

Innovative and Powerful Features!

- ◆ For global use with single- and two phase wide-range input 100/ 230–500 VAC
- ◆ Rugged metal case for harsh industrial environments
- ◆ Industrial operating temperature range: -25°C to $+70^{\circ}\text{C}$
- ◆ Power OK signal
- ◆ Remote On/Off
- ◆ Shock and vibration-proof
- ◆ Indefinite short circuit, overvoltage and overtemperature protection
- ◆ Redundancy module
- ◆ Buffer module for power backup
- ◆ Battery controller module
- ◆ 3-year product warranty



The successful TSP series of high performance DIN-rail mount power supplies has been expanded with 3 additional models which features an ultrawide input range of 85-132/187-550VAC. With these input voltages the power supplies can be used in almost all single- and 3 phase power networks worldwide.

A high, continuously available power reserve guarantees reliable start-up of loads with high inrush currents. Excellent electrical specifications and high immunity against electrical disturbances make these compact power supplies the best choice to power sensitive loads in industrial process control systems, machine tools or any other demanding industrial application. The power supplies comply also with IEC/EN 61204-3, the EMC standard for Industrial environment.

3 add-on modules for extra functions offer a great flexibility in system applications. A module for redundant operation with true power sharing is available. With the battery controller module the power supplies can be extended to a perfect DC-UPS system. The buffer module provides power back-up for up to 4 seconds without the need of any batteries. Easy and vibration proof installation with pluggable screw terminal block and snap-on mounting on DIN-rails.

Models

| Order Code | Output Voltage (Vnom) | *Output Current (Imax) | Output Power (Pmax) |
|---------------|------------------------------------|------------------------|---------------------|
| TSP 180–124WR | 24 VDC (adjustable 24 - 28 VDC) | 7.5 A | 180 W |
| TSP 360–124WR | | 15.0 A | 360 W |
| TSP 600–124WR | | 25.0 A | 600 W |

* Max. current at nominal output voltage and operating temperature up to 40°C max.

Input Specifications

| | |
|-----------------------------|---|
| Applicable 3-phase networks | – TN, TT Systems: 500 VAC Star configuration (EN60950, UL508) 500 VAC Delta (UL508 only) |
| | – IT Systems: 400 VAC Delta (IEC-62103) 230 VAC Delta (IEC-60950) 500 VAC (UL508) |
| Input voltage ranges | 85–132 VAC/187–550 VAC 50/60 Hz range selectable by selector switch |
| Harmonic limits | EN 61000-3-2, Class A (for limited output power) |
| Holdup time | 20 ms min. (full load 230 - 500 VAC) |
| Inrush current | 115 VAC 230 VAC TSP 180-124VWR t.b.a < 23 A TSP 360-124VWR t.b.a < 46 A TSP 600-124VWR t.b.a < 50 A |
| Efficiency | 88 % typ. |

Output Specifications

| | |
|-------------------------------------|---|
| Output voltage adjustable range | 24–28 VDC |
| Regulation | – Input variation 0.5 % max. – Load variation (10–100 %) 0.5 % max. – Load variation (10–100 %) parallel mode 2.0% |
| Ripple and noise (20MHz bandwidth) | 100 mV pk-pk typ. (150 mV pk-pk max. at I _{max}) |
| Electronic short circuit protection | current limitation at 125 % of I _{max} . constant current, automatic recovery |
| Output overvoltage protection | 34 V |
| Overload protection | electronic overload protection |
| Overtemperature protection | switch off at overtemperature, automatic restart |
| Status indicator | dual colour LED (green: DC OK, red: DC off) |
| Power OK signal | – trigger threshold: 18–22V – relay output: DC OK = contact closed (rated: 30 VDC/1.0 A) |
| Max. capacitive load | unlimited |

General Specifications

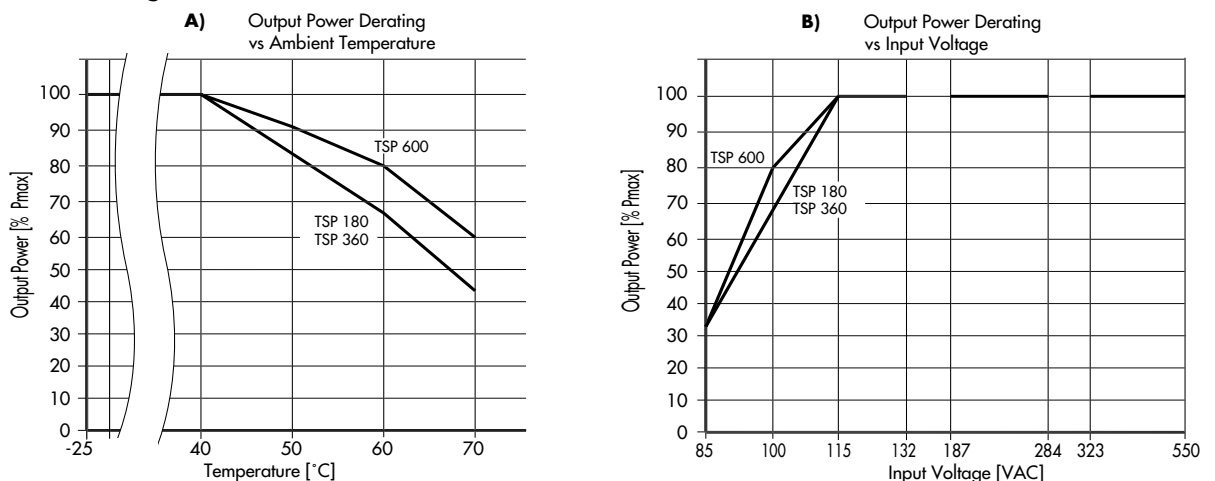
| | |
|------------------------------|--|
| Operating temperature range | –25°C to +70°C max. (–13°F. to +158°F) (for derating see graph A on page 3) |
| Cooling | convection cooling, no internal fan |
| Storage temperature | –25 °C...+85 °C (– 13°F...+185°F) |
| Humidity (non condensing) | 95 % rel. H max. |
| Pollution degree | 2 |
| Temperature coefficient | 0.02 %/K |
| Reliability, calculated MTBF | >350'000 heures in accordance to IEC 61709 |
| Remote On/Off | by ext. contact. DC on: -S contact open DC off: -S connected via 1 Kohm to -Vout |

All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

General Specifications

| | | |
|--|--|---|
| Isolation | | according to IEC/EN 60950-1, UL 60950-1, UL 508 |
| Safety standards | <ul style="list-style-type: none"> – Information technology equipment – Industrial control equipment – Electrical equipment of machines – Electronic equipment for power installation – Safety transformers for SMPS | IEC/EN 60950-1, UL 60950-1, CSA-C22.2 No. 60950-1-03 UL 508C, CSA-C22.2 No. 107 EN 60204 EN 50178 EN 61558-2-4 |
| Safety approvals and certifications | <ul style="list-style-type: none"> – CB report – UL approvals – CSA certification – GS certification | for IEC 60950-1 www.tracopower.com/products/tsp-wr-cb.pdf UL 60950-1 rec. File: E181381, UL 508C listed File: pending www.ul.com -> certifications (file no. 219759) for UL 60950-1 CSA-22.2 No. 60950-1-03, CSA C22.2 No. 107:1-01 www.tracopower.com/products/tsp-wr-csa.pdf for IEC/EN 60950-1, EN 60204, EN 61558-2-4 www.tracopower.com/products/tsp-wr-gs.pdf |
| Safety class | | Degree of electrical protection I (IEC 536) |
| Case protection | | IP 20 (IEC 529) |
| Electromagnetic compatibility (EMC), Emissions | <ul style="list-style-type: none"> – Conducted RI suppression on input – Radiated RI suppression | IEC/EN 61000-6-3, IEC/EN 61204-3 EN 55011 class B, EN 55022 class B, EN 55011 class B, EN 55022 class B, |
| Electromagnetic compatibility (EMC), Immunity | <ul style="list-style-type: none"> – Electrostatic discharge (ESD) – Radiated RF field immunity – Electrical fast transient / burst immunity – Surge immunity – Immunity to conducted RF disturbances – Power frequency field immunity – Voltage dips | IEC/EN 61000-6-2, IEC/EN 61204-3 IEC / EN 61000-4-2 4 kV / 8 kV IEC / EN 61000-4-3 10 V / m IEC / EN 61000-4-4 2 kV IEC / EN 61000-4-5 1 kV / 2 kV IEC / EN 61000-4-6 10 V IEC / EN 61000-4-8 30 A / m IEC / EN 61000-4-11 |
| Environment | <ul style="list-style-type: none"> – Vibration acc. IEC 60068-2-6; – Shock acc. IEC 60068-2-27 | 3 axis, sine sweep, 10-55 Hz, 1g, 1oct/min 3 axis, 15 g half sine, 11 ms |
| Enclosure material | | aluminium (chassis) / zinc plated steel (cover) |
| Mounting | <ul style="list-style-type: none"> – DIN-rail mounting – Wall mounting (option) | for DIN-rails as per EN 50022-35x15/7.5 (snap-on with self-locking spring) with wall mounting bracket - see page 10 |
| Connection | | detachable screw terminals (plugs included) 2 terminals per output |

Output Power Derating



All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

TSP-REM360 Redundancy Module

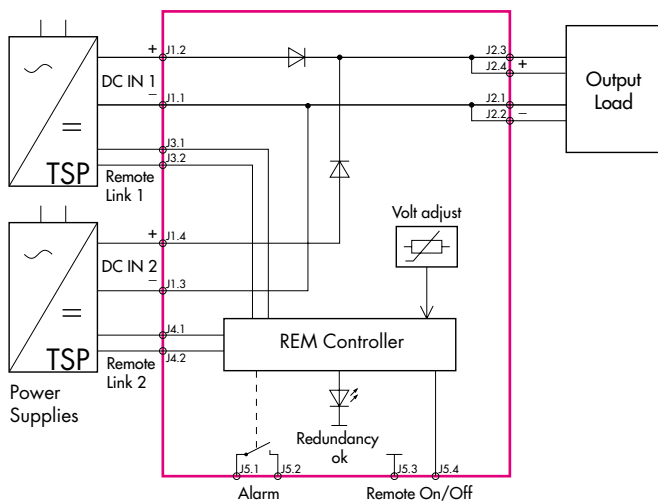
With this module and two power supplies of the TSP-WR series (of same type) a highly reliable, true redundant power system can be configured without any additional components. This module enforces equivalent sharing of the output current by each power supply. The system is fully redundant and provides output power even if one power supply has completely failed e.g. by short circuit on the output. In the event of either power supply failing or being disconnected, the second unit will automatically supply the full current to the load. The redundancy of the system is monitored and if lost, indicated by an alarm output. The inputs are hot swappable and can be loaded up to 15A each.



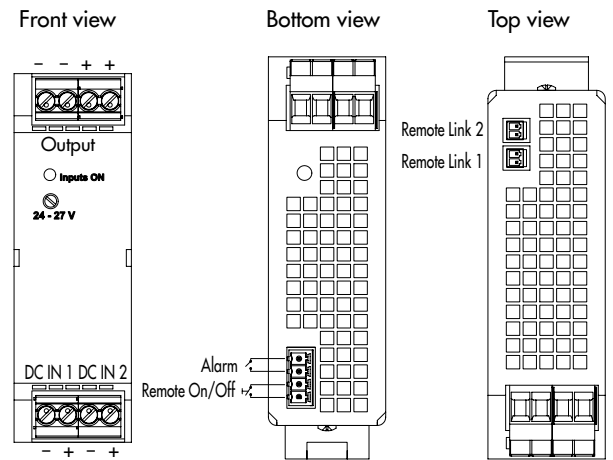
Models

| Order Code (includes terminal plugs) | Input | Max Power per Input | Output Voltage adjust. | Output Power max. |
|---|-------------------|------------------------|--------------------------------|----------------------|
| TSP-REM360 | 2 x 24 VDC | 2 x 360 W | 24 VDC (24 - 27 VDC) | 360 W |
| TSP-REM600 | 2 x Control input | 2 x 600 W | | 600 W |

Function Diagram



Connector Positions



Specifications

| | |
|-------------------------------|--|
| Operating temperature | - 25 °C to +70 °C max. (-13 °F to +158 °F) derating above 40 °C (104 °F): 1.5 %/K |
| Electromagnetic compatibility | in correspondence to connected units (no internal switching device) |
| Redundancy OK signal (Alarm) | trigger threshold at 18–22VDC, contact open if both inputs failed |
| Dimensions | see page 8 |
| Remote link cable (0.5m) | 2 cables included with TSP-REM360 module |
| Remote On/Off | by ext. contact: contact open = On, contact closed = Off |
| Installation instructions | www.tracopower.com/products/tsp-rem_inst.pdf |

TSP-BFM24 Buffer Module

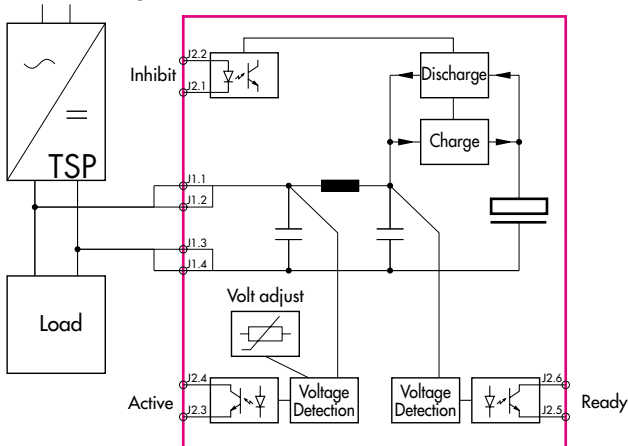
The TSP-BFM24 buffer module will hold the output voltage of a 24 VDC power supply after brown outs or voltage dips of up to ten full 50Hz cycles. During this buffer period no deterioration of the 24 VDC output voltage will occur. For many applications this buffer module is an ideal and cost effective alternative to a battery based backup system. The buffer module consists of a large bank of capacitors. When the power supply is switched on, the buffer capacitors will be charged. This will take approximately 30 seconds and an opto-coupler signal indicates the "READY" condition. When a power fail occurs, the capacitor bank is discharged, maintaining the output of the buffer module at its nominal voltage. This condition is indicated by an "POWER FAIL" signal. The hold up time is typically 200 ms at 25 A and 4 seconds typically at 1,2A. After 4 seconds the buffer device will switch off the output voltage. The operation modes of the module are indicated by a LED on the front panel also. The big advantage of this buffer solution is, that it is fully maintenance free and its storage capability does not deteriorate over the live time of the product.



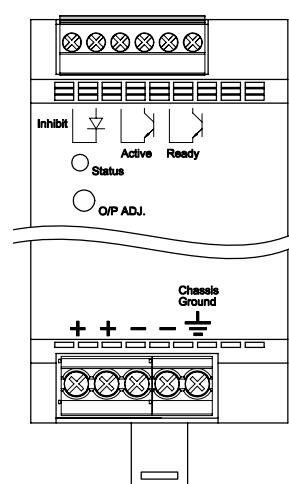
Models

| Order Code (includes terminal plugs) | Operating Voltage Range | Buffer Time | Output Power max. |
|---|-------------------------|---|-------------------|
| TSP-BFM24 | 24...28VDC | 200ms typ. @ 25A max. 4.0 s max. @ 1.2 A | 600 W |

Function Diagram



Connector Positions



Specifications

| | |
|-------------------------------|--|
| Operating temperature | - 25 °C to 70 °C max. (-13 °F to 158 °F) derating above 40 °C (104 °F): 1.5 %/K |
| Electromagnetic compatibility | in correspondence to connected units (no internal switching device) |
| Buffer voltage | adjustable, >1 V below input voltage, min. 22 VDC |
| Charging | 0.6 A max./30 s max. |
| Status signals | Buffer Active , Buffer Ready (optocoupler output) and dual colour LED for status indication |
| Inhibit | optocoupler input: 35 V max. < 5mA |
| Dimensions | see page 8 |
| Installation instructions | www.tracopower.com/products/tsp-bfm_inst.pdf |

TSP-BCM24 Battery Controller Module

This module provides a professional battery management system to charge and monitor an external lead-acid battery. Together with a power supply of the TSP series, a perfect DC-UPS system can be configured. The connected battery will be charged and held in charged mode by the power supply. In the event of a mains power failure the battery will supply the output power until the battery is discharged. As a consequence, the output voltage of the system is equivalent to the battery voltage. To avoid overcharging the battery, an external temperature sensor adjusts the battery voltage automatically to the required end of charge voltage. This can extend the battery life.

The battery is protected against deep discharge. Mains power and battery status are monitored regularly and failures indicated by corresponding LED's and alarm outputs. The module also provides an external On/Off input to switch-off both, power supply and battery.

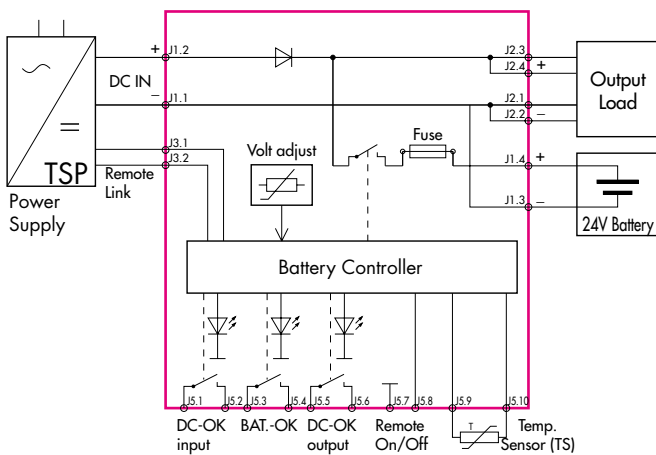


Models

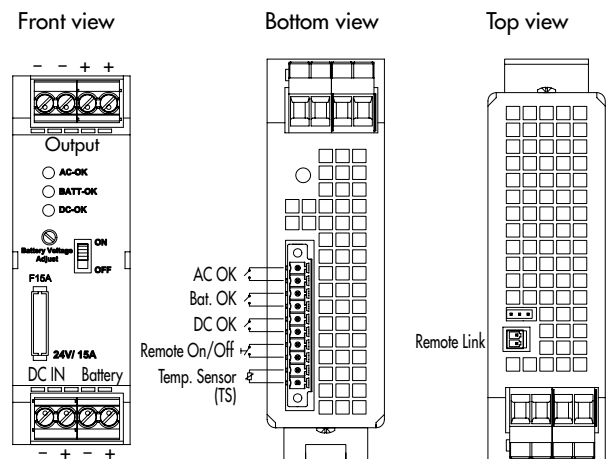
| Order code (includes terminal plugs) | Inputs | Input Power max | Output Voltage nom. | *Output Power max. |
|---|---------------------|--------------------|------------------------|-----------------------|
| TSP-BCM24 | 24 VDC Power Supply | 360 W | 24 VDC | 360 W |
| TSP-BCM24H | and 24 VDC Battery | 600 W | | 600 W |

*reduce max. output current by battery charging current

Function Diagram



Connector Positions



Specifications

| | |
|-------------------------------|--|
| Operating temperature | - 25 °C to +70 °C max. (-13 °F to +158 °F) derating above 40 °C (104 °F): 1.5 %/K |
| Electromagnetic compatibility | in correspondence to connected units (no internal switching device) |
| Battery protection | over voltage, deep discharge, short circuit- and revers connection (built-in fuse) |
| Status signals | DC-OK input, DC-OK output, BAT OK all relay contact closed at status OK |
| Rating per relay contact | 30 VDC/1.0 A max. |
| Dimensions | see page 8 |
| Remote link cable (0.5m) | 1 cable included with TSP-BCM24 module |
| Remote On/Off | by ext. contact: contact open = On, contact closed = Off |
| Installation instructions | www.tracopower.com/products/tsp-bcm_inst.pdf |

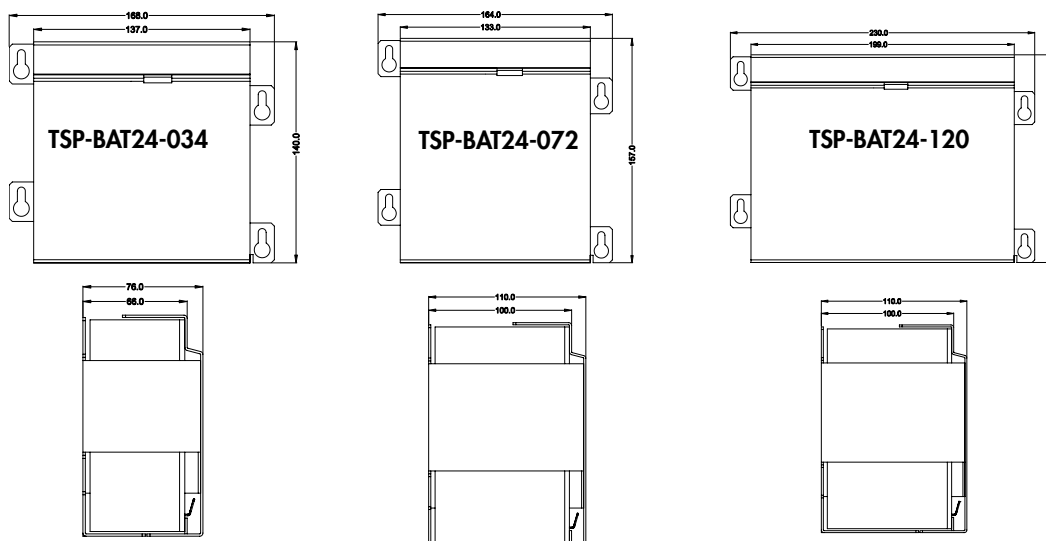
TSP-BAT Battery Pack

TSP battery packs are designed to build, in connection with the TSP-BCM battery controller module, a complete DC-UPS system. The entire range utilizes 12V maintenance free VRLA (valve regulated lead acid) batteries made by PANASONIC. These are not spillable lead gel type batteries. Two 12V batteries are connected in series and assembled into a stainless steel enclosure, with integrated connector and connection cable.



Models

| Order Code (includes mating connectors) | Nominal Voltage | Charge Current max. | Nominal Capacity (at 25°C, 77°F) |
|--|-----------------|------------------------|-------------------------------------|
| TSP-BAT24-034 | 24 VDC | 0.80 A | 3.4 Ah |
| TSP-BAT24-072 | | 1.75 A | 7.2 Ah |
| TSP-BAT24-120 | | 3.00 A | 12.0 Ah |



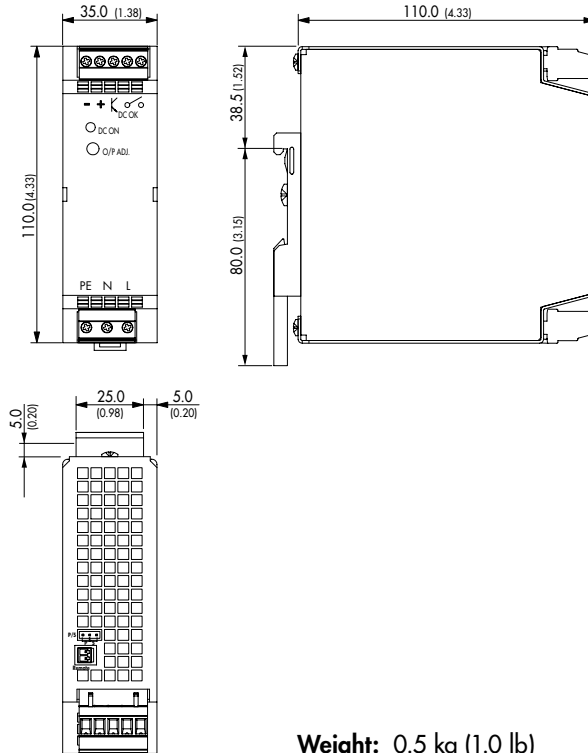
Detailed drawings in process

Specifications

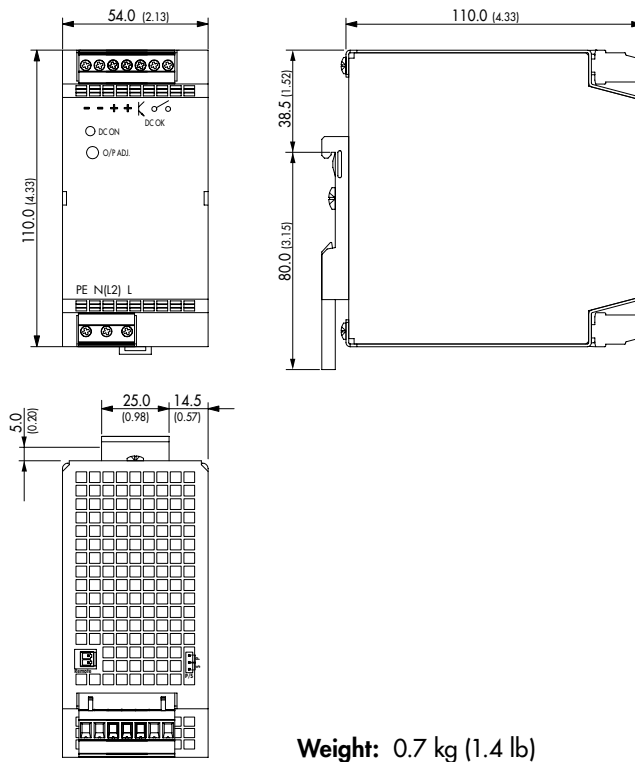
| | | |
|--------------------------|--|--|
| Temperature ranges (max) | – during discharge – when charging / charged – storage | -15 °C to +50 °C max. (5 °F to +122 °F) 0 °C to +40 °C max. (32 °F to +104 °F) -15 °C to +40 °C max. (5 °F to +104 °F) |
| Battery lifetime | | 3-5 years see general battery information for details: www.tracopower.com/products/tsp-panas_gen.pdf |
| Remote link cable | | 1 cable (0.5 m) included |
| Weight | TSP-BAT24-034 TSP-BAT24-072 TSP-BAT24-120 | 3.2 kg (7.1 lb) 5.8 kg (12.9 lb) 9.0 kg (20.0 lb) |
| Battery datasheets | TSP-BAT24-034 TSP-BAT24-072 TSP-BAT24-120 | www.tracopower.com/products/tsp-panas_034.pdf www.tracopower.com/products/tsp-panas_072.pdf www.tracopower.com/products/tsp-panas_120.pdf |

Case Dimensions

Models:
TSP-REM360
TSP-BCM24



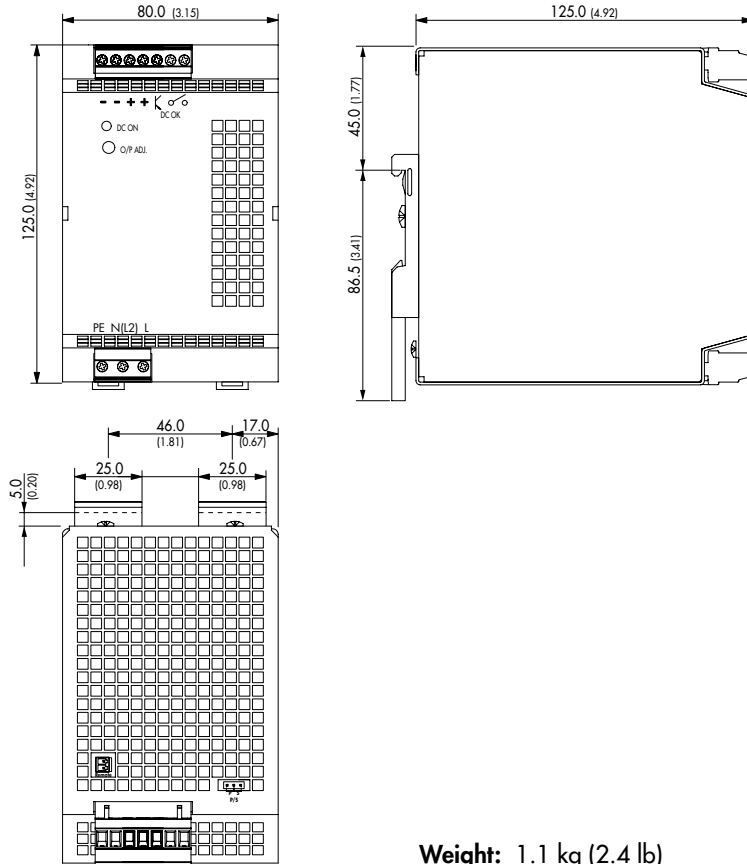
Models:
TSP 180-124WR
TSP-REM600
TSP-BCM24H
TSP-BFM24



Dimensions in [mm], () = inch
Tolerances: ± 0.5 mm (± 0.02)

Case Dimensions

Model:
TSP 360-124WR

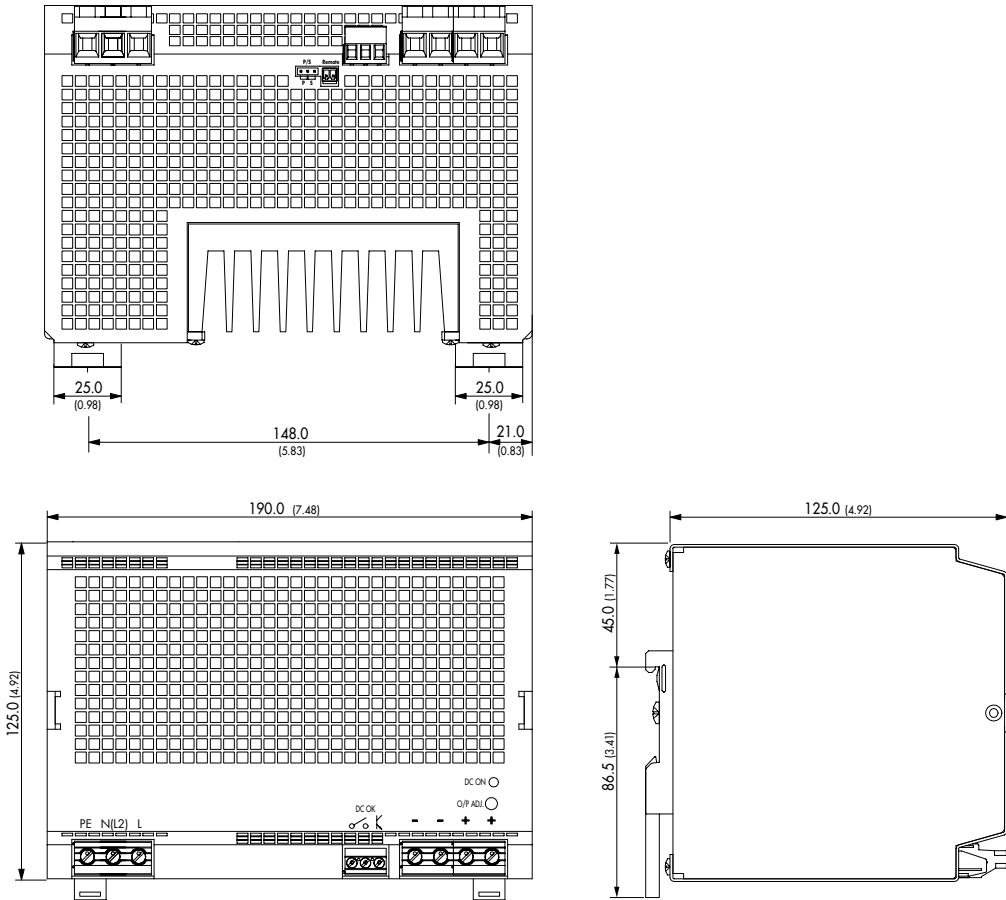


Weight: 1.1 kg (2.4 lb)

Dimensions in [mm], () = inch
Tolerances: ±0.5 mm (±0.02)

Case Dimensions

Model:
TSP 600-124WR



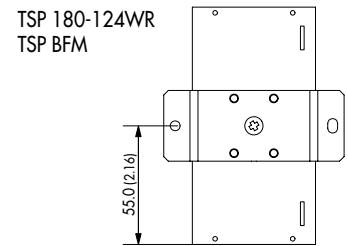
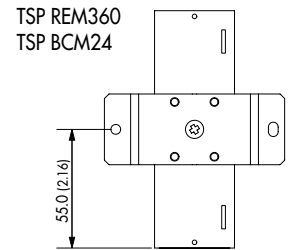
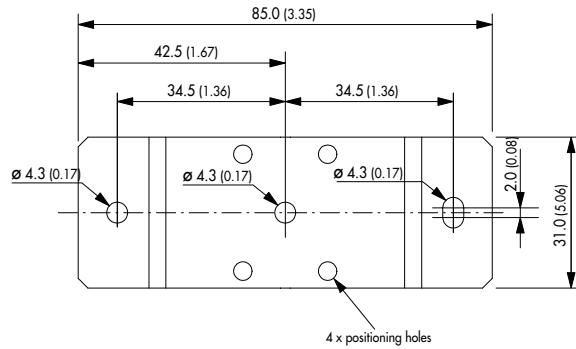
Weight: 3.0 kg (6.0 lb)

Dimensions in [mm], () = inch
Tolerances: ±0.5 mm (±0.02)

TSP-WMK Wall Mounting Bracket

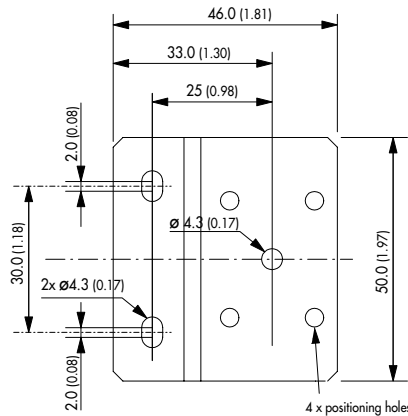
| Ordercode of kit | For models | Content of kit |
|------------------|------------------|---|
| TSP-WMK01 | TSP 180 | 1 bracket type A incl. M4-screw (DIN 74-Af4) |
| TSP-WMK02 | TSP 360, TSP 600 | 2 brackets type B incl. M4-screws (DIN 74-Af4) |

Type A:



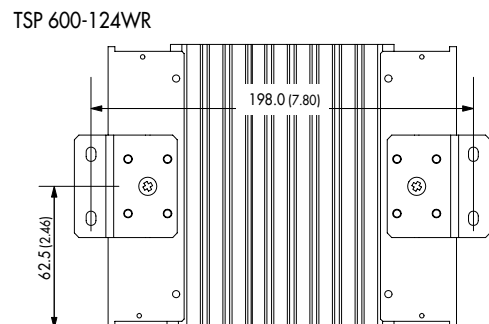
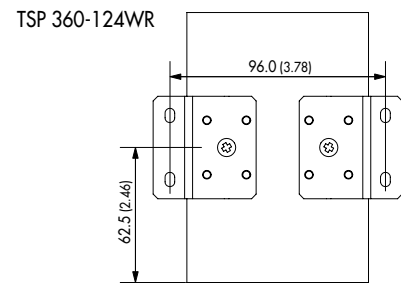
Material: 2 mm Mild Steel
Tolerance: ±0.1mm (± 0.004)

Type B:



Material: 2 mm Mild Steel
Tolerance: ±0.1mm (± 0.004)

Dimensions: [mm] () = Inch



Specifications can be changed any time without notice.