

**RACPR01-RD40 Series ◇ Redundancy Module**

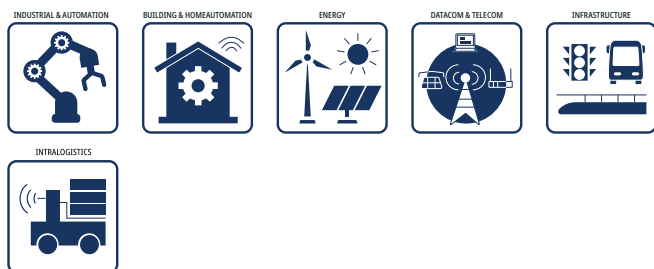
40A ◇ Input: DC 9-56V &amp; 2x 20A

**FEATURES**

- Slim Design (43mm) with 25° Push-In connectors
- Fast tool-less mounting and demounting
- Wide DC-Input Range 9V to 56V
- Operation with 12V, 24V & 48V power supplies
- Highest Efficiency up to 99.5%
- Very Low Voltage Drop 140mV
- Minimum Power Loss 5W typ.
- Reduced no load power consumption <200mW
- Operating temperature -40°C/+70°C
- Full Power -40°C/+70°C//Power Boost 150%/5s
- Highest Lifetime Expectancy 268.000h/40°C
- Made in Europe
- 3 year warranty



Dimensions (HxWxD): 135.0 x 43.0 x 140.4mm (5.3 x 2.0 x 6.1 inch)  
260g (0.57 lbs)

**APPLICATIONS****SAFETY & EMC****DESCRIPTION**

The light and slim RACPR01-RD40 is a high reliability n+1 DIN Rail redundancy diode module in extremely compact dimensions of 135 x 140.4mm with a width of only 43mm. The wide DC input range of 9V to 56V allows connection of Power Supplies with 12V, 24V or 48V outputs in n+1 redundancy operation up to 20A or up to 40A output in sharing or parallel operation. With highly efficient MOSFET-technology the module specially designed for demanding applications in the harsh industrial automation field with only 140mV voltage drop. These units will deliver up to 40A over the full -40°C to +70°C ambient temperature range with only convection cooling and maximum power loss of 5W typ. The unique and innovative modern design with 25° push-in connectors allows easy tool-less installation or replacement. The product is certified according to the global safety standards IEC/EN/UL/CSA 62368-1. Electromagnetic radiated and conducted emissions are compliant to heavy industrial EN 61000-6-4 Class B emission standard and EN 61000-6-2 immunity standard.

**SELECTION GUIDE**

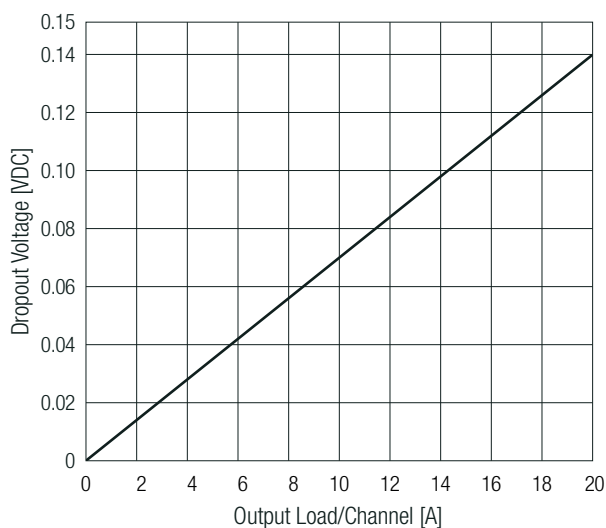
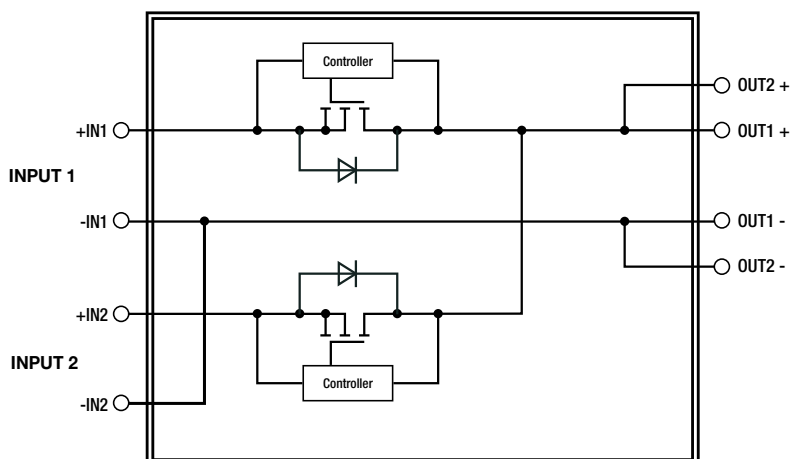
| Part Number  | Input Voltage Range [VDC] | Output Voltage nom. [VDC] | Input Current [A] | Output Current Redundancy Mode [A] | Output Current Parallel Mode [A] | Efficiency <sup>(1)</sup> typ. [%] |
|--------------|---------------------------|---------------------------|-------------------|------------------------------------|----------------------------------|------------------------------------|
| RACPR01-RD40 | 9-56                      | 12/24/48                  | 2x 20A            | 2x 20A                             | 40A                              | 99.5                               |

Note1: Efficiency is tested at nominal input (12/24/48VDC) and full load (all channels) at +25°C ambient.

**RACPR01-RD40 Series ◇ Redundancy Module****40A ◇ Input: DC 9-56V & 2x 20A****BASIC CHARACTERISTICS** (measured @  $T_{AMB} = 25^{\circ}\text{C}$ , nom.  $V_{IN}$  and after warm-up unless otherwise stated)

| Parameter                 | Condition                                           | Min.                     | Typ.        | Max.   |
|---------------------------|-----------------------------------------------------|--------------------------|-------------|--------|
| Nominal Input Voltage     |                                                     | 12VDC                    |             | 48VDC  |
| Operating Range           |                                                     | 9VDC                     |             | 56VDC  |
| Turn-on Voltage           |                                                     |                          |             | 9VDC   |
| Turn-off Voltage          |                                                     |                          |             | 7VDC   |
| Input Current             |                                                     |                          |             | 2x 20A |
| No Load Power Consumption | $V_{OUT} = 24\text{VDC}$                            |                          | 200mW       |        |
|                           | $V_{OUT} = 48\text{VDC}$                            |                          | 400mW       |        |
| Nominal Output Voltage    |                                                     |                          | 12/24/48VDC |        |
| Output Current            |                                                     |                          |             | 40A    |
|                           | 5sec max. <sup>(2)</sup> , refer to „Boost Power“   |                          |             | 60A    |
| Voltage Drop              | I/P to O/P, refer to „Input to Output Voltage Drop“ | Input: 1x 20A            | 140mV       |        |
|                           |                                                     | Input: 2x 20A            | 140mV       |        |
| Minimum Load              |                                                     | 0%                       |             |        |
| Ripple and Noise          | 20MHz bandwidth                                     | depends on input devices |             |        |
| Output Capacitance        |                                                     | depends on input devices |             |        |

Note2: For use with all RACPR01 power supplies. For other use case, please contact RECOM techsupport.  
Refer to „Boost Power“

**Input to Output Voltage Drop****BLOCK DIAGRAM**

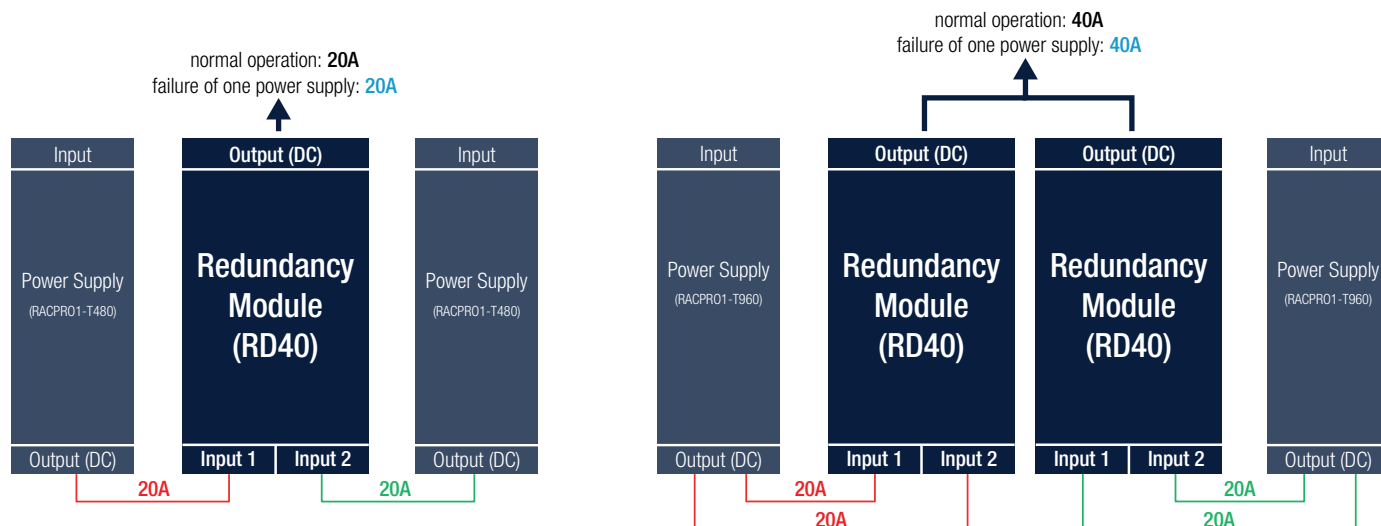
# RACPR01-RD40 Series ◇ Redundancy Module

40A ◇ Input: DC 9-56V & 2x 20A

## REDUNDANCY CONFIGURATION

Each input channel is supplied with half the nominal input current. In case one power supply fails, the other power supply supplies the missing input current so that the output remains unchanged (1+1 redundancy).

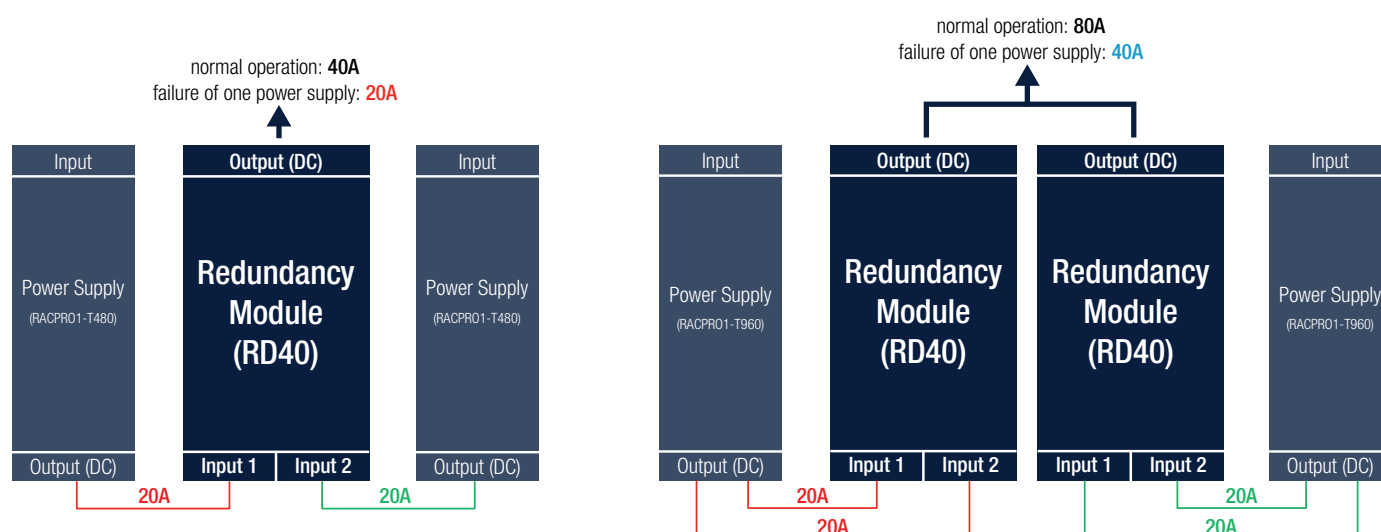
Each power supply needs to be able to supply the full output current at any given time.



## PARALLEL MODE

Each input channel is supplied with its full nominal input current, resulting in the full nominal value of the output current. In case one power supply fails, the output current drops.

For parallel operation at 40 A, two redundancy modules must be used, as each input is rated for a maximum of 20 A.



**RACPR01-RD40 Series ◇ Redundancy Module****40A ◇ Input: DC 9-56V & 2x 20A****PROTECTIONS (measured @  $T_{AMB} = 25^{\circ}\text{C}$ , nom.  $V_{IN}$  and after warm-up unless otherwise stated)**

| Parameter                      | Type       | Value                                              |
|--------------------------------|------------|----------------------------------------------------|
| Internal Input Fuse            |            | no                                                 |
| Short Circuit Protection (SCP) |            | depending on input devices                         |
| Return Voltage Immunity        | continuous | 63VDC max.                                         |
|                                | <5 min     | 70VDC max.                                         |
| Reverse Current                |            | 5mA max.                                           |
| Reverse Polarity Protection    |            | unit does not start when input voltage is reversed |
| Over Voltage Category (OVC)    |            | OVC III (4000m)                                    |
| Class of Equipment             |            | Class 3                                            |

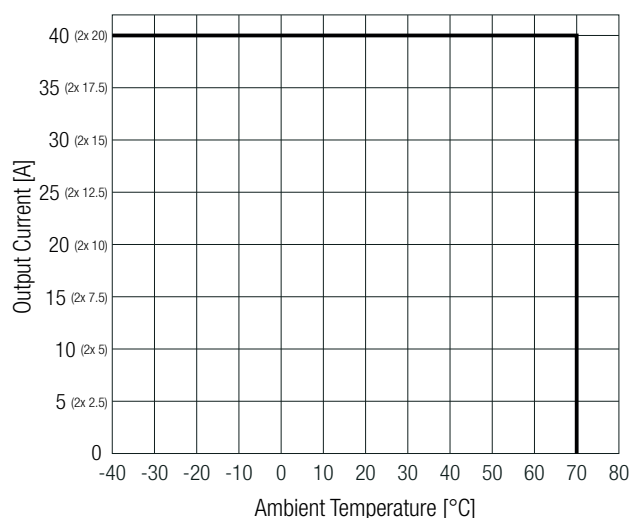
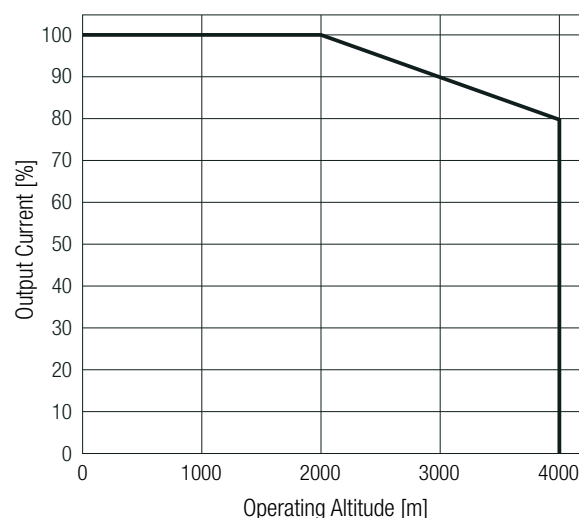
**ENVIRONMENTAL (measured @  $T_{AMB} = 25^{\circ}\text{C}$ , nom.  $V_{IN}$  and after warm-up unless otherwise stated)**

| Parameter                           | Condition                                  |                                | Value                                                                                        |
|-------------------------------------|--------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------|
| Operating Ambient Temperature Range | @ natural convection (0.1m/s)              |                                | -40°C to +70°C                                                                               |
| Operating Altitude <sup>(3)</sup>   | refer to „Altitude Derating“               |                                | 4000m (OVC III)                                                                              |
| Operating Humidity                  | non-condensing                             |                                | 95% RH max.                                                                                  |
| Pollution Degree                    |                                            |                                | PD2                                                                                          |
| IP Rating                           |                                            |                                | IP20                                                                                         |
| Shock                               | according to IEC 60068-2-27 Fa             | non-operating                  | 15G/11ms, 3 times (positive/negative) in all axis                                            |
| Vibration                           | according to IEC 60068-2-6 Fc              | non-operating                  | 5 - 8.4Hz @ 3.5mm deflection<br>8.4 - 150Hz @ 2G, 10 cycles /axis(min-max-min); 1 octave/min |
| MTBF                                | according to EN/IEC 61709 (SN29500)        | $T_{AMB} = 40^{\circ}\text{C}$ | $2600 \times 10^3$ hours                                                                     |
| Design Lifetime                     | $T_{AMB} = 40^{\circ}\text{C}$ @ 100% Load |                                | $268 \times 10^3$ hours                                                                      |

Note3: Recognized by safety agency for safe operation up to 5000m. High altitude operation may impact the performance and lifetime

**Derating Graph**

(Standard and upside down mounting orientation)

**Altitude Derating**(Standard and upside down mounting orientation,  $T_{AMB} = +60^{\circ}\text{C}$ )

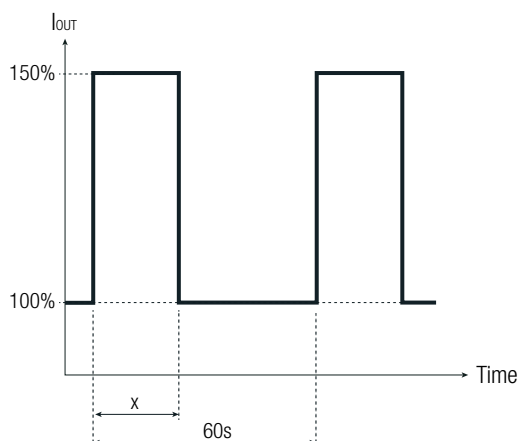
Note4: Above derating graph is valid for standard and upside-down mounting orientation only. For all other mounting orientations, the maximum output power must be reduced by 15% of the nominal power.

**RACPR01-RD40 Series ◇ Redundancy Module****40A ◇ Input: DC 9-56V & 2x 20A****ADDITIONAL FEATURES (only valid when using RACPR01 power supply units)**

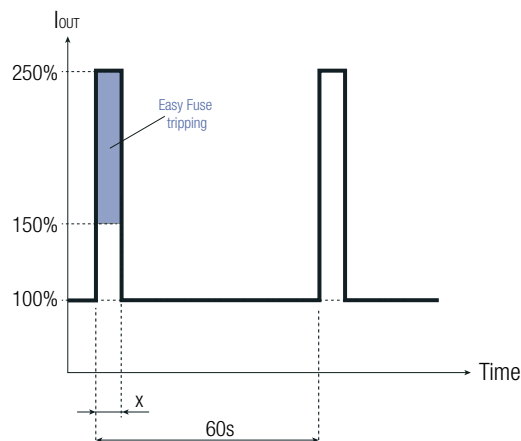
The functions listed below only apply when operating with RACPR01 power supplies. The duration of the boost power function "x" is defined by the respective power supply and is specified in the corresponding RACPR01 data sheet.

**Boost Power**

(Standard & upside down mounting orientation only, -40°C to +60°C max.)

**Easy Fuse tripping**

(-40°C to +60°C max.)

**SAFETY & CERTIFICATIONS**

| Certificate Type (Safety)                                                                          | Report Number      | Standard                                                               |
|----------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------|
| Audio/Video, information and communication technology equipment - Part 1: Safety requirements (CB) | E224736-A6032-CB-1 | IEC62368-1:2018 3rd Edition                                            |
| Audio/Video, information and communication technology equipment - Part 1: Safety requirements      |                    | EN IEC 62368-1:2020+A11:2020                                           |
| Audio/Video, information and communication technology equipment - Part 1: Safety requirements      | E224736-A6032-UL   | UL62368-1:2019 3rd Edition<br>CAN/CSA-C22.2 No. 62368-1-19 3rd Edition |
| RoHS2                                                                                              |                    | RoHS 2011/65/EU + AM2015/863                                           |

| EMC Compliance according to IEC/EN61000-6-4/6-2                                                                   | Condition                                                                  | Standard / Criterion                                          |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------|
| Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments |                                                                            | EN61000-6-2:2005+AC:2005                                      |
| Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential area        |                                                                            | EN61000-6-3:2007+A1:2011+AC:2012                              |
| ESD Electrostatic discharge immunity test                                                                         | Air: $\pm 2, 4, 6, 8\text{kV}$ ;<br>Contact: $\pm 2, 4, 6, 8\text{kV}$     | IEC61000-4-2:2008, Criteria A<br>EN61000-4-2:2009, Criteria A |
| Radiated, radio-frequency, electromagnetic field immunity test                                                    | 10V/m (80-1000MHz)                                                         | IEC/EN61000-4-3:2006+A2:2010, Criteria A                      |
| Fast Transient and Burst Immunity                                                                                 | DC Power Port: $\pm 2\text{kV}$<br>DC Output Port: $\pm 2\text{kV}$        | IEC/EN61000-4-4:2012, Criteria A                              |
| Surge Immunity                                                                                                    | DC Power Port: Symmetric: 1kV<br>Asymmetric: 2kV                           | IEC/EN61000-4-5:2014+A1:2017,<br>Criteria A                   |
|                                                                                                                   | DC Output Port: Symmetric: 1kV<br>Asymmetric (Input to DIN-rail (PE)): 1kV |                                                               |
| Immunity to conducted disturbances, induced by radio-frequency fields                                             | 10Vrms (0.15-80MHz)                                                        | IEC61000-4-6:2013, Criteria A<br>EN61000-4-6:2014, Criteria A |

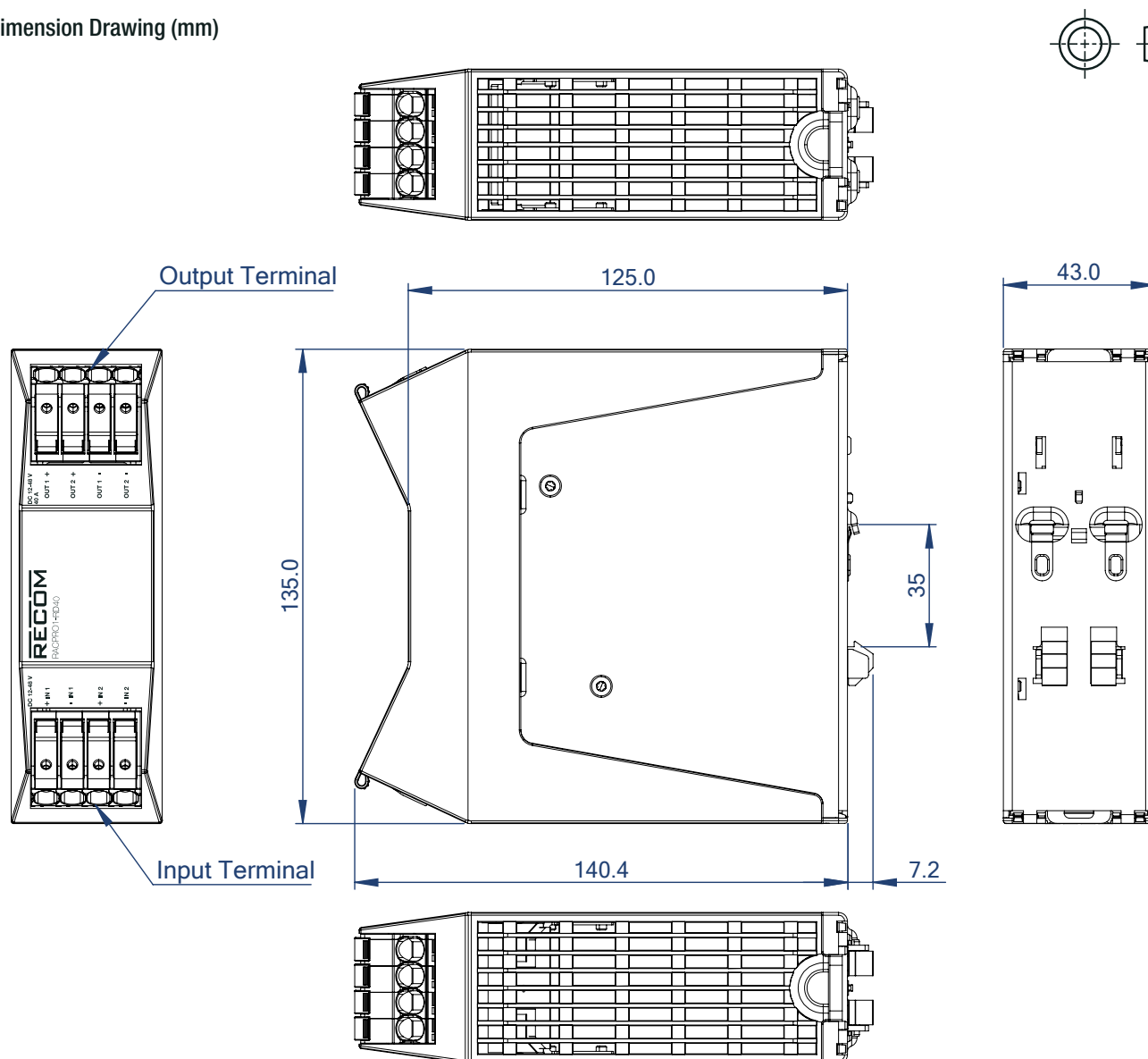
# RACPR01-RD40 Series ◇ Redundancy Module

40A ◇ Input: DC 9-56V & 2x 20A

## DIMENSION & PHYSICAL CHARACTERISTICS

| Parameter         | Type    | Value                                          |
|-------------------|---------|------------------------------------------------|
| Material          | chassis | polycarbonate (UL94 V-0) / aluminum            |
| Dimension (HxWxD) |         | 135.0 x 43.0 x 140.4mm<br>5.3 x 2.0 x 6.1 inch |
| Weight            |         | 260g<br>0.57 lbs                               |

Dimension Drawing (mm)



Tolerance:  $\pm 0.5\text{mm}$

### Input & Output Cage Clamp

| Connector                      | AWG  | mm <sup>2</sup> |
|--------------------------------|------|-----------------|
| Input                          | 24-8 | 0.25-6          |
| Output                         | 24-8 | 0.25-6          |
| Wire stripping length: 12-13mm |      |                 |

Note5: It is recommended to use flexible (stranded) or solid cables with the above mentioned cross-section. Ferrules are required for flexible cables. Use copper conductors designed for an operating temperature of at least 105°C.

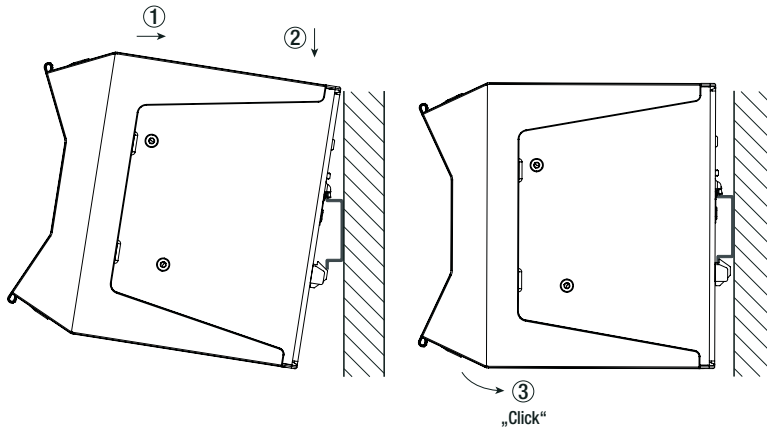
Each terminal connection is only approved for a current of up to 35A. For higher output currents, it is necessary to connect the pole pairs of the output terminal in parallel.

### INSTALLATION & APPLICATION

#### Mounting Instruction

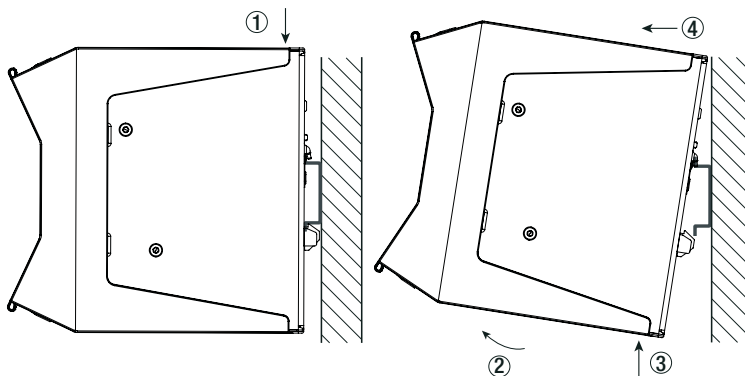
Mounting Rail: Standard TS35 DIN Rail in accordance with EN 60715.

#### Mounting



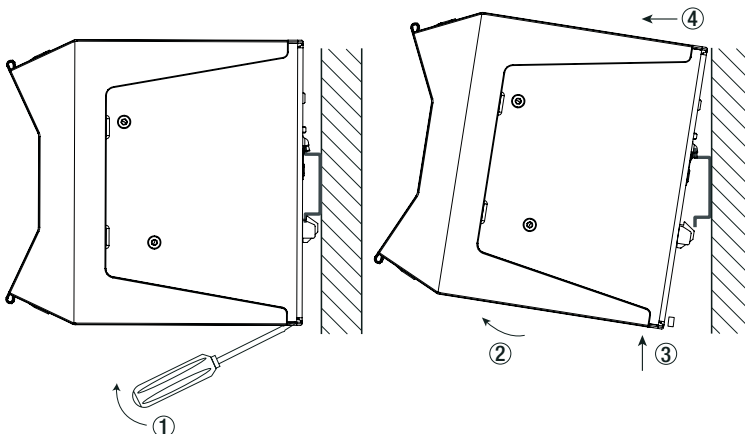
1. Place the device on the DIN rail with a slight upward tilt. Snap the device into the DIN rail.
2. Now tilt the device downwards until it reaches the lower part of the DIN rail.
3. Press the lower part of the device firmly against the rail until the device locks into position on the DIN rail.
4. To make sure it is securely locked in place, give the device a gentle shake.

#### Release Option 1 (tool-less)



1. Press the unlock button on the top of the device to release the latch from the rail.
2. While pushing the button, slightly tilt the device forward.
3. Pull the device away from the DIN rail by pushing it up.
4. Remove the power supply completely from the rail.

#### Release Option 2 (by using a screwdriver)



1. Pull the DIN rail latch by using a screwdriver OUT of the device and HOLD it.
2. Tilt the bottom of the device OUT.
3. Pull the device away from the DIN rail by pushing it up.
4. Remove the power supply completely from the rail.

Technical Data Sheet

# RACPR01-RD40 Series ♦ Redundancy Module

## 40A ♦ Input: DC 9-56V & 2x 20A



INSTALLATION & APPLICATION

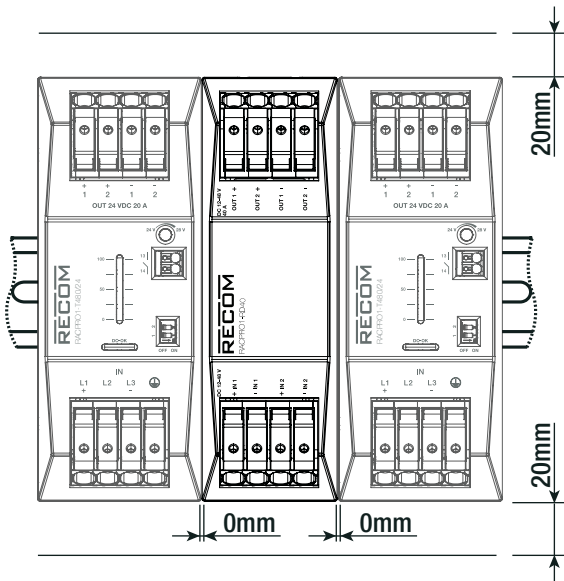
Installation Instructions

To guarantee sufficient convection cooling, keep a distance of 20mm above and below the device.

For vertical mounting the device should be installed with the input terminal on bottom side (standard mounting orientation). Mounting with the output terminals at the bottom (upside-down) has no impact on the thermal behavior.

For all other mounting orientations, the maximum output power must be reduced by 15% of the nominal power.

No space between supplies is required when the PSUs are from RECOM RACPR01 series.



PACKAGING INFORMATION

| Parameter                   | Type           | Value                  |
|-----------------------------|----------------|------------------------|
| Packaging Dimension (LxWxH) | cardboard box  | 175.0 x 166.0 x 59.0mm |
| Packaging Quantity          |                | 1 pc                   |
| Storage Temperature Range   |                | -40°C to +85°C         |
| Storage Humidity            | non-condensing | 85% RH max.            |

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.