Power supplies

Product information
# Power supplies

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Introduction

Transformers and power supplies are important links in the energy supply chain of automation systems. They form the heart of each and every electrical cabinet. 24 V has become established as a control voltage throughout the world, supplying power to all manner of electrical subassemblies. Other voltages are still also being used to power user applications. Careful consideration must be given to choosing the correct power supply as this is decisive for the connected components to function reliably.

Weidmüller power supplies have proven themselves over many years in the supply of power to electrical subassemblies. They carry the CE mark and meet the requirements contained in the standards DIN EN 50081-1 and DIN EN 50082-2 (as of 1st April 2002, EN 61000-6-2).

As a result, they are suitable for use in industry, small businesses and residential areas. Their performance capabilities have also been proven in harsh environments.

Weidmüller can provide industry-standard power supplies and supplementary components:

- Unregulated transformer power supplies
- Primary switch-mode power supplies
- DC/DC converters
- Diode modules
- UPS control modules
- Electronic fusing

Power supply units always consist of a transformer, which converts an AC voltage into a different AC voltage to meet application requirements.

A rectifier converts the AC voltage on the secondary side into a pulsating DC voltage, which is smoothed by means of a filter circuit.

The output voltage of stabilised power supply units is kept constant by means of a stabilising unit.

Input voltage in accordance with DIN IEC 38

In 2003 the tolerance for the valid 230 V AC / 400 V AC mains voltage was extended to ±10 %.

Weidmüller’s power supplies fulfilled the DIN IEC 38 specifications even before they came into force.

In use all over the world

Power supplies from Weidmüller have internationally recognised approvals endorsing their suitability for use in widely varying applications all over the world. They are used in mechanical engineering, in industrial automation, in systems engineering and in the power supply industry, in production lines and in building technology.

Temperature range

The power loss constantly produced by the power supplies is converted into heat. This heat is dissipated via a heat sink and the surface of the housing. Depending on the module, Weidmüller power supplies are suitable for use in ambient temperatures up to 60 °C. The device to be installed is selected taking the prevailing ambient temperatures into consideration.

Compact designs

Due to their small footprint, Weidmüller’s power supplies are also suitable for use in confined spaces. That saves space in electrical cabinets and reduces costs!
## Standards and approvals

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<td>DIN VDE 0805</td>
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<td>Specifications for small transformers</td>
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<tr>
<td>DIN VDE 0550 part 1</td>
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<td>Particular requirements for isolating and control transformers</td>
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<td>DIN VDE 0551</td>
<td>Specification for safety isolating transformers</td>
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<td>DIN VDE 0106 part 101</td>
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<tr>
<td>DIN VDE 0113 part 1</td>
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<td>DIN IEC 68</td>
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<tr>
<td>IEC 38</td>
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<tr>
<td>DIN EN 61131-2</td>
<td>Programmable logic controllers – equipment requirements and tests</td>
</tr>
<tr>
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<td>Safety approval for the United States market</td>
</tr>
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<tr>
<td>GL</td>
<td>Test specifications for electrical/electronic devices and systems for use in marine technology</td>
</tr>
<tr>
<td>73/23/EC</td>
<td>Electrical equipment for use within specific voltage limits (Low Voltage Directive)</td>
</tr>
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<td>89/336/EC</td>
<td>Electromagnetic compatibility (EMC Directive)</td>
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<td>98/37/EC</td>
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</tr>
</tbody>
</table>
Basic information about power supplies

Technical notes

Power supply
Power supply units provide the power supply to electronics devices and components. Their behaviour under load is defined; they are electrically isolated and, according to type, are constructed as unregulated, linear stabilized or as switch-mode power supply units. The power is drawn from the primary side, for example the 230 V mains and transformed.

Voltage regulator concepts
There are various concepts to implement voltage regulation. In the case of serial linear regulators, power transformers, rectifiers and regulators are considerable loss factors. These all add up to an efficiency of just 25 % to 50 %.

Primary switch-mode power supplies
Primary switch-mode power supplies can achieve 70 % to 90 % efficiency. The rectified mains voltage is converted and transformed into a high-frequency AC voltage by means of a switching regulator. The switching regulator operates in a range between 20 kHz to 200 kHz. In doing so, the secondary current is controlled in accordance with the principle of pulse-width or pulse modulation. As the power loss of the transistors during switching operations is considerably lower, the switch-mode power supply achieves a considerably greater degree of efficiency. Isolation to the mains is achieved via an HF transformer. The secondary voltage is rectified and smoothed.

The secondary DC voltage is altered through the pulse duty factor of the switch-mode regulator on the primary side. The regulator is composed of two electrically isolated components: on the primary side by the switch connected the mains potential, and on the secondary side by the control loop of the output voltage.

- Losses in the transformer are reduced by transforming high-frequency AC voltage
- Size of the transformer depends on the frequency
- The > the ‘f’, the < the transformer
- Smaller sizes, less weight
- Reduction of the copper losses N ~ 1/f

PFC – power factor correction
The purely inductive reactive current provides no effective power for the load; however, it must be transported from the generator to the load via the mains supply cables. Here, it leads to unwanted dissipation of power in the cables. To combat this disadvantage, the active power factor is optimised. Depending on the application, power factor correction can be achieved either by means of a power factor preregulator or by means of an additional capacitive load.

The so-called ‘Power Factor’ (PF for short) is the ratio between the ‘active real power’ – power provided to the output) and the ‘apparent power’ taken from the mains, the product of the effective mains voltage and effective mains current. Basically, the power factor is a measurement for how effectively the electrical energy is being used. A higher power factor represents better utilization of the electrical energy and, in the final analysis, greater efficiency.

What purpose does the power factor correction serve (PFC)?
A lower power factor equates to poorer utilization of the electrical power. The lower the power factor the greater the amount of energy drawn from the mains. If a low power factor is not corrected, the user has to accept a reactive power with the associated loss in addition to the real active power. And that has a whole range of disadvantages.

Why is power factor correction of such particular importance to switch-mode power supplies?
In spite of the many advantages that switch-mode power supplies offer, such as high performance in a compact design, they unfortunately also have disadvantages; the reason being, current is drawn from the mains in the form of short impulses whose peak amplitudes are many times higher than the resulting DC current. For example: high peaks and RMS currents are drawn from the mains, the sinusoidal mains voltage becomes distorted resulting in overcurrents in the neutral conductor of 3-phase systems, disruptive harmonic waves and many other negative effects are the consequence.
Basic information about power supplies

Technical notes

Advantages of power factor correction
(Power Factor Correction – PFC)

- Better utilisation of electrical energy, which in turn means lower electricity bills (typical saving of up to 50% p.a.).
- Increased overall efficiency and system capacity
- Improved mains voltage waveshapes
- Reduced component sizes
- Reduced heat loss
- Reduced high-frequency EMC interference

Active PFC and passive PFC
Passive PFC types use inductance and capacitive reactance to store the electrical energy taken from the mains and simultaneously suppress the resulting harmonic waves. As the mains energy source has only a low frequency (50 Hz or 60 Hz), larger and more voluminous reactance coils/inductors and capacitors will be required – bearing in mind that this can only achieve a power factor of approx. 0.7 to 0.8. In this case, the lower component cost factor of a passive PFC arrangement needs to be weighed up against the greater need for space and lower power factor.

Active PFC types utilize active components (for the most part integrated in an IC) to regulate the drawn current – in accordance with the voltage waveform – so that, as with a resistive load (PF = 1), it has essentially the same waveform. In addition, automatic utilization of a wide range of the mains AC input voltage is made possible by the PFC regulating circuit.

All of these advantages (in relation to efficiency, EMC disturbances, size, wide-range regulation and many more) need only be compared with the initial higher cost factor.

Efficiency
Efficiency is the calculated ratio of power output to power input, and is always less than one.

In order to reduce power loss, maximum efficiency is strived for under the given load conditions. For a power supply unit, efficiency is measured at maximum loading and under nominal input conditions. With multiple outputs, it generally depends on the distribution of the output power to the various outputs.

The value for the input current is always given as apparent current, because the wiring is dimensioned based on this detail.

Example for calculating the efficiency based on the 5 A ECOLINE device:
The device is not equipped with PFC. Cos φ is approx. 0.62

\[
P = \text{active power} \quad P_{\text{out}} = \text{output power} \\
S = \text{apparent power} \quad P_{\text{n}} = \text{input power} \\
Q = \text{reactive current} \quad I_{\text{app}} = \text{apparent current} \\
U_e = \text{input voltage} \\
\]

\[
P_{\text{n}} = U_e \times I_{\text{app}} \times \cos \phi = 230 \, \text{V} \times 1.0 \, \text{A} \times 0.62 = 142.6 \, \text{W} \\
\eta = P_{\text{out}}/P_{\text{n}} = 120/142.6 = 0.84 \text{ oder } 84 \% \\
\]

Power loss
This is the unwanted conversion of electrical power in heat dissipation. Please also refer to derating, cooling and efficiency. In this case, the ratio of power loss compared to output power can be three times as great. With this variant, there is not only a loss of energy, but cooling is also a problem.

\[
P_{\text{loss}} = P_{\text{input}} - P_{\text{output}} = \left(1 - \frac{1}{\eta}\right) \times P_{\text{output}} \\
\]

Cooling
Cooling is achieved by means of heat radiation, heat conduction or heat transfer. This is caused by the power loss, which is antiproportional to the degree of efficiency. If the power loss is too great, more efficient cooling is required, which means a larger heat sink or forced cooling with a fan instead of convection.

The direction of installation must be observed when operating devices making use of natural convection, otherwise sufficient cooling cannot be guaranteed. As a rule, the device is mounted in a horizontal position to ensure that the air can flow from bottom to top. The device cannot supply full power if the cooling is insufficient. Overloading will cause the switch-mode power supply to shut down on the output side. Constant thermal overloading will lead to a reduction of the operational lifetime.
Basic information about power supplies

Regulating principles

Switching regulator
A switch-mode regulator that often controls the switching element with the switching frequency by means of PWM.

Power factor preregulator
A switch mode transformer connected ahead of the actual power supply unit to shape the mains current to an approximate sinusoidal waveform. In so doing, the power factor is increased to the more favourable value of one. The abbreviation PFC (power factor correction) is often used.

Linear regulator
The difference between the input and output voltage drops across the linear regulator. As a consequence, the increase in power loss is linear to the output current, and must be dissipated as heat loss. The degree of efficiency and the associated size can only be justified for lower power outputs. The advantages are the low development costs and the regulating characteristics.

Series connection of the secondary circuit
To boost the voltage, switch-mode power supplies can be connected in series. This makes it possible to achieve 48 V DC from two 24 V DC circuits. The max current is equivalent to the rated value of a device. Ideally, devices from the same performance category should be used. This function can be carried out without additional modules or protective equipment.

Parallel connection of secondary circuit
In order to double the output performance or achieve redundancy, the outputs of a switch-mode power supply unit can be connected in parallel.

It is recommended that external decoupling diodes be used together with devices without active load sharing (connected to one another).

This guarantees a symmetrical load distribution without cross-coupling between the devices.

Characteristic curve U/I
In order to achieve a stable output voltage, switch-mode power supplies are equipped with a voltage stabilizer. Once the overload limit is reached, the device switches to a constant current mode. To protect the output, the voltage in the range between 105 % and 150 % (depending on the ambient temperature) is slowly lowered. However, the current remains relatively constant during this process.

Derating curves
Switch-mode power supplies are electronics devices, and require thermal protection to avoid excessive aging or even destruction.

For this reason, the technical data contains the temperature range at which the device can be operated at 100 % capacity. The performance must be reduced when the temperature range is exceeded. This can be 50 % of the maximum load. Load reduction in relation to the ambient temperature is depicted in the so-called derating curves.
Basic information about power supplies

Applications

Increasing performance through utilization of a second switch-mode power supply with the same rating data
Upgrading machines with more functions inevitably results in an increase in power output. As there is generally a power supply already in use, reasons of cost dictate that a second device with the same performance characteristics is added. A diode module will achieve 100 % decoupling when connecting both devices in parallel.

Redundant circuit for fail-safe power supply to loads
Both devices operate in parallel and share the load required by the equipment via the diode module. Should one of these devices fail, the second device immediately supplies the full amount of power. The diode module decouples both switch-mode power supplies to 100 %, so that they do not negatively affect each other if a failure occurs.

Power supply to critical loads
As a rule, actuators require relatively high amounts of current, and a modern power supply concept should envisage supplying them separately. It is also recommended that a second power supply unit with lower output be used to supply the controls (for example, PLC, IPC). Together with a diode module, doubling up guarantees that the controls are constantly supplied with power should one of the devices fail; thus ensuring that no data is lost.
Protection against reverse voltages
Due to switching procedures, inductive and capacitive loads generate high amounts of energy that can be fed back into the power supplies. In the worst case, this can result in destruction. Diode modules eliminate these negative characteristics and as such also contribute towards greater plant availability.

Fusing individual electrical circuits with electronics fuses
Due to the fact that switch-mode power supplies are only partially short-circuit proof, and should immediately reduce the output power for protection purposes if a failure occurs, electronic fuses are often utilized for selective fusing. In this case, the affected load circuit is immediately shut down. The electronic fuse transmits a signal to the controls. Now the problem can be targeted. Once rectified, the controls send a digital command for all fuses to reclose.
Primary switch-mode power supplies connectPower

Thanks to the wide range of inputs (85 V AC to 265 V AC), the connectPower range of switched-mode power supplies is suitable for a wide variety of applications. The devices are interference-suppressed (in accordance with DIN EN 55022 Class B) and fulfill safety extra-low voltage (SELV) requirements.

Equipped with an electronic short-circuit feedback control on the output side, the primary switched-mode power supplies are rated between 12 W and 300 W. The power supplies are suitable for both industrial and building automation.

Method of operation

Primary switched-mode power supplies are distinguished by a high degree of efficiency and also by their compact dimensions and moderate generation of heat. The mains voltage is rectified directly. The rectified voltage is then chopped with a higher frequency than that of the mains frequency. A transformer – which can be quite small due to the high switching frequency – converts the voltage with the switching frequency to the required value.

The voltage is now rectified and smoothed by a filter. This regulator control itself is carried out by means of pulse-width modulation. The on and off times of the chopper transformers are regulated to ensure that the output voltage remains stable.

Power distribution and redundancy

To increase performance, or for redundancy purposes, switched-mode power supplies from Weidmüller can be connected in parallel. Two techniques are available: an active and a passive power distribution. Active power distribution requires more complex switching. The advantage is the exact power distribution and uniform device loading.

Requiring less sophisticated switching, passive power distribution results in lower costs, but also in a load-dependent characteristic curve and less exact power distribution. Before connecting in parallel, the output voltages of the devices must be adjusted exactly (± 100 – 200 mV).

Power factor correction (PFC)

Power factor correction ensures that the mains current drawn is sinusoidal. One positive side-effect is the regulation of the power factor to approx. 1.
connectPower 1-phase
WAVEPOWER

CP SNT 12 W 24 V 0.5 A

### Technical data

<table>
<thead>
<tr>
<th>Input</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>85 ... 265 V AC, 120 ... 300 V DC</td>
</tr>
<tr>
<td>Input current</td>
<td>260 mA @ 115 V AC; 180 mA @ 230 V AC</td>
</tr>
<tr>
<td>Input frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Input fuse</td>
<td>2 A slow-blow fuse (internal)</td>
</tr>
<tr>
<td>Overvoltage protection</td>
<td>Varistor</td>
</tr>
<tr>
<td>Output</td>
<td></td>
</tr>
<tr>
<td>Output voltage</td>
<td>24 V DC</td>
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<tr>
<td>Output current</td>
<td>0.5 A</td>
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<tr>
<td>max. residual ripple</td>
<td>0.1 %</td>
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<td>Overload protection</td>
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<tr>
<td>Mains failure bridge-over time</td>
<td>30 ms @ 115 V AC / 80 ms @ 230 V AC</td>
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<tr>
<td>Control at 10...100% load</td>
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<td>Parallel connection option</td>
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<tr>
<td>Overload protection</td>
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<tr>
<td>Insulation coordination</td>
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<tr>
<td>Electrical isolation, output-earth</td>
<td>500 V RMS</td>
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<tr>
<td>Electrical isolation, input-earth</td>
<td>1.5 kV RMS</td>
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<td>Electrical isolation, input-output</td>
<td>3 kV RMS</td>
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<td>Electrical isolation, I/O rail</td>
<td>4 kV RMS</td>
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<td>General data</td>
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<td>Operating temperature</td>
<td>-20 °C ... +50 °C</td>
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<td>Storage temperature</td>
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<tr>
<td>Degree of efficiency at max. load</td>
<td>80 %</td>
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<td>Status indication</td>
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<td>Standards</td>
<td>EN 50178, EN 60950, IEC 950</td>
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<td>EMC standards</td>
<td>IEC 61000-6-2, -3</td>
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<tr>
<td>Power factor correction</td>
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<tr>
<td>Approvals</td>
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<thead>
<tr>
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<th>mm²</th>
</tr>
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<tr>
<td>Length x width x height</td>
<td>mm</td>
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<tr>
<td></td>
<td>2.5 / 0.5 / 2.5</td>
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<tr>
<td></td>
<td>112.4 x 22.5 x 92.4</td>
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### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
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<tbody>
<tr>
<td>CP SNT 12W 24V 0.5A</td>
<td>1</td>
<td>9918840024</td>
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</table>

### Accessories

| Note                  |                                         |

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Weidmüller  
13
Primary switch-mode power supplies

connectPower 1-phase
INSTAPOWER

Technical data

Input
- Input voltage: 85 … 265 V AC, 120 … 300 V DC
- Input current: 460 mA @ 115 V AC; 250 mA @ 230 V AC
- Input frequency: 50/60 Hz
- Thermistor: 2 A slow-blow fuse (internal)
- Overvoltage protection: Varistor

Output
- Output voltage: 28 V DC
- Output current: 28 V
- Overvoltage / thermal cut-out: 0.5 %
- Overvoltage / thermal cut-out: 8000 μF
- Overvoltage / thermal cut-out: 500 V RMS isolation, output-earth
- Overvoltage / thermal cut-out: 1.5 kV RMS isolation, input-earth
- Overvoltage / thermal cut-out: 3 kV RMS isolation, input-output
- Overvoltage / thermal cut-out: 4 kV RMS isolation, I/O rail
- Temperature: –20 °C … +50 °C
- Derating: 33 % @ 60 °C
- Screw connection: 4.0 / 0.1 / 4
- Dimensions: 62.5 x 52 x 90.5 mm

Ordering data

Type | (Qty.=1) | Order No.
--- | --- | ---
CP SNT 24 W 28 V 1 A | 9928890028
CP SNT 24 W 24 V 1 A | 9928890024
CP SNT 24 W 15 V 1.5 A | 9928890015

Accessories

Note
### Technical data

**Input**
- Input voltage: 85 … 265 V AC, 120 … 300 V DC
- Input current: 460 mA @ 115 V AC, 250 mA @ 230 V AC
- Input frequency: 50/60 Hz
- Making current limit: 2 A slow-blow fuse (internal)
- Input fusen: 2.5 A (T) / 250 V

**Output**
- Output voltage: 12 V DC
- Output current: 1.5 A
- Overvoltage protection: Varistor
- Maximum output power: 8000 μF
- Maximum residual ripple: 0.5 %

**Insulation coordination**
- 500 V RMS
- 3 kV RMS
- 4 kV RMS
- -20 °C ... +50 °C
- -40 °C ... +85 °C

**General data**
- 78 % Efficiency at max. load
- Standards: EN 60950, IEC 950
- Approvals: CSA / CE / cULus
- EMC standards: EN 61000-6 /-2, -3

**Connections**
- Screw connection: 4.0 / 0.1 / 4
- Dimensions: 62.5 x 52 x 90.5

### Ordering data

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<th>(Qty.=1)</th>
<th>Order No.</th>
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<td>CP SNT 24 W 12 V 1.5 A</td>
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<tr>
<td>CP SNT 24 W 5 V 2 A</td>
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<td>9928890005</td>
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**Note**

Clamping range (rating / min. / max.) mm²
Length x width x height mm
Dimensions: 33 % @ 60 °C

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### Accessories

**Note**

Weidmüller
Technical data

<table>
<thead>
<tr>
<th>Input</th>
<th>85 ... 264 V AC / 110 ... 370 V DC</th>
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<tbody>
<tr>
<td>Input voltage</td>
<td>500 mA at rated load</td>
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<tr>
<td>Input current</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Input frequency</td>
<td>yes</td>
</tr>
<tr>
<td>Making current limit</td>
<td>Fusible link 2.5 A (T) / 250 V</td>
</tr>
<tr>
<td>Input fuse link</td>
<td>Varistor</td>
</tr>
<tr>
<td>Overvoltage protection</td>
<td>105 % ... 150 % of max. output power, automatic restart</td>
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</table>

<table>
<thead>
<tr>
<th>Output</th>
<th>9 ... 15 V DC (adjustable with potentiometer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output voltage</td>
<td>3.5 A</td>
</tr>
<tr>
<td>Output current</td>
<td>42 W</td>
</tr>
<tr>
<td>max. output power</td>
<td>120 mV RMS</td>
</tr>
<tr>
<td>max. residual ripple</td>
<td>105 % ... 150 % of max. output power, automatic restart</td>
</tr>
<tr>
<td>Overload protection</td>
<td>Varistor</td>
</tr>
<tr>
<td>Overvoltage protection</td>
<td>11 ms @ 115 V AC / 50 ms @ 230 V AC</td>
</tr>
<tr>
<td>Mains failure bridge-over time</td>
<td>1 %</td>
</tr>
<tr>
<td>Control at 10 ... 100 % load</td>
<td>8000 μF</td>
</tr>
<tr>
<td>max. capacitance at output</td>
<td>500 V RMS</td>
</tr>
<tr>
<td>Insulation coordination</td>
<td>1.5 kV RMS</td>
</tr>
<tr>
<td>Electrical isolation, output-earth</td>
<td>3 kV RMS</td>
</tr>
<tr>
<td>Electrical isolation, input-earth</td>
<td>4 kV RMS</td>
</tr>
<tr>
<td>Electrical isolation, input-output</td>
<td>–10 °C ... +50 °C (derating from 45 °C)</td>
</tr>
<tr>
<td>Electrical isolation, I/O rail</td>
<td>–20 °C ... +85 °C</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>78 %</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>EN 50178; EN 60950 (SELV)</td>
</tr>
<tr>
<td>Degree of efficiency at max. load</td>
<td>n.a.</td>
</tr>
<tr>
<td>Standards</td>
<td>–10 °C ... +50 °C (derating from 45 °C)</td>
</tr>
<tr>
<td>Approvals</td>
<td>–20 °C ... +85 °C</td>
</tr>
<tr>
<td>EMC standards</td>
<td>70 %</td>
</tr>
<tr>
<td>Screw connection</td>
<td>EN 50178; EN 60950 (SELV)</td>
</tr>
<tr>
<td>Length x width x height</td>
<td>EN 55011 / EN 55022 / EN 61000-3-2, 3</td>
</tr>
<tr>
<td>mm</td>
<td>EN 55011 / EN 55022 / EN 61000-3-2, 3</td>
</tr>
<tr>
<td>62.5 x 70 x 90.5</td>
<td>EN 55011 / EN 55022 / EN 61000-3-2, 3</td>
</tr>
<tr>
<td>Note</td>
<td>EN 55011 / EN 55022 / EN 61000-3-2, 3</td>
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Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>CP SNT 48 W 24 V 2 A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty</td>
<td>1</td>
</tr>
<tr>
<td>Order No.</td>
<td>CP SNT 48 W 24 V 2 A</td>
</tr>
<tr>
<td>Note</td>
<td>on request</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Note</th>
<th></th>
</tr>
</thead>
</table>

Weidmüller
Primary switch-mode power supplies

connectPower 1-phase ECOLINE

CP SNT 70 W 24 V 3 A

CP SNT 120 W 24 V 5 A

Technical data

<table>
<thead>
<tr>
<th>Input</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>85 … 264 V AC; 120 … 370 V DC</td>
</tr>
<tr>
<td>Input current</td>
<td>2.0 A @ 100 … 240 V AC</td>
</tr>
<tr>
<td>Input frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Mains fuse</td>
<td>Fusible link 2.5 A (T) / 250 V</td>
</tr>
<tr>
<td>Overvoltage protection</td>
<td>Varistor</td>
</tr>
<tr>
<td>Output voltage</td>
<td>24 … 28 V DC (adjustable via potentiometer)</td>
</tr>
<tr>
<td>Output current</td>
<td>3.0 A</td>
</tr>
<tr>
<td>max. output power</td>
<td>72 W</td>
</tr>
<tr>
<td>max. residual ripple</td>
<td>100 mV bandwidth 20 MHz</td>
</tr>
<tr>
<td>Overload protection</td>
<td>105 % … 150 % Iconst. of max. output power, automatic restart</td>
</tr>
<tr>
<td>Stored energy time by mains failure: 115 V AC / 230 V AC</td>
<td>29 … 34 V</td>
</tr>
<tr>
<td>Closed-loop control at 10 % … 100 % load</td>
<td>10 ms / 20 ms</td>
</tr>
<tr>
<td>Possibility of parallel connection</td>
<td>2 %</td>
</tr>
<tr>
<td>Signal relay / change-over contact</td>
<td>recommended with diode module</td>
</tr>
<tr>
<td>Insulation co-ordination</td>
<td>250 V AC (max. 30 V DC) / 1 A</td>
</tr>
<tr>
<td>Galvanic isolation output-earth</td>
<td>0.5 kV AC</td>
</tr>
<tr>
<td>Galvanic isolation input-earth</td>
<td>1.5 kV AC</td>
</tr>
<tr>
<td>Galvanic isolation input-output</td>
<td>3 kV AC</td>
</tr>
</tbody>
</table>

General specifications

Operating temperature / Storage temperature | –10 °C … +55 °C / –20 °C … +85 °C |

Status display | LED green |

Standards
EN 60950
EN 55011, EN 55022, EN 55024, EN 61000-6-2, -3

EMC standards
EN 61000-6-2, -3

Mounting position
Horizontal on mounting rail TS 35

Clearance: above/below ≥ 3 cm

Weight | approx. 0.55 kg

Screw connection
2.5 / 0.13 / 4
110 x 55.5 x 125

For redundancy or correct function of the signal relays use a diode module

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP SNT 70 W 24 V 3 A</td>
<td>1</td>
<td>8708660000</td>
</tr>
</tbody>
</table>

Note

For redundancy or correct function of the signal relays use a diode module

Accessories

Note

Clamping area (nominal / min. / max.) | mm²|
Length x width x height | mm|

For redundancy or correct function of the signal relays use a diode module
Technical data

Input
- Input voltage: 88 ... 132 V AC / 176 ... 264 V AC reversible; 250 ... 370 V DC
- Input current: 3.6 A @ 115 V AC / 2.0 A @ 230 V AC
- Input frequency: 50/60 Hz
- Mains fuse: Fusible link 5 A (T) / 250 V
- Overvoltage protection: Varistor

Output
- Output voltage: 24 ... 28 V DC (adjustable via potentiometer)
- Output current: 10 A
- Output power: 240 W
- Overload protection: 105 % ... 150 % I<sub>const</sub> of max. output power, automatic restart
- Insulation co-ordination: 20 ms / 15 ms
- Recommended with diode module: 250 V AC (max. 30 V DC) / 1 A
- Efficiency under max. load: 84 %
- Efficiency at 85 %
- Status display: LED green
- Standards: EN 60950, EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3
- Mounting position: Horizontal on mounting rail TS 35
- Mounting: Clearance: above/below ≥ 3 cm
- Weight: approx. 1.6 kg

Output voltage
- 24 ... 36 V
- 10 ms / 15 ms
- 2 %
- Recommended with diode module: 250 V AC (max. 30 V DC) / 1 A
- Weight: approx. 2 kg

General specifications
- Operating temperature / Storage temperature: –10 °C ... +55 °C / –20 °C ... +85 °C
- Efficiency: 84 %
- Efficiency at 85 %
- Status display: LED green
- Standards: EN 60950, EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3
- Mounting position: Horizontal on mounting rail TS 25
- Mounting: Clearance: above/below ≥ 3 cm
- Weight: approx. 1.6 kg

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP SNT 250 W 24 V 10 A</td>
<td>1</td>
<td>8708888000</td>
</tr>
</tbody>
</table>

For redundancy or correct function of the signal relays use a diode module

Type Qty. Order No.
CP SNT 500 W 24 V 20 A 1 8778870000

For redundancy or correct function of the signal relays use a diode module

Note

Accessories

Note
**Technical data**

**Input**
- Input voltage
- Input current
- Input frequency
- Mains fuse

**Output**
- Output voltage
- Output current
- max. output power
- max. residual ripple
- Overload protection

**Oversorting protection**
- Stored energy time when 400 V AC mains fail
- Possibility of parallel connection

**Signal relay / change-over contact**

**Insulation co-ordination**
- Galvanic isolation output-earth
- Galvanic isolation input-earth
- Galvanic isolation input-output

**General specifications**
- Operating temperature / Storage temperature
- Degree of efficiency
- Status display
- Standards
- EMC standards
- Mounting position
- Mounting
- Weight
- Approvals

**Clamping area (nominal / min. / max.) mm²**
- Length x width x height mm

**Ordering data**

**Type**
- CP SNT3 250 W 24 V 10 A
- CP SNT3 500 W 24 V 20 A

**Note**

**Accessories**

**Note**
connectPower 3-phase ECOLINE

CP SNT3 1000 W 24 V 40 A

Technical data

Input

- Input voltage
- Input current
- Input frequency
- Mains fuse

Output

- Output voltage
- Output current
- max. output power
- max. residual ripple
- Overload protection
- Overvoltage protection
- Stored energy time when 400 V AC mains fail
- Possibility of parallel connection
- Signal relay / change-over contact

Insulation co-ordination

- Galvanic isolation output-earth
- Galvanic isolation input-earth
- Galvanic isolation input-output

General specifications

- Operating temperature / Storage temperature
- Degree of efficiency
- Status display
- Standards
- EMC standards
- Mounting position
- Mounting
- Weight
- Approvals

Derating curve

3/5/10/20/40 A

Output load / ambient temperature

- 3 x 400 V AC / 340 ... 575 V AC (650 ... 800 V DC)
- 3,4 A (Ue = 400 V AC)
- 47 ... 63 Hz
- external via 3 CBs 10 ... 16 A, char. C
- 24 ... 28 V DC (adjustable via potentiometer)
- 40 A
- 960 W
- < 100 mVss / bandwidth 20 MHz
- 105 % ... 130 % Iconst. of max. output power,
  automatic restart
- 29 ... 34 V
- > 10 ms at nominal load
- < 2 %
- directly with same type
- 250 V AC (max. 30 V DC) / 1 A

0.5 kW AC
- 1.5 kW AC
- 3 kW AC

- -10 °C ... +55 °C / -20 °C ... +85 °C
- 88 %
- LED green
- EN 60950
- EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3
- Horizontal on mounting rail TS 35
- Clearance: above/below ≥ 3 cm
- approx. 3.5 kg

Screw connection

4 / 0.13 / 6
10 / 0.32 / 16
125 x 280 x 150

Note

- Clamping area Input (nominal / min. / max.) mm²
- Clamping area Output (nominal / min. / max.) mm²
- Length x width x height mm

Ordering data

- Type
- Qty.
- Order No.
- CP SNT3 1000 W 24 V 40 A 1 8708730000

Accessories

Note
Primary switch-mode power supplies

connectPower 1-phase

Technical data

Input

- Input voltage: 85 ... 265 V AC, 120 ... 300 V DC
- Input current: 1.1 A @ 115 V AC, 0.55 A @ 230 V AC
- Input frequency: 50/60 Hz
- Input fuse: 2 A slow-blow fuse (internal)

Output

- Output voltage: 48 V DC
- Output current: 1.04 A
- < 50 mV RMS
- Overvoltage / thermal cut-out: Varistor
- Mains failure bridge-over time: 30 ms @ 115 V AC / 190 ms @ 230 V AC
- 1 % control at 10...100% load
- Overload protection: no parallel connection option

Insulation coordination

- Electrical isolation, output-earth: 500 V RMS
- Electrical isolation, input-earth: 1.5 kV RMS
- Electrical isolation, input-output: 3 kV RMS
- Electrical isolation, I/O rail: 3 kV RMS

General data

- Operating temperature/Storage temperature: -20 °C ... +40 °C / -40 °C ... +85 °C
- Efficiency at max. load: 78 %
- Status indication: green LED
- Standards: EN 50178, EN 60950, IEC 950, IEC 61000-6/-2,-3
- Approvals: no power factor correction

Screw connection

Type Qty. Order No.
CP SNT 55W 48V 1.04A 1 9927480048

Ordering data

Note

Accessories

Note

Bracket for wall mounting: 7920560000

Bracket for wall mounting: 7920560000
connectPower 1-phase

Technical data

Input
- Input voltage: 85 ... 265 V AC, 120 ... 300 V DC
- Input current: 1.1 A @ 115 V AC, 0.55 A @ 230 V AC
- Input frequency: 50/60 Hz
- Input fuse: 2 A slow-blow fuse (internal)

Output
- Output voltage: 12 ... 15 V DC
- Output current: 3 A
- max. output power: 36 V
- max. residual ripple: < 50 mV RMS
- Overvoltage protection: Varistor
- Overvoltage protection: 30 ms @ 115 V AC / 180 ms @ 230 V AC, 1 %
- Overload protection: no
- Parallel connection option: no

Insulation coordination
- Electrical isolation, output-earth: 500 V RMS
- Electrical isolation, input-earth: 1.5 kV RMS
- Electrical isolation, input-output: 3 kV RMS
- Electrical isolation, I/O rail: 3 kV RMS

General data
- Operating temperature/Storage temperature: -20 °C ... 40 °C / -40 °C ... +85 °C
- Degree of efficiency at max. load: 78 %
- Status indication: green LED
- Standards: EN 50178, EN 60950, IEC 950
- EMC standards: IEC 61000-6/-2,-3
- Power factor correction: no
- Approvals: Screw connection
- Derating: 2.1 A/24 V @ 50 °C; 1.5 A/24 V @ 60 °C

Screw connection
- 4.0 / 0.1 / 4
- 131 x 57 x 98

Ordering data

Type | Qty. | Order No.
--- | --- | ---
CP SNT 55 W 12-15 V 3 A | 1 | 9927480012

Note

Accessories

Bracket for wall mounting: 7920560000

Primary switch-mode power supplies

CP SNT 55 W 12-15 V 3 A

CP SNT 55 W 5 V 3 A

Screw connection
- 4.0 / 0.1 / 4
- 131 x 57 x 98

Ordering data

Type | Qty. | Order No.
--- | --- | ---
CP SNT 55 W 5 V 0 A | 1 | 9927480005

Note

Bracket for wall mounting: 7920560000
Primary switch-mode power supplies

**connectPower 1-phase**

## Technical data

### Input

- **Input voltage**: AC, max. 195/250 V AC, typ. 115 ... 230 V AC
- **Input current**: 2.9 A @ 115 V AC, 1.45 A @ 230 V AC
- **Input frequency**: 50/60 Hz
- **Input fuse**: 6.3 A slow-blow fuse (internal)
- **Overvoltage protection**: Varistor

### Output

- **Output voltage**: 48 V DC
- **Output current**: 3.5 A
- **Max. output power**: 168 V
- **Output isolation**: 0 % RMS
- **Overvoltage protection**: Varistor
- **Overcurrent and overvoltage protection**: 40 ms @ 115 V AC / 50 ms @ 230 V AC
- **Parallel connection option**: no
- **Mains failure bridge-over time**: 40 ms @ 115 V AC / 50 ms @ 230 V AC
- **Control at 10 ... 100 % load**: no

### Insulation coordination

- **Electrical isolation, output-earth**: 500 V RMS
- **Electrical isolation, input-earth**: 1.5 kV RMS
- **Electrical isolation, input-output**: 3 kV RMS
- **Electrical isolation, I/O rail**: 3 kV RMS

### General data

- **Operating temperature/Storage temperature**: 0 °C ... +50 °C /–40 °C ... +85 °C
- **Degree of efficiency at max. load**: 85 %
- **Status indication**: green LED
- **Standards**: EN 50178, EN 60950, IEC 950
- **EMC standards**: EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3
- **Power factor correction**: no
- **Approvals**: Screw connection

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP SNT 160 W 48 V 3.5 A</td>
<td>1</td>
<td>9925340048</td>
</tr>
<tr>
<td>CP SNT 160 W 24-28 V 6.5 A</td>
<td>1</td>
<td>9925340024</td>
</tr>
</tbody>
</table>

### Note

- **Clamping range (rating / min. / max.)**
- **Length x width x height**
- **Derating**: 10 % @ 60 °C

### Accessory

- **Bracket for wall mounting**: 7920560000
**Technical data**

**Input**
- Input voltage: AC, max. 195/250 V AC, typ. 115...230 V AC
- Input current: 2.9 A @ 115 V AC; 1.45 A @ 230 V AC
- Input frequency: 50/60 Hz
- Input fuse: 6.3 A slow-blow fuse (internal)

**Output**
- Output voltage: 12...15 V DC, 8 A
- Output current: 0.2 % RMS
- Overcurrent and overvoltage protection: Varistor
- Overvoltage protection: 0.2 % RMS

**Insulation coordination**
- Electrical isolation, output-earth: 500 V RMS
- Electrical isolation, input-earth: 1.5 kV RMS
- Electrical isolation, input-output: 3 kV RMS
- Electrical isolation, I/O rail: 3 kV RMS

**General data**
- Operating temperature/Storage temperature: 0 °C ... +50 °C /–40 °C ... +85 °C
- Degree of efficiency at max. load: 85 %
- Status indication: green LED
- Standards: EN 50178, EN 60950, IEC 950
- EMC standards: EN 55011, EN 55022, EN 55035, EN 61000-6-2,-3
- Power factor correction
- Approvals

**Clamping range (rating / min. / max.)** mm:
- 4.0 / 0.1 / 4

**Length x width x height** mm:
- 175 x 57 x 127

**Screw connection**
- Aluminum: 4.0 / 0.1 / 4
- Diameter: 175 x 57 x 127

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP SNT 160 W 12-15 V 8 A</td>
<td>1</td>
<td>9925340012</td>
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</table>

**Accessories**

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bracket for wall mounting: 7922660300</td>
</tr>
</tbody>
</table>

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**Primary switch-mode power supplies**
connectPower 1-phase

Technical data

Input
Input voltage: 100…200 V DC; typ 115…230 V AC
Input current: 3.3 A @ 115 V AC; 1.65 A @ 230 V AC
Input frequency: 50/60 Hz
Input fuse: H L W

Output
Output voltage: -28 V DC
Output current: max. output power

Overvoltage protection
- Varistor
- Overvoltage protection
- Overvoltage protection

Overload protection
- Mains failure bridge-over time
- Control at 10…100 % load
- Parallel connection option
- Signalling delay
- Monitoring function

Insulation coordination
- Electrical isolation, output-earth
- Electrical isolation, input-earth
- Electrical isolation, input-output
- Electrical isolation, I/O rail

General data
- Operating temperature/Storage temperature: -15°C … +50 °C (at 100 % duty cycle)/-40 °C … +85 °C
- Degree of efficiency at max. load: 80 %
- Standards: EN 50178, EN 60950, IEC 950
- EMC standards: EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3
- Power factor correction: PFC passive
- Derating: 20 % @ 60 °C
- Approvals: CSA / UL / CE / IEC 950

Clamping range (rating / min. / max.) mm²
Length x width x height mm

Ordering data

Type | Qty. | Order No.
--- | --- | ---
CP SNT 300W 24V 12.5A | 1 | 9916250024

Accessories

Bracket for wall mounting: 7920560000
### Technical data

**Input**
- Input voltage AC, typ.: 360…480 V AC
- Input current: 100 mA @ 230 V AC
- Input frequency 50/60 Hz
- Input fuse: 3 x 1 A slow-blow fuse (internal)

**Output**
- Output voltage: 24 V DC
- Output current: 2.3 A
- max. output power: 55 W
- max. residual ripple ≤ 50 mV RMS
- Overvoltage protection / thermal cut-out

**Mains failure bridge-over time**
- 120 ms @ 360 V AC / 120 ms @ 480 V AC
- 1 %
- Overvoltage / thermal cut-out

**Parallel connection option**
- no

**Insulation coordination**
- 500 V RMS isolation, output-earth
- 1.5 kV RMS isolation, input-earth
- 3 kV RMS isolation, input-output
- 3 kV RMS isolation, I/O rail

**General data**
- Operating temperature: 0 °C ... +70 °C
- Storage temperature: -40 °C ... +85 °C
- Degree of efficiency at max. load
- Status indication: green LED
- Standards: EN 50178, EN 60950, IEC 950
- EMC standards: EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3
- Power factor correction: no
- Approvals: CSA / UL / UR / CE

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP-SNT 380-480 V AC/24 V</td>
<td>1</td>
<td>9917790324</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
</table>

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**Primary switch-mode power supplies**

**connectPower 3-phase**

**CP-SNT 380-480 V AC/24 V**

![Schematic diagram]

**Technical data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage AC, typ.</td>
<td>360 … 550 V AC, typ.: 360 … 480 V AC</td>
</tr>
<tr>
<td>Input current</td>
<td>120 mA @ 360 V AC, 100 mA @ 230 V AC</td>
</tr>
<tr>
<td>Input frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Input fuse</td>
<td>3 x 1 A slow-blow fuse (internal)</td>
</tr>
<tr>
<td>Output voltage</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Output current</td>
<td>2.3 A</td>
</tr>
<tr>
<td>max. output power</td>
<td>55 W</td>
</tr>
<tr>
<td>max. residual ripple</td>
<td>≤ 50 mV RMS</td>
</tr>
<tr>
<td>Overvoltage protection / thermal cut-out</td>
<td></td>
</tr>
<tr>
<td>Mains failure bridge-over time</td>
<td>120 ms @ 360 V AC / 120 ms @ 480 V AC</td>
</tr>
<tr>
<td>Control at 10 … 100 % load</td>
<td>1 %</td>
</tr>
<tr>
<td>Parallel connection option</td>
<td>no</td>
</tr>
<tr>
<td>Overvoltage protection / thermal cut-out</td>
<td></td>
</tr>
<tr>
<td>500 V RMS isolation, output-earth</td>
<td></td>
</tr>
<tr>
<td>1.5 kV RMS isolation, input-earth</td>
<td></td>
</tr>
<tr>
<td>3 kV RMS isolation, input-output</td>
<td></td>
</tr>
<tr>
<td>3 kV RMS isolation, I/O rail</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0 °C ... +70 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 °C ... +85 °C</td>
</tr>
<tr>
<td>Degree of efficiency at max. load</td>
<td></td>
</tr>
<tr>
<td>Status indication</td>
<td>green LED</td>
</tr>
<tr>
<td>Standards</td>
<td>EN 50178, EN 60950, IEC 950</td>
</tr>
<tr>
<td>EMC standards</td>
<td>EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3</td>
</tr>
<tr>
<td>Power factor correction</td>
<td>no</td>
</tr>
<tr>
<td>Approvals</td>
<td>CSA / UL / UR / CE</td>
</tr>
</tbody>
</table>

**Note**

- Screw connection: 4.0 / 0.1 / 4
- Derating: 10 % @ 85 °C
- Type Qty. Order No.
  - CP-SNT 380-480 V AC/24 V 1 9917790324

---

**Weidmüller**
Diode modules decouple switch-mode power supplies to 100%. One disadvantage of switch-mode power supplies is that a negative interference of output capacity and voltages occurs by direct parallel connection of the secondary circuit that can, in the worst case, lead to the destruction of one of the devices. The devices do not generate the required increase in power; the result is cross coupling. Diode modules inserted into the secondary circuits provide a remedy. They are utilized, for example, to double the output power, for redundancy operations, for supplying critical loads with power or to protect against reverse voltages. Weidmüller provides devices with a max. output current of 40 A.

### Power supply to critical loads, for example, PLCs

![Diagram](image1)

- **Power supply 1:** 24 V DC / 10 A
- **Power supply 2:** 24 V DC / 3 A
- **Diode module:** 10 A
- **Status relays (Change over contact):** e.g. SPS, IPC

### Redundancy circuit with two ECOLINE 250 W

**Switch-mode power supplies**

![Diagram](image2)

- **Power supply 1:** 24 V DC / 10 A
- **Diode module:** 24 V DC / 3 A
- **Power supply 2:** 24 V DC / 10 A
- **Status relays (Change over contact):** e.g. to SPS, IPC
Diode modules

connectPower diode module
ECOLINE

Technical data

<table>
<thead>
<tr>
<th>Input</th>
<th>CP DM 10</th>
<th>CP DM 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>40 V DC max.</td>
<td>40 V DC max.</td>
</tr>
<tr>
<td>Input current</td>
<td>2 x 0 ... 10 A max.</td>
<td>2 x 0 ... 20 A max.</td>
</tr>
<tr>
<td>Output</td>
<td>40 V DC max.</td>
<td>40 V DC max.</td>
</tr>
<tr>
<td>Output voltage</td>
<td>V_{in} – 0,5 typ.</td>
<td>-10 °C ... 55 °C</td>
</tr>
<tr>
<td>Output current</td>
<td>0 ... 20 A max. or 10 A max. in redundancy mode</td>
<td>-20 °C ... 40 °C</td>
</tr>
</tbody>
</table>

General specifications

<table>
<thead>
<tr>
<th>Operating temperature</th>
<th>CP DM 10</th>
<th>CP DM 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>-10 °C ... 55 °C</td>
<td>-20 °C ... 40 °C</td>
</tr>
<tr>
<td>Efficiency under max. load</td>
<td>approx. 95,5 % at 24 V DC</td>
<td>approx. 95 % at 24 V DC</td>
</tr>
<tr>
<td>Mount onto mounting rails</td>
<td>Mounting rail TS 35 to DIN 50022</td>
<td>Mounting rail 35 mm to DIN 50022</td>
</tr>
<tr>
<td>Mounting position</td>
<td>Horizontal</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 0.15 kg</td>
<td>approx. 0.5 kg</td>
</tr>
</tbody>
</table>

Approvals

<table>
<thead>
<tr>
<th>Screw connection</th>
<th>CP DM 10</th>
<th>CP DM 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 / 0,13 / 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10,0 / 0,32 / 16,0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note

<table>
<thead>
<tr>
<th>Clamping area Input (nominal / min. / max.)</th>
<th>mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clamping area Output (nominal / min. / max.)</td>
<td>mm²</td>
</tr>
<tr>
<td>Length x width x height</td>
<td>mm</td>
</tr>
</tbody>
</table>

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP DM 10</td>
<td>1</td>
<td>8710620000</td>
</tr>
<tr>
<td>CP DM 20</td>
<td>1</td>
<td>8768650000</td>
</tr>
</tbody>
</table>

Note:

- Screw connection
- Clamping range identical for input / output
**Introduction DC/DC converter**

If there is no regulated and stable DC voltage available to supply sensitive equipment, DC/DC converters can guarantee a stabilized voltage. To a certain extent, other voltage levels are generated at the output; consequently, DC/DC converters can also be utilized to transform to other voltage levels. Electrical isolation of the input and output ensures reliable and safe separation of the circuits.

The status of the output is reliably indicated by means of a status LED.

**DC/DC converters**

DC/DC converters are particularly suitable for the decentralized power supply to circuitry, sub-assemblies and modules. DC/DC converters are often required in emergency power supplies supplying electrical devices from batteries and other DC systems.

It is possible to supply both sides of an analogue coupling module with the help of a DC/DC converter without neutralising the electrical isolation. Weidmüller’s DC/DC converters are available in housings suitable for installing onto mounting rails.

**Principle method of operation**

DC/DC converters are a variant of switch-mode regulators. The DC current at the input is chopped with the switching frequency and brought up to the required voltage by a transformer. The voltage is then rectified, smoothed and regulated.

**DC/DC converters for supplying sensitive loads**

*for example, PLCs, mini controllers etc.*

**Power supply to loads with different voltage levels**

**Input 24 V DC**

Long cables and extreme disruptive environments mean that the voltage supply is flawed by harmonic waves and voltage drops.

- Load circuit 1
  - For the reliable power supply to controllers

- Load circuit 2
  - For transforming the DC input voltage and supplying 12 V DC units
## Technical data

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>General data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage typ. 24 V DC</td>
<td>Output voltage</td>
<td>Operating temperature</td>
</tr>
<tr>
<td>Input fuse</td>
<td>Input current</td>
<td>-40 °C ... +85 °C max. full rate load</td>
</tr>
<tr>
<td>Overload behaviour</td>
<td>-40 °C ... +40 °C max. full rate load</td>
<td></td>
</tr>
<tr>
<td>Status indication</td>
<td>-40 °C ... +40 °C max. full rate load</td>
<td></td>
</tr>
<tr>
<td>Switching frequency</td>
<td>-40 °C ... +85 °C max. full rate load</td>
<td></td>
</tr>
<tr>
<td>Approvals</td>
<td>-40 °C ... +85 °C max. full rate load</td>
<td></td>
</tr>
</tbody>
</table>

### Input
- 18 ... 30 V DC, typ. 24 V DC
- 22 ... 24 V DC
- Overvoltage cut-out with self-reset
- 0 °C ... +40 °C max. full rate load
- green LED
- 200 kHz
- CSA / UL / UR / CE

### Output
- 18 ... 30 V DC, typ. 24 V DC
- 15 V DC
- Overvoltage cut-out with self-reset
- 0 °C ... +40 °C max. full rate load
- green LED
- 200 kHz
- CSA / UL / UR / CE

### General data
- Operating temperature
- Storage temperature
- Status indication
- Switching frequency
- Approvals

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP DC/DC 50 W 22-24 V DC 2 A</td>
<td>1</td>
<td>9919372424</td>
</tr>
<tr>
<td>CP DC/DC 50 W 15 V DC 3 A</td>
<td>1</td>
<td>9919372415</td>
</tr>
</tbody>
</table>

### Accessories

- Bracket for wall mounting: 7920560000

### Note
- Screw connection
  - 4.0 / 0.1 / 4
  - 131 x 57 x 98

## DC/DC converter

**connectPower**
**DC/DC converter**

**connectPower**

### Technical data

#### Input
- Input voltage type: 12 V DC
- Input fuse

#### Output
- Output voltage: 12 V DC
- Output current: 3 A
- Overload behaviour: Overvoltage cut-out with self-reset
- Overvoltage cut-out with self-reset
- Temperature range: 0 °C ... +40 °C max. full rate load
- Storage temperature: -40 °C ... +85 °C
- Status indication: green LED
- Switching frequency: 200.0 kHz
- Approvals: CSA / UL / UR / CE

#### General data
- Operating temperature: 0 °C ... +40 °C max. full rate load
- Storage temperature: -40 °C ... +85 °C
- Status indication: green LED
- Switching frequency: 200.0 kHz
- Approvals: CSA / UL / UR / CE

#### Screw connection
- 4.0 / 0.1 / 4
- 131 x 57 x 98

#### Note

### Ordering data

#### Connection system
- Screw connection

#### Type | Qty. | Order No.  
--- | --- | ---  
CP DC/DC 50 W 12 V 3 A | 1 | 9919371212

#### Accessories
- Bracket for wall mounting: 7920560000

**Note**

---

**CP DC/DC 50 W 5 V DC 8 A**

#### Technical data

#### Input
- Input voltage type: 9 V DC, type 12 V DC internal

#### Output
- Output voltage: 5 V DC
- Output current: 8 A
- Overload behaviour: Overvoltage cut-out with self-reset
- Overvoltage cut-out with self-reset
- Temperature range: 0 °C ... +40 °C max. full rate load
- Storage temperature: -40 °C ... +85 °C
- Status indication: green LED
- Switching frequency: 200.0 kHz
- Approvals: CSA / UL / UR / CE

#### General data
- Operating temperature: 0 °C ... +40 °C max. full rate load
- Storage temperature: -40 °C ... +85 °C
- Status indication: green LED
- Switching frequency: 200.0 kHz
- Approvals: CSA / UL / UR / CE

#### Screw connection
- 4.0 / 0.1 / 4
- 131 x 57 x 98

#### Note

### Ordering data

#### Type | Qty. | Order No.  
--- | --- | ---  
CP DC/DC 50 W 5 V 8 A | 1 | 9919371205

#### Accessories
- Bracket for wall mounting: 7920560000

**Note**
**Technical data**

<table>
<thead>
<tr>
<th>Input</th>
<th></th>
<th>CP DC/DC 50 W 22-24 V DC 2 A</th>
<th>CP DC/DC 50 W 15 V DC 3 A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>9...16 V DC, type 12 V DC internal</td>
<td></td>
<td>9...16 V DC, type 12 V DC internal</td>
</tr>
<tr>
<td>Input fuse</td>
<td>22...24 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overload behaviour</td>
<td>Overvoltage cut-out with self-reset</td>
<td></td>
<td>Overvoltage cut-out with self-reset</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0 °C...+40 °C max. full rate load</td>
<td></td>
<td>0 °C...+40 °C max. full rate load</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>–40 °C...+85 °C</td>
<td></td>
<td>–40 °C...+85 °C</td>
</tr>
<tr>
<td>Status indication</td>
<td>green LED</td>
<td></td>
<td>green LED</td>
</tr>
<tr>
<td>Approvals</td>
<td>CSA / UL/UR / CE</td>
<td></td>
<td>CSA / UL/UR / CE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General data</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection system</td>
<td>Screw connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screw connection</td>
<td>4.0 / 0.1 / 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length x width x height</td>
<td>131 x 57 x 98</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP DC/DC 50 W 22-24 V 2A</td>
<td>1</td>
<td>9919371224</td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Note</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bracket for wall mounting</td>
<td>CP DC/DC 50 W 15 V DC 3 A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Technical data

### Input
- **Input voltage typ.** 24 V DC
- **Input fuse**

### Output
- **Output voltage**
- **Output current**
- **Overload behaviour** with self-reset

### General data
- **Operating temperature**
  - Full rate load: 0 °C … +40 °C
  - –40 °C … +85 °C
- **Storage temperature**
- **Status indication**
- **Switching frequency**
- **Approvals**

### Clamping range (rating - / min. / max.)

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP DC/DC 50 W 12 V DC 3 A</td>
<td>1</td>
<td>9919372412</td>
</tr>
<tr>
<td>CP DC/DC 50 W 5 V DC 8 A</td>
<td>1</td>
<td>9919372405</td>
</tr>
</tbody>
</table>

### Length x width x height

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP DC/DC 50 W 12 V DC 3 A</td>
<td>1</td>
<td>9919372412</td>
</tr>
<tr>
<td>CP DC/DC 50 W 5 V DC 8 A</td>
<td>1</td>
<td>9919372405</td>
</tr>
</tbody>
</table>

### Screw connection

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP DC/DC 50 W 12 V DC 3 A</td>
<td>1</td>
<td>9919372412</td>
</tr>
<tr>
<td>CP DC/DC 50 W 5 V DC 8 A</td>
<td>1</td>
<td>9919372405</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bracket for wall mounting: 7920560000</td>
<td>1</td>
<td>9919372412</td>
</tr>
<tr>
<td>Bracket for wall mounting: 7920560000</td>
<td>1</td>
<td>9919372405</td>
</tr>
</tbody>
</table>
Unregulated power supplies

Compact power supply units are important links in the power supplies for controllers. They are utilised where processes or control voltages are required that vary from the mains voltage. Transformers provide the electrical isolation between the input circuit and the output circuit.

The minimum requirement (to VDE 0550) is 2000 V. Screw terminals secure the input-side connection to the mains. The single-phase devices are rated for a nominal voltage of \(-230 \pm 15\) V, or \(-400 \pm 15\) V, 50/60 Hz, the 3-phase devices for \(3 \times 400 \pm 5\) %. The secondary DC voltage from the transformer is conducted to a bridge rectifier where it is rectified.

The pulsating DC voltage is then fed from the rectifier and filtered to a low residual ripple by means of an electrolytic capacitor. This DC voltage is then fed to the output terminal. These are designed as pluggable screw terminals. A varistor is integrated in the output circuitry to attenuate voltage peaks. The operating status is indicated by means of a green LED via the output circuit. Devices with 600 W and higher are equipped with a fan.

Well-balanced spectrum for optimum economy

The output currents of these practical products are defined by way of two ambient temperatures.

Size selection is based on the maximum effectiveness of the components.

Adapted to standard voltages in accordance with IEC 38

By choosing the appropriate terminals, the \(\pm 15\) V tapping capability allows the single-phase devices to be connected to six different nominal AC voltages: 215, 230, 245, 385, 400, 415 V.

The \(\pm 5\) % tapping capability allows the 3-phase devices to be connected to three different nominal voltages: 380, 400, 415 V.

Single-phase unregulated power supplies

Block diagram for single-phase devices CP NT
Reliable short-circuit and overload protection

Integrated on the secondary side in device sizes up to CP NT 192 W, the FKS fuse protects against overloads and shortcircuits. For the devices CP NT 264 W and CP NT 432 W, this protection is achieved by means of a thermostatic switch built into the transformer.

Easy mounting

Keyhole assembly simplifies mounting and saves time. A snap-on fixing attachment for 35 mm DIN rails is available as an accessory for single-phase devices up to 144 W. Simply plugged into the device and secured with two screws, it ensures easiest possible mounting!

Transformers, vacuum-impregnated, painted black

- No humming
- Moisture cannot ingress into the windings
- Windings mechanically secured
- Improved heat dissipation from the windings
- Good heat dissipation

3-phase unregulated power supplies

Block diagram for 3-phase devices
CP NT3 250 / 400 / 500 W

Block diagram for 3-phase devices
CP NT3 600 / 750 / 1000 W
Unregulated power supplies

compactPower 1-phase

Technical data

**Input**
- Input voltage: ±15V
- Input current: A
- Input frequency: Hz
- No-load input current: A/At

**Output**
- Output voltage: V
- Output current at 40 °C: A
- Output current at 55 °C: A
- Max. output power: W
- Max. residual ripple: %

**Protective circuit**
- Fuse, max. t plug-in fuse: At

**Insulation coordination**
- Shock protection: kV
- Insulation strength: VBG4
- Insulation class: B
- Protection class: IP 20

**General data**
- Operating temperature: °C
- Storage temperature: °C
- Degree of efficiency at max. load: %
- Mounting position horizontal/arbitrary
- Status indication: green LED
- Weight: kg
- Standards:
  - EN 60950
  - EN 61558-2-4, -6, 72/23/EWG
  - Direct mounting, TS 35 with clip-on plate

**Clamping range**
- In.: rating / min. / max. mm
- Out.: rating / min. / max. mm
- Length x width x height mm

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>(Qty.=1)</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP NT 36W 24V 1.5A</td>
<td></td>
<td>8575280000</td>
</tr>
<tr>
<td>CP NT 72W 24V 3A</td>
<td></td>
<td>8575270000</td>
</tr>
<tr>
<td>CP NT 144W 24V 6A</td>
<td></td>
<td>8575280000</td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Note</th>
<th></th>
</tr>
</thead>
</table>

Clip-in plate for TS35: 8588900000

**Input**

<table>
<thead>
<tr>
<th>Input voltage</th>
<th>±15V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input current</td>
<td>A</td>
</tr>
<tr>
<td>Input frequency</td>
<td>Hz</td>
</tr>
<tr>
<td>No-load input current</td>
<td>A/At</td>
</tr>
</tbody>
</table>

**Output**

<table>
<thead>
<tr>
<th>Output voltage</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output current at 40 °C</td>
<td>A</td>
</tr>
<tr>
<td>Output current at 55 °C</td>
<td>A</td>
</tr>
<tr>
<td>Max. output power</td>
<td>W</td>
</tr>
<tr>
<td>Max. residual ripple</td>
<td>%</td>
</tr>
</tbody>
</table>

**Protective circuit**

<table>
<thead>
<tr>
<th>Fuse, max. t plug-in fuse</th>
<th>At</th>
</tr>
</thead>
</table>

**Insulation coordination**

<table>
<thead>
<tr>
<th>Shock protection</th>
<th>kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation strength</td>
<td>VBG4</td>
</tr>
<tr>
<td>Insulation class</td>
<td>B</td>
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<tr>
<td>Protection class</td>
<td>IP 20</td>
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</table>

**General data**

<table>
<thead>
<tr>
<th>Operating temperature</th>
<th>°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>°C</td>
</tr>
<tr>
<td>Degree of efficiency at max. load</td>
<td>%</td>
</tr>
<tr>
<td>Mounting position horizontal/arbitrary</td>
<td></td>
</tr>
<tr>
<td>Status indication</td>
<td>green LED</td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
</tr>
<tr>
<td>Standards</td>
<td>EN 60950</td>
</tr>
<tr>
<td>EN 61558-2-4, -6, 72/23/EWG</td>
<td></td>
</tr>
<tr>
<td>Direct mounting, TS 35 with clip-on plate</td>
<td></td>
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</table>

**Clamping range**

<table>
<thead>
<tr>
<th>In.</th>
<th>rating / min. / max. mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out.</td>
<td>rating / min. / max. mm</td>
</tr>
<tr>
<td></td>
<td>Length x width x height mm</td>
</tr>
</tbody>
</table>

**Ordering data**

<table>
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<td></td>
<td>8575270000</td>
</tr>
<tr>
<td>CP NT 144W 24V 6A</td>
<td></td>
<td>8575280000</td>
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</table>

**Accessories**

<table>
<thead>
<tr>
<th>Note</th>
<th></th>
</tr>
</thead>
</table>

Clip-in plate for TS35: 8588900000

**Input**

<table>
<thead>
<tr>
<th>Input voltage</th>
<th>±15V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input current</td>
<td>A</td>
</tr>
<tr>
<td>Input frequency</td>
<td>Hz</td>
</tr>
<tr>
<td>No-load input current</td>
<td>A/At</td>
</tr>
</tbody>
</table>

**Output**

<table>
<thead>
<tr>
<th>Output voltage</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output current at 40 °C</td>
<td>A</td>
</tr>
<tr>
<td>Output current at 55 °C</td>
<td>A</td>
</tr>
<tr>
<td>Max. output power</td>
<td>W</td>
</tr>
<tr>
<td>Max. residual ripple</td>
<td>%</td>
</tr>
</tbody>
</table>

**Protective circuit**

<table>
<thead>
<tr>
<th>Fuse, max. t plug-in fuse</th>
<th>At</th>
</tr>
</thead>
</table>

**Insulation coordination**

<table>
<thead>
<tr>
<th>Shock protection</th>
<th>kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation strength</td>
<td>VBG4</td>
</tr>
<tr>
<td>Insulation class</td>
<td>B</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP 20</td>
</tr>
</tbody>
</table>

**General data**

<table>
<thead>
<tr>
<th>Operating temperature</th>
<th>°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>°C</td>
</tr>
<tr>
<td>Degree of efficiency at max. load</td>
<td>%</td>
</tr>
<tr>
<td>Mounting position horizontal/arbitrary</td>
<td></td>
</tr>
<tr>
<td>Status indication</td>
<td>green LED</td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
</tr>
<tr>
<td>Standards</td>
<td>EN 60950</td>
</tr>
<tr>
<td>EN 61558-2-4, -6, 72/23/EWG</td>
<td></td>
</tr>
<tr>
<td>Direct mounting, TS 35 with clip-on plate</td>
<td></td>
</tr>
</tbody>
</table>

**Clamping range**

<table>
<thead>
<tr>
<th>In.</th>
<th>rating / min. / max. mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out.</td>
<td>rating / min. / max. mm</td>
</tr>
<tr>
<td></td>
<td>Length x width x height mm</td>
</tr>
</tbody>
</table>

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>(Qty.=1)</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP NT 36W 24V 1.5A</td>
<td></td>
<td>8575280000</td>
</tr>
<tr>
<td>CP NT 72W 24V 3A</td>
<td></td>
<td>8575270000</td>
</tr>
<tr>
<td>CP NT 144W 24V 6A</td>
<td></td>
<td>8575280000</td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Note</th>
<th></th>
</tr>
</thead>
</table>

Clip-in plate for TS35: 8588900000

**Input**

<table>
<thead>
<tr>
<th>Input voltage</th>
<th>±15V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input current</td>
<td>A</td>
</tr>
<tr>
<td>Input frequency</td>
<td>Hz</td>
</tr>
<tr>
<td>No-load input current</td>
<td>A/At</td>
</tr>
</tbody>
</table>

**Output**

<table>
<thead>
<tr>
<th>Output voltage</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output current at 40 °C</td>
<td>A</td>
</tr>
<tr>
<td>Output current at 55 °C</td>
<td>A</td>
</tr>
<tr>
<td>Max. output power</td>
<td>W</td>
</tr>
<tr>
<td>Max. residual ripple</td>
<td>%</td>
</tr>
</tbody>
</table>

**Protective circuit**

<table>
<thead>
<tr>
<th>Fuse, max. t plug-in fuse</th>
<th>At</th>
</tr>
</thead>
</table>

**Insulation coordination**

<table>
<thead>
<tr>
<th>Shock protection</th>
<th>kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation strength</td>
<td>VBG4</td>
</tr>
<tr>
<td>Insulation class</td>
<td>B</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP 20</td>
</tr>
</tbody>
</table>

**General data**

<table>
<thead>
<tr>
<th>Operating temperature</th>
<th>°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>°C</td>
</tr>
<tr>
<td>Degree of efficiency at max. load</td>
<td>%</td>
</tr>
<tr>
<td>Mounting position horizontal/arbitrary</td>
<td></td>
</tr>
<tr>
<td>Status indication</td>
<td>green LED</td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
</tr>
<tr>
<td>Standards</td>
<td>EN 60950</td>
</tr>
<tr>
<td>EN 61558-2-4, -6, 72/23/EWG</td>
<td></td>
</tr>
<tr>
<td>Direct mounting, TS 35 with clip-on plate</td>
<td></td>
</tr>
</tbody>
</table>

**Clamping range**

<table>
<thead>
<tr>
<th>In.</th>
<th>rating / min. / max. mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out.</td>
<td>rating / min. / max. mm</td>
</tr>
<tr>
<td></td>
<td>Length x width x height mm</td>
</tr>
</tbody>
</table>

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>(Qty.=1)</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
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<td>CP NT 36W 24V 1.5A</td>
<td></td>
<td>8575280000</td>
</tr>
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<td>8575270000</td>
</tr>
<tr>
<td>CP NT 144W 24V 6A</td>
<td></td>
<td>8575280000</td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Note</th>
<th></th>
</tr>
</thead>
</table>

Clip-in plate for TS35: 8588900000
### Technical data

#### Input
- **Input voltage**: ±15V
- **Input current**: 1.3 A / 0.7 A
- **Input frequency**: 50/60 Hz
- **No-load input current**: 0.3 A / 0.15 A
- **External back-up fuse**: 8 A

#### Output
- **Output voltage**: 230 V/400 V ±15 V
- **Output current at 40 °C**: 1.7 A
- **Output current at 55 °C**: 1.6 A
- **Max. output power**: 192 W
- **Max. residual ripple**: < 5 %
- **Fuse, max. plug-in fuse**: 15 A flat plug-in fuse

#### Protective circuit
- **Insulation coordination**: to VBG4
- **Electric shock protection**: 4 kV
- **Insulation strength**: 4 kV
- **Insulation class**: B
- **Degree of protection**: IP 20
- **Pollution severity**: -20 °C ... +55 °C
- **Operating temperature**: -20 °C ... +55 °C
- **Storage temperature**: -20 °C ... +80 °C

#### General data
- **Degree of efficiency at max. load**: 90 %
- **Mounting position horizontal/vertical**: 7 A / 55 °C; 8 A / 40 °C; 7 A / 40 °C
- **Status indication**: green LED

#### Weight
- **Standards**: EN 60950, EN 61558-2-4, -6, 72/23/EWG
- **DIN Rail compatibility**: Direct mounting
- **EMC standards**: EN 61000-6-2, -3
- **Approvals**: CE / cURus / UL/US

### Ordering data

#### Type (Qty.=1) Order No.
- **CP NT 192W 24V 8A**: 8575300000
- **CP NT 264W 24V 11A**: 8575310000
- **CP NT 432W 24V 18A**: 8575320000
### Technical data

#### Input
- **Input voltage**: 3 x 400 V ±5 %
- **Input current**: 0.9 A
- **Input frequency**: 50/60 Hz
- **No-load input current**: 0.11 A
- **3 No. thermostatic switches in primary winding**
- **3 x 1.6 AT**
- **External back-up fuse**: 10 AT

#### Output
- **Output voltage**: 24 V SELV
- **Output current**: 18 A/16 A
- **Output power**: 400 W
- **max. output power**: 400 W
- **max. residual ripple**: < 2 %
- **Fuse**: 10 AT
- **Insulation coordination**: to VBG4
- **Insulation strength**: 4 kV
- **Insulation class**: B
- **Protection circuit**: varistor
- **Protective circuit**: varistor
- **Insulation coordination**: SELV
- **Insulation strength**: 4 kV
- **Insulation class**: B
- **Protection circuit**: varistor

#### General data
- **Degree of efficiency at max. load**: 78 %
- **Mounting position**: horizontal/vertical
- **Weight**: 6.9 kg
- **Standards**: EN 61000-6 /-2, -3
- **DIN Rail compatibility**: Direct mounting
- **Condensation**: not allowed

#### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>(Qty.=1)</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP NT3 250W 24V 10A</td>
<td></td>
<td>8628620000</td>
</tr>
<tr>
<td>CP NT3 400W 24V 15A</td>
<td></td>
<td>8628630000</td>
</tr>
<tr>
<td>CP NT3 500W 24V 20A</td>
<td></td>
<td>8628650000</td>
</tr>
</tbody>
</table>

#### Accessories

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

---

Unregulated power supplies

### compactPower 3-phase

#### CP NT3 250
- **Input voltage**: 3 x 400 V ±5 %
- **Input current**: 0.9 A
- **Input frequency**: 50/60 Hz
- **No-load input current**: 0.11 A
- **3 No. thermostatic switches in primary winding**
- **3 x 1.6 AT**
- **External back-up fuse**: 10 AT

#### CP NT3 400
- **Input voltage**: 3 x 400 V ±5 %
- **Input current**: 0.9 A
- **Input frequency**: 50/60 Hz
- **No-load input current**: 0.11 A
- **3 No. thermostatic switches in primary winding**
- **3 x 1.6 AT**
- **External back-up fuse**: 16/18 AT

#### CP NT3 500
- **Input voltage**: 3 x 400 V ±5 %
- **Input current**: 0.9 A
- **Input frequency**: 50/60 Hz
- **No-load input current**: 0.11 A
- **3 No. thermostatic switches in primary winding**
- **3 x 1.6 AT**
- **External back-up fuse**: 20/22 AT

---

**Note:**
- Operating temperature
- Storage temperature
- Degree of efficiency at max. load
- Mounting position horizontal/vertical
- Fan signal
- Status indication
- Standards
- EMC standards
- DIN Rail compatibility
- Clamping range in.
- Clamping range Out.
- Fan sign
- Status indication
- Standards
- EMC standards
- DIN Rail compatibility

**Note:**
- Degree of efficiency at max. load
- Mounting position
- Weight
- Standards
- EMC standards
- DIN Rail compatibility

**Note:**
- Clamping range in.
- Clamping range Out.
- Fan sign
- Status indication
- Standards
- EMC standards
- DIN Rail compatibility

**Note:**
- Degree of efficiency at max. load
- Mounting position
- Weight
- Standards
- EMC standards
- DIN Rail compatibility

**Note:**
- Clamping range in.
- Clamping range Out.
- Fan sign
- Status indication
- Standards
- EMC standards
- DIN Rail compatibility

**Note:**
- Degree of efficiency at max. load
- Mounting position
- Weight
- Standards
- EMC standards
- DIN Rail compatibility

**Note:**
- Clamping range in.
- Clamping range Out.
- Fan sign
- Status indication
- Standards
- EMC standards
- DIN Rail compatibility

**Note:**
- Degree of efficiency at max. load
- Mounting position
- Weight
- Standards
- EMC standards
- DIN Rail compatibility
## Technical data

### Input
- **Input voltage**: 3 x 400 V ±5 %
- **Input current**: 1.2 A
- **Input frequency**: 50/60 Hz
- **No-load input current**: 0.15 A
- **3 No. thermostatic switches in primary winding**:
- **External back-up fuse**: 3 x 2 AF
- **Output voltage**: 24 V SELV
- **Output current at 40 °C/60 °C**: 600 W
- **max. output power**: 24 A/30 A
- **max. residual ripple**: 2.5 A
- **Fuse, max.**: 32 A/30 A
- **Protective circuit**: varistor
to VBG4
- **Insulation strength**: 6 kV
- **Insulation class**: B
- **Class of protection**: IP 20
- **Degree of efficiency at max. load**: 78 %
- **Weight**: 11 kg
- **Standards**: EN 61558-2-4, -6, 72/23/EWG
- **EMC standards**: EN 61000-6/-2, -3
- **DIN Rail compatibility**: Direct mounting
- **Clamping range In.** (rating-/min./max.) mm²: 2.5 / 0.5 / 2.5
- **Clamping range Out. (rating-/min./max.) mm²**: 6 / 0.5 / 6
- **Length x width x height mm**: 230 x 108 x 212
- **Degree of efficiency at max. load**: 78 %
- **Weight**: 11 kg
- **Standards**: EN 61558-2-4, -6, 72/23/EWG
- **EMC standards**: EN 61000-6/-2, -3
- **DIN Rail compatibility**: Direct mounting
- **Clamping range In.** (rating-/min./max.) mm²: 2.5 / 0.5 / 2.5
- **Clamping range Out. (rating-/min./max.) mm²**: 6 / 0.5 / 6
- **Length x width x height mm**: 230 x 108 x 212

### Output
- **Output voltage**: 24 V SELV
- **Output current at 40 °C/60 °C**: 750 W
- **max. output power**: 32 A/30 A
- **max. residual ripple**: < 2 %
- **Fuse, max.**: 40/42 AT
- **Protective circuit**: varistor
to VBG4
- **Insulation strength**: 4 kV
- **Insulation class**: B
- **Class of protection**: IP 20
- **Degree of efficiency at max. load**: 77 %
- **Weight**: 14 kg
- **Standards**: EN 61558-2-4, -6, 72/23/EWG
- **EMC standards**: EN 61000-6/-2, -3
- **DIN Rail compatibility**: Direct mounting
- **Clamping range In.** (rating-/min./max.) mm²: 2.5 / 0.5 / 2.5
- **Clamping range Out. (rating-/min./max.) mm²**: 6 / 0.5 / 6
- **Length x width x height mm**: 270 x 121 x 255

### General data
- **Operating temperature**: -20 °C … +60 °C
- **Storage temperature**: -20 °C … +60 °C
- **Degree of efficiency at max. load**: 78 %
- **Weight**: 11 kg
- **Standards**: EN 60950, EN 61558-2-4, -6, 72/23/EWG
- **EMC standards**: EN 61000-6/-2, -3
- **DIN Rail compatibility**: Direct mounting
- **Clamping range In.** (rating-/min./max.) mm²: 2.5 / 0.5 / 2.5
- **Clamping range Out. (rating-/min./max.) mm²**: 6 / 0.5 / 6
- **Length x width x height mm**: 230 x 108 x 212

### Ordering data
- **Type** (Qty.=1) **Order No.**
  - CP NT3 600W 24V 25A: 8628660000
  - CP NT3 750W 24V 30A: 8628670000
  - CP NT3 1000W 24V 40A: 8628680000

### Accessories
- **Note**
When the power supply fails, UPS control units take over the 12/24 V DC power supply to the installation within seconds, and guarantee plant availability for a defined length of time.

Professional signalling guarantees that all relevant signal statuses can be evaluated on the spot. Critical statuses can also be immediately redirected to a higher-level controller.

The battery module undertakes complete battery management of the connected lead-acid batteries. Constant charging and discharging plus electronic overcurrent protection guarantee an extremely long operational lifetime for the batteries.

Switch-mode power supply, battery control unit and battery providing an uninterrupted power supply.
Technical data

**Input**
- **Input voltage:** 120...300 V DC; typ. 115-230 V AC ±10 %
- **Input current AC:** 0.5 A @ 230 V AC
- **Input frequency:** 50/60 Hz
- **Input fuse:** 2 A slow-blow fuse (internal)
- **Thermistor:** Overvoltage protection

**Output**
- **Output voltage:** 12 V DC
- **Output current:** 2 A slow-blow fuse (internal)
- **Varistor:** Overvoltage protection

**General data**
- **Operating temperature:** -20 °C ... +45 °C
- **Storage temperature:** -20 °C ... +85 °C
- **Status indication:**
  - LED green (Full Charge): Battery voltage > 14.75 V DC
  - LED yellow (Battery Low): Battery voltage < 11 V DC
  - LED yellow (Charging): BBU charges Battery
  - LED red (Fault): no AC input voltage
  - LED red (Battery Reverse): Battery polarizing fault
  - LED red (Battery Open): no battery connected

**Standards**
- EN 50178, EN 60950, IEC 950
- EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3
- CSA / UL/UR / CE

**Approvals**
- CE

**Dimensions**
- **Clamping range (rating / min. / max.)** mm²
- **Length x width x height** mm

**Ordering data**

**Connection system**
- **Type:** CP-BBU 115-230 V AC / 12 V DC
- **Qty.**: 1
- **Order No.**: 9916280012

**Connection system**
- **Type:** CP-BBU 115-230 V AC / 24 V DC
- **Qty.**: 1
- **Order No.**: 9916280024

**Accessories**
- **Bracket for wall mounting:** 792060000

---

**Technical data**

**Input**
- **Input voltage:** 85 ... 265 V AC; 120 ... 300 V DC; typ. 115-230 V AC ±10 %
- **Input current:** 1 A @ 115 V AC; 0.6 A @ 230 V AC
- **Frequency:** 50/60 Hz
- **Fuse:** 2 A slow-blow fuse (internal)
- **Varistor:** Overvoltage protection

**Output**
- **Output voltage:** 24 V DC
- **Output current:** 3.00 A
- **Voltage:** 27.3 V
- **Efficiency:** 0.2 %

**General data**
- **Operating temperature:** -20 °C ... +45 °C
- **Storage temperature:** -20 °C ... +85 °C
- **Status indication:**
  - LED green (Full Charge): Battery voltage > 29.5 V DC
  - LED yellow (Battery Low): Battery voltage < 22 V DC
  - LED yellow (Charging): BBU charges Battery
  - LED red (Fault): no AC input voltage
  - LED red (Battery Reverse): Battery polarizing fault
  - LED red (Battery Open): no battery connected

**Standards**
- EN 50178, EN 60950, IEC 950
- EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3
- CSA / UL/UR / CE

**Approvals**
- CE

**Dimensions**
- **Clamping range (rating / min. / max.)** mm²
- **Length x width x height** mm

**Ordering data**

**Connection system**
- **Type:** CP-BBU 115-230 V AC / 24 V DC
- **Qty.**: 1
- **Order No.**: 9916280024

**Accessories**
- **Bracket for wall mounting:** 792060000
Fusing 24 V DC circuits

**WAVEguard electronic fusing**

Due to their technical characteristics, switched-mode power supplies provide no, or just a very limited, dynamic output current. When an overload condition occurs, the device limits the current for protection purposes and shuts down the voltage supply. The resulting loss of power means that conventional circuit breakers and safety fuses are not reliably tripped. Selective electronic fusing eliminates cross-coupling to parallel current paths; it fuses and specifically closes down only the malfunctioning circuits.

The result is greater plant availability with troubleshooting times, in systems becoming more complex by the day, reduced to a minimum.

---

**Additional reset**

For remote resetting, the reset input can be connected to a voltage pulse; the load circuit is closed again when the pulse edge falls. A cyclical autoreset is neither permissible nor is it sensible from a safety point of view.

**Visual signal indication and potential-free signal contact**

Failures must be signalled: the integrated LED and the signal contact (NC) indicate the control state of the fusing. That speeds up troubleshooting procedures and reduces repair costs.
WAVEguard

**Technical data**

**Input**
- Rated voltage: 24 V DC
- Rated current: 1.6 A
- Pulse > 100 ms +24 V, falling edge ON

**Output**
- Status relay / Change-over contact
- NCC, max. 50 V / 0.05 A; for low voltage only!
- LED green: OK, LED red: Tripped

**General data**
- Operating temperature: 0 °C … +55 °C (fitted)
- Storage temperature: –20 °C … +85 °C
- Standards: EN 50178, EN 61000-6-1, 2, 4, EN 55011

**Dimentions**
- Screw connection: 2.5 / 0.5 / 2.5
- Tension clamp connection: 1.5 / 0.5 / 2.5
- Periodic auto-reset not permitted; Tu = 23 °C, single module

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGS 24 V DC 1.6 A</td>
<td>1</td>
<td>8618900000</td>
</tr>
<tr>
<td>WGS 24 V DC 3.15 A</td>
<td>1</td>
<td>8618910000</td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuse for 24 V DC electric circuits</td>
<td></td>
<td>8621000000</td>
</tr>
</tbody>
</table>
## Technical data

### Input
- **Rated voltage**: 24 V DC
- **Rated current**: 6.3 A
- **Reset**: Pulse > 100 ms +24 V, falling edge ON

### Output
- **Status relay / Change-over contact**: NCC, max. 50 V / 0.05 A; for low voltage only!
- **Signalling delay**: 3.5 ms typically

### General data
- **Operating temperature**: 0 °C … +55 °C (fitted)
- **Storage temperature**: –20 °C … +85 °C
- **Status indication**: LED green: OK, LED red: Tripped
- **Standards**: EN 50178, EN 61000-6-1, 2, 4; EN 55011
- **Sliding switch**: OFF – wait 10 s – ON; on / off
- **Approvals**: CE / cULus

### Dimensions
- **Clamping range (rating- / min. / max.)**: 2.5 / 0.5 / 2.5 / 1.5 / 0.5 / 2.5
- **Length x width x height**: 92.4 x 22.5 x 72 / 92.4 x 22.5 x 72

### Ordering data
- **Type**: WGS 24 V DC 6.3 A
- **Qty.**: 1
- **Order No.**: 8618930000
- **Type**: WGS 24 V DC 8.0 A
- **Qty.**: 1
- **Order No.**: 8618940000

### Accessories
- **Fuse for 24 V DC electric circuits**
  - **Type**: 24 V DC 8 A
  - **Current**: 8 A
  - **Time (ms)**: 0 5 10 15 20 25 30 35 40 45 50
  - **Current (A)**: 6.3 A
  - **Time (ms)**: 0 5 10 15 20 25 30 35 40 45 50

### Note
- Periodic auto-reset not permitted; To = 23 °C, single module
Technical data

Input
- Rated voltage
- Rated current
- Reset

Output
- Status relay / Change-over contact
- Signalling delay

General data
- Operating temperature
- Storage temperature
- Status indication
- Standards
- EMC standards
- Sliding switch
- Approvals

Ordering data

Connection system
- Screw connection
- Tension clamp connection

Accessories

Dimensions
- Clamping range (rating / min. / max.) mm²
- Length x width x height mm

Note

Derating curves

Dynamic tripping characteristic curve

Trip current: 0.5 A

Trip current: 5.0 A
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Colombia, Malaysia, Taiwan  
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Croatia, Luxembourg, Turkey  
Czech Republic, Luxembourg, Ukraine  
Denmark, Nederland, United Arab Emirates  
Egypt, Nicaragua, United Kingdom  
El Salvador, Norway, USA  
Estonia, Oman, Venezuela  
Finland, Pakistan, Vietnam  
France, Paraguay, Yemen  
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Greece, Philippines  
Guatemala, Poland  
Honduras, Portugal  
Hong Kong, Qatar  
Hungary, Romania  
Iceland, Russia  
India  

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