

# Redundancy unit CP-C.1-A-RU

## Accessory for CP range power supplies

ABB's redundancy units are used to establish true redundancy which increases the availability of electrical systems significantly.



2CDC 271 001 V0018

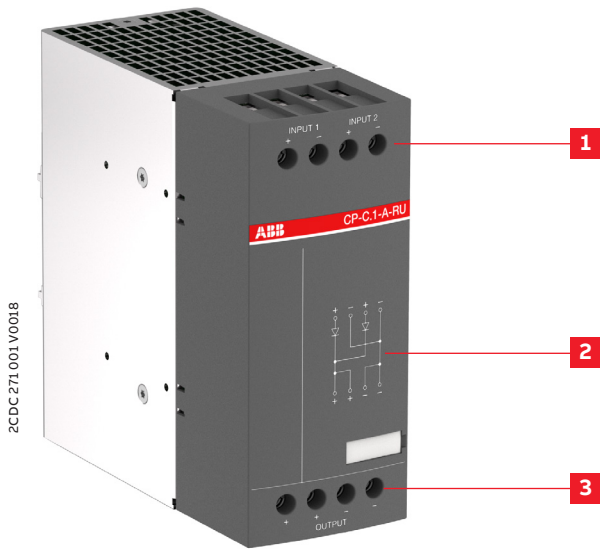
### Characteristics

- Decoupling of CP power supply units with 2 inputs, each up to 20 A per input / channel
- Output up to 40 A
- True redundancy by 100 % decoupling of two parallel connected power supplies
- 2 integrated diodes for the decoupling of 2 switch mode power supplies up to 20 A
- Device with coated PCBA for harsh environments and with extended temperature range
- Various certifications and approvals (see overview, document no. 2CDC114098D0201)

### Ordering details - CP-C.1-A-RU for decoupling of CP power supplies up to 20 A per input / channel

| Input voltage range | Rated input current per channel | Rated output voltage /current           |          | Type          | Order code      | Weight (1 pc.)<br>kg (lb) |
|---------------------|---------------------------------|---|----------|---------------|-----------------|---------------------------|
| 10 - 58 V DC        | 20 A                            | 12-48 V DC /<br>2 x 20 A<br>or 1 x 40 A | uncoated | CP-C.1-A-RU   | 1SVR360060R1001 | 1.04 (2.29)               |
|                     |                                 |   | coated   | CP-C.1-A-RU-C | 1SVR360060R2001 | 1.04 (2.29)               |
|                     |                                 |   | uncoated | CP-C.1-A-RU-L | 1SVR361060R1001 | 1.04 (2.29)               |

## Function



- 1 INPUT 1, 2:  
Terminals – input
- 2 Circuit diagram
- 3 OUTPUT ++/--  
Terminals – output

## Application

The redundancy unit CP-C.1-A-RU provides decoupling of two CP power supply units. It provides automatic redundant power supply operation for critical applications. It has 2 inputs, each up to 20 A, and 1 output up to 40 A.

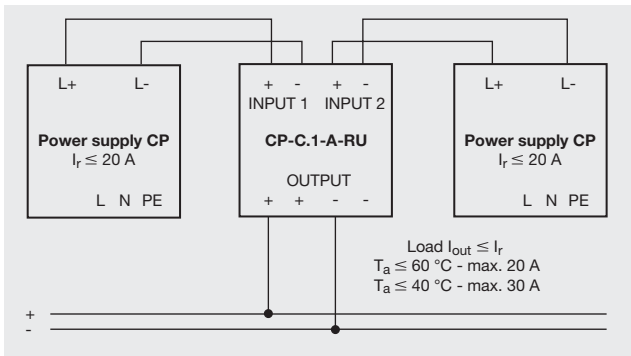
# Operating mode

## True redundancy with decoupling provided by the CP-C.1-A-RU and CP-C.1-A-RU-C

Redundant circuits are used to increase the operational reliability and eliminate power supply outages. Events that can cause a power supply failure include: incorrect wiring, blown fuses, or failure of a single power supply. If a fault event occurs (called initial fault) in the first power supply circuit, power to all loads is then supplied by the second (redundant) power supply. For this reason, both power supplies must be sized to handle the total current requirement of all loads. The primary and the redundant power supplies are decoupled from one another by the CP-C.1-A-RU unit.

It automatically switches from the primary to the redundant supply after a fault. It decouples the output of the failed power supply from the redundant supply preventing the initial fault from shorting or compromising the redundant supplies' output. In this way, uninterrupted supply of power to all loads is guaranteed. When available, the two power supplies should be connected to different input voltage phases, to avoid loss of power caused by a blown fuse on the primary side of the power supplies.

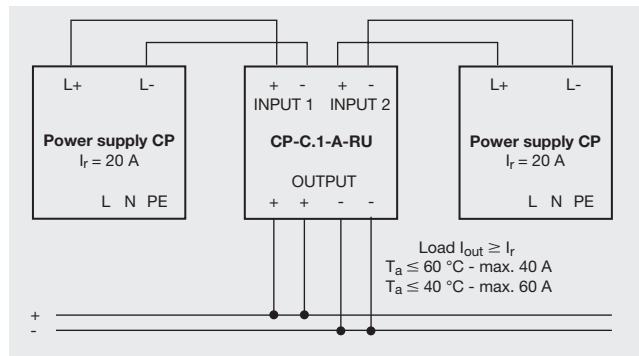
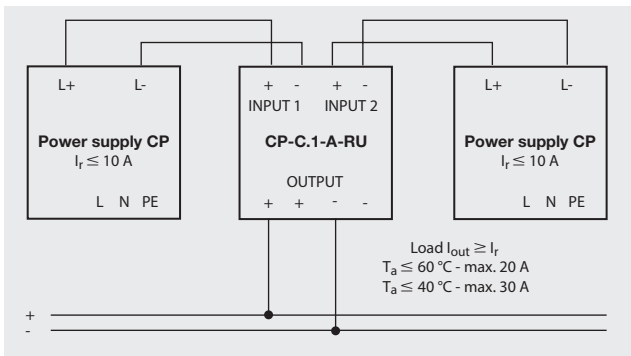
### True redundancy, $I_{out} \leq I_r$



## Parallel operation for increased power

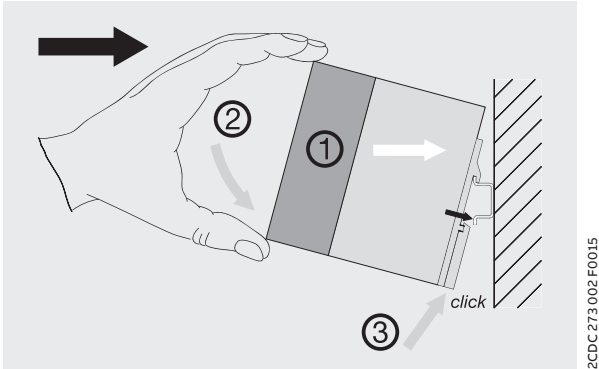
Another operation mode of two power supplies in combination with a redundancy unit is to parallel and decouple them for increased power. The setup looks similar to the true redundant installation above but the field of application is different. Instead of redundancy the max. output current (limits see under the schematics) can be used to power up the loads. The redundancy module decouples both power supplies from each other to avoid that any electrical failure from one power supply circuit affects the other one. However, using the increased power also means there is no redundancy since if one supply fails the other one can not supply the load alone.

### Increased power, $I_{out} \geq I_r$

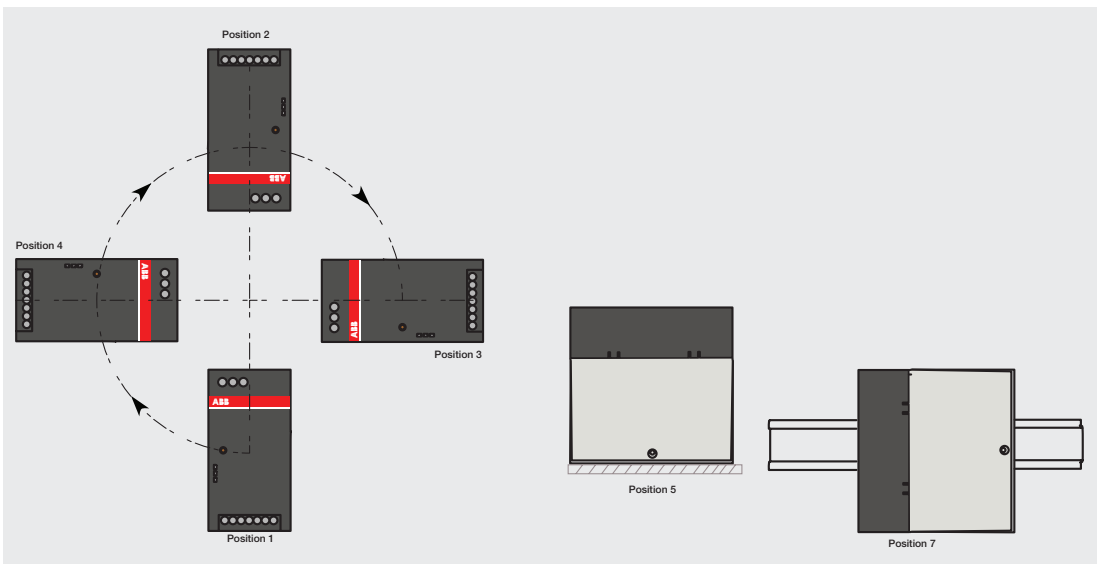


# Mounting

To mount the unit place the upper edge of the DIN rail adapter on the upper edge of the DIN rail holding the unit slightly tilted upwards as shown in the illustration. Then tilt the unit down until the latch snaps onto the DIN rail.

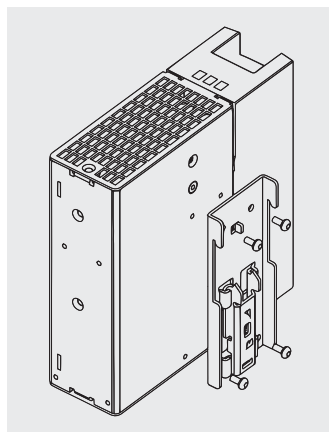
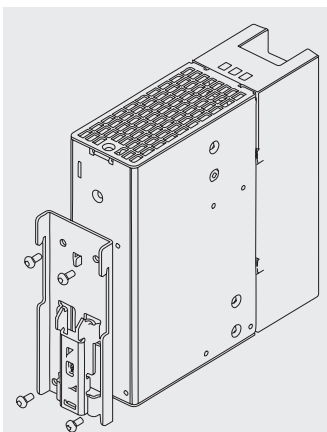


## Mounting positions



In order to ensure a sufficient convection in mounting position 1 and 7, the minimum distance to other modules must not be less than 25 mm in vertical direction and 25 mm in horizontal direction. For the derating of the output current, see the characteristic curve of temperature. Details for other mounting positions on request.

## Mounting CP-C.1-A-RU in position 7



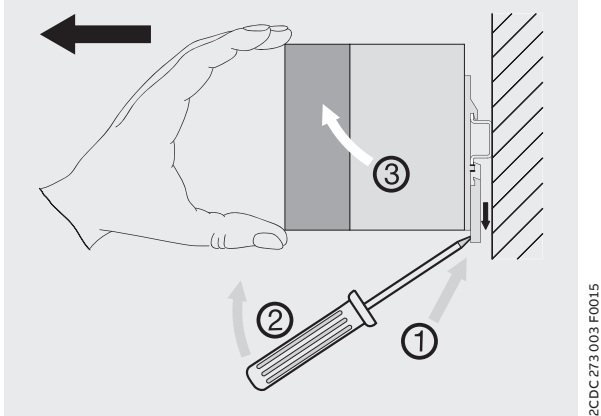
To mount the power supply in position 7 remove the DIN rail adapter that is fasten with 4 screws and attach it on the side of the power supply.

**Screwdriver:** Torx T10

**Tightening torque:**  $0.7 \pm 0.1$  Nm

## Demounting

To release the unit pull the latching lever downwards with a screwdriver and press the upper side of the the latching lever down. The device can be unhinged from the DIN rail and removed.



## Electrical connection

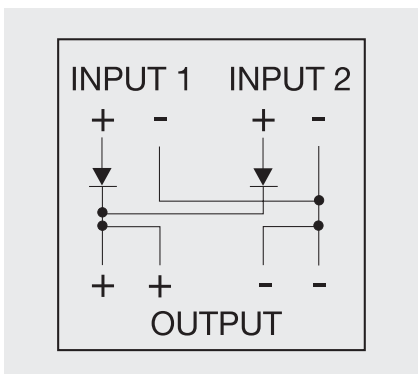
### Input side [INPUT 1 + - / INPUT 2 + -]

Connect the input terminals, stripping length of the cable – see technical data. For channel 1 left-hand input terminals + -, for channel 2 right-hand input terminals + -.

### Output side [OUTPUT ++ --]

Rate the lines for the maximum output current or provide a separate fuse protection. We recommend to choose the cable cross section as large as possible in order to minimize voltage drops. Observe the polarity.

### Connection diagram



INPUT 1 +, -      Connection of the output of power supply unit 1  
 INPUT 2 +, -      Connection of the output of power supply unit 2  
 OUTPUT ++, --    Output for load

# Safety instructions and warnings



## In operation pay attention to:

- Do not modify the installation (primary and secondary side)! High current! Risk of electric arcs and electric shock (danger to life)!
- Risk of burns: Depending on the operation conditions the housing can become hot.
- The device contains no user serviceable parts. In any case of device malfunction please send the unit back to manufacturer.



The device must be installed by qualified persons only and in accordance with the specific national regulations (e. g. VDE, etc.).

The CP-C.1 redundancy units are chassis-mounted units. It is maintenance-free and does not contain any integral setting elements and should therefore not be opened.



## Before any installation, maintenance or modification work:

- Read the operating and installation instructions carefully and completely!
- Disconnect the system from the supply network and protect against switching on!



## CAUTION

Improper installation/operation may impair safety of personnel and cause operational difficulties or destruction of the unit.



## WARNING

### Before start of operation the following must be ensured:

- Connection to mains or DC supply according to the specific national regulations for class of protection I. Power supply cables and unit must be sufficiently fused. A disconnecting device has to be provided for the end product to disengage unit and supply cables from supply mains if required.
- Rate the output lines for the output current of the power supply and connect them with the correct polarity.
- In order to ensure sufficient convection the distance to the other devices has to be considered.



## WARNING

### Danger to life!

Never carry out work when voltage is present. The power supply contains components with high stored energy and circuits with high voltage! Do not introduce any objects into the unit and do not open the unit. With some units of this range the output is capable of providing hazardous energy. Ensure that the service personnel is protected against inadvertent contact with parts carrying energy. If the internal fuse is blown most probably the device is defect. In this case an examination of the device by the manufacturer is necessary.

# Technical data

Data at  $T_a = 25\text{ °C}$ ,  $U_{in} = 230\text{ V AC}$  and rated values, unless otherwise indicated

## Input circuit - Supply circuit

| Type                                     |  | CP-C.1-A-RU, CP-C.1-A-RU-L            | CP-C.1-A-RU-C        |
|--|--|---------------------------------------|----------------------|
| <b>Input circuit - Supply circuit</b>    |  | <b>(+/-, -/-)</b>                     |                      |
| Rated input voltage $U_{in}$             |  | 12-48 V DC                            |                      |
| Input voltage range                      |  | 10 - 58 V DC                          |                      |
| Rated input current $I_{in}$ per channel | $-25\text{ °C} \leq T_a \leq 60\text{ °C}$ | 20 A                                  |                      |
| Maximum input current per channel        | $-25\text{ °C} \leq T_a \leq 40\text{ °C}$ | 30 A                                  |                      |
|  | $-40\text{ °C} \leq T_a \leq 40\text{ °C}$ | –                                     | 30 A                 |
| Transient overvoltage protection         |  | yes, varistor                         |                      |
| <b>Rated frequency</b>                   |  | <b>(+/-)</b>                          |                      |
| Rated output voltage $U_{out}$           |  | 12-48 V DC                            |                      |
| Voltage drop input/output                |  | typ. 0.6 V, max. 0.9 V                |                      |
| Rated output current $I_o$               | $-25\text{ °C} \leq T_a \leq 60\text{ °C}$ | 2 x 20 A or 1 x 40 A                  |                      |
| Max. output current (power reserve)      | $-25\text{ °C} \leq T_a \leq 40\text{ °C}$ | 2 x 30 A or 1 x 60 A                  |                      |
|  | $-40\text{ °C} \leq T_a \leq 40\text{ °C}$ | –                                     | 2 x 30 A or 1 x 60 A |
| Derating of the output current           | $60\text{ °C} < T_a \leq 70\text{ °C}$     | 2.5 % per Kelvin temperature increase |                      |
| Resistance to reverse feed               |  | < 60 V                                |                      |

## General data

|                                     |                               |   |
|-------------------------------------|-------------------------------|---|
| Power loss                          | input 2 x 20 A                | 23.0 W  |
|                                     | input 2 x 10 A                | 9.4 W   |
|                                     | input 2 x 5 A                 | 4.1 W   |
| MTBF                                | acc. to MIL 217 HDBK          | on request                                    |
| Dimensions                          |                               | see "Dimensional drawings"                    |
| Material of housing                 | cover / housing shell / front | aluminium / zinc-coated sheet steel / plastic |
| Mounting                            |                               | DIN rail (IEC/EN 60715), snap-on mounting     |
| Mounting position                   |                               | 1 and 7                                       |
| Minimum distance to other units     | horizontal / vertical         | 25 mm (0.98 in) / 25 mm (0.98 in)             |
| Degree of protection (IEC/EN 60529) | housing / terminals           | IP20 / IP20                                   |
| Protection class (IEC/EN 61140)     |                               | III   |

## Electrical connection

| Input circuit / Output circuit |  | CP-C.1-A-RU, CP-C.1-A-RU-L            | CP-C.1-A-RU-C |
|--------------------------------|--|---------------------------------------|---------------|
| Connecting capacity            | rigid                                  | 2.5-16 mm <sup>2</sup> (12-6 AWG)     |               |
|                                | fine-strand with(out) wire end ferrule | 2.5-10 mm <sup>2</sup> (12-8 AWG)     |               |
| Stripping length               |  | 10 mm (0.39 in)                       |               |
| Tightening torque              |  | 1.2 Nm (10.5 lb.in)                   |               |
| Recommended screw driver       |  | PH1 / Ø 4.0 x 0.8 mm (0.16 x 0.03 in) |               |

## Environmental data

|  | CP-C.1-A-RU, CP-C.1-A-RU-L   | CP-C.1-A-RU-C   |
|--|--|---|
| Ambient temperature range  | operation  | -25...+70 °C (-13... +158 °F)   |
|  | rated load   | -25...+60 °C (-13... +140 °F)   |
|  | storage  | -40...+85 °C (-40...+185 °F)  |
|  | transportation   | -40...+85 °C (-40...+185 °F)  |
| Climatic class (IEC/EN 60721-3-1)                                | storage  | 1K2   |
| Climatic class (IEC/EN 60721-3-2)                                | transportation   | 2K2   |
| Climatic class (IEC/EN 60721-3-3)                                | operation  | 3K3   |
| Damp heat, cyclic (IEC/EN 60068-2-30)                            | test Db: 55°C, 2 cycles  |   |
| Vibration (IEC/EN 60068-2-6)                                     | test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis |   |
| Shock, half-sine (IEC/EN 60068-2-27)                             | test Ea: 30 g, 6 ms, 3 pulses each axis; bump 20 g, 11 ms, 100 pulses each axis  |   |
| Coated PCBA  | no   | yes   |
| Gaseous corrosive environment withstand test (IEC/EN 60068-2-60) | -  | testing method: 4<br>testing period: 21 days<br>ambient conditions: 25 °C, 75 % r.h.<br>air/volume change rate per hour: 3-6<br>sample not energized during exposure<br>gas concentrations acc.<br>ISA-S71.04.2013 Harsh Group A, G3<br>IEC 60721-3.3 acc. 3C2/3C3<br>- H <sub>2</sub> S ≥ 100 ± 10 ppb<br>- SO <sub>2</sub> /SO <sub>3</sub> ≥ 300 ± 20 ppb<br>- Cl <sub>2</sub> ≥ 100 ± 10 ppb<br>- NO <sub>x</sub> ≥ 1250 ± 20 ppb |

## Isolation data

|   | CP-C.1-A-RU, CP-C.1-A-RU-L     | CP-C.1-A-RU-C      |
|---|--------------------------------|--------------------|
| Rated impulse withstand voltage U <sub>imp</sub> (EN 62477-1) | input circuit / output circuit | 1.5 kV (1.2/50 μs) |
|   | input circuit / PE             | 1.5 kV (1.2/50 μs) |
| Pollution degree  | 2                              |                    |

## Standards / Directives

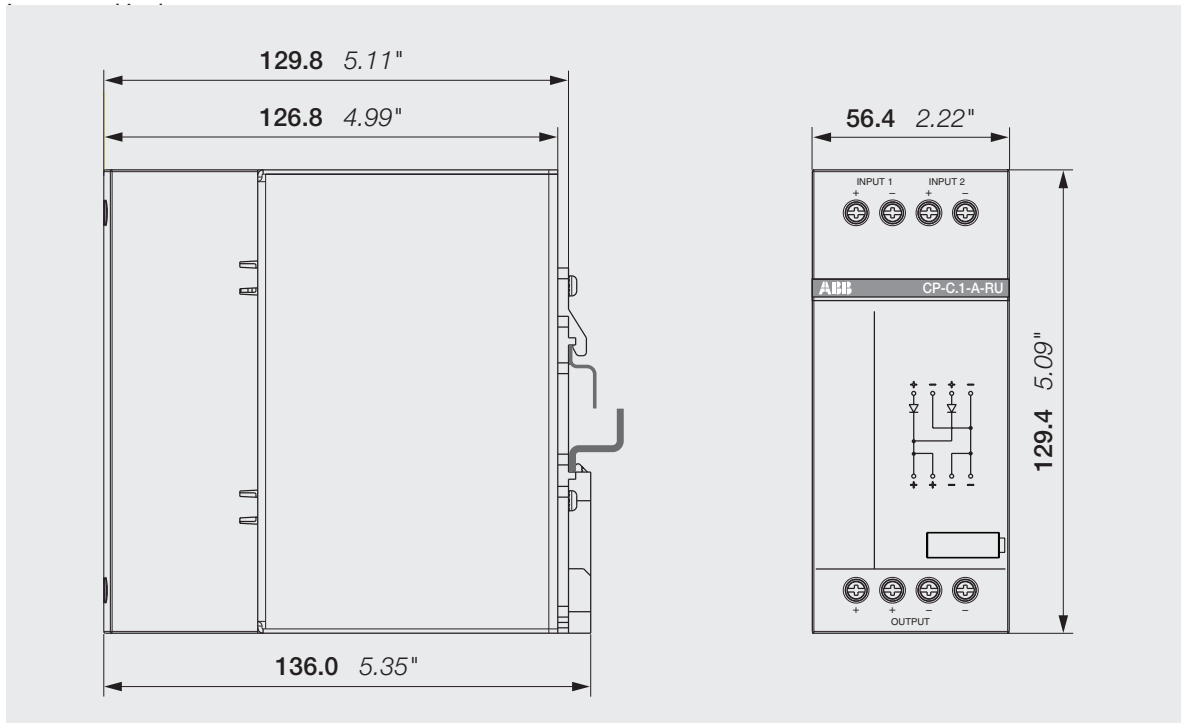
|                           | CP-C.1-A-RU, CP-C.1-A-RU-L  | CP-C.1-A-RU-C |
|---------------------------|---|---------------|
| Standards                 | IEC/EN 61204  |               |
| EMC Directive             | 2014/30/EU  |               |
| ATEX Directive            |   | 2014/34/EU    |
| RoHS Directive            | 2011/65/EU  |               |
| Electrical safety         | IEC/EN 61010-1, IEC/EN 61010-2-201, IEC 60950-1                                     |               |
| Process control equipment | UL 61010-1, UL 61010-2-201/CAN/CSA C22.2 no. 61010-1-12, CAN/CSA-IEC 61010-2-201:18 |               |

## Electromagnetic compatibility

|                                   | CP-C.1-A-RU, CP-C.1-A-RU-L | CP-C.1-A-RU-C  |
|-----------------------------------|----------------------------|--|
| Interference immunity to          |                            |  |
| electrostatic discharge           | IEC/EN 61000-4-2           | Level 4, contact discharge 8 kV, air discharge 15 kV (criterion B)                       |
| electrical fast transient / burst | IEC/EN 61000-4-4           | Level 3, DC mains inputs and output ±2 kV (criterion B)                                  |
| surge                             | IEC/EN 61000-4-5           | Level 1, DC mains inputs and output ±0.5 kV, input and output vs. PE ±1 kV (criterion B) |



## Dimensions



## Further documentation

| Document title                                    | Document type      | Document number    |
|---|--------------------|--------------------|
| Electronic relays and controls                    | Catalog            | 2CDC 110 004 C02xx |
| Redundancy unit                                   | Instruction manual | 1SVC 360 561 M0000 |
| Additional information and notes on safety (ATEX) | Instruction manual | 1SVC 360 560 M9000 |

You can find the documentation on the internet at [www.abb.com/lowvoltage](http://www.abb.com/lowvoltage)

-> Automation, Control and Protection -> Power supplies.

## CAD system files

You can find the CAD files for CAD systems at

<http://abb-control-products.partcommunity.com>

-> Low Voltage Products & Systems -> Control Products -> Electronic Relays and Controls.



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