# Industrial Power Supplies

**TSP-Series**

## Innovative and Powerful Features!

- Rugged metal case for harsh industrial environments
- Shock and vibration proof
- Worlwide Safety approval package.
- ATEX certification and IECEx test report (opt. EX)
- Model TSP 090-124N meets NEC class 2
- Industrial operating temperature range: –25°C to +70°C
- Adjustable output voltage
- Protection agains short-circuit, overvoltage and over-temperature
- Power OK signal, Remote On/Off
- Wall mounting (opt.)
- 3-year product warranty

EMC LVD | IEC 60950-1 | UL 60950-1 UL 508 UL 60079-15 | ATEX II3G

The TSP series comprises high performance DIN-rail mount power supplies designed for reliable operation under difficult factory floor conditions. High immunity against electrical disturbances and rugged metal casing make these modules the best choice to power sensitive loads in industrial process control systems, machine tools or other demanding industrial applications. They provide a DC-OK signal and external shut down function. Detachable screw terminal blocks make the connection easy.

This power supply line is accompanied by a wide range of function modules for reliable system solutions:

**Redundancy modules** for true current sharing in parallel operation and for redundant systems.
**Battery controller modules** to configure high reliable UPS systems for 12, 24 and 48 VDC. Selection of battery packs available.
**Buffer modules** for protection against short time AC power loss. Maintenance free! No batteries required.

## Function Modules (see page 5)

## Models

| Order Code | Output Power (Pmax) | **Output Voltage (Vnom) | ***Output Current (Imax) |
|---|---|---|---|
| TSP 070–112* | 72 W | 12 VDC | 6.0 A |
| TSP 090–124* | 90 W | 24 VDC | 3.75 A |
| TSP 090–124N | 90 W | 24 VDC | 3.75 A |
| TSP 090–148* | 96 W | 48 VDC | 2.0 A |
| TSP 140–112* | 144 W | 12 VDC | 12.0 A |
| TSP 180–124* | 180 W | 24 VDC | 7.5 A |
| TSP 180–148* | 192 W | 48 VDC | 4.0 A |
| TSP 360–124* | 360 W | 24 VDC | 15.0 A |
| TSP 360–148* | | 48 VDC | 7.5 A |
| TSP 600–124* | 600 W | 24 VDC | 25.0 A |
| TSP 600–136 | | 36 VDC | 16.5 A |
| TSP 600–148* | | 48 VDC | 12.5 A |

* For ATEX / IECEx compliant model add appendix -EX to order code.
** Output voltage adjustable 12–14 VDC, 24–28 VDC and 48–56VDC
*** Max. current at nominal output voltage and operating temperature up to 40 °C max.

## Input Specifications

| | | | |
|---|---|---|---|
| Input voltage range | | – TSP 070/090 | 85 – 264 VAC universal input |
| | | – other models: | 85 – 132 / 187 – 264 VAC autoselect |
| | | – output current derating at operation below 100 VAC | see graph B, page 4 |
| Input voltage frequency | | | 47 – 63 Hz |
| Harmonic limits | | | EN 61000-3-2, Class A (for limited output power) |
| Holdup time | | 230 VAC | 20 ms |
| | | 115 VAC | 10 ms at full load, 20 ms at 66% load |
| 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 B | | – TSP 070/090/140/180 | 6.0 – 16.0 A |
| | | – TSP 360 | 10.0 – 16.0 A |
| | | – TSP 600 | 16.0 – 25.0 A |
| Efficiency | | | 87 % typ. |

## Output Specifications

| | | | |
|---|---|---|---|
| Output voltage adj. range | | – 12 VDC models: | 12 – 14 VDC |
| | | – 24 VDC models: | 24 – 28 VDC |
| | | – 36 VDC model: | 36 – 42 VDC |
| | | – 48 VDC models: | 48 – 56 VDC |
| | | | At output voltage higher than nominal output voltage max. output current has to be reduced accordingly, in order not to exceed max. output power. |
| 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 Imax) |
| Electronic short circuit protection | | | current limitation at Imax.<br>constant current, automatic recovery |
| Output overvoltage protection | | – 12 VDC models: | 20 V |
| | | – 24 VDC models: | 35 V |
| | | – 36 VDC model: | 43 V |
| | | – 48 VDC models: | 60 V |
| Overload protection | | | electronic overload protection |
| Overtemperature protection | | | switch off at overtemperature, automatic restart |
| Power back immunity | | – 12 VDC models: | 16 V |
| | | – 24 VDC models: | 35 V |
| | | – 36 VDC model: | 48 V |
| | | – 48 VDC models: | 63 V |
| Status indicator | | | dual color LED (green: DC ok, red: DC off) |
| Power OK signal | – trigger threshold: | – 12 VDC models: | 9 – 11 V |
| | | – 24 VDC models: | 18 – 22 V |
| | | – 36 VDC model: | 27 – 34 V |
| | | – 48 VDC models: | 36 – 46 V |
| | – active output signal: (reference to –Vout) | – 12 VDC models: | 11.0 V ±1.0 V (20 mA max. for TSP 070, 40 mA max. for TSP 140) |
| | | – 24 VDC models: | 22.0 V ±2.0V / 20 mA max. (10 mA max. for TSP 090, 20mA max. for others) |
| | | – 36 VDC model: | 34.0 V ±2.0 V / 20 mA max. |
| | | – 48 VDC models: | 44.0 V ±4.0 V / 15 mA max. |
| | – relay output | | DC OK = contact closed<br>rated: 30 VDC/1.0 A for 12/24 VDC models<br>rated: 30 VDC/2.0 A for 36 VDC model<br>rated: 48 VDC/0.5 A for 48 VDC models |

## General Specifications

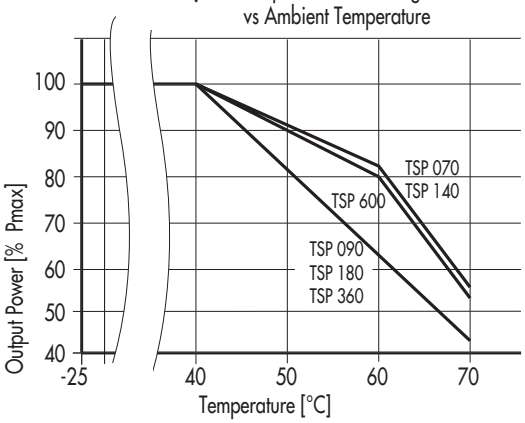
| | | |
|---|---|---|
| Max. capacitive load | | unlimited |
| Temperature range | – Operating | –25°C to +70°C max.<br>(for derating see graph A on page 4) |
| | – Storage | –25°C to +85°C |
| Cooling | | convection cooling, no internal fan |
| Humidity (non condensing) | | 95 % rel. H max. |
| Pollution degree | | 2 |
| Temperature coefficient | | 0.02 %/K |
| Reliability, calculated MTBF (at +25°C acc. to IEC 61709) | – TSP 070/090 | >1.8 Mio h |
| | – TSP 140 | >1.2 Mio h |
| | – TSP 180/360/600 | >0.9 Mio h |
| Remote On/Off | | by ext. contact.<br>DC on: -S contact open<br>DC off: -S connectetd via 1Kohm to -Vout |
| Isolation | | according to IEC/EN 60950-1, UL 60950-1, UL 508 |
| Safety standards | – Information technology equipment | IEC/EN 60950-1, UL 60950-1, CSA-C22.2 No. 60950-1-03 |
| | – Industrial control equipment | UL 508, CSA-C22.2 No. 107 |
| | – Electrical equipment for machines | EN 60204 |
| | – Electronic equipment for power installation | EN 50178 |
| | – Safety transformers for SMPS | EN 61558-2-16 |
| | – Limited power source (model TSP 090-124N) | EN 60950 sect. 2.5 and NEC Class 2 |
| | – Control equipment for hazardous location | UL 60079-15<br>(Class I, Division 2, Groups A,B,C,D AEx n C II C T4 U)<br>IEC/EN 60079-15 (Class I, Zone 2, EEx nC II C T4 U),<br>(Ex II3G EEX nAC IIC T4 (T3 with limited power) |
| Safety approvals and certifications | – CB report | for IEC/EN 60950-1<br>www.tracopower.com/products/tsp-cb.pdf |
| | – UL approvals | UL 60950-1 rec. File: e181381, UL 508C listed File: e210002<br>www.ul.com -> certifications |
| | – CSA certification | (file no. 219759) for UL 60950-1, UL 508, UL 60079-15-02, ANSI/ISA 12.12.01, CSA-22.2 No. 60950-1-03, CSA C22.2 No. 107, CSA 60079-15-02<br>www.tracopower.com/products/tsp-csa.pdf |
| | – Ex II3G ATEX 94/9/EC | certificate no. EPS 12 ATEX 1 424 X (option -EX only)<br>www.tracopower.com/products/tsp-atex.pdf |
| | – BG certification | EN 60950-1, EN 60204-1, EN 61558-2-16, EN 50178<br>www.tracopower.com/products/tsp-bg.pdf |
| Class of protection | | safety class I (IEC 536) |
| Degree of protection | | IP 20 (IEC/EN 60529) |
| Electromagnetic compatibility (EMC), Emissions | | EN 61000-6-3, EN 61204-3 |
| | – Conducted RI suppression on input | EN 55011 class B, EN 55022 class B, |
| | – Radiated RI suppression | EN 55011 class B, EN 55022 class B, |
| Electromagnetic compatibility (EMC), Immunity | | EN 61000-6-2, EN 61204-3 |
| | – Electrostatic discharge (ESD) | IEC / EN 61000-4-2 4 kV / 8 kV criteria B |
| | – Radiated RF field immunity | IEC / EN 61000-4-3 10 V / m criteria A |
| | – Electrical fast transient / burst immunity | IEC / EN 61000-4-4 2 kV criteria B |
| | – Surge immunity | IEC / EN 61000-4-5 1 kV / 2 kV criteria B |
| | – Immunity to conducted RF disturbances | IEC / EN 61000-4-6 10 V criteria A |
| | – Power frequency field immunity | IEC / EN 61000-4-8 30 A / m criteria A |
| | – Mains voltage dips and interruptions | IEC / EN 61000-4-11 criteria B/C |
| | – Voltage sag immunity | SEMI F47<br>www.tracopower.com/products/TSP_SemiF47.pdf |

## General Specifications

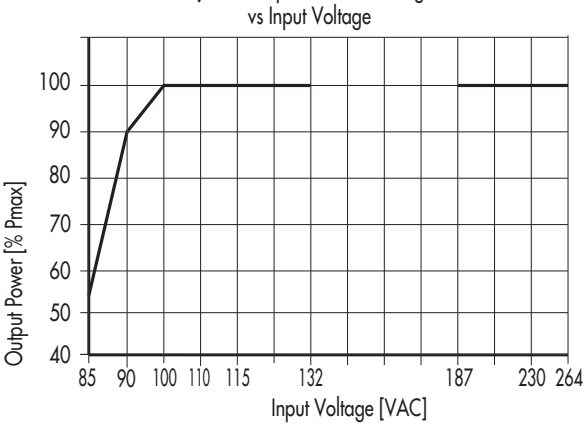
| | | |
|---|---|---|
| Environment | – Vibration acc. IEC 60068-2-6;<br>– Shock acc. IEC 60068-2-27 | 3 axis, sine sweep, 10 – 55 Hz, 1 g, 1 oct/min<br>3 axis, 15 g half sine, 11 ms |
| Enclosure material | | aluminium (chassis) / stainless steel (cover) |
| Mounting | – DIN-rail mounting<br><br>– Wall mounting (option) | for DIN-rails as per EN 50022-35x15/7.5<br>(snap-on with self-locking spring)<br>with wall mounting bracket - see page 9 |
| Connection | | detachable screw terminals (plugs included)<br>2 terminals per output |
| Remote On/Off connection | – 2 pin molex male terminal KK series | mating connector information (cable not included)<br>www.tracopower.com/products/tsp-rc-cable.pdf |
| Installation instructions | | www.tracopower.com/products/tsp-inst.pdf |

## Output Power Derating

**A)** Output Power Derating vs Ambient Temperature




**B)** Output Power Derating vs Input Voltage




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

## Function Modules Overview

### Redundancy Module:

With this module and two power supplies of the TSP series a highly reliable, true redundant power system can be configured without any additional components. This module provides:

– Operation with true current sharing
– Alarm outputs and redundancy OK signal
– Hot swappable inputs can be loaded up to 15A each (resp. 25A with model TSP REM600)

**Models**

| Order Code | Output Voltage adj. | Output Power |
|---|---|---|
| TSP–REM360 | 24 VDC (24 – 27 VDC) | 360 W |
| TSP–REM600 | | 600 W |

TSP-REM360
TSP-REM600

TSP-REM datasheet: www.tracopower.com/products/tsp-rem.pdf

### Battery Controller Modules + Batteries:

This module provides a professional battery controller to charge and monitor an external lead-acid battery. Together with a power supply of the TSP series and a battery pack a perfect DC-UPS system can be configured. This module provides:

- Battery protection for over voltage, deep discharge, short circuit and reverse connection
- Remote On/Off for battery and power supply
- Alarm outputs for input, output and battery condition
- Controlled end of charge voltage by temperature sensor
- Redundant inputs for two indepedant sources **(TSP-BCMU360 only)**

**Models**

| Order Code | Output Voltage | Output Power |
|---|---|---|
| TSP-BCM12 | 12 VDC | 180 W |
| TSP–BCM24 | 24 VDC | 360 W |
| TSP-BCM24A | | 600 W |
| TSP–BCM48 | 48 VDC | 360 W |
| TSP-BCM48A | | 600 W |
| TSP-BCMU360 | 24/48 VDC | 360 W |

TSP-BCM12
TSP-BCM24
TSP-BCM48

TSP-BCM24A
TSP-BCM48A

TSP-BCMU360

TSP-BCM datasheet: www.tracopower.com/products/tsp-bcm.pdf
TSP-BCMU datasheet: www.tracopower.com/products/tsp-bcmu.pdf

### Buffer Module:

This module will maintain the output voltage of a 24VDC power supply during typical mains faults, short time blackouts or voltage dips of up to ten full 50Hz cycles. During this buffer period no deterioration of the 24VDC output voltage will occur. This module provides:

- Capacitor bank for energy storage, no battery needed!
- Maintenance free, long lifetime, high performance also at low temperature.
- Guaranteed Hold-up-time 200ms/25A to 4s/1.2A max.
- Output 24 to 28VDC, 600W max.
- Active ready and inhibit signals

**Models**

| Order Code | Output Voltage | Output Power |
|---|---|---|
| TSP–BFM24 | 24 – 28VDC | 600 W |

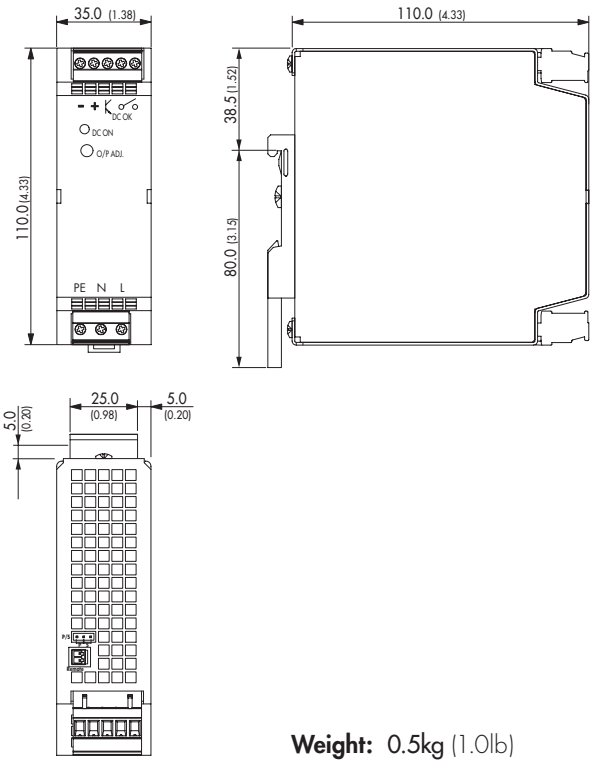
TSP-BFM24

TSP-BFM datasheet: www.tracopower.com/products/tsp-bfm.pdf

## Outline Dimensions

**Models:**
**TSP 070/090**

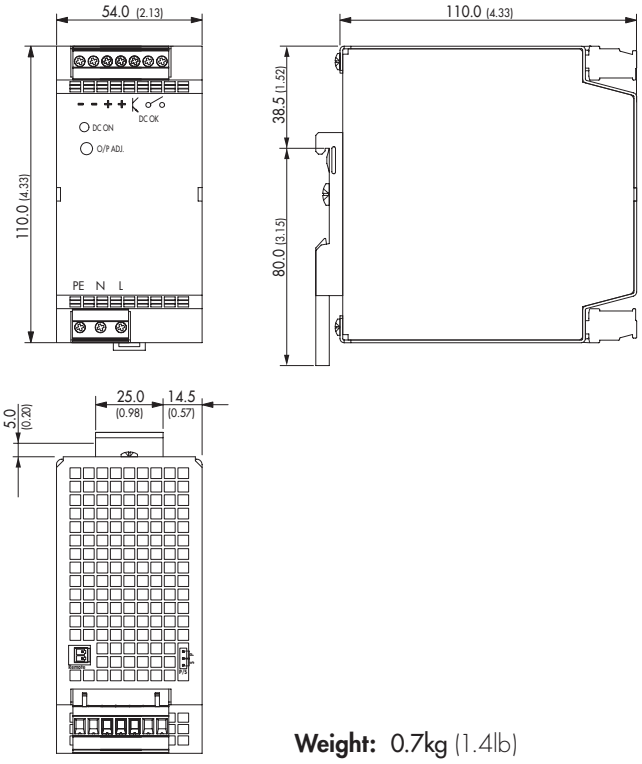
Fuction Modules:
TSP-REM360
TSP-BCM12
TSP-BCM24
TSP-BCM48




**Weight:** 0.5kg (1.0lb)

**Models:**
**TSP 140/180**

Fuction Modules:
TSP-REM600
TSP-BCM24A
TSP-BCM48A
TSP-BCMU360
TSP-BFM24

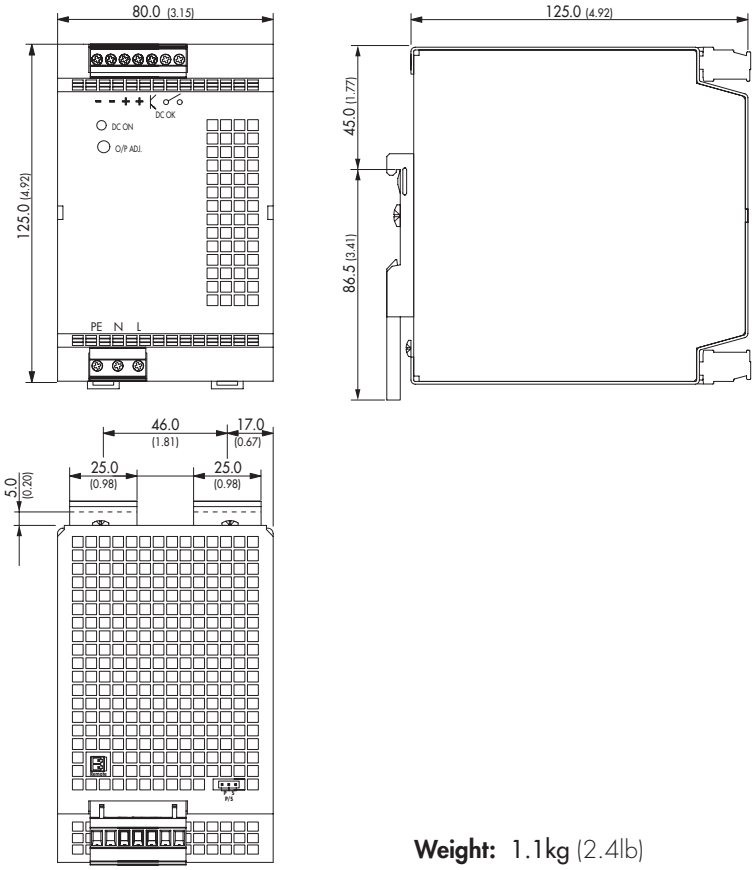



**Weight:** 0.7kg (1.4lb)

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

## Outline Dimensions

**Models:**
**TSP 360**

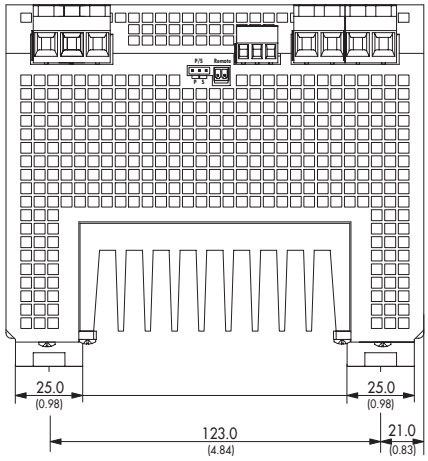


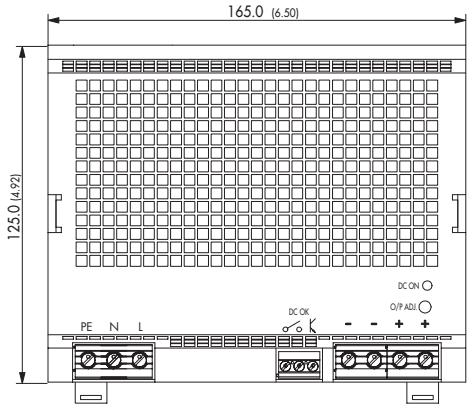

**Weight:** 1.1kg (2.4lb)

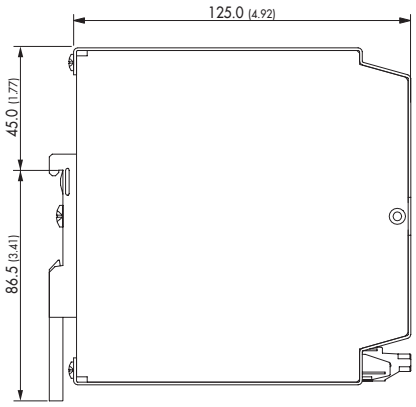
Dimensions in [mm], () = inch
Tolerances: ±0.5 mm (±0.02)

## Outline Dimensions

**Models:**
**TSP 600**



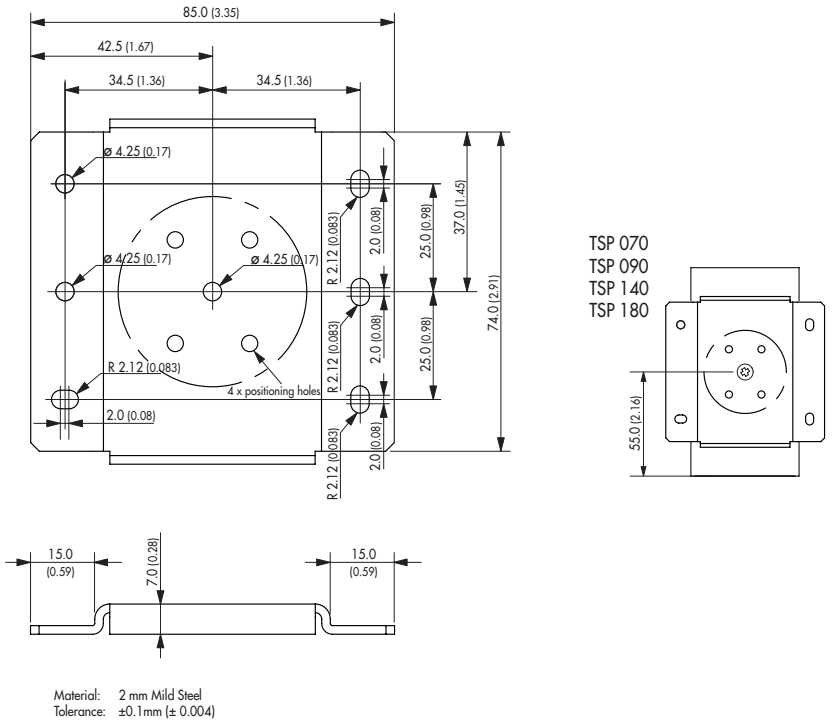

**Weight:** 2.8kg (6.0lb)

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

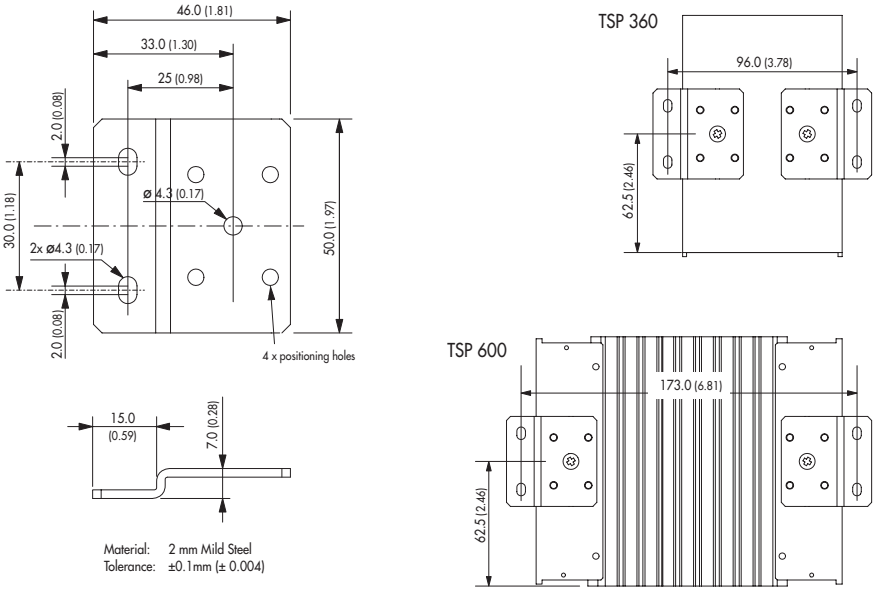
## TSP–WMK Wall Mounting Bracket

| Ordercode of Kit | For Models | Content of Kit |
|---|---|---|
| TSP-WMK03 | TSP 070, TSP 090, TSP 140, TSP 180 | 1 bracket |
| TSP-WMK02 | TSP 360, TSP 600 | 2 brackets |

**TSP-WMK03**




**TSP-WMK02**




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

Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

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