# Open Frame (Suffix "O")



Size: 4.00 x 2.00 x 1.16 inches

## U-Chassis (Suffix "U")



Size: 4.60 x 2.44 x 1.54 inches

#### Enclosed Case (Suffix "C")



Size: 4.60 x 2.44 x 1.54 inches

#### Enclosed w/ External Fan (Suffix "F")



Size: 4.60 x 2.44 x 1.94 inches

#### Din Rail (Suffix "D")



Size: 4.60in x 2.44in x 1.54in

# Din Rail with External Fan (Suffix "DF")



Size: 4.60in x 2.44in x 1.54in













# **FEATURES**

- 85~264VAC (120~370VDC) Input Voltage Range
- Protection Type Class I or Class II
- Active Power Factor Correction
- High Efficiency up to 92%
- Adjustable Output Voltage
- Built-in EMI Filter
- 5000M Operating Altitude

- Low Leakage Current under 100µF
- Low Standby Power Consumption under 0.3W
- -25°C to +80°C Operating Temperature Range
- Up to 150W with 10CFM Forced Air
- 4000VAC Input to Output 2 MOPP Insulation
- · Over Voltage, Over Load, and Short Circuit Protection
- Designed to Meet Energy Efficiency Level VI
- Compliant to RoHS EU Directive 2011/65/EU
- CE Marked
- ANSI/AAMI ES60601-1, EN60601-1, and IEC60601-1 3.1 Edition Medical Approvals
- Open Frame, U-Chassis, Enclosed Case, Enclosed Case with External Fan, DIN Rail and DIN Rail with External Fan Mechanical **Options**

# **APPLICATIONS**

- Medical
- Automation
- Datacom
- IPC
- Industrial
- Measurement
- Telecom

# **DESCRIPTION**

The PSMAF150 series of AC/DC medical power supplies provides up to 150 Watts of output power with 10CFM forced air and up to 110 Watts with convection cooling in a compact 2 x 4 inch footprint. These supplies feature a universal 85-264VAC (120~370 VDC) input, enabling them to be used anywhere in the world. The off load power draw is less than 0.3 Watts, which complies with many energy-saving initiatives. 12V, 15V, 18V, 24V, 28V, 36V, and 48VDC single output voltages are available for this series, all of which have a ±10% adjustment range. These supplies also feature a low leakage current of less than 100µA at 264VAC and are designed to withstand 4000VAC, input to output. The PSMAF150 series has an operating temperature range of -25°C to +80°C, power factor correction, and a high efficiency up to 92%. These supplies are also protected against short circuit, over voltage, and over current conditions. The PSMAF150 series has ANSI/AAMI ES60601-1, EN60601-1, and IEC60601-1 3.1 edition medical approvals, are CE Marked, are designed to meet Efficiency Level VI and meet the conducted and radiated EMI requirements of EN55011, EN55022 and FCC Part 18. Open frame, U-chassis, enclosed case, enclosed case with external fan, Din Rail and DIN rail with external fan mechanical options are available. Class I and Class II protection types are also available.



			MODEL SE	ELECTION T	ABLE			
(4)	Input	Output				ower		
Model Number (1)	Voltage	Voltage	10CFM Forced Air	Convection	Noise	10CFM Forced Air	Convection	Efficiency
PSMAF150-12S-O		12VDC	12.5A	8.34A	120mVp-p	150W	100W	91%
PSMAF150-15S-O	05 064	15VDC	10A	7.34A	150mVp-p	150W	110W	92%
PSMAF150-18S-O	85 - 264 VAC	18VDC	8.34A	6.12A	180mVp-p	150W	110W	92%
PSMAF150-24S-O		24VDC	6.25A	4.59A	220mVp-p	150W	110W	92%
PSMAF150-28S-O	(120 - 370 VDC)	28VDC	5.36A	3.93A	220mVp-p	150W	110W	92%
PSMAF150-36S-O	VDC)	36VDC	4.17A	3.06A	250mVp-p	150W	110W	92%
PSMAF150-48S-O		48VDC	3.13A	2.09A	250mVp-p	150W	100W	92%
PSMAF150-12S-U		12VDC	12.5A	8.34A	120mVp-p	150W	100W	91%
PSMAF150-15S-U		15VDC	10A	7.34A	150mVp-p	150W	110W	92%
PSMAF150-18S-U	85 - 264	18VDC	8.34A	6.12A	180mVp-p	150W	110W	92%
PSMAF150-24S-U	VAC	24VDC	6.25A	4.59A	220mVp-p	150W	110W	92%
PSMAF150-28S-U	(120 - 370	28VDC	5.36A	3.93A	220mVp-p	150W	110W	92%
PSMAF150-36S-U	VDC)	36VDC	4.17A	3.06A	250mVp-p	150W	110W	92%
PSMAF150-48S-U		48VDC	3.13A	2.09A	250mVp-p	150W	100W	92%
PSMAF150-12S-C		12VDC	12.5A	10.84A	120mVp-p	150W	100W	91%
PSMAF150-15S-C		15VDC	10A	9A	150mVp-p	150W	110W	92%
PSMAF150-18S-C	85 - 264 VAC (120 - 370	18VDC	8.34A	7.5A	180mVp-p	150W	110W	92%
PSMAF150-24S-C		24VDC	6.25A	5.63A	220mVp-p	150W	110W	92%
PSMAF150-28S-C	VDC)	28VDC	5.36A	4.83A	220mVp-p	150W	110W	92%
PSMAF150-36S-C		36VDC	4.17A	3.75A	250mVp-p	150W	110W	92%
PSMAF150-48S-C		48VDC	3.13A	2.71A	250mVp-p	150W	100W	92%
PSMAF150-12S-F		12VDC	12.5A	10.84A	120mVp-p	150W	100W	91%
PSMAF150-15S-F	05 004	15VDC	10A	9A	150mVp-p	150W	110W	92%
PSMAF150-18S-F	85 - 264 VAC	18VDC	8.34A	7.5A	180mVp-p	150W	110W	92%
PSMAF150-24S-F		24VDC	6.25A	5.63A	220mVp-p	150W	110W	92%
PSMAF150-28S-F	(120 - 370 VDC)	28VDC	5.36A	4.83A	220mVp-p	150W	110W	92%
PSMAF150-36S-F	(100)	36VDC	4.17A	3.75A	250mVp-p	150W	110W	92%
PSMAF150-48S-F		48VDC	3.13A	2.71A	250mVp-p	150W	100W	92%
PSMAF150-12S-D		12VDC	12.5A	10.84A	120mVp-p	150W	100W	91%
PSMAF150-15S-D	05 064	15VDC	10A	9A	150mVp-p	150W	110W	92%
PSMAF150-18S-D	85 - 264 VAC	18VDC	8.34A	7.5A	180mVp-p	150W	110W	92%
PSMAF150-24S-D	(120 - 370	24VDC	6.25A	5.63A	220mVp-p	150W	110W	92%
PSMAF150-28S-D	(120 - 370 VDC)	28VDC	5.36A	4.83A	220mVp-p	150W	110W	92%
PSMAF150-36S-D	VDC)	36VDC	4.17A	3.75A	250mVp-p	150W	110W	92%
PSMAF150-48S-D		48VDC	3.13A	2.71A	250mVp-p	150W	100W	92%
PSMAF150-12S-DF PSMAF150-15S-DF		12VDC 15VDC	12.5A 10A	10.84A 9A	120mVp-p 150mVp-p	150W	100W 110W	91% 92%
PSMAF150-18S-DF	85 - 264	18VDC	8.34A	7.5A	180mVp-p	150W 150W	110W	92%
PSMAF150-24S-DF	VAC	24VDC	6.25A	5.63A	220mVp-p	150W	110W	92%
PSMAF150-28S-DF	(120 - 370	28VDC	5.36A	4.83A	220mVp-p	150W	110W	92%
PSMAF150-36S-DF	VDC)	36VDC	4.17A	3.75A	250mVp-p	150W	110W	92%
PSMAF150-48S-DF		48VDC	3.13A	2.71A	250mVp-p	150W	100W	92%



# SPECIFICATIONS: PSMAF150 SERIES

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted. We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS		Min	Тур	Max	Unit
INPUT SPECIFICATIONS						
Operating Input Voltage	AC input		85		264	VAC
Range	DC input		120		370	VDC
Input Frequency	AC input		47		63	Hz
Innut Current	115VAC and full load				1.7	
Input Current	230VAC and full load				0.8	Α
No lood Innut Dower	@230VAC, With Fan Option			0.6		W
No load Input Power	@230VAC, Other Models				0.3	
Power Factor			0.95			
Input Inrush Current	230VAC				60	Α
Input Protection	Internal fuse in line and neutral		T3.15A / 250VAC			
OUTPUT SPECIFICATION:	S					
Output Voltage				See '	Table	
Initial Set Voltage Accuracy	230VAC and full load		-1.0		+1.0	%
Line Regulation	Low line to high line at full load		-0.2		+0.2	%
	No load to full load		-0.5		+0.5	0/
Load Regulation	10% load to 90% load		-0.4		+0.4	%
Voltage Adjustability			-10		+10	%
	10CFM forced air cooling				150	
Output Power					110	W
Convection cooling for 12V and 48V output models		odels			100	
Output Current				See '	Table	
Minimum Load				0		%
	With 1µF/25V 1206 X7R MLCC capacitor	12V output model		120		mVp-p
	With 1µF/25V 1206 X7R MLCC capacitor	15V output model		150		
	With 1µF/25V 1206 X7R MLCC capacitor	18V output model		180		
Ripple & Noise (20MHz BW)	With 1µF/50V 1206 X7R MLCC capacitor	24V output model		220		
	With 1µF/50V 1206 X7R MLCC capacitor	28V output model		220		
	With 1µF/50V 1206 X7R MLCC capacitor	36V output model		250		
	With 0.1µF/100V 1206 X7R MLCC capacitor	48V output model		250		
T	50 750/ 1 2 2 5 4 7	Peak Deviation			3	% Vout
Transient Response	Load step from 50~75% change at 2.5A/μs	Recovery Time		500		μs
Start-Up Time		-			1000	ms
Rise Time				20		ms
Hold-up Time	115VAC and full load		16			ms
Temperature Coefficient			-0.02		+0.02	%/°C
Fan Power Supply				12V at	500mA	
PROTECTION						
Over Voltage Protection	% of Vout (nom); latch mode		115		135	%
Over Load Protection	% of lout rated; hiccup mode		115		150	%
Short Circuit Protection			Cor	ntinuous, aut	omatic reco	very
GENERAL SPECIFICATION	NS					
Switching Frequency				60		kHz
		Input to Output	4000			
Isolation Voltage	1 minute (2MOPP insulation)	Input to FG	1500			VAC
Ŭ	,	Output to FG	1500			
Isolation Resistance	500VDC		0.1			GΩ
Leakage Current	264VAC				100	μA

Single Outputs



# SPECIFICATIONS: PSMAF150 SERIES

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted. We reserve the right to change specifications based on technological advances.

SPECIFICATION		TEST CONDITIONS	Min	Тур	Max	Unit	
ENVIRONMENTAL SPECIFICAT	TIONS						
10CFM forced air cooled: 150W (with derating)		-25		+80	00		
Operating Ambient Temperature	Convection cooled: 100~110W (with derating)		-25		+85	°C	
Storage Temperature Range	10CFM forced air	cooled: 150W (with derating)	-40		+75	°C	
Storage Temperature Range	Convection coole	d: 100~110W (with derating)	-40		+85	C	
Operating Altitude				5000 m	eters		
Shock				IEC68-2-27			
Thermal Shock				MIL-STE	-810F		
Vibration				IEC68	-2-6		
Relative Humidity	Non-condensing		5		95	% RH	
MTBF	MIL-HDBK-217F,	Ta=25°C, full load	786,100			Hours	
PHYSICAL SPECIFICATIONS						<u>'</u>	
	Open Frame Mod	els (Suffix "-O")		6.60oz (	187g)		
	U-Chassis Models	s (Suffix "-U")		8.29oz (			
Weight	DIN Rail (Suffix "-D")			9.81oz (			
, s	Enclosed Case Models (Suffix "-C")		9.03oz (256g)				
	Enclosed Case with External Fan Models (Suffix "-F")		9.03oz (256g)				
	Open Frame Models (Suffix "-O")		4.	00 x 2.00 x			
	,			01.6 x 50.8			
Dimensions (L x W x H)		"-U"), Enclosed Case (Suffix "-C") & DIN		60 x 2.44 x			
	Rail (Suffix "-D")			16.8 x 62.0			
	Enclosed Case with External Fan (Suffix "-F") & DIN Rail with External Fan (Suffix "-DF") Models		4.60 x 2.44 x 1.94 inches (116.8 x 62.0 x 49.2 mm)				
		-1 Version 3.1, EN/ANSI/AAMI ES 60601-1	(1	10.0 X 02.0			
Safety Approvals <sup>(4)</sup>	1200000	IEC/EN/UL 60950-1			CB:	UL(Demko)	
F141(2)	ENESOMA EN SE	200 FN00004 4 0 1 F00 B 1 40/45		Conducted		Class B	
EMI <sup>(3)</sup>	EN55011, EN 550	032, EN60601-1-2 and FCC Part 18/15		Radiated		Class A	
Harmonic Currents	EN61000-3-2	Full load			Cla	ass A and D	
Voltage Flicker	EN61000-3-3						
EMS	EN55024 and EN	60601-1-2					
ESD	EN61000-4-2	Air±15kV and Contact ±8kV			Pei	rf. Criteria A	
Radiated Immunity	EN61000-4-3	20 V/m			Pei	rf. Criteria A	
Fast Transient	EN61000-4-4	±2kV				rf. Criteria A	
Surge	EN61000-4-5	DM ±1kV and CM ±2kV				rf. Criteria A	
Conducted Immunity	EN61000-4-6	20 Vr.m.s				rf. Criteria A	
Power Frequency Magnetic Field	EN61000-4-8	10 A/m				rf. Criteria A	
Dip and Interruptions	EN61000-4-11				. 0		

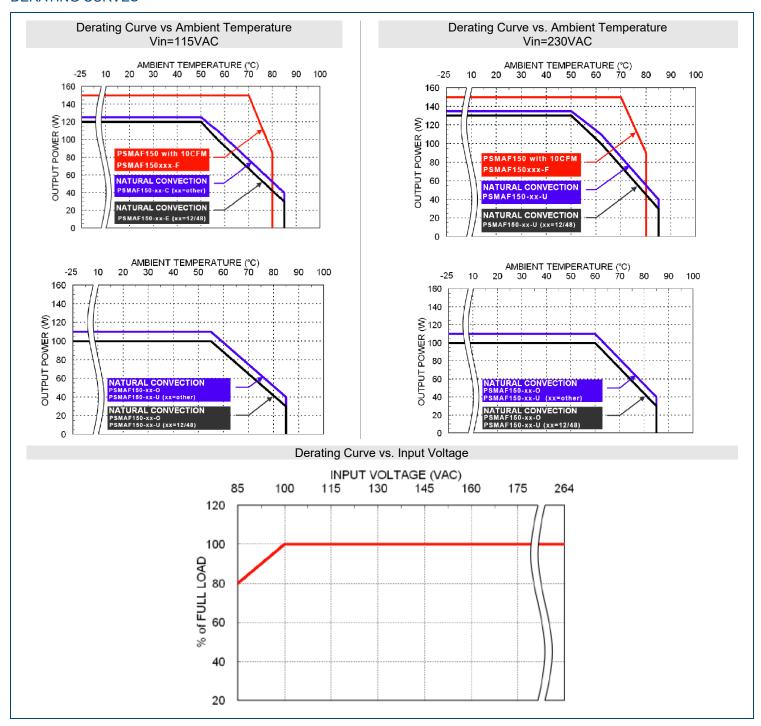
# NOTES

- 1. The "X" in the model number represents the package type. It can be "O" for open frame, "U" for U-chassis, "C" for enclosed case, "F" for enclosed case with external fan, "D" for DIN rail or "DF" for DIN rail with external fan. DIN rail is only available for enclosed case type models.
- 2. Class I and Class II protection types are also available for this series. Class I comes standard and for Class II add the suffix "B" to the model number.
- 3. External components may be required for class I application.
- 4. This product is Listed to applicable standards and requirements by UL.

\*Due to advances in technology, specifications subject to change without notice.

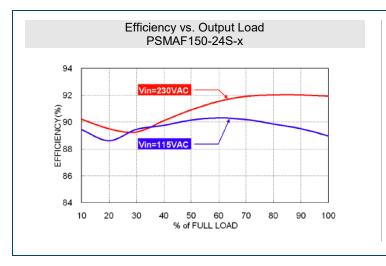


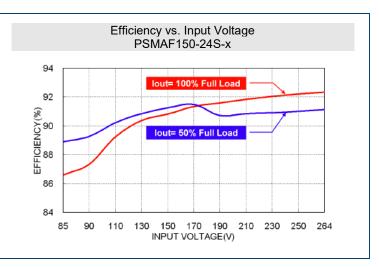
#### **DERATING CURVES -**





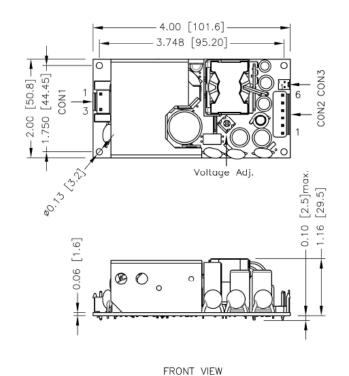
#### **EFFICIENCY CURVES**





# MECHANICAL DRAWINGS





# Connectors

CON1-Input Connector			
Pin 1	Line		
Pin 3	Neutral		

CON2-Output Connector			
Pin 1,2,3 -Vout			
Pin 4,5,6	+Vout		

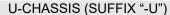
CON3-Fan Connector			
Pin 1	-Fan		
Pin 2	+Fan		

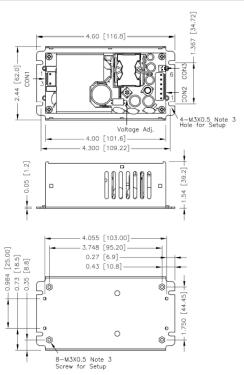
Mates with

Molex housing: 22-01-1022 Molex crimp terminals: 2759

\*Either one of four screw holes of Open/Chassis type can be considered as PE connection for CLASS I application







#### Connectors

CON1-Input Connector

• • • • • • • • • • • • • • • • • • • •	
Pin 1	Line
Pin 3	Neutral

# CON2-Output Connector

OONE-Output Connector				
Pin 1,2,3	-Vout			
Pin 4,5,6	+Vout			

# CON3-Fan Connector

00110 1 411 00111100101		
Pin 1	-Fan	
Pin 2	+Fan	

Mates with

Molex housing: 22-01-1022 Molex crimp terminals: 2759

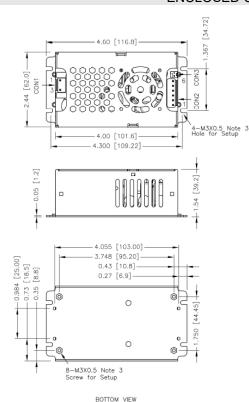
\*Either one of four screw holes of Open/Chassis type can be considered as PE connection for CLASS I application.

Notes:

All dimensions in inch [mm]
Tolerance: x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]

M3x0.5 screw locked torque MAX 5Kgf.cm/0.49N.m

# ENCLOSED CASE (SUFFIX "-C")



#### Connectors

#### CON1-Input Connector

· · · · · · · · · · · · · · · · · ·	
Pin 1	Line
Pin 3	Neutral

# CON2-Output Connector

Pin 1,2,3	-Vout
Pin 4,5,6	+Vout

# CON3-Fan Connector

D: 4	_
Pin 1	-Fan
Pin 2	+Fan

Mates with

Molex housing: 22-01-1022 Molex crimp terminals: 2759

\*Either one of four screw holes of Open/Chassis type can be considered as PE connection for CLASS I application.

Notes:

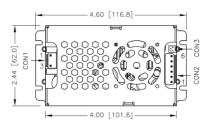
All dimensions in inch [mm] Tolerance: x.xx±0.02 [x.x±0.5]

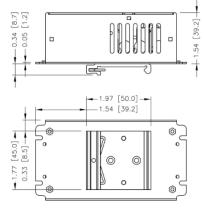
x.xxx±0.01 [x.xx±0.25]

M3x0.5 screw locked torque MAX 5Kgf.cm/0.49N.m



# DIN RAIL (SUFFIX "-D")





BOTTOM VIEW

# Connectors

# CON1-Input Connector

Pin 1	Line
Pin 3	Neutral

# CON2-Output Connector

00	p a
Pin 1,2,3	-Vout
Pin 4,5,6	+Vout

#### CON3-Fan Connector

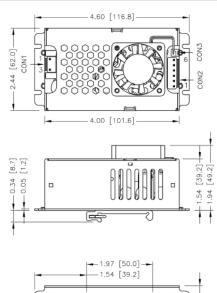
Pin 1	-Fan
Pin 2	+Fan

Mates with

Molex housing: 22-01-1022 Molex crimp terminals: 2759

\*Either one of four screw holes of Open/Chassis type can be considered as PE connection for CLASS I application

# DIN RAIL WITH FAN (SUFFIX "-DF")



# 1.97 [50.0] — 1.54 [39.2]

# Connectors

# CON1-Input Connector

Pin 1	Line
Pin 3	Neutral

# CON2-Output Connector

Pin 1,2,3	-Vout
Pin 4,5,6	+Vout

#### CON3-Fan Connector

CONTO I dil Collinottol				
Pin 1	-Fan			
Pin 2	+Fan			

Mates with

Molex housing: 22-01-1022 Molex crimp terminals: 2759

\*Either one of four screw holes of Open/Chassis type can be considered as PE connection for CLASS I application

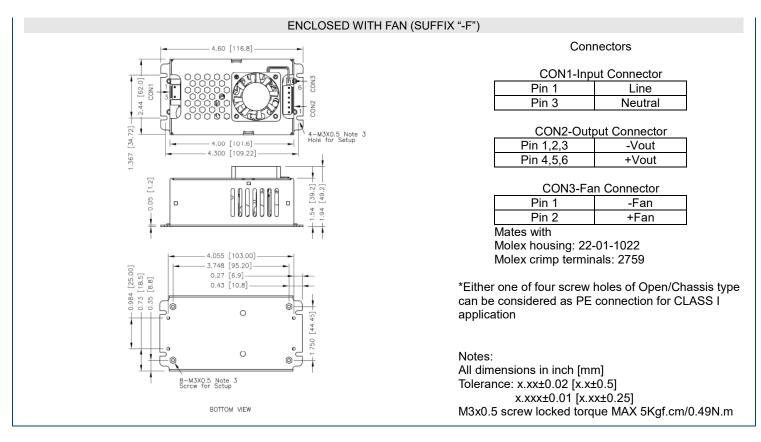
Notes:

All dimensions in inch [mm]
Tolerance: x.xx±0.02 [x.x±0.5]

x.xxx±0.01 [x.xx±0.25]

M3x0.5 screw locked torque MAX 5Kgf.cm/0.49N.m





# **CONNECTOR OPTIONS**

# Blank: JST Type

CON1: V CON2: V Crimp T CON1: S

Mates with housing CON1: VHR-3N CON2: VHR-6N

Crimp Terminals CON1: SVH-21T-P1.1 CON2: SVH-21T-P1.1

# -M: Molex Type



Mates with housing CON1: 09-50-8031 CON2: 09-50-8041

Crimp Terminals CON1: SD-2478 CON2: SD-2478

#### -T: Terminal Block



Screw locked torque MAX 2Kgf.cm/0.2N.m

Wire dimension range 26~16AWG

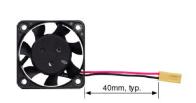
# EXTERNAL FAN OPTION -

External fan is optional for enclosed and DIN Rail models. The fan's life is shorter than the power supply's and has a shorter warranty. Please contact factory for more details.

Fan dimensions: 40mm x 40mm x 10mm

Air flow: 7CFM







#### MODEL NUMBER SETUP

PSMAF   150  -	12	S	-	0	В	M
Series Name Output Power	Input Voltage	Output Quantity		Package Type	Protection Type	Connector Type
	12: 12 VDC 15: 15 VDC 24: 24 VDC 28: 28 VDC 36: 36 VDC 48: 48 VDC	S: Single Output		O: Open Frame U: U-Chassis C: Enclosed Case F: Enclosed with External Fan D: DIN Rail (1) DF: Din Rail with External Fan	None: Class I B: Class II	None: JST Type M: Molex Type T: Terminal Block

Rev F

# COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001: 2015 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

# Contact Wall Industries for further information:

Phone: ☎(603)778-2300 Toll Free: ☎(888)597-9255 Fax: ☎(603)778-9797

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<sup>(1)</sup> DIN Rail is only available for enclosed case models