

INSTALLATION INSTRUCTIONS

TSP-EX Series Industrial Power Supply for Hazardous Locations

Order Code	* AC-Input Voltage Range	Output Power max.	** Output	*** Output Voltage Adjustment Range	recommended Circuit breaker (Characteristic B)
TSP 070-112 EX	100Vac – 240Vac Universal Input 85Vac – 263Vac 50 / 60Hz	72 Watt	12.0VDC / 6.00A	12.0 – 14.0VDC	6 - 16A
TSP 090-124 EX		90 Watt	24.0VDC / 3.75A	24.0 – 28.0VDC	
TSP 090-148 EX		96 Watt	48.0VDC / 2.00A	48.0 – 56.0VDC	
TSP 140-112 EX	115VAC / 230VAC Autorange 85VAC – 132VAC 187VAC – 264VAC 50 / 60Hz	144 Watt	12.0VDC / 12.0A	12.0 – 14.0VDC	
TSP 180-124 EX		180 Watt	24.0VDC / 7.5A	24.0 – 28.0VDC	
TSP 180-148 EX		192 Watt	48.0VDC / 4.00A	48.0 – 56.0VDC	
TSP 360-124 EX		360 Watt	24.0VDC / 15.0A	24.0 – 28.0VDC	10 - 16A
TSP 360-148 EX		360 Watt	48.0VDC / 7.50A	48.0 – 56.0VDC	
TSP 600-124 EX		600 Watt	24.0VDC / 25.0A	24.0 – 28.0VDC	16 – 25A
TSP 600-148 EX		600 Watt	48.0VDC / 12.5A	48.0 – 56.0VDC	

* Observe output current derating at operation below an input voltage of 110VAC

** Maximum output current at $V_{out\ nom}$

*** Adjustable by potentiometer with a screwdriver.

Input current:	@ Vin=115VAC	@ Vin=230VAC	Power Consumption	@ Vin=115VAC	@ Vin=230VAC
➤ TSP 070	2.0A typ.	1.0A typ.	➤ TSP 070	95 Watt typ.	93 Watt typ.
➤ TSP 090	2.1A typ.	1.0A typ.	➤ TSP 090	106 Watt typ.	105 Watt typ.
➤ TSP 140	2.5A typ.	1.4A typ.	➤ TSP 140	175 Watt typ.	173 Watt typ.
➤ TSP 180	2.8A typ.	1.5A typ.	➤ TSP 180	209 Watt typ.	207 Watt typ.
➤ TSP 360	5.0A typ.	2.5A typ.	➤ TSP 360	425 Watt typ.	412 Watt typ.
➤ TSP 600	10.0A typ.	5.0A typ.	➤ TSP 600	690 Watt typ.	670 Watt typ.

Operating temperature range: Natural Air Convection Cooling	-25°C – +70°C max -13°F – +158°F max				
Output Power Derating: above +40°C up to +50°C [above 104°F up to 122°F] $P_{out\ max}$ at +50°C [122°F]	TSP 070-112 EX ➔ 1.0%/K	$P_{out\ max} = 90\%$	TSP 180-148 EX ➔ 1.5%/K	$P_{out\ max} = 85\%$	
	TSP 090-124 EX ➔ 1.5%/K	$P_{out\ max} = 85\%$	TSP 360-124 EX ➔ 1.5%/K	$P_{out\ max} = 85\%$	
	TSP 090-148 EX ➔ 1.5%/K	$P_{out\ max} = 85\%$	TSP 360-148 EX ➔ 1.5%/K	$P_{out\ max} = 85\%$	
	TSP 140-112 EX ➔ 1.0%/K	$P_{out\ max} = 90\%$	TSP 600-124 EX ➔ 0.8%/K	$P_{out\ max} = 92\%$	
	TSP 180-124 EX ➔ 1.5%/K	$P_{out\ max} = 85\%$	TSP 600-148 EX ➔ 0.8%/K	$P_{out\ max} = 92\%$	
above +50°C up to +60°C [above 122°F up to 140°F] $P_{out\ max}$ at +60°C [140°F]	TSP 070-112 EX ➔ 1.2%/K	$P_{out\ max} = 78\%$	TSP 180-148 EX ➔ 2.0%/K	$P_{out\ max} = 65\%$	
	TSP 090-124 EX ➔ 2.0%/K	$P_{out\ max} = 65\%$	TSP 360-124 EX ➔ 2.0%/K	$P_{out\ max} = 65\%$	
	TSP 090-148 EX ➔ 2.0%/K	$P_{out\ max} = 65\%$	TSP 360-148 EX ➔ 2.0%/K	$P_{out\ max} = 65\%$	
	TSP 140-112 EX ➔ 1.2%/K	$P_{out\ max} = 78\%$	TSP 600-124 EX ➔ 1.2%/K	$P_{out\ max} = 80\%$	
	TSP 180-124 EX ➔ 2.0%/K	$P_{out\ max} = 65\%$	TSP 600-148 EX ➔ 1.2%/K	$P_{out\ max} = 80\%$	
above +60°C up to +70°C [above 140°F up to 158°F] $P_{out\ max}$ at +70°C [158°F]	TSP 070-112 EX ➔ 2.5%/K	$P_{out\ max} = 53\%$	TSP 180-148 EX ➔ 2.0%/K	$P_{out\ max} = 45\%$	
	TSP 090-124 EX ➔ 2.0%/K	$P_{out\ max} = 45\%$	TSP 360-124 EX ➔ 2.0%/K	$P_{out\ max} = 45\%$	
	TSP 090-148 EX ➔ 2.0%/K	$P_{out\ max} = 45\%$	TSP 360-148 EX ➔ 2.0%/K	$P_{out\ max} = 45\%$	
	TSP 140-112 EX ➔ 2.5%/K	$P_{out\ max} = 53\%$	TSP 600-124 EX ➔ 3.5%/K	$P_{out\ max} = 45\%$	
	TSP 180-124 EX ➔ 2.0%/K	$P_{out\ max} = 45\%$	TSP 600-148 EX ➔ 3.5%/K	$P_{out\ max} = 45\%$	
Load Derating all models	$P_{out\ max} = 55\%$ @ $V_{in} = 85Vac$ and $P_{out\ max} = 90\%$ @ $V_{in} = 90Vac$				
Storage temperature range:	-25°C – +85°C max / -13°F – +185°F max				
Parallel Operation:	Up to 5 power supplies possible. User selectable standard mode and parallel mode by jumper on PCB.				
Connections:	Crimp Terminal Housing: Molex KK-22-01-3027 Crimp Terminal: Molex KK-08-50-0032 Wire Size: 0.06mm ² - 0.3mm ² (AWG30..22)				
Case material:	Aluminium (chassis) and Zinc-plated steel (cover)				

Safety Instructions:

- Before installation read these instructions carefully and completely. This installation instruction cannot account for every possible condition of installation, operation or maintenance. Further information can be obtained from your local distributor office or from the product datasheet, which can be downloaded from our website: <http://www.tracopower.com/products/tsp.pdf>. More detailed information you will find at the TSP Instruction Manual which can also be downloaded from our website: http://www.tracopower.com/products/tsp_manual.pdf.
- The mains supply voltage connection, must be in accordance to IEC 62103, EN 50178 and IEC 60364, VDE100.
- Before any installation, maintenance or modification work ensure that the main switch is switched off and prevented from being switched on again. Non-observance, touching of any live components or improper handling of this power supply can result in death, severe personal injury or substantial property damage. Proper and safe operation is dependent on proper storage, handling, installation and operation.
- Compliance with the relevant national regulations (in the USA, Europe and other countries) must be ensured. Before operation is started the following conditions must be ensured:
 - ❖ Connection to mains supply in compliance with national regulations (e.g. VDE0100 and EN50178).
 - ❖ By use of stranded wires, all strands must be fastened in the terminal blocks. (Potential danger of contact with the case)
 - ❖ Power supply and mains cable must be sufficiently fused.
 - ❖ Degree of protection = I according to IEC536. The non-fused protective earth connection must be connected to the FG terminal (Protection Class I).
 - ❖ All output wires must be rated for the power supply output current and must be connected with the correct polarity.
 - ❖ Sufficient cooling must be ensured.
- **Never work on the power supply if power is supplied!** Risk of electric arcs and electrical shock, which can cause death, severe personal injury or substantial property damage.
- **Warning:** Hazardous voltages and components storing a very substantial amount of energy are present in this power supply during normal operating conditions. However, these are inaccessible. Improper handling may result in an electric shock or serious burns! **Do not open the power supply until at least 5 minutes after it has been disconnected from the mains on all poles.**
 - ❖ Only trained personnel may open the power supply.
 - ❖ Do not introduce any objects into the power supply. The output voltage adjustment potentiometer may only be actuated using an insulated screwdriver.
 - ❖ Keep away from fire and water.
 - ❖ Class I Equipment (Chassis earthed)
 - ❖ Do not operate voltage adjustment when an explosive atmosphere may be present
 - ❖ Do not disconnect while circuit is alive, unless area is known to be non-hazardous.

Installation Instructions:

- This power supply is designed for professional indoor systems in hazardous locations. In operation the power supply must not be accessible. It may be installed and put into service by qualified personnel only.
- Do not operate without PE connection! To comply with EMC and safety standards (CE mark and approvals) the power supply must be operated only if PE terminal is connected to the non-fused earth conductor.
- The correct mounting position for optimal cooling performance must be observed. **Do not cover any ventilation holes.** Leave a free space of minimum 80mm (3.15in.) above and below the power supply as well as 50mm (1.97in) on each side. Observe power derating.
- The internal fuse is not accessible, as it may not be replaced by the user. If this internal fuse has blown, the power supply has most properly an internal defect and, for safety reasons, must be shipped to the local distributor. In case this internal fuse has to be replaced in the field, replace only with same type and rating of fuse for continued protection against risk of fire.
- To comply with the ATEX directive following installation instructions have to be observed.
 1. These power supplies are constructed in accordance with the safety requirements of EN60079-0:2009 & EN60079-15:2010, Ex nA nC IIC T4 or T3 Gc.
 2. The Series TSP xxx-1xx EX power supplies units must be installed in switch cabinets or protective housings that meet the requirements of EN 60079-15 or, if applicable, EN 60079-0 (housing protection type min. IP54)
 3. For T3 the permissible ambient temperature range is -20°C to +70°C [-4°F to 158°F]. Observe load derating above an operating temperature of +40°C [104°F] and at a use at $V_{in} = 85V_{ac} - 93V_{ac}$.
 4. For T4 the permissible ambient temperature range is -20°C to +40°C [-4°F to 104°F].
 5. For installation in switch cabinets or in protective housings, it must be ensured that the stipulated maximum temperatures (T_a) are not exceeded on Series TSP xxx-1xx EX power supply units.
 6. When assembling and maintenance the pluggable terminals it always must be completely pushed in. In particular the snap-in locking devices at the pluggable terminals are to be examined for correct locking. Terminals with defective snap-in locking devices may not be used.
 7. The Series TSP xxx-1xx EX power supply units are Unit Group II Category 3G components (ex components) as defined by RL2014/34/EU (ATEX 95) Appendix I. A separate conformity on the end-equipment which contains these components evaluation process must be performed.
 8. For use / Installation also the requirements defined in EN 60079-14 must be observed.
- **Note:** This unit contains an automatic input voltage selection switch. Do not change the input voltage from 110/115Vac to 230/240Vac without disconnecting the input supply line first.
- **Recycling:** The unit contains elements that are suitable for recycling, and components that need special disposal. You are therefore requested to make sure that the power supply will be recycled environment friendly at the end of its service life.