

# PULS

Flexible. Reliable. Durable.

## DECENTRALISED POWER SUPPLIES

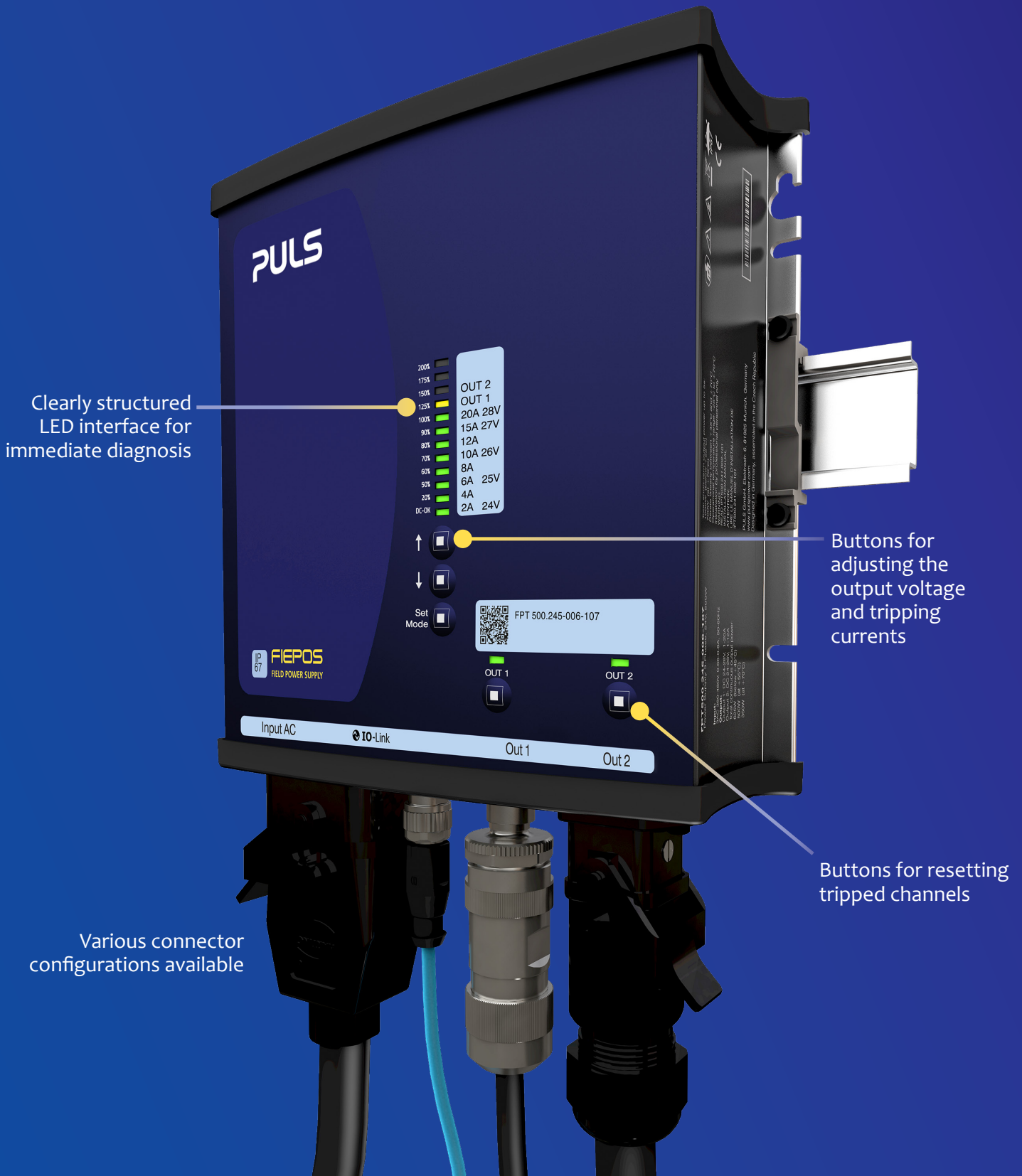


The alternative to...

- Centralised cabinets
- Decentralised on-site cabinets
- Customer-specific solutions

# FIEPOS

## FIELD POWER SUPPLY



### Basic Versions

1 DC output | 360 or 600 W  
Decentralised, cabinet-free power supplies  
page 8–9



## eFused Versions

Up to 4 DC outputs | 360 or 600 W

Decentralised power supplies with up to 4 current-limited outputs

page 10–13

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- 10 Decentralised power supplies with current-limited outputs
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## 10

Here is how to establish selective current distribution, protection, and monitoring directly in the field.



### Decentralised cabinet



### FIEPOS

\$\$	IP67 housing	
\$\$	Power supply	\$\$\$
\$	Electronic output fuse	
\$	Input fuse (optional)	
\$	Distribution terminal	
\$	Cabling	\$
\$	Plug connectors for input/output	
\$\$\$	Working time	\$
\$\$	Space	\$

## 13

Here is how you save costs by replacing an entire on-site cabinet with FIEPOS.

## THE HEART OF THE SYSTEM CONTINUES TO EVOLVE



The power supply is the heart of any system. This is a role it has held for decades now, working away in the background from inside the cabinet. Recent years, however, have seen the power supply increasingly distance itself from this modest role.

The variety of applications – not to mention the requirements that go with them – certainly work in favor of this development. This implies that, in addition to the typical function as a converter, there is a growing demand for complete power supply systems featuring integrated communication, redundancy, and protection functions. And then, of course, there is decentralisation, which also has a crucial role to play with regard to power supply and current distribution.

If we want to be able to meet this demand with standard products, a flexible product platform is needed to form the basis for implementing the various solutions. This platform also has to offer the fundamental qualities of a power supply, which include outstanding efficiency, a compact design, exceptional reliability, and a long service life.

It is with all of this in mind that we came up with FIEPOS – our Field Power Supplies for decentralised applications. The efficient 360 W and 600 W power supplies are accommodated within a very compact housing unit that offers a high level of IP protection (IP54, IP65 and IP67). These are available in various versions ex stock – including current-limited outputs for selective current distribution, a variety of different plug connectors, IO-Link as a communication interface, and decoupling MOSFETs for developing redundant systems.

FIEPOS opens up whole new worlds of possibilities for system developers and integrators when it comes to modern system planning. So no matter whether you are looking for a centralised or decentralised solution, PULS is set to ensure that the power supply remains the reliable heart of your system for the foreseeable future.

Bernhard Erdl  
CEO | Owner | Chief Developer  
PULS GmbH

Focusing on decentralisation

# DECENTRALISED, CABINET-FREE POWER SUPPLIES

The demand for flexible, modular systems is shaping the world of systems engineering as we know it, and the decentralisation of system components is shaping up to be a major development in this regard. By speeding up the system planning process, simplifying maintenance tasks, and facilitating straightforward expansions, more and more components now feature a degree of protection from IP54, IP65 and IP67 and are being relocated directly into the field. As a result, cabinets can be made smaller than ever or else dispensed with entirely.

By Maximilian Hülsebusch

So what exactly is going on with the power supply in decentralised systems and machine engineering? The products currently available on the market basically allow three different strategies:

## 1. No decentralisation of the power supply

The power supply is not included in the decentralisation process and remains in the central cabinets. When it comes to supplying the decentralised peripheral devices in the field, long cable harnesses with a large cross-section have to be taken into account. The power supply has to be oversized due to the loss of performance caused by the long cables.

## 2. Power supply in a decentralised on-site cabinet

The power supply – along with other standard components such as electronic fuses or switches – is taken out of the central cabinet and placed directly onto the machine in smaller, decentralised IP67 cabinets. Companies often handle the planning and assembly of these cabinets themselves.

## 3. Customer-specific solution

A customer-specific, decentralised solution is developed especially for the power supply. The size and mechanics are also specifically tailored to the system along with the electrical specifications.

### Benefits of a decentralised power supply

Many users have already sprung into action after recognising the benefits of a decentralised power supply: it starts with the system planning process, which offers greater freedom. There are many applications, such as conveyor belts or production lines that

can be supplied with energy much more efficiently and flexibly on a decentralised basis. The power supply no longer has to be oversized, and the individual system parts can be put together on a modular basis, allowing them to be extended, maintained, and converted more quickly and effectively than ever.

By making the cabinets smaller, or even doing away with them entirely, the newly gained space can also be used to expand added-value system components. Even the cable lengths and cross-sections can be reduced, which in turn saves on the costs of copper.

### Past obstacles on the road to a decentralised power supply

The cost of implementing a decentralised power supply does, however, remain high with the currently existing solutions. Even straightforward, decentralised on-site cabinets, for example, often comprise more than 10 components. All of these have to be ordered, stored, and ultimately combined into a system by a technician.

As for developing customer-specific solutions, this is even more time consuming, expensive, and only worthwhile in larger volumes.

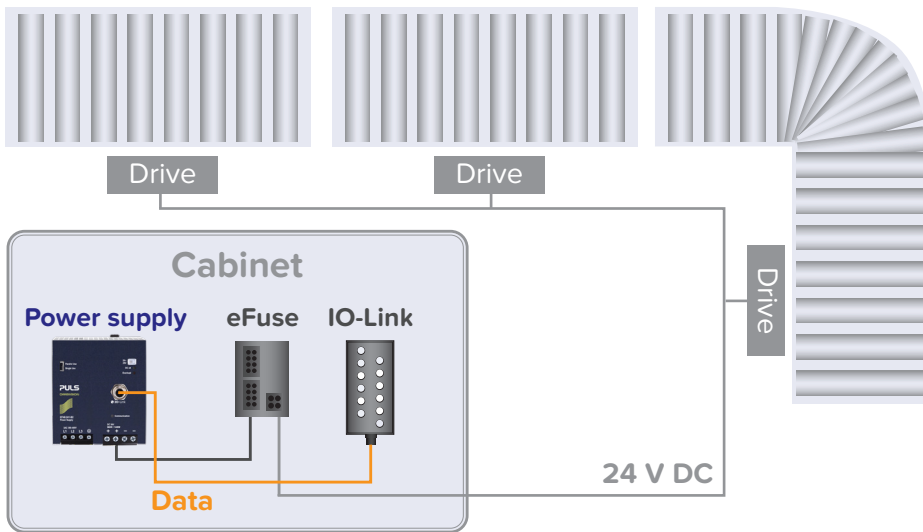
Until now, there hasn't been a decentralised standard power supply that is available to order ex stock, easy to install, and flexible enough to offer a viable alternative in all three cases.

### Cabinet-free power supply system as a solution

With the launch of the FIEPOS product family, the developers at PULS are closing this gap in the decentralisation market to open up whole new worlds of possibilities for users with reference to cabinet-free planning of their systems and machines.

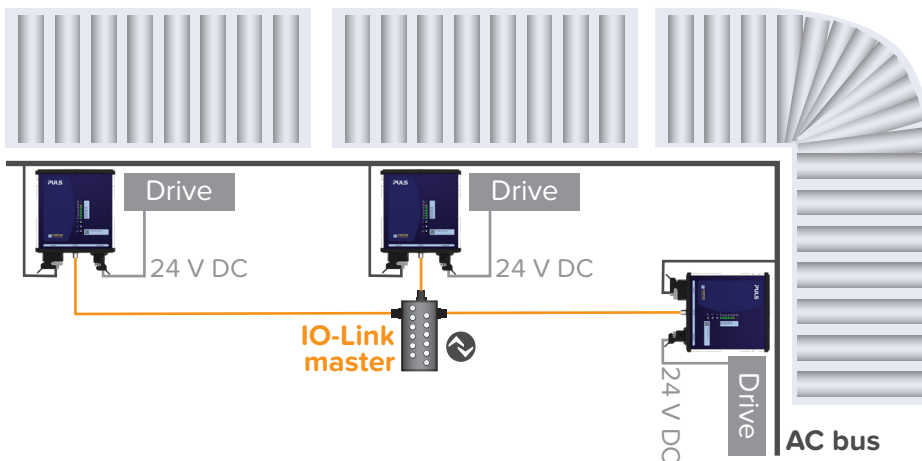
The range is based on 1-phase and 3-phase IP54, IP65 and IP67

## Without FIEPOS – centralised



When relying on a centralised supply for the peripheral devices in the field, long cable harnesses with a large cross-section have to be taken into account. The power supply has to be oversized due to the associated loss of performance.

## With FIEPOS – decentralised



There are many applications that can be supplied on a decentralised basis and in an energy-efficient and flexible manner. Individual system parts can be put together on a modular basis, allowing them to be extended, maintained, and converted more effectively.

power supplies with 360 W or 600 W output power. It also features an IO-Link or output OK signal as a communication interface. The various versions are based on this platform with numerous connector configurations as well as optional safety and redundancy functions. PULS classifies the devices into the two FIEPOS product series of Basic and eFused.

The devices in the Basic series have a single output, for which the various plug connectors such as M12-L/S/A, 7/8", or the HAN Q series are available. Furthermore, the Basic version is also available with an integrated decoupling MOSFET on the output side and a soft output regulation characteristic. These two functions make

the devices particularly ideal when it comes to assembling reliable redundant systems outside of the cabinet and help to increase performance by establishing parallel connections.

The FIEPOS eFused series comes complete with up to four internally protected outputs. Thanks to the built-in current limitation, these devices can easily be used for selective current distribution and protection. The outputs are configured and monitored via IO-Link or via the practical human-machine interface located directly on the front panel of the device.

FIEPOS Basic series with single output

# STRAIGHT FROM THE CABINET TO THE FIELD

With the FIEPOS Basic series, PULS is relocating the power supply from the cabinet directly into the field to offer an all-in-one power supply system for decentralised systems engineering.

## BENEFITS

### Flexibility

The compact housing with a high degree of IP protection (IP54, IP65 and IP67) and various connection options facilitates flexible positioning directly on the machine.

### Cost savings

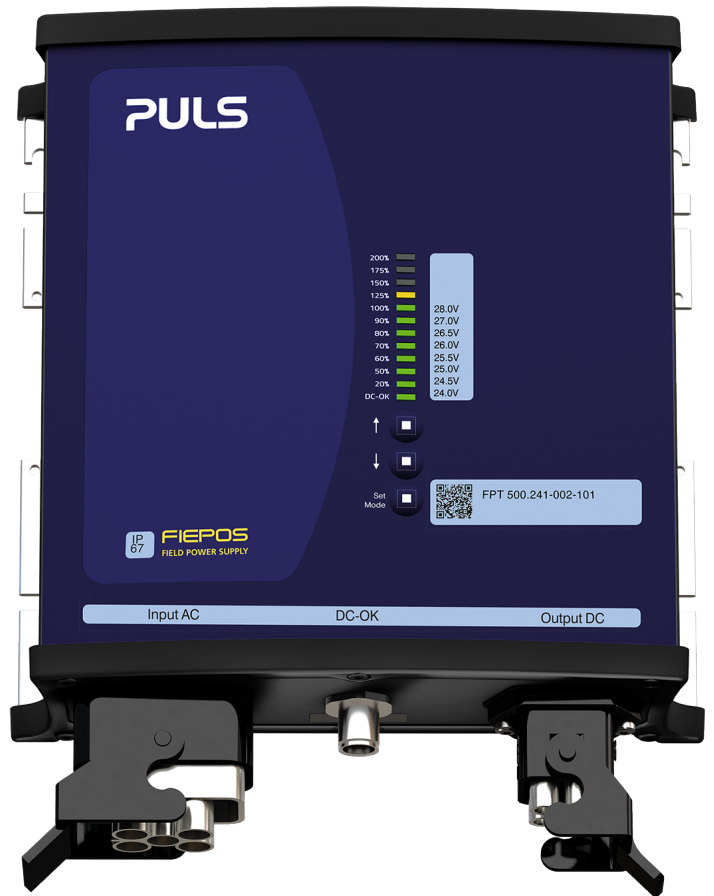
FIEPOS makes it possible to use shorter cables and smaller cable cross-sections. This not only saves on the costs of copper, but also on the installation work for the cabling.

### Ease of use

The diagnostics and configuration of the output voltage take place directly on the front of the device or else remotely via IO-Link.

### Environmentally friendly

The high degree of efficiency of > 95 % keeps the device cool. This means there is no need for any harmful potting compound.



Technical overview	FPS300 1-phase	FPH500 1-phase	FPT300 3-phase	FPT500 3-phase
Input voltage	AC 85-264 V	AC 170-264 V	3AC 320-550 V	3AC 320-550 V
Output voltage	DC 24-28 V	DC 24-28 V	DC 24 V / DC 24-28 V	DC 24-28 V / DC 48-56 V
Power nominal below 55°C	300 W	500 W	300 W	500 W
continuous below 45°C	360 W	600 W	-	600 W
temporary for 5 s below 55 °C	600 W	1000 W	-	1000 W
temporary for 60 s below 55 °C	-	-	450 W	-
temporary for 1 s below 55 °C	-	-	600 W	-
Efficiency at AC 230 V or 3AC 480 V and full load	95.7 %	94.8 %	95 %	95.6 %

# Q&A

## QUESTIONS & ANSWERS

### Where can the FIEPOS devices be used?

The potential applications of FIEPOS are virtually limitless. That said, modular applications in the field of conveyor systems, storage technology, robotics, control technology, regulation technology, and material handling in particular all benefit from this technology.

### What degree of protection is available for FIEPOS products?

The robust devices are available with IP54 (dust-protected, splash-proof), IP65 (dust-tight, jet-proof) and IP67 (dust-tight, temporarily immersible) protection, making them well protected against water, dust, and other contaminants.

### Do FIEPOS devices have power reserves?

Yes, all devices provide generous power reserves. E.g. FPT500 units provide 600 W for 5 s (at an ambient temperature of up to +55 °C). Please check the datasheet of the corresponding unit for more information.

### What temperature range can the devices be used in?

FIEPOS products can be operated in ambient temperatures ranging from -25 °C to +45 °C without any loss of performance. With linear derating, temperatures of up to +70 °C are allowed.

### Which plug connectors are available?

FIEPOS devices are available with the following plug types: 7/8", M12-L/-S/-A, HAN Q series. Other plug configurations are available on request.

### Can the device also be installed on the DIN rail?

Yes, all FIEPOS devices can be installed in three different ways: By simply attaching it to a DIN rail, by hanging and fixing it in place via the integrated keyholes, or by screw mounting.

**DECENTRALISED ALTERNATIVE TO A POWER SUPPLY IN...**

**...A CENTRALISED CABINET.**

**...A DECENTRALISED ON-SITE CABINET.**

**...A COMPLEX, CUSTOMER-SPECIFIC SOLUTION.**

FIEPOS eFused series with up to four outputs

# DECENTRALISED POWER SUPPLY WITH CURRENT-LIMITED OUTPUTS

With the FIEPOS eFused series, it couldn't be easier to establish selective current distribution, protection, and monitoring directly in the field. This gives you a decentralised alternative to power supplies protected by either an external, electronic four-channel protection module, four circuit breakers, or four external fuses.

The selective current distribution makes the eFused versions ideal for simultaneously supplying electromechanical loads (e.g., motors) and sensitive consumers such as PLC or sensors using a decentralised, fused power supply unit. What's more, the selective shut-down of faulty outputs makes for a high level of operational reliability. The eFused devices continue to impress on account of the clear benefits they offer over other solutions on the market.

### Space savings

The integrated, current-limited outputs result in no additional protection modules being required. The high degree of protection (IP54, IP65 and IP67) facilitates decentralised use directly on the machine.

### Excellent system availability

The selective protection means only faulty outputs are switched off, which makes for excellent system availability.

### Ease of operation

Tasks such as setting the tripping currents, resetting faulty electric circuits, and monitoring can all be completed via IO-Link or directly on the front of the device.

### Straightforward admin and logistics

An all-in-one solution is used rather than several different components. This means less work when it comes to managing part numbers and less space taken up in the warehouse.



# Q&A

## QUESTIONS & ANSWERS

### **What happens in the event of a fault?**

The device selectively switches off only the faulty outputs and reports this via IO-Link or output OK signal and the intuitive LED interface on the front of the device. Active current limitation means all other outputs continue to be supplied with voltage without restrictions. This is particularly important for sensitive and safety-critical loads such as PLCs or sensors.

### **Can the faulty electric circuits be reset remotely?**

Yes, the electric circuits can be reset by IO-Link or even directly on the device.

### **How do you adjust the tripping circuits?**

You can set your preferred tripping currents easily using the buttons on the device or remotely via IO-Link.

### **Is it also possible to create NEC class 2 compliant circuits?**

Yes, that's possible. We have built up a series in the FIEPOS family for this reason. The following units are designed for applications which require NEC Class 2 compliance: FPS300.246, FPH500.246, FPT300.246 and FPT500.246 feature NEC Class 2 outputs only. Variants such as the FPT500.247 are also available, which include a NEC Class 2 output in addition to two standard outputs (up to 10 A). The current limitation then intervenes to ensure that the maximum power of 100 VA defined for NEC class 2 is not exceeded.

### **What has to be taken into consideration in terms of the order of the outputs?**

The devices have a selectivity function that enables prioritised protection of sensitive loads. Output 1 has the highest priority, output 4 has the lowest. If the current budget is exceeded, the device switches off the outputs with the lowest priority first.

### **Are the outputs activated on a staggered basis?**

Yes, the outputs are switched on according to their priority and in 150 ms increments.

### **Which tripping characteristics are the devices based on?**

A different characteristic curve applies in each case depending on the set tripping current. For example: if the tripping current is set to 4 A, the output allows i.e. 5 A for 5 seconds and then switches off.

**THE DECENTRALISED ALTERNATIVE TO A POWER SUPPLY WITH...**

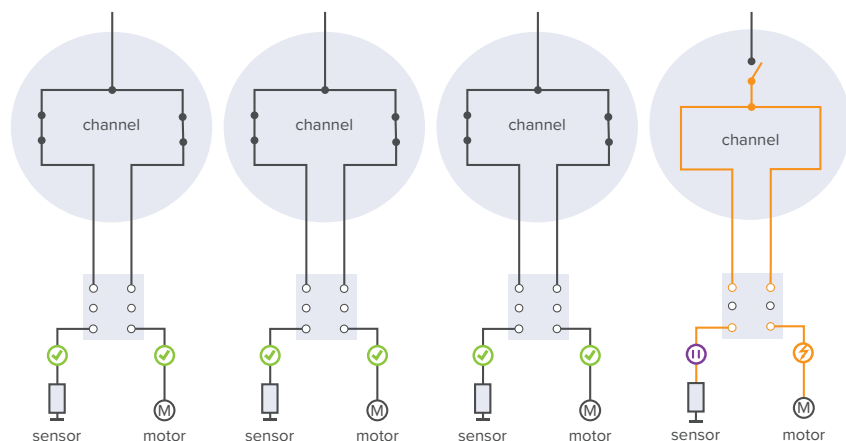
**...AN EXTERNAL, ELECTRONIC, 4-CHANNEL PROTECTION MODULE.**

**...4 CIRCUIT BREAKERS.**

**...4 EXTERNAL FUSES.**

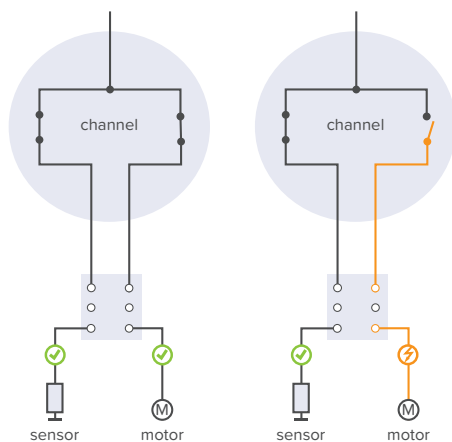
# THE PERFECT SOLUTION FOR EVERY APPLICATION

The FIEPOS eFused devices are available with various output configurations. This results in the following circuit designs.



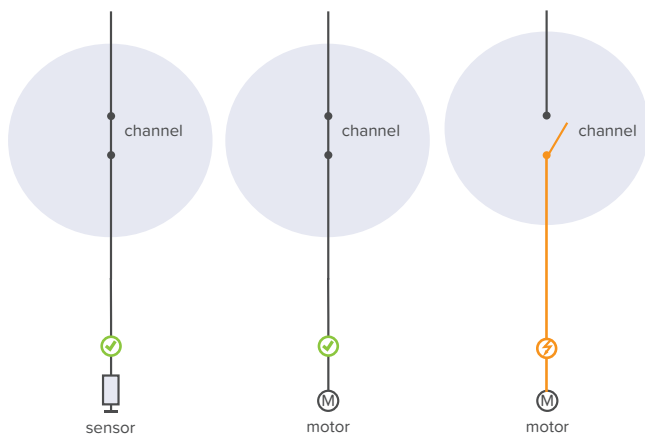
## 4 outputs. 4 load circuits.

In this version, the sensors and actuators share a load branch. In the event of a fault, the circuit opens and all components connected to this output connector are no longer supplied. The other outputs are not affected by this fault.



## 2 outputs. 4 load circuits.

This circuit allows for two separate circuits for sensors and actuators for each output connector. With this configuration, a maximum of 4 separate load branches can be established with two connectors.

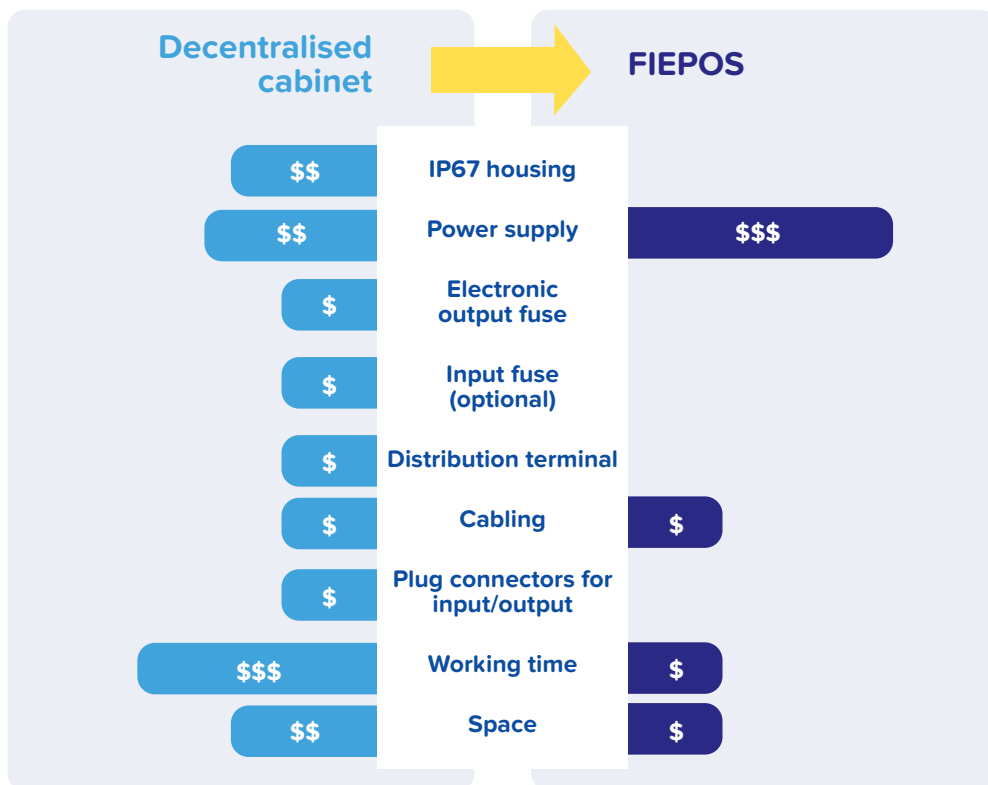
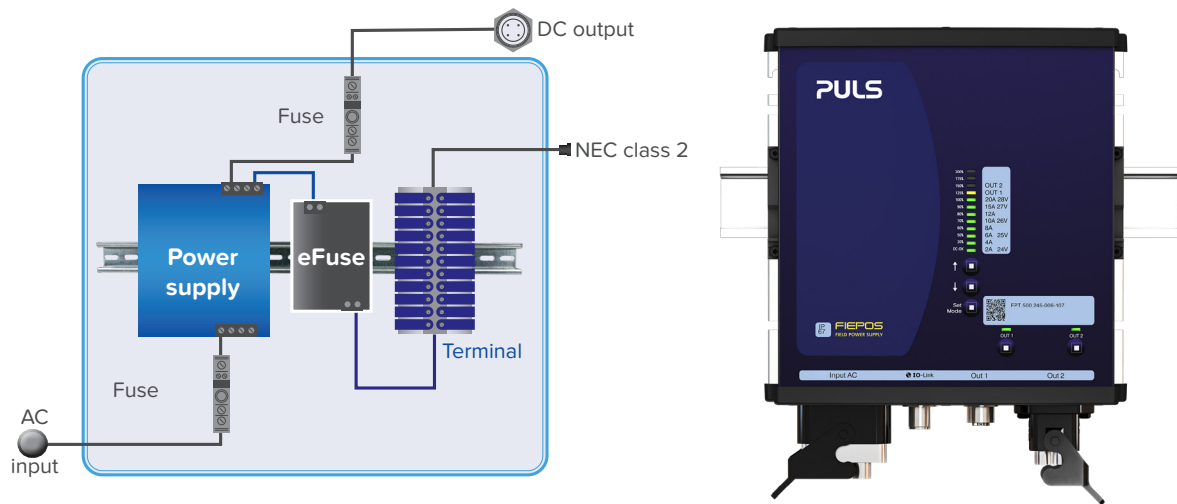


## 3 outputs. 3 load circuits.

In this version, a load is connected to each of the three output connectors. This means that each connector supplies one load circuit. If a output is switched off due to an error, the remaining ones will continue to be supplied with energy.

# THE ALTERNATIVE TO AN ON-SITE CABINET

FIEPOS eFused is also available with a current-limited high-power channel (20 A) and an additional fused low-power channel (2–12 A). The compact FIEPOS device can be attached directly to the machine and replaces decentralised on-site cabinets such as those comprising a DC 24 V 20 A power supply and an electronic fuse for creating an electric circuit compliant with NEC class 2 standards.



# FIND YOUR PRODUCT



## IP54, IP65 and IP67 power supplies, AC 100- 240 V

Output DC	Article number	Power	Input AC	Input DC	Special features
24 V 15 A	FPS300.241-002-101	360 W	AC 100-240 V	DC 110-300 V	DC OK, input: Han Q 4/2, output: Han Q 4/0
	FPS300.245-016-101				IO-Link, 2 channel, input: 7/8" - 3 pin, output: 1 x 7/8" 5 pin
	FPS300.245-034-105				IO-Link, 4 channel, input: M12-S, output: 2 x M12-L
	FPS300.245-047-103				IO-Link, 4 channel, input: 7/8" 3 pin, output: 2x 7/8" 4 pin
	FPS300.245-047-111				Output OK, 4 channel, input: 7/8" 3 pin, output: 2 x 7/8" 4 pin
	FPS300.245-049-102				Output OK, 3 channel, input: 7/8" 3 pin, output: 2 x 7/8" 4 pin
	FPS300.246-049-102				IO-Link, 3 channel NEC Class 2, input: M12-S, output: 3 x M12-L
	FPS300.245-049-112				IO-Link, 3 channel, input: 7/8" 3 pin, output: 3 x 7/8" 4 pin

## IP54, IP65 and IP67 power supplies, AC 200-240 V (highline)

Output DC	Article number	Power	Input AC	Input DC	Special features
24 V 25 A	FPH500.245-024-103	600 W	AC 200-240 V	DC 200-300 V	IO-Link, 3 channel, input: 7/8" 3 pin, output: 3 x M12-L
	FPH500.245-047-104				Output OK, 4 channel, input: 7/8" 3 pin, output: 2 x 7/8" 4 pin

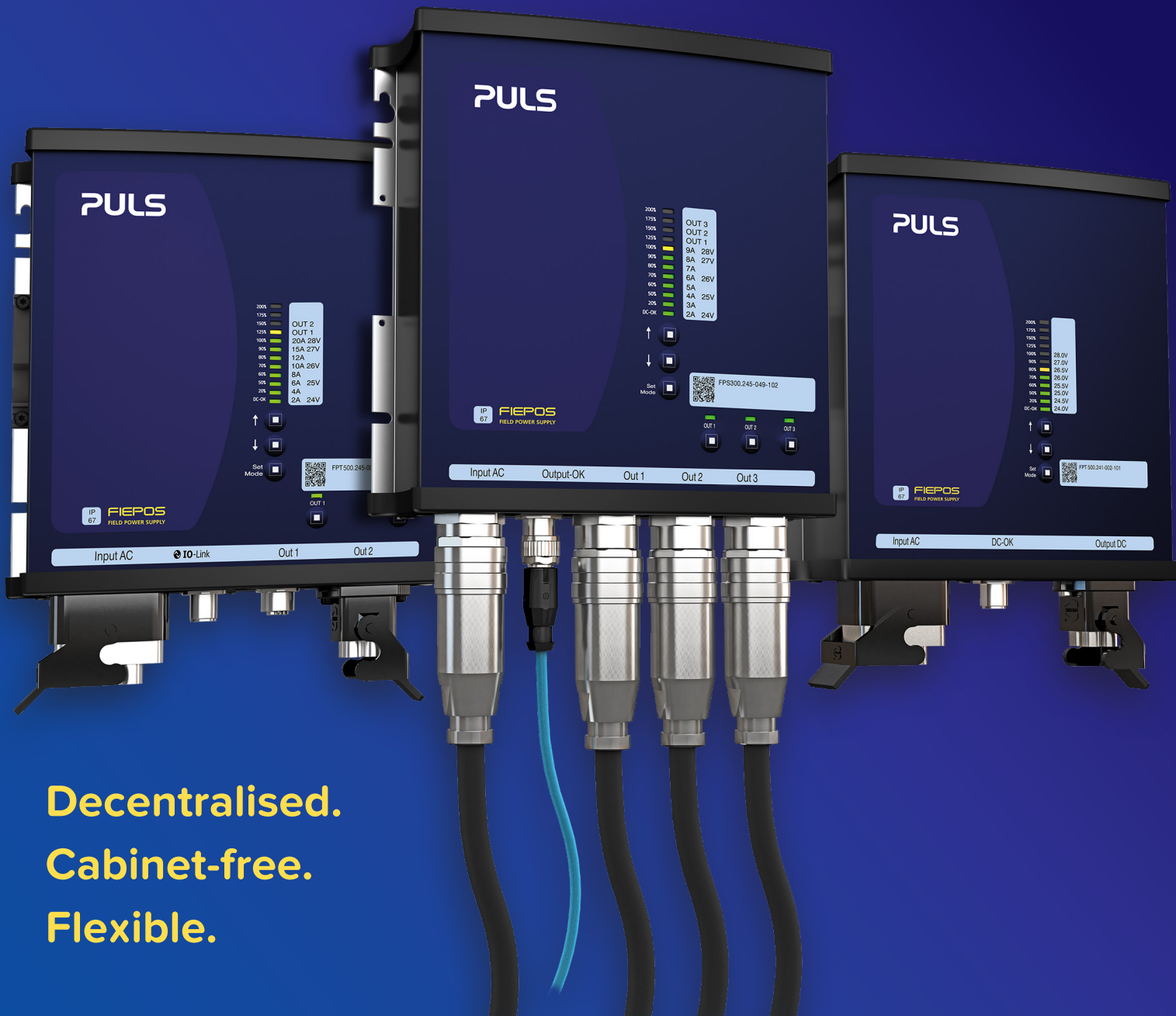
## IP54, IP65 and IP67 power supplies, 3AC 380-480 V

Output DC	Article number	Power	Input AC	Input DC	Special features	
24 V	12.5 A	FPT300.246-042-101	3AC 380-480 V		Output OK, 4 channel, input: Han Q 5/0, Output : 4 x M12-A	
		15 A			FPT300.242-002-101	360 W
	25 A	FPT500.241-001-102			600 W	Input: Han Q 4/2, output: Han Q 4/0
		FPT500.241-002-101				DC OK, input: Han Q 4/2, output: Han Q 4/0
		FPT500.241-006-104				DC OK, input: Han Q 4/2, output: ASi cable
		FPT500.241-010-108				DC OK, input: Han Q 4/2, output: Han Q 2/0
		FPT500.245-018-103				IO-Link, 4 channel, input: M12-S, output: 2 x 7/8" 4 pin
		FPT500.245-034-105				IO-Link, 4 channel, input: M12-S, output: 2 x M12-L
		FPT500.245-034-106				Output OK, 2 channel, input: M12-S, output: 2 x M12-L
		FPT500.245-062-117				IO-Link, 4 channel, input: M12-S, output: 2 x 7/8" 5 pin
		FPT500.247-064-102				IO-Link, 3 channel, input: 7/8", output: 1 x M12-A, 2 x 7/8" 5 pin

# PULS

## FIEPOS FIELD POWER SUPPLY

Power supply systems  
1-phase, 3-phase, 360 W or 600 W

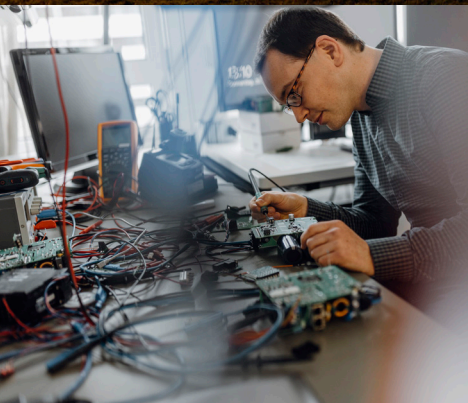
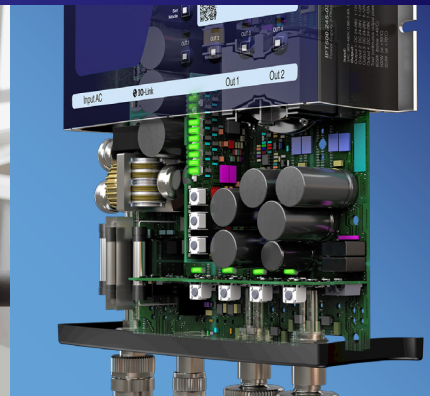


**Decentralised.  
Cabinet-free.  
Flexible.**

IP54, IP65 and IP67 housing | Wide variety of options | Optional current limitation  
Environmentally friendly design without potting

[www.pulspower.com](http://www.pulspower.com)

# Decentralised power supplies



## PULS FIEPOS

Find out how a decentralised power supply system can save you material costs, installation time, and space in your applications and warehouse.

PULS GmbH Elektrastrasse 6 81925 Munich [info@pulspower.com](mailto:info@pulspower.com) [www.pulspower.com](http://www.pulspower.com)



[www.pulspower.com/  
contact/puls-worldwide](http://www.pulspower.com/contact/puls-worldwide)