



# PCB Keyswitches

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## Examples for Applications Standards

MICON 5



RF 15



RG 85 III System



RF 15 with RK 90 System



### CE-Conformity

The products of the Chapter "PCB Keyswitches" can – relating to the CE-conformity according to the Low-Voltage Directive 73/23/EWG – be divided into the following groups:

#### All products with an operating voltage $U_B > 50 V$

F. ex. Short-Travel Main Switch KN 19, for this product the Low-Voltage Directive 73/23/EWG applies.

#### All products with an operating voltage $U_B < 50 V$

F. ex. MICON, RACON, RF 15, RS 76, for these components no directive applies.

#### Single parts, accessories and illumination

No directive applies for these products.

#### EMC-Law

The components of this catalogue are within the meaning of the law concerning the electromagnetic conformity (= EMC-Law) "basic components as, for ex., switches, signal lamps or like" and, therefore, do not fall within the scope of the EMC-Law.

#### Declarations of Conformity

Declarations of conformity for all concerned products are available and can be delivered upon request. Please always state the exact order reference of the respective product.

#### Marking

The marking will be corresponding to the Low-Voltage Directive 73/23/EWG resp. the Directive "CE-Marking 93/68/EWG" either on the packing or on the product itself or on the shipping documents.

### UL-approval

#### for MICON 5, RACON 8/12, Short-Travel Keyswitches RF 15/19

Data entry systems which are built with Rafi short-travel switches according to our design proposals meet the requirements of the UL approvals for the American market.

UL file no. for KN 19: E 116362  
 UL file no. for data entry systems: E 202520



## General Data

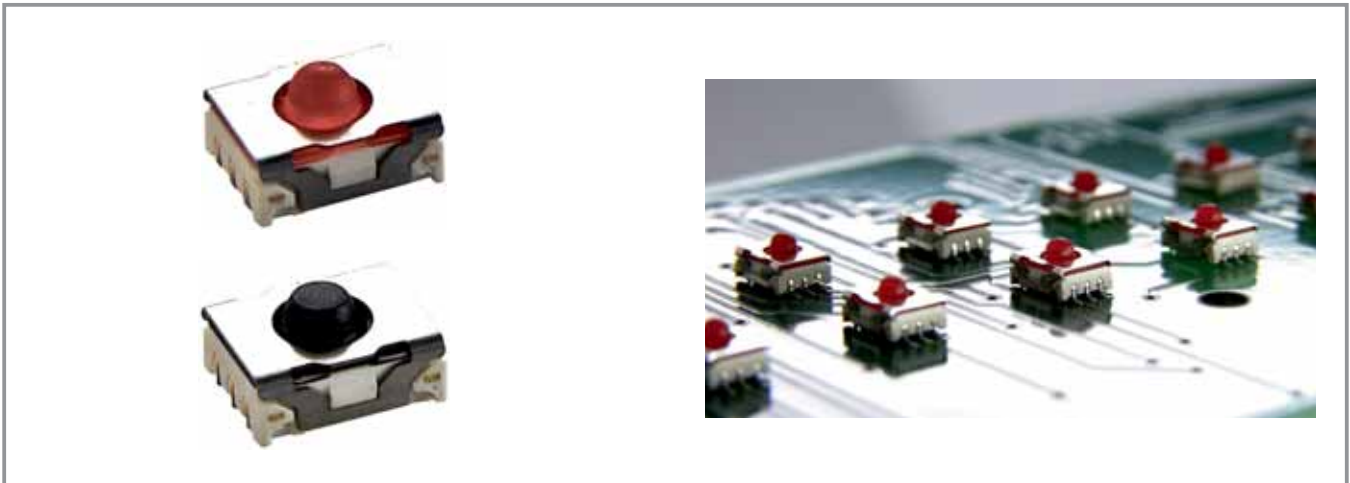
Short-travel switch range MICON 5, with sealed contact system, clear key click and extremely reliable switching. Use under overlay or under keycaps RK 90. THT and SMT versions which can be mounted automatically.

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**NEW**

## MICON 5 - Short-travel keyswitches



### General Data

MICON 5 short-travel keyswitches offer an extremely high switching reliability while needing very little space. They can be arranged as single keys, in rows or key blocks. When arranged under an overlay, MICON keyswitches should be combined with plungers.

The features at a glance:

- Suitable for the most common soldering methods
  - Wave soldering bath for THT versions
  - Reflow soldering for SMT version
  - Vapour phase soldering for SMT versions
  - Manual soldering
- SMT version suitable for processing with an automatic SMT assembly machines
- IMDS listed

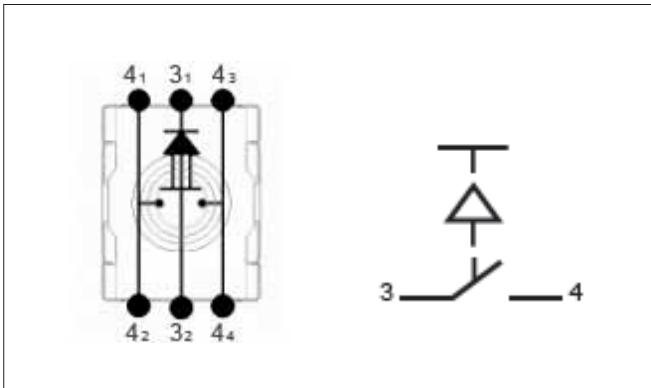
You can download actual product information from our internet site [www.rafi.de](http://www.rafi.de) / Catalogues and Downloads

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### Technical Data

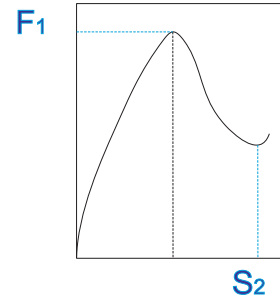
|                                   |                                   |  |                              |                               |
|-----------------------------------|-----------------------------------|--|------------------------------|-------------------------------|
| <b>MICON</b>                      | <b>Dimensions</b>                 |  | Rated current min.           | 0.01 mA                       |
|                                   | Length of housing                 | 6.4 mm                                 | Rated current max.           | 100 mA                        |
|                                   | Width of housing                  | 5.1 mm                                 | Rated power max.             | 1 W                           |
|                                   | Overall height                    | see order block                        | (ohmic load)                 |                               |
|                                   | <b>Mechanical design</b>          |  | Contact resistance when new  | 100 mΩ                        |
|                                   | Mounting                          | soldering                              | Rated voltage resistance AC  | 250 V                         |
|                                   | Terminals                         | see order block                        | Insulation resistance        | 10 <sup>9</sup> Ω             |
|                                   | Contact system                    | snap-action contact                    | <b>Other specifications</b>  |                               |
|                                   | Contact arrangement               | 1 NO                                   | Ambient temp. operating min. | -40 °C                        |
|                                   | Contact materials                 | Au                                     | Ambient temp. operating max. | +90 °C                        |
|                                   | Illumination                      | no                                     | Resistance to environment    | IEC 60068-2 -14, -30,-33, -78 |
|                                   | <b>Mechanical characteristics</b> |  | Operating life (test force)  | see order block               |
| Operating force F1 (±20%)         | see order block                   | Solder heat resistance / Solderability | see order block              |                               |
| Switching travel S2 (±0.15 mm)    | see order block                   | Flammability of materials              | UL 94 V1                     |                               |
| <b>Electrical characteristics</b> |                                   | Packing                                | see order block              |                               |
| Rated voltage min.                | 0.02 V                            | Produkt code                           | see order block              |                               |
| Rated voltage max.                | 35 V                              |  |                              |                               |

## MICON 5 Circuit Diagram

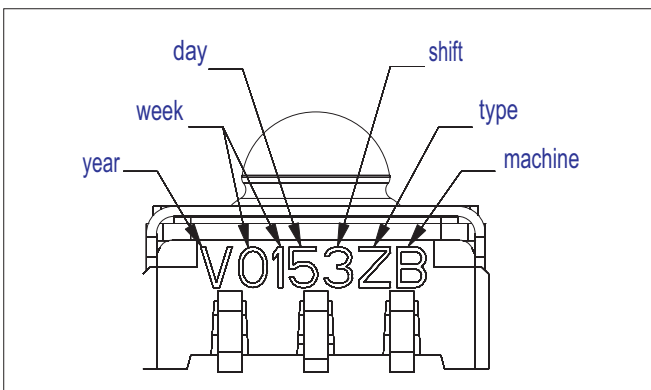


## MICON 5 Force-Travel Diagram

Operating force  $F_1$ : see order block  
Switching travel  $S_2$ : see order block



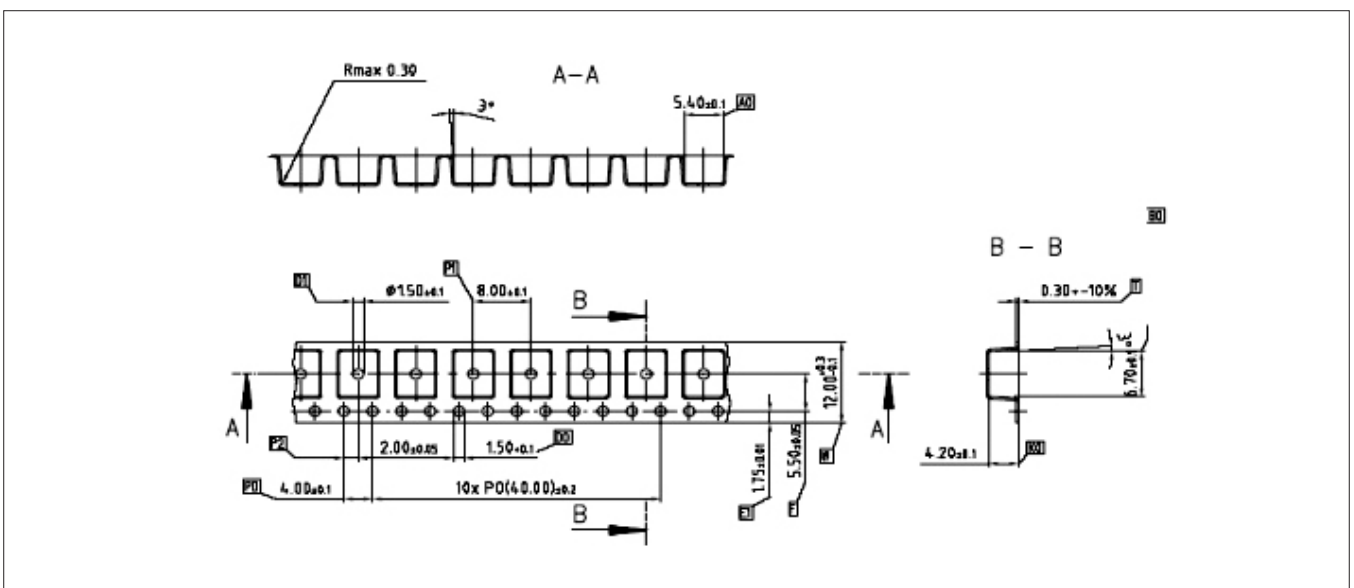
## MICON 5 Product Code acc. to DIN EN ISO 9001 (EN ISO 8402)



Traceability acc. to (EN ISO 8402) DIN EN ISO 9001, 2000, 7.5.3

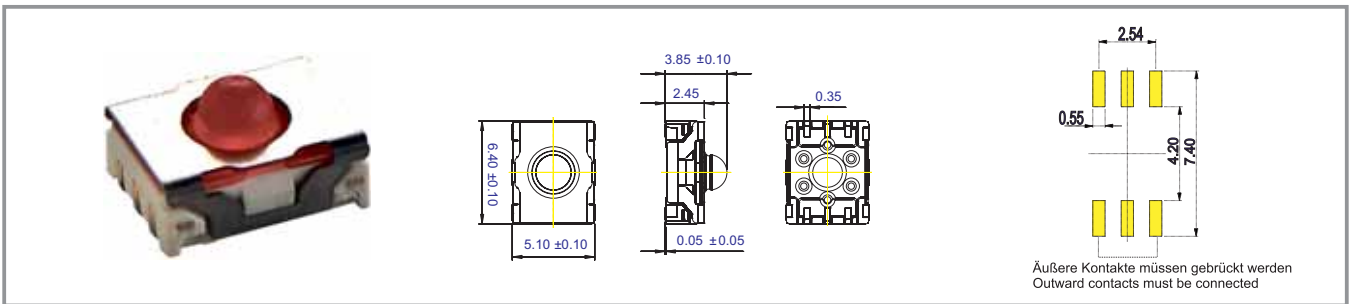
A 7-digit code is printed on the housing of the keyswitch. This code informs about production date, production shift and type of product.

## MICON 5 SMT Version, Tape and Reel Drawing



**NEW**

## MICON 5 - Short-travel keyswitch, SMT Standard



Äußere Kontakte müssen gebrückt werden  
Outward contacts must be connected

| Terminals | Solder heat resistance / Solderability | Operating force F1 (±20%) | Switching travel S2 (±0,15 mm) | Operating life (test force) | Produkt code | Order no.                |
|-----------|--|---------------------------|--------------------------------|-----------------------------|--------------|--------------------------|
| SMT       | E DIN IEC 600 68-2-58                  | 3.0 N                     | 0.7 mm                         | 1,000,000 (4 N)             | X            | <b>1.14.002.101/0000</b> |
| SMT       | E DIN IEC 600 68-2-58                  | 4.5 N                     | 0.8 mm                         | 250,000 (6 N)               | Z            | <b>1.14.002.001/0000</b> |
| SMT       | E DIN IEC 600 68-2-58                  | 5.5 N                     | 0.9 mm                         | 1,000,000 (8 N)             | W            | 1.14.002.111/0000        |
| SMT       | E DIN IEC 600 68-2-58                  | 8.0 N                     | 1.1 mm                         | 250,000 (12 N)              | Y            | 1.14.002.011/0000        |

Technical data see page 4 - 4

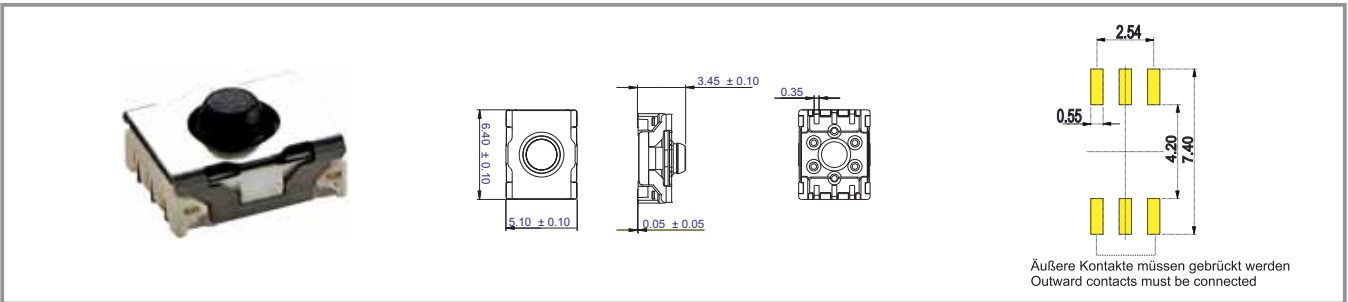
Packing: in tape, reel with 2100 pieces  
Keycaps see RK 90

Mounting hints:

Special pipette (Siemens Siplace order no.: 348514-02), mounting with collect and place head  
Recommendation for screen printing: 150 µm stencil with 10% reduction of the pad size.

## MICON 5 - Short-travel keyswitch, SMT low

**NEW**



| Terminals | Solder heat resistance / Solderability | Operating force F1 (±20%) | Switching travel S2 (±0,15 mm) | Operating life (test force) | Produkt code | Order no.                |
|-----------|--|---------------------------|--------------------------------|-----------------------------|--------------|--------------------------|
| SMT       | E DIN IEC 600 68-2-58                  | 3.0 N                     | 0.6 mm                         | 1,000,000 (4 N)             | S            | <b>1.14.002.103/0000</b> |
| SMT       | E DIN IEC 600 68-2-58                  | 4.5 N                     | 0.7 mm                         | 250,000 (6 N)               | T            | <b>1.14.002.003/0000</b> |
| SMT       | E DIN IEC 600 68-2-58                  | 5.5 N                     | 0.7 mm                         | 1,000,000 (8 N)             | R            | 1.14.002.113/0000        |

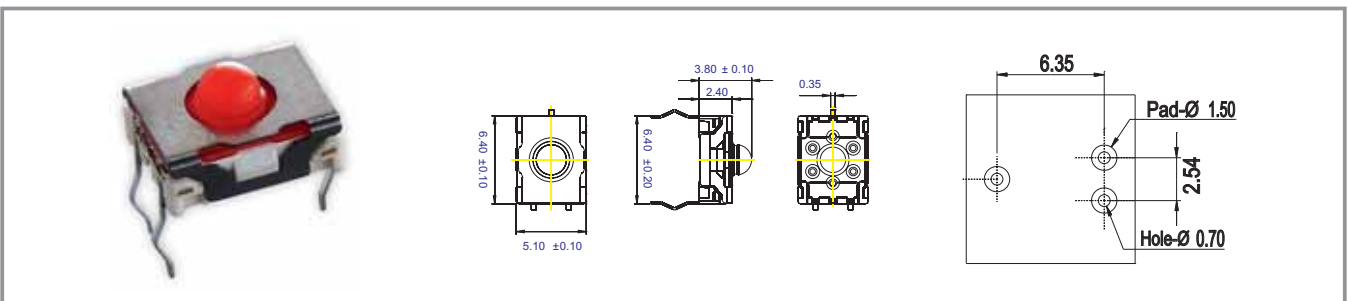
Technical data see page 4 - 4

Packing: in tape, reel with 2100 pieces  
Keycaps see RK 90

Mounting hints:

Special pipette (Siemens Siplace order no.: 348514-02), mounting with collect and place head  
Recommendation for screen printing: 150 µm stencil with 10% reduction of the pad size.

## MICON 5 - Short-travel keyswitch, THT Standard



| Terminals | Solder heat resistance / Solderability | Operating force F1 (±20%) | Switching travel S2 (±0,15 mm) | Operating life (test force) | Produkt code | Order no.         |
|-----------|--|---------------------------|--------------------------------|-----------------------------|--------------|-------------------|
| THT       | E DIN IEC 600 68-2-20                  | 3.0 N                     | 0.7 mm                         | 1,000,000 (4 N)             | O            | 1.14.002.106/0000 |
| THT       | E DIN IEC 600 68-2-20                  | 4.5 N                     | 0.8 mm                         | 250,000 (6 N)               | Q            | 1.14.002.006/0000 |
| THT       | E DIN IEC 600 68-2-20                  | 5.5 N                     | 0.9 mm                         | 1,000,000 (8 N)             | N            | 1.14.002.116/0000 |
| THT       | E DIN IEC 600 68-2-20                  | 8.0 N                     | 1.1 mm                         | 250,000 (12 N)              | P            | 1.14.002.016/0000 |

Technical data see page 4 - 4

Packing: in tubes with 102 pieces  
Keycaps see RK 90

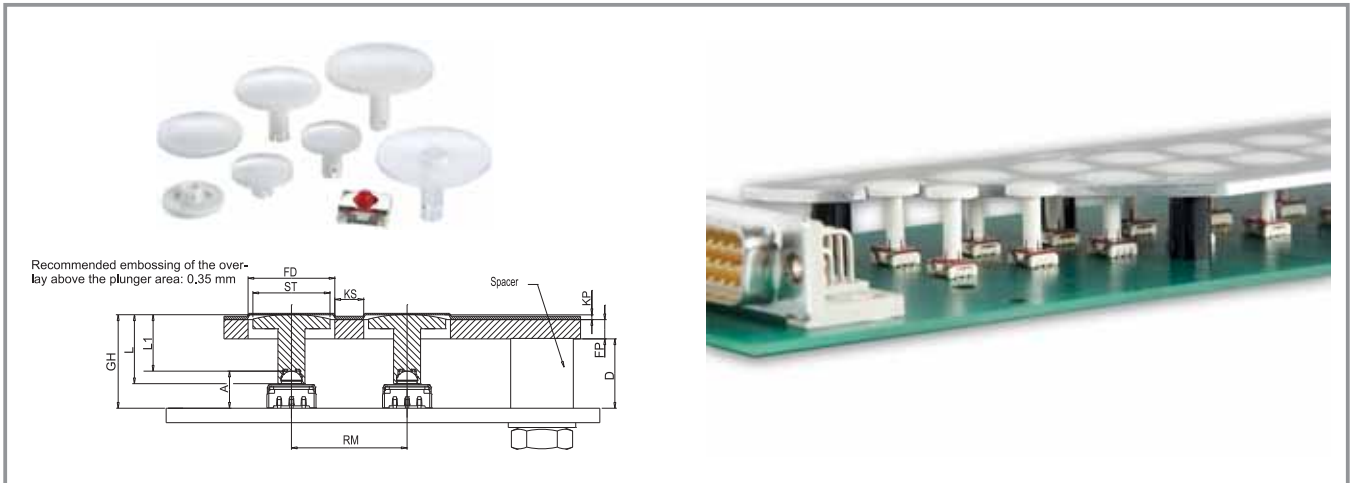
**4**

MICON

**NEW**

**NEW**

## MICON 5 - Plungers round, not illuminable



### General Data

- A - Height of keyswitch: SMT type: 3.85 mm, THT type: 3.80 mm
  - D - Length of spacer  $D = GH - KP - FP$
  - FD - Front panel cut-out  $FD = ST + 1 \text{ mm}$
  - FP - Front panel thickness
  - GH - Overall height:  $GH = A + L1 + 0.05$  (SMT type),  $GH = A + L1$  (THT type)
  - KP - Thickness of overlay + embossing
  - KS - Glue webs for overlay, min. 3 mm
  - L1 - Length of plunger above keyswitch  $L1 = GH - A$
  - L - Overall length of plunger  $L = L1 + 1.3 \text{ mm}$  (min. 3 mm)
  - RM - Key grid  $RM = FD + KS$
  - ST - Diameter of plunger
- The plungers can only be combined with MICON 5 version Standard (red bubble).

**4**

### Technical Data

#### General information

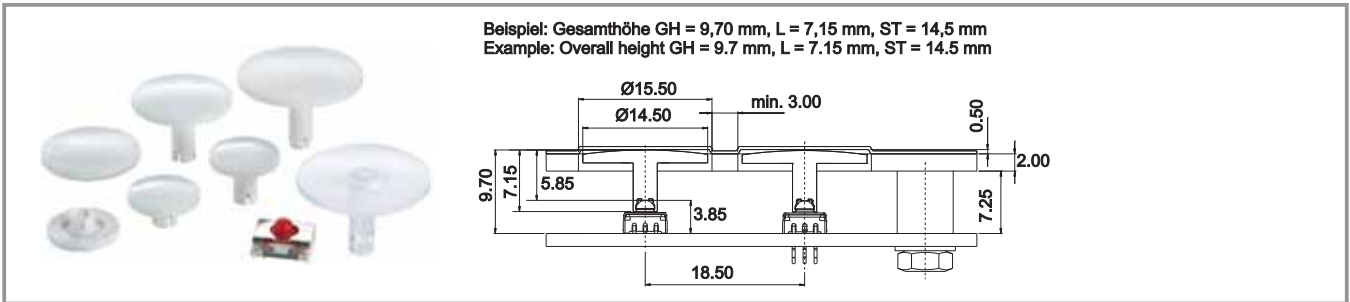
|                       |                 |
|-----------------------|-----------------|
| Plunger diameter/size | see order block |
| Length of plunger L   | see order block |

MICON



## MICON 5 - Plunger opaque, round, not illuminable

**NEW**



| Plunger diameter ST/size | Length of plunger L | Order no.         |
|--------------------------|---------------------|-------------------|
| 6.0 mm                   | 3.00 mm             | 5.46.001.103/0200 |
| 6.0 mm                   | 3.45 mm             | 5.46.001.104/0200 |
| 6.0 mm                   | 3.95 mm             | 5.46.001.105/0200 |
| 6.0 mm                   | 4.45 mm             | 5.46.001.106/0200 |
| 6.0 mm                   | 7.15 mm             | 5.46.001.107/0200 |
| 6.0 mm                   | 9.95 mm             | 5.46.001.108/0200 |
| 8.0 mm                   | 3.00 mm             | 5.46.001.123/0200 |
| 8.0 mm                   | 3.45 mm             | 5.46.001.124/0200 |
| 8.0 mm                   | 3.95 mm             | 5.46.001.125/0200 |
| 8.0 mm                   | 4.45 mm             | 5.46.001.126/0200 |
| 8.0 mm                   | 5.50 mm             | 5.46.001.121/0200 |
| 8.0 mm                   | 7.15 mm             | 5.46.001.127/0200 |
| 8.0 mm                   | 9.95 mm             | 5.46.001.128/0200 |
| 8.0 mm                   | 10.30 mm            | 5.46.001.122/0200 |
| 11.5 mm                  | 3.00 mm             | 5.46.001.143/0200 |
| 11.5 mm                  | 3.45 mm             | 5.46.001.144/0200 |
| 11.5 mm                  | 3.95 mm             | 5.46.001.145/0200 |
| 11.5 mm                  | 4.45 mm             | 5.46.001.146/0200 |
| 11.5 mm                  | 5.50 mm             | 5.46.001.141/0200 |
| 11.5 mm                  | 7.15 mm             | 5.46.001.147/0200 |
| 11.5 mm                  | 9.95 mm             | 5.46.001.148/0200 |
| 11.5 mm                  | 10.30 mm            | 5.46.001.142/0200 |

**4**

MICON

| Plunger diameter ST/size | Length of plunger L | Order no.         |
|--------------------------|---------------------|-------------------|
| 14.5 mm                  | 3.00 mm             | 5.46.001.163/0200 |
| 14.5 mm                  | 3.45 mm             | 5.46.001.164/0200 |
| 14.5 mm                  | 3.95 mm             | 5.46.001.165/0200 |
| 14.5 mm                  | 4.45 mm             | 5.46.001.166/0200 |
| 14.5 mm                  | 7.15 mm             | 5.46.001.167/0200 |
| 14.5 mm                  | 9.95 mm             | 5.46.001.168/0200 |
| 19.0 mm                  | 3.00 mm             | 5.46.001.183/0200 |
| 19.0 mm                  | 3.45 mm             | 5.46.001.184/0200 |
| 19.0 mm                  | 3.95 mm             | 5.46.001.185/0200 |
| 19.0 mm                  | 4.45 mm             | 5.46.001.186/0200 |
| 19.0 mm                  | 7.15 mm             | 5.46.001.187/0200 |
| 19.0 mm                  | 9.95 mm             | 5.46.001.188/0200 |

Technical data see page 4 - 8

Can only be combined with MICON 5 version Standard (red bubble)



## MICON 5: Just feel it.



AUTOMOTIVE



INSTRUMENTATION-CONTROL-  
AUTOMATION



MEDICAL TECHNOLOGY

**There is no miniature keyswitch which has a better tactile and acoustic feedback than the new RAFI MICON 5 short-travel keyswitch.**

The little one shows its excellence under keycaps, membrane overlays or elastic seals. Outstanding tactile feedback and absolutely

reliable switching behaviour in demanding applications, including hostile environments. MICON 5 – test it!

**For samples and information, please contact: [info@rafi.de](mailto:info@rafi.de)**

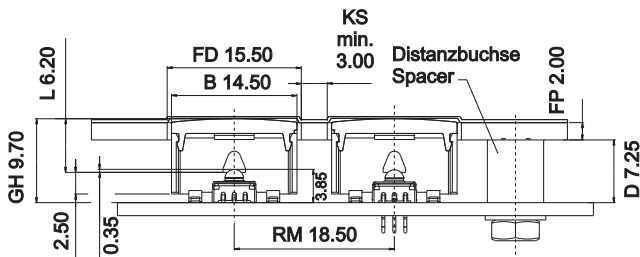
**RAFI GmbH & Co. KG**  
D-88276 Berg/Ravensburg  
Phone: +49 751 89-0, Fax: +49 751 89-13 00  
[www.rafi.de](http://www.rafi.de), [info@rafi.de](mailto:info@rafi.de)

**RAFI**  
SOLUTIONS WITH PASSION

**NEW**

## MICON 5 - Plungers square, illuminable

Musteraufbau, MICON 5 mit quadratischem Stößel, GH = 9.7 mm  
Sample assembly, MICON 5 with square plunger, GH = 9.7 mm



### General Data

#### Description

- A - Height of keyswitch: SMT = 3.85 mm, THT = 3.80 mm
  - B - Width of plunger (11 x 11 mm, 14,5 x 14,5 mm or 18 x 18 mm)
  - D - GH - FP - 0.5 mm (= embossing height 0.35 mm + glue height 0.15 mm)
  - FD - Front panel cut-out: B + 1 mm
  - FP - Thickness of front plate
  - GH - Overall height: A + 5.75 mm
  - KS - Glue strip min. 3 mm
  - R - Grid size: FD + KS
- The plungers can only be combined with MICON 5 version Standard (red bubble).

**4**

### Technical Data

#### General information

|                   |                 |
|-------------------|-----------------|
| Overall height GH | see order block |
| Colour of lens    | see order block |

MICON

## MICON 5 - Plunger square, illuminable, 11 x 11 mm

**NEW**



Pic. with 2 LED OSRAM LO M676-Q1R1-24

| Overall height GH | Colour of lens | Order no.         |
|-------------------|----------------|-------------------|
| 9.70 mm           | red            | 5.05.511.470/2300 |
| 9.70 mm           | green          | 5.05.511.470/2500 |
| 9.70 mm           | yellow         | 5.05.511.470/2400 |
| 9.70 mm           | white          | 5.05.511.470/2200 |
| 9.70 mm           | blue           | 5.05.511.470/2600 |
| 12.50 mm          | red            | 5.05.511.471/2300 |
| 12.50 mm          | green          | 5.05.511.471/2500 |
| 12.50 mm          | yellow         | 5.05.511.471/2400 |
| 12.50 mm          | white          | 5.05.511.471/2200 |
| 12.50 mm          | blue           | 5.05.511.471/2600 |
| 12.50 mm          | opaque blue    | 5.05.511.476/0600 |

Technical data see page 4 - 12

Can only be combined with MICON 5 version Standard (red bubble)

**4**

**MICON**

**NEW**

## MICON 5 - Plunger square, illuminable, 14.5 x 14.5 mm



Pic. with 4 LED OSRAM LO M676-Q1R1-24

| Overall height GH | Colour of lens | Order no.         |
|-------------------|----------------|-------------------|
| 9.70 mm           | red            | 5.05.511.475/2300 |
| 9.70 mm           | green          | 5.05.511.475/2500 |
| 9.70 mm           | yellow         | 5.05.511.475/2400 |
| 9.70 mm           | white          | 5.05.511.475/2200 |
| 9.70 mm           | blue           | 5.05.511.475/2600 |
| 12.50 mm          | red            | 5.05.511.476/2300 |
| 12.50 mm          | green          | 5.05.511.476/2500 |
| 12.50 mm          | yellow         | 5.05.511.476/2400 |
| 12.50 mm          | white          | 5.05.511.476/2200 |
| 12.50 mm          | blue           | 5.05.511.476/2600 |

**4**

Technical data see page 4 - 12

Can only be combined with MICON 5 version Standard (red bubble)

MICON

## MICON 5 - Plunger square, illuminable, 18 x 18 mm

**NEW**



Pic. with 6 LED OSRAM LO M676-Q1R1-24

| Overall height GH | Colour of lens | Order no.         |
|-------------------|----------------|-------------------|
| 9.70 mm           | red            | 5.05.511.480/2300 |
| 9.70 mm           | green          | 5.05.511.480/2500 |
| 9.70 mm           | yellow         | 5.05.511.480/2400 |
| 9.70 mm           | white          | 5.05.511.480/2200 |
| 9.70 mm           | blue           | 5.05.511.480/2600 |
| 12.50 mm          | red            | 5.05.511.481/2300 |
| 12.50 mm          | green          | 5.05.511.481/2500 |
| 12.50 mm          | yellow         | 5.05.511.481/2400 |
| 12.50 mm          | white          | 5.05.511.481/2200 |
| 12.50 mm          | blue           | 5.05.511.481/2600 |

Technical data see page 4 - 12

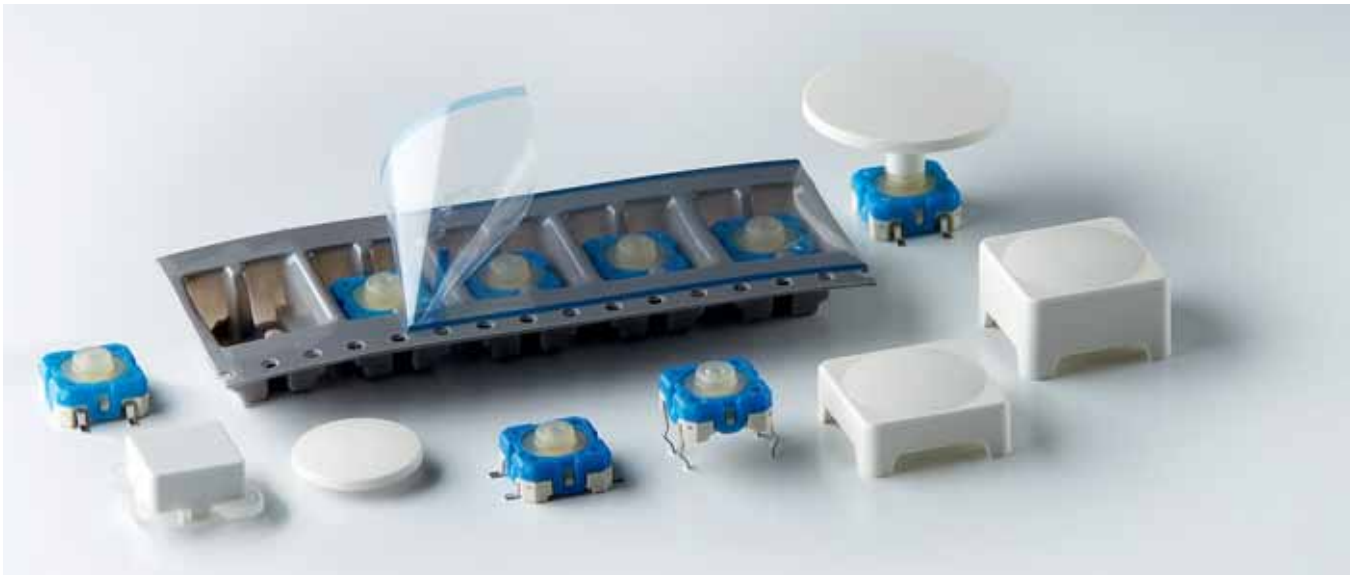
Can only be combined with MICON 5 version Standard (red bubble)

**4**

MICON







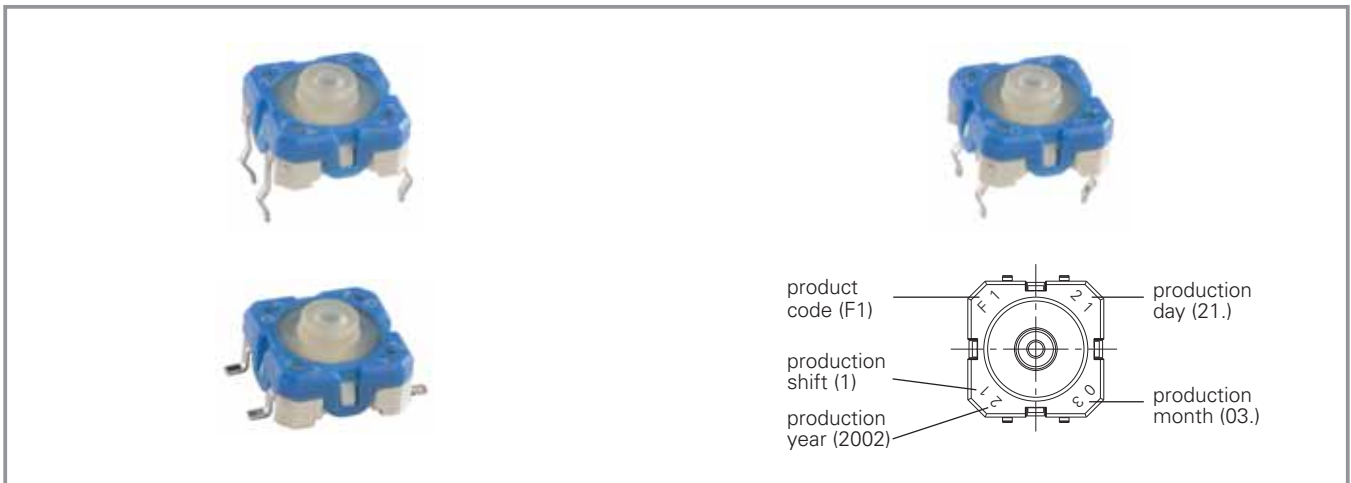
## General Data

RACON short-travel keyswitches with sealed contact system and distinct key click, excellent switching reliability. For use under an overlay or with RK 90 keycaps. Print and SMD versions available (suitable for automatic assembly).

## Content

|   |               |
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| RACON 8 - Short-travel keyswitch, SMT gullwing (Z) terminals  | 4 - 21        |
| <b>RACON 12 - Short-travel keyswitch</b>  | <b>4 - 22</b> |
| RACON 12 - Short-travel keyswitch solder terminals for PCB, outward   | 4 - 24        |
| RACON 12 - Short-travel keyswitch solder terminals for PCB, inward  | 4 - 25        |
| RACON 12 - Short-travel keyswitch SMT gullwing (Z) terminals  | 4 - 25        |
| <b>RACON 12V - Short-travel keyswitch with vertical adapter</b>   | <b>4 - 26</b> |
| RACON 12V - Short-travel keyswitch with vertical adapter  | 4 - 27        |
| <b>RACON 12 i - Short-travel keyswitch</b>  | <b>4 - 28</b> |
| RACON 12 i - Short-travel keyswitch   | 4 - 30        |
| <b>RACON - Special accessories</b>  | <b>4 - 32</b> |
| Plunger round   | 4 - 32        |
| Square plunger for membrane data entry system   | 4 - 34        |
| <b>RK 90 II - Key cap system for RACON 12 with individual sealing</b> <span style="border: 1px solid black; padding: 2px;">NEW</span> | <b>4 - 36</b> |
| RK 90 II - Sealing frame  | 4 - 37        |

## RACON 8 - Short-travel keyswitch



### General Data

RACON 8 short-travel keyswitches offer an extremely high switching reliability while needing very little space. They can be arranged as single keys, in rows or key blocks. When arranged under an overlay, RACON keyswitches should be combined with plungers.

The features at a glance:

- Suitable for the most common soldering methods
  - Wave soldering bath for THT versions
  - Reflow soldering for SMT version
  - Vapour phase soldering for SMT versions
  - Manual soldering
- SMT version suitable for processing with an automatic SMT assembly machine
- IMDS listed

You can download actual product information from our internet site [www.rafi.de](http://www.rafi.de) / Catalogues and Downloads

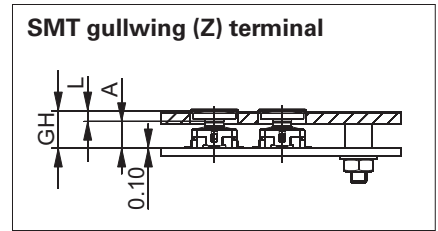
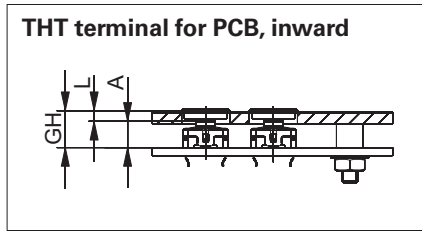
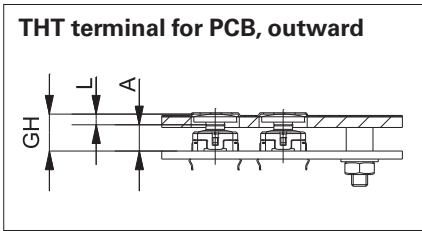
4

### Technical Data

|                                   |                         |  |                                     |
|-----------------------------------|-------------------------|--|-------------------------------------|
| <b>Dimensions</b>                 |                         | Rated current min.                     | 0.01 mA                             |
| Length of housing                 | 8.4 mm                  | Rated current max.                     | 100 mA                              |
| Width of housing                  | 8.4 mm                  | Rated power max.                       | 1 W                                 |
| Height of housing                 | see order block         | (ohmic load)                           |                                     |
|                                   |                         | Contact resistance when new max.       | 100 mΩ                              |
|                                   |                         | Insulation resistance                  | 10 <sup>9</sup> Ω                   |
| <b>Mechanical design</b>          |                         | <b>Other specifications</b>            |                                     |
| Mounting                          | soldering               | Ambient temp. operating min.           | -40 °C                              |
| Terminals                         | see order block         | Ambient temp. operating max.           | +90 °C                              |
| Contact system                    | snap-action contact     | Resistance to environment              | DIN EN 60068-2 -14, -30,-33 and -78 |
| Contact arrangement               | 1 NO                    | Operating life                         | 1,000,000                           |
| Contact materials                 | Au                      | Solderability / Solder heat resistance | see order block                     |
| Illumination                      | no                      | Flammability of materials              | UL 94 HB                            |
| <b>Mechanical characteristics</b> |                         | Packing                                | see order block                     |
| Operating force                   | 3.3 <sup>±0.6</sup> N   | Produkt code                           | see order block                     |
| Switching travel                  | 0.34 <sup>±0.1</sup> mm |  |                                     |
| <b>Electrical characteristics</b> |                         |  |                                     |
| Rated voltage min.                | 0.02 V                  |  |                                     |
| Rated voltage max.                | 35 V                    |  |                                     |

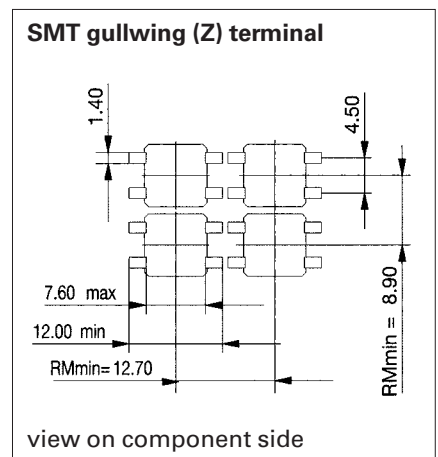
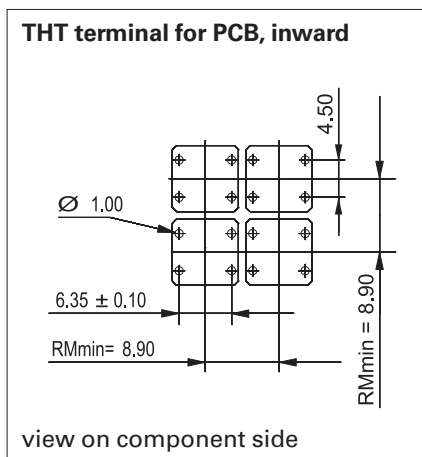
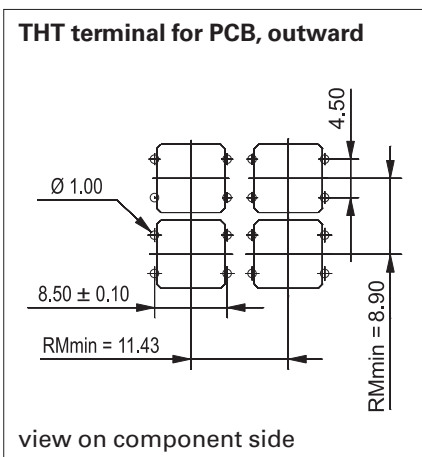
RACON

**RACON 8, Typical System Assembly with Plunger under Overlay**

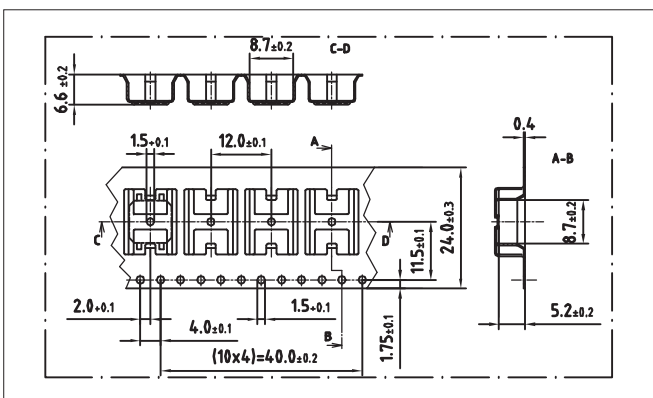


| Variable | Declaration         | THT terminal outward | THT terminal inward | SMT-terminal        |
|----------|---------------------|----------------------|---------------------|---------------------|
| A        | Height of keyswitch |                      | A = 4.90 +/- 0.1 mm |                     |
| GH       | Overall height      |                      | GH = A + L          | GH = A + L + 0.1 mm |
| L        | Length of plunger   |                      | L = GH - A          | L = GH - A - 0.1 mm |

**RACON 8, PCB Hole Pattern, Smallest Grid**

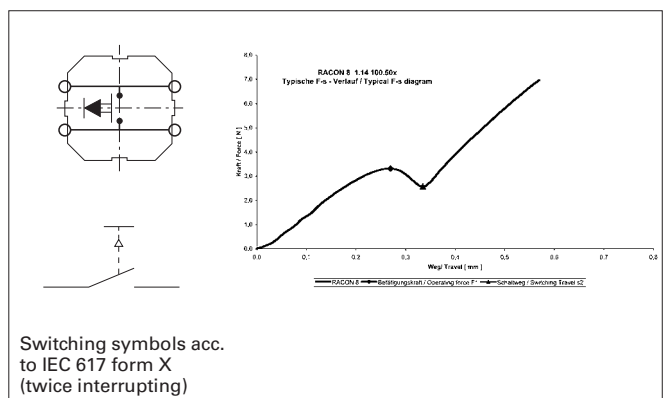


**RACON 8, SMT Terminal, Tape and Reel Drawing**



**Circuit Diagram RACON 8**

**Typical Force-Travel Diagram**



4

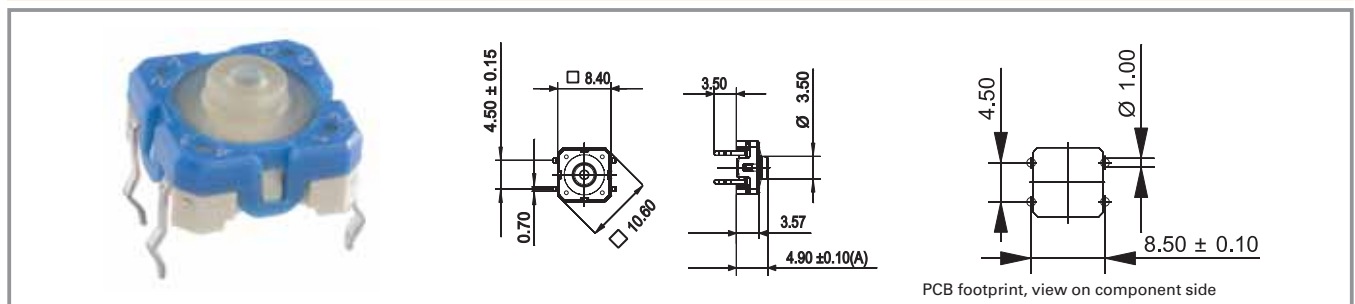
RACON

## Typical accessories RACON 8 - Short-travel keyswitch

| Description                              | Photo | Order no.                | Additional accessories see page |
|--|-------|--------------------------|---------------------------------|
| Spacer, round, length 6.25 mm, red       |       | <b>5.30.759.034/0000</b> | 2 - 239, 4 - 82, 5 - 30         |
| Plunger round                            |       | <b>5.46.167.311/0209</b> | 4 - 32                          |
| RK 90 - Keycap body, for lenses 9 x 9 mm |       | 5.55.103.265/1013        | 4 - 93                          |

For other plungers, refer to the chapter „RACON special accessories“; for keycaps, refer to the chapter „RK 90“

## RACON 8 - Short-travel keyswitch, THT outward



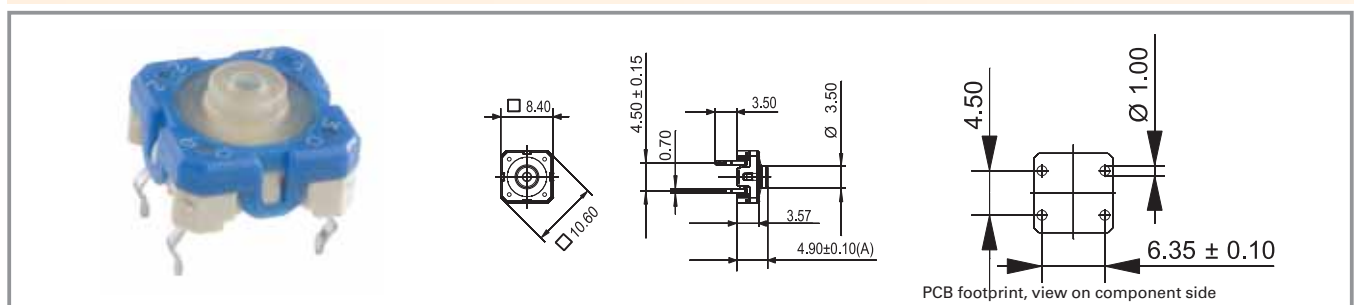
| Terminals   | Operating force | Solderability / Solder heat resistance | Produkt code | Packing          | Order no.                |
|-------------|-----------------|--|--------------|------------------|--------------------------|
| THT outward | 3.3±0.6 N       | E DIN IEC 600 68-2-20                  | A1           | tubes à 60 piece | <b>1.14.100.501/0000</b> |

Technical data see page 4 - 18

For keycaps refer to chapter „RK 90“; plungers see „RACON special accessories“

4

## RACON 8 - Short-travel keyswitch, THT inward



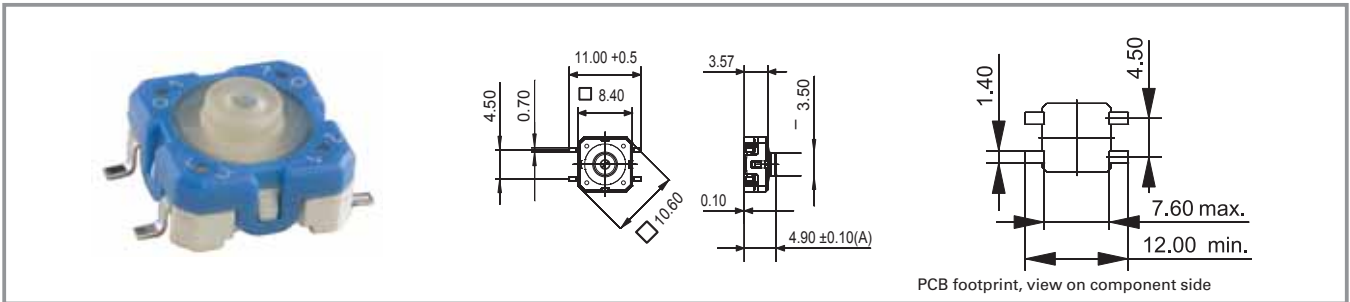
| Terminals  | Operating force | Solderability / Solder heat resistance | Produkt code | Packing          | Order no.                |
|------------|-----------------|--|--------------|------------------|--------------------------|
| THT inward | 3.3±0.6 N       | E DIN IEC 600 68-2-20                  | B1           | tubes à 60 piece | <b>1.14.100.502/0000</b> |

Technical data see page 4 - 18

For keycaps refer to chapter „RK 90“; plungers see „RACON special accessories“

RACON

## RACON 8 - Short-travel keyswitch, SMT gullwing (Z) terminals



| Terminals                  | Operating force | Solderability / Solder heat resistance | Produkt code | Packing                     | Order no.                |
|----------------------------|-----------------|--|--------------|-----------------------------|--------------------------|
| SMT Gullwing (Z) terminals | 3.3±0.6 N       | E DIN IEC 600 68-2-58                  | C1           | tape and reel à 1000 pieces | <b>1.14.100.503/0000</b> |

Technical data see page 4 - 18

For keycaps refer to chapter „RK 90“, plungers see „RACON special accessories“

## RACON 12 - Short-travel keyswitch



### General Data

RACON 12 short-travel keyswitches offer an extremely high switching reliability while needing very little space. They can be arranged as single keys, in rows or key blocks. When arranged under an overlay, RACON keyswitches should be combined with plungers.

The features at a glance:

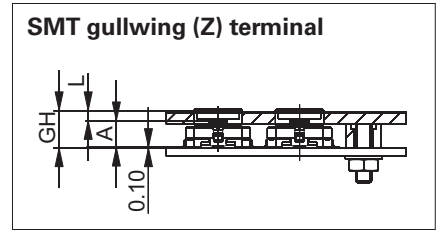
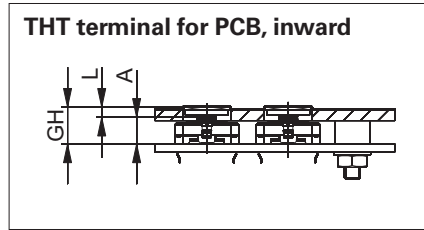
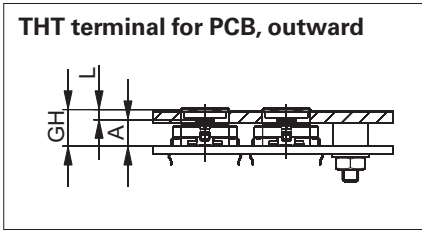
- Suitable for the most common soldering methods
  - Wave soldering bath for THT versions
  - Reflow soldering for SMT versions
  - Vapour phase soldering for SMT versions
  - Manual soldering
- SMT version suitable for processing with an automatic SMT assembly machine
- IMDS listed

4

### Technical Data

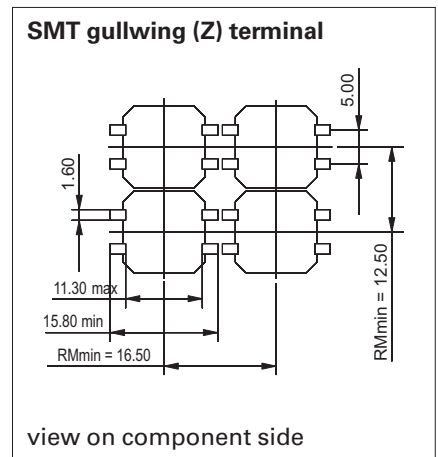
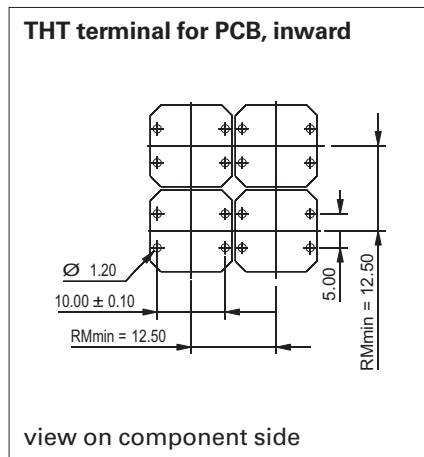
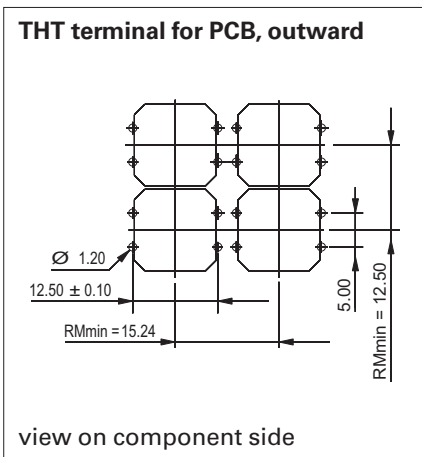
|                                   |                     |  |                                     |
|-----------------------------------|---------------------|--|-------------------------------------|
| <b>Dimensions</b>                 |                     | Rated current min.                     | 0.01 mA                             |
| Length of housing                 | 12 mm               | Rated current max.                     | 100 mA                              |
| Width of housing                  | 12 mm               | Rated power max. (ohmic load)          | 1 W                                 |
| Overall height                    | see order block     | Contact resistance when new max.       | 100 mΩ                              |
| <b>Mechanical design</b>          |                     | Insulation resistance                  | 10 <sup>9</sup> Ω                   |
| Mounting                          | soldering           | <b>Other specifications</b>            |                                     |
| Terminals                         | see order block     | Ambient temp. operating min.           | -40 °C                              |
| Contact system                    | snap-action contact | Ambient temp. operating max.           | +90 °C                              |
| Contact arrangement               | 1 NO                | Resistance to environment              | DIN EN 60068-2 -14, -30,-33 and -78 |
| Contact materials                 | Au                  | Operating life                         | 1,000,000                           |
| Illumination                      | no                  | Solderability / Solder heat resistance | see order block                     |
| <b>Mechanical characteristics</b> |                     | Flammability of materials              | UL 94 HB                            |
| Operating force                   | see order block     | Packing                                | see order block                     |
| Switching travel                  | see order block     | Produkt code                           | see order block                     |
| <b>Electrical characteristics</b> |                     |  |                                     |
| Rated voltage min.                | 0.02 V              |  |                                     |
| Rated voltage max.                | 35 V                |  |                                     |

RACON 12, Typical System Assembly with Plunger under Overlay

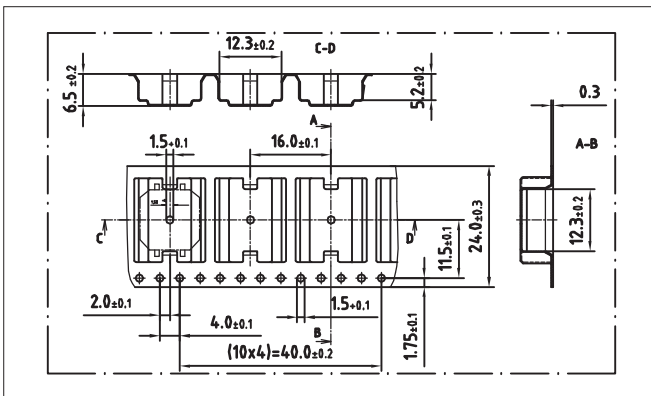


| Variable | Declaration         | THT terminal outward | THT terminal inward | SMT-terminal        |
|----------|---------------------|----------------------|---------------------|---------------------|
| A        | Height of keyswitch |                      | A = 4.95 +/- 0.1 mm |                     |
| GH       | Overall height      |                      | GH = A + L          | GH = A + L + 0.1 mm |
| L        | Length of plunger   |                      | L = GH - A          | L = GH - A - 0.1 mm |

RACON 12, PCB Hole Pattern, Smallest Grid

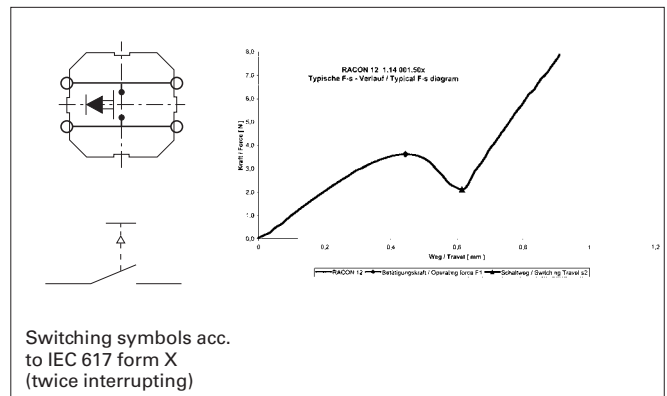


RACON 12, SMT Terminal, Tape and Reel Drawing



Circuit Diagram RACON 12

Typical Force-Travel Diagram



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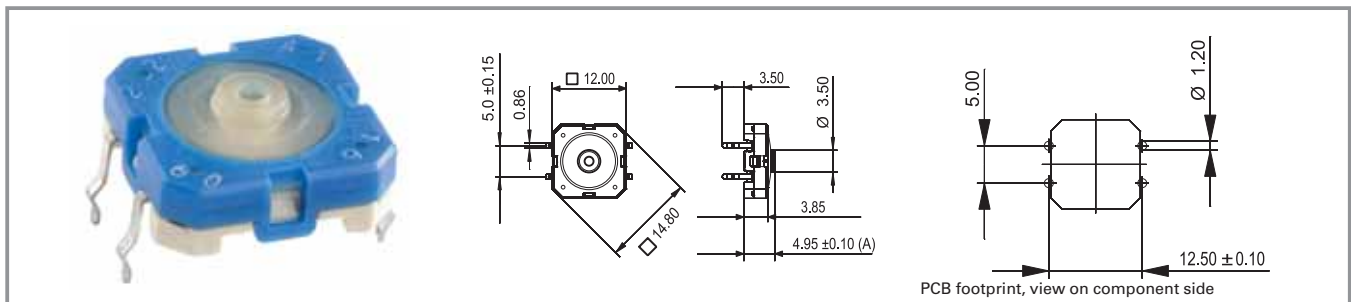
RACON

## Typical accessories RACON 12 - Short-travel keyswitch

| Description                                   | Photo | Order no.                | Additional accessories see page |
|---|-------|--------------------------|---------------------------------|
| Spacer, round, length 6.25 mm, red            |       | <b>5.30.759.034/0000</b> | 2 - 239, 4 - 82, 5 - 30         |
| Square plunger for membrane data entry system |       | 5.46.001.057/0209        | 4 - 34                          |
| Plunger round                                 |       | 5.46.168.050/0209        | 4 - 33                          |
| RK 90 - Keycap body, for lens 1 -module       |       | 5.55.103.030/1013        | 4 - 95                          |

For other plungers, refer to the chapter „RACON special accessories“; for keycaps, refer to the chapter „RK 90“

## RACON 12 - Short-travel keyswitch solder terminals for PCB, outward



| Terminals   | Operating force | Switching travel | Solderability / Solder heat resistance | Produkt code | Packing           | Order no.                |
|-------------|-----------------|------------------|--|--------------|-------------------|--------------------------|
| THT outward | 3.6±0.7 N       | 0.61±0.1 mm      | E DIN IEC 600 68-2-20                  | A1           | tubes à 45 pieces | <b>1.14.001.501/0000</b> |

Technical data see page 4 - 22

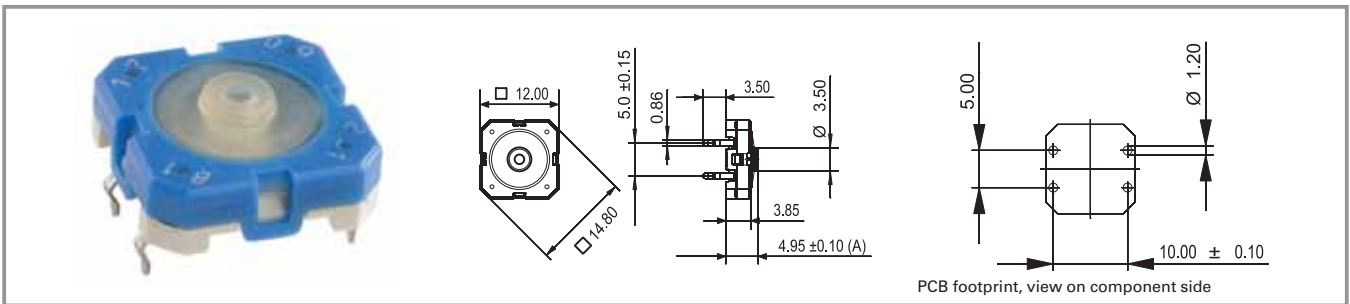
For keycaps refer to chapter „RK 90“; plungers see „RACON special accessories“

4

RACON



## RACON 12 - Short-travel keyswitch solder terminals for PCB, inward

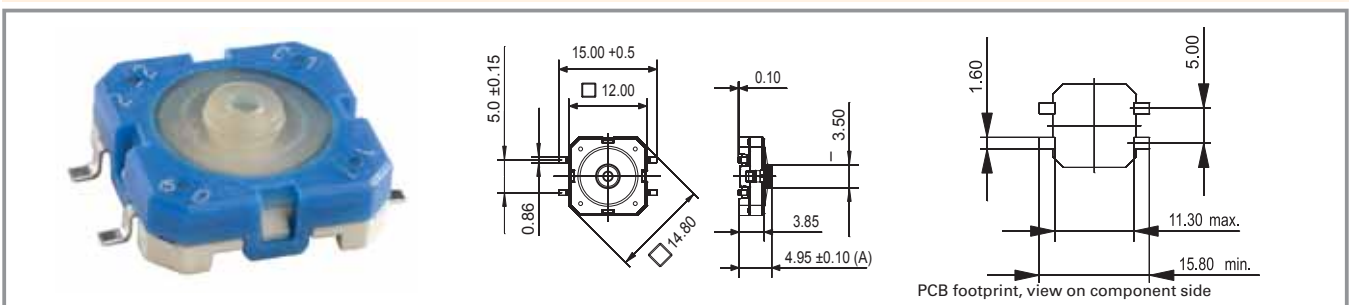


| Terminals   | Operating force | Switching travel | Solderability / Solder heat resistance | Produkt code | Packing           | Order no.                |
|-------------|-----------------|------------------|--|--------------|-------------------|--------------------------|
| THT outward | 3.6±0.7 N       | 0.61±0.1 mm      | E DIN IEC 600 68-2-20                  | B1           | tubes à 45 pieces | <b>1.14.001.502/0000</b> |

Technical data see page 4 - 22

For keycaps refer to chapter „RK 90“, plungers see „RACON special accessories“

## RACON 12 - Short-travel keyswitch SMT gullwing (Z) terminals



| Terminals        | Operating force | Switching travel | Solderability / Solder heat resistance | Produkt code | Packing                    | Order no.                |
|------------------|-----------------|------------------|--|--------------|----------------------------|--------------------------|
| SMT Gullwing (Z) | 3.6±0.7 N       | 0.61±0.1 mm      | E DIN IEC 600 68-2-58                  | C1           | tape and reel à 750 pieces | <b>1.14.001.503/0000</b> |
| SMT Gullwing (Z) | 6.8±1.6 N       | 0.7±0.1 mm       | E DIN IEC 600 68-2-58                  | ZD           | tape and reel à 750 pieces | 1.14.001.916/0000        |
| SMT Gullwing (Z) | 9.7±2.5 N       | 0.73±0.1 mm      | E DIN IEC 600 68-2-58                  | ZE           | tape and reel à 750 pieces | 1.14.001.920/0000        |

Technical data see page 4 - 22

For keycaps refer to chapter „RK 90“, plungers see „RACON special accessories“

## RACON 12V - Short-travel keyswitch with vertical adapter



### General Data

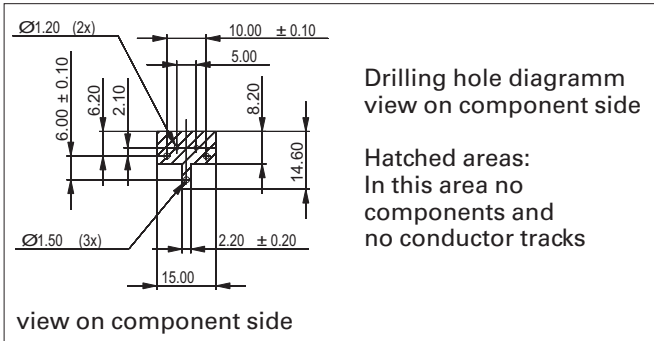
The RACON 12V version can be used, for example, for PC plug-in boards and for measurement and control engineering applications. The vertical mounting adapter (support element) absorbs the operating force so that the pressure on the soldered terminals is reduced. For this mounting arrangement, the keyswitch is provided with two horizontal terminals on one side.

### Technical Data

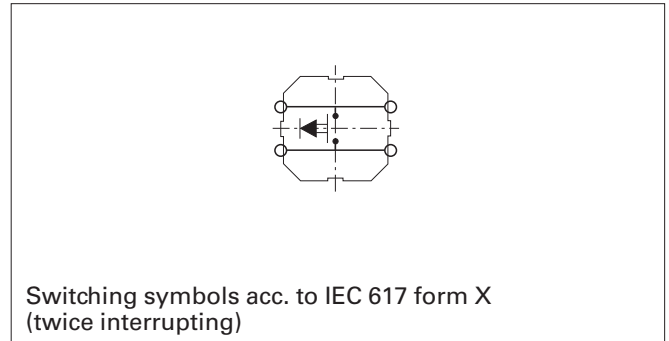
|                                   |                          |  |  |                   |
|-----------------------------------|--------------------------|--|--|-------------------|
| 4                                 | <b>Dimensions</b>        |  | Contact resistance when new                  | 100 mΩ            |
|                                   | Length                   | 14.5 mm                                | max.   |                   |
|                                   | Width                    | 13.6 mm                                | Insulation resistance                        | 10 <sup>9</sup> Ω |
|                                   | Overall height           | 4.95 mm                                |  |                   |
|                                   | <b>Mechanical design</b> |  | <b>Other specifications</b>                  |                   |
|                                   | Mounting                 | soldering                              | Ambient temp. operating min.                 | -40 °C            |
|                                   | Terminals                | THT                                    | Ambient temp. operating max.                 | +80 °C            |
|                                   | Contact system           | snap-action contact                    | Storage temperature min.                     | -50 °C            |
|                                   | Contact arrangement      | 1 NO                                   | Storage temperature max. (product)           | +85 °C            |
|                                   | Contact materials        | Au                                     | Storage temperature max. (in tube)           | +85 °C            |
| Illumination                      | no                       | Environmental resistance               | acc. to IEC 60068-2<br>-14, -30, -33 and -78 |                   |
| <b>Mechanical characteristics</b> |                          | Operating life                         | 1,000,000                                    |                   |
| Operating force                   | 3.6±0.7 N                | Solderability / solder heat resistance | E DIN IEC 600 68-2-20                        |                   |
| Switching travel                  | 0.61±0.1 mm              | Flammability of materials              | UL 94 HB                                     |                   |
| <b>Electrical characteristics</b> |                          | Packing                                | in boxes à<br>100 pieces                     |                   |
| Rated voltage min.                | 0.02 V                   | Produkt code                           | F 1  |                   |
| Rated voltage max.                | 35 V                     |  |  |                   |
| Rated current min.                | 0.01 mA                  |  |  |                   |
| Rated current max.                | 100 mA                   |  |  |                   |
| Rated power max. (ohmic load)     | 1 W                      |  |  |                   |

RACON

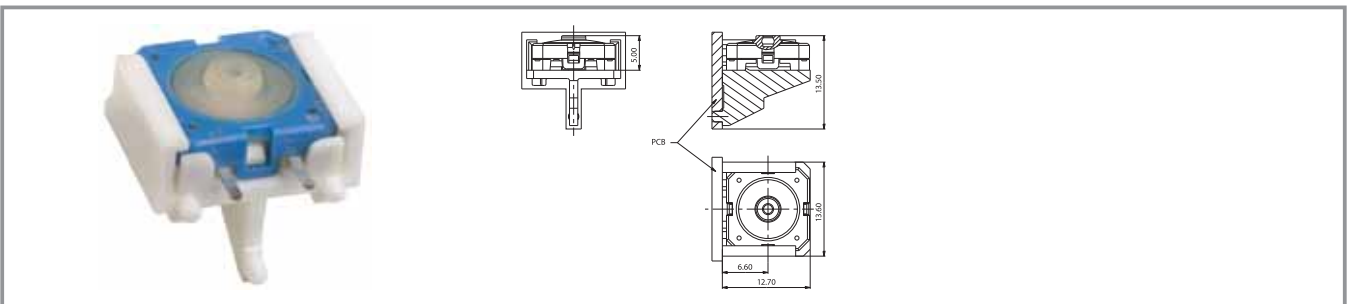
## PCB footprint RACON 12V



## Circuit Diagram RACON 12V



## RACON 12V - Short-travel keyswitch with vertical adapter

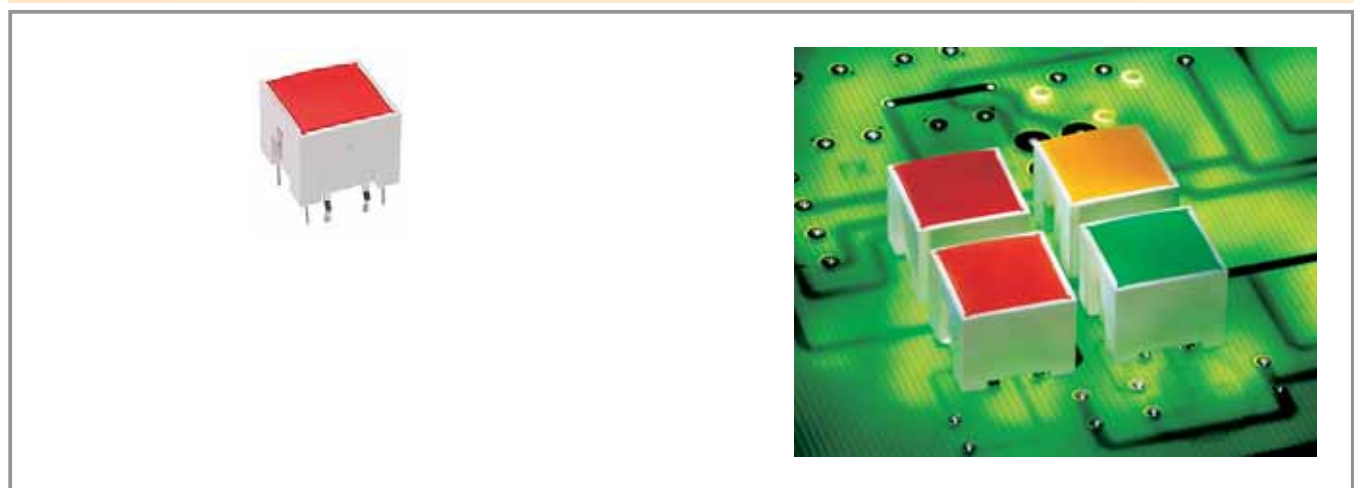


| Terminals | Contact arrangement | Produkt code | Packing               | Order no.         |
|-----------|---------------------|--------------|-----------------------|-------------------|
| THT       | 1 NO                | F 1          | in boxes à 100 pieces | 1.14.001.505/0000 |

Technical data see page 4 - 26

Plungers for overall height of 6.5 mm may not be used.

## RACON 12 i - Short-travel keyswitch



### General Data

#### Application note

Low-profile keyboards with RACON 12 i components should be designed with a grid spacing of 15.24 mm. With this grid, frame webs remain free between the individual keys. The overlay can be glued onto these frame webs; we recommend area embossing over the keys for the overlays. If our RK 90 system design is used, we recommend the 9 x 9 mm keycaps.

### Technical Data

4

#### General information

|                      |                  |
|----------------------|------------------|
| Colour of lens       | see order block  |
| Recommended key grid | 15.24 x 15.24 mm |
| Key grid min.        | 12.5 x 12.5 mm   |

#### Dimensions

|                |          |
|----------------|----------|
| Length         | 11.35 mm |
| Width          | 11.35 mm |
| Overall height | 9.7 mm   |

#### Mechanical design

|                     |                     |
|---------------------|---------------------|
| Mounting            | soldering           |
| Terminals           | THT                 |
| Contact system      | snap-action contact |
| Contact arrangement | 1 NO                |
| Contact materials   | Au                  |
| Illumination        | fully illuminated   |
|                     | 2 LED               |
| LED colour          | see order block     |
| LED type            | standard 2 mm       |

#### Mechanical characteristics

|                  |                         |
|------------------|-------------------------|
| Operating force  | 3.3 <sup>±0.6</sup> N   |
| Switching travel | 0.34 <sup>±0.1</sup> mm |

#### Electrical characteristics

|                                  |         |
|----------------------------------|---------|
| Rated voltage min.               | 0.02 V  |
| Rated voltage max.               | 35 V    |
| Rated current min.               | 0.01 mA |
| Rated current max.               | 100 mA  |
| Rated power max. (ohmic load)    | 1 W     |
| Contact resistance when new max. | 100 mΩ  |

|                             |                   |
|-----------------------------|-------------------|
| Dielectric strength AC min. | 750 V             |
| Insulation resistance       | 10 <sup>9</sup> Ω |

#### Electrical characteristics of LED

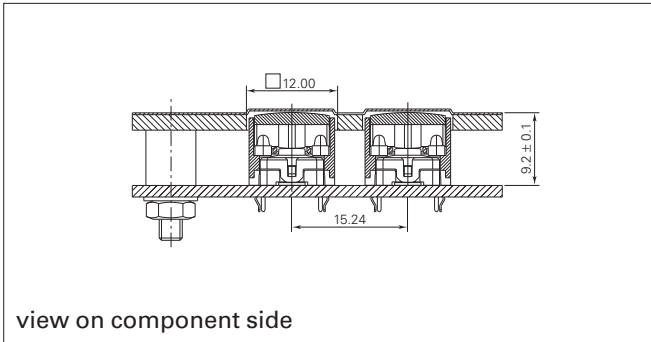
|  |  |
|--|--|
| LED rated current max. I <sub>F</sub> at 25 °C   | red/green: 30, yellow: 50 mA                 |
| LED current reduction beginning with 50 degree C | red: 0.5 mA/degree C, yellow 0.8 mA/degree C |
| LED wavelength typ.                              | red 639, green 510-535, yellow 590           |
| LED forward voltage U <sub>F</sub> at 20 mA      | red: 1.8 V/20 mA, yellow: 1.9 V/20 mA        |
| LED breakdown voltage U <sub>R</sub> at 25 °C    | min. 5 V/0.1 mA                              |

#### Other specifications

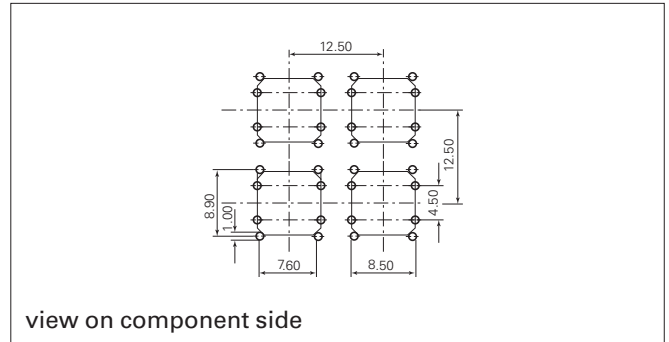
|  |   |
|--|---|
| Ambient temp. operating min.           | -40 °C                                    |
| Ambient temp. operating max.           | +80 °C                                    |
| Storage temperature min. (product)     | see order block                           |
| Storage temperature max. (intube)      | see order block                           |
| Environmental resistance               | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life                         | 1,000,000                                 |
| Solderability / solder heat resistance | E DIN IEC 600 68-2-20                     |
| Flammability of materials              | UL 94 HB                                  |
| Packing                                | tubes à 45 pieces                         |

RACON

**RACON 12i  
typical system assembly**

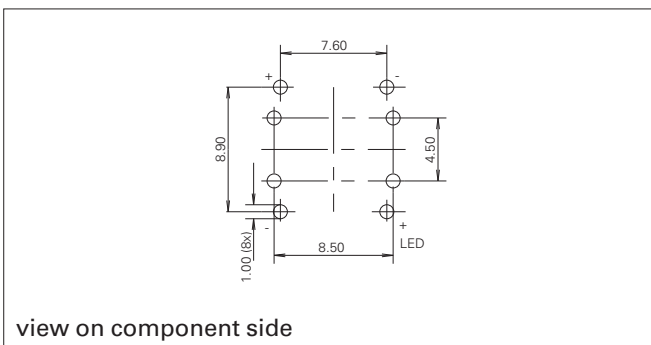


**RACON 12i smallest grid**

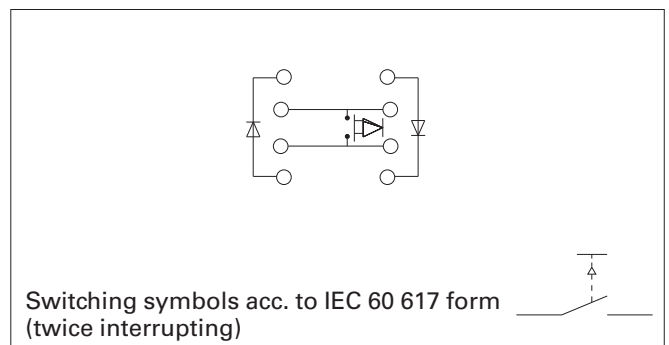


Explanation  
Recommended area embossing 0.35 mm at glue spacer thickness of 0.15 mm

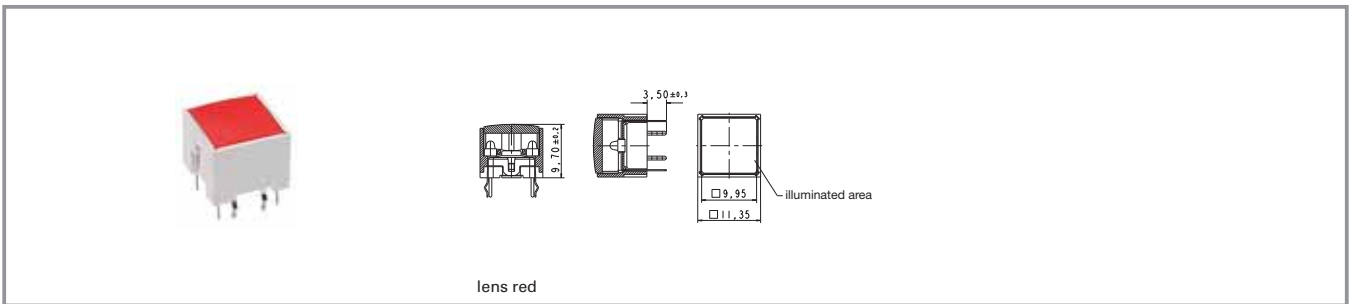
**LED hole patterns**



**Circuit Diagram RACON 12i**



## RACON 12 i - Short-travel keyswitch



lens red

| Terminals | Contact arrangement | Illumination               | Colour of lens | LED colour | Order no.         |
|-----------|---------------------|----------------------------|----------------|------------|-------------------|
| THT       | 1 NO                | fully illuminated<br>2 LED | red            | red        | 1.14.001.551/0000 |
| THT       | 1 NO                | fully illuminated<br>2 LED | green          | green      | 1.14.001.552/0000 |
| THT       | 1 NO                | fully illuminated<br>2 LED | yellow         | yellow     | 1.14.001.553/0000 |
| THT       | 1 NO                | fully illuminated<br>2 LED | orange         | yellow     | 1.14.001.554/0000 |

Technical data see page 4 - 28

If keycaps are used we recommend RK 90 keycaps 9 x 9 mm.



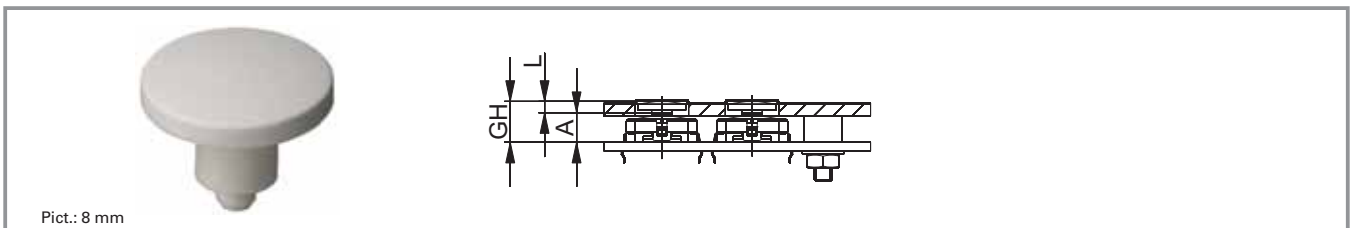
## RACON - Special accessories



### General Data

GH = „L“ length of plunger + „A“ height of keyswitch (+ 0.1 mm for SMT versions)  
 Front panel cut-out = size of plunger + 1 mm

### Plunger round



| Plunger diameter/size | RACON version | Length of plunger L | Order no.                |
|-----------------------|---------------|---------------------|--------------------------|
| 8 mm                  | RACON 8       | 1,4 mm              | <b>5.46.167.301/0209</b> |
| 8 mm                  | RACON 8       | 1.5 mm              | 5.46.167.102/0209        |
| 8 mm                  | RACON 8       | 1.6 mm              | 5.46.167.101/0209        |
| 8 mm                  | RACON 8/12    | 1,9 mm              | <b>5.46.167.090/0209</b> |
| 8 mm                  | RACON 8/12    | 2 mm                | 5.46.167.106/0209        |
| 8 mm                  | RACON 8/12    | 2.1 mm              | 5.46.167.107/0209        |
| 8 mm                  | RACON 8/12    | 4,6 mm              | <b>5.46.167.091/0209</b> |
| 8 mm                  | RACON 8/12    | 4.7 mm              | <b>5.46.167.311/0209</b> |
| 8 mm                  | RACON 8/12    | 4.8 mm              | <b>5.46.167.094/0209</b> |
| 8 mm                  | RACON 8/12    | 7,4 mm              | <b>5.46.167.092/0209</b> |
| 8 mm                  | RACON 8/12    | 7.5 mm              | 5.46.167.099/0209        |
| 8 mm                  | RACON 8/12    | 7.6 mm              | 5.46.167.096/0209        |

4

RACON

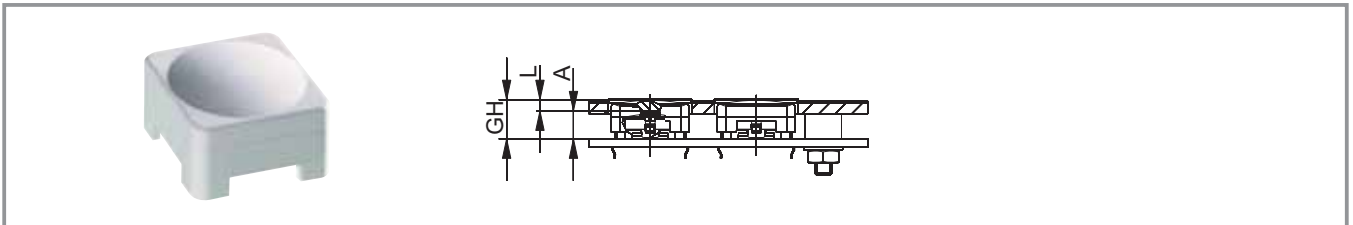


| Plunger diameter/size | RACON version | Length of plunger L | Order no.                |
|-----------------------|---------------|---------------------|--------------------------|
| 11.5 mm               | RACON 8       | 1,4 mm              | <b>5.46.167.227/0209</b> |
| 11.5 mm               | RACON 8       | 1.5 mm              | <b>5.46.167.061/0209</b> |
| 11.5 mm               | RACON 8       | 1.6 mm              | 5.46.167.060/0209        |
| 11.5 mm               | RACON 8/12    | 2 mm                | 5.46.167.067/0209        |
| 11.5 mm               | RACON 8/12    | 2.1 mm              | 5.46.167.064/0209        |
| 11.5 mm               | RACON 8/12    | 4,6 mm              | <b>5.46.167.043/0209</b> |
| 11.5 mm               | RACON 8/12    | 4.7 mm              | 5.46.167.050/0209        |
| 11.5 mm               | RACON 8/12    | 4.8 mm              | 5.46.167.047/0209        |
| 11.5 mm               | RACON 8/12    | 7.5 mm              | 5.46.167.059/0209        |
| 11.5 mm               | RACON 8/12    | 7.6 mm              | 5.46.167.058/0209        |
| 14.5 mm               | RACON 8       | 1,4 mm              | <b>5.46.168.227/0209</b> |
| 14.5 mm               | RACON 8       | 1.5 mm              | <b>5.46.168.061/0209</b> |
| 14.5 mm               | RACON 8       | 1.6 mm              | 5.46.168.060/0209        |
| 14.5 mm               | RACON 8/12    | 2 mm                | 5.46.168.067/0209        |
| 14.5 mm               | RACON 8/12    | 2.1 mm              | 5.46.168.064/0209        |
| 14.5 mm               | RACON 8/12    | 4,6 mm              | <b>5.46.168.043/0209</b> |
| 14.5 mm               | RACON 8/12    | 4.7 mm              | 5.46.168.050/0209        |
| 14.5 mm               | RACON 8/12    | 4.8 mm              | 5.46.168.047/0209        |
| 14.5 mm               | RACON 8/12    | 7,4 mm              | <b>5.46.168.044/0209</b> |
| 14.5 mm               | RACON 8/12    | 7.5 mm              | 5.46.168.059/0209        |
| 14.5 mm               | RACON 8/12    | 7.6 mm              | 5.46.168.058/0209        |
| 19 mm                 | RACON 8       | 1.5 mm              | <b>5.46.169.061/0209</b> |
| 19 mm                 | RACON 8       | 1.6 mm              | <b>5.46.169.060/0209</b> |
| 19 mm                 | RACON 8/12    | 2 mm                | <b>5.46.169.067/0209</b> |
| 19 mm                 | RACON 8/12    | 2.1 mm              | <b>5.46.169.064/0209</b> |
| 19 mm                 | RACON 8/12    | 4.7 mm              | 5.46.169.050/0209        |
| 19 mm                 | RACON 8/12    | 4.8 mm              | 5.46.169.047/0209        |
| 19 mm                 | RACON 8/12    | 7.5 mm              | <b>5.46.169.059/0209</b> |

| Plunger diameter/size | RACON version | Length of plunger L | Order no.         |
|-----------------------|---------------|---------------------|-------------------|
| 19 mm                 | RACON 8/12    | 7.6 mm              | 5.46.169.058/0209 |

Front panel cut-out = Plunger diameter + 1 mm.

## Square plunger for membrane data entry system



| Plunger diameter/size | RACON version | Length of plunger L | Order no.                |
|-----------------------|---------------|---------------------|--------------------------|
| 14 x 14 mm            | RACON 12THT   | 2.1 mm              | 5.46.001.064/0209        |
| 14 x 14 mm            | RACON 12THT   | 4.8 mm              | 5.46.001.060/0209        |
| 14 x 14 mm            | RACON 12THT   | 7.6 mm              | 5.46.001.063/0209        |
| 14 x 14 mm            | RACON 12 SMT  | 2 mm                | 5.46.001.057/0209        |
| 14 x 14 mm            | RACON 12 SMT  | 4.7 mm              | <b>5.46.001.058/0209</b> |
| 14 x 14 mm            | RACON 12 SMT  | 7.5 mm              | 5.46.001.059/0209        |

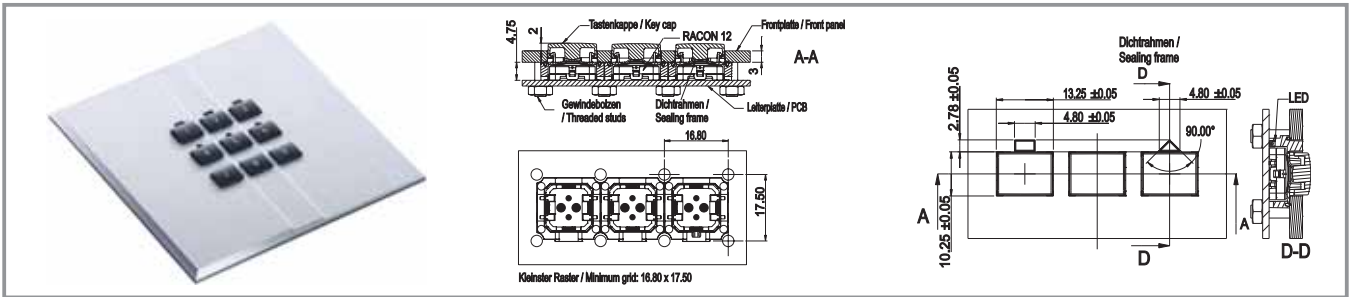
Front panel cut-out = 15 x 15 mm.

4

RACON



**NEW** RK 90 II, Key cap system for RACON 12 with individual sealing



## Technical Data

### General information

|                          |                     |
|--------------------------|---------------------|
| Thickness of front panel | 3.00 mm             |
| Light conductor          | see order block     |
| Key grid                 | min. 16.8 x 17.5 mm |
| Degree of protection     | IP 65               |

The key cap system RK 90 II has been developed especially for the short-travel keyswitch RACON 12. The lenses are snapped onto the sealing frame and then set onto the RACON 12 keyswitches. The PCB presses this unit against the front panel, so they are sealed.

Two versions of the sealing frames are provided with light conductors, either in square or triangle form. The lenses can be legended directly with laser. For bright letters (see picture) first white lenses are painted in dark, then the letters are cut out of the dark colour with laser.

## RK 90 II - Sealing frame



Sealing frame with square light conductor

with snapped-on lens

| Thickness of front panel | Light conductor | Order no. without lens | Note                          |
|--------------------------|-----------------|------------------------|-------------------------------|
| 3.00 mm                  | square          | 5.05.004.901/0000      | Please order lens separately. |
| 3.00 mm                  | triangular      | 5.05.004.902/0000      | Please order lens separately. |
| 3.00 mm                  | -               | 5.05.004.903/0000      | Please order lens separately. |

Technical data see page 4 - 36

**Lenses:**

- Lens RK 90 II, white: 5.46.654.192/0200
- Lens RK 90 II, red: 5.46.654.192/0300
- Lens RK 90 II, green: 5.46.654.192/0500
- Lens RK 90 II, blue: 5.46.654.192/0600
- Lens RK 90 II, yellow: 5.46.654.192/0400
- Lens RK 90 II, grey: 5.46.654.192/0700
- Lens RK 90 II, iron grey (varnished): 5.46.654.192/6033
- Lens RK 90 II, grey (varnished): 5.46.654.192/6032

Legended lenses on request.





## General Data

RF 15 (15 x 15 mm) and RF 19 (19 x 19 mm) with distinct key click, for use under an overlay or with RK 90 keycaps. Can be fully illuminated.

## Content

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|  |               |
|--|---------------|
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# Specifications LED

## 3 mm LED

| (valid for 25 °C)                              | Red LED             | Green LED           | Yellow LED            |
|--|---------------------|---------------------|-----------------------|
| Max. forward current $I_F$ :                   | 30 mA               | 30 mA               | 20 mA                 |
| Current reduction from: $T_0 = 50\text{ °C}$ : | approx 0.5 mA/°C    | approx 0.5 mA/°C    | approx 0.2 mA/°C      |
| Wavelength typ:                                | 635 nm              | 565 nm              | 586 nm                |
| Forward voltage $U_F/I_F$ typ:                 | 2 V/10 mA           | 2 V/10 mA           | 2 V/10 mA             |
| Reverse voltage $U_R/I_F$ typ:                 | 5 V/100 µA min.     | 5 V/100 µA min.     | 5 V/100 µA min.       |
| Ambient temperature, operating:                | - 20 °C ... + 80 °C | - 20 °C ... + 80 °C | - 20 °C ... + 80 °C   |
|  | Blue LED            | White LED           | Green LED superbright |
| Max. forward current $I_F$ :                   | 20 mA               | 25 mA               | 30 mA                 |
| Current reduction from: $T_0 = 50\text{ °C}$ : | approx 0.6 mA/°C    | -                   | -                     |
| Wavelength typ:                                | 470 nm              | -                   | 510-545 nm            |
| Forward voltage $U_F/I_F$ typ:                 | 2.7 V/10 mA         | 3.6 V/20 mA         | 3.5 V/20 mA           |
| Reverse voltage $U_R/I_F$ typ:                 | 5V/100 µA min.      | -                   | -                     |
| Ambient temperature, operating:                | - 20 °C ... + 80 °C | - 20 °C ... + 80 °C | -30 °C ... + 100 °C   |

## 2 mm LED (full illumination of RF 15/19)

| (valid for 25 °C)                              | Red LED              | Green LED            | Yellow LED          |
|--|----------------------|----------------------|---------------------|
| Max. forward current $I_F$ :                   | 30 mA                | 30 mA                | 50 mA               |
| Current reduction from: $T_0 = 50\text{ °C}$ : | 0.5 mA/°C            | 0.5 mA/°C            | 0.8 mA/°C           |
| Light current $f_v/I_F$ typ:                   | -                    | -                    | 250 mIm/20 mA       |
| Wavelength typ:                                | 637 nm               | 569 nm               | 590 nm              |
| Forward voltage $U_F/I_F$ typ:                 | 1.8 V/20 mA          | 2.1 V/10 mA          | 1.9 V/20 mA         |
| Reverse voltage $U_R/I_F$ typ:                 | 5 V/100 µA min.      | 5 V/100 µA min.      | 5 V/100 µA min.     |
| Ambient temperature, operating:                | - 55 °C ... + 100 °C | - 40 °C ... + 100 °C | -40 °C ... + 100 °C |
|  | Blue LED             | Multi-colour LED     |                     |
| Max. forward current $I_F$ :                   | 30 mA                | 30 mA                |                     |
| Current reduction from: $T_0 = 50\text{ °C}$ : | -                    | approx 0.6 mA/°C     |                     |
| Light current $f_v/I_F$ typ:                   | -                    | -                    |                     |
| Wavelength typ:                                | 464-485 nm           | 635/565 nm           |                     |
| Forward voltage $U_F/I_F$ typ:                 | 3.6 V/20 mA          | 2 V/10 mA            |                     |
| Reverse voltage $U_R/I_F$ typ:                 | -                    | -                    |                     |
| Ambient temperature, operating:                | - 20 °C ... + 80 °C  | - 20 °C ... + 80 °C  |                     |

4

|                                  |                          |   |
|----------------------------------|--------------------------|---|
| Calculating the series resistor: | Rated power of series:   | Example for 5 Volt:   |
| $R_V = \frac{U_B - U_F}{I_F}$    | $P_V = I_F^2 \times R_V$ | $R_V = \frac{5V - 2,0V}{0,02 A} = 150\ \Omega \text{ (= standard value)}$ |

RF

## RF 15 - Short-travel keyswitch



### General Data

Low-profile keyboards with RF 15 components should be designed with a 19.05 mm grid. With this grid, frame webs remain free between the individual keys. The overlay can be glued onto these frame webs; we recommend area embossing over the keys for the overlays.

### Technical Data

#### General information

|                      |                 |
|----------------------|-----------------|
| Colour of lens       | see order block |
| Recommended key grid | 19.05 mm        |

#### Dimensions

|                |        |
|----------------|--------|
| Length         | 15 mm  |
| Width          | 15 mm  |
| Overall height | 9.7 mm |

#### Mechanical design

|                     |                     |
|---------------------|---------------------|
| Mounting            | soldering in PCB    |
| Terminals           | THT                 |
| Contact system      | snap-action contact |
| Contact arrangement | 1 NO                |
| Contact materials   | see order block     |
| Illumination        | see order block     |
| LED colour          | see order block     |
| LED type            | see order block     |

#### Mechanical characteristics

|                      |                               |
|----------------------|-------------------------------|
| Operating force max. | 2.9 <sup>+0.6</sup> N         |
| Switching travel     | 0.5 <sup>+0.2</sup> mm        |
| Robustness min.      | with through-plated PCB 100 N |

#### Electrical characteristics

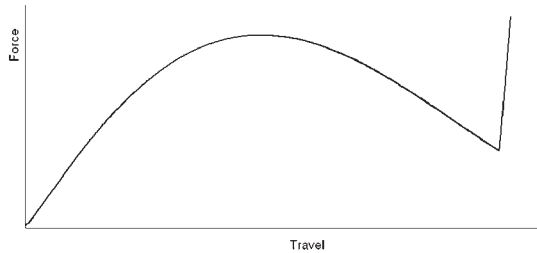
|                                  |                         |
|----------------------------------|-------------------------|
| Rated voltage min.               | Au: 0.02 V, Ag: 3 V     |
| Rated voltage max.               | Au: 35 V, Ag: 50 V      |
| Rated current min.               | Au: 0.01 mA, Ag: 0.1 mA |
| Rated current max.               | Au: 100 mA, Ag: 250 mA  |
| Rated power max. (ohmic load)    | Au: 2 W, Ag: 12.5 W     |
| Contact resistance when new max. | 100 mΩ                  |
| Insulation resistance            | 10 <sup>9</sup> Ω       |

#### Other specifications

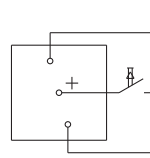
|  |   |
|--|---|
| Ambient temp. operating min.           | -25 °C                                    |
| Ambient temp. operating max.           | +70 °C                                    |
| Environmental resistance               | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations)       | 1,000,000                                 |
| Solderability / solder heat resistance | according to E DIN IEC 600 28-2-20        |
| Wave soldering                         | 260 °C max.                               |
| Manual soldering                       | 350 °C / 5 sec. max.                      |

## Force/Travel Diagram – Keyswitch RF 15

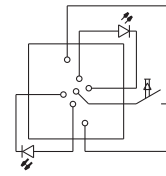
Operation characteristic limits RF



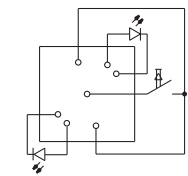
## Circuit Diagram – Keyswitch RF 15



Keyswitch, non-illuminated

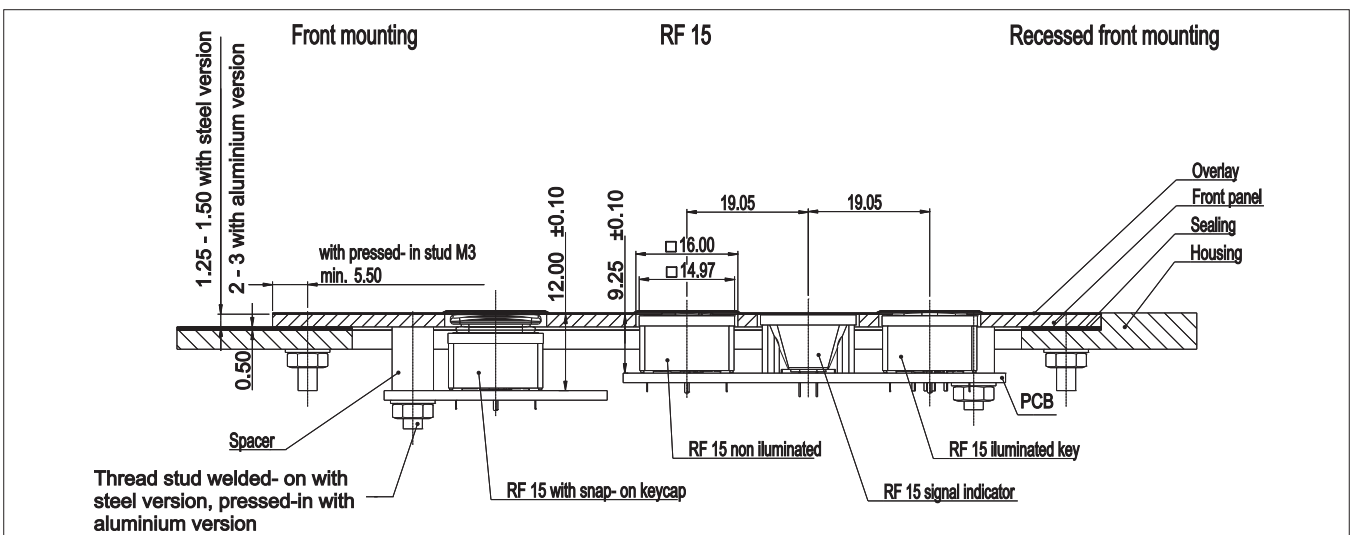


Keyswitch, fully illuminated

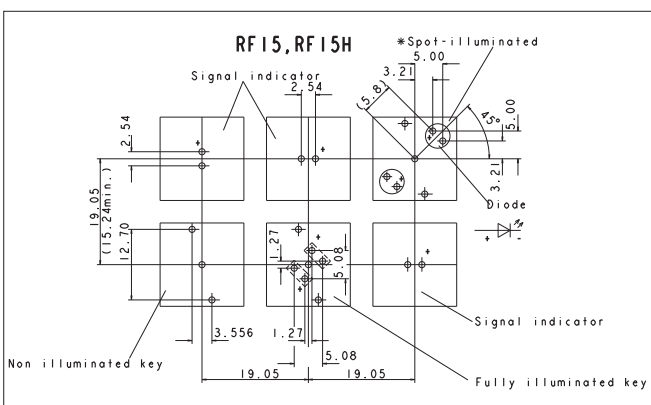


Keyswitch, spot-illuminated

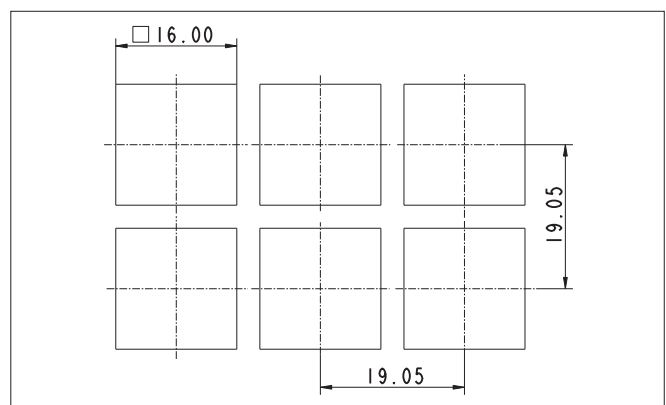
## Dimensional Drawing RF 15



## Hole Pattern RF 15

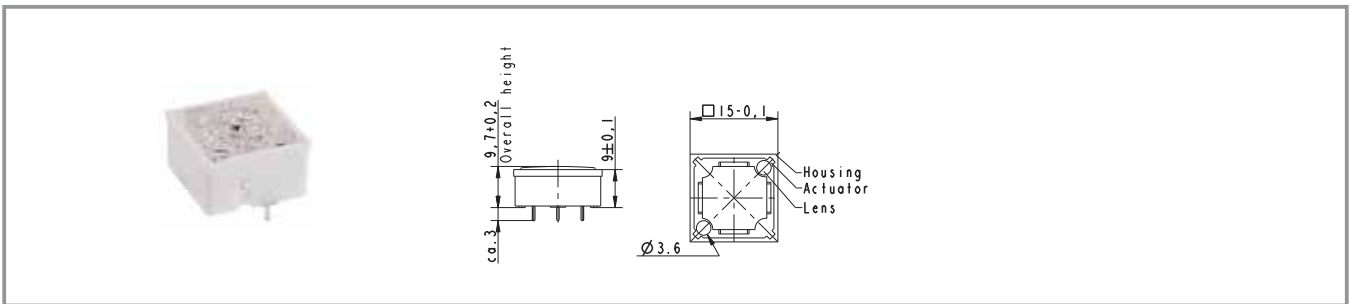


## Hole Pattern – Front Panel



View on component side, all hole diameters 1,1 ±0,1 mm

## RF 15 - Short-travel keyswitch, non-illuminated



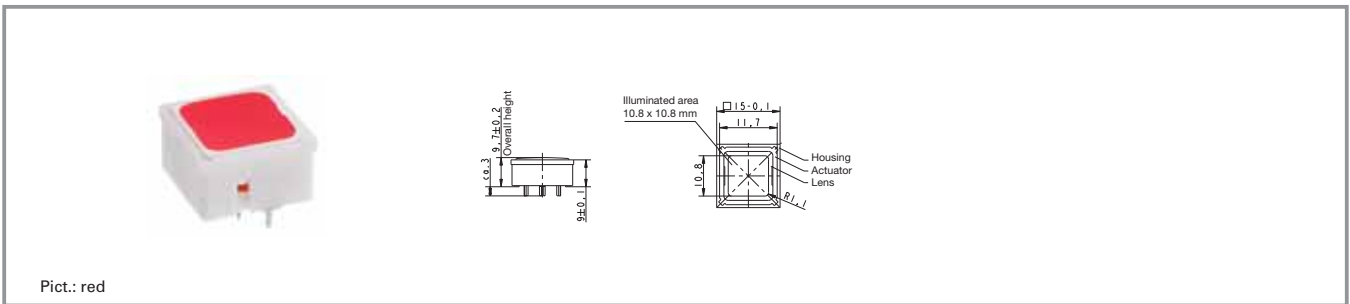
| Contact materials | Illumination    | Colour of lens | LED colour | LED type | Order no.                |
|-------------------|-----------------|----------------|------------|----------|--------------------------|
| Au                | not illuminated | transparent    | -          | -        | <b>3.14.100.001/0000</b> |
| Ag                | not illuminated | transparent    | -          | -        | <b>3.14.100.006/0000</b> |

Technical data see page 4 - 42

For keycaps, refer to chapter accessories and system RK 90.

If exchangeable legends are required, or if an overall height of 12.5 mm is required, a keycap can be mounted on the non-illuminated keys. The keycap legend is visible through a window in the overlay. You can change the legend by replacing the keycap.

## RF 15 - Short-travel keyswitch, fully illuminated with 2 LED



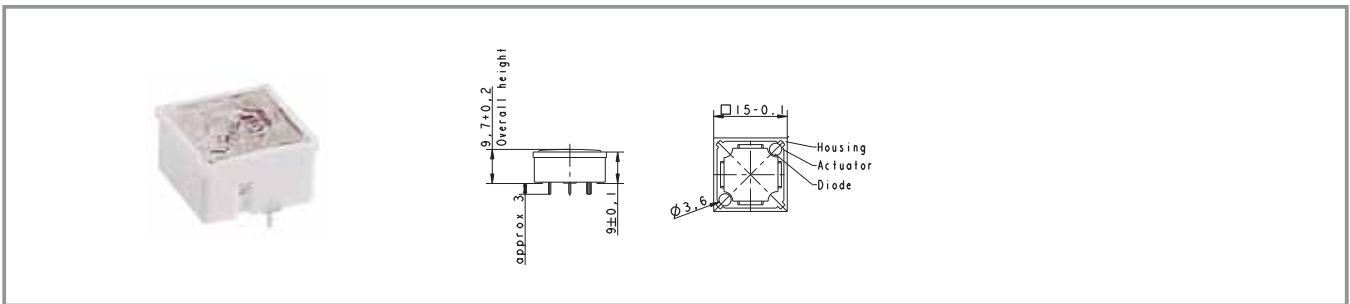
| Contact materials | Illumination               | Colour of lens | LED colour | LED type | Order no.                |
|-------------------|----------------------------|----------------|------------|----------|--------------------------|
| Au                | fully illuminated<br>2 LED | red            | red        | 2 mm     | <b>3.14.200.011/0000</b> |
| Au                | fully illuminated<br>2 LED | green          | green      | 2 mm     | <b>3.14.200.012/0000</b> |
| Au                | fully illuminated<br>2 LED | yellow         | yellow     | 2 mm     | <b>3.14.200.013/0000</b> |
| Au                | fully illuminated<br>2 LED | orange         | yellow     | 2 mm     | 3.14.200.014/0000        |
| Au                | fully illuminated<br>2 LED | blue           | blue       | 2 mm     | 3.14.200.015/0000        |
| Ag                | fully illuminated<br>2 LED | red            | red        | 2 mm     | <b>3.14.200.021/0000</b> |
| Ag                | fully illuminated<br>2 LED | green          | green      | 2 mm     | <b>3.14.200.022/0000</b> |
| Ag                | fully illuminated<br>2 LED | yellow         | yellow     | 2 mm     | <b>3.14.200.023/0000</b> |
| Ag                | fully illuminated<br>2 LED | orange         | yellow     | 2 mm     | 3.14.200.024/0000        |
| Ag                | fully illuminated<br>2 LED | blue           | blue       | 2 mm     | 3.14.200.025/0000        |

Technical data see page 4 - 42

For keycaps, refer to RK 90 system design.

Technical data of LED see separate page at the beginning of this chapter.

## RF 15 - Short-travel keyswitch, 1 LED spot-illumination



| Contact materials | Illumination               | Colour of lens | LED colour | LED type | Order no.                |
|-------------------|----------------------------|----------------|------------|----------|--------------------------|
| Au                | spot illumination<br>1 LED | opaque white   | blue       | 3 mm     | 3.14.100.030/0000        |
| Au                | spot illumination<br>1 LED | opaque white   | red        | 3 mm     | <b>3.14.100.031/0000</b> |
| Au                | spot illumination<br>1 LED | opaque white   | green      | 3 mm     | <b>3.14.100.032/0000</b> |
| Au                | spot illumination<br>1 LED | opaque white   | yellow     | 3 mm     | <b>3.14.100.033/0000</b> |
| Ag                | spot illumination<br>1 LED | opaque white   | blue       | 3 mm     | 3.14.100.040/0000        |
| Ag                | spot illumination<br>1 LED | opaque white   | red        | 3 mm     | <b>3.14.100.041/0000</b> |
| Ag                | spot illumination<br>1 LED | opaque white   | green      | 3 mm     | <b>3.14.100.042/0000</b> |
| Ag                | spot illumination<br>1 LED | opaque white   | yellow     | 3 mm     | <b>3.14.100.043/0000</b> |

Technical data see page 4 - 42

Double-spot LED illumination available on request

Technical data of LED see separate page at the beginning of this chapter.

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## RF 15 N - Short-travel keyswitch



### General Data

The RF 15N keyswitch provides a minimum overall height of 6.2 mm. The overall height can be varied by extension plungers which are inserted into the cross-like notches on the actuator tops. LEDs can only be arranged separately next to the keyswitches up to an overall height of 10 mm (i.e. without plunger or with small plunger). Keyswitches with overall heights of 12 mm or more can be provided with a maximum of 2 LEDs which are inserted into the recesses of the keyswitch housing. LEDs of keyswitches with overall heights of 12.5 mm or more should be placed onto LED spacers in order to obtain satisfactory illumination.

### Technical Data

4

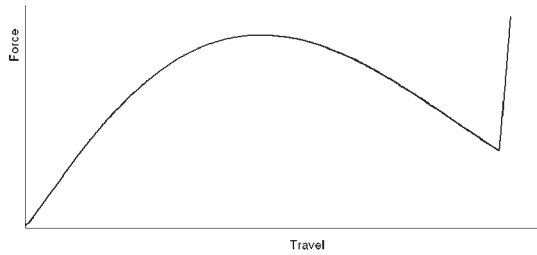
|                                   |  |   |  |
|-----------------------------------|--|---|--|
| <b>General information</b>        |  | <b>Electrical characteristics</b>         |  |
| Colour of lens                    | see order block  | Rated voltage min.                        | Au: 0.02 V, Ag: 3 V                          |
| Recommended key grid              | 19.05 mm   | Rated voltage max.                        | Au: 35 V, Ag: 50 V                           |
| <b>Dimensions</b>                 |  | Rated current min.                        | Au: 0.01 mA,<br>Ag: 0.1 mA                   |
| Length                            | 15 mm  | Rated current max.                        | Au: 100 mA,<br>Ag: 250 mA                    |
| Width                             | 15 mm  | Rated power max.<br>(ohmic load)          | Au: 2 W, Ag: 12.5 W                          |
| Overall height                    | 6.2 mm   | Contact resistance when new<br>max.       | 100 mΩ                                       |
| <b>Mechanical design</b>          |  | Insulation resistance                     | 10 <sup>9</sup> Ω                            |
| Mounting                          | soldering in PCB   | <b>Other specifications</b>               |  |
| Terminals                         | THT  | Ambient temp. operating min.              | -25 °C                                       |
| Contact system                    | snap-action contact  | Ambient temp. operating max.              | +70 °C                                       |
| Contact arrangement               | 1 NO   | Storage temperature max.<br>(in tube)     | +50 °C                                       |
| Contact materials                 | see order block  | Environmental resistance                  | acc. to IEC 60068-2<br>-14, -30, -33 and -78 |
| Illumination                      | external 3 mm LED<br>possible if height<br>more than 12 mm | Operating life min.<br>(operations)       | 1,000,000                                    |
| <b>Mechanical characteristics</b> |  | Solderability / solder heat<br>resistance | according to E DIN<br>IEC 600 28-2-20        |
| Operating force max.              | 2.9±0.6 N  | Wave soldering                            | 260 °C max.                                  |
| Switching travel                  | 0.5±0.2 mm   | Manual soldering                          | 350 °C / 5 sec. max.                         |
| Robustness min.                   | 100 with through-<br>plated PCB N                          |   |  |

RF

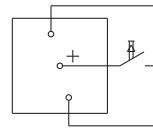


## Force/Travel Diagram – Keyswitch RF 15 N

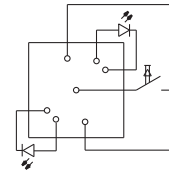
Operation characteristic limits RF



## Circuit Diagram – Keyswitch RF 15 N

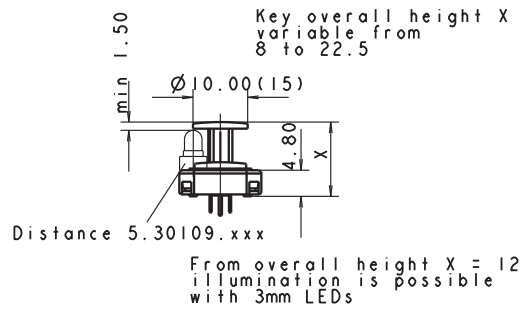
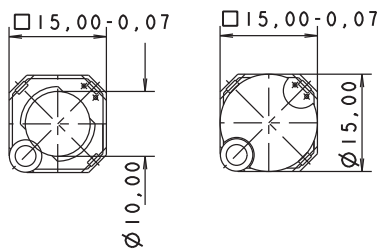


Keyswitch,  
non illuminated

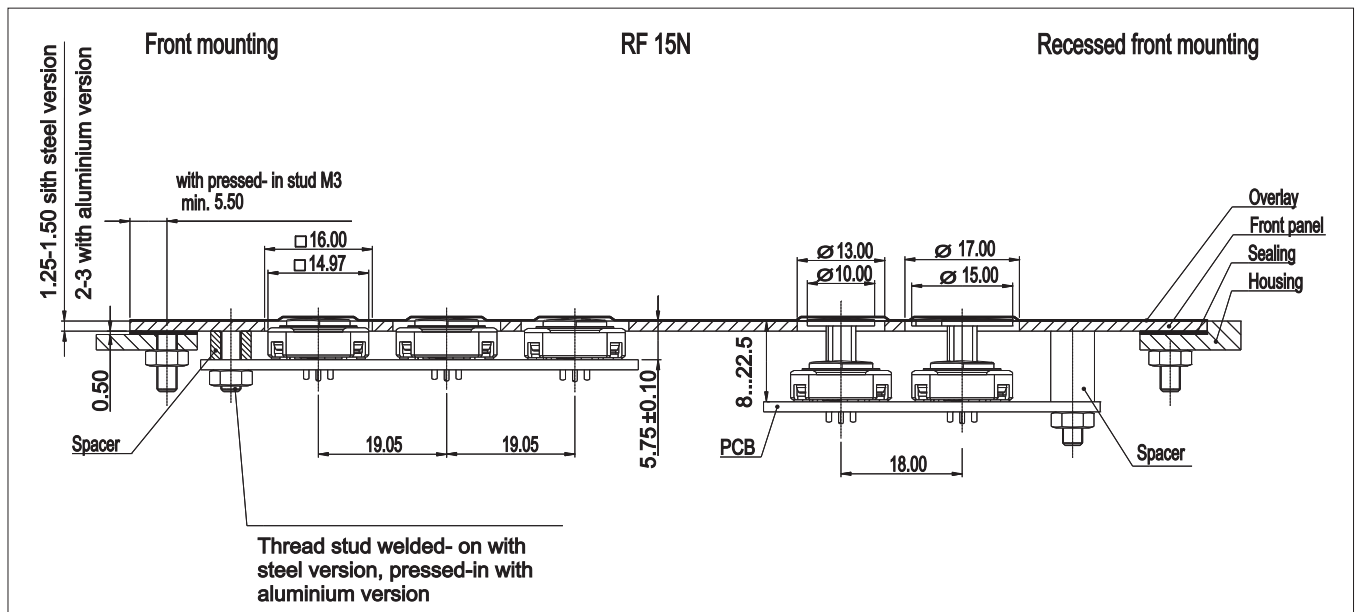


Keyswitch,  
spot-illuminated

## Dimensional Drawings RF 15 N



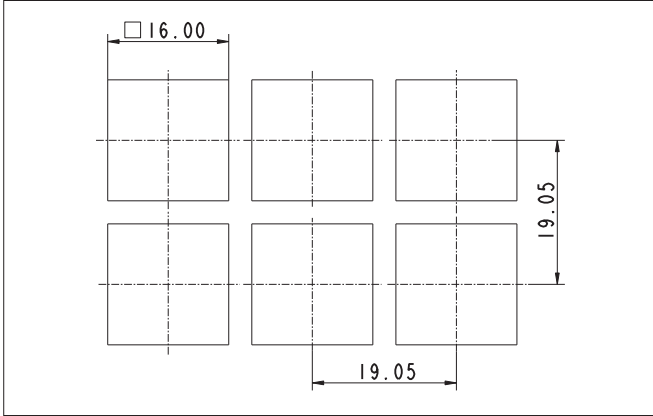
4



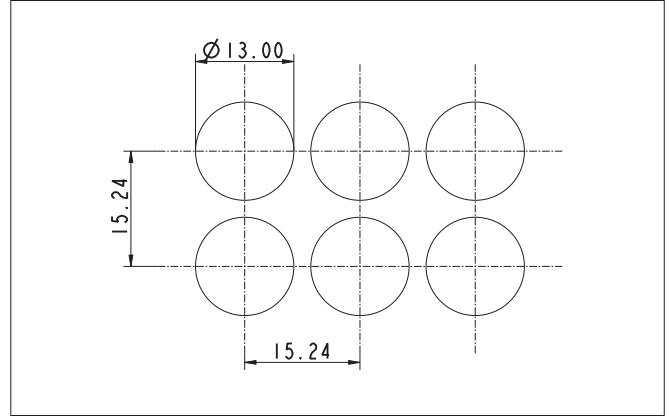
RF

Hole Patterns – Front Panel RF 15 N

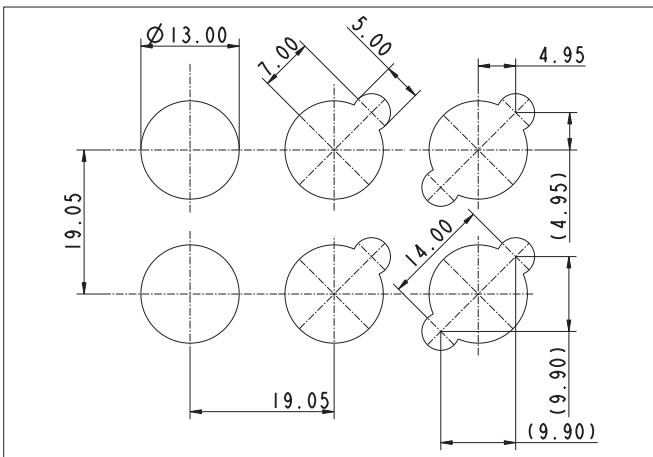
RF 15 N without plunger



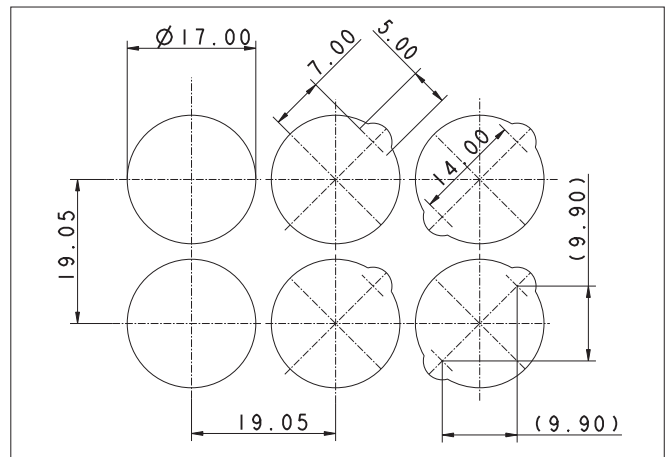
RF 15 N with plunger  $\varnothing$  10 mm, non-illuminated



RF 15 N with plunger  $\varnothing$  10 mm, illuminated

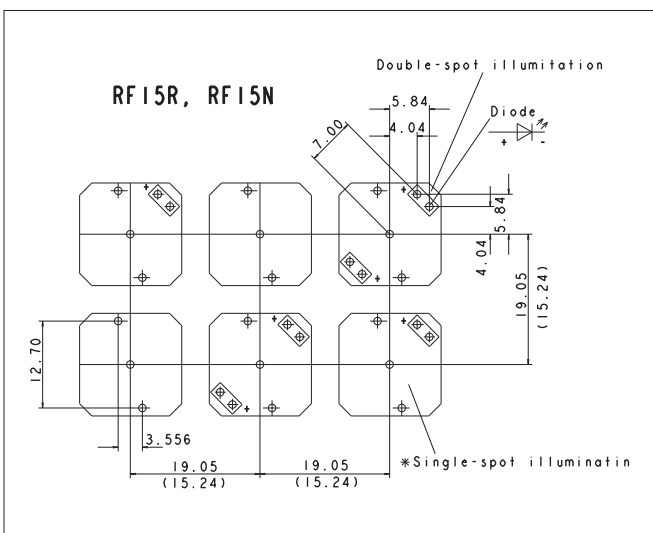


RF 15 N with plunger  $\varnothing$  15 mm, illuminated



4

Hole Pattern RF 15 N



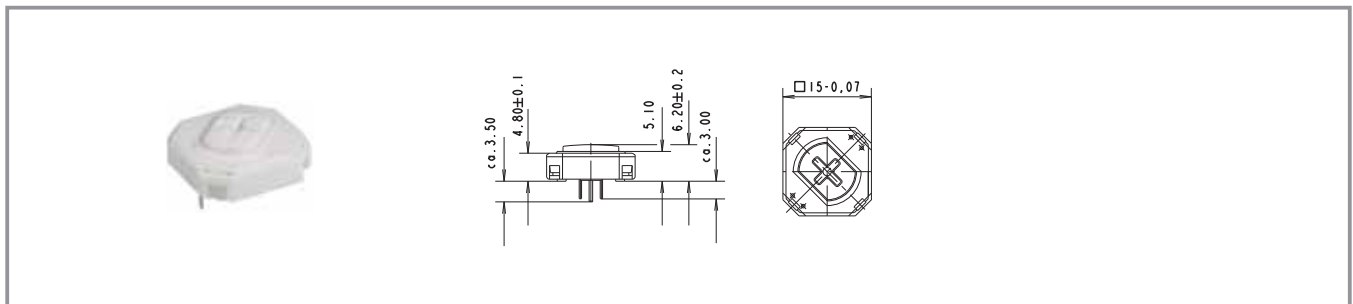
View on component side  
All hole diameters  $1.1 \pm 0.1$  mm  
PCB layout keyswitch 1/400" grid

RF

## Typical accessories RF 15 N - Short-travel keyswitch

| Description  | Photo | Order no.                | Additional accessories see page |
|--|-------|--------------------------|---------------------------------|
| RF 15 N - LED spacer $\varnothing$ 5 mm, spacing length 2.2 mm, light grey, for use with overall height of 12.5 mm |       | 5.30.109.010/0756        | 4 - 84                          |
| RF 15 N - Extension plunger, $\varnothing$ 10 mm, overall height 22.5 mm   |       | <b>5.46.011.028/0710</b> | 4 - 80                          |
| RF 15 N - Extension plunger, $\varnothing$ 15 mm, overall height 22.5 mm   |       | 5.46.017.028/0710        | 4 - 81                          |

## RF 15 N - Short-travel keyswitch, non-illuminated



| Contact materials | Illumination   | Recommended key grid | Overall height | Order no.                |
|-------------------|--|----------------------|----------------|--------------------------|
| Au                | external 3 mm LED possible if height more than 12 mm | 19.05 mm             | 6.2 mm         | <b>3.14.100.601/0000</b> |
| Ag                | external 3 mm LED possible if height more than 12 mm | 19.05 mm             | 6.2 mm         | <b>3.14.100.606/0000</b> |

Technical data see page 4 - 48

For keycaps, refer to RK 90 system design.  
Double-spot LED illumination available on request.

## RF 15 R - Short-travel keyswitch



### General Data

The round actuator of the RF 15 R keyswitch requires round front panel cut-outs. These make it possible to use a narrow keyboard grid of only 15.24 mm with sufficiently large frame webs between the individual keys. We recommend area embossing over the actuators for the overlay.

### Technical Data

#### General information

Recommended key grid 15.24 mm

#### Dimensions

Length 15 mm  
 Width 15 mm  
 Overall height see order block

#### Mechanical design

Mounting soldering in PCB  
 Terminals THT  
 Contact system snap-action contact  
 Contact arrangement 1 NO  
 Contact materials see order block  
 Illumination see order block  
 LED colour see order block  
 LED type see order block

#### Mechanical characteristics

Operating force max.  $2.9 \pm 0.6$  N  
 Switching travel  $0.5 \pm 0.2$  mm  
 Robustness min. with through-plated PCB 100 N

#### Electrical characteristics

Rated voltage min. Au: 0.02 V, Ag: 3 V  
 Rated voltage max. Au: 35 V, Ag: 50 V  
 Rated current min. Au: 0.01 mA, Ag: 0.1 mA  
 Rated current max. Au: 100 mA, Ag: 250 mA  
 Rated power max. (ohmic load) Au: 2 W, Ag: 12.5 W  
 Contact resistance when new max. 100 mΩ  
 Insulation resistance  $10^9 \Omega$

#### Other specifications

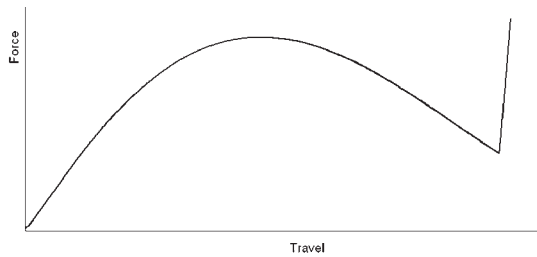
Ambient temp. operating min. -25 °C  
 Ambient temp. operating max. +70 °C  
 Environmental resistance acc. to IEC 60068-2 -14, -30, -33 and -78 1,000,000  
 Operating life min. (operations) 1,000,000  
 Solderability / solder heat resistance according to E DIN IEC 600 28-2-20  
 Wave soldering 260 °C max.  
 Manual soldering 350 °C / 5 sec. max.

4

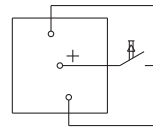
RF

## Force/Travel Diagram – Keyswitch RF 15 R

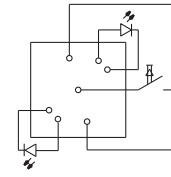
Operation characteristic limits RF



## Circuit Diagram – Keyswitch RF 15 R

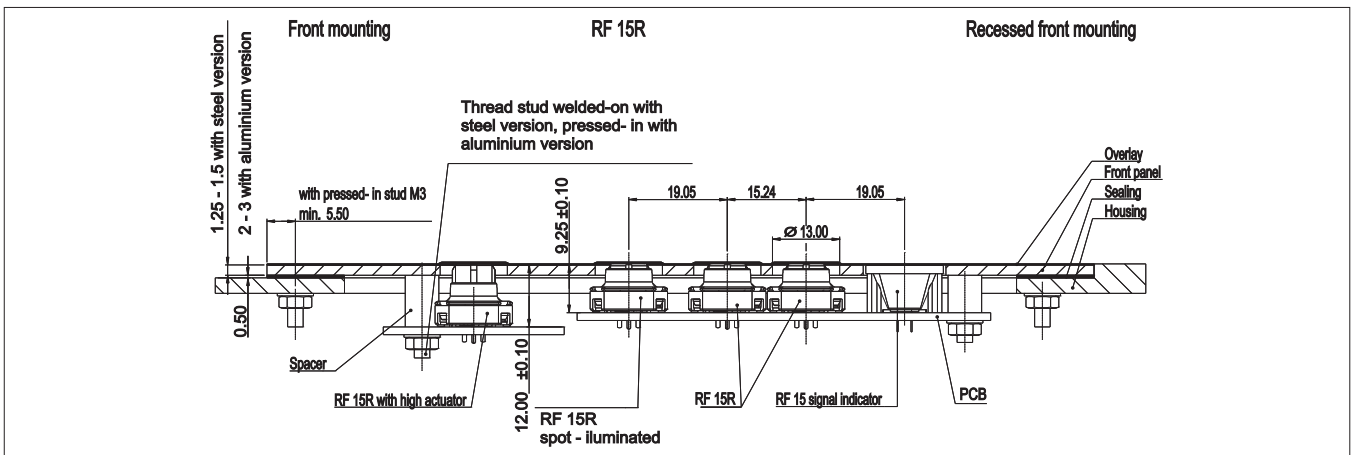


Keyswitch,  
non-illuminated

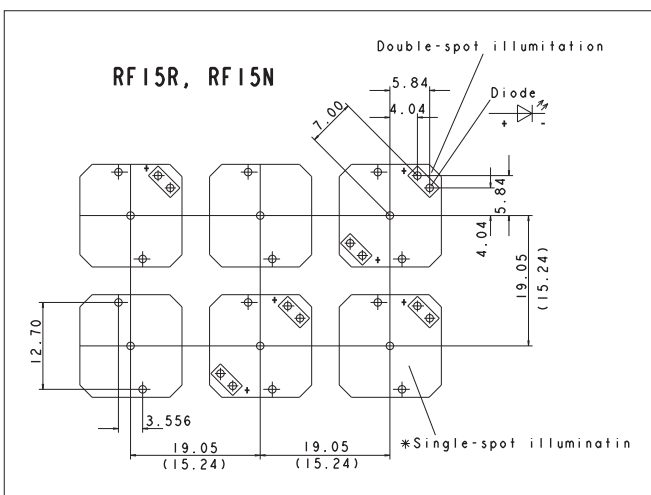


Keyswitch,  
spot-illuminated

## Dimensional Drawing RF 15 R



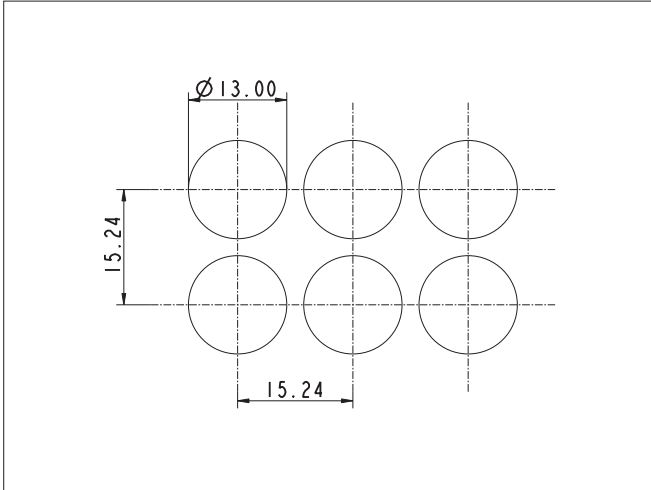
## Hole Pattern RF 15 R



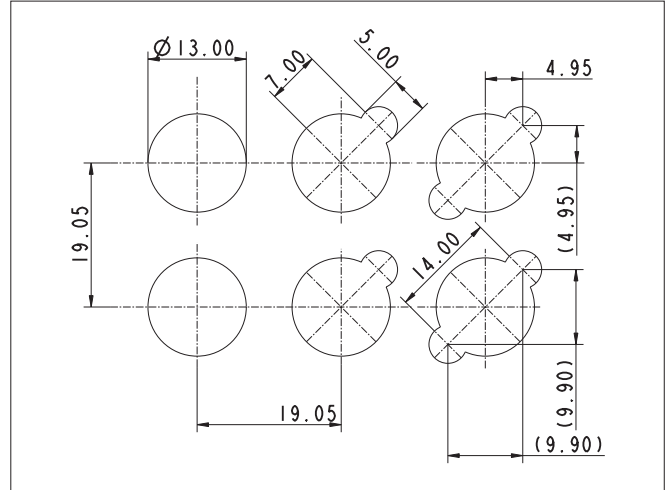
View on component side  
All hole diameters 1.1  $\pm$  0.1 mm  
PCB layout keyswitch 1/400" grid

Hole Pattern – Front Panel RF 15 R

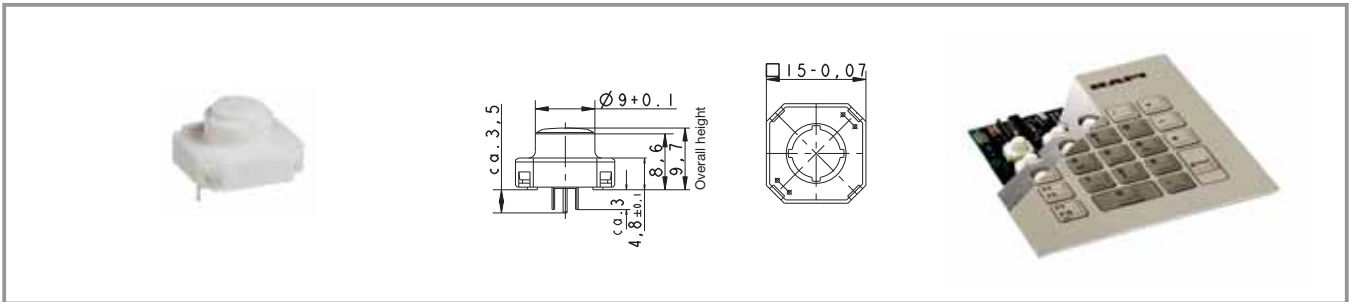
RF 15 R, non-illuminated



RF 15 R, illuminated



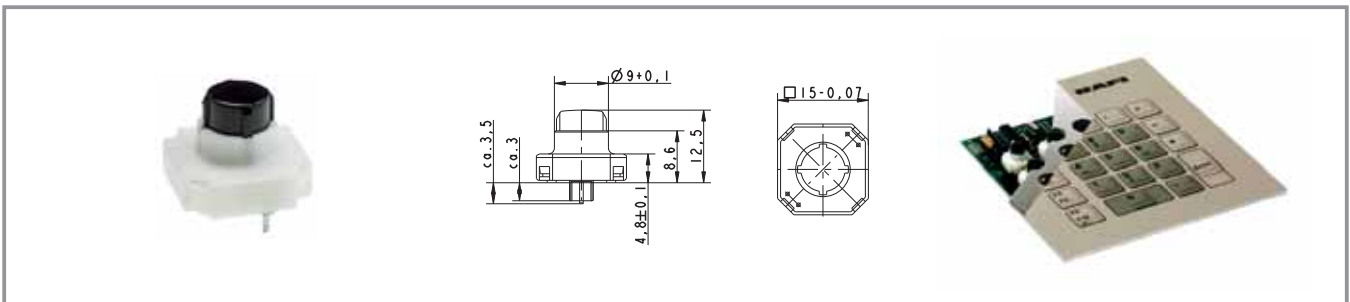
## RF 15 R - Low short-travel keyswitch, non-illuminated



| Contact materials | Overall height | Illumination    | LED type | LED colour | Order no.                |
|-------------------|----------------|-----------------|----------|------------|--------------------------|
| Au                | 9.7 mm         | not illuminated | -        | -          | <b>3.14.100.501/0000</b> |
| Ag                | 9.7 mm         | not illuminated | -        | -          | <b>3.14.100.506/0000</b> |

Technical data see page 4 - 52

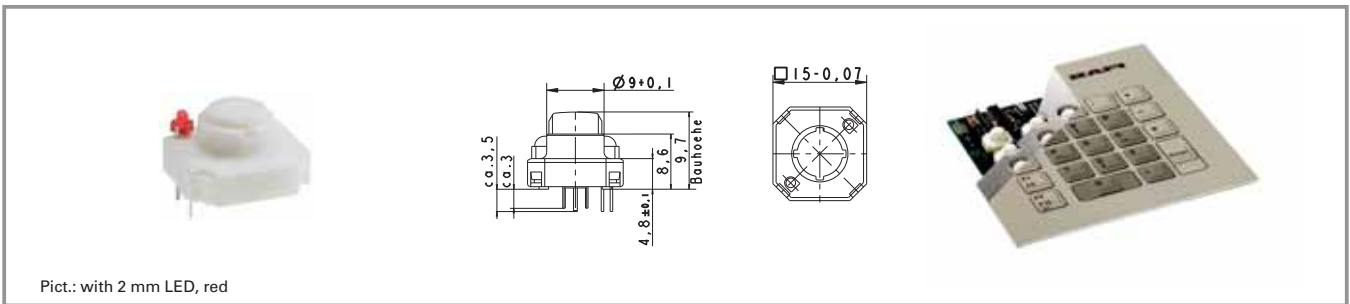
## RF 15 R - High short-travel keyswitch, non-illuminated



| Contact materials | Overall height | Illumination    | LED type | LED colour | Order no.                |
|-------------------|----------------|-----------------|----------|------------|--------------------------|
| Au                | 12.5 mm        | not illuminated | -        | -          | <b>3.14.100.801/0000</b> |
| Ag                | 12.5 mm        | not illuminated | -        | -          | <b>3.14.100.806/0000</b> |

Technical data see page 4 - 52

## RF 15 R - Low short-travel keyswitch, 1 LED spot-illumination



Pict.: with 2 mm LED, red

| Contact materials | Overall height | Illumination               | LED type | LED colour | Order no.                |
|-------------------|----------------|----------------------------|----------|------------|--------------------------|
| Au                | 9.7 mm         | spot illumination<br>1 LED | 2 mm     | red        | 3.14.100.531/0000        |
| Au                | 9.7 mm         | spot illumination<br>1 LED | 2 mm     | green      | <b>3.14.100.532/0000</b> |
| Au                | 9.7 mm         | spot illumination<br>1 LED | 2 mm     | yellow     | <b>3.14.100.533/0000</b> |
| Ag                | 9.7 mm         | spot illumination<br>1 LED | 2 mm     | red        | 3.14.100.541/0000        |
| Ag                | 9.7 mm         | spot illumination<br>1 LED | 2 mm     | green      | 3.14.100.542/0000        |
| Ag                | 9.7 mm         | spot illumination<br>1 LED | 2 mm     | yellow     | 3.14.100.543/0000        |

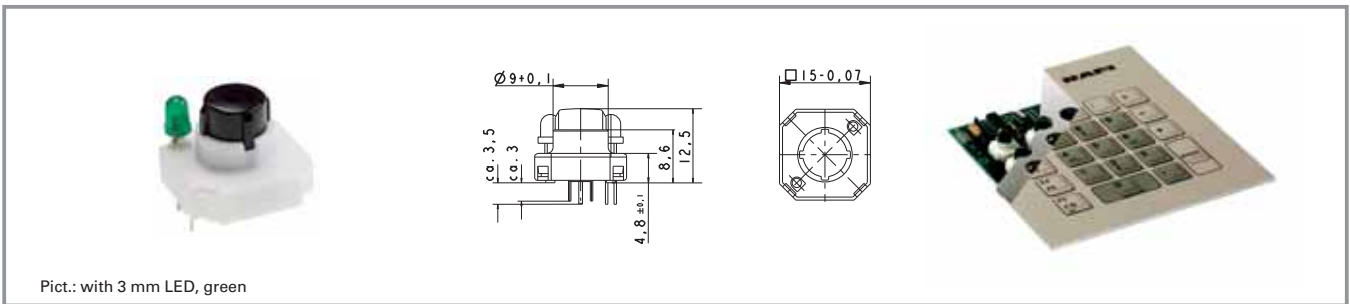
Technical data see page 4 - 52

Versions with 2 LEDs available on request.

Technical data of LED see separate page at the beginning of this chapter.



## RF 15 R - High short-travel keyswitch, 1 LED spot-illumination



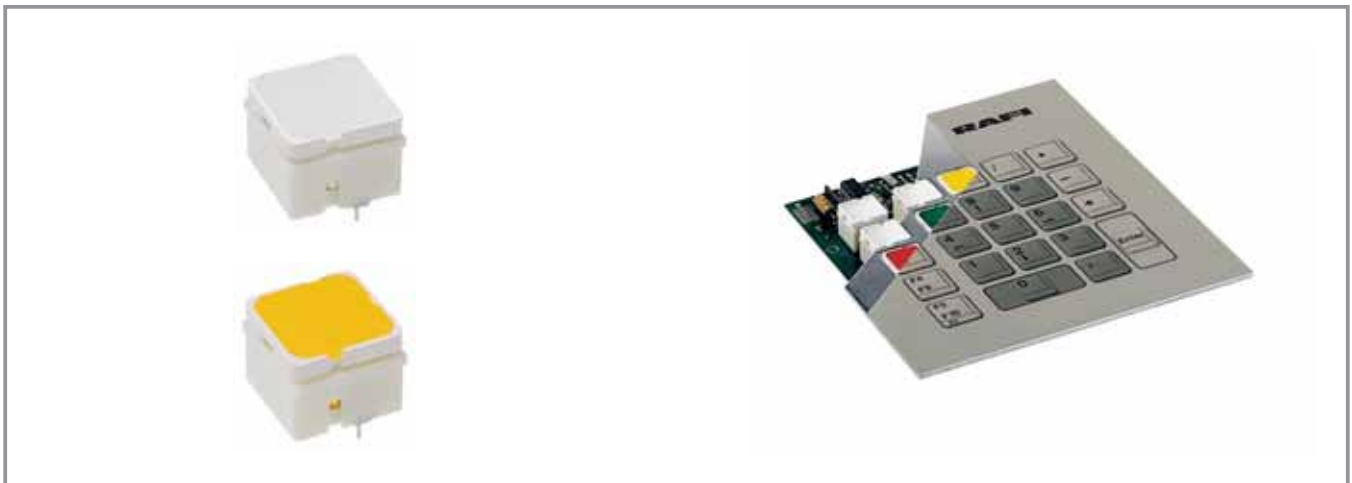
| Contact materials | Overall height | Illumination               | LED type | LED colour | Order no.         |
|-------------------|----------------|----------------------------|----------|------------|-------------------|
| Au                | 12.5 mm        | spot illumination<br>1 LED | 3 mm     | blue       | 3.14.100.830/0000 |
| Au                | 12.5 mm        | spot illumination<br>1 LED | 3 mm     | red        | 3.14.100.831/0000 |
| Au                | 12.5 mm        | spot illumination<br>1 LED | 3 mm     | green      | 3.14.100.832/0000 |
| Au                | 12.5 mm        | spot illumination<br>1 LED | 3 mm     | yellow     | 3.14.100.833/0000 |

Technical data see page 4 - 52

Versions with 2 LEDs available on request.

Technical data of LED see separate page at the beginning of the chapter.

## RF 15 H - Short-travel keyswitch



### General Data

#### Application notes:

The RF 15 H key has an overall height of 12.5 mm and can be fully illuminated. When designing membrane keyboards, we recommend using a key grid of at least 20 mm and a 0.13 mm overlay with area embossing over the keys. You can use the O-ring (accessory) to block the key and use it as an indicator field or blank spaceholder.

### Technical Data

#### General information

Colour of lens see order block  
 Recommended key grid 20 mm

#### Dimensions

Length 15 mm  
 Width 15 mm  
 Overall height 12.5 mm

#### Mechanical design

Mounting soldering in PCB  
 Terminals THT  
 Contact system snap-action contact  
 Contact arrangement 1 NO  
 Contact materials see order block  
 Illumination see order block  
 LED colour see order block  
 LED type see order block

#### Mechanical characteristics

Operating force max.  $2.9 \pm 0.6$  N  
 Switching travel  $0.5 \pm 0.2$  mm  
 Robustness min. with through-plated PCB 100 N

#### Electrical characteristics

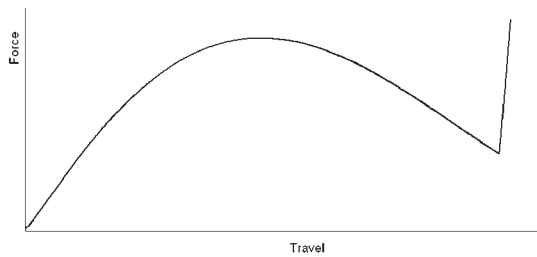
Rated voltage min. Au: 0.02 V, Ag: 3 V  
 Rated voltage max. Au: 35 V, Ag: 50 V  
 Rated current min. Au: 0.01 mA, Ag: 0.1 mA  
 Rated current max. Au: 100 mA, Ag: 250 mA  
 Rated power max. (ohmic load) Au: 2 W, Ag: 12.5 W  
 Contact resistance when new max. 100 mΩ  
 Insulation resistance  $10^9 \Omega$

#### Other specifications

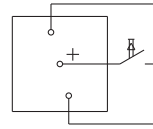
Ambient temp. operating min. -25 °C  
 Ambient temp. operating max. +70 °C  
 Environmental resistance acc. to IEC 60068-2 -14, -30, -33 and -78 1,000,000  
 Operating life min. (operations) 1,000,000  
 Solderability / solder heat resistance according to E DIN IEC 600 28-2-20  
 Wave soldering 260 °C max.  
 Manual soldering 350 °C / 5 sec. max.

## Force/Travel Diagram – Keyswitch RF 15 H

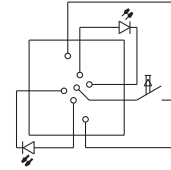
Operation characteristic limits RF



## Circuit Diagram – Keyswitch RF 15 H

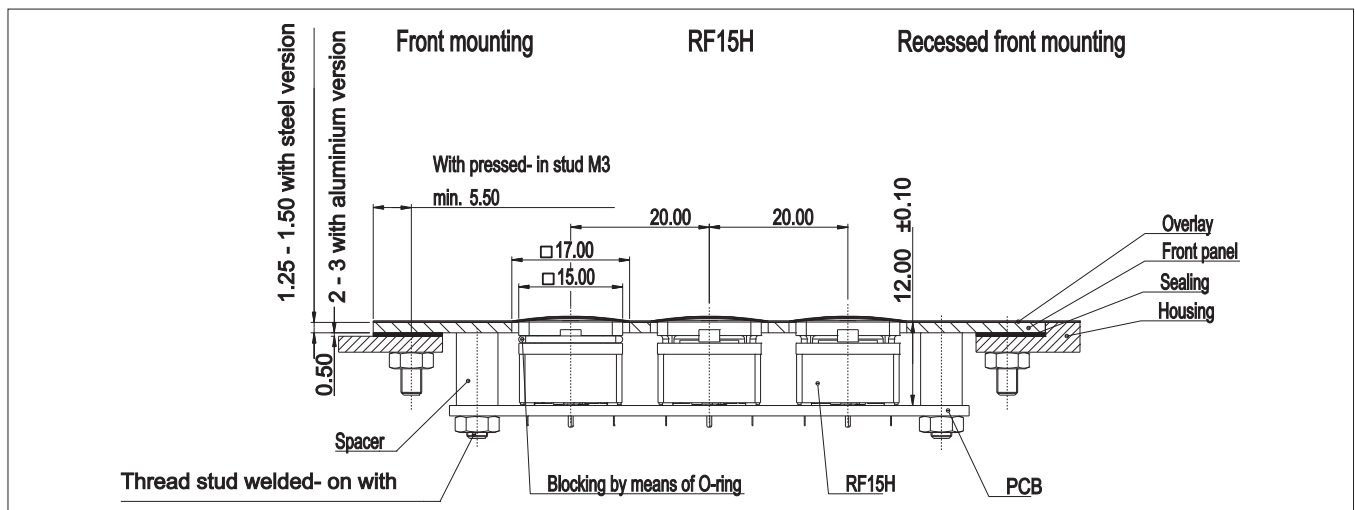


Keyswitch, non-illuminated

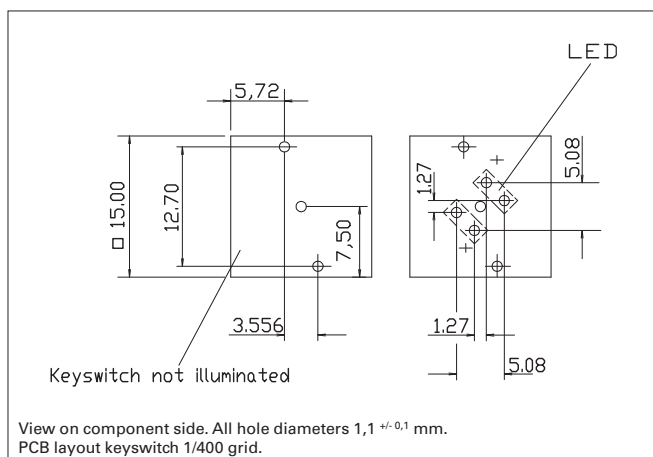


Keyswitch, fully illuminated

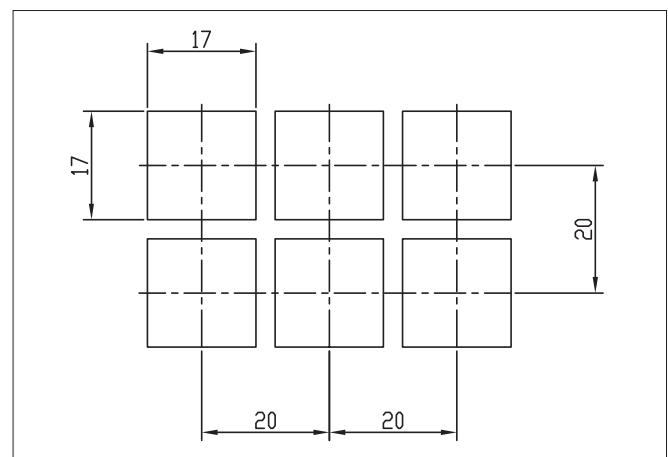
## Dimensional Drawing



## Hole Pattern



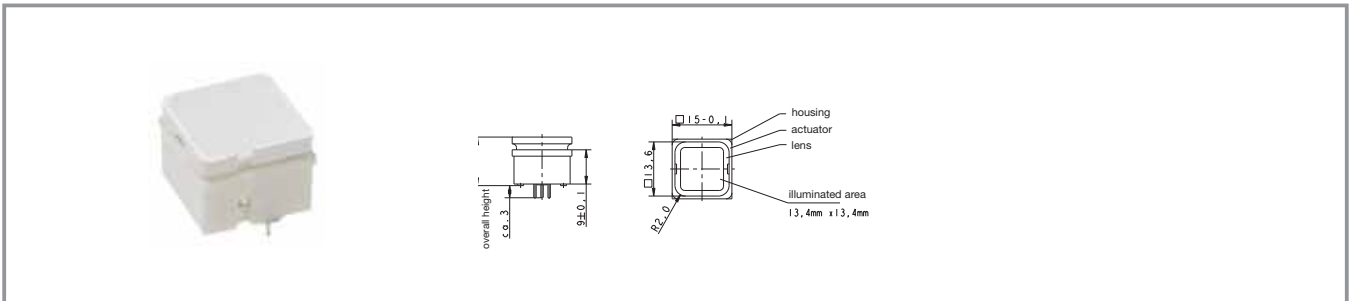
## Hole Pattern – Front Panel



## Typical accessories RF 15 H - Short-travel keyswitch

| Description                                      | Photo   | Order no.         | Additional accessories see page |
|--|---|-------------------|---------------------------------|
| O-ring, black, for blocking the operating stroke |  | 5.30.120.009/0100 | 5 - 25                          |

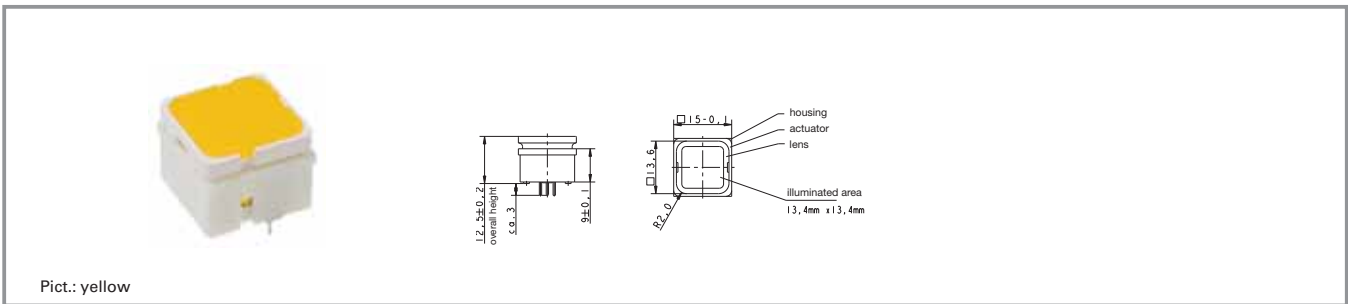
## RF 15 H - Short-travel keyswitch, non-illuminated



| Contact materials | Illumination    | Colour of lens | LED colour | LED type | Order no.         |
|-------------------|-----------------|----------------|------------|----------|-------------------|
| Au                | not illuminated | white          | -          | -        | 3.14.100.702/0000 |
| Ag                | not illuminated | white          | -          | -        | 3.14.100.707/0000 |

Technical data see page 4 - 58

## RF 15 H - Short-travel keyswitch, fully illuminated



| Contact materials | Illumination               | Colour of lens | LED colour         | LED type | Order no.                |
|-------------------|----------------------------|----------------|--------------------|----------|--------------------------|
| Au                | fully illuminated<br>2 LED | red            | red                | 2 mm     | 3.14.200.731/0000        |
| Au                | fully illuminated<br>2 LED | green          | green              | 2 mm     | <b>3.14.200.732/0000</b> |
| Au                | fully illuminated<br>1 LED | green          | green super bright | 3 mm     | 3.14.200.736/0000        |
| Au                | fully illuminated<br>2 LED | yellow         | yellow             | 2 mm     | <b>3.14.200.733/0000</b> |
| Au                | fully illuminated<br>1 LED | white          | white              | 3 mm     | <b>3.14.200.735/0000</b> |
| Au                | fully illuminated<br>2 LED | orange         | yellow             | 2 mm     | 3.14.200.738/0000        |
| Au                | fully illuminated<br>1 LED | blue           | blue               | 3 mm     | 3.14.200.739/0000        |
| Au/Ag             | fully illuminated<br>2 LED | yellow         | multi colour       | 3 mm     | 3.14.101.903/0000        |
| Ag                | fully illuminated<br>2 LED | red            | red                | 2 mm     | <b>3.14.200.741/0000</b> |
| Ag                | fully illuminated<br>2 LED | green          | green              | 2 mm     | <b>3.14.200.742/0000</b> |
| Ag                | fully illuminated<br>1 LED | green          | green super bright | 3 mm     | <b>3.14.200.746/0000</b> |
| Ag                | fully illuminated<br>2 LED | yellow         | yellow             | 2 mm     | <b>3.14.200.743/0000</b> |
| Ag                | fully illuminated<br>1 LED | white          | white              | 3 mm     | 3.14.200.745/0000        |
| Ag                | fully illuminated<br>2 LED | orange         | yellow             | 2 mm     | 3.14.200.748/0000        |
| Ag                | fully illuminated<br>1 LED | blue           | blue               | 3 mm     | 3.14.200.749/0000        |
| Ag                | fully illuminated<br>2 LED | white          | multi colour       | 3 mm     | 3.14.100.744/0000        |

Technical data see page 4 - 58

When using the keyswitches with multicolour LEDs the illumination colour can be varied from red to green by change of polarity. Due to the frequency of the polarity-changes the colours red, green, yellow as well as all secondary colours from these are possible.

Technical data of LED see separate page at the beginning of this chapter.

## RF 15 - Signal indicator



### Technical Data

#### General information

|                      |                 |
|----------------------|-----------------|
| Colour of lens       | see order block |
| Recommended key grid | 19.05 mm        |

#### Dimensions

|                |        |
|----------------|--------|
| Length         | 15 mm  |
| Width          | 15 mm  |
| Overall height | 9.7 mm |

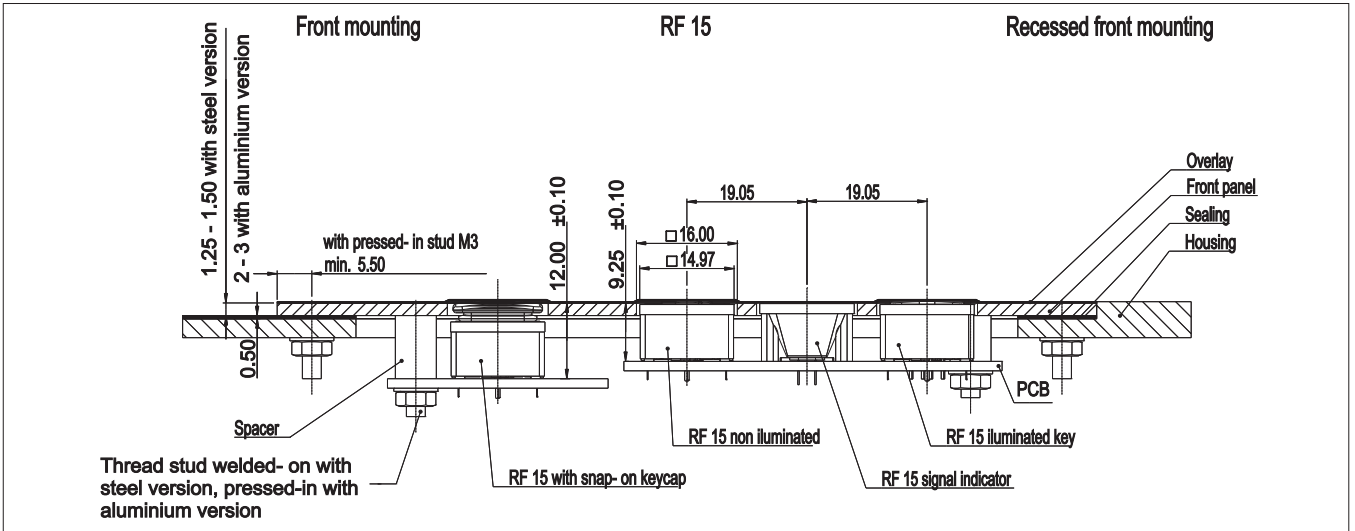
#### Mechanical design

|              |                            |
|--------------|----------------------------|
| Mounting     | THT soldering in PCB       |
| Illumination | fully illuminated<br>1 LED |
| LED colour   | see order block            |
| LED type     | 2 mm                       |

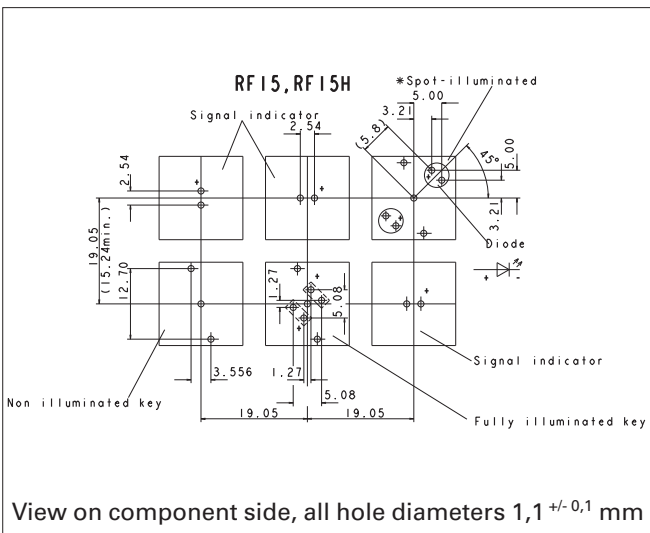
#### Other specifications

|  |  |
|--|--|
| Ambient temp. operating min.           | -25 °C                                       |
| Ambient temp. operating max.           | +70 °C                                       |
| Environmental resistance               | acc. to IEC 60068-2<br>-14, -30, -33 and -78 |
| Solderability / solder heat resistance | according to E DIN<br>IEC 600 28-2-20        |
| Wave soldering                         | 260 °C max.                                  |
| Manual soldering                       | 350 °C / 5 sec. max.                         |

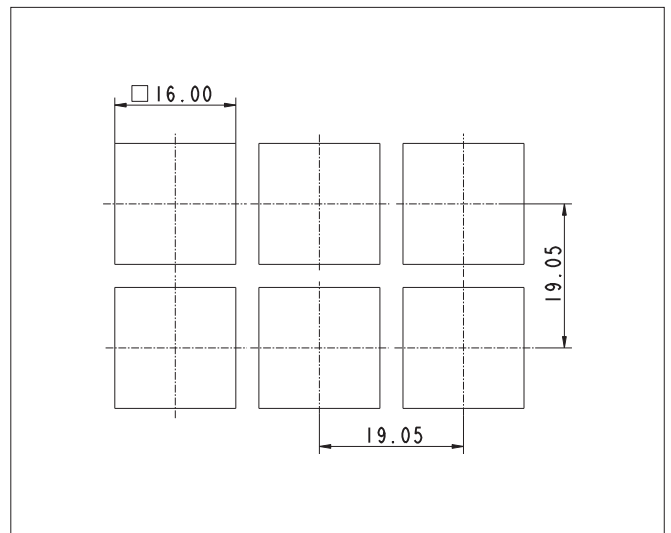
Dimensional Drawing Signal Indicator RF 15



Hole Pattern



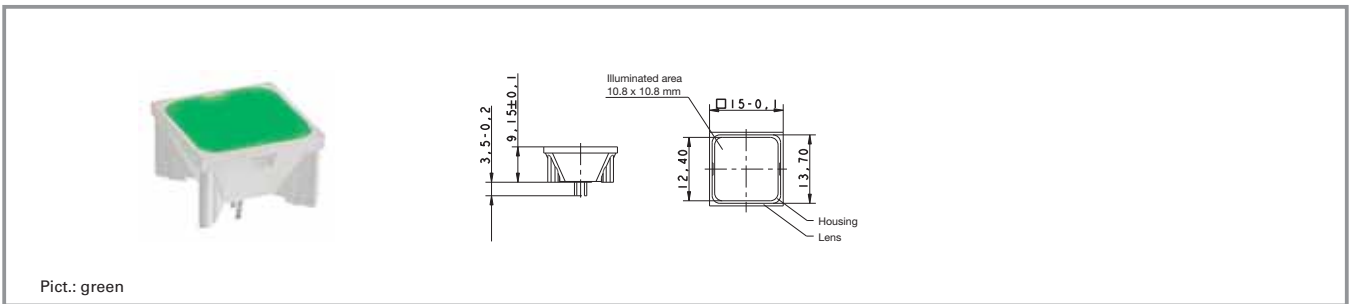
Hole Pattern – Front Panel



4

RF

## RF 15 - Signal indicator, fully illuminated, 1 LED



| Overall height | Illumination               | Colour of lens | LED colour | LED type | Order no.                |
|----------------|----------------------------|----------------|------------|----------|--------------------------|
| 9.7 mm         | fully illuminated<br>1 LED | red            | red        | 2 mm     | <b>3.14.200.051/0000</b> |
| 9.7 mm         | fully illuminated<br>1 LED | green          | green      | 2 mm     | <b>3.14.200.052/0000</b> |
| 9.7 mm         | fully illuminated<br>1 LED | yellow         | yellow     | 2 mm     | <b>3.14.200.053/0000</b> |
| 9.7 mm         | fully illuminated<br>1 LED | orange         | yellow     | 2 mm     | 3.14.200.054/0000        |
| 9.7 mm         | fully illuminated<br>1 LED | blue           | blue       | 2 mm     | 3.14.200.055/0000        |

Technical data see page 4 - 62

Technical data of LED see separate page at the beginning of chapter 4 PCB Keyswitches.





## RF 19 - Short-travel keyswitch



### General Data

#### Application notes:

RF 19 keys offer a large actuation area. When designing low-profile keyboards with a grid of  $\geq 23$  mm, frame webs remain free between the individual keys. The overlay can be glued onto these frame webs; we recommend area embossing over the keys for the overlay.

### Technical Data

#### General information

Colour of lens see order block  
Recommended key grid 23 mm

#### Dimensions

Length 19.05 mm  
Width 19.05 mm  
Overall height 9.7 mm

#### Mechanical design

Mounting soldering in PCB  
Terminals THT  
Contact system snap-action contact  
Contact arrangement 1 NO  
Contact materials see order block  
Illumination see order block  
LED colour see order block  
LED type see order block

#### Mechanical characteristics

Operating force max.  $2.9 \pm 0.6$  N  
Switching travel  $0.5^{+0.2}$  mm  
Robustness min. with through-plated PCB 100 N

#### Electrical characteristics

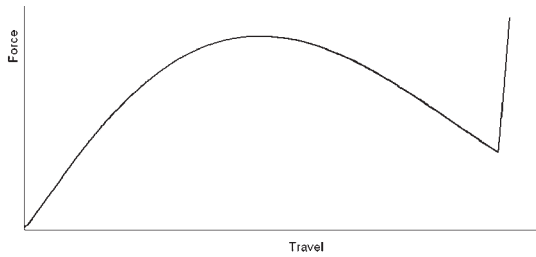
Rated voltage min. Au: 0.02 V, Ag: 3 V  
Rated voltage max. Au: 35 V, Ag: 50 V  
Rated current min. Au: 0.01 mA, Ag: 0.1 mA  
Rated current max. Au: 100 mA, Ag: 250 mA  
Rated power max. (ohmic load) Au: 2 W, Ag: 12.5 W  
Contact resistance when new max. 100 m $\Omega$   
Insulation resistance  $10^9 \Omega$

#### Other specifications

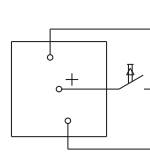
Ambient temp. operating min. -25 °C  
Ambient temp. operating max. +70 °C  
Environmental resistance acc. to IEC 60068-2 -14, -30, -33 and -78 1,000,000  
Operating life min. (operations) 1,000,000  
Solderability / solder heat resistance according to E DIN IEC 600 28-2-20  
Wave soldering 260 °C max.  
Manual soldering 350 °C / 5 sec. max.

## Force/Travel Diagram – Keyswitch RF 19

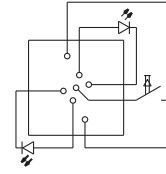
Operation characteristic limits RF



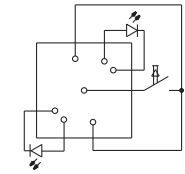
## Circuit Diagram – Keyswitch RF 19



Keyswitch, non-illuminated

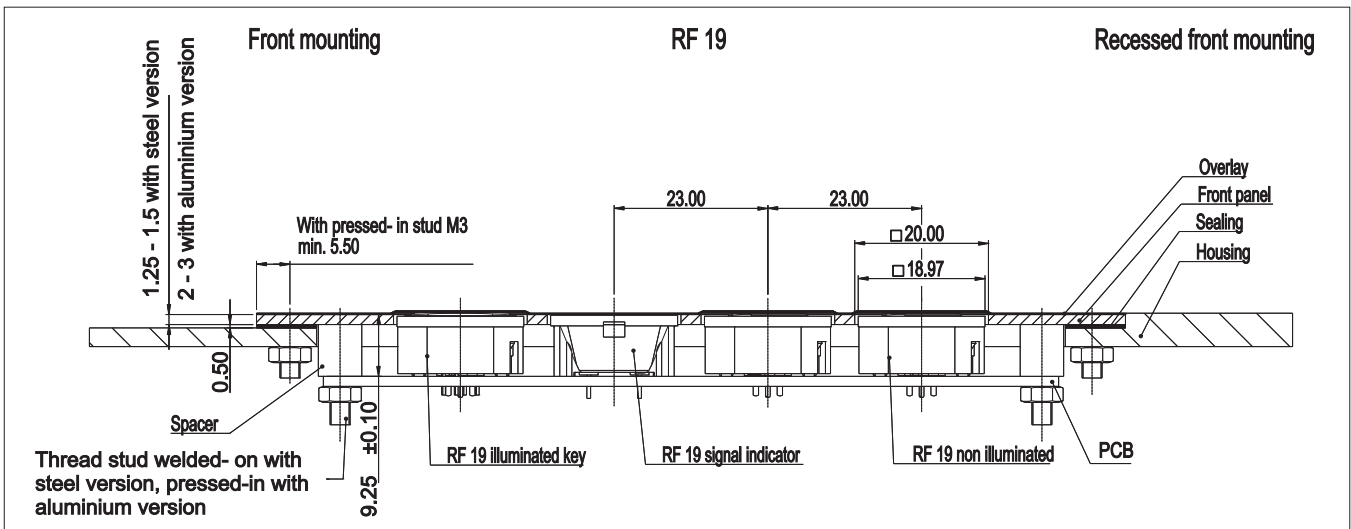


Keyswitch, fully illuminated

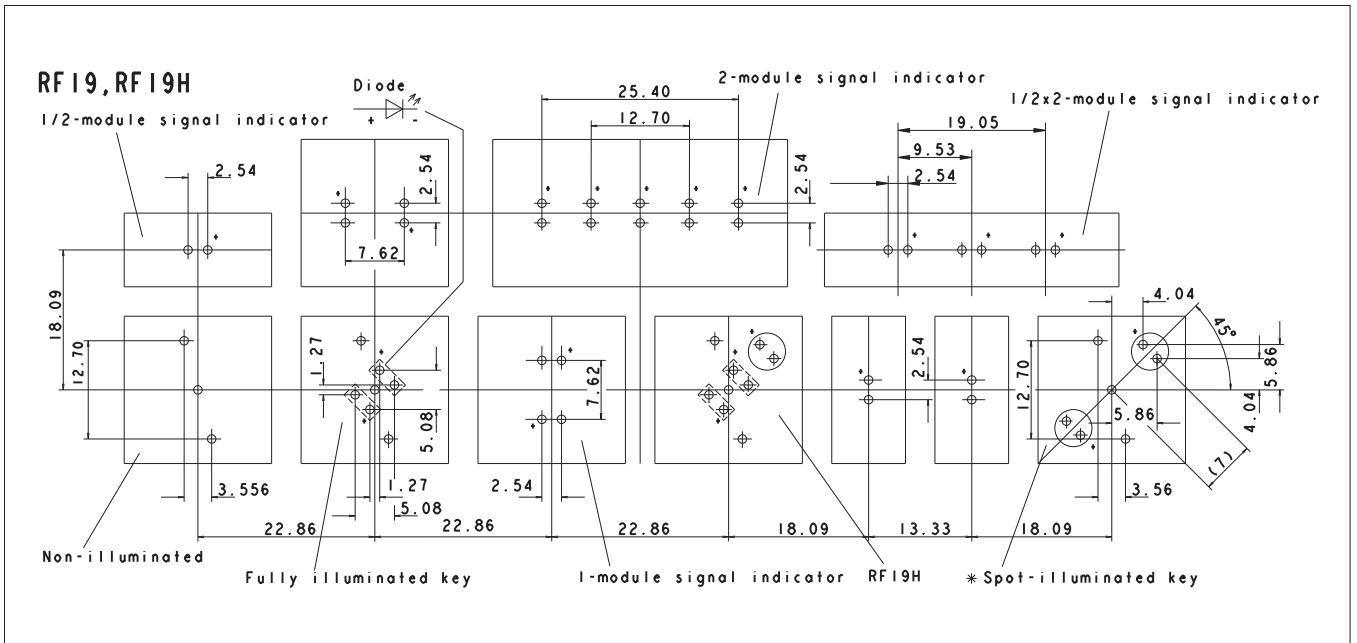


Keyswitch, spot-illuminated

## Dimensional Drawing

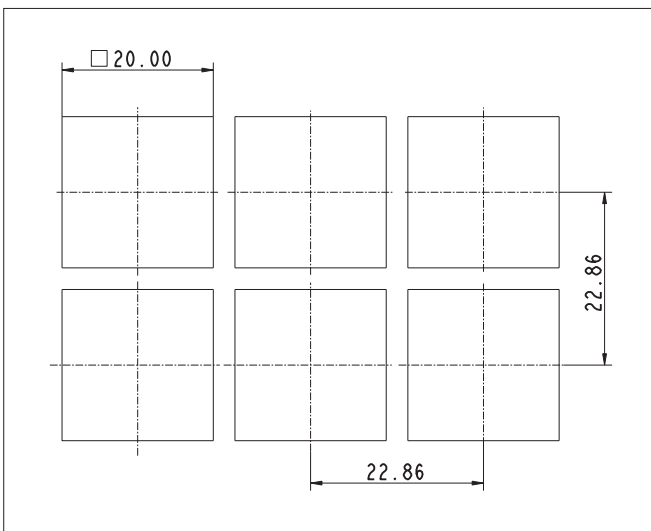


## Hole Patterns RF 19



\* The LED may be positioned either on the left-hand or right-hand side.  
 Standard version: LED on left-hand side  
 View on component side, all hole diameters 1.1 +/- 0.1 mm

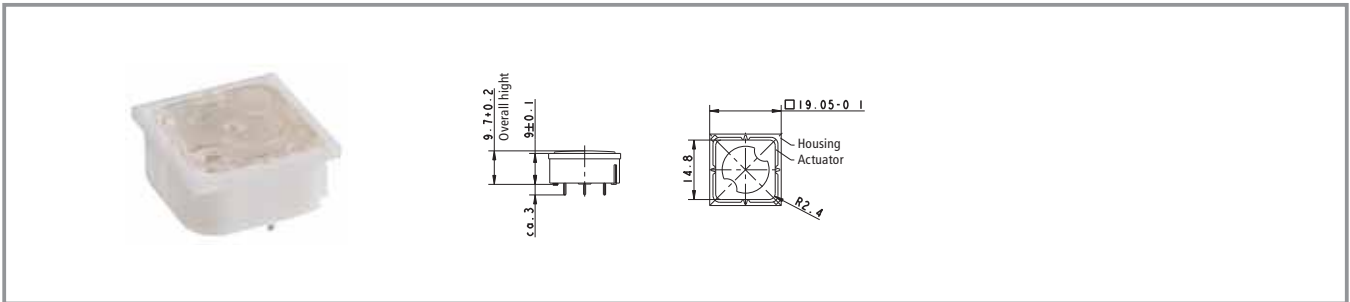
## Hole Patterns – Front Panel RF 19



4

RF

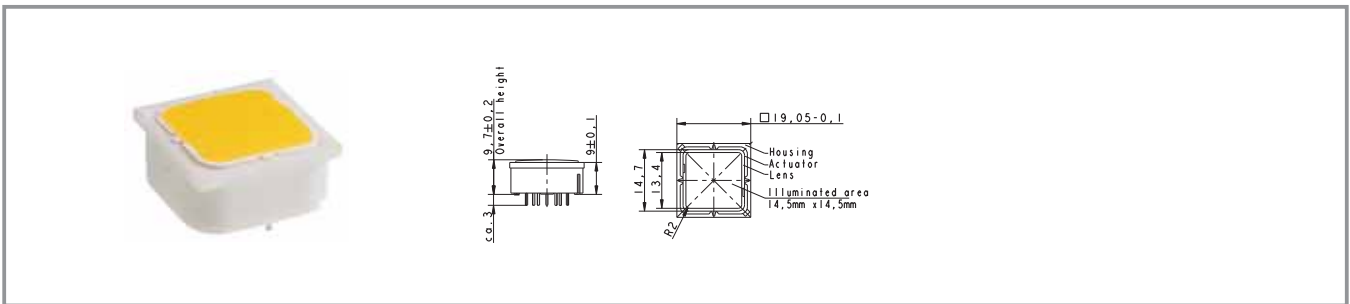
## RF 19 - Short-travel keyswitch, non-illuminated



| Contact materials | Illumination    | Colour of lens | LED colour | LED type | Order no.                |
|-------------------|-----------------|----------------|------------|----------|--------------------------|
| Au                | not illuminated | transparent    | -          | -        | <b>3.14.001.001/0000</b> |
| Ag                | not illuminated | transparent    | -          | -        | <b>3.14.001.006/0000</b> |

Technical data see page 4 - 66

## RF 19 - Short-travel keyswitch, fully illuminated with 2 LED



| Contact materials | Illumination               | Colour of lens | LED colour | LED type | Order no.                |
|-------------------|----------------------------|----------------|------------|----------|--------------------------|
| Au                | fully illuminated<br>2 LED | red            | red        | 2 mm     | <b>3.14.002.011/0000</b> |
| Au                | fully illuminated<br>2 LED | green          | green      | 2 mm     | <b>3.14.002.012/0000</b> |
| Au                | fully illuminated<br>2 LED | opaque white   | green      | 2 mm     | 3.14.002.901/0000        |
| Au                | fully illuminated<br>2 LED | yellow         | yellow     | 2 mm     | <b>3.14.002.013/0000</b> |
| Au                | fully illuminated<br>2 LED | orange         | yellow     | 2 mm     | 3.14.002.014/0000        |
| Au                | fully illuminated<br>2 LED | blue           | blue       | 2 mm     | 3.14.002.015/0000        |
| Ag                | fully illuminated<br>2 LED | red            | red        | 2 mm     | <b>3.14.002.021/0000</b> |
| Ag                | fully illuminated<br>2 LED | green          | green      | 2 mm     | <b>3.14.002.022/0000</b> |
| Ag                | fully illuminated<br>2 LED | yellow         | yellow     | 2 mm     | <b>3.14.002.023/0000</b> |
| Ag                | fully illuminated<br>2 LED | orange         | yellow     | 2 mm     | 3.14.002.024/0000        |
| Ag                | fully illuminated<br>2 LED | blue           | blue       | 2 mm     | 3.14.002.025/0000        |
| Ag                | fully illuminated<br>2 LED | opaque white   | green      | 2 mm     | 3.14.002.944/0000        |
| Ag                | fully illuminated<br>2 LED | white          | green      | 2 mm     | <b>3.14.002.026/0000</b> |
| Ag                | fully illuminated<br>2 LED | white          | yellow     | 2 mm     | <b>3.14.002.027/0000</b> |

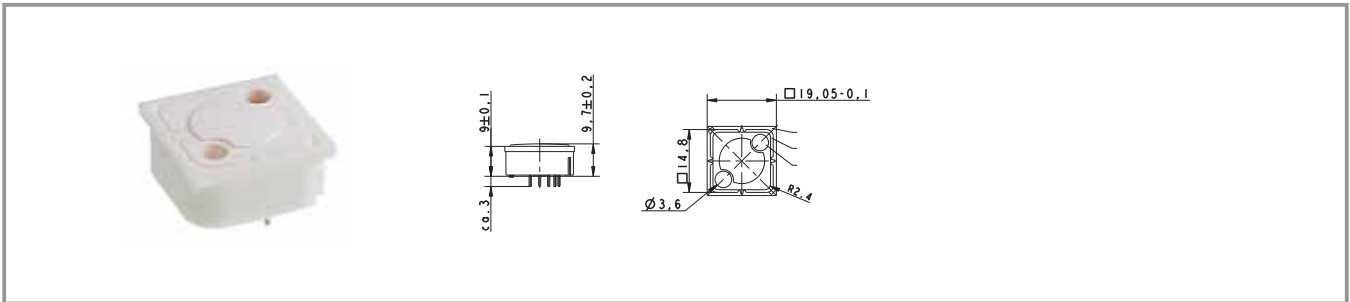
Technical data see page 4 - 66

Technical data of LED see separate page at the beginning of this chapter.

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RF

## RF 19 - Short-travel keyswitch, 1 LED spot-illumination



| Contact materials | Illumination               | Colour of lens | LED colour | LED type | Order no.                |
|-------------------|----------------------------|----------------|------------|----------|--------------------------|
| Au                | spot illumination<br>1 LED | opaque white   | blue       | 3 mm     | 3.14.001.030/0000        |
| Au                | spot illumination<br>1 LED | opaque white   | red        | 3 mm     | <b>3.14.001.031/0000</b> |
| Au                | spot illumination<br>1 LED | opaque white   | green      | 3 mm     | <b>3.14.001.032/0000</b> |
| Au                | spot illumination<br>1 LED | opaque white   | yellow     | 3 mm     | <b>3.14.001.033/0000</b> |
| Ag                | spot illumination<br>1 LED | opaque white   | blue       | 3 mm     | 3.14.001.040/0000        |
| Ag                | spot illumination<br>1 LED | opaque white   | red        | 3 mm     | <b>3.14.001.041/0000</b> |
| Ag                | spot illumination<br>1 LED | opaque white   | green      | 3 mm     | <b>3.14.001.042/0000</b> |
| Ag                | spot illumination<br>1 LED | opaque white   | yellow     | 3 mm     | <b>3.14.001.043/0000</b> |

Technical data see page 4 - 66

Versions with 2 LEDs available on request.

Technical data of LED see separate page at the beginning of this chapter.

## RF 19 H - Short-travel keyswitch



### General Data

#### Application notes:

The RF 19H key has an overall height of 12.5 mm and can be fully illuminated. When designing membrane keyboards, we recommend using a key grid of at least 24 mm and a 0.13 mm overlay with area embossing over the keys. You can use the O-ring (accessory) to block the key and use it as an indicator field or blank spaceholder.

### Technical Data

#### General information

|                      |                 |
|----------------------|-----------------|
| Colour of lens       | see order block |
| Recommended key grid | 24 mm           |

#### Dimensions

|                |          |
|----------------|----------|
| Length         | 19.05 mm |
| Width          | 19.05 mm |
| Overall height | 12.5 mm  |

#### Mechanical design

|                     |                     |
|---------------------|---------------------|
| Mounting            | soldering in PCB    |
| Terminals           | THT                 |
| Contact system      | snap-action contact |
| Contact arrangement | 1 NO                |
| Contact materials   | see order block     |
| Illumination        | see order block     |
| LED colour          | see order block     |
| LED type            | see order block     |

#### Mechanical characteristics

|                      |                               |
|----------------------|-------------------------------|
| Operating force max. | 2.9±0.6 N                     |
| Switching travel     | 0.5+0.2 mm                    |
| Robustness min.      | with through-plated PCB 100 N |

#### Electrical characteristics

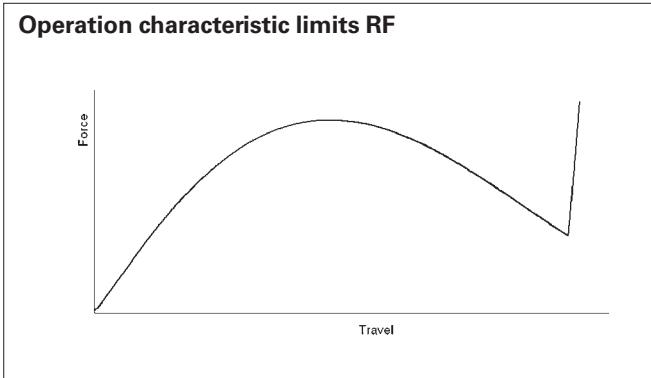
|                                  |                         |
|----------------------------------|-------------------------|
| Rated voltage min.               | Au: 0.02 V, Ag: 3 V     |
| Rated voltage max.               | Au: 35 V, Ag: 50 V      |
| Rated current min.               | Au: 0.01 mA, Ag: 0.1 mA |
| Rated current max.               | Au: 100 mA, Ag: 250 mA  |
| Rated power max. (ohmic load)    | Au: 2 W, Ag: 12.5 W     |
| Contact resistance when new max. | 100 mΩ                  |
| Insulation resistance            | 10 <sup>9</sup> Ω       |

#### Other specifications

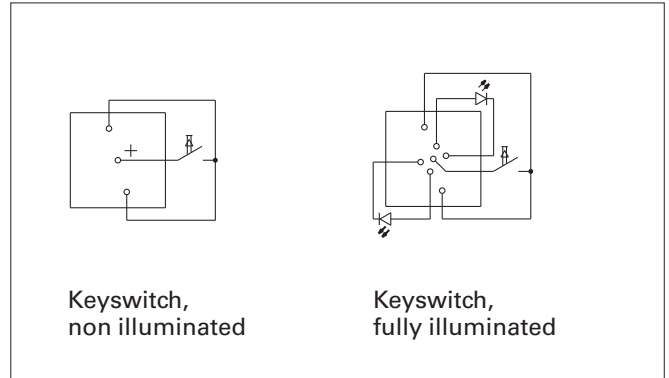
|  |   |
|--|---|
| Ambient temp. operating min.           | -25 °C                                    |
| Ambient temp. operating max.           | +70 °C                                    |
| Environmental resistance               | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations)       | 1,000,000                                 |
| Solderability / solder heat resistance | according to E DIN IEC 600 28-2-20        |
| Wave soldering                         | 260 °C max.                               |
| Manual soldering                       | 350 °C / 5 sec. max.                      |



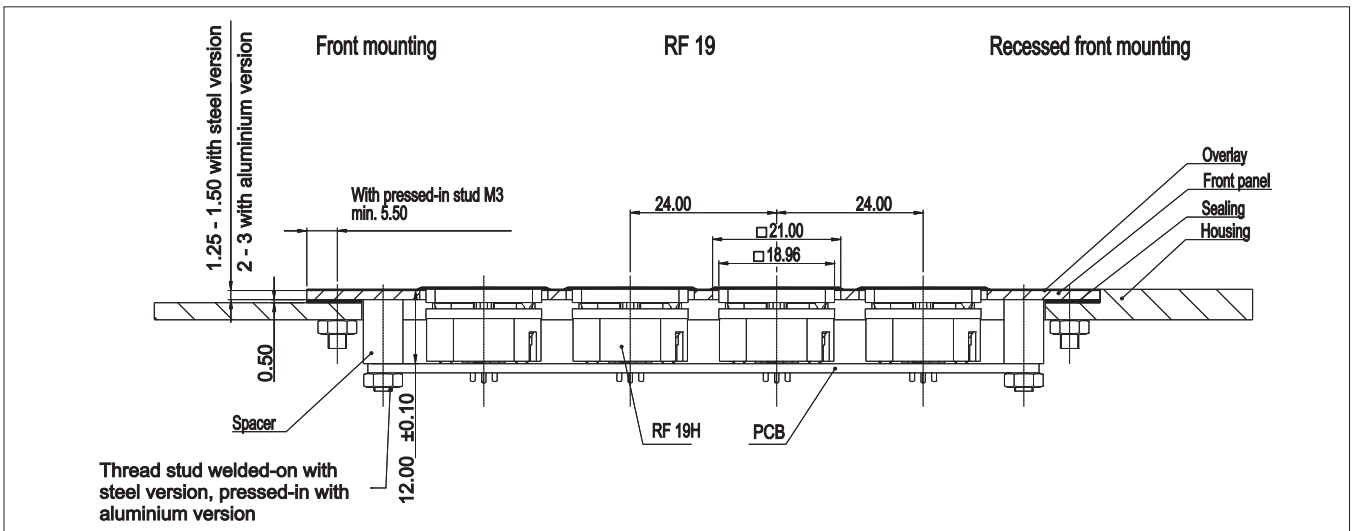
## Force/Travel Diagram – Keyswitch RF 19 H



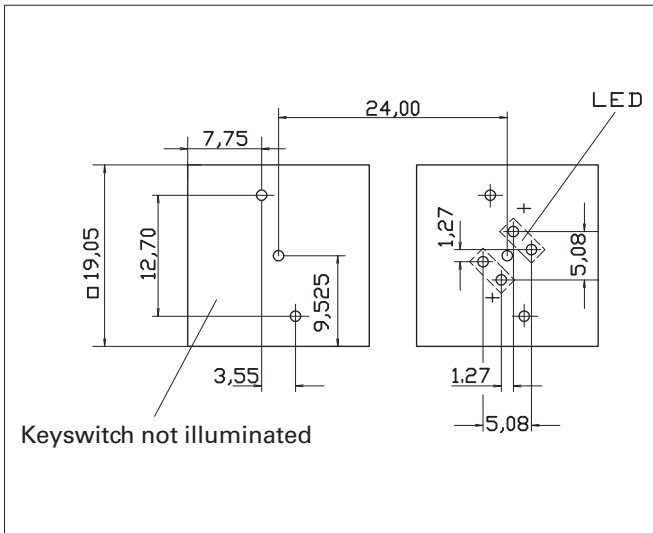
## Circuit Diagram – Keyswitch RF 19 H



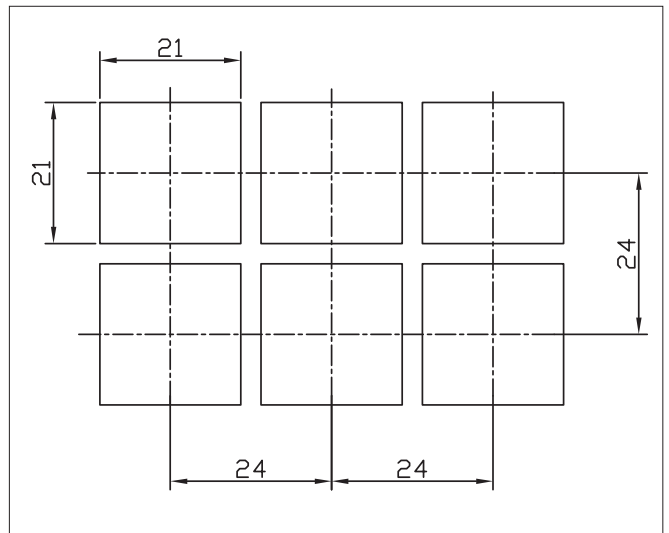
## Dimensional Drawing



## Hole Pattern RF 19 H



## Hole Pattern – Front Panel RF 19 H



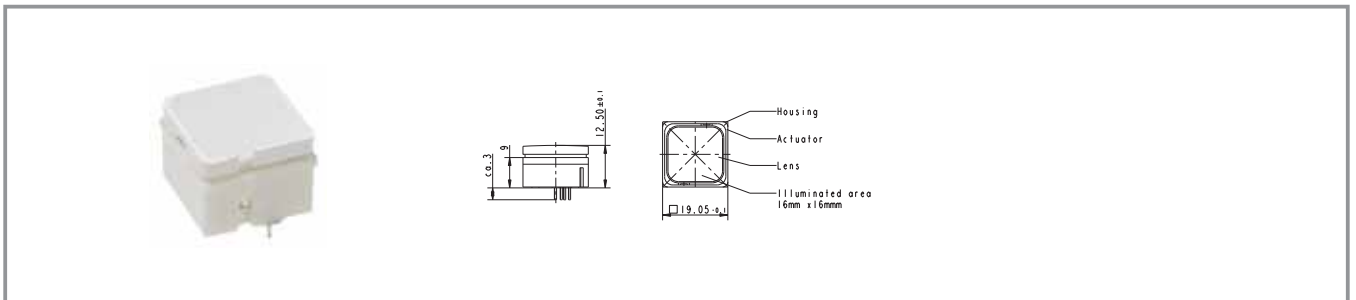
The LED may be positioned either on the left-hand or right-hand side.  
 Standard version: LED on left-hand side  
 View on component side, all hole diameters 1.1 +/- 0.1 mm

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## Typical accessories RF 19 H - Short-travel keyswitch

| Description                                       | Photo | Order no.         | Additional accessories see page |
|---|-------|-------------------|---------------------------------|
| O-ring, black, 16.0 x 1, for blocking RF 19H keys |       | 5.30.125.007/0100 | 5 - 25                          |

## RF 19 H - Keyswitch, non-illuminated



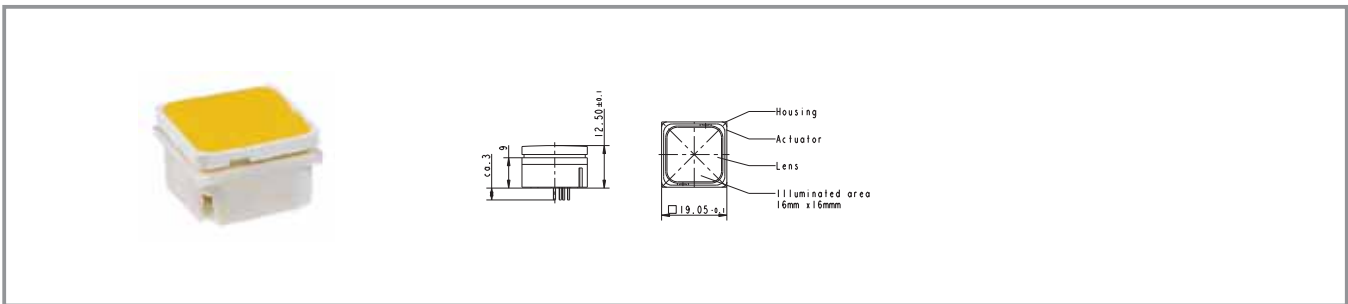
RF

| Contact materials | Illumination    | Colour of lens | LED colour | LED type | Order no.         |
|-------------------|-----------------|----------------|------------|----------|-------------------|
| Au                | not illuminated | white          | -          | -        | 3.14.001.501/0000 |
| Ag                | not illuminated | white          | -          | -        | 3.14.001.506/0000 |

Technical data see page 4 - 72

**Stock items** are marked by **bold printed order numbers.**

## RF 19 H - Short-travel keyswitch, fully illuminated



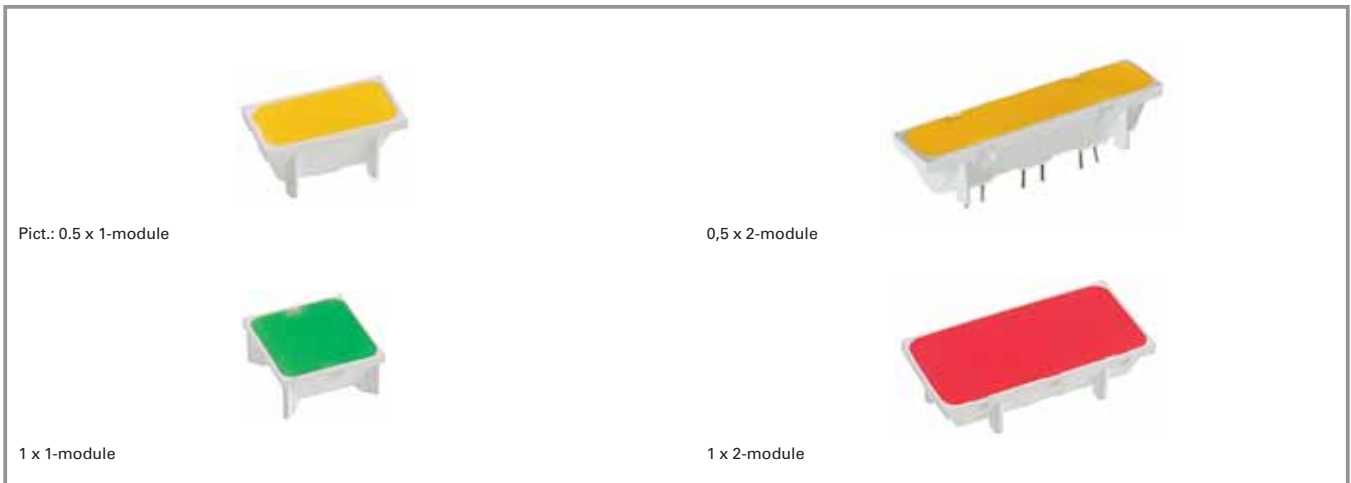
| Contact materials | Illumination               | Colour of lens | LED colour         | LED type | Order no.                |
|-------------------|----------------------------|----------------|--------------------|----------|--------------------------|
| Au                | fully illuminated<br>2 LED | red            | red                | 2 mm     | 3.14.002.613/0000        |
| Au                | fully illuminated<br>2 LED | green          | green              | 2 mm     | <b>3.14.002.632/0000</b> |
| Au                | fully illuminated<br>1 LED | green          | green super bright | 3 mm     | <b>3.14.002.633/0000</b> |
| Au                | fully illuminated<br>2 LED | yellow         | yellow             | 2 mm     | 3.14.002.653/0000        |
| Au                | fully illuminated<br>1 LED | white          | white              | 3 mm     | <b>3.14.002.684/0000</b> |
| Au                | fully illuminated<br>2 LED | orange         | yellow             | 2 mm     | 3.14.002.673/0000        |
| Au                | fully illuminated<br>2 LED | white          | multi colour       | 3 mm     | 3.14.001.672/0000        |
| Au                | fully illuminated<br>1 LED | blue           | blue               | 3 mm     | 3.14.002.683/0000        |
| Ag                | fully illuminated<br>2 LED | red            | red                | 2 mm     | 3.14.002.623/0000        |
| Ag                | fully illuminated<br>2 LED | green          | green              | 2 mm     | 3.14.002.642/0000        |
| Ag                | fully illuminated<br>1 LED | green          | green super bright | 3 mm     | 3.14.002.643/0000        |
| Ag                | fully illuminated<br>1 LED | blue           | blue               | 3 mm     | 3.14.002.688/0000        |
| Ag                | fully illuminated<br>2 LED | yellow         | yellow             | 2 mm     | 3.14.002.663/0000        |
| Ag                | fully illuminated<br>1 LED | white          | white              | 3 mm     | <b>3.14.002.689/0000</b> |
| Ag                | fully illuminated<br>2 LED | orange         | yellow             | 2 mm     | 3.14.002.678/0000        |
| Ag                | fully illuminated<br>2 LED | white          | multi colour       | 3 mm     | <b>3.14.001.682/0000</b> |

Technical data see page 4 - 72

When using the keyswitches with multicolour LEDs the illumination colour can be varied from red to green by change of polarity. Due to the frequency of the polarity-changes the colours red, green, yellow as well as all secondary colours from these are possible.

Technical data of LED see separate page at the beginning of this chapter.

**RF 19 - Signal indicator**



**Technical Data**

**General information**

Colour of lens see order block  
 Recommended key grid 23/x mm

**Dimensions**

Length see order block  
 Width see order block  
 Overall height 9.15 mm

**Mechanical design**

Mounting THT soldering in PCB  
 Illumination see order block  
 LED colour see order block  
 LED type see order block

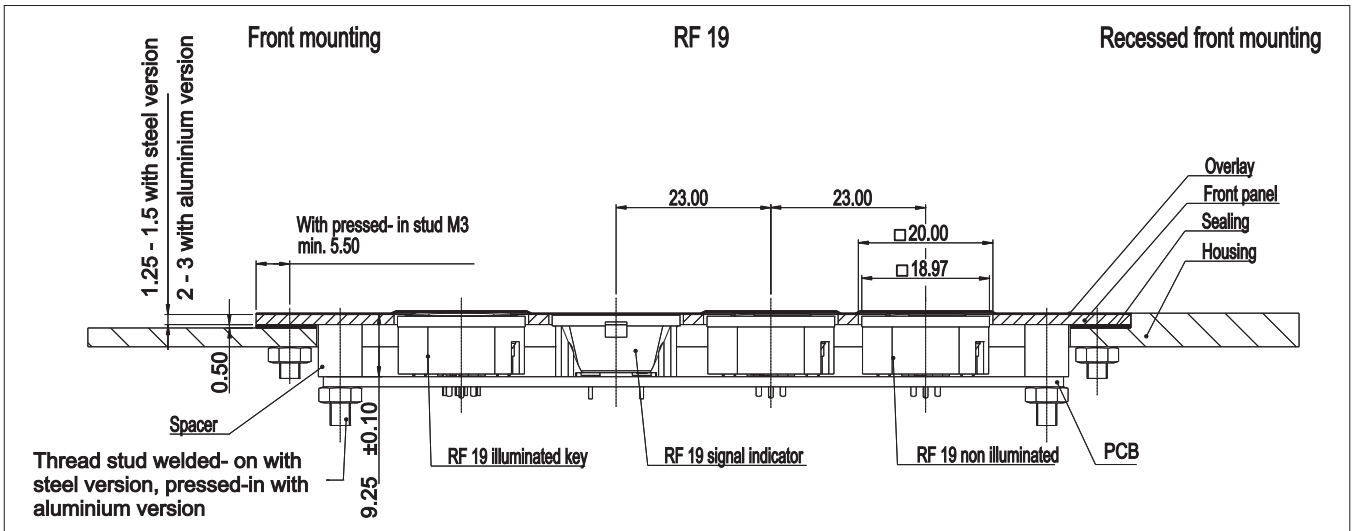
**Other specifications**

Ambient temp. operating min. -25 °C  
 Ambient temp. operating max. +70 °C  
 Environmental resistance acc. to IEC 60068-2 -14, -30, -33 and -78 according to E DIN IEC 600 28-2-20  
 Solderability / solder heat resistance 260 °C max.  
 Wave soldering 350 °C / 5 sec. max.  
 Manual soldering

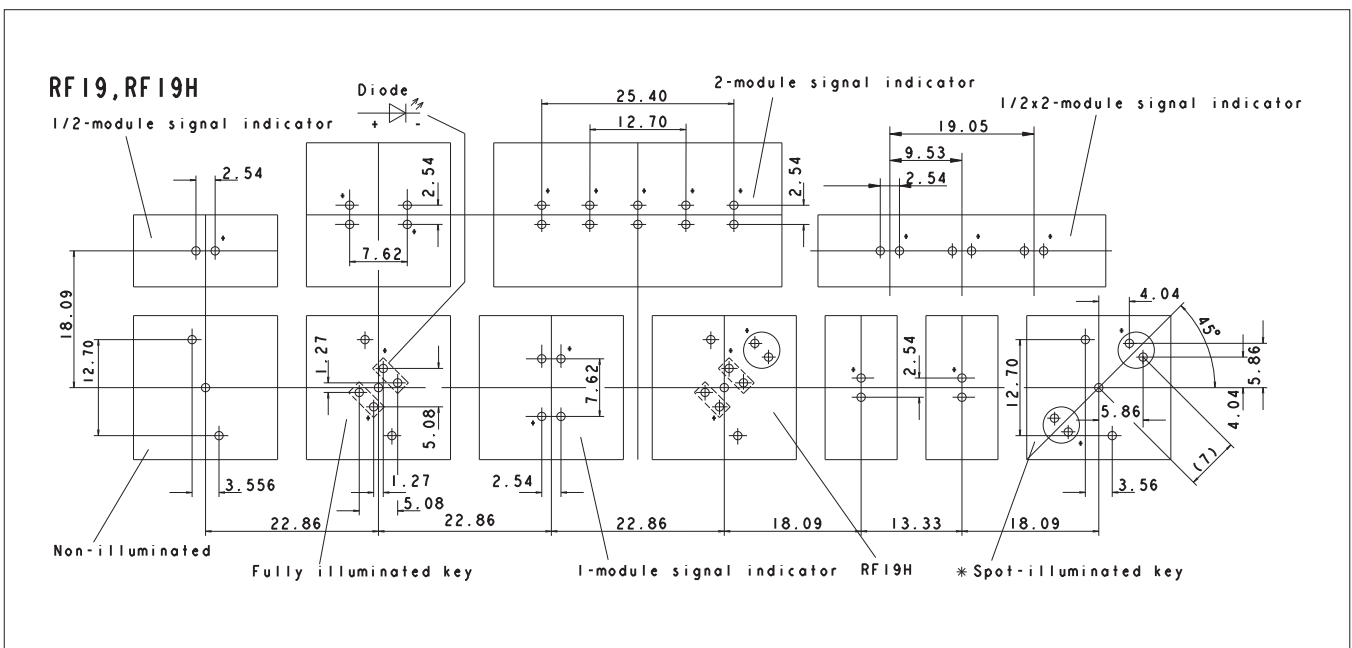
4

RF

## Dimensional Drawing Signal Indicator RF 19



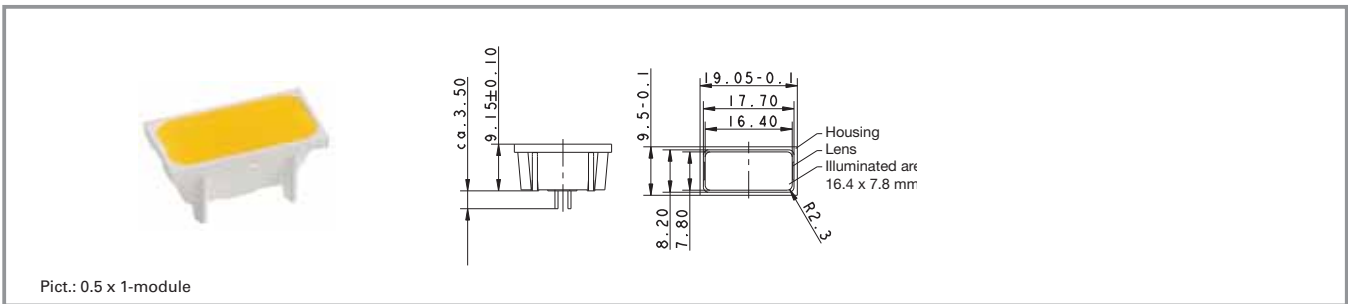
## Hole Pattern RF 19



\* The LED may be positioned either on the left-hand or right-hand side.  
Standard version: LED on left-hand side  
View on component side, all hole diameters 1.1 +/- 0.1 mm

Front panel cut-out = outer keyswitch size + 1 mm

## RF 19 - Signal indicator, 1/2 x 1-module



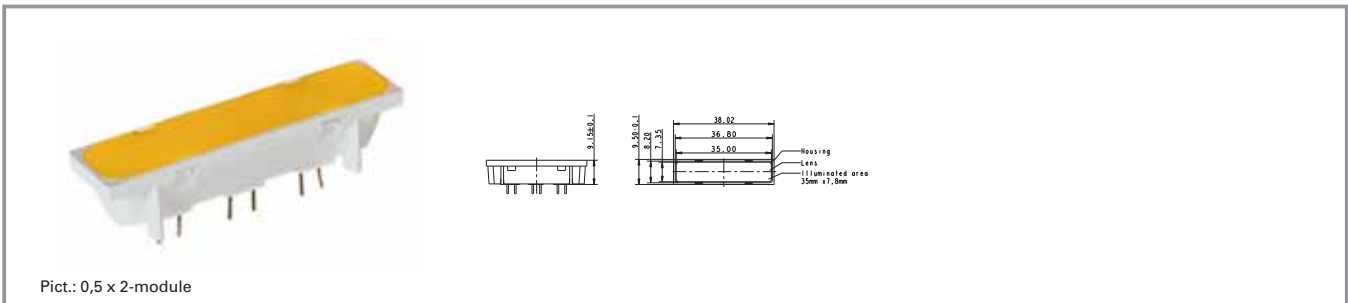
Pict.: 0.5 x 1-module

| illumination               | Colour of lens | LED colour | LED type | Order no.                |
|----------------------------|----------------|------------|----------|--------------------------|
| fully illuminated<br>1 LED | red            | red        | 2 mm     | <b>3.14.002.061/0000</b> |
| fully illuminated<br>1 LED | green          | green      | 2 mm     | 3.14.002.062/0000        |
| fully illuminated<br>1 LED | yellow         | yellow     | 2 mm     | 3.14.002.063/0000        |
| fully illuminated<br>1 LED | orange         | yellow     | 2 mm     | 3.14.002.064/0000        |

Technical data see page 4 - 76

Technical data of LED see separate page at the beginning of chapter 4 PCB Keyswitches.

## RF 19 - Signal indicator, 1/2 x 2-module



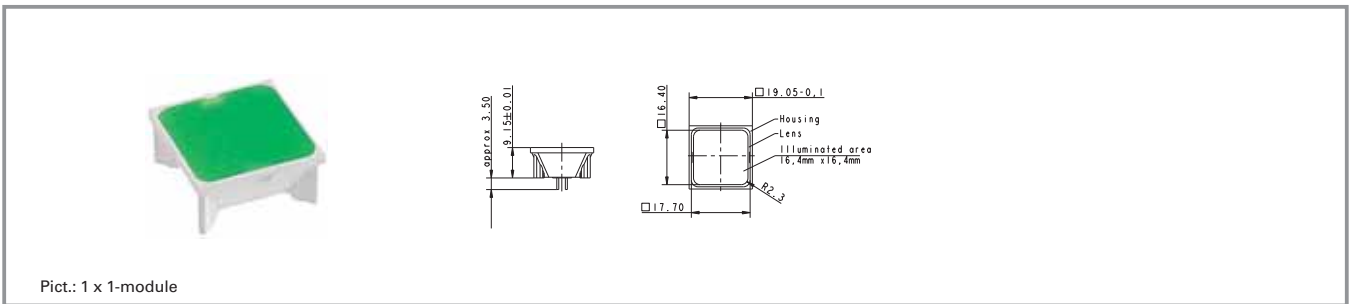
Pict.: 0,5 x 2-module

| illumination               | Colour of lens | LED colour | LED type | Order no.         |
|----------------------------|----------------|------------|----------|-------------------|
| fully illuminated<br>3 LED | red            | red        | 2 mm     | 3.14.002.908/0000 |
| fully illuminated<br>3 LED | green          | green      | 2 mm     | 3.14.002.909/0000 |
| fully illuminated<br>3 LED | yellow         | yellow     | 2 mm     | 3.14.002.910/0000 |
| fully illuminated<br>3 LED | orange         | yellow     | 2 mm     | 3.14.002.911/0000 |

Technical data see page 4 - 76

Technical data of LED see separate page at the beginning of chapter 4 PCB Keyswitches.

## RF 19 - Signal indicator, 1 x 1-module



Pict.: 1 x 1-module

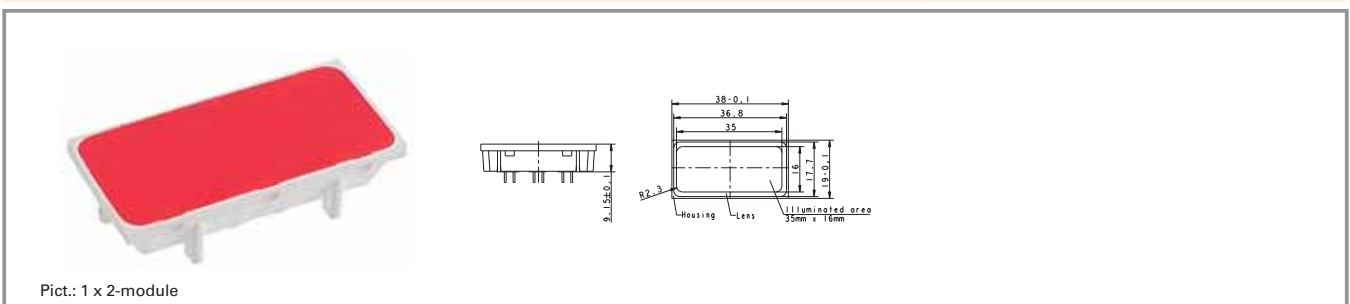
| illumination               | Colour of lens | LED colour | LED type | Order no.                |
|----------------------------|----------------|------------|----------|--------------------------|
| fully illuminated<br>2 LED | red            | red        | 2 mm     | <b>3.14.002.051/0000</b> |
| fully illuminated<br>2 LED | green          | green      | 2 mm     | <b>3.14.002.052/0000</b> |
| fully illuminated<br>2 LED | yellow         | yellow     | 2 mm     | <b>3.14.002.053/0000</b> |
| fully illuminated<br>2 LED | orange         | yellow     | 2 mm     | 3.14.002.054/0000        |
| fully illuminated<br>2 LED | blue           | blue       | 2 mm     | 3.14.001.659/0000        |

Technical data see page 4 - 76

For technical data of the LED see separate page at the beginning of chapter „RF short-travel keyswitches“

Suitable for RK 90 system design, illuminated for 2-module keycap.

## RF 19 - Signal indicator, 1 x 2-module



Pict.: 1 x 2-module

| illumination               | Colour of lens | LED colour | LED type | Order no.         |
|----------------------------|----------------|------------|----------|-------------------|
| fully illuminated<br>5 LED | red            | red        | 2 mm     | 3.14.002.071/0000 |
| fully illuminated<br>5 LED | green          | green      | 2 mm     | 3.14.002.072/0000 |
| fully illuminated<br>5 LED | yellow         | yellow     | 2 mm     | 3.14.002.073/0000 |
| fully illuminated<br>5 LED | orange         | yellow     | 2 mm     | 3.14.002.074/0000 |

Technical data see page 4 - 76

For technical data of the LED see separate page at the beginning of chapter „RF short-travel keyswitches“

## RF 15/19 - Special accessories



Pict.: opaque light grey

round and triangular versions

## Technical Data

### Dimensions

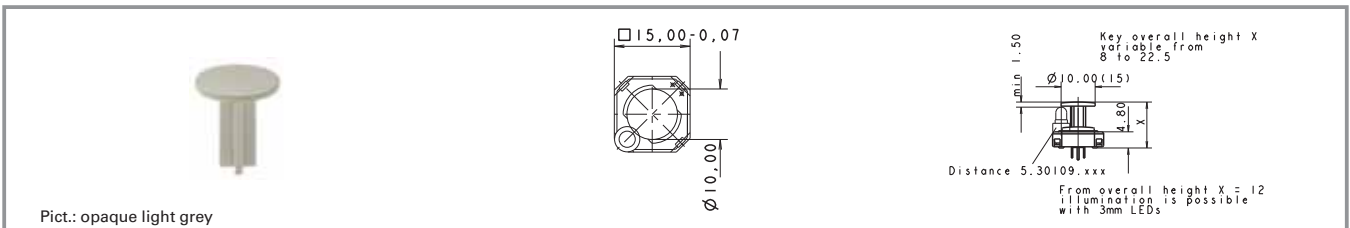
Length  
Width

see order block  
see order block

Overall height  
Diameter  
Colour

see order block  
see order block  
see order block

## RF 15 N - Extension plunger, round head



Pict.: opaque light grey

| Length | Width | Overall height | Diameter | Colour | Order no.                |
|--------|-------|----------------|----------|--------|--------------------------|
| -      | -     | 9 mm           | 10 mm    | -      | 5.46.011.036/0710        |
| -      | -     | 9.7 mm         | 10 mm    | -      | 5.46.011.030/0710        |
| -      | -     | 12.5 mm        | 10 mm    | -      | 5.46.011.037/0710        |
| -      | -     | 13 mm          | 10 mm    | -      | 5.46.011.038/0710        |
| -      | -     | 22.5 mm        | 10 mm    | -      | <b>5.46.011.028/0710</b> |

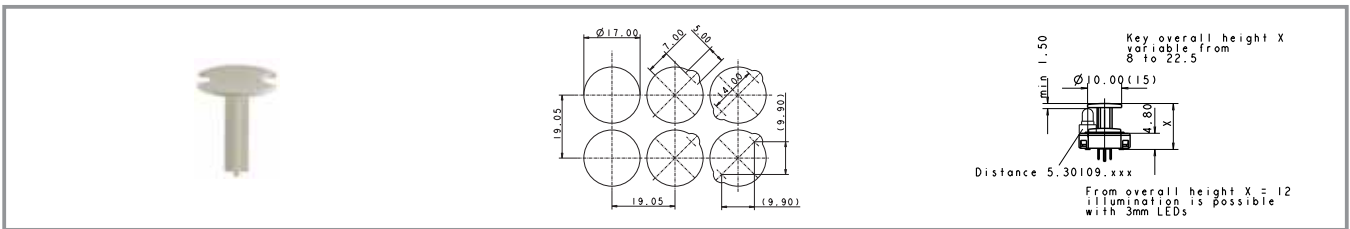
Length of plunger = Overall height - 4.25 mm.

4

RF



## RF 15 N - Extension plunger, round head, with recess for LED

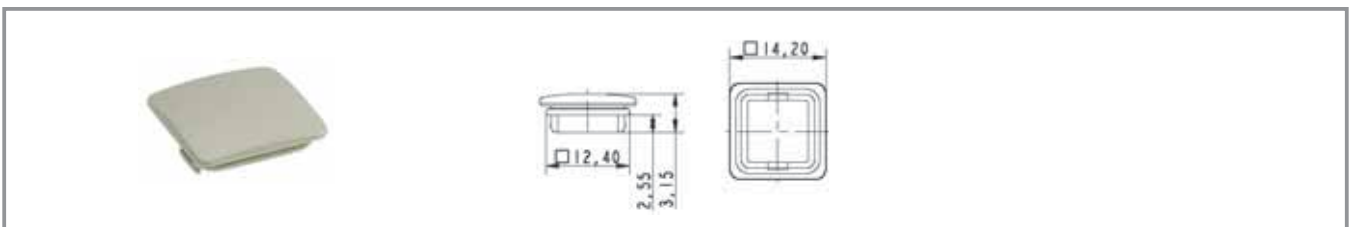


| Length | Width | Overall height | Diameter | Colour | Order no.         |
|--------|-------|----------------|----------|--------|-------------------|
| -      | -     | 9 mm           | 15 mm    | -      | 5.46.017.036/0710 |
| -      | -     | 9.7 mm         | 15 mm    | -      | 5.46.017.030/0710 |
| -      | -     | 12.5 mm        | 15 mm    | -      | 5.46.017.037/0710 |
| -      | -     | 22.5 mm        | 15 mm    | -      | 5.46.017.028/0710 |
| -      | -     | 13 mm          | 15 mm    | -      | 5.46.017.038/0710 |

Technical data see page 4 - 80

Length of plunger = Overall height - 4.25 mm.

## RF 15 - Keycap, snap-on, for overall height 12.5 mm



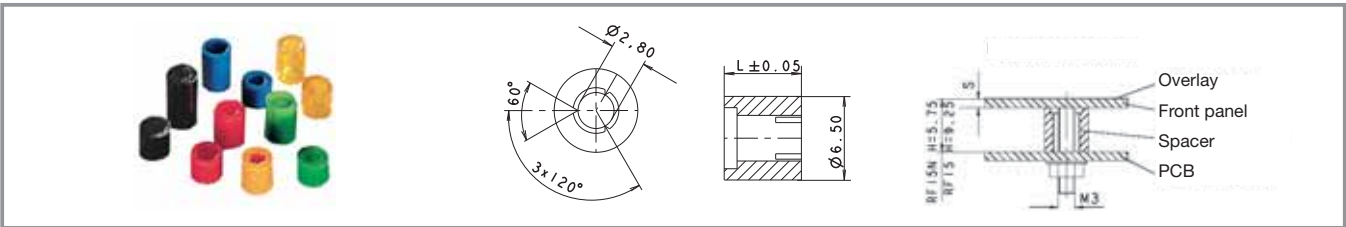
| Length  | Width   | Overall height | Diameter | Colour | Order no.         |
|---------|---------|----------------|----------|--------|-------------------|
| 14.2 mm | 14.2 mm | 12.5 mm        | -        | beige  | 5.46.654.059/0227 |

Technical data see page 4 - 80

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RF

## Spacers, round

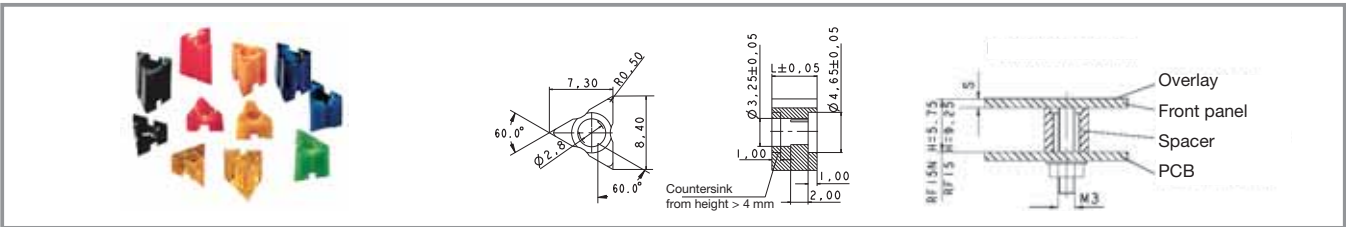


| Length   | Width | Overall height | Diameter | Colour                    | Order no.                |
|----------|-------|----------------|----------|---------------------------|--------------------------|
| 3.50 mm  | -     | -              | -        | blue transparent          | 5.30.759.023/0000        |
| 4 mm     | -     | -              | -        | green                     | 5.30.759.025/0000        |
| 4.25 mm  | -     | -              | -        | blue                      | 5.30.759.026/0000        |
| 4.50 mm  | -     | -              | -        | red                       | 5.30.759.027/0000        |
| 4.75 mm  | -     | -              | -        | blue transparent          | 5.30.759.028/0000        |
| 5 mm     | -     | -              | -        | black                     | 5.30.759.029/0000        |
| 5.25 mm  | -     | -              | -        | yellow orange transparent | 5.30.759.030/0000        |
| 5.50 mm  | -     | -              | -        | yellow                    | 5.30.759.031/0000        |
| 5.75 mm  | -     | -              | -        | green                     | <b>5.30.759.032/0000</b> |
| 6 mm     | -     | -              | -        | blue                      | <b>5.30.759.033/0000</b> |
| 6.2 mm   | -     | -              | -        | blue                      | 5.30.759.251/0000        |
| 6.25 mm  | -     | -              | -        | red                       | <b>5.30.759.034/0000</b> |
| 6.50 mm  | -     | -              | -        | blue transparent          | <b>5.30.759.035/0000</b> |
| 6.75 mm  | -     | -              | -        | black                     | <b>5.30.759.036/0000</b> |
| 7 mm     | -     | -              | -        | yellow orange transparent | <b>5.30.759.037/0000</b> |
| 7.25 mm  | -     | -              | -        | yellow                    | <b>5.30.759.038/0000</b> |
| 7.50 mm  | -     | -              | -        | green                     | <b>5.30.759.039/0000</b> |
| 7.75 mm  | -     | -              | -        | blue                      | <b>5.30.759.040/0000</b> |
| 8 mm     | -     | -              | -        | red                       | <b>5.30.759.041/0000</b> |
| 8.25 mm  | -     | -              | -        | blue transparent          | <b>5.30.759.042/0000</b> |
| 10.00 mm | -     | -              | -        | black                     | <b>5.30.759.043/0104</b> |

Technical data see page 4 - 80

Required spacer length = Overall height of key - front panel thickness - 0.5 mm (area embossing).

## Spacers, triangular



| Length  | Width | Overall height | Diameter | Colour                    | Order no.         |
|---------|-------|----------------|----------|---------------------------|-------------------|
| 2.50 mm | -     | -              | -        | blue                      | 5.30.759.094/0000 |
| 2.75 mm | -     | -              | -        | red                       | 5.30.759.095/0000 |
| 3 mm    | -     | -              | -        | blue transparent          | 5.30.759.096/0000 |
| 3.25 mm | -     | -              | -        | black                     | 5.30.759.097/0000 |
| 3.50 mm | -     | -              | -        | yellow orange transparent | 5.30.759.098/0000 |
| 3.75 mm | -     | -              | -        | yellow                    | 5.30.759.099/0000 |
| 4 mm    | -     | -              | -        | green                     | 5.30.759.100/0000 |
| 4.25 mm | -     | -              | -        | blue                      | 5.30.759.101/0000 |
| 4.50 mm | -     | -              | -        | red                       | 5.30.759.102/0000 |
| 4.75 mm | -     | -              | -        | blue transparent          | 5.30.759.103/0000 |
| 5 mm    | -     | -              | -        | black                     | 5.30.759.104/0000 |
| 5.25 mm | -     | -              | -        | yellow orange transparent | 5.30.759.105/0000 |
| 5.50 mm | -     | -              | -        | yellow                    | 5.30.759.106/0000 |
| 5.75 mm | -     | -              | -        | green                     | 5.30.759.107/0000 |
| 6 mm    | -     | -              | -        | blue                      | 5.30.759.108/0000 |
| 6.2 mm  | -     | -              | -        | blue                      | 5.30.759.253/0000 |
| 6.25 mm | -     | -              | -        | red                       | 5.30.759.109/0000 |
| 6.50 mm | -     | -              | -        | blue transparent          | 5.30.759.110/0000 |
| 6.75 mm | -     | -              | -        | black                     | 5.30.759.111/0000 |
| 7 mm    | -     | -              | -        | yellow orange transparent | 5.30.759.112/0000 |
| 7.25 mm | -     | -              | -        | yellow                    | 5.30.759.113/0000 |
| 7.50 mm | -     | -              | -        | green                     | 5.30.759.114/0000 |
| 7.75 mm | -     | -              | -        | blue                      | 5.30.759.115/0000 |

| Length   | Width | Overall height | Diameter | Colour                    | Order no.         |
|----------|-------|----------------|----------|---------------------------|-------------------|
| 8 mm     | -     | -              | -        | red                       | 5.30.759.116/0000 |
| 8.25 mm  | -     | -              | -        | blue transparent          | 5.30.759.117/0000 |
| 9 mm     | -     | -              | -        | blue                      | 5.30.759.254/0000 |
| 10.00 mm | -     | -              | -        | black                     | 5.30.759.124/0000 |
| 10.25 mm | -     | -              | -        | yellow orange transparent | 5.30.759.125/0000 |

Technical data see page 4 - 80

Required spacer length = Overall height of key - front panel thickness - 0.5 mm (area embossing).

## RF 15 N - LED spacer



| Length | Width | Overall height | Diameter | Colour     | Order no.         |
|--------|-------|----------------|----------|------------|-------------------|
| 2.2 mm | -     | 12.5 mm        | 5 mm     | light grey | 5.30.109.010/0756 |
| 12 mm  | -     | 22.5 mm        | 5 mm     | black      | 5.30.109.019/0105 |

Technical data see page 4 - 80



## General Data

Short-travel main switch for use in membrane keyboards under the overlay or with RK 90 keycaps, 250V, 4A max.  
A cut-out in the overlay is not required!

## Content

**KN 19 - Short-travel main switch**  
KN 19 - Short-travel main switch

**4 - 86**  
4 - 88

## KN 19 - Short-travel main switch



### General Data

The KN 19 makes it possible to implement a power switch directly in a low-profile data entry system. This eliminates the need for extra switches on the device and additional openings in the overlay. In this way, you can achieve an optimum of safety and a consistent design.

The contact opening widths comply with the VDE standards. The KN 19 can also be employed underneath RK 90 keycaps. Other actuation functions (momentary, latching/momentary) available on request.

### Technical Data

#### General information

Recommended key grid 19.05 x 38.1 mm

#### Dimensions

Length 37.8 mm  
 Width 18.8 mm  
 Overall height 9.7 mm

#### Mechanical design

Mounting on PCB  
 Terminals THT solder terminals  
 Contact system snap-action bridge contact

Contact arrangement see order block  
 Contact materials Ag  
 Illumination 1 LED (max. 3 mm) possible

Degree of protection IP40  
 Hot wire ignition acc. to IEC 60695-2-1 850 °C

#### Mechanical characteristics

Operating force max. 9±3 N  
 Operating travel 0.55±0.15 mm  
 Robustness max. 100 N

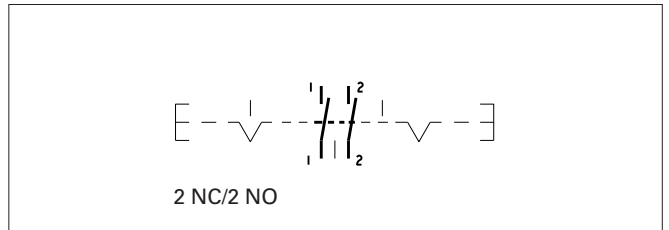
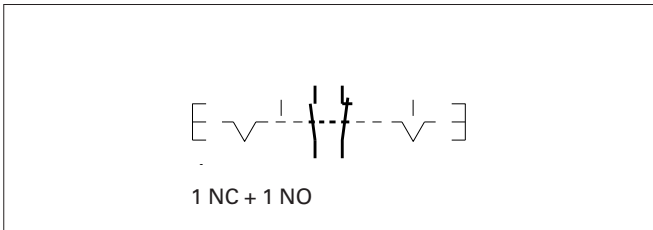
#### Electrical characteristics

Rated voltage AC min. 12 V  
 Rated voltage DC min. 12 V  
 Rated voltage AC max. 250 V  
 Rated voltage DC max. 50 V  
 Ohmic load AC 6 A  
 Ohmic load DC min. 0.1 A  
 Ohmic load DC max. 10 A  
 Contact resistance when new max. 50 mΩ  
 Capacity input current AC max. 100 A  
 Rated motor current AC 4 A  
 Rated filament lamp current AC 2.4 A  
 Bouncing time max. 10 ms

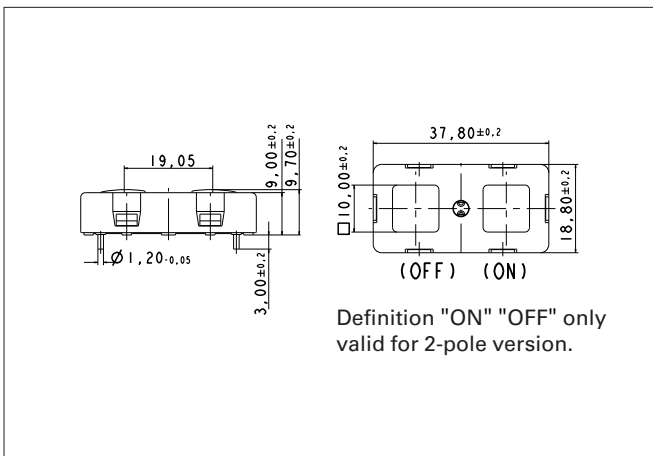
#### Other specifications

Ambient temp. operating min. -25 °C  
 Ambient temp. operating max. +70 °C  
 Environmental resistance acc. to IEC 60068-2 -14, -30, -33 and -78  
 Operating life AC AC 250 V: 200.000/2A; 100.000/6A  
 Operating life DC 50,000(10 A / 50 V=)  
 Soldering time max. 3 s  
 Soldering temperature max. 350 °C  
 Flame class acc. to UL 94 UL 94 VO

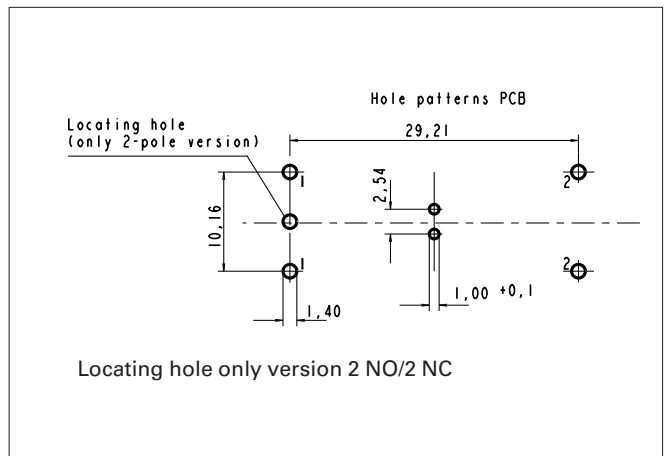
**Circuit Diagram**



**Dimensional Drawing**



**Hole Pattern**



**Approvals**



IEC 61058

UL 508, C22.2 No. 14-M91

## Approvals



IEC 61058



UL 508, C22.2 No.  
14-M91

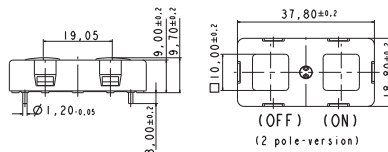
## Typical accessories KN 19 - Short-travel main switch

| Description              | Photo | Order no.         | Additional accessories see page |
|--------------------------|-------|-------------------|---------------------------------|
| KN19 - Absorption rubber |       | 5.30.729.009/0000 |                                 |

## KN 19 - Short-travel main switch



Pict.: 1 NC + 1 NO



| Contact arrangement | Rated voltage AC max. | Order no.                |
|---------------------|-----------------------|--------------------------|
| 1 NC + 1 NO         | 250 V                 | <b>1.12.000.001/0000</b> |
| 2 NC / 2 NO         | 250 V                 | <b>1.12.000.501/0000</b> |

Technical data see page 4 - 86

### Accessoires:

KN19 - Absorption rubber: 5.30.729.009/0000

For keycaps, refer to RK 90 system design.

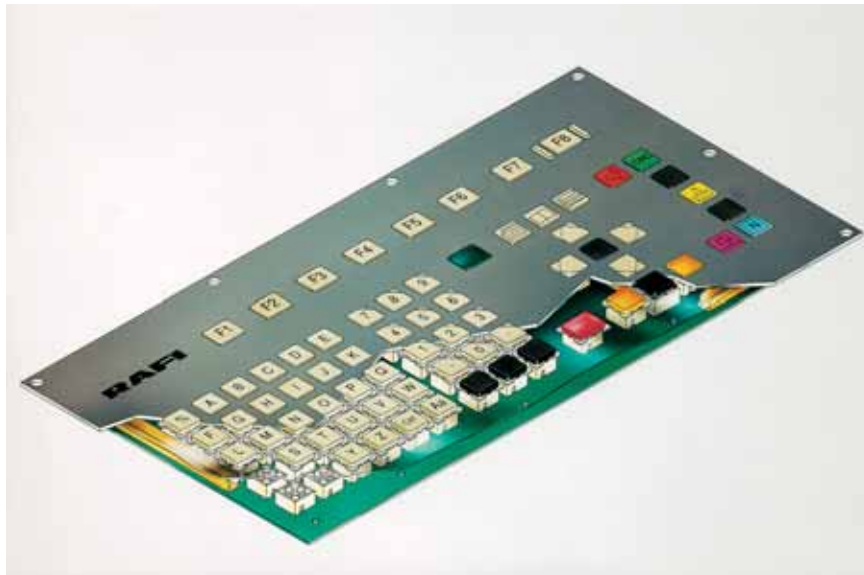
Positive opening NC contacts to IEC 60 947-5-1.

1-LED spot-illumination (max. 3 mm) possible.

4

KN  
19





## General Data

### Keycaps for RACON, RF 15 / RF 19 and KN 19 short-travel keyswitches

- You can insert a legend insert between lens and pressure pool of the transparent keycaps.

## Content

### RK 90 - Keycaps, plastic, 9 x 9 mm

RK 90 - Keycap body plastic, for lenses 9 x 9 mm

4 - 92  
4 - 93

### RK 90 - Keycaps, plastic, 14 mm

RK 90 - Keycap body plastic, for lenses 14 mm, 1-module  
 RK 90 - Keycap body plastic, for lenses 1¼-module  
 RK 90 - Keycap body plastic, for lenses 14 mm, 1½-module  
 RK 90 - Keycap body plastic, for lenses 2-module

4 - 94  
4 - 95  
4 - 95  
4 - 96  
4 - 96

### RK 90 - Keycaps, aluminum, 14 x 14 mm

RK 90 - Keycaps, aluminum, 14 mm, 1-module  
 RK 90 - Keycaps, aluminum, 14 mm, 1½-module  
 RK 90 - Keycaps, aluminum, 14 mm, 2-module

4 - 98  
4 - 98  
4 - 99  
4 - 99

### RK 90 - Special accessories

RK 90 - Fin, to avoid inadvertent operation  
 RK 90 - Spacer M 4  
 RK 90 - Silicone foil 600 x 590 x 0.45 mm

4 - 100  
4 - 100  
4 - 101  
4 - 101

## Keycap system RK 90

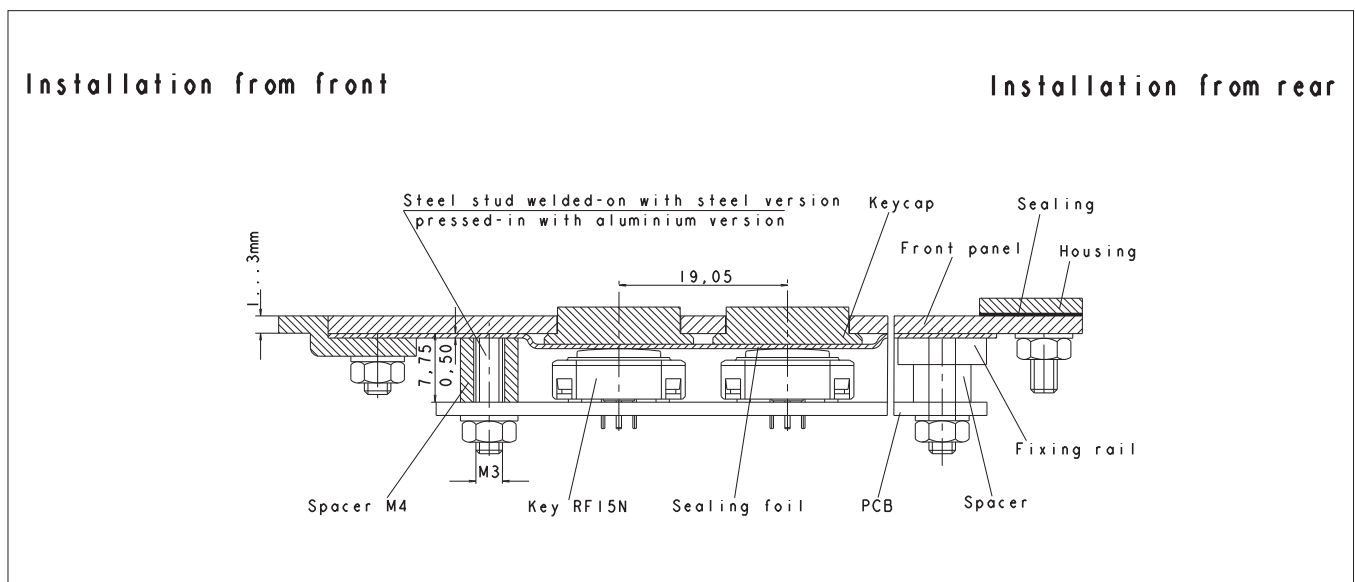
Example with RF 15 keyswitches. Instead of RF 15 following keyswitches can be used:

- MICON 5
- RACON 8/12
- RF 15 keyswitches and signal indicators
- RF 19 keyswitches and signal indicators
- Short-travel main switch KN 19

The RK 90 system was granted the prize of the Design Forum of the Hannover Fair.

**Degree of protection: IP65 according to DIN in front of the panel, with silicone sealing.**

## Installation methods



4

### Mounting from front

Sealing foil between RK 90 keyboard and customer's front panel.

### Mounting from rear

Sealing foil is screwed to RK 90 panel with fixing rails; sealing between keyboard and customer's front panel has to be provided.

## Legending

- **Laser printing:** This labelling method is possible for opaque keycaps. The symbols are engraved in the keycaps with laser.
- When using transparent lenses, the pressure pad can be legended by printing.

As the legending is protected by the lens, it is friction-proof.

- **Engraving:** With this method the keycaps are engraved with the required symbol and then inlaid with ink.

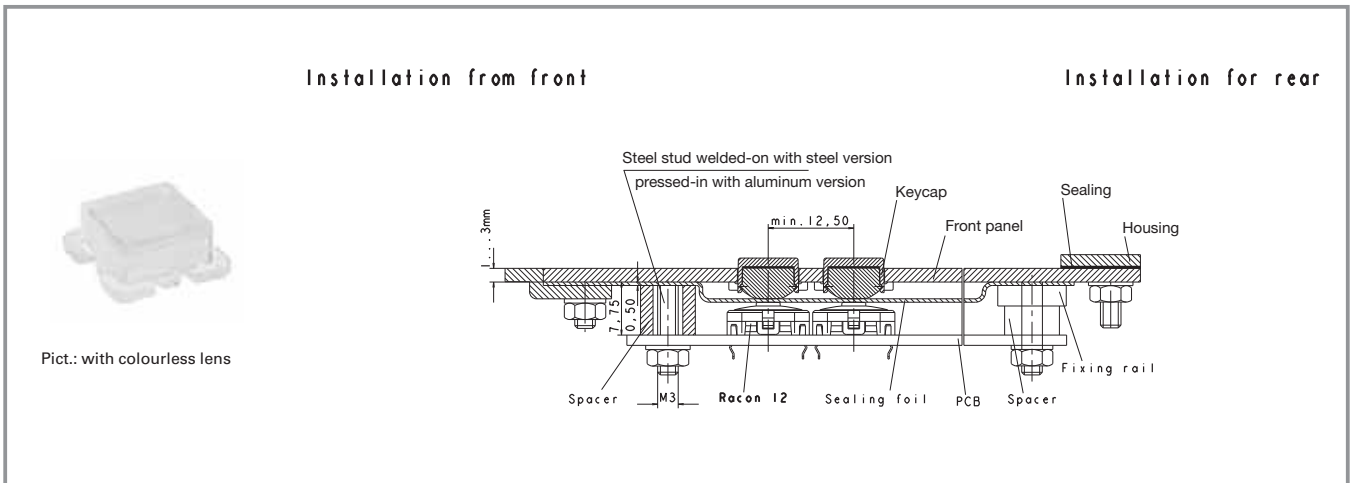
## Recommendations

- **Front panel thickness:**
  - **Aluminum:** 2 mm (1.5 mm min, 3 mm max.)  
(Fixing with M 3 pressed-in studs)
  - **Steel:** 2 mm (3 mm max.): V2A: 1.25 mm  
(Fixing with M 3 welded-on studs)The keytop surface is flush with the keyboard at a panel thickness of 3.5 mm.
- **Silicone sealing:**
  - Material: Silicone transparent
  - Type: A-SY 40-79
  - Hardness: 30° shore +/- 5°
  - Thickness: 0.45 +/- 0.05 mm
- **Installation:** Ensure that the keyboard slopes slightly so that any liquid can drain away between front panel and silicone sealing; if necessary, provide additional drain holes in the front panel.

## Cleaning liquids

For the cleaning of the plastic keycaps please do not use cleaning liquids based on alcohol or acid.

**RK 90 - Keycaps, plastic, 9 x 9 mm**



**General Data**

You can design especially small input fields with the small keycap 9 x 9 mm. For example, controls for measurement and laboratory equipment which do not offer much space for input fields because of their small size. RK 90 keycaps 9 x 9 mm and RACON short-travel keyswitches can be used to implement key grids of only 12.5 mm. The keycaps can be legended by laser-printing, engraving or standard printing. This keycap is our first choice in a combination with the illuminated RACON 12 i short-travel keyswitch.

**Please note:** For the cleaning of the plastic keycaps please do not use cleaning liquids based on alcohol or acid.

**Technical Data**

4

**General information**

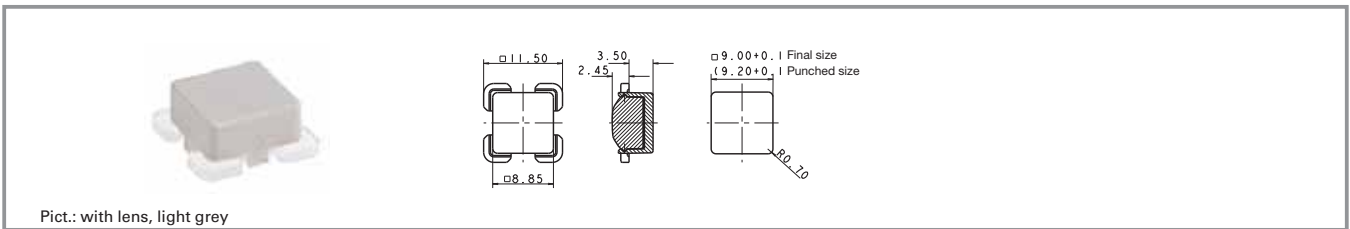
|  |                 |
|--|-----------------|
| Colour of lens                           | see order block |
| Size                                     | 1-module        |
| Degree of protection (with silicon seal) | IP65            |
| Illuminability                           | see order block |

**Dimensions**

|  |                |
|--|----------------|
| Dimension keycap in front of front panel | 8.85 x 8.85 mm |
| Dimension keycap behind front panel      | 11.5 x 11.5 mm |
| Dimension (c) hole patterns final size   | 9.00 x 9.00 mm |
| Dimension hole patterns punched size     | 9.20 x 9.20 mm |

Please order lens separately.

## RK 90 - Keycap body plastic, for lenses 9 x 9 mm



Pict.: with lens, light grey

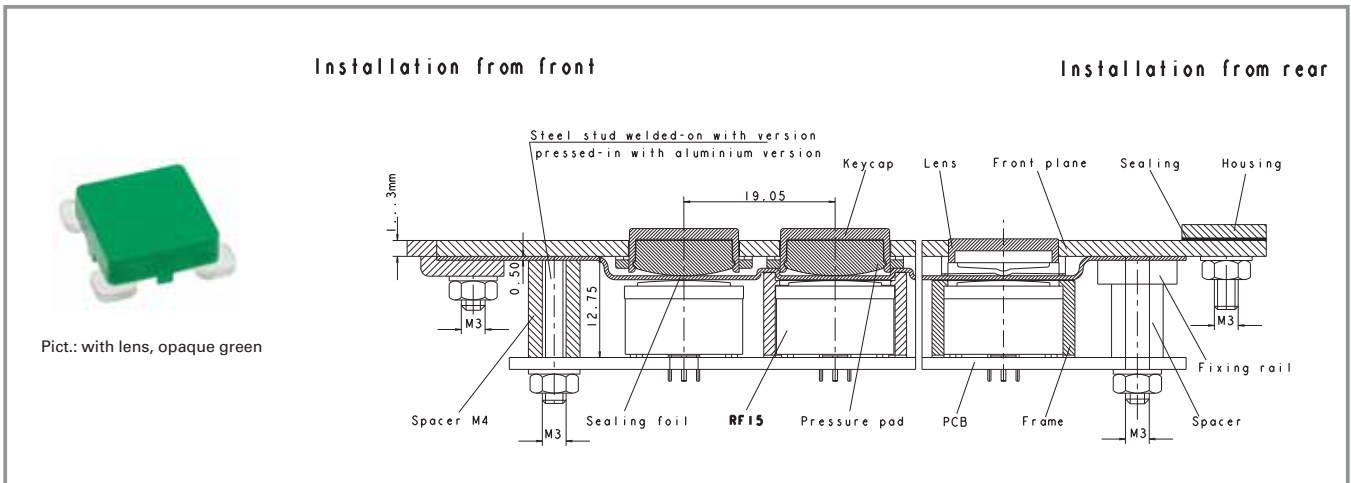
| Size     | Illuminability | Dimension keycap behind front panel | Dimension keycap in front of front panel | Dimension (c) hole patterns final size | Order no. without lens | Note                            |
|----------|----------------|-------------------------------------|--|--|------------------------|---------------------------------|
| 1-module | yes            | 11.5 x 11.5 mm                      | 8.85 x 8.85 mm                           | 9.00 x 9.00 mm                         | 5.55.103.265/1013      | Please order lenses separately. |

Technical data see page 4 - 92

### Lenses:

- RK 90 - Lens, 9 x 9 mm, opaque red: 5.46.651.015/0309
- RK 90 - Lens, 9 x 9 mm, opaque yellow: 5.46.651.015/0409
- RK 90 - Lens, 9 x 9 mm, opaque green: 5.46.651.015/0514
- RK 90 - Lens, 9 x 9 mm, opaque blue: 5.46.651.015/0611
- RK 90 - Lens, 9 x 9 mm, opaque light grey: 5.46.651.015/0700
- RK 90 - Lens, 9 x 9 mm, transparent colourless: 5.46.651.019/1002
- RK 90 - Lens, 9 x 9 mm, transparent red: 5.46.651.019/1307
- RK 90 - Lens, 9 x 9 mm, transparent yellow: 5.46.651.019/1403
- RK 90 - Lens, 9 x 9 mm, transparent green: 5.46.651.019/1510

**RK 90 - Keycaps, plastic, 14 mm**



**General Data**

Keycap system for 19.05 mm grid. The keycaps can be legended by laser-printing, engraving or standard printing. Keycaps / sets with legends and other keycap shapes / colours available on request.

**Please note:** For the cleaning of the plastic keycaps please do not use cleaning liquids based on alcohol or acid.

**Technical Data**

**General information**

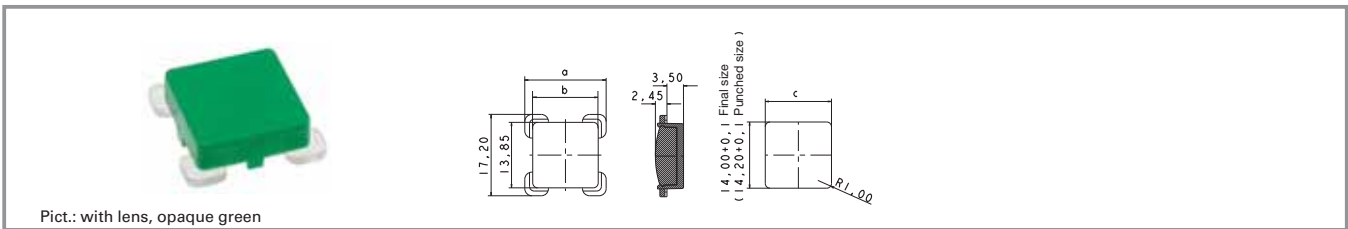
|  |                 |
|--|-----------------|
| Colour of lens                           | see order block |
| Size                                     | see order block |
| Degree of protection (with silicon seal) | IP65            |
| Illuminability                           | yes             |

**Dimensions**

|  |                 |
|--|-----------------|
| Dimension (b) in front of front panel  | see order block |
| Dimension (a) behind front panel       | see order block |
| Dimension (c) hole patterns final size | see order block |
| Dimension hole patterns punched size   | see order block |

4

## RK 90 - Keycap body plastic, for lenses 14 mm, 1-module



Pict.: with lens, opaque green

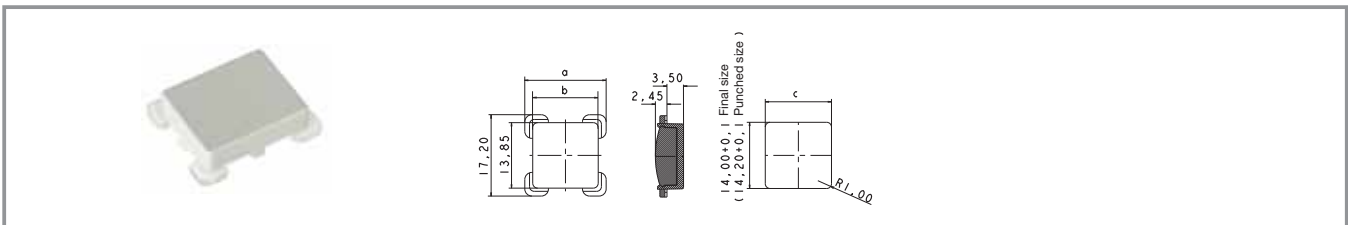
| Size     | Illuminability | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no. without lens | Note                            |
|----------|----------------|----------------------------------|---------------------------------------|--|------------------------|---------------------------------|
| 1-module | yes            | 17.20 x 17.20 mm                 | 13.85 x 13.85 mm                      | 14.00 x 14.00 mm                       | 5.55.103.030/1013      | Please order lenses separately. |

Technical data see page 4 - 94

### Lenses:

- RK 90 - Lens, 14 mm, 1-module, opaque red: 5.46.681.001/0309
- RK 90 - Lens, 14 mm, 1-module, opaque yellow: 5.46.681.001/0409
- RK 90 - Lens, 14 mm, 1-module, opaque green: 5.46.681.001/0514
- RK 90 - Lens, 14 mm, 1-module, opaque blue: 5.46.681.001/0611
- RK 90 - Lens, 14 mm, 1-module, opaque light grey: 5.46.681.001/0700
- RK 90 - Lens, 14 mm, 1-module, transparent colourless: 5.46.681.021/1002
- RK 90 - Lens, 14 mm, 1-module, transparent red: 5.46.681.021/1307
- RK 90 - Lens, 14 mm, 1.5-module, transparent yellow: 5.46.681.021/1403
- RK 90 - Lens, 14 mm, 1-module, transparent green: 5.46.681.021/1510

## RK 90 - Keycap body plastic, for lenses 1¼-module



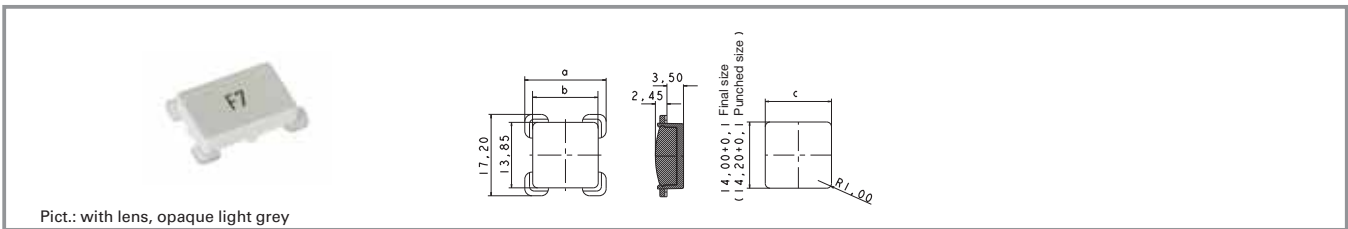
| Size        | Illuminability | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no. without lens | Note                            |
|-------------|----------------|----------------------------------|---------------------------------------|--|------------------------|---------------------------------|
| 1 1¼-module | yes            | 17.20 x 20.7 mm                  | 13.85 x 17.35 mm                      | 14,00 x 17,5 mm                        | 5.55.103.031/1013      | Please order lenses separately. |

Technical data see page 4 - 94

### Lenses:

- RK 90 - Lens, 14 mm, 1.25-module, opaque red: 5.46.681.002/0309
- RK 90 - Lens, 14 mm, 1.25-module, opaque light grey: 5.46.681.002/0700
- RK 90 - Lens, 14 mm, 1.25-module, transparent colourless: 5.46.681.022/1002
- RK 90 - Lens, 14 mm, 1.25-module, transparent red: 5.46.681.022/1307
- RK 90 - Lens, 14 mm, 1.25-module, transparent yellow: 5.46.681.022/1403
- RK 90 - Lens, 14 mm, 1.25-module, transparent green: 5.46.681.022/1510

## RK 90 - Keycap body plastic, for lenses 14 mm, 1½-module



Pict.: with lens, opaque light grey

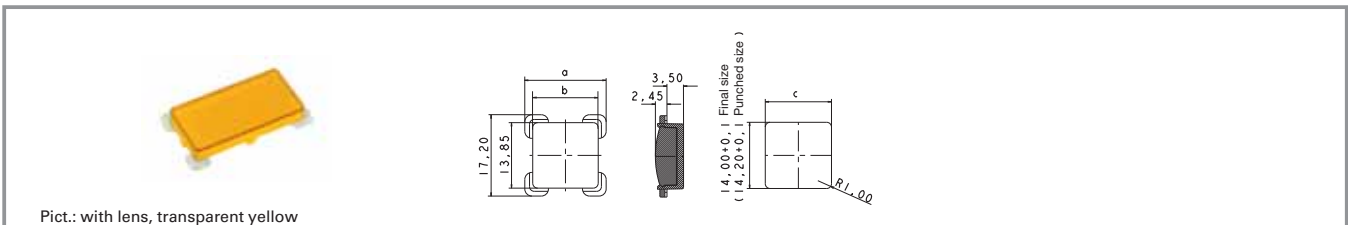
| Size      | Illuminability | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no. without lens | Note                            |
|-----------|----------------|----------------------------------|---------------------------------------|--|------------------------|---------------------------------|
| 1½-module | yes            | 17.20 x 24.20 mm                 | 13.85 x 20.85 mm                      | 14.00 x 21.00 mm                       | 5.55.103.032/1013      | Please order lenses separately. |

Technical data see page 4 - 94

### Lenses:

- RK 90 - Lens, 14 mm, 1.5-module, opaque red: 5.46.681.003/0309
- RK 90 - Lens, 14 mm, 1.5-module, opaque yellow: 5.46.681.003/0409
- RK 90 - Lens, 14 mm, 1.5-module, opaque green: 5.46.681.003/0514
- RK 90 - Lens, 14 mm, 1.5-module, opaque blue: 5.46.681.003/0611
- RK 90 - Lens, 14 mm, 1.5-module, opaque light grey: 5.46.681.003/0700
- RK 90 - Lens, 14 mm, 1.5-module, transparent colourless: 5.46.681.023/1002
- RK 90 - Lens, 14 mm, 1.5-module, transparent red: 5.46.681.023/1307
- RK 90 - Lens, 14 mm, 1.5-module, transparent yellow: 5.46.681.023/1403
- RK 90 - Lens, 14 mm, 1.5-module, transparent green: 5.46.681.023/1510

## RK 90 - Keycap body plastic, for lenses 2-module



Pict.: with lens, transparent yellow

| Size     | Illuminability | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no. without lens | Note                            |
|----------|----------------|----------------------------------|---------------------------------------|--|------------------------|---------------------------------|
| 2-module | yes            | 17.20 x 31.20 mm                 | 13.85 x 27.85 mm                      | 14.00 x 28.00 mm                       | 5.55.103.077/1013      | Please order lenses separately. |

Technical data see page 4 - 94

### Lenses:

- RK 90 - Lens, 14 mm, 2-module, opaque red: 5.46.681.004/0309
- RK 90 - Lens, 14 mm, 2-module, opaque yellow: 5.46.681.004/0409
- RK 90 - Lens, 14 mm, 2-module, opaque green: 5.46.681.004/0514
- RK 90 - Lens, 14 mm, 2-module, opaque blue: 5.46.681.004/0611
- RK 90 - Lens, 14 mm, 2-module, opaque light grey: 5.46.681.004/0700
- RK 90 - Lens, 14 mm, 2-module, transparent colourless: 5.46.681.024/1002
- RK 90 - Lens, 14 mm, 2-module, transparent red: 5.46.681.024/1307
- RK 90 - Lens, 14 mm, 2-module, transparent yellow: 5.46.681.024/1403
- RK 90 - Lens, 14 mm, 2-module, transparent green: 5.46.681.024/1510

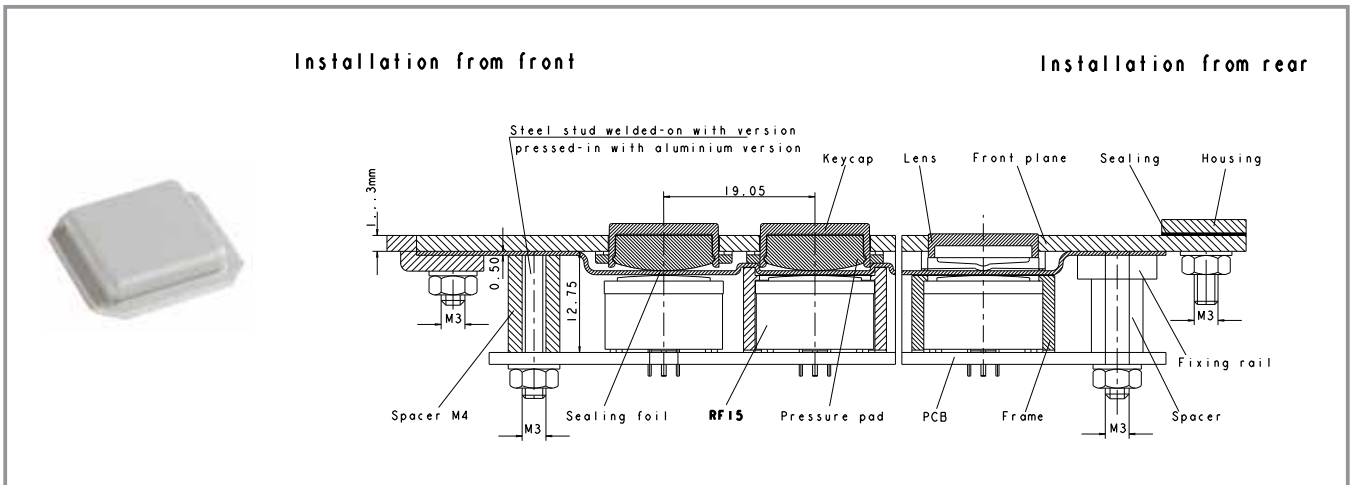
4

RK  
90





**RK 90 - Keycaps, aluminum, 14 x 14 mm**



**General Data**

The RK 90 system design with metal keycaps is fairly safe against mechanical, thermal or chemical effects. Combined with a metal front panel, this data entry system offers maximum protection against vandalism. Tried and tested MICON 5, RACON 8/12 or RF 15/19 PCB keyswitches are used underneath the metal keycaps. The keycaps can be provided with engraved, coloured anodized or laser-printed legends. This means that the legend is durable and cannot be removed by mechanical or chemical means.

4

**Technical Data**

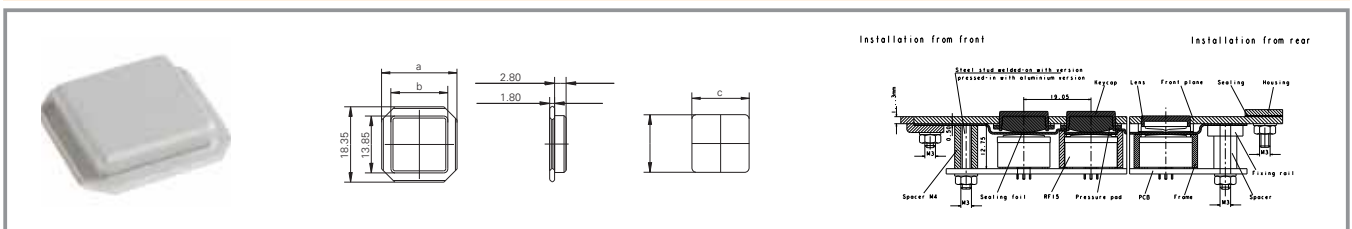
**General information**

|  |                                 |
|--|---------------------------------|
| Colour of lens                           | aluminum colourless<br>anodized |
| Size                                     | see order block                 |
| Degree of protection (with silicon seal) | IP65                            |

**Dimensions**

|  |                 |
|--|-----------------|
| Dimension (b) in front of front panel  | see order block |
| Dimension (a) behind front panel       | see order block |
| Dimension (c) hole patterns final size | see order block |
| Dimension hole patterns punched size   | see order block |

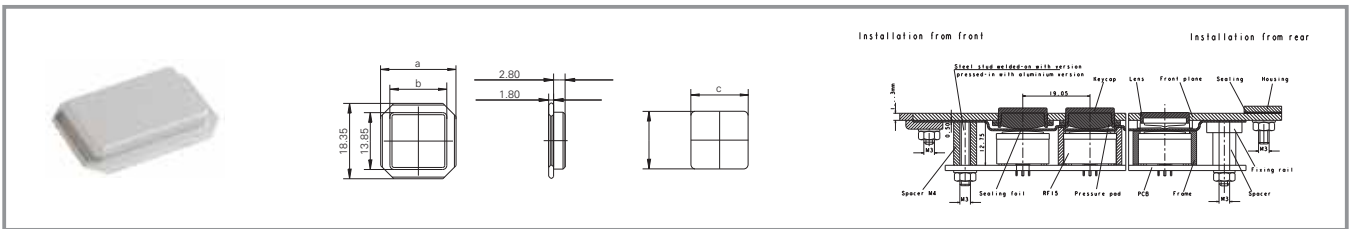
**RK 90 - Keycaps, aluminum, 14 mm, 1-module**



| Size     | Colour of lens               | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no.         |
|----------|------------------------------|----------------------------------|---------------------------------------|--|-------------------|
| 1-module | aluminum colourless anodized | 18.35 x 18.35 mm                 | 13.85 x 13.85 mm                      | 14.00 x 14.00 mm                       | 5.46.500.001/4010 |

RK 90

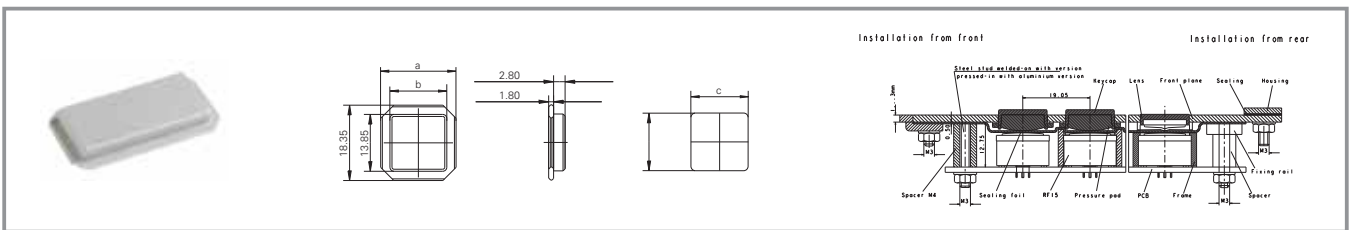
## RK 90 - Keycaps, aluminum, 14 mm, 1½-module



| Size      | Colour of lens               | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no.         |
|-----------|------------------------------|----------------------------------|---------------------------------------|--|-------------------|
| 1½-module | aluminum colourless anodized | 18.35 x 25.35 mm                 | 13.85 x 20.85 mm                      | 14.00 x 21.00 mm                       | 5.46.500.003/4010 |

Technical data see page 4 - 98

## RK 90 - Keycaps, aluminum, 14 mm, 2-module



| Size     | Colour of lens               | Dimension (a) behind front panel | Dimension (b) in front of front panel | Dimension (c) hole patterns final size | Order no.         |
|----------|------------------------------|----------------------------------|---------------------------------------|--|-------------------|
| 2-module | aluminum colourless anodized | 18.35 x 32.35 mm                 | 13.85 x 27.85 mm                      | 14.00 x 28.00 mm                       | 5.46.500.004/4010 |

Technical data see page 4 - 98

**RK 90 - Special accessories**



**Technical Data**

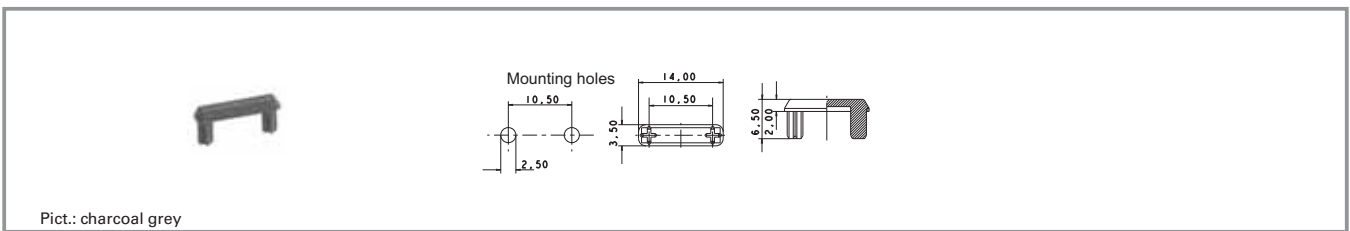
**General information**  
Colour

see order block

**Dimensions**  
Dimensions

see order block

**RK 90 - Fin, to avoid inadvertent operation**



| Short text   | Feature 1 | Feature 2 | Order no.                |
|--|-----------|-----------|--------------------------|
| RK 90 - Fin, to avoid inadvertent operation, light grey    | -         | -         | 5.55.103.079/0700        |
| RK 90 - Fin, to avoid inadvertent operation, charcoal grey | -         | -         | <b>5.55.103.079/0152</b> |

4

RK  
90

## RK 90 - Spacer M 4



| Short text  | Feature 1 | Feature 2                              | Order no.         |
|---|-----------|--|-------------------|
| RK 90 - Spacer M 4 with RF 15 keys, height 12.50 mm, mounting from front (1 pc. per stud)     | -         | 12.5 mm overall height for RF 15       | 5.30.764.040/0000 |
| RK 90 - Spacer M 4 with RF 15 keys, height 9.25 mm, mounting from rear (1 pc. per stud)       | -         | 9.25 mm overall height, for RF 15      | 5.30.764.027/0000 |
| RK 90 - Spacer M 4 with RF 15 N keys, height 5.50 mm, mounting from rear (1 pc. per stud)     | -         | 5.5 mm overall height, for RF15 N      | 5.30.764.010/0000 |
| RK 90 - Spacer M 4 with RACON 8/12 keys, height 7.50 mm, mounting from front (1 pc. per stud) | -         | 7.5 mm overall height for RACON 8/12   | 5.30.764.018/0000 |
| RK 90 - Spacer M 4 with RACON 8/12 keys, height 4.25 mm, mounting from rear (1 pc. per stud)  | -         | 4.25 mm overall height, for RACON 8/12 | 5.30.764.005/0000 |

Technical data see page 4 - 100

## RK 90 - Silicone foil 600 x 590 x 0.45 mm



| Short text                                | Feature 1   | Feature 2           | Order no.         |
|---|-------------|---------------------|-------------------|
| RK 90 - Silicone foil 600 x 590 x 0.45 mm | transparent | 600 x 590 x 0.45 mm | 7.16.102.006/0000 |

Technical data see page 4 - 100





## General Data

**Vandal-proof input system, ideally suited for elevator controls, info terminals, vending machines, etc.**

- Edge illumination and symbol illumination possible
- Connection: Each module individually with an 8-pin Micro-Match socket connector
- Modular fixing system with quick fasteners or single fixing
- Contact arrangement: 1 NO contact or 1 NC + 1 NO contact
- 50 V/250 mA max.
- Degree of protection IP65 (keylock switch IP40).

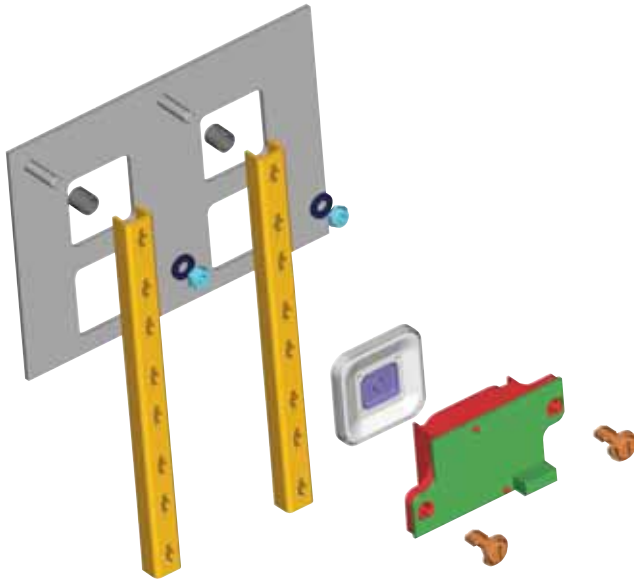
## Content

|  |                |
|--|----------------|
| <b>RG 85 III - Keyswitch</b>                                       | <b>4 - 106</b> |
| RG 85 III - Keyswitch, round design, without lens                  | 4 - 107        |
| RG 85 III - Keyswitch, square design, without lens                 | 4 - 108        |
| <b>RG 85 III - Keylock switch</b>                                  | <b>4 - 110</b> |
| RG 85 III - Keylock switch, round design, without lens             | 4 - 111        |
| RG 85 III - Keylock switch, square design, without lens            | 4 - 112        |
| <b>RG 85 III - Signal indicator, without lens</b>                  | <b>4 - 114</b> |
| RG 85 III - Signal indicator, without lens                         | 4 - 115        |
| <b>RG 85 III - Accessories</b>                                     | <b>4 - 116</b> |
| RG 85 III - Lenses for keyswitches, round                          | 4 - 116        |
| RG 85 III - Lenses for keyswitches, square                         | 4 - 118        |
| RG 85 III - Lenses for keylock switches, round                     | 4 - 121        |
| RG 85 III - Lenses for keylock switches, square                    | 4 - 121        |
| RG 85 III - Lens, round, for signal indicators                     | 4 - 121        |
| RG 85 III - Lens, square, for signal indicators                    | 4 - 122        |
| RG 85 III - Lens, triangular, for signal indicators                | 4 - 122        |
| Cable, 8 wires, with socket connectors on both ends                | 4 - 122        |
| Fixing rail, length 490 mm   | 4 - 123        |
| Spacer   | 4 - 123        |
| Fixing piece for mounting the elements with the rail fixing method | 4 - 123        |

## System Features

Perfectly suited for: elevator controls, info terminals, vending machines, etc.

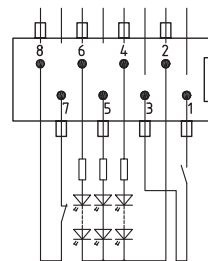
- Vandal proof construction
- Modular fixing system with quick fasteners or single fixing method using thread studs
- Connection with keyed 8-pin micro-match connector
- Degree of protection: IP40/65



## Keylock Switch Features

- Round or square design and lens shape
- Edge illumination in one or two colours with 4 LED for each colour
- Lens material: Aluminum or stainless steel with plastic inlays
- Contact arrangement: 1 NO
- Cylinder lock with pin tumblers
- Two switching positions: 0 and 90 degrees, key can be removed in any position
- Lock type 5201 – other lock types on request
- Included: 2 keys

## Micro-Match Connector Pin Assignment



- 1/3 NO contact
- 2 OV – LED
- 4 Edge illuminat./signal indicator 1<sup>st</sup> colour + 24V DC +/- 20%
- 5 Symbol illumination + 24V DC +/- 20%
- 6 Edge illuminat./signal indicator 2<sup>nd</sup> colour + 24V DC +/- 20%
- 7/8 NC contact

# 4

## Pushbutton Features

- Round or square design and lens shape
- Edge illumination in one or two colours with 4 LED for each colour
- Pushbutton with 1 NO contact: Additional illumination of the symbol with 2 LED possible
- Lens material: Aluminum or stainless steel with plastic inlays
- Switching element: short-travel keyswitch RF 19
  - 1 NO contact, non-illuminated
  - 1 NO contact, fully illuminated
  - 1 NC contact and 1 NO contact, non-illuminated

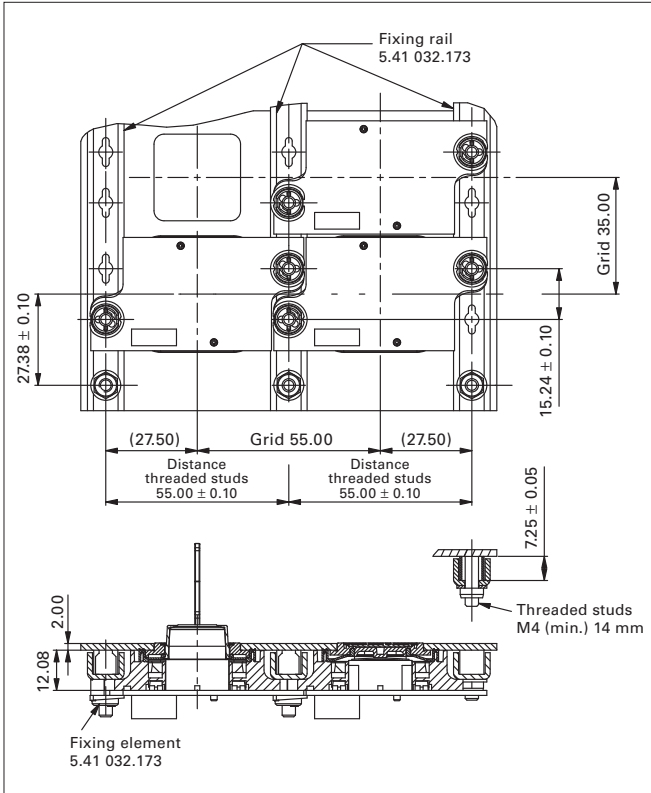
## Signal Indicator Features

- Lens shape round, square or triangular (arrow shape)
- Lens material: Translucent plastic material
- Fully illuminated with 5 LED

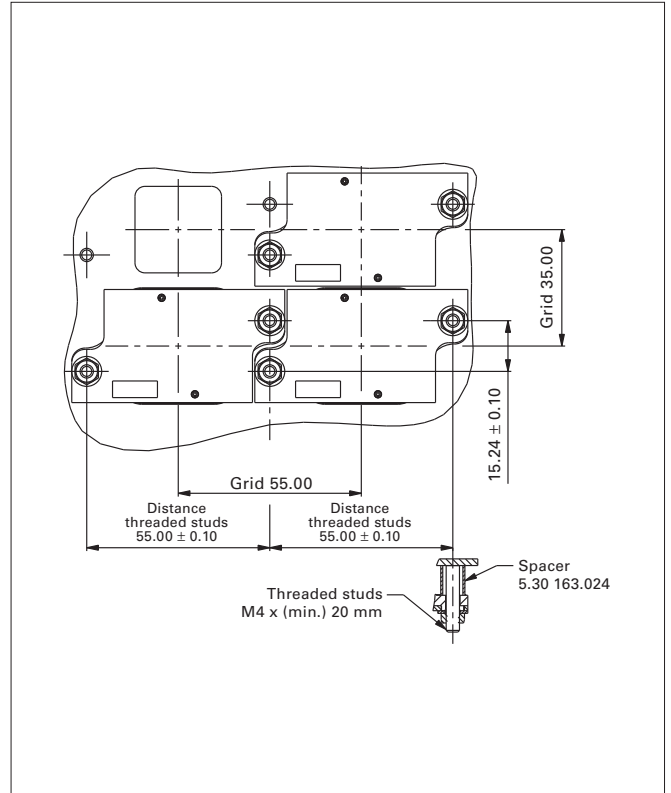


Installation plan

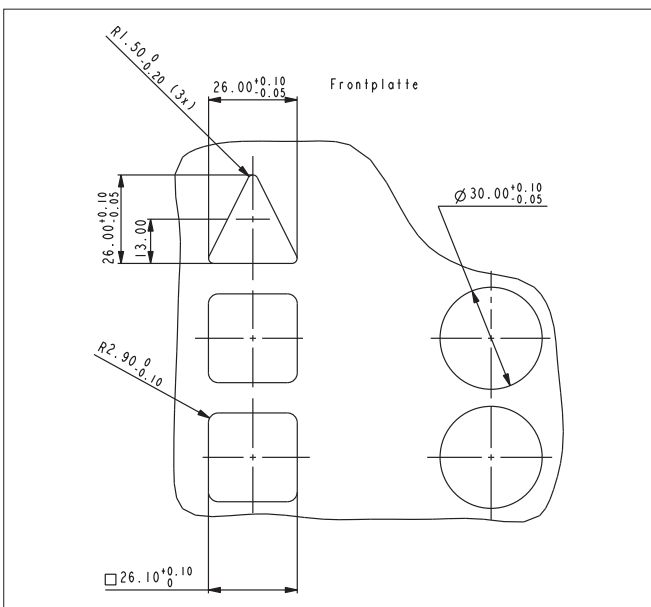
Rail fixing method



Single fixing method



Front panel



## RG 85 III - Keypad



### Technical Data

#### Dimensions

|                    |            |
|--------------------|------------|
| Mounting grid min. | 55 x 35 mm |
| Length             | 64 mm      |
| Width              | 34 mm      |

#### Mechanical design

|                     |  |
|---------------------|--|
| Version             | see order block                                      |
| Mounting            | on U-rails or single mounting                        |
| Terminals           | 8-pin Micro-Match® female connector                  |
| Contact system      | snap-action (1 NO ) or bridge contact (1 NC + 1 NO ) |
| Contact arrangement | see order block                                      |
| Contact materials   | Ag   |
| Symbol illumination | see order block                                      |
| Edge illumination   | see order block                                      |

#### Mechanical characteristics

|                     |        |
|---------------------|--------|
| Operating force     | 3.5 N  |
| Operating travel    | 1 mm   |
| Switching travel NO | 1 mm   |
| Switching travel NC | 0.6 mm |

#### Electrical characteristics

|                                      |                              |
|--------------------------------------|------------------------------|
| Rated voltage min.                   | 3 V                          |
| Rated voltage max.                   | 50 V                         |
| Rated current min.                   | 0.1 mA                       |
| Rated current max.                   | 250 mA                       |
| Rated power max.                     | 12.5 W                       |
| Contact resistance when new          | 100 mΩ                       |
| Contact resistance acc. to life max. | 3 Ω                          |
| Bouncing time max.                   | 10 ms                        |
| Operating voltage for LED            | 24±20% V                     |
| Input current LED                    | per colour/LED row 9 - 16 mA |

#### Other specifications

|                                      |   |
|--------------------------------------|---|
| Ambient temp. operating min.         | -25 °C                                    |
| Ambient temp. operating max.         | +70 °C                                    |
| Storage temperature min.             | -40 °C                                    |
| Storage temperature max.             | +80 °C                                    |
| Environmental resistance             | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations)     | 1,000,000                                 |
| Degree of protection rail mounting   | IP40                                      |
| Degree of protection single mounting | IP65                                      |
| Flammability of materials            | according to UL 94 HB                     |

4

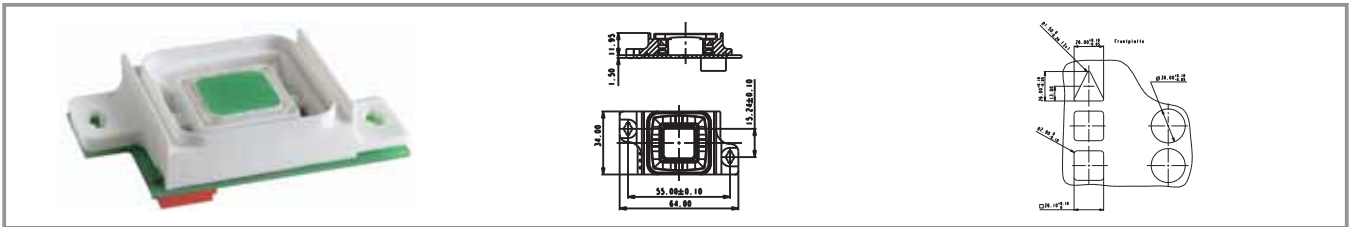
### Typical accessories RG 85 III - Keypad

| Description   | Photo | Order no.         | Additional accessories see page |
|---|-------|-------------------|---------------------------------|
| Cable, 8 wires, with socket connectors on both ends, length 1 m |       | 5.03.772.261/0000 | 4 - 122                         |
| RG 85 III - Lenses for keyswitches, round, stainless steel      |       | 5.04.914.000/2000 | 4 - 117                         |
| RG 85 III - Lenses for keyswitches, square, aluminum            |       | 5.04.915.100/2000 | 4 - 118                         |

RG 85 III



## RG 85 III - Keyswitch, square design, without lens



| Contact arrangement | Edge illumination       | Symbol illumination | Version | Order no.         |
|---------------------|-------------------------|---------------------|---------|-------------------|
| 1 NO                | 4 LED white             | -                   | square  | 3.99.400.112/2000 |
| 1 NO                | 4 LED red               | -                   | square  | 3.99.400.112/3000 |
| 1 NO                | 4 LED yellow            | -                   | square  | 3.99.400.112/4000 |
| 1 NO                | 4 LED green             | -                   | square  | 3.99.400.112/5000 |
| 1 NO                | 4 LED blue              | -                   | square  | 3.99.400.112/6000 |
| 1 NO                | 4 LED white, 4 LED blue | -                   | square  | 3.99.400.112/7000 |
| 1 NO                | 4 LED green, 4 LED red  | -                   | square  | 3.99.400.112/8000 |
| 1 NO                | 4 LED white             | 2 LED yellow        | square  | 3.99.400.112/2400 |
| 1 NO                | 4 LED red               | 2 LED red           | square  | 3.99.400.112/3300 |
| 1 NO                | 4 LED yellow            | 2 LED green         | square  | 3.99.400.112/4500 |
| 1 NO                | 4 LED green             | 2 LED green         | square  | 3.99.400.112/5500 |
| 1 NO                | 4 LED blue              | 2 LED blue          | square  | 3.99.400.112/6600 |
| 1 NO                | 4 LED white, 4 LED blue | 2 LED blue          | square  | 3.99.400.112/7600 |
| 1 NO                | 4 LED green, 4 LED red  | 2 LED red           | square  | 3.99.400.112/8300 |
| 1 NC + 1 NO         | 4 LED white             | -                   | square  | 3.99.400.132/2000 |
| 1 NC + 1 NO         | 4 LED red               | -                   | square  | 3.99.400.132/3000 |
| 1 NC + 1 NO         | 4 LED yellow            | -                   | square  | 3.99.400.132/4000 |
| 1 NC + 1 NO         | 4 LED green             | -                   | square  | 3.99.400.132/5000 |
| 1 NC + 1 NO         | 4 LED blue              | -                   | square  | 3.99.400.132/6000 |
| 1 NC + 1 NO         | 4 LED white, 4 LED blue | -                   | square  | 3.99.400.132/7000 |
| 1 NC + 1 NO         | 4 LED green, 4 LED red  | -                   | square  | 3.99.400.132/8000 |

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RG 85 III

Technical data see page 4 - 106

Please order lenses (square shape) separately.

Stock items are marked by bold printed order numbers.



## RG 85 III - Keylock switch



### Technical Data

#### Dimensions

|                    |                            |
|--------------------|----------------------------|
| Mounting grid min. | 55 x 35 mm                 |
| Length             | 64 mm                      |
| Width              | 34 mm (35 mm with sealing) |
| Mounting depth     | see order block            |

#### Mechanical design

|                      |                                     |
|----------------------|-------------------------------------|
| Version              | see order block                     |
| Mounting             | on U-rails or single mounting       |
| Terminals            | 8-pin Micro-Match® female connector |
| Contact system       | cross contact                       |
| Contact arrangement  | 1 NO                                |
| Contact materials    | Au alloy                            |
| Symbol illumination  | none                                |
| Edge illumination    | see order block                     |
| Lock                 | cylinder lock, lock type 5201       |
| Key removal position | Pos. 0 + 1                          |

#### Mechanical characteristics

|                     |                 |
|---------------------|-----------------|
| Rotating angle      | 1 x 90°         |
| Switching travel NO | 1 mm            |
| Switching travel NC | see order block |

#### Electrical characteristics

|                                      |                              |
|--------------------------------------|------------------------------|
| Rated voltage min.                   | 3 V                          |
| Rated voltage max.                   | 35 V                         |
| Rated current min.                   | 0.1 mA                       |
| Rated current max.                   | 100 mA                       |
| Rated power max.                     | 1 W                          |
| Contact resistance when new max.     | 100 mΩ                       |
| Contact resistance acc. to life max. | 3 Ω                          |
| Bouncing time max.                   | 10 ms                        |
| Operating voltage for LED            | 24±20% V                     |
| Input current LED                    | per colour/LED row 9 - 16 mA |

#### Other specifications

|                                      |   |
|--------------------------------------|---|
| Ambient temp. operating min.         | -25 °C                                    |
| Ambient temp. operating max.         | +70 °C                                    |
| Storage temperature min.             | -40 °C                                    |
| Storage temperature max.             | +80 °C                                    |
| Environmental resistance             | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Operating life min. (operations)     | 50,000                                    |
| Degree of protection rail mounting   | IP40                                      |
| Degree of protection single mounting | IP65                                      |
| Flammability of materials            | according to UL 94 HB                     |

### Typical accessories RG 85 III - Keylock switch

| Description   | Photo | Order no.         | Additional accessories see page |
|---|-------|-------------------|---------------------------------|
| RG 85 III - Lenses for keylock switches, round, stainless steel |       | 5.04.914.200/2000 | 4 - 121                         |
| RG 85 III - Lenses for keylock switches, square, aluminum       |       | 5.04.915.201/2000 | 4 - 121                         |

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RG 85 III









## RG 85 III - Signal indicator, without lens



### Technical Data

#### Dimensions

|                    |            |
|--------------------|------------|
| Mounting grid min. | 55 x 35 mm |
| Length             | 64 mm      |
| Width              | 34 mm      |

#### Mechanical design

|              |                                     |
|--------------|-------------------------------------|
| Version      | according to lens                   |
| Mounting     | on U-rails or single mounting       |
| Terminals    | 8-pin Micro-Match® female connector |
| Illumination | see order block                     |

#### Other specifications

|                                      |   |
|--------------------------------------|---|
| Ambient temp. operating min.         | -25 °C                                    |
| Ambient temp. operating max.         | +70 °C                                    |
| Storage temperature min.             | -40 °C                                    |
| Storage temperature max.             | +80 °C                                    |
| Environmental resistance             | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Degree of protection rail mounting   | IP40                                      |
| Degree of protection single mounting | IP65                                      |
| Flammability of materials            | according to UL 94 HB                     |

#### Electrical characteristics

|                           |                                    |
|---------------------------|------------------------------------|
| Operating voltage for LED | 24±20% V                           |
| Input current LED         | depending on LED colour 20 - 30 mA |

4

### Typical accessories RG 85 III - Signal indicator, without lens

| Description   | Photo | Order no.                | Additional accessories see page |
|---|-------|--------------------------|---------------------------------|
| Cable, 8 wires, with socket connectors on both ends, length 2 m |       | 5.03.772.262/0000        | 4 - 122                         |
| RG 85 III - Lens, square, for signal indicators                 |       | 5.04.903.009/0000        | 4 - 122                         |
| RG 85 III - Lens, round, for signal indicators                  |       | 5.04.903.010/0000        | 4 - 121                         |
| RG 85 III - Lens, triangular, for signal indicators             |       | <b>5.04.903.011/0000</b> | 4 - 122                         |

## RG 85 III - Signal indicator, without lens



| Illumination            | Order no.                |
|-------------------------|--------------------------|
| 5 LED white             | <b>3.99.400.100/2000</b> |
| 5 LED red               | <b>3.99.400.100/3000</b> |
| 5 LED yellow            | <b>3.99.400.100/4000</b> |
| 5 LED green             | <b>3.99.400.100/5000</b> |
| 5 LED blue              | <b>3.99.400.100/6000</b> |
| 5 LED white, 5 LED blue | <b>3.99.400.100/7000</b> |
| 5 LED green, 5 LED red  | <b>3.99.400.100/8000</b> |

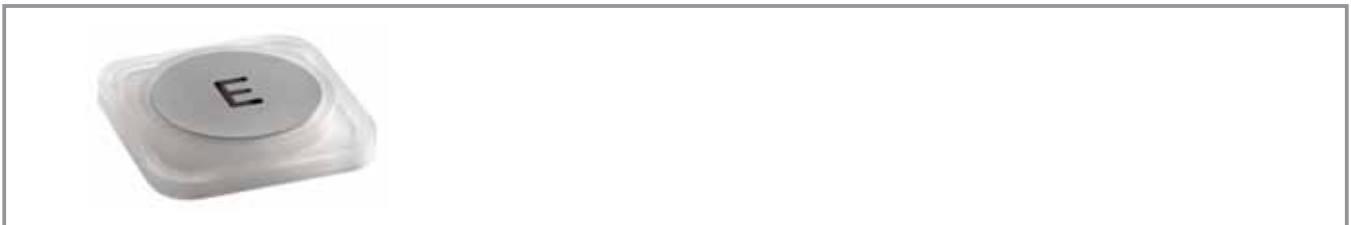
Technical data see page 4 - 114

Please order round, square or triangular lenses separately.

**RG 85 III - Accessories**



**RG 85 III - Lenses for keyswitches, round**



| Version  | Form of lens | Legending colour  | Legending | Order no.         |
|----------|--------------|-------------------|-----------|-------------------|
| aluminum | round        | -                 | -         | 5.04.915.000/2000 |
| aluminum | round        | opaque black      | 1         | 5.04.915.001/0100 |
| aluminum | round        | translucent white | 1         | 5.04.915.001/2000 |
| aluminum | round        | opaque black      | 2         | 5.04.915.002/0100 |
| aluminum | round        | translucent white | 2         | 5.04.915.002/2000 |
| aluminum | round        | opaque black      | 3         | 5.04.915.003/0100 |
| aluminum | round        | translucent white | 3         | 5.04.915.003/2000 |
| aluminum | round        | opaque black      | 4         | 5.04.915.004/0100 |
| aluminum | round        | translucent white | 4         | 5.04.915.004/2000 |
| aluminum | round        | opaque black      | 5         | 5.04.915.005/0100 |
| aluminum | round        | translucent white | 5         | 5.04.915.005/2000 |
| aluminum | round        | opaque black      | 6         | 5.04.915.006/0100 |
| aluminum | round        | translucent white | 6         | 5.04.915.006/2000 |
| aluminum | round        | opaque black      | U         | 5.04.915.021/0100 |
| aluminum | round        | translucent white | U         | 5.04.915.021/2000 |

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RG  
85 III

| Version         | Form of lens | Legending colour  | Legending           | Order no.         |
|-----------------|--------------|-------------------|---------------------|-------------------|
| aluminum        | round        | opaque black      | K                   | 5.04.915.022/0100 |
| aluminum        | round        | translucent white | K                   | 5.04.915.022/2000 |
| aluminum        | round        | opaque black      | E                   | 5.04.915.023/0100 |
| aluminum        | round        | translucent white | E                   | 5.04.915.023/2000 |
| aluminum        | round        | opaque yellow     | symbol „bell“       | 5.04.915.024/0400 |
| aluminum        | round        | opaque black      | symbol „open door“  | 5.04.915.025/0100 |
| aluminum        | round        | translucent white | symbol „open door“  | 5.04.915.025/2000 |
| aluminum        | round        | opaque black      | symbol „close door“ | 5.04.915.026/0100 |
| aluminum        | round        | translucent white | symbol „close door“ | 5.04.915.026/2000 |
| aluminum        | round        | opaque black      | symbol „ventilator“ | 5.04.915.027/0100 |
| aluminum        | round        | translucent white | symbol „ventilator“ | 5.04.915.027/2000 |
| aluminum        | round        | opaque black      | symbol „arrow“      | 5.04.915.028/0100 |
| aluminum        | round        | translucent white | symbol „arrow“      | 5.04.915.028/2000 |
| stainless steel | round        | -                 | -                   | 5.04.914.000/2000 |
| stainless steel | round        | opaque black      | 1                   | 5.04.914.001/0100 |
| stainless steel | round        | translucent white | 1                   | 5.04.914.001/2000 |
| stainless steel | round        | opaque black      | 2                   | 5.04.914.002/0100 |
| stainless steel | round        | translucent white | 2                   | 5.04.914.002/2000 |
| stainless steel | round        | opaque black      | 3                   | 5.04.914.003/0100 |
| stainless steel | round        | translucent white | 3                   | 5.04.914.003/2000 |
| stainless steel | round        | opaque black      | 4                   | 5.04.914.004/0100 |
| stainless steel | round        | translucent white | 4                   | 5.04.914.004/2000 |
| stainless steel | round        | opaque black      | 5                   | 5.04.914.005/0100 |
| stainless steel | round        | translucent white | 5                   | 5.04.914.005/2000 |
| stainless steel | round        | opaque black      | 6                   | 5.04.914.006/0100 |
| stainless steel | round        | translucent white | 6                   | 5.04.914.006/2000 |
| stainless steel | round        | opaque black      | U                   | 5.04.914.021/0100 |
| stainless steel | round        | translucent white | U                   | 5.04.914.021/2000 |

| Version         | Form of lens | Legending colour  | Legending           | Order no.         |
|-----------------|--------------|-------------------|---------------------|-------------------|
| stainless steel | round        | opaque black      | K                   | 5.04.914.022/0100 |
| stainless steel | round        | translucent white | K                   | 5.04.914.022/2000 |
| stainless steel | round        | opaque black      | E                   | 5.04.914.023/0100 |
| stainless steel | round        | translucent white | E                   | 5.04.914.023/2000 |
| stainless steel | round        | opaque yellow     | symbol „bell“       | 5.04.914.024/0400 |
| stainless steel | round        | opaque black      | symbol „open door“  | 5.04.914.025/0100 |
| stainless steel | round        | translucent white | symbol „open door“  | 5.04.914.025/2000 |
| stainless steel | round        | opaque black      | symbol „close door“ | 5.04.914.026/0100 |
| stainless steel | round        | translucent white | symbol „close door“ | 5.04.914.026/2000 |
| stainless steel | round        | opaque black      | symbol „ventilator“ | 5.04.914.027/0100 |
| stainless steel | round        | translucent white | symbol „ventilator“ | 5.04.914.027/2000 |
| stainless steel | round        | opaque black      | symbol „arrow“      | 5.04.914.028/0100 |
| stainless steel | round        | translucent white | symbol „arrow“      | 5.04.914.028/2000 |

Technical data see page 4 - 114

The lenses without legending can not be engraved - other than the mentioned legends on request.

## RG 85 III - Lenses for keyswitches, square



| Version  | Form of lens | Legending colour  | Legending | Order no.         |
|----------|--------------|-------------------|-----------|-------------------|
| aluminum | square       | -                 | -         | 5.04.915.100/2000 |
| aluminum | square       | opaque black      | 1         | 5.04.915.101/0100 |
| aluminum | square       | translucent white | 1         | 5.04.915.101/2000 |
| aluminum | square       | opaque black      | 2         | 5.04.915.102/0100 |
| aluminum | square       | translucent white | 2         | 5.04.915.102/2000 |
| aluminum | square       | opaque black      | 3         | 5.04.915.103/0100 |

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RG  
85 III

| Version         | Form of lens | Legending colour  | Legending           | Order no.         |
|-----------------|--------------|-------------------|---------------------|-------------------|
| aluminum        | square       | translucent white | 3                   | 5.04.915.103/2000 |
| aluminum        | square       | opaque black      | 4                   | 5.04.915.104/0100 |
| aluminum        | square       | translucent white | 4                   | 5.04.915.104/2000 |
| aluminum        | square       | opaque black      | 5                   | 5.04.915.105/0100 |
| aluminum        | square       | translucent white | 5                   | 5.04.915.105/2000 |
| aluminum        | square       | opaque black      | 6                   | 5.04.915.106/0100 |
| aluminum        | square       | translucent white | 6                   | 5.04.915.106/2000 |
| aluminum        | square       | opaque black      | U                   | 5.04.915.121/0100 |
| aluminum        | square       | translucent white | U                   | 5.04.915.121/2000 |
| aluminum        | square       | opaque black      | K                   | 5.04.915.122/0100 |
| aluminum        | square       | translucent white | K                   | 5.04.915.122/2000 |
| aluminum        | square       | opaque black      | E                   | 5.04.915.123/0100 |
| aluminum        | square       | translucent white | E                   | 5.04.915.123/2000 |
| aluminum        | square       | opaque yellow     | symbol „bell“       | 5.04.915.124/0400 |
| aluminum        | square       | opaque black      | symbol „open door“  | 5.04.915.125/0100 |
| aluminum        | square       | translucent white | symbol „open door“  | 5.04.915.125/2000 |
| aluminum        | square       | opaque black      | symbol „close door“ | 5.04.915.126/0100 |
| aluminum        | square       | translucent white | symbol „close door“ | 5.04.915.126/2000 |
| aluminum        | square       | opaque black      | symbol „ventilator“ | 5.04.915.127/0100 |
| aluminum        | square       | translucent white | symbol „ventilator“ | 5.04.915.127/2000 |
| aluminum        | square       | opaque black      | symbol „arrow“      | 5.04.915.128/0100 |
| aluminum        | square       | translucent white | symbol „arrow“      | 5.04.915.128/2000 |
| stainless steel | square       | -                 | -                   | 5.04.914.100/2000 |
| stainless steel | square       | opaque black      | 1                   | 5.04.914.101/0100 |
| stainless steel | square       | translucent white | 1                   | 5.04.914.101/2000 |
| stainless steel | square       | opaque black      | 2                   | 5.04.914.102/0100 |
| stainless steel | square       | translucent white | 2                   | 5.04.914.102/2000 |
| stainless steel | square       | opaque black      | 3                   | 5.04.914.103/0100 |

| Version         | Form of lens | Legending colour  | Legending           | Order no.         |
|-----------------|--------------|-------------------|---------------------|-------------------|
| stainless steel | square       | translucent white | 3                   | 5.04.914.103/2000 |
| stainless steel | square       | opaque black      | 4                   | 5.04.914.104/0100 |
| stainless steel | square       | translucent white | 4                   | 5.04.914.104/2000 |
| stainless steel | square       | opaque black      | 5                   | 5.04.914.105/0100 |
| stainless steel | square       | translucent white | 5                   | 5.04.914.105/2000 |
| stainless steel | square       | opaque black      | 6                   | 5.04.914.106/0100 |
| stainless steel | square       | translucent white | 6                   | 5.04.914.106/2000 |
| stainless steel | square       | opaque black      | U                   | 5.04.914.121/0100 |
| stainless steel | square       | translucent white | U                   | 5.04.914.121/2000 |
| stainless steel | square       | opaque black      | K                   | 5.04.914.122/0100 |
| stainless steel | square       | translucent white | K                   | 5.04.914.122/2000 |
| stainless steel | square       | opaque black      | E                   | 5.04.914.123/0100 |
| stainless steel | square       | translucent white | E                   | 5.04.914.123/2000 |
| stainless steel | square       | opaque yellow     | symbol „bell“       | 5.04.914.124/0400 |
| stainless steel | square       | opaque black      | symbol „open door“  | 5.04.914.125/0100 |
| stainless steel | square       | translucent white | symbol „open door“  | 5.04.914.125/2000 |
| stainless steel | square       | opaque black      | symbol „close door“ | 5.04.914.126/0100 |
| stainless steel | square       | translucent white | symbol „close door“ | 5.04.914.126/2000 |
| stainless steel | square       | opaque black      | symbol „ventilator“ | 5.04.914.127/0100 |
| stainless steel | square       | translucent white | symbol „ventilator“ | 5.04.914.127/2000 |
| stainless steel | square       | opaque black      | symbol „arrow“      | 5.04.914.128/0100 |
| stainless steel | square       | translucent white | symbol „arrow“      | 5.04.914.128/2000 |

The lenses without legending can not be engraved - other than the mentioned legends on request.

4

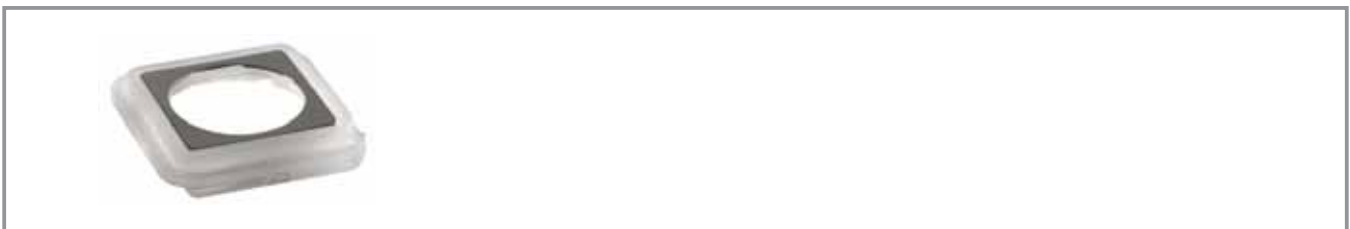


**RG 85 III - Lenses for keylock switches, round**



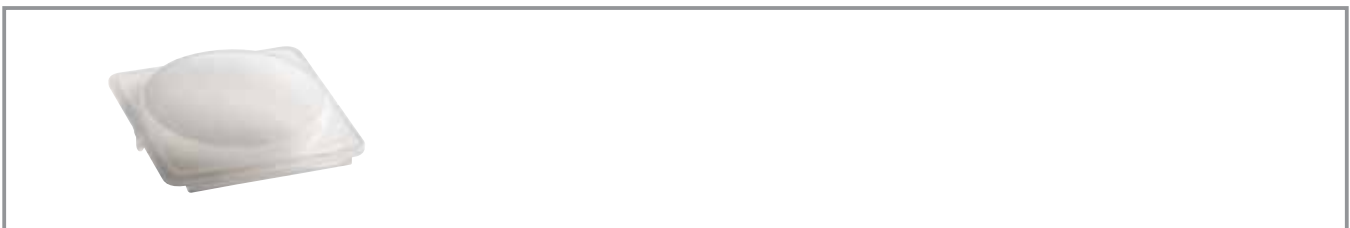
| Version         | Form of lens | Legending colour | Legending | Order no.                |
|-----------------|--------------|------------------|-----------|--------------------------|
| aluminum        | round        | -                | -         | <b>5.04.915.200/2000</b> |
| stainless steel | round        | -                | -         | 5.04.914.200/2000        |

**RG 85 III - Lenses for keylock switches, square**



| Version         | Form of lens | Legending colour | Legending | Order no.         |
|-----------------|--------------|------------------|-----------|-------------------|
| aluminum        | square       | -                | -         | 5.04.915.201/2000 |
| stainless steel | square       | -                | -         | 5.04.914.201/2000 |

**RG 85 III - Lens, round, for signal indicators**



| Version             | Form of lens | Legending colour | Legending | Order no.         |
|---------------------|--------------|------------------|-----------|-------------------|
| plastic translucent | round        | -                | -         | 5.04.903.010/0000 |

**RG 85 III - Lens, square, for signal indicators**



| Version             | Form of lens | Legending colour | Legending | Order no.         |
|---------------------|--------------|------------------|-----------|-------------------|
| plastic translucent | square       | -                | -         | 5.04.903.009/0000 |

**RG 85 III - Lens, triangular, for signal indicators**



| Version             | Form of lens | Legending colour | Legending | Order no.                |
|---------------------|--------------|------------------|-----------|--------------------------|
| plastic translucent | triangular   | -                | -         | <b>5.04.903.011/0000</b> |

4

**Cable, 8 wires, with socket connectors on both ends**



| Version     | Form of lens | Legending colour | Legending | Order no.         |
|-------------|--------------|------------------|-----------|-------------------|
| length: 1 m | -            | -                | -         | 5.03.772.261/0000 |
| length: 2 m | -            | -                | -         | 5.03.772.262/0000 |

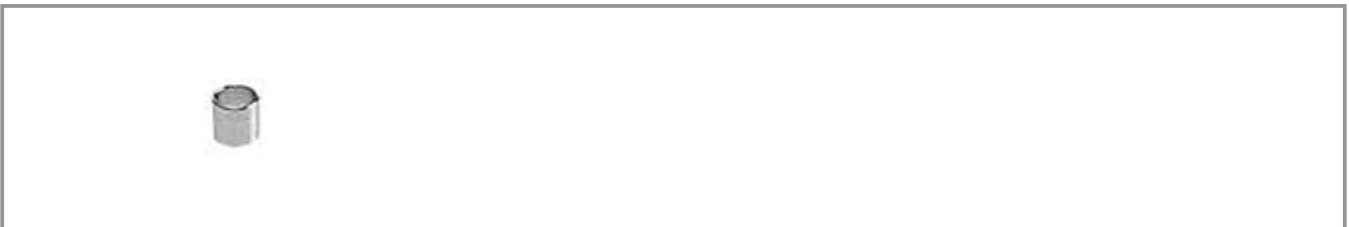
RG  
85 III

**Fixing rail, length 490 mm**



| Version        | Form of lens | Legending colour | Legending | Order no.         |
|----------------|--------------|------------------|-----------|-------------------|
| length: 490 mm | -            | -                | -         | 5.41.032.173/7500 |

**Spacer**



| Version           | Form of lens | Legending colour | Legending | Order no.         |
|-------------------|--------------|------------------|-----------|-------------------|
| mounting on rails | -            | -                | -         | 5.30.163.021/6000 |
| single mounting   | -            | -                | -         | 5.30.163.024/6000 |

**Fixing piece for mounting the elements with the rail fixing method**



| Version | Form of lens | Legending colour | Legending | Order no.         |
|---------|--------------|------------------|-----------|-------------------|
| -       | -            | -                | -         | 5.55.104.208/0459 |





## General Data

The RS 76 full-travel keyswitches are designed for configuring keyboards. They offer very comfortable operation with an overall height of 15.5 / 15.9 mm and a key travel of 4 mm. The modular system with a grid of 3/4" = 19.05 mm enables you to design any key block you may want.

### Mechanical contact system RS 76 M

A gold alloy is used as the contact material and provides high contact reliability, low contact resistance and short bouncing time.

### Solid-state contact system RS 76 C

The solid-state switch in Hall-IC technology ensures bounce-free and wear-free switching and a long operating life.

Function: When pressing the keys, a permanent magnet changes its position relative to the Hall-IC and thereby generates an output signal. Their use is especially recommended in hostile environments and for heavy duty applications.

## Content

|   |                |
|---|----------------|
| <b>RS 76 M - Full-travel keyswitch, not illuminable</b>             | <b>4 - 132</b> |
| RS 76 M - Full-travel keyswitch, not illuminable                    | 4 - 133        |
| RS 76 M - Full-travel keyswitch, with diode, not illuminable        | 4 - 133        |
| <b>RS 76 M - Full-travel keyswitch, illuminable</b>                 | <b>4 - 134</b> |
| RS 76 M - Full-travel keyswitch, illuminable, momentary             | 4 - 135        |
| RS 76 M - Full-travel keyswitch, illuminable, latching              | 4 - 135        |
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| <b>RS 76 C - Full-travel keyswitch, not illuminable</b>             | <b>4 - 138</b> |
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| RS 76 C - Full-travel keyswitch, illuminable, momentary             | 4 - 141        |
| RS 76 C - Full-travel keyswitch, illuminable, latching              | 4 - 141        |
| <b>RS 76 - Keycaps, not illuminable</b>                             | <b>4 - 142</b> |
| RS 76 - Keycap, opaque  | 4 - 142        |
| RS 76 - Keycap, opaque, with nail protection                        | 4 - 142        |
| RS 76 - Keycap with legend insert                                   | 4 - 143        |
| <b>RS 76 - Keycaps, illuminable</b>                                 | <b>4 - 144</b> |
| RS 76 - Keycap with light bar                                       | 4 - 144        |
| RS 76 - Keycap, illuminable, with legend insert                     | 4 - 144        |
| RS 76 - Keycap, illuminable, with nail protection and legend insert | 4 - 145        |
| RS 76 - Keycap, illuminable, with legend insert                     | 4 - 145        |
| RS 76 MX - Keycap, fully illuminable                                | 4 - 146        |
| <b>RS 76 - Keycaps, with legend, two-shot moulded/keycap sets</b>   | <b>4 - 148</b> |
| RS 76 - Keycap set, symbols A-Z                                     | 4 - 148        |
| RS 76 - Keycap set, symbols 0-9                                     | 4 - 149        |
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| RS 76 - Cover IP40  | 4 - 151        |
| PCB Keyswitches   | 4 - 125        |

The RAFI full-travel keyswitches RS 76 are modular systems for designing individual key blocks and keyboards in the 3/4 inch (= 19.05 mm) grid.

## Definitions

### Momentary keyswitches

Momentary keyswitches return to their initial position after being pressed (momentary action).

### Latching keyswitches

Latching keyswitches lock when actuated and are returned to their initial position when pressed again (push-push action).

### Keycap materials

Keycap without legend insert: ABS

Keycap with legend insert:

– Keycap body: ABS

– Lens: PC

### Keycap, n-module

A 2-module keycap f. ex. has the twofold length of a 1-module keycap.

### Contact principle

There are two contact principles:

– **Mechanical (M):** Cross contact (RS 76 M)  
Bridge contact  
(RS 76 M, illuminated)

– **Contactless (C):** Based on Hall-IC (RS 76 C)

### Manual Soldering

The soldering temperature should not exceed 300 °C and the soldering time should be less than 5 seconds.

### Soldering process wave soldering

Wave soldering is permitted.

---

## Legending of keycaps

Keycaps can be legended by different methods:

### Two-shot moulding

Using this method the symbol is separately manufactured from a plastic and then the appropriate keycap form is moulded round it. Advantage: The character becomes an integrated part of the keycap, thus eliminating abrasion. All RAFI keycap sets with standard legending are manufactured by this method. Customer specific two-shot moulded keycaps on request.

### Printing

Keycaps can be printed with a two-component ink on request. The abrasion of this kind of legending is high. This method of legending is suitable for average volumes.

### Engraving

In this labour intensive process the keycaps are engraved with the required symbol, then inlaid with ink. Only used for small volumes.

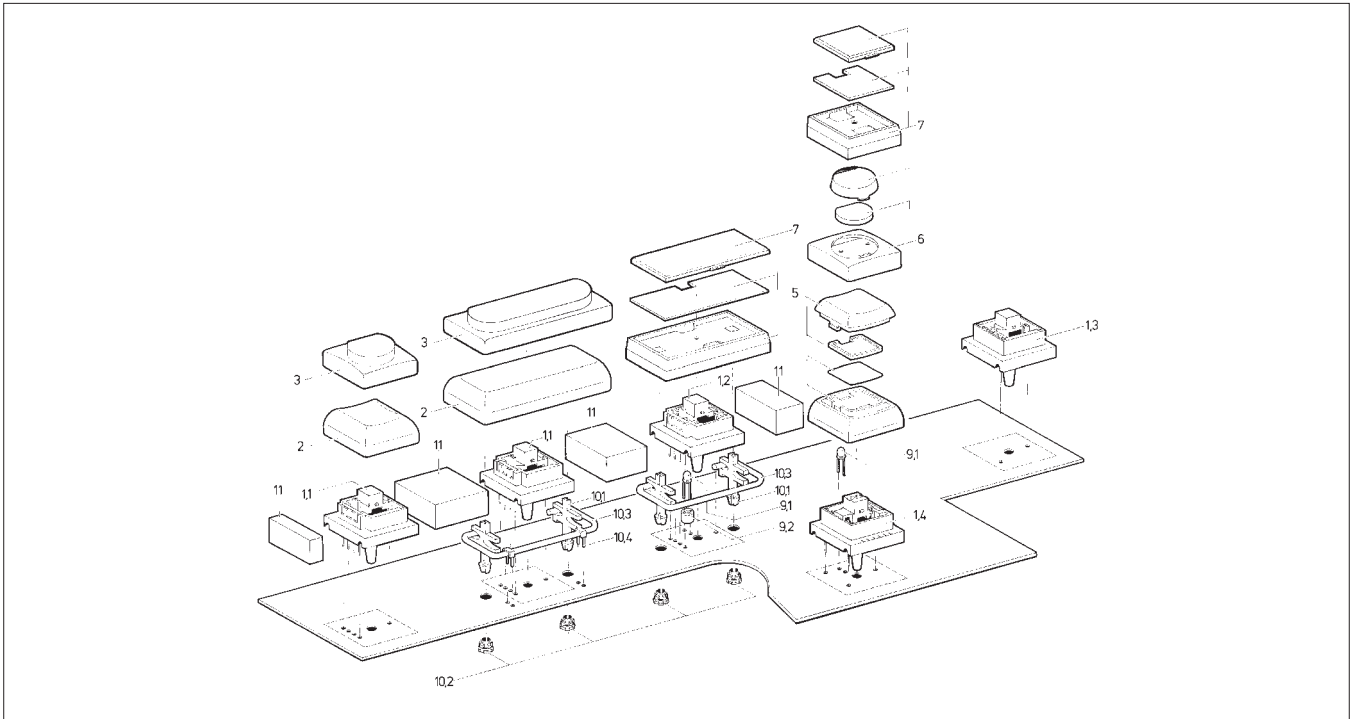
### Laser-printing

This method of legending can be recommended when complete keyboards are required in different keyboard layouts for which RAFI will develop the respective software. The keyboards can then be legended within a short time. This method of legending is particularly recommended for average to large volumes.

### Legend inserts

In the case of keycaps with replaceable legend inserts it is possible to print or engrave the legend inserts. As these inserts are protected by the lens, there can be no abrasion here either.

## Design



### No. Description

- 1.1 Keyswitch RS 76 C
- 1.2 Keyswitch RS 76 C with LED
- 1.3 Keyswitch RS 76 M
- 1.4 Keyswitch R 76 M with LED
- 2 Keycap, 1- resp. multi-module
- 3 Keycap with nail protection, 1- resp. multi-module
- 5 Keycap, illuminated
- 6 Keycap, illuminated
- 7 Keycap, illuminated
- 9.1 LED

- 9.2 Spacer for LED (for RS 76 C only)
- 10.1 Plunger for multi-moduel keycaps\*
- 10.2 Sleeve for multi-moduel keycaps\*
- 10.3 Metal lever for multi-module keycaps\*
- 10.4 Bearing bracket for multi-module keycaps\*
- 11 Covers

\*These parts are included as a complete packet in the delivery of keycaps  $\geq$  2-module.

## Hole Pattern PCB RS 76 M/RS 76 C

The hole patterns apply to the horizontal position of the keycaps only. Should they be in a vertical position,

the momentary keyswitch must be mounted accordingly, i. e. rotated by 90°.

### For 1 – 1<sup>3</sup>/<sub>4</sub>-module keycaps (view on component side)

|         | Momentary keyswitch, non-illuminated | Momentary keyswitch, illuminated |
|---------|--------------------------------------|----------------------------------|
| RS 76 M |                                      |                                  |
| RS 76 C |                                      |                                  |

# 4

### For 2-, 3- and 8-module keycaps (view on component side)

|           |  |
|-----------|--|
| RS 76 M/C |  |
|-----------|--|

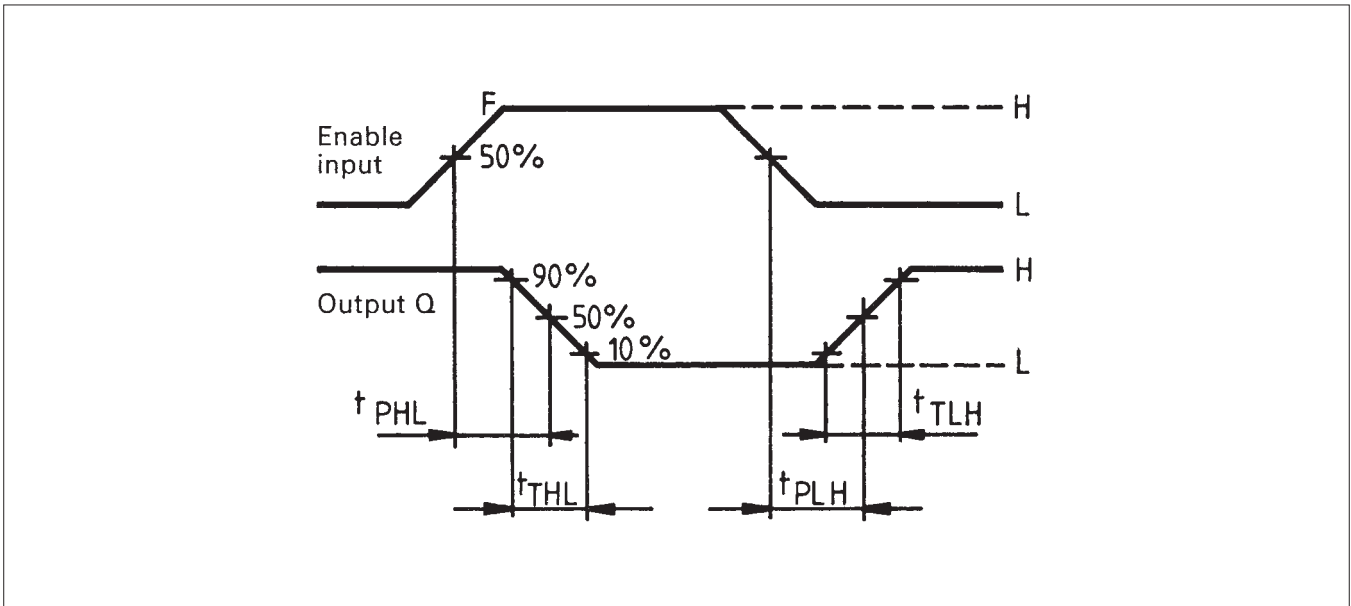
| Keycap   | L 1 mm | L 2 mm |
|----------|--------|--------|
| 2-module | 25,40  | 22,86  |
| 3-module | 30,48  | 24,13  |
| 5-module | 68,58  | 68,58  |

**Important note:** In the case of 2-, 3- and 8-module keycaps, additional holes must be provided for the accessories. In the case of keycaps < 2-module, neither accessories nor holes are required.

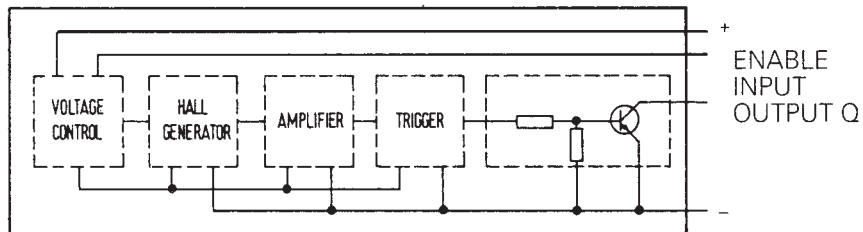


**Specific Technical Data RS 76 C**

| Output pulse diagram<br>Dynamic characteristics (max.) |           | $T_w = 25\text{ °C}$ | $T_w = 50\text{ °C}$ | $T_w = 70\text{ °C}$ |
|--|-----------|----------------------|----------------------|----------------------|
| Turn-on delay time                                     | $t_{PHL}$ | 3 $\mu\text{s}$      | 7 $\mu\text{s}$      | 10 $\mu\text{s}$     |
| Turn-off delay time                                    | $t_{PHL}$ | 4 $\mu\text{s}$      | 5 $\mu\text{s}$      | 6 $\mu\text{s}$      |
| Fall/rise time   | $t_{PHL}$ | 2 $\mu\text{s}$      | 2,5 $\mu\text{s}$    | 3 $\mu\text{s}$      |
|  | $t_{PHL}$ | 1 $\mu\text{s}$      | 1,5 $\mu\text{s}$    | 2,5 $\mu\text{s}$    |

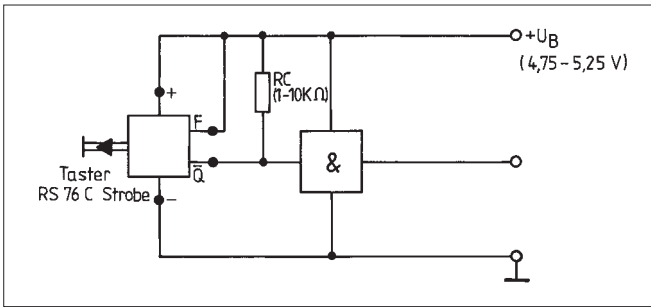


Block diagram  
Hall IC

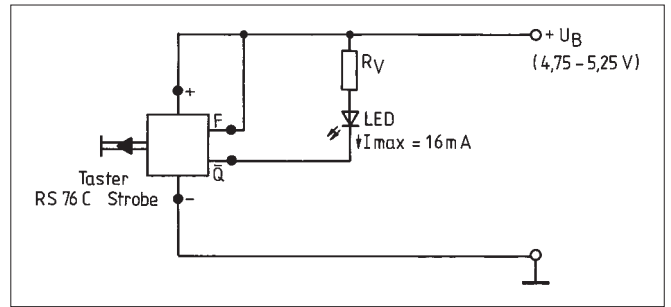


Static with Enable Input

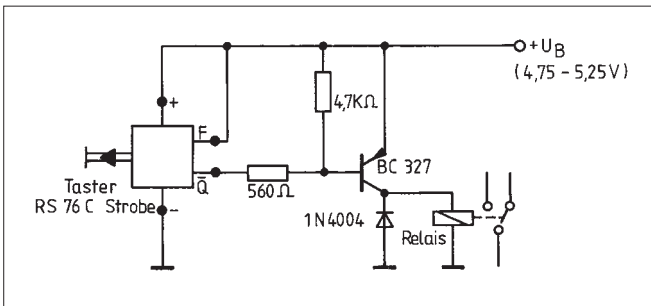
## Examples for Application RS 76 C



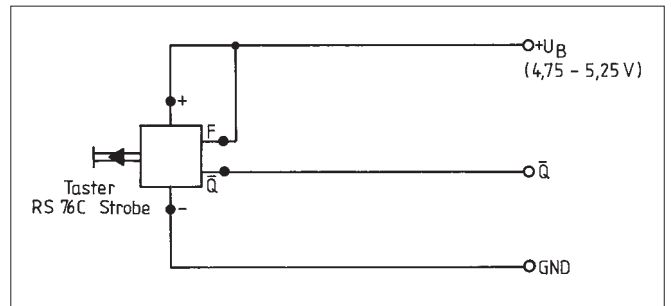
Driving of logic components



Indication of logical states

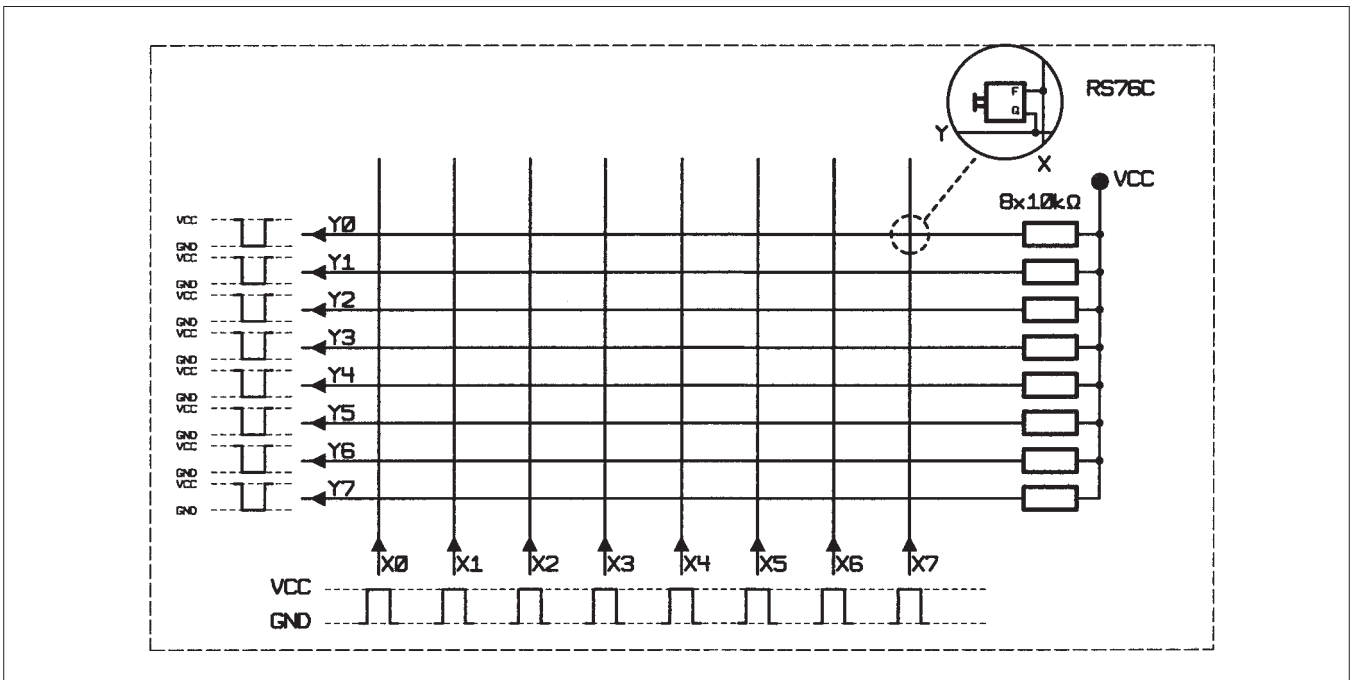


Driving of a PNP transistor



Use as static key with open collector output. Output transistor (NPN) is conductive when actuated.

4



Use in keyboards



## RS 76 M - Full-travel keyswitch, not illuminable



### Technical Data

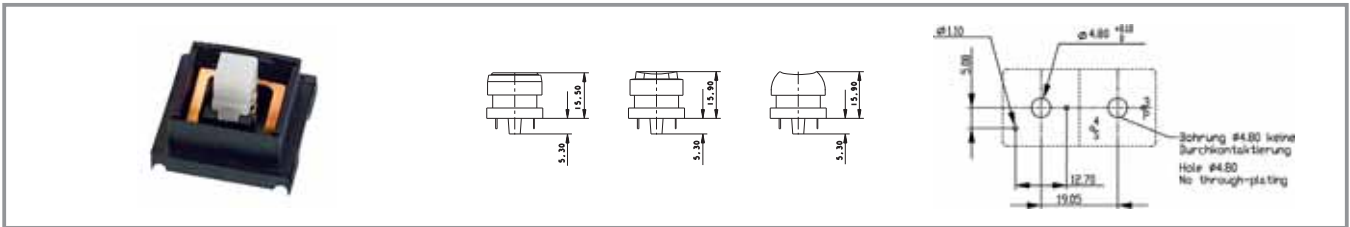
|                                   |                              |                                      |   |
|-----------------------------------|------------------------------|--------------------------------------|---|
| <b>General information</b>        |                              | Rated power max.                     | 1 W                                       |
| Recommended key grid              | 19.05 mm                     | Contact resistance when new max.     | 100 mΩ (without diode)                    |
| <b>Mechanical design</b>          |                              | Contact resistance acc. to life max. | 3 Ω (without diode)                       |
| Contact function                  | momentary                    | Insulation resistance                | 10 <sup>9</sup> Ω                         |
| Mounting                          | soldering                    | ESD strength max.                    | 8 kV                                      |
| Terminals                         | solder terminals, tin-plated | Bouncing time max.                   | 5 ms                                      |
| Contact system                    | cross contact                | <b>Other specifications</b>          |   |
| Contact arrangement               | 1 NO                         | Ambient temp. operating min.         | -25 °C                                    |
| Contact materials                 | Au alloy                     | Ambient temp. operating max.         | +70 °C                                    |
| Illumination                      | no                           | Storage temperature min.             | -40 °C                                    |
| <b>Mechanical characteristics</b> |                              | Storage temperature max. (product)   | +80 °C                                    |
| Operating force max.              | see order block              | Storage temperature max. (rail)      | +50 °C                                    |
| Operating travel                  | 4 mm                         | Environmental resistance             | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Switching travel                  | 1.5 - 2.8 mm                 | Operating life min. (operations)     | 10 <sup>7</sup>                           |
| Robustness min.                   | 100 N                        | Degree of protection                 | IP40                                      |
| <b>Electrical characteristics</b> |                              | Flammability of materials            | UL 94 HB                                  |
| Rated voltage min.                | 2 V (with Diode 3 V)         |                                      |   |
| Rated voltage max.                | 35 V                         |                                      |   |
| Rated current min.                | 0.01 mA                      |                                      |   |
| Rated current max.                | 100 mA                       |                                      |   |

4

### Typical accessories RS 76 M - Full-travel keyswitch, not illuminable

| Description                                    | Photo | Order no.                | Additional accessories see page |
|--|-------|--------------------------|---------------------------------|
| RS 76 C - Keycap with legend insert            |       | <b>5.04.665.221/5520</b> | 4 - 143                         |
| RS 76 C - Keycap, opaque, with nail protection |       | 5.80.000.000/0152        | 4 - 142                         |
| RS 76 C - Keycap, opaque                       |       | <b>5.82.000.000/0152</b> | 4 - 142                         |

## RS 76 M - Full-travel keyswitch, not illuminable

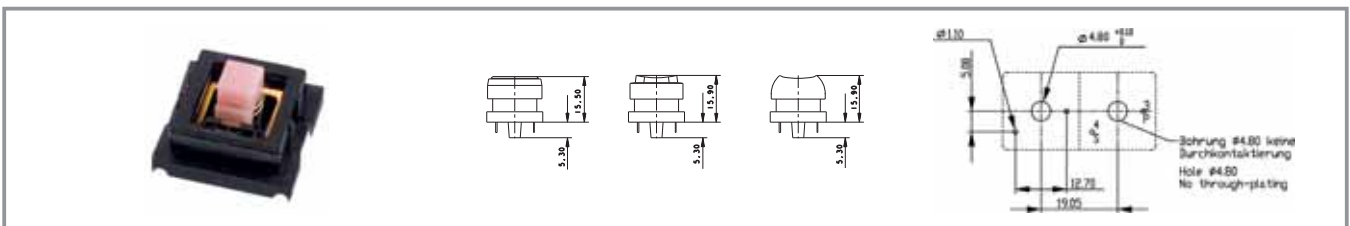


| Contact function | Illumination | Contact arrangement | Contact materials | Operating travel | Operating force max. | Bestell-Nr.              |
|------------------|--------------|---------------------|-------------------|------------------|----------------------|--------------------------|
| momentary        | no           | 1 NO                | Au alloy          | 4 mm             | 0.9 N                | <b>3.13.002.502/0000</b> |
| momentary        | no           | 1 NO                | Au alloy          | 4 mm             | 1.4 N                | <b>3.13.002.512/0000</b> |

Technical data see page 4 - 132

For accessories, refer to RS 76 special accessories.  
For keycaps, see keycaps for RS 76.

## RS 76 M - Full-travel keyswitch, with diode, not illuminable



| Contact function | Illumination | Contact arrangement | Contact materials | Operating travel | Operating force max. | Bestell-Nr.              |
|------------------|--------------|---------------------|-------------------|------------------|----------------------|--------------------------|
| momentary        | no           | 1 NO                | Au alloy          | 4 mm             | 0.9 N                | <b>3.13.005.001/0000</b> |
| momentary        | no           | 1 NO                | Au alloy          | 4 mm             | 1.4 N                | <b>3.13.005.011/0000</b> |

Technical data see page 4 - 132

For accessories, refer to RS 76 special accessories.  
For keycaps, see keycaps for RS 76.

## RS 76 M - Full-travel keyswitch, illuminable



Pict.: RS 76M, for spot illumination

RS 76MX, for full illumination

RS 76MX, keyboard fully illuminated

### Technical Data

#### General information

Recommended key grid 19.05 mm

#### Mechanical design

Contact function see order block  
 Mounting soldering  
 Terminals solder terminals, tin-plated  
 Contact system bridge contact  
 Contact arrangement 1 NO  
 Contact materials Au alloy  
 Illumination see order block

#### Mechanical characteristics

Operating force max. 1 N  
 Operating travel 4 mm  
 Switching travel 1.5 - 2.8 mm  
 Robustness min. 100 N

#### Electrical characteristics

Rated voltage min. 2 V  
 Rated voltage max. 35 V  
 Rated current min. 0.01 mA  
 Rated current max. 100 mA

Rated power max. 1 W  
 Contact resistance when new max. 200 mΩ  
 Contact resistance acc. to life max. 3 Ω  
 Insulation resistance 10<sup>9</sup> Ω  
 ESD strength max. 8 kV  
 Bouncing time max. 10 ms

#### Other specifications

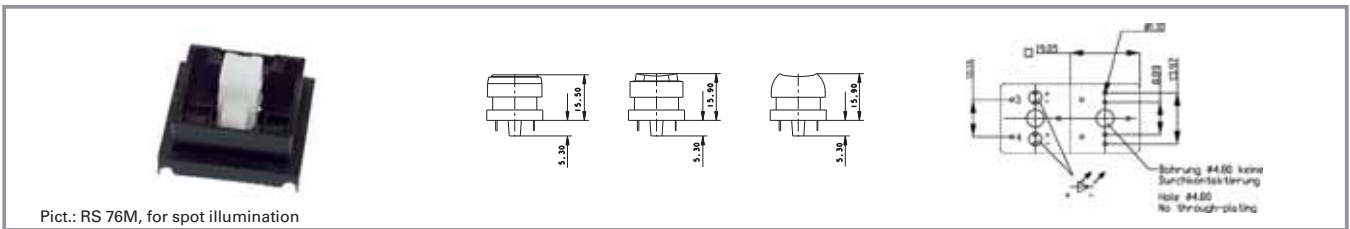
Ambient temp. operating min. -25 °C  
 Ambient temp. operating max. +70 °C  
 Storage temperature min. -40 °C  
 Storage temperature max. (product) +80 °C  
 Storage temperature max. (rail) +50 °C  
 Environmental resistance acc. to IEC 60068-2 -14, -30, -33 and -78  
 Operating life min. (operations) 10<sup>7</sup> momentary, 10<sup>5</sup> latching  
 Degree of protection IP40  
 Flammability of materials UL 94 HB

4

### Typical accessories RS 76 M - Full-travel keyswitch, illuminable

| Description   | Photo | Order no.                | Additional accessories see page |
|---|-------|--------------------------|---------------------------------|
| RS 76 - Cover IP40, 1-module, charcoal grey                           |       | 5.04.520.174/0152        | 4 - 151                         |
| RS 76 C - Keycap, illuminated, with legend insert                     |       | <b>5.04.665.521/5520</b> | 4 - 144                         |
| RS 76 C - Keycap, illuminated, with nail protection and legend insert |       | <b>5.04.665.911/5520</b> | 4 - 145                         |
| RS 76 C - Keycap with light bar                                       |       | <b>5.82.110.000/0242</b> | 4 - 144                         |

## RS 76 M - Full-travel keyswitch, illuminable, momentary



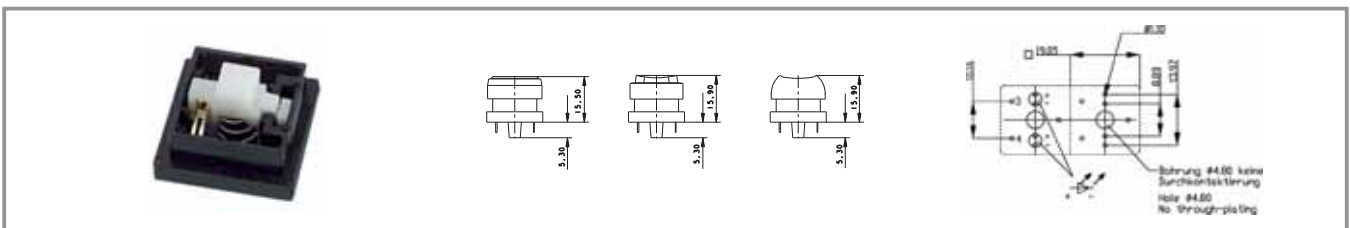
Pict.: RS 76M, for spot illumination

| Contact function | Contact system | Illumination                          | Recommended key grid | Order no.                |
|------------------|----------------|---------------------------------------|----------------------|--------------------------|
| momentary        | bridge contact | spot illumination possible with 3 LED | 19.05 mm             | <b>3.13.002.102/0000</b> |

Technical data see page 4 - 134

For accessories, refer to RS 76 special accessories.  
For keycaps, see keycaps for RS 76.

## RS 76 M - Full-travel keyswitch, illuminable, latching

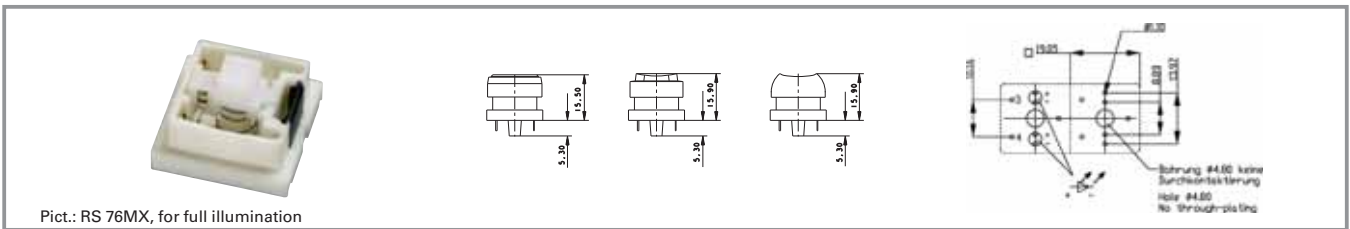


| Contact function | Contact system | Illumination                          | Recommended key grid | Order no.                |
|------------------|----------------|---------------------------------------|----------------------|--------------------------|
| latching         | bridge contact | spot illumination possible with 3 LED | 19.05 mm             | <b>3.13.002.022/0000</b> |

Technical data see page 4 - 134

For accessories, refer to RS 76 special accessories.  
For keycaps, see keycaps for RS 76.

## RS 76 MX - Full-travel keyswitch, fully illuminable



Pict.: RS 76MX, for full illumination

| Contact function | Contact system | Illumination     | Recommended key grid | Order no.         |
|------------------|----------------|------------------|----------------------|-------------------|
| momentary        | bridge contact | 2 SMT LED needed | 19.05 mm             | 3.13.002.922/0000 |

Technical data see page 4 - 134

**Accessoires:**

RS 76 MX - Keycap, fully illuminated: 5.05.511.168/0209

RS 76 MX - Keycap, fully illuminated: 5.05.511.168/0754

For accessories, refer to RS 76 special accessories.

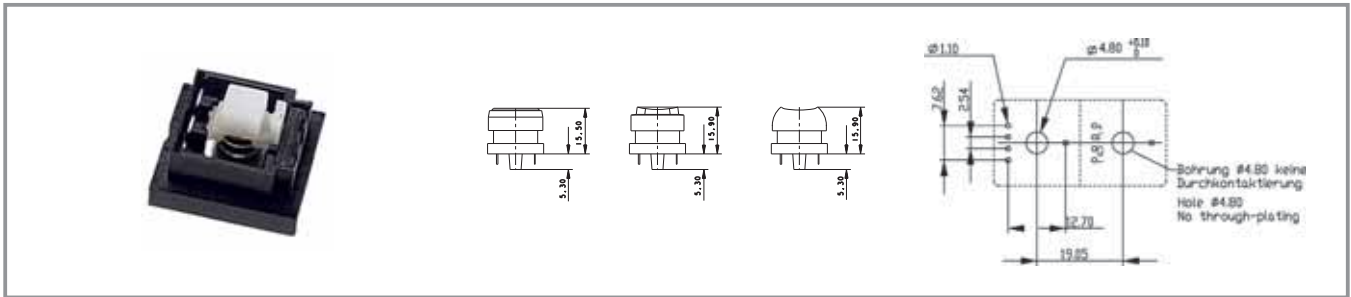
For keycaps, see keycaps for RS 76.

The SMT LEDs are soldered on the back of the printed circuit board and shine through openings in the board and keyswitch housing.





## RS 76 C - Full-travel keyswitch, not illuminable



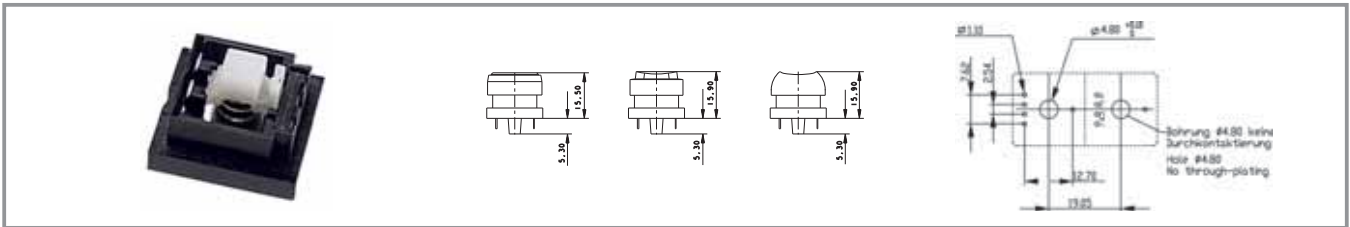
### Technical Data

|  |                              |   |   |
|--|------------------------------|---|---|
| <b>General information</b>                   |                              | Output saturation voltage (Q) max. bei 16 mA          | 0.4 V   |
| Recommended key grid                         | 19.05 mm                     | ESD strength max.                                     | 8 kV  |
| <b>Mechanical design</b>                     |                              | Output switching times (Q) at 25 °C, t <sub>PHL</sub> | 3 µs  |
| Contact function                             | momentary                    | Output switching times (Q) at 25 °C, t <sub>PLH</sub> | 4 µs  |
| Mounting                                     | soldering                    | Output switching times (Q) at 25 °C, t <sub>THL</sub> | 1 µs  |
| Terminals                                    | solder terminals, tin-plated | Output switching times (Q) at 25 °C, t <sub>TLH</sub> | 2 µs  |
| Contact system                               | contactless with Hall-IC     | <b>Other specifications</b>                           |   |
| Illumination                                 | no                           | Reliability of Hall-IC at 25 °C                       | $\lambda = 2.5 \times 10^{-7} \text{ h}^{-1}$ |
| <b>Mechanical characteristics</b>            |                              | Ambient temp. operating min.                          | 0 °C  |
| Switching travel off                         | 0.8 ... 2.4 mm               | Ambient temp. operating max.                          | +70 °C  |
| Operating force max.                         | see order block              | Storage temperature min.                              | -40 °C  |
| Operating travel                             | 4 mm                         | Storage temperature max. (product)                    | +80 °C  |
| Switching travel on                          | 1.5 - 2.8 mm                 | Storage temperature max. (rail)                       | +50 °C  |
| Robustness min.                              | 100 N                        | Environmental resistance                              | acc. to IEC 60068-2 -14, -30, -33 and -78     |
| <b>Electrical characteristics</b>            |                              | Operating life min. (operations)                      | see order block                               |
| Operating voltage DC                         | 4.75 ... 5.25 V              | Degree of protection                                  | IP40  |
| Supply current max. at U <sub>IL</sub> = 0 V | 0.5 mA                       | Flammability of materials                             | UL 94 HB                                      |
| Supply current max. at U <sub>IH</sub> = 5 V | 5 mA                         |   |   |
| Input voltage (F) at U <sub>IL</sub> = 0 V   | 0.4 V                        |   |   |
| Input voltage (F) at U <sub>IH</sub> = 2.4 V | 5.25 V                       |   |   |
| Output load current (Q) max.                 | 16 mA                        |   |   |
| Output residual current (Q) max.             | 10 µA                        |   |   |

### Typical accessories RS 76 C - Full-travel keyswitch, not illuminable

| Description                                    | Photo | Order no.                | Additional accessories see page |
|--|-------|--------------------------|---------------------------------|
| RS 76 C - Keycap with legend insert            |       | <b>5.04.665.221/5520</b> | 4 - 143                         |
| RS 76 C - Keycap, opaque, with nail protection |       | 5.80.000.000/0152        | 4 - 142                         |
| RS 76 C - Keycap, opaque                       |       | <b>5.82.000.000/0152</b> | 4 - 142                         |

## RS 76 C - Full-travel keyswitch, not illuminable

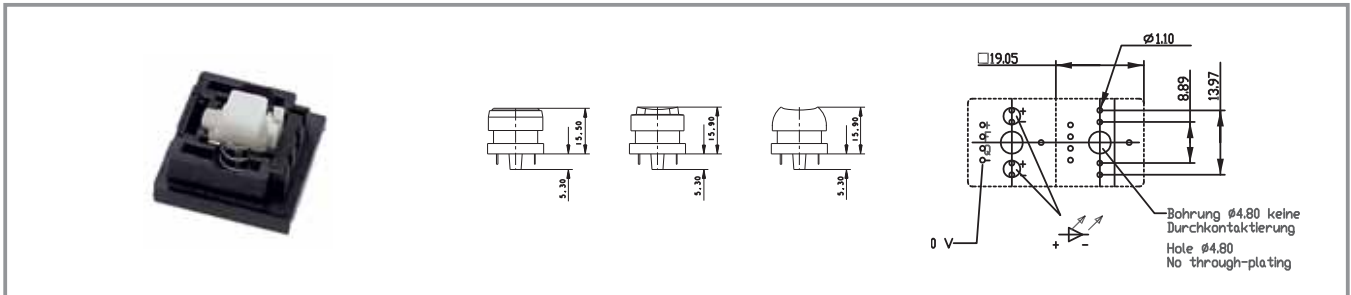


| Contact function | Operating life min. (operations) | Illumination | Operating force max. | Operating travel | Order no.                |
|------------------|----------------------------------|--------------|----------------------|------------------|--------------------------|
| momentary        | 10 <sup>8</sup>                  | no           | 0.7 N                | 4 mm             | <b>3.13.001.010/0000</b> |
| momentary        | 10 <sup>8</sup>                  | no           | 1 N                  | 4 mm             | <b>3.13.001.210/0000</b> |

Technical data see page 4 - 138

For accessories and keycaps, refer to RS 76. For applications, refer to the general description of RS 76.

## RS 76 C - Full-travel keyswitch, illuminable



### Technical Data

#### General information

Recommended key grid 19.05 mm

#### Mechanical design

Contact function see order block  
 Mounting soldering  
 Terminals tin-plated

Contact system contactless with Hall-IC

Illumination with LED  
 LED colour see order block

#### Mechanical characteristics

Switching travel on 1.5 - 2.8 mm  
 Switching travel off 0.8 ... 2.4 mm  
 Operating force max. 0.7 N  
 Operating travel 4 mm  
 Robustness min. 100 N

#### Electrical characteristics

Number of LED see order block  
 Operating voltage DC 4.75 ... 5.25 V  
 Supply current max. at  $U_{IL} = 0 V$  0.5 mA  
 Supply current max. at  $U_{IH} = 5 V$  5 mA  
 Input voltage (F) at  $U_{IL} = 0 V$  0.4 V  
 Input voltage (F) at  $U_{IH} = 2.4 V$  5.25 V  
 Output load current (Q) max. 16 mA

Output residual current (Q) max. 10  $\mu A$   
 Output saturation voltage (Q) max. bei 16 mA 0.4 V  
 ESD strength max. 8 kV  
 Output switching times (Q) at 25 °C,  $t_{PHL}$  3  $\mu s$   
 Output switching times (Q) at 25 °C,  $t_{PLH}$  4  $\mu s$   
 Output switching times (Q) at 25 °C,  $t_{THL}$  1  $\mu s$   
 Output switching times (Q) at 25 °C,  $t_{TLH}$  2  $\mu s$

#### Other specifications

Reliability of Hall-IC at 25 °C  $\lambda = 2.5 \times 10^{-7} h^{-1}$   
 Ambient temp. operating min. 0 °C  
 Ambient temp. operating max. +70 °C  
 Storage temperature min. -40 °C  
 Storage temperature max. +80 °C (product)  
 Storage temperature max. +50 °C (rail)  
 Environmental resistance acc. to IEC 60068-2 -14, -30, -33 and -78  
 Operating life min. (operations) see order block  
 Degree of protection IP40  
 Flammability of materials UL 94 HB

4

### Typical accessories RS 76 C - Full-travel keyswitch, illuminable

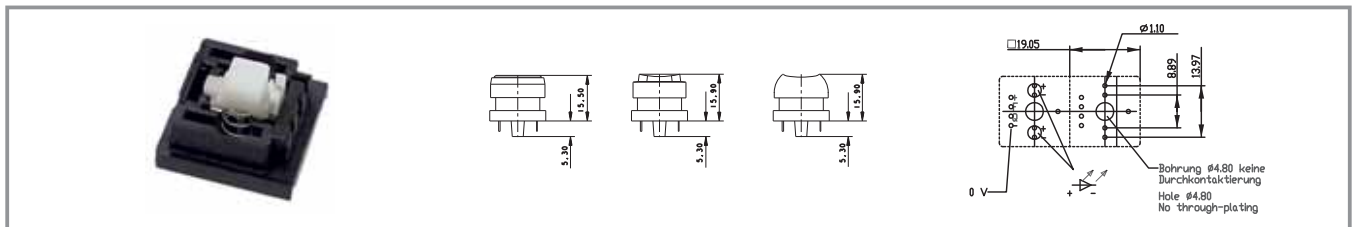
| Description   | Photo | Order no.                | Additional accessories see page |
|---|-------|--------------------------|---------------------------------|
| RS 76 - Cover IP40, 1-module, light grey                              |       | 5.04.520.174/0242        | 4 - 151                         |
| RS 76 C - Keycap, illuminated, with legend insert                     |       | <b>5.04.665.521/5520</b> | 4 - 144                         |
| RS 76 C - Keycap, illuminated, with nail protection and legend insert |       | <b>5.04.665.911/5520</b> | 4 - 145                         |

RS 76

## Typical accessories RS 76 C - Full-travel keyswitch, illuminable

| Description                     | Photo | Order no.                | Additional accessories see page |
|---------------------------------|-------|--------------------------|---------------------------------|
| RS 76 C - Keycap with light bar |       | <b>5.82.110.000/0242</b> | 4 - 144                         |

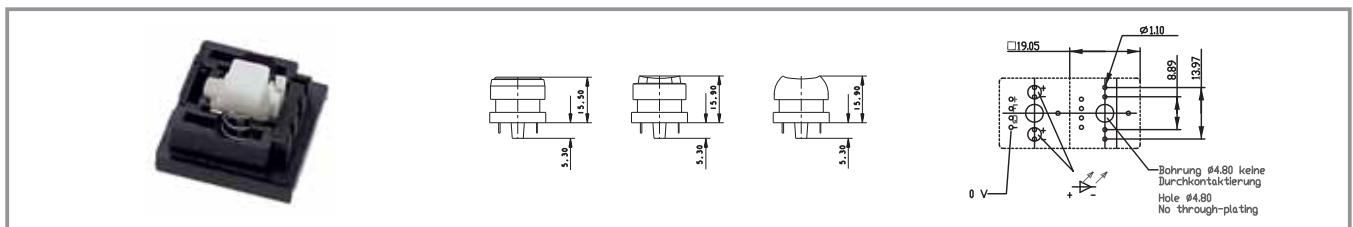
## RS 76 C - Full-travel keyswitch, illuminable, momentary



| Contact function | Operating life min. (operations) | Illumination | Operating force max. | Operating travel | Order no.                |
|------------------|----------------------------------|--------------|----------------------|------------------|--------------------------|
| momentary        | 10 <sup>8</sup>                  | with LED     | 0.7 N                | 4 mm             | <b>3.13.001.110/0000</b> |

Technical data see page 4 - 140

## RS 76 C - Full-travel keyswitch, illuminable, latching



| Contact function | Operating life min. (operations) | Illumination | Operating force max. | Operating travel | Order no.                |
|------------------|----------------------------------|--------------|----------------------|------------------|--------------------------|
| latching         | 10 <sup>5</sup>                  | with LED     | 0.7 N                | 4 mm             | <b>3.13.001.130/0000</b> |

Technical data see page 4 - 140

4



## RS 76 - Keycap with legend insert



Pict.: transparent colourless

| Size of keycap | Illumination | Colour of keycap /<br>legending | Colour of lens /<br>legend insert | Order no.                |
|----------------|--------------|---------------------------------|-----------------------------------|--------------------------|
| 1-module       | no           | charcoal grey/-                 | colourless/white                  | <b>5.04.665.221/5520</b> |
| 1-module       | no           | light grey/-                    | colourless/white                  | 5.04.665.230/5520        |

Supplied as single parts: Mat lens, legend insert, keycap body.

Other colours on request.

## RS 76 - Keycaps, illuminable



## RS 76 - Keycap with light bar



| Size of keycap | Illumination | Colour of keycap / legending | Colour of lens / legend insert | Order no.                |
|----------------|--------------|------------------------------|--------------------------------|--------------------------|
| 1-module       | yes          | light grey/-                 | -                              | <b>5.82.110.000/0242</b> |
| 1-module       | yes          | charcoal grey/-              | -                              | <b>5.82.110.000/0152</b> |

Other colours on request.

4

## RS 76 - Keycap, illuminable, with legend insert



| Size of keycap | Illumination | Colour of keycap / legending | Colour of lens / legend insert | Order no.                |
|----------------|--------------|------------------------------|--------------------------------|--------------------------|
| 1-module       | yes          | charcoal grey/-              | colourless/white               | <b>5.04.665.521/5520</b> |
| 1-module       | yes          | light grey/-                 | colourless/white               | <b>5.04.665.530/5520</b> |

Supplied as single parts: Mat lens, legend insert, diffuser foil, keycap body.  
Other colours on request.



## RS 76 - Keycap, illuminable, with nail protection and legend insert



Pict.: light grey, yellow lens

| Size of keycap | Illumination | Colour of keycap /<br>legending | Colour of lens /<br>legend insert | Order no.                |
|----------------|--------------|---------------------------------|-----------------------------------|--------------------------|
| 1-module       | yes          | charcoal grey/-                 | colourless/white                  | <b>5.04.665.911/5520</b> |
| 1-module       | yes          | light grey/-                    | colourless/white                  | <b>5.04.665.920/5520</b> |

Supplied as single parts: Mat lens, legend insert, keycap body.  
Other colours on request.

## RS 76 - Keycap, illuminable, with legend insert



Pict.: light grey, red lens

| Size of keycap | Illumination | Colour of keycap /<br>legending | Colour of lens /<br>legend insert | Order no.                |
|----------------|--------------|---------------------------------|-----------------------------------|--------------------------|
| 1-module       | yes          | charcoal grey/-                 | colourless/white                  | <b>5.04.665.161/5520</b> |
| 1-module       | yes          | light grey/-                    | colourless/white                  | <b>5.04.665.170/5520</b> |

Supplied as single parts: Mat lens, legend insert, diffuser foil, keycap body.  
Other colours on request.

## RS 76 MX - Keycap, fully illuminable



RS 76MX, keyboard fully illuminated

| Size of keycap                    | Illumination | Colour of keycap /<br>legending | Colour of lens /<br>legend insert | Order no.         |
|-----------------------------------|--------------|---------------------------------|-----------------------------------|-------------------|
| 1-module                          | yes          | white/-                         | white translucent/-               | 5.05.511.168/0209 |
| 1-module                          | yes          | light grey/-                    | white translucent/-               | 5.05.511.168/0754 |
| 1¼-module                         | yes          | white/-                         | white translucent/-               | 5.05.511.169/0209 |
| 1½-module                         | yes          | white/-                         | white translucent/-               | 5.05.511.170/0209 |
| 1¾-module                         | yes          | white/-                         | white translucent/-               | 5.05.511.171/0209 |
| 1¼-module with light<br>conductor | yes          | white/-                         | white translucent/-               | 5.05.511.173/0209 |

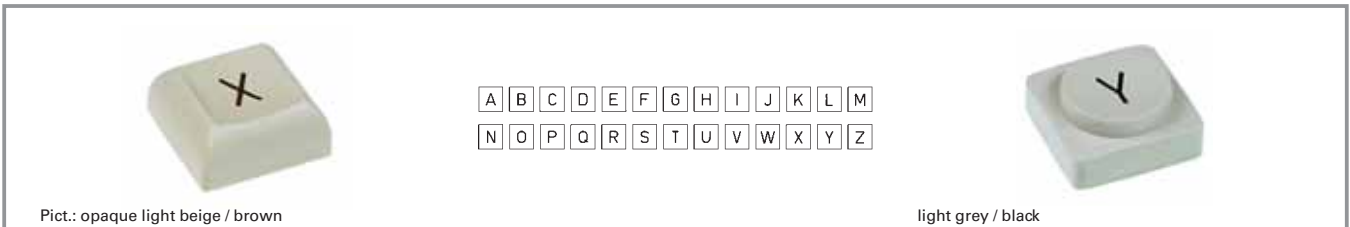
Laser-printed versions available on request.



**RS 76 - Keycaps, with legend, two-shot moulded/keycap sets**



**RS 76 - Keycap set, symbols A-Z**

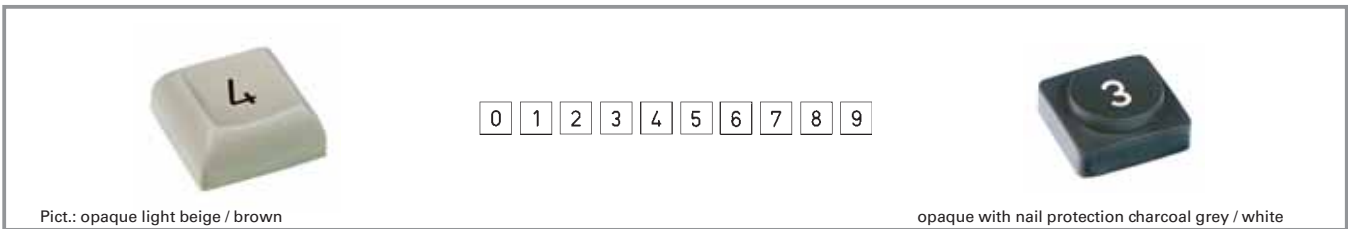


| Size of keycap | Form of lens                       | Colour of keycap / legending | Symbol | Order no.                |
|----------------|------------------------------------|------------------------------|--------|--------------------------|
| 1-module       | keycap opaque with nail protection | charcoal grey/white          | A-Z    | 5.00.999.500/0000        |
| 1-module       | keycap opaque with nail protection | light grey/black             | A-Z    | 5.00.999.824/0000        |
| 1-module       | keycap opaque                      | charcoal grey/white          | A-Z    | <b>5.00.999.525/0000</b> |
| 1-module       | keycap opaque                      | light grey/black             | A-Z    | <b>5.00.999.825/0000</b> |

Other symbols and colours on request.

4

## RS 76 - Keycap set, symbols 0-9



| Size of keycap | Form of lens                       | Colour of keycap / legending | Symbol | Order no.                |
|----------------|------------------------------------|------------------------------|--------|--------------------------|
| 1-module       | keycap opaque with nail protection | charcoal grey/white          | 0-9    | 5.00.999.504/0000        |
| 1-module       | keycap opaque with nail protection | light grey/black             | 0-9    | 5.00.999.826/0000        |
| 1-module       | keycap opaque                      | charcoal grey/white          | 0-9    | <b>5.00.999.529/0000</b> |
| 1-module       | keycap opaque                      | light grey/black             | 0-9    | <b>5.00.999.827/0000</b> |

Other symbols and colours on request.

## RS 76 - Accessories

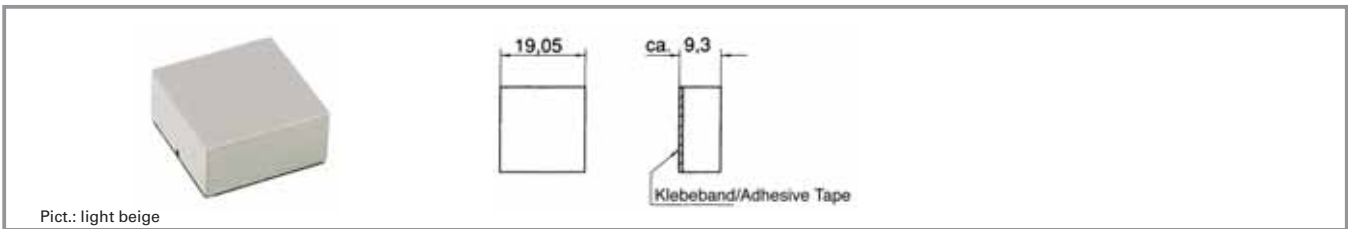


Pict.: light beige



dark grey

## RS 76 - Cover IP40



| Short text                                    | Feature 1     | Feature 2  | Order no.         |
|---|---------------|------------|-------------------|
| RS 76 - Cover IP40, 1/4-module, charcoal grey | charcoal grey | 1/4-module | 5.04.520.171/0152 |
| RS 76 - Cover IP40, 1/4-module, light grey    | light grey    | 1/4-module | 5.04.520.171/0242 |
| RS 76 - Cover IP40, 1/4-module, light beige   | light beige   | 1/4-module | 5.04.520.171/0710 |
| RS 76 - Cover IP40, 1/4-module, dark grey     | dark grey     | 1/4-module | 5.04.520.171/0801 |
| RS 76 - Cover IP40, 1/2-module, charcoal grey | charcoal grey | 1/2-module | 5.04.520.172/0152 |
| RS 76 - Cover IP40, 1/2-module, light grey    | light grey    | 1/2-module | 5.04.520.172/0242 |
| RS 76 - Cover IP40, 1/2-module, light beige   | light beige   | 1/2-module | 5.04.520.172/0710 |
| RS 76 - Cover IP40, 1/2-module, dark grey     | dark grey     | 1/2-module | 5.04.520.172/0801 |
| RS 76 - Cover IP40, 3/4-module, charcoal grey | charcoal grey | 3/4-module | 5.04.520.173/0152 |
| RS 76 - Cover IP40, 3/4-module, light grey    | light grey    | 3/4-module | 5.04.520.173/0242 |
| RS 76 - Cover IP40, 3/4-module, light beige   | light beige   | 3/4-module | 5.04.520.173/0710 |
| RS 76 - Cover IP40, 3/4-module, dark grey     | dark grey     | 3/4-module | 5.04.520.173/0801 |
| RS 76 - Cover IP40, 1-module, charcoal grey   | charcoal grey | 1-module   | 5.04.520.174/0152 |
| RS 76 - Cover IP40, 1-module, light grey      | light grey    | 1-module   | 5.04.520.174/0242 |
| RS 76 - Cover IP40, 1-module, light beige     | light beige   | 1-module   | 5.04.520.174/0710 |
| RS 76 - Cover IP40, 1-module, dark grey       | dark grey     | 1-module   | 5.04.520.174/0801 |

Other colours on request.







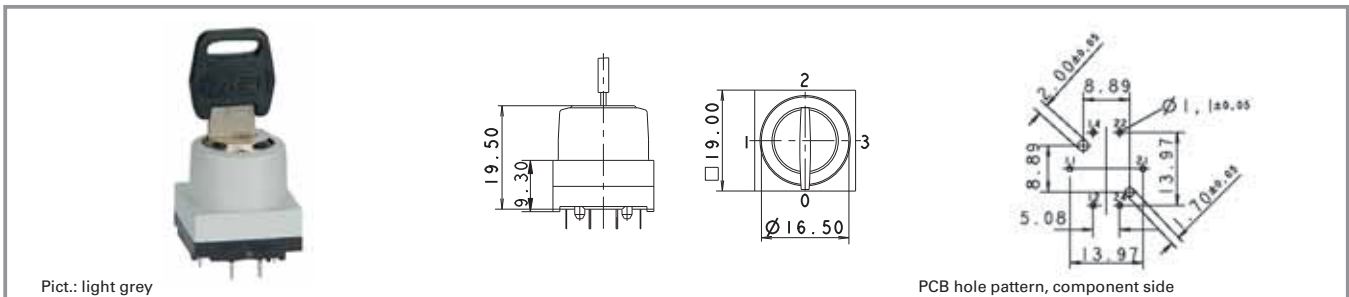
## General Data

Keylock switches for PCB mounting. Matching with the RS 76 full-travel keyswitches and the RF 15 and RF 19 short-travel keyswitches.

## Content

|  |                |
|--|----------------|
| <b>MICROMEK - Keylock switch IP54</b>  | <b>4 - 154</b> |
| MICROMEK - Keylock switch IP54         | 4 - 156        |
| <b>EUROLOCKS - Keylock switch IP54</b> | <b>4 - 158</b> |
| EUROLOCKS - Keylock switch IP54        | 4 - 159        |
| <b>Priority keylock switch IP54</b>    | <b>4 - 160</b> |
| Priority keylock switch IP54           | 4 - 161        |
| <b>Rotary switch IP40</b>              | <b>4 - 162</b> |
| Rotary switch IP40                     | 4 - 163        |

## MICROMECC - Keylock switch IP54



Pict.: light grey

PCB hole pattern, component side

### Technical Data

#### General information

Colour see order block  
Form of collar square

#### Dimensions

Length of collar 19 mm  
Width of collar 19 mm  
Overall height 19.5 mm

#### Mechanical design

Mounting soldering  
Terminals tin-plated  
Contact system cross contact self cleaning  
Contact function see order block  
Contact materials Au alloy  
Illuminability no  
Lock Micromec  
Wafers 5  
Lock type 001  
Number of locking positions 500  
Main key on request  
Key removal position see order block

#### Electrical characteristics

Rated voltage 2 ... 35 V  
Rated current max. 100 mA  
Contact resistance when new 100 mΩ  
max.  
Contact resistance acc. to life max. 200 mΩ  
Insulation resistance 10<sup>9</sup> Ω  
ESD strength max. 8 kV

#### Other specifications

Rotating angle see order block  
Operating life 10,000  
Degree of protection from front side IP54  
Ambient temp. operating min. -25 °C  
Ambient temp. operating max. +70 °C  
Storage temperature min. -40 °C  
Storage temperature max. +80 °C  
Environmental resistance acc. to IEC 60068-2 -14, -30, -33 and -78  
Flammability of materials UL 94 HB

#### Mechanical characteristics

Switching torque 0.04 ... 0.10 Nm  
Robustness max. 2 Nm  
Dielectric strength AC min. 500 V  
Rated power max. 1 W

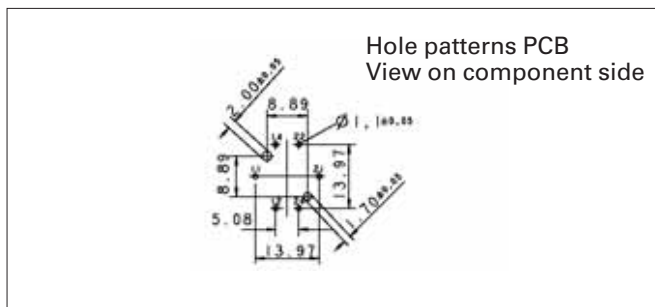
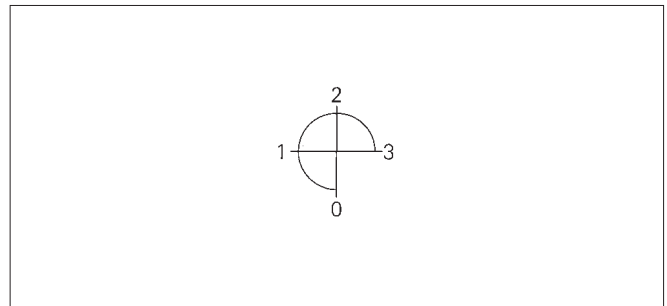
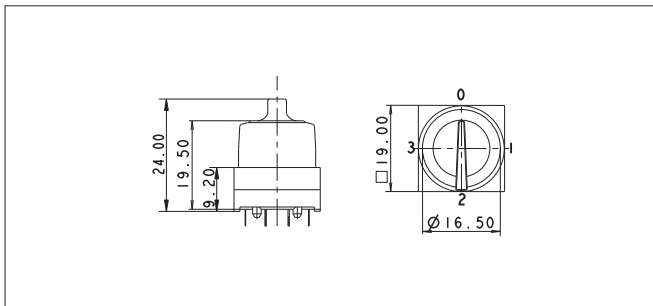
### Typical accessories MICROMECC - Keylock switch IP54

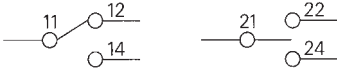
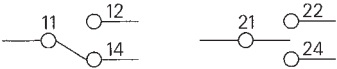
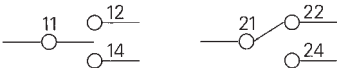
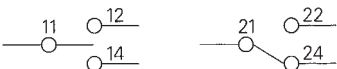
| Description   | Photo | Order no.         | Additional accessories see page |
|---|-------|-------------------|---------------------------------|
| O-ring for keylock switch   |       | 5.30.120.015/0100 | 5 - 25                          |
| Spare key, for single action, e.g. 1 x 90° (delivery content 1 key) |       | 5.58.007.001/0000 |                                 |
| Spare key, for double action, e.g. 2 x 90° (delivery content 1 key) |       | 5.58.008.001/0000 |                                 |
| Spare key for 3 angles, f.ex. 3 x 90° degree (content 1 key)        |       | 5.58.009.001/0100 |                                 |

## Typical accessories MICROMECC - Keylock switch IP54

| Description   | Photo  | Order no.         | Additional accessories see page |
|---|--|-------------------|---------------------------------|
| Spare key for 4 angles, f.ex. 4 x 90 degrees, (content 1 key) |  | 5.58.010.001/0100 |                                 |

## Configuration Diagram/Dimensional Drawing

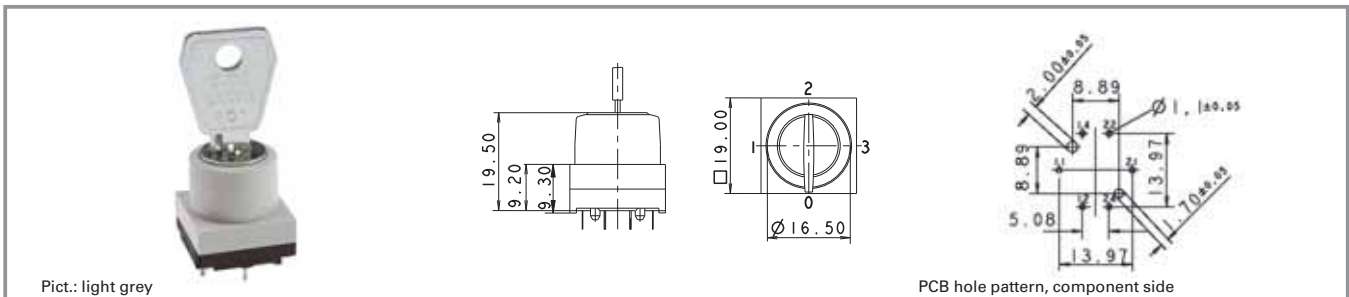


| Switching position | Contact function  |
|--------------------|---|
| 0                  |  |
| 1                  |  |
| 2                  |  |
| 3                  |  |





## EUROLOCKS - Keylock switch IP54



Pict.: light grey

PCB hole pattern, component side

### Technical Data

#### General information

|                |                 |
|----------------|-----------------|
| Colour         | see order block |
| Form of collar | square          |

#### Dimensions

|                  |         |
|------------------|---------|
| Length of collar | 19 mm   |
| Width of collar  | 19 mm   |
| Overall height   | 19.5 mm |

#### Mechanical design

|                             |                             |
|-----------------------------|-----------------------------|
| Mounting                    | soldering                   |
| Terminals                   | tin-plated                  |
| Contact system              | cross contact self cleaning |
| Contact function            | latching                    |
| Contact materials           | Au alloy                    |
| Illuminability              | no                          |
| Lock                        | Eurolocks                   |
| Wafers                      | 5                           |
| Lock type                   | 801                         |
| Number of locking positions | 50                          |
| Main key                    | no                          |
| Symmetric key               | yes                         |
| Key removal position        | see order block             |

#### Electrical characteristics

|                                      |                   |
|--------------------------------------|-------------------|
| Rated voltage                        | 2 ... 35 V        |
| Rated current max.                   | 100 mA            |
| Contact resistance when new max.     | 100 mΩ            |
| Contact resistance acc. to life max. | 200 mΩ            |
| Insulation resistance                | 10 <sup>9</sup> Ω |
| ESD strength max.                    | 8 kV              |

#### Other specifications

|                                      |   |
|--------------------------------------|---|
| Rotating angle                       | see order block                           |
| Operating life                       | 10,000                                    |
| Degree of protection from front side | IP54                                      |
| Ambient temp. operating min.         | -25 °C                                    |
| Ambient temp. operating max.         | +70 °C                                    |
| Storage temperature min.             | -40 °C                                    |
| Storage temperature max.             | +80 °C                                    |
| Environmental resistance             | acc. to IEC 60068-2 -14, -30, -33 and -78 |
| Flammability of materials            | UL 94 HB                                  |

#### Mechanical characteristics

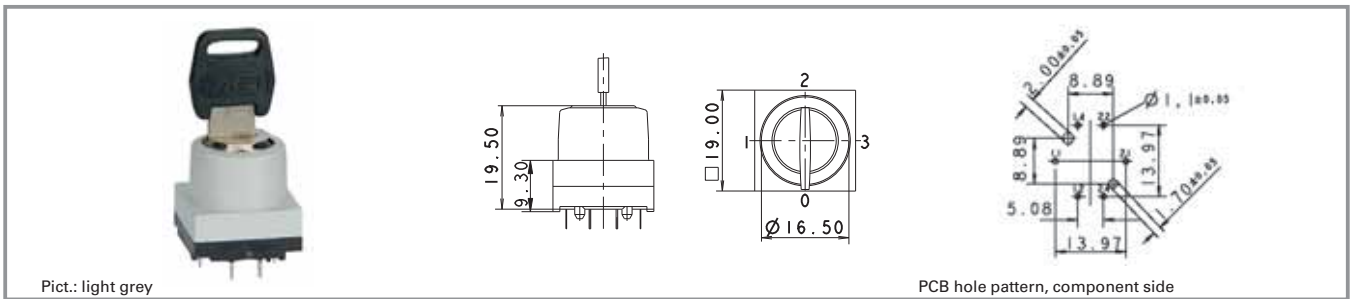
|                             |                  |
|-----------------------------|------------------|
| Switching torque            | 0.04 ... 0.10 Nm |
| Robustness max.             | 2 Nm             |
| Dielectric strength AC min. | 500 V            |
| Rated power max.            | 1 W              |

### Typical accessories EUROLOCKS - Keylock switch IP54

| Description                        | Photo | Order no.         | Additional accessories see page |
|------------------------------------|-------|-------------------|---------------------------------|
| O-ring for keylock switch          |       | 5.30.120.015/0100 | 5 - 25                          |
| Spare key (delivery content 1 key) |       | 5.58.006.801/0000 |                                 |



## Priority keylock switch IP54



Pict.: light grey

PCB hole pattern, component side

### General Data

Either 2 or 3 different keys are required, depending on the angle between positions. Key 1 can switch to position 1, key 2 can switch to position 1 and 2, etc.

### Technical Data

#### General information

Colour see order block  
Form of collar square

#### Dimensions

Length of collar 19 mm  
Width of collar 19 mm  
Overall height 19.5 mm

#### Mechanical design

Mounting soldering  
Terminals tin-plated  
Contact system cross contact self cleaning  
Contact function see order block  
Contact materials Au alloy  
Illuminability no  
Lock Micromec  
Wafers 5  
Lock type 001  
Number of locking positions 500  
Main key on request  
Key removal position see order block

#### Electrical characteristics

Rated voltage 2 ... 35 V  
Rated current max. 100 mA  
Contact resistance when new 100 mΩ  
Contact resistance acc. to life max. 200 mΩ  
Insulation resistance 10<sup>9</sup> Ω  
ESD strength max. 8 kV

#### Other specifications

Rotating angle see order block  
Operating life 10,000  
Degree of protection from front side IP54  
Ambient temp. operating min. -25 °C  
Ambient temp. operating max. +70 °C  
Storage temperature min. -40 °C  
Storage temperature max. +80 °C  
Environmental resistance acc. to IEC 60068-2 -14, -30, -33 and -78  
Flammability of materials UL 94 HB

#### Mechanical characteristics

Switching torque 0.04 ... 0.10 Nm  
Robustness max. 2 Nm  
Dielectric strength AC min. 500 V  
Rated power max. 1 W

### Typical accessories Priority keylock switch IP54

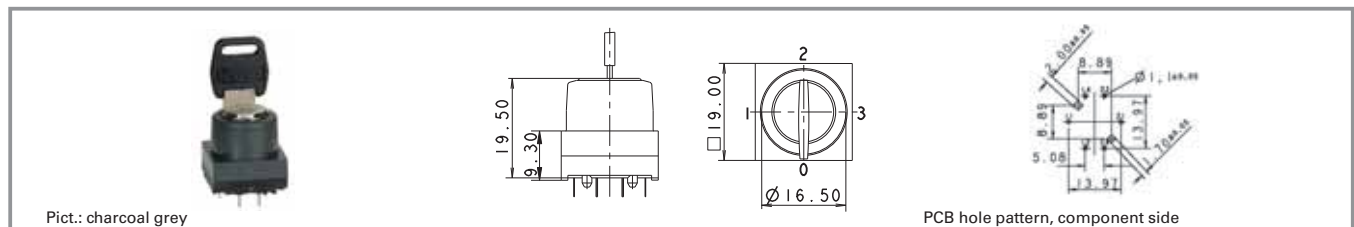
| Description               | Photo | Order no.         | Additional accessories see page |
|---------------------------|-------|-------------------|---------------------------------|
| O-ring for keylock switch |       | 5.30.120.015/0100 | 5 - 25                          |

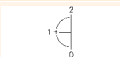
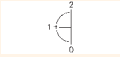


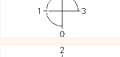
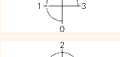
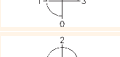
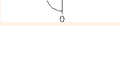


## Typical accessories Priority keylock switch IP54

| Description                           | Photo  | Order no.         | Additional accessories see page |
|---------------------------------------|--|-------------------|---------------------------------|
| Set of keys for 2 x 90° type (2 keys) |  | 5.58.099.012/0000 |                                 |
| Set of keys for 3 x 90° type (3 keys) |  | 5.58.099.013/0000 |                                 |

## Priority keylock switch IP54



| Contact function | Colour        | Rotating angle | Key removal position   | Order no.                |
|------------------|---------------|----------------|--|--------------------------|
| latching         | charcoal grey | 2 x 90°        |  | 3.13.027.001/0000        |
| latching         | light grey    | 2 x 90°        |  | 3.13.027.501/0000        |
| latching         | charcoal grey | 2 x 90°        |  | 3.13.027.006/0000        |
| latching         | light grey    | 2 x 90°        |  | 3.13.027.506/0000        |
| latching         | charcoal grey | 3 x 90°        |  | 3.13.027.011/0000        |
| latching         | light grey    | 3 x 90°        |  | 3.13.027.511/0000        |
| latching         | charcoal grey | 3 x 90°        |  | <b>3.13.027.016/0000</b> |
| latching         | light grey    | 3 x 90°        |  | 3.13.027.516/0000        |

Technical data see page 4 - 160

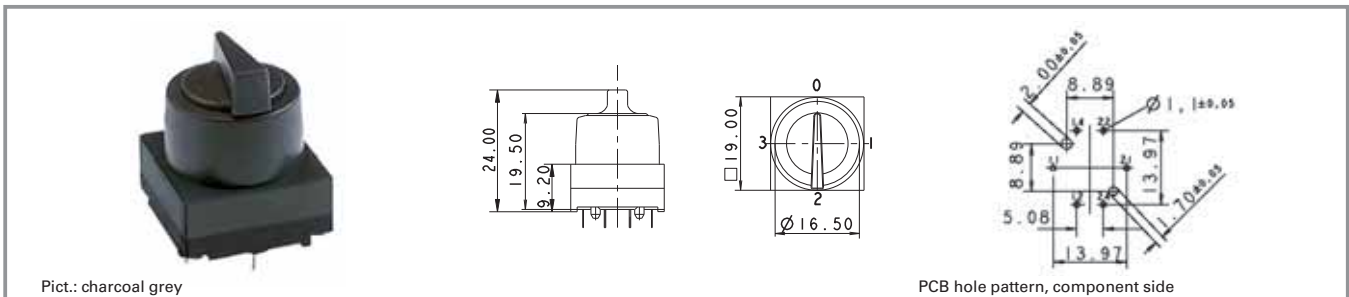
2 sets of keys included.

Other lock variants available on request.

For the switching arrangement, see IP54 Micromec keylock switch.

Either 2 or 3 different keys are required, depending on the angle between positions. Key 1 can switch to position 1, key 2 can switch to position 1 and 2, etc.

## Rotary switch IP40



Pict.: charcoal grey

PCB hole pattern, component side

### Technical Data

#### General information

Colour see order block  
Form of collar square

#### Dimensions

Length of collar 19 mm  
Width of collar 19 mm  
Overall height 24 mm

#### Mechanical design

Mounting soldering  
Terminals tin-plated  
Contact system cross contact self cleaning  
Contact function see order block  
Contact materials Au alloy  
Illuminability no

#### Mechanical characteristics

Torque against stop min. 0.45 Nm  
Dielectric strength AC min. see order block  
Rated power max. 1 W

#### Electrical characteristics

Rated voltage max. 35 V  
Rated current max. 100 mA  
Contact resistance when new 100 mΩ  
Contact resistance acc. to life max. 200 mΩ  
Insulation resistance 10<sup>9</sup> Ω  
ESD strength max. 8 kV

#### Other specifications

Rotating angle see order block  
Operating life 50,000  
Degree of protection from front side IP40  
Ambient temp. operating min. -25 °C  
Ambient temp. operating max. +70 °C  
Storage temperature min. -40 °C  
Storage temperature max. +80 °C  
Environmental resistance acc. to IEC 60068-2 -14, -30, -33 and -78  
Flammability of materials UL 94 HB





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