MDR-480HY

Single Output, Very Compact 480W DIN Rail AC/DC Power Supplies

Key Features:

- 480W Output Power
- 3,000 VAC I/O Isolation
- Universal AC Input
- Takes AC or DC Input
- Ultra Slim Case
- UL Approved
- -25°C to 70°C Operation
- DC OK Relay Contact
- Meets EN 55032 B
- >100 kHour MTBF
- High Efficiency

Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Input

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Range		90		264	VAC
		127		370	VDC
Input Frequency		47		63	Hz
Input Current	See Model Selection Guide				
Power Factor	115 VAC			0.99	
	230 VAC			0.94	
Leakage Current	240 VAC			0.6	mA
Start Up, Full Load	115 VAC			3000	ms
	230 VAC			1500	
Inrush Current, Cold Start	115 VAC		40		A Pk
	230 VAC		80		

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±2.0		%
Line Regulation			±0.5		%
Load Regulation			±1.0		%
Ripple & Noise (20 MHz), See Note 1	24V Output			100	mV p-p
	48V Output			120	
Hold-Up Time	Full Load, 230 VAC		14		ms
Temperature Coefficient			±0.03		%/°C
Over Current Protection		110		150	%IOUT
Short Circuit Protection, See Note 2	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage, See Note 3	Input to Output	3,000			VAC
	Input to Field Ground	2,000			
	Output to Field Ground	500			
	Output to DC OK Relay	500			
Isolation Resistance	500VDC, Input to Output	>100			MΩ
	500VDC, Input to Field Ground				
	500VDC, Output to Field Ground				

EMI **See Page 2**

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-25		+70	°C
Storage Temperature Range		-40		+85	°C
Cooling	Free Air Convection (See Derating Curves on Page 2)				
Humidity, RH, Non-condensing	Working	20		95	%
	Storage	10		95	
Overtemperature Protection	Autorecovery +105°C (±5°C)				

Physical

Size	3.37 x 4.92 x 5.08 in. (See Mechanical Drawing on Page 3)
Weight	56.44 oz (1,600g) (See Mechanical Drawing on Page 3)
Case Material	Aluminum and Steel

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C	100			kHours
Safety Standards	UL61010-1, UL61010-2-201				
Vibration	IEC 60068-2-6, 10-500 Hz, 2G 10 min/1 cycle, 60 min each along X, Y, Z axis				

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Model Selection Guide

Model Number	Input		Output					Over Voltage Protection (VDC) See Note 4	Efficiency % (Typ @ 230 VAC)	Peak Power (W) (3 sec)
	Current (A)		Voltage (VDC)	Adjust Range (VDC)	Current (A)		Power (W)			
	115 VAC	230 VAC			Rated	% Min.				
MDR-480HY-24	5	2.5	24	24.0 - 28.0	20	0	480	29.0 - 33.0	94	720
MDR-480HY-48	5	2.5	48	48.0 - 55.0	10	0	480	56.0 - 65.0	94	720

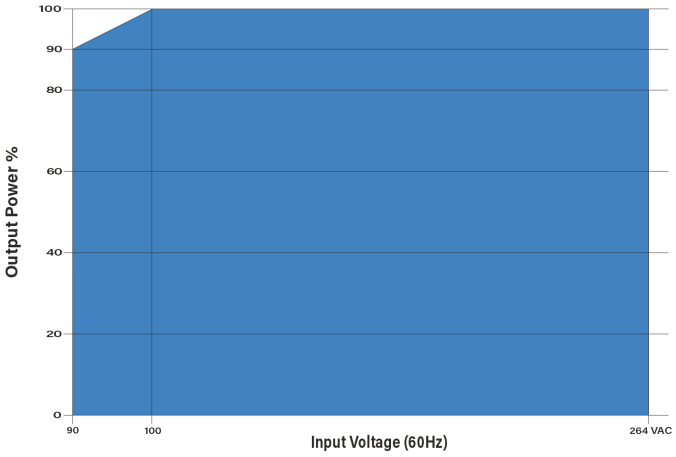
EMI/RFI

Parameter	Standard	Criteria	Level
Radiated Emissions	CISPR 32/EN 55032		B
Conducted Emissions	CISPR 32/EN 55032		B
ESD	EN 61000-4-2	B	±4KV Contact, ±8KV Air
RS	EN 61000-4-3	A	3V/m
EFT	EN 61000-4-4	B	±1KV
Surge	EN 61000-4-5	B	±1KV line to line
	EN 61000-4-5	B	±2KV line to ground
CS	EN 61000-4-6	A	3V.r.m.s
EMC	EN 61000-4-8	A	1A/m
Voltage Dip, Short, Interruption	EN61000-4-11	B	Voltage Dip >95% /30% Interruption >95%

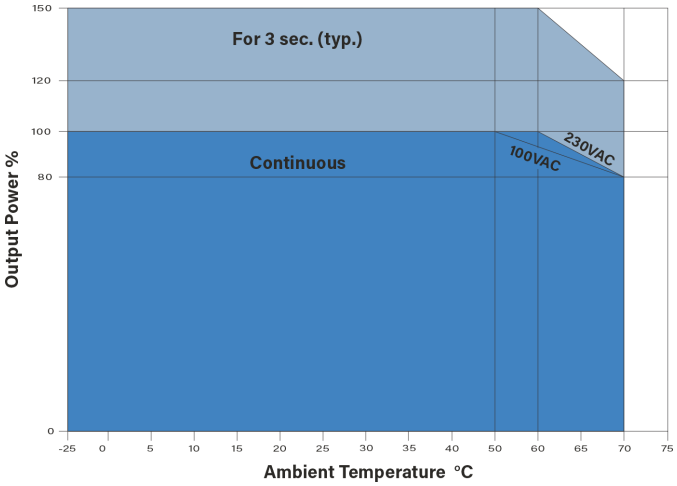
Notes:

1. Output ripple is measured at 20 MHz bandwidth using 0.1 μF and 47 μF capacitors connected in parallel as close to the power supply terminals as possible.
2. Output short circuit protection is provided by constant current limiting until hiccup after 3 seconds. The unit recovers automatically when the fault condition is removed.
4. Protection type: shutdown, recycle input to recover.
5. There is an ambient temperature derating of 3.5°C /1000m for operating higher than 2000m (6500ft).

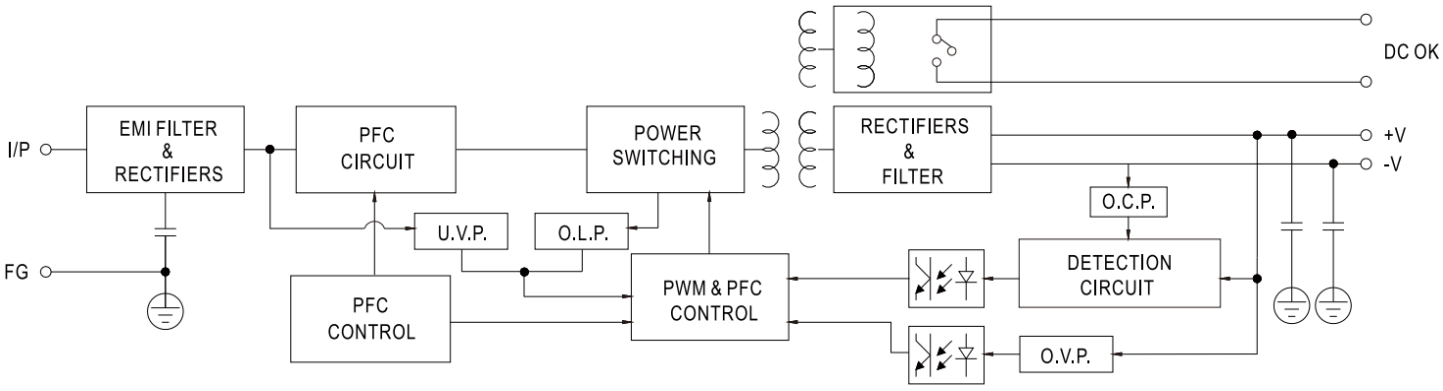
Input Voltage Derating



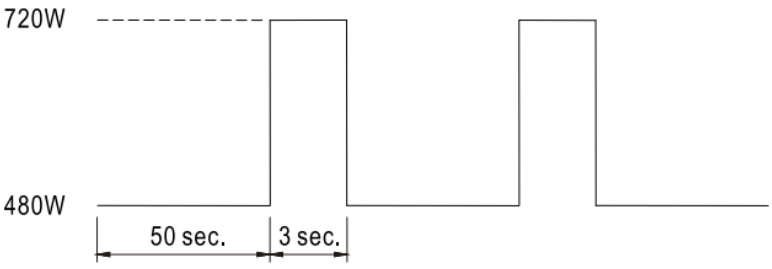
Temperature Derating



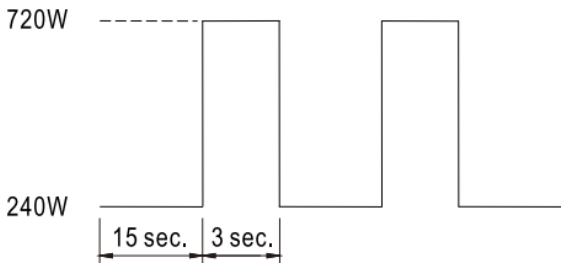
Block Diagram



Peak Loading

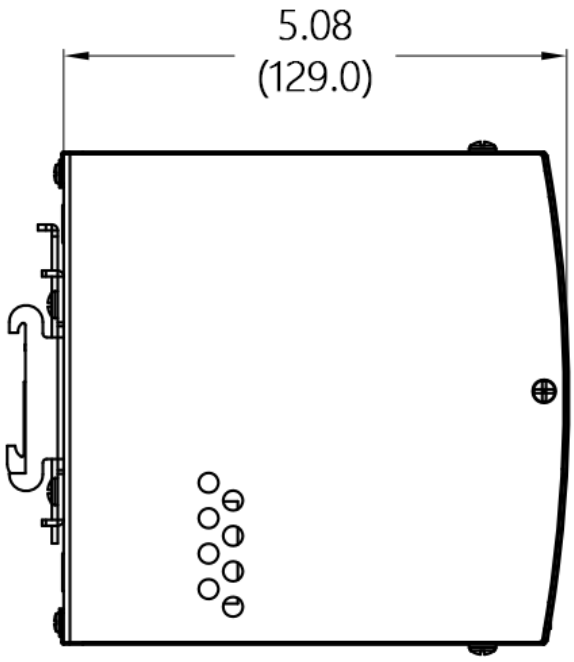


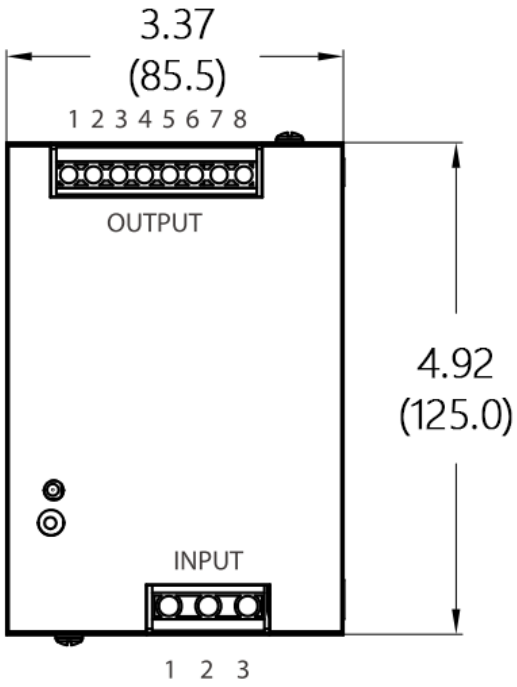
Full Load



Half Load

Mechanical Dimensions





DC OK Relay Contact	
Contact Closed	PSU turns on · DC OK
Conact Open	PSU turns off · DC Fail
Conact Ratings (Max.)	60VDC/0.3A resistive load
	30VDC/1A resistive load
	30VAC/0.5A resistive load

Installation Clearance:

- Top: 40mm
- Bottom: 20mm
- Sides: 5mm, increase space to 10-15mm if adjacent device is heat source

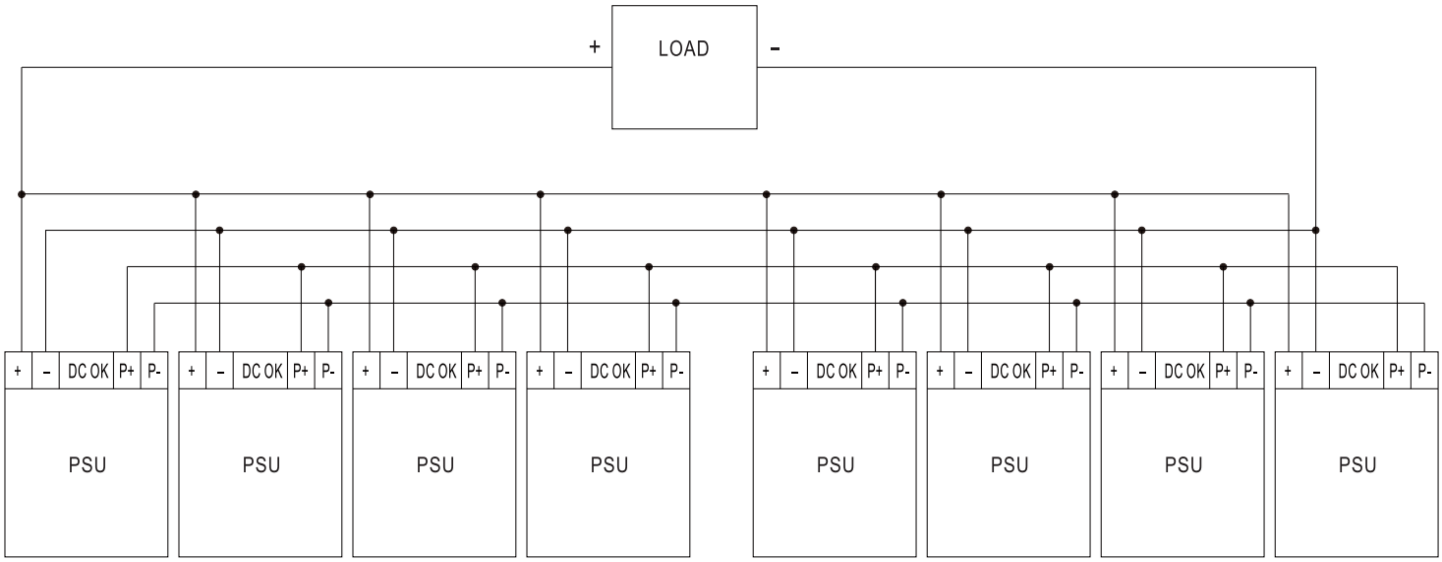
Input	
Pin	**Function**
1	GRND
2	AC (N)
3	AC (L)

Output	
Pin	**Function**
1, 2	+VOUT
3, 4	-VOUT
5, 6	Relay Contact
7	P+ (Current Share)
8	P- (Current Share)

Notes:

- All dimensions are typical in inches (mm)
- Weight: 56.44 Oz (1,600g)

Current Sharing



Notes:

1. Connection in parallel opration (P+, P- parallel connection).
2. The output voltage difference between parallel units should be less than 0.2V.
3. The output current most not exceed the value calculated with the following equation:

$$I_{OUT\ IN\ PARALLEL} = I_{RATED\ PER\ UNIT} * N_{UNITS} * 0.9$$

4. The maximum quantity of parallel operation is 8 units. If more units are required in parallel operation, please contact the manufacturer.
5. In parallel operation, the maximum output load should be more than 3% of the total output load (Min. load >3% $I_{PER\ UNIT} * N_{UNITS}$)