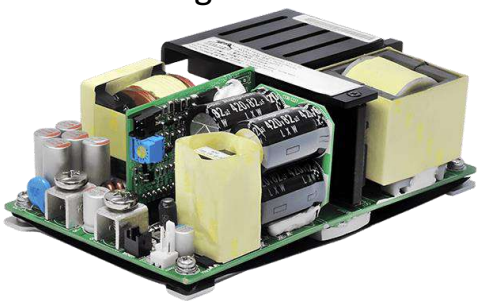
AC/DC 750W Switching Power Supply

Model: TN24 -0750-XX-L(LF)

Product image



Safety Mark

cULus UKCA CE CB RoHS

FEATURES

- Universal 90 - 264VAC or 127 - 373VDC input voltage.
- Operating ambient temperature range: -40°C to +70°C.
- Built-in active PFC function.
- Output short circuit, over-current, over-voltage protection, Over-temperature protection.
- 400W with convection cooling, 750W with forced air cooling (25CFM).
- High efficiency up to 95%.
- PG signal and remote sensing function.
- High power density, compact size: 5”x3”x1.34” (above PCB).
- Operating altitude up to 5000m.
- Safety according to IEC62368, IEC60335, IEC61558.
- Suitable for Household and Similar Electrical Appliances, Industrial and Networking PoE Switching equipment.

Models & Ratings

Model No.	Cooling Method	Rated Power (W)	Output Voltage/ Current	Output Voltage Adjustable Range (V)	Efficiency at 230VAC (%) Typ.	Cap. Load Max. (µF)
TN24-0750-12	Natural Convection	400	12V / 33.3A	11.4 -12.6	92	5600
	Forced air Cooling	700	12V / 58.3A			
TN24-0750-18	Natural Convection	400	18V / 22.2A	16.2-18.9	93	3300
	Forced air Cooling	700	18V / 38.8A			
TN24-0750-24	Natural Convection	450	24V/18.8A	22.8 - 25.2	94	3300
	Forced air Cooling	750	24V/31.2A			
TN24-0750-36	Natural Convection	450	36V / 12.5A	34.2 - 37.8	94.5	2200
	Forced air Cooling	750	36V / 20.8A			
TN24-0750-42	Natural Convection	450	42V / 10.7A	39.9 – 44.1	94.5	2200
	Forced air Cooling	750	42V / 17.8A			
TN24-0750-48	Natural Convection	450	48V / 9.3A	45.6 - 50.4	95	1600
	Forced air Cooling	750	48V / 15.6A			
TN24-0750-54	Natural Convection	450	54V / 8.3A	51.3 - 56.7	95	1200
	Forced air Cooling	750	54V / 13.9A			

Rated Power :
The total power output of the power supply should not exceed its rated power. This is crucial because exceeding the rated power can lead to overheating, damage, or reduced lifespan of the power supply.

Output Voltage/ Current :
If the output voltage is increased, the total power should not exceed the rated power. This implies that if you raise the voltage, the current must be reduced accordingly to ensure the product's power rating is not exceeded.

Conversely, if the output voltage is decreased, the current should not exceed the rated output current. This is because lowering the voltage while maintaining a high current could push the power beyond the rated maximum.

Efficiency at 230VAC (%) :
Load efficiency is calculated as the ratio of output power to input power (At 230VAC Input). When the fan is powered externally, the input power for the efficiency calculation does not include the fan's power draw.

Model No. :
1. TN24-0750-XX open frame series is also available, named TN24-0750-XX.

2. 25 CFM for External Fan (TN24-0750-XX-L Series): The "25 CFM" (Cubic Feet per Minute) refers to the airflow rate of an external fan associated with the TN24-0750-XX-L series. This means that if you are using an external fan with this series, it should provide an airflow of 25 CFM to effectively cool the power supply.

3. 25 CFM for Built-in Fan (TN24-0750-XX-LF Series): In the TN24-0750-XX-LF series, there is a built-in fan that provides the same airflow rate of 25 CFM. This built-in fan automatically activates when the power supply is powered on, ensuring the power supply is cooled properly without requiring an external fan.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		90	-	264	VAC
	DC input		127	-	373	VDC
Input Frequency	-		47	-	63	Hz
Input Current	115VAC & Rated load		-	-	8	Arms
	230VAC & Rated load		-	-	4	
Inrush Current	115VAC	At 25°C, Cold start	-	40	-	A peak
	230VAC		-	80	-	
Power Factor	115VAC & Rated load		0.98	-	-	-
	230VAC & Rated load		0.95	-	-	-
Earth Leakage Current	264VAC/63Hz		-	-	0.5	mA

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage	See Models and Ratings table		12	-	54	VDC
Initial Set Accuracy	115/230VAC, 50% load		-	±1	-	%
Output Voltage Adjustment	-		-	±5	-	%
Minimum Load	-		0	-	-	A
Load Regulation	Output from 0 - 100% load		-	±2	-	%
Line Regulation	Rated load		-	±1	-	%
Ripple & Noise	20MHz bandwidth	0 °C < Ta < 70°C	-	-	1	%
		-20 °C < Ta < 0°C	-	-	1.5	%
Transient Response	Recovery within 1% in less than 500μs for a 50% step load change		-	±5	-	%
Fan Power	Offer output power of 12V/0.5A with fan cooled		-	-	-	-
Turn-on time	115/230VAC rated load from input AC turn on		-	-	2	S
Rise time	10% to 90% of output voltage		10		70	mS
Hold-up Time	At 25°C, 115VAC & 230VAC		10	-	-	mS
Short Circuit Protection	Output shut down and auto recovery		-	-	10	S
Over-current Protection	Output shut down and auto recovery		105	-	135	%
Over-voltage Protection	Output shut down and latch off, manual reset (Re-power on or Re-remote on)		110	-	130	%
Over-temperature Protection	Output shut down and latch off, manual reset (Re-power on or Re-remote on)		-	-	-	-
Remote Sense	When RS+ and RS- are connected to the system, with function of remote voltage compensation, if not needed, left RS+ and RS- open					
5V Standby	5Vsb: The load capacity is 1A convection cooled, the load capacity is 1.5A with fan cooled.					

PG Signal	Power on	The PG signal goes high	-	-	500	ms
	Power off	The PG signal goes low	1	-	-	
	High level	High	2	-	5.25	V
	Low level	Low	0	-	0.8	
Power on/off Control	Power on voltage	PS-ON = High	2	-	5.25	VDC
	Power off voltage	PS-ON = Low	0	-	0.8	

Ripple & Noise :

Please refer to Fig. A for measurement of Vo, line & load regulation and ripple voltage, Ripple and noise is the maximum peak-to-peak voltage value measured at the output with 20MHz bandwidth, at rated line voltage and output load, and with a 100µF electrolytic capacitor in parallel with a 0.1µF ceramic capacitor.

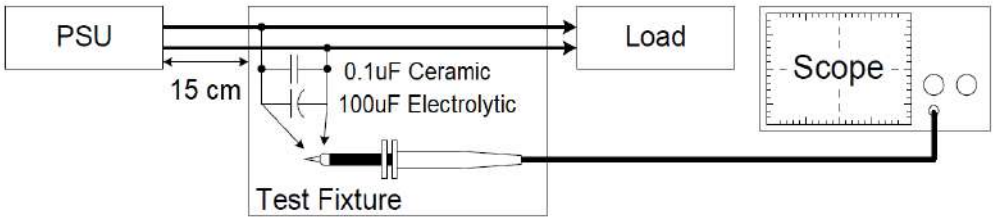


Figure A

Fan Power :

For fan power connection method, please refer to CON601 in the external dimension drawing.

Short Circuit Protection :

Short Circuit Protection: < 10s Indicate that the power supply should be able to recover and return to its normal operating state within 10 seconds after the short circuit condition is cleared.

Hold-up Time :

10mS minimum at 115VAC & 230VAC input and 80% of maximum load.

Over-current Protection :

≥105% Io: The power supply has an overload protection threshold at or above 105% of its rated output current.

Over-voltage Protection :

The power supply disables the output voltage in response to over voltage fault. To recover, the power supply must be turned off and then turned back on, allowing it to reset and resume normal operation if the fault has been resolved.

PG Signal :

The PG signal is used to monitor whether the power supply is working normally. For PG standby connection method, please refer to CON702 in the external dimension drawing.

Power on/off Control :

For PS_ON, 5V standby connection method, please refer to CON706 in the external dimension drawing.

General Specifications

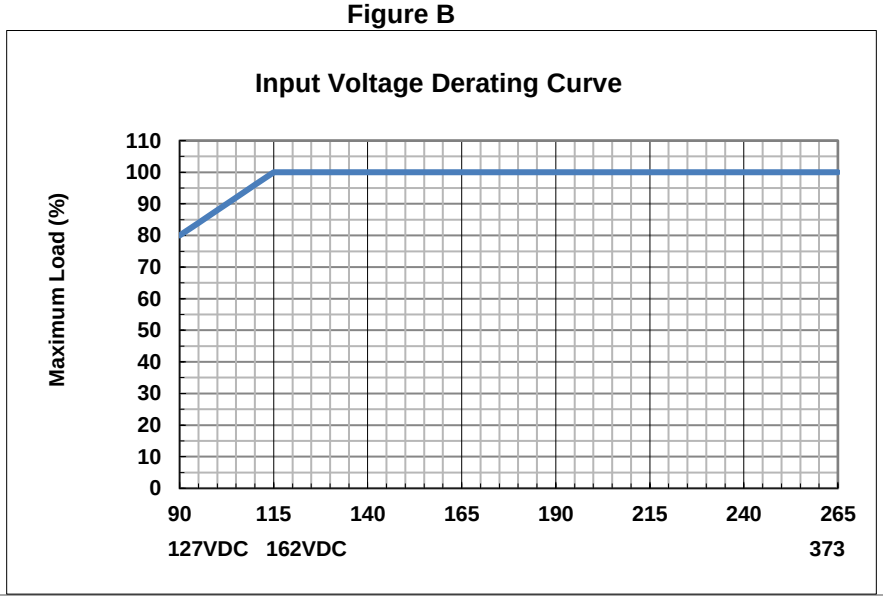
Item		Operating Conditions		Min.	Typ.	Max.	Unit
Operating Temperature		Refer to power de-rating curve		-40	-	+70	°C
Storage Temperature		Non-operation		-40	-	+85	
Operating Humidity		Non-condensing		10	-	90	%
Storage Humidity				5	-	95	
Power De-rating	Operating Temperature	Convection cooling 400W/450W	+50°C to +70°C	2.0/1.76	-	-	%/°C
		Forced cooled 700W/750W	+50°C to +70°C	2.15/2.0	-	-	
	Input voltage	90VAC – 115VAC		0.8	-	-	%/VAC
		127VDC – 162VDC		0.8	-	-	%/VDC
Dielectric Strength test	Input - output	Reinforced		4000	-	-	VDC
	Input - Case	Basic		2500	-	-	
	output - Case			500	-	-	
Insulation Resistance		Input – Case, 500VDC 1min. at 25°C and 70% RH		100	-	-	MΩ
Switching Frequency		PFC (multimode)		25	65	130	KHz
		LLC (main power)		60	100	150	
Mean Time Between Failure		At 100VAC/60Hz full load 25°C, Telcordia SR332, issue4.		900,000	-	-	Hrs.

Power De-rating :

Input voltage de-rating curve, refer to Fig. B and temperature de-rating curve, refer to Fig. C & D.

a. The AC Input voltage: de-rate linearly from 100% load at 115VAC to 80% load at 90VAC.
b. The DC Input voltage: de-rate linearly from 100% load at 162VDC to 80% load at 127VDC.
c. 24-54V forced-cooled > 25 CFM: de-rate linearly from 100% load at +50 °C to 60% load at +70 °C.
d. 12V-18V forced-cooled > 25 CFM: de-rate linearly from 100% load at +50 °C to 57% load at +70 °C.
e. 24-54V convection-cooled: de-rate linearly from 53% load at +45 °C to 30% load at +70 °C.
f. 12V-18V convection-cooled: de-rate linearly from 57% load at +45 °C to 29% load at +70 °C.

Figure B



Input Voltage VAC/VDC

Temperature De-rating Curve

TN24-0750-12/18
(full load 700W with 25CFM)

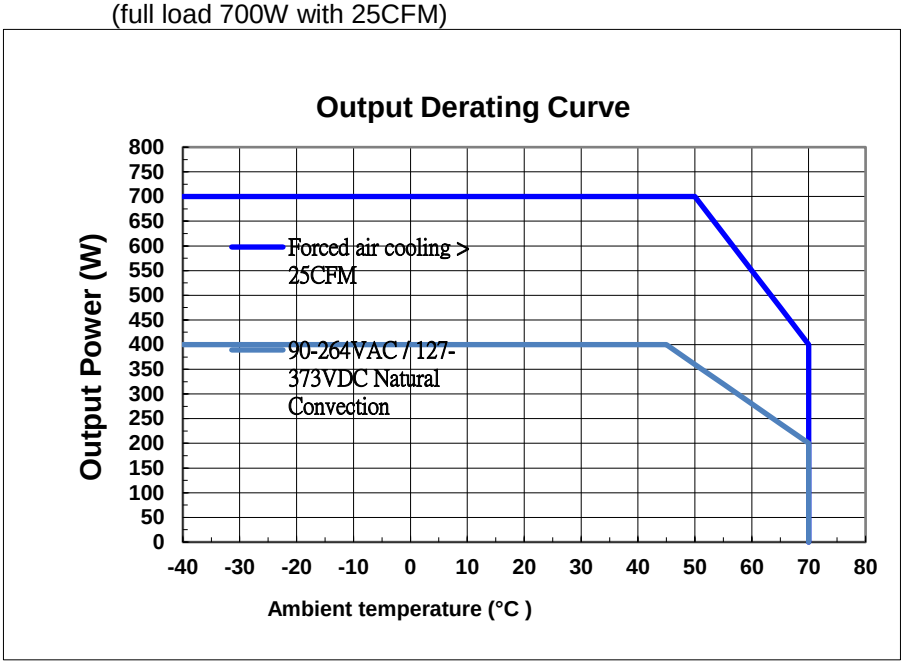


Figure C

Temperature De-rating Curve

TN24-0750-24//36V/42/48/54
(full load 750W with 25CFM)

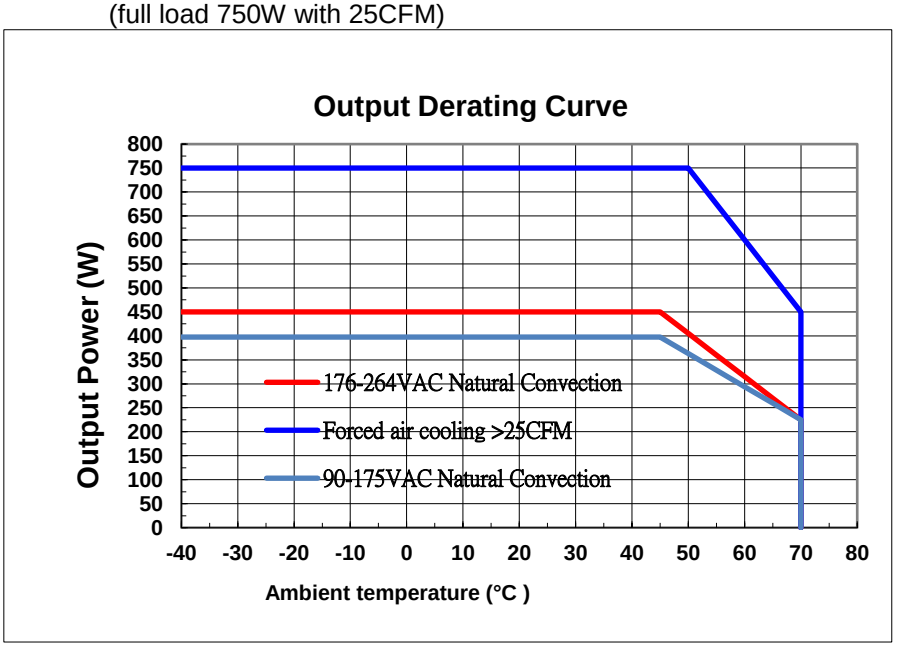


Figure D

Dielectric Strength test :
Safety electric strength test for 3 seconds, leakage current < 10mA.

Altitude :
For every 305 meters of altitude increase, the operating ambient temperature needs to be decreased by 1°C.

Safety Approvals

Safety Standard	12V/18V/24V/36V/42V/48V/54V	UL/cUL UL62368-1, 3rd Edition. CB IEC62368 3rd Edition. IEC61558-1. IEC60335
Safety Class		Class I

Electromagnetic Compatibility (EMC)

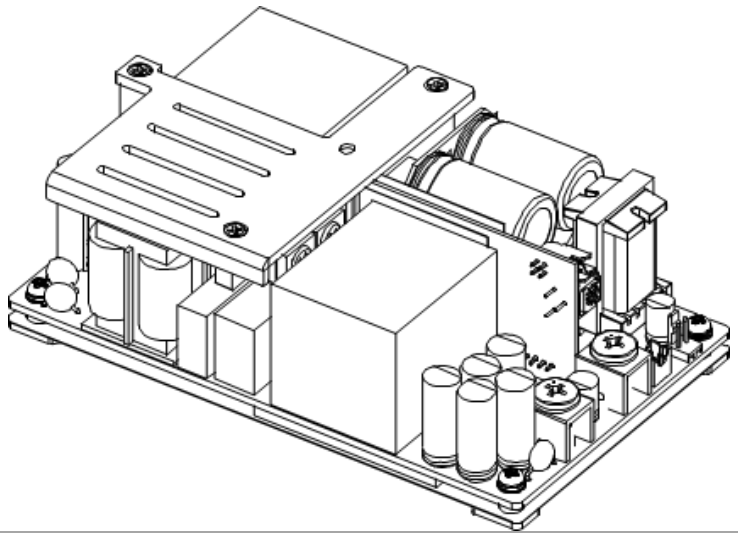
Emissions	CE	EN55032(CISPR32) CLASS A With external core (K5B T25X12X15 in input Cable), Class B	
	RE	EN55032(CISPR32) CLASS A With external core (K5B T25X12X15 in input Cable), Class B	
	Harmonic Current	IEC/EN61000-3-2 CLASS A and CLASS D	
	Flicker	IEC/EN61000-3-3	
Immunity	ESD	IEC61000-4-2 Contact +/- 8KV; Air discharge +/-15KV	Criteria A
	RS	IEC61000-4-3 10V/m.	Criteria A
	EFT	IEC61000-4-4 +/- 2KV.	Criteria A
	Surge	IEC61000-4-5, Line to Line +/-2KV; Line to Earth +/-4KV	Criteria A
	CS	IEC61000-4-6	Criteria A
	DIP	IEC61000-4-11 0%, 70%	Criteria B

The power supply should be considered a part of the system component. All EMC tests will install the test samples on a metal enclosure dummy load for testing. The power supply needs to be confirmed for electromagnetic compatibility in conjunction with the terminal equipment.

Dimensions and Recommended Layout

Item	Value	Unit
Weight (Typ.)	TBD	g
Size (L x W x H)	127 x 76.2 x 41 (Refer to outline drawing)	mm

Outline Drawing:

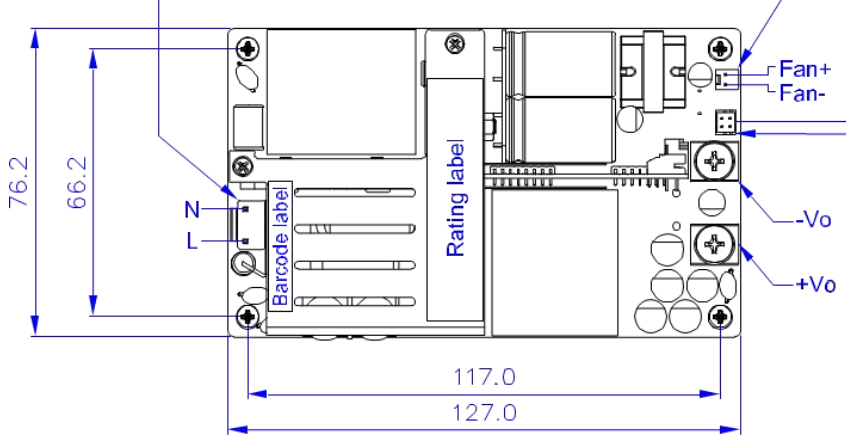


CON1

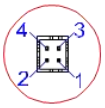
Input Connector	Mates Housing
JWT A3963WV2-3P(N2) WST M3-I39606S(3PN2) TKP PVHI-03N2	JWT A3963H02-3P(N2) WST M3-I39606S(3PN2) TKP HVH-03N2

CON601

Output Connector	Mates Housing
JWT A2508WV0-2P TKP 8812-02(LF)	JWT A2508H00-2P TKP 8811-02(LF)

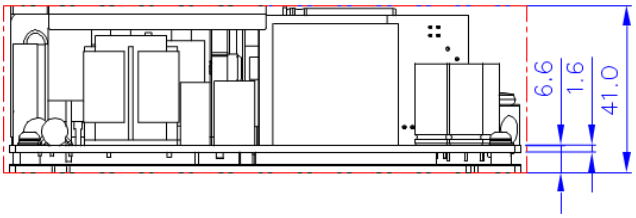


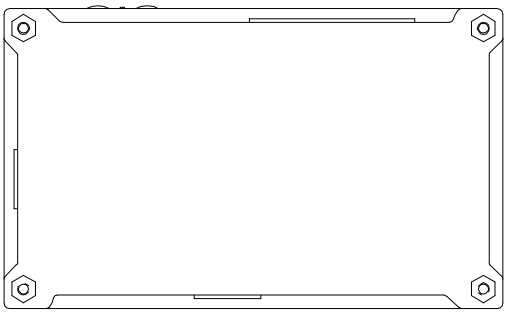
1 +5Vsb, 2 SGND
3 PS-ON, 4 SGND

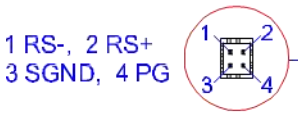


CON706

Output Connector
WST MD4-I20003 TKP DH2I-2x2 MOST WELL 2WF2VD-203602MT23A01
Mates Housing
WST MD4-I20003PS TKP DH2-2x2-01 MOST WELL 2HG2CT-203202NP21A01







CON702

Input Connector	Mates Housing
WST MD4-I20003R TKP DH2L -2x2 MOST WELL 2WF2HD-210602T111A01	WST MD4-I20003PS TKP DH2-2x2-01 MOST WELL 2HG2CT-210202NP21A01