Technical Data Sheet

RACPRO1-4SP/BS Series ◊ e-fuse

4-Channel 5 & 10A ◊ Input: 24VDC

RECOM ACCESSORIES

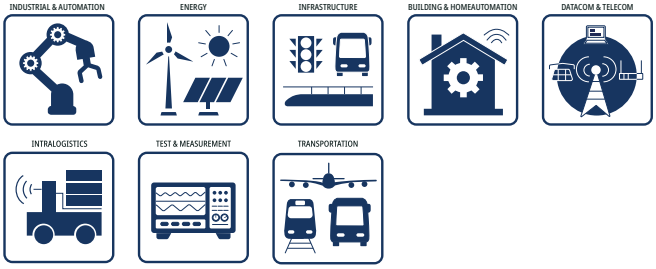
FEATURES

- 4 channel e-Fuse with 4x5A or 4x10A
- Safe start against highly capacitive loads up to 6mF/A
- Smooth ramp up of output voltage
- Overload priority channel protection
- Current adjustment in offline mode
- Output hiccup or tripping mode adjustable by buttons
- Smart hiccup protection with increasing time intervals
- Short circuit protection & power boost 150%/5s
- Adjustable power limit & load indication by LED
- DC-OK signal & reset by remote Control
- Smallest Size 100 x 22 x 110.7mm
- Full Power up to 60°C
- Made in Europe with 3 years warranty



Dimensions (HxWxD): 100 x 22.2 x 110.7mm (3.94 x 0.87 x 4.36 inch)
145g (0.32 lbs)

APPLICATIONS



SAFETY & EMC

RoHS2 compliant 10 from 10 | Reach compliant | CE | IECEE CB SCHEME | cULus E224736

DESCRIPTION

The RECOM RACPRO1-4SP/24/xxA-BS is a compact 4-channel electronic fuse (e-Fuse) in a slim 'book shape' format, measuring only 22 mm wide. Each independent 24 VDC output has own preset overcurrent limit, ensuring that a fault on one channel does not affect the others to maintain maximum system reliability.

Real-time output current monitoring is shown via LED indicators that change from green/yellow (normal operation) to orange (>80% Inom.) to red (power boost active). A DC-OK signal enables remote monitoring, while individual ON/OFF control per channel simplifies maintenance and fault diagnostics. Available in 4×5A or 4×10A versions, the modules offer full output power up to 60°C ambient, a 150% power boost for 5 seconds, >150% overload for up to 100ms to avoid nuisance tripping, and feature sequential power-up and smooth output ramping to reduce inrush currents and to safely handle highly capacitive or inductive loads. Under system overload conditions, channels disconnect in reverse priority order, keeping essential loads active longer. Users can select between overcurrent hiccup (auto-reset) or trip mode and set current limits easily offline, making the RACPRO1-4SP/24/xxA-BS ideal for reliable and user-friendly power distribution.

The unique smart hiccup mode with increasing time intervals reduces the electrical and thermal stress on the e-Fuse and the connected components if the load is higher than the output power of the power supply. The product is certified according to the global safety standards IEC/EN/UL 62368-1. The e-Fuse modules are made in Europe and come with a 3-year warranty.

SELECTION GUIDE

Part Number	Input Voltage Range [VDC]	Output Voltage nom. [VDC]	Output Channels [ ]	Output Current per Channel [A]	Efficiency typ. (1) [%]	rated Output Power per Channel (2) [W]
RACPRO1-4SP/24V/5A/BS	22-29	24	4	5	99	120
RACPRO1-4SP/24V/10A/BS	22-29	24	4	10	99	240

Note1: Efficiency is tested at nominal input 24VDC, 100% load each output and +25°C ambient.

Note2: Boost Power 150% for 5sec max., over the entire operating ambient temperature range; refer to **„Boost Power"**.

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RACPRO1-4SP/BS Series ◊ e-fuse

4-Channel 5 & 10A ◊ Input: 24VDC

MODEL NUMBERING

RACPRO1-4SP/24V/ A/BS

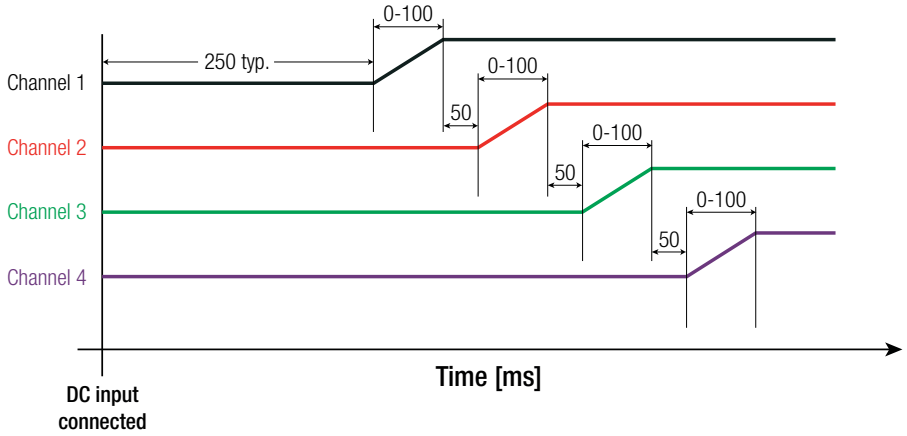
- 4SP: integrated 4 channel eFuse
- 24V: Nom. Output Voltage
- A: Max. Output Current / Channel
- BS: Book Shape package

BASIC CHARACTERISTICS (measured @ T_{AMB}= 25°C, nom V_{IN}= 24VDC, rated load, unless otherwise stated)

Parameter	Condition		Min.	Typ.	Max.
Nominal Input Voltage				24VDC	
Operating Input Range			22VDC		29VDC
Absolute Maximum Input Voltage	no damage to the device				29VDC
Turn-on Voltage				21.5VDC	
Turn-off Voltage	Channel 1			17.5VDC	
	Channel 2			18.5VDC	
	Channel 3			19.5VDC	
	Channel 4			20.5VDC	
Input Current	nom. V_{IN}= 24VDC	RACPRO1-4SP/24V/5A/BS			20.1A
		RACPRO1-4SP/24V/10A/BS			40.1A
No Load Power Consumption	nom. V_{IN}= 24VDC			1.5W	
Internal Consumption				100mA	
Nominal Output Voltage				24VDC	
Output Current (per channel)	nom. V_{IN}= 24VDC	RACPRO1-4SP/24V/5A/BS		5A	
		RACPRO1-4SP/24V/10A/BS		10A	
Voltage Drop	Input to Output				250mV
Minimum Load			0%		
Turn-On delay of Outputs				refer to **„Start-up Sequence“**	
Ripple and Noise	20MHz bandwidth				65mVp-p
Maximum Capacitive Load (per channel)	RACPRO1-4SP/24V/5A/BS		30mF		
	RACPRO1-4SP/24V/10A/BS		60mF		

Start-up Sequence

The graph illustrates the staggered start-up sequence of the four output channels. Each channel is enabled sequentially to ensure controlled power-up of the connected loads.



The first channel starts up after a typical delay of 250 ms. Subsequent channels are enabled sequentially, with a 50 ms delay between channels. Each subsequent channel is initiated once the previous channel has started successfully, or once its maximum start-up time of 100 ms has elapsed.

For channels 2 and above, start-up is initiated only if the preceding channel is neither ramping up nor in protection mode. The actual start-up time within the 0–100 ms range depends on the connected load. This controlled start-up sequence minimizes system stress and supports loads with high capacitive or inductive characteristics.

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RACPRO1-4SP/BS Series ◊ e-fuse

4-Channel 5 & 10A ◊ Input: 24VDC

RECOM ACCESSORIES

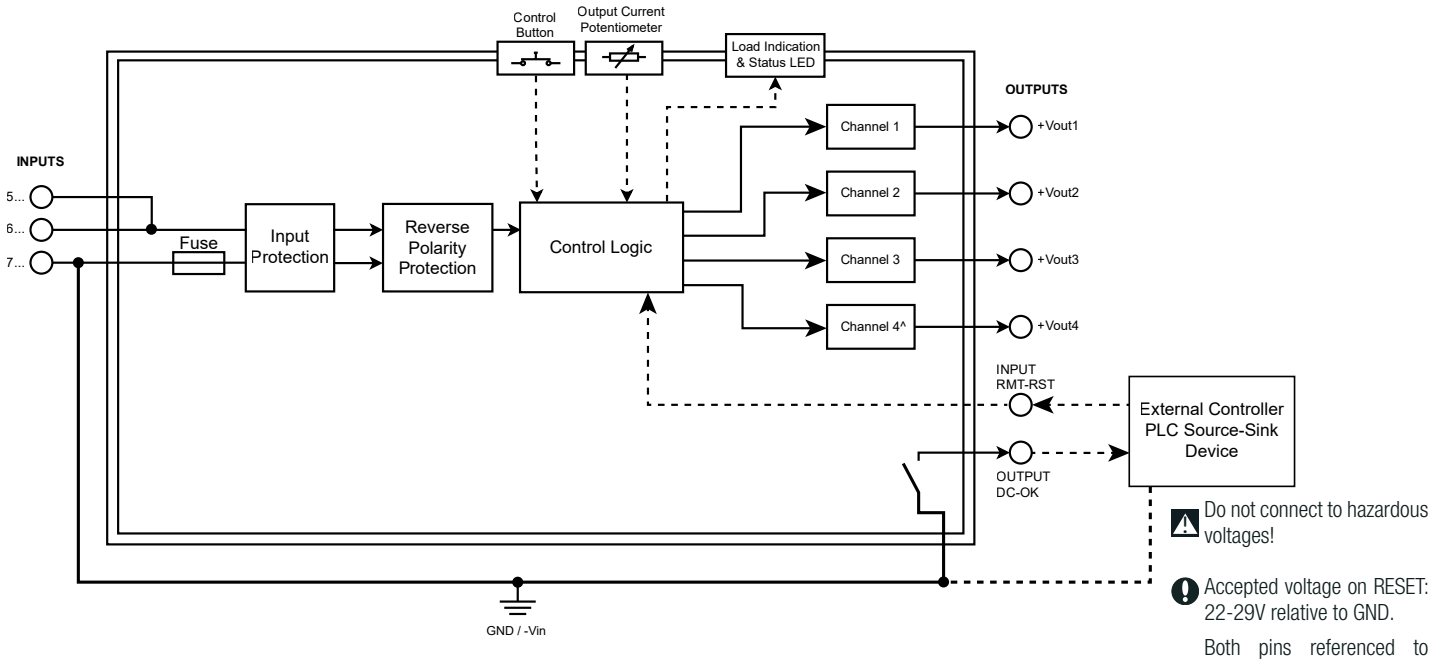
ADDITIONAL FEATURES

Parameter	Condition		Value
Output Current Range (adjustable)	detented potentiometer, 8 selectable current limits steps	RACPRO1-4SP/24V/5A/BS	1.5A, 2A, 2.5A, 3A, 3.5A, 4A, 4.5A, 5A
		RACPRO1-4SP/24V/10A/BS	3A, 4A, 5A, 6A, 7A, 8A, 9A, 10A
Boost Power	refer to **„Boost Power“** over the entire operating range up to 70°C		150% for 5s
Load Indication LED			refer to **„LED STATUS Indication** (1)“
DC-OK Signal (3)	closed (= input GND)		output voltage ok, normal mode
	open		abnormal mode, no operation or failure of one or more channels
Remote Reset Input (4)	referred to input ground		yes, by applying 22-29VDC
Signal Contact Rating	do not connect signaling contact to hazardous voltages		30VDC/0.1A

Note3: The DC-OK contact opens if one or more channels are in an abnormal condition (e.g. overload, brownout or fault); otherwise, the contact remains closed.

Note4: Do not connect remote reset input to hazardous voltages!

BLOCK DIAGRAM



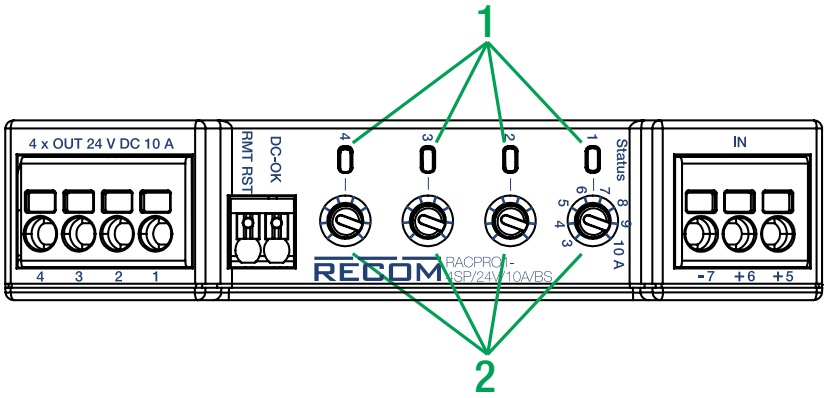
Do not connect to hazardous voltages!

Accepted voltage on RESET: 22-29V relative to GND.

Both pins referenced to input GND, not galvanically isolated!

Source sand sink must share common GND.

FRONT PANEL ELEMENTS



1. LED Status Indicator (refer to **„LED STATUS Indication** (1)“

2. Output current potentiometer / Control buttons (refer to next page)

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CONTROL BUTTON (2)

The e-Fuse module provides advanced, individually controllable protection channels with user-configurable locking, protection modes, and current limiting functions.
All settings and status indications are managed via the front-panel push buttons and multi-color LED indicators.
The menu remains active for 8 seconds. Each button press resets the 8-second time-out.

NORMAL BUTTON OPERATION

1. Turn off an active channel (press corresponding control button)
2. Turn a channel that was in latch-shutoff due to overcurrent back on (press corresponding control button)

CHANNEL BUTTON LOCK / UNLOCK (Menu 1)

1. Press and hold the control button of **Channel 1** for 3 seconds to enter the button lock / unlock menu. All LEDs will turn white, indicating entry into **Menu 1**.
2. Press the corresponding channel button to toggle the lock status of the selected button.
3. Menu 1 closes automatically after 8 seconds of inactivity.

LED Indication	Meaning
Blinking white (0.5 s ON / 0.5 s OFF) repeat	Button LOCKED
Steady (non-blinking white)	Button UNLOCKED (factory set)

PROTECTION-MODE SELECTION (Menu 2)

1. Press and hold the control button of **Channel 2** for 3 seconds to enter the protection-mode menu. All LEDs turn purple to indicate that the **Menu 2** is active.
2. Press the corresponding channel button to toggle the protection mode of the selected output channel.
3. Menu 2 closes automatically after 8 seconds of inactivity.

LED Indication	Meaning
Blinking purple (0.5 s ON / 0.5 s OFF) repeat	LATCH-OFF mode
Steady (non-blinking purple)	HICCUP mode (factory set)

OUTPUT CURRENT LIMIT ADJUSTMENT (2)

The device offers 8 selectable current limit steps per channel.
At 24 V output, the adjustable range refer to **„Output Current Range (adjustable)“** and can be also adjusted in offline mode.

LED STATUS INDICATION (1)

One LED/channel for displaying actual and target current or various status messages of the corresponding channel.

LED indication	Blinking pattern	Status
green light	steady	channel active <80% INOM
orange light	steady	channel active >80% INOM
red light	steady	power boost activated
orange blinking	1.0s OFF / 1.0s ON; repeat	channel deactivated
red blinking	1.0s OFF / 1.0s ON; repeat	channel in reset state, overload protection
orange blinking	1.0s OFF / 0.25s ON / 0.25s OFF / 0.25s ON; repeat	channel in reset state, brownout (undervoltage) protection
red blinking *	1.0s OFF / 0.25s ON / 0.25s OFF / 0.25s ON; repeat	channel in reset state, fault (overtemperature at input terminal)
white light	steady	MENU 1: channel lock menu (Channel-button unlocked)
purple light	steady	MENU 2: reset menu (Hiccup mode)
white blinking	0.5s OFF / 0.5s ON; repeat	MENU 1: channel (Button) locked
purple blinking	0.5s OFF / 0.5s ON; repeat	MENU 2: latch OFF mode activated

* only available for 10A-Version

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RACPRO1-4SP/BS Series ◊ e-fuse

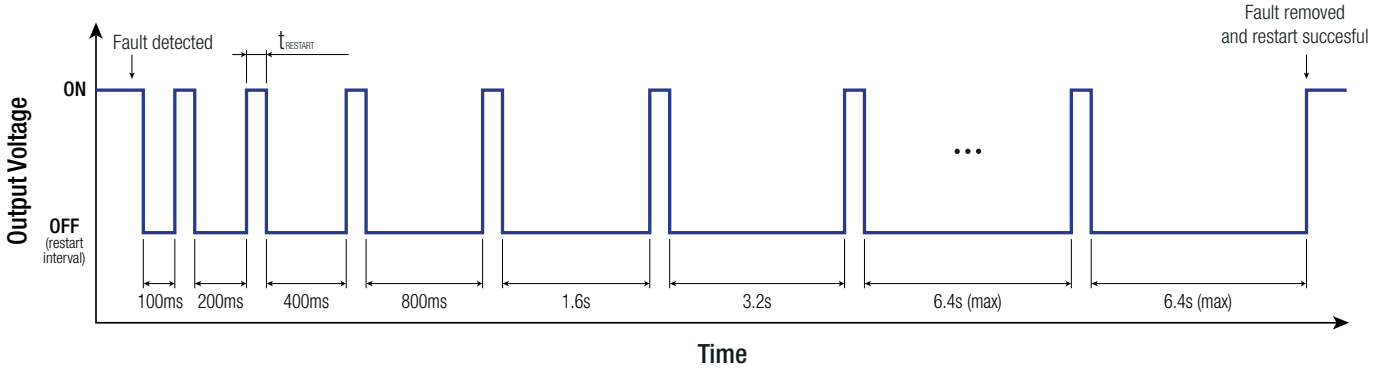
4-Channel 5 & 10A ◊ Input: 24VDC

RECOM ACCESSORIES

PROTECTIONS (measured @ T_{AMB}= 25°C, nom V_{IN}= 24VDC, rated load, unless otherwise stated)

Parameter	Type		Value
Internal Input Fuse	in GND path	RACPRO1-4SP/24V/5A/BS	T15A, slow-blow
		RACPRO1-4SP/24V/10A/BS	T25A, slow-blow
Short Circuit Protection (SCP)	selectable via Channel-Button		latch off or hiccup mode
	in brownout condition		refer to below smart hiccup
Return Voltage Immunity			35VDC max., dynamically
Over Current Protection (OCP)	latch off or hiccup mode (refer to below graph), selectable via Button		>150% of rated Output Current
Tripping Characteristic	at short circuit		120ms max.
			5s min. / 5.5s typ. (at 150% load)
Tripping Delay			100ms typ.
Class of Equipment			Class III

Smart hiccup mode with increasing restart intervals



In the event of a brownout condition, for example when the output load exceeds the power that the input supply can provide and the input voltage consequently drops, the Smart Hiccup function is activated. The output is switched off and periodic restart attempts are performed. The time between restart attempts is progressively increased from 100 ms to 200 ms, 400 ms, 800 ms, 1.6 s, 3.2 s and finally to a maximum of 6.4 s.

If the brownout condition is still present during a restart attempt, the output is switched off again and the next restart attempt is performed after the corresponding interval. Once the maximum interval of 6.4 s has been reached, restart attempts continue every 6.4 s until the brownout condition is removed. In the event of an output overload or short circuit without a corresponding input-voltage breakdown, the standard hiccup or latch-off protection mode is activated instead, depending on the configured operating mode.

This Smart Hiccup behavior reduces repetitive restart attempts during a persistent brownout condition, thereby reducing electrical and thermal stress on the eFuse, connected system components, and associated wiring. At the same time, normal operation can resume quickly once the condition causing the brownout has been removed.

ENVIRONMENTAL (measured @ T_{AMB}= 25°C, nom V_{IN}= 24VDC, rated load, unless otherwise stated)

Parameter	Condition		Value
Operating Ambient Temperature Range	@ natural convection (0.1m/s), with derating		-40°C to +70°C
Operating Altitude [5]			5000m
Operating Humidity	non-condensing		5-95% 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 8.4 -150Hz @ 2G, 10 cycles /axis(min-max-min); 1 octave/min
MTBF	according to EN/IEC 61709 (SN29500)		1031 x 10^3 hours
Lifetime Expectancy	T_{AMB}= 40°C @ 100% Load	RACPRO1-4SP/24V/5A/BS	47 x 10^3 hours
		RACPRO1-4SP/24V/10A/BS	51 x 10^3 hours

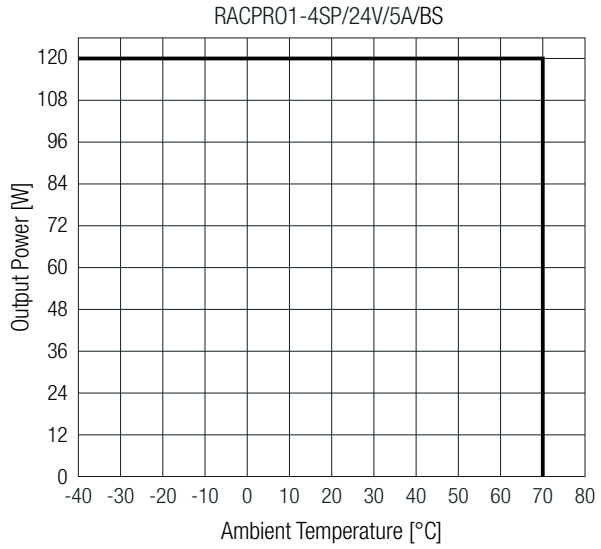
Note5: Recognized by safety agency for safe operation up to 5000m. High altitude operation may impact the performance and lifetime

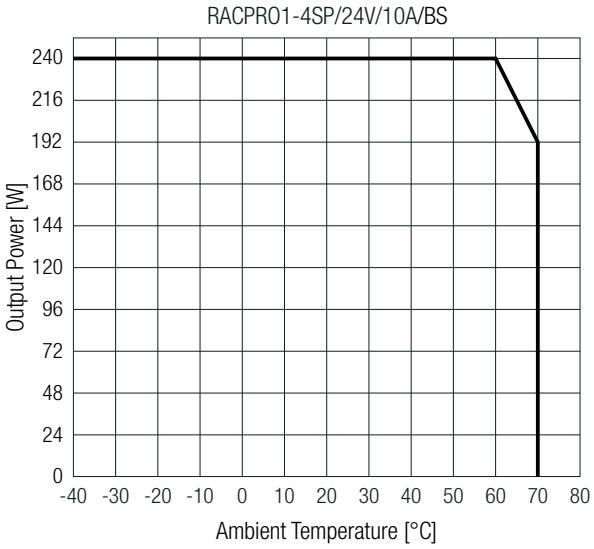
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ENVIRONMENTAL (measured @ T_{AMB}= 25°C, nom V_{IN}= 24VDC, rated load, unless otherwise stated)

Derating Graph (per channel)

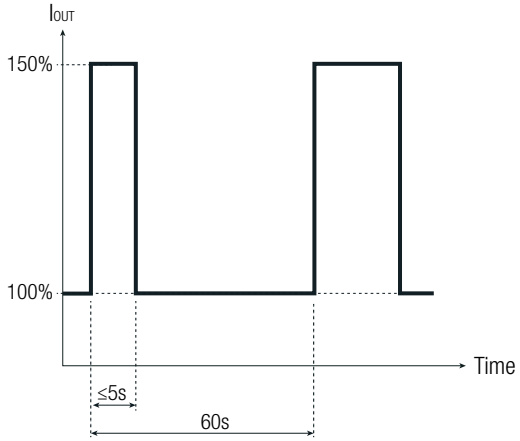
(Standard orientation and natural convection 0.1m/s)





Boost Power

(V_{IN}= 22-29VDC, -40°C to +60°C)



SAFETY & CERTIFICATIONS

Certificate Type (Safety)	Report Number	Standard
Audio/Video, information and communication technology equipment - Part 1: Safety requirements (CB)	E224736-A6033-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-A6033 -UL	UL62368-1:2019 3rd Edition CAN/CSA-C22.2 No. 62368-1-19 3rd Edition
RoHS2		RoHS 2011/65/EU + AM2015/863

EMC Compliance according to IEC/EN61000-6-2/6-3	Condition	Standard / Criterion
Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments		IEC/EN61000-6-2:2019
Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential area	Class B (input); Class A (output)	IEC/EN 61000-6-3:2021
ESD Electrostatic discharge immunity test	Air: ±8kV	IEC61000-4-2:2008, Criteria A EN61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	10V/m (80-6000MHz)	IEC/EN61000-4-3:2006+A2:2010, Criteria A
Fast Transient and Burst Immunity	DC-Input/Output Ports: ±2kV	IEC/EN61000-4-4:2012 Criteria A
Surge Immunity	DC-Input/Output Port: V(+) - V(-): ±1kV V(+)-PE, V(-)-PE: ±2kV	IEC/EN61000-4-5:2014+A1:2017, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	10Vrms (0.15-80MHz)	IEC61000-4-6:2013, Criteria A EN61000-4-6:2014, Criteria A

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RACPRO1-4SP/BS Series ◊ e-fuse

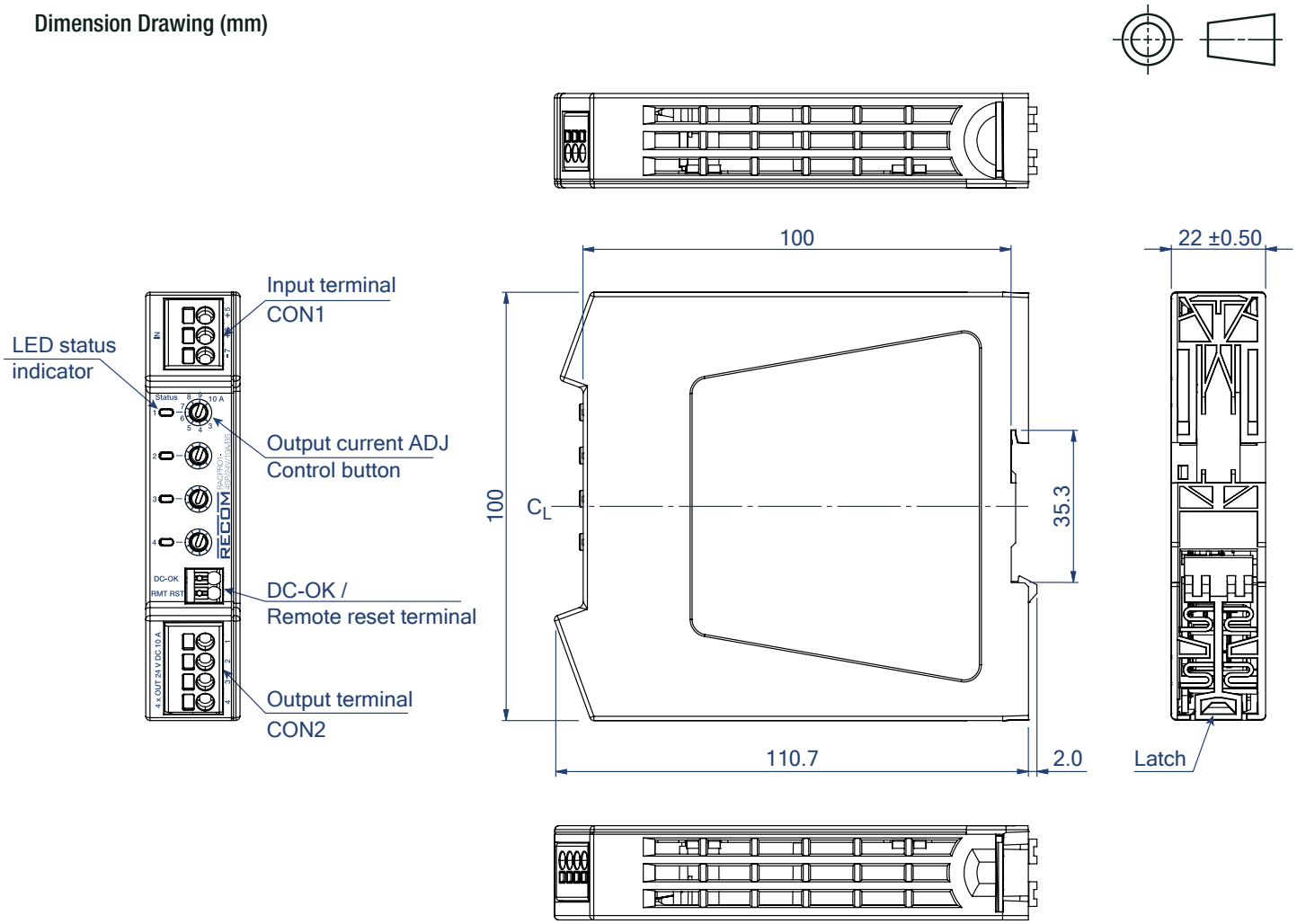
4-Channel 5 & 10A ◊ Input: 24VDC

RECOM ACCESSORIES

DIMENSION & PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	chassis	polycarbonate (UL94 V-0)
Dimension (HxWxD)		100 x 22 x 110.7mm 3.94 x 0.87 x 4.36 inch
Weight		145g 0.32 lbs

Dimension Drawing (mm)



Push-In Input Terminal (7, 8)

#	Function	AWG	mm²
+5, +6	+Vin	26-12	0.2-2.5
-7	-Vin	26-12	0.2-2.5
Wire stripping length: 10-11mm			

Push-In Output Terminal (7)

#	Function	AWG	mm²
1, 2, 3, 4	+Vout	26-14	0.2-2.0
Wire stripping length: 10-11mm			

Push-In Signal/Reset Terminal (7)

Function	AWG	mm²
Signal	28-16	0.25-1.5
Wire stripping length: 8-9mm		

Do not connect to hazardous voltages

Note6: Use flexible (stranded wire) or solid cables with above wire cross-section is recommended.
Use copper conductors designed for an operating temperature of at least 105°C.

Note7: Ferrules are required for flexible cable.

Note8: For input currents >20 A, both +Vin terminals (5 and 6) must be connected using separate 2.5 mm² conductors to ensure proper current sharing.
Incorrect wiring may trigger the thermal protection of the input terminal (Fault).

Tolerance: ±0.5mm

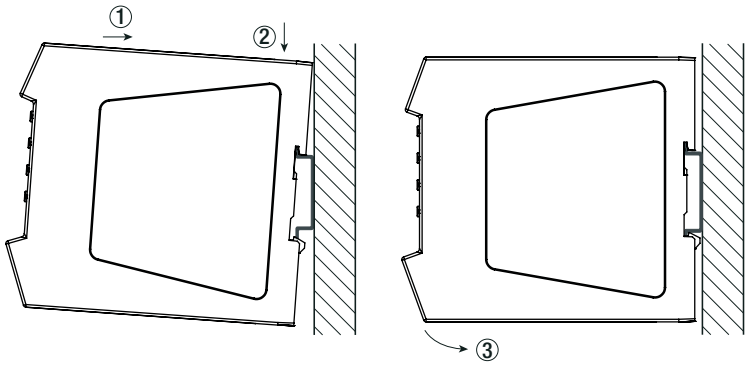
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INSTALLATION

Mounting Instruction

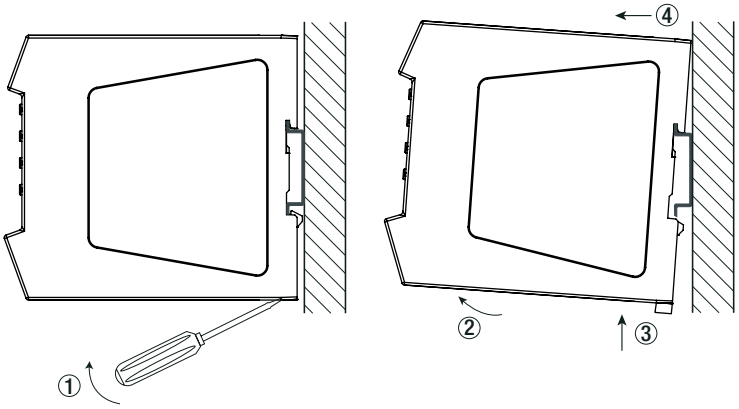
Mounting Rail: Standard TS35 DIN Rail in accordance with EN 60715.

Mounting



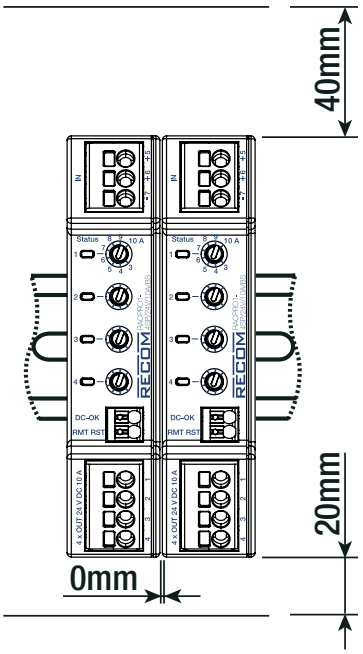
1. Place the device on the DIN rail with a slight upward tilt. Snap the device into the DIN rail.
2. Now tilt the device downwards until it reaches the lower part of the DIN rail.
3. Press the lower part of the device firmly against the rail until the device locks into position on the DIN rail.
4. To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

Release



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.

Installation Instructions



To guarantee sufficient convection cooling, keep a distance of 40mm above and 20mm below the device.

For vertical mounting the device must be installed with the input terminal on top (standard orientation).

No spacing between adjacent devices is required. No derating is required at ambient temperatures ≤ 40 °C.

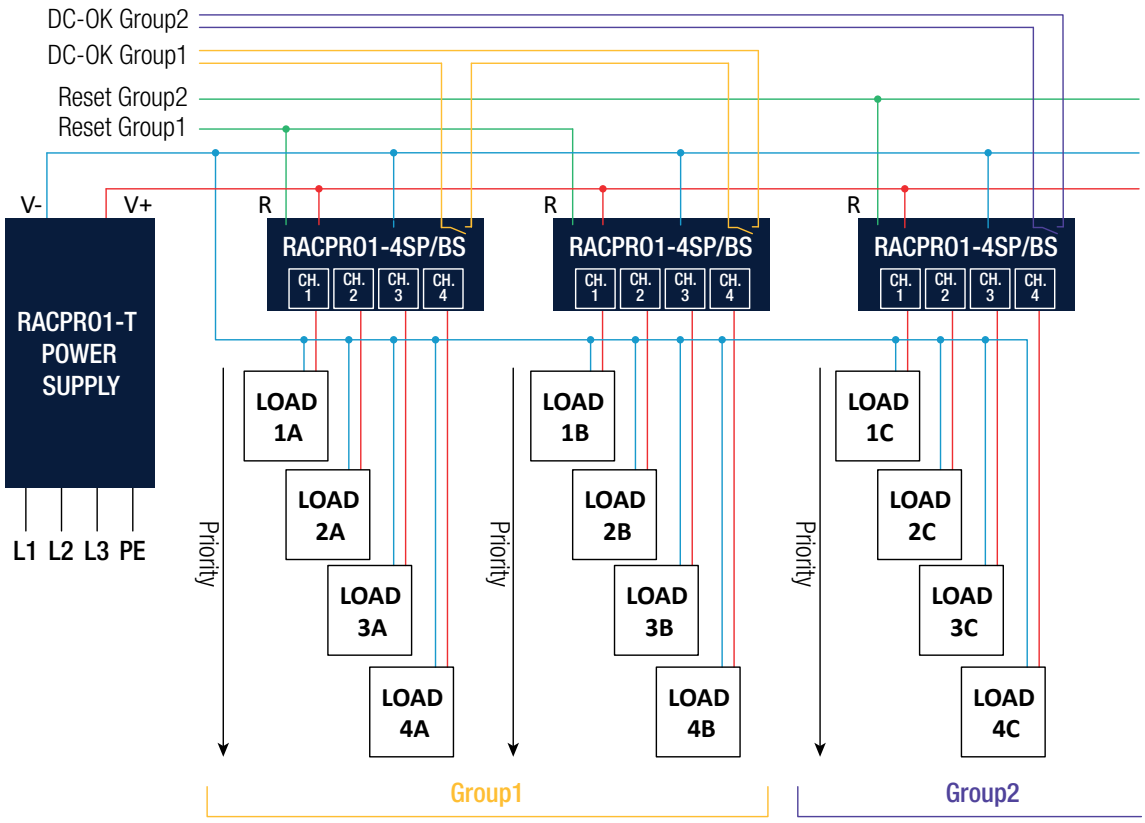
For all other mounting orientations, please get in contact with RECOM.

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RACPRO1-4SP/BS Series ◊ e-fuse

4-Channel 5 & 10A ◊ Input: 24VDC

APPLICATION EXAMPLE



PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	cardboard box	127.0 x 105.0 x 37.0mm
Packaging Quantity		1 pc
Storage Temperature Range		-40°C to +85°C
Storage Humidity	non-condensing	95% RH max.

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Binzackerstrasse 33
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