

Empowering the All Electric Society 

Internal use only

**100** years of passion for  
technology and innovation

Welcome

# TRIO POWER 3RD Generation



Power supplies

# TRIO POWER



Power supplies

# Agenda

- Save space
- Flexible, robust and reliable
- Easy handling
- Smart diagnostics
- Advantages at a glance
- Product overview



# TRIO POWER – Advantages

Small design

Small overall width



- ✔ Save space
- Flexible, robust and reliable
- Easy handling
- Smart diagnostics

# Power supplies

# Save space



# TRIO POWER – Advantages

Small design

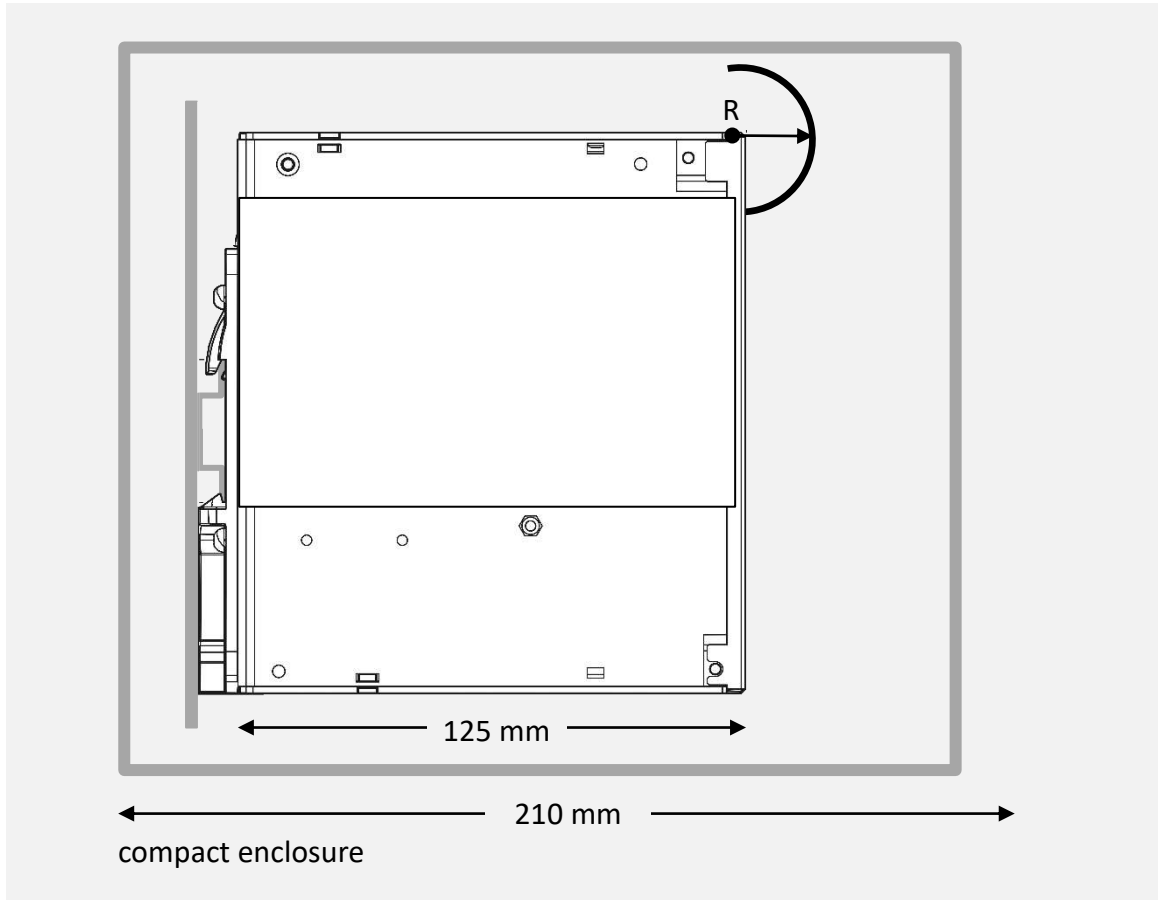
Small overall width

Low installation depth



- ✔ Save space
- Flexible, robust and reliable
- Easy handling
- Smart diagnostics

## Low installation depth



Reduced depth of 125 mm

- Enable access to small cabinets (AX 210 mm)
- Allows mounting of other components at the switch cabinet door

# TRIO POWER – Advantages

Small design

Small overall width

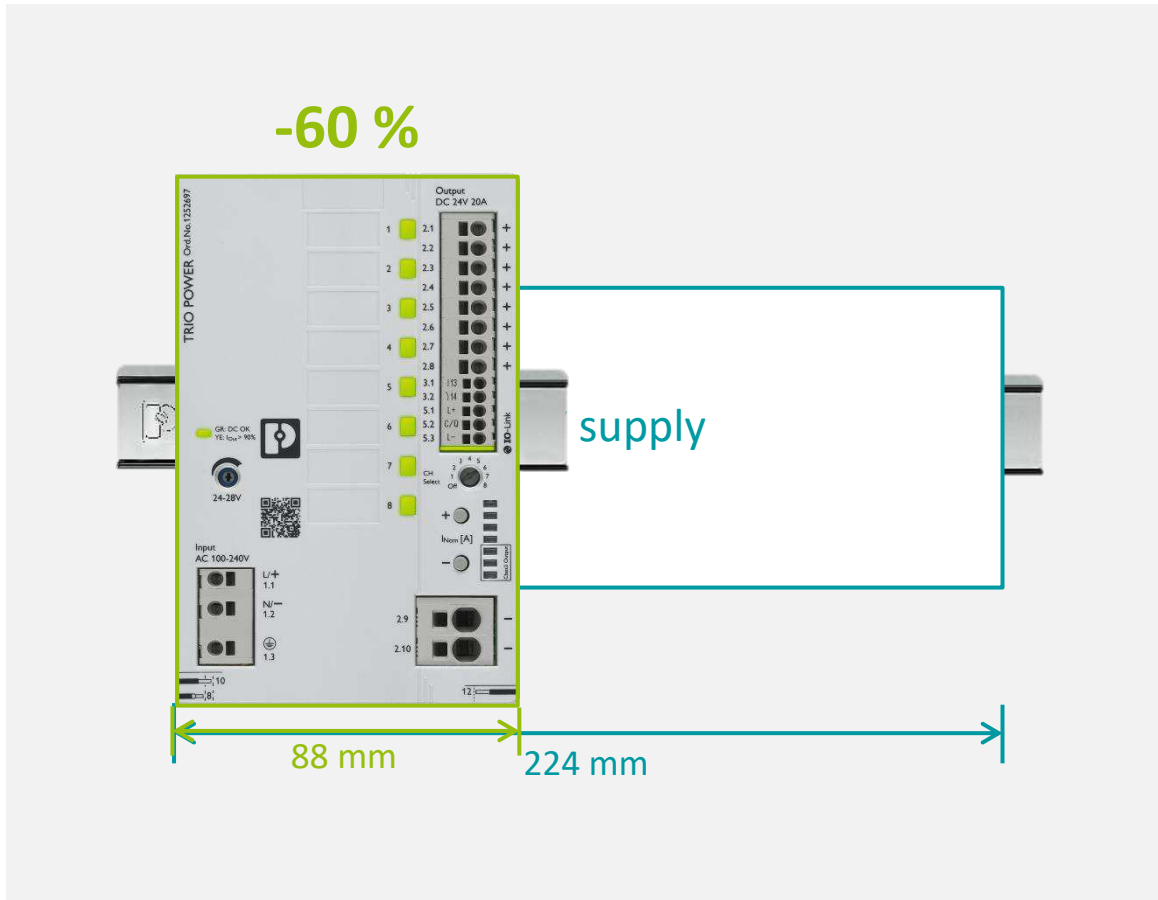
Low installation depth



- ✔ Save space
- Flexible, robust and reliable
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# Integration of electronic protection



Most common solution:

- Standard power supply + X standard circuit breaker
- ▶ The complete 24 V supply

Basic idea:

- Integration of the downstream protection devices in a compact integrated device

Implementation:

- ▶ Up to 60 % space savings in the cabinet



# TRIO POWER – Advantages

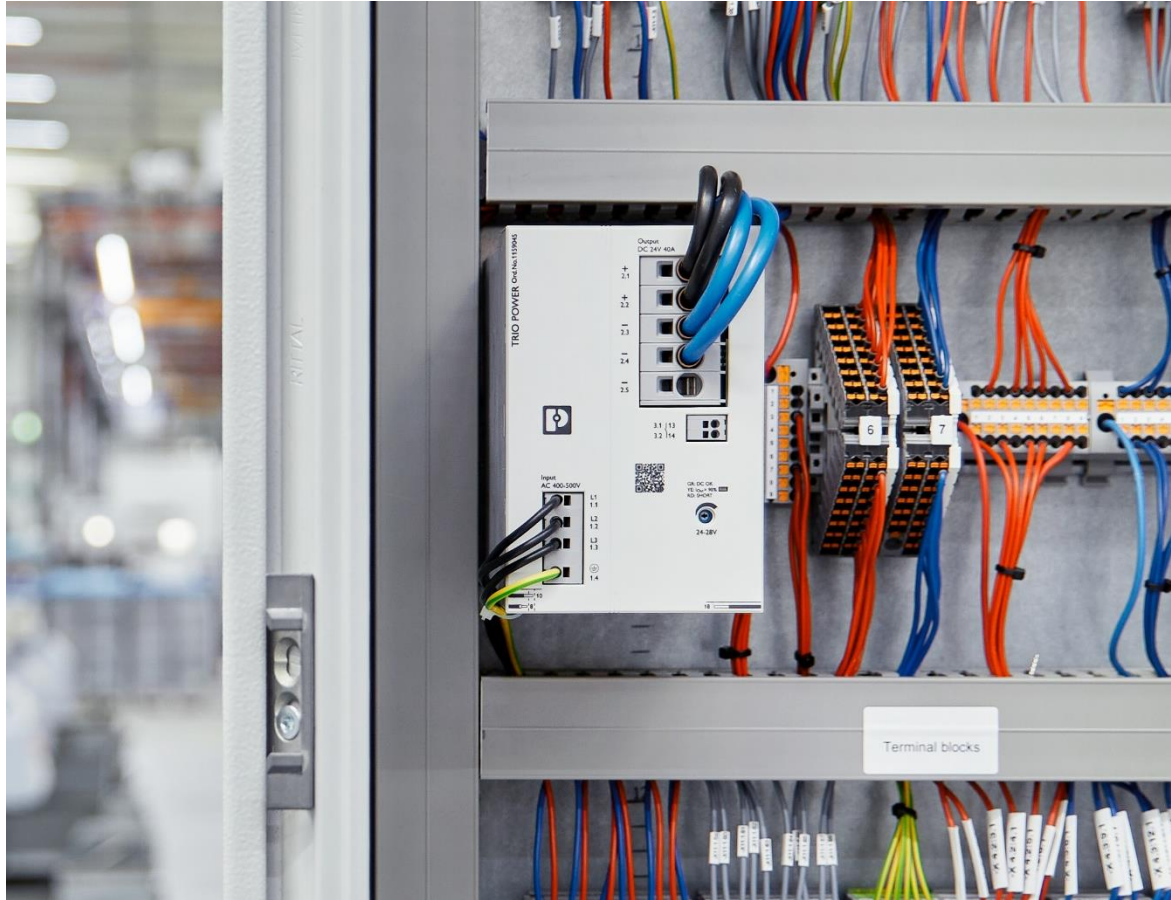
Portfolio for  
drive technology



- Save space
- ✓ Flexible, robust and reliable
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- Smart diagnostics

Power supplies

# Portfolio



Portfolio for drive technology

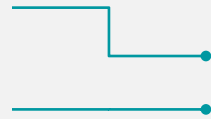
- High power up to 960 W
- Available in 1 AC/3 AC, 24 V DC
- Protection against regeneration up to 35 V DC resp.
- Slimmest 960 W device on the market (90 mm)

# TRIO POWER – Advantages

Portfolio for  
drive technology

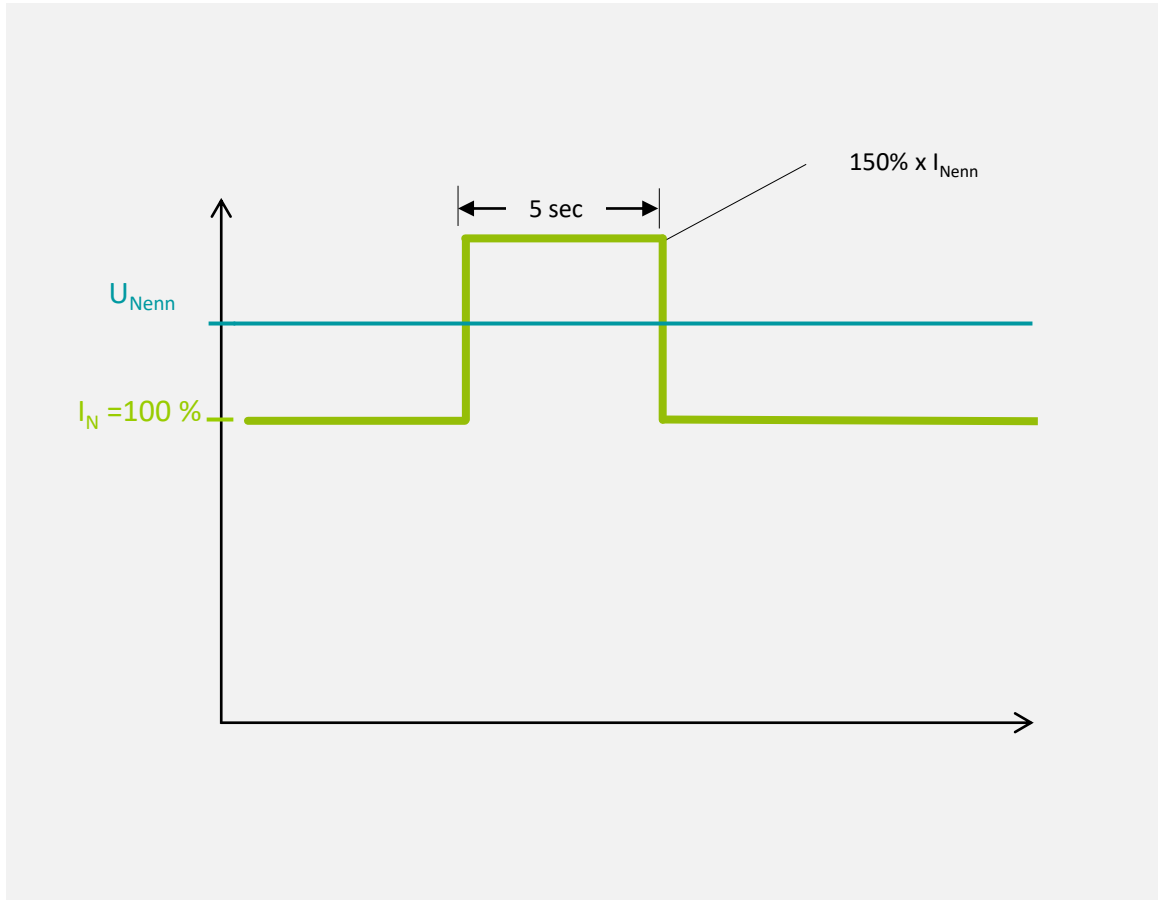
Dynamic boost

Reliable starting of difficult loads



- Save space
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# Dynamic power reserve



Reliable starting of difficult loads

Power supply **with** dynamics power reserve

What are the conditions?

▶ Preload: 100 %



▶ Recovery time:  $\leq 55$  s



▶ Ambient temperature: up to 70 °C



**System availability is given!**



# TRIO POWER – Advantages

**Portfolio for drive technology**

**Dynamic boost**

**Applicable worldwide**

Voltage range:

- 1 AC: 100-240 V -15/+10 %
- DC: 100-240 V  $\pm$ 10 %
- 3 AC: 400-500 V -20/+10 %



- Save space
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- Easy handling
- Smart diagnostics

# TRIO POWER – Advantages

Portfolio for drive technology

Dynamic boost

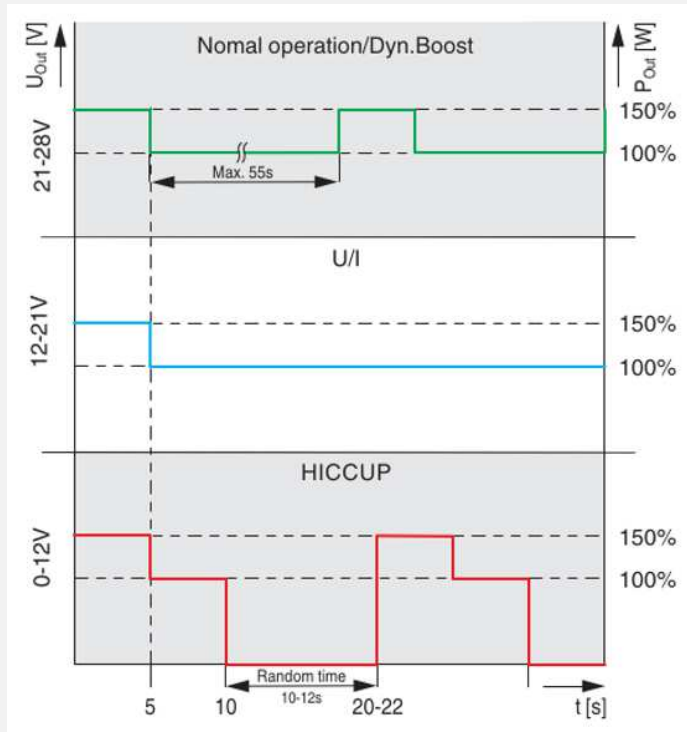
Applicable worldwide

Strong output characteristic and flexible tripping curve



- Save space
- ✓ Flexible, robust and reliable
- Easy handling
- Smart diagnostics

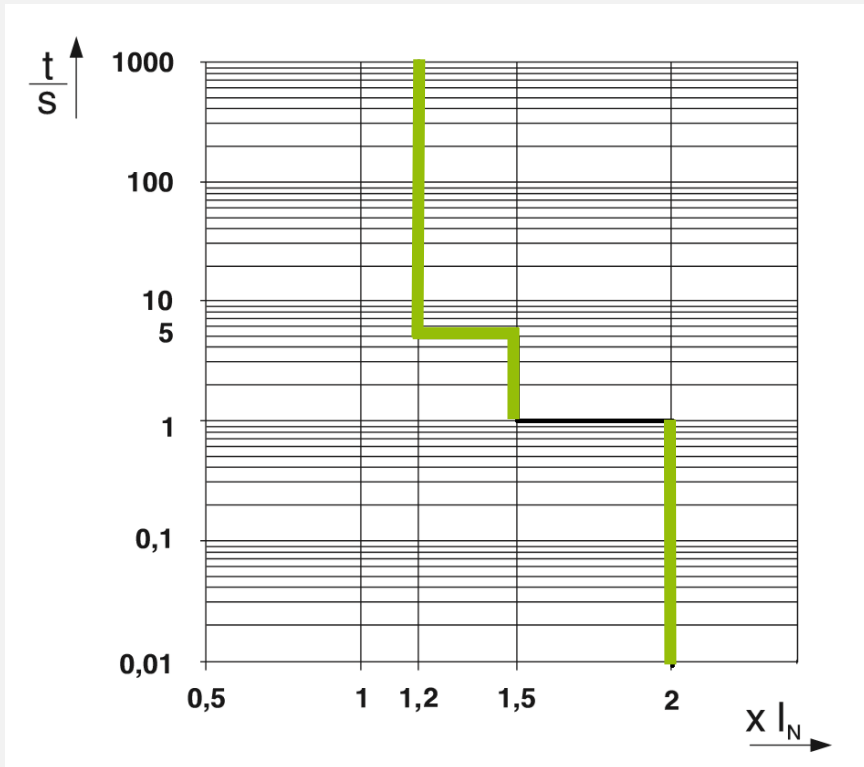
# Strong output characteristic: U/I Advanced



These are the advantages for **TRIO POWER** power supplies:

- Boost available in normal mode
  - ▶ Starting difficult loads ✓
- Constant current in U/I operation
  - ▶ Advantages in parallel operation ✓
- 5 s+5 s constant current cycle in hiccup operation
  - ▶ Reliable capacity charging and safe operation ✓

# Flexible tripping curve



These are the advantages for **TRIO POWER power supplies with integrated electronic protection:**

- 150 % x  $I_N$  dynamic boost for 5 s
  - ▶ Starting of difficult loads
- 120 % x  $I_N$  steady
  - ▶ Same as MCBs
- Fast tripping at 200 % x  $I_N$ 
  - ▶ Safe protection at overload



# TRIO POWER – Advantages

Portfolio for drive technology

Dynamic boost

Applicable worldwide

Strong output characteristic

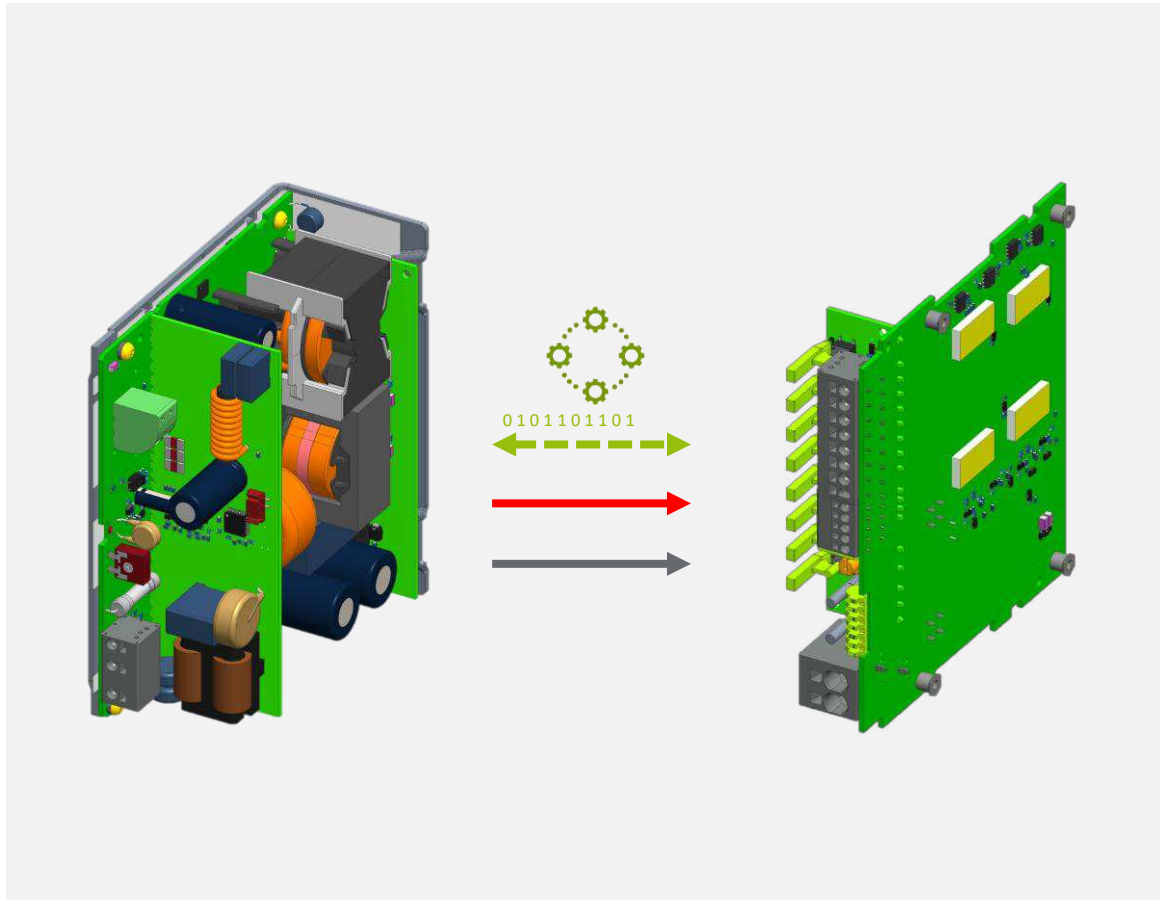
Integrated functions

Status monitoring of power supply and breaker module



- Save space
- ✓ Flexible, robust and reliable
- Easy handling
- Smart diagnostics

# Bidirectional communication

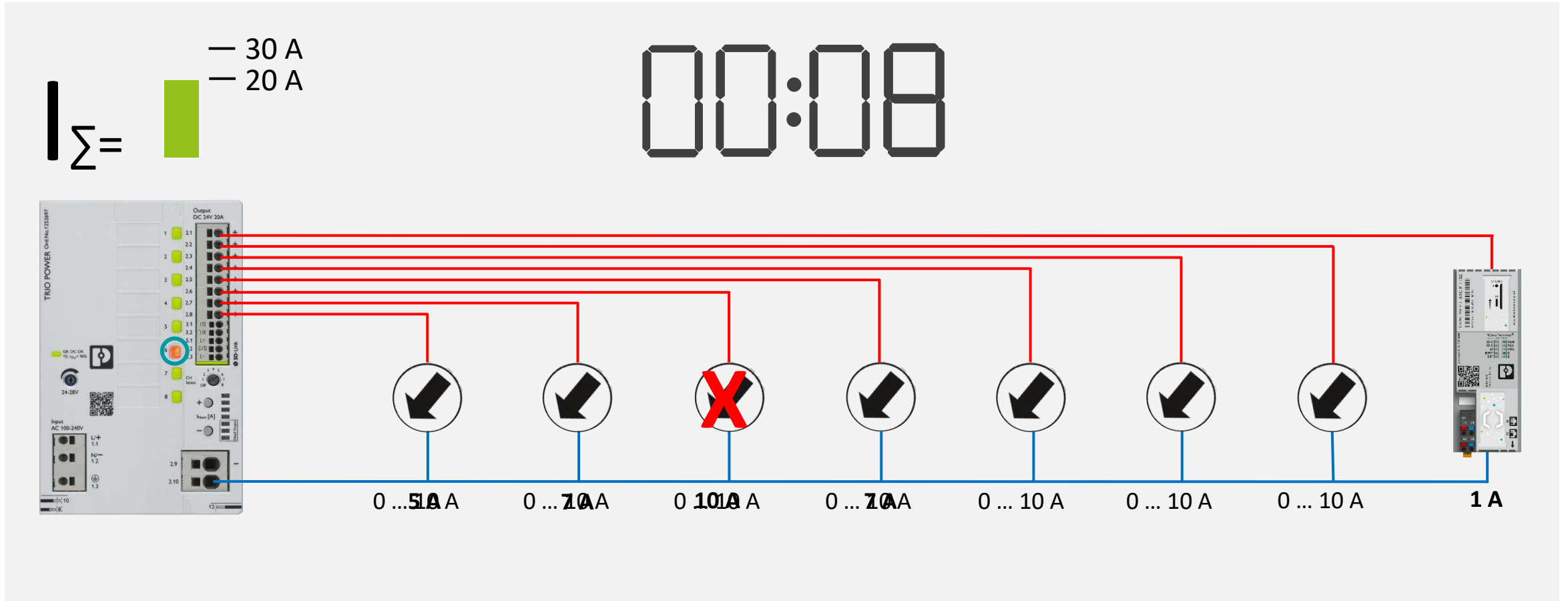


## Advantages

- Problematic channels are dropped in an emergency, depending on configuration, to protect the entire system from overload
- Guarantee safe operation of the NEC Class2 circuits

Power supplies

# Bidirectional Communication



# TRIO POWER – Advantages

Portfolio for drive technology

Dynamic boost

Applicable worldwide

Strong output characteristic

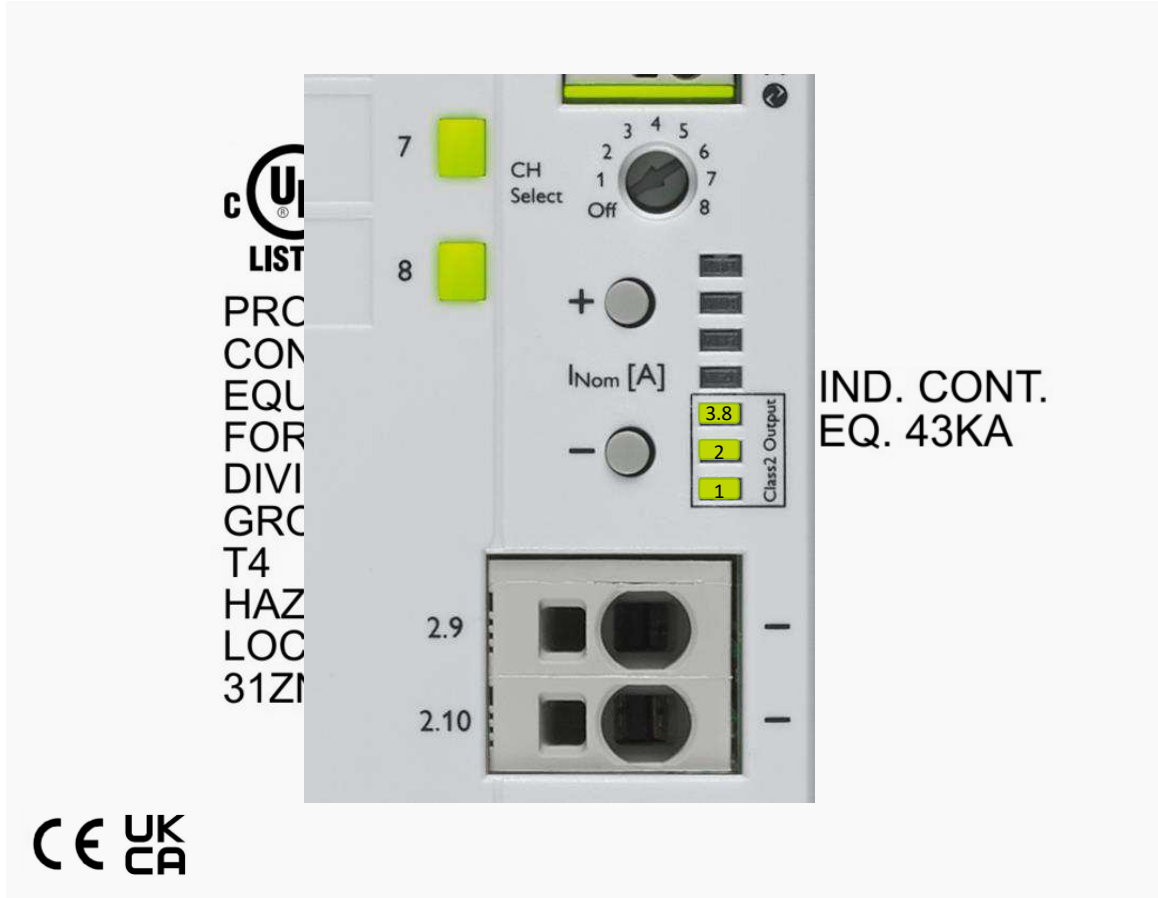
Integrated functions

International approval package



- Save space
- ✓ Flexible, robust and reliable
- Easy handling
- Smart diagnostics

# International approval package



- Electrical safety:
  - UL/IEC 61010-2-201
  - UL/IEC 61010-1
  - IEC 62368-1
  - UL/ANSI/ISA 12.12.01 (HazLoc)
- Maritime:
  - DNV GL
- NEC Class 2:
  - UL1310
- Electronic Breaker:
  - UL2367

# TRIO POWER – Advantages

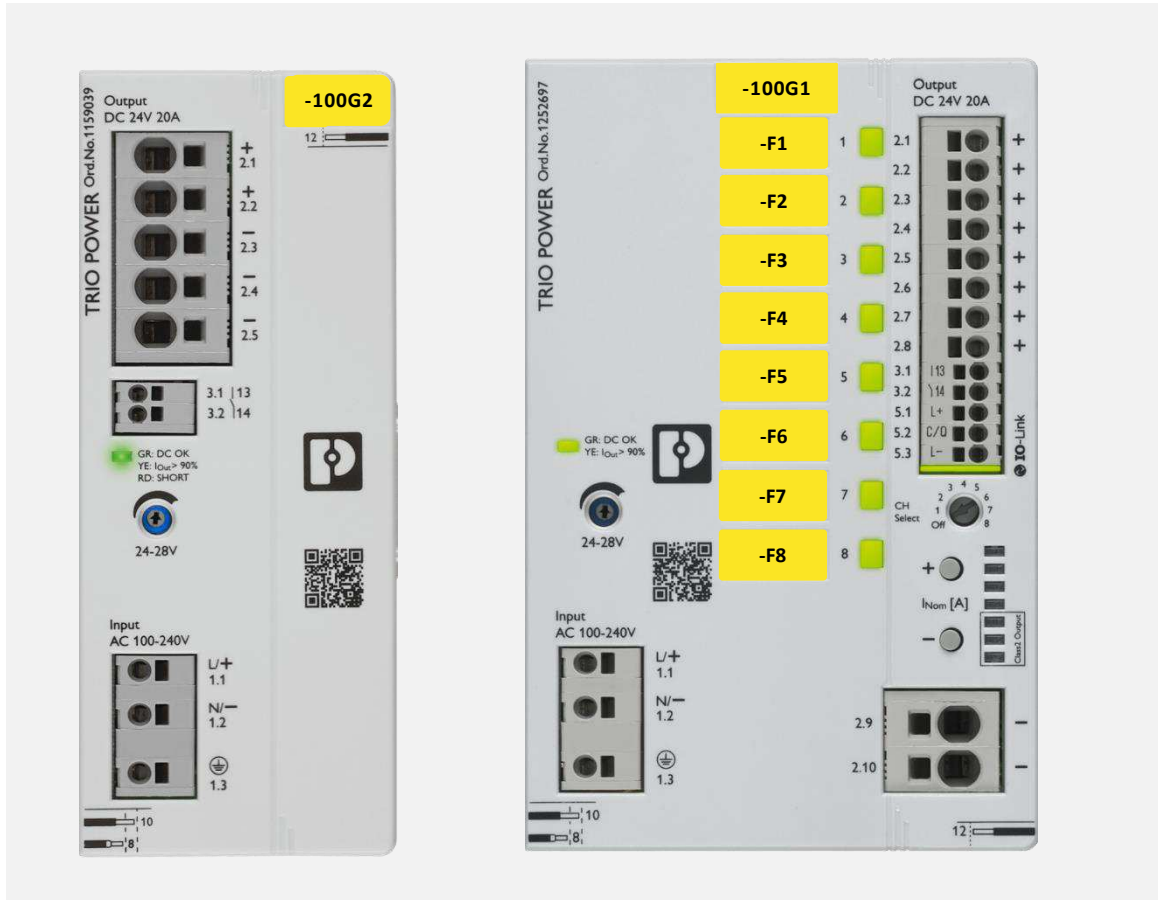
Labeling fields



- Save space
- Flexible, robust und reliable
- ✓ Easy handling
- Smart diagnostics

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# Integrated labeling fields



These are the advantages:

- Enable clean and simple device and circuit labeling
- Compatible with Phoenix Contact EML marking material



# TRIO POWER – Advantages

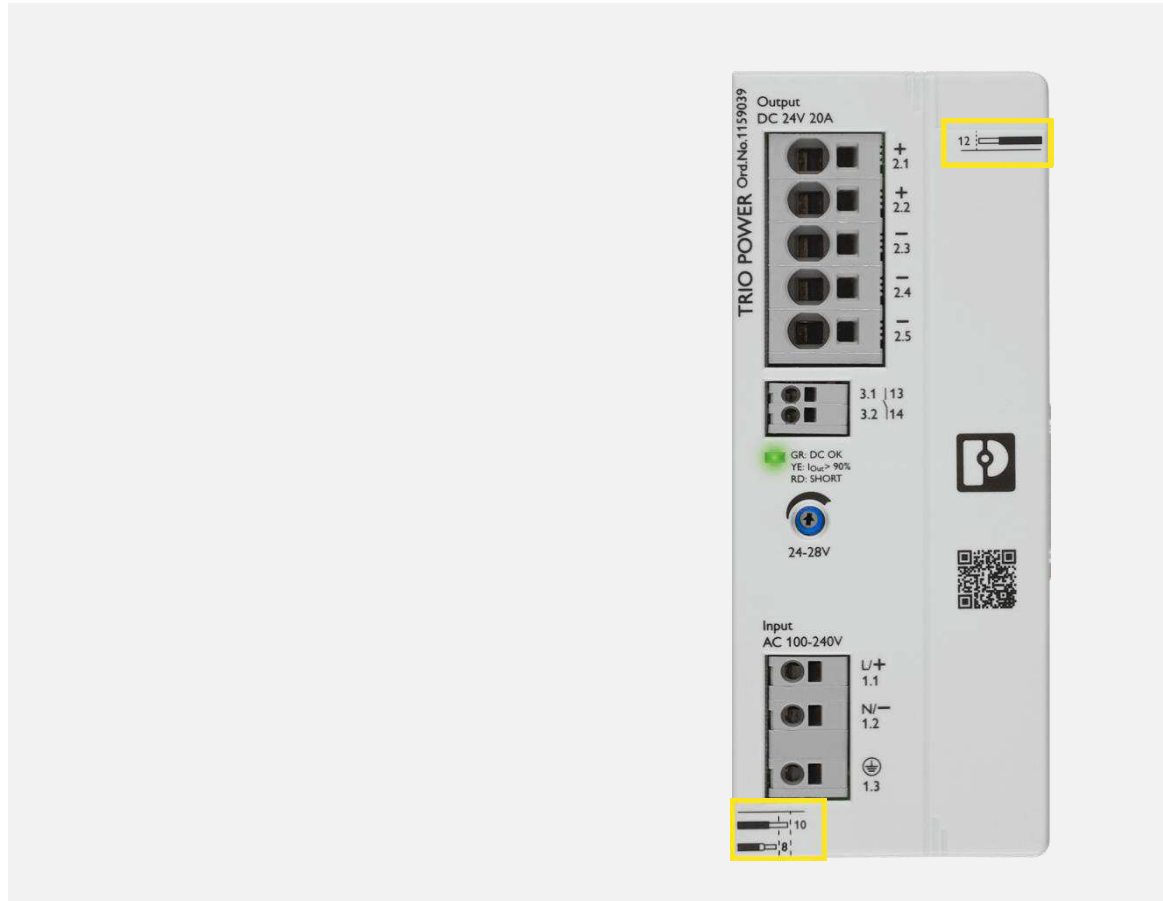
Labeling fields

Marking



- Save space
- Flexible, robust und reliable
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- Smart diagnostics

# Clear marking of the stripping lengths



Here's how it works:

- Simple pictograms on the front show the installer the stripping length to be used

# Clear marking of the stripping lengths



Here's how it works:

- Simple pictograms on the front show the installer the stripping length to be used
- Simply apply the line to the device and read measurement directly

# TRIO POWER – Advantages

Labeling fields

Marking

Tool-free wiring



- Save space
- Flexible, robust und reliable
- ✓ Easy handling
- Smart diagnostics

Power supplies

# Tool-free wiring



These are the advantages:

- Fast tool-free wiring with just one movement
- Less installation effort due the simple top-hat rail mounting
- Integrated circuit breaker reduces installation and wiring effort by up to 70 %

# TRIO POWER – Advantages

Labeling fields

Marking

Tool-free wiring

Tamper resistant protection of the settings



- Save space
- Flexible, robust und reliable
- ✓ Easy handling
- Smart diagnostics

# Tamper resistant protection of the settings



Here's how it works:

- By mechanical closure of the potentiometer opening

This is needed:

- Phoenix Contact standard accessories:  
Sealing plug – SEALING PLUG - 1175957



# TRIO POWER – Advantages

Labeling fields

Marking

Tool-free wiring

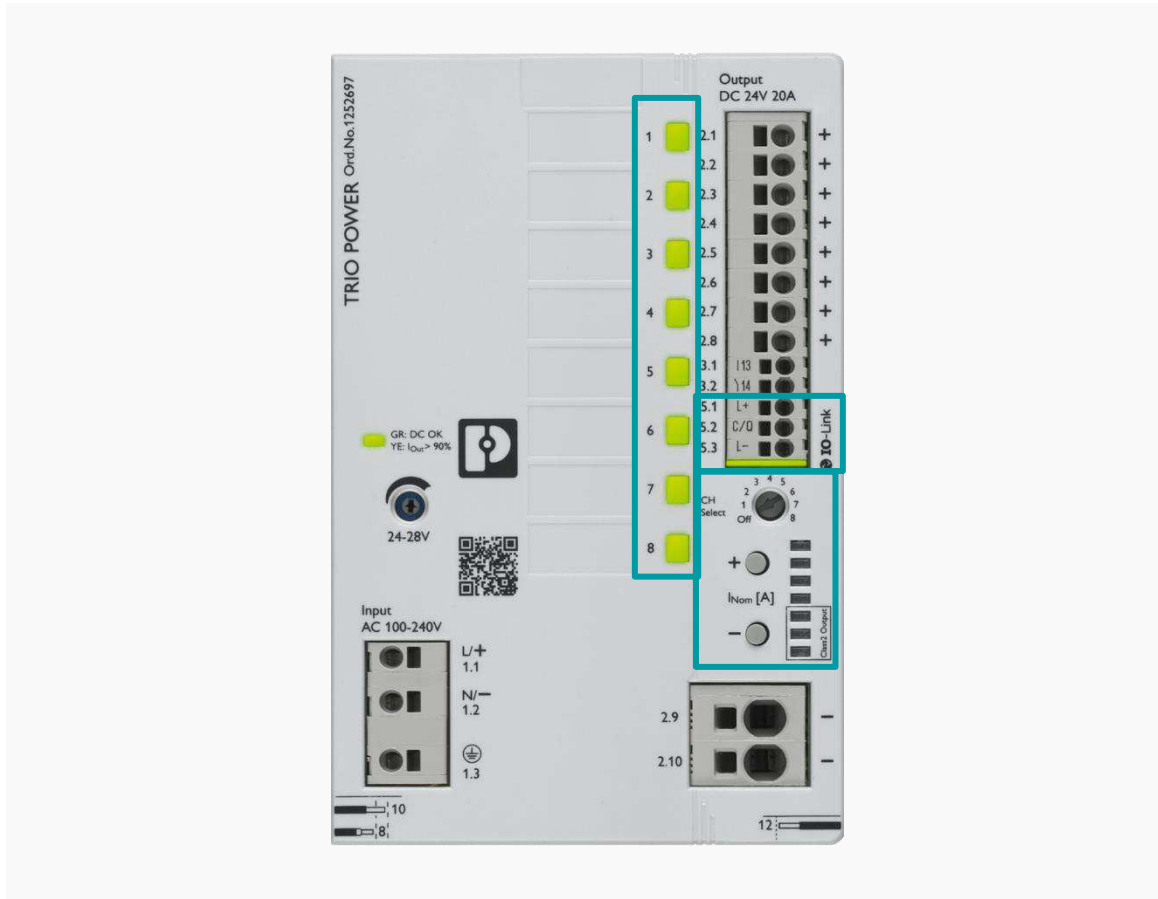
Tamper resistant protection of the settings

Easy Set-up concept



- Save space
- Flexible, robust und reliable
- ✓ Easy handling
- Smart diagnostics

# Easy Set-up concept



Quick and easy Set-up and adjustment:

- Setting of nominal current via rotary selector switch, pushbutton and bargraph
- Channels control: Switching on, off and resetting of the channels via 3-color LED buttons
- TRIO POWER with integrated device circuit breaker : Alternatively, make settings via IO-Link

Power supplies

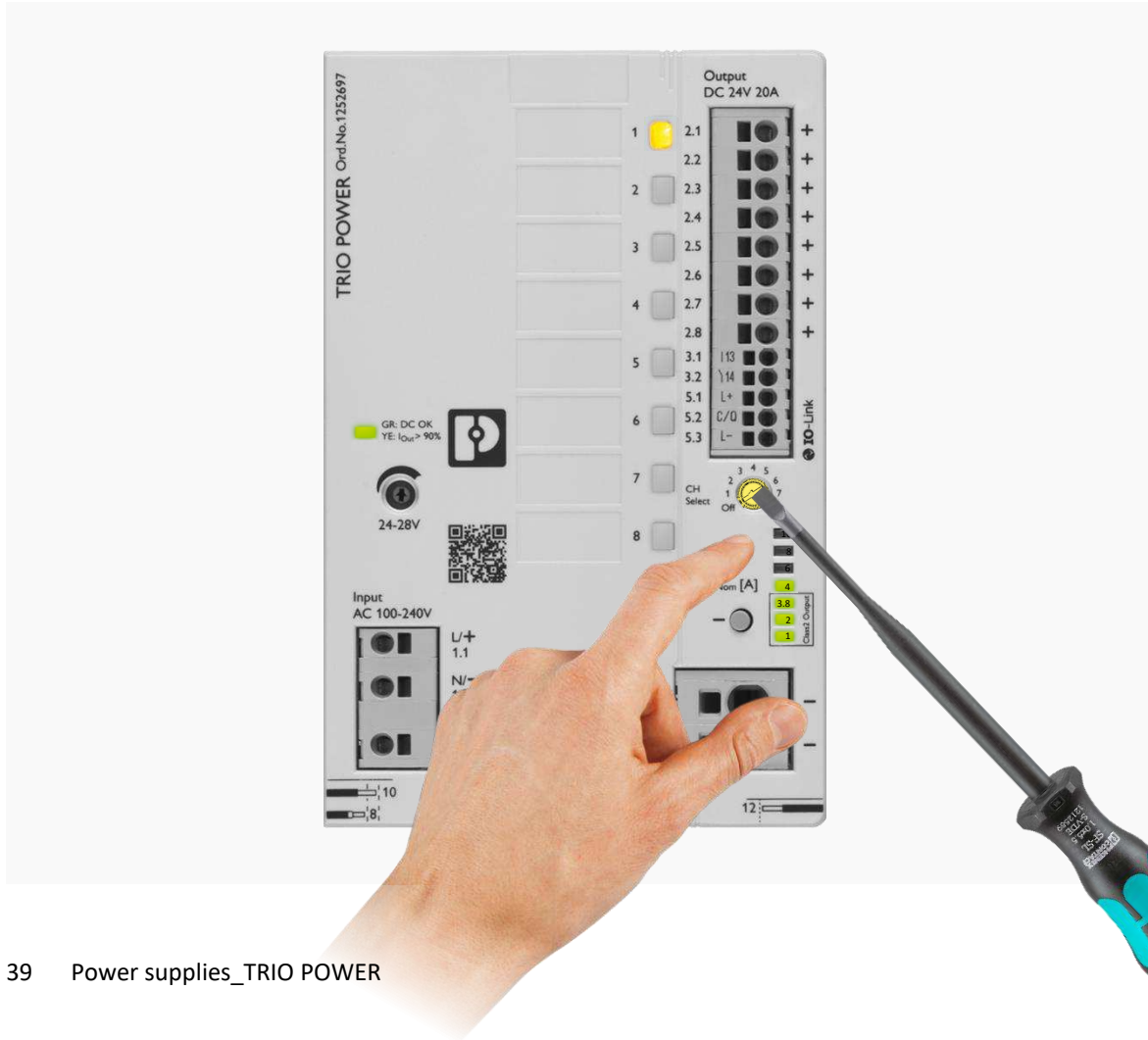
# Easy Set-up concept



Order of Setup:

1. Switch on mains – DC OK

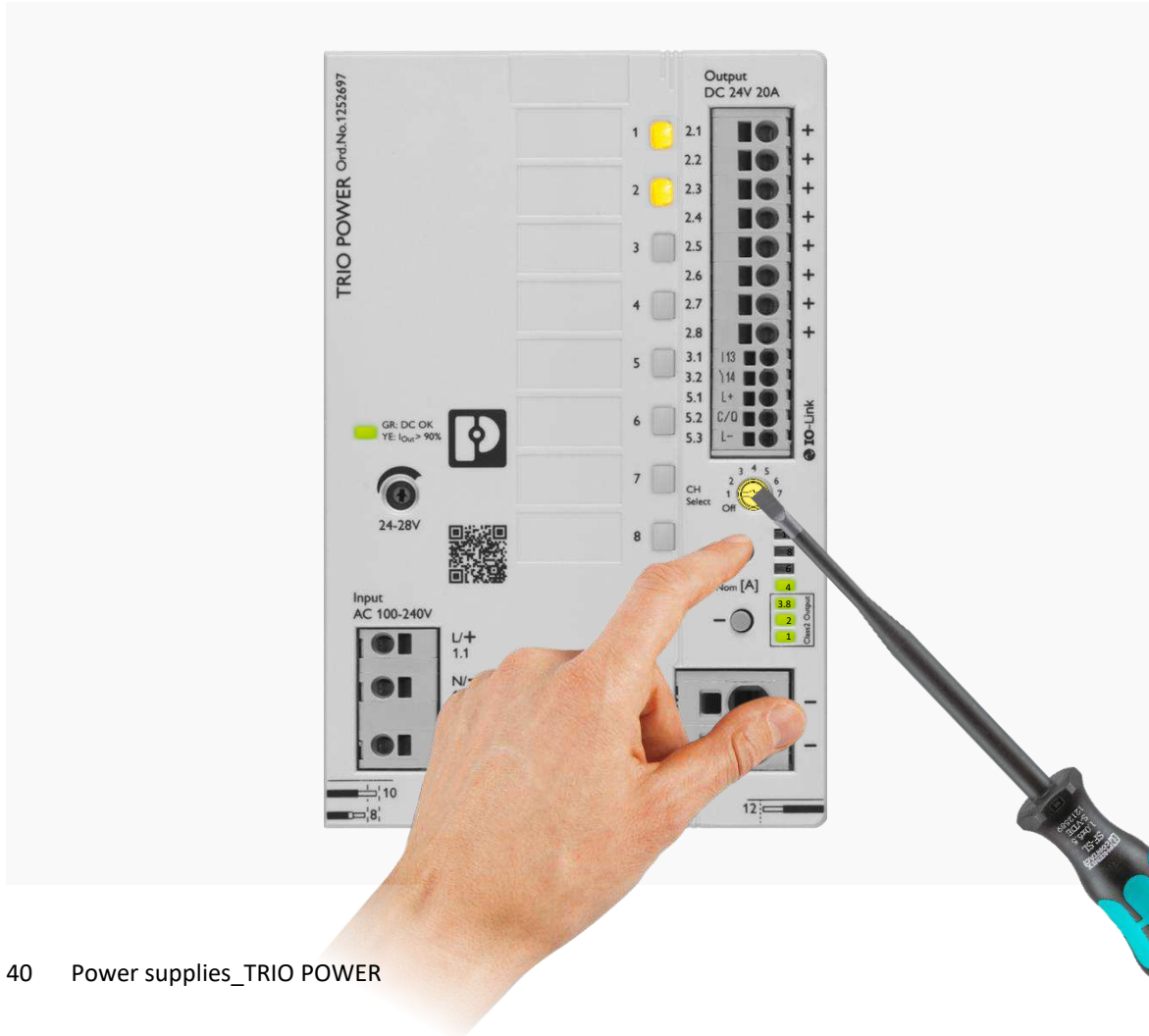
# Easy Set-up concept



## Order of Setup:

1. Switch on mains – **DC OK**
2. Turn CH Select switch to CH 1 – **CH 1 flashes**
  - a) LED bargraph shows **I<sub>Nom</sub> = 1 A**
  - b) Push "+" button to increase I<sub>Nom</sub> – LED bargraph indicates the value in **green**

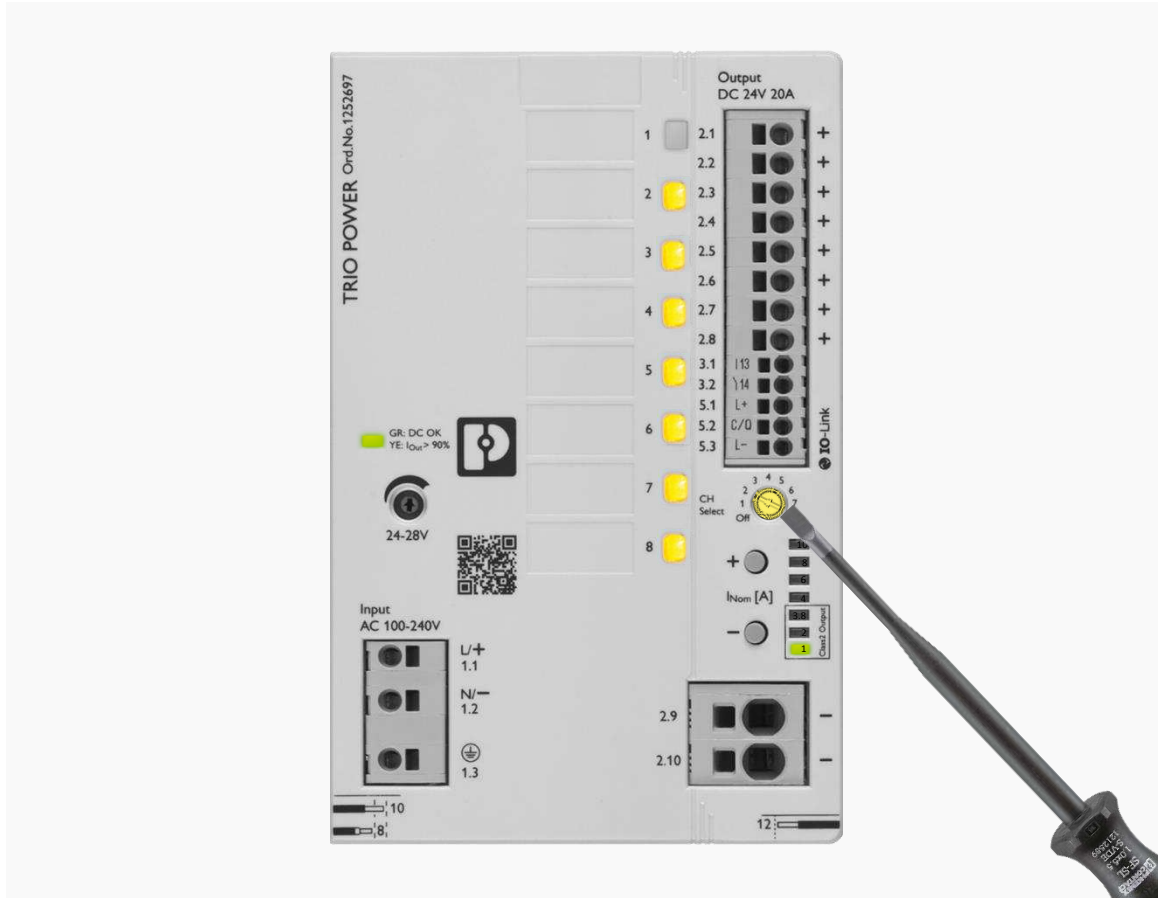
# East Set-up concept



## Order of Setup:

1. Switch on mains – **DC OK**
2. Turn CH Select switch to CH 1 – **CH 1 flashes**
  - a) LED bargraph shows **I<sub>Nom</sub> = 1 A**
  - b) Press "+" button to increase I<sub>Nom</sub> – LED bargraph indicates the value in **green**
3. Turn CH Select switch to CH 2 – **CH 2 flashes**
  - a) Repeat step 2. b) to adjust CH2

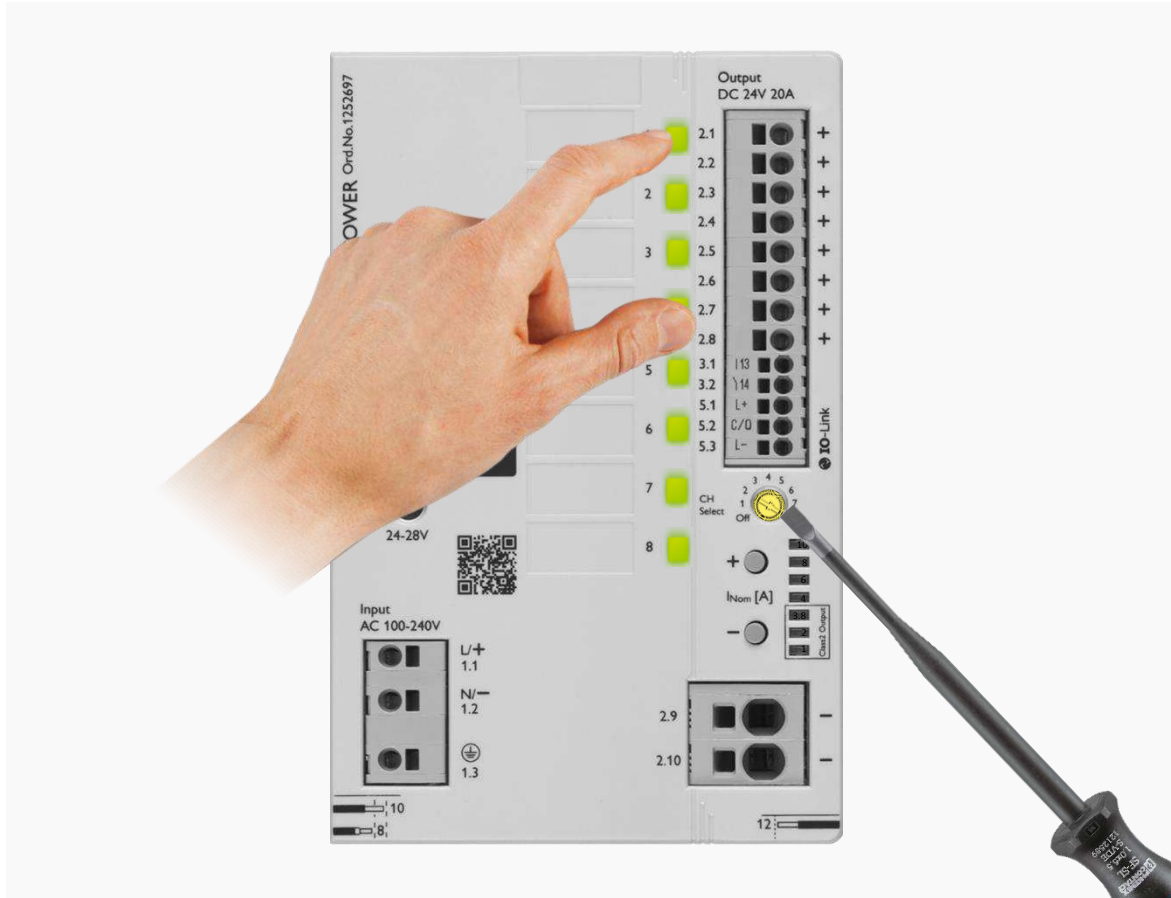
# Easy Set-up concept



## Order of Setup:

1. Switch on mains – **DC OK**
2. Turn CH Select switch to CH 1 – **CH 1 flashes**
  - a) LED bargraph shows  **$I_{Nom} = 1 A$**
  - b) Push "+" button to increase  $I_{Nom}$  – LED bargraph indicates the value in **green**
3. Turn CH Select switch to CH 2 – **CH 2 flashes**
  - a) Repeat step 2. b) to adjust CH2
4. Repeat step 3 to adjust all channels

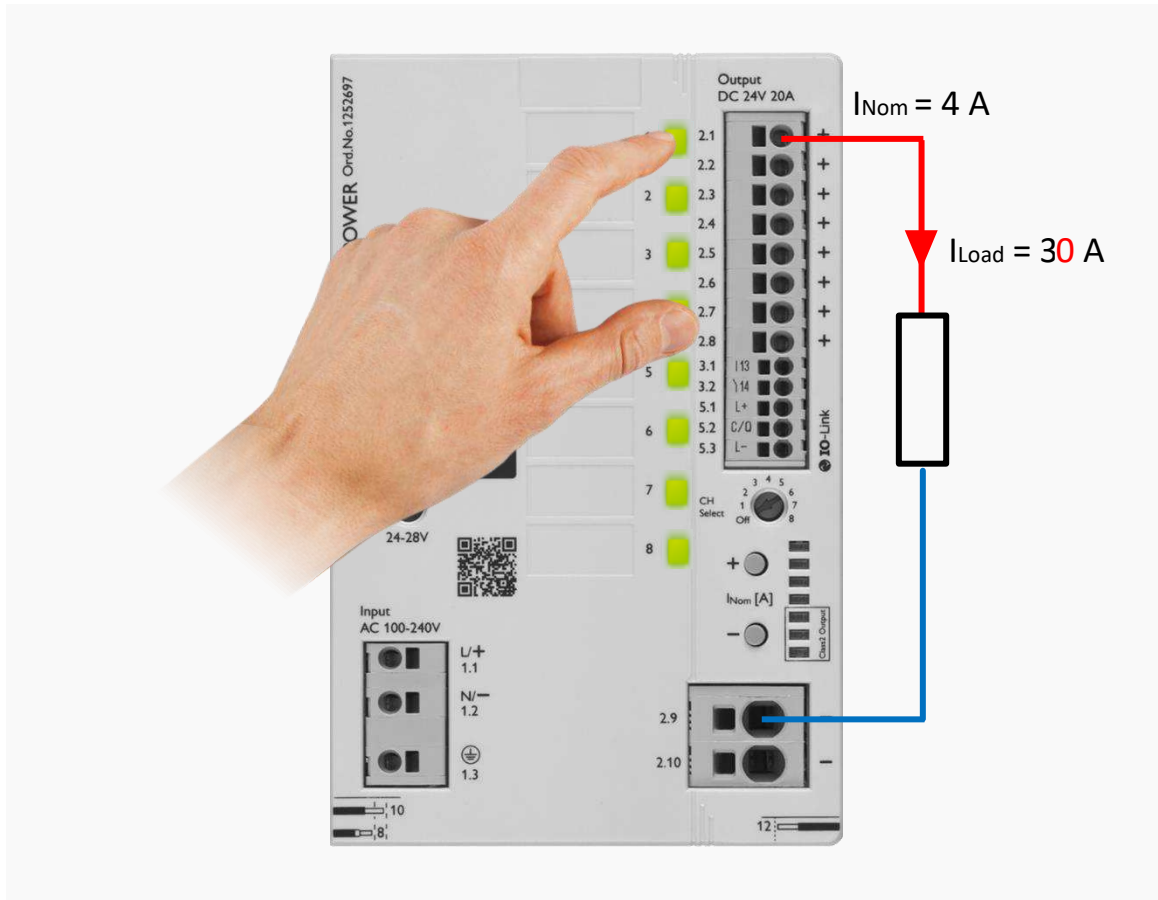
# Easy Set-up concept



## Order of Setup:

1. Switch on mains – **DC OK**
2. Turn CH Select switch to CH 1 – **CH 1 flashes**
  - a) LED bargraph shows  **$I_{Nom} = 1 A$**
  - b) Push "+" button to increase  $I_{Nom}$  – LED bargraph shows the value in **green**
3. Turn CH Select switch to CH 2 – **CH 2 flashes**
  - a) Repeat step 2. b) to adjust CH2
4. Repeat step 3, to adjust all channels
5. Turn CH Select switch to „Off“ to close adjustment process
6. Switch on CH 1 bis CH 8 by pressing **CH 1 bis CH 8**
7. Set-up is completed!

# Easy Set-up concept



## Operation mode:

1. Load is connected to output –  
Load current is  $< 80\% \times I_{Nom}$ : CH 1
2. Load current raises to  $> 80\% \times I_{Nom}$ : CH 1
3. Load current raises to  $> 120\% \times I_{Nom}$ : CH 1/CH 1
4. After 5 s CH 1 trips and stops supplying the load
  - ▶ CH 1 LED starts cool-down-phase for 5 s: CH 1
  - ▶ After 5 s: CH 1 flashes to show that it is ready to switch on
5. Remove/repair defect load and press CH 1 to switch on CH1
  - ▶ CH 1 is active: CH 1

# TRIO POWER – Advantages

Multicolor LED signaling



- Save space
- Flexible, robust and reliable
- Easy handling
- ✓ Smart diagnostics

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# Multicolor LED



Multicolor LED signals all relevant states:

DC OK relay

State

# TRIO POWER – Advantages

Multicolor LED signaling

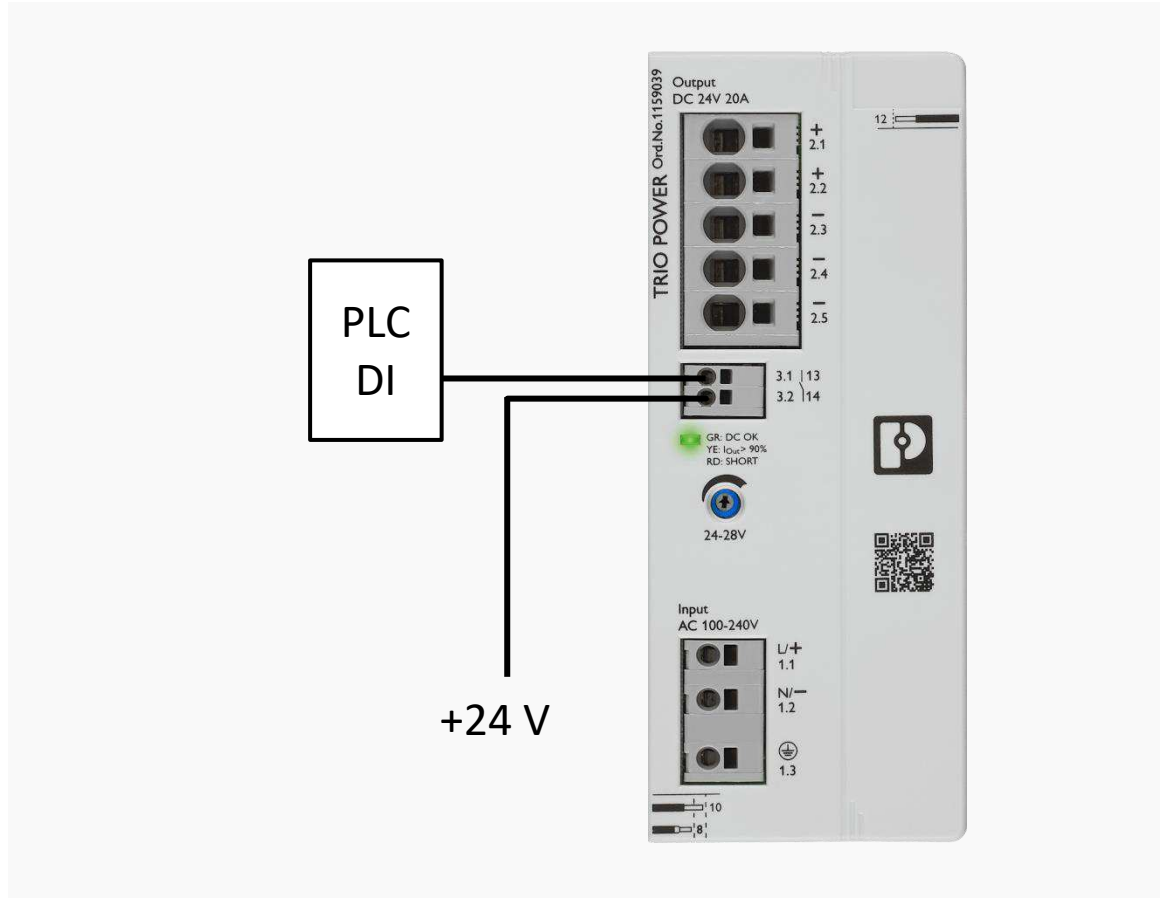
DC OK contact



- Save space
- Flexible, robust and reliable
- Easy handling
- ✓ Smart diagnostics

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# DC OK contact



DC OK contact signals all relevant states:

DC OK relay	State
-------------	-------

# TRIO POWER – Advantages

Multicolor LED signaling

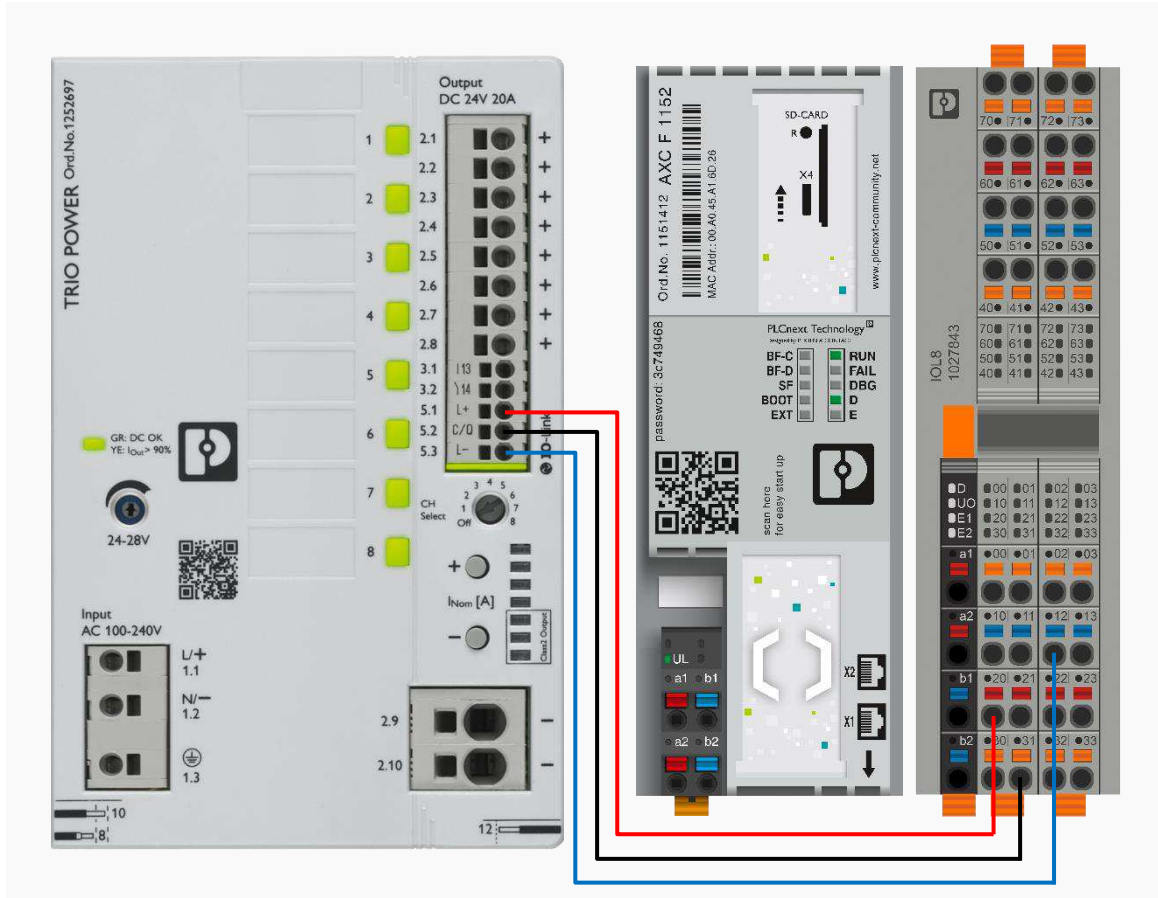
DC OK contact

IO-Link  
With integrated  
fuse protection



- Save space
- Flexible, robust and reliable
- Easy handling
- ✓ Smart diagnostics

# IO-Link interface



## IO-Link interface for diagnostic and configuration

1. Configuration of the commissioning parameters
  - ▶ Output voltage
  - ▶ Nominal currents of the channels
  - ▶ Configuration of the channels
2. Diagnosis of important process data
  - ▶ Status of all channels and overall device
  - ▶ Load current/voltage of all channels and overall device
3. Remote switching of channels
4. Direct integration via IoDD in PLCNext Engineer
5. Locking the manual settings

# TRIO POWER – Summary of Highlights

## Save space

Due to low overall width

## Robust and reliable

Thanks to dynamic boost with strong output characteristic curve



## Easy handling

Due to push-in connection technology

## Smart Diagnostics

Thanks to multicolor LEDs and DC OK contact for clear status display, optionally with IO-Link

# TRIO POWER with integrated device protection – Summary of Highlights

## Integrated device protection

Supply and protect in one device through integrated multi-channel device protection

## Easy handling

Low installation costs due to 70 % less wiring and assembly effort

## Easy Set-up concept

Configuration manual operation or configuration via IO-Link






## Superior system availability




Prioritized load management with intelligent self-monitoring



## Save space

Due to low overall width

# TRIO POWER – Product overview 3<sup>rd</sup> generation

TRIO POWER, 1~			
			
Input	85 V AC ... 264 V AC 90 V DC ... 264 V DC	85 V AC ... 264 V AC 90 V DC ... 264 V DC	85 V AC ... 264 V AC 90 V DC ... 264 V DC
W x H x D in mm	35 x 135 x 120	40 x 135 x 132	55 x 135 x 132
	<b>24 V / 5 A</b> <small>new</small>	<b>24 V / 10 A</b> <small>new</small>	<b>24 V / 20 A</b> <small>new</small>
Type	TRIO3-PS/1AC/24DC/5	TRIO3-PS/1AC/24DC/10	TRIO3-PS/1AC/24DC/20
Item no.	1159037	1159038	1159039

TRIO POWER, 3~			
			
Input	3 x 320 V AC ... 550 V AC 2 x 360 V AC ... 550 V AC	3 x 320 V AC ... 550 V AC 2 x 360 V AC ... 550 V AC	3 x 320 V AC ... 550 V AC 2 x 360 V AC ... 550 V AC
W x H x D in mm	40 x 135 x 132	60 x 135 x 132	90 x 135 x 167
	<b>24 V / 10 A</b> <small>new</small>	<b>24 V / 20 A</b> <small>new</small>	<b>24 V / 40 A</b> <small>new</small>
Type	TRIO3-PS/3AC/24DC/10	TRIO3-PS/3AC/24DC/20	TRIO3-PS/3AC/24DC/40
Item no.	1159042	1159044	1159045

TRIO POWER with integrated device protection, 1~			
	 IO-Link	 IO-Link	
Input	85 V AC ... 264 V AC 90 V DC ... 264 V DC	85 V AC ... 264 V AC 90 V DC ... 264 V DC	
W x H x D in mm	68 x 135 x 132	88 x 135 x 132	
	<b>24 V / 10 A</b> <small>new</small>	<b>24 V / 20 A</b> <small>new</small>	
Type	TRIO3-PS/1AC/24DC/10/4C/IOL	TRIO3-PS/1AC/24DC/20/8C/IOL	
Item no.	1252696	1252697	

# Tools to help you sell

- Standard 5 YEAR Warranty
- TRIO3 Qualifies for the LLW if all guidelines are followed.
- Digital Demo : [www.phoenixcontact.com/demo-triopower](http://www.phoenixcontact.com/demo-triopower)
- Liberal samples are available
- Power Supply Brochure Lit# 1161769
- Landing page: [www.phoenixcontact.com/us-triopower](http://www.phoenixcontact.com/us-triopower)
- Power Reliability BDAE's



# TRIO3 POWER



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