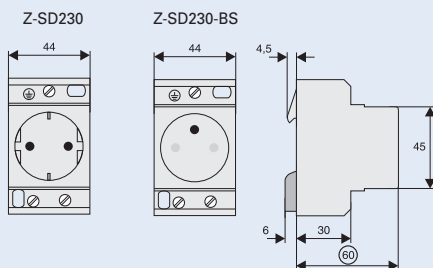
Electrical:

| | |
|---------------|----------|
| Rated voltage | 250 V AC |
| Rated current | 10/16 A |

Mechanical:

| | |
|--------------------------------|---|
| Frame size | 45 mm |
| Device height | 76 mm |
| Device width | 44 mm |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection, built-in | IP40 |
| Upper and lower terminals | lift terminals |
| Terminal capacity | 1 to 2x2.5 mm ² |

Dimensions [mm]

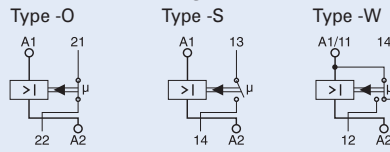


For types and art. numbers see page 51

Priority-(Current) Relay Z-LAR/

- For simple priority connection of important consumers
- For fast current increase
- Expensive peak loads are avoided efficiently (staggered heating)
- Integrated auxiliary switch, 1 NC or 1 NO or 1 CO contact
- NC and NO contact are potential free

Connection diagram



Technical Data

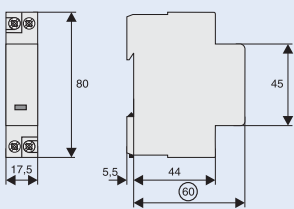
| | Z-LAR/8 | Z-LAR/16 | Z-LAR/32 |
|--|--------------------------|------------------|------------------|
| Electrical: | | | |
| Nominal thermal current I_{th} | 8 A | 16 A | 32 A |
| Rated voltage U_n | 250 V AC | 250 V AC | 250 V AC |
| Responding current I_{AN} | ≥ 3 A | ≥ 10 A | ≥ 15 A |
| Release current I_A | ≤ 1.8 A | ≤ 4.2 A | ≤ 7.4 A |
| Max. electrical switching frequency | 3600/h | 3600/h | 3600/h |
| Rated insulation voltage U_i | 440 V | 440 V | 440 V |
| Power loss at I_{th} | | | |
| Effective power | 3.4 W | 1.95 W | 3,17 W |
| Apparent power | 7.7 VA | 4.66 VA | 7.36 VA |
| Rated peak withstand voltage U_{imp} | 4 kV | 4 kV | 4 kV |
| Back-up fuse line protection | max. 10 A | max. 16 A | max. 32 A |
| Switching contact | | | |
| Function NC, NO, CO | | | |
| Back-up fuse | max. 10 A gL | max. 16 A gL | max. 32 A gL |
| Contact gap ^{*)} | < 3 mm (μ) | < 3 mm (μ) | < 3 mm (μ) |
| Switching capacity | 1 A/250 V~ | 1 A/250 V~ | 1 A/250 V~ |
| Minimum switching capacity | 300 mW | 300 mW | 300 mW |
| Minimum operational voltage | 12 V | 12 V | 12 V |
| Electrical endurance | 100,000 operating cycles | | |

*) Distance between contacts less than 3 mm.

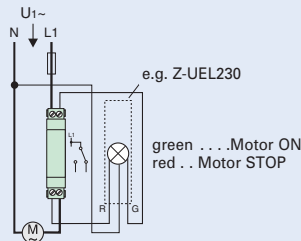
Mechanical:

| | | | |
|--|--------------------------------------|-------------------------|-------------------------|
| Frame size | 45 mm | 45 mm | 45 mm |
| Device height | 80 mm | 80 mm | 80 mm |
| Device width | 17.5 mm (1 MU) | 17.5 mm (1 MU) | 17.5 mm (1 MU) |
| Mounting | quick fastening on DIN rail EN 60715 | | |
| Degree of protection, built-in | IP40 | IP40 | IP40 |
| Upper and lower terminals | lift terminals | lift terminals | lift terminals |
| Degree of protection of terminals | IP20 | IP20 | IP20 |
| Terminal capacity | | | |
| Main circuit | 2 x 10 mm ² | 2 x 10 mm ² | 2 x 10 mm ² |
| Auxiliary circuit | 2 x 2.5 mm ² | 2 x 2.5 mm ² | 2 x 2.5 mm ² |
| Fastening torque of terminal screws | | | |
| Main circuit | max. 2.4 Nm | max. 2.4 Nm | max. 2.4 Nm |
| Auxiliary circuit | max. 1 Nm | max. 1 Nm | max. 1 Nm |

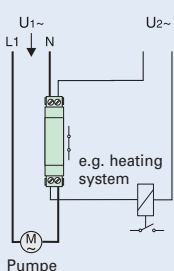
Dimensions [mm]



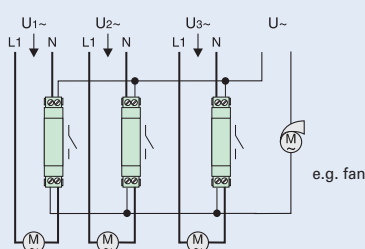
Connection Example - Operating Status



Connection Example - Priority for Pump



Connection Example - "OR" Circuit, Extraction System

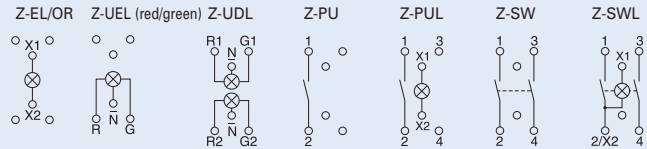


For types and art. numbers see page 51

Signal Lamps Z-EL, Z-DL., Z-BEL; Pushbutton Units Z-PU.; Switches Z-SW.

- Long service life
- Colour of LED can be selected by alternative wiring
- Flash option by usage of different terminals only, changeover option, no additional relay necessary (Z-BEL)

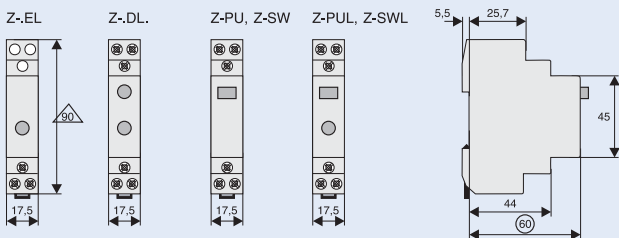
Connection diagrams



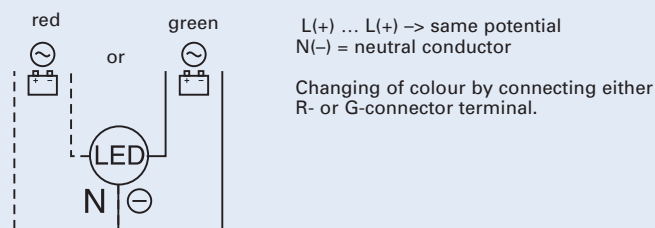
Technical Data

| | Z-EL, Z-DLD, Z-BEL | Z-PU, Z-PUL | Z-SW, Z-SWL |
|---------------------------------------|--|---|---|
| Electrical: | | | |
| Rated voltage | - | 250 V AC | 250 V AC |
| Frequency | - | 50 Hz | 50 Hz |
| Rated current | - | 16 A | 16 A |
| LED | | | |
| Rated voltage | 230 V AC/DC 24 V AC/DC | 230 V AC/DC 24 V AC/DC | 230 V AC/DC 24 V AC/DC |
| Range of operational voltage | (50 V) 110–240 V AC/DC (5 V) 12–24 V AC/DC | (50 V) 110–240 V AC/DC (5 V) 12–24 V AC/DC | (50 V) 110–240 V AC/DC (5 V) 12–24 V AC/DC |
| Luminosity | 15 mcd | 15 mcd | 15 mcd |
| Power loss | 2 W/LED | 2 W | 2 W |
| Switching contact | - | 16 A/250 V~ | 16 A/250 V~ |
| Contact function | - | 1NO, 2NO, 1NO+1NC, 2NC | 1NO, 2NO, 1NO+1NC |
| Flashing frequency | typ. 2 Hz (Z-BEL) | - | - |
| Maximum back-up fuse, short circuit | - | 20 A gG | 20 A gG |
| Mechanical: | | | |
| LED colour | red, green, red + green white + white, red / green orange, blue, white | orange | orange |
| Push-button colour | - | green - NO-contact red - NC-contact black - NO/NC-contact | black |
| Frame size | 45 mm | 45 mm | 45 mm |
| Device height | 90 mm | 90 mm | 90 mm |
| Device width | 17.5 mm (1 MU) | 17.5 mm (1 MU) | 17.5 mm (1 MU) |
| Mounting | quick fastening with 2 lock-in positions on DIN rail EN 60715 | | |
| Degree of protection installed device | IP40 | IP40 | IP40 |
| Terminals | lift terminals | lift terminals | lift terminals |
| Terminal capacity | 1–10 mm ² | 1–10 mm ² | 1–10 mm ² |
| Resistance to climatic conditions | acc. to IEC/EN 60068 | acc. to IEC/EN 60068 | acc. to IEC/EN 60068 |

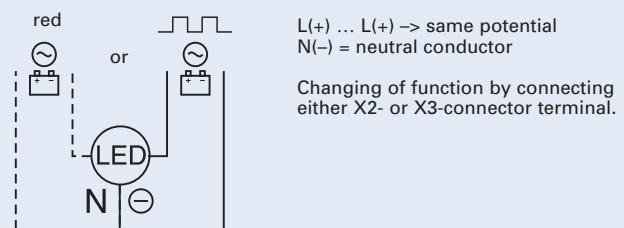
Dimensions [mm]



Connection example for LED red/green



Connection example for flashing function

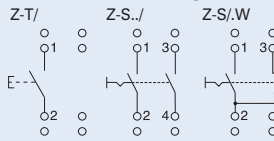


For types and art. numbers see page 52, 53

Pushbutton Z-T; Control Switch Z-S/, Z-S32/; Changeover Switch Z-S/.W

- Design according to EN 60669, VDE 0632
- Types Z-S/WM and /2WM with central position (0-position)

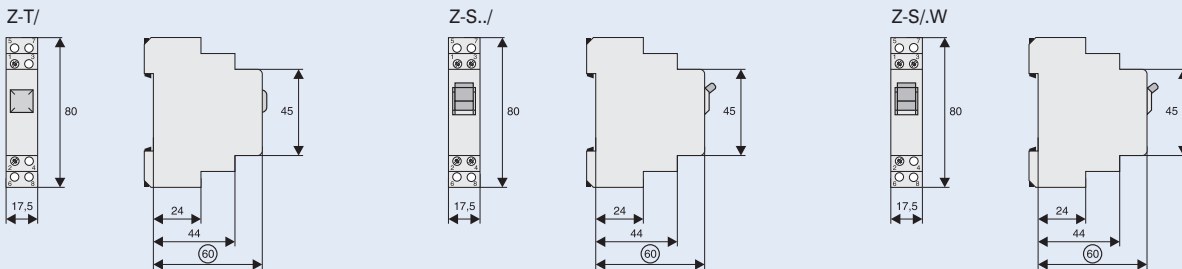
Connection diagrams



Technical Data

| | Z-T/ | Z-S./ | Z-S/.W |
|-----------------------------------|---|--|--|
| Electrical: | | | |
| Rated voltage | 230/400 V AC | 230/400 V AC | 230/400 V AC |
| Frequency | 50 Hz | 50 Hz | 50 Hz |
| Rated current | 16 A/230 V~ | 16, 32 A/230 V~ | 16 A/230 V~ |
| Switching capacity | – | 1.25 x I _n ; 1.1 x U _n | 1.25 x I _n ; 1.1 x U _n |
| Short circuit strength | 10 kA | 10 kA | 10 kA |
| Mechanical: | | | |
| Switching toggle | – | black | black |
| Pushbutton colour | green - NO black - NO/NC | – | – |
| Frame size | 45 mm | 45 mm | 45 mm |
| Device height | 80 mm | 80 mm | 80 mm |
| Device width | 17.5 mm (1 MU) | 17.5 mm (1 MU) | 17.5 mm (1 MU) |
| Mounting | quick fastening with 2 lock-in positions on DIN rail EN 60715 | | |
| Degree of protection, built-in | IP40 | IP40 | IP40 |
| Upper and lower terminals | lift terminals | lift terminals | lift terminals |
| Terminal capacity | 1–10 mm ² | 1–10 mm ² | 1–10 mm ² |
| Resistance to climatic conditions | acc. to IEC/EN 60068 | acc. to IEC/EN 60068 | acc. to IEC/EN 60068 |

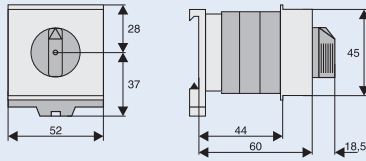
Dimensions [mm]



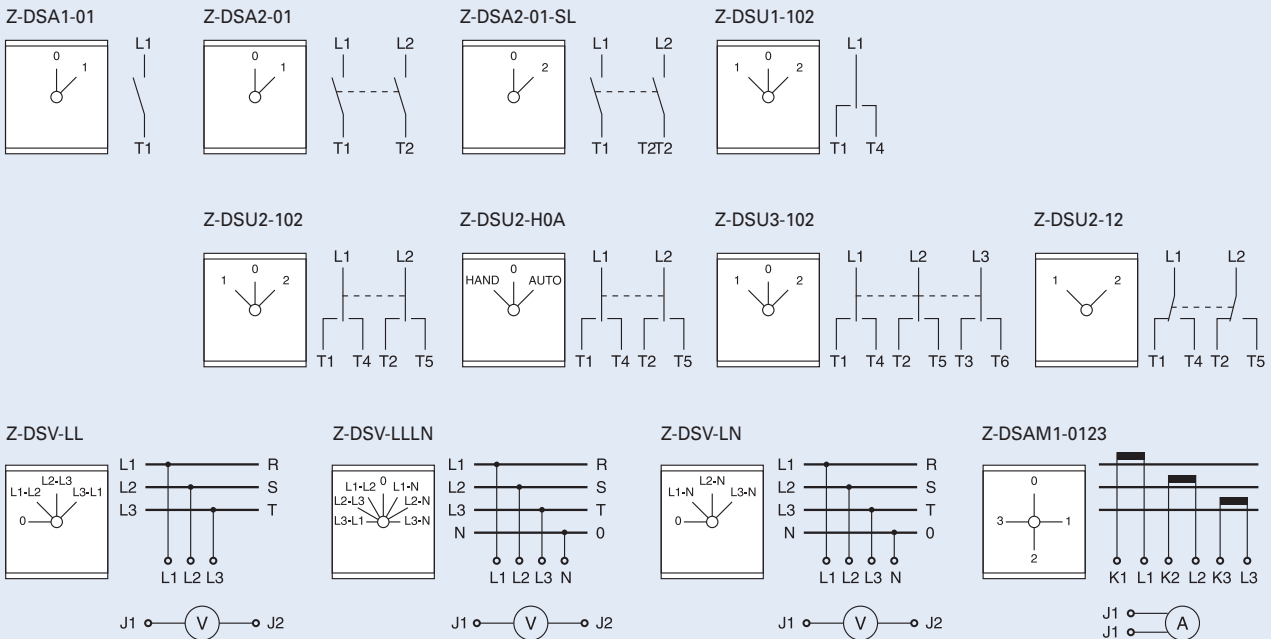
Rotary Switch Z-DS

- Rotary switches of series Z-DS are of a modular design:
The switch proper consists of the engaging work and the switching package. The switching cams (for which it is also called cam switch) are driven by a stable, torsion-proof aluminium shaft. The switching package consists of one or several switching cells with one or two independent contacts. Connections of adjoining switch terminals (necessary in case of voltmeter changeover switch Z-DSV) are contained in the pressed switch component. Consequently, there is no obstacle when connecting the connection lines.
- Application:
Suitable for virtually any application, e.g. motor switch, garage doors, fans, shutters, heating system control, lighting fixtures, instrument switches, different control purposes, etc.

Dimensions [mm]



Connection diagrams



Technical Data

| Data acc. to IEC 60947-3, IEC 60947-5-1, VDE 0660, EN 60947-3, SEV, CEE24 | | | |
|--|---------------|--------|---|
| Nominal thermal current I_{th} open | A | 20 | Utilisation category AC-15 Switching of electromagnetic drives, contactors, valves, pull-type electromagnets Nominal operational current I_n up to 240 V A 6 380-440 V A 4 500 V A 5 |
| Nominal thermal current I_{thg} hermetically enclosed | A | 20 | |
| Nominal operational voltage U_e $U_{imp} = 6$ kV Disconnecter conditions acc. to ÖVE, IEC | V | 690 | |
| Circuit breaking capacity I_v | | | 2-pole disconnection |
| | 3 x 220-440 V | A 160 | Utilisation category DC-21A, DC-21B Switching of resistive loads Time constant $L/R \leq 1$ ms Nominal operational current I_n 1-pole |
| | 3 x 500 V | A 100 | |
| | 3 x 660-690 V | A 80 | |
| Utilisation category AC-21A, AC-21B Switching resistive loads including low overloads Nominal operational current I_n | A | 20 | |
| Utilisation category AC-23A, AC-23B Switching motors and other highly inductive loads Nominal operational current I_n | 400 V | A 16 | Utilisation category DC-3 - DC-5 Switching of shunt motors and series motors Time constant $L/R \leq 15$ ms Nominal operational current I_n 1-pole |
| Nominal power | 220-240 V | kW 4 | |
| 3-phase, 3-pole | 380-440 V | kW 7.5 | |
| | 500 V | kW 7.5 | |
| | 660-690 V | kW 7.5 | |
| Star-delta starting switch for squirrel cage motors Nominal power | | | Terminal capacity one or several wires fine wires fine wires with wire end sleeve terminal screw number of conductors per terminal |
| 3-phase, 3-pole | 220-240 V | kW 3.7 | |
| | 380-415 V | kW 7.5 | Switching of capacitive load maximum making capacity |
| | | | |
| Utilisation category AC3 Switching of 3-phase AC motors Nominal operational current I_n | 400 V | A 12 | up to 500 V A 140 |
| Nominal power | 220-240 V | kW 3 | |
| 3-phase, 3-pole | 380-440 V | kW 5.5 | |
| | 500 V | kW 5.5 | |
| | 660-690 V | kW 5.5 | |
| | | | Degree of protection from behind |
| | | | IP20 |

For types and art. numbers see page 54

| | | | | | | | |
|---|-------|-------------------|-----|---------------------------------|------|---|-----|
| Short circuit protection | | | | Short-time load capacity | | | |
| max. fuse | gL/gG | A | 20 | Load duration | 3 s | A | 100 |
| Rated short-time withstand current (1 second current) | | A | 250 | | 10 s | A | 60 |
| Conditional rated short circuit current | | kA _{RMS} | 10 | | 30 s | A | 35 |
| | | | | | 60 s | A | 25 |

Rotary Switch Z-DS for Lighting Systems

| Utilisation category | Rated operational current 60 °C | I _e | AC-1 | A | Z-DS... |
|----------------------------|------------------------------------|----------------|------|-----|---------|
| Utilisation category AC-1 | Rated operational current 60 °C | I _e | AC-1 | A | 20 |
| Utilisation category AC-5a | Rated operational power 220-240 V~ | cosφ = 0,5 | kW | DUO | 1.1 |
| | | | | | 0.4 |
| | | | | | 3 |
| Utilisation category AC-5b | Rated operational power 220-240 V~ | | | kW | 1.4 |



Incandescent Lamps

| Utilisation category | Power | Current | Z-DS... |
|--------------------------|-------|---------|---|
| AC-5b | W | A | max. number of lamps per current path at 230 V, 50 Hz |
| Incandescent lamps AC-5b | 60 | 0.27 | 22 |
| | 100 | 0.45 | 13 |
| | 200 | 0.91 | 7 |
| | 300 | 1.36 | 4 |
| | 500 | 2.27 | 3 |
| | 1000 | 4.5 | 1 |



Fluorescent Tubes, Mercury Arc Lamps

| Utilisation category | Power | Current | Capacitor | Z-DS... | | |
|--|---|-------------------------------------|-----------|---|--------|---------|
| AC-5a | W | A | µF | max. number of lamps per current path at 230 V, 50 Hz | | |
| Lamp Types | Fluorescent tubes without compensation or with series compensation | 11 | 0.16 | - | 60 | |
| | | 18 | 0.37 | 2.7 | 25 | |
| | | 24 | 0.35 | 2.5 | 25 | |
| | | 36 | 0.43 | 3.4 | 20 | |
| | | 58 | 0.67 | 5.3 | 14 | |
| | | 65 | 0.67 | 5.3 | 13 | |
| | | 85 | 0.8 | - | 11 | |
| | | Fluorescent tubes, lead-lag circuit | 11 | 0.07 | - | 2 x 100 |
| | | | 18 | 0.11 | - | 2 x 50 |
| | 24 | | 0.14 | - | 2 x 40 | |
| | 36 | | 0.22 | - | 2 x 30 | |
| | 58 | | 0.35 | - | 2 x 20 | |
| | 65 | | 0.35 | - | 2 x 15 | |
| | 85 | | 0.47 | - | 2 x 10 | |
| | Fluorescent tubes with parallel comp. | 11 | 0.16 | 2.0 | 30 | |
| | | 18 | 0.37 | 2.0 | 20 | |
| | | 24 | 0.35 | 3.0 | 15 | |
| | | 36 | 0.43 | 4.5 | 10 | |
| | | 58 | 0.67 | 7.0 | 6 | |
| | | 65 | 0.67 | 7.0 | 5 | |
| | | 85 | 0.8 | 8.0 | 4 | |
| | Fluorescent tubes with electronic ballast | 18 | 0.09 | - | 40 | |
| | | 36 | 0.16 | - | 20 | |
| | | 58 | 0.25 | - | 15 | |
| | | 2 x 18 | 0.17 | - | 2 x 20 | |
| | | 2 x 36 | 0.32 | - | 2 x 10 | |
| | | 2 x 58 | 0.49 | - | 2 x 7 | |
| | Mercury arc lamps, high pressure without compensation e.g. HQL, HPL | 50 | 0.61 | - | 16 | |
| 80 | | 0.8 | - | 12 | | |
| 125 | | 1.15 | - | 8 | | |
| 250 | | 2.15 | - | 4 | | |
| 400 | | 3.25 | - | 3 | | |
| 700 | | 5.4 | - | 1 | | |
| 1000 | | 7.5 | - | 1 | | |
| Mercury arc lamps, high pressure with compensation e.g. HQL, HPL | | 50 | 0.28 | 7 | 7 | |
| | | 80 | 0.41 | 8 | 5 | |
| | | 125 | 0.65 | 10 | 3 | |
| | | 250 | 1.22 | 18 | 2 | |
| | | 400 | 1.95 | 25 | 1 | |
| | | 700 | 3.45 | 45 | 1 | |
| | | 1000 | 4.8 | 60 | - | |

Metal Halide Lamps

| Lamp Types | Power | Current | Capacitor | Z-DS... |
|--|-------|---------|-----------|---|
| | W | A | µF | max. number of lamps per current path at 230 V, 50 Hz |
| Metal halide lamps without compensation, e.g. HQL, HPI | 35 | 0.53 | - | 22 |
| | 70 | 1 | - | 12 |
| | 150 | 1.8 | - | 6 |
| | 250 | 3 | - | 4 |
| | 400 | 3.5 | - | 3 |
| | 1000 | 9.5 | - | 1 |
| | 2000 | 16.5 | - | - |
| Metal halide lamps with compensation, e.g. HQL, HPI | 35 | 0.25 | 6 | 8 |
| | 70 | 0.45 | 12 | 4 |
| | 150 | 0.75 | 20 | 2 |
| | 250 | 1.5 | 33 | 1 |
| | 400 | 2.1 | 35 | 1 |
| | 1000 | 5.8 | 95 | - |
| | 2000 | 11.5 | 148 | - |
| Transformers for low-voltage halogen lamps | 20 | - | - | 40 |
| | 50 | - | - | 20 |
| | 75 | - | - | 13 |
| | 100 | - | - | 10 |
| | 150 | - | - | 7 |
| | 200 | - | - | 5 |
| | 300 | - | - | 3 |

Sodium Vapour Lamps

| | Power | Current | Capacitor | Z-DS... |
|--|-------|---------|-----------|---|
| | W | A | µF | max. number of lamps per current path at 230 V, 50 Hz |
| Sodium vapour lamps low-pressure without compensation | 35 | 1.5 | - | 7 |
| | 55 | 1.5 | - | 7 |
| | 90 | 2.4 | - | 4 |
| | 135 | 3.5 | - | 3 |
| | 150 | 3.3 | - | 3 |
| | 180 | 3.3 | - | 3 |
| | 200 | 3.3 | - | 3 |
| Sodium vapour lamps low-pressure with compensation | 35 | 0.31 | 20 | 3 |
| | 55 | 0.42 | 20 | 2 |
| | 90 | 0.63 | 30 | 1 |
| | 135 | 0.94 | 45 | 1 |
| | 150 | 1 | 40 | 1 |
| | 180 | 1.16 | 40 | 1 |
| | 200 | 1.32 | 25 | 1 |
| Sodium vapour lamps high-pressure without compensation | 150 | 1.8 | - | 5 |
| | 250 | 3 | - | 4 |
| | 330 | 3.7 | - | 3 |
| | 400 | 4.7 | - | 2 |
| | 1000 | 10.3 | - | 1 |
| Sodium vapour lamps high pressure with compensation | 150 | 0.83 | 20 | 2 |
| | 250 | 1.5 | 33 | 2 |
| | 330 | 2 | 40 | 1 |
| | 400 | 2.4 | 48 | 1 |
| | 1000 | 6.3 | 106 | - |

Time Lag Relays ZR

Functions

- **ZRER/W**
 - E ON delay
 - R OFF delay
- **ZRMF1/W, ZRMF2/WW**
 - E ON delay
 - R OFF delay
 - Ws Single shot leading edge with control input
 - Wa Single shot trailing edge with control input
 - Es ON delay with control input
 - Wu Single shot leading edge voltage controlled
 - Bp Flasher pause first
- **ZRTAK/W**
 - lp Asymmetric flasher pause first
 - li Asymmetric flasher pulse first

Indicators:

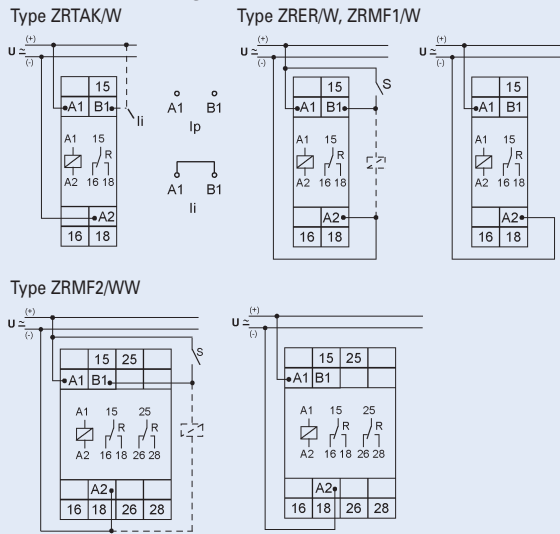
ZRER/W, ZRMF1/W, ZRMF2/WW

- Green LED U/t ON: indication of supply voltage
- Green LED U/t flashes: indication of time period
- Yellow LED R ON/OFF: indication of output relay

ZRTAK/W

- Green LED U/t ON: indication of supply voltage
- Green LED U/t slow flashing: indication of time period t1
- Green LED U/t fast flashing: indication of time period t2
- Yellow LED R ON/OFF: indication of output relay

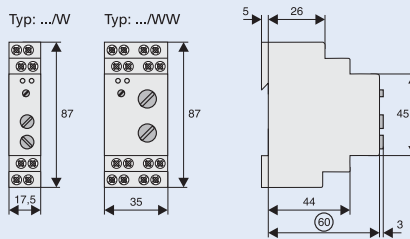
Connection diagram



Time Ranges

| Absolute time range | Setting range | |
|---------------------|---------------|--------|
| 1 s | 50 ms | 1 s |
| 10 s | 500 ms | 10 s |
| 1 min | 3 s | 1 min |
| 10 min | 30 s | 10 min |
| 1 h | 3 min | 1 h |
| 10 h | 30 min | 10 h |
| 100 h | 5 h | 100 h |

Dimensions [mm]



Technical Data

Electrical:

| | |
|-----------------------|----------------------------|
| Design according to | EN 60669 |
| Basic accuracy | ± 1 % (of scale end value) |
| Setting accuracy | < 5 % (of scale end value) |
| Repeating accuracy | < 0.5 % or ± 5 ms |
| Effect of voltage | - |
| Effect of temperature | ≥ 0.01 % / °C |

Input circuit:

| | |
|-----------------|---|
| Feed voltage | |
| Terminals A1-A2 | 24 V to 240 V AC/DC 24 V / -15 % to 240 V / + 10 % |

| | |
|-------------------|-------------|
| Nominal frequency | 48 to 63 Hz |
|-------------------|-------------|

| | |
|---------------------|--|
| Nominal consumption | |
|---------------------|--|

| | |
|-------------|--------------|
| Type: .../W | 4 VA (1.5 W) |
|-------------|--------------|

| | |
|--------------|------------|
| Type: .../WW | 6 VA (2 W) |
|--------------|------------|

| | |
|------|-------|
| Duty | 100 % |
|------|-------|

| | |
|-------------------------|--------|
| Operational again after | 100 ms |
|-------------------------|--------|

| | |
|-------------------------------|------|
| Residual ripple in case of DC | 10 % |
|-------------------------------|------|

| | |
|-----------------|----------------------------|
| Release voltage | >30 % of min. feed voltage |
|-----------------|----------------------------|

| | |
|------------------------|---------------------|
| Output circuit: | 1 potential-free CO |
|------------------------|---------------------|

| | |
|--------------------|--------------------------|
| Switching capacity | 2000 VA (8 A / 250 V AC) |
|--------------------|--------------------------|

| | |
|-----------------|-----|
| Fuse protection | 8 A |
|-----------------|-----|

| | |
|----------------------|---------------------------------------|
| Mechanical endurance | 20 x 10 ⁶ operating cycles |
|----------------------|---------------------------------------|

| | |
|----------------------|--|
| Electrical endurance | |
|----------------------|--|

| | |
|--------------------------------|--------------------------------------|
| at a resistive load of 1000 VA | 2 x 10 ⁵ operating cycles |
|--------------------------------|--------------------------------------|

| | |
|---------------------|--|
| Switching frequency | |
|---------------------|--|

| | |
|-------------------------------|-------------|
| at a resistive load of 100 VA | max. 60/min |
|-------------------------------|-------------|

| | |
|--------------------------------|------------|
| at a resistive load of 1000 VA | max. 6/min |
|--------------------------------|------------|

| | |
|----------------------------|--|
| (in acc. with IEC 947-5-1) | |
|----------------------------|--|

| | |
|---------------------|------|
| Rated surge voltage | 4 kV |
|---------------------|------|

| | |
|----------------------|-------------------------------|
| Overvoltage category | III (in acc. with EN 60664-1) |
|----------------------|-------------------------------|

Control contact

| | |
|------------------------------|--------------------------------------|
| Input carrying potential | Terminals A1-B1 |
| loadable | yes |
| Maximum line length | 10 m |
| Minimum control pulse length | |
| DC | 50 ms |
| AC | 100 ms |
| Trigger level (sensitivity) | automatic adaption to supply voltage |

Mechanical:

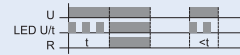
| | |
|---------------------------------------|----------------------------|
| Frame size | 45 mm |
| Device height | 87 mm |
| Device width | 17.5 (W) and 35 (WW) mm |
| Degree of protection, built-in | IP40 |
| Position of installation | optional |
| Upper and lower terminals | bow terminal |
| Terminal protection | finger and hand touch safe |
| Terminal capacity | |
| 1 x 0.5-2.5mm ² | |
| 1 x 4 mm ² | |
| 2 x 0.5-1.5 mm ² | |
| 2 x 2.5 mm ² | |
| Tightening torque | |
| of terminal screws | max. 1 Nm |
| Permitted relative humidity | 15% to 85% |
| in acc. with IEC 60721-3-3, Class 3K3 | |
| Ambient temperature | -25 to +55% |
| in acc. with EN 60068-1 | |
| Storage and transport temperature | -25 to + 70 °C |
| Pollution degree | 2 |
| When built in | 3 |

For types and art. numbers see page 54

Description of Functions

• E - ON delay

When the supply voltage U is applied, the set interval t begins (green LED U/t flashes). After the interval t has expired (green LED U/t illuminated) the output relay R switches into on-position (yellow LED illuminated) This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the expiry of the interval t, the interval already expired is erased and is restarted when the supply voltage is next applied.



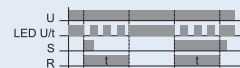
• R - OFF delay

The supply voltage U must be constantly applied to the device (green LED U/t illuminated) When the control contact S is closed, the output relay R switches into on-position (yellow LED illuminated). If the control contact is opened, the set interval t begins (green LED U/t flashes) After the interval t has expired (green LED U/t illuminated) the output relay switches into off-position (yellow LED not illuminated) If the control contact is closed again before the interval t has expired, the interval already expired is erased and is restarted.



• Ws - Single shot leading edge with control input

The supply voltage U must be constantly applied to the device (green LED U/t illuminated). When the control contact S is closed, the output relay R switches into on-position (green LED U/t illuminated) and the set interval t begins (green LED U/t flashes). After the interval t has expired (green LED U/t illuminated) the output relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.



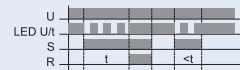
• Wa - Single shot trailing edge with control input

The supply voltage U must be constantly applied to the device (green LED U/t illuminated). Closing the control contact S has no influence on the condition of the output R. When the control contact is opened, the output relay switches into on-position (yellow LED illuminated) and the set interval t begins (green LED U/t flashes). After the interval t has expired (green LED U/t illuminated), the output relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.



• Es - ON delay with control input

The supply voltage U must be constantly applied to the device (green LED U/t illuminated). When the control contact S is closed, the set interval t begins (green LED U/t flashes). After the interval t has expired (green LED U/t illuminated) the output relay R switches into on-position (yellow LED illuminated). This status remains until the control contact is opened again. If the control contact is opened before the interval t has expired, the interval already expired is erased and is restarted with the next cycle.



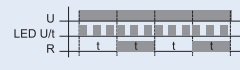
• Wu - Single shot leading edge voltage controlled

When the supply voltage U is applied, the output relay R switches into on-position (yellow LED illuminated) and the set interval t begins (green LED U/t flashes). After the interval t has expired (green LED U/t illuminated) the output relay switches into off-position (yellow LED not illuminated). This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the interval t has expired. The output relay switches into off-position. The interval already is erased and is restarted when the supply voltage is next applied.



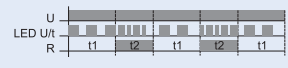
• Bp - Flasher pause first

When the supply voltage U is applied, the set interval t begins (green LED U/t flashes). After the interval t has expired, the output relay R switches into onposition (yellow LED illuminated) and the set interval t begins again. After the interval t has expired. the output relay switches into off-position (yellow LED not illuminated). The output relay is triggered at a ratio of 1:1 until the supply voltage is interrupted.



• Ip - Asymmetric flasher pause first

When the supply voltage U is applied, the set interval t1 begins (green LED U/t flashes slowly) After the interval t1 has expired. the output relay R switches into on-position (yellow LED illuminated) and the set interval t2 begins (green LED U/t flashes fast). After the interval t2 has expired, the output relay switches into off-position (yellow LED not illuminated). The output relay is triggered at the ratio of t1:t2 until the supply voltage is interrupted.



• li - Asymmetric flasher pulse first

When the supply voltage U is applied, the output relay R switches into on-position (yellow LED illuminated) and the set interval t1 begins (green LED U/t flashes slowly). After the interval t1 has expired, the output relay switches into off-position (yellow LED not illuminated) and the set interval t2 begins (green LED U/t flashes fast). After the interval t2 has expired, the output relay switches into on-position (yellow LED illuminated). The output relay is triggered at the ratio of t1:t2 until the supply voltage is interrupted.



Impulse Relay Z-S.

- Relay for switching electrical consumers in impulse operation
- According to EN 60669
- Size compatible with the other installation devices
- Glow lamps of illuminated pushbuttons connected parallel produce reactive currents which need to be compensated by a capacitor block Z-S/KO
- For max. number of parallel glow lamps see Technical Data

Security:

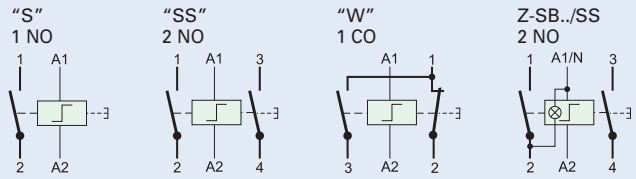
- Optional optical operating status display by means of LED
- Switching position indicated on the front side by manual operating key
- All terminals - coil and contacts - equipped with guide for secure terminal connection. Misplacement of wires impossible.
- Made of hardly flammable materials and plastics free from chlorine and halogens.

Advantages:

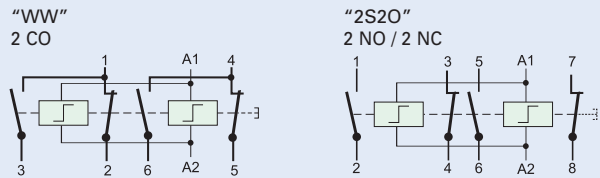
- Low switching noise
- Easy to connect thanks to large terminals which are supplied open
- Simple snap-on fastening on 35 mm DIN railm
- High degree of flexibility thanks to a variety of contact configurations

Connection diagrams

1TE Z-S./.



2TE Z-S./.



Technical Data

Electrical:

| | |
|---|-------------------------------------|
| Design according to | EN 60669-2-2 |
| Rated current (250 V AC) | 16 A |
| Number of poles | 1 to 3 |
| Main contacts | |
| NO | 1, 2, 3 and 4 (1 MU) |
| CO | 1, 2 (1MU, 2 MU) |
| Control Circuit | |
| Rated control feed voltage U_s | 12, 24, 48, 230 V AC 12, 24 V DC |
| Rated frequency | 50 Hz |
| Operating range | 0.9–1.1 x U_s |
| Pickup power of coils | 12 VA / typ. 7 W |
| Max. number of parallel pushbutton units | unlimited |
| Max. number of parallel illuminated pushbutton units (230 V 0.6 mA typ.) | |
| without compensation | 8 units (1 MU), 15 units (2 MU) |
| with compensation 1 x Z-SC/KO (Z-S/KO) | 23 units (1 MU) |
| with compensation 2 x Z-SC/KO (Z-S/KO) | 46 units (1 MU), 43 units (2 MU) |
| Command duration | |
| minimum | > 200 ms |
| recommended | < 1 min |
| maximum | ~ 1 hod, < 100 %, with spacer Z-DST |
| Sensitivity to command impulse | |
| make | rise edge |
| break | fall edge |
| Rated peak withstand voltage U_{imp} | 2 kV (1.2 / 50 μ s) |
| Load Circuit | |
| Rated operational voltage U_n | 250 / 415 V AC |
| Minimum operational voltage U_{min} | 24 V AC / DC (U_s 8-110 V) |
| Rated insulation voltage U_i | 500 V |
| Rated peak withstand voltage U_{imp} | 4 kV (1.2 / 50 μ s) |
| Conventional thermal current I_{th} | 16 A AC |
| Rated operational current I_e | 16 A AC |

| | |
|--|--|
| Rated constant current I_u | 16 A AC |
| Rated current DC I_e | |
| 24 V | 16 A DC |
| 48 V | 12.5 A DC |
| 230 V | 1 A DC |
| Conditional rated short circuit current I_{sc} | 10 kA (with 20 A gL/gG) |
| Duration of bouncing | < 10 ms (typ. < 5 ms) |
| Endurance | |
| electrical comp. | $\geq 40 \times 10^3$ operating cycles |
| mechanical comp. | $\geq 1 \times 10^6$ operating cycles |

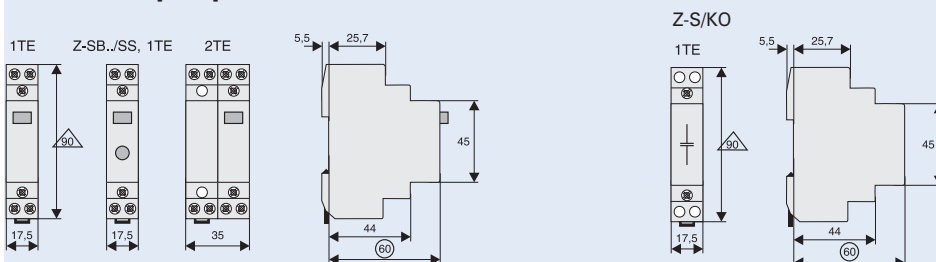
Mechanické

| | |
|---------------------------------------|--|
| Frame size | 45 mm |
| Device height | 90 mm |
| Device width | 17.5 mm (1 MU) |
| Mounting | quick fastening on DIN rail |
| Degree of protection installed device | IP20 |
| Position of device in use | works in any position |
| Upper and lower terminals | lift terminals (captive) |
| Terminal capacity | |
| Contact and coil | 0.5–10 mm ² one- or more wire 0.5–6 mm ² fine-wire with wire end sleeve |
| Temperature range | -20 °C to +45 °C |
| Total contact gap | > 5 mm / independent contacts |
| Contact material | does not contain cadmium |

Accessories

| | |
|------------------------|-----------------------|
| Capacitor block Z-S/KO | 1.5 μ F, 240 V AC |
|------------------------|-----------------------|

Dimensions [mm]



For types and art. numbers see page 55

Impulse Relay Z-SC with Central Control

- Relay for switching electrical consumers in impulse operation
- According to EN 60669
- Size compatible with the other installation devices
- Possibility of two-level control – local and central
- Glow lamps of illuminated pushbuttons connected parallel produce reactive currents which need to be compensated by a capacitor block Z-S/KO
- For max. number of parallel glow lamps see Technical Data
- Necessary not to exceed maximum value of rated voltage of control circuit - both local and central control must be fed from identical phase. Input without signal must not be connected to zero potential (otherwise inner blocking diode between inputs is destroyed)

Security:

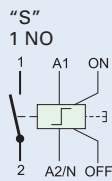
- Switching position indicated on the front side by manual operating key
- All terminals - coil and contacts - equipped with guide for secure terminal connection. Misplacement of wires impossible.
- Made of hardly flammable materials and plastics free from chlorine and halogens.

Advantages:

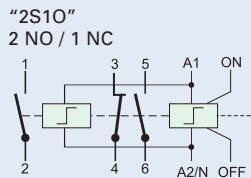
- Low switching noise and no humming
- Easy to connect thanks to large terminals which are supplied open
- Simple snap-on fastening on 35 mm DIN rail
- High degree of flexibility thanks to a variety of contact configurations

Connection diagrams

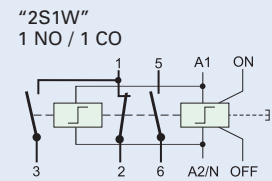
1TE Z-SC./S



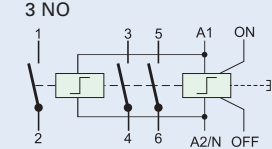
2TE Z-SC./.



2TE Z-SC./.



"3S"



Technical Data

Electrical:

| | |
|--------------------------|--------------------|
| Design according to | EN 60669-2-2 |
| Rated current (250 V AC) | 16 A |
| Number of poles | 3 |
| Main contacts | |
| NO | 1 (1 MU), 3 (2 MU) |
| NO + NC | 2+1 (2 MU) |
| CO + NO | 1+1 (2 MU) |

Control Circuit

| | |
|--|---|
| Rated control feed voltage U_s | 24, 230 V AC |
| Rated frequency | 50 Hz; 50–60 Hz 240 V |
| Operating range | 0.9–1.1 x U_s |
| Maximum power of coils, pick-up | $U_s = 24 V$: 25 VA (15 W) |
| pick-up | $U_s = 230 V$: 32 VA (19 W) |
| Max. number of parallel pushbutton units | unlimited |
| Max. number of parallel illuminated pushbutton units (230 V 0.6 mA typ.) | |
| without compensation | 8 units (1 MU), 15 units (2 MU) |
| with compensation 1 x Z-SC/KO (Z-S/KO) | 23 units (1 MU) |
| with compensation 2 x Z-SC/KO (Z-S/KO) | 46 units (1 MU), 43 units (2 MU) |
| Minimum command duration | > 200 ms |
| Rated peak withstand voltage U_{imp} | 2 kV (1.2/50 μ s) |
| Duty | 100 % (1 MU) < 100 %, 1 h max. with spacer Z-DST |

Load Circuit

| | |
|--|-------------------------------|
| Rated operational voltage U_n | 240 / 415 V AC |
| Minimum operational voltage U_{min} | 24 V AC / DC (U_s 8-110 V) |
| Rated insulation voltage U_i | 500 V |
| Rated peak withstand voltage U_{imp} | 4 kV (1,2 / 50 μ s) |
| Conventional thermal current I_{th} | 16 A AC |
| Rated operational current I_o | 16 A AC |

| | |
|---|--|
| Rated constant current I_u | 16 A AC |
| Rated current DC I_e | |
| 24 V | 16 A DC |
| 48 V | 12,5 A DC |
| 230 V | 1 A DC |
| Conditional rated short circuit current I_q | 10 kA (with 20 A gL/gG) |
| Duration of bouncing | < 10 ms (typ. < 5 ms) |
| Endurance | |
| electrical comp. | $\geq 40 \times 10^3$ operating cycles |
| mechanical comp. | $\geq 1 \times 10^6$ operating cycles |

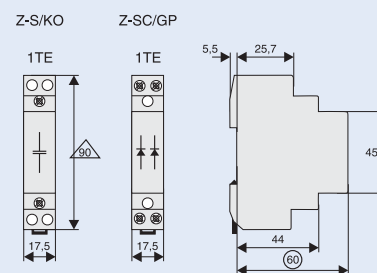
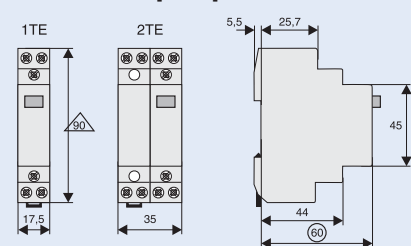
Mechanical:

| | |
|---------------------------------------|--|
| Frame size | 45 mm |
| Device height | 90 mm |
| Device width | 17.5 mm (1 MU) |
| Mounting | quick fastening on DIN rail |
| Degree of protection installed device | IP20 |
| Position of device in use | works in any position |
| Upper and lower terminals | lift terminals |
| Terminal capacity | |
| Contact and coil | 0.5–10 mm ² one- or more wire 0.5–6 mm ² fine-wire with wire end sleeve |
| Temperature range | -20 °C to +45 °C |
| Total contact gap | > 5 mm / independent contacts |
| Contact material | does not contain cadmium |

Accessories

| | |
|------------------------|-----------------------|
| Capacitor block Z-S/KO | 1.5 μ F, 240 V AC |
| Group block Z-SC/GP | 240 V AC |

Dimensions [mm]

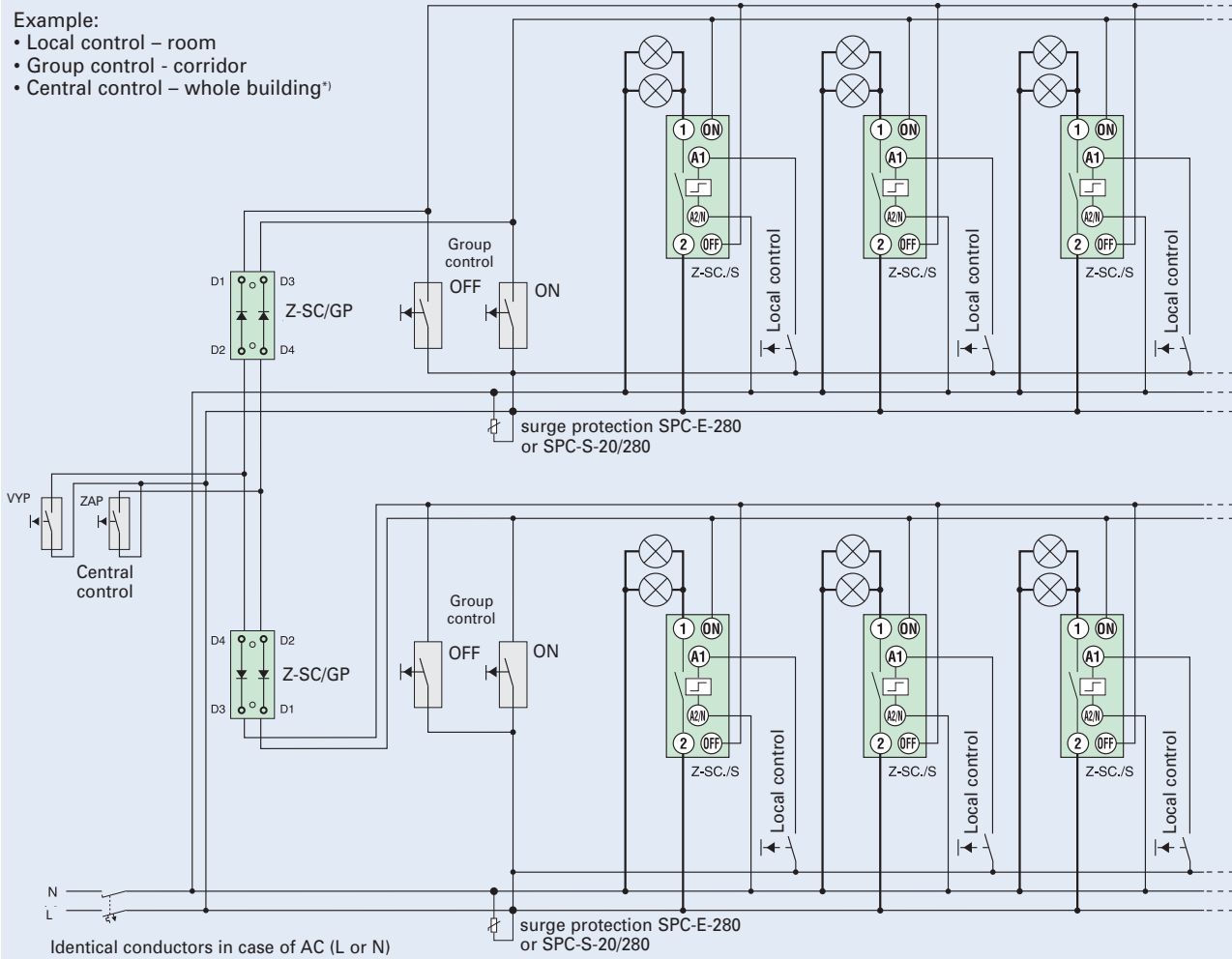


For types and art. numbers see page 55

Block Diagram for Central, Group, and Local Control

Example:

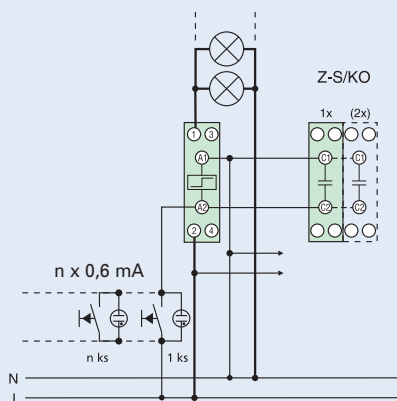
- Local control – room
- Group control - corridor
- Central control – whole building*)



*) Note:

Central control units Z-SC./GP are supplemented with diodes for preventing against mutual influence of particular groups (floors) among themselves.

Compensation by Means of Capacitor Block

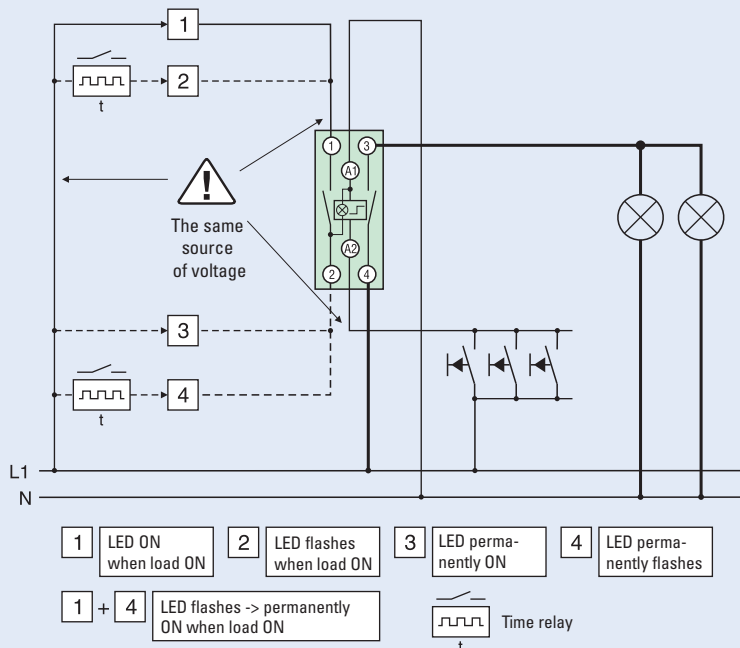


Note:

Glow lamps connected parallel to pushbuttons cause permanent current. This current can affect proper function of impulse relays negatively (break of contacts can not happen in case of more glow lamps connected). For this reason there can be compensator to lead-out unwanted current of glow lamps out from relay coil.

Impulse Relay with Switchable LED - application examples (1 to 4)

Signalisation LED Impulse relay Z-SB../SS Pushbutton ON/OFF Load



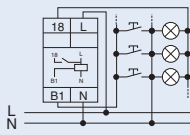
For types and art. numbers see page 55

Staircase Switch with switch-off warning and stop function TLE, TLK

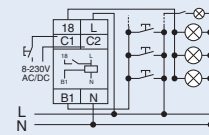
- Automatic electronic staircase switch
- Switch-off warning can be switched off (type TLK)
- Subsequent switching is possible, programmable long-time function
- Power saving function, low switching noise
- Automatic 3-/4 wire circuit recognition
- Zero voltage safety thanks to memory function (type TLK)
- Central control function (type TLK)
- External voltage control input (type TLK)

Connection diagrams

e.g. 3 wire circuit TLE



e.g. 4 wire circuit with attic lighting TLK



Technical Data

Electrical:

| | |
|-------------------------|--------------------------------|
| Feed voltage | 230 VAC |
| Rated voltage tolerance | -15 %, +10 % |
| Power consumption | 6 VA (0.8 W) |
| Rated frequency | 48–63 Hz |
| Duty | 100 % |
| Reset time | 500 ms |
| Adjustment range | 0.5–15 min. |
| Overvoltage category | III (in acc. with IEC 60664-1) |
| Rated surge voltage | 4 kV |

Output

| | |
|--------------------------------|---|
| Contact | 1 NO (Terminals L-18) |
| Rated voltage | 250 VAC |
| Constant current | 16 A |
| Switch on peak current (20 ms) | 80 A |
| Switching capacity AC | 4000 VA / AC1, 384 W / DC |
| Maximum current | 30 A / < 3s |
| Switching voltage | 250 V AC1 / 24 V DC |
| Minimum switching capacity DC | 500 mW |
| Output indication | yellow LED () |
| Mechanical endurance | 30 x 10 ⁶ switching operations |
| Electrical endurance (AC1) | 10 x 10 ⁵ switching op. 16 A/250 V |

Control input B1

| | |
|-------------------------------------|--|
| Connection (carrying voltage) | Pushbutton T-N (3 wire circuit) Pushbutton T-L (4 wire circuit) |
| Glow lamps parallel to control keys | max. 100 mA |
| Overload protection | electronic |

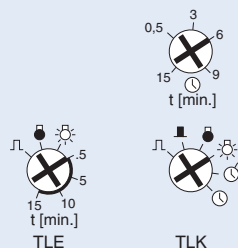
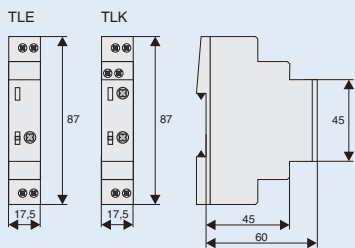
Control input C1-C2 (type TLK)

| | |
|--|---------------|
| | 8–230 V AC/DC |
|--|---------------|

Mechanical:

| | |
|-------------------------------------|--|
| Frame size | 45 mm |
| Device height | 87 mm |
| Device width | 17.5 mm (1 MU) |
| Installation | quick fastening on DIN rail EN 60715 |
| Protection class / Pollution degree | IP20 / 2 |
| Terminal capacity | 1x 0.5–4 mm ² 2x 0.5–2.5 mm ² |
| Tightening torque | max. 1 Nm |
| Temperature range | -25 °C to +55 °C |
| Operation position | any |

Dimensions [mm]



Mode

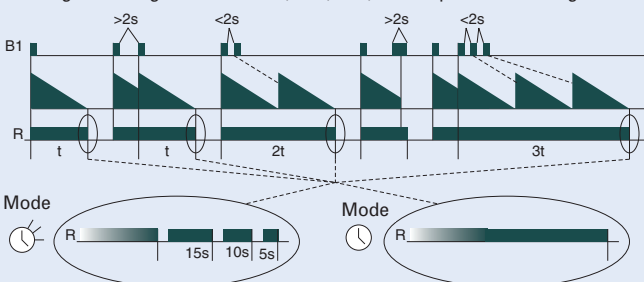
- Automatic timing
 - Automatic timing with switch-off warning
 - Permanent light
 - Off
 - Impulse relay
 - Impulse relay, zero-voltage proof
- 2000 W
 - 1000 W
 - 500 W
 - max. 100 mA

Functional Description

Automatic timing

After pushing the button the output relay closes (terminals L-18) and the set time starts to run. If the button is pushed again before the time t has lapsed the time re-starts from zero (subsequent switching function in accordance with EN 60669-2-3). Repeated quick pressing of the pushbutton ("pumping") leads to the addition of 2, 3 or more time intervals up to 60 min. Pushing the button once for a long time (> 2 s) stops the running lighting period, and the relay switches off (power saving function).

In the function, the device generates short pulses (flickering) as a switch-off warning (according to DIN 18015-2), 15 s, 10 s, and 5 s prior to switching off.



Mode



Mode



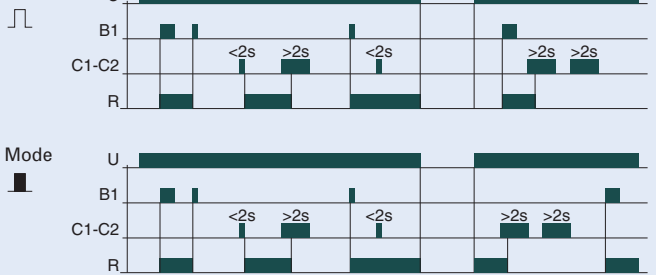
The additional control input permits activating the staircase switch e.g. from an intercom system by means of a voltage from 8 to 230 V AC/DC in the modes and . This input channel permits starting the lighting time, as well as subsequent switching. Switching off (power saving function) and programming of longer lighting periods ("pumping") is not possible via this input channel.

For types and art. numbers see page 56

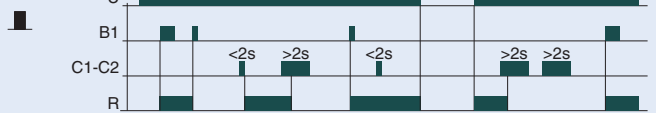
Impulse mode

In the impulse mode each push of the button makes the output relay switch over. In the function the output relay is always open after the feed voltage has been applied. In the function the relay immediately picks up when the feed voltage is applied provided that it was closed prior to the power failure. By applying a short voltage pulse (< 2 s) to the additional control input C1-C2 the relay R is switched on (central ON). A longer voltage pulse (> 2 s) causes the relay R to switch off (central OFF).

Mode



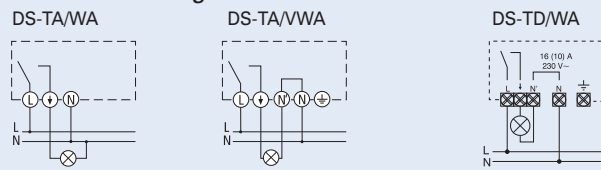
Mode



Light Intensity Switch for support rail assembly, DS-TA, DS-TD

- Device for automatic control of lighting systems
- For outdoor installation
- Wall mounting IP55
- With integrated light sensor
- Brightness range infinitely adjustable
- Type DS-TA: can be combined with timers for time and light-dependent control
- Type DS-TA: with integrated timer
- With make and break-time delay
- Suitable for street lighting, yard or general outdoor lighting

Connection diagram

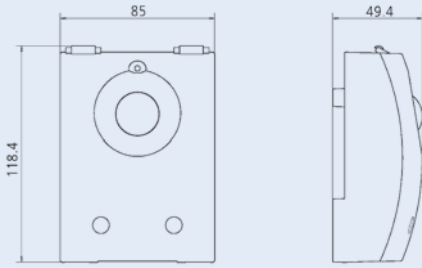


Technical Data

| | DS-TA/WA | DS-TA/VWA | DS-TD/WA |
|---|--|---|---|
| General: | | | |
| Design according to | EN 60669-1, EN 60669-2-1 | | |
| Rated voltage | 230 V AC/220V ~ | 230 V AC/220V ~ | 230 V AC/220V ~ |
| Rated operating voltage tolerance | -10%...+10% | -10%...+10% | -10%...+10% |
| Rated frequency | 50-60 Hz | 50-60 Hz | 50-60 Hz |
| Power consumption | 3.5 VA | 4.5 VA | 2 VA |
| Brightness range | 5 – 200 Lux | 2 – 200 Lux | 2 – 200 Lux, digital |
| Drive | - | - | Quartz |
| Power reserve at 20 °C | - | - | 1,5 years |
| Type of battery | - | - | Lithium, replaceable |
| Operating cycles | 40,000 | 40,000 | 40,000 |
| Degree of protection | IP55 | IP55 | IP55 |
| Ambient temperature | -35 °C...+55 °C | -35 °C...+55 °C | -35 °C...+55 °C |
| Storage temperature | -40 °C...+70 °C | -40 °C...+70 °C | -40 °C...+70 °C |
| Protection class - device | II | II | II |
| Switching contacts: | | | |
| Type of switching contact | 1 x NO | 1 x NO | 1 x NO |
| Contact material | Ag Sn O ₂ | Ag Sn O ₂ | Ag Sn O ₂ |
| Switching capacity at 250 V ~cosφ=1 | 10 A | 16 A | 16 A |
| Switching capacity at 250 V ~cosφ=0,6 | 6 A | 10 A | 10 A |
| Switching capacity with lamps | | | |
| Incandescent lamps | 1000 W | 2300 W | 2300 W |
| Halogen lamps | 1000 W | 2300 W | 2300 W |
| Fluorescent lamps | | | |
| Non-compensated | 1000 VA | 2300 VA | 2300 VA |
| Compensated in parallel | 120 VA (18 µF) | 400 VA (42 µF) | 400 VA (42 µF) |
| Lead-lag circuit - compensated in series | 1000 W | 2300 W | 2300 W |
| Ballast - compensated | 4 x 7W, 3 x 11W, 3 x 15W, 2 x 20W, 3 x 23W | 9 x 7W, 7 x 11W, 7 x 15W, 7 x 20W, 7 x 23 W | 9 x 7W, 7 x 11W, 7 x 15W, 7 x 20W, 7 x 23 W |
| Make-time delay | 40 s | 2-100 s | 0-10 min, digital |
| Break-time delay | 40 s | 2-100 s | 0-10 min, digital |
| Non-delayed switching status indication | LED | LED | LED |
| Programme features: | | | |
| Number of channels | 1 | 1 | 1 |
| Minimum switching time | - | - | 1 min. |
| Programming via EEPROM or software | - | - | No |
| Automatic change of clock to summer/winter time | - | - | Yes |
| Random switching | - | - | No |
| LCD background light | - | - | No |
| Size & weight: | | | |
| Width | 85 mm | 85 mm | 85 mm |
| Height | 49.4 mm | 49.4 mm | 49.4 mm |
| Length | 118.4 mm | 118.4 mm | 118.4 mm |
| Weight | 202 g | 247 g | 320 g |
| Terminals: | | | |
| Terminal capacity - fine stranded wire | 1...2.5 mm ² | 1...2.5 mm ² | 1...2.5 mm ² |
| Terminal capacity - solid wire | 1...4 mm ² | 1...4 mm ² | 1...4 mm ² |
| Size of terminal screws | M3 | M3 | M3 |
| Type of screw head | Slotted, size 1 | Slotted, size 1 | Slotted, size 1 |
| Max. torque | 0.5 Nm | 0.5 Nm | 0.5 Nm |

For types and art. numbers see page 56

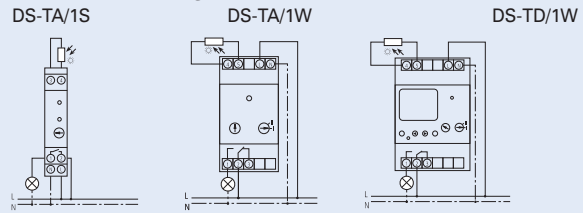
Dimensions (mm)



Light Intensity Switch for wall mounting, DS-TA, DS-TD

- Device for automatic control of lighting systems
- With external light sensor
- Brightness range infinitely adjustable
- Type DS-TA: can be combined with timers for time and light-dependent control
- Type DS-TD: with integrated timer for time and light-dependent control
- With make and break-time delay
- Supplied with light sensor IP65
- Spare sensors available

Connection diagrams



Technical Data

| | DS-TA/1S | DS-TA/1W | DS-TD/1W |
|---|---|---|---|
| General: | | | |
| Design according to | EN 60669-1, EN 60669-2-1 | | |
| Rated voltage | 220-240 V AC | 230 V AC | 230 V AC |
| Rated operating voltage tolerance | -15%...+10% | -10%...+10% | -10%...+10% |
| Rated frequency | 50-60 Hz | 50-60 Hz | 50-60 Hz |
| Power consumption | approx. 6 VA | approx. 5 VA | approx. 5 VA |
| Brightness range | 2 – 100 Lux | 2 – 2000 Lux | 2 – 2000 Lux, digital |
| Max. cable length for sensor | 100 m | 100 m | 100 m |
| Drive | - | - | Quartz |
| Operating cycles | 40,000 | 40,000 | 40,000 |
| Degree of protection - control device | IP20 | IP20 | IP20 |
| Degree of protection - sensor | IP54/IP65 | IP54/IP65 | IP54/IP65 |
| Ambient temperature | -25 °C...+50 °C | -10 °C...+50 °C | -10 °C...+50 °C |
| Ambient temperature - sensor | -40 °C...+70 °C | -40 °C...+70 °C | -40 °C...+70 °C |
| Storage temperature | -25 °C...+50 °C | -25 °C...+50 °C | -25 °C...+50 °C |
| Storage temperature - sensor | -40 °C...+70 °C | -40 °C...+70 °C | -40 °C...+70 °C |
| Protection class - device | II | II | II |
| Protection class - sensor | II | III | III |
| Switching contacts: | | | |
| Type of switching contact | 1 x NO | 1 x CO | 1 x CO |
| Contact material | Ag Sn O ₂ | Ag Sn O ₂ | Ag Sn O ₂ |
| Switching capacity at 250 V~cosφ=1 | 16 A | 10 A | 10 A |
| Switching capacity at 250 V~cosφ=0,6 | 10 A | 6 A | 6 A |
| Switching capacity with lamps | | | |
| Incandescent lamps | 2300 W | 2300 W | 2300 W |
| Halogen lamps | 2300 W | 2300 W | 2300 W |
| Fluorescent lamps | | | |
| Non-compensated | 2300 VA | 2300 VA | 2300 VA |
| Compensated in parallel | 400 VA (42 µF) | 400 VA (42 µF) | 400 VA (42 µF) |
| Lead-lag circuit - compensated in series | 2300 W | 2300 W | 2300 W |
| Ballast - compensated | 4 x 7 W, 3 x 11 W, 3 x 15 W, 2 x 20 W, 3 x 23 W | 9 x 7 W, 7 x 11 W, 7 x 15 W, 7 x 20 W, 7 x 23 W | 9 x 7 W, 7 x 11 W, 7 x 15 W, 7 x 20 W, 7 x 23 W |
| Make-time delay | 20 s | 40 s | 80 s |
| Break-time delay | 80 s | 40 s | 80 s |
| Non-delayed switching status indication | LED | LED | LED |
| Programme features: | | | |
| Number of channels | 1 | 1 | 1 |
| Minimum switching time | - | - | 1 min. |
| Max. programme steps in the memory | - | - | 42 |
| Programming via EEPROM or software | - | - | No |
| Automatic change of clock to summer/winter time | - | - | Yes |
| Random switching | - | - | Yes |
| LCD background light | - | - | No |
| Size & weight: | | | |
| Width | 17.5 mm (1 MU) | 52.5 mm (3 MU) | 72 mm (4 MU) |
| Height | 65.5 mm | 65.5 mm | 65.5 mm |
| Length | 90 mm | 90 mm | 90 mm |
| Weight | 172 g | 330 g | 330 g |

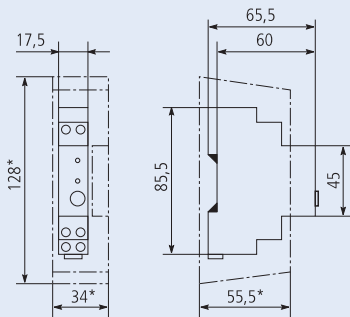
For types and art. numbers see page 56

Technical Data

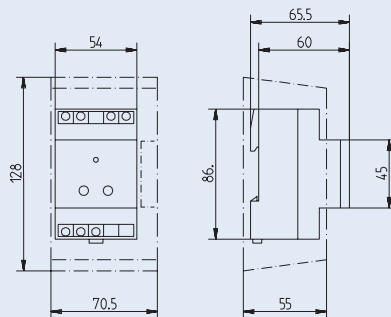
| | DS-TA/1S | DS-TA/1W | DS-TD/1W |
|--|-------------------------|-------------------------|-------------------------|
| Terminals: | | | |
| Terminal capacity - fine stranded wire | 1...2.5 mm ² | 1...2.5 mm ² | 1...2.5 mm ² |
| Terminal capacity - solid wire | 1...4 mm ² | 1...4 mm ² | 1...4 mm ² |
| Size of terminal screws | M3 | M3 | M3 |
| Type of screw head | PZ size 1 | PZ size 1 | PZ size 1 |
| Max. torque | 0.8 Nm | 0.8 Nm | 0.8 Nm |

Dimensions (mm)

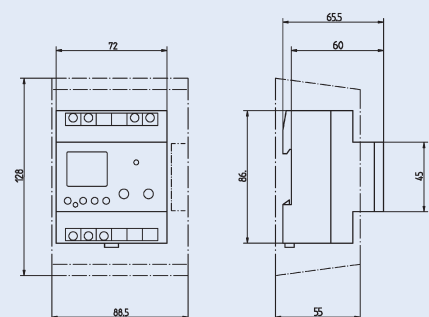
DS-TA/1S



DS-TA/1W



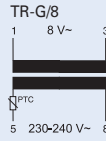
DS-TD/1W



Bell Transformers TR-G

- Bell transformers with separate windings according to EN 61558
- Not for permanent duty

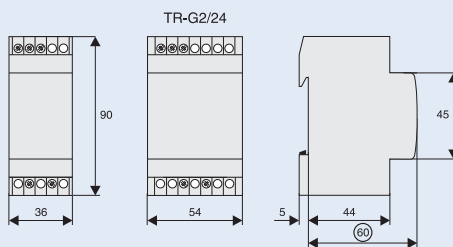
Connection diagrams



Technical Data

| | TR-G/8 | TR-G3/8 | TR-G3/18 | TR-G2/24 |
|---|--------------------------------------|----------------------------------|---------------------------------|-----------------------------|
| Electrical | | | | |
| Rated output | 8 VA | 8 VA | 18 VA | 24 VA |
| Rated supply voltage range at terminals | 230–240 V AC 5–8 | 230–240 V AC 5–8 | 230–240 V AC 5–8 | 230–240 V AC 5–8 |
| Rated frequency | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| No-load current | 25 mA | 26 mA | 36 mA | 24 mA |
| Rated supply current | 69 mA | 58 mA | 72/124/138 mA | 155/160 mA |
| Primary resistance | 616 Ω | 667 Ω | 229 Ω | 616 Ω |
| Rated output voltage at terminals | 8 V AC 1–3 | 4/8/12 V AC 2–3/1–2/1–3 | 4/8/12 V AC 2–3/1–2/1–3 | 12/24 V AC 1–2/1–3 |
| No-load output voltage | 13 V | 4.9 / 12 / 16.8 V | 5.9 / 12 / 17.8 V | 16 / 31 V |
| Output voltage at rated output current | 8.4 V 1 A | 3.8 / 7.9 / 12.2 V 1–1–0.67 A | 4.3 / 8.4 / 12.7 V 2–2–1.5 A | 12.2 / 23.2 V 2–1 A |
| Secondary resistance | 2 Ω | 0.9 / 1.9 / 2.8 Ω | 0.4 / 1 / 1.3 Ω | 1 / 3 Ω |
| Power loss in no-load operation | 1.4 W | 1.4 W | 1.8 W | 1.9 W |
| Total power loss at nominal load | 7.1 W | 6.2 W | 11.6 W | 11.9 W |
| Short circuit proof | PTC | PTC | PTC | PTC |
| Test voltage (primary-secondary) | 5 kV | 5 kV | 5 kV | 5 kV |
| Pollution degree | P2 | P2 | P2 | P2 |
| Mechanical | | | | |
| Frame size | 45 mm | 45 mm | 45 mm | 45 mm |
| Device height | 90 mm | 90 mm | 90 mm | 90 mm |
| Device width | 36 mm | 36 mm | 36 mm | 54 mm |
| Weight | 236 g | 253 g | 354 g | 612 g |
| Mounting | quick fastening on DIN rail EN 60715 | | | |
| Degree of protection, built-in | IP20 | IP20 | IP20 | IP20 |
| Upper and lower terminals | lift terminals | lift terminals | lift terminals | lift terminals |
| Terminal capacity | 1 - 3 x 2.5 mm ² | 1 - 3 x 2.5 mm ² | 1 - 3 x 2.5 mm ² | 1 - 3 x 2.5 mm ² |
| Tightening torque of terminal screws | 0.5 Nm | 0.5 Nm | 0.5 Nm | 0.5 Nm |
| Permitted relative humidity | < 95 % | < 95 % | < 95 % | < 95 % |
| Rated ambient temperature | 40 °C | 40 °C | 40 °C | 35 °C |
| Temperature rise at intermittent duty (20 x 1 min 100% a 5 min 20%) | 24 K | 24 K | 26 K | 31 K |
| Insulation class | E | E | E | E |
| Glow wire-test | 850 °C | 850 °C | 850 °C | 850 °C |

Dimensions [mm]



Practical Hint



Safety transformer



Bell transformer



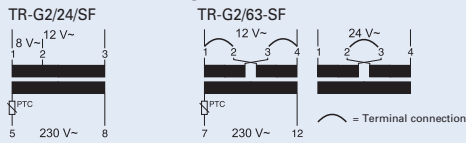
Short circuit-proof transformer

For types and art. numbers see page 56




Safety Transformers TR-G./..-SF

- Safety transformers with separate windings according to EN 61558
- For permanent duty

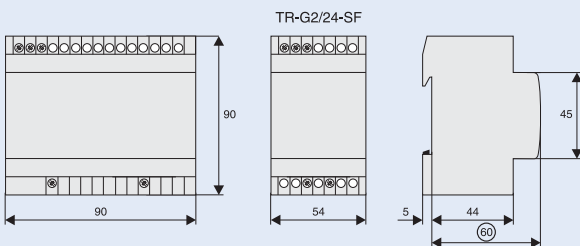
Connection diagrams



Technical Data

| | TR-G2/24-SF | TR-G2/24-SF2 | TR-G2/63-SF |
|---|---|---|---|
| Electrical: |  |  |  |
| Rated output | 24 VA | 24 VA | 63 VA |
| Rated supply voltage range at terminals | 230–240 V AC 5–8 | 230–240 V AC 7–12 | 230–240 V AC 7–12 |
| Rated frequency | 50 Hz | 50 Hz | 50 Hz |
| No-load current | 22 mA | 58 mA | 60 mA |
| Rated supply current | 100/150 mA | 140/135 mA | 340 mA |
| Primary resistance | 133 Ω | 92 Ω | 41 Ω |
| Rated output voltage at terminals | 8/12 V AC 1–2/1–3 | 12/24 V AC 1–2/1–3 | 12/24 V AC 1–4/1–4 |
| No-load output voltage | 9.9/15.6 V | 13.3/26.8 V | 13.6/27.3 V |
| Output voltage at rated output current | 8.2/12.3 V 2–2 A | 11.6/23.8 V 2–1 A | 12/24.1 V 5.2–2.6 A |
| Secondary resistance | 0.5 / 0.75 Ω | 0.45 / 0.95 Ω | 0.15 / 0.6 Ω |
| Power loss in no-load operation | 1.8 W | 4.3 W | 4.1 W |
| Total power loss at nominal load | 10.4 W | 6.3 W | 19.6 W |
| Duty | 100 % | 100 % | 100 % |
| Short circuit proof | PTC | PTC | PTC |
| Test voltage (primary-secondary) | 5 kV | 5 kV | 5 kV |
| Pollution degree | P2 | P2 | P2 |
| Mechanical: | | | |
| Frame size | 45 mm | 45 mm | 45 mm |
| Device height | 90 mm | 90 mm | 90 mm |
| Device width | 54 mm | 90 mm | 90 mm |
| Weight | 604 g | 1087 g | 1256 g |
| Mounting | quick fastening on DIN rail EN 60715 | | |
| Degree of protection, built-in | IP40 | IP40 | IP40 |
| Upper and lower terminals | lift terminals | lift terminals | lift terminals |
| Terminal capacity | 1–3 x 2.5 mm ² | 1–3 x 2.5 mm ² | 1–3 x 2.5 mm ² |
| Tightening torque of terminal screws | 0.5 Nm | 0.5 Nm | 0.5 Nm |
| Permitted relative humidity | <95 % | <95 % | <95 % |
| Rated ambient temperature | 25 °C | 35 °C | 25 °C |
| Temperature rise at uninterrupted duty | 56 K | 34 K | 51 K |
| Insulation class | E | F | F |
| Glow wire-test | 850 °C | 850 °C | 850 °C |

Dimensions [mm]



Practical Hint



Safety transformer



Bell transformer



Short circuit-proof transformer

For types and art. numbers see page 56

Installation Relays Z-R, Z-TN

Installation relays Z-R are suitable for switching 1-phase or 3-phase consumers in various applications:

- Switching lighting systems and electrical heating systems
 - Switching ventilation and air conditioning systems, fans
 - Switching heat pumps
 - Switching electrically controlled roller doors/gates, and blinds
- The installation relays of series Z-R meet the requirements of standards EN 60947. The installation relays of series Z-TN meet the requirements of standards EN 61095.

EN 60947 deals with "Electromagnetic contactors in electrical system manufacturing".
EN 61095 deals with "Electromechanical contactors for household and similar purposes." Compliance with this standard means meeting very high demands in terms of safety for humans and property.

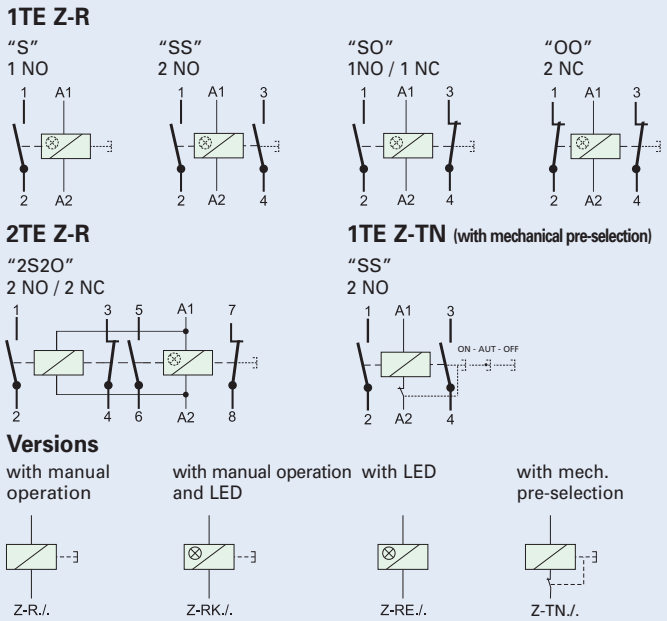
Security:

- Optional optical operating status display by means of LED
- Switching position indicated on the front side by manual operating key
- All terminals - coil and contacts - equipped with guide for secure terminal connection. Misplacement of wires impossible.
- Made of hardly flammable materials and plastics free from chlorine and halogens
- Switching contacts with safe disconnection AC1 according to EN 0947-4-4 (Z-R, Z-RK)

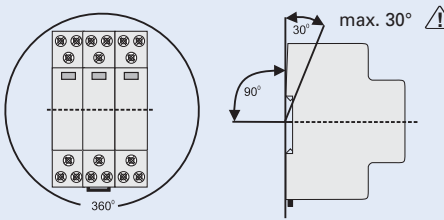
Advantages:

- Available in three versions (Z-R, Z-RK, Z-RE)
 - Low switching noise, no humming
 - Easy to connect thanks to large terminals supplied open
 - Simple snap-on fastening on 35 mm DIN rail
 - High degree of flexibility thanks to a variety of contact configurations
 - Version with mechanical pre-selection of functions ON/AUTO/OFF (Z-TN)
- ON/permanently ON: Contact permanently ON until a control pulse is switched on and OFF again. Then, the relay reverts to the AUT position.
 AUT/AUTOMATIC: Standard relay function by control voltage at the coil. OFF/permanently OFF: Contacts permanently OFF, independently of the control voltage at the coil.

Connection diagrams

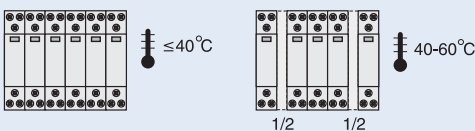


Permitted installation positions



Packing density at full contact load

Z-R./ Z-TN./
 It is recommended to use spacer Z-DST (0.5 MU) in case of ambient temperature higher than 40 °C .



Technical Data:

Electrical:

| | |
|---|-------------------------------|
| Design according to | Z-R EN 60947 Z-TN EN 61095 |
| Rated voltage | 250 V, 240 / 415 V AC |
| Rated current | 20 A, 250 V AC |
| Rated current AC1 I _e | 20 A AC1 (Z-R, Z-RK) |
| Rated operational power P _e | 4.6 kW 415 V |
| Number of poles | 1 až 4 |
| Main contacts | NO/NC |
| | 1, 2 (1 MU) 3, 4 (2 MU) |
| EMR compatibility | B |
| Control Circuit | |
| Rated control feed voltage U _s | 8, 12, 24, 230 V AC, 24 V DC |
| Rated frequency | 50 Hz |
| Operating range | 0.85–1.1 x U _s |
| Maximum power of coils | |
| pick-up | 10–13 VA, 6–8 W |
| retaining | 3.4–4.0 VA, 2.0–2.4 W |
| Minimum command duration | > 50 ms |
| Operating noise | no humming |
| Duty | 100 % |
| Rated peak withstand voltage U _{imp} | 2 kV (1.2/50 μs) |

Load Circuit

| | |
|--|---|
| Rated operational voltage U _n | 250 V AC |
| Minimum operational voltage U _{min} | 24 V AC / DC (U _s 8 - 110 V) |
| Rated insulation voltage U _i | 500 V |
| Rated peak withstand voltage U _{imp} | 4 kV (1.2/50 μs) |
| Conventional thermal current I _{th} | 20 A AC |
| Rated operational current I _e | 20 A AC |
| Rated constant current I _u | 20 A AC |
| Rated current DC I _e | |
| 24 V | 16 A DC |
| 48 V | 12.5 A DC |
| 230 V | 1 A DC |
| Conditional rated short circuit current I _q | 10 kA (with 20 A gL/gG) |
| Duration of bouncing | < 10 ms (typ. < 5 ms) |

For types and art. numbers see page 57

Technical Data (continued)

UTILISATION CATEGORIES 1 MU (except 3S, 4S)

| | |
|-----------------------------------|--|
| AC-1 $\square/\square/\square$ *) | |
| Rated operational voltage U_e | 250 V AC |
| Rated operational current I_e | 20 A AC |
| Rated operational power AC-1 | 4000 W ($\cos\varphi = 0.8$), 5000 VA |
| AC-3 \odot | |
| Rated operational voltage U_e | 250 V AC |
| Rated operational current I_e | 8 A AC |
| Rated operational power AC-3 | 900 W ($\cos\varphi = 0.45$), 2000 VA |
| AC-5a \otimes | |
| Rated operational voltage U_e | 250 V AC |
| Rated operational current I_e | 10 A AC |
| Rated operational power AC-5a | 1125 W ($\cos\varphi = 0.45$), 2500 VA |
| AC-5b \otimes | |
| Rated operational voltage U_e | 230 V AC |
| Rated operational current I_e | 8.8 A AC |
| Rated operational power AC-5b | 2024 W |
| AC-7a \blacksquare | |
| Rated operational voltage U_e | 240 / 415 V AC |
| Rated operational current I_e | 20 A AC |
| Rated operational power AC-7a | 4000 W ($\cos\varphi = 0.8$), 5000 VA |

UTILISATION CATEGORIES 2MU (3S, 4S)


| | |
|---------------------------------|--|
| AC-1 $\square/\square/\square$ | |
| Rated operational voltage U_e | 240/415 V AC |
| Rated operational current I_e | 20 A AC |
| Rated operational power AC-1 | 4000 W ($\cos\varphi = 0.8$), 5000 VA |
| AC-3 \odot | |
| Rated operational voltage U_e | 240/415 V AC |
| Rated operational current I_e | 8 A AC |
| Rated operational power AC-3 | 900 W ($\cos\varphi = 0.45$), 2000 VA |
| AC-5a \otimes | |
| Rated operational voltage U_e | 240/415 V AC |
| Rated operational current I_e | 10 A AC |
| Rated operational power AC-5a | 1125 W ($\cos\varphi = 0.45$), 2500 VA |

| | |
|-------------------------------------|---|
| AC-5b \otimes | |
| Rated operational voltage U_e | 230/400 V AC |
| Rated operational current I_e | 8.8 A AC |
| Rated operational power AC-5b | 2024 W |
| AC-7a (dle EN 61095) \blacksquare | |
| Rated operational voltage U_e | 240/415 V AC |
| Rated operational current I_e | 20 A AC |
| Rated operational power AC-7a | 4000 W ($\cos\varphi = 0.8$), 5000 VA |
| AC-7b (dle EN 61095) \odot | |
| Rated operational voltage U_e | 240/415 V AC |
| Rated operational current I_e | 10 A AC |
| Rated operational power AC-7b | 1125 W ($\cos\varphi = 0.8$), 2500 VA |

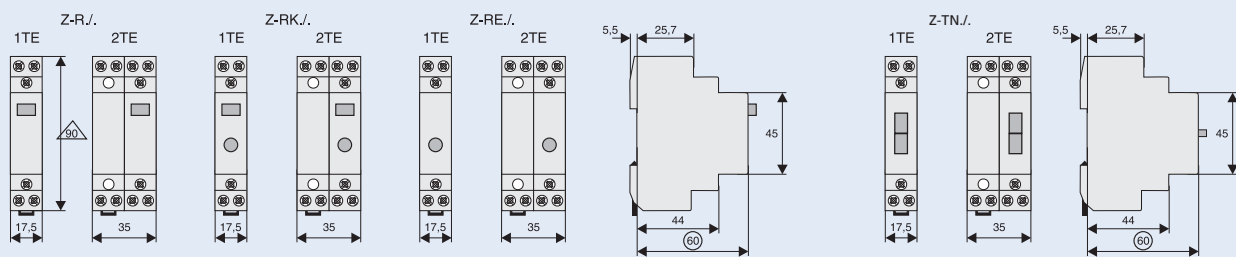
| | | |
|-----------|------------------|--|
| Endurance | electrical comp. | $\geq 40 \times 10^3$ operating cycles |
| | mechanical comp. | $\geq 1 \times 10^6$ operating cycles |

Mechanical:

| | |
|---------------------------------------|---|
| Frame size | 45 mm |
| Device height | 90 mm |
| Device width | 17.5 mm (1 MU) |
| Mounting | quick fastening on DIN rail 35 mm |
| Degree of protection installed device | IP20 |
| Mounting position | as required |
| Upper and lower terminals | lift terminals (captive) |
| Terminal capacity | |
| Contact and coil | 0.5–10 mm ² one- or more wire 0.5–6 mm ² fine-wire with wire end sleeve |
| Temperature range | -20 °C to +45 °C |
| Total contact gap | > 5 mm / independent contacts |
| Contact material | does not contain cadmium |

*)  Suitable for insulation, tested on AC-1

Dimensions [mm]



Installation Contactors Z-SCH

These switching devices have been designed and rated particularly for modular installation in modular distribution boxes for electrical installation or cabinets with device covers. The innovative technology of the electrical AC magnet system of these switching devices, permits reducing the switching noise and suppressing humming while ensuring reliability and high contact forces in modular devices requiring little space. Thanks to these characteristics, the application requirements on systems and equipment in offices and residential areas are fully met.

The installation contactors Z-SCH are suitable for switching 1-phase or 3-phase consumers up to 63 A. These devices for universal use in systems and installations for buildings permit implementation of the following applications and control functions:

- Switching of lighting systems
- Switching of electrical heating systems
- Switching of ventilation systems
- Switching of air conditioning systems and fans
- Switching of heat pumps
- Switching of electrically controlled (motor-operated) roller doors/gates, and blinds
- etc.

The installation contactors of series Z-SCH meet the requirements of standards EN 61095 and EN 60947.

EN 61 095 deals with "Electromechanical contactors for household and similar purposes." Compliance with this standard means meeting very high demands in terms of safety for humans and property.

EN 60 947 deals with "Electromagnetic contactors in electrical system manufacturing."

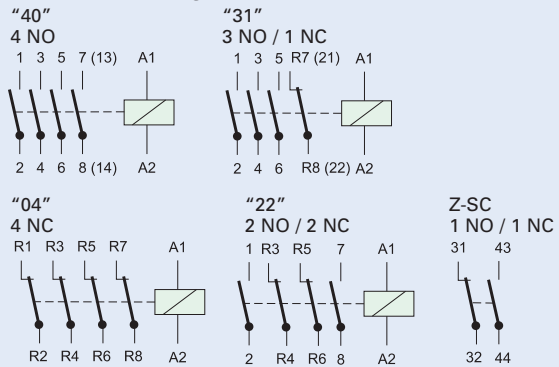
Safety:

- Finger and hand touch safe
- Front-side switch position indicator
- Hardly flammable materials and chlorine-free and halogen-free plastics are used

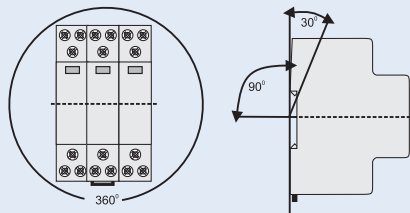
Advantages:

- Low switching noise
- No humming
- Easy to connect thanks to large terminals with captive connecting screws of type Pozidrive which are supplied open and equipped with a screwdriver guide for automatic wiring.
- Versions with different contacts configurations
- Simple snap-on fastening of 35 mm DIN rail EN 60715
- In devices with 25 ... 63 A, flexibility is further enhanced by clip-on auxiliary switch Z-SC (contacts 11), laterally to the right.
- Plenty of space and easy access for coil feed connection
- Power ratings of 25, 40, 63A AC1 to meet field requirements.

Connection diagrams Z-SCH



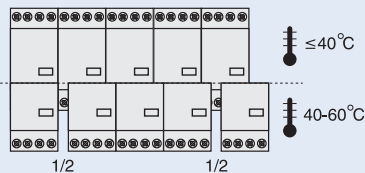
Permitted Installation Positions



Packing Density at full contact load

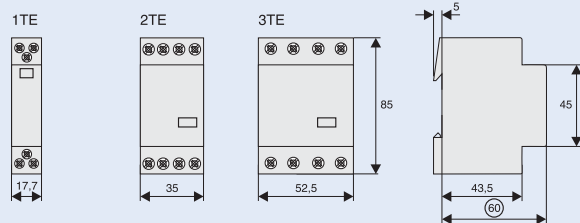
Z-SCH

It is recommended to use spacer Z-DST (0.5 MU) in case of ambient temperature higher than 40 °C.

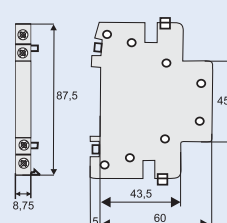


Dimensions [mm]

Z-SCH.../1/25 Z-SCH.../25 Z-SCH.../40, .../63




Z-SC



Technical Data of Installation Contactors Z-SCH

| Values according to IEC 1095, EN 61095, VDE 0660, IEC 947-4-1, EN 60947-4-1, VDE | | | Z-SCH/25/.. | Z-SCH/40/.. | Z-SCH/63/.. | Z-SC |
|---|-----------|-----------------|-------------|-------------|-------------|------|
| Utilisation category AC-1 (e.g. heating system)) | | | | | | |
| Rated operational current $I_n (=I_{th})$ open | at 60 °C | A | 25 | 40 | 63 | - |
| Service life of switching element | | $S \times 10^6$ | 0.1 | 0.1 | 0.1 | - |
| Rated operational power AC-1 | 220–240 V | kW | 9.5 | 16 | 25 | - |
| | 380–415 V | kW | 17 | 27.5 | 43 | - |
| Utilisation category AC-3 (Switching of 3-phase AC motors) | | | | | | |
| Rated operational current I_n | | A | 9 | 27 | 30 | - |
| Service life of switching element u | | $S \times 10^6$ | 0.15 | 0.15 | 0.15 | - |
| Rated power of 3-phase AC motors 50-60 Hz | kW | 2,2 | 7.5 | 8 | - | - |
| | 230–240 V | kW | 2.5 | 8 | 8.5 | - |
| | 380–415 V | kW | 4 | 12.5 | 15 | - |
| Utilisation category DC-1 (Switching of resistive loads, $L/R \leq 15$ ms) values for make contacts | | | | | | |
| 1-pole | 24 V DC | A | 25 | 40 | 63 | - |
| | 48 V DC | A | 22 | 25 | 26 | - |
| | 60 V DC | A | 18 | 19 | 21 | - |
| | 110 V DC | A | 5 | 7 | 8 | - |
| | 220 V DC | A | 0.5 | 0.7 | 0.7 | - |
| 2-pole in series | 24 V DC | A | 25 | 40 | 63 | - |
| | 48 V DC | A | 25 | 40 | 44 | - |
| | 60 V DC | A | 25 | 33 | 36 | - |
| | 110 V DC | A | 16 | 17 | 18 | - |
| | 220 V DC | A | 4 | 5 | 6 | - |
| 3-pole in series | 24 V DC | A | 25 | 40 | 63 | - |
| | 48 V DC | A | 25 | 40 | 63 | - |
| | 60 V DC | A | 25 | 40 | 61 | - |
| | 110 V DC | A | 25 | 31 | 34 | - |
| | 220 V DC | A | 10 | 15 | 16 | - |
| 4-pole in series | 24 V DC | A | 25 | 40 | 63 | - |
| | 48 V DC | A | 25 | 40 | 63 | - |
| | 60 V DC | A | 25 | 40 | 63 | - |
| | 110 V DC | A | 25 | 40 | 63 | - |
| | 220 V DC | A | 15 | 20 | 21 | - |
| Utilisation category DC-3 and DC-5 (Switching of inductive load, $L/R \leq 15$ ms) values for make contacts | | | | | | |
| 1-pole | 24 V DC | A | 15 | 23 | 25 | - |
| | 48 V DC | A | 5 | 10 | 10 | - |
| | 60 V DC | A | 4 | 5 | 5 | - |
| | 110 V DC | A | 1 | 1.5 | 1.5 | - |
| | 220 V DC | A | 0.1 | 0.3 | 0.3 | - |
| 2-pole in series | 24 V DC | A | 25 | 40 | 45 | - |
| | 48 V DC | A | 17 | 23 | 25 | - |
| | 60 V DC | A | 13 | 15 | 15 | - |
| | 110 V DC | A | 5 | 5 | 5 | - |
| | 220 V DC | A | 0.5 | 1 | 1 | - |
| 3-pole in series | 24 V DC | A | 25 | 40 | 63 | - |
| | 48 V DC | A | 25 | 40 | 45 | - |
| | 60 V DC | A | 25 | 30 | 30 | - |
| | 110 V DC | A | 15 | 15 | 15 | - |
| | 220 V DC | A | 3 | 4 | 4 | - |
| 4-pole in series | 24 V DC | A | 25 | 40 | 63 | - |
| | 48 V DC | A | 25 | 40 | 63 | - |
| | 60 V DC | A | 25 | 40 | 63 | - |
| | 110 V DC | A | 25 | 40 | 45 | - |
| | 220 V DC | A | 8 | 10 | 10 | - |
| Main Switching Elements ($U_{imp} = 4$ kV) | | | | | | |
| Rated insulation voltage U_i | | V AC | 440 | 440 | 440 | 440 |
| Rated operational voltage U_e | | V AC | 440 | 440 | 440 | 440 |
| Rated operational voltage | AC1, AC3 | 1 / h | 300 | 600 | 600 | 600 |
| Mechanical endurance | | $S \times 10^6$ | 1 | 1 | 1 | 1 |
| Auxiliary Switching Elements ($U_{imp} = 4$ kV) | | | | | | |
| Rated insulation voltage U_i | | V AC | 440 | 440 | 440 | 440 |
| Nominal thermal current = I_{th} | 40 °C | A | 25 | 40 | 63 | 10 |
| | 60 °C | A | 25 | 40 | 63 | 6 |
| Utilisation category AC-15 (Controlling of electromagnetic load) | | | | | | |
| Rated operational current I_e | 220–240 V | A | - | - | - | 3 |
| | 380–415 V | A | - | - | - | 2 |
| | 440 V | A | - | - | - | 1.6 |
| Utilisation category DC-13 (Controlling of electromagnetic load at DC) | | | | | | |
| Rated operational current I_e per pole | 24–60 V | A | - | - | - | 2 |
| | 110 V | A | - | - | - | 0.4 |
| | 220 V | A | - | - | - | 0.1 |


For types and art. numbers see page 58

| | | | Z-SCH/25/.. | Z-SCH/40/.. | Z-SCH/63/.. | Z-SC | |
|--|--|-----------------|-------------|-------------|-------------|------------|-----|
| Trip Coil Power  | Rated voltage of coils | V AC | 24, 230 | 230 | 230 | 230 | |
| | Switching on Holding | VA | 14 - 18 | 33 - 45 | 33 - 45 | - | |
| | | VA | 4.4 - 8.4 | 7 | 7 | - | |
| | | W | 1.6 - 3.2 | 2.6 | 2.6 | - | |
| | Operating range of trip coils | | | | | | |
| | Coil voltage range (multiplication factor) U_g | | | 0.85 - 1.1 | 0.85 - 1.1 | 0.85 - 1.1 | - |
| | Pv Power loss per current path | | | | | | |
| | Pvges. Power loss per device at nominal current load | | W | 2 | 3 | 7 | 0.5 |
| | | 1-pole | W | 5.2 | 5.6 | 5.6 | - |
| | | 2-pole | W | 7.2 | 8.6 | 16.6 | - |
| 3-pole | | W | 9.2 | 11.6 | 23.6 | - | |
| | 4-pole | W | 11.2 | 14.6 | 30.6 | - | |
| Switching noise (on and off) Typical mean values | | dB | 80 | 78 | 78 | - | |
| Terminal capacity | | | | | | | |
| Main conductor | one or several wires | mm ² | 1.5 - 10 | 2.5 - 25 | 2.5 - 25 | 0.5 - 2.5 | |
| | fine wires | mm ² | 1.5 - 6 | 2.5 - 16 | 2.5 - 16 | 0.5 - 2.5 | |
| | fine wires with wire end | mm ² | 1.5 - 6 | 2.5 - 16 | 2.5 - 16 | 0.5 - 1.5 | |
| | number of conductors per terminal | | 1 | 1 | 1 | 2 | |
| Coil | one or several wires | mm ² | 0.75 - 2.5 | 0.75 - 2.5 | 0.75 - 2.5 | - | |
| | fine wires | mm ² | 0.5 - 2.5 | 0.5 - 2.5 | 0.5 - 2.5 | - | |
| | fine wires with wire end sleeve | mm ² | 0.5 - 1.5 | 0.5 - 1.5 | 0.5 - 1.5 | - | |
| | number of conductors per terminal | | 1 | 1 | 1 | - | |
| Weight | | kg / unit | 0.22 | 0.36 | 0.36 | 0.026 | |
| Short circuit protection (main circuit) Maximum nominal current of fuse Co-ordination type 1 | | gL / gG | A | 35 | 63 | 80 | - |
| Short circuit protection (auxiliary circuit) Maximum nominal current of fuses Short-circuit current 1000 A, without fusing of contacts | | gL / gG | A | - | - | - | 10 |
| Switching times at control voltage $U_g \pm 10\%$ | | | | | | | |
| | Make delay | ms | 9 - 15 | 11 - 15 | 11 - 15 | - | |
| | Break delay | ms | 4 - 8 | 6 - 13 | 6 - 13 | - | |
| | Arc duration | ms | 10 - 15 | 10 - 15 | 10 - 15 | - | |

Installation Contactors Z-SCH for Lighting Systems


The decisive factors are the type, connection and current consumption of lamps during switch-on and in permanent operation. Only 90 % of the continuous current of switching devices should be used in view of higher current consumption as a result of increases of voltage. The maximum number of lamps per phase that can be operated by a switching device is

dependent on the nominal current and making current of lamps on the one hand, and on the continuous current and making capacity of the switching devices on the other. Thus, e.g. in lead-lag circuits, the continuous current of contactors can be used, while this is not possible in fluorescent tubes with separate compensation.

| | | | Z-SCH/25/.. | Z-SCH/40/.. | Z-SCH/63/.. | Z-SC | |
|---|--|---------------------|-------------|-------------|-------------|------|---|
| Utilisation category AC-1 resistive load | Rated operational current 60 °C | I_g for AC-1 | A | 25 | 40 | 63 | - |
| | Making capacity: | Root mean square | A | 200 | 360 | 480 | - |
| | | Peak value | A | 280 | 510 | 680 | - |
| Utilisation category AC-5a discharge lamps, fluorescent tubes | Rated operational power 220-240 V~ DUO | $\cos\varphi = 0,5$ | kW | 1.3 | 3.4 | 5.5 | - |
| | | $\cos\varphi = 0,9$ | kW | 1.2 | 3.1 | 5.1 | - |
| | | | kW | 3.7 | 6.3 | 10 | - |
| Utilisation category AC-5b incandescent lamps  | Rated operational power 240 V~ | | kW | 3 | 5,7 | 8 | - |

Incandescent Lamps

The incandescent lamp filament has a very low ohmic resistance when it is cold. Therefore, when switching on, there is a high peak current (up to $20 \times I_n$). When switching off, only the nominal current is switched off.

| | | Power | Current | Z-SCH/25/.. | Z-SCH/40/.. | Z-SCH/63/.. | Z-SC |
|---|--------------------|--|---------|-------------|-------------|-------------|------|
| Utilisation category AC-5b | | W | A | ks | ks | ks | |
|  | Incandescent lamps | 60 | 0.27 | 50 | 92 | 129 | - |
| | | 100 | 0.45 | 30 | 55 | 77 | - |
| | | 200 | 0.91 | 15 | 27 | 38 | - |
| | | 300 | 1.36 | 10 | 19 | 26 | - |
| | | 500 | 2.27 | 6 | 11 | 16 | - |
| | | 1000 | 4.5 | 3 | 6 | 8 | - |
| | | Low voltage halogen lamps (12 ur 24 V) with transformer (with electronic transformer) | 20 | 0,09 | 52 | 110 | 174 |
| 50 | 0.22 | | 24 | 50 | 80 | - | |
| 75 | 0.33 | | 16 | 35 | 54 | - | |
| 100 | 0.43 | | 12 | 27 | 43 | - | |
| 150 | 0.65 | | 9 | 19 | 29 | - | |
| 200 | 0.87 | | 6 | 14 | 23 | - | |
| 300 | 1.30 | | 4 | 9 | 14 | - | |
| max. number of lamps per current path at 230 V, 50 Hz | | | | | | | |

Fluorescent Tubes, Mercury Arc Lamps

High- and low pressure discharge lamps with mercury vapour, with or without fluorescent-coated glass body are perfectly identical in their electrical behaviour.

In order to limit the operational current and pre-conduction current, and to achieve the initial peak voltage, reactance coils are used as ballast.

Capacitors are used for compensation of the resulting reactive current, which are either connected in series with the coil (lead-lag circuit) or parallel

to the mains (separate compensation, very rarely used now). The high making current in case of separate compensation (max. 30 x nominal current of the capacitor) which goes down quickly is usually attenuated considerably by the feed line.

Utilisation category AC-5a

| | | |
|--|--|---|
| Fluorescent tubes | Fluorescent lamps without comp. or with series comp. | $I = I_{eAC1} \times 0.5$ |
| | Lead-lag circuit (2x..) | $I = I_{eAC1} \times 0.35$ |
| | Fluorescent tubes parallelkomp | $I = I_{Peak} / 100$ (take into account compensation capacitor) |
| I / I_{Lampe} = number of connectable lamps per current path | Fluorescent tubes with electronic ballast | $I = I_{Peak} / 50$ |
| | Mercury arc lamps,HD without compensation | $I = I_{eAC1} \times 0.5$ |
| | Mercury arc lamps,HD with compensation | $I = I_{Peak} / 100$ (take into account compensation capacitor) |

Utilisation category AC-5a

| Lamp Types | Power W | Current A | Capacitor µF | max. number of lamps per current path at 230 V, 50 Hz | | | | |
|--|---|--------------|-----------------|---|-------------|-------------|---------|---|
| | | | | Z-SCH/25/.. | Z-SCH/40/.. | Z-SCH/63/.. | Z-SC | |
| Fluorescent lamps without compensation or with series compensation | 11 | 0.16 | 1.3 | 75 | 210 | 310 | - | |
| | 18 | 0.37 | 2.7 | 34 | 90 | 140 | - | |
| | 24 | 0.35 | 2.5 | 34 | 90 | 140 | - | |
| | 36 | 0.43 | 3.4 | 30 | 70 | 140 | - | |
| | 58 | 0.67 | 5.3 | 20 | 45 | 70 | - | |
| | 65 | 0.67 | 5.3 | 19 | 40 | 65 | - | |
| | 85 | 0.8 | 5.3 | 16 | 35 | 60 | - | |
| | Fluorescent tubes lead-lag circuit | 11 | 0.07 | - | 2 x 110 | 2 x 220 | 2 x 250 | - |
| | | 18 | 0.11 | - | 2 x 55 | 2 x 130 | 2 x 200 | - |
| | | 24 | 0.14 | - | 2 x 44 | 2 x 110 | 2 x 160 | - |
| | | 36 | 0.22 | - | 2 x 33 | 2 x 70 | 2 x 100 | - |
| | | 58 | 0.35 | - | 2 x 22 | 2 x 46 | 2 x 70 | - |
| | | 65 | 0.35 | - | 2 x 16 | 2 x 40 | 2 x 60 | - |
| | | 85 | 0.47 | - | 2 x 11 | 2 x 30 | 2 x 40 | - |
| | Fluorescent tubes with parallel comp. | 11 | 0.16 | 3.0 | 43 | 67 | 107 | - |
| | | 18 | 0.37 | 4.0 | 32 | 50 | 80 | - |
| | | 24 | 0.35 | 4.0 | 32 | 50 | 80 | - |
| | | 36 | 0.43 | 4.0 | 32 | 50 | 80 | - |
| 58 | | 0.67 | 7.0 | 18 | 36 | 46 | - | |
| 65 | | 0.67 | 7.0 | 18 | 36 | 46 | - | |
| 85 | | 0.8 | 8.0 | 16 | 33 | 44 | - | |
| Fluorescent tubes with electronic ballast | 18 | 0.09 | - | 40 | 100 | 150 | - | |
| | 36 | 0.16 | - | 20 | 50 | 75 | - | |
| | 58 | 0.25 | - | 15 | 30 | 55 | - | |
| | 80 | 0.4 | - | 10 | 20 | 30 | - | |
| | 2 x 18 | 0.17 | - | 2 x 20 | 2 x 50 | 2 x 60 | - | |
| | 2 x 36 | 0.32 | - | 2 x 10 | 2 x 25 | 2 x 30 | - | |
| | 2 x 58 | 0.49 | - | 2 x 7 | 2 x 15 | 2 x 20 | - | |
| Mercury arc lamps. high pressure without compensation e.g.: HQL, HPL | 50 | 0.61 | - | 21 | 38 | 55 | - | |
| | 80 | 0.8 | - | 16 | 28 | 40 | - | |
| | 125 | 1.15 | - | 11 | 20 | 28 | - | |
| | 250 | 2.15 | - | 6 | 11 | 15 | - | |
| | 400 | 3.25 | - | 4 | 7 | 10 | - | |
| | 700 | 5.4 | - | 2 | 4 | 6 | - | |
| | 1000 | 7.5 | - | 1 | 3 | 4 | - | |
| | Mercury arc lamps, high pressure with compensation e.g.: HQL, HPL | 50 | 0.28 | 7 | 18 | 36 | 50 | - |
| | | 80 | 0.41 | 8 | 16 | 31 | 44 | - |
| | | 125 | 0.65 | 10 | 13 | 25 | 35 | - |
| | | 250 | 1.22 | 18 | 7 | 14 | 19 | - |
| | | 400 | 1.95 | 25 | 5 | 10 | 14 | - |
| | | 700 | 3.45 | 45 | 3 | 6 | 8 | - |
| | | 1000 | 4.8 | 60 | 2 | 4 | 6 | - |

Fluorescent lamps in DUO connection ($\cos \varphi = 1$)

Metal Halide Lamps

Metal halide lamps are a version of high-pressure mercury arc lamps with higher luminous efficiency and fidelity of colour (metalloids [halogens] added to the mercury fill up the Hg-spectrum with its many gaps). Ballast and ignition devices are necessary. Starting time 3 ... 5 minutes at $1.4 - 2 \times I_n$. After switching on, it is not possible to light the lamp again immediately (lamp extinguishes after a power cut-off

of only 1/2 period). Therefore, in many cases in important facilities ionisation of part of the lamps is maintained by switching over to 415 V, 500 Hz (e.g. to an emergency power supply). In this case, the lamp lights immediately after the mains voltage is on again. Otherwise, this would take several minutes. When using suitable ignition devices, the lamps can be lit again immediately.

| | | |
|--|---|---|
| I / I_{Lampe} = number of connectable lamps per current path | Metal halide lamps (HQI) without compensation | $I = I_{eAC1} \times 0,5$ |
| | Metal halide lamps (HQI) with compensation | $I = I_{Peak} / 100$ (take into account compensation capacitor) |
| | Transformer for low voltage halogen lamps | $I = I_{Peak} / 50$ |

| Lamp Types | Power W | Current A | Capacitor µF | max. number of lamps per current path at 230 V, 50 Hz | | | | |
|---|--|--------------|-----------------|---|-------------|-------------|------|---|
| | | | | Z-SCH/25/.. | Z-SCH/40/.. | Z-SCH/63/.. | Z-SC | |
| Metal halide lamps without compensation e.g. HQI, HPI | 35 | 0.53 | - | 28 | 57 | - | - | |
| | 70 | 1 | - | 15 | 30 | - | - | |
| | 150 | 1.8 | - | 8 | 17 | - | - | |
| | 250 | 3 | - | 5 | 10 | - | - | |
| | 400 | 3.5 | - | 4 | 8 | - | - | |
| | 1000 | 9.5 | - | 1 | 3 | - | - | |
| | 2000 | 16.5 | - | - | 2 | - | - | |
| | 400 V per Pol | 2000 | 10.5 | - | - | 2 | - | - |
| | | 3500 | 18 | - | - | 1 | - | - |
| | Metal halide lamps with electronic ballast HQI | 20 | 0.1 | - | 9 | 18 | 20 | - |
| 35 | | 0.2 | - | 6 | 11 | 13 | - | |
| 70 | | 0.36 | - | 5 | 12 | 12 | - | |
| 150 | | 0.7 | - | 4 | 10 | 10 | - | |
| Metal halide lamps with compensation e.g. HQI, HPI | 35 | 0.25 | 6 | 21 | 42 | 58 | - | |
| | 70 | 0.45 | 12 | 11 | 21 | 29 | - | |
| | 150 | 0.75 | 20 | 4 | 13 | 18 | - | |
| | 250 | 1.5 | 33 | 4 | 9 | 11 | - | |
| | 400 | 2.1 | 35 | 1 | 9 | 10 | - | |
| | 1000 | 5.8 | 95 | - | 3 | 4 | - | |
| | 2000 | 11.5 | 148 | - | 2 | 2 | - | |
| | 400 V per Pol | 2000 | 6.6 | 58 | - | 3 | 4 | - |
| | | 3500 | 11.6 | 100 | - | 2 | 3 | - |
| | Transformers for low-voltage halogen lamps | 20 | - | - | 52 | 110 | 174 | - |
| 50 | | - | - | 24 | 50 | 80 | - | |
| 75 | | - | - | 16 | 35 | 54 | - | |
| 100 | | - | - | 12 | 27 | 43 | - | |
| 150 | | - | - | 9 | 19 | 29 | - | |
| 200 | | - | - | 5 | 14 | 23 | - | |
| 300 | | - | - | 4 | 9 | 14 | - | |

Sodium Vapour Lamps

For 200 W, 1200 mm high-pressure lamps and low-pressure lamps, reactance coils are used as ballast. For smaller lamps, stray field transformers can be used as ballast. Take into account, the long starting period.

Low pressure lamps:

Without compens.: Making curr. $1 \times X I_g$, $\cos\varphi = 0.3$; starting time 5 .. 10 min
Decisive for selection of device: 60 % continuous current
 $I = I_{eAC1} \times 0.6$

With compensation: Making curr.: $20 \times X I_g$, $\cos\varphi = 0.45$; starting time 5 .. 10 min
(at $1.6 \times I_n$), $I = I_{Peak} / 200$

High pressure lamps:

Without compens.: Making curr. $1.4 \times X I_g$, $\cos\varphi = 0.5$;
starting time 5 .. 10 min
Decisive for selection of device: 60 % continuous current
 $I = I_{eAC1} \times 0.6$

With compensation: Making curr.: $20 \times X I_g$, $\cos\varphi = 0.95$; starting time 5 .. 10 min
(at $1.6 \times I_n$)

Note: number of lamps

| | Power W | Current A | Capacitor µF | max. number of lamps per current path at 230 V, 50 Hz | | | |
|--|------------|--------------|-----------------|---|-------------|-------------|------|
| | | | | Z-SCH/25/.. | Z-SCH/40/.. | Z-SCH/63/.. | Z-SC |
| Sodium vapour lamps low-pressure without compensation | 35 | 1.5 | - | 9 | 22 | 30 | - |
| | 55 | 1.5 | - | 9 | 22 | 30 | - |
| | 90 | 2.4 | - | 6 | 13 | 19 | - |
| | 135 | 3.3 | - | 4 | 10 | 14 | - |
| | 150 | 3.3 | - | 4 | 10 | 14 | - |
| | 180 | 3.3 | - | 4 | 10 | 14 | - |
| | 200 | 3.3 | - | 4 | 10 | 14 | - |
| Sodium vapour lamps low-pressure with compensation | 35 | 0.31 | 20 | 6 | 15 | 18 | - |
| | 55 | 0.42 | 20 | 4 | 15 | 18 | - |
| | 90 | 0.63 | 30 | 4 | 10 | 12 | - |
| | 135 | 0.94 | 45 | 3 | 7 | 8 | - |
| | 150 | 1 | 40 | 3 | 8 | 9 | - |
| | 180 | 1.16 | 40 | 3 | 8 | 9 | - |
| | 200 | 1.32 | 30 | - | 10 | 12 | - |
| Sodium vapour lamps high-pressure without compensation | 150 | 1.8 | - | 8 | 15 | 22 | - |
| | 250 | 3 | - | 5 | 10 | 13 | - |
| | 330 | 3.7 | - | 4 | 8 | 10 | - |
| | 400 | 4.7 | - | 3 | 6 | 8 | - |
| | 1000 | 10.3 | - | 1 | 3 | 4 | - |
| Sodium vapour lamps high pressure with compensation | 150 | 0.83 | 20 | 7 | 20 | 25 | - |
| | 250 | 1.5 | 33 | 4 | 12 | 15 | - |
| | 330 | 2 | 40 | 3 | 10 | 13 | - |
| | 400 | 2.4 | 48 | 2 | 8 | 12 | - |
| | 1000 | 6.3 | 106 | 1 | 4 | 6 | - |

For types and art. numbers see page 58

Utilisation Categories of Contactors

| Type of current | Utilisation category | Typical Applications I = Making current, I _c = Breaking current, I _e = Rated operational current, U = Voltage, U _e = Rated operational voltage U _r = Recovery voltage | Verification of electrical service life | | | | | | Verification of switching capacity | | | | | | | |
|-----------------|--|---|--|-----------------|------|-------------------|-------------------|------|------------------------------------|--|------|-------------------|--------------------|------|---------------|------|
| | | | Switching on | | | Switching off | | | Switching on | | | Switching off | | | | |
| | | | $\frac{I}{I_e}$ [A] | $\frac{U}{U_e}$ | cosφ | $\frac{I_c}{I_e}$ | $\frac{U_r}{U_e}$ | cosφ | $\frac{I}{I_e}$ [A] | $\frac{U}{U_e}$ | cosφ | $\frac{I_c}{I_e}$ | $\frac{U_r}{U_e}$ | cosφ | | |
| AC | AC-1 | Non-inductive or slightly inductive load, Resistance furnaces | all values | 1 | 1 | 0.95 | 1 | 1 | 0.95 | all values | 1.5 | 1.05 | 0.8 | 1.5 | 1.05 | 0.8 |
| | AC-2 | Slip ring motors: starting, switching off | all values | 2.5 | 1 | 0.65 | 2.5 | 1 | 0.65 | all values | 4 | 1.05 | 0.65 | 4 | 1.05 | 0.8 |
| | AC-3 | Squirrel cage motors: starting, switching off, running motors ⁴⁾ | I _e ≤ 17 I _e > 17 | 6 | 1 | 0.65 | 1 | 0.17 | 0.65 | I _e ≤ 100 I _e > 100 | 10 | 1.05 | 0.45 | 8 | 1.05 | 0.45 |
| | AC-4 | Squirrel cage motors: starting, plugging reversing, inching | I _e ≤ 17 I _e > 17 | 6 | 1 | 0.65 | 6 | 1 | 0.65 | I _e ≤ 100 I _e > 100 | 12 | 1.05 | 0.45 | 10 | 1.05 | 0.45 |
| | AC-5a AC-5b | Switching of electric discharge lamp controls Switching of incandescent lamps | | | | | | | | 3.0 1.5 ²⁾ | 1.05 | 0.45 | 3.0 | 1.05 | 0.45 | |
| | AC-6a ³⁾ AC-6b ³⁾ | Switching of transformers Switching of capacitor banks | | | | | | | | | | | 1.05 ²⁾ | 1.05 | 0.45 | |
| | AC-7a | Slightly inductive loads in household appliances and similar applications | according to manufacturer specifications | | | | | | | 1.5 | 1.05 | 0.8 | 1.5 | 1.05 | 0.8 | |
| | AC-7b | Motor loads for household appliances | | | | | | | | 8.0 | 1.05 | ¹⁾ | 8.0 | 1.05 | ¹⁾ | |
| | AC-8a | Switching of hermetically enclosed refrigerant compressor motors with manual reset of overload releases ⁵⁾ | | | | | | | | 6.0 | 1.05 | ¹⁾ | 6.0 | 1.05 | ¹⁾ | |
| | AC-8b | Switching of hermetically enclosed refrigerant compressor motors with automatic reset of overload releases ⁵⁾ | | | | | | | | 6.0 | 1.05 | ¹⁾ | 6.0 | 1.05 | ¹⁾ | |
| DC | DC-1 | Non-inductive or slightly inductive load, Resistance furnaces | all values | 1 | 1 | 1 | 1 | 1 | 1 | all values | 1.5 | 1.05 | 1 | 1.5 | 1.05 | 1 |
| | DC-3 | Shunt motors: starting, plugging, reversing, inching, dynamic braking | all values | 2.5 | 1 | 2 | 2.5 | 1 | 2 | all values | 4 | 1.05 | 2.5 | 4 | 1.05 | 2.5 |
| | DC-5 | Series motors: starting, plugging, reversing, inching, dynamic braking | all values | 2 | 1 | 7.5 | 2.5 | 1 | 7.5 | all values | 4 | 1.05 | 2.5 | 4 | 1.05 | 2.5 |
| | DC-6 | Switching of incandescent lamps | | | | | | | | 1.5 ²⁾ | 1.05 | ²⁾ | 1.5 ²⁾ | 1.05 | ²⁾ | |

according to IEC 947-4-1, EN 60 947, VDE 0660 Part 102

¹⁾ cosφ = 0.45 for I_e ≤ 100 A; cosφ = 0.35 for I_e ≤ 100 A.

²⁾ The tests must be carried out with an incandescent lamp load connected.

³⁾ In this case, the test data must be derived from the test values for AC-3 or AC-4 according to a special table.

⁴⁾ Devices for utilisation category AC-3 may be used for occasional inching or plugging during a limited period, such as for setting up a machine. However, during this limited period of time, the number of operations must not exceed five per minute or ten in a ten minute period.

⁵⁾ Hermetically enclosed refrigerant compressor motor means a combination of a compressor and a motor both of which are housed in the same enclosure with no external shaft or shaft seals, the motor running in the refrigerant.

Utilisation Categories of Auxiliary Switches

| Type of current | Utilisation category | Typical Applications I = Making current, I _c = Breaking current, I _e = Rated operational current, U = Voltage, U _e = Rated operational voltage U _r = Recovery voltage t _{0,95} = the time in ms until 95% of the stationary current has been reached P = U _e × I _e = Rated power in Wattsh | Normal conditions of use | | | | | | Divergent conditions of use | | | | | |
|-----------------|----------------------|---|--------------------------|-----------------|-------------------|-----------------|-----------------|-------------------|-----------------------------|-----------------|-------------------|-----------------|-----------------|-------------------|
| | | | Switching on | | | Switching off | | | Switching on | | | Switching off | | |
| | | | $\frac{I}{I_e}$ | $\frac{U}{U_e}$ | cosφ | $\frac{I}{I_e}$ | $\frac{U}{U_e}$ | cosφ | $\frac{I}{I_e}$ | $\frac{U}{U_e}$ | cosφ | $\frac{I}{I_e}$ | $\frac{U}{U_e}$ | cosφ |
| AC | AC-12 | Control of resistive and solid state loads in optocoupler input circuits | 1 | 1 | 0.9 | 1 | 1 | 0.9 | - | - | - | - | - | - |
| | AC-13 | Control of solid state loads with transformerisolation | 2 | 1 | 0.65 | 1 | 1 | 0.65 | 10 | 1.1 | 0.65 | 1.1 | 1.1 | 0.65 |
| | AC-14 | Control of small electromagnetic loads (max. 72 VA) | 6 | 1 | 0.3 | 1 | 1 | 0.3 | 6 | 1.1 | 0.7 | 6 | 1.1 | 0.7 |
| | AC-15 | Control of electromagnetic loads (above 72 VA) | 10 | 1 | 0.3 | 1 | 1 | 0.3 | 10 | 1.1 | 0.3 | 10 | 1.1 | 0.3 |
| DC | DC-12 | Control of resistive and solid state loads in optocoupler input circuits | 1 | 1 | 1 ms | 1 | 1 | 1 ms | - | - | - | - | - | - |
| | DC-13 | Control of electromagnets | 1 | 1 | 6xP ¹⁾ | 1 | 1 | 6xP ¹⁾ | 1.1 | 1.1 | 6xP ¹⁾ | 1.1 | 1.1 | 6xP ¹⁾ |
| | DC-14 | Control of electromagnetic loads with economy resistors in the circuit | 10 | 1 | 15 ms | 1 | 1 | 15 ms | 10 | 1.1 | 15 ms | 10 | 1.1 | 15 ms |

according to IEC 947-4-1, EN 60 947, VDE 0660 Part 102

¹⁾ The value „6xP“ is the result of an empirical relationship which is found to represent most direct current magnetic loads up to an upper limit of P = 50 W with 6 [ms]/[W] = 200 [ms]. Loads with a rated power above 50 W are composed of small loads located parallel to each other. Therefore, 300 ms is an upper limit independent of the power rating.

Relay for low-level signals

The electronic relay is a universal switching device designed especially for transmitting small or low-level signals of electronic control systems. The **RELLVA** has been designed to switch low-level signals. The relay can be energized through analogue control signals of a roller-shutter or heating control, for example. The switching contact allows to switch a binary signal for digital inputs, for example of a programmable controller, of a control relay (e.g. EASY control relay) or of a Z-CC Communication Centre.

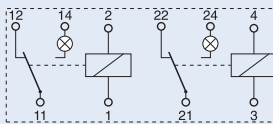
The **REHLVA** in turn can switch higher loads of up to 5 A 250 V AC1. It can be energized through a binary signal of a digital output, for example. The switching contact can switch electrical consumers of up to 5 A 250 V AC1, but it can also be used for energizing contactors, for example.

The **REMLVA** is a combination of the relays mentioned above. One relay is equipped with the switching contact for low-level signals, the other one with the switching contact for higher loads up to 5 A 250 V AC1.

The multi-functional coil, which can be energized in a range from 24 V to 250 V AC and DC, covers a wide variety of applications. In addition, all types have two relays for separate energizing in one enclosure of 1 MU width.

- Electronic switching relay
- 2 relays for separate energizing in one enclosure of 1 MU width
- Switching of very small signals from 10mV / 1µA
- Universal control voltage range from 24 to 230 V AC/DC
- Switching of higher loads of up to 5 A 250 V AC AC1
- 1 change-over contact for each relay with switch position indication by LED
- Railway service qualification tested

Connection diagram



Technical Data

Electrical:

| | |
|--------------------|---|
| Standard according | EN 61810 |
| Number of poles | 2x1 |
| EMC – Environment | EN 61000-4-2, 61000-4-4, 61000-4-5, 61810-5 |

Control circuit:

| | |
|--|----------------------|
| Rated voltage U_s | 24-250 V AC/DC |
| Rated frequency | 0-50 Hz |
| Operating range | 0.90-1.1 x U_s |
| Minimum command duration | 0.1 s |
| Rated peak withstand voltage U_{imp} | 4 kV (1.2/50 µs) |
| Duty | 100% |
| Trip coil power | |
| switching on | 0.1/24V; 1/250V VA/W |
| holding | 0.1/24V; 1/250V VA/W |

Load Circuit, Main Contacts

| | |
|---|--|
| Change over | 2 (to be energized separately) |
| Rated operational voltage U_e / Rated operational current I_e | |
| RELLVA | 30 V DC / 2 A 220 V DC / 0.3 A |
| REHLVA | 250 V AC / 5 A 30 V DC / 5 A 300 V DC / 0.25 A |

| | |
|----------------------------|---|
| REMLVA | |
| Switching contact 11/12/14 | 30 V DC / 2 A 220 V DC / 0.3 A 250 V AC / 5 A |
| Switching contact 21/22/24 | 30 V DC / 5 A 300 V DC / 0.25 A |

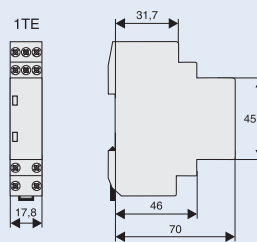
| | |
|---|----------------|
| Minimum operational voltage U_{min} / Minimum operational current I_{min} | |
| RELLVA | 10 mV / 10 µA |
| REHLVA | 100 mV / 10 mA |

| | |
|--|---|
| REMLVA | |
| Switching contact 11/12/14 | 10 mV / 10 µA |
| Switching contact 21/22/24 | 100 mV / 10 mA |
| Rated insulation voltage U_i | 500 V DC |
| Rated peak withstand voltage U_{imp} | 1.5 kV between open contacts; 2.5 kV between contacts and coil |

Mechanical:

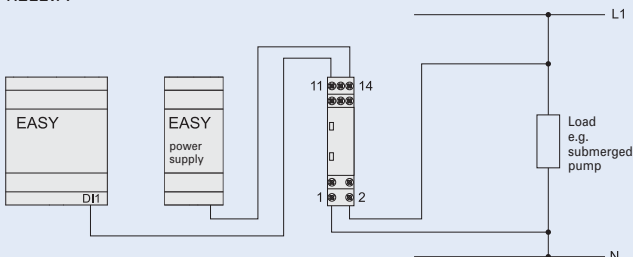
| | |
|---------------------------------------|---|
| Frame size | 45 mm |
| Device height | 70 mm |
| Device width | 17.8 mm (1 MU) |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection installed device | IP20 |
| Mounting position | as required |
| Shock resistance | max. 750 m/s ² |
| Terminal capacity | 1x 2.5 mm ² (flexible) 1x 4 mm ² (rigid) 2x 1.5 mm ² (rigid) |
| Temperature range | -40 to +85 °C |

Dimensions [mm]

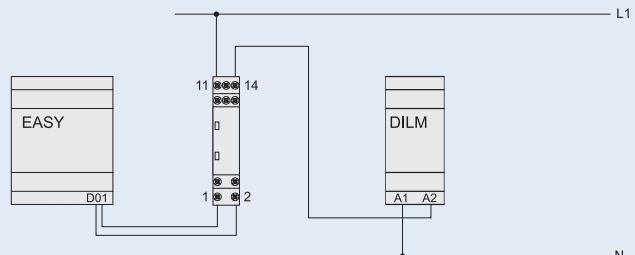


Examples

RELLVA



REHLVA

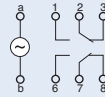


For types and art. numbers see page 58

Astronomical, digital Timer SA-TD/1W

- Digital timer in CMOS-technology
- Microprocessor and quartz control
- Programming by means of multi-function keys
- LCD display
- Programme data saved in case of power failure
- Optionally in each programme impulse time (switching interval 1-99 s) or fixed switching time (shortest switching interval 1 min) are possible
- Direct manual switching of relay ON/OFF
- Manual switching of relay to permanent operation ON/OFF (holiday operation)
- Automatic change to summer/winter time
- Automatic leap year adjustment
- Terminal covers which can be sealed with leads available as accessories

Block Diagram



Technical Data

SA-TD/1W

General:

| | |
|--|--------------------------|
| Design according to | EN 60730-1, EN 60730-2-7 |
| Rated voltage | 230-240 V AC |
| Rated voltage tolerance | -15%...+10% |
| Rated frequency | 50-60 Hz |
| Power consumption | max. 6 VA |
| Drive | Quartz |
| Accuracy at 20 °C | 1 s/day |
| Power reserve at 20 °C | 10 years |
| Type of battery | Li |
| Operating cycles | > 40,000 |
| Degree of protection | IP20 |
| Ambient temperature | -30 °C...+55 °C |
| Storage temperature | -30 °C...+55 °C |
| Protection class (acc. to EN 60 730-1) upon installation | II |

Switching contacts:

| | |
|--------------------------------------|-------------------------|
| Type of switching contact | 1 x change-over contact |
| Contact material | Ag Sn O ₂ |
| Switching capacity at 250 V~cosφ=1 | 16 A |
| Switching capacity at 250 V~cosφ=0.6 | 10 A |

Programme features:

| | |
|------------------------------------|--------|
| Switching period | Week |
| Number of channels | 1 |
| Min. switching time | 1 min. |
| Max. programme steps in the memory | 732 |

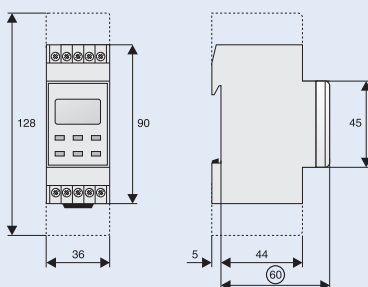
Size & Weight:

| | |
|--------|--------------|
| Width | 36 mm (2 MU) |
| Height | 65.5 mm |
| Length | 90 mm |
| Weight | 170 g |

Terminals:

| | |
|--|-------------------------|
| Terminal capacity - fine stranded wire | 1...2.5 mm ² |
| Terminal capacity - solid wire | 1...4 mm ² |
| Size of terminal screw | M3.5 |
| Type of screw head | PZ size 1 |
| Max. torque | 0.8 Nm |

Dimensions [mm]

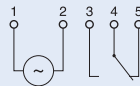


For types and art. numbers see page 59

Analogue Timers SU-T

- Programming by means of switching slides
- Synchronous drive with accuracy given by net system frequency accuracy, without power reserve
- Quartz system with accuracy of quartz oscillator, with power reserve

Block Diagram



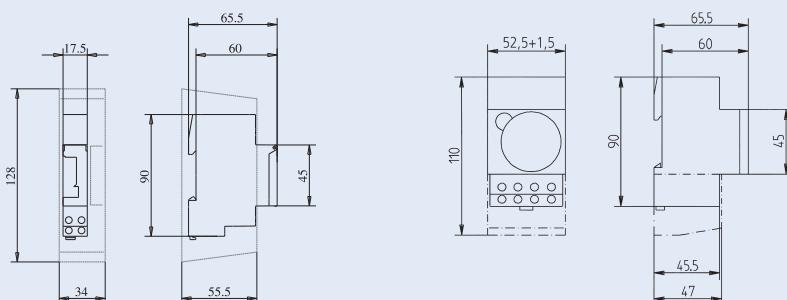
Technical Data

| | SU-TS/TA | SU-TS/1W-TA | SU-TS/WO | SU-TQ/TA | SU-TQ/1W-TA, -WO | SU-TQ/2W-TW |
|-----------------------------|--------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| General: | | | | | | |
| Design according to | EN 60669-1, EN 60669-2-1 | | | | | |
| Rated voltage | 230 V AC ± 10% | 230 V AC ± 10% | 230 V AC ± 10% | 230 V AC ± 10% | 230 V AC ± 10% | 230 V AC ± 10% |
| Rated frequency | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| Power consumption | max. 2.5 VA | max. 2.5 VA | max. 2.5 VA | max. 2.5 VA | max. 2.5 VA | max. 2.5 VA |
| Drive | Mains | Mains | Mains | Quartz | Quartz | Quartz |
| Accuracy at 20°C | - | - | - | ≤ ± 1 s/day | ≤ ± 1 s/day | ≤ ± 1 s/day |
| Power reserve at 20°C | - | - | - | > 3 days | > 3 days | > 3 days |
| Type of battery | - | - | - | NiMH | NiMH | NiMH |
| Operating cycles | > 10 000 | > 10 000 | > 10 000 | > 10 000 | > 10 000 | > 10 000 |
| Degree of protection | IP20 | IP20 | IP20 | IP20 | IP20 | IP20 |
| Ambient temperature | -25 °C...+50 °C | -20 °C...+50 °C | -10 °C...+50 °C | -10 °C...+50 °C | -20 °C...+50 °C | -20 °C...+50 °C |
| Storage temperature | -25 °C...+50 °C | -20 °C...+50 °C | -10 °C...+50 °C | -10 °C...+50 °C | -20 °C...+50 °C | -20 °C...+50 °C |
| Protection class | II | II | II | II | II | II |
| Switching contacts: | | | | | | |
| Type of switching cont. | 1 x NO | 1 x CO | 1 x NO | 1 x NO | 1 x CO | 1 x CO |
| Contact material | Solid silver | Solid silver | Solid silver | Solid silver | Solid silver | Solid silver |
| Switching capacity | | | | | | |
| at 250 V~cosφ=1 | 16 A | 16 A | 16 A | 16 A | 16 A | 16 A |
| at 250 V~cosφ=0,6 | 4 A | 4 A | 4 A | 4 A | 4 A | 4 A |
| Programme features | | | | | | |
| Switching period | Day | Day | Week | Day | Day, Week | Week |
| Number of channels | 1 | 1 | 1 | 1 | 1 | 2 |
| Shortest switching interval | 15 min. | 15 min. | 30 min. | 2 hours | 15 min. | 30 min., 4 hours |
| Max. programme steps | | | | | | |
| - in the memory | 96 | 48 | 84 | 96 | 48 | 32/day |
| Size & Weight: | | | | | | |
| Width | 17.5 mm (1 MU) | 52.5 mm (3 MU) | 17.5 mm (1 MU) | 17.5 mm (1 MU) | 52.5 mm (3 MU) | 52.5 mm (3 MU) |
| Height | 65.5 mm | 65.5 mm | 65.5 mm | 65.5 mm | 65.5 mm | 66.5 mm |
| Length | 90 mm | 90 mm | 90 mm | 90 mm | 90 mm | 90 mm |
| Weight | 80 g | 164 g | 90 g | 80 g | 170 g, 172 g | 175 g |
| Terminals: | | | | | | |
| Terminal capacity | | | | | | |
| fine stranded wire | 1...2.5 mm ² | 1...2.5 mm ² | 1...2.5 mm ² | 1...2.5 mm ² | 1...2.5 mm ² | 1...2.5 mm ² |
| solid wire | 1...4 mm ² | 1...4 mm ² | 1...4 mm ² | 1...4 mm ² | 1...4 mm ² | 1...4 mm ² |
| Size of terminal screws | M3.5 | M3.5 | M3.5 | M3.5 | M3.5 | M3.5 |
| Type of screw head | PZ size 1 | PZ size 1 | PZ size 1 | PZ size 1 | PZ size 1 | PZ size 1 |
| Max. torque | 2 Nm | 2 Nm | 2 Nm | 2 Nm | 2 Nm 2 | Nm |

Dimensions [mm]

SU-TS/TA, SU-TS/WO, SU-TQ/TA

SU-TS/1W-TA, SU-TQ/1W-TA, SU-TQ/1W-WO, SU-TQ/2W-TW

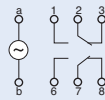


For types and art. numbers see page 59

Digital Timers Z-SDM

- Digital timers in CMOS-technology
- Microprocessor and quartz control
- Programming by means of multi-function keys
- LCD display
- Program data saved in case of power failure
- Optionally in each program impulse time (switching interval 1-99 s) or fixed switching time (shortest switching interval 1 min) are possible
- Direct manual switching of relay ON/OFF
- Manual switching of relay to permanent operation ON/OFF (holiday operation)
- Automatic change to summer/winter time
- Automatic leap year adjustment
- Design according to EN 60730

Block Diagram *)

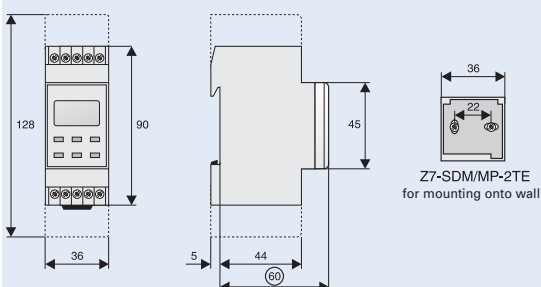


*) Actual connection diagram is given on each device.

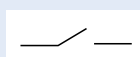
Technical Data

| | Z-SDM/1K-TA | Z-SDM/1K-WO | Z-SDM/2K-WO |
|--------------------------------------|--------------------------------------|-----------------------------------|-----------------------------------|
| Electrical: | | | |
| Rated voltage | 230 V AC | 230 V AC | 230 V AC |
| Rated frequency | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Current consumption | 29 mA, $\cos \varphi = 0.13$ | 29 mA, $\cos \varphi = 0.13$ | 29 mA, $\cos \varphi = 0.13$ |
| Apparent power | 6.6 VA | 6.6 VA | 6.6 VA |
| Reactive power | -6.5 VAr | -6.5 VAr | -6.5 VAr |
| Power loss | 0.9 W | 0.9 W | 0.9 W |
| Switching contact (potential-free) | 1 CO | 1 CO | 2 CO |
| Rated insulation voltage | 250 V | 250 V | 250 V |
| Switching capacity | | | |
| Rated current | 16 A (μ *) | 16 A (μ) | 16 A (μ) |
| Resistive load | 3000 W, $\cos \varphi = 1$ | 3000 W, $\cos \varphi = 1$ | 3000 W, $\cos \varphi = 1$ |
| Incandescent lamp load | 1000 W, $\cos \varphi = 1$ | 1000 W, $\cos \varphi = 1$ | 1000 W, $\cos \varphi = 1$ |
| Inductive load | 2 A/250 V AC $\cos \varphi = 0.6$ | 2 A/250 V AC $\cos \varphi = 0.6$ | 2 A/250 V AC $\cos \varphi = 0.6$ |
| Power reserve | 250 h | 250 h | 250 h |
| Power reserve storage | NiMH-Aku | NiMH-Aku | NiMH-Aku |
| Data saved by | EEPROM | EEPROM | EEPROM |
| Accuracy at 20 °C | approx. 1 s per day | approx. 1 s per day | approx. 1 s per day |
| Switching accuracy | 1 s | 1 s | 1 s |
| Quartz frequency | 32.768 MHz | 32.768 MHz | 32.768 MHz |
| Switching pairs freely programmable | 20/day | 20/week | 20/week |
| Switching interval | 1 min. or 1 s | 1 min. or 1 s | 1 min. or 1 s |
| Mechanical: | | | |
| Frame size | 45 mm | 45 mm | 45 mm |
| Device height | 90 mm | 90 mm | 90 mm |
| Device width | 36 mm | 36 mm | 36 mm |
| Weight | 170 g | 170 g | 200 g |
| Mounting | quick fastening on DIN rail EN 60715 | | |
| Degree of protection, built-in | IP20 | IP20 | IP20 |
| Upper and lower terminals | lift terminals | lift terminals | lift terminals |
| Terminal capacity | | | |
| one-wire | 1.5–4 mm ² | 1.5–4 mm ² | 1.5–4 mm ² |
| fine wire | 1–2.5 mm ² | 1–2.5 mm ² | 1–2.5 mm ² |
| Tightening torque of terminal screws | 0.8 Nm | 0.8 Nm | 0.8 Nm |
| Permitted relative humidity | < 95 % | < 95 % | < 95 % |
| Perm. ambient temperature range | 0 to +55 °C | 0 to +55 °C | 0 to +55 °C |
| Flame class acc. to EN 60730 | D | D | D |

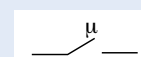
Dimensions [mm]



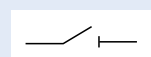
Note: symbols of switching devices



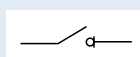
Switch



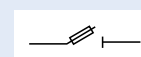
*) Switch with contact distance to 3 mm



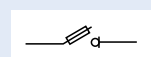
Circuit breaker



Switch disconnector



Fuse circuit breaker



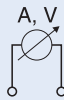
Fuse disconnector

For types and art. numbers see page 59

Analogue Measuring Instruments Z-MG

- Analogue ammeters and voltmeters
- For measuring single-phase AC voltages and currents
- Direct measuring range up to 40 A (AC)
- Type Z-MG/AA5-WS with exchangeable dial for transducer operation up to 600 A
- Exchangeable dial (Z-MG/WS...)
- Moving iron measuring unit
- Accessories: Voltmeter changeover switch, see type Z-DSV

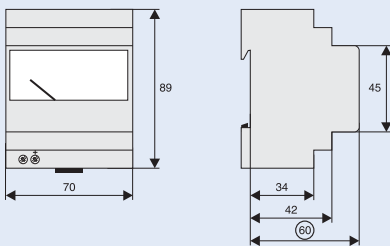
Block Diagram



Technical Data

| | Z-MG/AA-10 | Z-MG/AA-40 | Z-MG/AA5-WS | Z-MG/VA-250 | Z-MG/VA-500 |
|--------------------------------------|---|-----------------------------|-----------------------------|----------------------------|----------------------------|
| Electrical: | | | | | |
| Rated voltage U_n | – | – | – | 250 V AC | 500 V AC |
| Rated current I_n | 10 A | 40 A | 5 A | – | – |
| Input signal | symmetric, sinusoidal, form factor 1.11 | | | | |
| Rated frequency | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| Operational frequency | 45–65 Hz | 45–65 Hz | 45–65 Hz | 45–65 Hz | 45–65 Hz |
| Measuring accuracy class | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Measuring range | 0 - I_n | 0 - I_n | 0 - I_n | 0 - U_n | 0 - U_n |
| Power consumption | <1.1 VA | <1.1 VA | <1.1 VA | <3 VA | <3 VA |
| Exceeding of measuring range | | | | | |
| permanently | $1.2 \times I_n$ | $1.2 \times I_n$ | $1.2 \times I_n$ | $1.2 \times U_n$ | $1.2 \times U_n$ |
| short time | $10 \times I_n/5 \text{ s}$ | $10 \times I_n/5 \text{ s}$ | $10 \times I_n/5 \text{ s}$ | $2 \times U_n/5 \text{ s}$ | $2 \times U_n/5 \text{ s}$ |
| Rated insulation voltage | 0.6 kV | 0.6 kV | 0.6 kV | 0.6 kV | 0.6 kV |
| Test voltage 50 Hz/1 min. | 2 kV | 2 kV | 2 kV | 2 kV | 2 kV |
| Mechanical: | | | | | |
| Frame size | 45 mm | 45 mm | 45 mm | 45 mm | 45 mm |
| Device height | 89 mm | 89 mm | 89 mm | 89 mm | 89 mm |
| Device width | 70 mm | 70 mm | 70 mm | 70 mm | 70 mm |
| Weight | 130 g | 130 g | 130 g | 130 g | 130 g |
| Mounting | quick fastening on DIN rail EN 60715 | | | | |
| Degree of protection, built-in | IP50 | IP50 | IP50 | IP50 | IP50 |
| Upper and lower terminals | lift terminals | | | | |
| Terminal capacity | 4 mm ² | 8 mm ² | 4 mm ² | 4 mm ² | 4 mm ² |
| Tightening torque of terminal screws | 1 Nm | 1,8 Nm | 1 Nm | 1 Nm | 1 Nm |
| Permitted relative humidity | 65 % | 65 % | 65 % | 65 % | 65 % |
| Perm. ambient temperature range | -25 to +50 °C | -25 to +50 °C | -25 to +50 °C | -25 to +50 °C | -25 to +50 °C |
| Flame class acc. to UL 94 | V1 | V1 | V1 | V1 | V1 |

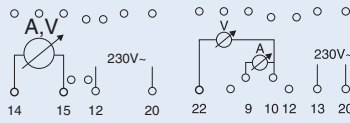
Dimensions [mm]



Digital Measuring Instruments Z-MG

- Digital ammeters and voltmeters
- For measuring single-phase AC voltages and currents
- 7 segment display, green LEDs
- LED overload display
- Direct measuring range up to 20 A (Z-MG/AD-20)
Via current transformer X/5A (Z-MG/AD-999) display up to 999 A.
- Type Z-MG/AD-999: Possible current transformer ratios 15/5, 20/5, 25/5, 40/5, 60/5, 100/5, 150/5, 200/5, 250/5, 400/5, 600/5, 1000/5 A adjustable
(For underlined ratios current transformers Z7-MG/WAK or Z7-MG/WAS can be used)
- Accessories: Voltmeter changeover switch, see type Z-DSV

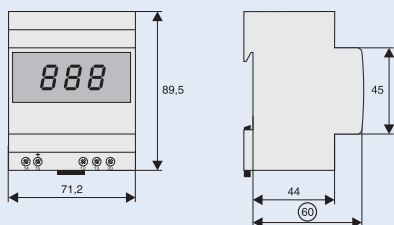
Connection diagram



Technical Data

| | Z-MG/AD-20 | Z-MG/AD-999 | Z-MG/VD-600 | Z-MG/VD+AD | Z-MG/VD+AD+S |
|---|--------------------------------------|-------------------|-------------------|---------------------------|---------------------------|
| Electrical: | | | | | |
| Rated voltage U_n | – | – | 600 V AC | 500 V AC | 500 V AC |
| Rated current I_n | 20 A | 5 A | – | 5 A | 5 A |
| Auxiliary voltage | 230 V, 50 Hz | 230 V, 50 Hz | 230 V, 50 Hz | 230 V, 50 Hz | 230 V, 50 Hz |
| Power consumption auxiliary voltage | < 4.5 VA | < 4.5 VA | < 4.5 VA | < 2.5 VA | < 2.5 VA |
| Rated frequency | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| Operational frequency | 45–65 Hz | 45–65 Hz | 45–65 Hz | 47–63 Hz | 47–63 Hz |
| Measuring accuracy | ±1 % +1 digit | ±1 % +1 digit | ±1 % +1 digit | ±1 % +1 digit | ±1 % +1 digit |
| Resolution | 1 digit | 1 digit | 1 digit | 1 V / 0.01–10A | 1 V / 0.01–10A |
| Number of measuring operations per second | 3 | 3 | 3 | 0.67 | 0.67 |
| Measuring range | 0– I_n | 0– I_n | 0– U_n | 0–600V/0.1–6A | 0–600V/0.1–6A |
| Power consumption | | | | | |
| Voltage input | – | – | – | ≤ 0.1 VA | ≤ 0.1 VA |
| Current input | < 1.1 VA | < 1.1 VA | – | ≤ 0.6 VA | ≤ 0.6 VA |
| Input impedance | – | – | >1 MΩ | – | – |
| Exceeding of measuring range | | | | | |
| permanently | 2 x I_n | 2 x I_n | 1.1 x U_n | 1.2 x U_n / 1.2 x I_n | 1.2 x U_n / 1.2 x I_n |
| short time | 2.5 x I_n /5 s | 10 x I_n /5 s | – | 2 x I_n /5 s | 2 x I_n /5 s |
| Rated insulation voltage | 0.66 kV | 0.66 kV | 0.66 kV | 0.66 kV | 0.66 kV |
| Test voltage 50 Hz/1 min. | 2 kV | 2 kV | 2 kV | 3 kV | 3 kV |
| Contact (alarms) 2 pcs. | – | – | – | – | programmable |
| Type | – | – | – | – | min. and/or max. |
| Set point | – | – | – | – | 0-120 % |
| Hysteresis | – | – | – | – | 0-set point |
| Delay | – | – | – | – | 0-60 s (1 s steps) |
| Relay state | – | – | – | – | energised/de-energ. |
| Contacts range | – | – | – | – | 5 A / 250 V AC |
| Mechanical: | | | | | |
| Frame size | 45 mm | 45 mm | 45 mm | 45 mm | 45 mm |
| Device height | 89.5 mm | 89.5 mm | 89.5 mm | 89.5 mm | 89.5 mm |
| Device width | 71.2 mm | 71.2 mm | 71.2 mm | 71.2 mm | 71.2 mm |
| Maximum display reading | 999 | 999 | 999 | 999 | 999 |
| Height of figures | 14 mm | 14 mm | 14 mm | 14 mm | 14 mm |
| Weight | 300 g | 300 g | 300 g | 250 g | 270 g |
| Mounting | quick fastening on DIN rail EN 60715 | | | | |
| Degree of protection, built-in | IP20 | IP20 | IP20 | IP20 | IP20 |
| Upper and lower terminals | lift terminals | lift terminals | lift terminals | lift terminals | lift terminals |
| Terminal capacity | 4 mm ² | 4 mm ² | 4 mm ² | 4 mm ² | 4 mm ² |
| Tightening torque of terminal screws | 0.6 Nm | 0.6 Nm | 0.6 Nm | 0.6 Nm | 0.6 Nm |
| Permitted relative humidity | 95 % | 95 % | 95 % | 20–80 % | 20–80 % |
| Perm. ambient temperature range | -10 °C to +55 °C | -10 °C to +55 °C | -10 °C to +55 °C | -5 °C to +55 °C | -5 °C to +55 °C |
| Flame class acc. to UL 94 | V1 | V1 | V1 | V1 | V1 |

Dimensions [mm]



For types and art. numbers see page 60

Measuring range - resolution

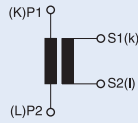
| Z-MG/VD+AD Z-MG/VD+AD+S | Range | | | | | | | | | | 5A 5.00 10mA | | |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------|-------|-------|
| | 10A | 15A | 20A | 25A | 30A | 40A | 50A | 60A | 70A | 75A | 80A | 50A | 10mA |
| Display | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 40.0 | 50.0 | 60.0 | 70.0 | 75.0 | 80.0 | 50.0 | 10.0 |
| Resolution | 100mA | 100mA | 100mA | 100mA | 100mA | 100mA | 100mA | 100mA | 100mA | 100mA | 100mA | 100mA | 100mA |
| Display | 100 | 120 | 150 | 160 | 200 | 250 | 300A | 400 | 500 | 600 | 700 | 750 | 800 |
| Resolution | 100A | 120A | 150A | 160A | 200A | 250A | 300A | 400A | 500A | 600A | 700A | 750A | 800A |
| Display | 1.00 | 1.20 | 1.50 | 1.60 | 2.00 | 2.50 | 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 7.50 | 8.00 |
| Resolution | 1kA | 1.2kA | 1.5kA | 1.6kA | 2kA | 2.5kA | 3kA | 4kA | 5kA | 6kA | 7kA | 7.5kA | 8kA |

Accessories for Measuring Instruments

Current Transformer for Cable Z-MG/WAK, Current Transformer for Busbar Z-MG/WAS

- Transform high currents to standard measuring currents
- Current transformers help to cut costs when installing and connecting busbar system
- Recommended from 40 A upward
- Accuracy classes
Class 0.5: for accurate measurement and calibrated kWh-meters
Class 1: for general measurement and non-calibrated kWh-meters
Class 3: for coarse measurement, relays and for protection
- When winding several turns of the primary cable around the current transformer, you will receive half the primary current per turn while power and class remain unchanged.

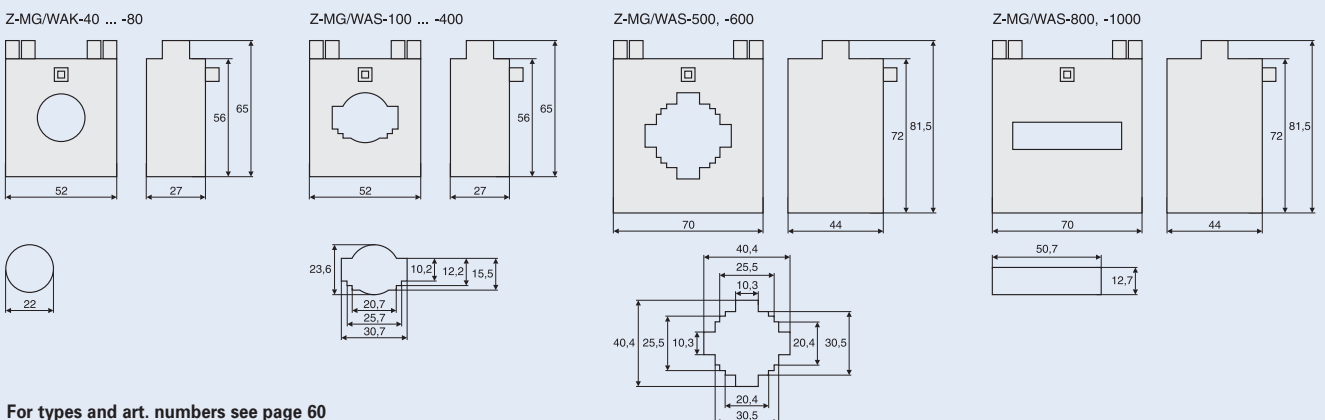
Connection diagram



Technical Data

| | Z-MG/WAK | | Z-MG/WAS | |
|--|--|--------|--|--------|
| Electrical: | | | | |
| Max. service voltage | 720 V | | 720 V | |
| Secondary current | 5 A | | 5 A | |
| Rated frequency | 50 – 60 Hz | | 50 – 60 Hz | |
| Cable diameter | 21 mm | | 23 mm, 30 mm | |
| Busbar cross section | – | | 30 x 10 mm, 40 x 10 mm, 50 x 12 mm | |
| | Class | P [VA] | Class | P [VA] |
| Primary nominal current I _{pN} 40 A | 3 | 1.3 | | |
| 50 A | 3 | 1.5 | | |
| 60 A | 3 | 1.5 | | |
| 80 A | 3 | 2 | | |
| 100 A | | | 1 | 1.5 |
| 150 A | | | 1 | 3 |
| 200 A | | | 1 | 3 |
| 250 A | | | 0.5 | 2 |
| 300 A | | | 0.5 | 2 |
| 400 A | | | 0.5 | 3 |
| 500 A | | | 0.5 | 10 |
| 600 A | | | 0.5 | 10 |
| 800 A | | | 0.5 | 10 |
| 1000 A | | | 0.5 | 10 |
| Connections | P1 (K) primary input, P2 (L) primary output, s1 (k) secondary input, s2 (l) secondary output | | | |
| Nominal thermic short-time current I _{th} | 60 x I _{pn} for 1 s | | 60 x I _{pn} for 1 s | |
| Nominal dynamic short circuit current I _{dyn} | 2.5 x I _{th} for 1 s | | 2.5 x I _{th} for 1 s | |
| Permanent overload | 1.2 x I _{pn} | | 1.2 x I _{pn} | |
| Insulation class (IEC 85) | E | | E | |
| Test voltage 50 Hz/1 min. | 6 kV | | 6 kV | |
| Mechanical: | | | | |
| Weight | 300 g | | 300 g | |
| Mounting | quick fastening on DIN rail EN 60715, wall mounting, | | directly onto the cable or onto busbar | |
| Degree of protection | IP30 | | IP30 | |
| Secondary connection | plug-in 6.3 mm | | plug-in 6.3 mm | |
| Maximum tightening torque of screw terminals | 1.9 Nm | | | |
| Permitted relative humidity | 80 % | | 80 % | |
| Perm. ambient temperature range | -20 to +50 °C | | -20 to +50 °C | |
| Max. temperature of busbars | – | | 70 °C | |

Dimensions [mm]

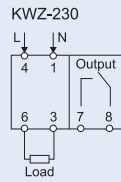


For types and art. numbers see page 60

Power Meter KWZ

- Power meter according to EN 61036 for sub-measurement
- For active energy
- **Type KWZ-230:** single-phase kWh-meter
- Possibility of remote consumption reading with e.g. impulse counter Z-IMZ/24

Connection diagram



Technical Data

KWZ-230

Electrical:

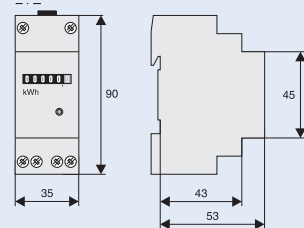
| | |
|---|---|
| Rated voltage U_n | 230 V AC |
| Working range | 0.9 - 1.2 x U_n |
| Rated current I_n | 10 A, direct |
| Maximum current I_{max} | 40 A |
| Rated frequency | 50/60 Hz |
| Auxiliary voltage | from measurement |
| Power loss | 2 W |
| Input signal | sinusoidal |
| Power factor | $\cos\varphi = 0,5$ inductive to $\cos\varphi = 0,8$ capacitive |
| Accuracy class | 1 |
| Resolution | 0.1 kWh |
| LED signal | 640 pulse/kWh |
| Own consumption per phase | <8 VA |
| Pulse output rated values | 5-48 V DC, 50 mA |
| Pulse value (jumper) | 10 pulse / kWh |
| Switching contact (potential-free) | 1 NO |
| Rated peak withstand voltage (1.2/50) μ s | 5 kV |
| Test voltage 50 Hz/1 min. | 2.5 kV |

Mechanical:

| | |
|--------------------------------------|--|
| Frame size | 45 mm |
| Device height | 90 mm |
| Device width | 35 mm (2 MU) |
| Weight | 180 g |
| Display | 5 + 1 digit |
| Maximum display reading | 99999,9 kWh |
| Height of figures | 4 mm |
| Mounting | quick fastening on DIN rail |
| Degree of protection, built-in | IP20 |
| Upper and lower terminals | lift terminals |
| Terminal capacity | 12 mm ² (2,5 mm ² pulse-outp.) |
| Tightening torque of terminal screws | 2 Nm |
| Permitted relative humidity | 90 % |
| Perm. ambient temperature range | -5 to +55 °C |

Dimensions [mm]

KWZ-230



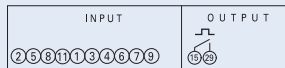
For types and art. numbers see page 61

Power Meter KWZ-3PH

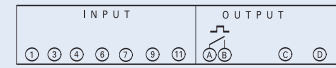
- Energy meters for active energy measuring
- With digital display
- 3-phase version
- Rated voltage 230/400 V
- Accuracy class 1
- Programming by front keyboard, 2 keys
- Energy meter according to EN 62053 for sub-measurement
- Sealability front frame and terminal

Connection diagram

KWZ-3PH



KWZ-3PH-63

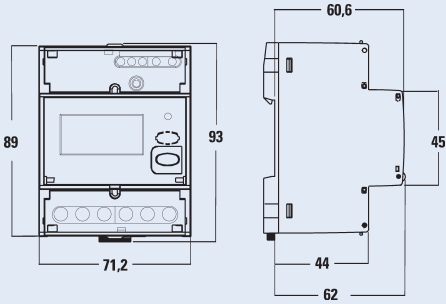


Technical Data

| | KWZ-3PH | KWZ-3PH-63 |
|--|--|---|
| Electrical | | |
| Rated voltage U_n | 230-240/400-415 V AC | 230-240/400-415 V AC |
| Working range | 110-254/190-440 V AC | 110-254/190-440 V AC |
| Rated current I_b | 1 a 5 A | 10 A |
| Maximum current I_{max} | 6 A | 63 A |
| Maximum back-up fuse | 10A gG/gL / B10 (only voltage pathes) | 63A gG/gL / C63 |
| Rated frequency | 50 a 60 Hz | 50 a 60 Hz |
| Frequency range | 47-63 Hz | 47-63 Hz |
| Power consumption per phase (current path) | ≤ 0.5 VA – each phase | ≤ 4 VA – each phase |
| Overload short time | 20 x I_{max} / 0.5 s | 30 x I_{max} / 10 ms |
| Auxiliary voltage | from measurement | from measurement |
| Input signal | sinusoidal | sinusoidal |
| Accuracy class | 1 | 1 |
| Metering LED | 1 imp / 0,1 Wh | 1 imp / Wh |
| Pulse output S0 | | |
| Max. load of transistor output | max. 110 V AC/DC, 50 mA | max. 110 V AC/DC, 50 mA |
| Meets requirements | DIN 43864 / EN 62053-31 | DIN 43864 / EN 62053-31 |
| Pulse frequency (selectable) | 1 imp. / 10Wh-100Wh-1kWh-10kWh nebo 1 imp. / 10VArh-100VArh- 1kVArh-10kVArh | 1 imp. / 1Wh-10Wh--100Wh1kWh-10kWh nebo 1 imp. / 10VArh-100VArh- 1kVArh-10kVArh |
| Pulse duration (selectable) | 50-100-150-200-300-400-500 ms | 50-100-150-200-300-400-500 ms |
| Programmable parameters | connection (1-phase, 3-phases 3- or 4-wire), external VT and CT-ratio, power demand, pulse output | connection (3-phases 3- or 4-wire), counting, power demand, pulse output |
| Overvoltage category | III | III |
| Insulation voltage rating (phase - phase) | 450 V | 300 V |
| Rated impulse withstand voltage (1.2/50) μ s | 5 kV | 5 kV |
| Test voltage | | |
| Input/pulse-output | 2.75 kV | 2.75 kV |
| all circuits and earth | 4 kV | 4 kV |
| Protection class | II | II |
| Mechanical | | |
| Frame size | 45 mm | 45 mm |
| Device height | 89 mm | 89 mm |
| Device width | 71.2 mm | 71.2 mm |
| Weight | 260 g | 260 g |
| Display | LCD 8 digit | LCD 8 digit |
| Digit height | 6 mm | 6 mm |
| Maximum display | setable | 999999,99 kWh |
| Resolution | setable | 10 W |
| Measurement display | subdivided on 6 pages | subdivided on 7 pages |
| Mounting | quick fastening on DIN rail EN 60715 | |
| Degree of protection, front frame / terminals | IP52 / IP20 | IP52 / IP20 |
| Upper and lower terminals | screw terminals | screw terminals |
| Terminal capacity | | |
| Current terminal | rigid cable 0.05-4 mm ² flexible cable 0.05-2.5 mm ² | input: rigid cable 1-10 mm ² flexible cable 1-13 mm ² |
| Voltage terminal | rigid cable 0.05-4 mm ² flexible cable 0.05-2.5 mm ² | output: rigid cable 1-4 mm ² flexible cable 1-3 mm ² |
| Permitted relative air humidity | suitable for tropical dissipation | suitable for tropical dissipation |
| Reference temperature | 23 °C ±2 °C | 23 °C ±2 °C |
| Perm. ambient temperature range | | |
| Operating | -5 to +55 °C | -5 to +55 °C |
| Storing | -25 to +70 °C | -25 to +70 °C |
| Pollution degree | 2 | 2 |

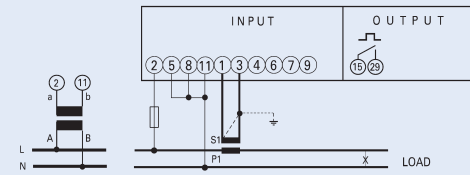
For types and art. numbers see page 61

Dimensions [mm]

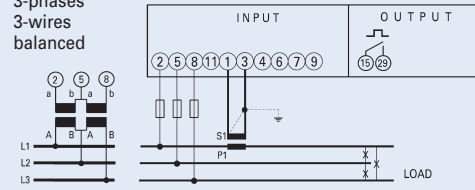


Wiring diagrams KWZ-3PH

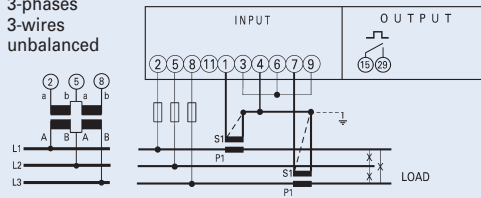
1-phase



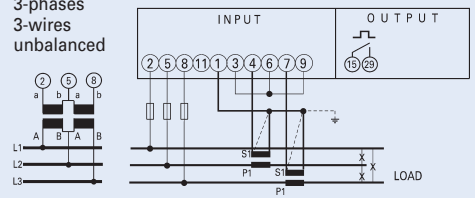
3-phases 3-wires balanced



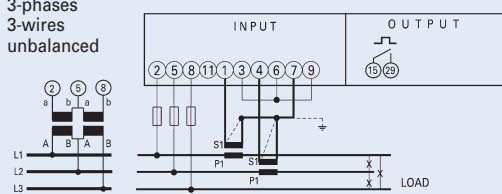
3-phases 3-wires unbalanced



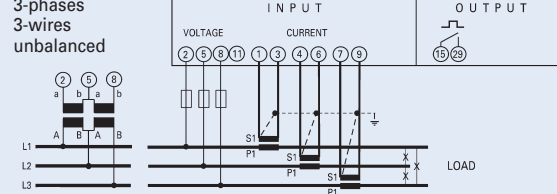
3-phases 3-wires unbalanced



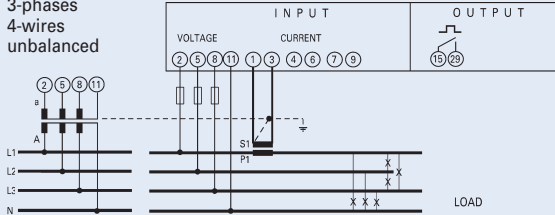
3-phases 3-wires unbalanced



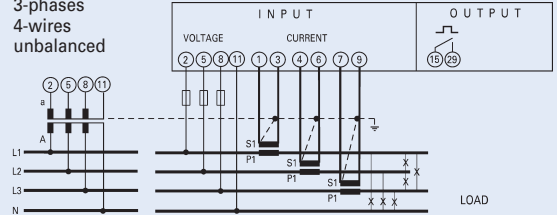
3-phases 3-wires unbalanced



3-phases 4-wires unbalanced

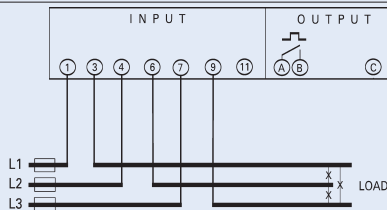


3-phases 4-wires unbalanced

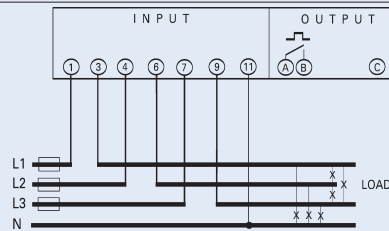


Wiring diagrams KWZ-3PH-63

3-phases 3-wires



3-phases 4-wires



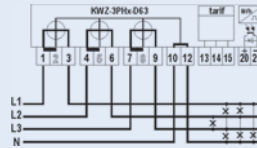
For types and art. numbers see page 61

Power meters KWZ-3PH(D)

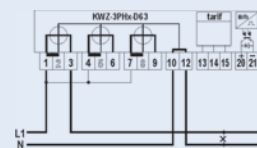
- For measuring of active energy
- Accurate measuring even in case of uneven load per each phase
- Works properly even in case of 2 phase lost
- Can be used also for 1phase measuring
- Design according to EN 62053-21
- KWZ-3PH with electromechanical counter
- KWZ-3PHD with digital display
- KWZ-3PH(D)-63 for direct measuring, accuracy class 2
- KWZ-3PH(D)-I5(I1) for semidirect measuring x/5 A (x/1 A), accuracy class 1
- S0 impulse output as a standard for all versions
- KKWZ-3PHD as 1 to 4 tariff version
- KWZ-3PHD version -R with relay output
- KWZ-3PHD version -C with communication RS-485 (MODBUS RTU)
- KWZ-3PHD version -M with communication module M-BUS
- Type approval and calibration for Czech Rep.
- KWZ-3PHD version -D (-DC, -DR) two-tariff version

Connection diagrams

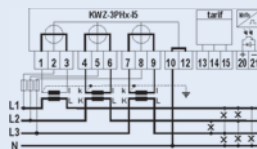
3-phase direct measuring



1-phase direct measuring



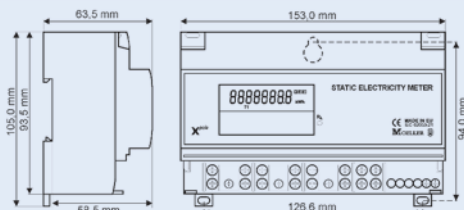
3-phase semidirect measuring



Technical Data

| | KWZ-3PH(D)-D63 | KWZ-3PH(D)-I5 |
|---|---|---|
| Electrical: | | |
| Rated voltage U_n | 230/400 V AC | 230/400 V AC |
| Working range | 0.9–1.1 x U_n | 0.9–1.1 x U_n |
| Rated current I_n | 5 A | 5 A |
| Maximum current I_{max} | 63 A | 6 A |
| Rated frequency | 50 Hz ±5% | 50 Hz ±5% |
| Input signal | Sinusoidal | Sinusoidal |
| Power consumption – current circuit | ≤ 0.05 VA at I_n per phase | ≤ 0.05 VA at I_n per phase |
| Power consumption – voltage circuit | ≤ 7.7 VA, cap. 0.7 W per phase | ≤ 7.7 VA, cap. 0.7 W per phase |
| Isolation strength of meas. core | 12 kV | 12 kV |
| Accuracy class | 2 | 1 |
| Resolution | 0.1 kWh | X x 0.01 kWh |
| LED signal | 10 000 imp/kWh | 10 000 imp/kWh |
| S0 pulse output rated values | max. 27 VDC, 27 mA | max. 27 VDC, 27 mA |
| Pulse value S0 | 500 imp/kWh | 5 000 imp/kWh |
| Relay output cont. (potential free) | 1 NO | 1 NO |
| Rated peak withstand voltage (1,2/50) μs výstupu S0 | 6 kV | 6 kV |
| Test voltage 50 Hz/1 min., S0 output | 4 kV | 4 kV |
| Relay output rated values (-R version) | 100 V DC/AC, 100 mA | 100 V DC/AC, 100 mA |
| Relay pulse value (-R version) | 100 imp/kWh, 250 ms | 100 imp/kWh, 250 ms |
| Maximum back-up | B63 | B6 (voltage and current circuit) |
| Mechanical: | | |
| Frame size | 45 mm | 45 mm |
| Device height | 93.5 mm | 93.5 mm |
| Device width | 153 mm (8.5 MU) | 153 mm (8.5 MU) |
| Weight | 490 g | 490 g |
| Mech. counter | 6+1 | 6+1 |
| Dig. display | 6+2 | 6+2 |
| Height of figures dig. | 8 mm | 8 mm |
| Height of figures mech. | 5.5 mm | 5.5 mm |
| Terminals | screw | screw |
| Terminal capacity | 16 mm ² (2.5 mm ²) | 16 mm ² (2.5 mm ²) |
| Tightening torque of terminal screws | 2 Nm (1 Nm) | 2 Nm (1 Nm) |
| Degree of protection | IP20, IP40 with terminal cover KWZ-SCOV (measuring core IP51) | |
| Permitted relative humidity | <75 % | <75 % |
| Perm. ambient temperature range | -40 to + 60 °C | -40 to + 60 °C |
| Flame class | V1 | V1 |

Dimensions [mm]



For types and art. numbers see page 61

Measuring modules NZM-XMC

- Measuring modules for net analysis
- Possibility of direct mounting onto NZM circuit breaker cables or onto mounting panel
- Versions – MB: possibility to display data at NZM-XMC-DISP or via MODBUS at other device (e.g. touch panels XV100)
- Display NZM-XMC-DISP with standard frame 96x96 mm
- Version with S0 output, or with MODBUS (one slot for external communication, the other for connection of NZM-XMC-DISP)
- Active and inductive reactive energy measurement including component analysis, accuracy 1 % and 2 %, respectively
- Temperature measurement
- All MODBUS versions can operate as a slave on PROFIBUS-DP via adapter

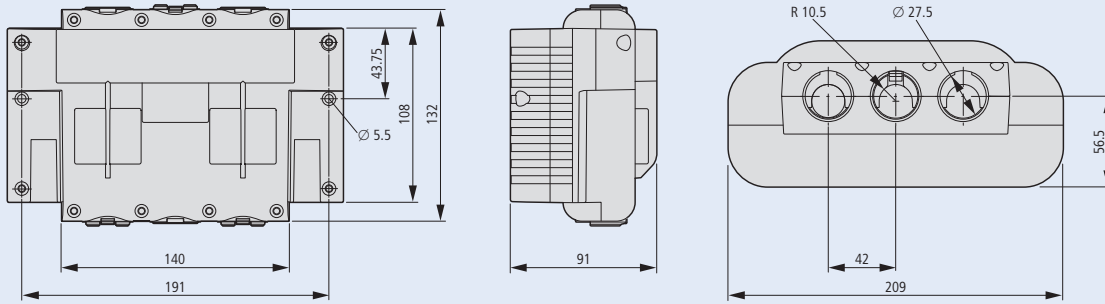
Technical Data

| | NZM2-XMC-S0 | NZM3-XMC-S0 | NZM2/3-XMC-MB | |
|---|---|-----------------------------|--|---------------|
| Electrical: | | | | |
| Supply | | | | |
| Rated voltage | 18 – 36 V DC | 18 – 36 V DC | 18 – 36 V DC | |
| Maximum current | 200 mA | 200 mA | 200 mA | |
| Connector type | Phoenix contact GMVSTBR (2.5-2-ST-7.62) | | | |
| Voltage measurement | | | | |
| Rated operational voltage | 690 V AC | 690 V AC | 690 V AC | |
| Test voltage (8/20 μ s) | 8 kV | 8 kV | 8 kV | |
| Maximum voltage | 800 V AC | 800 V AC | 800 V AC | |
| Impedance | 1 k Ω | 1 k Ω | 1 k Ω | |
| Frequency | 45 – 65 Hz | 45 – 65 Hz | 45 – 65 Hz | |
| Accuracy | 0.4 % measuring + 0.05 % FS | 0.4 % measuring + 0.05 % FS | 0.4 % measuring + 0.05 % FS | |
| Overvoltage category (EN 61010) | IV (600 V) | IV (600 V) | IV (600 V) | |
| Current measurement | | | | |
| Rated operational current | 300 A | 500 A | 300 A (NZM2) / 500 A (NZM3) | |
| Maximum current | 350 A | 740 A | 350 A (NZM2) / 740 A (NZM3) | |
| Peak current test (1 s) | 30 kA | 30 kA | 30 kA | |
| Frequency | 45 – 200 Hz | 45 – 200 Hz | 45 – 200 Hz | |
| Overvoltage category (EN 61010) | IV (600 V) | IV (600 V) | IV (600 V) | |
| Power measurement | | | | |
| Maximum power (per phase) | – | – | 280 kW | |
| Accuracy | – | – | 0.95 % measuring + 0.05 % FS | |
| Accuracy active power | class 1 (IEC 62053-21) | class 1 (IEC 62053-21) | class 1 (IEC 62053-21) | |
| Accuracy reactive power | – | – | class 2 (IEC 62053-23) | |
| Pulse input | | | | |
| Input type | transistor NPN | transistor NPN | transistor NPN | |
| VCE max. | 80 V | 80 V | 80 V | |
| VCE sat | 0,4 V | 0,4 V | 0,4 V | |
| Ic max | 50 mA | 50 mA | 50 mA | |
| Ic recommended | 10 mA | 10 mA | 10 mA | |
| Insulation voltage | 3 kV | 3 kV | 3 kV | |
| Maximum switching rate | 2 Hz | 2 Hz | 4 Hz | |
| Pulse length | 120 ms | 120 ms | \geq 20 ms | |
| Number of pulses | 15 imp. / kWh | 7,5 imp. / kWh | – | |
| Digital output | | | | |
| Maximum voltage | – | – | 350 V | |
| Maximum current | – | – | 120 mA | |
| Insulation voltage | – | – | 2,5 kV | |
| Digital input | | | | |
| Maximum voltage | – | – | 50 V | |
| VIH max | – | – | 3 V | |
| MODBUS RS-485 | | | | |
| Transfer rate | – | – | 9600, 19200, 38400, 56000, 57600 bit/s | |
| Stop bites | – | – | 1, 2 | |
| Parity | – | – | none, odd, even | |
| Insulation voltage | – | – | 3 kV | |
| Output - display | | | | |
| Voltage | – | – | 5 V DC | |
| Maximum current | – | – | 180 mA | |
| Mechanical: | | | | |
| Dimensions | 3-pole | 209x91x132 mm | 209x91x132 mm | 209x91x132 mm |
| | 4-pole | 251x91x132 mm | 251x91x132 mm | 251x91x132 mm |
| Weight | 3-pole | 850 g | 850 g | 850 g |
| | 4-pole | 975 g | 975 g | 975 g |
| Material | UL94-V0 | | | |
| Operating temperature | -15 to +65 °C | | | |
| Storing temperature | -40 to +80 °C | | | |
| Humidity (without condensation) | 5 to 95 % | | | |
| Maximum operational elevation above sea level | 2000 m | | | |
| Degree of protection | IP20 | | | |

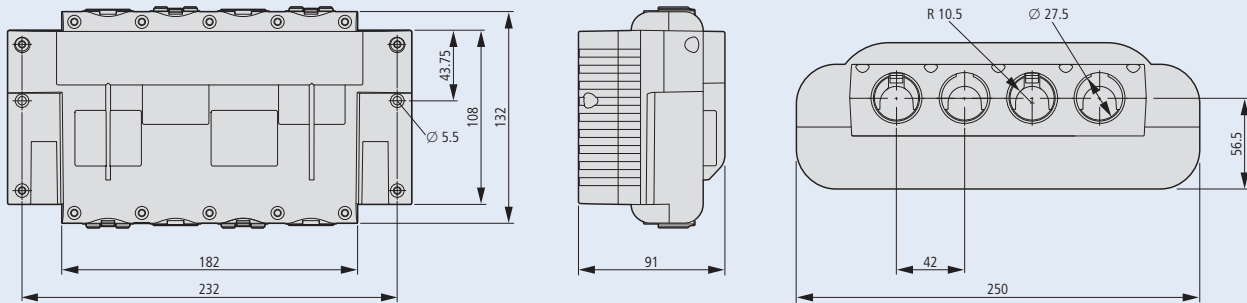
For types and art. numbers see page 62

Dimensions [mm]

NZM2 (3)...XMC-S0(MB)



NZM2 (3)(-4)...XMC-S0(MB)

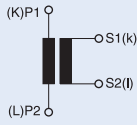


Accessories for Measuring Instruments

Current transformers MAK

- According to EN 60044-1, BS 3938 and DIN 42600
- Transform high currents to standard meas. currents to 5 A
- Current transformers reduce expenses on connection and installation of busbars
- Recommended for currents up 50 A
- Accuracy classes
 - class 0.5: for accurate measuring and type tested powermeters (for official measuring)
 - class 1 for common measuring and non type tested powermeters (sub-measurement)

Connection diagram



Technical Data

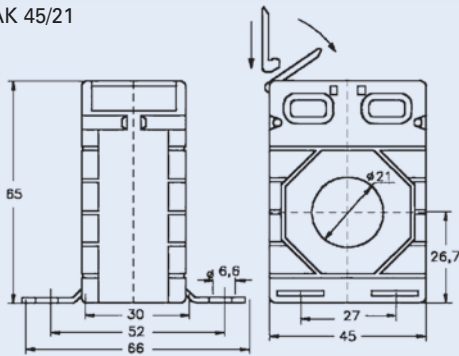
Electrical:

| | |
|---|----------------------------|
| Rated voltage | 720 V AC |
| Rated frequency | 50–60 Hz |
| Rated primary current I_{pn} | 50–2000 A |
| Rated secondary current | 5 A (on request 1 A) |
| Rated thermic short time current I_{th} | 40-80 I_{pn} for 1 s |
| Rated dynamic short circuit current I_{dyn} | 2.5 x I_{th} for 1 s |
| Permanent overload | 1.2 x I_{pn} |
| Insulation class | E |
| Test voltage 50 Hz/1 min. | 4 kV _{eff} |
| Accuracy class | 0.5 or 1 |
| Perm. ambient temperature range | -20 °C ... +45 °C (+65 °C) |
| Perm. ambient temperature range (storing) | -50 °C ... +80 °C |

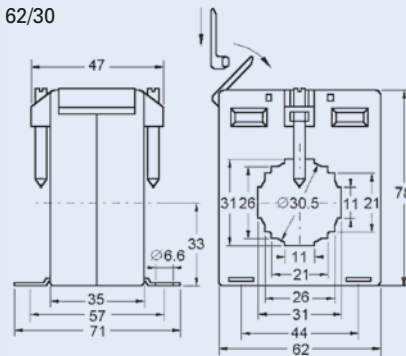
Mechanical :

see dimension diagrams

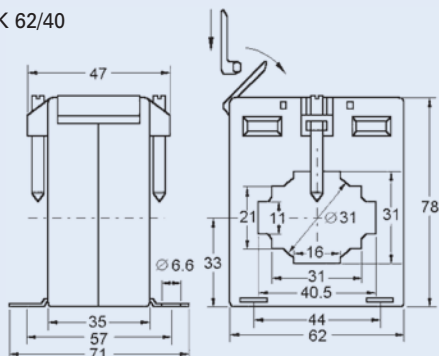
MAK 45/21



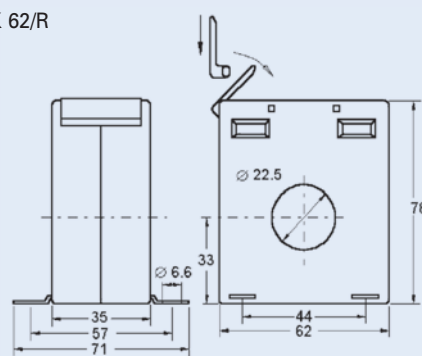
MAK 62/30



MAK 62/40



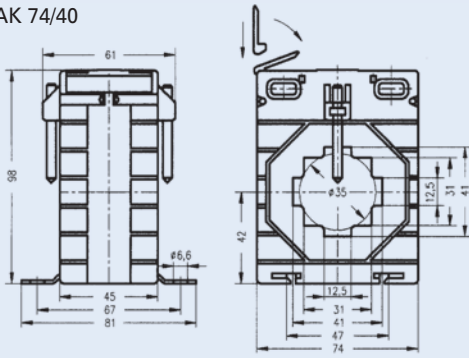
MAK 62/R



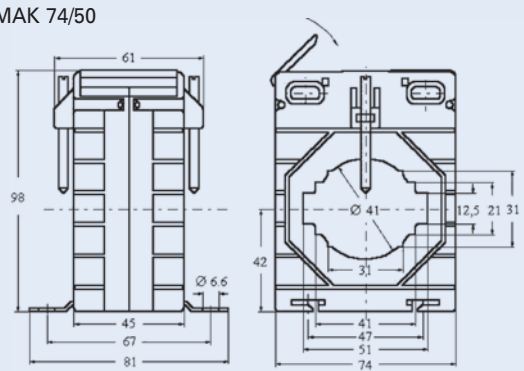
For types and art. numbers see page 63

Accessories for Measuring Instruments – Continuation

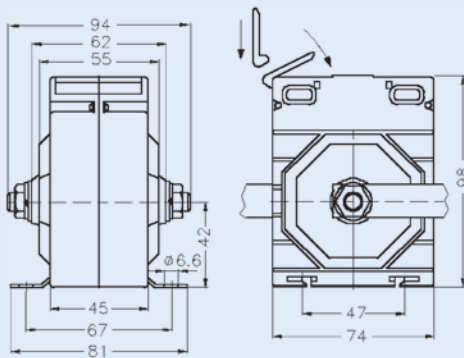
MAK 74/40



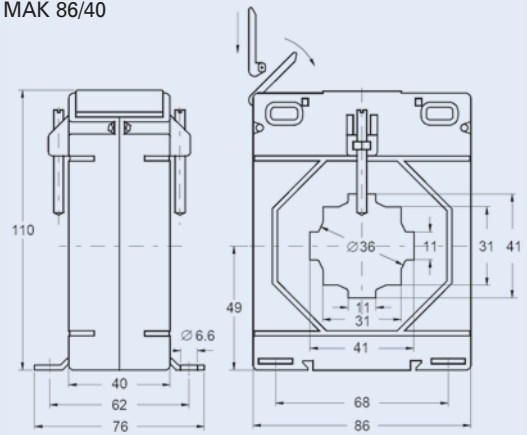
MAK 74/50



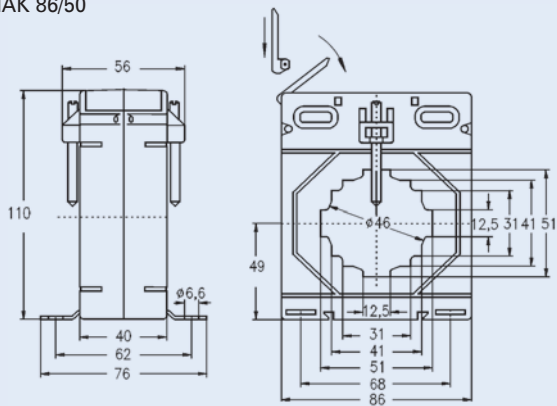
MAK 74/WS



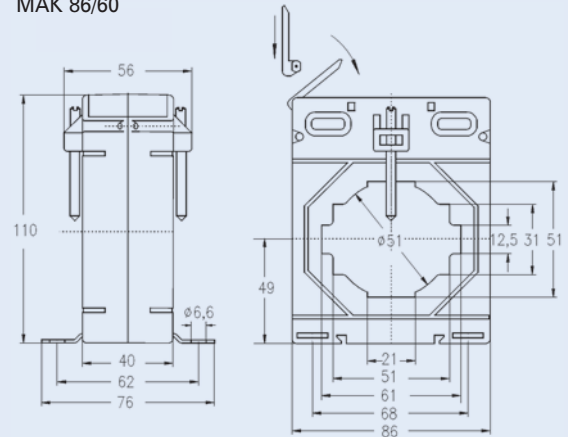
MAK 86/40



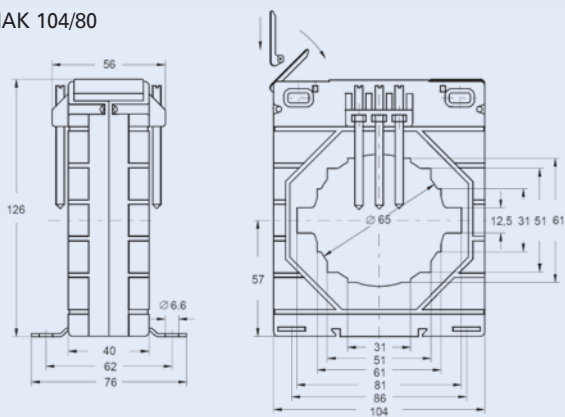
MAK 86/50



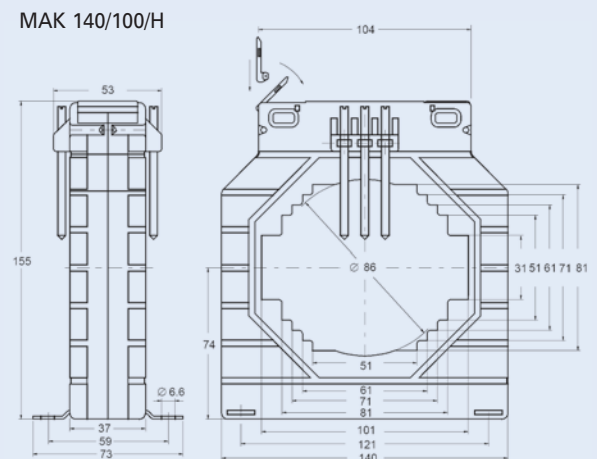
MAK 86/60



MAK 104/80



MAK 140/100/H

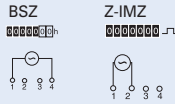


For types and art. numbers see page 63

Operating Hours Counter BSZ, Pulse Counter Z-IMZ

- According to EN 61010
- Hours counter for gathering operating time data of machines and systems and determining operating costs, maintenance intervals, warranty and working times.

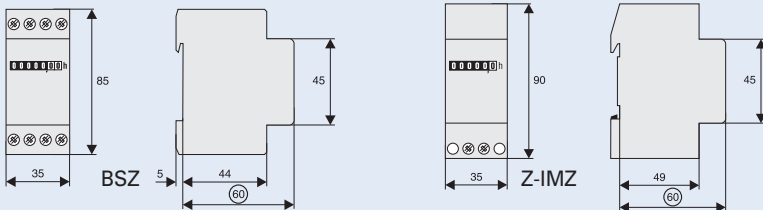
Connection diagram



Technical Data

| | BSZ/230 | BSZ/24 | Z-IMZ/230 | Z-IMZ/24 |
|--------------------------------------|--------------------------------------|--------------------------------|------------------------|------------------------|
| Electrical: | | | | |
| Rated voltage | 230 V AC $\pm 10\%$ | 24 V AC $\pm 10\%$ | 230 V AC $\pm 10\%$ | 24 V AC $\pm 10\%$ |
| Rated frequency | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| Current consumption | 10 mA | 10 mA | 8 mA | 10 mA |
| Accuracy | line frequency-dependent | | - | - |
| Counting frequency | - | - | max. 10 imp. / s | max. 10 imp. / s |
| Pulse duration / interval | - | - | 10 ms | 10 ms |
| Duty | - | - | 100 % | 100 % |
| Own consumption | 1 VA | 1 VA | 1.84 VA | 0.24 VA |
| Mechanical: | | | | |
| Frame size | 45 mm | 45 mm | 45 mm | 45 mm |
| Device height | 85 mm | 85 mm | 90 mm | 90 mm |
| Device width | 35 mm | 35 mm | 35 mm | 35 mm |
| Weight | 75 g | 75 g | 60 g | 60 g |
| Zero position | no | no | no | no |
| Operation indicator | no | no | no | no |
| Counting range | 99999.99 h | 99999.99 h | 9999999 | 9999999 |
| Height of figures | 3.5 mm | 3.5 mm | 4 mm | 4 mm |
| Colour of figures | white on black decimals red | white on black decimals red | white on black | white on black |
| Mounting | quick fastening on DIN rail EN 60715 | | | |
| Degree of protection, built-in | IP40 | IP40 | IP65 | IP65 |
| Lower terminals | screw terminals | | | |
| Terminal capacity | 10 mm ² | 10 mm ² | 0.14–4 mm ² | 0.14–4 mm ² |
| Tightening torque of terminal screws | 1.2 Nm | 1.2 Nm | 0.8 Nm | 0.8 Nm |
| Temperature range | -25 to +55 °C | -25 to +55 °C | -10 to +70 °C | -10 to +70 °C |

Dimensions [mm]



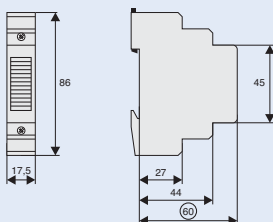
Signalling Devices, Buzzer Z-SUM, Bell Z-GLO

- Version without sparking

Technical Data

| | | | |
|--------------------|----------------------|---------------------------|---------------------------------|
| Electrical: | | Mechanical: | |
| Rated voltage | 12, 24, 230 V AC | Frame size | 45 mm |
| Frequency | 50 Hz | Device height | 86 mm |
| Power loss 12 V | 6.5 VA | Device width | 17.5 mm (1 MU) |
| 24 V, 230 V | 4.5 VA | Mounting | quick fastening on DIN EN 60715 |
| Duty | 100 % (max 12 hours) | Degree of protection | IP20 |
| Volume Buzzer Z-SU | 75 dB | Upper and lower terminals | lift terminals |
| Bell Z-GL | 77 dB | Terminal capacity | max. 10 mm ² |

Dimensions [mm]

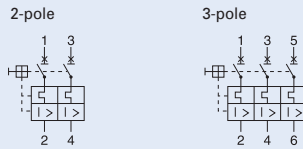


For types and art. numbers see page 64

Manual Motor Starters Z-MS

- Reliable protection of motors in case of thermal overload and short circuit
- Magnetic short-circuit tripping fixed
- Thermal overload tripping adjustable
- Suitable for installation in compact distribution boxes
- Contact position indicator red - green
- Busbar positioning optionally above or below
- Main field of application: switching and protection of three-phase AC motors with power ratings up to 15 kW (380/400 V) and other consumers up to 40 A
- Necessary not to exceed range of operation temperatures
- Load capacity is reduced with growing ambient temperature and with placing switches Z-MS one beside the other
- Also suitable as a main switch
- Isolating characteristics according to EN 60947
- Terminals and accessories compatible with PL7, PL6 etc.

Connection diagram



Technical Data

General:

| | |
|---|---|
| Terminal capacity | 1–25 mm ² |
| Busbar thickness | 0.8–2 mm |
| Mechanical endurance | 20,000 operating cycles |
| Shock resistance (shock duration 20 ms) | 20 g |
| Ambient temperature | open -25 ... + 50 °C hermetically enclosed -25 ... + 40 °C |
| Resistance to climatic conditions | |
| - humidity and heat, constant, according to | 60068-2-3 |
| - humidity and heat, periodical, according to | 60068-2-30 |
| Mass approx. (2 MU / 3 MU) | 244/366 g |
| Degree of protection | IP20 |

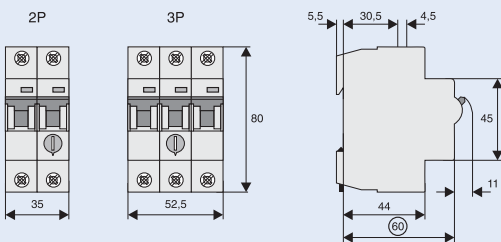
Main Current Paths

| | |
|--|---|
| Rated insulation voltage U _i | 440 V |
| Rated peak withstand voltage U _{imp} | 4 kV |
| Rated short circuit breaking capacity I _q | 10 kA |
| Rated max. breaking capacity I _{cu} | 10 kA |
| Rated operational breaking capacity I _{cs} | 7.5 kA |
| Thermal current I _{thmax} = I _{emax} | 40 A |
| Electrical endurance AC-3 at I _e | 6000 operating cycles |
| Motor switching capacity AC-3 at 16 A | 400 (415) V |
| Max. voltage for DC | 48 V per pole |
| Min. operating voltage AC/DC | 12/12 V for I _n = 1.6 to 40 A 24/24 V for I _n = 1 A; 48/48 V for 0.4 to 0.63 A; 230/- for 0.16 to 0.25 A |
| Power loss per contact | 2.3 W (1.6–10 A); 3.3 W (16 A); 4.5 W (25–40 A) |

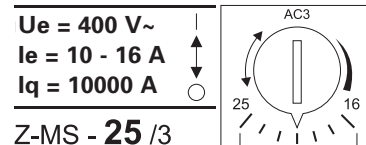
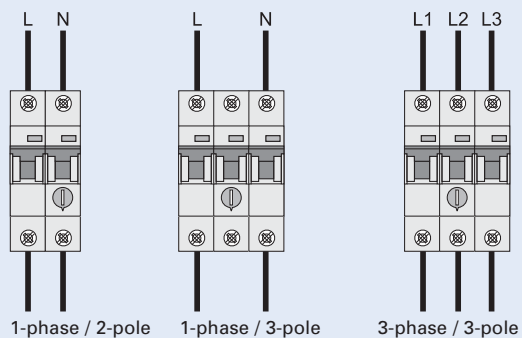
Auxiliary switch Z-AHK / Z-NHK

| | |
|--|------------------------------|
| Rated insulation voltage U _i | 440 V |
| Thermal current I _{th} | 8 A |
| Rated operational current I _e | 6 A |
| at AC-13 | 250 V 440 V |
| Max. back-up fuse for short-circuit protection | 4 A (gL/gG), PL7-4/B-HS |
| Terminal capacity (1 or 2 conductors) | 0.75 ... 2.5 mm ² |

Dimensions [mm]



Connection



Example of device printing I_i = 10x I_e 16x I_e

For types and art. numbers see page 65

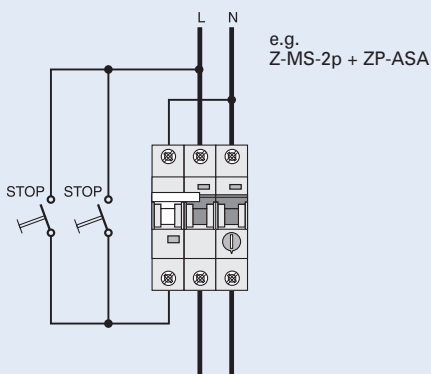
Selection of Switches for the Protection of Motors

| Motor power and current | | | | | | Setting ranges of overload release [A] |
|-------------------------|------|-------------------|------|-------------------|------|--|
| 1-phase 230–240 V | | 3-phase 230–240 V | | 3-phase 400–415 V | | |
| [kW] | [A] | [kW] | [A] | [kW] | [A] | |
| | | | | 0.06 | 0.2 | 0.16–0.25 |
| | | 0.06 | 0.4 | 0.09 | 0.3 | 0.25–0.4 |
| | | 0.09 | 0.5 | 0.12 | 0.4 | 0.4–0.63 |
| | | | | 0.18 | 0.6 | 0.4–0.63 |
| 0.06 | 0.7 | 0.12 | 0.7 | 0.25 | 0.8 | 0.63–1 |
| 0.09 | 0.7 | | | | | 0.63–1 |
| 0.12 | 1.3 | | | 0.37 | 1.1 | 1–1.6 |
| | | 0.18 | 1.0 | 0.55 | 1.5 | 1–1.6 |
| 0.18 | 1.9 | 0.37 | 2.0 | 0.75 | 1.9 | 1.6–2.5 |
| 0.25 | 2.4 | | | | | 1.6–2.5 |
| 0.37 | 2.9 | 0.55 | 2.7 | 1.1 | 2.6 | 2.5–4 |
| | | 0.8 | 3.2 | 1.5 | 3.6 | 2.5–4 |
| 0.55 | 4.2 | 1.1 | 4.6 | 2.2 | 5.0 | 4–6.3 |
| 0.75 | 5.6 | | | | | 4–6.3 |
| 1.1 | 7.4 | 1.5 | 6.3 | 2.5–3.0 | 6.6 | 6.3–10 |
| 1.5 | 8.9 | 2.5 | 8.7 | | | 6.3–10 |
| | | | | 4.0 | 8.5 | 6.3–10 |
| 2.2 | 14.5 | 3.0 | 11.5 | 5.5 | 11.3 | 10–16 |
| | | | | 7.5 | 13.2 | 10–16 |
| 3 | 17.8 | 4.0 | 14.8 | | | 16–20 |
| | | 5.5 | 19.6 | 11.0 | 21.7 | 16–20 |
| | | 7.5 | 26.4 | 15.0 | 29.3 | 25–40 |
| | | 11.0 | 38.0 | 18.5 | 36.0 | 25–40 |

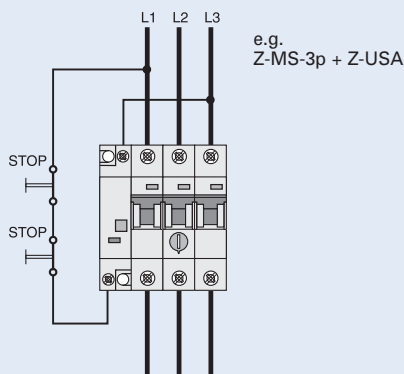
Overview of Types, Maximum Back-up Fuse and Short Circuit Behaviour

| Type | Setting range [A] | Max. back-up fuse gL/gG [A] | | Typical responding currents of short-circuit releases [A] |
|-----------|-------------------|---|-----------|---|
| | | 3 x 230 V | 3 x 400 V | |
| Z-MS-0,16 | 0.10–0.16 | | | 1.3–1.7 |
| Z-MS-0,25 | 0.16–0.25 | | | 2.0–2.6 |
| Z-MS-0,40 | 0.25–0.40 | in case of short circuit currents up to the short circuit breaking capacity | | 3.1–4.8 |
| Z-MS-0,63 | 0.40–0.63 | no back-up fuse required | | 4.9–6.6 |
| Z-MS-1,00 | 0.63–1.00 | | | 10–13 |
| Z-MS-1,60 | 1.0–1.6 | | | 16–21 |
| Z-MS-2,50 | 1.6–2.5 | | | 25–33 |
| Z-MS-4,00 | 2.5–4.0 | | | 40–52 |
| Z-MS-6,30 | 4.0–6.3 | 100 | 100 | 63–82 |
| Z-MS-10,0 | 6.3–10.0 | 100 | 100 | 78–105 |
| Z-MS-16,0 | 10.0–16.0 | 100 | 100 | 160–208 |
| Z-MS-25,0 | 16.0–25.0 | 100 | 100 | 250–325 |
| Z-MS-40,0 | 25.0–40.0 | 100 | 100 | 400–520 |

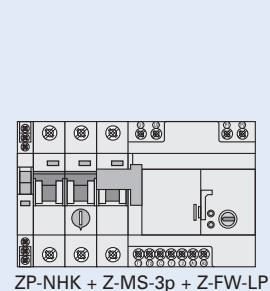
Connection of Shunt Trip Release



Connection of Undervoltage Release

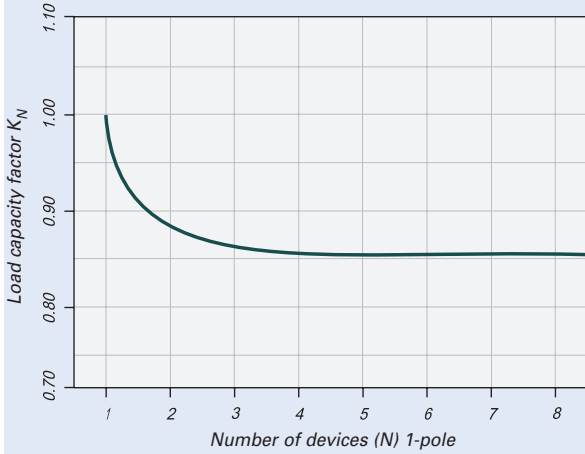


Block Diagram with Remote Switching Device



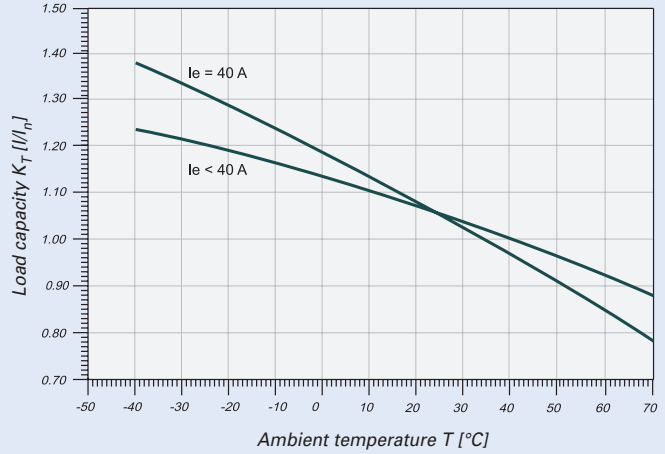
For types and art. numbers see page 65

Load Capacity in Case of Block Installation



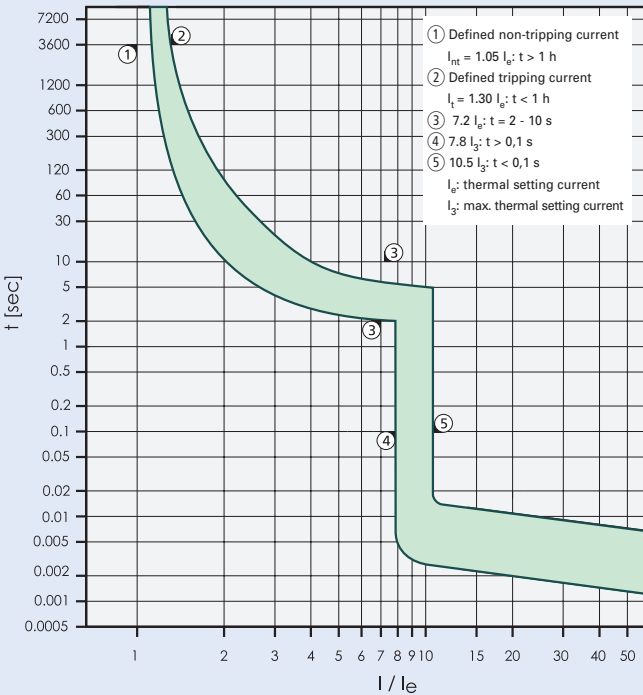
Permitted permanent load at ambient temperature T [°C] with n devices:
 $I_{DL}(T,N) = I_n \cdot K_T(T) \cdot K_N(N)$

Effect of the Ambient Temperature on the Load Capacity



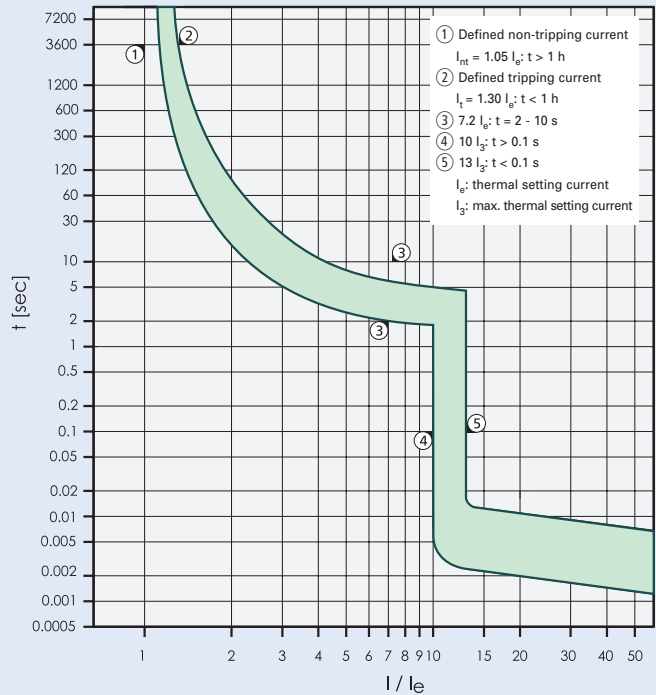
Valid for Z-MS devices, 3-pole, reference ambient temperature 20°C,
 permitted permanent load at ambient temperature T [°C] with N devices:
 $I_L(T) = I_n \cdot K_T(T)$

Typical Tripping Characteristic MS 0.16/0.25/0.4/0.63/10 A



Tripping current as a multiple of the maximum setting current,
 at an ambient temperature of 20 °C, from cold state

Typical Tripping Characteristic MS 1/1.6/2.5/4/6.3/16/25/40 A

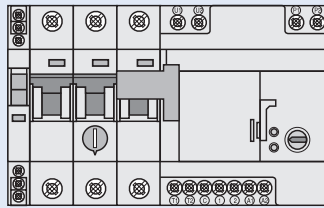


Tripping current as a multiple of the maximum setting current,
 at an ambient temperature of 20 °C, from cold state

Accessories for Manual Motor Starters Z-MS

- Accessories for manual motor starters are the same as for PF7, PF6 etc. (releases, auxiliary switches and busbar system)
- Shunt trip release ZP-ASA
- Undervoltage releases
 - Z-USA: instantaneous
 - Z-USD: delayed
- Auxiliary switch ZP-IHK: 1 NO + 1 NC
- Tripping signal switch ZP-NHK: 1 NO + 1 NC
- Remote control and automatic switching device Z-FW
- Moisture-proof enclosure IP54
 - Z-MFG: PE terminal only
 - Z-MFG/NL: PE + N terminals
 - Z-MFG/NOT: PE + N terminals and EMERGENCY OFF key

Installation Example



ZP-NHK + Z-MS-2p + Z-FW-LP

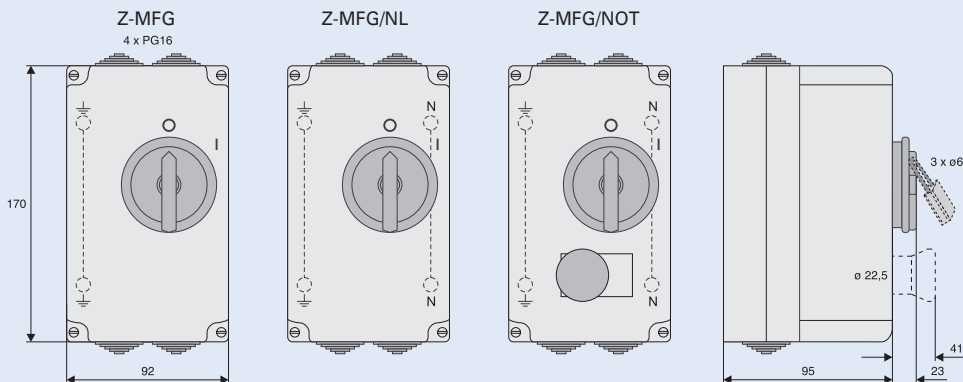
Moisture-proof Enclosure Z-MFG

- According to EN 50298
- Suitable for manual motor starters Z-MS, e.g. 3p (+ Z-USA); miniature circuit breakers; circuit breakers, etc.
- Earth conductor connection integrated in all types
- Entries for 4 x PG16 cable glands prepared
- Scope of delivery: 4 entry bushes, 1 mushroom-shaped pushbutton (red) + 1 contact (NC) in Z-MFG/NOT
- Operation: Turning handle, can be locked in the OFF-position by means of 3 padlocks, (max. \varnothing 6 mm)
- Enclosure cover can be sealed with leads in 2 locations

Technical Data

| | Z-MFG | Z-MFG//NL | Z-MFG/NOT |
|---------------------------------|-------------------------|-------------------------|-------------------------|
| Electrical: | | | |
| Power Loss of installed devices | max. 17 W | max. 17 W | max. 17 W |
| Mechanical: | | | |
| Degree of protection | IP54 | IP54 | IP54 |
| Protection class | II | II | II |
| Neutral connection | - | integrated | integrated |
| Max. Device width | 4 MU | 4 MU | 4 MU |
| Terminal capacity N/PE | max. 16 mm ² | max. 16 mm ² | max. 16 mm ² |
| Tightening torque | | | |
| N/PE-terminals | max. 2 Nm | max. 2 Nm | max. 2 Nm |
| cover screws | max. 2 Nm | max. 2 Nm | max. 2 Nm |

Dimensions [mm]



For types and art. numbers see page 65

Compact Enclosure KLV-TC

- Compact enclosure, degree of protection IP30
- Without door
- For 45 mm devices for modular installation
- Can be sealed

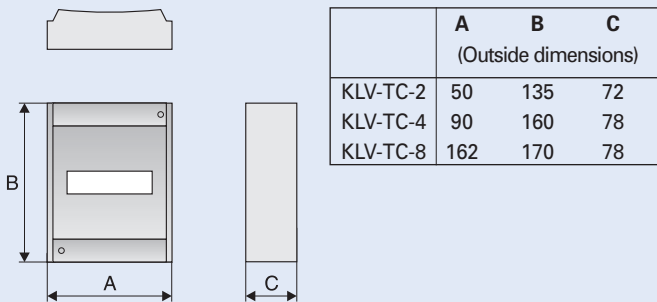
Technical Data

| | KLV-TC-2 | KLV-TC-4 | KLV-TC-4-TB | KLV-TC-8 | KLV-TC-8-TB1 | KLV-TC-8-TB2 |
|--------------------------------------|----------|----------|---------------|----------|----------------|------------------|
| Mechanical: | | | | | | |
| Module units (MU) | 1+1 | 3+1 | 3+1 | 6+2 | 6+2 | 6+2 |
| Weight | 0.09 kg | 0.15 kg | 0.17 kg | 0.32 kg | 0.35 kg | 0.36 kg |
| Terminal Support with Terminal Block | - | - | KLV-TC-TB-4/4 | - | KLV-TC-TBC-4/4 | KLV-TC-TBC-4/4+4 |

Terminal Support with Terminal Block

| Type Designation | Number of Terminal | Weight |
|------------------|--|----------|
| KLV-TC-TB-4/4 | 2 x 10 mm ² + 2 x 16 mm ² | 0.018 kg |
| KLV-TC-TBC-4/4 | 2 x 10 mm ² + 2 x 16 mm ² | 0.030 kg |
| KLV-TC-TBC-4/4+4 | 2 x (2 x 10 mm ² + 2 x 16 mm ²) | 0.045 kg |

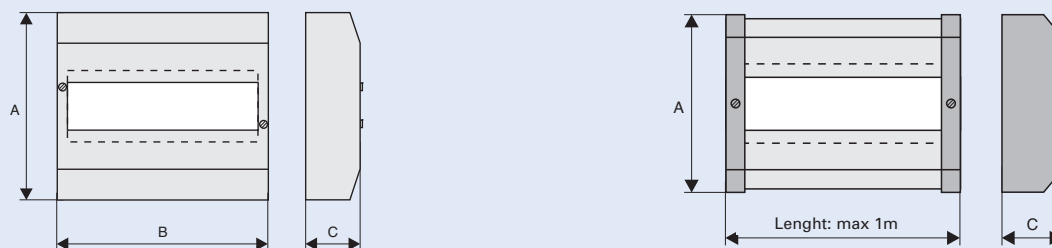
Dimensions [mm]



Enclosures ISO, KLV-LV-SP-45

- Plastic enclosure with terminal and busbar
- 1-row
- 45 mm device cut-out
- Terminal included
ISO 0 - KL7 (7 x 16 mm²)
ISO 1 - KL15 (15 x 16 mm²)
- For devices with frame size 45 mm
- Side boards and profiled strips are connected with glue
- KLV-LV-SP-45 - side boards
- KLV-LV-PL-45 - profiled strips 2 m

Dimensions [mm]



| | A | B | C |
|-------|----------------------|-----|----|
| | (Outside dimensions) | | |
| ISO 0 | 180 | 150 | 79 |
| ISO 1 | 180 | 220 | 79 |

| | A | C |
|-----------|----------------------|------|
| | (Outside dimensions) | |
| KLV-LV-45 | 156 | 75.5 |

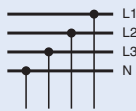
For types and art. numbers see page 66

Busbar Systems

Universal busbar system 50 A, 80 A for devices

- Low number of components, 2 angle types per busbar cross-section for three-phase AC
- Same busbar cover and end caps for ZV-SS and ZV-SS-80A
- Short-circuit withstand strength and dielectric properties tested according to EN 60739-1
- Optional placing of connection points of particular phases, arbitrary combinations can be created

Connection diagram

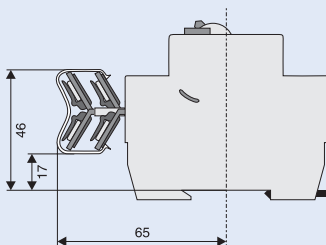


Technical Data

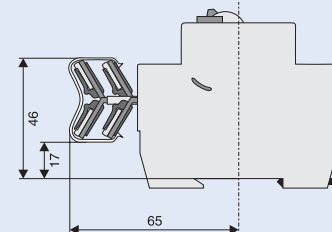
Electrical:

| | | | |
|--|--|-------------------------------|----------------------|
| Rated operation voltage | 240/415 V | | |
| Rated frequency | 50/60 Hz, DC | | |
| Rated voltage | 690 V (at pollution degree 2) 440 V (at pollution degree 3) | | |
| Overvoltage category | III | | |
| Rated impulse withstand voltage U_{imp} | 4 kV | | |
| Rated current | ZV-./., ZV-SS 50 A | ZV-./.-80A, ZV-SS-80A 80 A | ZV...-N-05TE 32 A |
| Rated conditional short-circuit current | | | |
| AC s 125 A gG | 50 kA | 50 kA | 10 kA |
| AC s 160 A gG | - | 50 kA | 10 kA |
| DC s 160 A gG | 10 kA | 10 kA | - |
| Feed in the load centre with 50 mm ² terminal ZD-80 | | | |
| rated current ZV-SS | 80 A | | |
| rated current ZV-SS-80A | 125 A | | |
| Mechanical: | | | |
| Busbar cross section | ZV-SS 25 mm ² Cu | 16 mm ² Cu | |
| Busbar length | 1 m | | |
| Degree of protection mounted with cover and end caps | IP20 | | |
| Pollution degree | 2 (3) | | |
| Minimum clearance | ≥ 3.2 mm | | |
| Minimum creepage distance | ≥ 7 mm | | |

Dimensions [mm] 50 A



Dimensions [mm] 80 A



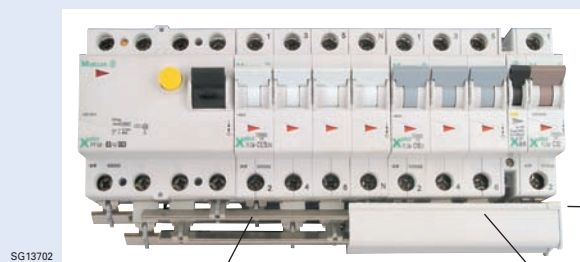
Example



Connection angle ZV-L1/N (-80A) for L1 and N

Connection angle ZV-L2/L3 (-80A) for L2 and L3

Connection angle ZV-N-05TE (-80A) for N path (e.g. PL7 with 1.5 MU)



Busbar
ZV-SS, ZV-SS-80A

Busbar cover ZV-ADP

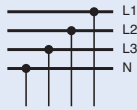
End caps ZV-AEK

For types and art. numbers see page 68

Busbar Block 10 mm², 16 mm² (1 MU)

- Length 1 m
- Delivered without end caps. Please order separately.
- Short version (/16, /8) delivered with end caps.

Connection diagram



Technical Data

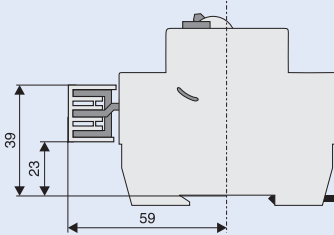
Electrical:

| | |
|--------------------------|---------------------|
| Rated voltage, frequency | 240/415 V, 50/60 Hz |
| Rated current | |
| 10 mm ² | 63 A |
| 16 mm ² | 80 A |
| Short circuit strength | 25 kA |

Mechanical:

| | |
|----------------------|------------------------------|
| Busbar cross section | 10 and 16 mm ² Cu |
| Step distance | 17.8 / 27 mm |

Dimensions [mm]



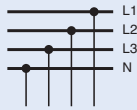
| Devices to busbar | Pcs. of the devices | End caps | | Type |
|--|------------------------|--------------------------------------|--|---|
| 1-phase | x57 x57 x16 | Z-V- AK/1P | | Z-GV-10/1P-1TE Z-GV-16/1P-1TE Z-GV-16/1P-1TE/16 |
| 2-phases | x28 x8 | Z-AK- 16/2+3P | | Z-GV-16/1P+N-2TE Z-GV-16/1P+N-2TE/16 |
| 3-phases | x19 x19 x2 x5 | Z-AK- 10/2+3P Z-AK- 16/2+3P | | Z-GV-10/3P-3TE Z-GV-16/3P-3TE Z-GV-16/3P-3TE/8 Z-GV-16/3P-3TE/16 |
| 4-phases | x27 | Z-AK- 16/4P | | Z-GV-16/3P+3N-6TE |
| | x14 x4 | Z-AK- 16/4P | | Z-GV-16/3P+N-4TE Z-GV-16/3P+N-4TE/16 |
| 1-phase + Auxiliary Switch | x38 | Z-V- AK/1P | | Z-GV-16/1P+HS |
| 3-phases + Auxiliary Switch | x16 | Z-AK- 16/2+3P | | Z-GV-16/3P+HS |

For types and art. numbers see page 68

Busbar Block 16 mm² for 1-p+N devices (1.5 MU)

- Length 1m
- Delivered without end caps. Please order separately.
- Short version (/9) delivered with end caps.

Connection diagram



Technical Data

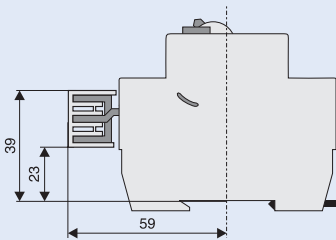
Electrical:

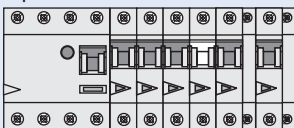
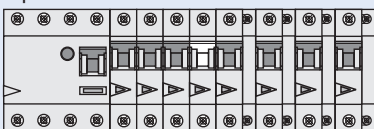


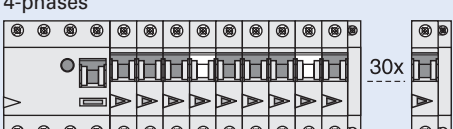
| | |
|--------------------------|---------------------|
| Rated voltage, frequency | 240/415 V, 50/60 Hz |
| Rated current | 63 A |
| Short circuit strength | 25 kA |

Mechanical:

| | |
|----------------------|-----------------------|
| Busbar cross section | 16 mm ² Cu |
| Step distance | 26.7 mm |

Dimensions [mm]



| Devices to busbar | Pcs. of the devices | End caps | Type |
|---|---------------------|--------------|------------------------------------|
| <p>4-phases</p>  | | Z-V-AK/4P | Z-GSV-10/FI+EH+2XLS1N |
| <p>4-phases</p>  | | Z-V-AK/4P | Z-GSV-10/FI+EH+4XLS1N |
| <p>2-phases</p>  | x37 x9 | Z-AK-16/2+3P | Z-GSV-16/1P+N Z-GSV-16/1P+N/9 |
| <p>4-phases</p>  | x37 x9 | Z-AK-16/4P | Z-GSV-16/3P+3N Z-GSV-16/3P+3N/9 |
| <p>4-phases</p>  | | Z-V-AK/4P | Z-GSV-16/FI+EH+KR+30XLS1N |

Busbar Block 10mm² (Pins) Z-SV...-SD

- Special busbars for sockets Z-SD... (placing of sockets one besides the other)
- Cross section 10 mm² for rated current 50 A
- Length 1m
- Including end caps

Connection diagram



Technical Data

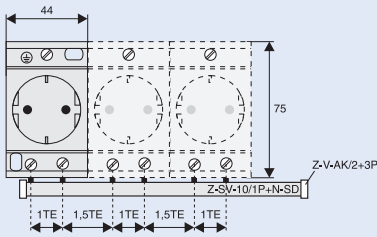
Electrical:

| | |
|------------------------|---------------------|
| Rated voltage | 230/400 V, 50/60 Hz |
| Rated current | 50 A |
| Short circuit strength | 25 kA |

Mechanical:

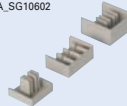
| | |
|----------------------|-----------------------|
| Busbar cross section | 10 mm ² Cu |
| Step distance | 44 mm |

Dimensions [mm]



Accessories

WA_SG10602



End caps

WA_SG10702

WA_SG10702



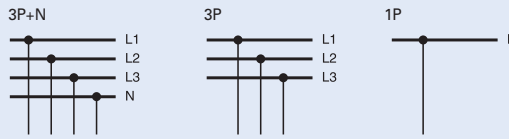
Connection terminal
Z-EK/25/QL

Connection terminal
Z-EK/25

Busbar Block Z-SV (1.5 MU) for PLHT

- Busbar system with fixed spacing and position of terminals
- For circuit breakers PLHT, fuse switch disconnectors and fuse bases Z-SLS, D0-SO/..
- Cross section 16 and 35 mm² for rated currents 80 and 110 A, respectively
- Length 1 m
- End caps must be ordered separately (type Z-SV-35/3P+N-6TE delivered with end caps)
- Terminal shape – pin

Connection diagram

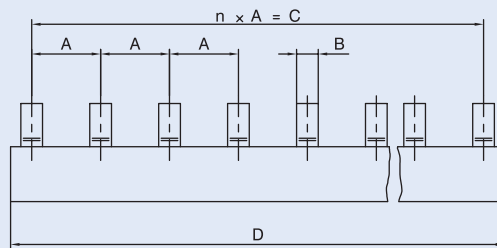
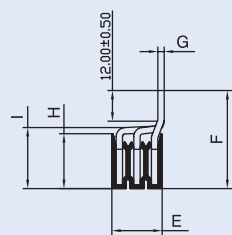


Technical Data

| | Z-SV-16 | Z-SV-35 |
|--|---------------------------|--------------------------------|
| Electrical | | |
| Rated operational voltage | 240/415 VAC | 240/415 VAC |
| Rated frequency | 50/60 Hz | 50/60 Hz |
| Rated voltage | 500 V | 690 V |
| Overvoltage category | III | III |
| Rated impulse withstand voltage U_{imp} | 4 kV | 6 kV |
| Rated current | 80 A | 110 A |
| Rated conditional short-circuit current AC with 350 A gG | 50 kA _{r.m.s.} | 100 kA _{r.m.s.} |
| Mechanical | | |
| Busbar cross section | 16 mm ² Cu | 35 mm ² Cu |
| Step distance | 27 mm | 27 mm (Z-SV-35/PLHT-V 30.5 mm) |
| Flame class | V0, Glow wire-test 960 °C | V0, Glow wire-test 850 °C |
| Degree of protection, with end caps | IP20 | IP20 |
| Pollution degree | 2 | 2 |
| Comparative tracking index | CTI 300 | CTI 600 |
| Minimum clearance | ≥ 5 mm | ≥ 4,3 mm |
| Minimum creepage distance | ≥ 10.2 mm | ≥ 6.7 mm |

Dimensions [mm]

| | n | A | B | C | D | E | F | G | H | I |
|----------------|----|------|-----|-----|------|------|------|-----|------|------|
| Z-SV-16/3P | 35 | 27 | 5 | 945 | 971 | 14.9 | 31 | 1.5 | 17 | 19 |
| Z-SV-35/3P | 35 | 27 | 8.5 | 945 | 1000 | 19.7 | 38.4 | 2.5 | 21.5 | 23.9 |
| Z-SV-35/PLHT-V | 32 | 30,5 | 8.5 | 976 | 1000 | 19.7 | 38.4 | 2.5 | 21.5 | 23.9 |

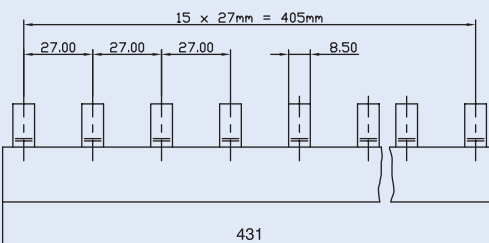
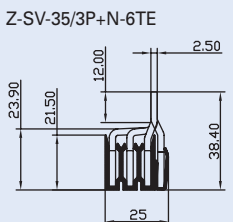


Accessories for Z-SV-16

Wa_sg10802



Connection terminal
Z-EK/50

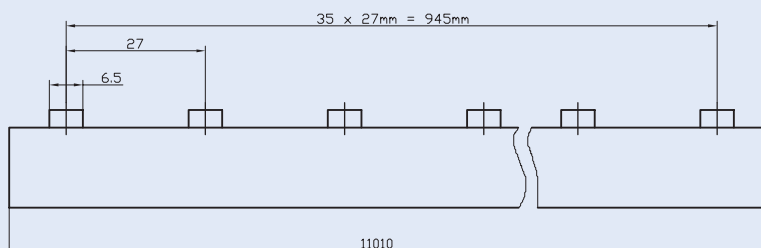
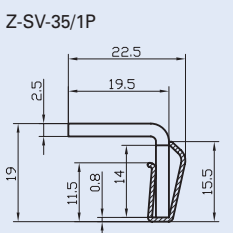


Accessories for Z-SV-35

Wa_sg10802



Connection terminals
Z-EK/95, Z-EK/95-3N,
Z-EK/95-1




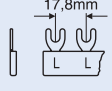
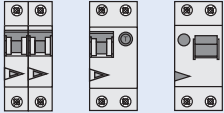
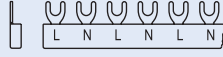
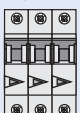
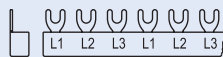
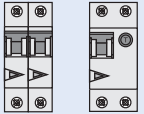
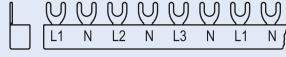

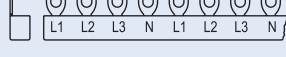
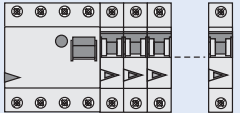
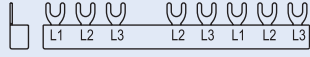
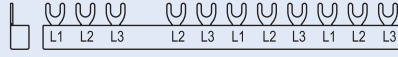
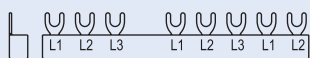
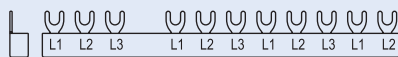

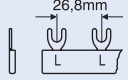
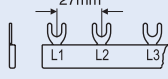
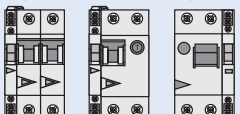
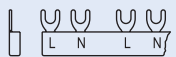
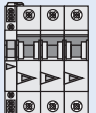
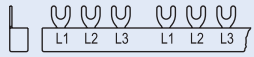
For types and art. numbers see page 70

Fork-Type Euro-Vario Busbar EVG

- Busbar system with fixed spacing and position of terminals
- For installation devices series Moeller line Xpole (PL7, PL6, PF7, PF6, PHF7, dRCM, PFL7, PFL6, PFR,...)
- Versions for device without or with auxiliary contact (not connected to busbar)
- 3-pole version for combination with 4-pole RCD when N-conductor is not connected to busbar
- Various length, cannot be cut
- End-cap-less design, terminal shape – fork

Technical Data

| Electrical | | Mechanical | |
|------------------------|---------------------|----------------------|---|
| Rated voltage | 240/415 V, 50/60 Hz | Busbar length | 2, 6, 9, 12, 16, 20 MU |
| Rated current | | Busbar cross section | 10 mm ² / 16 mm ² |
| 10 mm ² | 63 A | Step distance | |
| 16 mm ² | 80 A | 10 mm ² | 17.8 mm / 26.8 mm / 71.2 mm |
| Short circuit strength | 25 kA | 16 mm ² | 17.8 mm / 27 mm / 71.2 mm |

| Devices to busbar | Pcs. of the devices | End caps | Type |
|--|--------------------------------------|--|--|
| 1-phase  | x2 x6 x12 |  | EVG-../1PHAS/2MODUL EVG-../1PHAS/6MODUL EVG-../1PHAS/12MODUL |
| 2-phases  | x2 x3 x6 |  | EVG-../2PHAS/4MODUL EVG-../2PHAS/6MODUL EVG-../2PHAS/12MODUL |
| 3-phases  | x2 x3 x4 x5 x6 |  | EVG-../3PHAS/6MODUL EVG-../3PHAS/9MODUL EVG-../3PHAS/12MODUL EVG-../3PHAS/16MODUL EVG-../3PHAS/20MODUL |
| 4-phases  | x8 x9 |  | EVG-3P+3N/16MODUL EVG-3P+3N/18MODUL |
|  | x2 x3 |  | EVG-../4PHAS/8MODUL EVG-../4PHAS/12MODUL |
| For combination RCD/MCBs with RCD 4-pole, 3-phases  | |     | EVG-3PHAS/N/5MODUL/LS EVG-3PHAS/N/8MODUL/LS EVG-16/3PHAS/N/5MODUL/LS EVG-16/3PHAS/N/8MODUL/LS |
| 1-phase + Auxiliary Switch  | x2 x6 x9 x6 x8 x9 |   | EVG-../1PHAS/2MODUL/HI EVG-16/1PHAS/6MODUL/HI EVG-../1PHAS/9MODUL/HI EVG-16/3x1PHAS/6MODUL/HI EVG-16/3x1PHAS/8MODUL/HI EVG-16/3x1PHAS/9MODUL/HI |
| 2-phases + Auxiliary Switch  | x2 x3 x5 |  | EVG-../2PHAS/4MODUL/HI EVG-16/2PHAS/6MODUL/HI EVG-../2PHAS/10MODUL/HI |
| 3-phases + Auxiliary Switch  | x2 x4 |  | EVG-../3PHAS/6MODUL/HI EVG-../3PHAS/12MODUL/HI |

For types and art. numbers see page 71

Fuse-links DII, DIII

- According to EN 60269-1, EN 60269-3
- For fuse-bases DII-SO..., DIII-SO...
- Delayed fuse links gG (gL)
- Standard fuse links DZ

Connection diagram



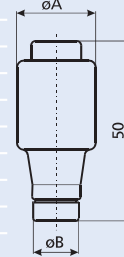
Technical Data

Electrical

| | |
|---|------------------------------|
| Operating class | gG (gL) |
| Rated voltage U_n | |
| AC | 500 V |
| DC | 400 V |
| Rated frequency | 45 - 65 Hz |
| Insulating class | C-VDE0110 |
| Rated short-circuit breaking capacity at $1.1 \times U_n$ | |
| AC | 50 kA / $\cos \varphi = 0.2$ |
| DC | 8 kA / $t = 15 \text{ ms}$ |

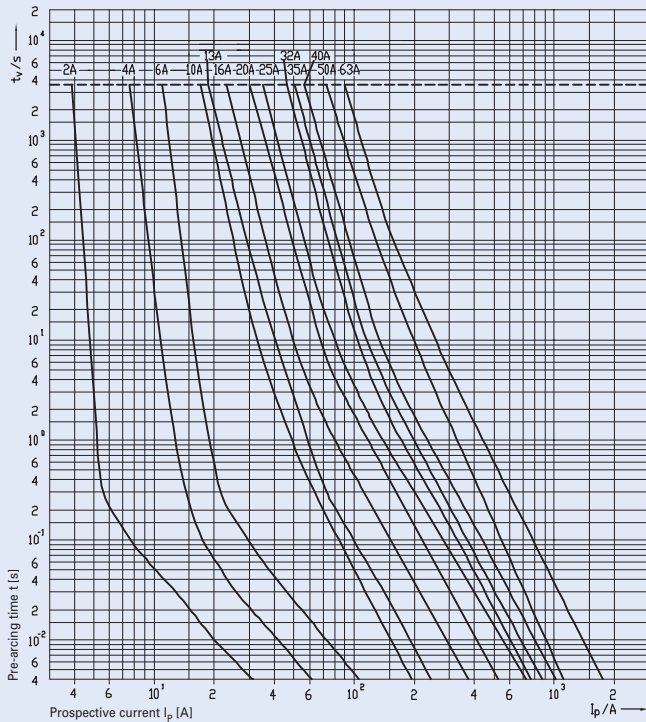
Dimensions [mm]

| I_n (A) | $\varnothing A$ | $\varnothing B$ |
|-------------------------------|-----------------|-----------------|
| DII for fuse-base E27 | | |
| 2 | 21.5 | 6 |
| 4 | 21.5 | 6 |
| 6 | 21.5 | 6 |
| 10 | 21.5 | 8 |
| 16 | 21.5 | 10 |
| 20 | 21.5 | 12 |
| 25 | 21.5 | 14 |
| DIII for fuse-base E33 | | |
| 35 | 27 | 16 |
| 50 | 27 | 18 |
| 63 | 27 | 20 |

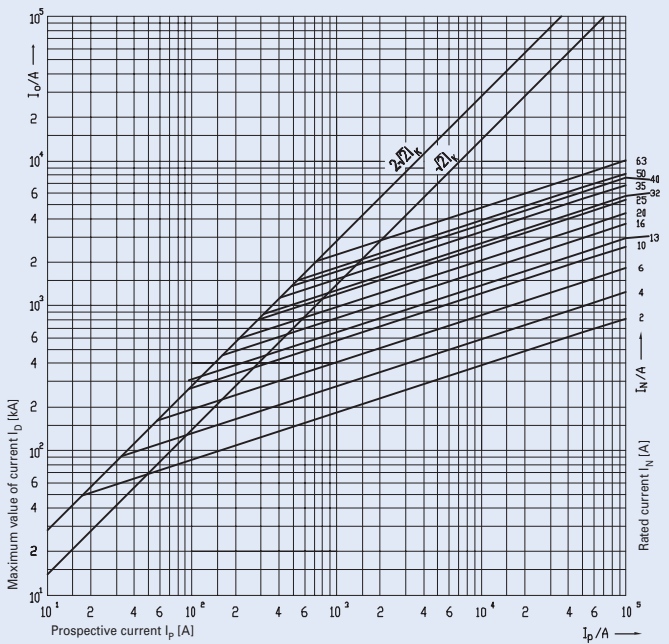


Characteristics Z-DII./SE

Time/current characteristics of Z-DII-Fuse-links 2 ... 63A gG(gL)

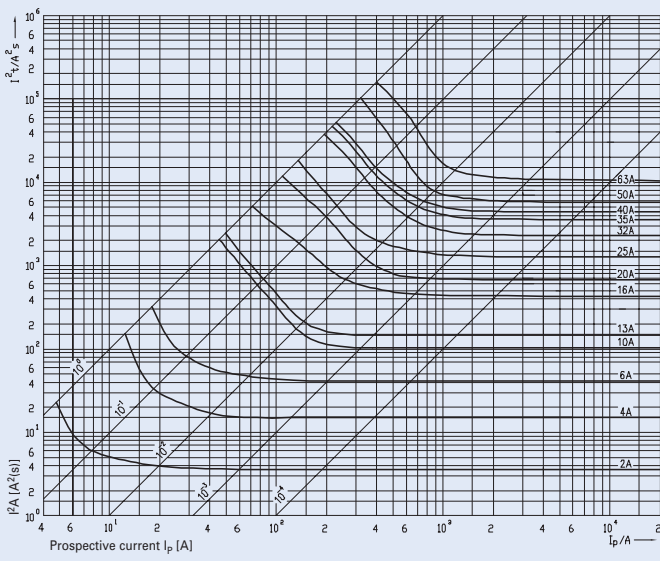


Let-through current characteristics of Z-DII-Fuse-links 2 ... 63A gG(gL)

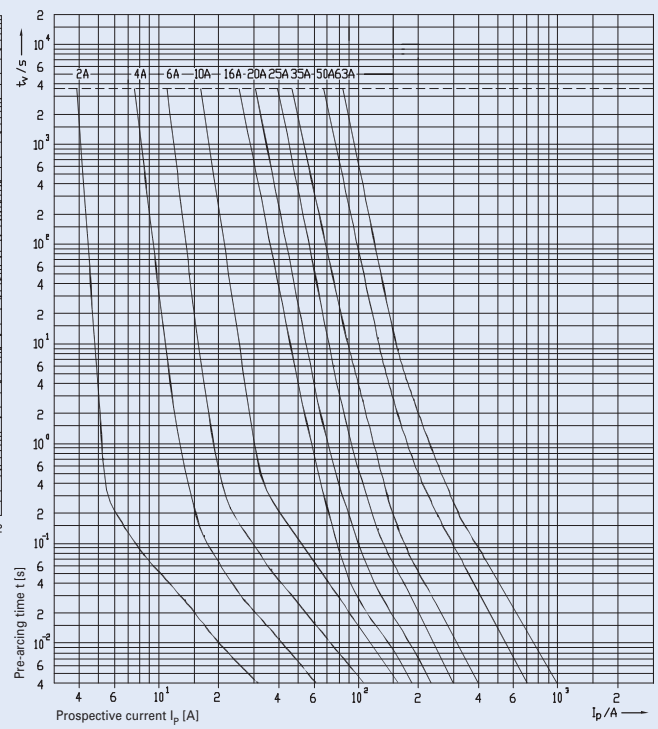


Characteristics Z-DII./SE

Melting energy characteristics I²t/A of Z-DII-Fuse-links 2 ... 63A gG(L)



Time/current characteristics of Z-DII-Fuse-links 2 ... 63A DZ



Screw-in Gauge Ring Z-DII./PS

- Used for current coding of DII.-SO/...

Technical Data

Electrical:

Rated current

| | |
|------|----------|
| DII | 2 - 20 A |
| DIII | 2 - 50 A |

Gauge Ring Z-DII./PE

- Used for current coding of DII.-SO/...-PS

Technické údaje

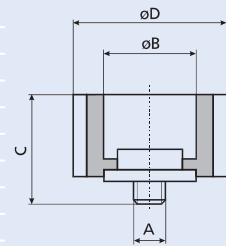
Electrical:

Rated current

| | |
|------|-----------|
| DII | 2 - 25 A |
| DIII | 35 - 63 A |

Dimensions [mm]

| I_n (A) | A | B | C | D |
|------------------------|-------|------|----|----|
| DII for fuse-base E27 | | | | |
| 2 | 3/16" | 6.5 | 17 | 24 |
| 4 | 3/16" | 6,5 | 17 | 24 |
| 6 | 3/16" | 6.5 | 17 | 24 |
| 10 | 3/16" | 8.5 | 17 | 24 |
| 16 | 3/16" | 10,5 | 17 | 24 |
| 20 | 3/16" | 12.5 | 17 | 24 |
| 25 | 3/16" | 14.5 | 17 | 24 |
| DIII for fuse-base E33 | | | | |
| 35 | 3/16" | 16.5 | 17 | 24 |
| 50 | 3/16" | 18.5 | 17 | 24 |
| 63 | 3/16" | 20.5 | 17 | 24 |



Screw Caps Z-DII./SK

- Used for DII.-SO

Technical Data

Electrical

Rated current

| | |
|------|-----------|
| DII | max. 25 A |
| DIII | max. 63 A |

Rated voltage

| | |
|---------------|---------------------|
| Z-DII/SK | 500 V AC / 400 V DC |
| Z-DIII/SK | 500 V AC / 400 V DC |
| Z-DIII/SK-690 | 690 V AC |

Mechanical

Type

DII

DIII

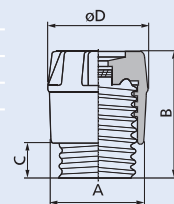
Thread

E27

E33

Dimensions [mm]

| I_n (A) | A | B | C | D |
|---------------|----|----|----|----|
| Z-DII/SK | 34 | 44 | 12 | 35 |
| Z-DIII/SK | 43 | 44 | 12 | 43 |
| Z-DIII/SK-690 | 43 | 65 | 12 | 43 |



Practical Hint

A complete and functioning D-fuse system consists of

- base for screw-in gauge ring + fuse-link + screw-in gauge ring + screw cap
- base for gauge ring + fuse-link + gauge ring + screw cap

The gauge ring is not required for the highest rated current of each size (DII ... 25 A and DIII ... 63 A).

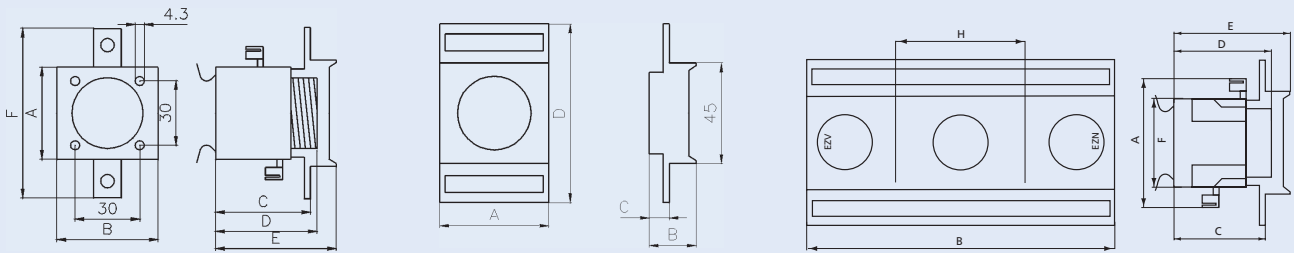
Fuse bases for standard mounting DII.-SO/...

- Fuse bases for fuse links DII and with thread E27 to 25 A
- Fuse bases for fuse links DIII and with thread E33 to 63 A
- For mounting onto device rail, type ...MP for mounting onto panel

Technical Data

| | Type | Thread | Dimensions | | | | | | | |
|--------------------------------------|-----------------|--------|------------|-----|------|----|----|----|-----|----|
| | | | A | B | C | D | E | F | G | H |
| 1-pole fuse bases with plastic cover | DII-SO/25/1-MP | E27 | 41 | 39 | 44 | 47 | 60 | 62 | - | - |
| | DII-SO/25/1 | E27 | 41 | 39 | 44 | 47 | 60 | 62 | - | - |
| | DIII-SO/63/1-MP | E33 | 43 | 47 | 44 | 47 | 56 | 79 | - | - |
| | DIII-SO/63/1 | E33 | 43 | 47 | 44 | 47 | 56 | 79 | - | - |
| Plastic cover | DII-SO/25/1 | | | | | | | | | |
| | DII-SO/25/1-MP | E27 | 40 | 24 | 10,8 | 80 | | | | |
| | DIII-SO/63/1 | | | | | | | | | |
| | DIII-SO/63/1-MP | E33 | 49 | 21 | 9 | 80 | | | | |
| 3-pole fuse bottoms linear | DII-SO/25/3 | E27 | 41 | 121 | 44 | 47 | 60 | 30 | 4,3 | 50 |
| | DIII-SO/63/3 | E33 | 43 | 148 | 44 | 47 | 56 | 32 | 4,3 | 62 |

Dimensions [mm]



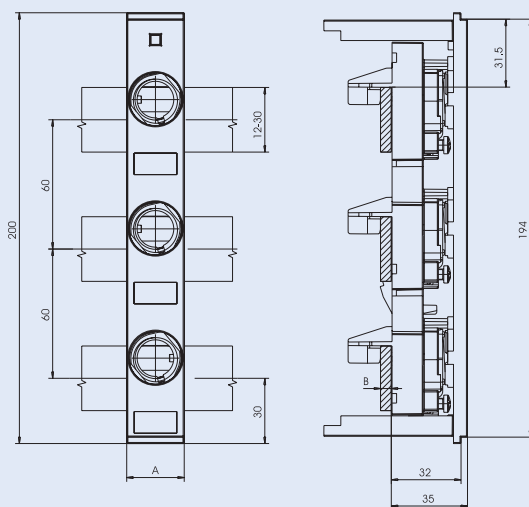
Fuse bases for direct mounting onto busbars

- Fuse bases for fuse links DII and with thread E27 to 25 A
- Fuse bases for fuse links DIII and with thread E33 to 63 A
- Including shock hazard protection cover, front and bottom plate and description label
- Delivered empty without screw caps
- Version -R for gauge rings Z-DII./PE
- Version -R-PS for screw/in gauge rings Z-DII./PS

Technical Data

| | DII-SO/25/3-R(-PS) | DIII-SO/63/3-R(-PS) |
|--|--|--|
| Electrical | | |
| Number of poles | 3 | 3 |
| Rated operational voltage U_e | 500 V AC | 690 V AC |
| Rated frequency | 40 - 60 Hz | 40 - 60 Hz |
| Rated operational current I_e | 25 A | 63 A |
| Conv. thermal current with fuse-links I_{th} | 25 A | 63 A |
| Rated duty | uninterrupted duty | uninterrupted duty |
| Rated conditional short-circuit current | 50 kA _{r.m.s.} | 50 kA _{r.m.s.} |
| Overvoltage category | III | III |
| Rated impulse withstand voltage U_{imp} | 4 kV | 4 kV |
| Power loss per current path | 0.4 W | 3.34 W |
| Power loss of base without fuse-links | 1.2 W | 10 W |
| Max. permissible power loss of fuse-links | 4 W | 7 W |
| Mechanical | | |
| Device height | 200 mm | 200 mm |
| Device width | 45 mm | 54 mm |
| Weight | 140 g | 150 g |
| Mounting onto busbars, without drilling or screwing | 12x5/10 20x5/10 25x5/10 30x5/10 | 12x5/10 20x5/10 25x5/10 30x5/10 |
| Degree of protection while operating | IP20 | IP20 |
| Terminals | Lift terminals | Lift terminals |
| Terminal capacity | 1.5 - 25 mm ² | 1.5 - 25 mm ² |
| Tightening torque of terminal screws | 2,6 Nm | 2.6 Nm |
| Electrical thread type | E27 | E33 |
| Ambient temperature range | -25 to +55 °C *) | -25 to +55 °C *) |
| *) (35 °C normal temperature, at 55 °C with reduced operational current) | | |
| Pollution degree | 3 | 3 |
| Climatic resistance: moist heat | EN 60068-2-78, EN 60068-2-30 | |

Dimensions [mm]



| Type | A |
|---------------------|----|
| DII-SO/25/3-R(-PS) | 45 |
| DIII-SO/63/3-R(-PS) | 54 |

Fuse-Links Z-C10, Z-C14, Z-C22

- For fuse-switch-disconnectors C10-SLS, VLC14 and VLC22
- According to EN 60269-1 and IEC 60269-2-1
- Rated voltage 690, 500, 400 V, 50 Hz (according to I_n)
- High breaking capacity 100 kA
- Low let-through energy
- Characteristic gG suitable for protection of electrical lines, cables
- Characteristic AM suitable for protection of circuits with motors

Connection diagram



Technical Data

| Electrical | Z-C10/SE 10x38 | Z-C14/SE 14x51 | Z-C22/SE 22x58 |
|---------------------------------------|---|---|---|
| Operating class | gG (gL) | gG (gL) | gG (gL) |
| Rated voltage U_n | 1 - 25 A / 500 V AC 32 A / 400 V AC | 2 - 32 A / 690 V AC 40 - 50 A / 500 V AC | 16 - 40 A / 690 V AC 50 - 100 A / 500 V AC |
| Operating class | aM | aM | aM |
| Rated voltage U_n | 1 - 16 A / 500 V AC 20 - 32 A / 400 V AC | 2 - 25 A / 690 V AC 32 - 50 A / 500 V AC | 16 - 50 A / 690 V AC 80 - 100 A / 500 V AC |
| Rated frequency | 50 Hz | 50 Hz | 50 Hz |
| Rated short-circuit breaking capacity | 100 kA | 100 kA | 100 kA |

Max. Power dissipation

Operating class gG - Power dissipations 400 V / 500 V / 690 V

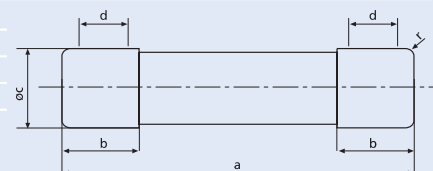
| | max. 3 W acc. IEC 60269-2 | max. 5 W acc. IEC 60269-2 | max. 9,5 W acc. IEC 60269-2 |
|---------------------|----------------------------------|----------------------------------|------------------------------------|
| Rated current I_n | 10x38 | 14x51 | 22x58 |
| 1 | 0.55 | | |
| 2 | 0.90 | 1.45 | |
| 4 | 1.45 | 1.60 | |
| 6 | 1.55 | 1.95 | |
| 8 | 1.05 | 1.40 | |
| 10 | 1.10 | 1.45 | |
| 12 | 1.55 | 1.95 | |
| 16 | 2.85 | 3.00 | 3.05 |
| 20 | 2.80 | 3.15 | 3.40 |
| 25 | 2.95 | 4.10 | 4.40 |
| 32 | 3.00 | 4.80 | 5.10 |
| 40 | | 4.75 | 7.20 |
| 50 | | 4.95 | 7.60 |
| 63 | | | 8.00 |
| 80 | | | 8.20 |
| 100 | | | 9.40 |

Operating class aM - Power dissipations 400 V / 500 V / 690 V

| | max. 1,2 W acc. IEC 60269-2 | max. 3 W acc. IEC 60269-2 | max. 7 W acc. IEC 60269-2 |
|---------------------|------------------------------------|----------------------------------|----------------------------------|
| Rated current I_n | 10x38 | 14x51 | 22x58 |
| 1 | 0.55 | | |
| 2 | 0.60 | 0.80 | |
| 4 | 0.55 | 0.60 | |
| 6 | 0.45 | 0.50 | |
| 8 | 0.45 | 0.50 | |
| 10 | 0.55 | 0.90 | |
| 12 | 0.55 | 0.95 | |
| 16 | 0.80 | 1.10 | 1.30 |
| 20 | 0.95 | 1.40 | 1.45 |
| 25 | 1.00 | 2.10 | 2.45 |
| 32 | 1.20 | 2.10 | 2.50 |
| 40 | | 2.60 | 2.95 |
| 50 | | 2.95 | 3.30 |
| 63 | | | 4.00 |
| 80 | | | 5.30 |
| 100 | | | 6.40 |

Dimensions [mm]

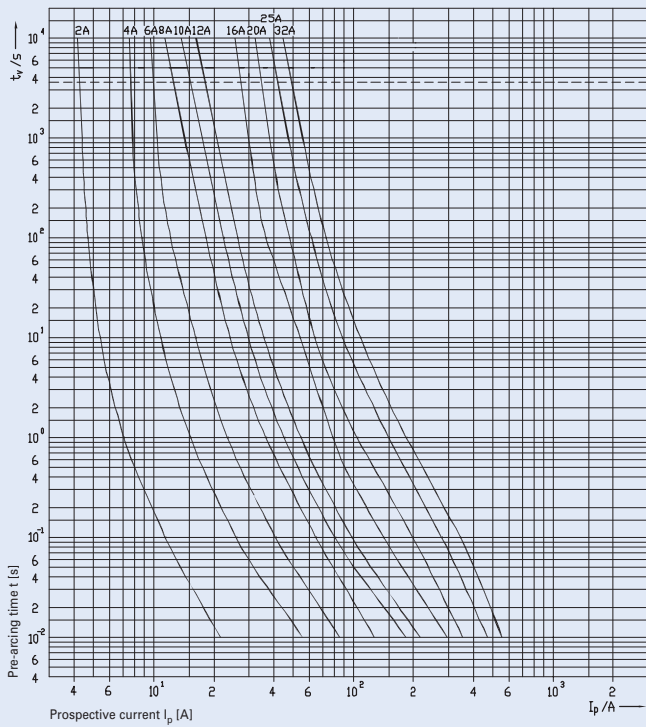
| Type | Size | a | $b_{max.}$ | c | $d_{min.}$ | r |
|-------|-------|-------------|------------|----------|------------|---------|
| Z-C10 | 10x38 | 38,0±0,6 | 10,5 | 10,3±0,1 | 6 | 1,5±0,5 |
| Z-C14 | 14x51 | 51,0+0,6/-1 | 13,8 | 14,3±0,1 | 7,5 | 2±0,5 |
| Z-C22 | 22x58 | 58,0+1/-2 | 16,2 | 22,2±0,1 | 11 | 2±0,5 |



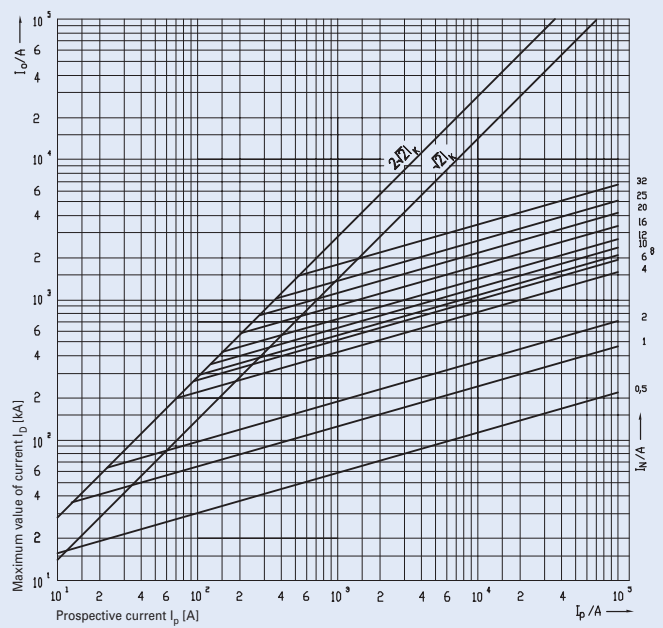
For types and art. numbers see page 76, 77

Characteristics Z-C10/SE, Operating class gG, 10x38

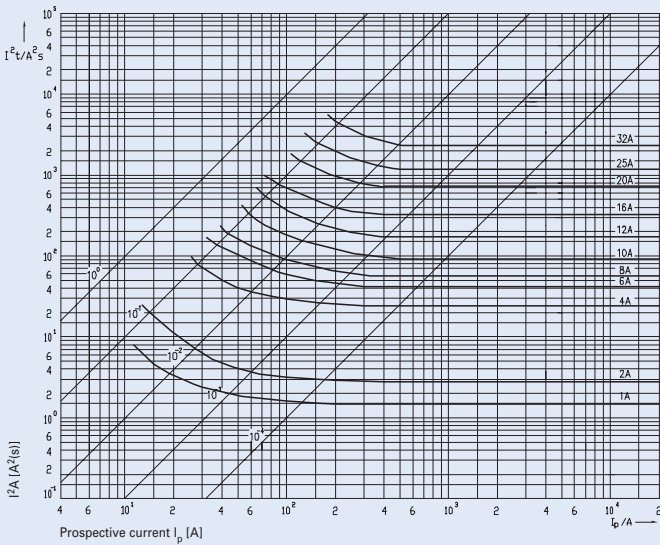
Time/current characteristics of Z-C10-Fuse-links 2 ... 32A gG(gL)



Let-through current characteristics of Z-C10-Fuse-links 2 ... 32A gG(gL)

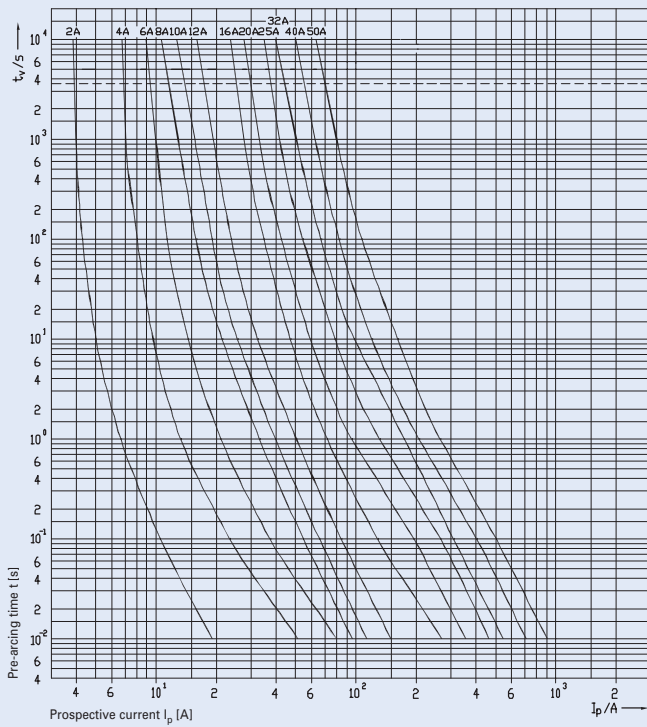


Melting energy characteristics I^2t/A of Z-C10-Fuse-links 1 ... 32A gG(gL)

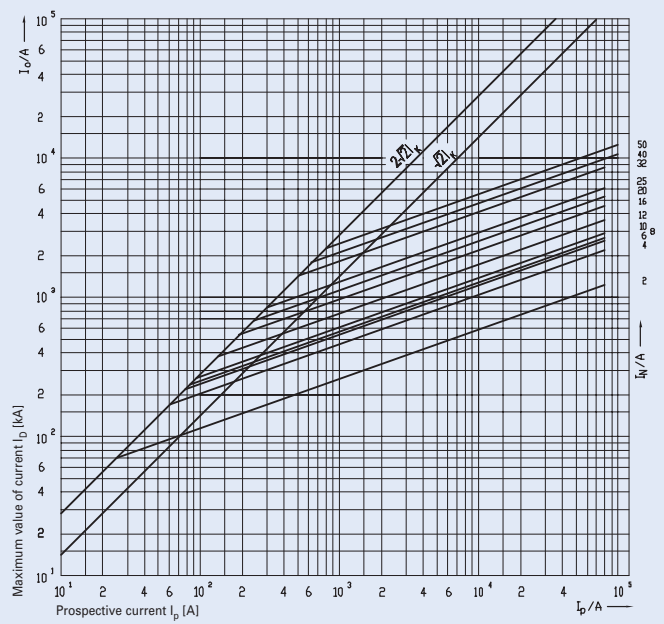


Characteristics Z-C14/SE, Operating class gG, 14x51

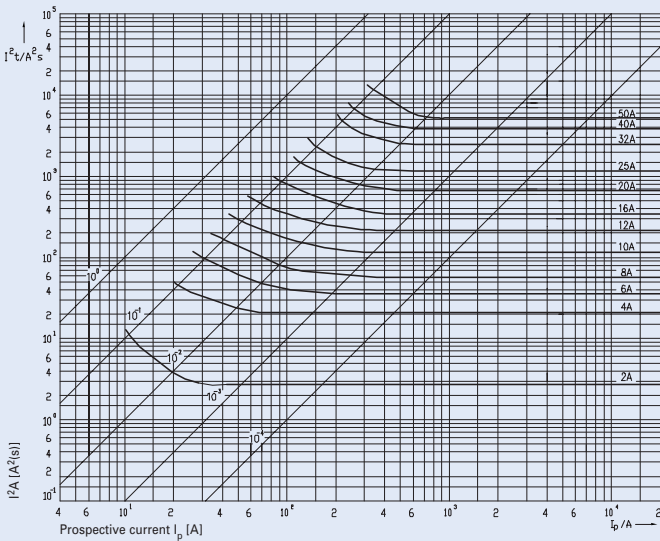
Time/current characteristics of Z-C14-Fuse-links 2 ... 50A gG(gL)



Let-through current characteristics of Z-C14-Fuse-links 2 ... 50A gG(gL)

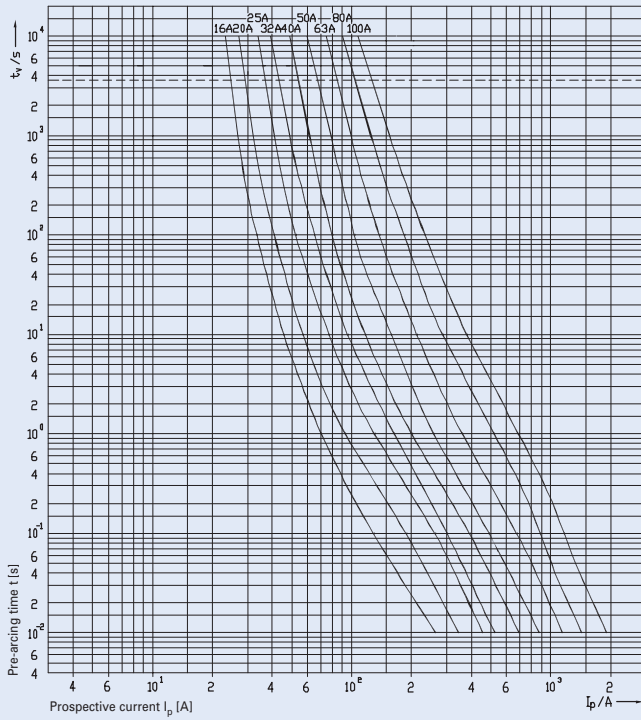


Melting energy characteristics I^2t/A of Z-C14-Fuse-links 2 ... 50A gG(gL)

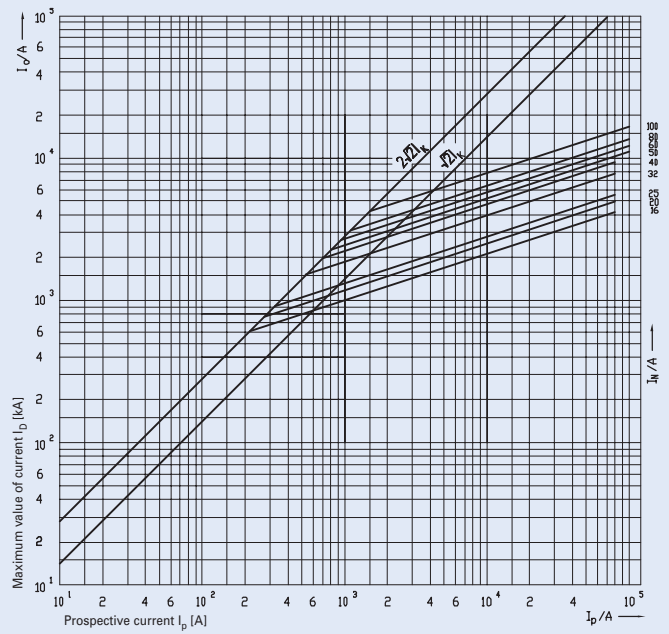


Characteristics Z-C22/SE, Operating class gG, 14x51

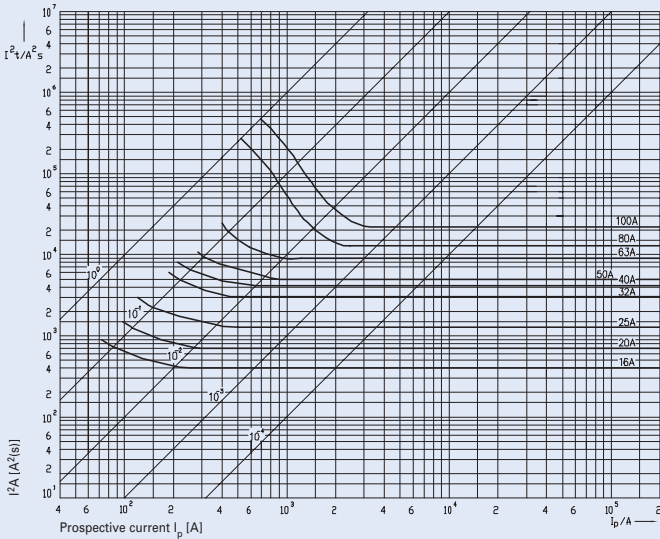
Time/current characteristics of Z-C22-Fuse-links 16 ... 100A gG(gL)



Let-through current characteristics of Z-C22-Fuse-links 16 ... 100A gG(gL)

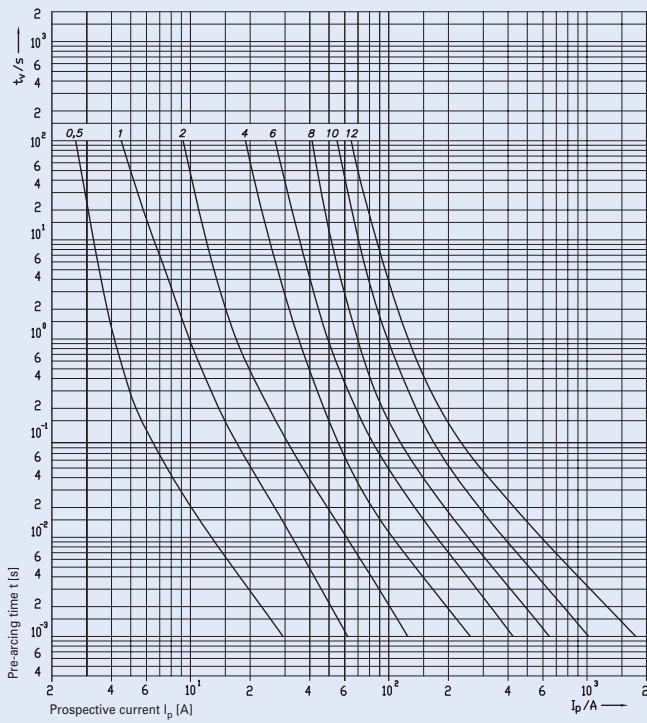


Melting energy characteristics I^2t/A of Z-C22-Fuse-links 16 ... 100A gG(gL)

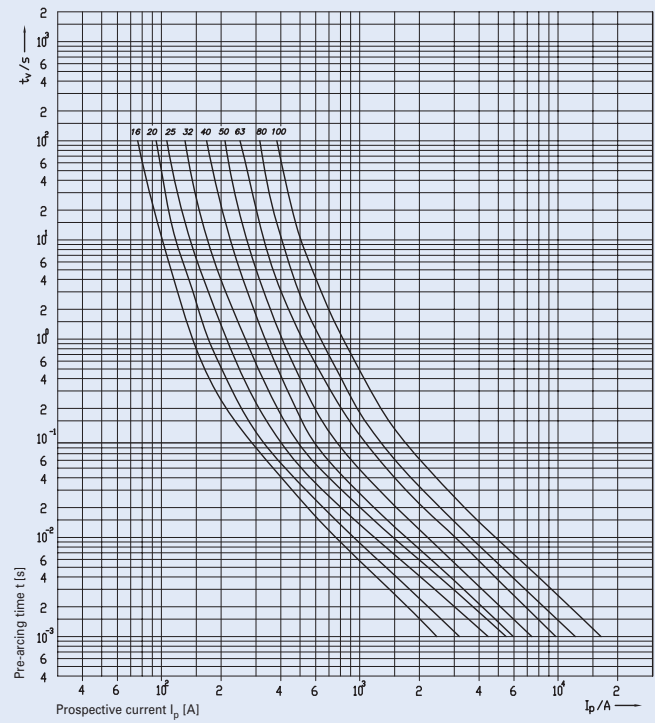


Characteristics Z-C../SE, Operating class aM, 10x38 - 14x51 - 22x58

Time/current characteristics of Z-C...Fuse-links 16 ... 100A gG(L)



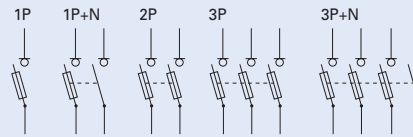
Time/current characteristics of Z-C...Fuse-links 16 ... 100A aM



Fuse-Switch-Disconnecter C10-SLS, VLC

- For cylindrical fuse-links Z-C10, Z-C14, Z-C22
- Mainly for industrial applications
- Design according to EN 60947-3
- Types /L with visual tripping indicator (flashing)
- Sealable

Connection diagram



Technical Data

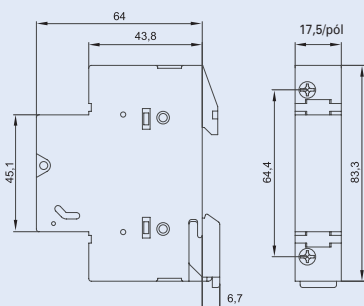
| | C10-SLS | VLC14 | VLC22 |
|---|------------------------|------------------------|------------------------|
| Electrical | | | |
| Number of poles | 1P, 1P+N, 2P, 3P, 3P+N | 1P, 1P+N, 2P, 3P, 3P+N | 1P, 1P+N, 2P, 3P, 3P+N |
| Rated operational voltage U_e | | | |
| 1P | 690 V, 50 Hz | 690 V, 50 Hz | 690 V, 50 Hz |
| 1P+N | 400 V, 50 Hz | 690 V, 50 Hz | 690 V, 50 Hz |
| 2P, 3P, 3P+N | 690 V, 50 Hz | 690 V, 50 Hz | 690 V, 50 Hz |
| Rated operational current I_e | 32 A | 50 A | 100 A |
| Rated conditional short-circuit current | 100 kA (at 400 V) | 100 kA | 100 kA |
| Rated short-time withstand current I_{cw} | 300 A | 600 A | 1200 A |
| Utilization category | AC 22 B | AC 22 B | AC 21 B |
| Rated insulation voltage U_i | 690 V | 690 V | 690 V |
| Overvoltage category | II | IV | IV |
| Rated impulse withstand voltage U_{imp} | 4 kV | 8 kV | 8 kV |
| Power loss per current path without fuse-link | 0.9 W | 1 W | 3.1 W |
| Maximum permissible power loss of fuse-links | | | |
| gG | 3 W | 5 W | 9.5 W |
| aM | 1.2 W | 3 W | 7 W |

Mechanical

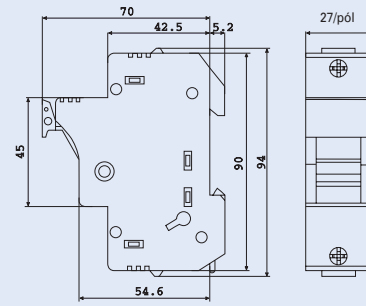
| | | | |
|--------------------------------------|--|--------------------------|-------------------------|
| Frame size | 45 mm | 45 mm | 45 mm |
| Device height | 83.3 mm | 94 mm | 121 mm |
| Device width | 17.5 mm per pole | 27 mm per pole | 36 mm per pole |
| Weight | | | |
| 1P | 58 g | 100 g | 160 g |
| 1P+N | 70 g | 222 g | 355 g |
| 2P | 120 g | 201 g | 310 g |
| 3P | 180 g | 308 g | 480 g |
| 3P+N | 195 g | 437 g | 680 g |
| Mounting | Quick fastening on DIN rail IEC/EN 60715 | | |
| Degree of protection | IP20 | IP20 | IP20 |
| Terminals above and below | lift terminals | lift terminals | lift terminals |
| Terminal capacity | 0.5 - 10 mm ² | 1.5 - 35 mm ² | 4 - 50 mm ² |
| | AWG 20-8 | AWG 16-2 | - |
| Tightening torque of terminal screws | ≥ 1.2 Nm | 2.5 - 3 Nm | 2.5 - 3 Nm |
| Ambient temperature range | -25 to +40 °C | -25 to +40 °C | -25 to +40 °C |
| Flame class | glow wire tested 960 °C | glow wire tested 960 °C | glow wire tested 960 °C |
| Pollution degree | 2 | 1 | 1 |
| Comparative tracking index | CTI 450 | CTI 400 | CTI 400 |

Dimensions [mm]

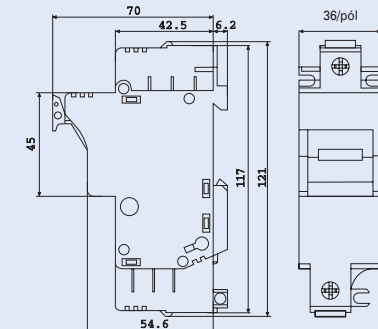
C10-SLS



VLC 14



VLC 22



For types and art. numbers see page 77

Fuse-Links Z-C10../PV Photovoltaic application

- According to EN 60269-1 and EN 60269-4
- For fuse-switch-disconnectors FCFDC10DI...-SOL

Connection diagram



Technical Data

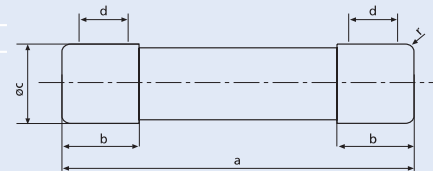
| Electrical | Z-C10/SE-.../PV 10x38 |
|--|---|
| Rated voltage U_n | 6 - 20 A / 1000 V DC 25 A / 900 V DC |
| Rated frequency | DC |
| Rated short-circuit breaking capacity $t = L/R$ | 30 kA 2 ms |

Max. Power dissipation

| Rated current I_n | Pre-arcing Joule integral $L/R = 2$ ms | Operating Joule integral $L/R = 2$ ms | Power dissipation at $0.7 \times I_n$ | Power loss at I_n P_d | Weight P_d |
|------------------------|---|--|--|---------------------------------|-----------------|
| [A] | [A ² s] | [A ² s] | [W] | [W] | [g] |
| 2 | 1.3 | 3.5 | 1.47 | 1.00 | 10 |
| 4 | 3.3 | 28 | 0.52 | 1.25 | 10 |
| 6 | 5.5 | 45 | 0.73 | 1.65 | 10 |
| 8 | 8 | 62 | 0.93 | 1.9 | 10 |
| 10 | 11 | 88 | 1.06 | 2.3 | 10 |
| 12 | 23 | 180 | 1.03 | 1.9 | 10 |
| 16 | 35 | 270 | 1.00 | 2.5 | 10 |
| 20 | 50 | 430 | 1.18 | 3.25 | 10 |
| 25 | 75 | 620 | 1.25 | 3.45 | 10 |

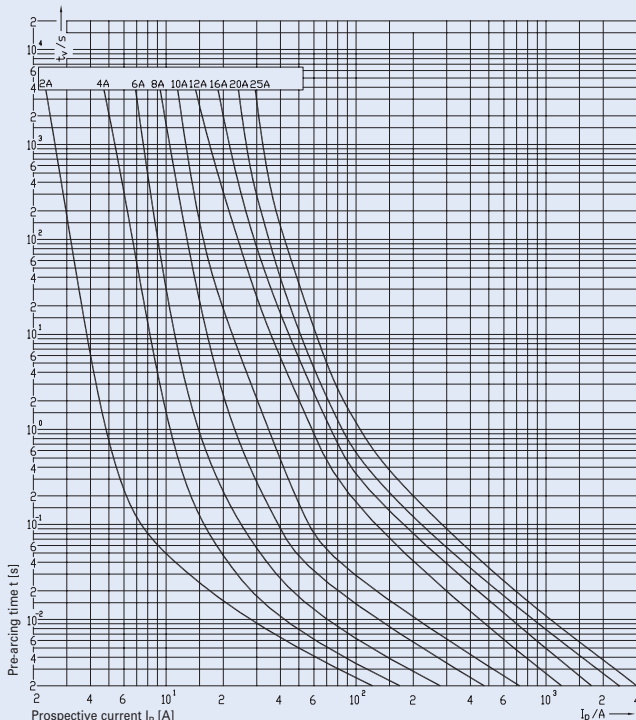
Dimensions [mm]

| Type | Size | a | $b_{max.}$ | c | $d_{min.}$ | r |
|-------|-------|----------|------------|----------|------------|---------|
| Z-C10 | 10x38 | 38.0±0.6 | 10.5 | 10.3±0.1 | 6 | 1.5±0.5 |



Characteristics Z-C10/SE-.../PV, Photovoltaic application

Time/current characteristics of Z-C10/SE-.../PV Fuse-links 2 ... 25A

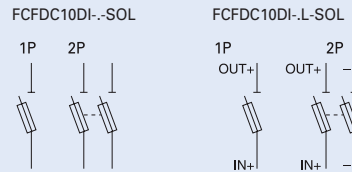


For types and art. numbers see page 78

Fuse disconnectors FCFDC10DI-.-SOL for photovoltaic applications

- Design according to EN 60947-1 ed. 4.0
EN 60947-3 ed. 2 + A1
- Fuse disconnectors for PV strings
- For use with fuse links Z-C10/SE..PV
- Version with visual tripping indicator:
 - 50-400 V flashing
 - 400-1000 V permanent light
- Sealable
- Delivered without fuse links

Connection diagram



Technical Data

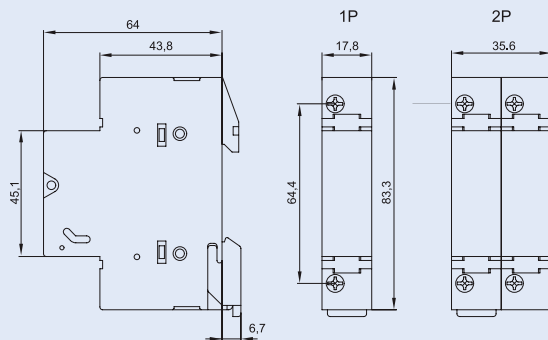
Electrical:

| | |
|--|-----------|
| Number of poles | 1P, 2P |
| Rated operational voltage U_e | 1000 V DC |
| Rated current I_e | 25 A |
| Conditional short-circuit current | 10 kA |
| Utilization category | DC 20 B |
| Rated insulation voltage U_i | 1000 V DC |
| Overvoltage category | III |
| Rated impulse withstand voltage U_{imp} | 6 kV |
| Power loss per current path | |
| without fuse-link | 0,9 W |
| Maximum permissible power loss of fuse-links | 3 W |

Mechanical:

| | |
|--------------------------------------|--------------------------------------|
| Frame size | 45 mm |
| Device height | 83.3 mm |
| Device width | 17.5 mm per pole |
| Weight | |
| 1P | 58 g |
| 2P | 70 g |
| Mounting | Quick fastening on DIN rail EN 60715 |
| Degree of protection | IP20 |
| Terminals | lift terminals |
| Terminal capacity | 0.5 - 10 mm ² AWG 20-8 |
| Tightening torque of terminal screws | 1.2 Nm |
| Ambient temperature range | -25 to +40 °C |
| Flame class | glow wire tested 960 °C |
| Pollution degree | 2 |
| Comparative tracking index | CTI 450 |

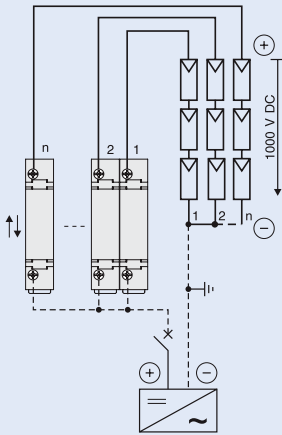
Dimensions [mm]



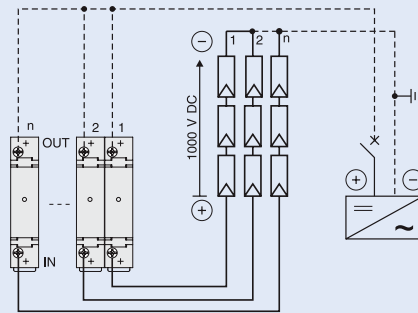
Photovoltaic applications

Earthed system

FCFDC10DI-1-SOL

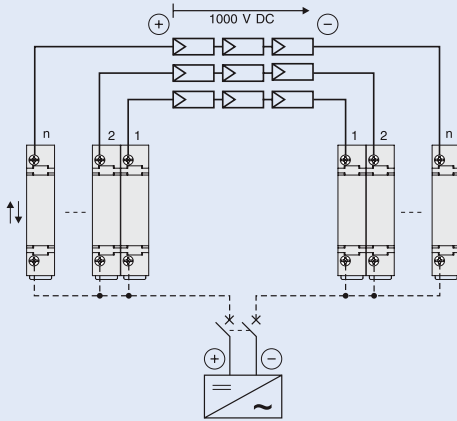


FCFDC10DI-1L-SOL

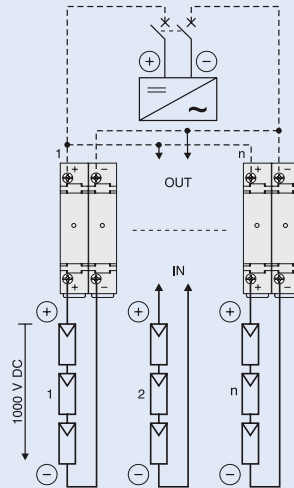


Unearthed system

FCFDC10DI-1-SOL



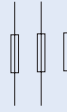
FCFDC10DI-2L-SOL



Fuse-Links Z-D0../SE

- According to DIN VDE 0636, DIN 49522
- For fuse-switch-disconnectors Z-SLS, -SLK
- For fuse-bases D0.-SO and Z-D02/R/3

Connection diagram



Technical Data

Electrical

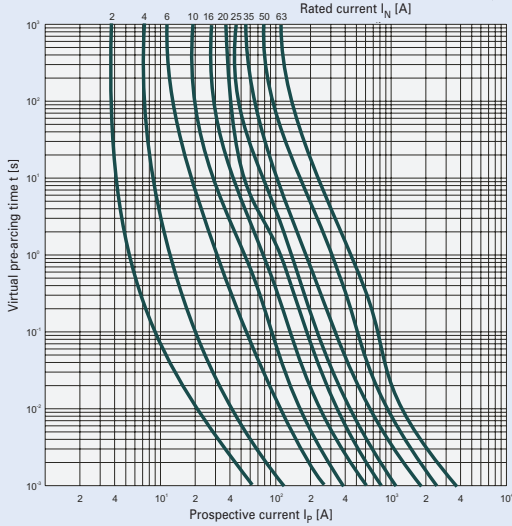
| | |
|---------------------------------------|-----------------------|
| Operating class | gG (gL) |
| Rated voltage | |
| AC | 400 V |
| DC | 220 V |
| Rated frequency | 45 - 65 Hz |
| Rated insulation voltage U_i | 2500 V |
| Rated short-circuit breaking capacity | 50 kA (AC), 8 kA (DC) |

Mechanical

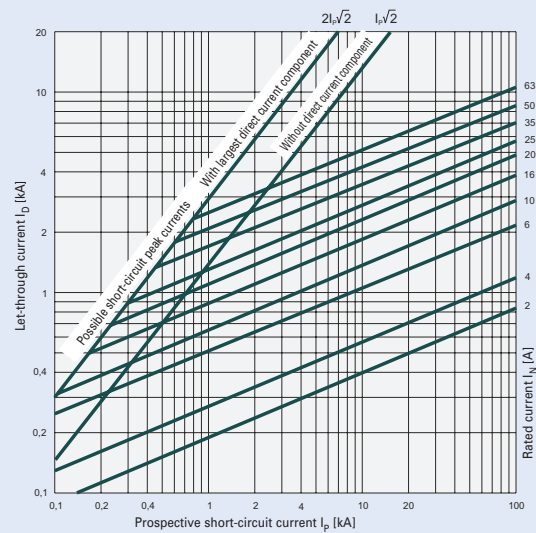
| | |
|------|------------------------------|
| Size | |
| D01 | 1, 2, 4, 6, 10, 13, 16 A |
| D02 | 20, 25, 32, 35, 40, 50, 63 A |

Characteristics Z-D0../SE

Time/current characteristics of Z-D0-Fuse-links 2 ... 63A gG(gL)



Let-through current characteristics of Z-D0-Fuse-links, 2...63 A gG(gL)



Cartridge Ring Adapter Insert D0

- According to DIN 49523
- For fuse links Z-D01/SE and Z-D02/SE

Technical Data

Electrical:

| | |
|---------------|-----------|
| Rated current | |
| D01 | 2 - 10 A |
| D02 | 20 - 50 A |
| D02-D01 | 2 - 16 A |

Screw Caps Z-D0../SK

- Screw caps for systems D01 and D02

Technical Data

Electrical:

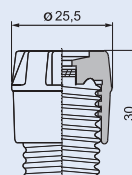
| | |
|---------------|-----------|
| Rated current | |
| D01 | max. 16 A |
| D02 | max. 63 A |

Mechanical:

| | |
|-------------------|-----|
| Electrical thread | |
| D01 | E14 |
| D02 | E18 |

Practical Hint

A complete and functioning D-fuse system consists of base + fuse-link + cartridge-ring adapter insert + screw cap.
The cartridge-ring adapter insert is not required for the highest rated current of each size (D01...16A and D02...63A).



For types and art. numbers see page 79, 80

Fuse-Base D01 and D02 for mounting onto device rail

- According to DIN VDE 0636-301
- Size D01/D02
- Base with terminal cover
- Silikon- and chlorine free
- Cartridge-ring adapter inserts Z-D0./PE for D01 2-10A, D02 20-50A required for current coding
- Cartridge-ring adapter inserts Z-D02-D01-PE-.. for D02 fuse-base and D01 fuse-links available

Technical Data

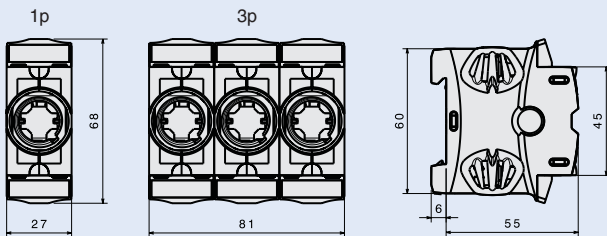
Electrical

| | |
|---|------------------|
| Number of poles | 1P, 3P |
| Rated voltage | 400 VAC, 250 VDC |
| Rated current | |
| D01 | 16 A |
| D02 | 63 A |
| Conditional short-circuit current tested with inserts | 50 kA (AC) |
| Operating class gG (gL) | 8 kA (DC) |

Mechanical

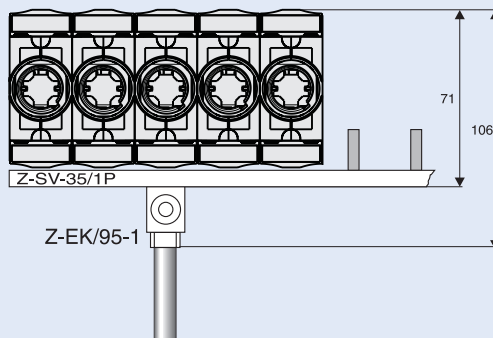
| | |
|--------------------------------------|--------------------------------------|
| Frame size | 45 mm |
| Device height | 68 mm |
| Device width | 27 mm per pole |
| Weight | 1P 3P |
| | 76 g 230 g |
| Electrical thread | |
| D01 | E14 |
| D02 | E18 |
| Mounting | quick fastening on DIN rail EN 60715 |
| Upper and lower terminals | double function terminals |
| Terminal capacity | 1.5 - 35 mm ² |
| Tightening torque of terminal screws | 2.5 - 3 Nm |
| Comparative tracking index | CTI 200 |

Dimensions [mm]

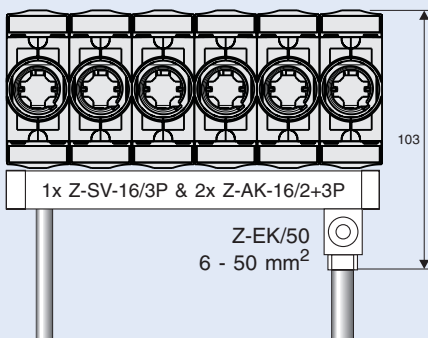


Busbar Examples

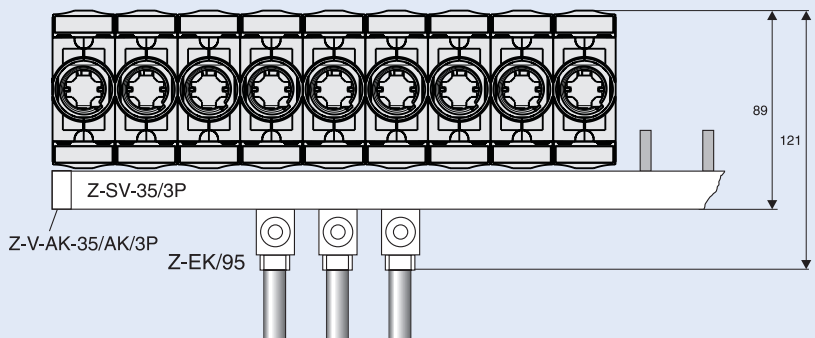
1-phase **35 mm²**



3-phases **16 mm²**



3-phases **35 mm²**



Terminal capacity Z-EK/95, Z-EK/95-1

- 25 - 95 mm² rigid/stranded
- 16 - 70 mm² flexible with wire end ferrules

For types and art. numbers see page 80

Slide Fuse-Base D02 (+D01) for direct mounting onto busbars

- Design according to EN 60269-1, VDE 0636 part 301
- Vertical and horizontal mounting possible
- Delivered empty and without screw caps
- For 60 mm - busbar system, 5 or 10 mm thick
- Suitable for busbars 12 x 5/10, 20 x 5/10, 25 x 5/10, 30 x 5/10, with double T profile
- Does not contain halogens, phosphorus or silicon
- Recyclable
- Marking area on the base and cover
- For fuse-links DIN 49522 D02 20...63A 400VAC / 250VDC
- For cartridge-ring adapter inserts DIN 49523
- Cartridge-ring adapter inserts Z-D02-D01-PE... for D01 fuse-links 1...16 A available

Technical Data

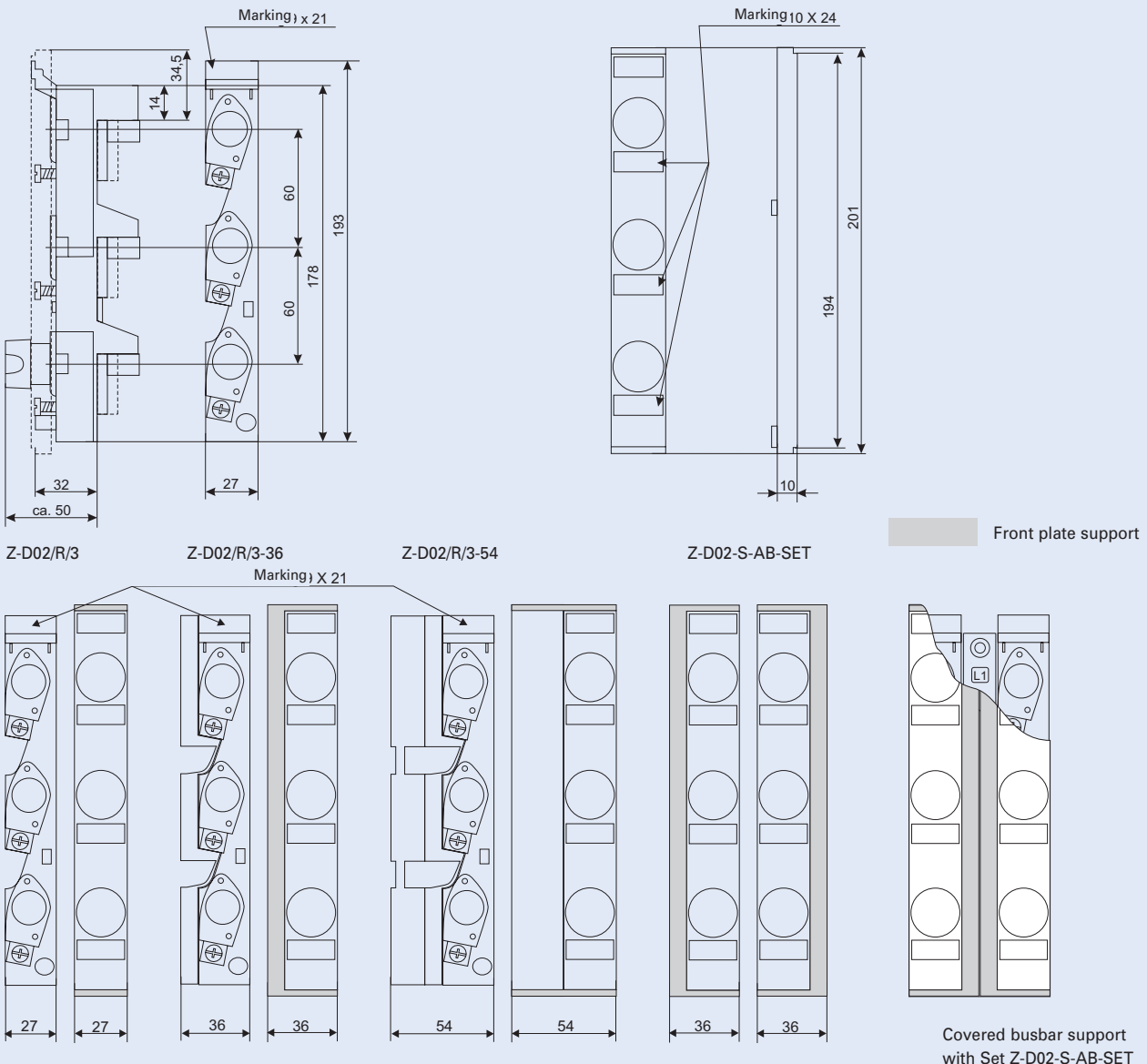
Electrical

| | |
|--|-------------------------|
| Number of poles | 3 |
| Rated operational voltage U_e | 400 V AC |
| Rated frequency | 40 - 60 Hz |
| Rated operational current I_e | 63 A |
| Conv. thermal current with fuse-links I_{th} | 63 A |
| Rated duty | uninterrupted duty |
| Rated conditional short-circuit current | 50 kA _{r.m.s.} |
| Overvoltage category | IV |
| Rated impulse withstand voltage U_{imp} | 6 kV |
| Power loss per current path | 0.5 W |
| Power loss of base without fuse-links | 1.5 W |
| Max. permissible power loss of fuse-links | 5.5 W |

Mechanical

| | |
|---|--|
| Device height | 201 mm |
| Device width | 27 / 36 / 54 mm |
| Weight | 163 g / 184 g / 205 g |
| Mounting onto busbars, without drilling or screwing | 12x5/10, 15x5/10, 20x5/10, 25x5/10, 30x5/10 |
| Degree of protection while operating | IP20 |
| Terminals | Lift terminals |
| Terminal capacity | 1.5 - 35 mm ² |
| Tightening torque of terminal screws | 3 - 4 Nm |
| Electrical thread type | E18 |
| Ambient temperature range | -25 °C to +55 °C |
| Pollution degree | 3 |
| Flame class according UL94 | V0 |
| Comparative tracking index | CTI 600 |
| Climatic resistance: moist heat | constant acc. to EN 60068-2-78 cyclical acc. to EN 60068-2-30 |

Dimensions [mm]



For types and art. numbers see page 80

Switch-Disconnecter-Fuse D02-S for direct mounting onto busbars

- Switch-Disconnectors with fuses (delivered without fuse links)
- For fuse links Z-D02/SE and Z-D01/SE (with cartridge-ring adapter insert Z-D02-D01/PE-... and adapter spring Z-D02/SIKA-HF)
- For mounting onto 60 mm busbar systems e.g. SASY 60i
- Suitable for busbars 20 x 5/10, 30 x 5/10, with double T profile
- Rated current 63 A, rated operating voltage 400 V AC
- Utilization category AC-23B
- Including shock hazard protection cover, front and bottom plate and description label
- Delivered empty without screw caps
- 3-pole
- Width 36 mm

Connection diagram



Technical Data

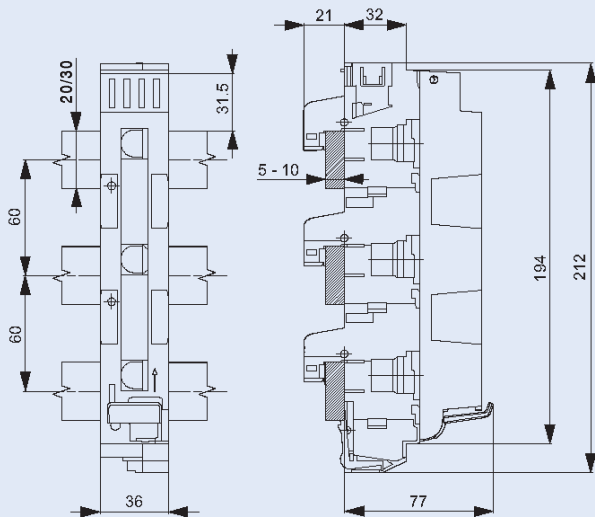
Electrical

| | |
|--|-------------------------|
| Number of poles | 3P |
| Rated operational voltage U_e AC | 400 V / 40-60 Hz |
| Rated operational current I_e | 63 A |
| Conventional thermal current with fuse-links I_{th} | 63 A |
| Rated duty | Uninterrupted duty |
| Rated conditional short-circuit current | 50 kA _{r.m.s.} |
| Utilization category | AC 23 B |
| Overvoltage category | III |
| Rated impulse withstand voltage U_{imp} | 8 kV |
| Power loss per current path | 2 W at I_e |
| Power loss per current path with fuse-link | 7.5 W at I_e |
| Max. permissible power loss of fuse-links | 5.5 W |

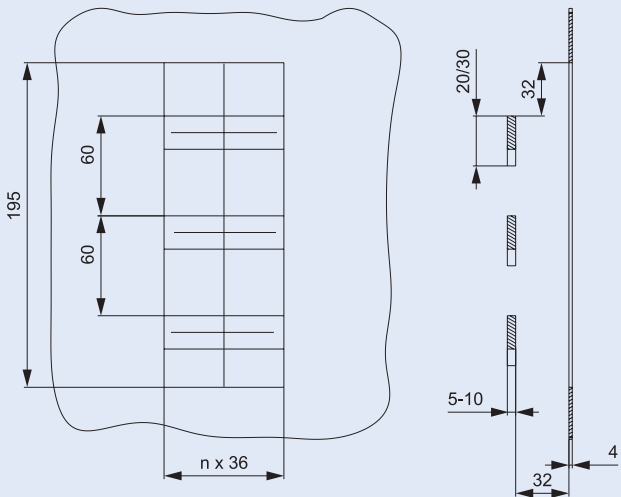
Mechanical

| | |
|--------------------------------------|--|
| Device height | 212 mm |
| Device width | 36 mm |
| Weight | 260 g |
| Mounting | with a distance between busbars of 60 mm, SASY 60i |
| Degree of protection (in use) | IP30 |
| Terminals | lift terminals |
| Terminal capacity | 1.5 - 25 mm ² Cu |
| Tightening torque of terminal screws | max. 2.6 Nm |
| Electrical thread | E18 |
| Temperature range | -25 to +55 °C |
| Pollution degree | 3 |

Dimensions [mm]



Cut-out for front plate

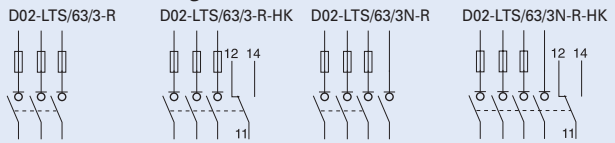


Slide Switch-Disconnecter-Fuse D02-LTS for direct mounting onto busbars

- Switch disconnectors with fuses (delivered without fuse links)
- Design according to EN 60947-3
- For fuse links Z-D02/SE and Z-D01/SE (with cartridge-ring adapter insert Z-D02-D01/PE-... and adapter spring Z-D02/SIKA-HF) and cylindrical fuse links Z-C10/SE (with adapter Z-D02-LTS-HF)
- For mounting onto 60 mm busbar systems e.g. SASY 60i
- Visual tripping indicator (flashing)
- Contact position indicator red - green
- Delivered empty
- Including adapter Z-D02-LTS-HF

- Version -HK with auxiliary contact
- Can be sealed with leads, lockable

Connection diagram



Technical Data

Electrical

| | |
|---|-------------------------|
| Number of poles | 3P/3P+N |
| Rated operational voltage U_e AC | 400 V / 40-60 Hz |
| Rated operational current I_e | 63 A |
| Rated uninterrupted current I_u | 63 A |
| Rated duty | Uninterrupted duty |
| Rated short-circuit capacity I_{cm}, I_{cn} | 50 kA _{r.m.s.} |
| Utilization category | AC 22 B |
| Overvoltage category | IV |
| Rated impulse withstand voltage U_{imp} | 6 kV |
| Power loss per current path | 1.5 W at I_e |
| Power loss per current path with fuse-link | 7 W at I_e |
| Max. permissible power loss of fuse-links | 5.5 W |

Mechanical

| | |
|--|--|
| Device height 3P/3P+N | 226/262 mm |
| Device width | 27 mm |
| Weight | 340 g |
| Mounting onto busbars, without drilling or screwing | 12x5/10 mm 20x5/10 mm 25x5/10 mm 30x5/10 mm |
| Degree of protection while operating (built-in) | IP20/IP40 |
| Terminals | Lift terminals |
| Terminal capacity | 1.5 - 35 mm ² Cu |
| Tightening torque of terminal screws | max. 4 Nm |
| Temperature range | -25 to +55 °C |
| Pollution degree | 3 |

Auxiliary switch electrical

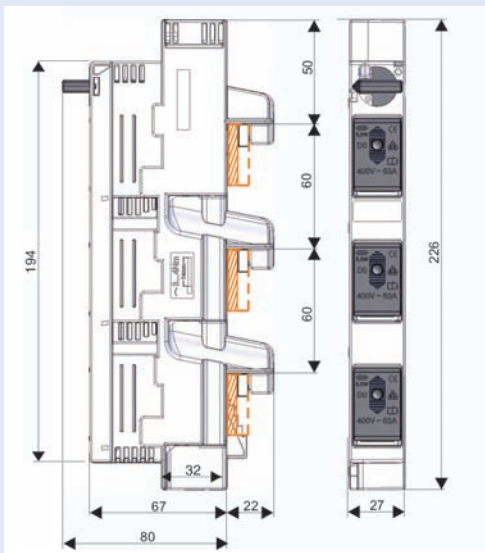
| | |
|---------------------------------|------------------------|
| 1 CO | 5 A / 250 V AC |
| Max. thermal back-up protection | 2 A gL PL7-B4/...HS |

Connection

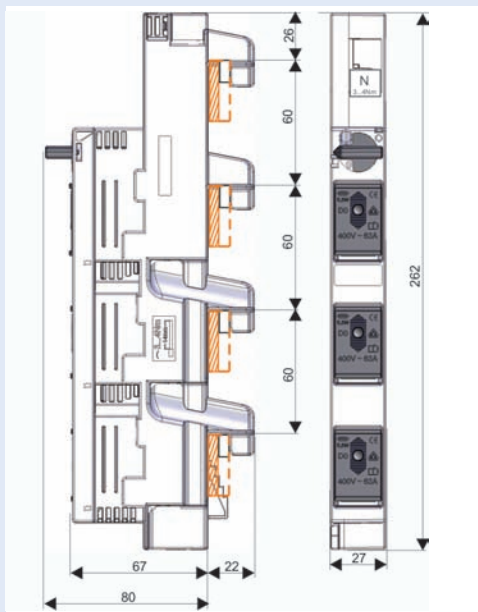
| | |
|-------------------------|--------------|
| Femal push-on connector | 2.8 x 0.5 mm |
|-------------------------|--------------|

Dimensions [mm]

3P



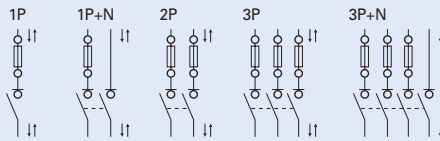
3P+N



Switch-Disconnecter-Fuse Z-SLS/D01

- Switch disconnectors with fuses for fuse links Z-D01/SE
- Visual tripping indicator
- Delivered without fuse links
- Rated current 16 A
- Rated operating voltage 230/400 V AC, 60 V DC (1-pole), 110 V DC (2-pole)
- Utilization category AC-22B, DC-21B
- Integrated mechanical current coding
- Can be sealed
- Supply side from top or bottom

Connection diagram



Technical Data

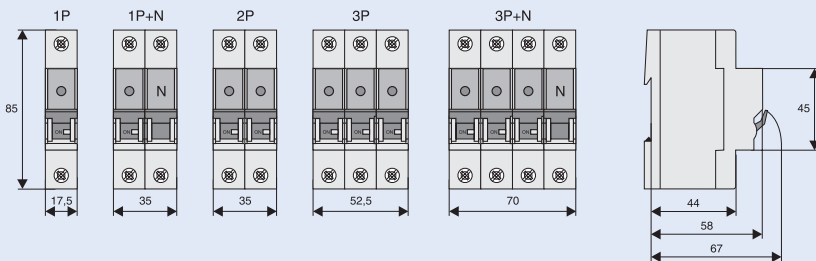
Electrical

| | |
|--|--------------------------|
| Number of poles | 1P, 1P+N, 2P, 3P, 3P+N |
| Rated operational voltage U_e | |
| AC | 400 V |
| DC | 1P to 60 V / 2P to 110 V |
| Rated operational current I_e | 16 A |
| Rated uninterrupted current I_u | 16 A |
| Rated short-circuit making capacity I_{cm} | 50 kA _{r.m.s.} |
| Utilization category | AC 22 B, DC 21 B |
| Overvoltage category | IV |
| Rated impulse withstand voltage U_{imp} | 6 kV |
| Power loss per current path | 0.64 W at I_e |
| Power loss per current path with fuse-link | 2.24 W at I_e |

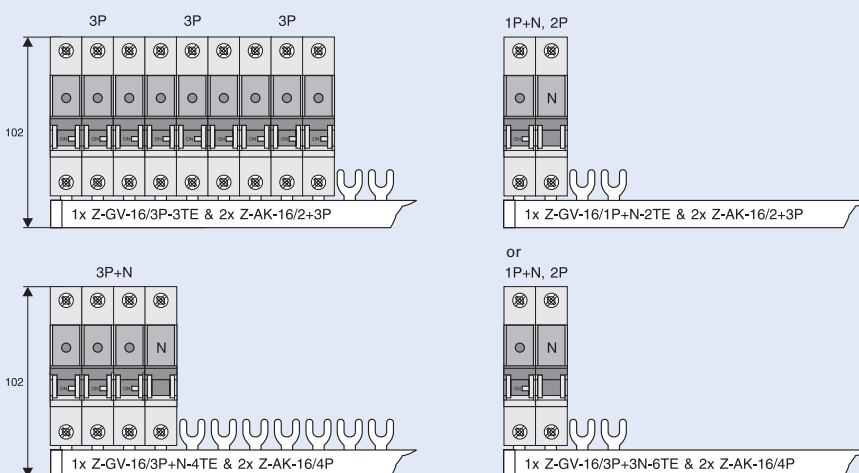
Mechanical

| | |
|--------------------------------------|--|
| Frame size | 45 mm |
| Device height | 86 mm |
| Device width | 17.5 mm per pole (1MU) |
| Weight | 1P 90g 1P+N 170g 2P 180g 3P 270g 3P+N 350g |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection | IP20 |
| Upper and lower terminals | lift terminals |
| Terminal capacity | 1.5 - 25 mm ² |
| Tightening torque of terminal screws | max. 2.5 Nm |
| Temperature range | -25 to +60 °C |
| Flame class | V0, glow-wire tested 960 °C |
| Pollution degree | 3 |
| Comparative tracking index | CTI 600 |

Dimensions [mm]



Busbar Connection Examples

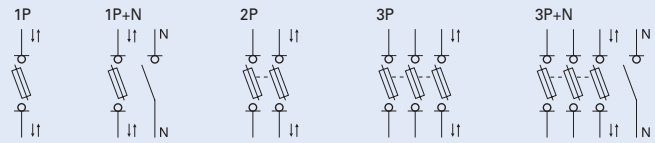


For types and art. numbers see page 81

Fuse-Switch-Disconnecter Z-SLS/NEOZ, Standard

- Fuse switch disconnectors for fuse links size D01 and D02
- Empty
- Mechanical current coding with fuse-link set
- Can be sealed
- Supply side from top or bottom

Connection diagram



Technical Data

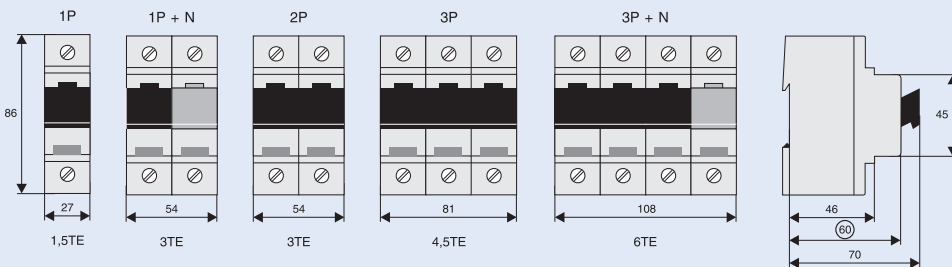
Electrical:

| | |
|--|-------------------------|
| Number of poles | 1P, 1P+N, 2P, 3P, 3P+N |
| Rated operational voltage U_e | |
| AC | 400 V |
| DC | 110 V (1P) / 220 V (2P) |
| Rated operational current I_e | 63 A |
| Rated uninterrupted current I_u | 63 A |
| Rated short-circuit making capacity I_{cm} | 50 kAr.m.s |
| Utilization category | AC 22 B, DC 21 B |
| Overvoltage category | IV |
| Rated impulse withstand voltage U_{imp} | 6 kV |
| Power loss per current path | 0.5 W at I_e |
| Power loss per current path with fuse-link | 7.5 W při I_e |

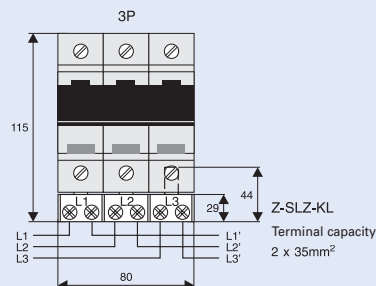
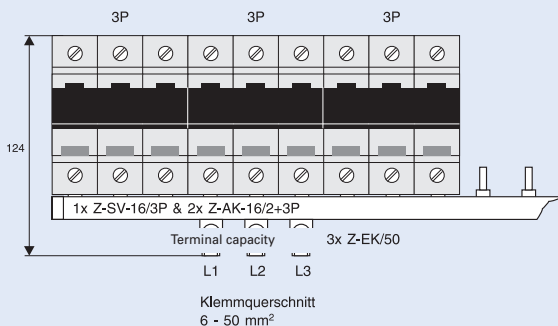
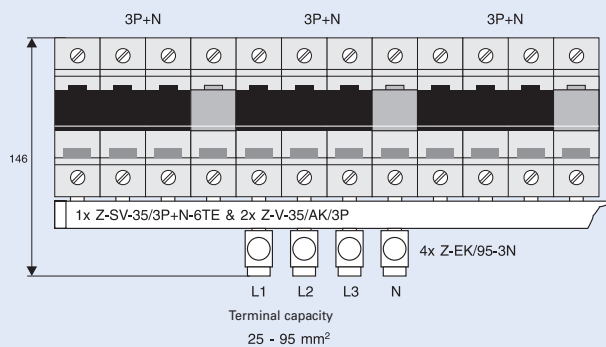
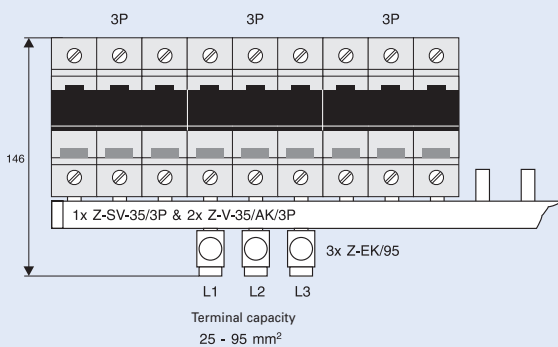
Mechanical:

| | |
|--------------------------------------|---|
| Frame size | 45 mm |
| Device height | 86 mm |
| Device width | 27 mm per pole (1.5 MU) |
| Weight | 1P 113g 1P+N 225g 2P 224g 3P 450g 3P+N 472g |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection | IP20 |
| Upper and lower terminals | lift terminals |
| Terminal capacity | 1.5 - 35 mm ² |
| Tightening torque of terminal screws | max. 4.5 Nm |
| Temperature range | -25 to +60 °C |
| Flame class | V0, glow-wire tested 960 °C |
| Pollution degree | 3 |
| Comparative tracking index | CTI 600 |

Dimensions [mm]



Busbar Connection Examples

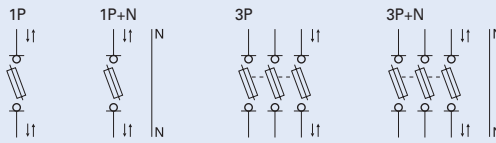


For types and art. numbers see page 82

Fuse-Switch-Disconnecter Z-SLS/CEK

- Fuse switch disconnectors for fuse links size D01 and D02
- Integrated mechanical current coding
- Rated current up to 63 A acc. to mech. coding
- Mechanical current coding by means of fuse link set
- Can be sealed
- Supply side from top or bottom
- Type Z-SLS/CEK no visual tripping indicator
- Type Z-SLS/CEK...SP visual tripping indicator, equipped with neutral lead through terminal, Integrated switch-locking

Connection diagrams



Technical Data

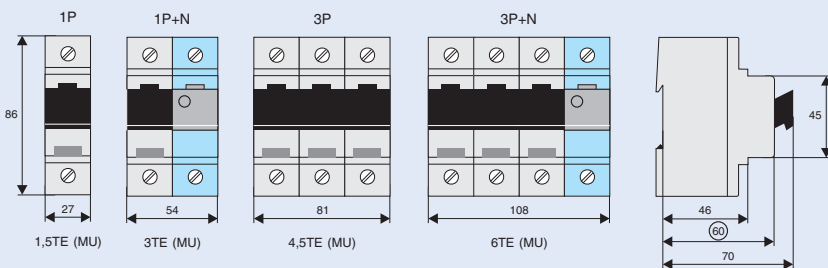
Electrical:

| | |
|---|--------------------------------------|
| Number of poles | 1P, 1P+N, 3P, 3P+N |
| Rated operational voltage U_e AC | 400 V |
| Rated uninterrupted current I_u 1P, 1P+N 3P, 3P+N | 10, 16, 25 A 16, 25, 35, 50, 63 A |
| Rated short-circuit making capacity I_{cm} | 50 kAr.m.s |
| Utilization category | AC 22 B |
| Overvoltage category | IV |
| Rated impulse withstand voltage U_{imp} | 6 kV |
| Power loss per current path | 0.5 W at I_e |
| Power loss per current path with fuse-link | 7.5 W at I_e |

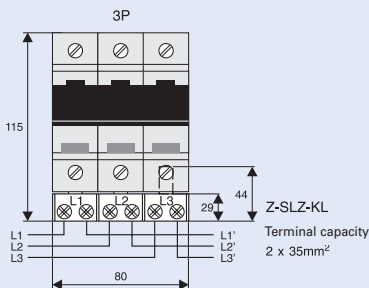
Mechanical:

| | |
|--------------------------------------|---|
| Frame size | 45 mm |
| Device height | 86 mm |
| Device width | 27 mm per pole (1.5 MU) |
| Weight | 147 g / 441 g |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection | IP20 |
| Upper and lower terminals | lift terminals |
| Terminal capacity | 1.5 - 35 mm ² |
| Tightening torque of terminal screws | max. 4.5 Nm |
| Temperature range | -25 to +60 °C |
| Flame class | V0, glow-wire tested 960 °C |
| Pollution degree | 3 |
| Comparative tracking index | CTI 600 |

Dimensions [mm]



Busbar Connection Example

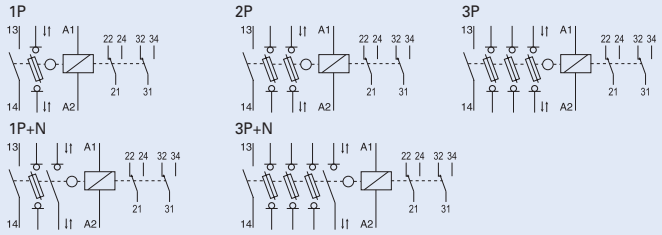


For types and art. numbers see page 82

Fuse-Switch-Disconnecter Z-SLK, with Fuse Monitoring

- Fuse switch disconnectors for fuse links size D01 and D02
- With fuse monitoring (HS)
- Rated current 63 A, utilization category AC-22B, DC-21B
- Mechanical current coding with fuse-link set
- Can be sealed
- Supply side from top or bottom
- Version Z-SLK/NEOZ for rated operational voltage 60-230 V AC, 60-110 V DC (1-pole); 60-400 V AC, 60-220 V DC (2-pole); 60-400 V AC (1+N, 3, 3+N-pole)
- Version Z-SLK/D0 for rated operational voltage 24-60 V AC/DC (1, 2-pole); 24-60 V AC (3-pole)

Connection diagram



Technical Data

Electrical

| | |
|--|------------------------|
| Number of poles | 1P, 1P+N, 2P, 3P, 3P+N |
| Rated operational voltage U_e | |
| AC: 1P, 1P+N | 60 - 230 V AC |
| 2P, 3P, 3P+N | 60 - 400 V AC |
| DC: 1P | 60 - 110 V DC |
| 2P | 60 - 220 V DC |
| Rated operational current I_e | 63 A |
| Rated uninterrupted current I_u | 63 A |
| Rated short-circuit making capacity I_{cm} | 50 kA _{r.m.s} |
| 1 NO | 5 A / 250 V |
| Utilization category | AC 22 B, DC 21 B |
| Overvoltage category | IV |
| Rated impulse withstand voltage U_{imp} | 6 kV |
| Power loss per current path | 0.5 W at I_e |
| Power loss per current path with fuse-link | 7,5 W at I_e |

Relay Component - Electrical

| | |
|---------------------------------|-------------------|
| Operational voltage range | 24-240 V AC/DC |
| Operational voltage tolerance | ±10% |
| Power consumption | 5 VA |
| Frequency | 50-60 Hz |
| Function display | |
| Line voltage | 1 LED |
| Trouble | 1 LED |
| Duty | 100% |
| Responding delay | approx. 100 ms |
| Reset time | approx. 100 ms |
| Relay contacts | 2 CO, 5 A / 250 V |
| Auxiliary switch | |
| Rated impulse withstand voltage | 4 kV |
| Overvoltage category | III |

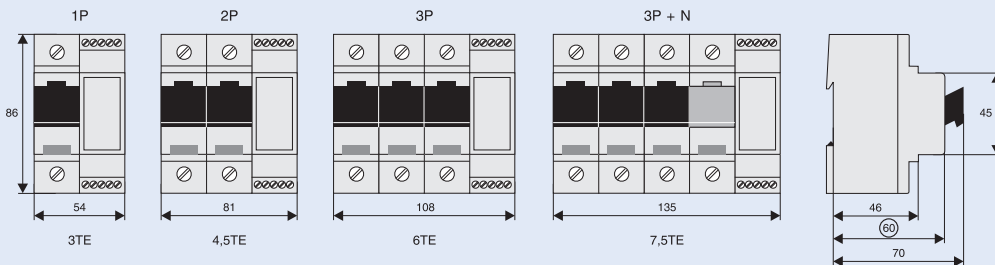
Mechanical

| | |
|--------------------------------------|--|
| Frame size | 45 mm |
| Device height | 86 mm |
| Device width | 27 mm/pole (1.5 MU) + 27 mm |
| Weight | 1P 2P 3P 3P+N 224 g 345 g 450 g 590 g |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection | IP20 |
| Upper and lower terminals | lift terminals |
| Terminal capacity | 1,5 - 35 mm ² |
| Tightening torque of terminal screws | max. 4,5 Nm |
| Temperature range | -25 až +60 °C |
| Flame class | V0, glow-wire tested 960 °C |
| Pollution degree | 3 |
| Comparative tracking index | CTI 600 |

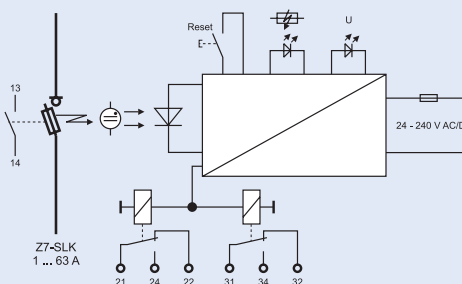
Relay Component - Mechanical

| | |
|--------------------------------------|----------------------------|
| Upper and lower terminals | lift terminals |
| Terminal capacity | |
| rigid | 0.14 - 4 mm ² |
| flexible | 0.14 - 2.5 mm ² |
| Tightening torque of terminal screws | 0.5 - 0.7 Nm |

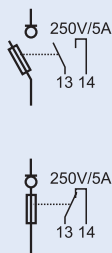
Dimensions [mm]



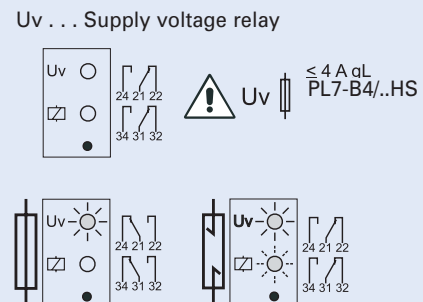
Block Diagram



Function - Switch position



Relay - Fuse Monitoring



For types and art. numbers see page 82

Fuse-link Sets complete Z-SLS/B, Z-SLS/E

- Suitable for fuse switch disconnectors Z-SLS/NEOZ, Z-SLS/CEK, Z-SLK/NEOZ, Z-SLK/D0
- Supplied as a set with 3 fuse-links and 3 gauge-pieces in plastic box of different colours which can be mounted onto DIN rail.

Connection diagram



Technical Data

Electrical

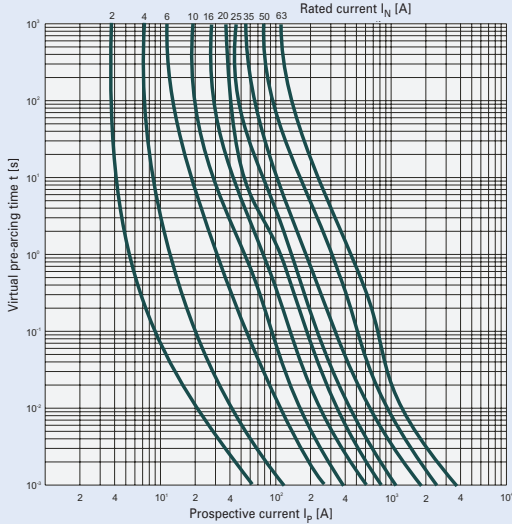
| | | | |
|-----------------|------------|------------|---------|
| Operating class | gG (gL) | | |
| Rated voltage | Z-SLS/B/24 | Z-SLS/B | Z-SLS/E |
| AC | 24 - 60 V | 60 - 400 V | 400 V |
| DC | 24 - 60 V | 60 - 220 V | 220 V |
| Test voltage | 5 kV | | |

Mechanical

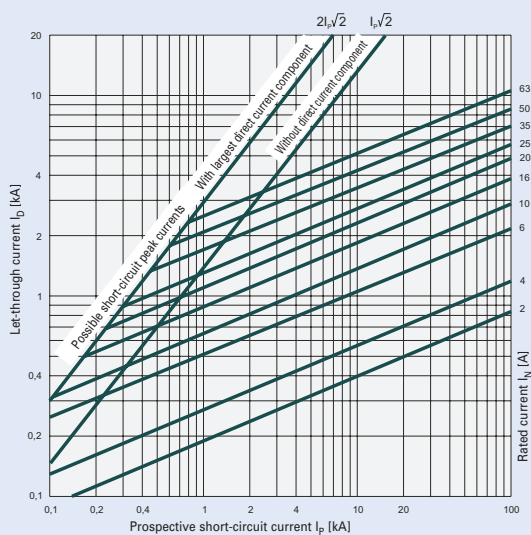
| | |
|------|------------------------------|
| Size | |
| D01 | 1, 2, 4, 6, 10, 13, 16 A |
| D02 | 20, 25, 32, 35, 40, 50, 63 A |

Characteristics

Time/current characteristics of D0-Fuse-links 2 ... 63A gG(gL)



Let-through characteristics of D0-Fuse-links 2 ... 63A gG(gL)



Solid-link Set Z-SLS/TR-SET

- Supplied as a set with 3 solid-links inserts and 3 gauge-pieces in plastic box which can be mounted onto DIN rail
- Suitable for fuse switch disconnectors Z-SLS/NEOZ, Z-SLS/CEK, Z-SLK/NEOZ, Z-SLK/D0
- Dimensions of plastic box:

| | |
|------------|-------|
| Frame size | 45 mm |
| Depth | 75 mm |
| Width | 54 mm |

Connection diagram



Technical Data

Electrical

| | |
|-----------------------------------|----------|
| Rated voltage | 400 V AC |
| Rated uninterrupted current I_U | 63 A |
| Test voltage | 5 kV |

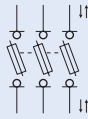
Mechanical

| | |
|----------|------|
| Size D02 | 63 A |
|----------|------|

Fuse-Switch-Disconnecter with visual tripping indicator Z-SLS/CB

- Suitable for the following fuse-links Z-D01/SE and Z-D02/SE
- Installation of fuse links D01 by means of cartridge ring adapter insert Z-D02-D01/PE and adapter Z-SLS/CB-HF
- Installation of fuse links D02 by means of cartridge ring adapter insert D02 Z-D02/PE
- Can be sealed with leads
- Rated current up to 63 A acc. to cartridge ring insert
- Can be sealed

Connection diagram



Technical Data

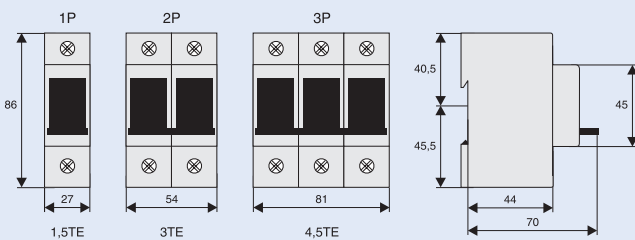
Electrical:

| | |
|--|-------------------------|
| Number of poles | 1P, 2P, 3P |
| Rated operational voltage U_e | |
| AC | 400 V |
| DC | 110 V (1P) / 220 V (2P) |
| Rated operational current I_e | 63 A |
| Rated uninterrupted current I_u | 63 A |
| Rated short-circuit making capacity I_{cm} | 50 kAr.m.s |
| Utilization category | AC 22 B |
| Overvoltage category | IV |
| Rated impulse withstand voltage U_{imp} | 6 kV |
| Power loss per current path | 0.5 W at I_e |
| Power loss per current path with fuse-link | 7.5 W at I_e |

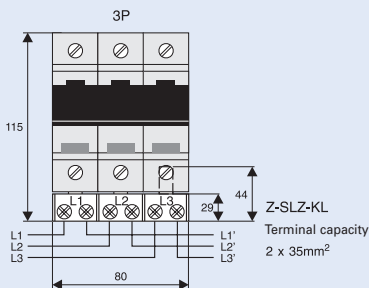
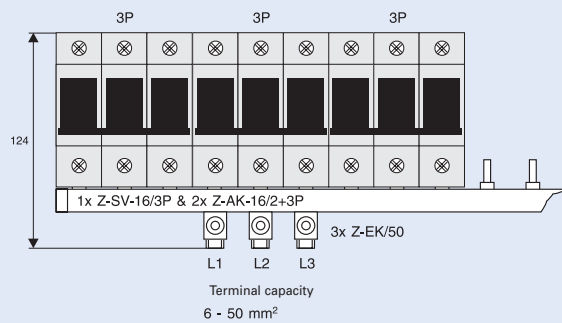
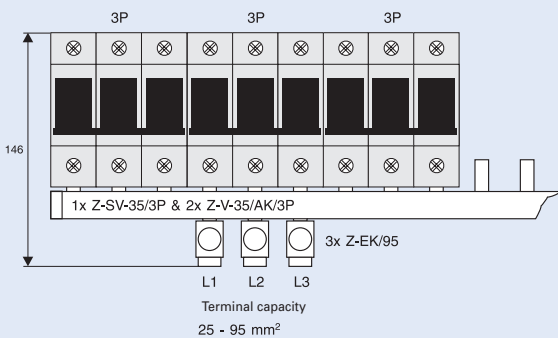
Mechanical:

| | |
|--------------------------------------|---|
| Frame size | 45 mm |
| Device height | 86 mm |
| Device width | 27 mm per pole (1.5 MU) |
| Weight | 1P 2P 3P |
| | 120 g 230 g 350 g |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection | IP20 |
| Upper and lower terminals | lift terminals |
| Terminal capacity | 1.5 - 35 mm ² |
| Tightening torque of terminal screws | max. 4.5 Nm |
| Temperature range | -25 to +60 °C |
| Flame class | V0, glow-wire tested 960 °C |
| Pollution degree | 3 |
| Comparative tracking index | CTI 600 |

Dimensions [mm]



Busbar Connection Examples

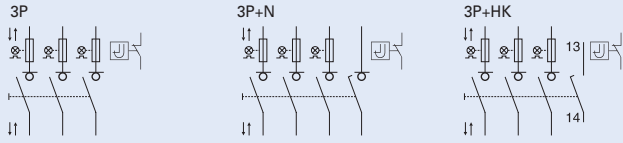


For types and art. numbers see page 84

Switch-Disconnecter-Fuse D02-LTS - Current coding by means of cartridge-ring adapter inserts

- Design according to EN 60947-3
- For fuse links Z-D01/SE and Z-D02/SE
- Thermal monitoring with integrated thermo switch
- Installation of fuse links D01 by means of cartridge ring adapter insert Z-D02-D01/PE and adapter Z-SLS/CB-HF
- Installation of fuse links D02 by means of cartridge ring adapter insert D02 Z-D02/PE
- Installation of cylindrical fuse links Z-C10/SE by means of adapter Z-D02-LTS -HF
- Visual tripping indicator is flashing
- Version D02-LTS/63-3-HK with integrated auxiliary contact
- Delivered without fuse links
- Including adapter Z-D02-LTS -HF for fuse links D01 or cylindrical fuse links Z-C10/SE
- Can be sealed

Connection diagram



Technical Data

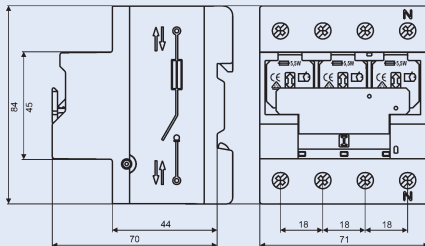
Electrical

| | |
|--|-------------------------|
| Number of poles | 3P, 3P+N, 3P+HK |
| Rated operational voltage U_e | |
| AC | 400 V |
| Rated operational current I_e | 63 A |
| Rated uninterrupted current I_u | 63 A |
| Rated short-circuit making capacity I_{cm} | 50 kA _{r.m.s.} |
| Utilization category | AC 22 B |
| Overvoltage category | IV |
| Rated impulse withstand voltage U_{imp} | 6 kV |
| Power loss per current path | 1.8 W at I_e |
| Power loss per current path with fuse-link | 7.3 W at I_e |
| Max. permissible power loss of fuse-links | 5.5 W |
| Auxiliary switch | |
| 1 NO | 5 A / 250 V AC |
| Max. thermal back-up protection | 2 A gL: PL7-B4/..-HS |
| Thermo switch | |
| 1 NC | |
| AC $\cos \varphi = 1$ | 2.5 A / 250 V |
| AC $\cos \varphi = 0.6$ | 1.5 A / 250 V |
| DC | 1.6 A / 24 V |
| | 1.2 A / 48 V |

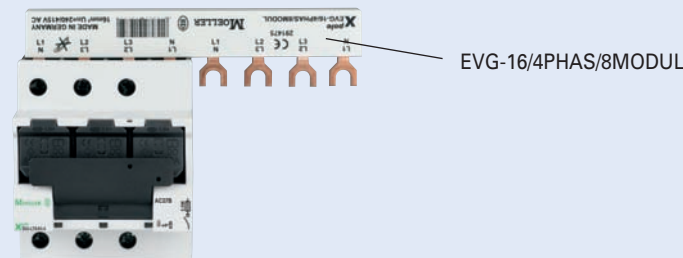
Mechanical

| | |
|--------------------------------------|--------------------------------------|
| Frame size | 45 mm |
| Device height | 84 mm |
| Device width | 18 mm per pole (1 MU) |
| Weight | 3P 340 g 3P+N 380 g 3P+HK 380 g |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection | IP20 |
| Upper and lower terminals | lift terminals |
| Terminal capacity | 1.5 - 25 mm ² |
| Tightening torque of terminal screws | max. 3 Nm |
| Temperature range | -25 to +60 °C |
| Flame class | V0, glow-wire tested 960 °C |
| Pollution degree | 3 |
| Comparative tracking index | CTI 600 |
| Femal push-on connector | 0.8 x 2.5 mm |

Dimensions [mm]



Busbar Connection Example 3P, 3P+N



NH-Fuse-Links

- System of NH fuse links
- Type sizes 00, 1, 2, 3, 4a
- Rated voltage 500 V, 50 Hz
- Characteristic gG suitable for cables

Technical Data

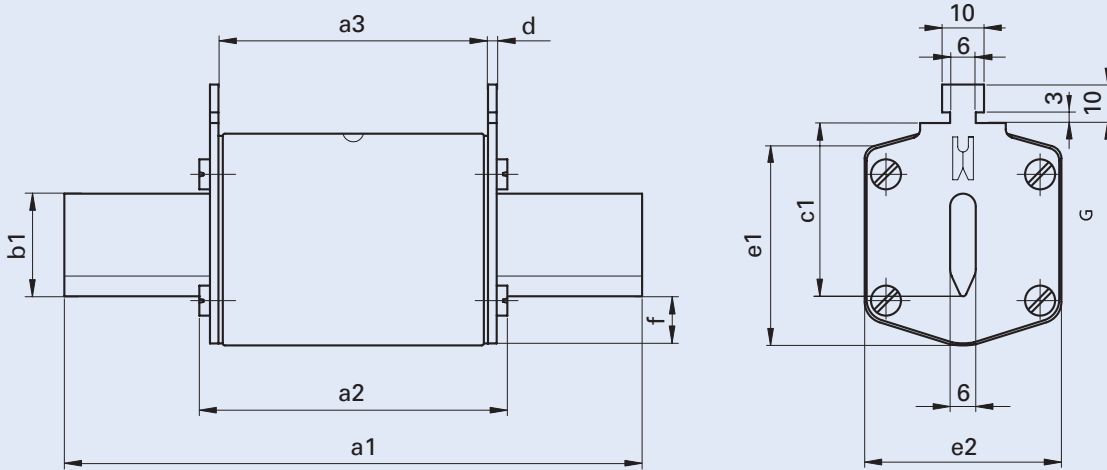
| | NH-00/ | NH-1/ | NH-2/ | NH-3/ | NH-4a/ |
|------------------------------|----------|----------|----------|-----------|------------|
| Electrical | | | | | |
| Nominal voltage AC | 500 V AC | 500 V AC | 500 V AC | 500 V AC | 500 V AC |
| Nominal current | 6-160 A | 32-250 A | 35-400 A | 100-630 A | 800-1600 A |
| Rated frequency | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| Nominal breaking capacity AC | 120 kA | 120 kA | 120 kA | 120 kA | 120 kA |
| Max. Power loss | | | | | |
| $I_n = 6 A$ | 1.3 W | - | - | - | - |
| 10 A | 1.5 W | - | - | - | - |
| 16 A | 1.8 W | - | - | - | - |
| 20 A | 1.9 W | - | - | - | - |
| 25 A | 2.4 W | - | - | - | - |
| 32 A | 2.9 W | 3.6 W | - | - | - |
| 35 A | 3.1 W | 3.8 W | 3.7 W | - | - |
| 40 A | 3.6 W | 4.1 W | - | - | - |
| 50 A | 4.2 W | 4.6 W | 4.6 W | - | - |
| 63 A | 5.0 W | 6.2 W | 5.8 W | - | - |
| 80 A | 5.2 W | 6.4 W | 6.4 W | - | - |
| 100 A | 6.7 W | 8.7 W | 8.3 W | 7.7 W | - |
| 125 A | 7.8 W | 10.3 W | 10.0 W | 10.8 W | - |
| 145 A | 8.7 W | - | - | - | - |
| 160 A | 9.4 W | 14.1 W | 12.8 W | 12.1 W | - |
| 200 A | - | 15.8 W | 15.8 W | 13.6 W | - |
| 224 A | - | 17.4 W | 17.4 W | 15.4 W | - |
| 250 A | - | 19.1 W | 19.1 W | 19.6 W | - |
| 300 A | - | - | 20.6 W | 21.2 W | - |
| 315 A | - | - | 21.6 W | 22.3 W | - |
| 355 A | - | - | 24.2 W | 26.5 W | - |
| 400 A | - | - | 26.8 W | 26.8 W | - |
| 425 A | - | - | - | 29.0 W | - |
| 500 A | - | - | - | 37.0 W | - |
| 630 A | - | - | - | 47.0 W | - |
| 800 A | - | - | - | - | 67.0 W |
| 1000 A | - | - | - | - | 69.0 W |
| 1250 A | - | - | - | - | 84.0 W |
| 1600 A | - | - | - | - | 106.0 W |

Dimensions [mm]

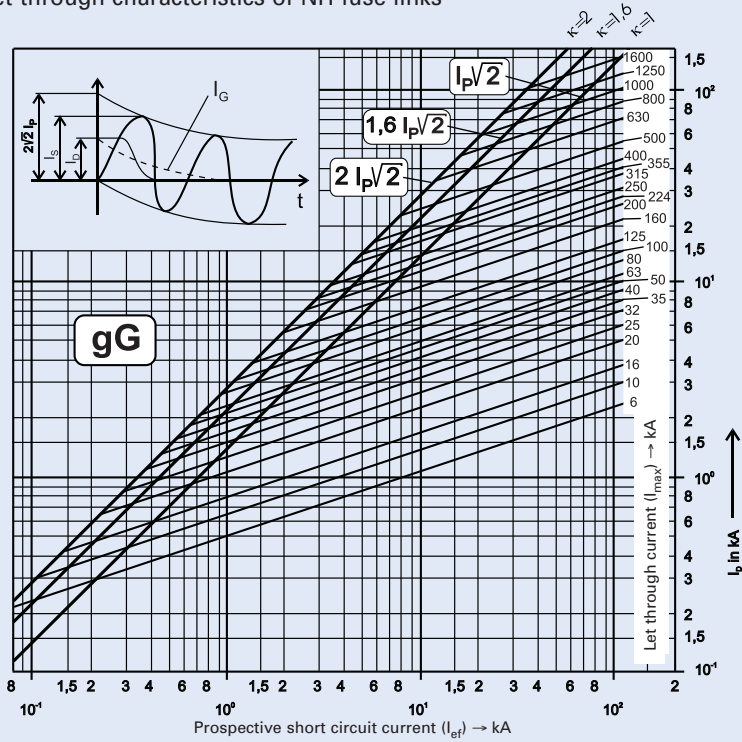
| Type | a1 | a2 | a3 | b1 | c1 | d | e1 | e2 | f | Rated current |
|------|-----|----|----|----|----|-----|-----|----|----|---------------|
| 00 | 78 | 53 | 45 | 15 | 35 | 2,0 | 36 | 20 | 5 | up to 100 A |
| | | | | | | | | 30 | | 125 – 160 A |
| 1 | 135 | 72 | 62 | 15 | 40 | 2,5 | 41 | 30 | 8 | up to 160 A |
| | | | | 20 | | | 39 | 40 | 12 | 200 – 250 A |
| 2 | 150 | 72 | 62 | 20 | 48 | 2,5 | 49 | 40 | 12 | up to 250 A |
| | | | | 25 | | | 59 | 50 | 15 | 300 – 400 A |
| 3 | 150 | 72 | 62 | 25 | 60 | 2,8 | 59 | 50 | 15 | up to 400 A |
| | | | | 32 | | | 72 | 71 | | 425 – 630 A |
| 4a | 200 | 96 | 82 | 50 | 85 | 4,0 | 109 | 98 | 27 | 800 – 1600 A |

For types and art. numbers see page 85

Dimensions [mm]

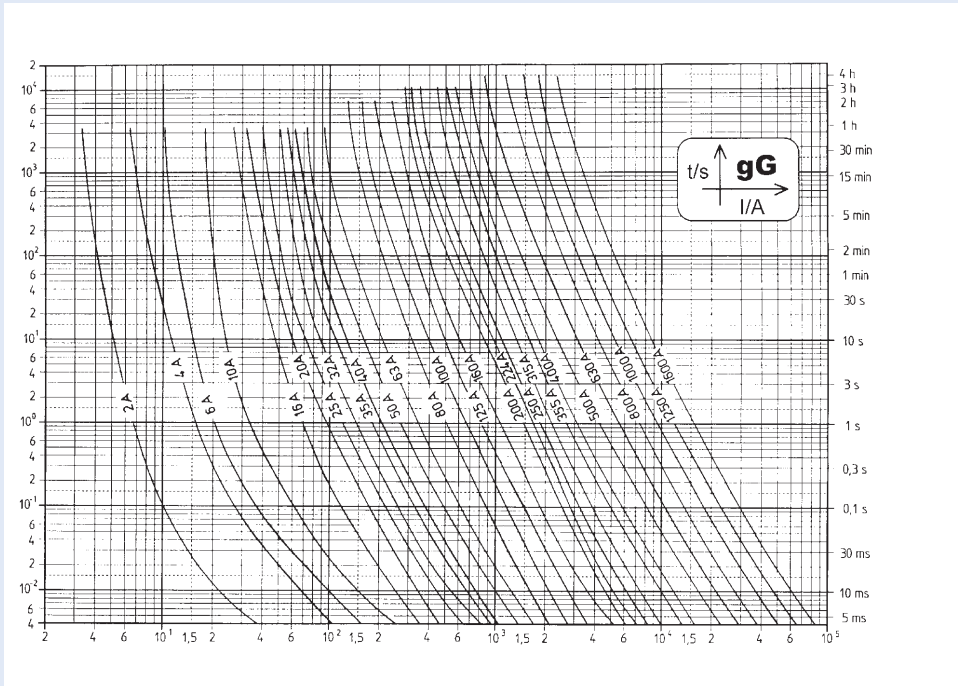


Let-through characteristics of NH fuse links



Time-current characteristics of NH fuse links

Time-current characteristics of NH fuse links for ambient temperature $20 \pm 5 \text{ }^\circ\text{C}$.

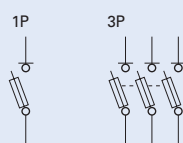


For types and art. numbers see page 85

NH-Fuse-Switch-Disconnecter LTS 160/..., LTS 250/...

- Supplied without NH-fuse-links
- Version LTS...R for direct mounting onto 60 mm busbar systems
- For mounting onto 100 mm busbar systems adapter Z-LTS-...-SAD/100 can be used
- Design according to EN 60947-3
- Halogen-free plastic, self-extinguishing, marked for recycling
- Corrosion-proof metal parts
- Parameters of LTS-160/00/3-ES with electronic signalisation are identical with LTS-160/00/3E, only standard connection by means of screws M8
- Parameters of LTS-250/1/3-ES with electronic signalisation are identical with LTS-250/1/3
- The switch cover can be removed in the OFF position
- Transparent windows are hinged and permit testing of the fuse-links

Connection diagram



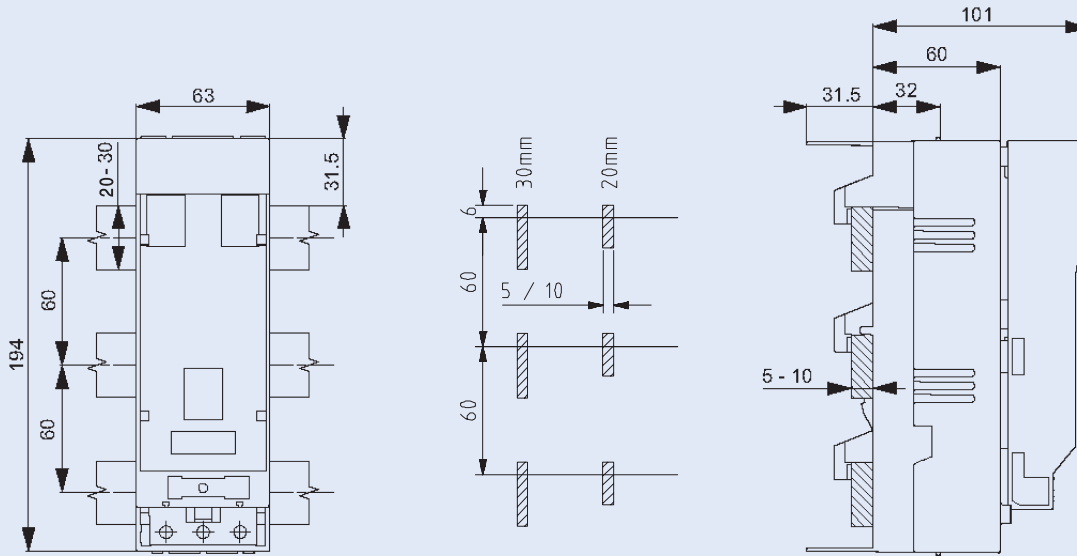
Technical Data

| | LTS-100/C00/3-R | LTS-160/00/1 | LTS-160/00/3E | LTS-160/00/3E-R | LTS-250/1/3 | LTS-250/1/3-R |
|---|----------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Electrical: | | | | | | |
| Technical data according to | EN 60947 | EN 60947 | EN 60947 | EN 60947 | EN 60947 | EN 60947 |
| Size | C00 | 00 | 00 | 00 | 1 | 1 |
| Number of poles/phases | 3 | 1 | 3 | 3 | 3 | 3 |
| Conventional free air thermal current with NH-fuse-links I_{th} | 100 A (500 V) – (690 V) | 160 A (500 V) 125 A (690 V) | 160 A (500 V) 125 A (690 V) | 160 A (500 V) 125 A (690 V) | 250 A (500 V) 200 A (690 V) | 250 A (500 V) 200 A (690 V) |
| Max. permitted nominal power loss of NH-fuse-links | 7,5 W | 12 W | 12 W | 12 W | 23 W | 23 W |
| Conventional free air thermal current with solid-links I_{th} | 160 A | 200 A | 200 A | 200 A | 400 A | 400 A |
| Max. permitted nominal power loss of solid-links | - | 1.2 W | 1.2 W | 1.2 W | 2.6 W | 2.6 W |
| Utilization category AC-23B | | | | | | |
| Rated operational voltage U_e | - | 400 V AC | 400 V AC | 400 V AC | 400 V AC | 400 V AC |
| Rated operational current I_e | - | 160 A | 160 A | 160 A | 250 A | 250 A |
| Rated short-circuit making capacity | - | 80 kA | 80 kA | 80 kA | 80 kA | 80 kA |
| Utilization category AC-22B | | | | | | |
| Rated operational voltage U_e | 500 V AC | 500 V AC | 500 V AC | 500 V AC | 500 V AC | 500 V AC |
| Rated operational current I_e | 100 A | 160 A | 160 A | 160 A | 250 A | 250 A |
| Rated short-circuit making capacity | 50 kA | 80 kA | 80 kA | 80 kA | 50 kA | 50 kA |
| Utilization category AC-21B | | | | | | |
| Rated operational voltage U_e | - | 690 V AC | 690 V AC | 690 V AC | 690 V AC | 690 V AC |
| Rated operational current I_e | - | 125 A | 125 A | 125 A | 200 A | 200 A |
| Rated short-circuit making capacity | - | 50 kA | 50 kA | 50 kA | 50 kA | 50 kA |
| Rated insulation voltage U_i | 750 V | 1000 V | 1000 V | 1000 V | 1000 V | 1000 V |
| Rated impulse withstand voltage U_{imp} | 8 kV | 8 kV | 8 kV | 8 kV | 12 kV | 12 kV |
| Rated frequency | 50–60 Hz | 50–60 Hz | 50–60 Hz | 50–60 Hz | 50–60 Hz | 50–60 Hz |
| Rated duty | uninterrupted duty | | | | | |
| Rated short-circuit making capacity I_{cm} with solid-links | - | 6.2 kA | 6.2 kA | 6.2 kA | 8.2 kA | 8.2 kA |
| Rated short-time withstand current I_{cw} with solid-links | - | 4 kA/1 s | 4 kA/1 s | 4 kA/1 s | 8 kA/1 s | 8 kA/1 s |
| Power loss without NH-fuse-links | - | 2.3 W at 160 A | 7 W at 160 A | 10 W at 160 A | 10 W at 250 A | 10 W at 250 A |
| Power loss without solid-links | - | 3.3 W at 200 A | 10 W at 200 A | 16 W at 200 A | 24 W at 400 A | - |
| Mechanical: | | | | | | |
| Standard connection | Lift terminal | M8 | Lift terminal | Lift terminal | M10 | M10 |
| For busbar max. width | 30 mm | 20 mm | 20 mm | 30 mm | 30 mm | 30 mm |
| For cable lugs | Cu | 1.5 – 50 mm ² | 2x70 mm ² | 2x70 mm ² | 2.5 – 70 mm ² | 2x150 mm ² |
| | Al | - | 2x95 mm ² | 2x95 mm ² | - | 2x185 mm ² |
| Ambient temperature range | -5 °C to +40 °C | -5 °C to +40 °C | -5 °C to +40 °C | -5 °C to +40 °C | -5 °C to +40 °C | -5 °C to +40 °C |
| Degree of protection | IP20 | IP20 | IP20 | IP30 | IP20 | IP20 |
| Pollution degree | 3 | 3 | 3 | 3 | 3 | 3 |

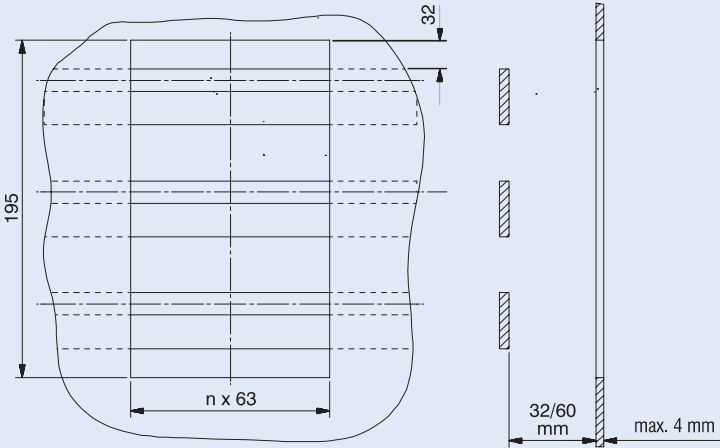
For types and art. numbers see page 86

Dimensions [mm]

LTS-100/C00/3-R



Cut-out for front plate

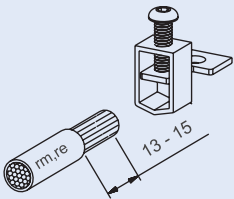


Cable Terminal Connections LTS-100/00/3-R

Lift terminal:

Cross section Cu 1.5-50 mm²
Cu-Band 6 x 9 x 0,8

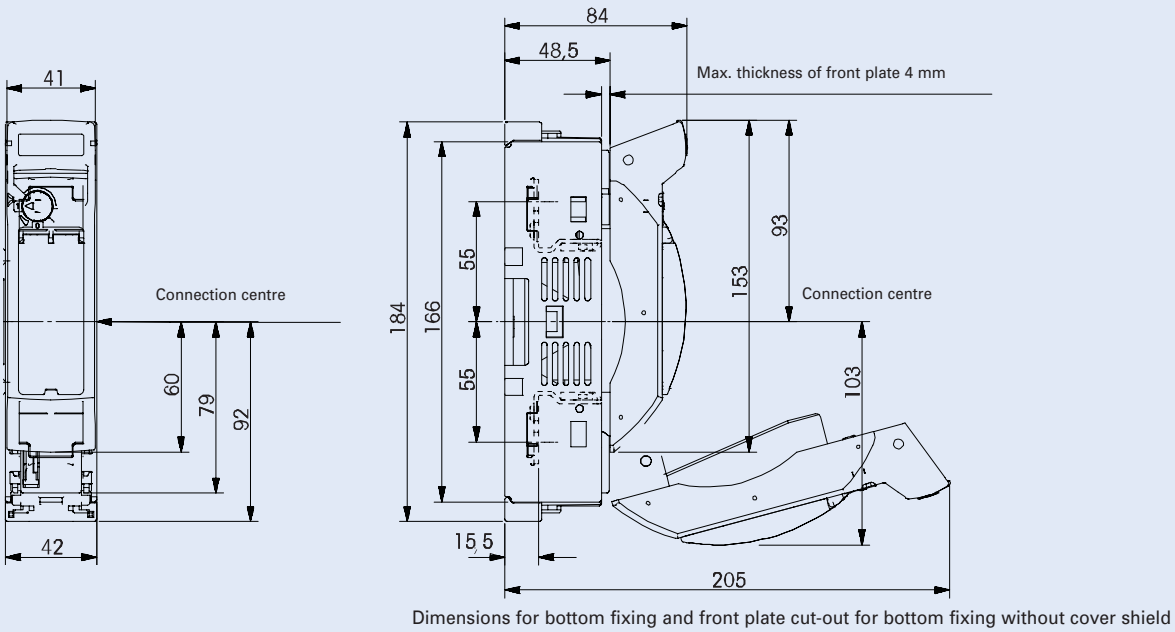
Tightening torque 2.6 Nm



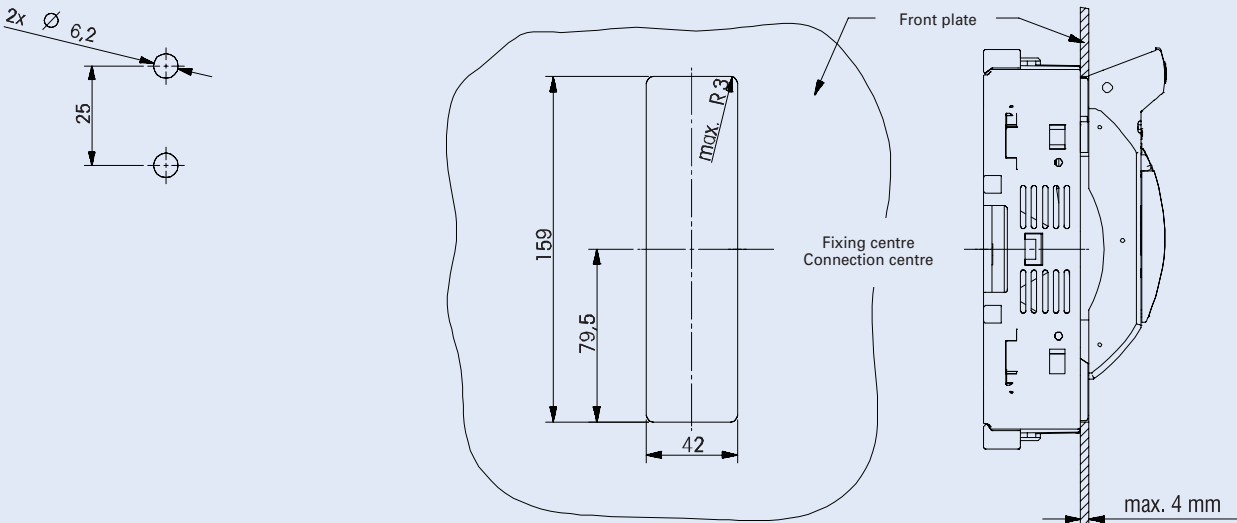
For types and art. numbers see page 86

Dimensions [mm]

LTS-160/00/1

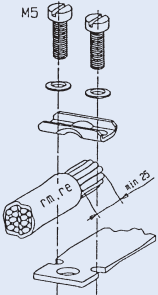


Dimensions for bottom fixing and front plate cut-out for bottom fixing without cover shield

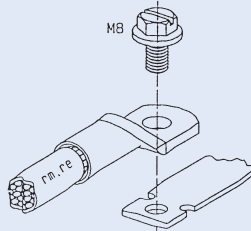


Cable Terminal Connections LTS-160/00/1

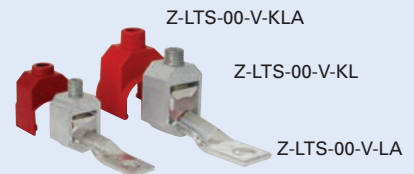
Clamp strap Z-LTS-160-BK:
Cross section Cu 4-70 mm²
Tightening torque 3-4 Nm



Screw M8
Cross section Cu 16-70, Al 16-95 mm²
Tightening torque 15-17 Nm



V-shaped terminal
Cross section: 50-95 mm² se (sector solid)
35-70 mm² sm (sector stranded)
10-50 mm² rm (round multi wired)
Tightening torque 12 Nm

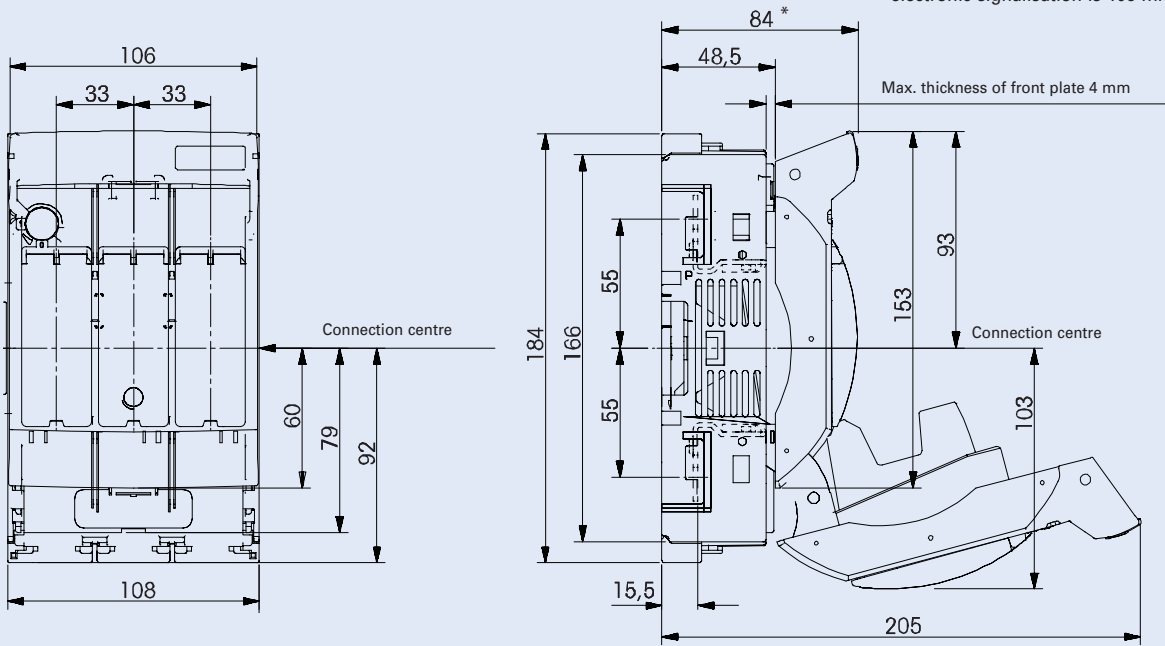


WA-SG01502

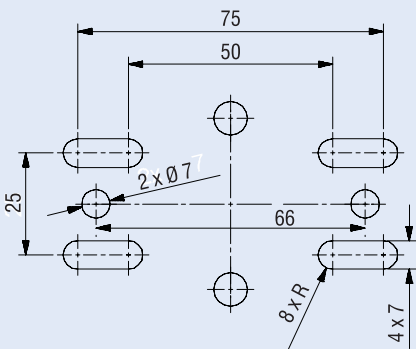
Dimensions [mm]

LTS-160/00/3E - mounting on panel

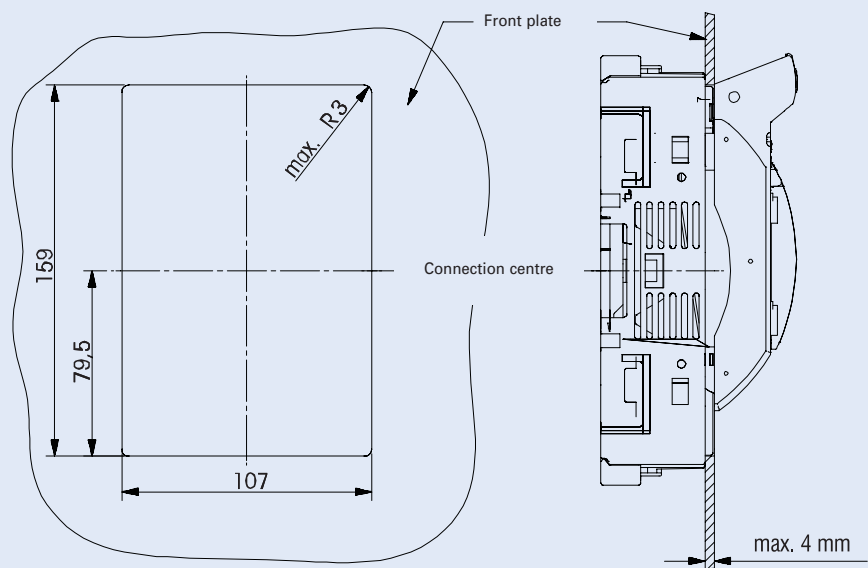
* Total depth of the device in version -ES with electronic signalisation is 106 mm



Dimensions of fastening openings **



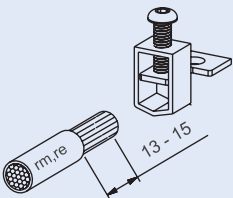
Cut-out for front plate **



** For bottom connection

Cable Terminal Connections LTS-160/00/3E

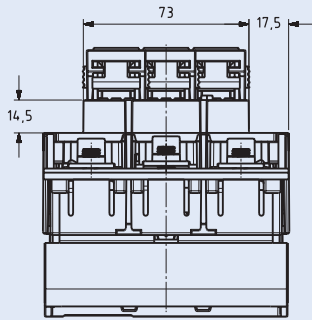
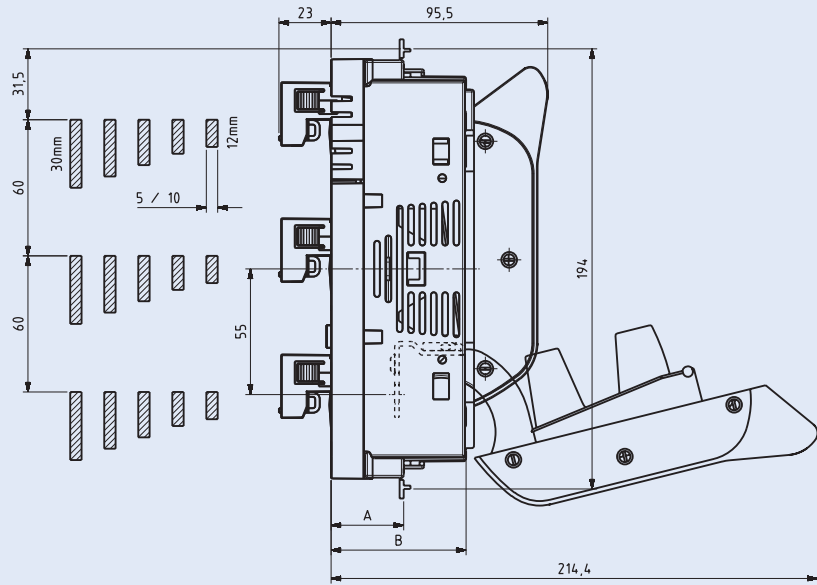
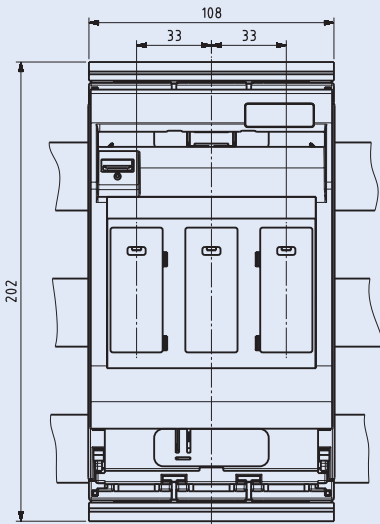
Cross section Cu 2.5-70 mm²
Tightening torque 6 Nm



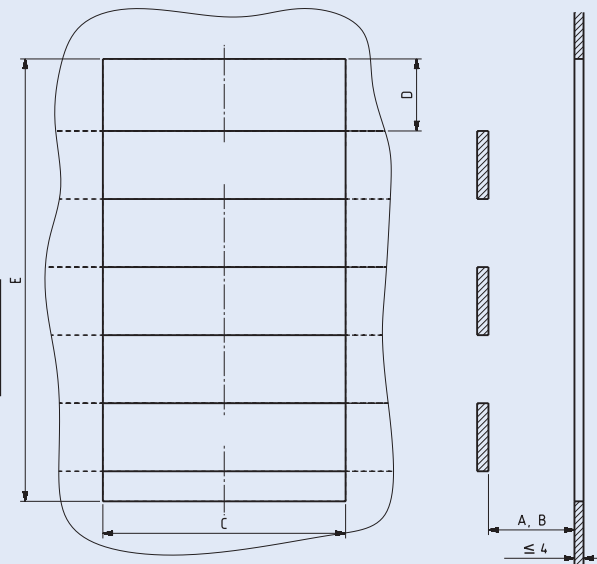
For types and art. numbers see page 86

Dimensions [mm]

LTS 160/00/3E-R - mounting on busbars



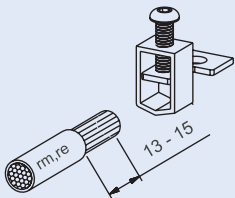
Cut-out for front plate



| Depth | Cut-out dimensions | | |
|-------|--------------------|------|-----|
| | C | D | E |
| A 32 | 109 | 31.5 | 195 |
| B 60 | 107 | 13.5 | 159 |

Cable Terminal Connections LTS-160/00/3E-R

Cross section Cu 2.5-70 mm²
Tightening torque 6 Nm

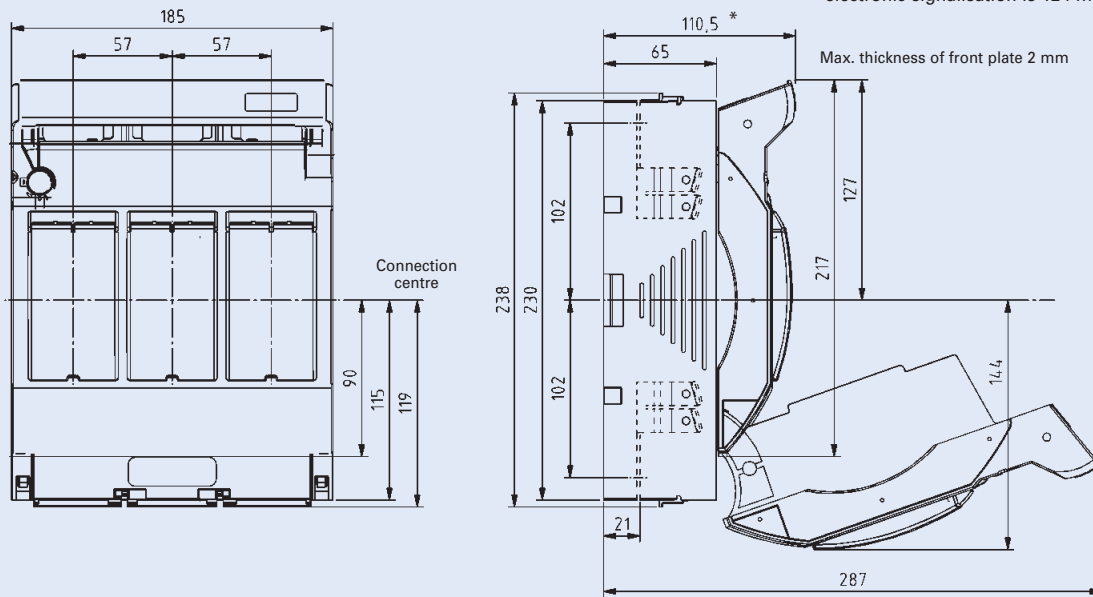


For types and art. numbers see page 86

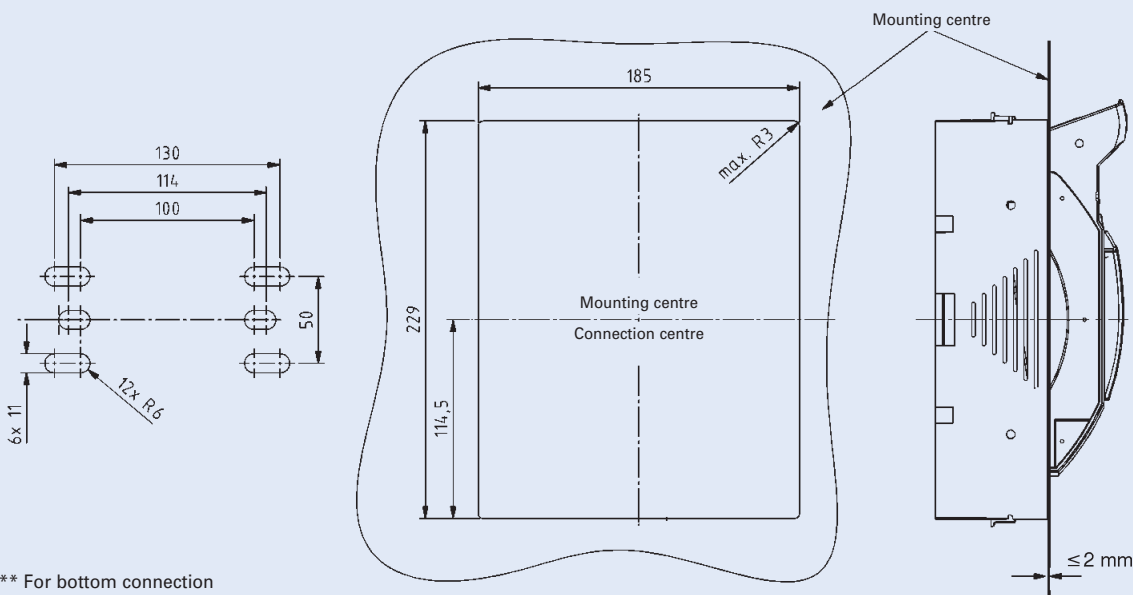
Dimensions [mm]

LTS 250/1/3 - mounting on panel

* Total depth of the device in version -ES with electronic signalisation is 124 mm



Cut-out for front plate **

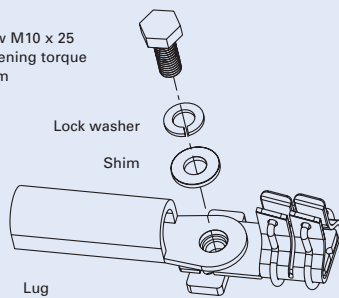


** For bottom connection

Cable Terminal Connections LTS-250/1/3

Screw connection

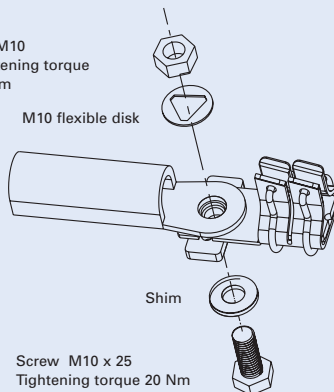
Screw M10 x 25
Tightening torque
20 Nm



Suitable for lugs according to:
DIN 46235 max. 10-150 mm²
DIN 46234 max. 10-150 mm²
DIN 46329 max. 10-185 mm²
(240 mm²)

Bolt connection

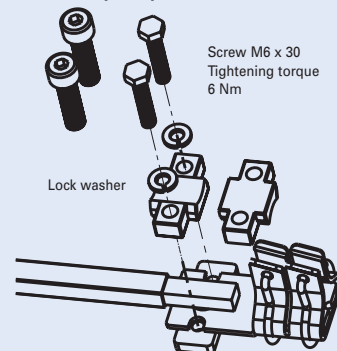
Nut M10
Tightening torque
20 Nm



Suitable for lugs according to:
DIN 46235 max. 10-150 mm²
DIN 46234 max. 10-150 mm²
DIN 46329 max. 10-185 mm²
(240 mm²)

Al/Cu clamp strap Z-LTS-250-BK

Screw M6 x 30
Tightening torque
6 Nm

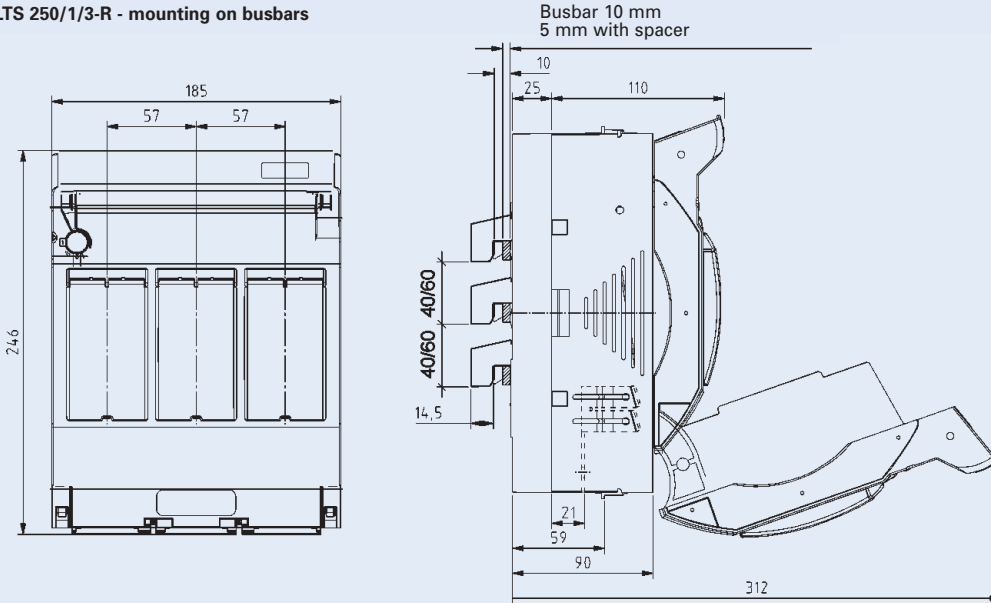


Suitable: for round conductor 70-150 mm² mm
for rails or laminated copper 18 x 7-18

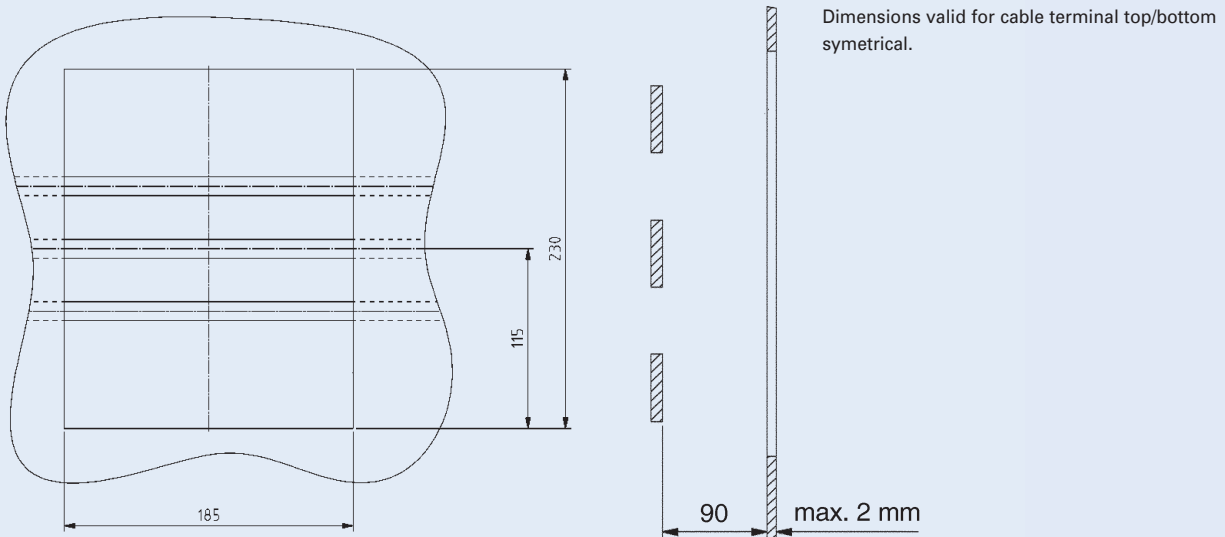
For types and art. numbers see page 86

Dimensions [mm]

LTS 250/1/3-R - mounting on busbars

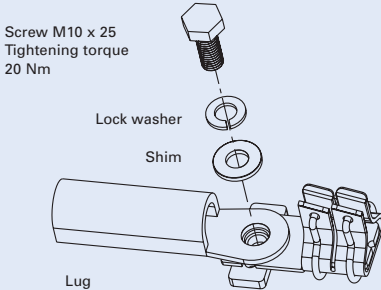


Cut-out for front plate



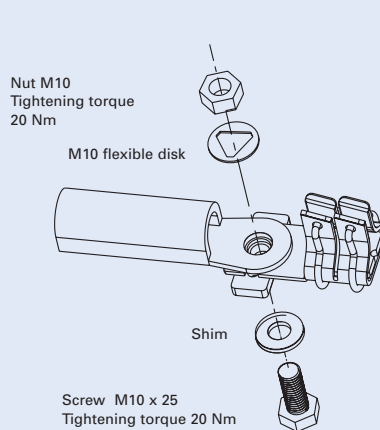
Cable Terminal Connections LTS-250/1/3-R

Screw connection



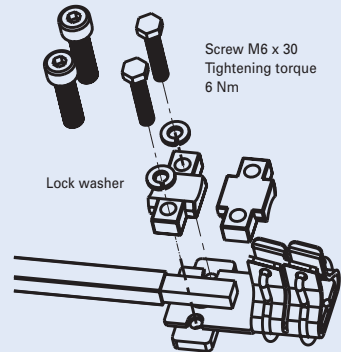
Suitable for lugs according to:
DIN 46235 max. 10-150 mm²
DIN 46234 max. 10-150 mm²
DIN 46329 max. 10-185 mm²
(240 mm²)

Bolt connection



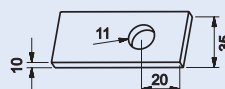
Suitable for lugs according to:
DIN 46235 max. 10-150 mm²
DIN 46234 max. 10-150 mm²
DIN 46329 max. 10-185 mm²
(240 mm²)

Al/Cu clamp strap Z-LTS-250-BK



Suitable: for round conductor 70-150 mm² rm
for rails or laminated copper 18 x 7-18

Copper Rails:

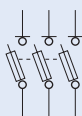


For types and art. numbers see page 86

NH-Fuse-Switch-Disconnecter LTS-400/..., LTS-630/...

- Supplied without NH-fuse-links
- For mounting onto 100 mm busbar systems adapter Z-LTS-...-SAD/100 can be used
- Fully isolated, touch protection acc. to EN 60947
- The base body consists of a glass-fibre reinforced high-temperature-resistant, non-flammable, self-extinguishing and halogen-free plastic
- The single-part contact system is corrosion- and torsion-proof
- The protective cover consists of a glass-fibre re-enforced, high-temperature-resistant, self-extinguishing and halogen-free plastic
- The switch cover features large viewing windows permitting to see the marking and the flat indicator of the NH-fuse-links
- Transparent windows are hinged and permit testing of the fuse-links
- The switch cover can be removed in the OFF position
- Type LTS-400/2/3-R for mounting onto SASY 60 mm
- Parameters of LTS-400/2/3-ES with electronic signalisation are identical with LTS-400/2/3
- Parameters of LTS-630/3/3-ES with electronic signalisation are identical with LTS-630/3/3

Connection diagrams



Technical Data

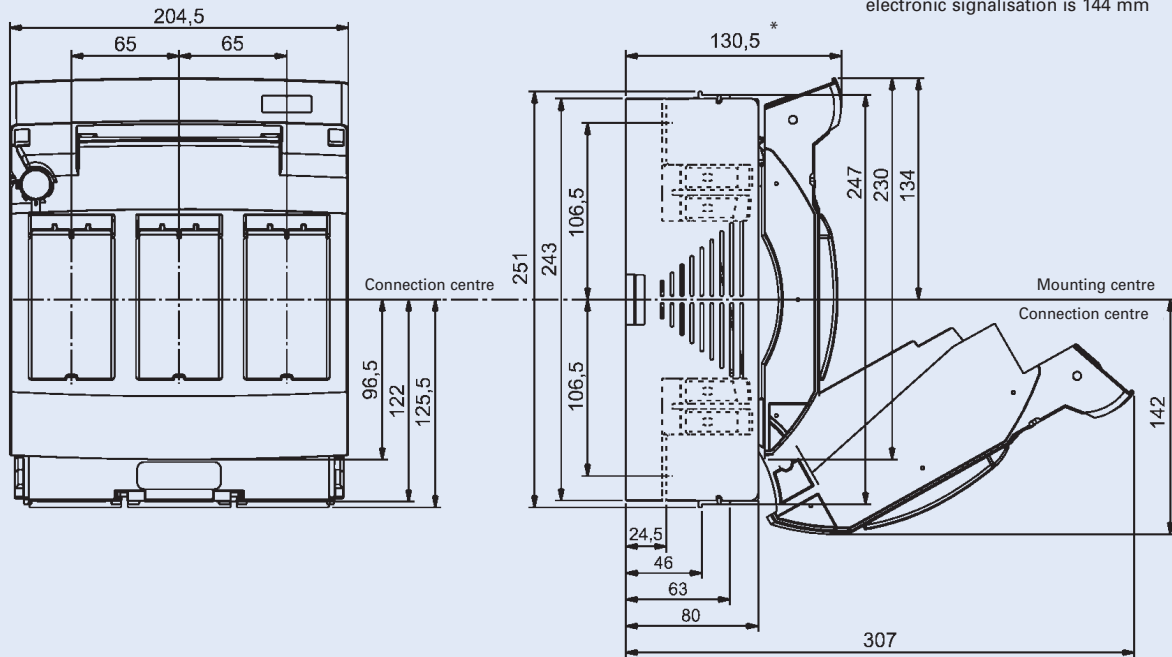
| | LTS-400/2/3 | LTS-400/2/3-R | LTS-630/3/3 |
|---|--|--|--|
| Electrical: | | | |
| Technical data according to | EN 60947 | EN 60947 | EN 60947 |
| Size | 2 | 2 | 3 |
| Number of poles/phases | 3 | 3 | 3 |
| Conventional free air thermal current with NH-fuse-links I_{th} | 400 A (500 V) 315 A (690 V) | 400 A (500 V) 315 A (690 V) | 630 A (500 V) 500 A (690 V) |
| Max. permissible power loss of NH-fuse-links | 34 W | 34 W | 48 W |
| Conventional free air thermal current with solid-links I_{th} | 630 A | 530 A | 780 A |
| Max. permissible power loss of solid-links | 9 W | 9 W | 17,5 W |
| Utilization category AC-23B | | | |
| Rated operational voltage U_e | 400 V AC | 400 V AC | 400 V AC |
| Rated operational current I_e | 400 A | 400 A | 630 A |
| Rated short-circuit making capacity with fuse-links | 80 kA | 80 kA | 80 kA |
| Utilization category AC-22B | | | |
| Rated operational voltage U_e | 500 V AC | 500 V AC | 500 V AC |
| Rated operational current I_e | 400 A | 400 A | 630 A |
| Rated short-circuit making capacity with fuse-links | 80 kA | 80 kA | 80 kA |
| Utilization category AC-21B | | | |
| Rated operational voltage U_e | 690 V AC | 690 V AC | 690 V AC |
| Rated operational current I_e | 315 A | 315 A | 500 A |
| Rated short-circuit making capacity with fuse-links | 80 kA | 80 kA | 50 kA |
| Rated insulation voltage U_i | 1000 V | 1000 V | 1000 V |
| Rated impulse withstand voltage U_{imp} | 12 kV | 12 kV | 12 kV |
| Rated frequency | 50–60 Hz | 50–60 Hz | 50–60 Hz |
| Rated duty | uninterrupted duty | uninterrupted duty | uninterrupted duty |
| Rated short-circuit making capacity I_{cm} with solid-links | 10,6 kA | 10,6 kA | 18,6 kA |
| Rated short-time withstand current I_{cw} with solid-links | 13 kA/1 s | 13 kA/1 s | 13 kA/1 s |
| Power loss without NH-fuse-links | 20 W at 400 A | 53 W at 400 A | 40 W at 630 A |
| Power loss without solid-links | 50 W at 630 A | - | 150 W at 1000 A |
| Mechanical: | | | |
| Standard connection | M10 | M10 | M12 |
| For busbar max. width | 35 mm | 35 mm | 45 mm |
| For cable lugs | Cu 2x240 mm ² Al 2x240 mm ² | 2x240 mm ² 2x240 mm ² | 2x240 mm ² 2x300 mm ² |
| Ambient temperature range | -5 °C to +40 °C | -5 °C to +40 °C | -5 °C to +40 °C |
| Degree of protection | IP20 | IP20 | IP20 |
| Pollution degree | 3 | 3 | 3 |

For types and art. numbers see page 86

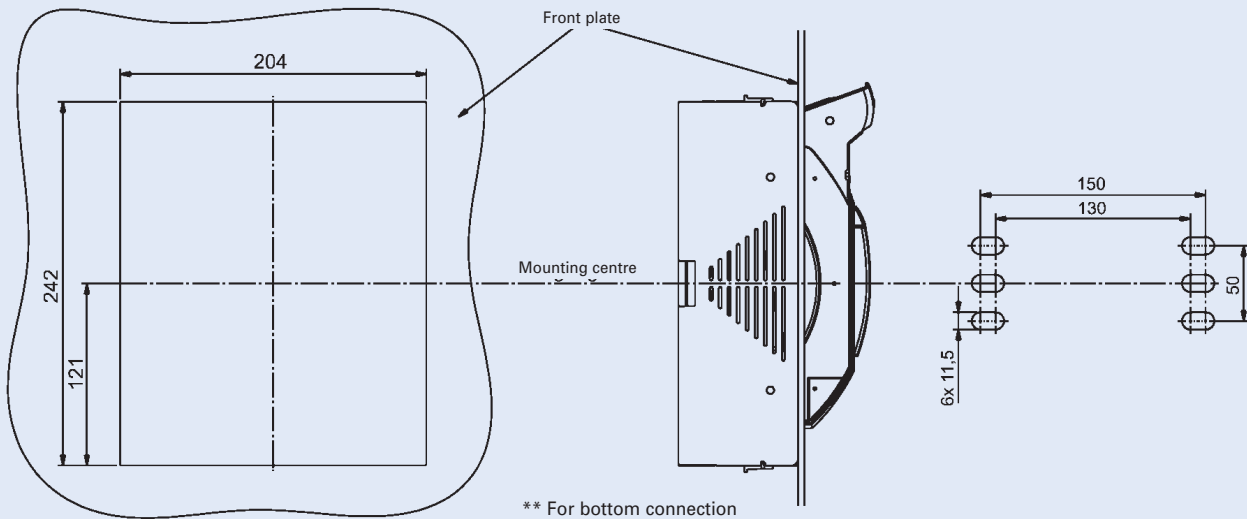
Dimensions [mm]

LTS-400/2/3

* Total depth of the device in version -ES with electronic signalisation is 144 mm



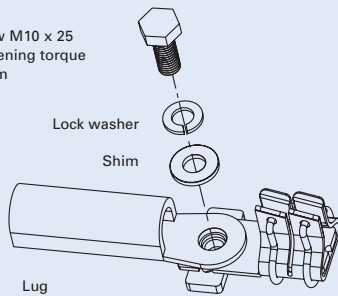
Cut-out for front plate **



Cable Terminal Connections LTS-400/2/3

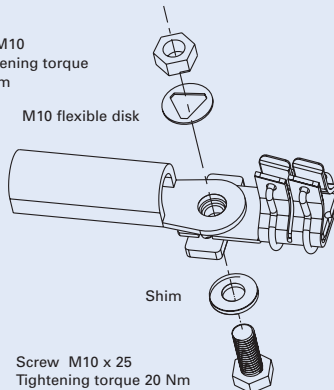
Screw connection

Screw M10 x 25
Tightening torque
20 Nm



Bolt connection

Nut M10
Tightening torque
20 Nm

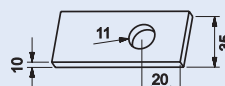


Screw M10 x 25
Tightening torque 20 Nm

Suitable for lugs according to:
DIN 46235 max. 10-185 mm²
DIN 46234 max. 10-240 mm²
DIN 46329 max. 10-240 mm²

Suitable for lugs according to:
DIN 46235 max. 10-185 mm²
DIN 46234 max. 10-240 mm²
DIN 46329 max. 10-240 mm²

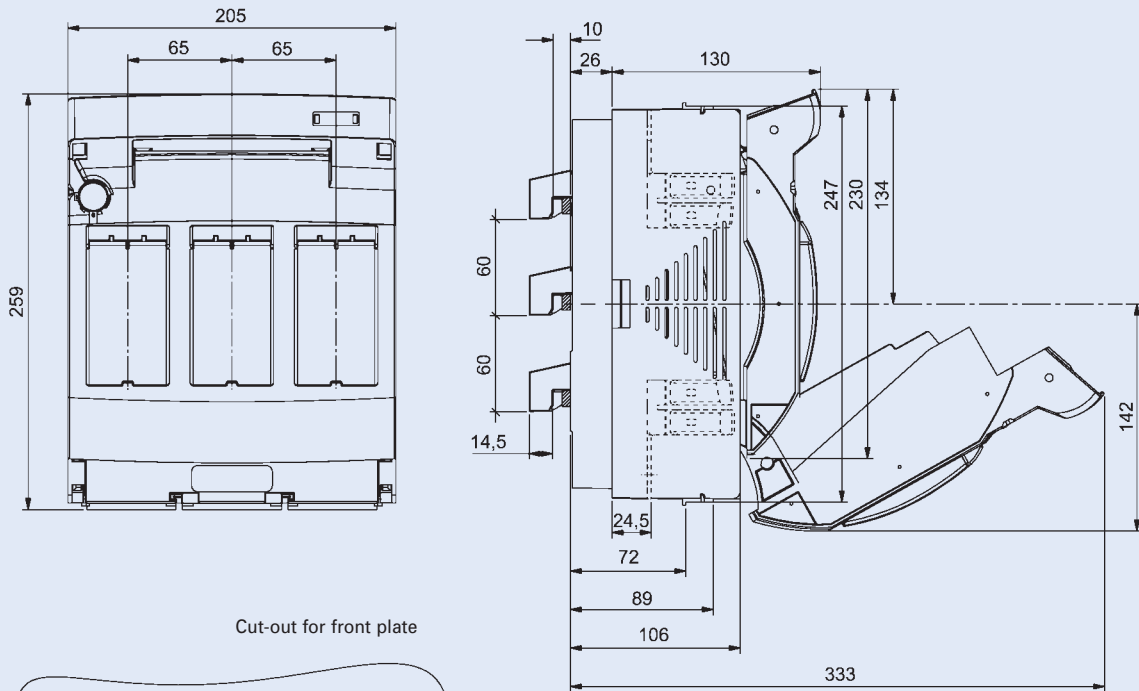
Copper Rails:



For types and art. numbers see page 86

Dimensions [mm]

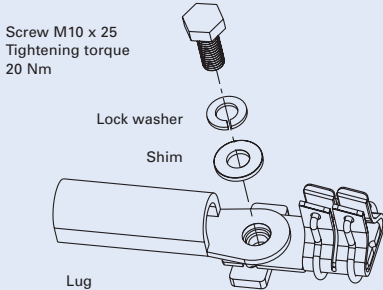
LTS-400/2/3-R



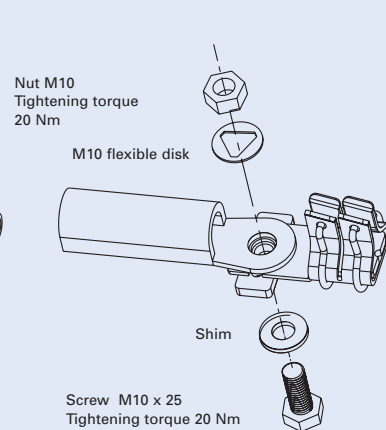
Dimensions valid for cable terminal top/bottom symmetrical.

Cable Terminal Connections LTS-400/2/3-R

Screw connection



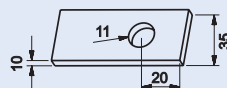
Bolt connection



Suitable for lugs according to:
DIN 46235 max. 10-185 mm²
DIN 46234 max. 10-240 mm²
DIN 46329 max. 10-240 mm²

Suitable for lugs according to:
DIN 46235 max. 10-185 mm²
DIN 46234 max. 10-240 mm²
DIN 46329 max. 10-240 mm²

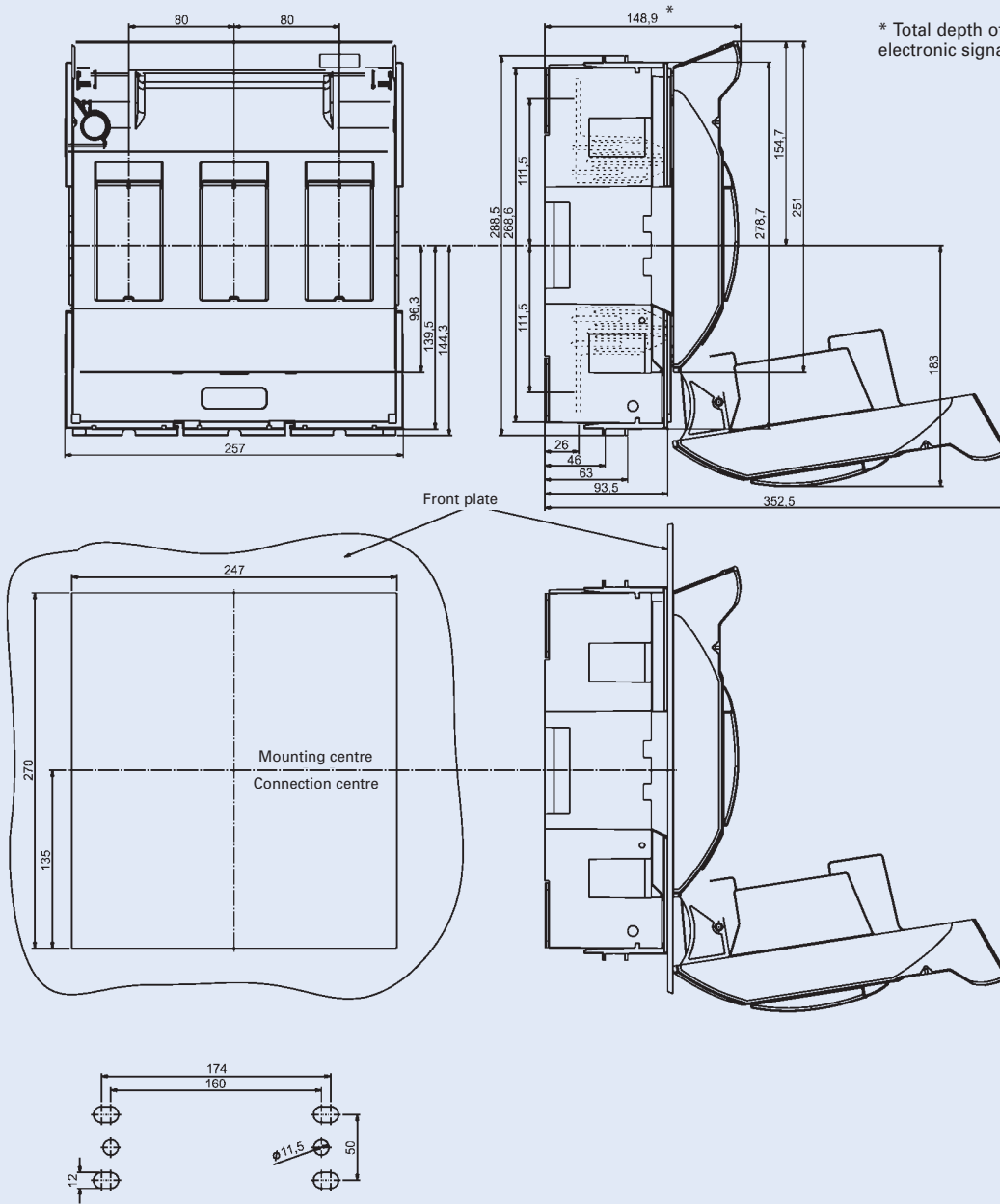
Copper Rails:



For types and art. numbers see page 86

Dimensions [mm]

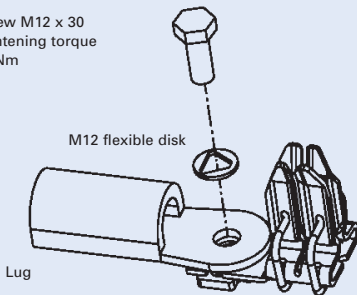
LTS-630/3/3



Cable Terminal Connections LTS-630/3/3

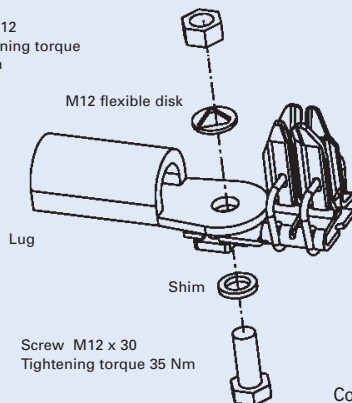
Screw connection

Screw M12 x 30
Tightening torque
35 Nm



Bolt connection

Nut M12
Tightening torque
35 Nm



Suitable for lugs according to:
DIN 46235 max. 10-240 mm²
DIN 46234 max. 10-240 mm²
DIN 46329 max. 10-300 mm²

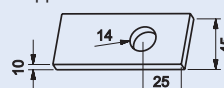
Note:

2 cable lugs can be connected simultaneously

Suitable for lugs according to:

DIN 46235 max. 10-240 mm²
DIN 46234 max. 10-240 mm²
DIN 46329 max. 10-300 mm²

Copper Rails:

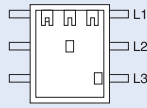


For types and art. numbers see page 86

Busbar Adapter LTS

- For the drill-free mounting of LTS fuse-switch-disconnectors on busbar systems with a distance between busbars of 100 mm
- For busbar 15 x 5/10, 20 x 5/10, 25 x 5/10, 30 x 5/10, 40 x 5/10, 50 x 5/10, 60 x 5/10
- Connection on top or bottom possible
- Mounting requires little time and space
- 3-pole

Connection diagram

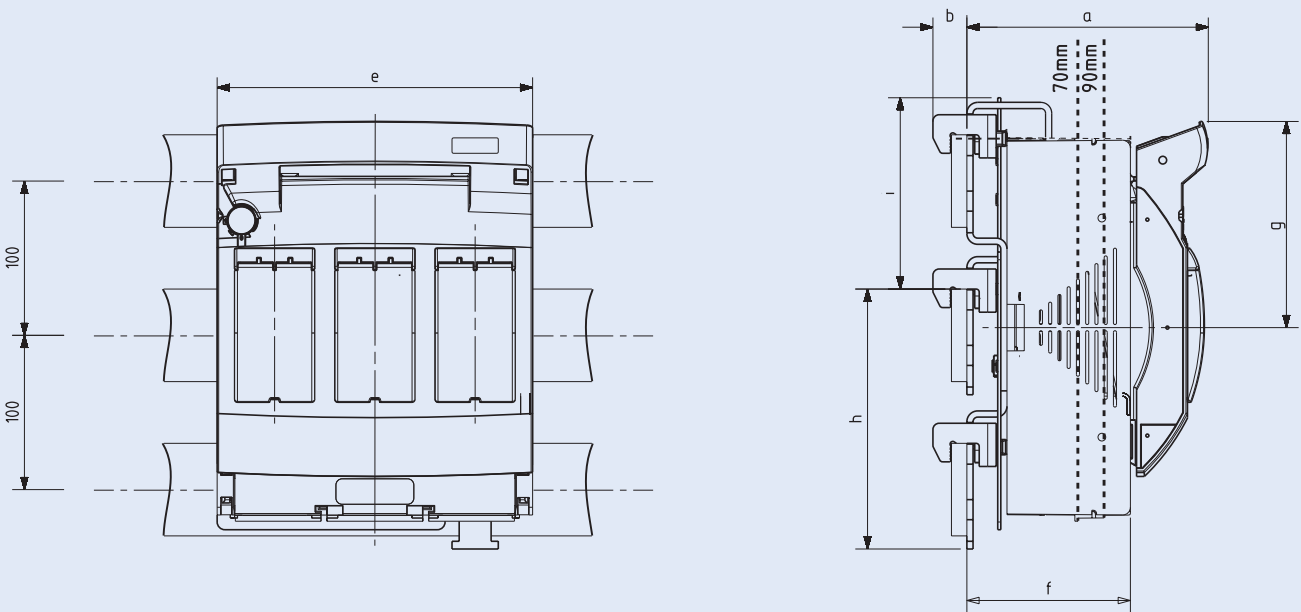


Technical Data

| Adapter | Size | Distance between Busbars | Mounting | Max. Busbar Cross Section |
|----------------------|------|--------------------------|-----------------|---------------------------|
| Z-LTS-250-SAD/100-KR | 1 | 100 mm | screw M10 15 Nm | 60 x 10 mm |
| Z-LTS-400-SAD/100-KR | 2 | 100 mm | screw M10 15 Nm | 60 x 10 mm |
| Z-LTS-630-SAD/100-KR | 3 | 100 mm | screw M10 15 Nm | 60 x 10 mm |

Dimensions [mm]

Symmetrical adapter, same dimensions for cable connection on top or bottom

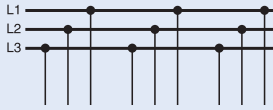


| Adapter | Size | NH-Fuse-Switch-Disconnectors | a | b | e | f | g | h | i |
|----------------------|------|------------------------------|-------|----|-------|-----|-----|-------|-----|
| Z-LTS-250-SAD/100-KR | 1 | LTS-250/1/3 | 137 | 22 | 185 | 91 | 127 | 168.5 | 121 |
| Z-LTS-400-SAD/100-KR | 2 | LTS-400/2/3 | 157 | 22 | 204.5 | 106 | 134 | 168.5 | 124 |
| Z-LTS-630-SAD/100-KR | 3 | LTS-630/3/3 | 174.5 | 22 | 256 | 122 | 155 | 168.5 | 124 |

Busbar Block 35 mm² Z-LTS-00/3-SV for LTS-160/00/3E

- Delivered with end caps
- Extension terminal Z-LTS-EK/95 available

Connection diagram



Technical Data

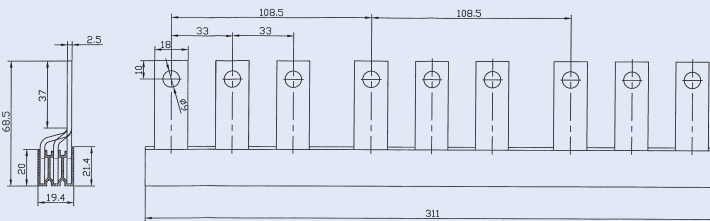
Electrical

| | |
|---|-------------------------|
| Rated voltage, frequency | 690/400 V, 50 Hz |
| Rated current | |
| Feeding from the side | 110 A |
| Feeding in the middle | 220 A |
| Rated conditional short-circuit current with back-up fuse 250 A gG(gL) | 100 kA _{r.m.s} |

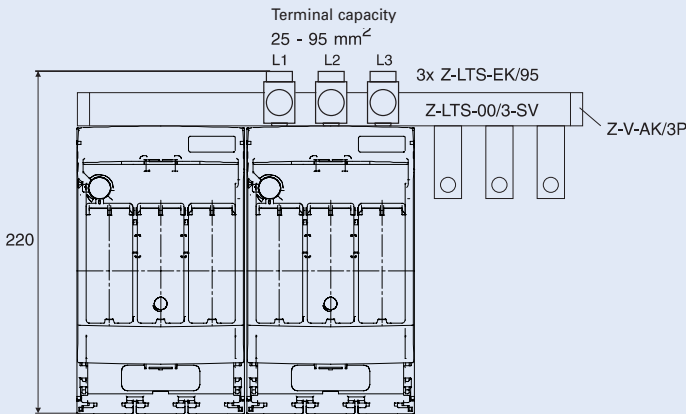
Mechanical

| | |
|----------------------|-----------------------|
| Busbar cross section | 35 mm ² Cu |
| Step distance | 33 mm / 108.5 mm |
| Weight | 446 g |

Dimensions [mm]



Example



NH-Vertical Fuse Switch Disconnectors LTS-L(G)

- For power NH fuse-links
- Supplied without NH fuse links
- Symmetrical vertical fuse disconnector with a possibility of top or bottom output
- Fully insulated, finger and hand touch-safe according to EN 60947
- Base made from duroplastic strengthened with glass fibers
- Metal parts corrosion-proof
- Cover made from non-flammable termoplastic strengthened with glass fibers
- The switch cover features large viewing windows permitting to see the marking and the flat indicator of the NH-fuse links
- The sliding viewing windows feature test holes
- The switch cover can be deposited ("park position")

Connection diagram



Technical Data

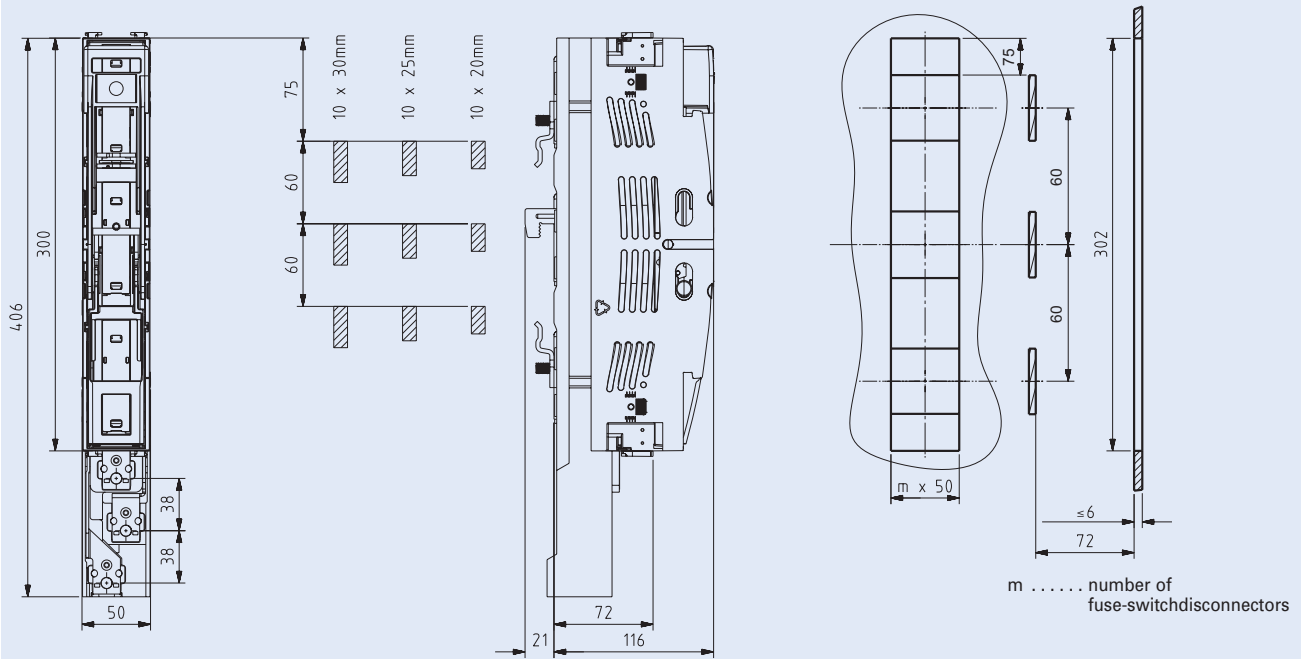
| | LTS-L(G)/160/00 LTS-L/160/00-60-10-R | LTS-L(G)/250/1 | LTS-L(G)/400/2 | LTS-L(G)/630/3 |
|---|---|--------------------------------|--------------------------------|--------------------------------|
| Electrical: | | | | |
| Technical data according to | EN 60947 | EN 60947 | EN 60947 | EN 60947 |
| Size | 00 | 1 | 2 | 3 |
| Number of poles/phases | 3 | 3 | 3 | 3 |
| Conventional free air thermal current with NH-fuse links I_{th} | 160 A (500 V) 160 A (690 V) 100 A (690 V) version -10-R | 250 A (500 V) 200 A (690 V) | 400 A (500 V) 315 A (690 V) | 630 A (500 V) 500 A (690 V) |
| Max. permitted nominal power loss of NH fuse links | 12 W | 23 W | 34 W | 48 W |
| Conventional free air thermal current with solid links I_{th} | 250 A | 400 A | 630 A | 1000 A |
| Max. permitted nominal power loss of solid links | 1.2 W | 2.6 W | 9 W | 17.5 W |
| Utilisation category AC-23 B | | | | |
| Rated operational voltage U_e | 400 V AC | 500 V AC | 400 V AC | 400 V AC |
| Rated operational current I_e | 160 A | 250 A | 400 A | 630 A |
| Rated short circuit making capacity with fuse links | 80 kA | 120 kA | 120 kA | 80 kA |
| Utilisation category AC-22 B | | | | |
| Rated operational voltage U_e | 500 V AC | 690 V AC | 500 V AC | 500 V AC |
| Rated operational current I_e | 160 A | 250 A | 400 A | 630 A |
| Rated short circuit making capacity with fuse links | 80 kA | 120 kA | 120 kA | 80 kA |
| Utilisation category AC-21 B | | | | |
| Rated operational voltage U_e | 690 V AC | 690 V AC | 690 V AC | 690 V AC |
| Rated operational current I_e | 100 A | 250 A | 400 A | 630 A |
| Rated short circuit making capacity with fuse links | 10 kA | 120 kA | 120 kA | 80 kA |
| Rated insulation voltage U_i | 1000 V | 1000 V | 1000 V | 1000 V |
| Rated impulse withstand voltage U_{imp} | 8 kV | 8 kV | 8 kV | 8 kV |
| Rated frequency | 50–60 Hz | 50–60 Hz | 50–60 Hz | 50–60 Hz |
| Rated duty | uninterrupted duty | uninterrupted duty | uninterrupted duty | uninterrupted duty |
| Rated short-circuit making capacity I_{cm} with solid links | 4,5 kA | 16 kA | 16 kA | 16 kA |
| Rated short-time withstand current I_{cw} with solid links | 4.5 kA/1 s | 8 kA/1 s | 8 kA/1 s | 12.6 kA/1 s |
| Power loss without NH-fuse links | 20 W at 160 A | 24 W at 250 A | 46 W at 400 A | 92 W at 630 A |
| Power loss without solid links | 49 W at 200 A | 65 W at 400 A | 126 W at 630 A | 161 W at 1000 A |
| Mechanical: | | | | |
| Standard connection | M8 * | M10 * | M12 * | M12 * |
| For busbar max. width | 20 mm | 40 mm | 40 mm | 40 mm |
| For busbar | 100 mm, 185 mm * | 185 mm | 185 mm | 185 mm |
| For cable lugs | max. 1x70 mm ² | max. 300 mm ² | max. 300 mm ² | max. 300 mm ² |
| Ambient temperature range | -5 °C to +40 °C | -5 °C to +40 °C | -5 °C to +40 °C | -5 °C to +40 °C |
| Degree of protection | IP2Lx | IP2Lx | IP2Lx | IP2Lx |
| Pollution degree | 3 | 3 | 3 | 3 |

* according to type

For types and art. numbers see page 88, 89

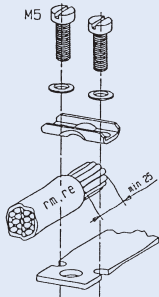
Dimensions [mm]

LTS-L/160/00



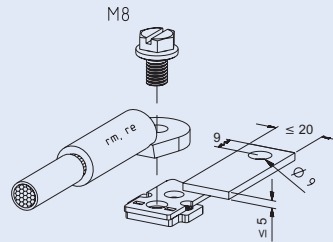
Cable Terminal Connections LTS-L/160/00

Clamp strap Z-LTS-160-BK:
Cross section Cu 4-70 mm²
Tightening torque 3-4 Nm



re round solid
rm round stranded
se sectorial solid
sm sectorial stranded

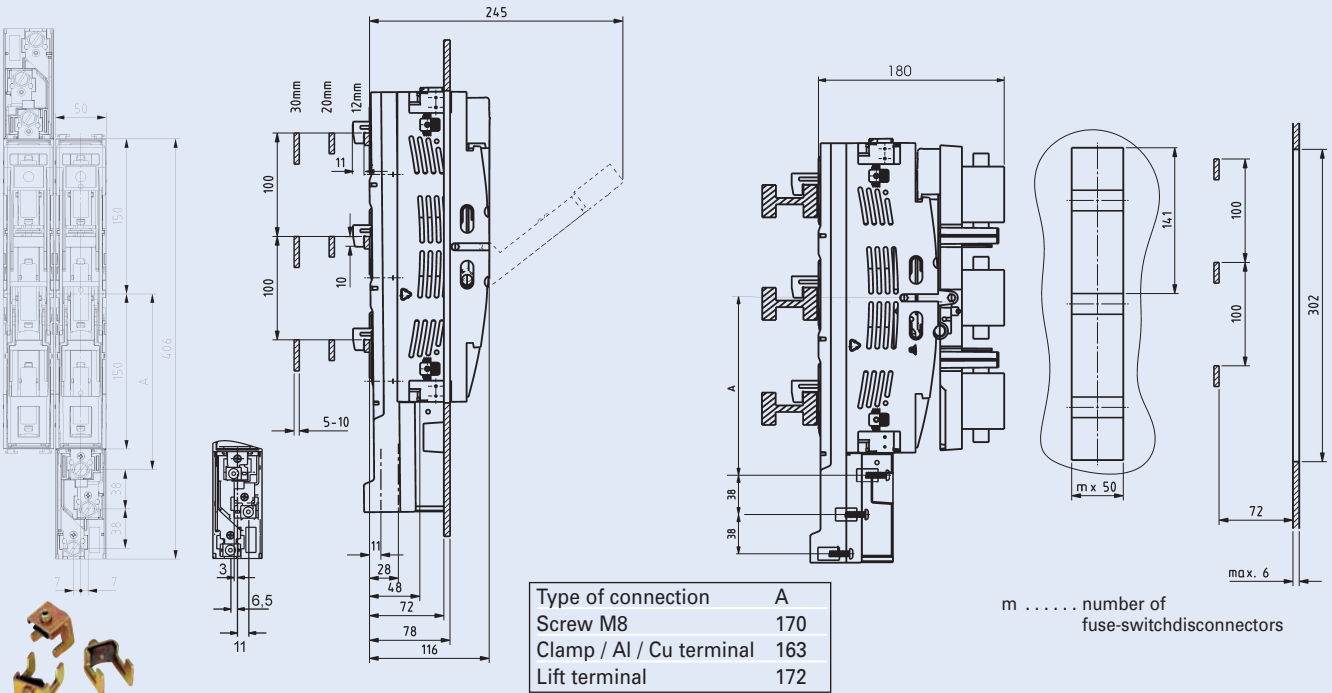
Screw M8
Cross section Cu 16-70, Al 16-95 mm²
Tightening torque 15-17 Nm



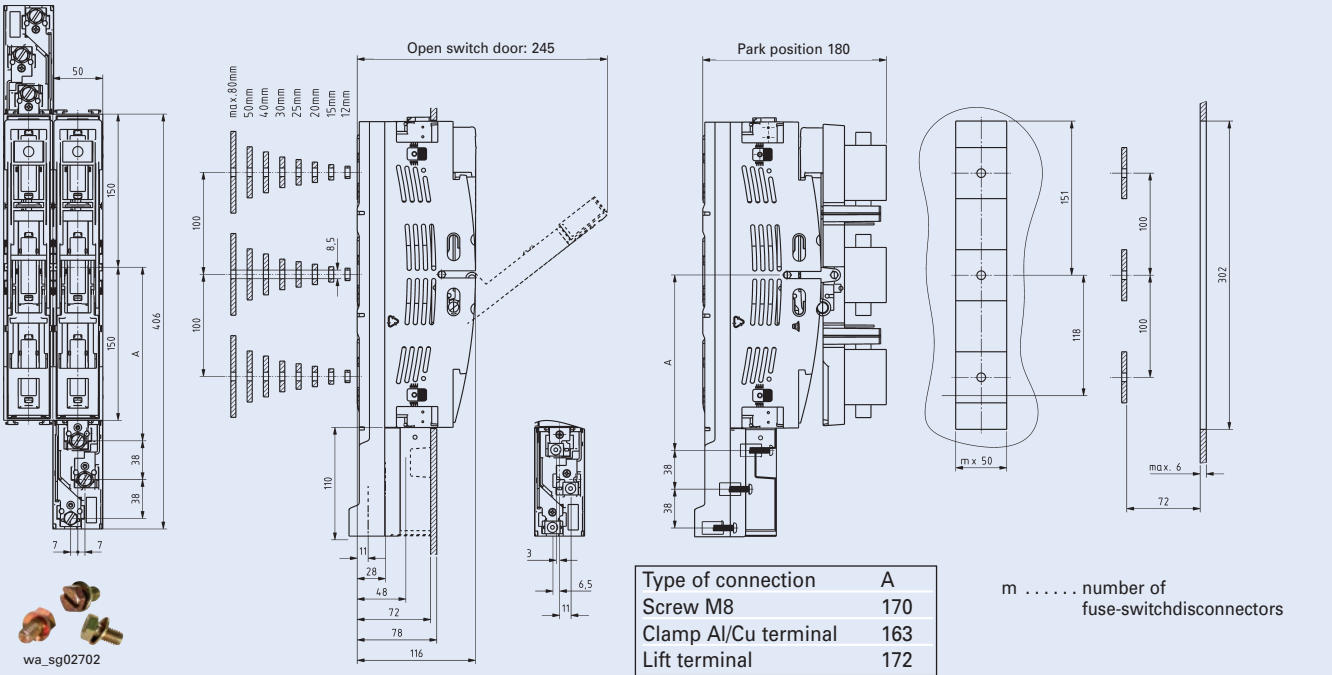
Dimensions [mm]

LTS-L(G)/160/00

Drill-free mounting with hooked clamps Z-LTS-LG/00-KR

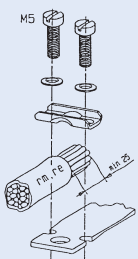


Screw Mounting - Cu drilled



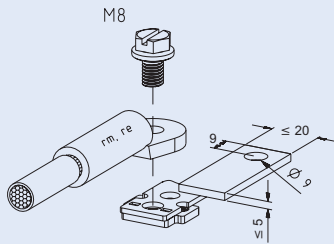
Cable Terminal Connections LTS-L/160/00

Clamp strap Z-LTS-160-BK:
Cross section Cu 4-70 mm²
Tightening torque 3-4 Nm



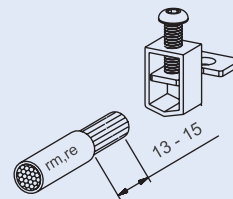
re round solid
rm round stranded
se sectorial solid
sm sectorial stranded

Screw M8
Cross section Cu 16-70, Al 16-95 mm²
Tightening torque 15-17 Nm



Cable Terminal Connections LTS-L/160/00/3-L

Cross section Cu 2.5-70 mm²
Tightening torque 6 Nm

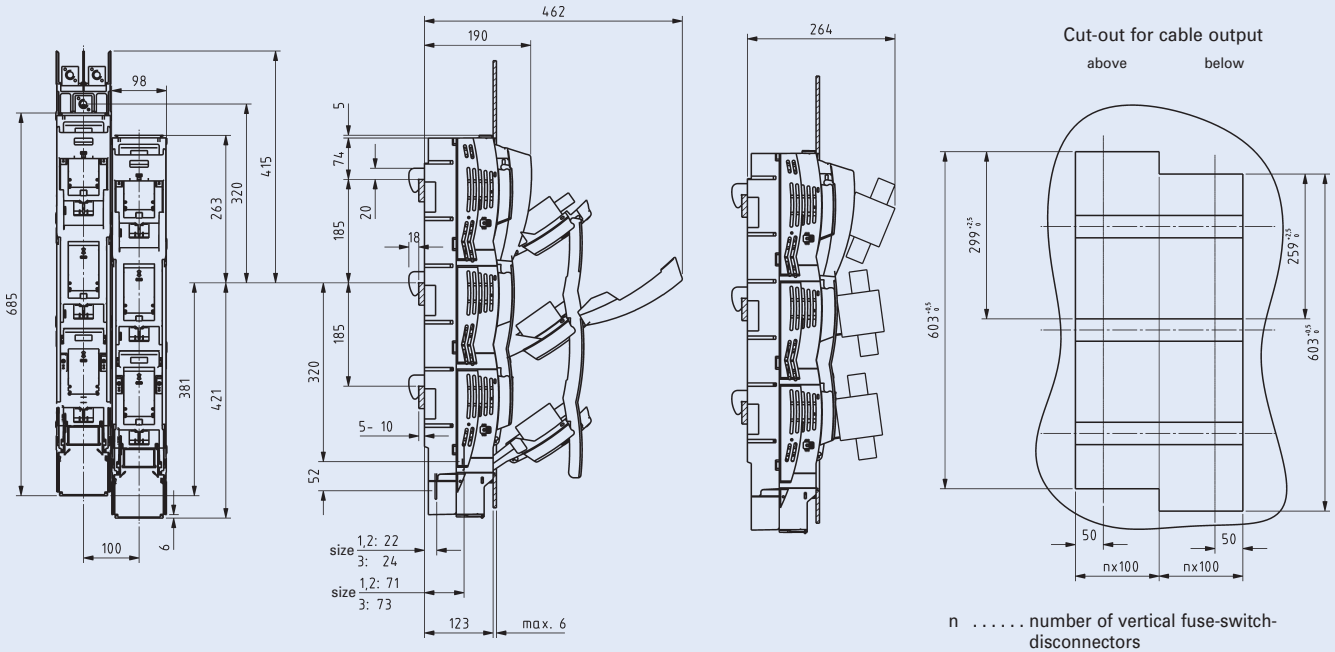


For types and art. numbers see page 88

Dimensions [mm]

LTS-L/250/1, LTS-L/400/2, LTS-L/630/3

Drill-free mounting with hooked clamps

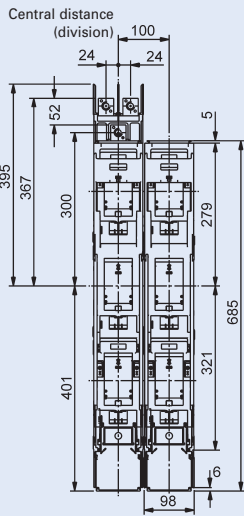


Hooked Clamps Z-LTS-L-KR

For direct mounting without drilling onto bus bar system.

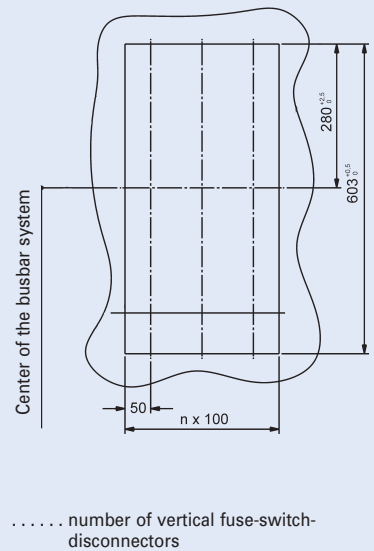


Screw Mounting - Cu drilled



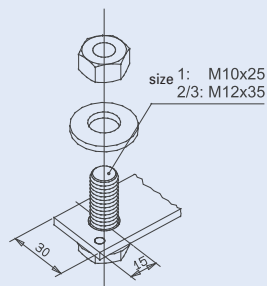
1) Dimensions to busbar upper edge

WA-SG14703



Cable Terminal Connections LTS-L/250/1, LTS-L/400/2, LTS-L/630/3

Bolt connection:
Cross section max. 300 mm²
Tightening torque ± 35 Nm
Accessories: Cable lug max. width 45 mm

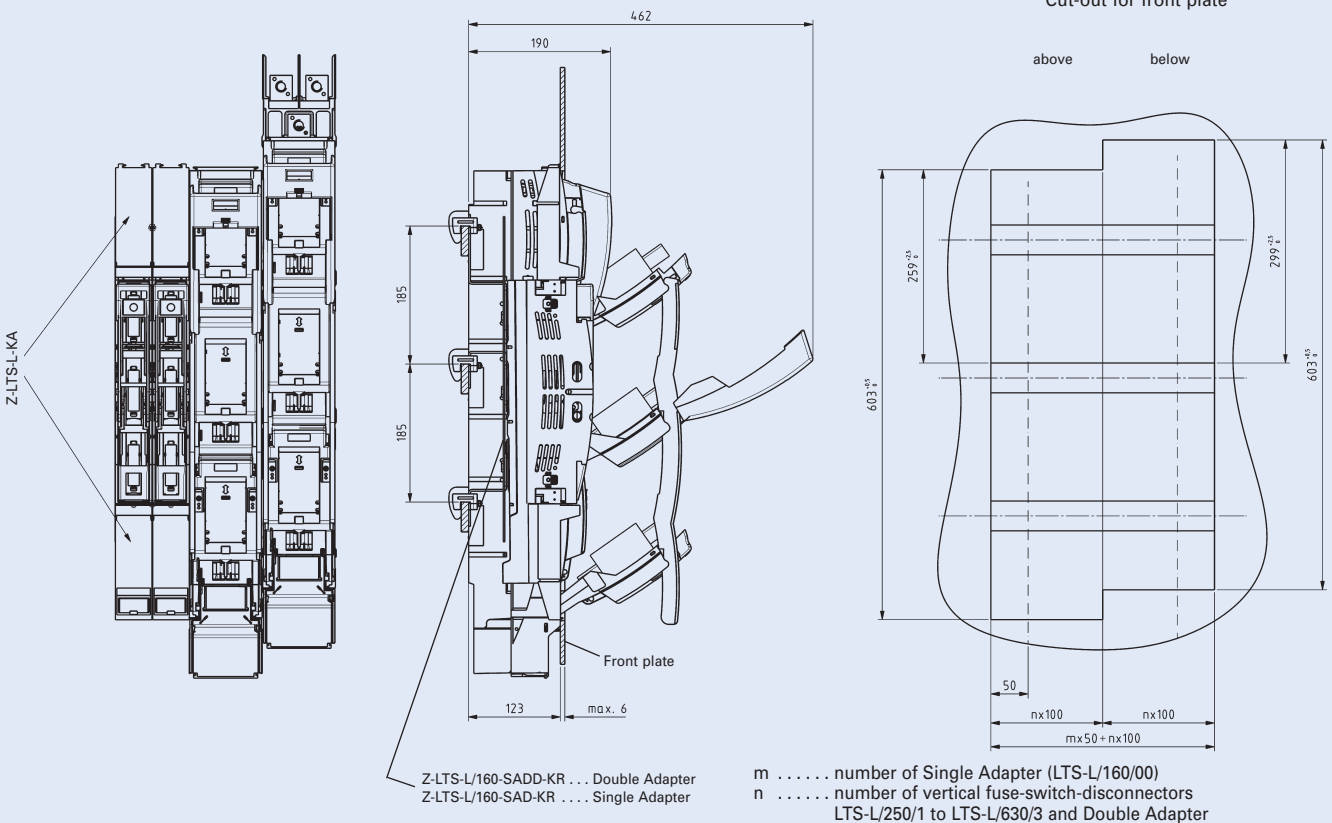


For types and art. numbers see page 88, 89

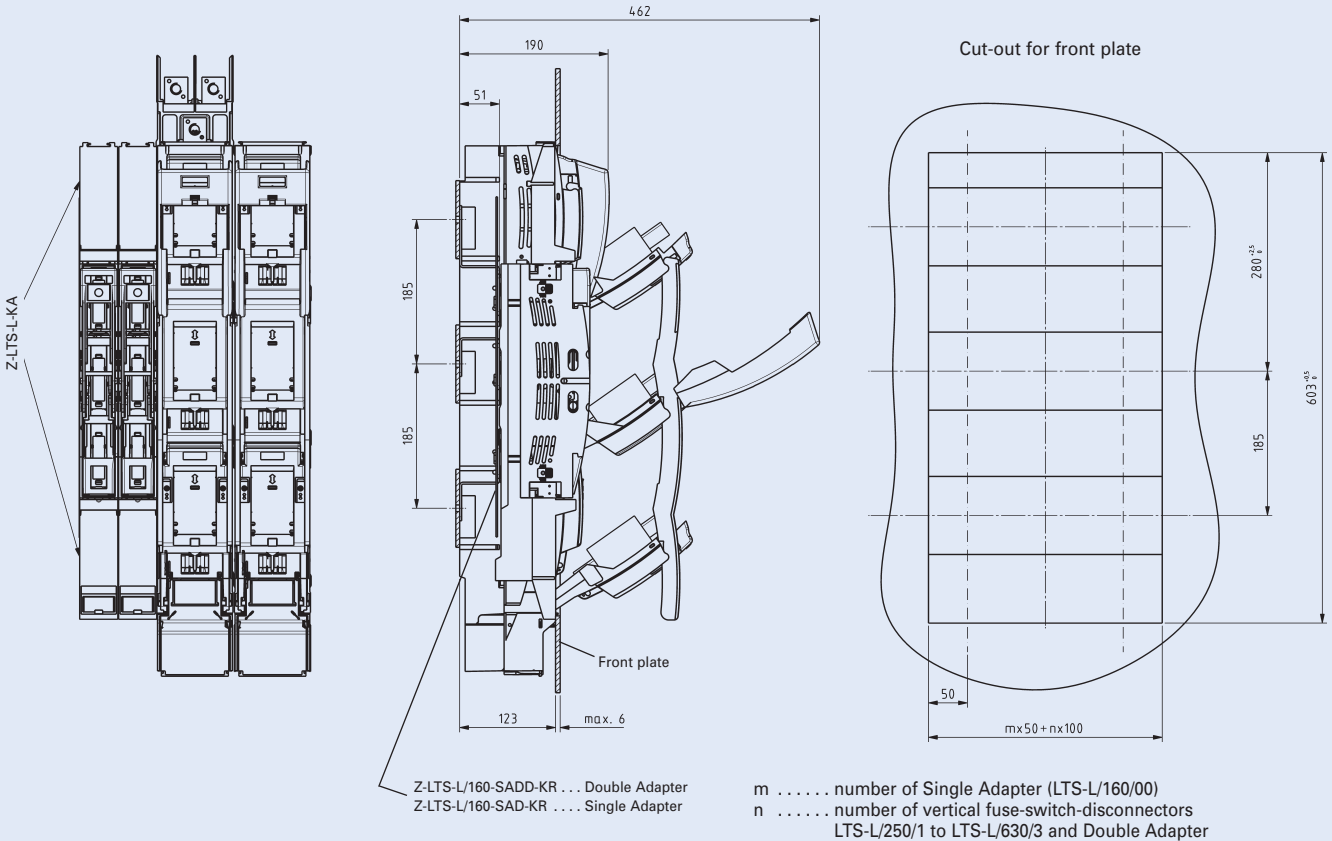
Dimensions [mm]

Kombination LTS-L/160/00 und LTS-L/250/1, LTS-L/400/2, LTS-L/630/3

Drill-free mounting with hooked clamps



Screw Mounting - Cu drilled



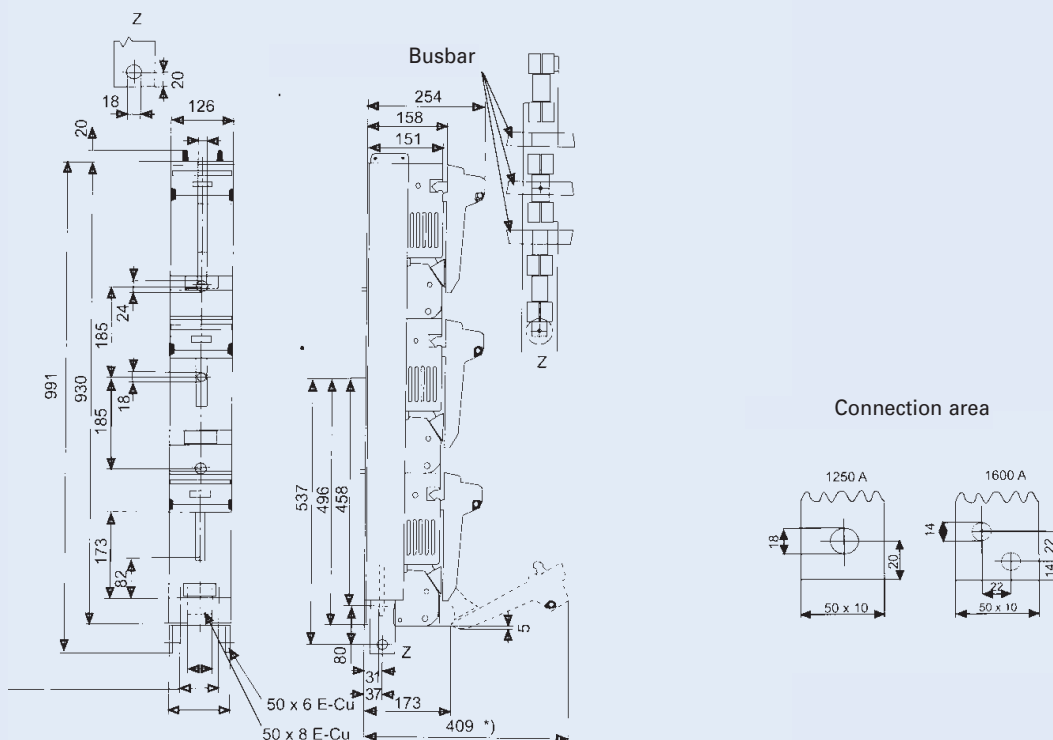
For types and art. numbers see page 88, 89

Vertical Fuse Disconnectors LTS-LG size 4a

Technical Data

| | LTS-LG 1250/4a-B(T) | LTS-LG 1600/4a-B(T) |
|--|---------------------|---------------------|
| Electrical: | | |
| Technical data according to | EN 60947 | EN 60947 |
| Rated operational voltage U_e | 690 V AC | 690 V AC |
| Size | 4a | 4a |
| Number of poles / phases | 3 | 3 |
| Conventional free air thermal current with NH-fuse-links I_{th} | 1250 A | 1600 A |
| Max. permitted nominal power loss of NH-fuse-links | 110 W | 140 W |
| Conventional free air thermal current with solid-links I_{th} | 1250 A | 1600 A |
| Max. permitted nominal power loss of solid-links | 42 W | 42 W |
| Utilization category AC-22B | | |
| Rated operational voltage U_e | 400 V AC | – |
| Rated operational current I_e | 1250 A | – |
| Utilization category AC-21B | | |
| Rated operational voltage U_e | – | 400 V AC |
| Rated operational current I_e | – | 1600 A |
| Rated insulation voltage U_i | 1000 V | 1000 V |
| Rated impulse withstand voltage U_{imp} | 8 kV | 8 kV |
| Rated frequency | 50–60 Hz | 50–60 Hz |
| Rated duty | uninterrupted duty | uninterrupted duty |
| Rated short-circuit making capacity I_{cm} with solid-links | 68 kA | 68 kA |
| Rated conditional short circuit current in case of protection with fuses | 50 kA (400 V AC) | 31,5 kA (400 V AC) |
| Rated short-time withstand current I_{cw} with solid-links | 32 kA/1 s | 32 kA/1 s |
| Power loss without NH-fuse-links | 336 W | 568 W |
| Power loss without solid-links | 336 W at 1000 A | 568 W at 1000 A |
| Mechanical: | | |
| Standard connection | M16 / phase | 2xM12 / phase |
| For busbar max. width | 80 mm | 80 mm |
| Degree of protection | IP20 | IP20 |
| Pollution degree | 3 | 3 |

Dimensions [mm]



For types and art. numbers see page 89

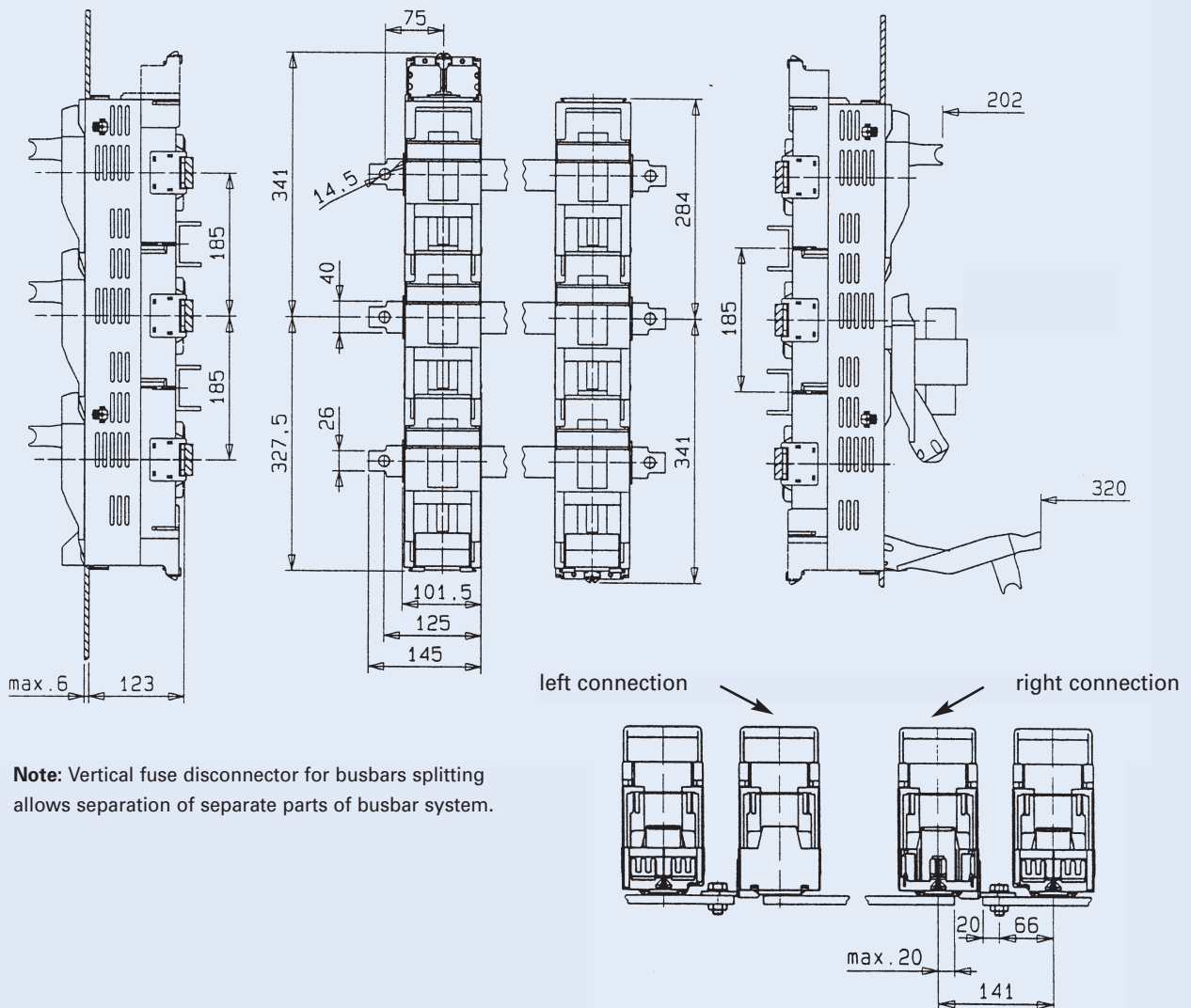
Vertical Fuse Disconnectors for Busbars Splitting LTS-LG

- For NH fuse-links
- Vertical fuse disconnector for busbars splitting allows separation and protection of separate parts of busbar system
- Supplied without NH fuse-links
- Metal parts corrosion-proof
- Two sizes: size 2 (400 A)
size 3 (630 A)
- Universal mounting (right / left output)

Technical Data

| | LTS-LG 400/2-S2 | LTS-LG 630/3-1 |
|------------------------------|-----------------|----------------|
| Electrical: | | |
| Rated voltage U_e | 660 V AC | 660 V AC |
| Rated current I_e | 160 A | 160 A |
| Max. NH fuse-link power loss | 12 W | 48 W |

Vertical Fuse Disconnectors for Busbars Splitting (size 2, 3)

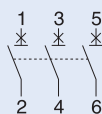


For types and art. numbers see page 89

LZM MCCBs up to 1600 A and LN Switch Disconnectors

- For protection against short circuit and overload
- Both thermal and short-circuit release adjustable
- Breaking capacity is not changed in case of reverse connection of MCCB
- Mounting: vertical, can be rotated by $\pm 90^\circ$ in each axis
- Possibility of mounting of all circuit breakers with identical mounting depth by means of spacers (step 17.5 mm)
- According to EN 60947-2
- Switch disconnectors LN are structurally identical with MCCBs LZM. They are not equipped with overcurrent tripping units (short circuit release and thermal release).
- Releases U/A for remote control can be used

Circuit diagram



Technical data

| | LZM1 / LN1 | LZM2 / LN2 | LZM3 / LN3 | LZM4 / LN4 |
|---|--|--------------------------|--|---|
| Electrical | | | | |
| Rated current I_n | 20-160 A / 63-160 A | 160-300 A / 160-250 A | 320-630 A / 400-630 A | 800 – 1600 A |
| Rated operational voltage U_e | 415 V AC | 415 V AC | 415 V AC | 415 V AC |
| Rated insulation voltage U_i | 690 V AC | 690 V AC | 690 V AC | 690 V AC |
| Rated impulse withstand voltage U_{imp} | | | | |
| main contacts | 6000 V | 6000 V | 6000 V | 6000 V |
| auxiliary contacts | 6000 V | 6000 V | 6000 V | 6000 V |
| Overvoltage category | III / 3 | III / 3 | III / 3 | III / 3 |
| Rated short-circuit making capacity I_{cm} | | | | |
| 240 V | 121 kA / - | 121 kA / - | 187 kA / - | 105 kA / - |
| 400 / 415 V | 76 kA / 2.8 kA | 76 kA / 5.5 kA | 105 kA / 25 kA | 105 kA / 53 kA |
| Rated short-time withstand current I_{cw} | | | | |
| $t = 0,3$ s | - / 2 kA | 1.9 kA / 3.5 kA | 3.3 kA / 12 kA | 19.2 kA / 25 kA |
| $t = 1$ s | - / 2 kA | 1.9 kA / 3.5 kA | 3.3 kA / 12 kA | 19.2 kA / 25 kA |
| Rated ultimate short-circuit breaking capacity I_{cu} of MCCB | | | | |
| 240 V 50/60 Hz | 55 kA | 55 kA | 85 kA | 50 kA |
| 400/415 V 50/60 Hz | 36 kA | 36 kA | 50 kA | 50 kA |
| Rated service short-circuit breaking capacity I_{cs} of MCCB | | | | |
| 240 V 50/60 Hz | 27.5 kA | 27.5 kA | 42.5 kA | 25 kA |
| 400/415 V 50/60 Hz | 18 kA | 18 kA | 25 kA | 25 kA |
| Maximum back-up fuse gG/gL | | | | |
| Circuit breaker | $I_n \leq 100$ A: 200 A gG/gL $I_n \geq 125$ A: 315 A gG/gL | 355 A gG/gL | $I_n \leq 400$ A: 400 A gG/gL $I_n \leq 630$ A: 630 A gG/gL | $I_n \leq 1250$ A: 2x630 A $I_n = 1600$ A: 2x800 A |
| Switch disconnector | $I_n \leq 125$ A: 125 A gG/gL $I_n = 160$ A: 160 A gG/gL | 250 A gG/gL | 630 A gG/gL | 2 x 800 A gG/gL |
| Endurance mechanical | 10000 operating cycles | 10000 operating cycles | 7500 operating cycles | 5000 operating cycles |
| Maximum frequency of switching cycles | 30 / 120 op. cycles/hod. | 30 / 120 op. cycles/hod. | 30 / 60 op. cycles/hod. | 30 / 60 op. cycles/hod. |
| Endurance electrical | | | | |
| AC-1 400/415 V 50/60 Hz | 5000 operating cycles | 5000 operating cycles | 2500 operating cycles | 1500 operating cycles |
| MCCB power loss per pole ¹⁾ | 16.7 W / 12.7 W | 19 W / 16 W | 40 W / 40 W | 97 W / 97 W |
| Total disconnection time at short circuit | < 10 ms / - | < 10 ms / - | < 10 ms / - | < 25 ms / - |

¹⁾ For power loss the given values are linked to maximum rated current (160 A / 300 A / 630 A / 1600 A).

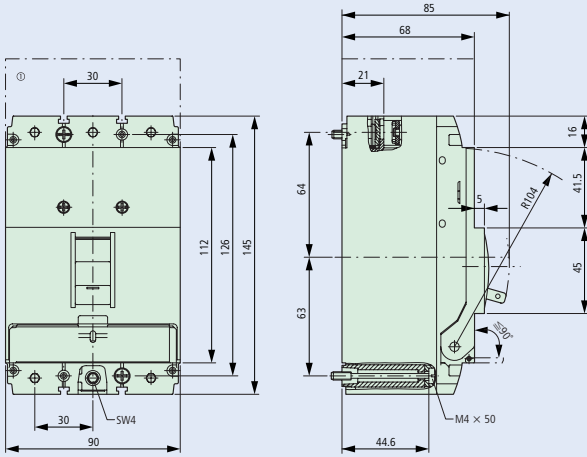
Mechanical:

| | | | | |
|---------------------------|--|--|------------------------|-------------------------|
| Frame size | 45 mm | 95 mm | 95 mm | 117 mm |
| Connecting terminals | Clamp type | M8 bolt connection | M10 bolt connection | M10 bolt connection |
| Terminal capacity | | | | |
| 1 conductor | 2.5–70 mm ² | 2.5–185 mm ² | 35–240 mm ² | 120–240 mm ² |
| 2 conductors | 4–25 mm ² | 25–70 mm ² | 4–120 mm ² | 95–180 mm ² |
| Ambient temperature range | -25 to +70 °C | -25 to +70 °C | -25 to +70 °C | -25 to +70 °C |
| Mounting | 4 pcs. of M4 on DIN rail using NZM1-XC35 | 4 pcs. of M4 on DIN rail using NZM2-XC75 | 4 pcs. of M5 | 4 pcs. of M5 |

| Num. of auxiliary switches | LZM1 / LN1 | LZM2 / LN2 | LZM3 / LN3 | LZM4 / LN4 |
|----------------------------|------------|------------|------------|------------|
| HIN | 1 | 2 | 3 | 3 |
| HIA | 1 | 1 | 1 | 2 |

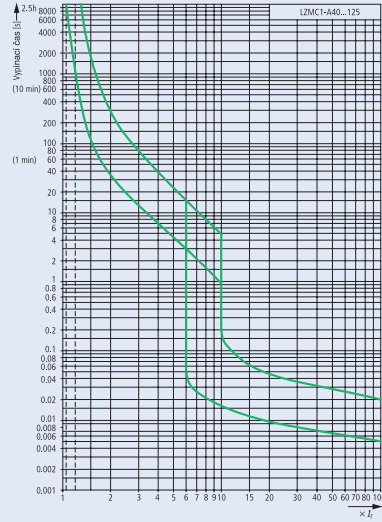
LZM1 MCCBs and LN1 Switch Disconnectors

Dimensions [mm]



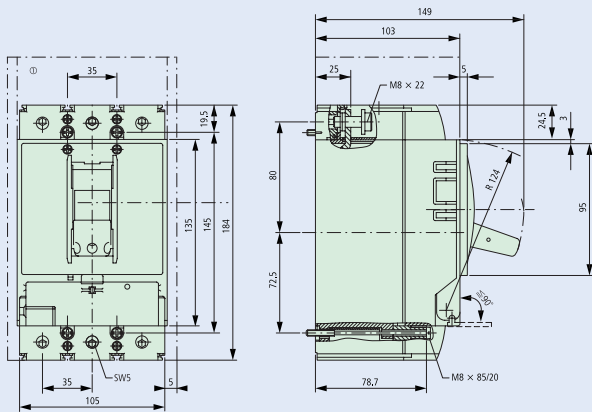
① Removable terminal cover

LZM1 circuit breaker tripping characteristic



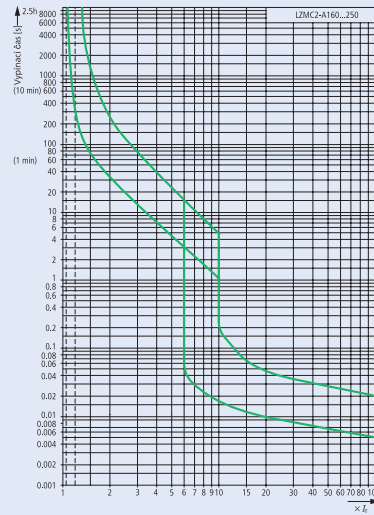
LZM2 MCCBs and LN2 Switch Disconnectors

Dimensions [mm]



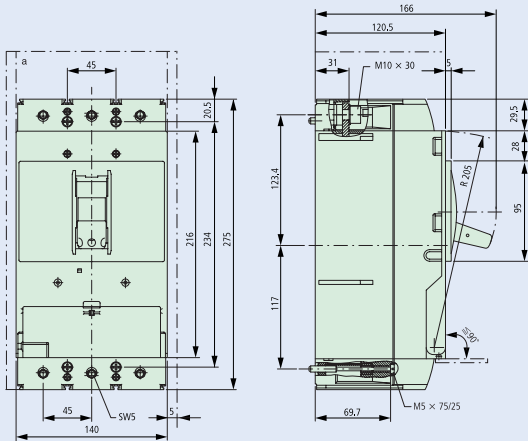
① Removable terminal cover

LZM2 circuit breaker tripping characteristic

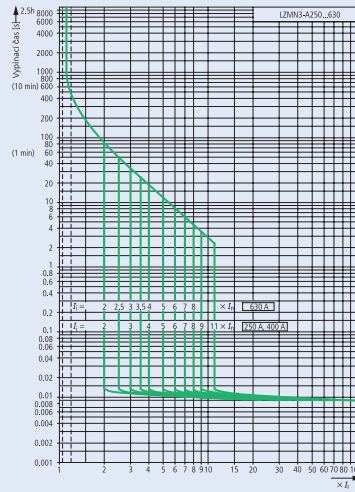


LZM3 MCCBs and LN3 Switch Disconnectors

Dimensions [mm]



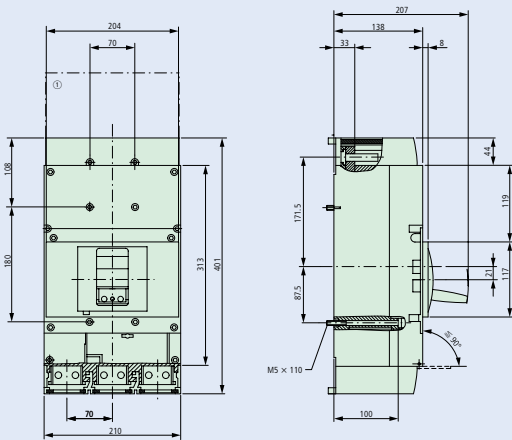
LZM3 circuit breaker tripping characteristic



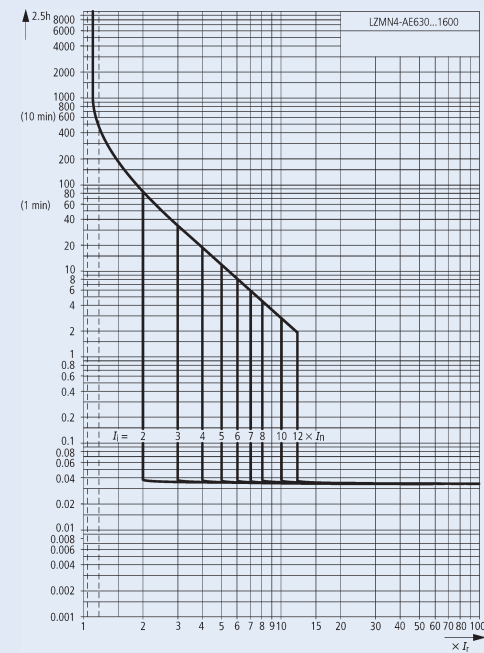
Note: Tripping characteristics of LZM3 are in lines because this MCCB is equipped with electronic releases (toleration area is not taken into account)

LZM4 MCCBs and LN4 Switch Disconnectors

Dimensions [mm]



LZM4 circuit breaker tripping characteristic



Detailed information about accessories of LZM see catalogue "Circuit-breakers and switch-disconnectors".

For types and art. numbers see page 94, 95



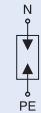
SPD Class T1 (I, B), Lightning Current Arrester SPI

- Field of application: For the protection of low voltage distribution systems against direct lightning stroke into the overhead power supply line or external lightning protection system (IEC 61024-1, IEC 61312-1).
- Application according to HD 60364-5-534
- SPD class **B** basically in accordance with VDE 0675, Part 6/A3 11.97
- Test class **I** in accordance with EN 61643-11
- SPD-type **T1** in accordance with EN 61643-11
- Capsuled version: during the discharge process, the device does not issue any hot ionised gases. Therefore, there is no need for keeping a safety distance to flammable materials and conductive parts.

Practical Hint

Installation of lightning current arresters upstream of the meter is subject to coordination with the relevant power supply company. Installation of an effective protection cascade (SPD classes T1 (I, B), T2 (II, C), T3 (III, C)) requires coordinated application of the respective protective devices. This is ensured by a defined line length between protective devices. When using lightning current arresters of type SPI in connection with surge arresters SPC with a maximum continuous operating voltage U_c of 460 V AC, no specific line length or decoupling coils are required. In case of building supply via underground cable and, in addition, there is no risk of direct lightning stroke it can be sufficient to use SPD class T2 (II, C) only. It is recommended, however, to use also SPD class T1 (I, B).

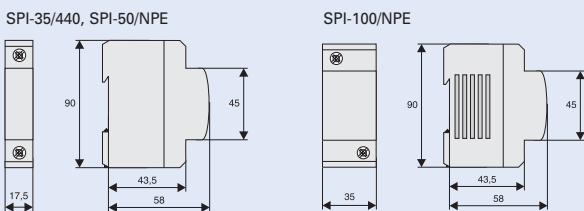
Technical Data

| | SPI-35/440 | SPI-50/NPE | SPI-100/NPE |
|--|---|---|---|
| Electrical: | | | |
| Design | capsuled | capsuled | capsuled |
| Responding time t_r | < 100 ns | < 100 ns | < 100 ns |
| Voltage protection level U_p | 1.5 kV | 1.5 kV | 1.5 kV |
| Maximum continuous operating voltage U_c | 440 V AC | 260 V AC | 260 V AC |
| Temporary overvoltage test value U_T (200 ms) (5 s) | – | 1200 VAC | 1200 VAC |
| Frequency | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Impulse current (8/20) μs I_{max}/I_n | 35 kA | 50 kA | 100 kA |
| Impulzní proud I_{imp} (10/350) μs | | | |
| Peak current | 35 kA | 50 kA | 100 kA |
| Charge Q | 17.5 As | 25 As | 50 As |
| Specific energy | 305 kJ/Ω | 625 kJ/Ω | 2500 kJ/Ω |
| Insulation resistance R_{ISO} | >10 MΩ | >10 MΩ | >10 MΩ |
| Short-circuit current quenching capability I_{fi} without back-up fuse | 3 kA _{r.m.s.} /260 V 1.5 kA _{r.m.s.} /440 V | 500 A _{r.m.s.} /260 V | 100 A _{r.m.s.} /260 V |
| Short-circuit current strength at max. back-up fuse | 25 kA _{r.m.s.} | – | – |
| Maximum back-up fuse | 125 AgL | – | – |
| Connection diagram |  |  |  |

Mechanical:

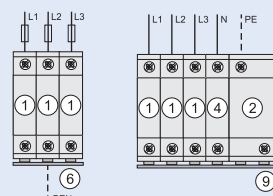
| | | | |
|--|--------------------------------------|--|--|
| Frame size | 45 mm | 45 mm | 45 mm |
| Device height | 90 mm | 90 mm | 90 mm |
| Device width | 17.5 mm | 17.5 mm | 35 mm |
| Weight | 174 g | 178 g | 320 g |
| Upper and lower lift terminal capacity | rigid flexible | 0.5–35 mm ² 0.5–25 mm ² | 10–50 mm ² 16–35 mm ² |
| Tightening torque of terminal screws | 4–4.5 Nm | 4–4.5 Nm | 6–8 Nm |
| Mounting | quick fastening on DIN rail EN 50022 | | |
| Degree of protection acc. to IEC 60529 | IP20 (IP40) | | |
| Accessories: busbars | Z-GV-U/ | | |
| Permitted relative air humidity | < 95 % | | |
| Permitted ambient temperature | -40 °C to +85 °C | | |

Dimensions [mm]



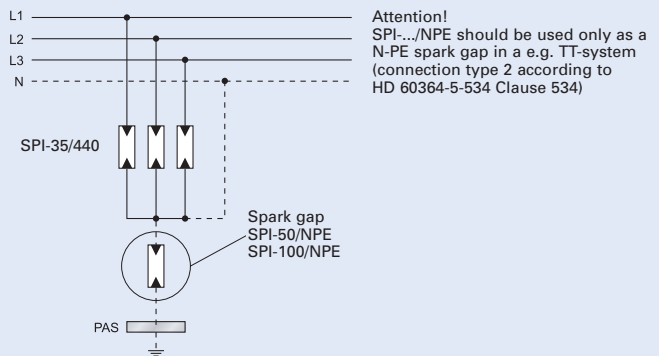
Lightning current arrester Sets, Lightning protection classes I, II, III, IV

SPI-35/440/3 SPI-3+1



- ① ... SPI-35/440
- ② ... SPI-100/NPE
- ④ ... SPB-D-125
- ⑥ ... Z-GV-U/3
- ⑨ ... Z-GV-U/6

Application Example



SPI-50/NPE: for protection class III, IV according to EN 62305-1

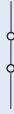
SPI-100/NPE: for protection class I, II, III, IV according to EN 62305-1

For types and art. numbers see page 98

Lead-Through Terminal for Surge Protective Devices, Class T1 (I, B), SPB-D-125

- Suitable for simplification of connection of SPDs.

Connection diagram



Technical Data

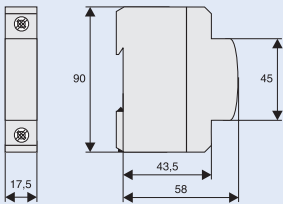
Electrical:

| | |
|-------------------------------------|--|
| Design basically in accordance with | IEC 61643-1: 1998-02, DIN VDE 0675 part 6: 1989-11, IEC 61024-1: 1990-03, EN 60947-7-1: 1989-10, DIN VDE 0110-1: 1997-04 |
| Rated voltage U_C | 500 V AC/DC |
| Rated current I_n | 125 A / 30 °C |
| Impulse current (10/350) μ s | |
| Peak current | 100 kA |
| Charge Q | 50 As |
| Specific energy | 2.5 MJ/ Ω |
| Overvoltage category | III |

Mechanical:

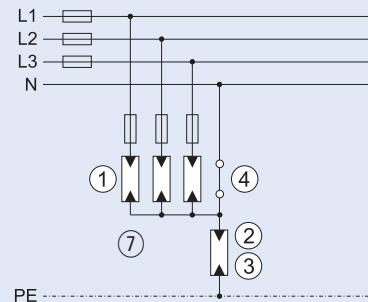
| | |
|--------------------------------------|---------------------------------|
| Frame size | 45 mm |
| Device height | 90 mm |
| Device width | 17.5 mm |
| Mounting | quick fastening on DIN rail |
| Upper and lower terminals | lift and open-mouthed terminals |
| Terminal capacity | |
| rigid | 0.5–35 mm ² |
| flexible | 0.5–25 mm ² |
| Tightening torque of terminal screws | 4–4.5 Nm |
| Permitted relative air humidity | < 95 % |
| Pollution degree | 2 |
| Resistance to climatic conditions | F / DIN 40040 |
| Temperature range | -40 to +85 °C |

Dimensions [mm]



Connection type 2 according to HD 60364-5-534

Utilization of SPB-D-125 - see page 275



Busbars Z-GV-U

- Busbars Z-GV-U/ permit to implement customary SPD combinations
- Suitable for SPB-D-125, SPI
- The rated cross-section of Z-GV is 16 mm²
- The busbars must be cut to length in some cases

Technical Data

Electrical:

| | |
|---------------|---------------------|
| Rated voltage | 230/400 V, 50/60 Hz |
| Rated current | 63 A |

Mechanical:

| | |
|----------------------|-----------------------|
| Busbar cross section | 16 mm ² Cu |
|----------------------|-----------------------|

Models



Z-GV-U/2



Z-GV-U/3



Z-GV-U/4



Z-GV-U/5



Z-GV-U/6



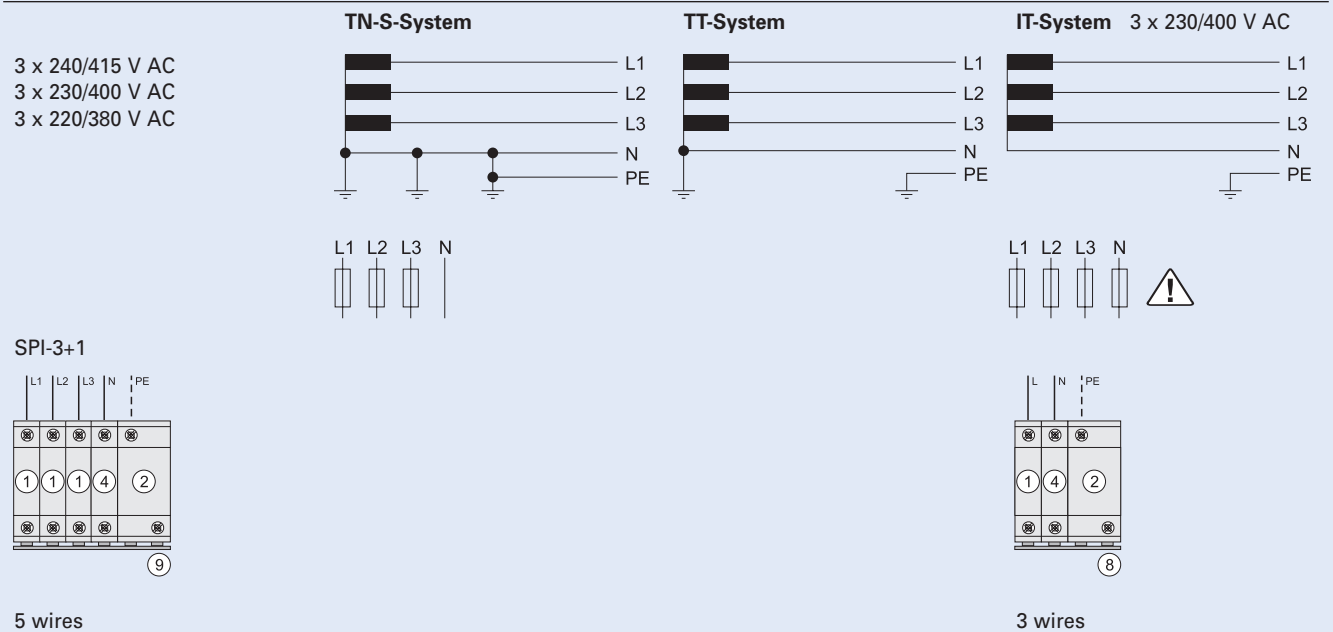
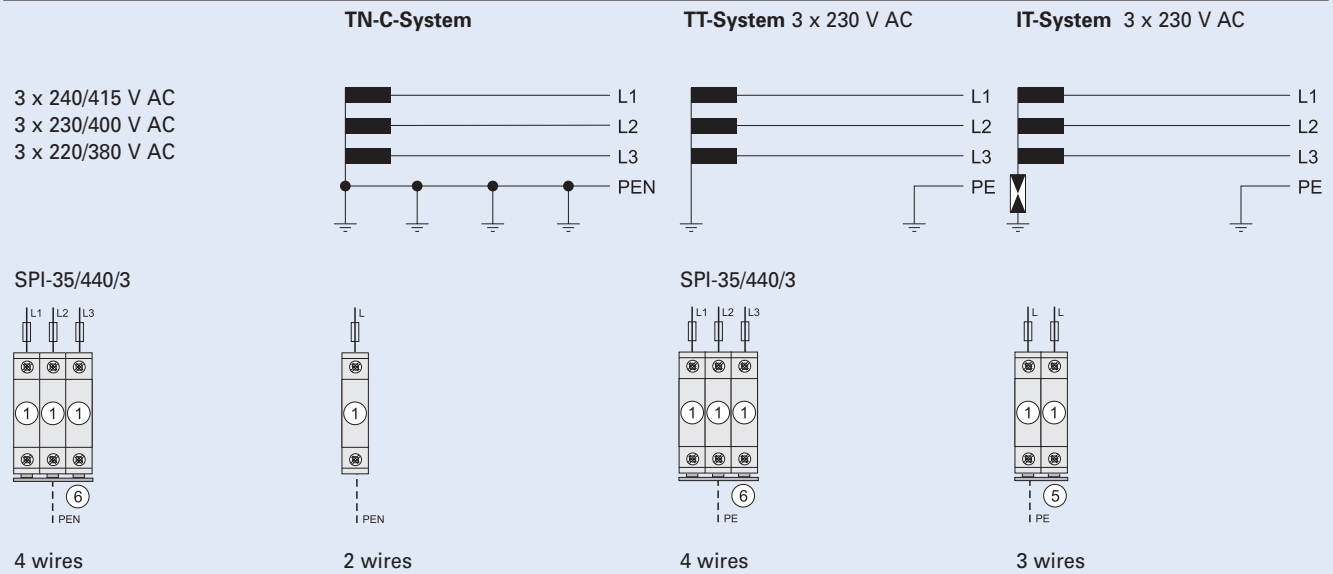
Z-GV-U/8



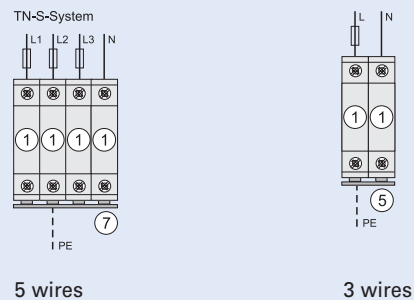
Z-GV-U/9

For types and art. numbers see page 98

Connection examples of SPDs class T1 (I, B) type SPI in different systems (according to HD 60364-5-534)



TN-S-System



Lightning current arrester

- ① ... SPI-35/440
- ② ... SPI-100/NPE (for protection class I, II, III, IV)
- ③ ... SPI-50/NPE (for protection class III, IV)

Lead-through terminal

- ④ ... SPB-D-125

Busbar

- ⑤ ... Z-GV-U/2
- ⑥ ... Z-GV-U/3
- ⑦ ... Z-GV-U/4
- ⑧ ... Z-GV-U/4 at SPI-100/NPE
Z-GV-U/3 at SPI-50/NPE
- ⑨ ... Z-GV-U/6 (Z-GV-U/5 at SPI-50/NPE)

Connection examples of SPDs class T1 (I, B) of type SPI and SPDs class T2 (II, C) without using of decoupling coil in different systems (according to HD 60364-5-534)

Lightning current arrester

- ① ...SPI-35/440
- ⑥ ...SPI-100/NPE
- ③ ...SPI-50/NPE

Surge arrester

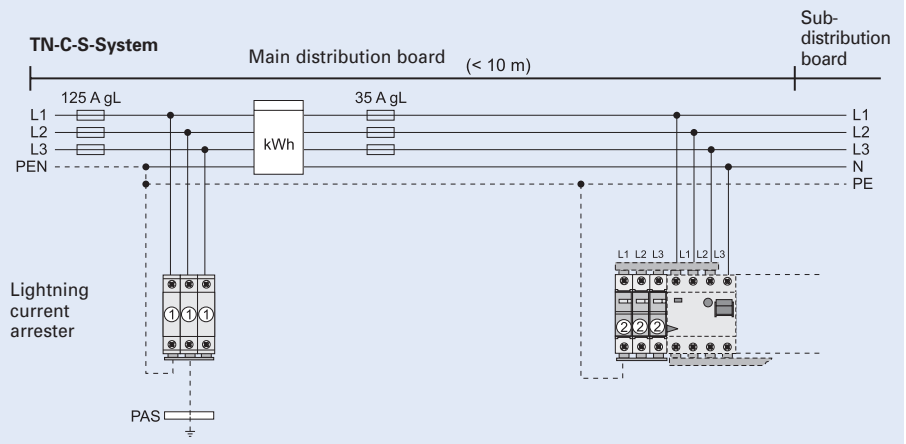
- ② ...SPC-S-20/460/3, SPC-E-460

Lead-through terminal

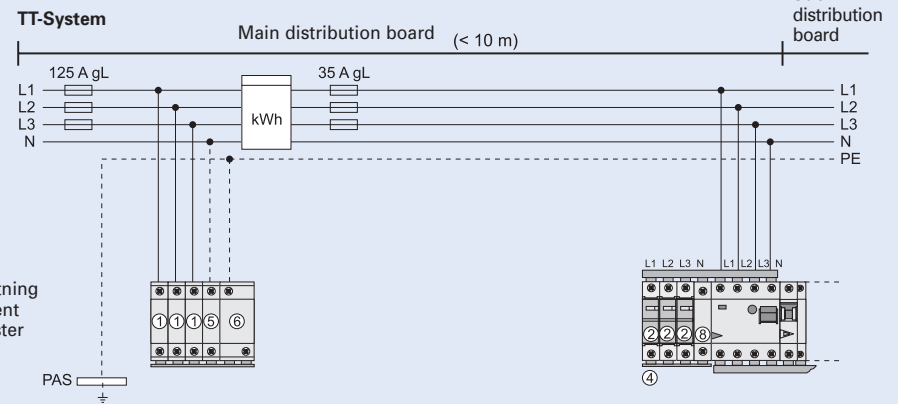
- ⑤ ...SPB-D-125
- ⑧ ...Z-D63

Busbar

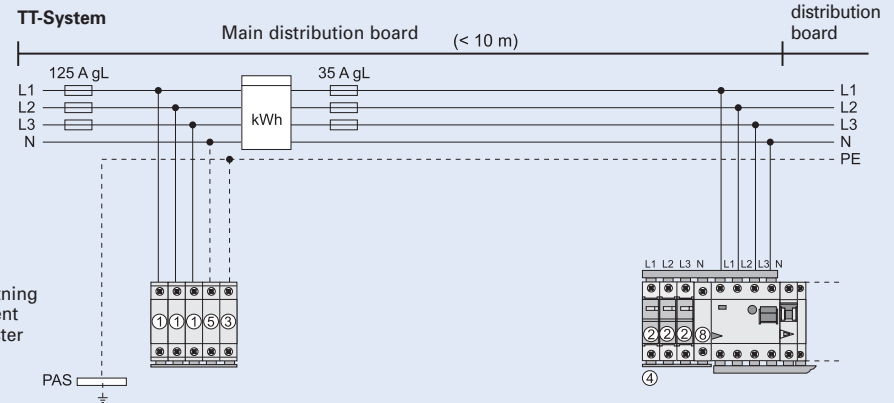
- ④ ...ZV-KSBI-4TE



Protection Class I, II, III, IV



Protection Class III, IV



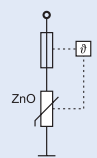

SPD Class T1+T2 (I+II, B+C), Lightning Current Arrester - Surge Arresters SPB-12/280

- For the protection of low voltage distribution systems against transient overvoltage caused by direct and indirect lightning stroke and switching operations.
- Application according to HD 60364-5-534
- Test class **I** and **II** in accordance with EN 61643-11
- SPD-type **T1** and **T2** in accordance with EN 61643-11
- Lightning protection classes III and IV in accordance with EN 62305-1

Connection diagram



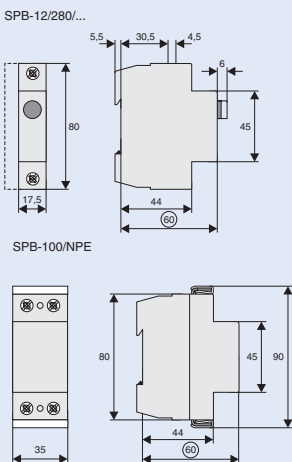
Technical Data

| | SPB-12/280 | SPB-100/NPE |
|---|---|--|
| Electrical: | | |
| Responding time (rate of voltage rise 5 kV/μs) | < 25 ns | < 100 ns |
| Voltage protection level at nominal discharge current | < 1.5 kV | < 1.5 kV |
| Maximum continuous operating voltage U_C | 280 V AC | 255 V AC |
| Temporary overvoltage test value U_T | 370 VAC (5 s) | 1200 VAC (200 ms) |
| Rated frequency | 50/60 Hz | 50/60 Hz |
| Nominal discharge current (8/20) μs I_n | 25 kA | 100 kA |
| Maximum discharge current I_{max} (8/20) μs | 50 kA | 100 kA |
| Voltage protection level at 5 kA (8/20) μs | 950 V | - |
| Impulse current I_{imp} (10/350) μs | | |
| Peak current | 12,5 kA | 100 kA |
| Charge Q | 6.25 As | 50 As |
| Specific energy | 39.1 kJ/Ω | 2500 kJ/Ω |
| Open circuit voltage U_{OC} | 10 kV | - |
| Follow current interrupt rating I_{fi} | - | 100 A _{r.m.s} |
| Maximum back-up fuse | 160 AgL/gG | - |
| Maximum short-circuit current | 50 kA _{r.m.s} | - |
| Connection diagram |  |  |

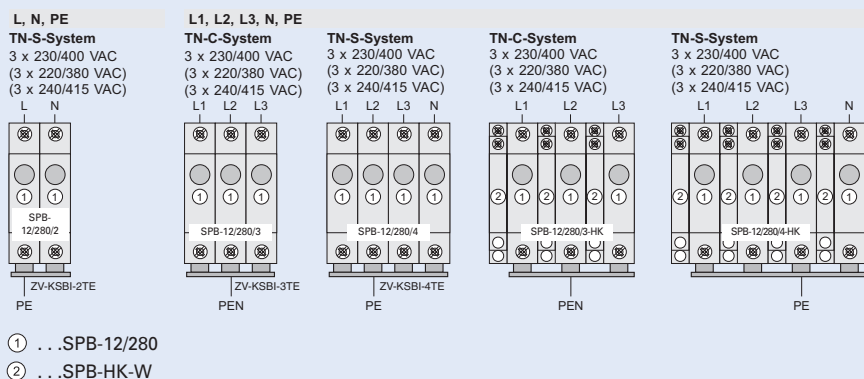
Mechanical:

| | | |
|---|---|----------------------|
| Frame size | 45 mm | 45 mm |
| Device height | 80 mm | 80 mm |
| Device width | 17.5 mm | 35 mm |
| Weight | 121 g | 250 g |
| Permitted ambient temperature | -40 °C to +70 °C | -40 °C to +70 °C |
| Degree of protection | IP40 | IP40 |
| Upper and lower lift terminal capacity | 4–25 mm ² | 4–35 mm ² |
| Upper and lower open mouthed terminals for busbar thickness up to | 1.5 mm | 1.5 mm |
| Tightening torque of terminal screws | 2.4–3 Nm | 2.4–3 Nm |
| Mounting | Quick fastening on DIN rail according to EN 60715 | |
| Accessories: busbars 16 mm ² auxiliary switch | Type ZV-KSBI ... | SPB-HK-W |

Dimensions [mm]



Lightning current arrester - surge arrester Sets



For types and art. numbers see page 99

Set consisting of SPD class T1 (I, B) and SPD class T2 (II, C), SP-B+C/3

- Combination of SPDs class T1 (I, B) and class T2 (II, C) is designed for protection of buildings, especially buildings with external protection against lightning stroke (lightning conductor) and buildings which are supplied with overhead cable.

Scope of delivery of the set

SP-B+C/3 (TN-C)

- 3 pieces of SPI-35/440 lightning current arrester
- 1 piece of SPC-S-20/460/3 surge arrester
- including busbar

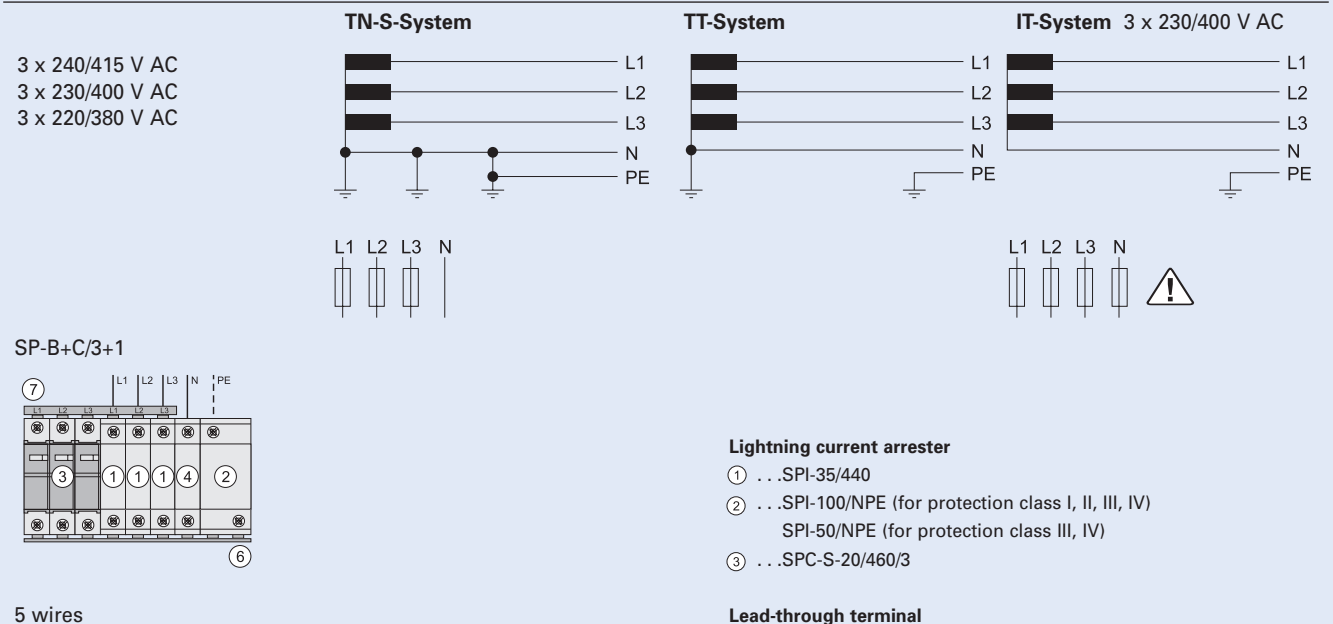
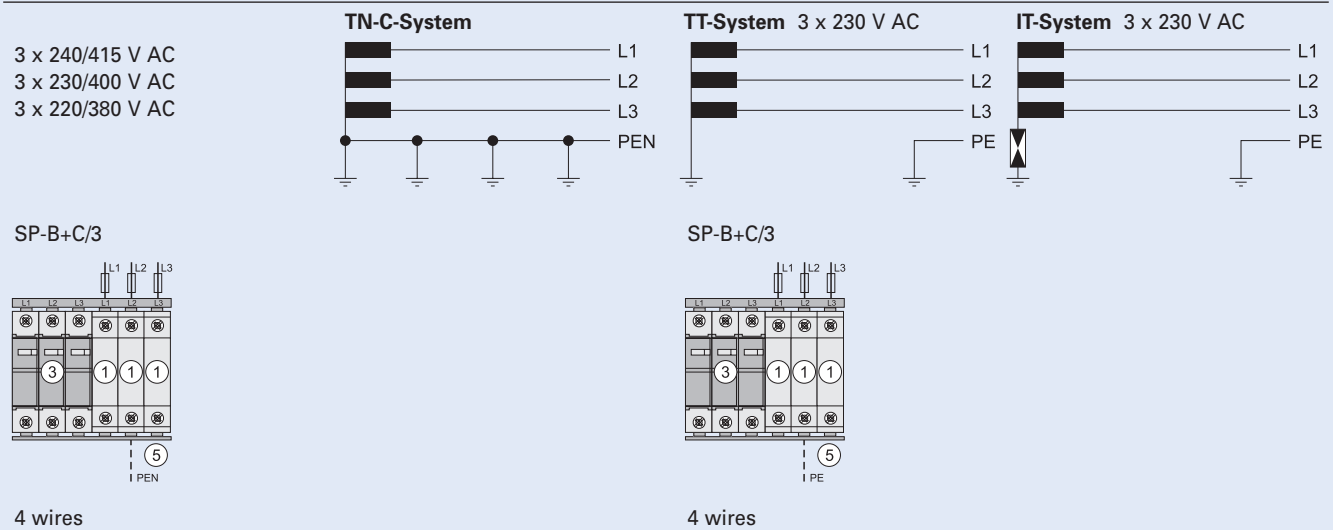
SP-B+C/3+1 (TN-S)

- 3 pieces SPI-35/440 lightning current arrester
- 1 piece SPI-100/NPE sum sparring gap
- 1 piece SPB-D-125 lead-through terminal
- 1 piece SPC-S-20/460/3 surge arrester
- including busbar

Connection examples of SPDs T1 + T2 (I + II, B + C) in different systems

SPD Class T1 + T2 (I + II, B + C)

SPI B SPC C



Lightning current arrester

- ① ... SPI-35/440
- ② ... SPI-100/NPE (for protection class I, II, III, IV)
SPI-50/NPE (for protection class III, IV)
- ③ ... SPC-S-20/460/3

Lead-through terminal

- ④ ... SPB-D-125

Busbar

- ⑤ ... Z-GV-U/6
- ⑥ ... Z-GV-U/9
- ⑦ ... Z-GV-16/3P-3TE/6

For types and art. numbers see page 99

SPD Class T2 (II, C), Surge Arresters SPC-E

- Field of application:
For the protection of low voltage distribution systems against transient overvoltage caused by indirect lightning stroke and switching operations.
- SPD class **C** according to ÖVE-SN 60 Part 1 / Part 4
- Test class **II** according to EN 61643-11
- SPD-type **T2** according to EN 61643-11

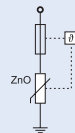
Connection diagram



Technical Data

| | SPC-E-280 | SPC-E-N/PE |
|---|-----------|------------|
| Electrical: | | |
| Responding time (rate of voltage rise 5 kV/μs) | < 25 ns | < 100 ns |
| Voltage protection level at nominal discharge current I_n | < 1.4 kV | < 1 kV |
| Voltage protection level at 5 kA (8/20) μs | 1000 V | – |
| Maximum continuous operating voltage U_c | 280 V AC | 260 V AC |
| Maximum continuous operating voltage | 50/60 Hz | 50/60 Hz |
| Nominal discharge current I_n at (8/20) μs | 20 kA | 20 kA |
| Charge Q at I_n | 0.57 As | 0.57 As |
| Specific energy at I_n | 5.7 kJ/Ω | 5.7 kJ/Ω |
| Maximum discharge current I_{max} | 40 kA | 40 kA |
| Maximum back-up fuse | 125 AgL | – |
| Maximum short-circuit current | 50 kA | – |
| Short-circuit current quenching capability at U_c and I_n | – | 100 A |

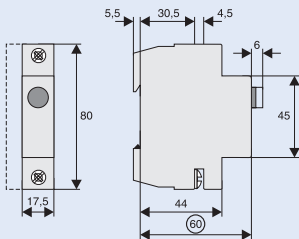
Connection diagram



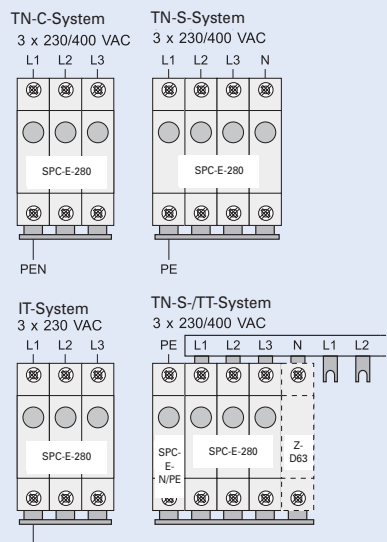
Mechanical:

| | |
|---|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 17.5 mm |
| Weight | 97 g |
| Permitted ambient temperature | -40 °C to +70 °C |
| Degree of protection IEC 60529 (built-in) | IP40 |
| Upper and lower lift terminal capacity | 4–25 mm ² |
| Upper and lower open mouthed terminals for busbar thickness up to | 1.5 mm |
| Tightening torque of terminal screws | 2.4–3 Nm |
| Mounting | Quick fastening on DIN rail according to EN 60715 |
| Accessories: busbars 16 mm ² | ZV-KSBI |

Dimensions [mm]



Application Examples SPC-E according to HD 60364-5-534



- ① ...SPB-12/280
- ② ...SPB-HK-W

For types and art. numbers see page 100

SPD Class T2 (II, C), Plug-in Surge Arresters SPC-S

- For the protection of low voltage distribution systems against transient overvoltage caused by indirect lightning stroke and switching operations.
- SPD class **C** according to ÖVE-SN 60 Part 1 / Part 4
- Test class **II** according to EN 61643-11
- SPD-type **T2** according to EN 61643-11
- Auxiliary switch SPC-S-HK for remote message transmission can be mounted onto the device

Connection diagram



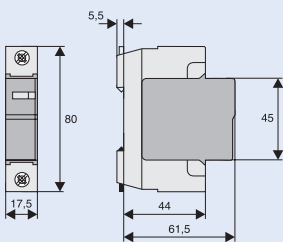
Technical Data

| | SPC-S-20/280 | SPC-S-20/460 | SPC-S-N/PE |
|--|--------------|--------------|--------------------|
| Electrical: | | | |
| Mechanical coding | x | x | y |
| Responding time (rate of voltage rise 5 kV/μs) | < 25 ns | < 25 ns | < 100 ns |
| Voltage protection level at nominal discharge current I_n / U_{oc} | < 1.4 kV | < 2.2 kV | < 1.0 kV |
| Voltage protection level at 5 kA (8/20) μs | 1000 V | 1700 V | - |
| Maximum continuous operating voltage U_c | 280 V AC | 460 V AC | 260 V AC |
| Temporary overvoltage test value U_T (5 s) | 350 V AC | 580 V AC | 1200 V AC (200 ms) |
| Rated frequency | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Open circuit voltage U_{oc} | 10 kV | - | - |
| Nominal discharge current I_n (8/20) μs | 20 kA | 20 kA | 20 kA |
| Charge Q at I_n | 0.57 As | 0.57 As | 0.57 As |
| Specific energy at I_n | 5.7 kJ/Ω | 5.7 kJ/Ω | 5.7 kJ/Ω |
| Maximum discharge current I_{max} | 40 kA | 40 kA | 40 kA |
| Short-circuit current quenching capability at U_c and I_n | - | - | 100 A |
| Maximum short-circuit current | 50 kA | 50 kA | - |
| Maximum back-up fuse | 160 A gL | 160 A gL | 160 A gL |
| Connection diagram | | | |

Mechanical:

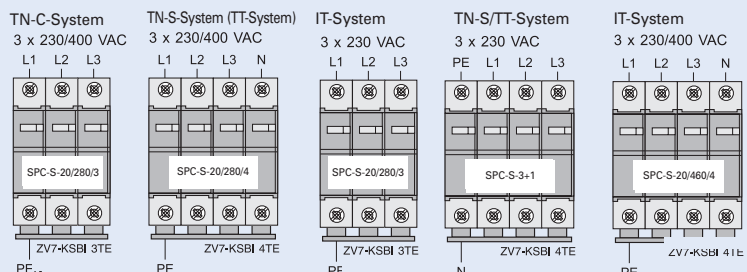
| | |
|--|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | |
| 1-pole | 17.5 mm (1 MU) |
| 1+1-pole | 35 mm (2 MU) |
| 2-pole | 35 mm (2 MU) |
| 3-pole | 52.5 mm (3 MU) |
| 3+1-pole | 70 mm (4 MU) |
| 4-pole | 70 mm (4 MU) |
| Mechanical coding | |
| 1-pole | x |
| 1+1-pole | yx |
| 2-pole | xx |
| 3-pole | xxx |
| 3+1-pole | yxxx |
| 4-pole | xxxx |
| Weight Basey 1P/1+1P/2P/3P/3+1P/4P | 53/120/120/180/240/240 g |
| Weight Complete Devices 1P/1+1P/2P/3P/3+1P/4P | 110/201/220/330/412/440 g |
| Permitted ambient temperature | -40 °C to +70 °C |
| Upper and lower lift terminal capacity | 4–25 mm ² |
| Upper and lower open mouthed terminals for busbar thickness up to 1.5 mm | |
| Tightening torque of terminal screws | 2.4–3 Nm |
| Mounting | Quick fastening on DIN rail according to EN 60715 |
| Accessories: busbars 16 mm ² | ZV-KSBI |

Dimensions [mm]



For types and art. numbers see page 100

Application Examples SPC-S according to HD 60364-5-534



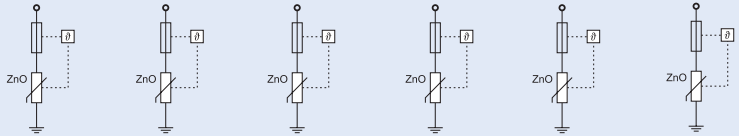
SPD Class T2 (II, C), Plug-in Surge Arresters SPC-S for special voltages

- Variants of arresters SPC-S for special voltages
- For standard application in TN system 230 / 400 V version with rated voltage 230 and 460 V are recommended
- For applications with nonstandard voltage
- Suitable e.g. for IT systems (continuous operating voltage of an arrester must be higher than phase to phase voltage)
- For the protection of low voltage distribution systems against transient overvoltage caused by indirect lightning stroke and switching operations.
- SPD class **C** according to ÖVE-SN 60 Part 1 / Part 4
- Test class **II** according to EN 61643-11
- SPD-type **T2** according to EN 61643-11
- Auxiliary switch SPC-S-HK for remote message transmission can be mounted onto the device

Connection diagram



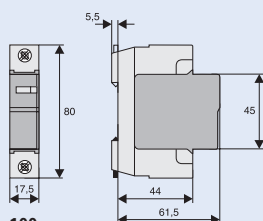
Technical Data

| Inserts | SPC-S-15/75 | -20/130 | -20/175 | -20/335 | -20/385 | -20/580 |
|---|--|----------|----------|----------|----------|----------|
| Electrical: | | | | | | |
| Mechanical coding | x | x | x | x | x | x |
| Responding time (rate of voltage rise 5 kV/μs) | < 25 ns | < 25 ns | < 25 ns | < 25 ns | < 25 ns | < 25 ns |
| Voltage protection level at nominal discharge current I_n | < 550 V | < 800 V | < 1.0 kV | < 1.6 kV | < 1.8 kV | < 2.6 kV |
| Voltage protection level at 5 kA (8/20) μs | 400 V | 550 V | 700 V | 1200 V | 1350 V | 2000 V |
| Maximum continuous operating voltage U_c | 75 V AC | 130 V AC | 175 V AC | 335 V AC | 385 V AC | 580 V AC |
| Temporary overvoltage test value U_T (5 s) | = U_c | = U_c | = U_c | 415 VAC | 415 VAC | = U_c |
| Rated frequency | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Open circuit voltage U_{OC} | - | - | - | 5 kV | - | - |
| Nominal discharge current I_n (8/20) μs | 15 kA | 20 kA | 15 kA | 20 kA | 20 kA | 20 kA |
| Charge Q at I_n | 0.43 As | 0.57 As | 0.57 As | 0.57 As | 0.57 As | 0.57 As |
| Specific energy at I_n | 3.2 kJ/Ω | 5.7 kJ/Ω | 5.7 kJ/Ω | 5.7 kJ/Ω | 5.7 kJ/Ω | 5.7 kJ/Ω |
| Maximum discharge current I_{max} | 30 kA | 40 kA | 40 kA | 40 kA | 40 kA | 40 kA |
| Maximum short-circuit current | 50 kA | 50 kA | 50 kA | 50 kA | 50 kA | 50 kA |
| Maximum back-up fuse | 160 A gL | 160 A gL | 160 A gL | 160 A gL | 160 A gL | 160 A gL |
| Connection diagram |  | | | | | |

Mechanical:

| | |
|--|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | |
| 1-pole | 17.5 mm (1 MU) |
| 1+1-pole | 35 mm (2 MU) |
| 2-pole | 35 mm (2 MU) |
| 3-pole | 52.5 mm (3 MU) |
| 3+1-pole | 70 mm (4 MU) |
| 4-pole | 70 mm (4 MU) |
| Mechanical coding | |
| 1-pole | x |
| 1+1-pole | yx |
| 2-pole | xx |
| 3-pole | xxx |
| 3+1-pole | yxxx |
| 4-pole | xxxx |
| Weight Basey 1P/1+1P/2P/3P/3+1P/4P | 53/120/120/180/240/240 g |
| Weight Complete Devices 1P/1+1P/2P/3P/3+1P/4P | 110/201/220/330/412/440 g |
| Permitted ambient temperature | -40 °C to +70 °C |
| Upper and lower lift terminal capacity | 4–25 mm ² |
| Upper and lower open mouthed terminals for busbar thickness up to 1.5 mm | |
| Tightening torque of terminal screws | 2.4–3 Nm |
| Mounting | Quick fastening on DIN rail according to EN 60715 |
| Accessories: busbars 16 mm ² | ZV-KSBI |

Dimensions [mm]



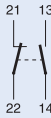
For types and art. numbers see page 100

Auxiliary Switch for Surge Arresters SPB-HK-W

- Field of application:
For mounting onto surge protective devices for external defect message transmission
- Design basically in accordance with EN 60947-5-1
- Can be mounted subsequently to SPD
- Suitable for SPB-12/280, SPC-E

Connection diagram

SPB-HK-W



Technical Data

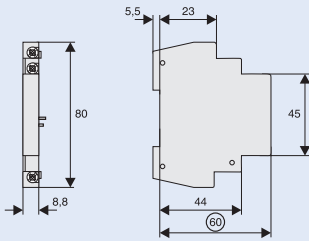
Electrical:

| | |
|--------------------------------|--------------|
| Rated insulation voltage | 250 V |
| Rated frequency | 50/60 Hz |
| Switching contact | |
| SPB-HK-W | 1 NC + 1 NO |
| Minimum voltage per contact | 24 V AC |
| Rated operational current AC12 | 2 A/250 V AC |
| Maximum back-up fuse | 2 A gL |
| Overvoltage category | IV |
| Pollution degree | 2 |

Mechanical:

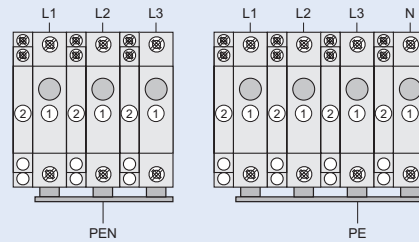
| | |
|--------------------------------------|----------------------------|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 8.8 mm |
| Weight | 41 g |
| Mounting | SPB-12/280, SPC-E |
| Degree of protection of terminals | finger and hand touch safe |
| Upper and lower terminals | lift terminals |
| Terminal capacity | 2 x 2.5 mm ² |
| Tightening torque of terminal screws | 0.8–1 Nm |
| Degree of protection, built-in | IP40 |

Dimensions [mm]



For types and art. numbers see page 99

Application Examples



Auxiliary Switch for Surge Arresters SPC-S-HK

- Field of application:
For mounting onto surge protective devices for external defect message transmission
- Design basically in accordance with EN 60947-5-1
- Can be mounted subsequently
- Suitable for SPC-S, SPD-S-1+1

Connection diagram



Technical Data

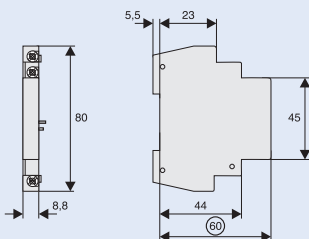
Electrical:

| | |
|--------------------------------|--------------|
| Rated insulation voltage | 250 V |
| Rated frequency | 50/60 Hz |
| Switching contact | 1 CO |
| Minimum voltage per contact | 24 V AC |
| Rated operational current AC12 | 2 A/250 V AC |
| Maximum back-up fuse | 2 A gL |
| Overvoltage category | IV |
| Pollution degree | 2 |

Mechanical:

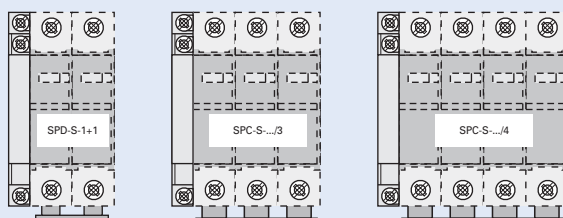
| | |
|--------------------------------------|------------------------------|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 8.8 mm |
| Weight | 41 g |
| Mounting | screw-mounting onto SPC-S-S. |
| Degree of protection of terminals | finger and hand touch safe |
| Upper and lower terminals | lift terminals |
| Terminal capacity | 2 x 2.5 mm ² |
| Tightening torque of terminal screws | 0.8–1 Nm |
| Degree of protection, built-in | IP40 |

Dimensions [mm]



For types and art. numbers see page 100

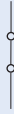
Application Examples



Lead-Through Terminal for Surge Protective Devices, Class T2 (II, C): Z-D63

- The lead-through terminal permits orderly wiring of SPDs of class T2 (II, C)
- 1-pole
- Suitable for standard busbar connection to all Xpole devices

Connection diagram



Technical Data

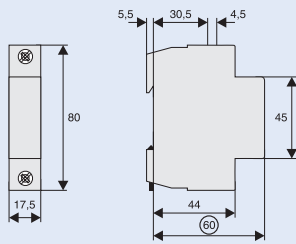
Electrical:

| | |
|-----------------|-------------|
| Rated voltage | 500 V AC/DC |
| Rated current | 63 A |
| Rated frequency | 50/60 Hz |

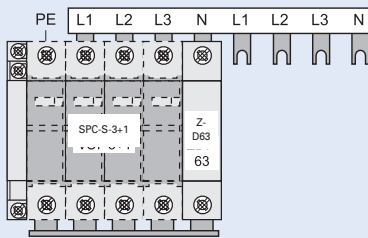
Mechanical:

| | |
|---|---|
| Frame size | 45 mm |
| Device height | 80 mm |
| Device width | 17.5 mm |
| Mounting | quick fastening on DIN rail EN 60715 |
| Degree of protection, built-in | IP40 |
| Degree of protection of terminals | finger and hand touch safe |
| Upper and lower terminals | lift and open-mouthed terminals |
| Terminal capacity | 1–25 mm ² |
| Busbar thickness | 0.8–2 mm |
| Tightening torque of terminal screws | 2.4–3 Nm |

Dimensions [mm]



Application Example / Connection type 2 acc. to HD 60364-5-534



For types and art. numbers see page 101

Busbars ZV-KSBI

- Busbars ZV-KSBI permit to implement customary SPD combinations
- Suitable for SPC-..., Z-D63
- The rated cross-section of ZV-KSBI is 16 mm²
- The busbars must be cut to length in some cases

Technical Data

Electrical:

| | |
|---------------|---------------------|
| Rated voltage | 230/400 V, 50/60 Hz |
| Rated current | 63 A |

Mechanical:

| | |
|----------------------|-----------------------|
| Busbar cross section | 16 mm ² Cu |
|----------------------|-----------------------|

Models



ZV-KSBI-2TE



ZV-KSBI-3TE



ZV-KSBI-4TE



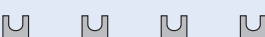
ZV-KSBI-5TE



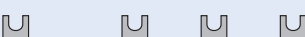
ZV-KSBI-5TE/N



ZV-KSBI-7TE



ZV-KSBI-7TE/N



ZV-KSBI-9TE/N



ZV-KSBI-11TE

1 2 3 4 5 6 7 8 9 10 11

For types and art. numbers see page 101

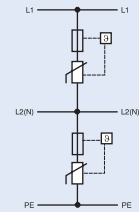
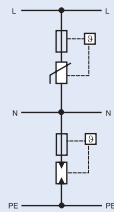
SPD Class T3 (III, D), Surge Protective Device SPD-S-1+1 (set), SPD-S-280/2

- Field of application:
For fine protection of user equipment against transient overvoltage
- For mounting on DIN rails in distribution boxes for electrical installation EN 60715
- No decoupling from upstream surge protection of the consumer system required - SPD class T2 (II, C)
- SPD class **D** basically in accordance with ÖVE-SN 60 Part 1, 4
- Test class **III** according to EN 61643-11
- SPD-type **T3** according to EN 61643-11
- Suitable for high back-up fuse 63 A gL / C 63
- Auxiliary switch SPC-S-HK for remote message transmission can be mounted onto the device

Technical Data

| | SPD-S-1+1 | | SPD-S-280/2 | |
|--|--|--|---|--|
| Electrical: | | | | |
| Mechanical coding | y / x | | x / x | |
| Test class according (to IEC 61643-1) | III | | III | |
| Test class basically in accordance (with ÖVE-SN 60, Part 1) | D | | D | |
| Responding time (rate of voltage rise 5 kV/μs) L-N / N-PE / L-PE | < 25 ns / < 100 ns / < 100 ns | | L1-L2(N) / L2(N)-PE / L1-PE < 25 ns | |
| Max. continuous operating voltage U_C L-N / N-PE | 335 V AC / 260 V AC | | L1-L2(N) / L2(N)-PE 280 V AC | |
| Temporary overvoltage test value U_T (5 s) L-N/L-PE | 350 V AC / 416 V AC | | L-N/L-PE 350 V AC / 416 V AC | |
| (200 ms) N-PE | 1200 V AC | | N-PE 1200 V AC | |
| Rated frequency | 50/60 Hz | | 50/60 Hz | |
| Open circuit voltage U_{OC} L-N / N-PE / L-PE | 5 kV | | L1-L2(N) / L2(N)-PE / L1-PE 10 kV | |
| Voltage protection level U_p at U_{OC} L-N / N-PE / L-PE | ≤ 1000 V / ≤ 900 V / ≤ 1000 V | | L1-L2(N) / L2(N)-PE ≤ 950 V | |
| Nominal discharge current I_n L-N / N-PE / L-PE | 2.5 kA (8/20) μs | | L1-L2(N) / L2(N)-PE 5 kA (8/20) μs | |
| Voltage protection level U_p at I_n L-N / N-PE / L-PE | ≤ 1000 V / ≤ 700 V / ≤ 1000 V | | L1-L2(N) / L2(N)-PE ≤ 950 V | |
| Maximum discharge current I_{max} L-N / N-PE / L-PE | 10 kA (8/20) μs | | L1-L2(N) / L2(N)-PE / L1-PE 10 kA (8/20) μs | |
| Follow current interrupt rating I_{fi} N-PE | 100 A _{r.m.s.} | | - | |
| Maximum back-up fuse | 63 A gL / C 63 | | 63 A gL / C 63 | |
| Maximum short-circuit current | 50 kA _{r.m.s.} | | 50 kA _{r.m.s.} | |

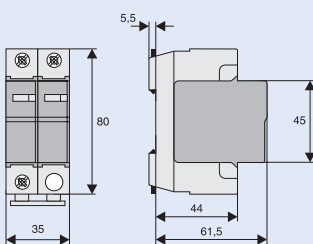
Connection diagram



Mechanical:

| | | |
|---|--------------------------------------|----------------------|
| Mechanical coding of base | yx | xx |
| Frame size | 45 mm | 45 mm |
| Device height | 80 mm | 80 mm |
| Device width | 35 mm | 35 mm |
| Weight | 220 g | 220 g |
| Upper and lower lift terminal capacity | 1–25 mm ² | 1–25 mm ² |
| Open-mouthed terminals at both sides for busbar thickness up to | 1.5 mm | 1.5 mm |
| Tightening torque of terminal screws | 2.4–3 Nm | 2.4–3 Nm |
| Permitted ambient temperature | -40 °C to +70 °C | -40 °C to +70 °C |
| Mounting | quick fastening on DIN rail EN 60715 | |
| Degree of protection, built-in | IP40 | IP40 |

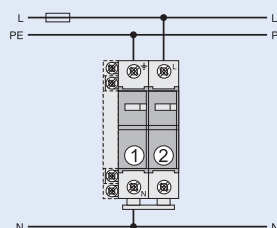
Dimensions [mm]



Application Examples

SPD-S-1+1

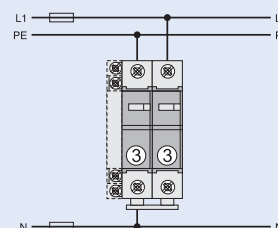
TN-, TT-System
3 x 230/400 V AC
3 x 240/415 V AC



- ① ... SPD-S-N/PE
② ... SPD-S-L/N

SPD-S-280/2

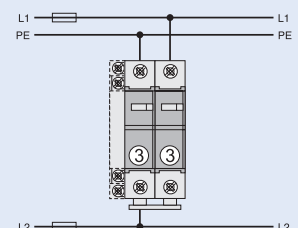
IT-System
3 x 230/400 V AC



- ③ ... SPD-S-280/2

SPD-S-280/2

IT-, TT-System
3 x 133/230 V AC



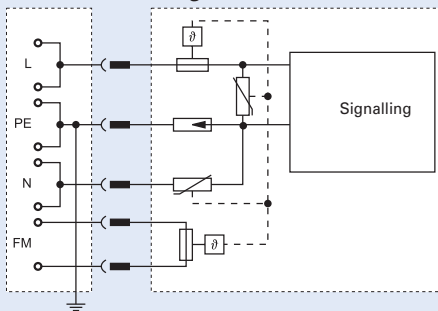
- ③ ... SPD-S-280/2

For types and art. numbers see page 102

SPD Class T3 (III, D), Surge Protective Device VDK 280 ES

- Surge arresters for protection of electronic instruments against overvoltage
- It is recommended to use SPD class T3 (III, D) in installations supplemented with SPDs class T2 (II, C)
- Distance between SPD class T2 (II, C) and T3 (III, D) should not be shorter than 5 m
- Clustered surge protection for a few sockets for distances up to 5 m
- Suitable to be installed into installation systems, e.g. cable canals and flush-mounted installation boxes
- SPD class **D** basically in accordance with VDE 0675, Part 6/A3 11.97
- Test class **III** basically in accordance with EN 61643-11
- Test type **T3** according to EN 61643-11

Connection diagram



Technical Data

Electrical:

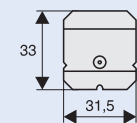
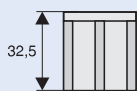
| | | |
|--|------------------|-------------------------------|
| Open circuit voltage U_{oc} | | 4 kV |
| Voltage protection level U_p at U_{oc} | symm./asymm.(PE) | ≤ 1.3 kV / ≤ 1.5 kV |
| Responding time (t_a) | symm./asymm.(PE) | ≤ 25 ns / ≤ 150 ns |
| Maximum continuous operating voltage U_c | | 250 V / 50 Hz |
| Rated load current | | 16 A / 40 °C |
| Nominal discharge current I_n (8/20) μ s | symm./asymm.(PE) | 1.5 kA / 1.5 kA |
| Maximum discharge current I_{max} (8/20) μ s | symm./asymm.(PE) | 4.5 kA / 4.5 kA |
| Residual voltage at I_s | symm./asymm.(PE) | ≤ 1.2 kV / ≤ 650 V |
| Maximum back-up fuse | | 16 A gL / C16 |
| Message transmission contact | | |
| Max. operational voltage | | 250 V AC |
| Max. operational current | | 3 A / 45 °C |

Mechanical:

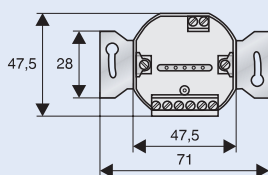
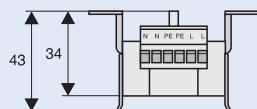
| | | |
|--------------------------------------|--------------------------|--------------------------|
| Weight | 60 g | |
| Terminal capacity | Solid | Stranded wire |
| Line voltage | 0.2–4 mm ² | 0.2–2.5 mm ² |
| Message transmission contact | 0.14–1.5 mm ² | 0.14–1.5 mm ² |
| Tightening torque of terminal screws | 0.5–0.6 Nm | |
| Permitted ambient temperature | -40 °C to +75 °C | |
| Degree of protection acc. to EN 529 | IP40 | |

Dimensions [mm]

Insert: VDK 280 E



Base: VDK 280 S



SPD class T3 (III, D), Socket with Surge Arrester

- Flush-mounted socket
- Safety flanges
- Mal-function of SPD signalisation. If red control light is lighting, SPD is broken and must be replaced. (Socket is in order, does not limit surges)

Technical Data

Electrical:

| | |
|------------------------------|----------|
| Rated voltage | 250 V AC |
| Rated current I_n | 16 A |
| Protection level | |
| -L/N | < 1.2 kV |
| -L/PE, N/PE | < 1 kV |
| Max. pulse current I_{max} | 4.5 kA |

Mechanical:

| | |
|-------------------|-------------------------|
| Device depth | 32 mm |
| Mounting | into installation boxes |
| Terminal capacity | |
| L/N | 4 x 2.5 mm ² |
| PE | 2 x 4 mm ² |

For types and art. numbers see page 102

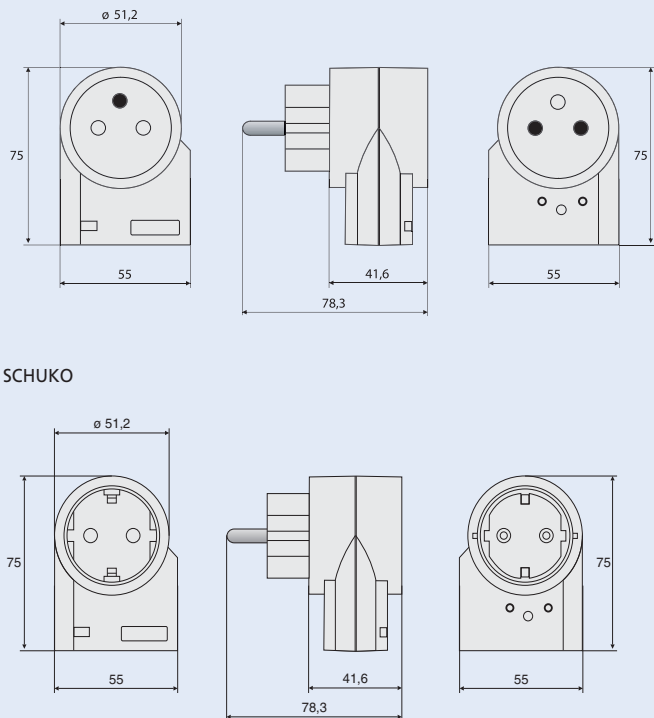
SPD Class T3 (III, D), Plug-in-SPD SPD-STC

- For protection of user equipment against transient overvoltage in case of upstream surge protection in the low voltage distribution system
- Designed in the form of an earth-contact intermediate plug with integrated baby safe
- Pilot lamp operation/failure
 - Green LED lights - operating
 - Green LED does not light - failure
- No line length from upstream installed arrester class T2 (II, C) necessary
- Test class III according to EN 61643-11
- SPD-type 3 T3 according to EN 61643-11
- Comply with standards: VDE 0620-1, SEK SS 428 08 34, NEK-HD 195 S6

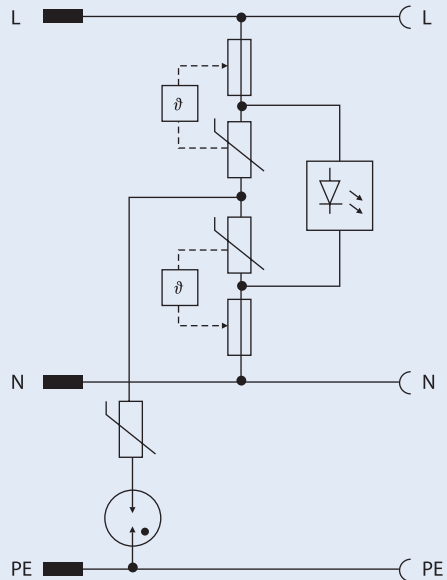
Technical Data

| | | SPD-STC |
|--|---------------------|--|
| Electrical: | | |
| Rated voltage | | 230 V AC |
| Rated frequency | | 50 Hz |
| Rated load current I_L | | 16 A |
| Voltage protection level U_p | symm. / asymm. (PE) | 1.2 kV / 1.5 kV |
| Maximum continuous operating voltage U_c | symm. / asymm. (PE) | 275 V / 360 V AC |
| Open circuit voltage U_{oc} | | 4 kV |
| Nominal discharge current I_n | | 3 kA |
| Maximum discharge current I_{max} | | 8 kA |
| Maximum back-up fuse | | 16 A gL / C 16 |
| Maximum short-circuit current | | 3 kA _{r.m.s.} |
| Overvoltage category | | III |
| Mechanical: | | |
| Device size | | 103 x 63 x 70 mm |
| Weight | | 110 g |
| Mounting | | Intermediate plug in protective earth socket |
| Degree of protection acc. to IEC 60529 | | IP20 |
| Range of temperature | | -25 °C to +75 °C |
| Flame class | | V0 |
| Pollution degree | | 2 |

Dimensions [mm]



Connection diagram



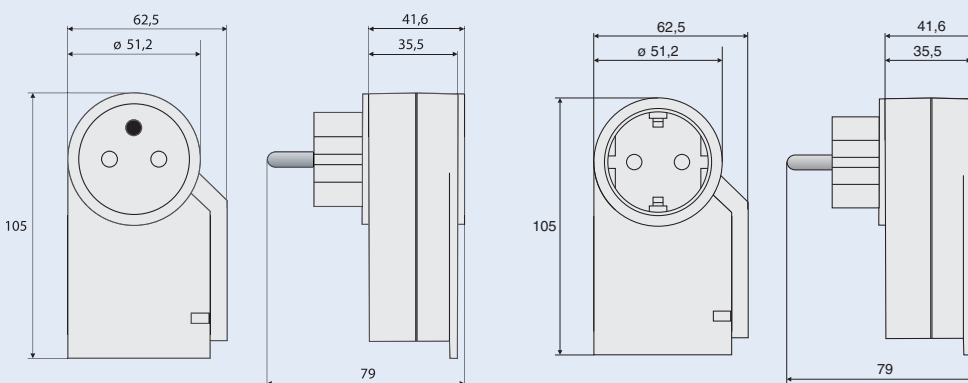
SPD Class T3 (III, D), Plug-in-SPD SPD-STC/ISDN

- For protection of user equipment against transient overvoltage in case of upstream surge protection in the low voltage distribution system
- Designed in the form of an earth-contact intermediate plug with integrated baby safe
- Pilot lamp operation/failure
 - Green LED lights - operating
 - Green LED does not light - failure
- No line length from upstream installed arrester class T2 (II, C) necessary
- Mains protection:
 - Test class III according to EN 61643-11
 - SPD-type T3 according to EN 61643-11
- ISDN-S0 - Interface:
 - Tested according to EN 61643-21
- Comply with standards: VDE 0620-1, SEK SS 428 08 34, NEK-HD 195 S6

Technical Data

| | | SPD-STC/ISDN |
|--|-----------------------------------|--|
| Electrical - Mains side | | |
| Rated voltage | | 230 V AC |
| Rated frequency | | 50 Hz |
| Rated load current I_L | | 16 A |
| Voltage protection level U_p | symm. / asymm. (PE) | 1.2 kV / 1.5 kV |
| Maximum continuous operating voltage U_c | symm. / asymm. (PE) | 275 V / 360 V AC |
| Open circuit voltage U_{oc} | | 4 kV |
| Nominal discharge current I_n | | 3 kA |
| Maximum discharge current I_{max} | | 8 kA |
| Maximum back-up fuse | | 16 A gL / C 16 |
| Maximum short-circuit current | | 3 kA _{r.m.s.} |
| Overvoltage category | | III |
| Electrical - ISDN-S0-Interface | | |
| Cut off frequency f_g (3 db) | symm. in the 100 Ω -system | 300 kHz |
| Protection level U_p | Line-Line: C1 (1 kV/0.5 kA) | ≤ 65 V |
| | Line-PE: C2 (4 kV/2 kA) | ≤ 900 V |
| Max. continuous operating voltage U_c | | 6 V DC |
| Impulse durability | Line-Line: | C1 (1 kV/0.5 kA) C3 (7.5 kV/100 A) |
| | Line-PE: | C2 (4 kV/2 kA) C3 (7.5 kV/100 A) |
| Mechanical | | |
| Device size | | 104 x 63 x 79 mm |
| Weight | | 144 g |
| Mounting | | Intermediate plug in protective earth socket |
| Degree of protection acc. to IEC 60529 | | IP20 |
| Range of temperature | | -25 °C to +75 °C |
| Flame class | | V0 |
| Pollution degree | | 2 |

Dimensions [mm]

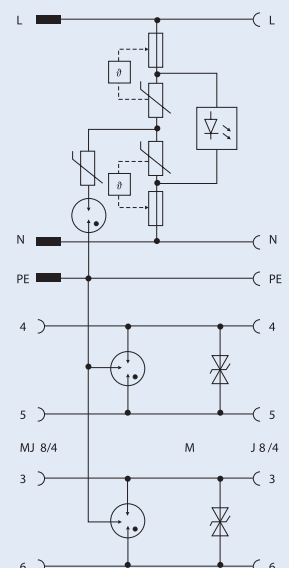


Practical Hint

No telecom signal – protection device of the ISDN-S0-interface is defect.

For types and art. numbers see page 103

Connection diagram



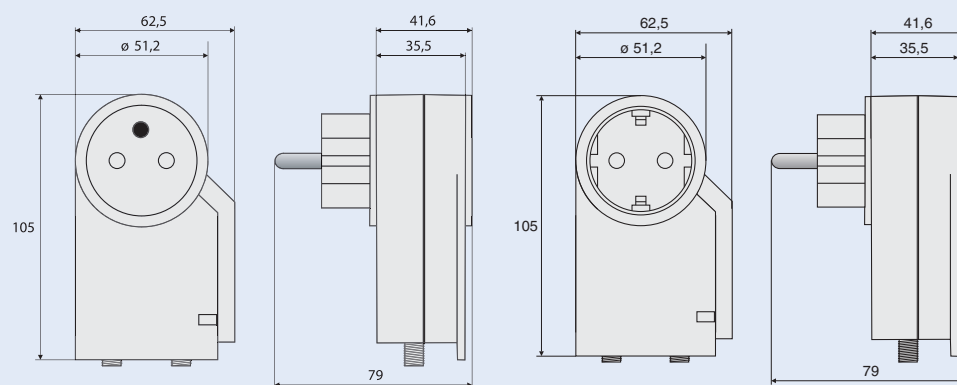
SPD Class T3 (III, D), Plug-in-SPD SPD-STC/TV-SAT

- For protection of user equipment against transient overvoltage in case of upstream surge protection in the low voltage distribution system
- Designed in the form of an earth-contact intermediate plug with integrated baby safe
- Pilot lamp operation/failure
 - Green LED lights - operating
 - Green LED does not light - failure
- No line length from upstream installed arrester class T2 (II, C) necessary
- Mains protection:
 - Test class **III** according to EN 61643-11
 - SPD-type **T3** according to EN 61643-11
- TV/SAT - Interface:
 - Tested according to EN 61643-21
- Comply with standards: VDE 0620-1, SEK SS 428 08 34, NEK-HD 195 S6

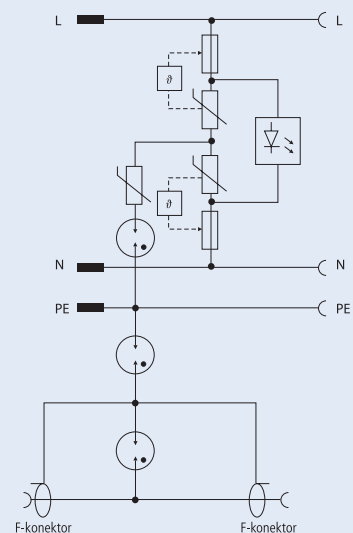
Technical Data

| | | SPD-STC/TV-SAT |
|--|--|--|
| Electrical - Mains side | | |
| Rated voltage | | 230 V AC |
| Rated frequency | | 50 Hz |
| Rated load current I_L | | 16 A |
| Voltage protection level U_p | symm. / asymm. (PE) | 1.2 kV / 1.5 kV |
| Maximum continuous operating voltage U_c | symm. / asymm. (PE) | 275 V / 360 V AC |
| Open circuit voltage U_{oc} | | 4 kV |
| Nominal discharge current I_n | | 3 kA |
| Maximum discharge current I_{max} | | 8 kA |
| Maximum back-up fuse | | 16 A gL / C 16 |
| Maximum short-circuit current | | 3 kA _{r.m.s.} |
| Overvoltage category | | III |
| Electrical - ISDN-S0-Interface | | |
| Operating frequency range | | DC ... 2400 MHz |
| Insertion loss a_E | | ≤ 0.3 dB to 2.4 GHz |
| Return loss a_R | | ≤ 14 dB to 2.4 GHz |
| Protection level U_p | Inner conductor-Shield: C2 (4 kV/2 kA) | ≤ 700 V |
| | Shield-PE: C2 (10 kV/5 kA) | ≤ 1200 V |
| Max. continuous operating voltage U_c | | 72 V DC |
| Impulse durability | Inner conductor-Shield: | C2 (4 kV/2 kA) C3 (7.5 kV/100 A) |
| | Shield-PE: | C2 (10 kV/5 kA) C3 (7.5 kV/100 A) |
| Mechanical | | |
| Device size | | 104 x 63 x 79 |
| Weight | | 157 g |
| Mounting | | Intermediate plug in protective earth socket |
| Degree of protection acc. to IEC 60529 | | IP20 |
| Range of temperature | | -25 °C to +75 °C |
| Flame class | | V0 |
| Pollution degree | | 2 |

Dimensions [mm]



Connection diagram



Practical Hint

No TV-signal – protection device of the TV/SAT-interface is defect.

For types and art. numbers see page 103

SPD class T3 (III, D), Multiple Socket Ledges 19" with Switch SPD-STL/19

Technical Data

SPD-STL/19/7F-S/BL/UTE

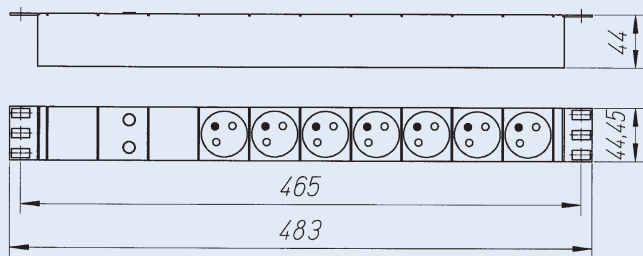
Electrical

| | |
|--|-------------------------------|
| Tested according to | IEC 61643-1+A1 / EN 61643-11 |
| SPD-type / Test class | T3 / III |
| Maximum continuous operating voltage U_c | 255 V / 50 Hz |
| Rated load current / Rated current I_L | 16 A |
| Max. back-up fuse | B 16 / 16 A gG |
| Open circuit voltage U_{oc} | 5 kV |
| Voltage protection level U_p at U_{oc} | symm./asymm. (PE) 1 kV / 1 kV |
| Short-circuit strength with maximum back-up fuse | 6 kA _{rms} |
| Filter | - |

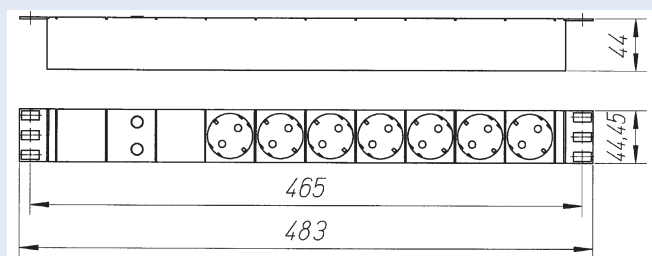
Mechanical

| | |
|--|-------------------|
| Device size | 19" x 1HE x 44 mm |
| Permitted ambient temperature | -5 °C to +25 °C |
| Degree of protection acc. to IEC 60529 | IP20 |

Dimensions [mm]

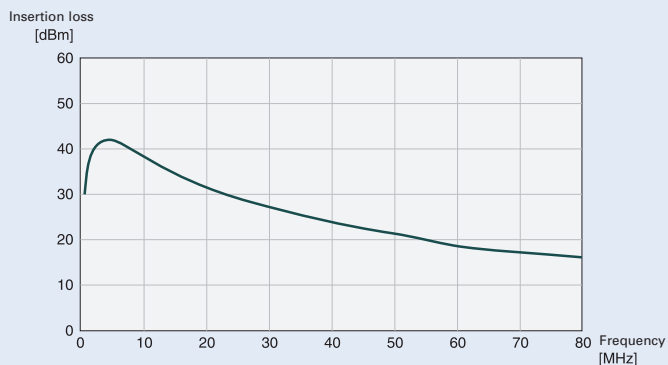


SCHUKO

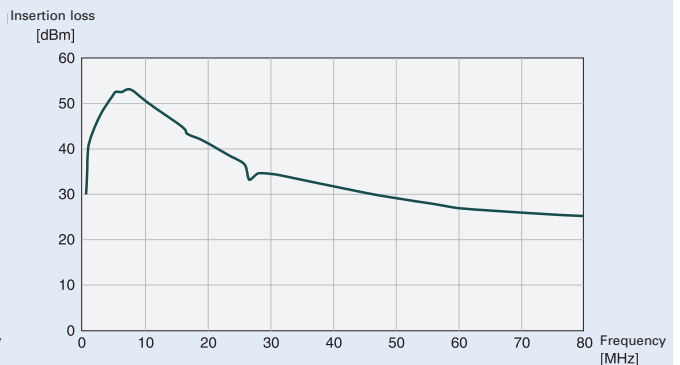


Insertion loss

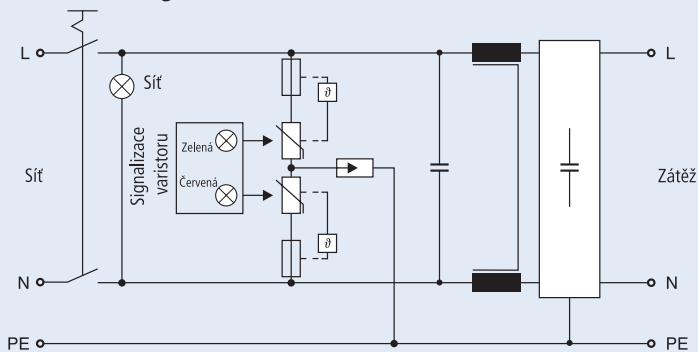
Asymmetrical



Symmetrical



Connection diagram



For types and art. numbers see page 103

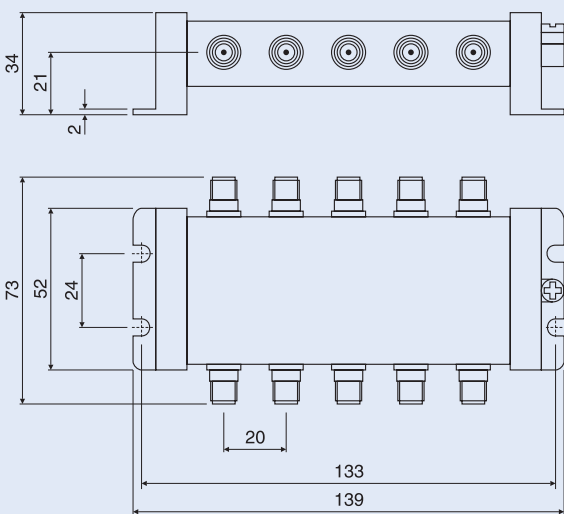
Surge Protective Device SP-MS/SAT for Receiving Facilities

- Field of application:
Protection of antenna distributors/multi-switches against lightning
- Suitable for analog or digital satellite receiving facilities as well as for terrestrial TV and radio antennas
- Protects 5 separate channels of your choice
- Tested to EN 61643-21

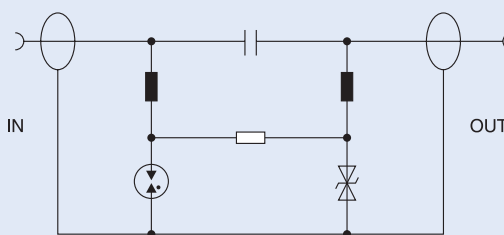
Technical Data

| SP-MS/SAT | | |
|---|-----------------|---------------------------|
| Electrical | | |
| IEC test class | | B2 / C1 / C2 / C3 / D1 |
| Responding time t_a | centre - shield | ≤ 1 ns |
| Measured limiting voltage at 1 kV/ s spike | centre - shield | 2.5 kA |
| Max. continuous operating voltage U_c | centre - shield | 20 VDC |
| Frequency range | | 47 MHz ... 2200 MHz |
| Rated current | | 400 mA |
| Continuous operating current I_c at U_c | | ≤ 2 μ A |
| Nominal discharge current I_n (8/20) μ s | centre - shield | 2.5 kA |
| Max. discharge current I_{max} (8/20) μ s | centre - shield | 5 kA |
| Impulse current I_{imp} (10/350) μ s | | 500 A |
| Impulse durability according to EN 61643-21 | centre - shield | C2 (4 kV / 2 kA) |
| | centre - shield | D1 (500 A) |
| | centre - shield | C3 (100 A) |
| | centre - shield | B2 (4 kV / 100 A) |
| | centre - shield | C3 (1 kV / 500 A) |
| Resistance per path | | 3.3 Ω (in DC-path) |
| Insertion loss up to 2.4 GHz | | ≤ 2 dB |
| Overvoltage category | | II |
| Mechanical | | |
| Dimensions | | 139 x 73 x 34 mm |
| Weight | | 269 g |
| Mounting | | Surface-mounting |
| Degree of protection according to IEC 60529 | | IP40 |
| Connection of TV-SAT | 5 x IN | F-Connector jack |
| | 5 x OUT | F-Connector jack |
| Equipotential bonding | | Screw connection M3 |
| Ambient temperature for operation/storage/transport | | -40 °C to +80 °C |
| Pollution degree | | 2 |

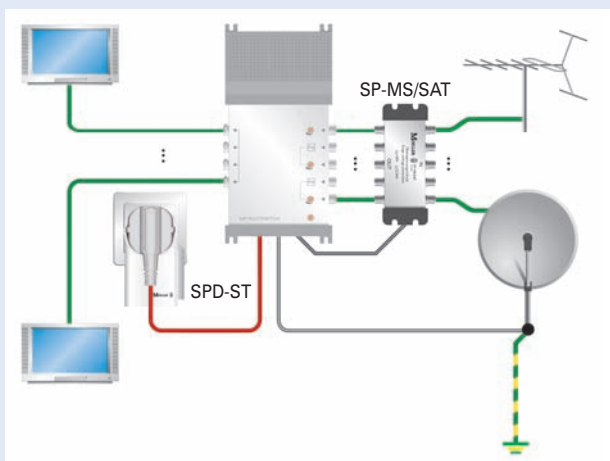
Dimensions [mm]



Connection diagram



Example of application



Practical Hint

SP-MS/SAT surge protective device is defect - no TV-signal.

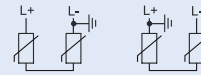
For types and art. numbers see page 103

SPD Class T2 (II, C) for photovoltaic applications for earthed systems SPPT2PA-...-2PE

- Utilization:
For protection of photovoltaic systems against transient overvoltage caused by indirect lightning strokes and switching processes
- Test class II according to EN 61643-11
- SPD-type T2 according to EN 61643-11
- Version SPPT2PA-...-AX with signalisation contact of malfunction of an insert

Connection diagram

SPPT2PA-...-2PE



Technical Data

| | SPPT2PA-600-2PE | SPPT2PA-1000-2PE(-AX) |
|--|--------------------------------------|------------------------------------|
| Electrical | | |
| Responding time | ≤ 25 ns | ≤ 25 ns |
| Maximum continuous operating voltage U_c | 600 V DC | 1000 V DC |
| Rated frequency | DC | DC |
| Nominal discharge current (8/20) μs I_n | 15 kA (8/20) μs | 15 kA (8/20) μs |
| Protection level U_p at I_n | ≤ 3 kV | ≤ 5 kV |
| Protection level at 5 kA (8/20) μs | ≤ 2.5 kV | ≤ 4 kV |
| Maximum discharge current I_{max} | 30 kA (8/20) μs | 30 kA (8/20) μs |
| Max. back-up fuse | – | – |
| Max. short circuit current I_{sc} | 80 A | 80 A |
| Residual current I_{PE} | ≤ 20 A | ≤ 20 A |
| Mechanical | | |
| Frame size | 45 mm | 45 mm |
| Device height | 90 mm | 90 mm (99 mm) |
| Device width | 35.6 mm | 35.6 mm |
| Weight | 247 g | 247 g (249 g) |
| Terminal capacity flexible / rigid | 4-25/4-35 mm ² /AWG11-2 | 4-25/4-35 mm ² /AWG11-2 |
| Tightening torque of terminal | 4.5 Nm | 4.5 Nm |
| Permitted ambient temperature | -40 °C to +80 °C | -40 °C to +80 °C |
| Mounting | quick fastening on DIN rail EN 60715 | |
| Degree of protection | IP20 | IP20 |
| Pollution degree | 2 | 2 |

Auxiliary contact

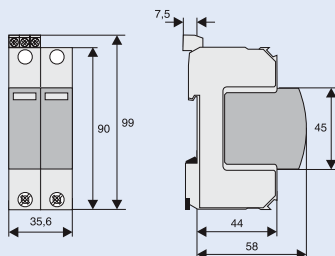
Electrical:

| | |
|-----------------------------|-------------------------------------|
| Rated insulating voltage | 250 V |
| Rated frequency | 50/60 Hz |
| Contact | 1 CO |
| Minimum voltage per contact | 5 V AC/DC |
| Rated operational current | 1.5 A / 250 V AC 1.5 A / 30 V DC |
| Min. allowed energy | 5 mA / 5 V |

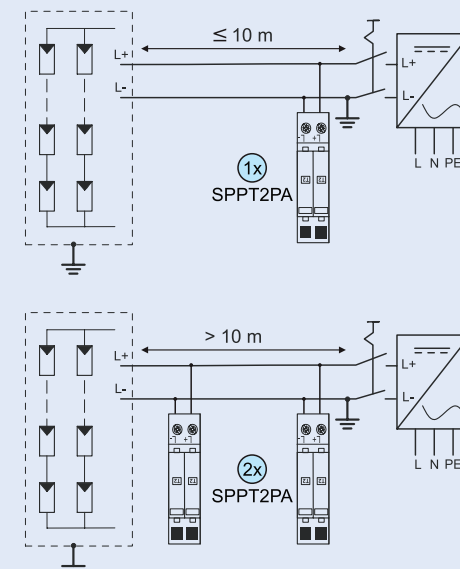
Mechanical:

| | |
|---|-----------------------------------|
| Cross section of connected conductors stranded / solid | 1.5/1.5 mm ² /AWG28-16 |
| Terminal torque | 0.25 Nm |

Dimensions [mm]



Application notes acc. to EN 50539-12



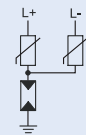
For types and art. numbers see page 104

SPD Class T2 (II, C) for photovoltaic applications for unearthed systems SPPT2PA-...-2+1PE

- Utilization:
For protection of photovoltaic systems against transient overvoltage caused by indirect lightning strokes and switching processes
- Test class **II** according to EN 61643-11
- SPD-type **T2** according to EN 61643-11
- Galvanic separation of unearthed systems by means of spark gap
- Version SPPT2PA-...-AX with signalisation contact of malfunction of an insert

Connection diagram

SPPT2PA-...-2+1PE



Technical Data

| | | SPPT2PA-600-2+1PE | SPPT2PA-1000-2+1PE(-AX) |
|--|---------------------|--------------------------------------|------------------------------------|
| Electrical | | | |
| Responding time | L+ -> L- / L- -> PE | ≤ 25 ns / ≤ 100 ns | ≤ 25 ns / ≤ 100 ns |
| Maximum continuous operating voltage $U_{c,e}$ | | 600 V DC | 1000 V DC |
| Rated frequency | | DC | DC |
| Rated discharge current I_n for (8/20) μ s | | 15 kA (8/20) μ s | 15 kA (8/20) μ s |
| Protection level U_p at I_n | L+ -> L- / L- -> PE | ≤ 3 kV / ≤ 3 kV | ≤ 5 kV / ≤ 3 kV |
| Protection level at 5 kA (8/20) μ s | L+ -> L- / L- -> PE | ≤ 2.5 kV / ≤ 2 kV | ≤ 4 kV / ≤ 2 kV |
| Maximum discharge current I_{max} | | 30 kA (8/20) μ s | 30 kA (8/20) μ s |
| Max. back-up fuse | | - | - |
| Max. zkratový proud I_{sc} | | 80 A | 80 A |
| Residual current I_{PE} | | ≤ 20 A | ≤ 20 A |
| Mechanical | | | |
| Frame size | | 45 mm | 45 mm |
| Device height | | 90 mm | 90 mm (99 mm) |
| Device width | | 53.4 mm | 53.4 mm |
| Weight | | 318 g | 318 g (323 g) |
| Terminal capacity flexible / rigid | | 4-25/4-35 mm ² /AWG11-2 | 4-25/4-35 mm ² /AWG11-2 |
| Tightening torque of terminal | | 4.5 Nm | 4.5 Nm |
| Permitted ambient temperature | | -40 °C to +80 °C | -40 °C to +80 °C |
| Mounting | | quick fastening on DIN rail EN 60715 | |
| Degree of protection | | IP20 | IP20 |
| Pollution degree | | 2 | 2 |

Pomocný kontakt

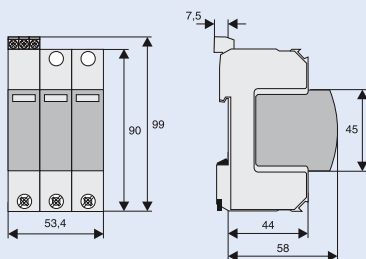
Electrical:

| | |
|-----------------------------|------------------|
| Rated insulating voltage | 250 V |
| Rated frequency | 50/60 Hz |
| Contact | 1 CO |
| Minimální napětí na kontakt | 5 V AC/DC |
| Jmenovitý pracovní proud | 1.5 A / 250 V AC |
| | 1.5 A / 30 V DC |
| Min. dovolená energie | 5 mA / 5 V |

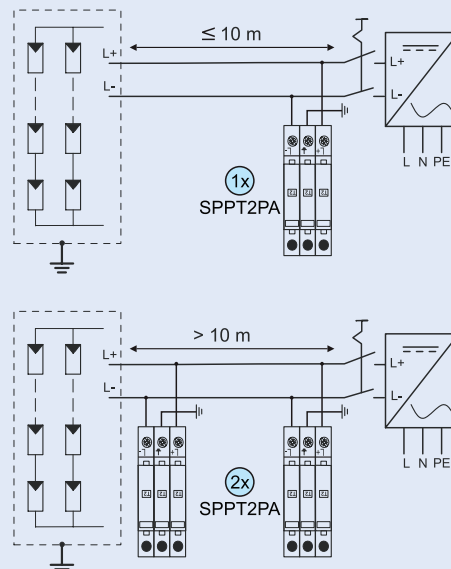
Mechanical:

| | |
|---------------------------------------|-----------------------------------|
| Cross section of connected conductors | |
| stranded / solid | 1.5/1.5 mm ² /AWG28-16 |
| Terminal torque | 0.25 Nm |

Dimensions [mm]



Application notes acc. to EN 50539-12

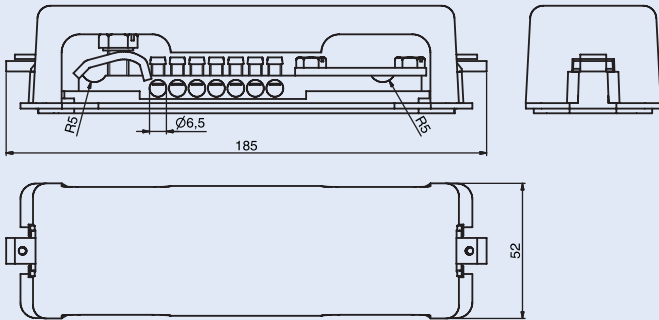


For types and art. numbers see page 104

Earthing / Equipotential Bonding

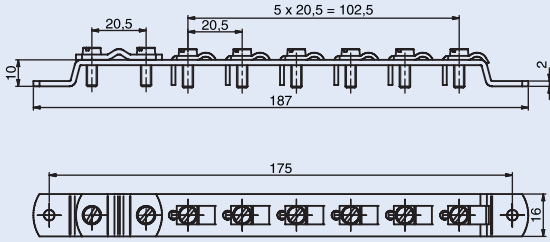
Equipotential Bonding Bar PAS-7x16

Dimensions [mm]



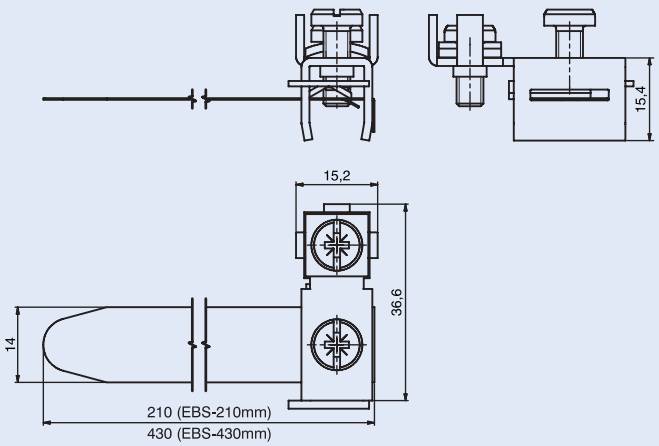
Earthing Bar for Antenna Lines PAS-HF-6

Dimensions [mm]



Earth Clip EBS

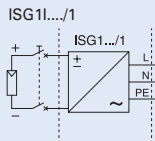
Dimensions [mm]



PV-Inverter Grid connected Indoor ISG11

- With three MC3 sockets
- LCD display
- With integrated protection against earth residual current
- Inverters are operated with monitoring software
- Two independent main monitoring units with all-pole disconnecter (ENS) acc. to VDE 0126-1-1

Connection diagram



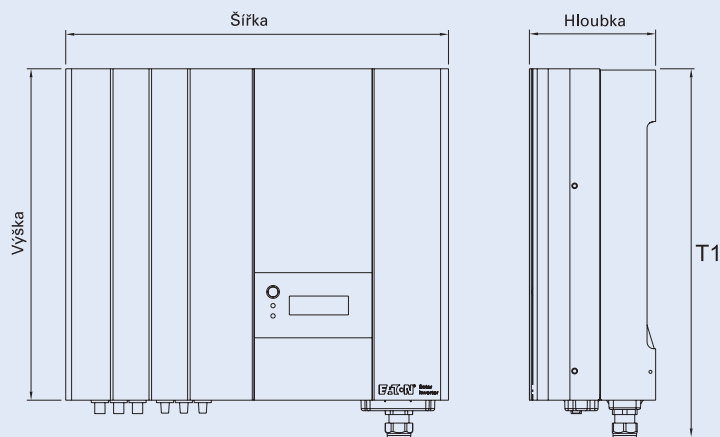
Technical Data

| | ISG11-1500/1 | ISG11-2000/1 | ISG11-2800/1 | ISG11-3300/1 | ISG11-4000/1 |
|---------------------------|-----------------------------|------------------|------------------|------------------|------------------|
| Electrical | | | | | |
| DC | | | | | |
| Max. DC power | 1760 W | 2320 W | 3180 W | 3820 W | 4630 W |
| Max. DC voltage | 450 VDC | 500 VDC | 500 VDC | 500 VDC | 500 VDC |
| MPP voltage range | 150-405 VDC | 150-450 VDC | 150-450 VDC | 150-450 VDC | 150-450 VDC |
| Nominal DC voltage | 360 VDC | 400 VDC | 400 VDC | 400 VDC | 400 VDC |
| Max. input current | 8.9 ADC | 10 ADC | 13 ADC | 17 ADC | 20 ADC |
| MPP Tracker | 1 | 1 | 1 | 1 | 1 |
| AC | | | | | |
| Output power | 1500 W | 2000 W | 2800 W | 3300 W | 4000 W |
| Max. output power | 1650 W | 2200 W | 3000 W | 3600 W | 4400 W |
| Operating voltage | 190-256 VAC | 190-256 VAC | 190-256 VAC | 190-256 VAC | 190-256 VAC |
| Operating frequency | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| Current THD | < 3% | < 3% | < 3% | < 3% | < 3% |
| Power factor | < 1 | < 1 | < 1 | < 1 | < 1 |
| Power connection | 1-phase | 1-phase | 1-phase | 1-phase | 1-phase |
| SYSTEM | | | | | |
| Max. efficiency | > 95% | > 96% | > 96% | > 96% | > 96% |
| Euro efficiency | > 94% | > 95% | > 95% | > 95% | > 95% |
| Stand-by power | ≤ 7 W | ≤ 7 W | ≤ 7 W | ≤ 7 W | ≤ 7 W |
| Overvoltage category | III | III | III | III | III |
| Degree of protection | IP43 | IP43 | IP43 | IP43 | IP43 |
| Operating temperature | -20 °C to +55 °C | -20 °C to +55 °C | -20 °C to +55 °C | -20 °C to +55 °C | -20 °C to +55 °C |
| Humidity (non-condensing) | 0-95% | 0-95% | 0-95% | 0-95% | 0-95% |
| Accustic noise level | < 35 dBA | < 35 dBA | < 35 dBA | < 35 dBA | < 35 dBA |
| Comm. interface | RS232 (RS485 optional) | | | | |
| Display | LCD / 1 line, 16 characters | | | | |

Mechanical

| | | | | | |
|----------------|-------------|-------------|-------------|-------------|-------------|
| W x H x D [mm] | 326x270x130 | 360x303x130 | 360x303x145 | 447x389x146 | 447x389x146 |
| T1 [mm] | 340 | 373 | 373 | 459 | 459 |
| Weight [kg] | 9.2 | 11.5 | 12.5 | 16.4 | 16.4 |

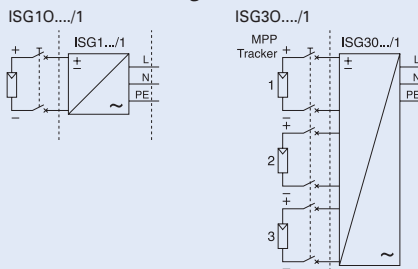
Dimensions [mm]



PV-Inverter Grid connected Outdoor ISG.O

- With three MC3 sockets
- LCD display
- With integrated protection against earth residual current
- Inverters are operated with monitoring software
- Two independent main monitoring units with all-pole disconnector (ENS) acc. to VDE 0126-1-1
- Outdoor line with degree of protection IP65, inverter must not be exposed to rain (necessary to place e.g. under a roof)

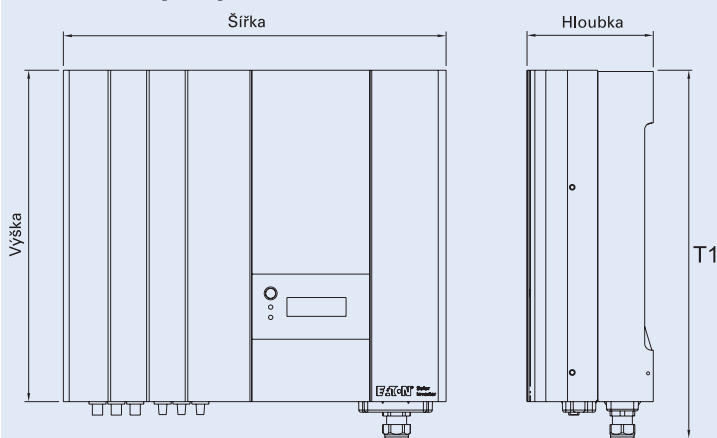
Connection diagram



Technical Data

| | | ISG10-4000/1 | ISG30-4600/1 |
|-------------------|---------------------------|-----------------------------|------------------------------|
| Electrical | | | |
| DC | Max. DC power | 4630 W | 3800 W / tracker |
| | Max. DC voltage | 500 VDC | 750 VDC |
| | MPP voltage range | 150-450 VDC | 125-700 VDC |
| | Nominal DC voltage | 400 VDC | 600 VDC |
| | Max. input current | 20 ADC | 8,5 A / tracker |
| | MPP Tracker | 1 | 3 |
| AC | Output power | 4000 W | 4600 W |
| | Max. output power | 4400 W | 5000 W |
| | Operating voltage | 190-256 VAC | 190-256 VAC |
| | Operating frequency | 50 Hz | 50 Hz |
| | Current THD | < 3% | < 3% |
| | Power factor | < 1 | < 1 |
| Power connection | | 1-phase | 1-phase |
| SYSTEM | Max. efficiency | > 96% | > 96% |
| | Euro efficiency | > 95% | > 94.5% |
| | Stand-by power | ≤ 7 W | ≤ 8 W |
| | Overvoltage category | III | III |
| | Degree of protection | IP65 | IP65 |
| | Operating temperature | -20 °C to +55 °C | -20 °C to +55 °C |
| | Humidity (non-condensing) | 0-95% | 0-95% |
| | Accoustic noise level | < 35 dBA | < 35 dBA |
| Comm. interface | | RS232 (RS485 optional) | RS232 (RS485 optional) |
| Display | | LCD / 1 line, 16 characters | LCD / 2 lines, 32 characters |
| Mechanical | | | |
| W x H x D [mm] | | 447x389x146 | 442x532x134 |
| T1 [mm] | | 459 | 602 |
| Weight [kg] | | 19,5 | 27 |

Dimensions [mm]



For types and art. numbers see page 106

Power loss

| Type designation | P _V [W] | Type designation | P _V [W] | Type designation | P _V [W] | Type designation | P _V [W] |
|--------------------|--------------------|----------------------|--------------------|-------------------|--------------------|--------------------|--------------------|
| C10-SLS/32/1 | 3.00 | LTS-100/C00/3-R | 7.50 | NH-1/160 | 14.10 | PF7-40/4/003-A | 9.60 |
| C10-SLS/32/1N | 3.00 | LTS-160/00/1 | 2.30 | NH-1/200 | 15.80 | PF7-40/4/003-G | 9.60 |
| C10-SLS/32/2 | 6.00 | LTS-250/1/3 | 10.00 | NH-1/224 | 17.40 | PF7-40/4/01 | 8.40 |
| C10-SLS/32/3 | 9.00 | LTS-250/1/3-R | 28.00 | NH-1/250 | 19.10 | PF7-40/4/01-A | 8.40 |
| C10-SLS/32/3N | 9.00 | LTS-400/2/3 | 20.00 | NH-2/35 | 3.70 | PF7-40/4/01-G | 8.40 |
| C10-SLS/32/1-L | 3.00 | LTS-400/2/3-R | 53.00 | NH-2/50 | 4.60 | PF7-40/4/01-S/A | 8.40 |
| C10-SLS/32/1N-L | 3.00 | LTS-L/160/00 | 20.00 | NH-2/63 | 5.80 | PF7-40/4/01-U | 8.40 |
| C10-SLS/32/2-L | 6.00 | LTS-L/160/00-60-10-R | 20.00 | NH-2/80 | 6.40 | PF7-40/4/03 | 8.40 |
| C10-SLS/32/3-L | 9.00 | LTS-L/400/2 | 46.00 | NH-2/100 | 8.30 | PF7-40/4/03-A | 8.40 |
| C10-SLS/32/3N-L | 9.00 | LTS-L/630/3 | 92.00 | NH-2/125 | 10.00 | PF7-40/4/03-S/A | 8.40 |
| D01-SO/16/1 | 2.50 | LZMC1-A20-I | 9.80 | NH-2/160 | 12.80 | PF7-40/4/03-U | 8.40 |
| D01-SO/16/3 | 7.50 | LZMC1-A25-I | 8.80 | NH-2/200 | 15.80 | PF7-40/4/05 | 8.40 |
| D02-S/63/3-RS | 8.00 | LZMC1-A32-I | 9.10 | NH-2/224 | 17.40 | PF7-63/2/003 | 9.70 |
| D02-SO/63/1 | 5.50 | LZMC1-A40-I | 11.00 | NH-2-250 | 19.10 | PF7-63/2/003-A | 9.70 |
| D02-SO/63/3 | 16.50 | LZMC1-A50-I | 13.50 | NH-2-300 | 20.60 | PF7-63/2/01 | 7.20 |
| dRCM-25/4/003-G/A+ | 3.30 | LZMC1-A63-I | 14.00 | NH-2/315 | 21.60 | PF7-63/2/01-A | 7.20 |
| dRCM-25/4/03-G/A+ | 3.30 | LZMC1-A80-I | 15.50 | NH-2/355 | 24.20 | PF7-63/2/03 | 7.20 |
| dRCM-40/4/003-G/A+ | 10.10 | LZMC1-A100-I | 24.00 | NH-2/400 | 26.80 | PF7-63/2/03-A | 7.20 |
| dRCM-40/4/03-G/A+ | 10.10 | LZMC1-A125-I | 38.00 | NH-3/100 | 7.70 | PF7-63/4/003 | 13.40 |
| dRCM-63/4/003-G/A+ | 13.90 | LZMC1-A160-I | 50.00 | NH-3/125 | 10.80 | PF7-63/4/003-A | 13.40 |
| dRCM-63/4/03-G/A+ | 11.00 | LZMC2-A160-I | 40.00 | NH-3/160 | 12.10 | PF7-63/4/003-G | 13.40 |
| dRCM-80/4/003-G/A+ | 11.90 | LZMC2-A200-I | 48.00 | NH-3/200 | 13.60 | PF7-63/4/003-R | 13.40 |
| dRCM-80/4/03-G/A+ | 11.90 | LZMC2-A250-I | 57.00 | NH-3/224 | 15.40 | PF7-63/4/01 | 10.50 |
| dRCM-63/4/003-R+ | 13.90 | LZMC2-A300-I | 83.70 | NH-3/250 | 19.60 | PF7-63/4/01-A | 10.50 |
| dRCM-40/4/03-S/A+ | 8.90 | LZMN3-A320-I | 30.72 | NH-3/300 | 21.20 | PF7-63/4/01-G | 10.50 |
| dRCM-63/4/03-S/A+ | 11.00 | LZMN3-A400-I | 48.00 | NH-3/315 | 22.30 | PF7-63/4/01-S/A | 10.50 |
| dRCM-80/4/03-S/A+ | 11.90 | LZMN3-A500-I | 75.00 | NH-3/355 | 26.50 | PF7-63/4/01-U | 10.50 |
| dRCM-40/4/003-U+ | 8.90 | LZMN3-AE630-I | 119.10 | NH-3/400 | 26.80 | PF7-63/4/03 | 10.50 |
| dRCM-40/4/03-U+ | 8.90 | LZMN4-AE800-I | 71.00 | NH-3/425 | 29.00 | PF7-63/4/03-A | 10.50 |
| dRCM-63/4/003-U+ | 13.90 | LZMN4-AE1000-I | 111.00 | NH-3/500 | 37.00 | PF7-63/4/03-S/A | 10.50 |
| dRCM-63/4/03-U+ | 13.90 | LZMN4-AE1250-I | 173.40 | NH-3/630 | 47.00 | PF7-63/4/03-U | 10.50 |
| dRCM-80/4/03-U+ | 11.90 | LZMN4-AE1600-I | 284.20 | NH-4a/800 | 67.00 | PF7-63/4/05 | 10.50 |
| IS-16/1 | 0.20 | mRB6-13/3N/B/003-A | 10.20 | NH-4a/1000 | 69.00 | PF7-80/4/003 | 11.40 |
| IS-16/2 | 0.40 | mRB6-13/3N/B/01-A | 10.20 | NH-4a/1250 | 84.00 | PF7-80/4/003-A | 11.40 |
| IS-16/3 | 0.60 | mRB6-13/3N/B/03-A | 10.20 | NH-4a/1600 | 106.00 | PF7-80/4/01 | 11.40 |
| IS-16/4 | 0.80 | mRB6-16/3N/B/003-A | 9.00 | PBHT-80/4/003-A | 7.00 | PF7-80/4/01-S | 11.40 |
| IS-20/1 | 0.40 | mRB6-16/3N/B/01-A | 9.00 | PBHT-80/4/03-A | 7.00 | PF7-80/4/03 | 11.40 |
| IS-20/2 | 0.70 | mRB6-16/3N/B/03-A | 9.00 | PBHT-80/4/03-S/A | 7.00 | PF7-80/4/03-A | 11.40 |
| IS-20/3 | 1.10 | mRB6-6/3N/C/003-A | 5.80 | PBHT-80/4/05-A | 7.00 | PF7-80/4/03-S/A | 11.40 |
| IS-20/4 | 1.40 | mRB6-6/3N/C/01-A | 5.80 | PBHT-80/4/05-S/A | 7.00 | PF7-80/4/03-U | 11.40 |
| IS-25/1 | 0.50 | mRB6-6/3N/C/03-A | 5.80 | PBHT-80/4/1-A | 7.00 | PF7-80/4/05 | 11.40 |
| IS-25/2 | 0.90 | mRB6-10/3N/C/003-A | 5.90 | PBHT-80/4/1-S/A | 7.00 | PF7-100/4/003 | 18.80 |
| IS-25/3 | 1.40 | mRB6-10/3N/C/01-A | 5.90 | PBHT-125/4/003-A | 39.70 | PF7-100/4/003-A | 18.80 |
| IS-25/4 | 1.80 | mRB6-10/3N/C/03-A | 5.90 | PBHT-125/4/03-A | 39.70 | PF7-100/4/003-R | 18.80 |
| IS-32/1 | 0.50 | mRB6-13/3N/C/003-A | 10.20 | PBHT-125/4/03-S/A | 39.70 | PF7-100/4/01 | 18.80 |
| IS-32/2 | 1.00 | mRB6-13/3N/C/01-A | 10.20 | PBHT-125/4/05-A | 39.70 | PF7-100/4/01-A | 18.80 |
| IS-32/3 | 1.60 | mRB6-13/3N/C/03-A | 10.20 | PBHT-125/4/05-S/A | 39.70 | PF7-100/4/03 | 18.80 |
| IS-32/4 | 2.00 | mRB6-16/3N/C/003-A | 9.00 | PBHT-125/4/1-A | 39.70 | PF7-100/4/03-A | 18.80 |
| IS-40/1 | 0.70 | mRB6-16/3N/C/01-A | 9.00 | PBHT-125/4/1-S/A | 39.70 | PF7-100/4/03-S/A | 18.80 |
| IS-40/2 | 1.50 | mRB6-16/3N/C/03-A | 9.00 | PF6-25/2/003 | 2.00 | PF7-100/4/03-U | 18.80 |
| IS-40/3 | 2.20 | mRB6-6/3N/D/003-A | 5.80 | PF6-25/4/003 | 3.10 | PF7-100/4/05 | 18.80 |
| IS-40/4 | 2.80 | mRB6-6/3N/D/01-A | 5.80 | PF6-40/2/003 | 5.80 | PF7-100/4/05-A | 18.80 |
| IS-63/1 | 1.80 | mRB6-10/3N/D/003-A | 5.90 | PF6-40/2/03 | 5.40 | PFDm-125/4/003 | 27.00 |
| IS-63/2 | 3.50 | mRB6-10/3N/D/01-A | 5.90 | PF6-40/4/003 | 9.60 | PFDm-125/4/003-A | 27.00 |
| IS-63/3 | 5.30 | mRB6-13/3N/D/003-A | 7.70 | PF6-40/4/03 | 8.40 | PFDm-125/4/01 | 27.00 |
| IS-63/4 | 7.00 | mRB6-13/3N/D/01-A | 7.70 | PF6-63/4/003 | 10.50 | PFDm-125/4/01-A | 27.00 |
| IS-80/1 | 2.70 | mRB6-16/3N/D/003-A | 9.00 | PF6-63/4/03 | 10.50 | PFDm-125/4/03 | 27.00 |
| IS-80/2 | 5.40 | mRB6-16/3N/D/01-A | 9.00 | PF7-16/2/001-A | 2.60 | PFDm-125/4/03-A | 27.00 |
| IS-80/3 | 8.00 | NH-00/6 | 1.30 | PF7-25/2/003 | 2.00 | PFDm-125/4/03-S/A | 81.00 |
| IS-80/4 | 10.80 | NH-00/10 | 1.50 | PF7-25/2/003-A | 2.00 | PFDm-125/4/05 | 27.00 |
| IS-100/1 | 4.30 | NH-00/16 | 1.80 | PF7-25/2/003-G | 1.30 | PFDm-125/4/05-A | 27.00 |
| IS-100/2 | 8.60 | NH-00/20 | 1.90 | PF7-25/2/01 | 1.30 | PFL7-6/1N/B/003 | 1.90 |
| IS-100/3 | 12.90 | NH-00/25 | 2.40 | PF7-25/2/01-A | 1.30 | PFL7-6/1N/B/003-A | 1.90 |
| IS-100/4 | 17.20 | NH-00/32 | 2.90 | PF7-25/2/01-G | 1.30 | PFL7-6/1N/C/003 | 1.90 |
| IS-125/1 | 5.50 | NH-00/35 | 3.10 | PF7-25/2/03-A | 1.30 | PFL7-6/1N/C/003-A | 1.90 |
| IS-125/2 | 11.00 | NH-00/40 | 3.60 | PF7-25/4/003 | 3.10 | PFL7-10/1N/B/003 | 2.50 |
| IS-125/3 | 16.50 | NH-00/50 | 4.20 | PF7-25/4/003-A | 3.10 | PFL7-10/1N/B/003-A | 2.50 |
| IS-125/4 | 22.00 | NH-00/63 | 5.00 | PF7-25/4/01 | 2.80 | PFL7-10/1N/C/003 | 2.50 |
| LN1-63-I | 5.91 | NH-00/80 | 5.20 | PF7-25/4/01-A | 2.80 | PFL7-10/1N/C/003-A | 2.50 |
| LN1-100-I | 14.88 | NH-00/100 | 6.70 | PF7-25/4/01-S/A | 2.80 | PFL7-13/1N/B/003 | 3.10 |
| LN1-125-I | 23.25 | NH-00/125 | 7.80 | PF7-25/4/03-A | 2.80 | PFL7-13/1N/B/003-A | 3.10 |
| LN1-160-I | 38.10 | NH-00/145 | 8.70 | PF7-40/2/003 | 5.80 | PFL7-13/1N/B/003-G | 3.10 |
| LN2-160-I | 19.66 | NH-00/160 | 9.40 | PF7-40/2/003-A | 5.80 | PFL7-13/1N/C/003 | 3.10 |
| LN2-200-I | 30.72 | NH-1/32 | 3.60 | PF7-40/2/003-G | 5.80 | PFL7-13/1N/C/003-A | 3.10 |
| LN2-250-I | 48.00 | NH-1/35 | 3.80 | PF7-40/2/01 | 5.40 | PFL7-13/1N/C/003-G | 3.10 |
| LN3-400-I | 48.37 | NH-1/40 | 4.10 | PF7-40/2/01-A | 5.40 | PFL7-16/1N/B/003 | 3.20 |
| LN3-630-I | 120.00 | NH-1/50 | 4.60 | PF7-40/2/01-G | 5.80 | PFL7-16/1N/B/003-A | 3.20 |
| LN4-800-I | 72.75 | NH-1/63 | 6.20 | PF7-40/2/01-S | 5.80 | PFL7-16/1N/B/003-G | 3.20 |
| LN4-1000-I | 113.67 | NH-1/80 | 6.40 | PF7-40/2/03-A | 5.40 | PFL7-16/1N/C/003 | 3.20 |
| LN4-1250-I | 177.61 | NH-1/100 | 8.70 | PF7-40/2/03-S | 5.40 | PFL7-16/1N/C/003-A | 3.20 |
| LN4-1600-I | 291.00 | NH-1/125 | 10.30 | PF7-40/4/003 | 9.60 | PFL7-16/1N/C/003-G | 3.20 |

| Type designation | P_V [W] | Type designation | P_V [W] | Type designation | P_V [W] | Type designation | P_V [W] |
|--------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|
| PFL7-20/1N/B/003 | 4.70 | PL7-B4 | 1.40 | PL7-C16/3 | 6.90 | PL7-D32/3N | 11.40 |
| PFL7-20/1N/B/003-G | 4.70 | PL7-B6 | 1.80 | PL7-C16/3N | 7.20 | PL7-D40 | 3.20 |
| PFL7-20/1N/C/003 | 4.70 | PL7-B6/1N | 2.00 | PL7-C20 | 3.20 | PL7-D40/2 | 7.00 |
| PFL7-20/1N/C/003-G | 4.70 | PL7-B6/2 | 3.60 | PL7-C20/1N | 3.60 | PL7-D40/3 | 10.40 |
| PFL7-25/1N/B/003 | 4.80 | PL7-B6/3 | 5.50 | PL7-C20/2 | 6.60 | PL7-D40/3N | 10.70 |
| PFL7-25/1N/B/003-G | 4.80 | PL7-B6/3N | 5.60 | PL7-C20/3 | 9.80 | | |
| PFL7-25/1N/C/003 | 4.80 | PL7-B10 | 1.90 | PL7-C20/3N | 10.10 | PLHT-B20 | 2.70 |
| PFL7-25/1N/C/003-G | 4.80 | PL7-B10/1N | 2.10 | PL7-C25 | 3.00 | PLHT-B20/2 | 2.70 |
| PFL7-32/1N/B/003 | 6.60 | PL7-B10/2 | 3.90 | PL7-C25/1N | 3.50 | PLHT-B20/3 | 2.70 |
| PFL7-32/1N/C/003 | 6.60 | PL7-B10/3 | 5.90 | PL7-C25/2 | 6.40 | PLHT-B20/3N | 2.70 |
| PFL7-40/1N/B/003 | 9.40 | PL7-B10/3N | 6.10 | PL7-C25/3 | 9.40 | PLHT-B25 | 2.80 |
| PFL7-40/1N/C/003 | 9.40 | PL7-B13 | 2.50 | PL7-C25/3N | 9.70 | PLHT-B25/2 | 2.80 |
| PL6-B10 | 1.90 | PL7-B13/1N | 2.90 | PL7-C32 | 3.70 | PLHT-B25/3 | 2.80 |
| PL6-B10/2 | 3.90 | PL7-B13/2 | 5.30 | PL7-C32/1N | 4.40 | PLHT-B25/3N | 2.80 |
| PL6-B10/3 | 5.90 | PL7-B13/3 | 7.80 | PL7-C32/2 | 8.10 | PLHT-B32 | 3.80 |
| PL6-B13 | 2.50 | PL7-B13/3N | 8.10 | PL7-C32/3 | 12.10 | PLHT-B32/2 | 3.80 |
| PL6-B13/2 | 5.30 | PL7-B16 | 2.20 | PL7-C32/3N | 12.50 | PLHT-B32/3 | 3.80 |
| PL6-B13/3 | 7.80 | PL7-B16/1N | 2.60 | PL7-C40 | 3.40 | PLHT-B32/3N | 3.80 |
| PL6-B16 | 2.20 | PL7-B16/2 | 4.70 | PL7-C40/2 | 7.50 | PLHT-B40 | 4.40 |
| PL6-B16/2 | 4.70 | PL7-B16/3 | 6.90 | PL7-C40/3 | 11.20 | PLHT-B40/2 | 4.40 |
| PL6-B16/3 | 6.90 | PL7-B16/3N | 7.20 | PL7-C40/3N | 11.50 | PLHT-B40/3 | 4.40 |
| PL6-B2 | 1.40 | PL7-B20 | 3.20 | PL7-C50 | 4.50 | PLHT-B40/3N | 4.40 |
| PL6-B2/2 | 2.80 | PL7-B20/1N | 3.60 | PL7-C50/2 | 9.90 | PLHT-B50 | 5.10 |
| PL6-B2/3 | 4.10 | PL7-B20/2 | 6.60 | PL7-C50/3 | 14.90 | PLHT-B50/2 | 5.10 |
| PL6-B20 | 3.20 | PL7-B20/3 | 9.80 | PL7-C50/3N | 15.30 | PLHT-B50/3 | 5.10 |
| PL6-B20/2 | 6.60 | PL7-B20/3N | 10.10 | PL7-C63 | 5.20 | PLHT-B50/3N | 5.10 |
| PL6-B20/3 | 9.80 | PL7-B25 | 3.00 | PL7-C63/2 | 11.50 | PLHT-B63 | 5.20 |
| PL6-B25 | 3.00 | PL7-B25/1N | 3.50 | PL7-C63/3 | 17.20 | PLHT-B63/2 | 5.20 |
| PL6-B25/2 | 6.40 | PL7-B25/2 | 6.40 | PL7-C63/3N | 17.70 | PLHT-B63/3 | 5.20 |
| PL6-B25/3 | 9.40 | PL7-B25/3 | 9.40 | PL7-C1/1-DC | 1.50 | PLHT-B63/3N | 5.20 |
| PL6-B32 | 3.70 | PL7-B25/3N | 9.70 | PL7-C2/1-DC | 1.40 | PLHT-B80 | 7.10 |
| PL6-B32/2 | 8.10 | PL7-B32 | 3.70 | PL7-C3/1-DC | 1.50 | PLHT-B80/2 | 7.10 |
| PL6-B32/3 | 12.10 | PL7-B32/1N | 4.40 | PL7-C4/1-DC | 1.50 | PLHT-B80/3 | 7.10 |
| PL6-B4 | 1.40 | PL7-B32/2 | 8.10 | PL7-C6/1-DC | 1.50 | PLHT-B80/3N | 7.10 |
| PL6-B4/2 | 2.90 | PL7-B32/3 | 12.10 | PL7-C10/1-DC | 1.50 | PLHT-B100 | 9.10 |
| PL6-B4/3 | 4.40 | PL7-B32/3N | 12.50 | PL7-C13/1-DC | 2.50 | PLHT-B100/2 | 9.10 |
| PL6-B40 | 3.40 | PL7-B40 | 3.40 | PL7-C16/1-DC | 2.20 | PLHT-B100/3 | 9.10 |
| PL6-B40/2 | 7.50 | PL7-B40/2 | 7.50 | PL7-C20/1-DC | 3.20 | PLHT-B100/3N | 9.10 |
| PL6-B40/3 | 11.20 | PL7-B40/3 | 11.20 | PL7-C25/1-DC | 3.00 | PLHT-B125 | 11.90 |
| PL6-B50 | 4.50 | PL7-B40/3N | 11.50 | PL7-C32/1-DC | 3.70 | PLHT-B125/2 | 11.90 |
| PL6-B50/2 | 9.90 | PL7-B50 | 4.50 | PL7-C40/1-DC | 3.40 | PLHT-B125/3 | 11.90 |
| PL6-B50/3 | 14.90 | PL7-B50/2 | 9.90 | PL7-C50/1-DC | 4.50 | PLHT-B125/3N | 11.90 |
| PL6-B6 | 1.80 | PL7-B50/3 | 14.90 | PL7-C1/2-DC | 3.00 | PLHT-C20 | 2.71 |
| PL6-B6/2 | 3.60 | PL7-B50/3N | 15.30 | PL7-C2/2-DC | 2.80 | PLHT-C20/2 | 5.42 |
| PL6-B6/3 | 5.50 | PL7-B63 | 5.20 | PL7-C3/2-DC | 3.00 | PLHT-C20/3 | 16.30 |
| PL6-B63 | 5.20 | PL7-B63/2 | 11.50 | PL7-C4/2-DC | 2.90 | PLHT-C20/3N | 18.40 |
| PL6-B63/2 | 11.50 | PL7-B63/3 | 17.20 | PL7-C6/2-DC | 2.90 | PLHT-C25 | 2.78 |
| PL6-B63/3 | 17.20 | PL7-B63/3N | 17.70 | PL7-C10/2-DC | 3.00 | PLHT-C25/2 | 5.56 |
| PL6-C2 | 1.40 | PL7-C0,16 | 2.20 | PL7-C13/2-DC | 5.30 | PLHT-C25/3 | 8.34 |
| PL6-C2/2 | 2.80 | PL7-C0,25 | 2.00 | PL7-C16/2-DC | 4.70 | PLHT-C25/3N | 8.62 |
| PL6-C4 | 1.40 | PL7-C0,5 | 1.20 | PL7-C20/2-DC | 6.60 | PLHT-C32 | 3.79 |
| PL6-C4/2 | 2.90 | PL7-C0,5/2 | 2.40 | PL7-C25/2-DC | 6.40 | PLHT-C32/2 | 7.58 |
| PL6-C4/3 | 4.40 | PL7-C0,5/3 | 3.50 | PL7-C32/2-DC | 8.10 | PLHT-C32/3 | 11.40 |
| PL6-C6 | 1.50 | PL7-C0,75 | 1.30 | PL7-C40/2-DC | 7.50 | PLHT-C32/3N | 11.75 |
| PL6-C6/2 | 2.90 | PL7-C1 | 1.60 | PL7-C50/2-DC | 9.90 | PLHT-C40 | 4.42 |
| PL6-C6/3 | 4.40 | PL7-C1,6 | 1.60 | PL7-D2 | 1.00 | PLHT-C40/2 | 8.84 |
| PL6-C10 | 1.50 | PL7-C1/2 | 3.10 | PL7-D4 | 1.40 | PLHT-C40/3 | 13.30 |
| PL6-C10/2 | 3.00 | PL7-C1/3 | 4.70 | PL7-D6 | 1.50 | PLHT-C40/3N | 13.70 |
| PL6-C10/3 | 4.60 | PL7-C2 | 1.40 | PL7-D6/2 | 2.90 | PLHT-C50 | 5.14 |
| PL6-C13 | 2.50 | PL7-C2/1N | 1.50 | PL7-D6/3 | 4.40 | PLHT-C50/2 | 10.30 |
| PL6-C13/2 | 5.30 | PL7-C2/2 | 2.80 | PL7-D6/3N | 4.60 | PLHT-C50/3 | 15.40 |
| PL6-C13/3 | 7.80 | PL7-C2/3 | 4.10 | PL7-D10 | 1.50 | PLHT-C50/3N | 15.93 |
| PL6-C16 | 2.20 | PL7-C4 | 1.40 | PL7-D10/2 | 3.00 | PLHT-C63 | 5.20 |
| PL6-C16/2 | 4.70 | PL7-C4/1N | 1.60 | PL7-D10/3 | 4.60 | PLHT-C63/2 | 10.40 |
| PL6-C16/3 | 6.90 | PL7-C4/2 | 2.90 | PL7-D10/3N | 4.70 | PLHT-C63/3 | 15.60 |
| PL6-C20 | 3.20 | PL7-C4/3 | 4.40 | PL7-D13 | 1.90 | PLHT-C63/3N | 16.12 |
| PL6-C20/2 | 6.60 | PL7-C6 | 1.50 | PL7-D13/2 | 4.00 | PLHT-C80 | 7.14 |
| PL6-C20/3 | 9.80 | PL7-C6/1N | 1.60 | PL7-D13/3 | 5.90 | PLHT-C80/2 | 14.30 |
| PL6-C25 | 3.00 | PL7-C6/2 | 2.90 | PL7-D13/3N | 6.10 | PLHT-C80/3 | 21.40 |
| PL6-C25/2 | 6.40 | PL7-C6/3 | 4.40 | PL7-D16 | 2.20 | PLHT-C80/3N | 22.13 |
| PL6-C25/3 | 9.40 | PL7-C6/3N | 4.60 | PL7-D16/2 | 4.70 | PLHT-C100 | 9.13 |
| PL6-C32 | 3.70 | PL7-C10 | 1.50 | PL7-D16/3 | 6.90 | PLHT-C100/2 | 18.30 |
| PL6-C32/2 | 8.10 | PL7-C10/1N | 1.70 | PL7-D16/3N | 7.20 | PLHT-C100/3 | 27.40 |
| PL6-C32/3 | 8.10 | PL7-C10/2 | 3.00 | PL7-D20 | 2.00 | PLHT-C100/3N | 28.30 |
| PL6-C40 | 3.40 | PL7-C10/3 | 4.60 | PL7-D20/2 | 4.10 | PLHT-C125 | 11.89 |
| PL6-C40/2 | 7.50 | PL7-C10/3N | 4.70 | PL7-D20/3 | 6.10 | PLHT-C125/2 | 23.80 |
| PL6-C40/3 | 11.20 | PL7-C13 | 2.50 | PL7-D20/3N | 6.20 | PLHT-C125/3 | 35.67 |
| PL6-C50 | 4.50 | PL7-C13/1N | 2.90 | PL7-D25 | 2.50 | PLHT-C125/3N | 36.86 |
| PL6-C50/2 | 9.90 | PL7-C13/2 | 5.30 | PL7-D25/2 | 5.20 | PLHT-D20 | 2.70 |
| PL6-C50/3 | 14.90 | PL7-C13/3 | 7.80 | PL7-D25/3 | 7.70 | PLHT-D20/2 | 2.70 |
| PL6-C63 | 5.20 | PL7-C13/3N | 8.10 | PL7-D25/3N | 7.90 | PLHT-D20/3 | 2.70 |
| PL6-C63/2 | 11.50 | PL7-C16 | 2.20 | PL7-D32 | 3.40 | PLHT-D20/3N | 2.70 |
| PL6-C63/3 | 17.20 | PL7-C16/1N | 2.60 | PL7-D32/2 | 7.40 | PLHT-D25 | 2.80 |
| PL7-B2 | 1.40 | PL7-C16/2 | 4.70 | PL7-D32/3 | 11.10 | PLHT-D25/2 | 2.80 |

| Type designation | P _V [W] | Type designation | P _V [W] | Type designation | P _V [W] |
|------------------|--------------------|------------------|--------------------|------------------|--------------------|
| PLHT-D25/3 | 2.80 | Z-RK230/S | 4.47 | Z-SLS/B-25A | 1.40 |
| PLHT-D25/3N | 2.80 | Z-RK230/SO | 4.47 | Z-SLS/B-2A | 1.20 |
| PLHT-D32 | 3.80 | Z-RK230/SS | 6.47 | Z-SLS/B-32A | 2.40 |
| PLHT-D32/2 | 3.80 | Z-RK24/SO | 4.15 | Z-SLS/B-35A | 2.80 |
| PLHT-D32/3 | 3.80 | Z-RK24/SS | 6.15 | Z-SLS/B-40A | 3.70 |
| PLHT-D32/3N | 3.80 | Z-S/2WE | 1.17 | Z-SLS/B-4A | 1.20 |
| PLHT-D40 | 4.40 | Z-S/2WM | 1.44 | Z-SLS/B-50A | 4.00 |
| PLHT-D40/2 | 4.40 | Z-S/3S | 2.16 | Z-SLS/B-63A | 5.00 |
| PLHT-D40/3 | 4.40 | Z-S/3S10 | 2.53 | Z-SLS/B-6A | 1.20 |
| PLHT-D40/3N | 4.40 | Z-S/4S | 2.35 | Z-SLS/CB/1 | 7.50 |
| PLHT-D50 | 5.10 | Z-S/SSOO | 1.17 | Z-SLS/CB/2 | 15.00 |
| PLHT-D50/2 | 5.10 | Z-S/WM | 0.72 | Z-SLS/CB/3 | 22.50 |
| PLHT-D50/3 | 5.10 | Z-S12/SS | 3.00 | Z-SLS/CEK10/1 | 1.60 |
| PLHT-D50/3N | 5.10 | Z-S230/2S2O | 3.00 | Z-SLS/CEK10/1-SP | 1.60 |
| PLHT-D63 | 5.20 | Z-S230/S | 1.50 | Z-SLS/CEK16/1 | 2.20 |
| PLHT-D63/2 | 10.40 | Z-S230/SO | 1.50 | Z-SLS/CEK16/1-SP | 2.20 |
| PLHT-D63/3 | 15.60 | Z-S230/SS | 3.00 | Z-SLS/CEK16/3 | 6.60 |
| PLHT-D63/3N | 16.12 | Z-S230/W | 1.50 | Z-SLS/CEK16/3-SP | 6.60 |
| PLHT-D80 | 7.10 | Z-S230/WW | 3.00 | Z-SLS/CEK25/1 | 2.90 |
| PLHT-D80/2 | 14.30 | Z-S24/2S2O | 3.00 | Z-SLS/CEK25/1-SP | 2.90 |
| PLHT-D80/3 | 21.40 | Z-S24/S | 1.50 | Z-SLS/CEK25/3 | 8.70 |
| PLHT-D80/3N | 22.11 | Z-S24/SO | 3.00 | Z-SLS/CEK25/3-SP | 8.70 |
| PLHT-D100 | 9.10 | Z-S24/SS | 3.00 | Z-SLS/CEK35/3 | 9.90 |
| PLHT-D100/2 | 18.30 | Z-S24/W | 1.50 | Z-SLS/CEK35/3-SP | 9.90 |
| PLHT-D100/3 | 27.40 | Z-S24/WW | 3.00 | Z-SLS/CEK50/3 | 13.50 |
| PLHT-D100/3N | 28.29 | Z-S32/3S | 4.48 | Z-SLS/CEK50/3-SP | 13.50 |
| SP-B+C/3 | 0.45 | Z-S32/4S | 6.21 | Z-SLS/CEK63/3 | 16.50 |
| SP-B+C/3+1 | 0.45 | Z-S32/S | 1.44 | Z-SLS/CEK63/3-SP | 16.50 |
| SPB-1+1 | 0.22 | Z-S32/SS | 2.88 | Z-SLS/D01/1 | 0.70 |
| SPB-12/280 | 0.22 | Z-S48/2S2O | 3.00 | Z-SLS/D01/1+N | 1.20 |
| SPB-12/280/2 | 0.44 | Z-S48/S | 1.50 | Z-SLS/D01/2 | 1.40 |
| SPB-12/280/3 | 0.66 | Z-S48/SO | 1.50 | Z-SLS/D01/3 | 2.10 |
| SPB-12/280/4 | 0.88 | Z-S48/SS | 3.00 | Z-SLS/D01/3+N | 2.60 |
| SPB-3+1 | 0.66 | Z-S48/W | 1.50 | Z-SLS/E-10A | 1.10 |
| SPC-E-280 | 0.10 | Z-S48/WW | 3.00 | Z-SLS/E-13A | 1.90 |
| SPC-S-15/75 | 0.02 | Z-SB23/SS | 3.05 | Z-SLS/E-16A | 1.70 |
| SPC-S-20/130 | 0.08 | Z-SB230/SS | 3.37 | Z-SLS/E-20A | 1.80 |
| SPC-S-20/130/1 | 0.08 | Z-SB24/SS | 3.05 | Z-SLS/E-25A | 2.40 |
| SPC-S-20/175 | 0.07 | Z-SC230/1S1W | 3.00 | Z-SLS/E-2A | 1.20 |
| SPC-S-20/175/1 | 0.07 | Z-SC230/2S1O | 3.00 | Z-SLS/E-32A | 2.40 |
| SPC-S-20/175/2 | 0.13 | Z-SC230/3S | 4.50 | Z-SLS/E-35A | 2.80 |
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| SPC-S-20/385/4 | 0.54 | Z-SCH24/25-22 | 6.50 | Z-SW/S | 1.50 |
| SPC-S-20/460 | 0.15 | Z-SCH24/25-40 | 10.50 | Z-SW/SO | 1.50 |
| SPC-S-20/460/1 | 0.15 | Z-SDM/1K-TA | 0.90 | Z-SW/SS | 3.00 |
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| SPC-S-20/460/3 | 0.45 | Z-SDM/2K-WO | 0.90 | Z-SWL230/S | 2.08 |
| SPC-S-20/460/4 | 0.60 | Z-SLK/NEOZ/1 | 0.50 | Z-SWL230/SO | 2.08 |
| SPC-S-20/580 | 0.18 | Z-SLK/NEOZ/1+N | 1.00 | Z-SWL230/SS | 3.58 |
| SPC-S-20/580/1 | 0.18 | Z-SLK/NEOZ/2 | 1.00 | Z-SWL24/SO | 1.62 |
| SPD-S-1+1 | 0.10 | Z-SLK/NEOZ/3 | 1.50 | Z-SWL24/SS | 3.12 |
| SPD-S-280 | 0.10 | Z-SLK/NEOZ/3+N | 2.00 | Z-TN230/1S1O | 4.10 |
| SPD-S-280/2 | 0.20 | Z-SLS/B/24-10A | 1.10 | Z-TN230/3S | 10.20 |
| SPD-S-L/N | 0.10 | Z-SLS/B/24-13A | 1.90 | Z-TN230/4S | 12.20 |
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| SPD-STC/ISDN | 0.90 | Z-SLS/B/24-1A | 1.20 | Z-TN24/1S1O | 4.10 |
| SPD-STC/TV-SAT | 0.90 | Z-SLS/B/24-20A | 1.80 | Z-TN24/3S | 10.20 |
| SPI-100/NPE | 0.10 | Z-SLS/B/24-25A | 2.40 | Z-TN24/4S | 12.20 |
| SPI-35/440 | 0.06 | Z-SLS/B/24-2A | 1.20 | Z-TN24/SS | 6.10 |
| SPI-50/NPE | 0.06 | Z-SLS/B/24-32A | 2.40 | Z-UDL230 | 1.15 |
| TLE | 1.00 | Z-SLS/B/24-35A | 2.80 | Z-UDL24 | 0.24 |
| TLK | 1.00 | Z-SLS/B/24-40A | 3.70 | Z-UEL230 | 0.58 |
| TR-G/8 | 7.10 | Z-SLS/B/24-4A | 1.20 | Z-UEL24 | 0.12 |
| TR-G2/24 | 11.90 | Z-SLS/B/24-50A | 4.00 | Z-UR/400 | 4.00 |
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| TR-G2/63-SF | 19.60 | Z-SLS/B-10A | 1.10 | Z-USA/400 | 4.40 |
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| TR-G3/8 | 6.20 | Z-SLS/B-16A | 1.70 | ZRMF1/W | 1.00 |
| Z-RE24/SS | 6.15 | Z-SLS/B-1A | 1.20 | ZRMF2/WW | 1.30 |
| Z-RK23/2S2O | 10.25 | Z-SLS/B-20A | 1.80 | ZRTAK/W | 1.00 |

| Type | Business information page | Technical data page | Type | Business information page | Technical data page | Type | Business information page | Technical data page |
|------------------|---------------------------|---------------------|---------------------------|---------------------------|---------------------|----------------------|---------------------------|---------------------|
| B | | | | | | | | |
| BSZ | 64 | 212 | NZMN2-VED | 93 | | Z-C10/SE..PV | 78 | 235 |
| C | | | NZMN3-VED | 94 | | Z-C14/SE | 76 | 229 |
| C10-SLS/32 | 77 | 234 | NZMN4-VED | 95 | | Z-C22/SE | 76 | 229 |
| D | | | NZM-XMC | 62 | 208 | Z-CC/2CO | 50 | 167 |
| D IV | 74 | 224 | P | | | Z-D01/PE | 79 | 238 |
| D01-SO/16 | 80 | 239 | PAS | 104 | 296 | Z-D01/SE | 79 | 238 |
| D02-LTS/63 | 81 | 242 | PBHT | 22 | 125 | Z-D01/SK | 80 | 238 |
| D02-LTS/63 | 84 | 249 | PDIM | 20 | 124 | Z-D02/PE | 79 | 238 |
| D02-S/63/3-RS | 81 | 241 | PF6 | 18 | 122 | Z-D02/R/3-36 | 80 | 240 |
| D02-SO/63 | 80 | 239 | PF7 | 6 | 113 | Z-D02/R/3-54 | 80 | 240 |
| D02-SO/63/3-R-27 | 80 | 240 | PFD | 16 | 121 | Z-D02/SE | 79 | 238 |
| DIII-SO/63 | 75 | 227 | PFL6 | 28 | 132 | Z-D02/SIKA-HF | 80 | |
| DII-SO/25 | 75 | 227 | PFL7 | 24 | 128 | Z-D02/SK | 80 | 238 |
| dRCM | 10 | 115 | PFR2-03 | 12 | 117 | Z-D02-D01/PE | 79 | 238 |
| DS-T | 56 | 183 | PFR3-03 | 12 | 117 | Z-D02-LTS-HF | 81 | |
| E | | | PHF7 | 14 | 119 | Z-D02-S-AB-SET | 80 | |
| EBS | 104 | 296 | PL6 | 38 | 144 | Z-D0-PE-Z | 79 | |
| EVG | 71 | 223 | PL7 | 32 | 137 | Z-D63 | 47 | 156 |
| F | | | PL7-B4...-HS | 47 | 157 | Z-D80 | 47 | 156 |
| FCFDC10DI...-SOL | 78 | 236 | PL7-C...-DC | 36 | 137 | Z-DII/PE | 74 | 226 |
| FFS/16 | 50 | 169 | PLHT | 42 | 150 | Z-DII/PS | 74 | 226 |
| G | | | R | | | Z-DII/SE | 74 | 224 |
| GR | 66 | | REHLVA | 58 | 197 | Z-DII/SK | 75 | 226 |
| I | | | RELLVA | 58 | 197 | Z-DIII/PE | 74 | 226 |
| IS | 46 | 155 | REMLVA | 58 | 197 | Z-DIII/PS | 74 | 226 |
| IS/SPE-1TE | 46 | | S | | | Z-DIII/SE | 74 | 224 |
| ISG | 106 | 297 | SA-TD/1W | 59 | 198 | Z-DIII/SK | 75 | 226 |
| ISO | 66 | 217 | SBS-RS60 | 75 | | Z-DLD | 52 | 172 |
| K | | | SPB | 99 | 280 | Z-DS | 54 | 174 |
| KLV-LV | 66 | | SP-B+C | 99 | 281 | Z-DS/S | 56 | 185 |
| KLV-TC | 66 | 217 | SPB-D-125 | 98 | 277 | Z-DST | 55 | |
| KWZ-230 | 61 | 204 | SPB-HK-W | 99 | | Z-DST | 58 | |
| KWZ-3PH | 61 | 205 | SPC-E | 100 | 282 | Z-EK | 70 | |
| KWZ-3PH-63 | 61 | 205 | SPC-S | 100 | 283 | Z-EL | 52 | 172 |
| KWZ-3PH-D63 | 61 | 207 | SPC-S-HK | 99 | | Z-FAM | 49 | 164 |
| KWZ-3PHD-D63 | 61 | 207 | SPC-S-HK | 100 | | Z-FW/0.. | 50 | 168 |
| KWZ-3PHD-I5 | 61 | 207 | SPD-S | 102 | 287 | Z-FW-LP | 50 | 165 |
| KWZ-3PH-I5 | 61 | 207 | SPD-STC | 102 | 289 | Z-FW-MO | 50 | 165 |
| KWZ-SCOV | 61 | | SPD-STC/ISDN | 102 | 290 | Z-GLO | 64 | 212 |
| L | | | SPD-STC/TV-SAT | 102 | 291 | Z-GSV | 68 | 220 |
| LN1 | 92 | 273 | SPD-STL/19/7F-S/BL/UTE102 | 292 | | Z-GV | 68 | 219 |
| LN2 | 93 | 273 | SPI | 98 | 276 | Z-GV-U | 98 | 277 |
| LN3 | 94 | 273 | SP-MS/SAT | 102 | 293 | Z-HA-EK/35 | 48 | |
| LN4 | 95 | 273 | SPPT2PA | 104 | 294 | Z-HD | 16 | 121 |
| LTS | 86 | 253 | SU-TQ | 59 | 199 | Z-HD | 47 | 158 |
| LTS-L | 88 | 266 | SU-TS | 59 | 199 | Z-HK | 47 | 121 |
| LZMC1 | 92 | 273 | T | | | Z-HWS-FI | 8 | |
| LZMC2 | 93 | 273 | TLE | 56 | 182 | Z-IMZ | 64 | 212 |
| LZMN3 | 94 | 273 | TLK | 56 | 182 | Z-IS/AK-1TE | 46 | |
| LZMN4 | 95 | 273 | TR-G | 56 | 187 | Z-KAM | 49 | 164 |
| M | | | V | | | Z-LAR | 51 | 171 |
| MAK | 63 | 210 | VDK280ES | 102 | 288 | Z-LHASA/24 | 44 | 154 |
| mRB6 | 30 | 136 | VLC14 | 77 | 234 | Z-LHK | 44 | 154 |
| N | | | VLC22 | 77 | 234 | Z-LTS | 87 | 265 |
| NH | 85 | 250 | Z | | | Z-LTS....-SAD/100-KR | 86 | 264 |
| NZM2-4-XMC | 62 | 208 | Z7-MG/WS | 60 | | ZLTS-M/DOHD | 89 | |
| NZM2-XMC | 62 | 208 | Z7-SDM/AK-2TE | 59 | | ZLTS-M/KH | 89 | |
| NZM3-4-XMC | 62 | 208 | Z7-SDM/MP-2TE | 59 | | ZLTS-M3/W | 89 | |
| NZM3-XMC | 62 | 208 | Z-AHK | 47 | 158 | ZLTS-MO/SW | 89 | |
| | | | Z-AK | 68 | 219 | Z-MFG | 65 | 216 |
| | | | Z-BEL | 52 | 172 | Z-MFPA | 51 | 170 |
| | | | Z-BHASA | 22 | 127 | Z-MG | 60 | 201 |
| | | | Z-BOX | 66 | | Z-MG/WAK | 60 | 203 |
| | | | Z-C10/SE | 76 | 229 | Z-MG/WAS | 60 | 203 |
| | | | | | | Z-MS | 65 | 213 |
| | | | | | | Z-NH | 86 | |
| | | | | | | Z-NH-AE | 89 | |
| | | | | | | Z-NHK | 47 | 158 |
| | | | | | | Z-NKA-SCH | 50 | 169 |
| | | | | | | ZP-A | 46 | 158 |

| Type | Business information page | Technical data page |
|-----------------|---------------------------|---------------------|
| ZP-ASA | 48 | 161 |
| ZP-IHK | 48 | 160 |
| ZP-NHK | 48 | 160 |
| Z-PU | 52 | 172 |
| Z-PUL | 52 | 172 |
| ZP-WHK | 48 | 160 |
| ZR | 54 | 177 |
| Z-R | 57 | 189 |
| Z-RC/230 | 58 | |
| Z-RC/AK | 8 | |
| Z-RE | 57 | 189 |
| Z-RK | 57 | 189 |
| Z-S | 55 | 179 |
| Z-S/ | 53 | 173 |
| Z-S/KO | 55 | 180 |
| Z-SB | 55 | 179 |
| Z-SC | 58 | 191 |
| Z-SC.. | 55 | 180 |
| Z-SC/GP | 55 | 180 |
| Z-SD230 | 51 | 170 |
| Z-SDM | 59 | 200 |
| Z-SCH | 58 | 191 |
| Z-SCHAK | 58 | |
| Z-SLK/D0 | 82 | 246 |
| Z-SLK/NEOZ | 82 | 246 |
| Z-SLS/B | 83 | 247 |
| Z-SLS/CB | 84 | 248 |
| Z-SLS/CEK | 82 | 245 |
| Z-SLS/D01 | 81 | 243 |
| Z-SLS/E | 83 | 247 |
| Z-SLS/NEOZ | 82 | 244 |
| Z-SLS/TR-SET | 83 | |
| Z-SLZ | 84 | |
| Z-SUM | 64 | 212 |
| Z-SV | 68 | 221 |
| Z-SW | 53 | 172 |
| Z-SWL | 53 | 172 |
| Z-T | 53 | 173 |
| Z-TN | 57 | 189 |
| Z-TR/AP | 56 | |
| Z-UDL | 52 | 172 |
| Z-UEL | 52 | 172 |
| Z-UR/400 | 49 | 163 |
| Z-USA | 49 | 162 |
| Z-USD | 49 | 162 |
| ZV-ADP | 68 | 218 |
| ZV-AEK | 68 | 218 |
| Z-V-AK | 68 | 219 |
| ZV-BS-G | 68 | |
| ZV-KSBI | 101 | 286 |
| ZV-L1/N-10 | 68 | 218 |
| ZV-L1/N-80A-10 | 68 | 218 |
| ZV-L2/L3-10 | 68 | 218 |
| ZV-L2/L3-80A-10 | 68 | 218 |
| ZV-N-05TE-10 | 68 | 218 |
| ZV-SS | 68 | 218 |
| ZV-SS-80A | 68 | 218 |
| Z-WFR 2 | 12 | 117 |
| Z-WFR 3 | 12 | 117 |

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