



Innovative and Powerful Features!

- ◆ True industrial Grade Design
- ◆ Rugged Metal Case for harsh industrial Environments
- ◆ For worldwide Use – Autoselect Input and International Safety Approvals
- ◆ ATEX Certification for Applications in hazardous Locations
- ◆ Model TSP 090-124N meets NEC Class 2
- ◆ Industrial Operating Temperature Range: -25°C to +70°C
- ◆ Variable Output Voltage
- ◆ Indefinite Short Circuit, Overvoltage and Overtemperature Protection
- ◆ Power Good Signal
- ◆ Remote On/Off
- ◆ Shock and Vibration Proof
- ◆ Wall Mounting (Opt.)
- ◆ Redundancy Module
- ◆ Buffer Module for Power Backup
- ◆ Battery Controller Module
- ◆ 3 Year Product Warranty



The TRACOPOWER TSP series is a new generation of high performance DIN-rail power supplies designed to work reliable also under difficult factory floor conditions. A high 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 other demanding industrial application. Easy installation with detachable screw terminal block and snap-on mounting on DIN-rails.

For system applications all models offer a DC-OK signal and external shut down function. Redundant operation with true power sharing is available as an option. With another option these power supplies can be extended to a perfect DC-UPS system with automatic battery management.

The TSP series power supplies complies with the latest EMC standard EN 61204-3 for industrial environments.

Models			
Model No.	*Output Voltage (Vnom)	**Output Current (Imax)	Output Power (Pmax)
TSP 070-112	12 VDC	6.5 A	78 W
TSP 090-124	24 VDC	3.75 A	90 W
TSP 090-124N	24 VDC	3.75 A	90 W
TSP 140-112	12 VDC	13.0 A	156 W
TSP 180-124	24 VDC	7.5 A	180 W
TSP 360-124	24 VDC	15.0 A	360 W
TSP 600-124	24 VDC	25.0 A	600 W

* Output voltage adjustable 12 - 14 VDC resp. 24 - 28 VDC

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

Product Features

The Ultimate DIN - Rail Power Supply !

Remote On/Off

Control Output for true
N+1 Redundancy or
Battery Operation

Jumper for Parallel
Operation or Battery Charge
Mode selectable by Jumper

Detachable Screw Terminal
Block for quick disconnect
and easy Installation

Rugged, Ultracompact
Metal Case, Shock and
Vibration tested per
IEC 60068-2 Standard

Double Output Terminals
for easy Potential
Distribution

Industrial Safety
Approval Package
to comply with:
IEC/EN 60950
UL/cUL 60950
UL 508, CSA-C22.2
FM 3611
ATEX 94/9/EC

Dual Color Status
Indicator LED

Adjustable Output Voltage

EMC Compliance to
EN 61204-3 Standard
for Industrial
Power Supplies

Remote Diagnostic via
floating Relay Contact
or NPN Output

Convection Cooling,
no internal Fan, Thermal
Overload Protection

Autorange Input
for worldwide Use

Self-locking DIN-rail fixing
Latch or optional Wall
Mounting Brackets



Input Specifications

Input voltage range	85–132 / 187–264 VAC autoselect output current derating at operation below 100 VAC - see graph B	
Input voltage frequency	47 – 63 Hz	
Harmonic limits	EN 61000-3-2, Class A (for limited output power)	
Holdup time	20 ms min. (full load 115/230 VAC)	
Inrush current	115 VAC	230 VAC
	– TSP 070/090 < 12 A	< 20 A
	– TSP 140/180 < 13 A	< 25 A
	– TSP 360 < 16 A	< 25 A
	– TSP 600 < 25 A	< 30 A
Recommended circuit breaker, characteristic C or fuse, slow blow type	– TSP 070/090 6.0 A	6.0 A
	– TSP 140/180 6.0 A	6.0 A
	– TSP 360 10.0 A	10.0 A
	– TSP 600 15.0 A	15.0 A
Efficiency	87% typ.	

Output Specifications

Output voltage adj. range	– 12 VDC models:	12 – 14 VDC
	– 24 VDC models:	24 – 28 VDC
Regulation	– Input variation	0.5 % max.
	– Load variation (10–100 %)	0.5 % max.
Ripple and Noise (20MHz Bandwidth)	100 mV pk-pk typ. (200 mV pk-pk max. at I _{max})	
Electronic short circuit protection	current limitation at I _{max} . constant current, automatic recovery	
Output overvoltage protection	– 12 VDC models:	20V
	– 24 VDC models:	35V
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	– trigger threshold:	– 12 VDC models: 9 - 11V
		– 24 VDC models: 18 - 22V
	– active output signal: (reference to –V _{out})	– 12 VDC models: 11.0 V ±1.0V (20 mA max. for TSP 070, 40 mA max. for TSP 140)
		– 24 VDC models: 22.0 V ±2.0V / 20mA max. (10 mA max. for TSP 090, 20mA max. for others)
	– relay output	DC OK = contact closed (rated: 30VDC / 1.0A)
Max. capacitive load	unlimited	

General Specifications

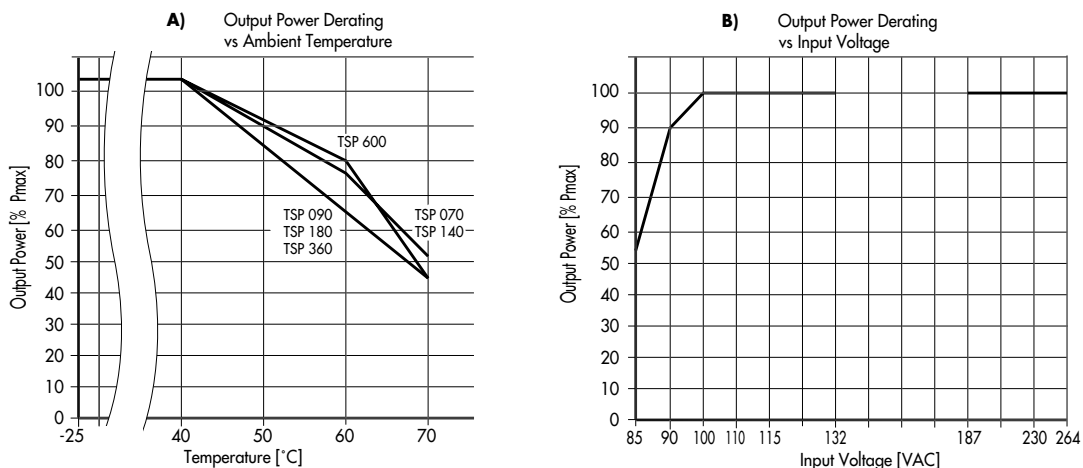
Operating temperature range	– 25°C...+70°C max. (–13°F...+158°F) (for derating see graph A on page 4)
Cooling	convection cooling, no internal fan
Storage temperature	–25 °C...+85 °C (– 13°F...+185°F)
Humidity (non condensing)	95 % rel. H max.
Pollution degree	2
Temperature coefficient	0.02 %/K
Reliability, calculated MTBF	>350'000h in acc. to IEC 61709
Remote on/off	by ext. contact. DC on: -S contact open DC off: -S connectid 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	<ul style="list-style-type: none"> - 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 (SEV 05 ATEX 0146 U), 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	<ul style="list-style-type: none"> - 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	<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 	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	<ul style="list-style-type: none"> - Vibration acc. IEC 60068-2-6; - Shock acc. IEC 60068-2-27 	3 axis, sine sweep, 10-55Hz, 1g, 1oct/min 3 axis, 15g half sine, 11ms
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

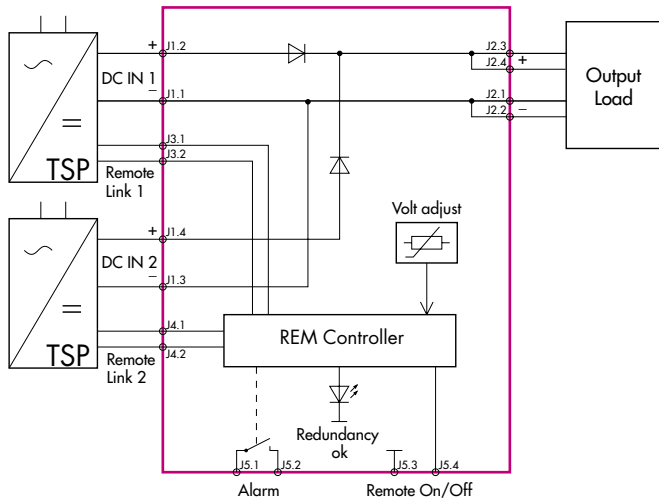
With this module and two power supplies of the TSP series (90,180 and 360W models) a highly reliable, true redundant power system can be configured without any additional components. This module enforces the equivalent sharing of the output current by each power supply. The system is fully redundant 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.



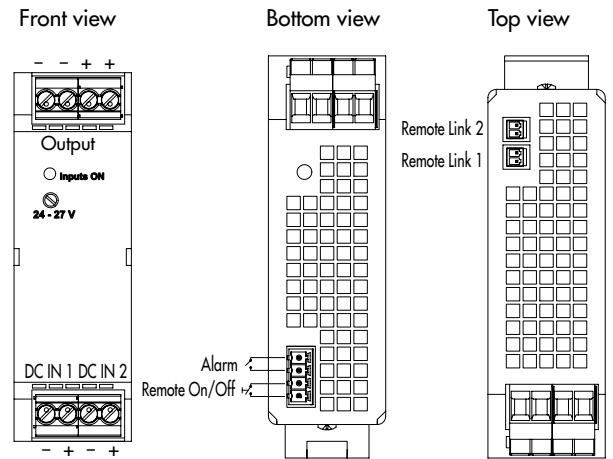
Models

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
Dimensions	same as model TSP 090 (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

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

TSP-BFM24 Buffer Module

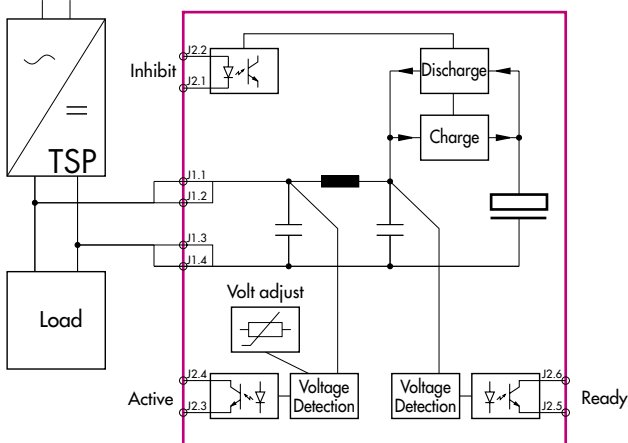
The TSP-BFM24 Buffer Module will hold the output voltage of a 24VDC power supply after brown outs or voltage dips of up to ten full 50Hz cycles. During this buffer period no deterioration of the 24VDC output voltage will occur. For many applications this buffer module is an ideal and cost effective alternative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



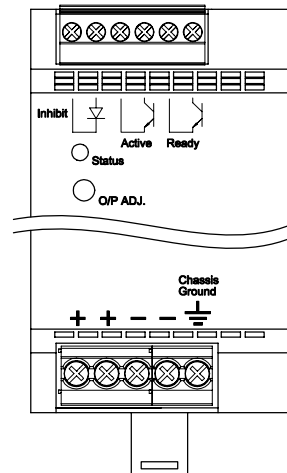
Models

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	same as model TSP 140 (see page 8)

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.

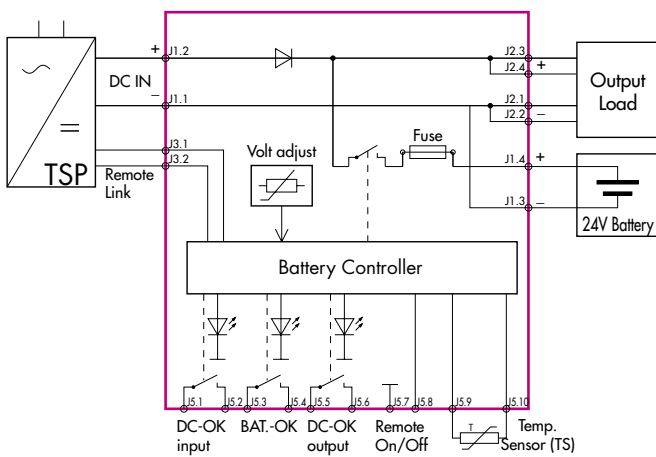


Models

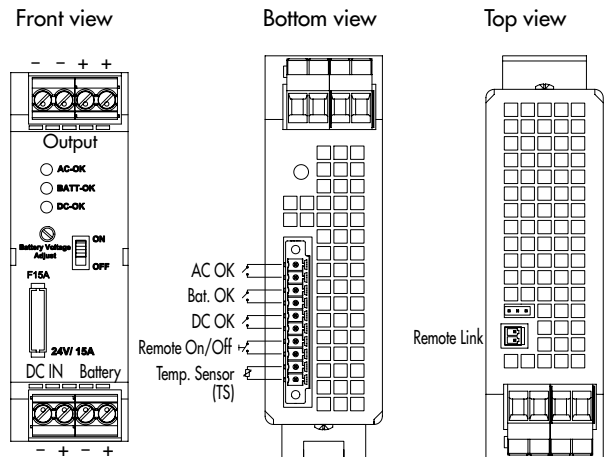
Order code (includes terminal plugs)	Inputs	Input Power max	Output Voltage nom.	*Output Power max.
TSP-BCM24	24 VDC Power Supply and 24 VDC Battery	360 W	24 VDC	360 W

*reduce max. output current by battery charging current

Function Diagram



Connector Positions



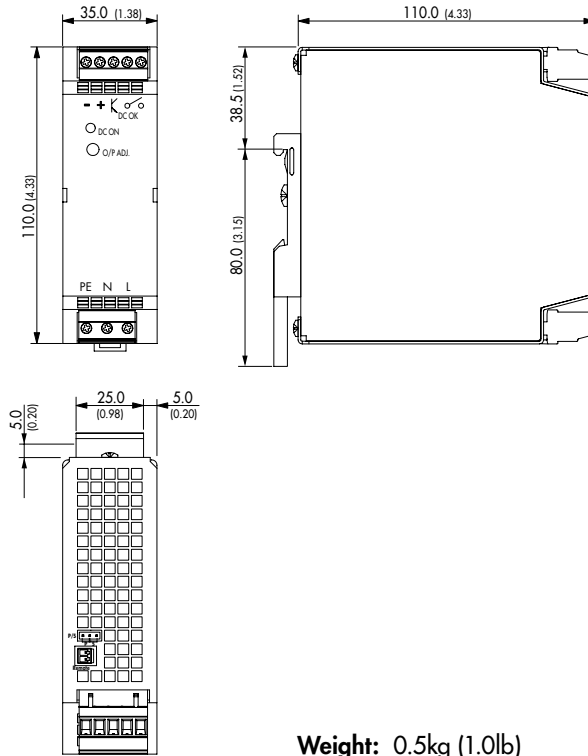
Specifications

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.
Dimensions	same as model TSP 090 (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

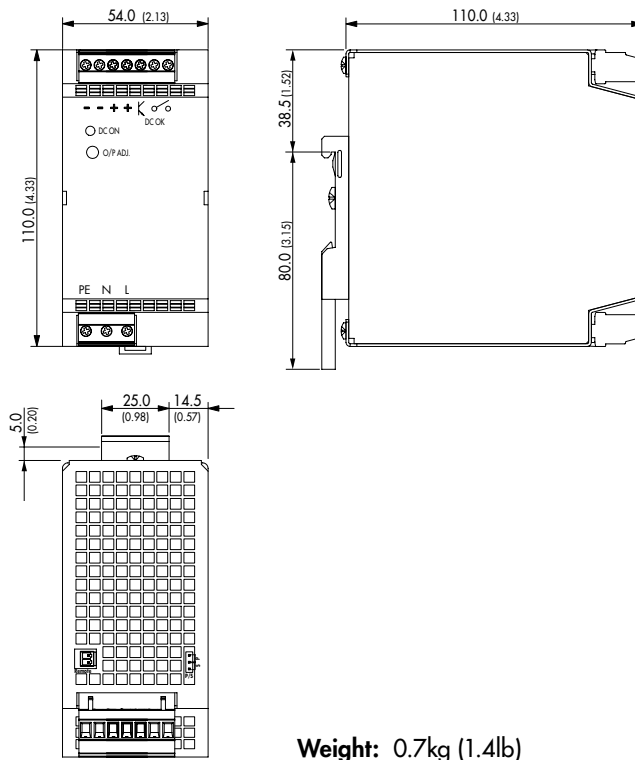
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Outline Dimensions

TSP 070/090
(TSP-REM360)
(TSP-BCM24)



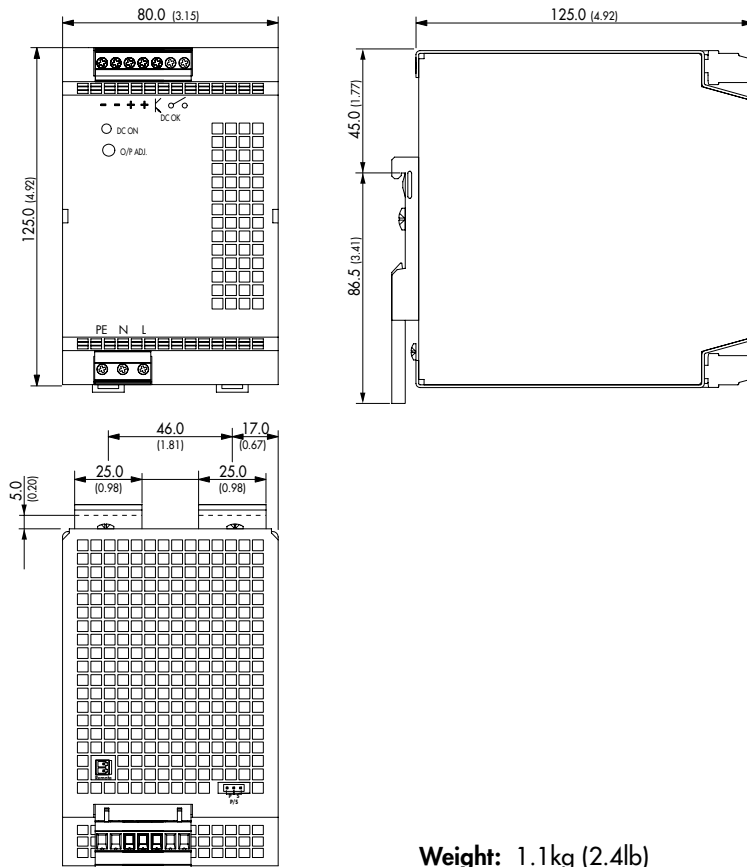
TSP 140/180
(TSP-BFM24)



Tolerances: ± 0.5 mm (± 0.02)

Outline Dimensions

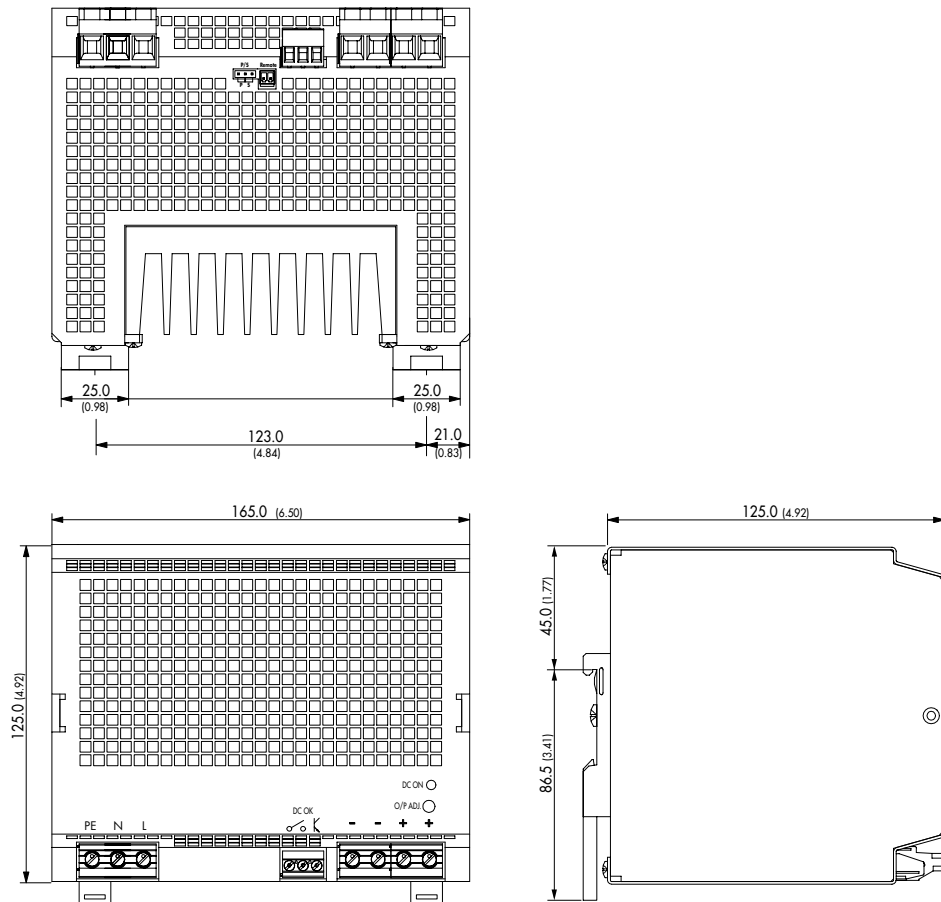
TSP 360



Weight: 1.1kg (2.4lb)

Outline Dimensions

TSP 600



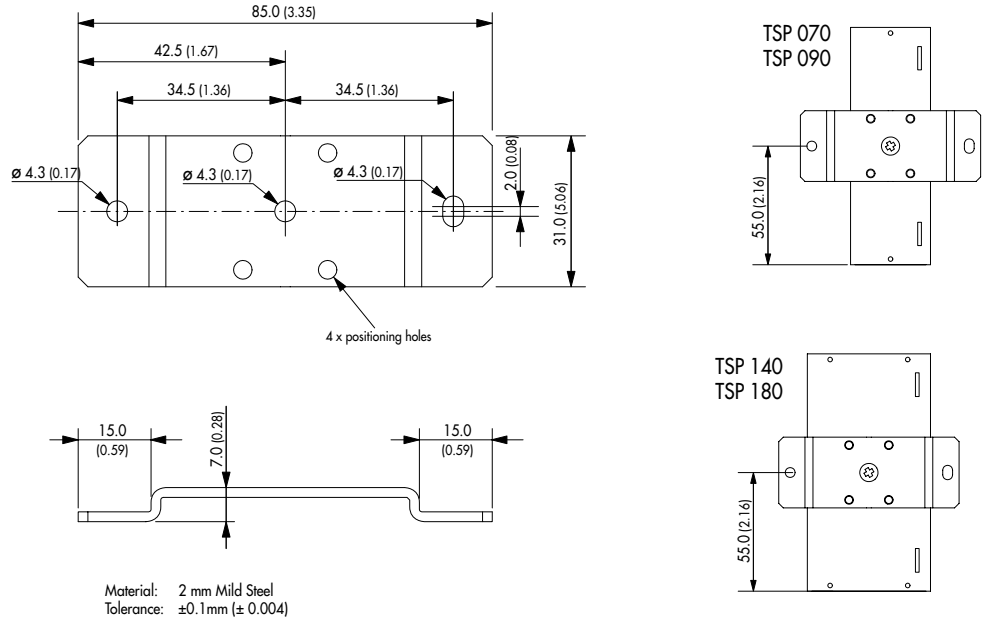
Weight: 2.8kg (6.0lb)

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

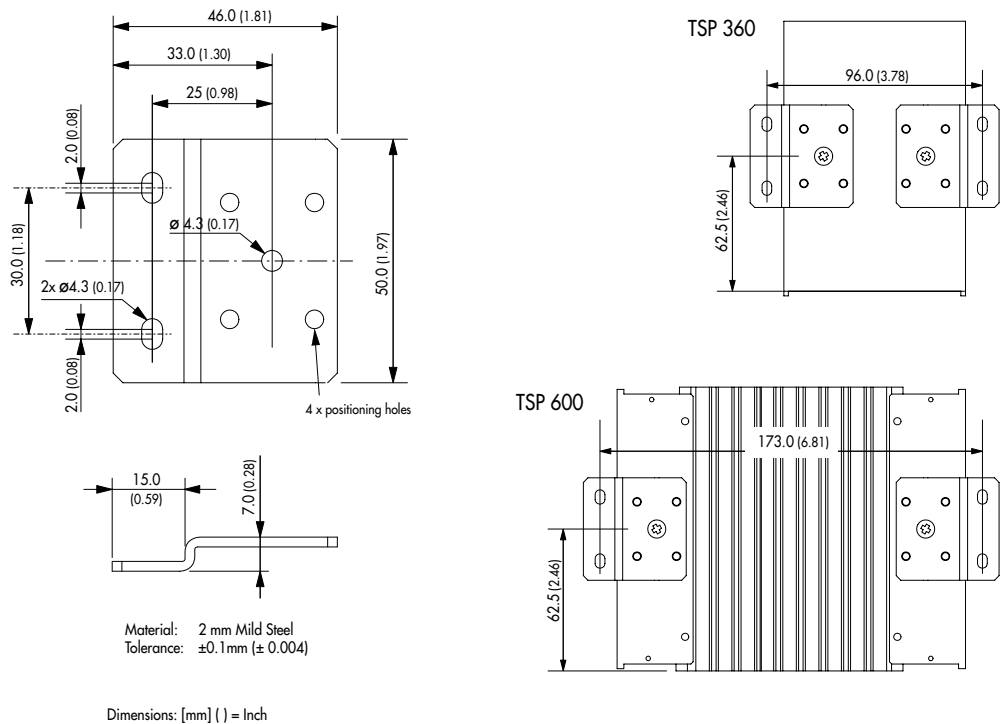
TSP-WMK Wall Mounting Bracket

Ordercode of kit	For models	Content of kit
TSP-WMK01	TSP 070, TSP 090, TSP 140, 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:



Type B:



Specifications can be changed without notice