175W AC/DC Switching Power Supply
Model: TG23-0175-01



FEATURES

- Universal 85-264VAC input voltage.
- Built-in active PFC function.
- 200 W Peak Capability.
- 110 W Convection-cooled, 175 W with forced air cooling.
- Dual output, High efficiency up to 89.9%.
- High power density, compact size: 5.71”x3.9”x1.62”.
- Operating ambient temperature range: -10°C to +70°C.
- Output short circuit, over-current, over-voltage protection, over-temperature protection.
- Operating altitude up to 5,000m.
- Remote Function: Remote On/Off, Remote Sense, Power Fail Signal.
- Safety according to IEC62368-1.

Models & Ratings

Model No.	Cooling Method	Peak Power (W) (1)	Rated Power (W) (1)	V1 Output Voltage/ Current	V2 Output Peak Current (1)	V2 Output Voltage/ Current	Efficiency Typ. (2)
TG23-0175-01	Convention Cooling	-	110	5V / 9.42A	-	12V / 5.23A	89.9
	Forced Air Cooling (4)	200	175	5V / 15A	12V / 10.4A	12V / 8.34A	

Notes:
1.Under any conditions, the total power of the product should not exceed the rated power.
Peak rating can be taken for 5 seconds in every minute. Average power not to exceed maximum power.

2.When measuring full-load efficiency (typical values are measured at 230VAC input and 175W load), the fan should be connected to an external power supply.

3.The equipment tested with forced air cooling fan min 11.3 CFM outwardly and installed in final system, see below figure A for details.
Disclaimer:
The force air flow and structural diagrams are for reference only of the PSU standalone safety declaration, actual requirements should be based on system configuration and measurement of component temperature rise.

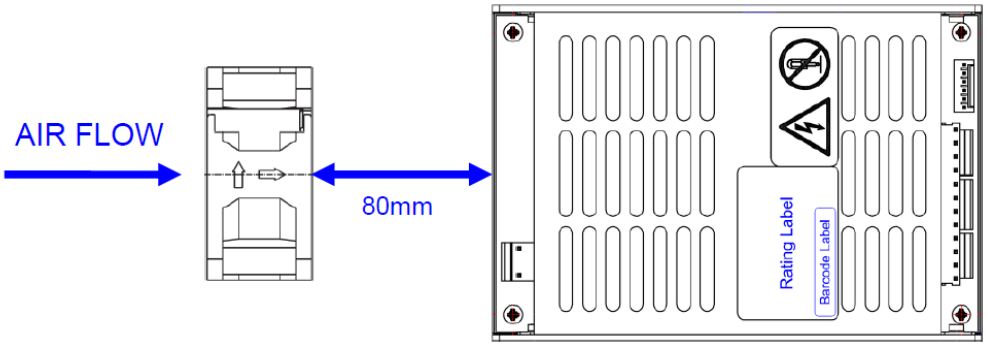


Figure A.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	Input voltage (Refer to power derating curve)		85	100-240	264	VAC
Input Frequency	-		47	50-60	63	Hz
Input Current	115VAC & Maximum load		-	-	2.0	Arms
	230VAC & Maximum load		-	-	0.9	
Inrush Current	115VAC	At 25°C, Cold start	-	-	17	A peak
	230VAC		-	-	35	
Power Factor	115VAC & Maximum load		0.95	-	-	-
	230VAC & Maximum load		0.90	-	-	-
Earth Leakage Current	264VAC/63Hz		-	-	0.75	mA

V1_5V Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage	-	4.75	5	5.25	VDC
Initial Set Accuracy	115/230VAC, 50% load	-	±1	-	%
Output Load	-	0	-	15	A
Line Regulation	90 - 264VAC, constant load	-	±1	-	%
Load Regulation	Output from 0 - 100% load	-	±2	-	%
Ripple & Noise (4)	Oscilloscope Bandwidth : 20MHz	-	-	1	%
Transient Response	50-75% and 75-50% load step, 1A/µsec slew rate	-	±5	-	%
Turn on Delay Time	115/230VAC Maximum load from input AC turn on	-	-	1	S
Rise Time	Full load, 10% to 90% of output voltage	-	-	50	mS
Hold-up Time	At 25°C, 115VAC & Maximum load, 90% of output voltage	20	-	-	mS
Over-voltage Protection	Output shut down and latch off	110	-	130	%
Over-current Protection (5)	Output shut down and auto recovery	110	-	135	%
Short Circuit Protection	Output shut down and latch off	-	-	-	-

V2_12V Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage	-	11.4	12	12.6	VDC
Initial Set Accuracy	115/230VAC, 50% load	-	±1	-	%
Output Load	-	0	-	8.34	A
Line Regulation	90 - 264VAC, constant load	-	±1	-	%
Load Regulation	Output from 0 - 100% load	-	±2	-	%
Ripple & Noise (4)	Oscilloscope Bandwidth : 20MHz	-	-	1	%
Transient Response	50-75% and 75-50% load step, 1A/µsec slew rate	-	±5	-	%
Turn on Delay Time	115/230VAC Maximum load from input AC turn on	-	-	1	S
Rise Time	Maximum load, 10% to 90% of output voltage	-	-	50	mS
Hold-up Time	At 25°C, 115VAC & Maximum load, 90% of output voltage	20	-	-	mS
Over-voltage Protection	Output shut down and latch off	110	-	130	%
Over-current Protection (5)	Output shut down and auto recovery	110	-	160	%
Short Circuit Protection	Output shut down and auto recovery	-	-	-	-
Over-temperature Protection (6)	Output shut down and auto recovery	-	-	-	-
Fan Output (7)	Optional	-	-	0.35	A

Remote Signal Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Remote On/Off (8) (9)	Outputs turn off	High level / floated	2.0	-	5.5	VDC
	Outputs turn on	Low level	0	-	0.8	
Remote Sense (8) (10)	5V only, compensates for 10% whichever is lower.		-	10	-	%
PF Signal (8) (11)	Open collector output		-	-	-	-

Notes:

4. Please refer to Figure B to measure Vo, line regulation, load regulation, and ripple voltage. The output voltage is measured at the power supply output terminal.

Ripple and noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a C1: 0.1μF ceramic or film capacitor and C2: 47μF low ESR electrolytic capacitor parallel, After 20 min warm up.

When the ambient temperature is below -20°C, Some specification parameters may not be met, such as ripple and noise.

Ripple & Noise measurement circuit

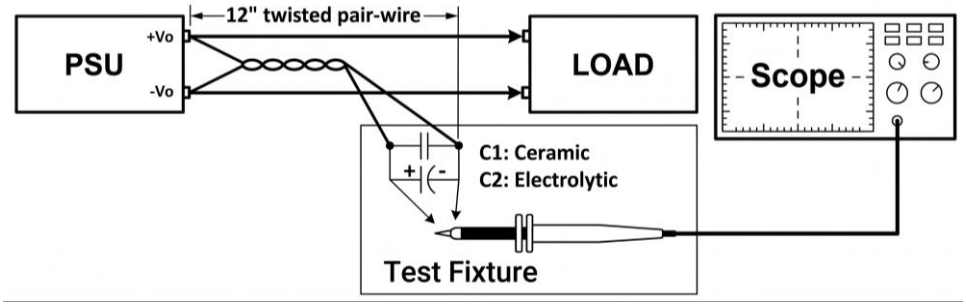


Figure B.

5. The overload current should ramp up from the maximum current or peak current at a minimum rate of 0.1A/100ms. When it detects that it is higher than 110-160 % of the maximum current or peak current, it will shut down and auto recovery.

6. Over Temperature Protection (OTP)

Over temperature shut down function is provided.

When ambient or internal temperature rises abnormally, over temperature protection function operates and output will be shut down. After shut down, please wait for the temperature to return to normal and automatically resume operation or remove the input and cool it down to reset over temperature protection, and then re-input.

Over temperature protection function operates at out of the specification area.

This function may not activate or cannot avoid power supply damage depending on the situation.

7. Fan Supply (Optional)

User-accessible fan supply rated at 12V at 350mA(max).

8. Remote Signal Connector (CON102)

Signal Connector (CON102)	
Pin	Function
1	Remote On/Off
2	(V1) +Sense
3	(V1) -Sense
4	Power Fail Signal

5	Vrtn Fan Supply
6	+12V Fan Supply

9. Remote On/Off Signal

The power supply is turned on by an external TTL (Low level) signal or connect Pin 1 (CON102) to Vrtn (0V), If the remote switch is not connected(or floating) to an external control signal, the power supply will not be turned on.

Remote	Voltage Level	Function
High Level / floated	2.0V - 5.0V	Power Supply Turn-Off
Low Level	0V - 0.8V	Power Supply Turn-On

10. Remote Sense Signal

(V1) +5V only, compensates for 0.5V or 10% whichever is lower, Please refer to Figure C for connection instructions.

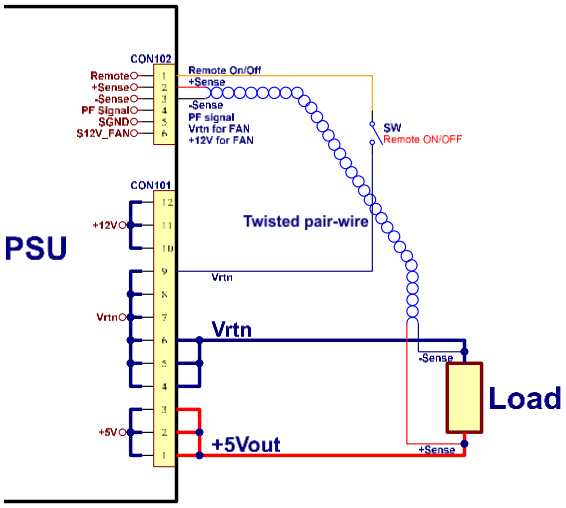


Figure C.

11. Power Fail Signal

Open collector output referenced to 0V sense. When using the power fail signal, -Sense must be connected to Vrtn (0V). Please refer to Figure D for connection instructions.

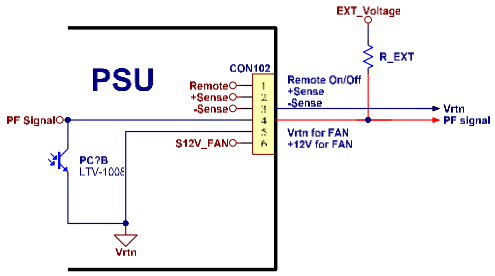


Figure D.

General Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Power density	Compact size: 5.71"x3.9"x1.62"		-	-	4.85	W/In^3
Electrical Strength Test (8)	Input - Output	Electrical strength test for 1 minute, leakage current is less than 10mA.	3,000	-	-	VAC
	Input - FG		1,800	-	-	
	Output - FG		500	-	-	VDC
Insulation Resistance	Input - Output	25±5°C, 70% RH, non-condensing testing voltage 500VDC.	100	-	-	MΩ
	Input - FG		100	-	-	
Mean Time Between Failure	At 100VAC/60Hz full load 25°C, Telcordia SR332, issue4.		500,000	-	-	Hrs.

Notes:
8.The electric strength test of LY production line was conducted for 3 seconds, and the leakage current was less than 10mA.

Environmental Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Operating Temperature (9)	Refer to power de-rating curve		-10	-	+70	°C
Storage Temperature	Non-operation		-40	-	+85	
Operating Humidity	Non-condensing		10	-	90	%
Storage Humidity	Non-operation		5	-	95	
Power De-rating (15)	Operating Temperature	+50°C to +70°C	2.5	-	-	%/°C
	Input voltage	85VAC - 90VAC	1	-	-	%/VAC
Altitude	Operating altitude		-	-	5,000	meter
Vibration	Operating：0.5G, 5 - 500Hz, 10 minutes per cycle, 30 minutes for each X, Y and Z axis.					
Shock	Non-operating (package)：20G, half sin-wave, each per axis.					
Baseplate temperature	When using conduction cooling, max baseplate temperature is 110°C but some components are not thermally connected to the baseplate.					
RoHS	Directive 2011/65/EU, (EU) 2015/863 COMPLIANT.					

Notes:
9. Input voltage and temperature derating curve: Please refer to the derating specifications and curves below.
   a. Input Voltage Derating Curves: Please refer to Figure E.
      Derate linearly from 100% load at 90VAC to 95% load at 85VAC.

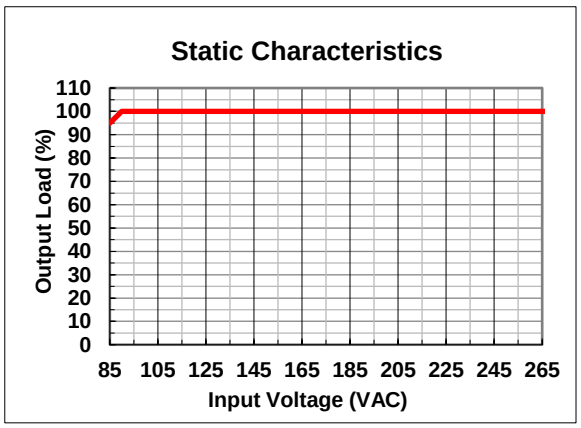


Figure E.

Input voltage (VAC)	Rated output load (%)
90 - 264	100
85	95

b. Temperature Derating Curves: Please refer to Figure F.
1. Forced air cooling: Derate linearly from 100% load at +50 °C to 50% load at +70 °C.
2. Convention cooling: Derate linearly from 62.8% load at +50 °C to 31.4% load at +70 °C.

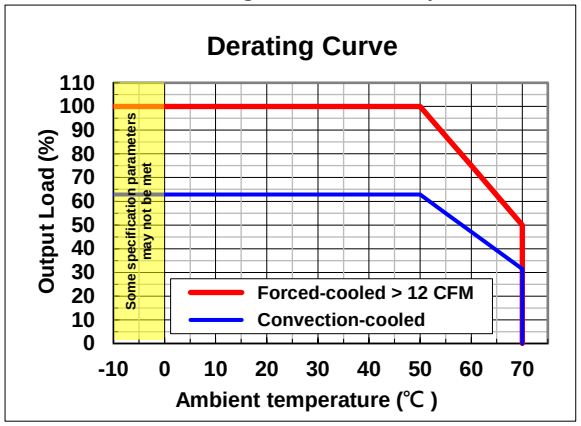


Figure F.

Ambient temperature (°C)	Forced air cooling Rated output load (%)	Convention cooling Rated output load (%)
-10 - +50	100	62.8
+60	75	40
+70	50	31.4

Safety Approvals

Certification	Standard	Notes & conditions
UL	UL/cUL UL62368-1, 3rd Edition	-
TUV	TUV EN62368-1, 3rd Edition	-
CB report	CB IEC62368-1, 3rd Edition	-
Safety Class	Class I only	-

Electromagnetic Compatibility (EMC)

EMC Emissions (16)	Standard		Test level
Conducted	EN55032(CISPR32)		Class B
Radiated	EN55032(CISPR32)		Class B
Harmonic Current	IEC/EN61000-3-2		Class D
Voltage Flicker	IEC/EN61000-3-3		-
EMC Immunity	Standard	Test level	Criteria
ESD	EN61000-4-2	level 4, Contact +/- 8KV; Air discharge +/-15KV	Criteria A
Radiated Susceptibility	EN61000-4-3	level 3, 10V/m	Criteria A
EFT/Burest	EN61000-4-4	level 3, +/- 2KV	Criteria A
Surges	EN61000-4-5	level 3, Com. mode: 2KV, 12 ohm; Diff. mode: 1KV, 2 ohm	Criteria A
CS	EN61000-4-6	level 2,	Criteria A
Magnetic Fields (PFMF)	EN61000-4-8	level 3,	Criteria A
Dips and Interruptions	EN61000-4-11		Criteria B

Note:
16. The power supply should be considered a part of the system component. All EMC tests conducted with the unit installed in a metal enclosure dummy system. The power supply needs to be confirmed for electromagnetic compatibility in conjunction with the terminal equipment.

Dimensions and Recommended Layout

Item	Models	Value	Unit
Weight (Typ.)	-	505 (Ref.)	g
Size (L x W x H)	-	145.0 x 99.0 x 41.0 (Refer to outline drawing)	mm

Outline Drawing: (Unit: mm, Tolerance: ±0.5 mm)

