FNP3000 Series

AC-DC Front-End Power Supply

Bel Power Solutions FNP3000 Series is a low profile 1U high power density hot swappable power supply providing 3000 watts of 80+ Platinum efficiency.

The form factor allows integration of up to four parallel or N+1 redundant modules in a standard 1U 19” rack.

Hot swap capability implemented, using industry standard connector that integrates both AC source; DC output & signal I/O in a single true “blind mate” configuration.



RoHS Compliant

Key Features & Benefits

- Up to 3000 W continuous power
- 80 PLUS Platinum Efficiency
- PoE output isolation; (1500 Vrms to ground)
- High power density - 33.48 W/in^3
- PMBus® communication for monitoring & control
- Dual fan forced cooling with speed control
- Front to back and back to front airflow versions
- Power factor correction
- 3.3 VDC (2A) standby voltage
- Redundant (N+1) operation
- Blind mate connections for hot-swap
- Constant power (CP) mode
- Harmonic correction to EN61000-3-2, Class A
- DROOP current sharing
- Single I/O connector for AC input, DC output & signals
- Remote on/off control
- Power good signal
- Optional 19” four slot power shelf

Disclaimer: PMBus is a registered trademark of SMIF, Inc.

1. ORDERING INFORMATION

MODEL	OUTPUT VOLTAGE	OUTPUT CURRENT MAX	OUTPUT POWER [2,3] MAX	RIPPLE & NOISE [1] MAX	EFFICIENCY [4]	AIRFLOW DIRECTION
FNP3000-1048NA	48 VDC	62.5 A	3000 W	480 mVp-p	94 %	N: Normal (Front to Back)
FNP3000-1048RA	48 VDC	62.5 A	3000 W	480 mVp-p	94 %	R: Reversed (Back to Font)
FNP3000-1054NA	54 VDC	55.5 A	3000 W	540 mVp-p	94 %	N: Normal (Front to Back)
FNP3000-1054RA	54 VDC	55.5 A	3000 W	540 mVp-p	94 %	R: Reversed (Back to Font)

NOTES:

1 Measured at 20 MHz bandwidth at an oscilloscope jack on the output with 0.1 µF ceramic and 10 µF aluminum electrolyitc capacitors.
2 At 90~180 VAC input, maximum of 1500 W.
3 At 180~264 VAC input, maximum of 3000 W.
4 At 230 VAC input, 3000 W. Meets 80 PLUS platinum efficiency requirements.
5 All specifications measured at: Ta = 25°C and 220 VAC input voltage unless otherwise specified.

2. INPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
Input Voltage Range	Normal operating ($V_{i\,min}$ to $V_{i\,max}$)	90	115/230	264	VAC
Input Frequency		47	50/60	64	Hz
Max Input Current	@ 90 VAC, 1500 W			20.2	A_{rms}
	@ 180 VAC, 3000 W			18.5	
Inrush Current	@ 115 VAC, cold start		20		A
	@ 230 VAC, cold start		40		
Power Factor	@ 230 VAC, 3000 W	0.99			

3. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
Main Output V_1					
Line and Load Regulation			±3%		Vset
Load Capacitance				30000	µF
Transient Response	50% step load, 1A/µsec slew rate, recovery to 1% within 1 msec			3	% Vset
Start-up Time				5	sec
Hold-up Time	@ 230 VAC, full load	12			ms
Remote Sense	Between both output terminals		0.5		V
Current Share Accuracy (Droop)	Over 25% to 100% full load		±10		%
LED Indicator	AC OK: “green” to indicate AC above the lower limit that is required to sustain normal operation DC OK: “green” to indicate module in normal operating condition				

Stanby Output V_{SB}				
Output Voltage		3.3		VDC
Output Current	0		2	A
Ripple and Noise [1]			33	mVp-p
Line and Load Regulation		±5%		Vset
Load Capacitance			1000	µF
Transient Response	50% step load, 1A/µsec slew rate, recovery to 1% within 1 msec		3	% Vset
Startup Time			5	sec

[1] Measured at 20 MHz bandwidth at an oscilloscope jack on the output with 0.1 µF ceramic and 10 µF aluminum electrolyitc capacitors.

4. PROTECTIONS

PARAMETER	CONDITIONS/DESCRIPTION	MIN	NOM	MAX	UNITS
Over Voltage Protection	V1: latch off V2: latch off	110		60 120	Vdc %
Over Current Protection	V1: constant current inception V2: hiccup			62.5 2.6	A A
Over Temperature Protection	at full load, auto recovery		55		°C

5. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
Storage Temperature	Non-Condensing	-40		70	°C
Operating Temperature	@ full load no derating	0		50	
Humidity	Storage Operating Humidity	5 10		90	%
MTBF	Calculated per Telcordia SR-332 Issue 2, Sept 2006, component stress method at Ta = 25°C	916			Khrs
Acoustic	ISO 7779-1999			60	dB LpAm
Cold [2]	IEC 68 Part 2 – 1: at -10°C minimum for 4 hours				
Dry Heat	IEC 68 Part 2 – 2: at 50°C minimum for 4 hours				
Damp Heat, Cyclic	IEC 68 Part 2 – 30: at 20~45°C, 30~95 %RH				
Low Air Pressure (operating)	IEC 68 Part 2 – 13: at 10,000 feet, 697 mbar				
Vibration (Sinusoidal)	IEC 68 Part 2 – 6: at 10~58 Hz, 0.075 mm; 58~500 Hz, 10 m/s2, 1 octave/minute, 10 cycles/main axis		1		G
Shock	IEC 68 Part 2 – 27: at 300 m/s2, 11 ms, half sine wave 3 shocks / main axis		30		G
Bump	IEC 68 Part 2 – 29: at 150 m/s2, 6 ms, half sine wave 900 bumps / main axis		15		G
WEEE	Directive 2012/19/EU				
RoHS	EU Directive 2011/65/EU				

[2] The module shall start up at -10°C, however it is not required that the full specification is achieved until the operational internal temperature has risen to 0°C.

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6. ELECTROMAGNETIC COMPATIBILITY

PARAMETER	CONDITIONS / DESCRIPTION	MIN	TYP	MAX	UNITS
Insulation Safety Rating / Test Voltage	Input to output, reinforced input to chassis, basic	3000 1500			Vrms Vrms
Isolation Voltage	Output to output Output to chassis Signals to chassis/ground V2 to chassis/ground	1500 1500 1500 100			Vrms Vrms VDC VDC
Grounding	The main output V1 is “floating” and not referenced to chassis/ground.The output control and status signals are referenced to the V2 output return connection.				
Conducted Emissions	FCC 15 Sub Part B, EN55022, Class A: 3dB margin tested with resistive load				
Radiated Emissions	FCC 15 Sub Part B, EN55022, Class A: 3dB margin tested with resistive load				
Harmonic Compliance	EN/IEC 61000-3-2:2009, Class A Harmonic Limits Compliance Level: 230 Vac line voltage; 100% output load				
Flicker	EN/IEC 61000-3-3:2009 limits as specified in the standard: flicker and voltage fluctuations				
Electrostatic Discharge	EN/IEC 61000-4-2, ±8 kV operational air discharge, ±8 kV contact discharge: all parameters to remain within limits, test set up to be defined				
RF Electro-Magnetic Field. Amplitude Modulated	EN/IEC 61000-4-3 80~1000 MHz, 10V/m, 80% AM Modulation (1 kHz): all parameters to remain within limits, test set up to be defined				
Immunity To Fast Transients	EN/IEC 61000-4-4 Power lines: ±2 kV: all parameters to remain within limits, test set up to be defined				
Surges (Mains)	EN/IEC 61000-4-5 ±1 kV line to line, ±2 kV line to earth, Criteria A: all parameters to remain within limits, test set up to be defined				
RF Continuous Conducted	EN/IEC 61000-4-6 150 kHz~80 MHz 3Vrms 80% AM (1 kHz), Criteria A: all parameters to remain within limits, test set up to be defined				
Voltage Dips/ Interruptions	IEC 61000-4-11 30% reduction for 10 ms, 60% reduction for 100 ms: Reset is permitted must be selfrecovering. Additionally, the PSU shall not latch up during any brownout condition.				

7. SAFETY / APPROVALS

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
Agency Approvals	Approved to latest edition of the following standards: UL/CSA60950-1, IEC60950-1 and EN60950-1.				

8. MECHANICAL

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	NIT
Dimensions	W x H x D		101.6 x 40.6 x 355.6 4 x 1.6 x 14		mm inch
Weight			2010		g
Cooling / Airflow	Integral fans				
Material Flammability	UL 94V-0				
AC Input	IEC320/C14				
DC Output	FCI PwrBlade P/N 51939-661LF mates with FCI P/N 51915-351LF				

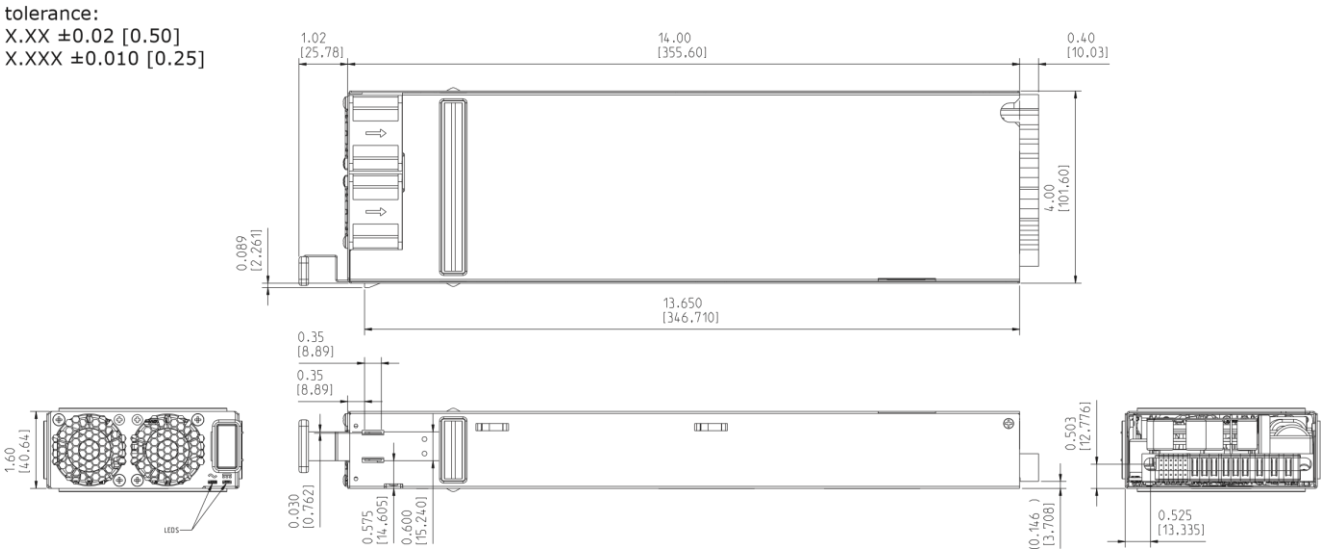
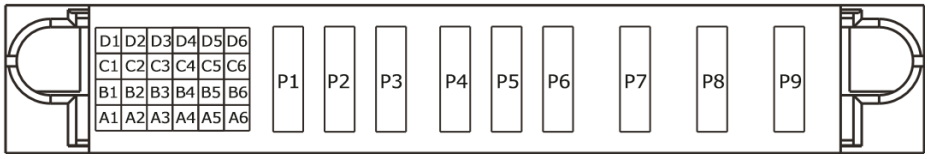


Figure 2 – Mechanical Dimensions



9. DC PIN ASSIGNMENTS

PIN		FUNCTION	DESCRIPTION		HIGH / LOW LEVEL	Imax
P1, P2, P3		V (-VE/return)	V1 (-VE) output terminal			
P4, P5, P6		V (+VE)	V1 (+VE) output terminal			
P7		earth/chassis ground	protective/safety earth			
P8		neutral	neutral or AC line#2			
P9		line	hot/AC line#1			
signal pin column “1”	A1	I²C address A0	I²C address - LSB			
	B1	I²C address A1	I²C address bit			
	C1	I²C address A2	I²C address - MSB			
	D1	REMOTE_ON_L	internal pull up to 3.3 V			3.3 mA
			signal pin status	output status		
			open circuit	“off”		
			logic “1”	“off”		
			logic “0”	“on”		

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signal pin column "2"	A2	DC_OK_L	"L" to indicate DC output is within regulation, there is no internal pull up resistor and it should be provided externally to support VCEO ≤ 20 VDC, Ic ≤ 5 mA DC	>2.1 V <0.4 V	-5 mA
	B2	AC_OK_L	"L" to indicate AC above lower limit that is required for sustain normal operation, there is no internal pull up resistor and it should be provided externally to support VCEO ≤ 20 VDC, Ic ≤ 5 mA DC	>2.1 V <0.4 V	-5 mA
	C2	PS_PRESENT_L	detects presence of power supply, "low" when inserted, host system to provide pull up resistor capable of sourcing 5 mA	>2.1 V <0.4 V	-5 mA
	D2	Vstandby (+VE)	V2 (+VE) output terminal		
signal pin column "3"	A3	I²C/SMbus clock	external 3.32 kΩ pull-up needed to 3.3 V		-3 mA
	B3	I²C/SMbus data	external 3.32 kΩ pull-up needed to 3.3 V		-3 mA
	C3	SMBALERT	communications (SMBus) alert	>2.1 V <0.4 V	-5 mA
	D3	Vstandby (-VE)	V2 (-VE) output terminal		
signal pin column "4"	A4	n/a	reserved		
	B4	n/a	reserved		
	C4	OTP_OK_L	temperature "OK" signal	>2.1 V <0.4 V	-5 mA
	D4	n/a	reserved		
signal pin column "5"	A5	Spare/Vpgm	analog VPGM signal		
	B5	n/a	reserved		
	C5	n/a	reserved		
	D5	n/a	reserved		
signal pin column "6"	A6	V1 -VE sense	V1 negative sense connection		
	B6	Ishare	V1 current share option		
	C6	n/a	reserved		
	D6	V1 +VE sense	V1 positive sense connection		

10. APPLICATION NOTES

DIGITAL COMMUNICATION FEATURE SET

The default method of digital communication shall utilize I2C hardware capable of operation at a minimum of 100 kHz clock (SCL) frequency. A mandatory feature of this module is that should either the module be disconnected from the incoming AC source (inserted in to a slot in an unpowered state); the module input fuse(s) fail; or the internal auxiliary supply (which derives the VCC of the I2C equipped device) fail, then any line associated with the I2C bus (SCL; SDA) should be disconnected (effectively tri-stated) from the I2C bus to prevent erroneous operation that may result from this unpowered condition. All I2C lines shall be "clean" and free from excessive spikes and common mode noise and comply with the requirements of the generic standard which defines I2C logic levels.

The I2C hardware should conform to the requirements of the NXP (formerly Philips Semiconductor) Standard: UM10204 I2C Bus Specification and User Manual; Rev 0.3; 19 June 2007.

The rectifier shall be capable of processing commands to monitor & control the rectifier via the digital bus by use of the following protocols:

- CUI's "standard" protocol – this shall be considered the "default" that shall be offered as a standard.
- The PMBus® (Power Management Bus) Protocol – this shall be considered the "optional" offering.

I2C "STANDARD" FEATURE

The following features will be offered as "standard" by the base product:

VITAL PRODUCT DATA (VPD)

This feature shall provide write-protected Vital Product Data (VPD) which shall include the following:

- Revision level
- CUI Date Code and origin of manufacture
- CUI Serial number (from the product label) is the last 5 or 6 maximum numbers, and is padded with zeros to fit the PMBus® variable as 8 bytes total

SLAVE ADDRESSES

The product's 7-bit I2C slave address is formed by determining the logic state of the address pins A0, A1 and A2. A pull-up resistor shall be supplied within the product for each address pin. The values of A0, A1 and A2 are set in the backplane of the system. Thus the device can be set to respond to all 7-bit addresses in the range from binary 1011 000 to 1011 111.

The address pins shall be read once the micro-controllers have been initialized. To prevent hot swapping from latching the slave address to a specific slot in the enclosure, the software shall continuously read and update at an interval of 1 s the slave address accordingly.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	0	1	1	A2	A1	A0	R/W

DIGITAL INTERFACE

The product is provided with a digital communications interface that is based upon a subset of the SMBus™ & PMBus® Protocols.

The communication interface is a Two Wire Interface (TWI) using devices hardware compatible with I^2C.

The interface is based upon the I^2C Protocol developed by Philips Semiconductors (now NXP). Reference to the "I^2C Bus Specification and User Manual" UM10204 Rev.03 – 19 June 2007 is recommended.

GENERAL INFORMATION

Refer to the PMBus®/SMBus specification for details on read/write operations when dealing with Byte, Word or Block process calls. Packet Error Correction (PEC) and Address Resolution Protocol (ARP) are not supported.

If the PMBus® master tries to read more bytes than the length of the data selected by the command code, the additional bytes will be sent as 0xFF.

The PMBus® slave device may apply clock stretching by holding the clock line (SCL) low after a command to indicate that it is busy processing data. A master device on the PMBus® bus may attempt to continue with the communications but must first wait until the clock line is released. Clock stretching times will vary depending on the data being processed and/ or if there are any higher priority events occur during the response but shall not exceed 25 ms.

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PMBus® COMMAND SUBSET

The following is subset of commands (extracted from the "PMBus® Power System Management Protocol Specification; Part II Command Language; Rev 1.2, 6 September 2010") and apply on a per module basis, (although certain commands could be applied "globally"). For a full definition of the individual command refer to the above referenced PMBus™ specification.

OPCODE (HEX)	COMMAND NAME	NO. OF BYTES	TYPE	READ / WRITE	COMMAND DESCRIPTION
01	OPERATION	1	Byte	W	The OPERATION command is used to turn the unit on & off in conjunction with the CONTROL (short; last make, first make pin).
03	CLEAR_FAULTS	0	N/A	W	Clear fault data latched at STATUS_WORD
19	CAPABILITY	1	Byte	R	Follows PMBus® spec.
78	STATUS_BYTE	1	Byte	R	Lower byte returned from the STATUS_WORD
79	STATUS_WORD	2	Word	R	The command returns two bytes of data relating to the unit fault condition.
88	READ_VIN	2	Word	R	Provides the measured input voltage of the power module. (Divide decimal value by 100)
89	READ_IIN	2	Word	R	Provides the measured input current of the power module. (Divide decimal value by 100)
8B	READ_VOUT	2	Word	R	Provides the measured output voltage of the power module. (Divide decimal value by 100)
8C	READ_IOUT	2	Word	R	Provides the measured output current of the power module. (Divide decimal value by 100)
8D	READ_TEMPERATURE_1	2	Word	R	This command shall return the prevailing internal ambient of the power module, in degrees Celsius.
8E	READ_TEMPERATURE_2	2	Word	R	This command shall return a select component temperature used by the power module, in degrees Celsius.
8F	READ_TEMPERATURE_3	2	Word	R	This command shall return a select component temperature used by the power module, in degrees Celsius.
90	READ_FAN_SPEED_1	2	Word	R	Provides the measured fan speed (RPM) in the power module.
91	READ_FAN_SPEED_2	2	Word	R	Provides the measured fan speed (RPM) in the power module.
96	READ_POUT	2	Word	R	This command shall return the calculated output being delivered by the power module, in Watts. (Divide value by 10)
97	READ_PIN	2	Word	R	This command shall return the calculated input being drawn by the power module, in Watts. (Divide value by 10)
98	PMBus®_REVISION	1	Byte	R	PMBus® Revision
99	MFR_ID	8	Block	R	The command returns the ASCII string for manufacturer's ID.
9A	MFR_MODEL	12	Block	R	The command returns the ASCII string manufacturer's model.
9B	MFR_REVISION	2	Block	R	The command returns the ASCII string manufacturer's revision (example case "A0").
9C	MFR_LOCATION	8	Block	R	The command returns the ASCII string manufacturer's revision (example case "TORONTO").
9D	MFR_DATE	4	Block	R	The command returns the ASCII string manufacturer's date code (example case "0913").
9E	MFR_SERIAL	8	Block	R	The command returns manufacturers serial number.

PMBUS® NON-STANDARD EXTENDED COMMAND SUBSET

OPCODE (HEX)	COMMAND NAME	NO. OF BYTES	TYPE	READ / WRITE	COMMAND DESCRIPTION
16	FIRMWARE_REVISION	4	Block	R	Read vendor specific firmware revision (ASCII string). Example case “A100”
17	BUILD	4	Block	R	Read vendor specific Build (ASCII string)
20	AUXILIARY_VOLTAGE	2	Word	R	Provides the measured output auxiliary voltage of the power module. (Divide decimal value by 100)
8D	READ_TEMPERATURE_4	2	Word	R	This command shall return a select component temperature used by the power module, in degrees Celsius.
8E	READ_TEMPERATURE_5	2	Word	R	This command shall return a select component temperature used by the power module, in degrees Celsius.

REMOTE ON/OFF (PMBus® OPERATION COMMAND 0X01)

This command can be used to turn the unit on and off via the PMBus® interface.

If D1 (REMOTE_ENABLE) is LOW (enabled) then the PMBus® Remote On/Off function can turn the unit off and on. If D1 (REMOTE_ENABLE) is HIGH (disabled) then the PMBus® Remote On/Off function cannot turn the unit on or off and can be ignored.

The bit encoding of the data byte of the command is as follows.

Bits [7:6]	Bits [5:4]	Bits [3:2]	Bits [1:0]	Unit State
00	XX	XX	XX	Off
01	XX	XX	XX	Off
10	00	XX	XX	On
10	01	00	XX	No change
10	01	11	XX	No change
10	01	01	XX	On
10	01	10	XX	On
10	10	01	XX	On
10	10	10	XX	On
10	10	11	XX	No change
10	11	XX	XX	No change
11	XX	XX	XX	No change

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11. DEMO BOARD POWER CONNECTIONS

ACCESSORIES		
DESCRIPTION	**CUI PART NUMBER**	**VENDOR/PART NUMBER**
Demo Board[1]	01T-152501-1	
DC Output Mating Connector	22P-S00061-4	FCI 51915-351LF
I²C Dongle[2]		Microchip DV164122
Demo Board AC Power Cord[3]		CNC Tech 800-12-32D-BL-0003F

NOTES:

1. This demo board is intended for user connection to evaluate the power supply in the laboratory by qualified personnel. Please take necessary safety precautions during product evaluation.
2. The PICkit Serial Analyzer is an USB-based tool used to direct communication between a PC and an external serial device. The kit comes complete with hardware (supporting I2C™, SMBus, SPI and USART protocols), an easy-to-use GUI (to configure and display communications) and a target demonstration board for out-of-the-box functionality. http://www.microchip.com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=1406&dDocName=en028600
3. For North American use only

DEMO BOARD POWER CONNECTIONS	
J1	+48V Output
J2	48V Return
J9	+ Standby Output
J8	Standby Output Return

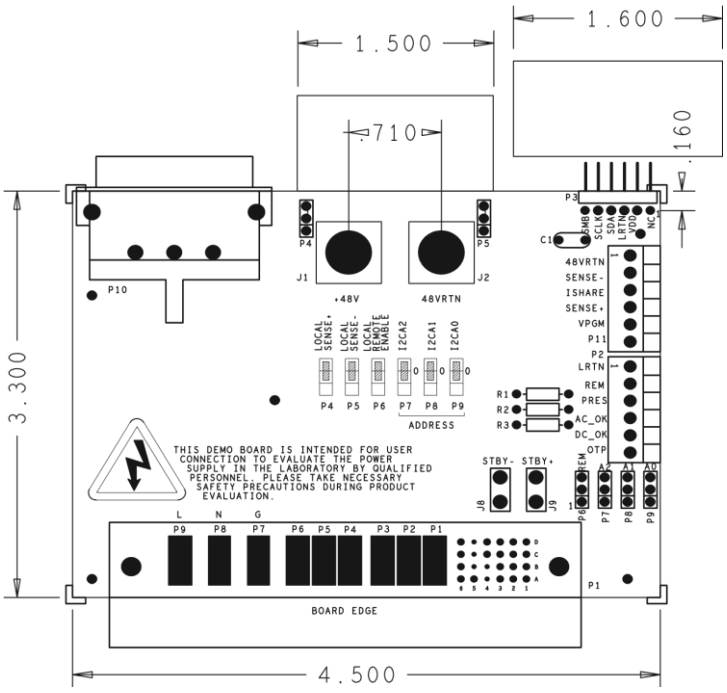


Figure 3 – Demo Board

DEMO BOARD CONNECTION/SETTINGS	
P1	AC & DC Mating Connector
P2	Control & Status Signals
1	Logical Return
2	Remote ON (override by P6)
3	Present
4	AC_OK
5	DC_OK
6	OTP
P3	I2C Dongle Connection
1	SMB
2	SCL
3	SDA
4	Logical Return
5	VDD
6	NC
P4	Jumper to Local Sense+, remove jumper for remote sense
P5	Jumper to Local Sense-, remove jumper for remote sense
P6	Jumper to ON, remove jumper for Remote ON/OFF
P7	Jumper to set I2C A2 = 0, remove jumper to set address by host
P8	Jumper to set I2C A1 = 0, remove jumper to set address by host
P9	Jumper to set I2C A0 = 0, remove jumper to set address by host
P11	Control & Status Signals
1	48 V Return
2	SENSE- (override by P5)
3	ISHARE (optional force sharing)
4	SENSE+ (override by P4)
5	Vpgm
6	NC

12. POWER SHELF

POWER SHELF MODEL NUMBER	POWER MODULE MODEL NUMBER	AIRFLOW DIRECTION	SHELF POWER		STANDBY OUTPUT	IEC INLET TYPE
			110 Vin	220 Vin		
FNR-1U-F-B-1574	FNP3000-1048NA or FNP3000-1054NA	Front to Back	6000 W	12000 W	All Parallel, dual polarity terminal block	C22
FNR-1U-F-D-1574A	FNP3000-1048NA or FNP3000-1054NA	Front to Back	6000 W	12000 W	A & B Feed, dual polarity terminal block	C22
FNR-1U-B-B-1574B	FNP3000-1048RA or FNP3000-1054RA	Back to Front	5400 W	12000 W	All Parallel, dual polarity terminal block	C20
FNR-1U-B-D-1574C	FNP3000-1048RA or FNP3000-1054RA	Back to Front	5400 W	12000 W	A & B Feed, dual polarity terminal block	C20
FNR-1U-F-B-1574D	FNP3000-1048NA or FNP3000-1054NA	Front to Back	6000 W	12000 W	All Parallel, single polarity terminal block	C22
FNR-1U-B-B-1574E	FNP3000-1048RA or FNP3000-1054RA	Back to Front	5400 W	12000 W	All Parallel, single polarity terminal block	C20

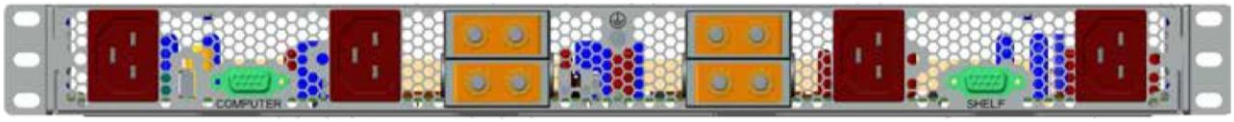


Figure 4 – 1574, 1574A, 1574D - Front to Back Airflow

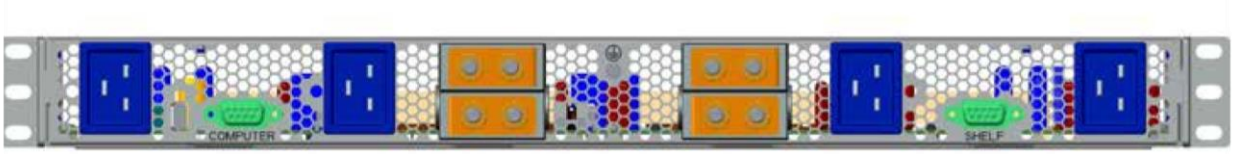


Figure 5 – 1574B, 1574C, 1574E - Back to Front Airflow

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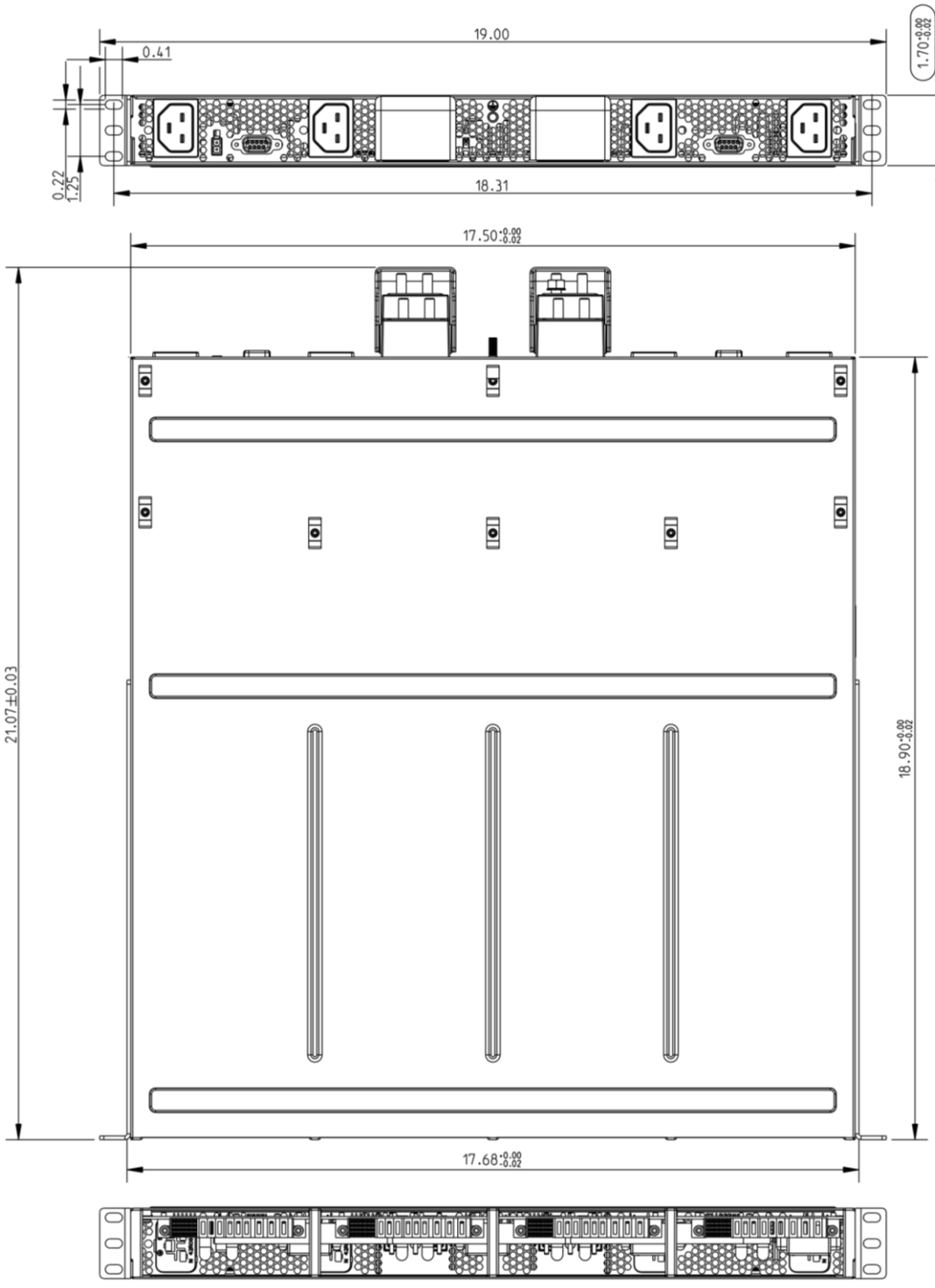


Figure 6 – 1574, 1574A, 1574D - Front to Back Airflow

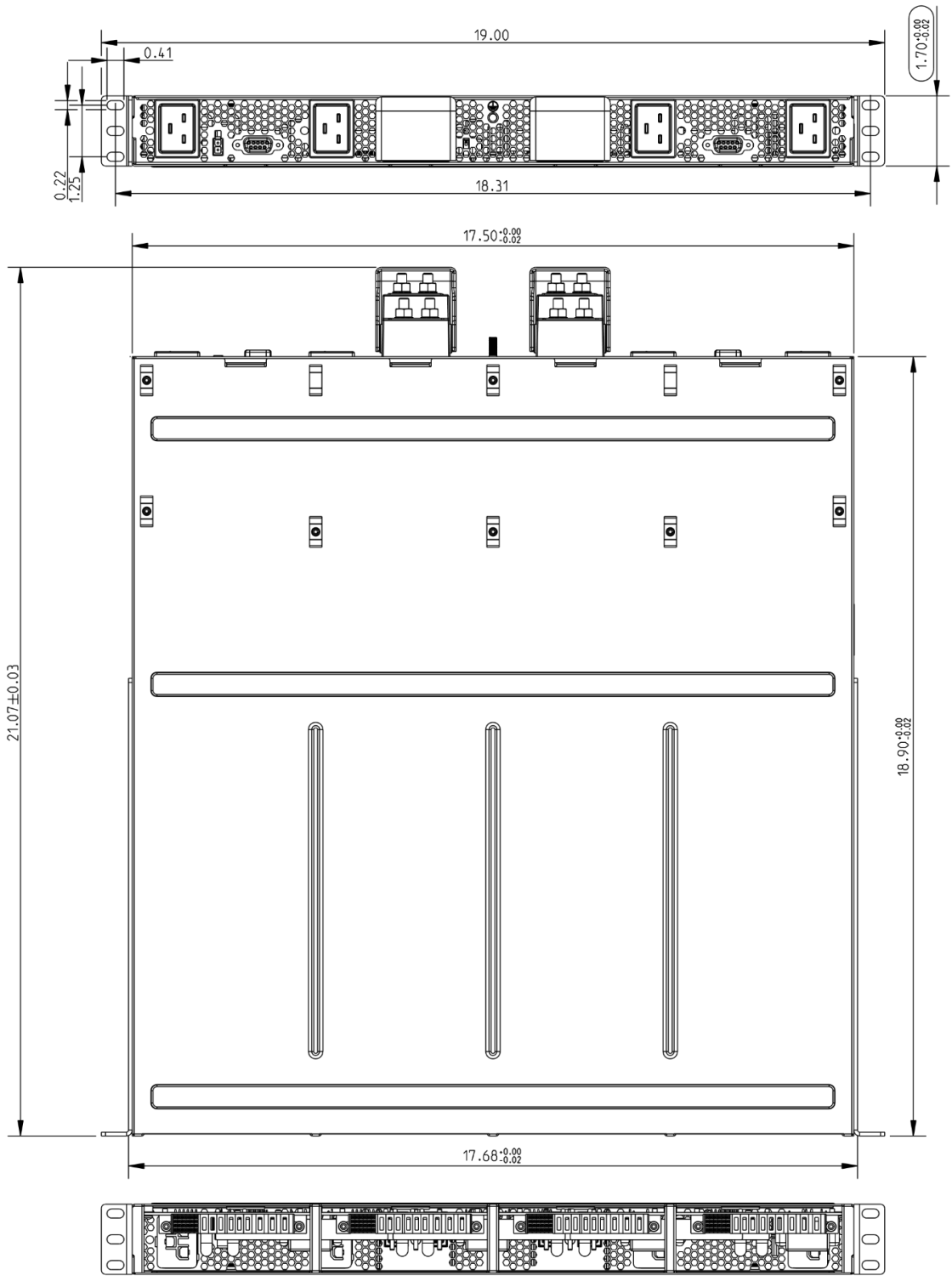
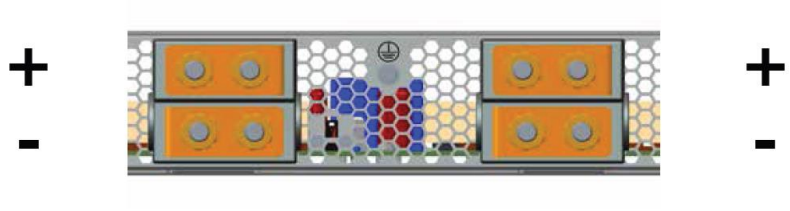


Figure 7 – 1574B, 1574C, 1574E - Back to Front Airflow

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1574 AND 1574B OUTPUT TERMINAL BLOCK CONFIGURATION
All 4 power modules wired in parallel inside the power shelf, 12 kW available from each output



1574A AND 1574C OUTPUT TERMINAL BLOCK CONFIGURATION
Each terminal block wired to 2 power modules, 6 kW available from each output



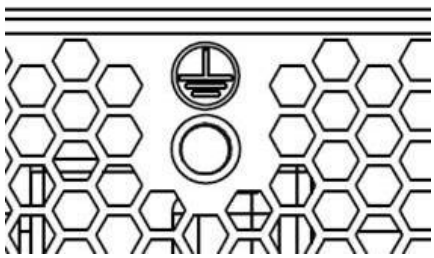
1574A AND 1574C OUTPUT TERMINAL BLOCK CONFIGURATION
Each terminal block wired to 2 power modules, 6 kW available from each output



13. ASSEMBLY INSTRUCTIONS

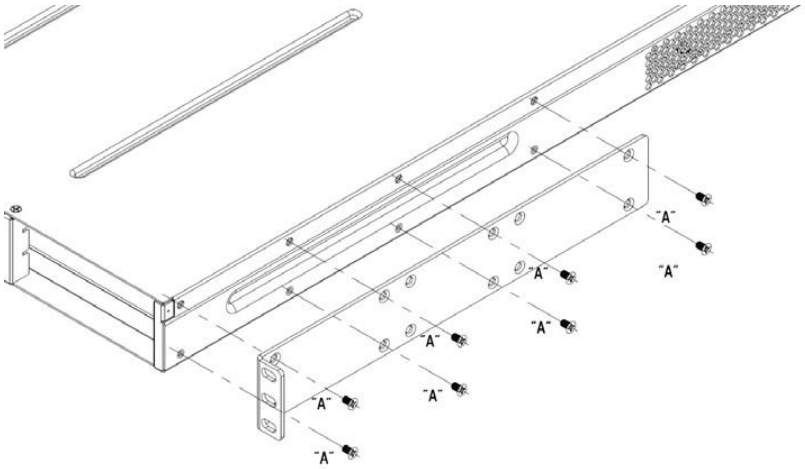
CHASSIS GROUNDING

A ground stud is provided at the rear of the power shelf as shown below.Earth ground stud nut #10-32 to be torqued 16 to 19 in-lbs typical.



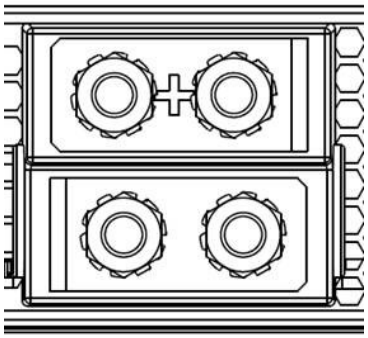
BRACKET ATTACHMENT

The mounting brackets are factory attached in the flush position.
The mounting brackets can be repositioned by customer, however the #6-32 mounting screws to be reattached with typical torque of 6 to 8 in-lbs.



OUTPUT CABLE CONNECTION

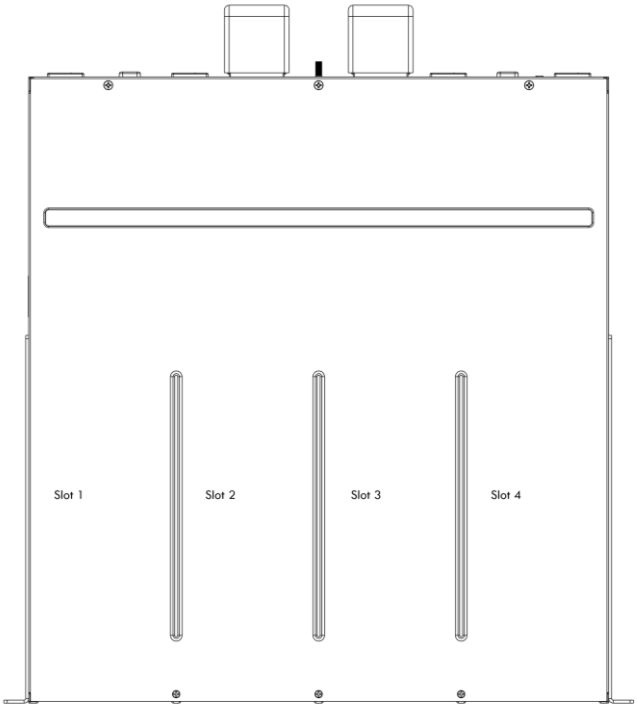
The Output and Return Cables (#2 AWG wire on 1/4" slud - not provided) to be A ground stud is provided at the rear of the power shelf as shown below. Earth ground stud nut #10-32 to be torqued 16 to 19 in-lbs typical.



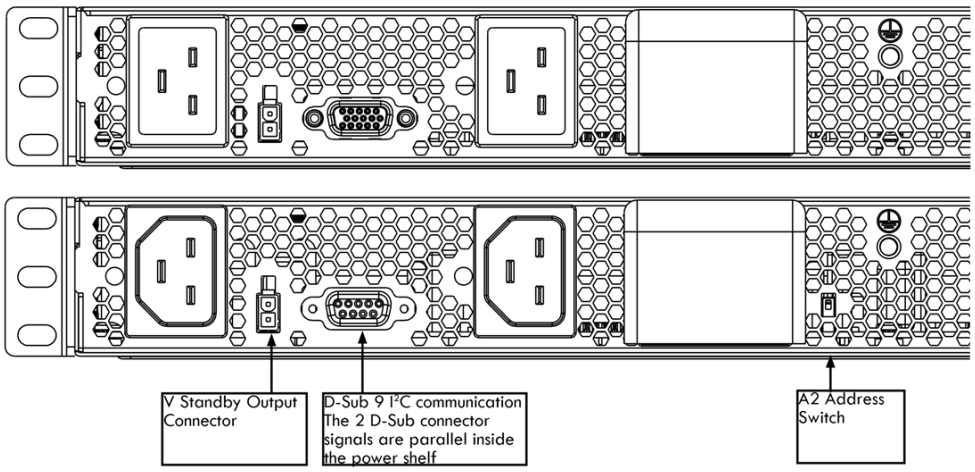
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AC LINE CORD CONNECTION

The power shelf is not shipped with AC line cords and the customer is responsible to provide its own AC line cords to meet the respective local electrical code requirements.



A2 Address Switch	ADDRESS			
	Slot 1	Slot 2	Slot 3	Slot 4
DOWN	000	001	010	011
UP	100	101	110	111



V Standby Output Connector, Mating Connector Molex 39-01-2020, terminals 39-00-0038

CONNECTOR – PIN#	SIGNAL NAME	FUNCTION
1 (lower position)	+3.3/5VSTANDBY	+3.3/5VDC +VE Output
2 (upper position)	+3.3/5VSTANDBY RTN	+3.3/5VDC –VE Output

SYSTEM INTERFACE CONNECTION	D SUB 9 PIN (FEMALE)	SYSTEM TO SHELF	SHELF TO SHELF
SDA	1	Yes	Yes
SCL	2	Yes	Yes
Not use	3		
Vpgm	4	Yes	Yes
Vpgm Return	5	Yes	Yes
Digital Return	6	Yes	Yes
SMB Alert	7	Yes	Yes
Not use	8		
I-Share	9	Yes	Yes

A2 Address Switch, UP position for “1”, DOWN position for “0”

ACCESSORIES		
DESCRIPTION	PART NUMBER	VENDOR / PART NUMBER
AC Power Cord for 1547,A,D (1)		Schurter C21.6051.5002
AC Power Cord for 1547B,C,E (1)		Schurter C19.6009.5195
D-Sub 9 male to male cable		Digi-Key AE9870-ND
Vstandby Output Mating Connector		Molex 39-01-2020
I^2C dongle (2)		Microchip DV164122
I^2C dongle to D sub 9	Cable 014-157401-4	

NOTES:
(1) For North American use only
(2) The PICkit Serial Analyzer is an USB-based tool used to direct communication between a PC and an external serial device. The kit comes complete with hardware (supporting I2C™, SMBus, SPI and USART protocols), an easy-to-use GUI (to configure and display communications) and a target demonstration board for out-of-the-box functionality. http://www.microchip.com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=1406&dDocName=en028600

For more information on these products consult: tech.support@psbel.com

NUCLEAR AND MEDICAL APPLICATIONS - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.
TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.

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