



Innovative and Powerful Features!

- ◆ For worldwide Operation – with ultra-wide Input Range from 100 to 550VAC
- ◆ For Single- and 3 Phase Networks
- ◆ Robust Design- qualified for harsh Industrial Environments
- ◆ Industrial Operating Temperature Range: –25°C to +70°C
- ◆ Power Good Signal
- ◆ Indefinite Short Circuit, Overvoltage and Overtemperature Protection
- ◆ Wall Mounting Option
- ◆ Modular Design with Add-on Modules for:
 - Redundancy Operation
 - DC-UPS
 - Buffer for Power Back-up
- ◆ International Safety Approvals incl. ATEX and Class I, Div.2 Certification
- ◆ 3 Year Warranty



The successful TSP series of high performance DIN-Rail Power Supplies has been expanded with 3 additional models which features an ultrawide input range of 85-132/230-550VAC. With this 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 makes these compact modules the best choice to power sensitive loads in industrial process control systems, machine tools or any other demanding industrial application. The power supplies complies also with the new EMC standard for Industrial environments, IEC/EN 61204-3.

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 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			
Model No.	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: 500 VAC Star configuration (EN60950+UL508) 500 VAC Delta (UL508 only) – IT: 400 VAC Delta (IEC-62103) 230 VAC Delta (IEC-60950) 500 VAC UL508 only												
Input voltage ranges	85–132 / {187–264 / 323–550 autorange} selectable by manual slide 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	<table><tr><td></td><td>115 VAC</td><td>230 VAC</td></tr><tr><td>TSP 180-124VVR</td><td>t.b.a</td><td>< 23 A</td></tr><tr><td>TSP 360-124VVR</td><td>t.b.a</td><td>< 46 A</td></tr><tr><td>TSP 600-124VVR</td><td>t.b.a</td><td>< 50 A</td></tr></table>		115 VAC	230 VAC	TSP 180-124VVR	t.b.a	< 23 A	TSP 360-124VVR	t.b.a	< 46 A	TSP 600-124VVR	t.b.a	< 50 A
	115 VAC	230 VAC											
TSP 180-124VVR	t.b.a	< 23 A											
TSP 360-124VVR	t.b.a	< 46 A											
TSP 600-124VVR	t.b.a	< 50 A											
Efficiency	88% typ.												

Output Specifications

Output voltage adj. range	24 – 28 VDC						
Regulation	<table> <tr> <td>– Input variation</td><td>0.5 % max.</td></tr> <tr> <td>– Load variation (10–100 %)</td><td>0.5 % max.</td></tr> <tr> <td>– Load variation (10–100 %) parallel mode</td><td>2.0%</td></tr> </table>	– Input variation	0.5 % max.	– Load variation (10–100 %)	0.5 % max.	– Load variation (10–100 %) parallel mode	2.0%
– 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 color LED (green: DC ok, red: DC off)						
Power-Good signal	<table> <tr> <td>– trigger threshold:</td><td>18 - 22V</td></tr> <tr> <td>– relay output</td><td>DC OK = contact closed (rated: 30VDC / 1.0A)</td></tr> </table>	– trigger threshold:	18 - 22V	– relay output	DC OK = contact closed (rated: 30VDC / 1.0A)		
– trigger threshold:	18 - 22V						
– relay output	DC OK = contact closed (rated: 30VDC / 1.0A)						
Max. capacitive load	unlimited						

General Specifications

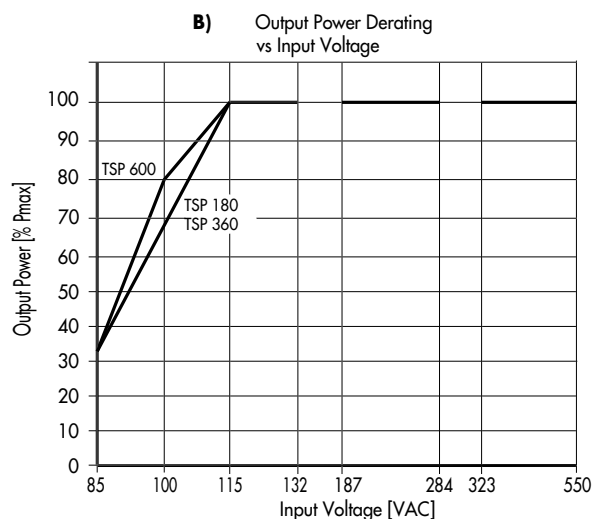
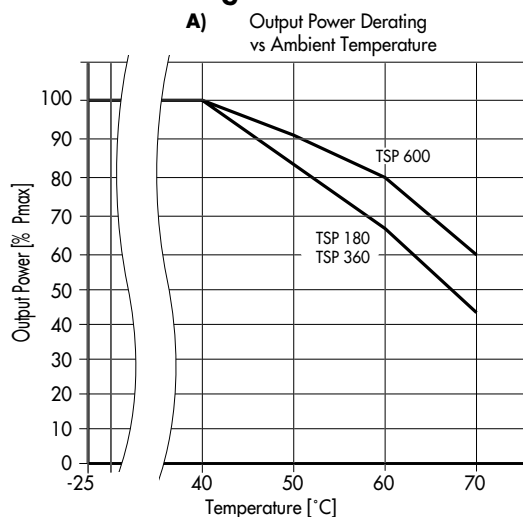
Operating temperature range	– 25°C...+70°C max. (–13°F...+158°F) (for derating see graph A on page 4)
Cooling	convection cooling, no internal fan
Storage temperature	–25 °C...+85 °C (– 13°F...+185°F)
Humidity (non condensing)	95 % rel. H max.
Pollution degree	2
Temperature coefficient	0.02 %/K
Reliability, calculated MTBF	>350'000h in acc. to IEC 61709
Remote On/Off	by ext. contact. DC on: -S contact open DC off: -S connectetd via 1Kohm 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, UL 60950, UL 508C	
Safety standards	– Information technology equipment – Industrial control equipment – Electrical equipment of machines – Electronic equipment for power installation – Control equipment for hazardous location – Safety transformers for SMPS – Limitet power source (model TSP 090-124N)	IEC/EN 60950, UL 60950, CSA-C22.2 No. 60950-1-03 UL 508, CSA-C22.2 EN 60204 EN 50178 IEC/EN 60079-15 (Class I, Zone 2, EEx nC II C T4 U), ANSI/UL60079-15 (Class I, Division 2, Groups A,B,C,D AEx n C II C T4 U) EN 61558-2-4 EN 60950 sect. 2.5 and NEC Class 2
Safety approvals / certifications	CB-Report as per IEC 60950, EN 60950-1:2003 CSA/UL 60950, CSA-C22.2 No.14-95, UL 508C CSA File no.: 219759 EN 60204, EN 61558-2-4 ATEX 94/9/EC, ANSI/UL 60079-15, FM 3611.	
Safety class	Degree of electrical protection I (IEC 536)	
Case protection	IP 20 (IEC 529)	
Electromagnetic compatibility (EMC), Emissions	– Conducted RI suppression on input – Radiated RI suppression	EN 61000-6-3, EN 61204-3 EN 55011 class B, EN 55022 class B, EN 55011 class B, EN 55022 class B,
Electromagnetic compatibility (EMC), Immunity	– 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	EN 61000-6-2, 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	– 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	– 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

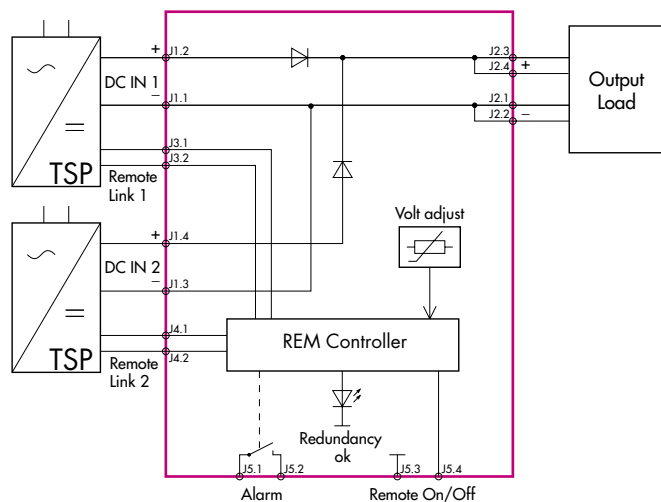
With this module and two power supplies of the TSP series (180 and 360W models) a highly reliable, true redundant power system can be configured without any additional components. This module enforces the equivalent sharing of the output current by each power supply. The system is fully redundant and provides the output power even if one power supply has completely failed e.g. by short circuit on the output. In the event of either, one 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.



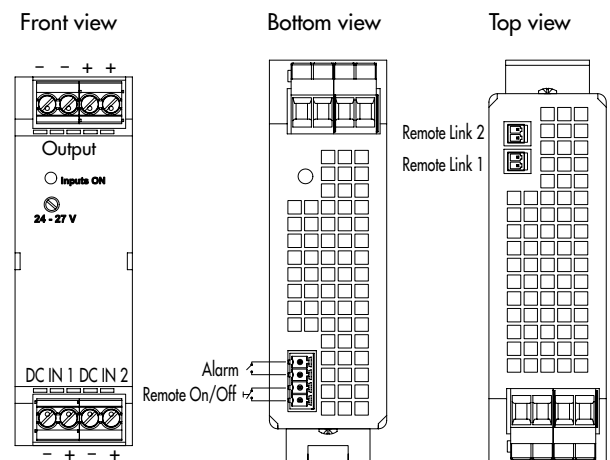
Models

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

Function Diagram



Connector Positions



Specifications

Operating temperature	– 25°C...+70°C max. (–13°F...+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 closed if one or both inputs failed
Remote link cable (0.5m)	2 cables included with TSP-REM360 module
Remote On/Off	by ext. contact: contact open = On, contact closed = Off
Dimensions	see page 7

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

TSP-BFM24 Buffer Module

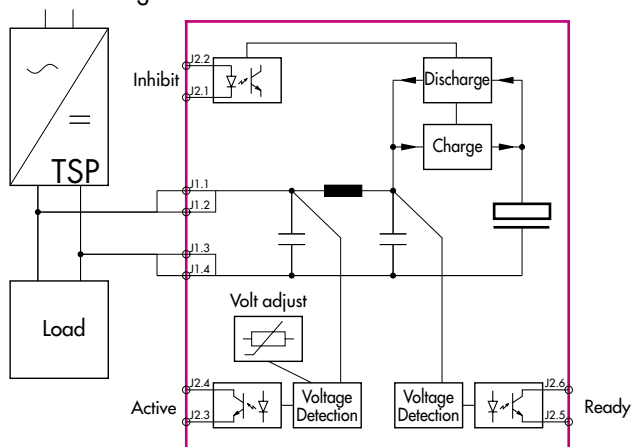
The TSP-BFM24 Buffer Module will hold the output voltage of a 24VDC power supply after brown outs or voltage dips of up to ten full 50Hz cycles. During this buffer period no deterioration of the 24VDC output voltage will occur. For many applications this buffer module is an ideal and cost effective alternative 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 second and an opto-coupler signal is indicating 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 200ms at 25A 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.



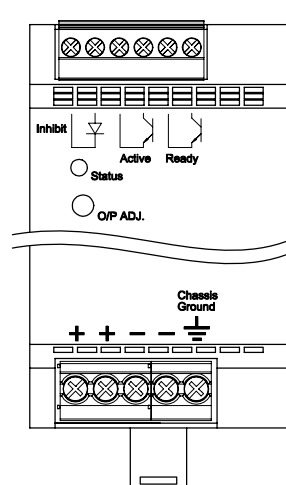
Models

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. @ 1.2A	600 W

Function Diagram



Connector Positions



Specifications

Operating temperature	- 25°C...+70°C max. (-13°F...+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, >1V below input voltage, min. 22VDC
Charging	0.6A max. / 30s max.
Status signals	Buffer Active , Buffer Ready (optocoupler output) and dual colour LED for status indication
Inhibit	optocoupler input: 35V max. <5mA
Dimensions	see page 7

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

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 case 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. By this, the battery life time can be extended.

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

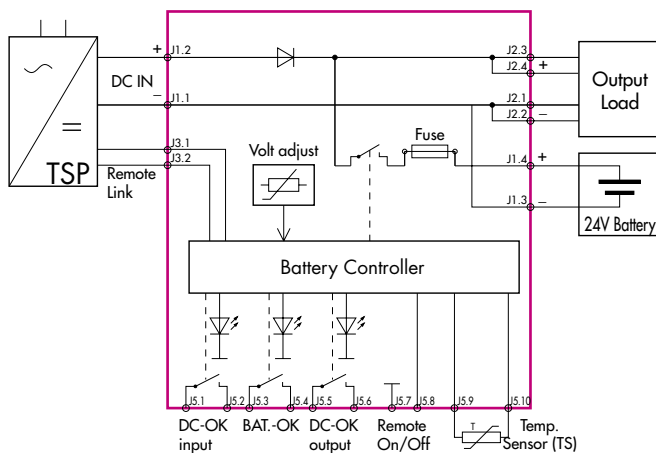


Models

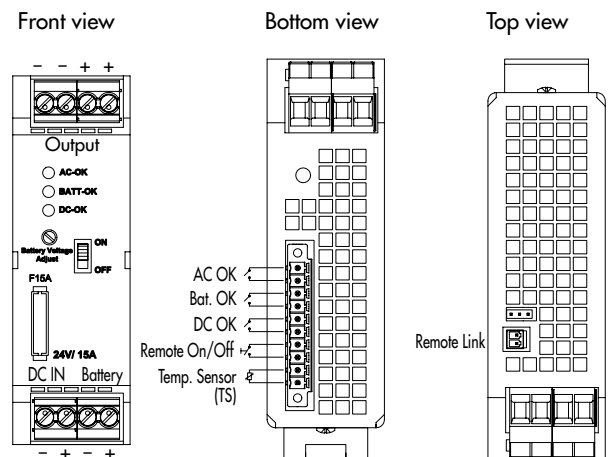
Order code (includes terminal plugs)	Inputs	Input Power max	Output Voltage nom.	*Output Power max.
TSP-BCM24	24 VDC Power Supply and 24 VDC Battery	360 W	24 VDC	360 W

*reduce max. output current by battery charging current

Function Diagram



Connector Positions



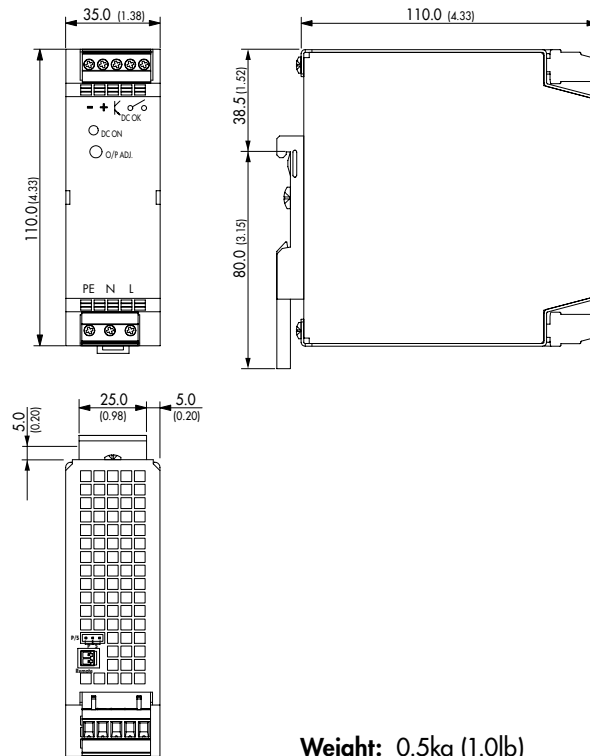
Specifications

Operating temperature	– 25°C...+70°C max. (–13°F...+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.
Remote link cable (0.5m)	1 cable included with TSP-BCM24 module
Remote On/Off	by ext. contact: contact open = On, contact closed = Off
Dimensions	see page 7

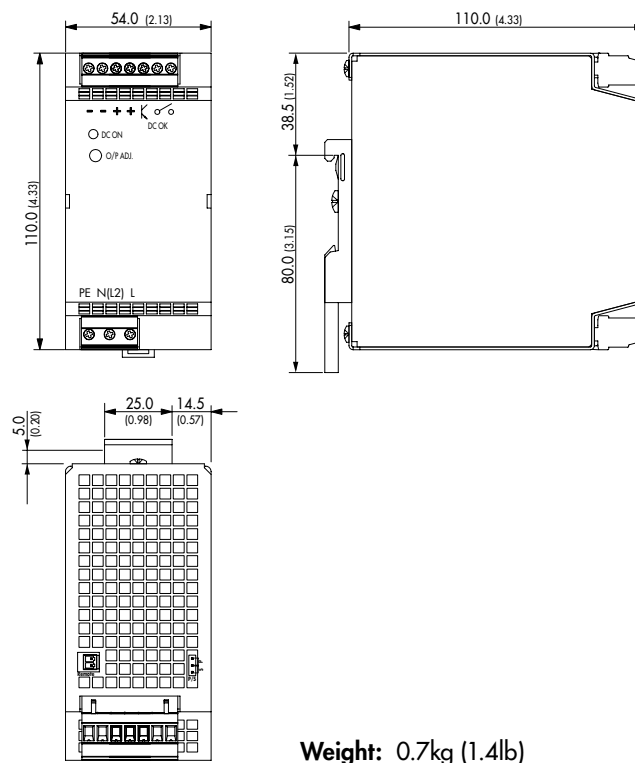
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Outline Dimensions

TSP-REM360
TSP-BCM24

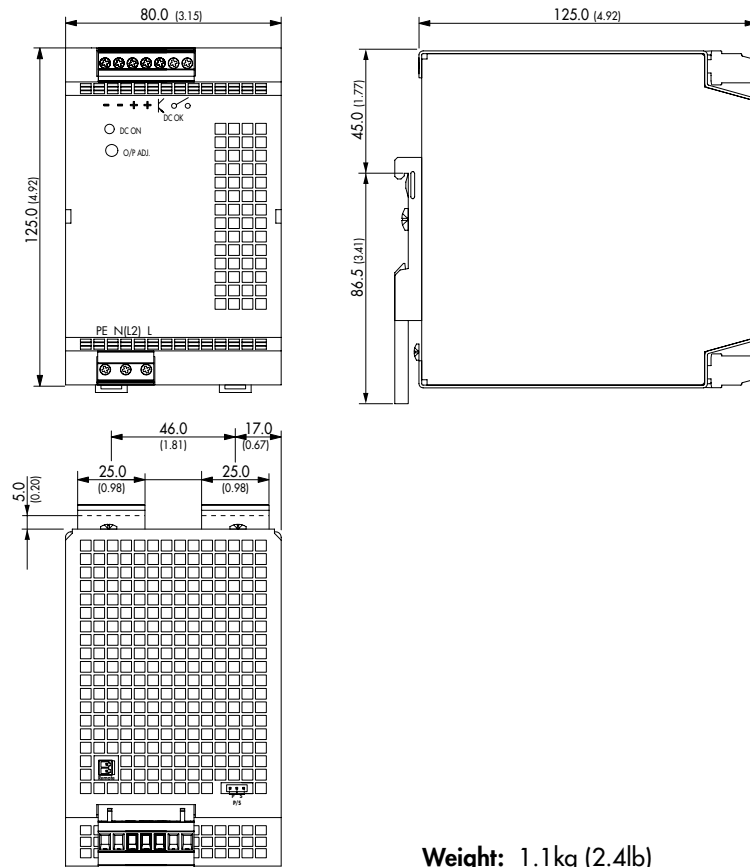


TSP 180-124 WR
TSP-BFM24



Outline Dimensions

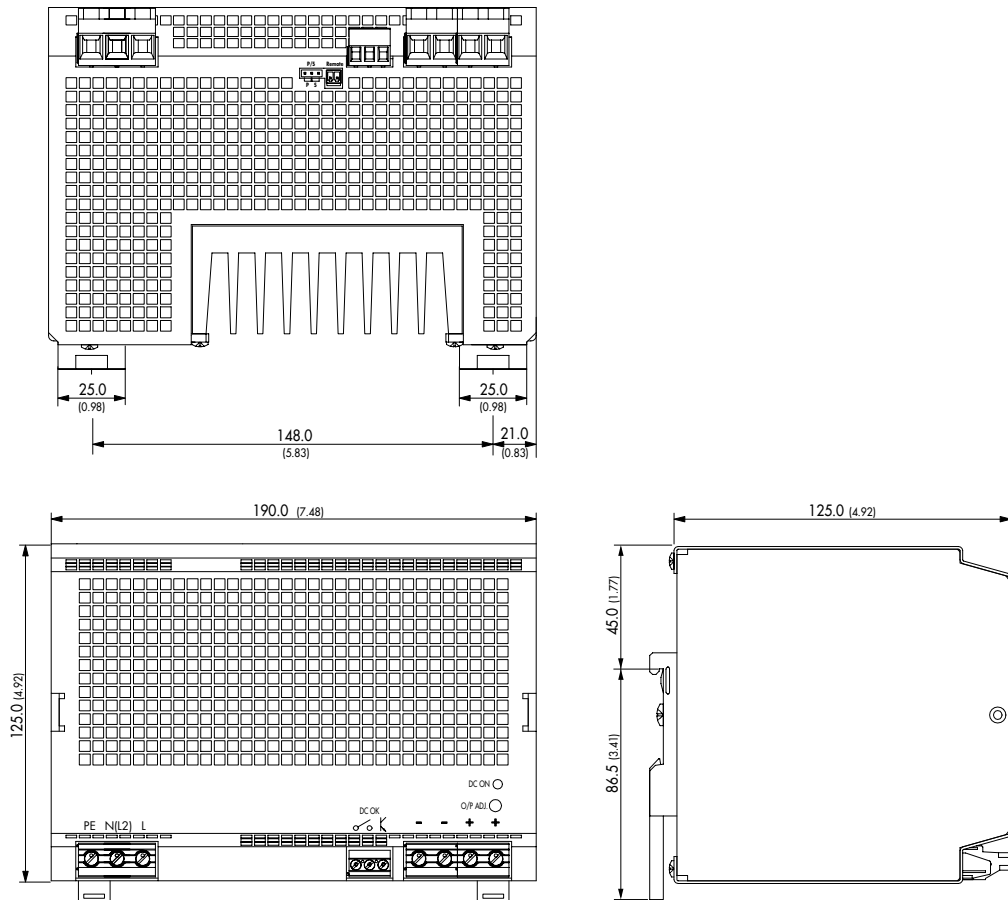
TSP 360-124WR



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

Outline Dimensions

TSP 600-124WR

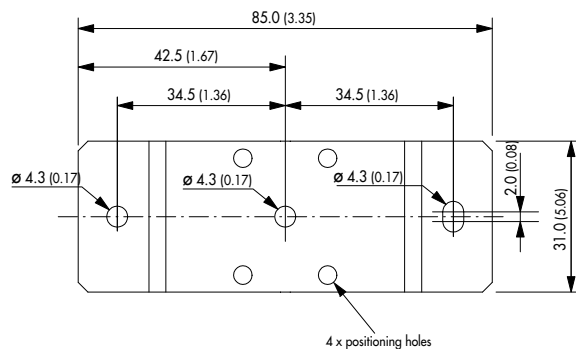


Weight: 3.0 kg (6.0lb)

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

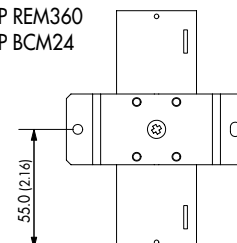
TSP-WMK Wall Mounting Bracket

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)

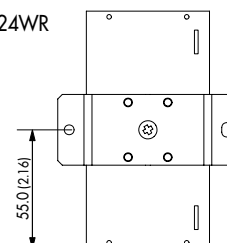
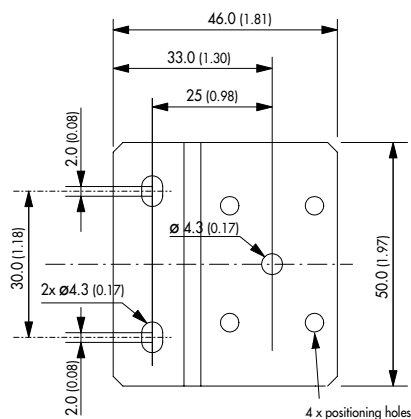
Type A:


Material: 2 mm Mild Steel
Tolerance: $\pm 0.1\text{ mm}$ (± 0.004)

TSP REM360
TSP BCM24



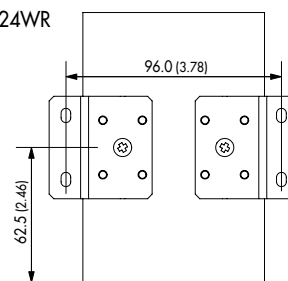
TSP 180-124WR
TSP BFM


Type B:


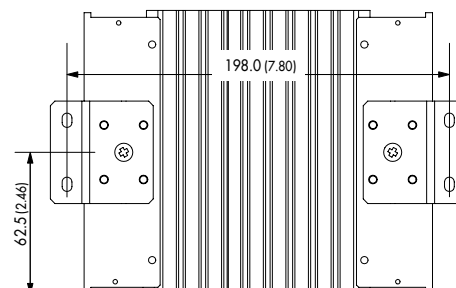
Material: 2 mm Mild Steel
Tolerance: $\pm 0.1\text{ mm}$ (± 0.004)

Dimensions: [mm] () = Inch

TSP 360-124WR



TSP 600-124WR



Specifications can be changed without notice