



PULS

DIN-RAIL POWER SUPPLIES

SELECTION GUIDE

2015 / 2016

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PULS – The Technology Leader

Reliable and Future-Proof Partner

PULS is the only company worldwide which focuses fully on DIN rail power supplies. As a result, our experienced team continues to pioneer the technological advancements of DIN rail power supplies making us the recognized technology leader in the industry who often also sets the market's standards.

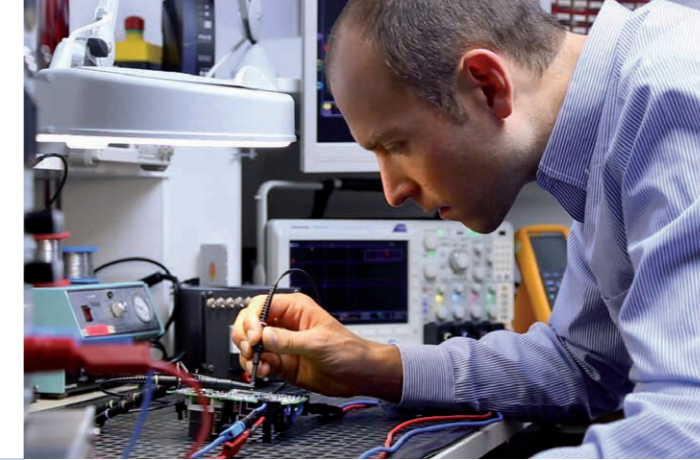
All PULS power supplies are developed in Germany and the entire value chain is under our direct control. Both our factories, located in Czech Republic and China, are identically equipped, organized and managed - and in our customer audits, their above-average standard is emphasized over and over again. Our offering has proven to be especially attractive as a result of our combination of efficient, mid-sized structures and direct global support for our customers.

PULS has produced DIN rail power supplies since 1991 but from 1997 onwards we have focused our efforts exclusively in this field. Our major successes started off with the SilverLine range and has since continued and flourished with the DIMENSION, PIANO and MiniLine families. Our broad product portfolio is available directly from stock and offers a highly credible solution for virtually all applications. If our standard units do not fulfill the specific requirements for your particular application, we can offer a standard unit modification or - together with our subsidiary MG V - a Value-Add system solution in order to fit your individual needs.

The easy, uncomplicated installation of our products is important to us. Because of this, we pay great attention to providing a simple assembly and wiring-in process as well as extensive and informative data sheets and application notes. Our sales force receives ongoing technical training and our highly competent application specialists are available to you for further consultation.

The best enterprises and companies all over the world put their trust in our team and in our products. You too?

Yours
Bernhard Erdl
Founder and CEO



Dependability

- High MTBF and long lifetime
- Outstanding energy efficiency
- Cool-Design for low temperatures
- Production-friendly setup
- Long product availability



Products

- At the forefront of technology
- Unique efficiency approx. 95%
- Small and lightweight
- High peak output current
- Easy to use
- Wide product portfolio

Focus

- All resources concentrated on DIN rail power supplies
- High-performance organisation structure
- Decades of competence



Portfolio

Power Supplies

MiniLine



MiniLine ML-Series Compact and Installed in Seconds

These units, in their rugged plastic housing are highly efficient, compact, reliable and can be installed in seconds.

- 1- or 2-phase input
- 15-100W
- Several models with DC input
- Spring clamp terminals or screw terminals

Supplementary Units

PISA-Series Protection Modules

The new and innovative solution to distribute and protect load circuits.

Low-price, space-saving alternative to electronic fuses.

Y-Series Redundancy Modules

For building redundant power supply systems or to isolate sensitive circuits. Increases the reliability and availability of the DC voltage with minimal power losses and voltage drops.

U-Series DC-UPS Systems

These modules improve safety and prevent downtime, loss of data and long restart sequences. If seconds, minutes, or hours of backup time are required, PULS Buffer Modules or DC-UPS controllers can provide a solution.

Z-Series Mounting Brackets

Accessories suitable for wall or panel mounting and panel brackets for side mounting.

PIANO



PIANO PIC-Series Simply Good

For applications where basic functionality is requested. High reliability at a very attractive price.

- 1-phase input
- 120W and 240W
- Best-in-Class lifetime
- Robust plastic housing
- Large screw connection terminals
- DC-OK relay contact

DIMENSION



DIMENSION Q-Series Premium Class Power Supplies

Suitable when you need state-of-the-art technology and flexibility for demanding tasks. With high efficiencies, minimal losses, a compact housing and many other features, this series is Best-in-Class.

- 1- or 3-phase Input
- 80-960W
- 50% BonusPower®
- AC and DC wide range input
- Low inrush current surge
- DC-OK relay contact
- Quick-connect spring-clamp terminals
- Active power factor correction (PFC)
- Comprehensive approval package

DIMENSION C-Series Effective Solution in a Compact Design

Power Supplies for users looking for highly reliable power supplies in a compact housing. Focusing only on the essential features of the premium class achieves advantages in price.

- 1- / 2- / 3-phase input
- 80-480W
- 20% PowerBoost®
- Low inrush current surge
- Large screw connection terminals

DIMENSION X-Series For Motors and Heavy Loads

Efficient and cost saving 960W 3-phase power supplies with semi-regulation.



Custom Built Solutions

Modifications and Value-Add System Solutions

For special customer requests which may not be covered by standard products, PULS and MGW are offering solutions which combine modern technology with custom-designed needs.

New Products

PIANO

Simply Good

120W/240W 1-phase power supplies
High Reliability, Lower in Price



CP10

DIMENSION CP10

240W 1-phase power supplies
High-End Innovation



- Versions: 24V / 5A, 24V / 10A
- Best-in-Class reliability
- Best-in-Class lifetime
- Basic functionality
- Large, rugged screw terminals
- Full performance from -10°C to +55°C
- PIC240.241D: -25°C to +55°C
- Radio interference Class B
- DC-OK relay contact

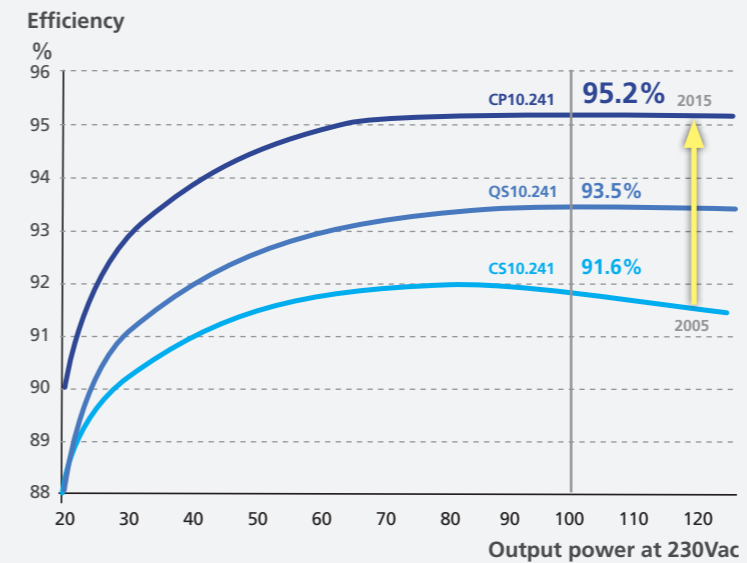
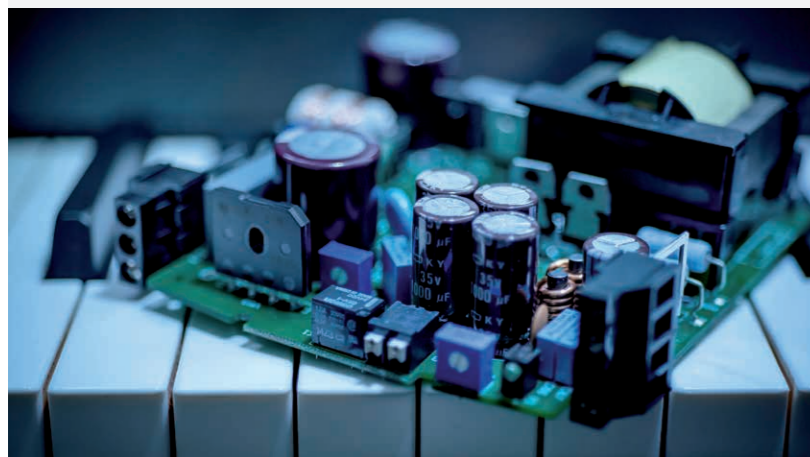
Best-in-Class Efficiency

At 230V, +25°C and full load



The Single Board Concept

High quality manufacturing and lower production costs mean price savings for the user.

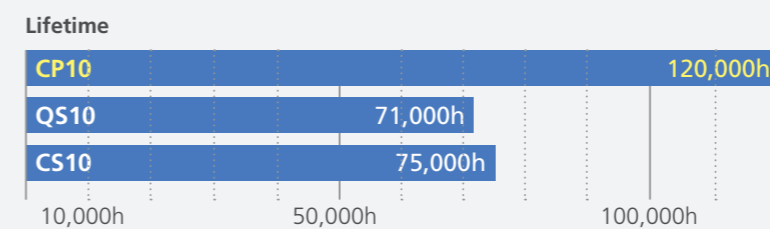


95,2% World Record in Efficiency

An efficiency level of 94% used to be seen as state-of-the-art. Through the replacement of traditional silicon with the new wide-bandgap material silicon carbide with a sophisticated LLC converter topology we now reach a record efficiency of 95,2%. This means a reduction of losses by 46% in comparison to CS10.

Versions:

- 24V 10A
- 48V 5,4A
- 12V 16A



The CP10 reaches a **minimum lifetime of 120,000 hours**, measured at +40°C ambient temperature and full load. Thus it is far above the usual market values.

Size 2005 → 2015




39mm instead of 60mm!

Due to an innovative circuit topology and a sophisticated thermal design the width has been reduced from previous 60mm to 39mm.

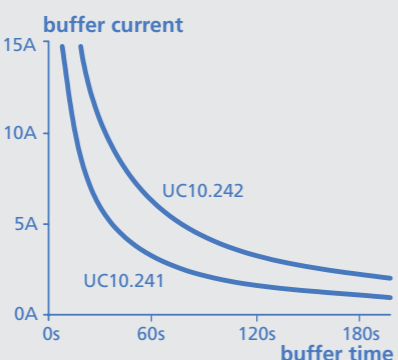
New Products



UC10



Control unit with integrated energy storage




| Buffer Time (s) | UC10.241 (A) | UC10.242 (A) |
|-----------------|--------------|--------------|
| 0s | 15A | 15A |
| 60s | ~5A | ~10A |
| 120s | ~3A | ~7A |
| 180s | ~2.5A | ~5.5A |

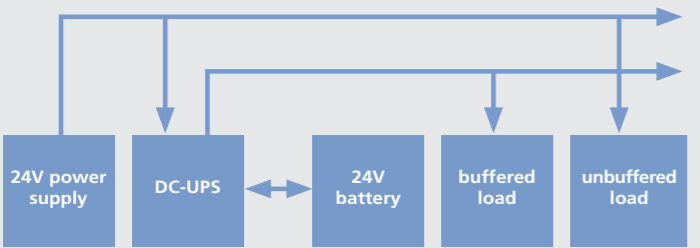
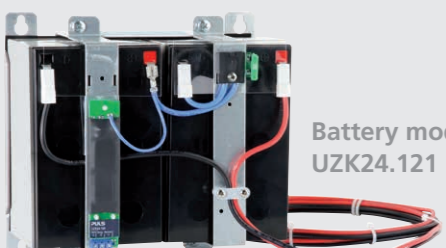
DC-UPS without Batteries 24V, 15A

- Built-in double layer capacitors as energy source – no replacement needed
- Operational lifetime expectancy typically over 10 years
- No generation of hydrogen as with VRLA batteries. Installation possible in enclosed control cabinets.
- Wide temperature range from -40°C to +60°C
- Supports PC-mode function for safe restart of PCs after power failure
- Two versions with different storage capacities – 6kWh and 12kWh

UB20



Control unit

Battery module UZK24.121

DC-UPS, adjustable Voltage 24V, 20A / 30A

1-Battery-Concept

For longer battery lifetime: Each 12V battery is charged and monitored separately.

Regulated Output Voltage

- Stable output voltage independent of the battery voltage
- Adjustable output voltage from 22.5V to 26V for battery mode

Additional Features

- 50% BonusPower®: 30A for max. 4s
- One control unit can be used for battery sizes from 3.9Ah to 150Ah
- High breaking capacity for branch protectors or for the startup of motors
- Smart battery diagnostic and monitoring functions



QS5.241-60 QS10.241-60 CPS20.241-60




DIN Rail Power Supplies for Rail Vehicles

- Tested according to:
 - EN 50155 **Railways Applications – Electronic Equipment used on Rolling Stock** classified according to T3, TX, C2 and S2
 - EN 61373 **Rolling Stock Equipment – Shock and Vibration Tests** Cat. 1, Class B
 - EN 50121-3-2 **Electromagnetic Compatibility – Rolling Stock – Apparatus**
 - EN 45545-2 **Fire Protection on Railway Vehicle** classified according to Hazard Level HL3

- Input voltage: DC 110V (-30%/+40%), 0.1s 66Vdc (-40%)
- 100% higher buffer time than required in the railway standard EN 50155 (S2)
- All units with conformal coated circuit boards

| | Power | DC-Input | AC-Input | EN 50155 | Fire protection EN 45545-1 | Conformal coated |
|--------------|-------|----------|----------|----------|----------------------------|------------------|
| QS5.241-60 | 100W | x | | x | x | x |
| QS10.241-60 | 200W | x | | x | x | x |
| CPS20.241-60 | 200W | x | | x | x | x |
| QS10.241-C1 | 240W | | x | x | x | x |
| CPS20.241-C1 | 480W | | x | x | x | x |
| QT20.241-C1 | 480W | | x | x | x | x |

Overview 1

Power Supplies

100-240V AC/DC-Converters

| Output | Order number | Page | Output Range | Power | Width in mm | Input | Special Features |
|--------|----------------|---------------|--------------|-----------|-------------|-----------------------|----------------------------|
| 5V | 3A ML15.051 | 18 | 5-5.5Vdc | 15W | 22.5 | AC 100-240V | |
| | 5A ML30.101 | 18 | 5-5.5Vdc | 25W | 45.0 | AC 100-240V | |
| 12V | 1.3A ML15.121 | 18 | 12-15Vdc | 15W | 22.5 | AC 100-240V | |
| | 2.5A ML30.102 | 18 | 10-12Vdc | 30W | 45.0 | AC 100-240V | very low output noise |
| | 4.2A ML50.102 | 18 | 12-15Vdc | 50W | 45.0 | AC 100-240V | |
| | 4.5A ML60.121 | 18 | 12-15Vdc | 54W | 45.0 | AC 100-240V | |
| | 4.5A ML60.122 | 18 | 12-15Vdc | 54W | 45.0 | AC 100-240V | -40°C operation |
| | 7.5A ML100.102 | 19 | 12-15Vdc | 90W | 72.5 | AC 100-120 / 220-240V | |
| | 15A QS10.121 | 19 | 12-15Vdc | 180W | 60.0 | AC 100-240V | |
| | 16A CP10.121 | 19 | 12-15Vdc | 192W | 39.0 | AC 100-240V | |
| | 30A CPS20.121 | 19 | 12-15Vdc | 405W | 65.0 | AC 100-240V | |
| | ±12V | 2.5A ML30.106 | 19 | ±12-15Vdc | 36W | 45.0 | AC 100-240V |
| 24V | 0.63A ML15.241 | 19 | 24-28Vdc | 15W | 22.5 | AC 100-240V | |
| | 1.3A ML30.100 | 19 | 24-28Vdc | 30W | 45.0 | AC 100-240V | |
| | 1.3A ML30.241 | 19 | 24-28Vdc | 30W | 22.5 | AC 100-240V | |
| | 2.1A ML50.100 | 20 | 24-28Vdc | 50W | 45.0 | AC 100-240V | |
| | 2.1A ML50.101 | 20 | 24-28Vdc | 50W | 45.0 | AC 100-240V | optimised for parallel use |
| | 2.1A ML50.109 | 20 | 24-28Vdc | 50W | 45.0 | AC 100-240V | conformal coated |
| | 2.1A ML50.111 | 20 | 24-28Vdc | 50W | 45.0 | AC 100-240V | with plug connector |
| | 2.5A ML60.241 | 20 | 24-28Vdc | 60W | 45.0 | AC 100-240V | |
| | 2.5A ML60.242 | 20 | 24-28Vdc | 60W | 45.0 | AC 100-240V | -40°C operation |
| | 3A ML70.100 | 20 | 24-28Vdc | 72W | 45.0 | AC 100-120 / 220-240V | |
| | 3.3A CS3.241 | 20 | 24-28Vdc | 80W | 32.0 | AC 100-240V | |
| | 3.4A QS3.241 | 21 | 24-28Vdc | 80W | 32.0 | AC 100-240V | |
| | 3.8A QS5.DNET | 21 | 24Vdc | 91W | 40.0 | AC 100-240V | DeviceNet® approved |
| | 3.9A ML95.100 | 21 | 24-28Vdc | 95W | 72.5 | AC 100-120 / 220-240V | NEC CLASS 2 |
| | 4.2A ML100.100 | 21 | 24-28Vdc | 100W | 72.5 | AC 100-120 / 220-240V | |
| | 4.2A ML100.109 | 21 | 24-28Vdc | 100W | 72.5 | AC 100-120 / 220-240V | conformal coated |
| | 5A CS5.241 | 21 | 24-28Vdc | 120W | 32.0 | AC 100-120 / 200-240V | |
| | 5A CS5.241-C1 | 21 | 24-28Vdc | 120W | 32.0 | AC 100-120 / 200-240V | conformal coated |
| | 5A CS5.241-S1 | 21 | 24-28Vdc | 120W | 32.0 | AC 100-120 / 200-240V | spring terminals |
| | 5A CS5.243 | 21 | 24-28Vdc | 120W | 32.0 | AC 100-120V | |
| | 5A CS5.244 | 21 | 24-28Vdc | 120W | 32.0 | AC 200-240V | |
| | 5A PIC120.241C | 22 | 24-28Vdc | 120W | 39.0 | AC 200-240V | DC-OK relay contacts |
| | 5A PIC120.241D | 22 | 24-28Vdc | 120W | 39.0 | AC 100-120/ 200-240V | DC-OK relay contacts |
| | 5A PIC120.242C | 22 | 24-28Vdc | 120W | 49.0 | AC 200-240V | |
| | 5A QS5.241 | 21 | 24-28Vdc | 120W | 40.0 | AC 100-240V | |
| | 5A QS5.241-A1 | 21 | 24-28Vdc | 120W | 40.0 | AC 100-240V | conformal coated, ATEX |
| | 8A QS10.DNET | 22 | 24-24.5Vdc | 192W | 60.0 | AC 100-240V | DeviceNet® approved |

| Output | Order number | Page | Output Range | Power | Width in mm | Input | Special Features |
|--------------|------------------|----------|--------------|-------|-------------|-----------------------|--|
| 24V | 10A CS10.241 | 22 | 24-28Vdc | 240W | 60.0 | AC 100-120 / 200-240V | |
| | 10A CS10.241-S1 | 22 | 24-28Vdc | 240W | 60.0 | AC 100-120 / 200-240V | spring-clamp terminals |
| | 10A CS10.242 | 22 | 24-28Vdc | 240W | 60.0 | AC 100-120 / 200-240V | passive PFC |
| | 10A CS10.243 | 22 | 24-28Vdc | 240W | 60.0 | AC 100-120V | |
| | 10A CS10.244 | 23 | 24-28Vdc | 240W | 60.0 | AC 200-240V | |
| | 10A CP10.241 | 22 | 24-28Vdc | 240W | 39.0 | AC 100-240V | |
| | 10A CP10.241-S1 | 22 | 24-28Vdc | 240W | 39.0 | AC 100-240V | spring-clamp terminals |
| | 10A CP10.242 | 22 | 24-28Vdc | 240W | 39.0 | AC 100-240V | enhanced DC input |
| | 10A PIC240.241C | 23 | 24-28Vdc | 240W | 49.0 | AC 200-240V | DC-OK relay contacts |
| | 10A PIC240.241D | 23 | 24-28Vdc | 240W | 49.0 | AC 100-240V | DC-OK relay contacts |
| | 10A QS10.241 | 23 | 24-28Vdc | 240W | 60.0 | AC 100-240V | |
| | 10A QS10.241-A1 | 23 | 24-28Vdc | 240W | 60.0 | AC 100-240V | conformal coated, ATEX |
| | 10A QS10.241-C1 | 23 | 24-28Vdc | 240W | 60.0 | AC 100-240V | conformal coated |
| | 10A QS10.241-D1 | 23 | 24-28Vdc | 240W | 60.0 | AC 100-240V | enhanced DC-input |
| | 20A CPS20.241 | 23 | 24-28Vdc | 480W | 65.0 | AC 100-240V | |
| | 20A CPS20.241-C1 | 23 | 24-28Vdc | 480W | 65.0 | AC 100-240V | conformal coated |
| | 20A QS20.241 | 23 | 24-28Vdc | 480W | 82.0 | AC 100-240V | |
| | 20A QS20.241-A1 | 23 | 24-28Vdc | 480W | 82.0 | AC 100-240V | conformal coated, ATEX |
| | 20A QS20.241-C1 | 23 | 24-28Vdc | 480W | 82.0 | AC 100-240V | conformal coated |
| | 20A QS20.244 | 23 | 24-28Vdc | 480W | 70.0 | AC 200-240V | |
| 40A QS40.241 | 23 | 24-28Vdc | 960W | 125.0 | AC 100-240V | | |
| 40A QS40.244 | 23 | 24-28Vdc | 960W | 125.0 | AC 200-240V | | |
| 30V | 8A QS10.301 | 24 | 28-32Vdc | 240W | 60.0 | AC 100-240V | |
| 36V | 13.3A CPS20.361 | 24 | 36-42Vdc | 480W | 65.0 | AC 100-240V | |
| | 13.3A QS20.361 | 24 | 36-42Vdc | 480W | 82.0 | AC 100-240V | |
| | 26.7A QS40.361 | 24 | 36-42Vdc | 960W | 125.0 | AC 100-240V | |
| 48V | 1.1A ML50.105 | 24 | 48-56Vdc | 50W | 45.0 | AC 100-240V | |
| | 2.1A ML100.105 | 24 | 48-56Vdc | 100W | 72.5 | AC 100-120 / 220-240V | |
| | 5A CS10.481 | 25 | 48-52Vdc | 240W | 60.0 | AC 100-120 / 200-240V | |
| | 5A QS10.481 | 25 | 48-56Vdc | 240W | 60.0 | AC 100-240V | |
| | 5A QS10.481-D1 | 25 | 48-56Vdc | 240W | 60.0 | AC 100-240V | enhanced DC input |
| | 5.4A CP10.481 | 25 | 48-56Vdc | 259W | 39.0 | AC 100-240V | |
| | 10A CPS20.481 | 25 | 48-56Vdc | 480W | 65.0 | AC 100-240V | |
| | 10A QS20.481 | 25 | 48-55Vdc | 480W | 82.0 | AC 100-240V | |
| | 20A QS40.481 | 25 | 48-54Vdc | 960W | 125.0 | AC 100-240V | |
| | 20A QS40.484 | 25 | 48-54Vdc | 960W | 125.0 | AC 200-240V | |
| 360-460V | 2.5A PAS395 | 25 | 360-460Vdc | 1025W | 310.0 | AC 220-240V | charger for electrochem. double-layer capacitors |

Overview 2

Power Supplies

380-480V AC/DC-Converters

| Output | Order number | Page | Output Range | Power | Width in mm | Input | Special Features |
|--------|-----------------|------|--------------|-------|-------------|--------------|------------------|
| 12V | 8A CT5.121 | 26 | 12-15Vdc | 96W | 40.0 | 2AC 380-480V | |
| 24V | 3.75A ML90.200 | 26 | 24-28Vdc | 90W | 72.5 | 2AC 380-480V | NEC CLASS 2 |
| | 4.2A ML100.200 | 26 | 24-28Vdc | 100W | 72.5 | 2AC 380-480V | |
| | 5A CT5.241 | 26 | 24-28Vdc | 120W | 40.0 | 2AC 380-480V | |
| | 10A CT10.241 | 26 | 24-28Vdc | 240W | 62.0 | 3AC 380-480V | |
| | 20A QT20.241 | 26 | 24-28Vdc | 480W | 65.0 | 3AC 380-480V | |
| | 20A QT20.241-C1 | 26 | 24-28Vdc | 480W | 65.0 | 3AC 380-480V | conformal coated |
| | 40A QT40.241 | 26 | 24-28Vdc | 960W | 110.0 | 3AC 380-480V | |
| | 40A XT40.241 | 27 | 24Vdc | 960W | 96.0 | 3AC 400V | semi-regulated |
| | 40A XT40.242 | 27 | 24Vdc | 960W | 96.0 | 3AC 480V | semi-regulated |
| 36V | 13.3A QT20.361 | 27 | 36-42Vdc | 480W | 65.0 | 3AC 380-480V | |
| | 26.6A XT40.361 | 27 | 36Vdc | 960W | 96.0 | 3AC 400V | semi-regulated |
| | 26.6A XT40.362 | 27 | 36Vdc | 960W | 96.0 | 3AC 480V | semi-regulated |
| | 26.7A QT40.361 | 27 | 36-42Vdc | 960W | 110.0 | 3AC 380-480V | |
| 48V | 5A CT10.481 | 27 | 48-56Vdc | 240W | 62.0 | 3AC 380-480V | |
| | 10A QT20.481 | 27 | 48-55Vdc | 480W | 65.0 | 3AC 380-480V | |
| | 20A QT40.481 | 27 | 48-54Vdc | 960W | 110.0 | 3AC 380-480V | |
| | 20A XT40.481 | 27 | 48Vdc | 960W | 96.0 | 3AC 400V | semi-regulated |
| | 20A XT40.482 | 27 | 48Vdc | 960W | 96.0 | 3AC 480V | semi-regulated |
| 72V | 13.3A XT40.721 | 27 | 72Vdc | 960W | 96.0 | 3AC 400V | semi-regulated |
| | 13.3A XT40.722 | 27 | 72Vdc | 960W | 96.0 | 3AC 480V | semi-regulated |

DC/DC-Converters

| Output | Order number | Page | Output Range | Power | Width in mm | Input | Special Features |
|--------|--------------------|--------------|--------------|---------|-------------|-------------|-------------------------|
| 5V | 8A SLD2.100 | 28 | 5-5.5Vdc | 40W | 49.0 | DC 24V | |
| 12V | 8A CD5.121 | 28 | 12-15Vdc | 96W | 32.0 | DC 24V | |
| 24V | 3.8A CD5.241-L1 | 28 | 24Vdc | 92W | 32.0 | DC 24V | NEC CLASS 2 |
| | 4A CD5.243 | 28 | 23-28Vdc | 96W | 32.0 | DC 12V | |
| | 4.2A QS5.241-60 | 29 | 24-28Vdc | 100W | 40.0 | DC 110 | railway applications |
| | 5A CD5.241 | 28 | 23-28Vdc | 120W | 32.0 | DC 24V | |
| | 5A CD5.241-S1 | 28 | 24-28Vdc | 120W | 32.0 | DC 24V | with signal contacts |
| | 5A CD5.242 | 28 | 24-28Vdc | 120W | 32.0 | DC 48V | |
| | 8.3A QS10.241-60 | 29 | 24-28Vdc | 200W | 60.0 | DC 110 | railway applications |
| | 10A CP10.242 | 29 | 24-28Vdc | 240W | 39.0 | DC 110-300V | |
| | 10A QS10.241-D1 | 29 | 24-28Vdc | 240W | 60.0 | DC 110-300V | |
| | 16.3A CPS20.241-60 | 29 | 24.5Vdc | 400W | 65.0 | DC 110 | railway applications |
| | 20A CPS20.241-D1 | 29 | 24-28Vdc | 480W | 65.0 | DC 110-300V | |
| | 20A QTD20.241 | 29 | 24-28Vdc | 480W | 65.0 | DC 600V | for intermediate DC bus |
| | 30.6V | 4A SLAD4.100 | 30 | 30.6Vdc | 120W | 40.0 | DC 24V |
| 48V | 5A QS10.481-D1 | 29 | 48-56Vdc | 240W | 60.0 | DC 110-300V | |
| | 10A CPS20.481-D1 | 29 | 48-56Vdc | 480W | 65.0 | DC 110-300V | |

For more power supplies with DC-input see overview on page 29.

Conformal Coated Power Supplies

| Output | Order number | Page | Output Range | Power | Width in mm | Input | Special Features |
|--------|------------------|------|--------------|-------|-------------|-----------------------|------------------|
| 24V | 2.1A ML50.109 | 20 | 24-28Vdc | 50W | 45.0 | AC 100-240V | |
| | 4.2A ML100.109 | 21 | 24-28Vdc | 100W | 72.5 | AC 100-120 / 220-240V | |
| | 5A CS5.241-C1 | 21 | 24-28Vdc | 120W | 32.0 | AC 100-120 / 200-240V | |
| | 5A QS5.241-A1 | 21 | 24-28Vdc | 120W | 40.0 | AC 100-240V | ATEX |
| | 10A QS10.241-C1 | 23 | 24-28Vdc | 240W | 60.0 | AC 100-240V | |
| | 10A QS10.241-A1 | 23 | 24-28Vdc | 240W | 60.0 | AC 100-240V | ATEX |
| | 20A CPS20.241-C1 | 23 | 24-28Vdc | 480W | 82.0 | AC 100-240V | |
| | 20A QS20.241-A1 | 23 | 24-28Vdc | 480W | 82.0 | AC 100-240V | ATEX |
| | 20A QS20.241-C1 | 23 | 24-28Vdc | 480W | 82.0 | AC 100-240V | |
| | 20A QT20.241-C1 | 26 | 24-28Vdc | 480W | 65.0 | 3AC 380-480V | |

AS-Interface® Power Supplies

| Output | Order number | Page | Output Range | Power | Width in mm | Input | Special Features |
|--------|---------------|------|--------------|-------|-------------|-----------------------|------------------|
| 30V | 2.8A SLA3.100 | 30 | 30.5Vdc | 85W | 49.0 | AC 100-120 / 220-240V | |
| | 4A SLA4.100 | 30 | 30.5Vdc | 120W | 73.0 | AC 100-120 / 220-240V | |
| | 4A SLAD4.100 | 30 | 30.5Vdc | 120W | 40.0 | DC 24V | DC/DC-converter |
| | 8A SLA8.100 | 30 | 30.5Vdc | 240W | 91.0 | AC 100-120 / 220-240V | |
| | 8A SLA8.300 | 30 | 30.5Vdc | 240W | 129.0 | 3AC 400-500V | |

DeviceNet® Power Supplies

| Output | Order number | Page | Output Range | Power | Width in mm | Input | Special Features |
|--------|---------------|------|--------------|-------|-------------|-------------|------------------|
| 24V | 3.8A QS5.DNET | 21 | 24Vdc | 91W | 40.0 | AC 100-240V | NEC CLASS 2 |
| | 8A QS10.DNET | 22 | 24-24.5Vdc | 192W | 60.0 | AC 100-240V | NEC CLASS 1 |

Mounting Brackets

| Order number | Page | Description |
|---------------------------|------|--|
| ZM1 - ZM3.WALL, ZM1.UBC10 | 31 | mounting brackets for a direct wall or panel mounting without a DIN rail |
| ZM11.SIDE - ZM15.SIDE | 31 | brackets for sideways installation with or without a DIN rail |

Custom Built Solutions

| Order Number | Page | Description |
|----------------------------|------|---|
| Modifications | 41 | modified standard units – examples |
| Value-Add System Solutions | 41 | standard units with customised elements |

Overview 3

Redundancy, Buffering, Protection

Redundancy Modules

| Order Number | Page | Input / Output | Width in mm | Special Features |
|--------------|------|---------------------|-------------|---|
| MLY10.241 | 32 | 12-48V, 2x5A / 10A | 45 | dual-input diode redundancy module |
| MLY02.100 | 32 | 12-48V, 2x5A / 10A | 45 | dual-input diode redundancy module |
| YR2.DIODE | 32 | 12-48V, 2x10A / 20A | 32 | dual-input diode redundancy module |
| YRM2.DIODE | 32 | 24-48V, 2x10A / 20A | 32 | dual-input diode redundancy module with signal contacts |
| YR40.241 | 33 | 24-28V, 2x20A / 40A | 36 | dual-input MOSFET redundancy module, for all power supplies |
| YR40.242 | 33 | 12-28V, 2x20A / 40A | 36 | dual-input MOSFET redundancy module, not for QT20, QTD20 |
| YR40.245 | 33 | 12-28V, 1x40A / 40A | 46 | single-input MOSFET redundancy module, not for QT40 |
| YR40.482 | 33 | 24-56V, 2x20A / 40A | 46 | dual-input MOSFET redundancy module, for all power supplies |
| YR80.241 | 33 | 24-28V, 2x40A / 80A | 46 | dual-input MOSFET redundancy module, for all power supplies |
| YR80.242 | 33 | 12-28V, 2x40A / 80A | 46 | dual-input MOSFET redundancy module, not for QT40 |

DC-UPS and Batteries

| Order Number | Page | Output | Width in mm | Special Features |
|--------------|------|----------|-------------|--|
| UB10.241 | 36 | 24V, 10A | 49 | DC-UPS control unit for external batteries 3.9-40Ah |
| UB10.242 | 36 | 24V, 10A | 49 | DC-UPS control unit for external batteries 17-130Ah |
| UB10.245 | 36 | 24V, 10A | 49 | DC-UPS with additional 12V output |
| UB20.241 | 36 | 24V, 20A | 49 | DC-UPS control unit for external batteries 3.9-130Ah |
| UBC10.241 | 36 | 24V, 10A | 49 | DC-UPS with integrated 5Ah battery |
| UBC10.241-N1 | 36 | 24V, 10A | 123 | same as UBC10.241, but battery not assembled |

DC-UPS and Buffer Modules with capacitor storage

| Order Number | Page | Ratings | Width in mm | Special Features |
|--------------|------|------------------|-------------|---|
| UC10.241 | 39 | 24V, 15A, 6kWs | 126 | DC-UPS with capacitor storage, typ. 9s at 15A |
| UC10.242 | 39 | 24V, 15A, 12kWs | 198 | DC-UPS with capacitor storage, typ. 18s at 15A |
| UF20.241 | 39 | 24V, 20A, 0.2kWs | 64 | electrolytic capacitor buffer module, typ. 310ms at 20A |
| UF20.481 | 39 | 48V, 20A, 0.2kWs | 64 | electrolytic capacitor buffer module, typ. 150ms at 20A |

Protection Modules

| Order Number | Page | Width in mm | Special Features |
|---------------|------|-------------|--|
| PISA11.401 | 34 | 45 | 4-channel protection module; Outputs: 4x1A |
| PISA11.402 | 34 | 45 | 4-channel protection module; Outputs: 4x2A |
| PISA11.403 | 34 | 45 | 4-channel protection module; Outputs: 4x3A |
| PISA11.404 | 34 | 45 | 4-channel protection module; Outputs: 4x4A |
| PISA11.406 | 34 | 45 | 4-channel protection module; Outputs: 4x6A |
| PISA11.410 | 35 | 45 | 4-channel protection module; Outputs: 4x10A |
| PISA11.203206 | 35 | 45 | 4-channel protection module; Outputs: 2x3A and 2x6A |
| PISA11.206212 | 35 | 45 | 4-channel protection module; Outputs: 2x6A and 2x12A |
| PISA11.CLASS2 | 35 | 45 | 4-channel protection module; Outputs: 4x NEC CLASS 2 listed as „Limited Power Source“, < 100VA per channel |

Power Supplies

1-Phase Power Supplies

24V 15-30W

5V, 12V, 15V 15-405W

100-240V AC/DC-Converters

5V, 12V, 15V
24V

15-450W
15-30W



NEW

| Output Voltage | 5V | | 12V | | | | | 12V | | | | ±12V | 24V | | |
|---|--|--|--|--|--|--|--|--|--|-----------------------------------|--|--|--|--|--|
| Output Current | 3A | 5A | 1.3A | 3.4A | 4.2A | 4.5A | 4.5A | 7.5A | 15A | 16A | 30A | 2.5W | 0.63A | 1.3A | 1.3A |
| Adjustment Range | 5-5.5V | 5-5.5V | 12-15V | 10-12V | 12-15V | 12-15V | 12-15V | 12-15V | 12-15V | 12-15V | 12-15V | ±12-15V | 24-28V | 24-28V | 24-28V |
| Output Current | 3.0A | 5.0A | 1.3-1.0A | 3-2.5A | 4.2-3.4A | 4.5-3.6A | 4.5-3.6A | 7.5-6A | 15-13.5A | 16-12.8A | 30/27A | 2.5A a) | 0.63-0.54A | 1.3-1.1A | 1.3-1.1A |
| Output Power | 15W | 25W | 15W | 30W | 50W | 54W | 54W | 90W | 180W | 192W | 360/405W | 36W | 15W | 30W | 30W |
| Power Reserves | - | - | - | - | - | - | - | - | 50% | 20% | 20% | - | - | - | - |
| Ripple & Noise max. [mV _{pp}] | 50mV | 50mV | 75mV | 10mV | 100mV | 50mV | 50mV | 50mV | 50mV | 50mV | 100mV | 50mV | 50mV | 50mV | 50mV |
| AC Input Voltage | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-120V/ 220-240V -15%/+10% auto select | AC 100-240V ±15% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range |
| Harmonic Correction | - | - | - | - | - | - | - | - | active | active | active | - | - | - | - |
| EN 61000-3-2 (PFC-Norm) | not applicable | not applicable | not applicable | not applicable | not applicable | not applicable | not applicable | fulfilled | fulfilled | fulfilled | fulfilled | not applicable | not applicable | not applicable | not applicable |
| Power Factor, typ. | 0.44 | 0.53 | 0.44 | 0.53 | 0.52 | 0.5 | 0.44 | 0.55 | 0.92 | 0.96 | 0.95 | 0.53 | 0.44 | 0.53 | 0.49 |
| Input Inrush Current Limiter | NTC | NTC | NTC | NTC | NTC | NTC | active | NTC | active | active | active | NTC | NTC | NTC | NTC |
| Input Inrush Current | 16A/31A ^{b)} | 17A/35A ^{b)} | 16A/31A ^{b)} | 17A/35A ^{b)} | 17A/35A ^{b)} | 16A/32A ^{b)} | 6A/6A ^{c)} | 22A/37A ^{b)} | 4A/7A ^{d)} | 6A/9A | 9A/7A ^{d)} | 17A/35A ^{b)} | 16A/31A ^{b)} | 17A/35A ^{b)} | 18A/35A ^{b)} |
| External Input Fuse Recommendation | B - 6A or C - 3A | B - 10A or C - 6A | B - 6A or C - 3A | B - 10A or C - 6A | B - 10A or C - 6A | B - 10A or C - 6A | B - 6A or C - 3A | B - 10A or C - 6A | B - 6A or C - 4A | B - 6A or C - 6A | B - 10A or C - 10A | B - 10A or C - 6A | B - 6A or C - 3A | B - 10A or C - 6A | B - 6A or C - 3A |
| DC Input Voltage | DC 110-300V -20%/+25% | DC 110-300V -20%/+25% | DC 110-300V -20%/+25% | DC 110-300V -20%/+25% | DC 110-300V -20%/+25% | DC 110-300V -20%/+25% | DC 110-300V -20%/+25% | DC 290V -25%/+30% | DC 110-150V -20%/+25% | DC 110-150V ±20% | - | DC 110-300V -20%/+25% | DC 110-300V -20%/+25% | DC 110-300V -20%/+25% | DC 110-300V -20%/+25% |
| Efficiency, typ. | 77.2% | 80.0% | 82.5% | 84.0% | 90.0% | 87.2% | 87.6% | 88.5% | 91.8% | 94.3% | 92.6% | 86.0% | 85.1% | 87.5% | 89.4% |
| Power Losses, typ. | 4.5W | 6.3W | 3.2W | 5.8W | 6.0W | 7.9W | 7.6W | 11.7W | 16.1W | 11.6W | 28.8W | 5.9W | 2.7W | 4.3W | 3.7W |
| MTBF (+40°C, SN 29500) | 2686 kh | 1963 kh | 3811 kh | 650 kh | 600 kh | 1690 kh | 1571 kh | 500 kh | 631 kh | t.b.d. | 554 kh | 600 kh | 4369 kh | 650 kh | 2405 kh |
| Operat. Temperature Range | -10°C to +70°C | -10°C to +70°C | -10°C to +70°C | -10°C to +70°C | -10°C to +70°C | -10°C to +70°C | -40°C to +70°C | -10°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -10°C to +70°C | -10°C to +70°C | -10°C to +70°C | -10°C to +70°C |
| Derating +60°C to +70°C | 0.4W/°C | 0.5W/°C | 0.4W/°C | 0.8W/°C | 1.3W/°C | 1.4W/°C | 1.4W/°C | 2.5W/°C | 5W/°C | 4.8W/°C | 0.75A/°C | 1W/°C | 0.4W/°C | 0.8W/°C | 0.8W/°C |
| Connection Terminals | screw terminals | spring terminals | screw terminals | spring terminals | spring terminals | screw terminals | screw terminals | spring terminals | spring terminals | screw terminals | screw terminals | spring terminals | screw terminals | spring terminals | screw terminals |
| Dimensions WxHxD | 22.5x75x91mm | 45x75x91mm | 22.5x75x91mm | 45x75x91mm | 45x75x91mm | 45x75x91mm | 45x75x91mm | 72.5x75x103mm | 60x124x117mm | 39x124x117 | 65x124x127mm | 45x75x91mm | 22.5x75x91mm | 45x75x91mm | 22.5x75x91mm |
| Weight | 130g | 240g | 130g | 250g | 260g | 250g | 250g | 360g | 930g | 600g | 1000g | 240g | 130g | 230g | 140g |
| DC-OK Signal | - | - | - | - | - | - | - | - | yes | yes | yes | - | - | - | - |
| Special Features | | | | very low output noise | | | -40°C version | | | shutdown input | | dual-output voltage | | | |
| Order Number | ML15.051 | ML30.101 | ML15.121 | ML30.102 | ML50.102 | ML60.121 | ML60.122 | ML100.102 | QS10.121 | CP10.121 e) | CPS20.121 | ML30.106 | ML15.241 | ML30.100 | ML30.241 |

a) Both outputs can be flexibly loaded to this power as long as the output power of 36W retaining inter less current at lower load output should be at least 5% of the more highly loaded output. b) Peak current at 120Vac / 230Vac, ambient temperature of +40 ° C and cold start c) between -40°C and +70°C d) Peak current at 120Vac / 230Vac, independent of temperature e) available QIII 2015

100-240V AC/DC-Converters

24V

50-120W



| Output Voltage | 24V | | | | | | 24V | | | | | | | |
|---|--|--|--|--|--|-----------------------------------|-----------------------------------|--|--|--|--|-----------------------|-----------------------|--|
| Output Current | 2.1A | 2.1A | 2.5A | 2.5A | 3A | 3.3A | 3.4A | 3.8A | 3.95A | 4.2A | 5A | 5A | 5A | 5A |
| Adjustment Range | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V |
| Output Current | 2.1-1.8A | 2.1-1.8A | 2.5-2.1A | 2.5-2.1A | 3-2.6A | 3.3-2.7A | 3.4-3A | 3.8A | 3.95-3.4A | 4.2-3.6A | 5-4.3A | 5-4.3A | 5-4.3A | 5-4.5A |
| Output Power | 50W | 50W | 60W | 60W | 72W | 80W | 80W | 91.2W | 95W | 100W | 120W | 120W | 120W | 120W |
| Power Reserves | - | - | - | - | - | - | 50% | - | - | - | 20% | 20% | 20% | 50% |
| Ripple & Noise max. [mV _{pp}] | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV |
| AC Input Voltage | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V -15%/+10% wide range | AC 100-120V/ 220-240V -15%/+10% manual select | AC 100-240V ±10% wide range | AC 100-240V ±15% wide range | AC 100-240V -15%/+10% wide range | AC 100-120V/ 220-240V -15%/+10% auto select | AC 100-120V/ 220-240V -15%/+10% auto select | AC 100-120/ 200-240V ±10% auto select | AC 100-120V ±10% | AC 200-240V ±10% | AC 100-240V -15%/+10% wide range |
| Harmonic Correction | - | - | - | - | - | - | - | active | - | - | - | - | - | active |
| EN 61000-3-2 (PFC-Norm) | not applicable | not applicable | not applicable | not applicable | fulfilled | not fulfilled | not fulfilled | fulfilled | fulfilled | fulfilled | - | not applicable | not fulfilled | fulfilled |
| Power Factor, typ. | 0.52 | 0.52 | 0.5 | 0.44 | 0.54 | 0.56 | 0.47 | 0.90 | 0.55 | 0.55 | 0.47 | 0.59 | 0.50 | 0.91 |
| Input Inrush Current Limiter | NTC | NTC | NTC | active | NTC | NTC | active | active | NTC | NTC | active | NTC | NTC | active |
| Input Inrush Current | 17A/35A ^{d)} | 17A/35A ^{d)} | 16A/32A ^{d)} | 6A/6A ^{e)} | 26A/30A ^{d)} | 23A/45A ^{d)} | 5A/10A ^{d)} | 9A/11A ^{f)} | 22A/37A ^{d)} | 22A/37A ^{d)} | 3A/3A ^{e)} | 45A ^{g)} | 30A ^{h)} | 9A/11A ^{f)} |
| External Input Fuse Recommendation | B - 10A or C - 6A | B - 10A or C - 6A | B - 10A or C - 6A | B - 6A or C - 3A | B - 10A or C - 6A | B - 10A or C - 6A | B - 6A or C - 6A | B - 6A or C - 3A | B - 10A or C - 6A | B - 10A or C - 6A | B - 10A or C - 6A | B - 16A or C - 10A | B - 16A or C - 10A | B - 6A or C - 3A |
| DC Input Voltage | DC 110-290V -25%/+30% | DC 110-300V -20%/+25% | DC 110-300V -20%/+25% | DC 110-300V -20%/+25% | DC 290V -25%/+30% | DC 110-300V -20%/+25% | DC 110-300V -20%/+25% | DC 110-300V ±20% | DC 290V -25%/+30% | DC 290V -25%/+20% | - | - | - | DC 110-300V ±20% |
| Efficiency, typ. | 89.0% | 88.5% | 89.7% | 90.4% | 89.0% | 89.8% | 90.0% | 92.0% | 90.0% | 90.0% | 90.2% | 90.0% | 90.2% | 92.7% |
| Power Losses, typ. | 6.2W | 6.8W | 6.9W | 6.4W | 8.7W | 9.1W | 9.1W | 7.9W | 10.5W | 11.4W | 13.2W | 13.5W | 13.2W | 9.4W |
| MTBF (+40°C, SN 29500) | 2613 kh | 600 kh | 1916 kh | 1866 kh | 600 kh | 2243 kh | 1451 kh | 831 kh | 500 kh | 500 kh | 869 kh | 740 kh | 940 kh | 831 kh |
| Operat. Temperature Range | -10°C to +70°C | -10°C to +70°C | -10°C to +70°C | -40°C to +70°C | -10°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -10°C to +70°C | -10°C to +70°C | -25°C to +70°C | -10°C to +70°C | -10°C to +70°C | -25°C to +70°C |
| Derating +60°C to +70°C | 1.3W/°C | 1.3W/°C | 1.5W/°C | 1.5W/°C | 1.8W/°C | 1.8W/°C | 2W/°C | 2W/°C | 2W/°C | 2.5W/°C | 3W/°C | 3W/°C | 3W/°C | 3W/°C |
| Connection Terminals | spring terminals | spring terminals | screw terminals | screw terminals | spring terminals | screw terminals | spring terminals | spring terminals | spring terminals | spring terminals | screw terminals | screw terminals | screw terminals | spring terminals |
| Dimensions WxHxD | 45x75x91mm | 45x75x91mm | 45x75x91mm | 45x75x91mm | 45x75x91mm | 32x124x102mm | 32x124x102mm | 40x124x117mm | 72.5x75x103mm | 72.5x75x103mm | 32x124x117mm | 32x124x117mm | 32x124x117mm | 40x124x117mm |
| Weight | 240g | 240g | 250g | 250g | 260g | 430g | 440g | 620g | 360g | 360g | 500g | 500g | 500g | 620g |
| DC-OK Signal | yes | yes | - | - | - | - | - | yes | - | - | - | - | - | yes |
| Special Features | | optimized for parallel use | | -40°C version | | | | DeviceNet® | NEC CLASS 2 | | | regional version | regional version | |
| Order Number | ML50.100 ML50.109 a) | ML50.101 ML50.111 b) | ML60.241 | ML60.242 | ML70.100 | CS3.241 | QS3.241 | QS5.DNET | ML95.100 | ML100.100 ML100.109 a) | CS5.241 CS5.241-C1 a) CS5.241-51 c) | CS5.243 | CS5.244 | QS5.241 QS5.241-A1 a) |

a) Conformal coated b) ML50.111 with pluggable screw, connected in parallel with load distribution and a depth of 98mm c) With spring terminals d) Peak current at 120Vac / 230Vac, ambient temperature +40°C and cold start e) 3 x 400V, 50Hz / 3 x 480Vac, 60Hz, independent of temperature f) Peak current at 120Vac / 230Vac, independent of temperature g) Peak current at 120Vac, ambient temperature +40°C and cold start h) Peak current at 230Vac, ambient temperature +40°C and cold start

100-240V AC/DC-Converters

24V

120-960W



| | NEW | | NEW | | NEW | | NEW | | NEW | | NEW | | NEW | | NEW | | | |
|---|--|---|------------------------------------|---|---|---|-----------------------|----------------------|---|--|---|--|--|-----------------------------------|----------------------|--------------------------|--|--------|
| Output Voltage | 24V | | | | | | | | 24V | | | | | | | | | |
| Output Current | 5A | 5A | 8A | 10A | 10A | 10A | 10A | 10A | 10A | 10A | 10A | 10A | 10A | 20A | 20A | 20A | 40A | 40A |
| Adjustment Range | 24-28V | 24-28V | 24-24.5V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V |
| Output Current | 5-4.3A | 5-4.3A | 8A | 10-8.6A | 10-8.6A | 10-8.6A | 10-8.6A | 10-8.6A | 10-9A | 10-8.6A | 10.0-8.6A | 20-17.1A | 20-17A | 20-17A | 20-17A | 40-34.4A | 40-34.3A | |
| Output Power | 120W | 120W | 192W | 240W | 240W | 240W | 240W | 240W | 240W | 240W | 240W | 480W | 480W | 480W | 960W | 960W | | |
| Power Reserves | - | - | - | 20% | 20% | 20% | 20% | 20% | 50% | - | - | 20% | 50% | 50% | 50% | 50% | 50% | |
| Ripple & Noise max. [mV _{pp}] | 100mV | 100mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 100mV | 100mV | 50mV | 100mV | 100mV | 100mV | 100mV | |
| AC Input Voltage | AC 200-240V ±10% | AC 100-120V/ 200-240V ±10% auto select | AC 100-240V ±15% wide range | AC 100-240V -15%/+10% wide range | AC 100-120V/ 200-240V ±10% auto select | AC 100-120V/ 200-240V ±10% auto select | AC 100-120V ±10% | AC 100-120V ±10% | AC 200-240V ±10% | AC 100-240V ±15% wide range | AC 200-240V ±10% | AC 100-240V ±10% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V ±15% wide range | AC 200-240V ±15% | AC 200-240V -15%/+10% | AC 100-240V -15%/+10% wide range | |
| Harmonic Correction | - | - | active | active | - | PFC-Drossel | - | - | active | - | active | active | active | - | active | active | | |
| EN 61000-3-2 (PFC-Norm) | - | - | fulfilled | fulfilled | not fulfilled | fulfilled | not applicable | not fulfilled | fulfilled | - | fulfilled | fulfilled | fulfilled | - | fulfilled | fulfilled | | |
| Power Factor, typ. | 0.54 | 0.54 | 0.92 | 0.97 | 0.51 | 0.57 | 0.57 | 0.52 | 0.92 | 0.52 | 0.91 | 0.95 | 0.90 | 0.50 | 0.96 | 0.99 | | |
| Input Inrush Current Limiter | NTC | NTC | active | active | active | active | NTC | NTC | active | NTC | active | active | active | active | active | active | | |
| Input Inrush Current | 28A ⁱ⁾ | 22A/33A ^{f)k)} | 4A/7A ^{g)} | 6/9A | 3A/3A ^{g)} | 3A/3A ^{g)} | 85A ^{h)} | 48A ⁱ⁾ | 4A/7A ^{g)} | 48A ⁱ⁾ | 12A/26A ^{f)} | 9A/7A ^{g)} | 9A/7A ^{g)} | 40A ^{j)} | 14A ^{j)} | 17A/11A ^{g)} | | |
| External Input Fuse Recommendation | B - 10A or C - 6A | B - 10A or C - 6A | B - 6A or C - 4A | B - 6A or C - 6A | B - 10A or C - 6A | B - 10A or C - 6A | B - 16A or C - 10A | B - 10A or C - 6A | B - 6A or C - 4A | B - 10A or C - 6A | B - 6A or C - 6A | B - 10A or C - 10A | B - 10A or C - 10A | B - 10A or C - 6A | B - 10A or C - 8A | B - 16A or C - 16A | | |
| DC Input Voltage | - | - | DC 110-150V -20%/+25% | DC 110-150V ±20% | - | - | - | - | DC 110-150V -20%/+25% | - | - | - | DC 110-150V -20%/+25% | - | - | - | | |
| Efficiency, typ. | 90.5% | 92.3% | 93.4% | 95.2% | 91.6% | 91.2% | 91.3% | 91.3% | 93.5% | 91.4% | 94.3% | 94.0% | 93.9% | 94.5% | 94.6% | 94.6% | | |
| Power Losses, typ. | 12.6W | 10.0W | 13.6W | 12.1W | 22.0W | 23.2W | 23.4W | 23.4W | 16.7W | 22.6W | 14.5W | 30.6W | 31.4W | 28.3W | 54.8W | 54.8W | | |
| MTBF (+40°C, SN 29500) | 1720 kh | t.b.d. | 581 kh | 667 kh | 821 kh | 821 kh | 710 kh | 910 kh | 581 kh | 791 kh | t.b.d. | 537 kh | 469 kh | 577 kh | 366 kh | 300 kh | | |
| Operat. Temperature Range | -10°C to +70°C | -10°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | 0°C to +70°C | 0°C to +70°C | -25°C to +70°C | -10°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | | |
| Derating +60°C to +70°C | 3W/°C ^{k)} | 3W/°C ^{k)} | 5W/°C | 6W/°C | 6W/°C | 6W/°C | 6W/°C | 6W/°C | 6W/°C | 6W/°C ^{k)} | 6W/°C ^{k)} | 12W/°C | 12W/°C | 12W/°C | 24W/°C | 24W/°C | | |
| Connection Terminals | screw terminals | screw terminals | spring terminals | screw terminals | screw terminals ^{b)} | screw terminals | screw terminals | screw terminals | spring terminals | screw terminals | screw terminals | screw terminals | spring terminals | spring terminals | spring terminals | screw terminals | | |
| Dimensions WxHxD | 39x124x124mm | 39x124x124mm | 60x124x117mm | 39x124x117mm | 60x124x117mm | 60x124x117mm | 60x124x117mm | 60x124x117mm | 60x124x117mm | 49x124x124mm | 49x124x124mm | 65x124x127mm | 82x124x127mm | 70x124x127mm | 125x124x127mm | 125x124x127mm | | |
| Weight | 350g | 370g | 900g | 600g | 700g | 800g | 700g | 700g | 900g | 550g | 540g | 1000g | 1200g | 880g | 1800g | 1900g | | |
| DC-OK Signal | yes | yes | yes | yes | - | - | - | - | yes | yes | yes | yes | yes | yes | yes | yes | | |
| Special Features | | | DeviceNet [®] approved | | | PFC version | regional version | regional version | | | | | | regional version | regional version | | | |
| Order Number | PIC120.241C PIC120.242C ^{e)} | PIC120.241D ^{l)} | QS10.DNET | CP10.241 CP10.242 ^{d)} CP10.241-S1 ^{b)} | CS10.241 CS10.241-S1 ^{b)} | CS10.242 | CS10.243 | CS10.244 | QS10.241 QS10.241-A1 ^{a)} QS10.241-C1 ^{c)} QS10.241-D1 ^{d)} | PIC240.241C PIC240.241D ^{m)} | CPS20.241 CPS20.241-C1 ^{c)} | QS20.241 QS20.241-A1 ^{a)} QS20.241-C1 ^{c)} | QS20.244 | QS40.244 | QS40.241 | | | |

a) Conformal coated and ATEX approval b) With spring clamp terminals c) Conformal coated d) Using extended DC input 110-300V ±20% e) Without DC OK relay contact f) Peak current at 120Vac / 230Vac, ambient temperature of +40°C and cold start g) Peak current at 120Vac / 230Vac, independent of temperature h) Peak current at 120Vac, ambient temperature +40°C and cold start i) Peak current at 230Vac, ambient temperature +40°C and cold start j) Peak current at 230Vac, independent of temperature k) Derating over +55°C l) Available QIII 2015 m) Available QIV 2015

100-240V AC/DC-Converters

30V, 36V, 48V 50-960W
410V 1025W



NEW

| Output Voltage | 30V | | | | 36V | | 48V | | 48V | | | | | 410V | | | | | | | | |
|---|-----------------------------------|--|--|--|--|-------|-----------------------------------|--|-----|--|------|--|------------------------|------|---|-----------------------------------|--|-----------------------------------|--------------------------|--|---|------------------|
| Output Current | 8A | | | | 13.3A | 13.3A | 26.7A | 1.05A | | 2.1A | 5.4V | | 5A | 5A | 10A | 10A | 20A | 20A | 2.5A | | | |
| Adjustment Range | 28-32V | | | | 36-42V | | 36-42V | 36-42V | | 48-56V | | 48-56V | 48-56V | | 48-52V | 48-56V | 48-56V | 48-55V | 48-54V | 48-54V | 360-460V | |
| Output Current | 8.6-7.5A | | | | 13.3-11.4A | | 13.3-11.4A | 26.7-22.9A | | 1.05-0.9A | | 2.1-1.8A | 5.4-4.6A | | 5-4.6A | 5-4.3A | 10-8.6A | 10-8.7A | 20-17.8A | 20-17.8A | 2.5A | |
| Output Power | 240W | | | | 480W | | 480W | 960W | | 50W | | 100W | 259W | | 240W | 240W | 480W | 480W | 960W | 960W | 1025W | |
| Power Reserves | 50% | | | | 20% | | 50% | 50% | | - | | - | 20% | | 20% | 50% | 20% | 50% | 50% | 50% | 50% | - |
| Ripple & Noise max. [mV _{pp}] | 50mV | | | | 100mV | | 100mV | 130mV | | 50mV | | 50mV | 50mV | | 100mV | 100mV | 50mV | 100mV | 150mV | 150mV | 10mV | |
| AC Input Voltage | AC 100-240V ±15% wide range | | | | AC 100-240V -15%/+10% wide range | | AC 100-240V ±15% wide range | AC 100-240V -15%/+10% wide range | | AC 100-240V -15%/+10% wide range | | AC 100-120V/ 220-240V -15%/+10% auto select | AC 100-240V ±10% | | AC 100-120V/ 200-240V ±10% auto select | AC 100-240V ±15% wide range | AC 100-240V -15%/+10% wide range | AC 100-240V ±15% wide range | AC 200-240V -15%/+10% | AC 100-240V -15%/+10% wide range | AC 220-240V -20%/+10% | |
| Harmonic Correction | active | | | | active | | active | active | | - | | - | active | | - | active | active | active | active | active | active | active |
| EN 61000-3-2 (PFC-Norm) | fulfilled | | | | fulfilled | | fulfilled | fulfilled | | not applicable | | fulfilled | fulfilled | | - | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled |
| Power Factor. typ. | 0.92 | | | | 0.95 | | 0.90 | 0.99 | | 0.52 | | 0.55 | 0.98 | | 0.51 | 0.92 | 0.95 | 0.90 | 0.96 | 0.99 | >0.9 | |
| Input Inrush Current Limiter | active | | | | active | | active | active | | NTC | | NTC | active | | active | active | active | active | active | active | active | |
| Input Inrush Current | 4A/7A ^d | | | | 9A/7A ^d | | 9A/7A ^d | 17A/11A ^d | | 17A/35A ^b | | 22A/37A ^b | 6A/9A | | 3A/3A ^d | 4A/7A ^d | 9A/7A ^d | 9A/7A ^d | 14A ^d | 17A/11A ^d | 14A ^d | |
| External Input Fuse Recommendation | B - 6A or C - 4A | | | | B - 10A or C - 10A | | B - 10A or C - 10A | B - 16A or C - 16A | | B - 10A or C - 6A | | B - 10A or C - 6A | B - 6A or C - 6A | | B - 10A or C - 6A | B - 6A or C - 4A | B - 10A or C - 10A | B - 10A or C - 10A | B - 10A or C - 8A | B - 16A or C - 16A | B - 10A or C - 8A | |
| DC Input Voltage | DC 110-150V -20%/+25% | | | | - | | DC 110-150V -20%/+25% | - | | DC 110-300V -20%/+25% | | DC 290V -25%/+30% | DC 110-150V ±20% | | - | DC 110-150V -20%/+25% | - | DC 110-150V -20%/+25% | - | - | - | |
| Efficiency, typ. | 93.5% | | | | 94.3% | | 94.0% | 94.6% | | 90.0% | | 91.0% | 95.5% | | 91.6% | 92.0% | 93.9% | 94.3% | 95.0% | 95.0% | 94.4% | |
| Power Losses, typ. | 16.7W | | | | 29.0W | | 30.6W | 54.8W | | 6.0W | | 10.0W | 12.3W | | 22.0W | 20.9W | 31.2W | 29.0W | 50.5W | 50.5W | 60.8W | |
| MTBF (+40°C, SN 29500) | 581 kh | | | | 537 kh | | 469 kh | 300 kh | | 600 kh | | 500 kh | t.b.d. | | 830 kh | 606 kh | 537 kh | 469 kh | 392 kh | 300 kh | t.b.d. | |
| Operat. Temperature Range | -25°C to +70°C | | | | -25°C to +70°C | | -25°C to +70°C | -25°C to +70°C | | -10°C to +70°C | | -10°C to +70°C | -25°C to +70°C | | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -40°C to +65°C |
| Derating +60°C to +70°C | 6W/°C | | | | 12W/°C | | 12W/°C | 24W/°C | | 1.3W/°C | | 2.5W/°C | 6.5W/°C | | 6W/°C | 6W/°C | 12W/°C | 12W/°C | 24W/°C | 24W/°C | - | |
| Connection Terminals | spring terminals | | | | screw terminals | | spring terminals | screw terminals | | spring terminals | | spring terminals | screw terminals | | screw terminals | spring terminals | screw terminals | spring terminals | screw terminals | screw terminals | screw terminals | spring terminals |
| Dimensions WxHxD | 60x124x117mm | | | | 65x124x127mm | | 82x124x127mm | 125x124x127mm | | 45x75x91mm | | 73x75x103mm | 39x124x117mm | | 60x124x117mm | 60x124x117mm | 65x124x127mm | 82x124x127mm | 125x124x127mm | 125x124x127mm | 310x158x80mm | |
| Weight | 900g | | | | 1000g | | 1200g | 1900g | | 240g | | 360g | 600g | | 700g | 900g | 1000g | 1200g | 1800g | 1900g | 2300g | |
| DC-OK Signal | yes | | | | yes | | yes | yes | | - | | - | yes | | - | yes | yes | yes | yes | yes | yes | |
| Special Features | | | | | | | | | | | | | | | | | | | regional version | | charger f. electrochem. double layer capac. | |
| Order Number | QS10.301 | | | | CPS20.361 | | QS20.361 | QS40.361 | | ML50.105 | | ML100.105 | CP10.481 ^{e)} | | CS10.481 | QS10.481 | QS10.481-D1 ^{a)} | CPS20.481 | QS20.481 | QS40.484 | QS40.481 | PAS395 |

a) Using the extended DC input b) Peak current at 120Vac / 230Vac, ambient temperature of +40°C and cold start c) Peak current at 120Vac / 230Vac, independent of temperature d) Peak current at 230Vac, independent of temperature e) Available QIII 2015

Power Supplies

3-Phase Power Supplies

12V, 24V 90-960W

36V, 48V, 72V 240-960W

380-480V AC/DC-Converters

12V, 24V

90-960W

36V, 48V, 72V

240-960W



| Output Voltage | 12V | 24V | | | | | | 24V | 36V | | | 48V | | | | 72V | |
|---|---|------------------------------------|------------------------------------|---|---|------------------------------------|---|--|------------------------------------|--|---|---|------------------------------------|---|--|--|----------------|
| Output Current | 8A | 3.75A | 4.2A | 5A | 10A | 20A | 40A | 40A | 13.3A | 26.6A | 26.7A | 5A | 10A | 20A | 20A | 13.3A | |
| Adjustment Range | 12-15V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 24V | 36-42V | 36V | 36-42V | 48-56V | 48-55V | 48-54V | 48V | 72V | |
| Output Current | 8-6.4A | 3.75-3.2A | 4.2-3.6A | 5-4.3A | 10-8.6A | 20-17.5A | 40-34.3A | 40A | 13.3A | 26.6A | 26.7-22.9A | 5-4.3A | 10A | 20-17.8A | 20A | 13.3A | |
| Output Power | 96W | 90W | 100W | 120W | 240W | 480W | 960W | 960W | 480W | 960W | 960W | 240W | 480W | 960W | 960W | 960W | |
| Power Reserves | - | - | - | 20% | 20% | 50% | 50% | 25% | 50% | 25% | 50% | 20% | 50% | 50% | 25% | 25% | |
| Ripple & Noise max. [mV _{pp}] | 100mV | 50mV | 50mV | 50mV | 50mV | 100mV | 100mV | 1500mV | 100mV | 2000mV | 130mV | 100mV | 100mV | 150mV | 2500mV | 3000mV | |
| AC Input Voltage | 2AC 380-480V -15%/+20% wide range | 2AC 380-480V ±15% wide range | 2AC 380-480V ±15% wide range | 2AC 380-480V -15%/+20% wide range | 3AC 380-480V -15%/+20% wide range | 3AC 380-480V ±15% wide range | 3AC 380-480V -15%/+20% wide range | 3AC 400V ^{b)} 3AC 480V ^{b)} ±15% | 3AC 380-480V ±15% wide range | 3AC 400V ^{b)} 3AC 480V ^{b)} ±15% | 3AC 380-480V -15%/+20% wide range | 3AC 380-480V -15%/+20% wide range | 3AC 380-480V ±15% wide range | 3AC 380-480V -15%/+20% wide range | 3AC 400V ^{b)} 3AC 480V ^{b)} ±15% | 3AC 400V ^{b)} 3AC 480V ^{b)} ±15% | |
| Harmonic Correction | PFC inductor | - | - | PFC inductor | PFC inductor | active | active | active | active | active | active | PFC inductor | active | active | active | active | |
| EN 61000-3-2 (PFC-Norm) | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | fulfilled | |
| Power Factor, typ. | 0.44 | 0.60 | 0.60 | 0.45 | 0.53 | 0.94 | 0.88 | 0.93 | 0.94 | 0.93 | 0.88 | 0.53 | 0.94 | 0.88 | 0.93 | 0.93 | |
| Input Inrush Current Limiter | active | NTC | NTC | active | active | active | active | active | active | active | active | active | active | active | active | active | |
| Input Inrush Current | 4A/4A ^{e)} | 30A/36A ^{d)} | 30A/36A ^{d)} | 4A/4A ^{e)} | 4A/4A ^{f)} | 3A/3A ^{d)} | 4.5A/4.5A ^{d)} | 2A ^{g)} | 3A/3A ^{d)} | 2A ^{g)} | 4.5A/4.5A ^{g)} | 4A/4A ^{f)} | 3A/3A ^{d)} | 4.5A/4.5A ^{d)} | 2A ^{g)} | 2A ^{g)} | |
| External Input Fuse Recommendation | B - 6A or C - 3A | B - 10A or C - 6A | B - 10A or C - 6A | B - 6A or C - 3A | B - 6A or C - 3A | B - 6A or C - 3A | B - 6A or C - 6A | B - 6A or C - 3A | B - 6A or C - 3A | B - 6A or C - 3A | B - 6A or C - 6A | B - 6A or C - 3A | B - 6A or C - 3A | B - 6A or C - 6A | B - 6A or C - 3A | B - 6A or C - 3A | |
| DC Input Voltage | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Efficiency, typ. | 85.4% | 89.5% | 89.5% | 90.4% | 92.8% | 95.0% | 95.3% | 95.5% | 94.8% | 95.5% | 95.3% | 92.8% | 95.4% | 95.4% | 96.0% | 95.5% | |
| Power Losses, typ. | 16.4W | 10.5W | 11.7W | 12.7W | 18.6W | 25.3W | 47.3W | 45.2W | 26.3W | 45.2W | 47.3W | 18.6W | 23.1W | 46.3W | 40.0W | 45.2W | |
| MTBF (+40°C, SN 29500) | 983 kh | 1594 kh | 1594 kh | 1173 kh | 975 kh | 690 kh | 375 kh | 529 kh | 690 kh | 529 kh | 375 kh | 1051 kh | 690 kh | 375 kh | 540 kh | 539 kh | |
| Operat. Temperature Range | -25°C to +70°C | -10°C to +70°C | -10°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | |
| Derating +60°C to +70°C | 2.5W/°C | 2W/°C | 2.5W/°C | 3W/°C | 6W/°C | 12W/°C | 24W/°C | 24W/°C | 12W/°C | 24W/°C | 24W/°C | 6W/°C | 12W/°C | 24W/°C | 24W/°C | 24W/°C | |
| Connection Terminals | screw terminals | spring terminals | spring terminals | screw terminals | screw terminals | spring terminals | screw terminals | screw terminals | spring terminals | screw terminals | screw terminals | screw terminals | spring terminals | screw terminals | screw terminals | screw terminals | |
| Dimensions WxHxD | 40x124x117mm | 72.5x75x103mm | 72.5x75x103mm | 40x124x117mm | 62x124x117mm | 65x124x127mm | 110x124x127mm | 96x124x159mm | 65x124x127mm | 96x124x159mm | 110x124x127mm | 62x124x117mm | 65x124x127mm | 110x124x127mm | 96x124x159mm | 96x124x159mm | |
| Weight | 500g | 360g | 360g | 500g | 750g | 870g | 1500g | 1400g | 870g | 1400g | 1500g | 750g | 870g | 1500g | 1400g | 1400g | |
| DC-OK Signal | - | - | - | - | - | yes | yes | - | yes | - | yes | - | yes | yes | - | - | |
| Special Features | | NEC CLASS 2 | | | | | | semi-regulated | semi-regulated | | | semi-regulated | | | | | semi-regulated |
| Order Number | CT5.121 | ML90.200 | ML100.200 | CT5.241 | CT10.241 | QT20.241 | QT40.241 | XT40.241 ^{b)} XT40.242 ^{b)} | QT20.361 | XT40.361 ^{b)} XT40.362 ^{b)} | QT40.361 | CT10.481 | QT20.481 | QT40.481 | XT40.481 ^{b)} XT40.482 ^{b)} | XT40.721 ^{b)} XT40.722 ^{b)} | |

a) Conformal Coated b) Separate units for 3AC 400V and 3AC 480V required, use XT40.241, XT40.361, XT40.481, XT40.721 for 3AC 400V mains and XT40.242, XT40.362, XT40.482, XT40.722 for 3AC 480V mains c) Peak current at 120Vac / 230Vac, ambient temperature +40°C and cold start d) At 3 x 400V, 50Hz / 3 x 480Vac, 60Hz, independent of temperature e) Peak current at 2 x 400Vac / 2 x 480Vac, independent of temperature f) Peak current at 3 x 400Vac / 3 x 480Vac, independent of temperature g) At 3 x 400Vac, independent of temperature

DC/DC-Converters

There are multiple applications for DC/DC-Converters.

- Stabilised control voltages in battery powered applications
- For galvanic isolation in mobile applications e.g. ships or fork-lifts
- To avoid earth loops
- To restore control voltage at the end of long cable runs, to compensate for voltage drops



CPS20, QS10, CD5

Converters for AC- and DC-Input

Several AC units also have an approved DC input voltage range.

Input: DC 110-300V

| Order Number | Output |
|--------------|------------------|
| ML15.015 | 5-5.5V 3A 15W |
| ML30.101 | 5-5.5V 5A 25W |
| ML15.121 | 12-15V 1.3A 15W |
| ML30.102 | 10-12V 2.5A 30W |
| ML50.102 | 12-15V 4.2A 50W |
| ML60.121 | 12-15V 4.5A 54W |
| ML15.241 | 24-28V 0.6A 15W |
| ML30.100 | 24-28V 1.3A 30W |
| ML30.241 | 24-28V 1.3A 30W |
| ML50.100 | 24-28V 2.1A 50W |
| ML60.241 | 24-28V 2.5A 60W |
| CS3.241 | 24-28V 3.3A 80W |
| QS3.241 | 24-28V 3.4A 82W |
| QS5.241 | 24-28V 5A 120W |
| QS10.241-D1 | 24-28V 10A 240W |
| ML50.105 | 48-56V 1.05A 50W |
| QS10.481-D1 | 48-56V 5A 240W |

Input: DC 110-150V

| Order Number | Output |
|--------------|-------------------|
| QS10.121 | 12-15V 15A 180W |
| QS10.241 | 24-28V 10A 240W |
| QS20.241 | 24-28V 20A 480W |
| QS10.301 | 28-32V 8A 240W |
| QS20.361 | 36-42V 13.3A 240W |
| QS10.481 | 48-56V 5A 240W |
| QS20.481 | 48-56V 10A 480W |

| Nominal Input Voltage | NEW | | | | | | NEW | | | NEW | | | NEW | | | |
|---|---------------------|-----------------------------------|---------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------|---------------------|---------------------|--------------------------|----------------------|----------------------|--------------------------|----------------------|--------------------------|------------------------|
| | DC 24V | | DC 48V | | DC 100-300V | | DC 110V | | DC 110-300V | | DC 600V | | | | | |
| Output Voltage Range | 5-5.5V | 12-15V | 23-28V | 23-28V | 24V | 24V | 23-28V | 24-28V | 48-56V | 24-28V | 24-28V | 24-28V | 24-28V | 24-28V | 48-56V | 24-28V |
| Input Voltage | DC 24V -25%/+50% | DC 24V -25%/+35% ^{a)} | DC 24V -30%/+35% | DC 24V -25%/+35% ^{a)} | DC 24V -25%/+35% ^{a)} | DC 24V -40%/+35% ^{a)} | DC 48V ±25% | DC 100-300V ±20% | DC 100-300V ±20% | DC 110V -30%/+40% | DC 110V -30%/+40% | DC 110V -30%/+40% | DC 110-300V -20%/+25% | DC 110-300V ±20% | DC 110-300V -20%/+25% | DC 600V -20%/+40% |
| Output Current | 8A | 8-6.4A | 4-3.4A | 5-4.3A | 5-4.3A | 3.8A | 5-4.3A | 20-17.1A | 10-8.6A | 4.2-3.6A | 8.3-7.1A | 16.3A | 10-9A | 10-8.6A | 5-4.3A | 20A |
| Output Power | 40W | 96W | 96W | 120W | 120W | 92W | 120W | 480W | 480W | 100W | 200W | 400W | 240W | 240W | 240W | 480W |
| Power Reserves | - | 20% | 20% | 20% | 20% | - | 20% | 20% | 20% | - | - | - | 50% | 20% | 50% | 25% |
| Ripple & Noise max. [mV _{pp}] | 50mV | 75mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 50mV | 70mV | 50mV | 50mV | 100mV | 100mV |
| Efficiency, typ. | 82.0% | 88.2% | 87.7% | 90.2% | 90.3% | 90.5% | 90.3% | 94.6% | 94.6% | 91.4% | 92.5% | 94% | 93.5% | 95.2% | 92.0% | 95.0% |
| Power Losses, typ. | 8.5W | 12.8W | 13.5W | 13.3W | 12.9W | 9.7W | 12.9W | 27.4W | 27.4W | 9.7W | 16.7W | 25.7W | 16.7W | 12.1W | 20.9W | 25.5W |
| MTBF (+40°C, SN 29500) | 510 kh | 1161 kh | 1056 kh | 1048 kh | 1178 kh | 1178 kh | 951 kh | 537 kh | 537 kh | t.b.d. | t.b.d. | t.b.d. | 581 kh | 667kh | 606 kh | 446 kh |
| Operat. Temperature Range | 0°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -40°C to +70°C | -40°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C |
| Derating +60°C to +70°C | 1.5W/°C | 2.5W/°C | 2.5W/°C | 3W/°C | 3W/°C | - | 3W/°C | 12W/°C | 12W/°C | - | 4W/°C | 4W/°C | 6W/°C | 6W/°C | 6W/°C | 12W/°C |
| Connection Terminals | screw terminals | screw terminals | screw terminals | spring terminals | screw terminals | spring terminals | screw terminals | screw terminals | screw terminals | spring terminals | spring terminals | spring terminals | spring terminals | screw terminals | spring terminals | spring terminals |
| Dimensions WxHxD | 49x124x102mm | 32x124x102mm | 32x124x102mm | 32x124x102mm | 32x124x102mm | 32x124x102mm | 32x124x102mm | 65x124x127mm | 65x124x127mm | 40x124x117mm | 60x124x117mm | 65x124x127mm | 60x124x117 mm | 39x124x117mm | 60x124x117mm | 65x124x127mm |
| Weight | 470g | 425g | 435g | 450g | 425g | 425g | 425g | 940g | 940g | 620g | 900g | 940g | 900g | 600g | 900g | 890g |
| Special Features | DC-OK signal | | | | | | NEC CLASS 2 | | | for railway applications | | | AC- + DC- input | enhanced DC-input | AC- + DC- input | intermediate DC-bus |
| Order Number | SLD2.100 | CD5.121 | CD5.243 | CD5.241-S1 | CD5.241 | CD5.241-L1 | CD5.242 | CPS20.241-D1 | CPS20.481-D1 | QS5.241-60 | QS10.241-60 | CPS20.241-60 | QS10.241-D1 | CP10.242 | QS10.481-D1 | QTD20.241 |

a) Extended input voltage range with derating allowed, see data sheet

Power Supplies

AS-Interface® Power Supplies

The AS-Interface® field bus system is a network technology where power and data are provided by the same wire.

Therefore, special power supplies with an output voltage of 30.6V and an integrated data decoupling circuit are required which prevent the modulated signal voltage on the AS-Interface® bus from being corrupted. The outputs of these power supplies are inductive and are not suitable for other purposes.

To protect the AS-Interface® cable, all 8A units have an electronic fuse (FUSE-mode) which shuts down the output by overload after 2-5 seconds.



| Output | 30.6V | | | | 30.6V |
|---|--|--|--|------------------------------------|------------------------|
| Output Current | 2.8A | 4A | 8A | 8A | 4A |
| Output Voltage | 30.6V | 30.6V | 30.6V | 30.6V | 30.6V |
| Ripple & Noise max. [mV _{pp}] | 50mV | 50mV | 50mV | 50mV | 50mV |
| AC Input Voltage | AC 100-120V/ 220-240V -15% / +10% manual select | AC 100-120V/ 220-240V -15% / +10% manual select | AC 100-120V/ 220-240V -15% / +10% manual select | 3AC 400-500V ±15% wide range | - |
| Harmonic Correction | - | - | - | PFC-Drossel | - |
| EN 61000-3-2 (PFC-Norm) | fulfilled | fulfilled | - | fulfilled | not applicable |
| Power Factor, typ. | 0.50 | 0.53 | 0.48 | 0.50 | not applicable |
| Input Inrush Current Limiter | NTC | NTC | active | NTC | active |
| DC Input Voltage | - | - | - | - | DC 24V *) -25%/+35% |
| Efficiency, typ. | 90.5% | 90.0% | 92.0% | 91.5% | 90.5% |
| Power Losses, typ. | 9.1W | 13.5W | 21.2W | 22.5W | 12.7W |
| MTBF (+40°C, SN 29500) | 1942 kh | 1222 kh | 869 kh | 1220 kh | 1247 kh |
| Operat. Temperature Range | -10°C to +70°C | -10°C to +70°C | -10°C to +70°C | -10°C to +70°C | -25°C to +70°C |
| Derating +60°C to +70°C | 2W/°C | 3W/°C | 6W/°C | 6W/°C | 3W/°C |
| Connection Terminals | screw terminals | screw terminals | screw terminals | screw terminals | screw terminals |
| Dimensions WxHxD | 49x124x102mm | 73x124x102mm | 91x124x102mm | 129x124x117mm | 40x124x102mm |
| Weight | 500g | 670g | 890g | 1160g | 500g |
| Special Features | NEC CLASS 2 | ground-fault monitor included | FUSE-Mode | FUSE-Mode | DC/DC-converter |
| Order Number | SLA3.100 | SLA4.100 | SLA8.100 | SLA8.300 | SLAD4.100 |

*) Extended input voltage range with derating allowed, see data sheet



Mounting Brackets

Mounting brackets for direct wall or panel mounting without the need for DIN rail. Other brackets for sideways installation of the power supplies with or without DIN rail for control cabinets which do not have the required installation depth.

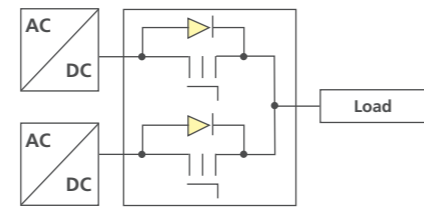
| Order Number | Description |
|--------------|--|
| ZM1.WALL | Wall mounting bracket for light DIMENSION units |
| ZM2.WALL | Wall mounting bracket for QS20, QS40, QT40, CPS20, ... |
| ZM3.WALL | Wall mounting bracket for ML60, PISA11 and MLY (VPE 25 pieces) |
| ZM4.WALL | Wall mounting bracket for CP10 |
| ZM1.UBC10 | Wall mounting bracket for UBC10 |
| ZM11.SIDE | Side mounting bracket for CS3, CS5, QS3, YR2, YRM2 |
| ZM12.SIDE | Side mounting bracket for CT5, QS5 |
| ZM13.SIDE | Side mounting bracket for CS10, CT10, QS10, CPS20, ... |
| ZM14.SIDE | Side mounting bracket for QT20, QTD20, UF20 |
| ZM15.SIDE | Side mounting bracket for QS20 (except QS20.244) |

Redundancy Modules

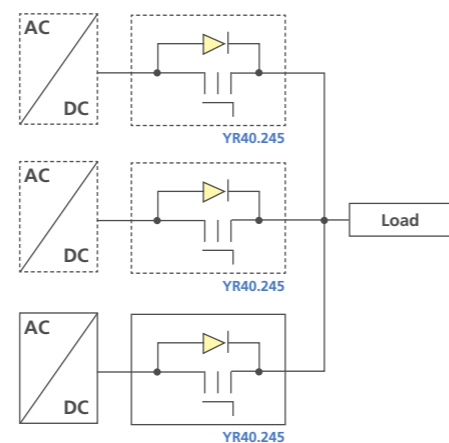
Using redundant systems can increase the reliability and availability of the DC voltage. To achieve redundancy, one extra power supply must be installed in order to supply the required current in case one unit in the system fails. Each individual standard power supply must be isolated from the others with a redundancy module.

This guarantees that a non-functional power supply (e.g. a short circuit at the output) does not prevent the working units from providing a DC voltage. New to PULS product offering is the utilisation of MOSFETs instead of diodes.

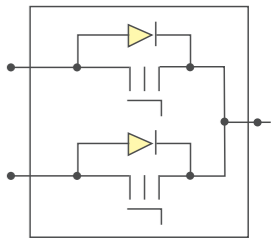
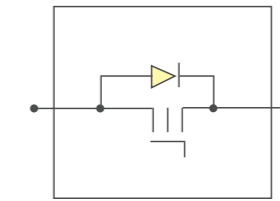
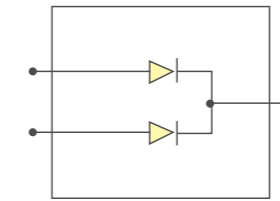
This reduces the heat generation and the voltage drop between input and output.



1+1-Redundancy



N+1-Redundancy



DIODE

| Nominal Voltage | DC 12-48V | | | 24-48V |
|---|------------------|------------------|------------------|----------------------|
| Input / Output | 2x 5A / 10A | 2x 5A / 10A | 2x 10A / 20A | 2x 10A / 20A |
| Input Voltage Range | DC 9-60V | DC 9-60V | DC 9-60V | DC 18-60V |
| Nominal Current per Input a) | 5A | 5A | 10A | 10A |
| Output Current Nominal Current a) Short Circuit b) | 10A max. 16A | 10A max. 16A | 20A max. 25A | 20A max. 25A |
| Voltage Drop c) In- / Output | 800mV | 800mV | 800mV | 800mV |
| Power Losses c) No Load Nominal Load | 0W 4.0W | 0W 4.0W | 0W 8.0W | 1W 9.0W |
| MTBF (+40°C, SN 29500) | 85 Mio. h | 85 Mio. h | 47 Mio. h | 9.1 Mio. h |
| Operat. Temperature Range | -40°C to +70°C | -40°C to +70°C | -40°C to +70°C | -40°C to +70°C |
| Derating +60°C to +70°C | 0.25A/°C | 0.25A/°C | 0.5A/°C | 0.5A/°C |
| Dimensions WxHxD | 45x75x91mm | 45x75x91mm | 32x124x102mm | 32x124x117mm |
| Weight | 140g | 140g | 290g | 350g |
| Connection Terminals | screw terminals | spring terminals | spring terminals | screw terminals |
| Special Features | | | | DC-OK-relay contacts |
| Order Number | MLY10.241 | MLY02.100 | YR2.DIODE | YRM2.DIODE |

a) 50% higher currents are allowed up to 5s b) Current at voltage <6V c) 1+1-redundancy (= 50% of the nominal current) and symmetrical input currents

MOSFET

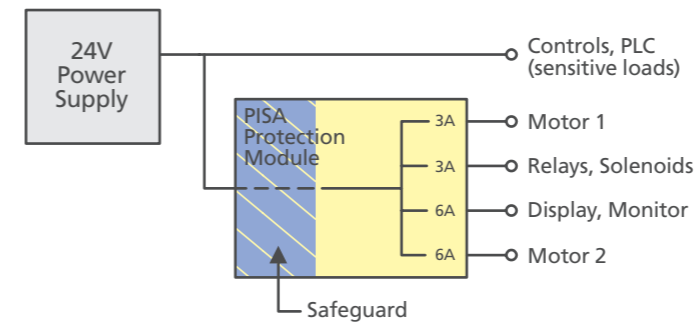
| Nominal Voltage | DC 12-28V | | | DC 24-28V | | DC 24-56V |
|---|--|--|---|--------------------|--------------------|-----------------|
| Input / Output | 2x 20A / 40A | 1x 40A / 40A | 2x 40A / 80A | 2x 20A / 40A | 2x 40A / 80A | 2x 20A / 40A |
| Input Voltage Range | DC 8.4-36.4V | DC 8.4-36.4V | DC 8.4-36.4V | DC 8.4-36.4V | DC 8.4-36.4V | DC 20.4-64.4V |
| Nominal Current per Input a) | 20A | 40A | 40A | 20A | 40A | 20A |
| Output Current Nominal Current a) Short Circuit b) | 40A max. 26A | 40A max. 22A | 80A max. 44A | 40A max. 65A | 80A max. 130A | 40A max. 45A |
| Voltage Drop c) In- / Output | 72mV | 80mV (at 1x20A) 150mV (at 40A) | 65mV | 72mV | 49mV | 60mV |
| Power Losses c) No Load Nominal Load | 0.2W 1.7W | 0.1W 1.8W (at 1x20A) 6.2W (at 40A) | 0.2W 2.9W | 0.7W 2.15W | 0.7W 2.7W | 0.62W 1.8W |
| MTBF (+40°C, SN 29500) | 4.5 Mio. h | 6.4 Mio. h | 2.5 Mio. h | 2.7 Mio. h | 2.1 Mio. h | 4.1 Mio. h |
| Operat. Temperature Range | -40°C to +70°C | -40°C to +70°C | -40°C to +70°C | -40°C to +70°C | -40°C to +70°C | -40°C to +70°C |
| Derating +60°C to +70°C | 1A/°C | 1A/°C | 2A/°C | nicht erforderlich | nicht erforderlich | 1A/°C |
| Dimensions WxHxD | 36x124x127mm | 46x124x127mm | 46x124x127mm | 36x124x127mm | 46x124x127mm | 46x124x127mm |
| Weight | 280g | 340g | 370g | 340g | 440g | 360g |
| Connection Terminals | screw terminals | screw terminals, plug connector | screw terminals | screw terminals | screw terminals | screw terminals |
| Special Features | not suitable for QT20, QTD20, SilverLine | not suitable for QT40, SilverLine | not suitable for QT40, SilverLine | | | |
| Order Number | YR40.242 | YR40.245 | YR80.242 | YR40.241 | YR80.241 | YR40.482 |

a) 50% higher currents are allowed up to 5s b) Current at voltage <6V c) 1+1-redundancy (= 50% of the nominal current) and symmetrical input currents

Protection Modules

PISA is a new and innovative low-cost concept for current distribution and protection of 24V load circuits. First, it distributes the current of a large power source to four lower current output channels and therefore allows for smaller wires to be used. The second function is to permit only as much current on the outputs so that the input voltage of this unit (which corresponds to the output voltage of the power supply) does not fall below 21V. This ensures a safe and uninterrupted supply voltage for sensitive equipment, such as PLCs, controls or sensors, when they are connected directly to the same power supply as the PISA module.

Less critical loads, that are not affected by short voltage interruptions or that could even be the cause of a fault on the 24V power supply are connected to one of the four current controlled output channels of the PISA module. The protection is independent of the length of the wires or of the power supplies' characteristics.



| Output Current | channel 1 | 1A | 2A | 3A | 4A | 6A |
|---|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | channel 2 | | | | | |
| | channel 3 | | | | | |
| | channel 4 | | | | | |
| Nominal Voltage | | DC24-28V | DC24-28V | DC24-28V | DC24-28V | DC24-28V |
| Input Voltage Range | | 18-30Vdc | 18-30Vdc | 18-30Vdc | 18-30Vdc | 18-30Vdc |
| Required Input Voltage for turning-on the Outputs, typ. | | 21.4Vdc | 21.4Vdc | 21.4Vdc | 21.4Vdc | 21.4Vdc |
| Turn-on Delay of Outputs | | 270ms | 270ms | 270ms | 270ms | 270ms |
| Input Voltage Protection Level min./max. | | 21.0Vdc/21.8Vdc | 21.0Vdc/21.8Vdc | 21.0Vdc/21.8Vdc | 21.0Vdc/21.8Vdc | 21.0Vdc/21.8Vdc |
| Output Current (all 4 outputs together) | | 4A | 8A | 12A | 16A | 20A |
| Output Current Limitation min./max. | | 9A/12.7A | 9A/12.7A | 16.6A/23.6A | 16.6A/23.6A | 20.5A/30A |
| Shutdown-times at Short Circuit, typ. | | 110ms | 110ms | 10ms | 10ms | 8ms |
| Voltage Drop, typ. | | 41mV | 83mV | 75mV | 101mV | 124mV |
| Input Current at no Load, typ. | | 43mA | 43mA | 43mA | 43mA | 43mA |
| No-load Losses, typ | | 1.0W | 1.0W | 1.0W | 1.0W | 1.0W |
| Power Losses, typ. | | 1.0W | 1.3W | 1.4W | 1.8W | 2.4W |
| MTBF (+40°C, SN 29500) | | 2347 kh | 2323 kh | 2283 kh | 2114 kh | 1942 kh |
| Operat. Temperature Range | | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C |
| Derating each Channel | | - | - | - | 0.025A/°C | 0.025A/°C |
| Dimensions WxHxD | | 45x75x91mm | 45x75x91mm | 45x75x91mm | 45x75x91mm | 45x75x91mm |
| Weight | | 120g | 120g | 120g | 120g | 120g |
| Connection Terminals | | screw terminals | screw terminals | screw terminals | screw terminals | screw terminals |
| Order Number | | PISA11.401 | PISA11.402 | PISA11.403 | PISA11.404 | PISA11.406 |

| Output Current | channel 1 | 10A | 3A | 6A | 3.7A (NEC CLASS 2) |
|---|-----------|-------------------|---|--|-------------------------------|
| | channel 2 | | | | |
| | channel 3 | | | | |
| | channel 4 | | | | |
| Nominal Voltage | | DC24-28V | DC24-28V | DC24-28V | DC24-28V |
| Input Voltage Range | | 18-30Vdc | 18-30Vdc | 18-30Vdc | 18-30Vdc |
| Required Input Voltage for turning-on the Outputs, typ. | | 21.4Vdc | 21.4Vdc | 21.4Vdc | 21.4Vdc |
| Turn-on Delay of Outputs | | 270ms | 270ms | 270ms | 270ms |
| Input Voltage Protection Level min./max. | | 21.0Vdc/21.8Vdc | 21.0Vdc/21.8Vdc | 21.0Vdc/21.8Vdc | 21.0Vdc/21.8Vdc |
| Output Current (all 4 outputs together) | | 20A | 18A | 20A | 14.8A at 24V; 12.8A at 28V |
| Output Current Limitation min./max. | | 20.5A/30A | 20.5A/30A | 20.5A/30A | 16.6A/23.6A |
| Shutdown-times at Short Circuit, typ. | | 8ms | 8ms | 8ms | 10ms |
| Voltage Drop, typ. | | 197mV | 92mV (channel 1+2) 107mV (channel 3+4) | 178mV (channel 1+2) 182mV (channel 3+4) | 92mV at 24V, 81mV at 28V |
| Input Current at no Load, typ. | | 43mA | 43mA | 43mA | 43mA |
| No-load Losses, typ | | 1.0W | 1.0W | 1.0W | 1.0W |
| Power Losses, typ. | | 4.9W | 1.9W | 4.2W | 1.6W |
| MTBF (+40°C, SN 29500) | | 1296 kh | 2095 kh | 1373 kh | 2198 kh |
| Operat. Temperature Range | | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C | -25°C to +70°C |
| Derating each Channel | | 0.025A/°C | 0.025A/°C | 0.025A/°C | - |
| Dimensions WxHxD | | 45x75x91mm | 45x75x91mm | 45x75x91mm | 45x75x91mm |
| Weight | | 120g | 120g | 120g | 120g |
| Connection Terminals | | screw terminals | screw terminals | screw terminals | screw terminals |
| Order Number | | PISA11.410 | PISA11.203206 | PISA11.206212 | PISA11.CLASS2 |

24V DC-UPS with Batteries

For the installation of a DC-UPS system there are three essential elements necessary: a power supply, a DC-UPS and a battery.

The DC-UPS is responsible for monitoring and charging the battery as well as controlling the seamless transition between normal and buffer mode.

The advantages of the PULS DC-UPS are:

- 1-Battery-Concept: each battery is individually charged and monitored which avoids the need for matched batteries
- Easy and self-explanatory plug and play
- Optimised battery management system for longest battery life
- 22.5-26V adjustable output voltage in buffer mode for the UB20
- Adjustable maximum buffer time to protect the battery



UB10 / UB20

NEW

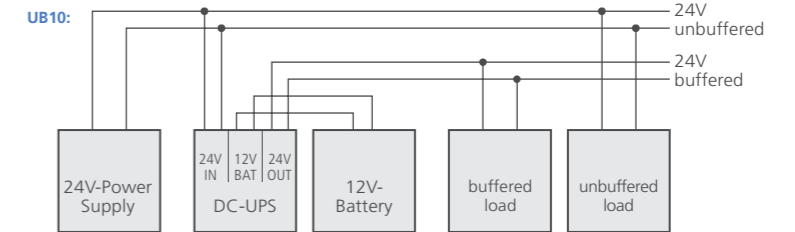
| Nominal Current | 10A | 10A | 10A | 20A | 10A |
|---|--|--|--|--|--|
| Nominal Voltage | DC 24V | DC 24V | DC 24V | DC 24V | DC 24V |
| Storage Element | external battery | external battery | external battery | external battery | built-in battery |
| Allowed Battery Sizen | 12V, 3.9 to 40Ah | 12V, 17 to 130Ah | 12V, 3.9 to 40Ah | 24V, 3.9 to 150Ah | 12V, 5Ah |
| Output 1 in Normal-mode | 15A | 15A | 15A | 25A | 15A |
| Buffer-mode | 10A/15A a) | 10A/15A a) | 10A/15A a) | 20A/30A a) | 10A/15A a) |
| Output 2 in Normal-mode | - | - | 12V 5A | - | - |
| Buffer-mode | - | - | 12V 5A | - | - |
| Output Power in Normal-mode | 360W | 360W | 360W | 600W | 360W |
| Output Power in Buffer-mode | 240W/360W a) | 240W/360W a) | 240W/360W a) | 480W/720W a) | 240W/360W a) |
| Output Voltage in Normal-mode | minimal smaller than output voltage (Output 1) | | | | |
| Output Voltage in Buffer-mode | regulated to: 22.5V | regulated to: 22.5V | regulated to: 22.5V and 12.0V | selectable: 22.5V/24V/25V/26V | regulated to: 22.5V |
| Temperature Tracking of the End-of-Charge Voltage | manual select | manual select/ automatically | manual select | automatically with temp. Sensor b) | automatically with temp. Sensor |
| Int. Current Consumption (incl. Charging Current) | 1.3A | 2.2A | 1.3A | 1.8A/3.5A c) | 1.3A |
| MTBF (+40°C, SN 29500) | 886 kh | 886 kh | 788 kh | 649 kh | 886 kh |
| Operat. Temperature Range | -25°C to +70°C | -25°C to +50°C | -25°C to +70°C | -40°C to +70°C | 0°C to +40°C |
| Derating | >60°C 0.25A/°C | - | >50°C 0.25A/°C | >60°C 0.5A/°C | - |
| Dimensions WxHxD | 49x124x117mm | 49x124x117mm | 49x124x117mm | 46x124x127mm | 123x124x119mm |
| Weight | 530g | 545g | 650g | 750g | 2.85kg |
| Connection Terminals | spring terminals | spring terminals | spring terminals | screw terminals | spring terminals |
| Signals | Ready, Buffering, Inhibit, Replace Battery | Ready, Buffering, Inhibit, Replace Battery | Ready, Buffering, Inhibit, Replace Battery | Ready, Buffering, Inhibit, Replace Battery | Ready, Buffering, Inhibit, Replace Battery |
| Order Number | UB10.241 | UB10.242 | UB10.245 | UB20.241 | UBC10.241 UBC10.241-N1 d) |

a) 15A/360W resp. 30A/720W for up to 5s b) With PULS battery modules c) If adjusted to <10Ah / >10Ah d) Battery not included

Battery Modules for DC-UPS

Battery modules use maintenance-free VRLA batteries (Valve regulated Lead-Acid) and are charged at PULS before delivery. Battery modules can be ordered with (UZK) or without a battery (UZO). All battery modules from PULS support the 1-Battery-Concept. The 24V battery modules are equipped with a center-tap which protect against over-current and with an integrated temperature sensor.

Users who opt for using their own batteries and who still want to take advantage of the PULS-1-Battery-Concept, can use the sensor board with a PT1000 temperature sensor and center-tap fuse.



| Order Number | Description | Dimensions |
|--------------|--|---------------|
| UZB12.051 | 12V, 5Ah Battery replacement for UBC10.241 | 90x106x70mm |
| UZB12.071 | 12V, 7Ah Battery replacement for UZK12.071 and UZK24.071 a) | 151x98x65mm |
| UZB12.121 | 12V, 12Ah Battery replacement for UZK24.121 a) | 151x98x98mm |
| UZB12.261 | 12V, 26Ah Battery replacement for UZK12.261 | 175x125x166mm |
| UZK12.071 | 12V, 7Ah Battery module with battery for UB10 | 155x124x112mm |
| UZK12.261 | 12V, 26Ah Battery module with battery for UB10 | 214x179x158mm |
| UZK24.071 | 24V, 7Ah Battery module with battery for UB20 | 137x186x143mm |
| UZK24.121 | 24V, 12Ah Battery module with battery for UB20 | 203x186x143mm |
| UZO12.07 | Same as the UZK12.071 battery module but without battery | 155x124x112mm |
| UZO12.26 | Same as the UZK12.261 battery module but without battery | 214x179x158mm |
| UZO24.071 | Same as the UZK24.071 battery module but without battery | 137x186x143mm |
| UZO24.121 | Same as the UZK24.121 battery module but without battery | 203x186x143mm |
| UZS24.100 | Sensorboard with PT1000 temperature sensor and center-tap fuse | 23x15x110,5mm |

a) Two required

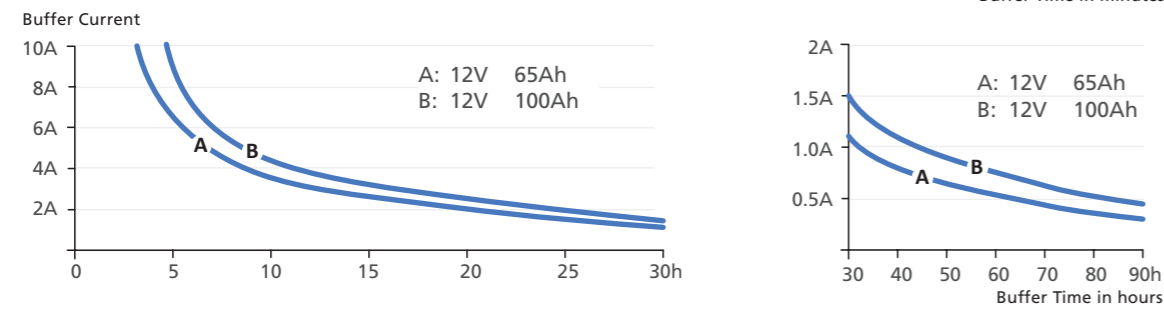
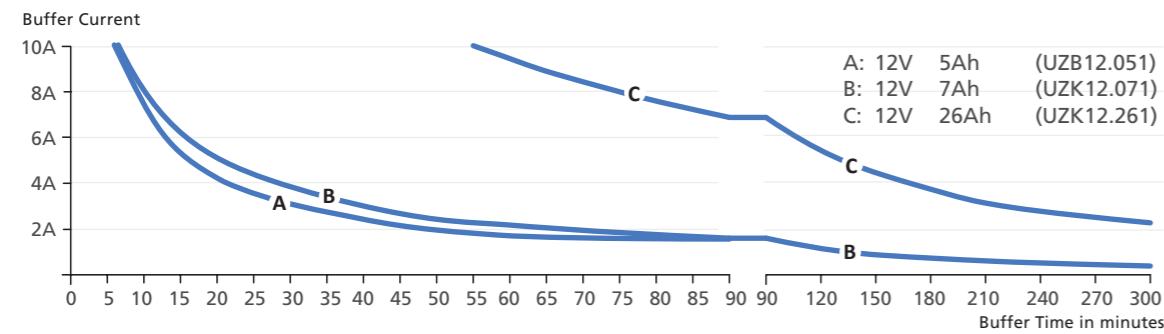


UZK12.071

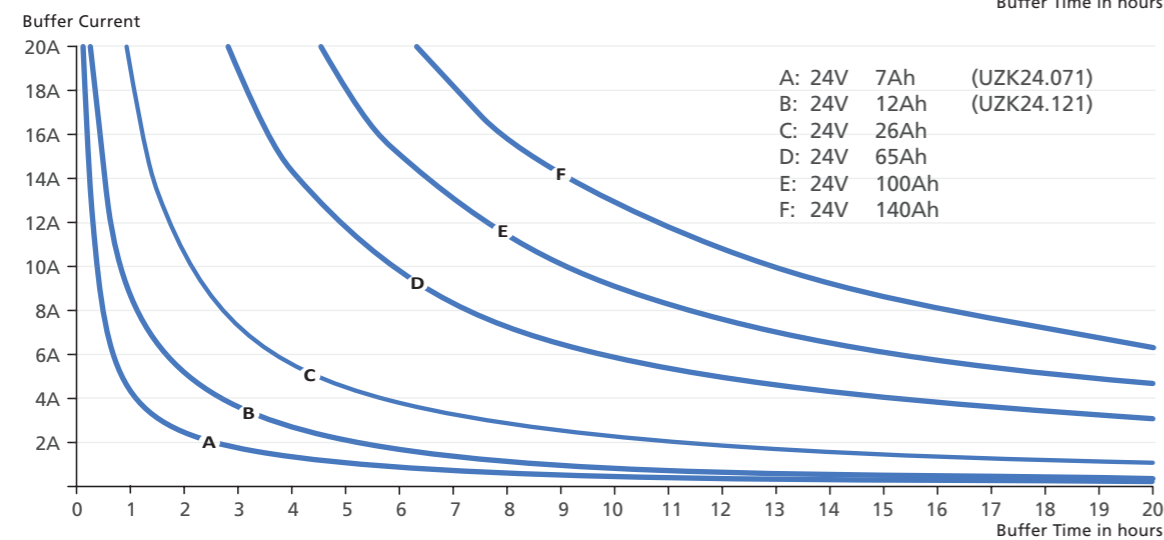
Buffer Times

| Buffer Current | 0A | 0.2A | 0.5A | 1A | 3A | 5A | 7A | 10A | 15A | 20A |
|---------------------------|--------------|---------------|-----------|-----------|-----------|-----------|----------|----------|-------|-------|
| UBC10.241 | 1d 10h | 11h 22min | 3h 50min | 2h | 30min | 16min 15s | 11Min | 6min 15s | 5s | - |
| UB10 + 12V, 7Ah battery | 5d 15h | 2d 2h 50min | 5h | 2h 30min | 40min | 21min 30s | 13min | 6min 45s | 5s | - |
| UB10 + 12V, 26Ah battery | 14d 8h | 5d 11h 52min | 22h | 12h | 3h 40min | 2h 10min | 1h 30min | 55min | 5s | - |
| UB10 + 12V, 65Ah battery | 23d 18h | 8d 9h 54min | 54h | 30h | 10h 30min | 6h | 4h | 2h 45min | 5s | - |
| UB10 + 12V, 100Ah battery | 1d 17h 40min | 17h 13min 20s | 84h | 46h | 16h 12min | 9h | 6h | 4h 7min | 5s | - |
| UB20 + 24V, 7Ah battery | 2d 22h 50min | 1d 6h 41min | 11h 35min | 6h 8min | 1h 58min | 1h 4min | 42min | 26min | 13min | 8min |
| UB20 + 24V, 12Ah battery | 2d 22h 50min | 2d 20h 3min | 20h | 10h 30min | 3h 20min | 1h 50min | 1h 12min | 45min | 23min | 15min |

UB10



UB20

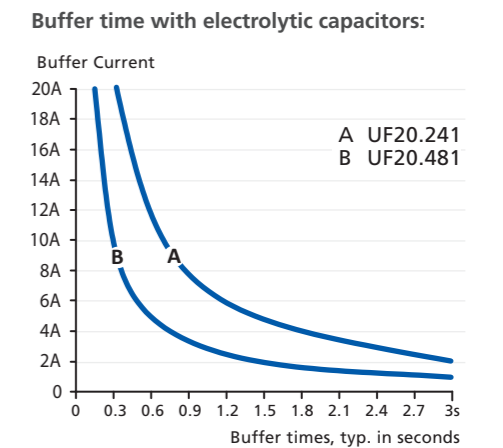
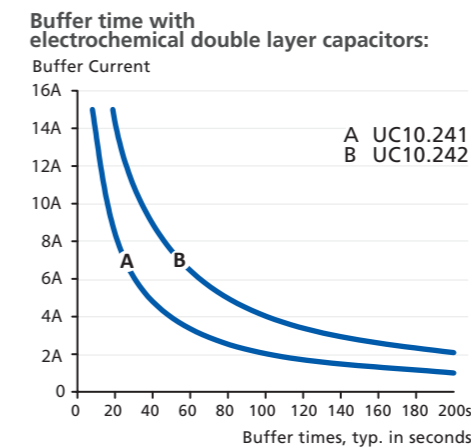


The table above shows typical buffer times of standard battery modules. The aging effect during operation is not included. We recommend calculating a buffer time reduction of 30-50% for the life of the batteries.

DC-UPS and Buffer Modules with Capacitor Storage

The DC-UPS with integrated electrochemical double layer capacitors are fully maintenance free and guarantee an uninterrupted power supply for periods measured in seconds. Buffer modules with electrolytic capacitors work similarly to a DC-UPS and can bridge power failures in the 24V or 48V net for periods measured in milliseconds (see graphs below).

Contrary to the required replacement of DC-UPS systems based on batteries, a regular replacement of the capacitors is not necessary. In buffer mode, the output voltage is regulated and the change from normal to buffer mode is without interruptions. All modules are protected against overload and short-circuit.



| Nominal Voltage | NEW | | NEW | |
|--------------------------------|---|---|---------------------------|---------------------------|
| | DC 24V | DC 24V | DC 24V | DC 48V |
| Storage Element | Electrochemical Double Layer Capacitors | Electrochemical Double Layer Capacitors | Electrolytic Capacitors | Electrolytic Capacitors |
| Integrated Storage Element | 6 kW _s | 12 kW _s | 0.2 kW _s | 0.2 kW _s |
| Nominal Voltage | 15A | 15A | not relevant | not relevant |
| Buffer Current, max. | 15A | 15A | 20A | 20A |
| Voltage in Buffer-mode | 22.5V | 22.5V | 22.5V ^{a)} | 22.5V ^{a)} |
| Separation of Input and Output | yes | yes | no | no |
| Charging Time | 16 minutes | 32 minutes | 18 seconds | 22 seconds |
| Buffer Time | typ. 16.5s at 10A typ. 9s at 15A | typ. 33s at 10A typ. 18s at 15A | 310ms at 20A | 150ms at 20A |
| Power Losses, typ. | 4.6W at 10A | 4.6W at 10A | 1.9W im Stand-by | 1.9W im Stand-by |
| MTBF (+40°C, SN 29500) | 954 kh | 850 kh | 2327 kh | 2348 kh |
| Operat. Temperature Range | -40°C to +60°C | -40°C to +60°C | -25°C to +70°C | -25°C to +70°C |
| Connection Terminals | spring terminals | spring terminals | spring terminals | spring terminals |
| Dimensions WxHxD | 126x124x117mm | 198x124x117mm | 64x124x102mm | 64x124x102mm |
| Weight | 1150g | 1720g | 740g | 740g |
| Signals | Ready, Buffering, Inhibit, PC-Mode | Ready, Buffering, Inhibit, PC-Mode | Ready, Buffering, Inhibit | Ready, Buffering, Inhibit |
| Order Number | UC10.241 | UC10.242 | UF20.241 | UF20.481 |

^{a)} Or selectable 1V (UF20.241) or 2V (UF20.481) smaller than input voltage

Modifications

PULS and MGV are developing customised solutions for special requirements, which are not covered by standard power supplies.

You can use and benefit from the know-how of our development teams.



DC/DC-converter for solar applications

- Input: 240-460Vdc
- Output: 24V
- Power: 480W

DC/DC-converter

- Input: 48-72Vdc
- Output: 23-25Vdc / 3.1A / 72W
- Operational temperature: -40 to +70°C
- DC-OK signal



DC/DC-converter with high DC-input voltage

- Input: 360-480Vdc
- Output: 24Vdc / 20A
- Operational temperature: -40 to +70°C
- Transient resistant input
- Signal contacts
- Return voltage immunity



Power Supply with two output voltages and fan

- Input: 3AC 400-480V
- Output: 162Vdc and 300Vdc
- Optimized for dynamic loads
- High lifetime expectation at +60°C environmental temperature because of integrated fan
- Communication interface

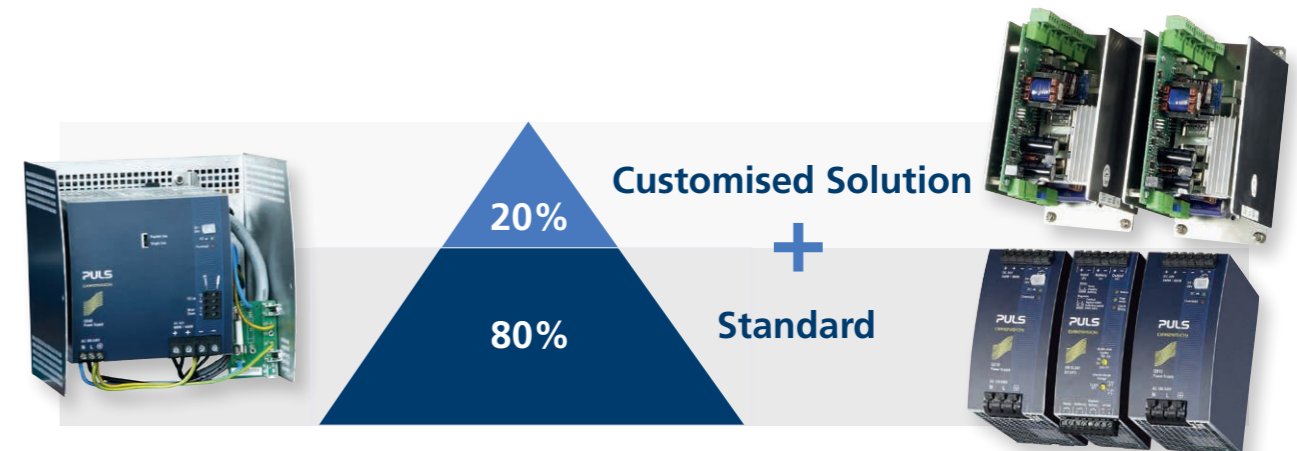


AC/DC-converter for railway applications

- Input: AC 110-230V
- Output: 24V / 3W
- Operational temperature: -40 to +70°C
- Impedance input lead: 200Ω

Value-Add System Solutions

PULS and MGV are offering services to combine standard units with an assembly and wiring package to provide a complete power supply system. The purpose is to create reliable, customised solutions based on current proven production units. Because of the high percentage of existing standard units, you will receive a cost-effective, customised solution in a timely manner.



Special housing protects against dripping water with switch and plug connector

Uninterruptable DC/DC-converter with two output voltages



The **PULS Group**, consisting of PULS and MGV, is the largest privately owned and managed supplier of DIN Rail Power Supplies in Germany.














PULS has an extensive product offering of standard power supplies and a strong global presence.

MGV has more than 30 years of professional experience in customised power supply solutions. MGV is characterised by short communication channels, high flexibility and an application-orientated consulting service.

With **PULS & MGV** you are supported by the best of both worlds. We combine the service of a small company and its customised developments with the technology, reliability and cost-optimisation of a high volume, global leader in power supply manufacturing.

Standards and Approvals

Available Standards and Approvals – An Overview of PULS Products:

| | | | | | |
|--|---------------|---|---|---------------|--|
|  | Europe | CE mark: The CE mark in conjunction with the manufacturer's Declaration of Conformity confirms that the directives of the European Union stated in the manufacturer's declaration of conformity have been fulfilled. European standards (EN standards) provide the foundation for fulfilling the directives. |  | Class I Div 2 | US approval for use in areas with potentially explosive atmospheres (Haz. Loc.). This certification mark is based on the ANSI/ISA-12.12.01. The approval may be either provided by UL or CSA. |
|   | USA | ICE Industrial Control Equipment – Instrumentation for control devices. This certification mark is based on the UL 508. Device approval (LISTED) for the USA UL (Underwriters Laboratories Inc.) is an independent testing and certification body, which also holds its own set of standards (UL standards). Under a reciprocal agreement with Canada, the approval is also recognised in Canada if the Canadian requirements are additionally taken into account in the approval process. This can be identified from the small „c“ on the left-hand side of the certification mark. |  | GL | Germanischer Lloyd – Prototype testing for the shipbuilding and offshore sector |
|  | ITE | ITE (Information Technology Equipment) – Safety of information technology equipment. This certification mark is based on the UL 60950-1. |  | ABS | ABS American Bureau for Shipping – Type testing (PDA) for shipbuilding or offshore approvals for the USA. |
|  | International | CB Scheme: The CB scheme is an international agreement on the mutual recognition of test results between currently approximately 60 national testing organizations in more than 40 countries. It is based on the harmonised IEC standards in conjunction with national variations of these standards. PULS offers a CB scheme in accordance with IEC 60950-1 for many devices. A uniform report form and an inspection of the labs in accordance with established standards ensure that the testing methods are the same in all labs while guaranteeing the quality of test results. All participating countries have to recognise the CB report and award a national certification mark based on it. |  | Russia | TR EAC registration: Approval for Russia, Kazakhstan and Belarus |
|  | International | IECEx: International approval for the use of equipment in areas with potentially explosive atmospheres. This certification mark is based on the IEC 60079-0 and IEC 60079-15 standards. |  | NEC CLASS 2 | „NEC CLASS 2“ electric circuits are deemed non-hazardous in terms of fire and electrical shock hazards. The advantage of such electric circuits is the significantly reduced effort needed for cabling during installation, which makes them more economical, and the significantly lower amount of testing work required for the approval of the entire system. The power source must either be constructed in accordance with UL 1310 or must be classified and listed as a Limited Power Source (LPS) in accordance with IEC 60950-1. |
|  | ATEX | European approval for the use of equipment in areas with potentially explosive atmospheres. This certification mark is based on the EN 60079-0 and EN 60079-15 standards. |  | SEMI F47 | Requirements of the semiconductor industry in terms of mains voltage loss. For example, power supplies may not show signs of output voltage loss at 50% mains voltage for a duration of 200 ms. Such voltage loss may occur when heavy loads are switched on or when supply grids are switched from one to another. |

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