

400 Series

420 Surge Protective Device

Installation, Operation and Maintenance Manual



**EMERSON NETWORK POWER SURGE PROTECTIVE
DEVICE INSTALLATION, OPERATION AND
MAINTENANCE MANUAL**

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Surge Protective Devices

The Emerson Network Power **420 Surge Protective Devices** are high quality, high energy surge current diversion system designed to protect sensitive equipment from damaging transient voltage surges resulting from load switching, lightning strikes and other sources.

The installer should perform the following steps to assure a quality installation. Please read all instructions before starting the installation of this product. These instructions do not replace national or local electrical codes — check applicable codes to ensure compliance.

INSTALLATION

DANGER

ONLY QUALIFIED PERSONNEL SHOULD INSTALL OR SERVICE THIS SYSTEM. ELECTRICAL SAFETY PRE-CAUTIONS MUST BE FOLLOWED WHEN INSTALLING OR SERVICING THIS EQUIPMENT. TO PREVENT RISK OF ELECTRICAL SHOCK, TURN OFF AND LOCK OUT ALL POWER SOURCES TO THE UNIT BEFORE MAKING ELECTRICAL CONNECTIONS OR SERVICING.

Environment — The unit is designed for operation indoors in ambient temperatures of -40°C (-40°F) to +85°C (+185°F) with a relative humidity of 0% to 95% (non-condensing). The unit is provided in an industrial enclosure, which should not be installed in areas with excessive dust, corrosive vapors, flammable materials or explosive atmospheres.

Mounting — Mount unit as close as possible to the service panel in close proximity to the breaker that will feed the SPD. Remove plastic cover on unit to gain access to the four mounting holes in case. Use #6 x 3/4" self-threading screws (provided), to mount the SPD to wall or metal back plane. Replace cover on unit and torque cover screws to 10 IN-LBS, (see drawing). For best performance, unit should be positioned so that the length of the wiring to the surge protective device (SPD) unit is minimized.

Wire Sizing/Routing — #12 AWG wiring is provided with unit. To reduce the wiring impedance to surge currents, the phase, neutral (if required), and ground conductors are recommended to be twisted together and routed in the same raceway (conduit). Avoid any sharp bends in the conductors. All wiring must comply with the National Electrical Code (NEC) and applicable local codes.

Conduit Connection — The SPD wires should feed through the plastic conduit piece supplied. The conduit should be cut to match the distance from the unit to electrical panel. Use the supplied conduit hub to connect to the electrical panel.

Wiring Connections — Before making connections to the unit, verify that the unit model number and nameplate voltage rating are appropriate for connection to the intended power source (See table).

1. It is recommended that a 20A circuit breaker be used for installation and connection to the service panel.
2. Connect the white wire (if provided) of the SPD to the neutral of the supply, and connect the green wire (if provided) of the SPD to source ground.
3. Connect each Black Phase Wire to corresponding phase on the service panel.
4. If not using the relay contact wires for remote sensing, cut and dress the wires. If using remote sensing, these wires are connected to COM (orange), NC (blue), and NO (yellow) respectively. (Relay's maximum switching capacity is 250VAC, 10A.)

DANGER — For proper and safe operation, neutral and ground **MUST** be reliably connected. Failure to operate this unit from a solidly grounded power source of the proper configuration will reduce or impede operation, and may result in unit failure.

Applying Power — Apply power to the SPD and assure status indications are normal. Under normal conditions, the green "OK" LED is illuminated and the red "REPLACE" LED is OFF. If normal status indication does not exist, see "TROUBLESHOOTING".

PRODUCT RATINGS AND LIMITATIONS

Voltage Protection Rating — To obtain the voltage protection ratings (VPRs), as obtained by Underwriters Laboratories, Incorporated, in accordance with the *Standard for Safety, Surge Protective Devices (SPDs), Standard 1449 Third Edition, released 2009*, marked on this product, the #12 AWG wire supplied must be utilized to connect the 420 SPD to your facilities' power grid. Connections made with conductors other than #12 AWG may result in different VPRs.

Circuit Ampacity Limitations — This device has been investigated by Underwriters Laboratories, Incorporated to withstand, without exposing live circuits or components on power sources, a voltage of two times (2x) the device ratings, and fault currents of up to 200,000 AIC, as described in the *Standard for Safety, Surge Protective Devices (SPDs), Standard 1449, Third Edition, released 2009*.

TROUBLESHOOTING

If any of the diagnostic indicators indicates a problem (i.e. red LED ON, and/or green LED OUT), check all connections and voltages to the unit. If all connections are reliable, and proper voltages are supplied to the unit, call Emerson Network Power Surge Protection, Inc at 607-721-8840.

MODEL NUMBER CONFIGURATION

Model #:

1 2 3 4 5 6 7 8 9 10 11 12 13

(1-3) Series
420 = Non-Modular MOV - Medium Exposure

(4-5) Configuration & Voltage
 See Chart Below

(6-7) Surge Rating Per Mode
05 = 50kA

(8) Modes of Protection
A = All Modes of Protection (100kA Per Phase)
B = L-N & N-G (50kA Per Phase)
E = L-L (50kA Per Phase)
F = L-N (50kA Per Phase)

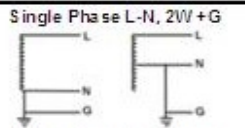
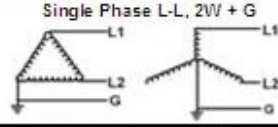
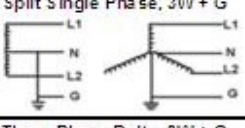
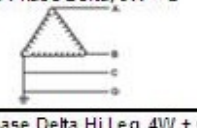
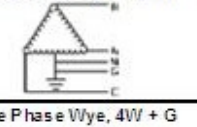
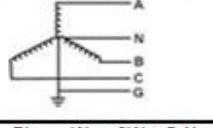
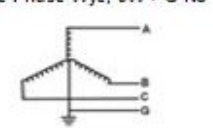
(9) Connection Type
W = Wire Leads

(10) Monitoring Options
R = LED/Relay
A = LED/Alarm/Relay

(11) Enclosure
J = NEMA Type 4X (plastic)

(12) UL 1449 Type
0 = No UL
1 = Type 1, 20kA
2 = Type 2, 20kA

(13) MOV Option
S = Standard
Q = High Rated

Source Configurations		Nominal Operating Voltage				MCOV	Configuration & Voltage
		L-N	L-G	L-L	Tolerance		
Single Phase	Single Phase L-N, 2W + G 	120	120	N/A	±25%	150 L-N	"NA"
		220,230,240	220,230,240	N/A	±15%	275 L-N	"NB"
		277	277	N/A	±15%	320 L-N	"NC"
		347	347	N/A	±15%	420 L-N	"ND"
	Single Phase L-L, 2W + G 	N/A	208, 240	208, 240	±15%	320 L-L	"LB"
		N/A	400	400	±15%	580 L-L	"LE"
		N/A	480	480	±15%	580 L-L	"LF"
		N/A	600	600	±15%	680 L-L	"LG"
	Split Single Phase, 3W + G 	120	120	208, 240	±25%	150 L-N	"SA"
		240	240	480	±15%	320 L-N	"SB"
277		277	480	±15%	320 L-N	"SC"	
347		347	600	±15%	420 L-N	"SD"	
Three Phase DELTA	Three Phase Delta, 3W + G 	N/A	208, 240	208, 240	±15%	320 L-L	"DB"
		N/A	380,400,415	380,400,415	±15%	580 L-L	"DE"
		N/A	480	480	±15%	580 L-L	"DF"
		N/A	600	600	±15%	680 L-L	"DG"
	Three Phase Delta Hi Leg, 4W + G 	120/208/120	120/208/120	208	±15%	150 L-N	"HB"
		120/240/120	120/240/120	240	±15%	150 L-N	"HB"
	240/480/240	240/480/240	480	±15%	320 L-N	"HF"	
Three Phase WYE	Three Phase Wye, 4W + G 	120	120	208	±25%	150 L-N	"YA"
		127	127	220	±25%	150 L-N	"YA"
		220,230,240	220,230,240	380,400,415	±15%	320 L-N	"YB"
		254	254	440	±15%	320 L-N	"YC"
		277	277	480	±15%	320 L-N	"YC"
		347	347	600	±15%	420 L-N	"YD"
	Three Phase Wye, 3W + G No 	N/A	120	208	±25%	150 L-G	"XA"
		N/A	127	220	±25%	150 L-G	"XA"
		N/A	220,230,240	380,400,415	±15%	320 L-G	"XB"
		N/A	254	440	±15%	320 L-G	"XC"
	N/A	277	480	±15%	320 L-G	"XC"	
	N/A	347	600	±15%	420 L-G	"XD"	

SPD WIRING & MOUNTING

CIRCUIT BREAKER & WIRE SIZE

Phase/Neutral/Ground

Connection Wire:
24" of #12 AWG Included

Overcurrent Protection:
20A Recommended

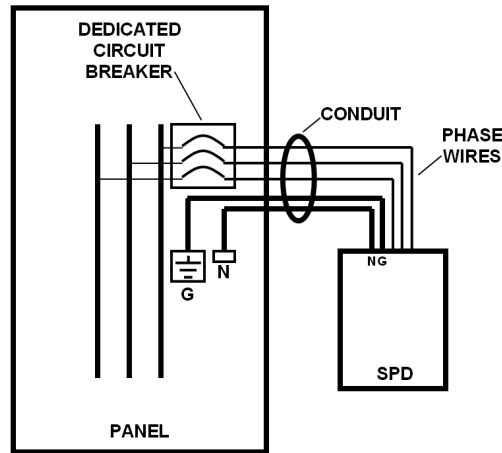
Summary Alarm Contacts

Connection Wire:
24" of #18 AWG Included

Normally Open (NC) = Yellow
Normally Closed (NC) = Blue
Common (COM) = Orange

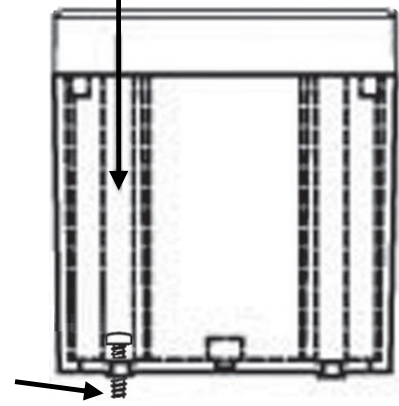
250VAC, 10A max

PARALLEL WIRING DIAGRAM



SCREW MOUNTING

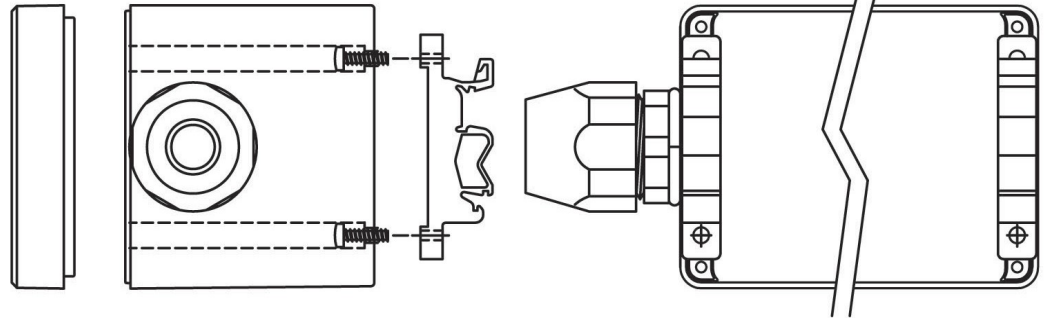
Remove cover, and use #6 x 3/4" self-threading screws (provided) for mounting. Replace cover, torque screws to 10 in/lbs.



DIN RAIL MOUNTING KIT

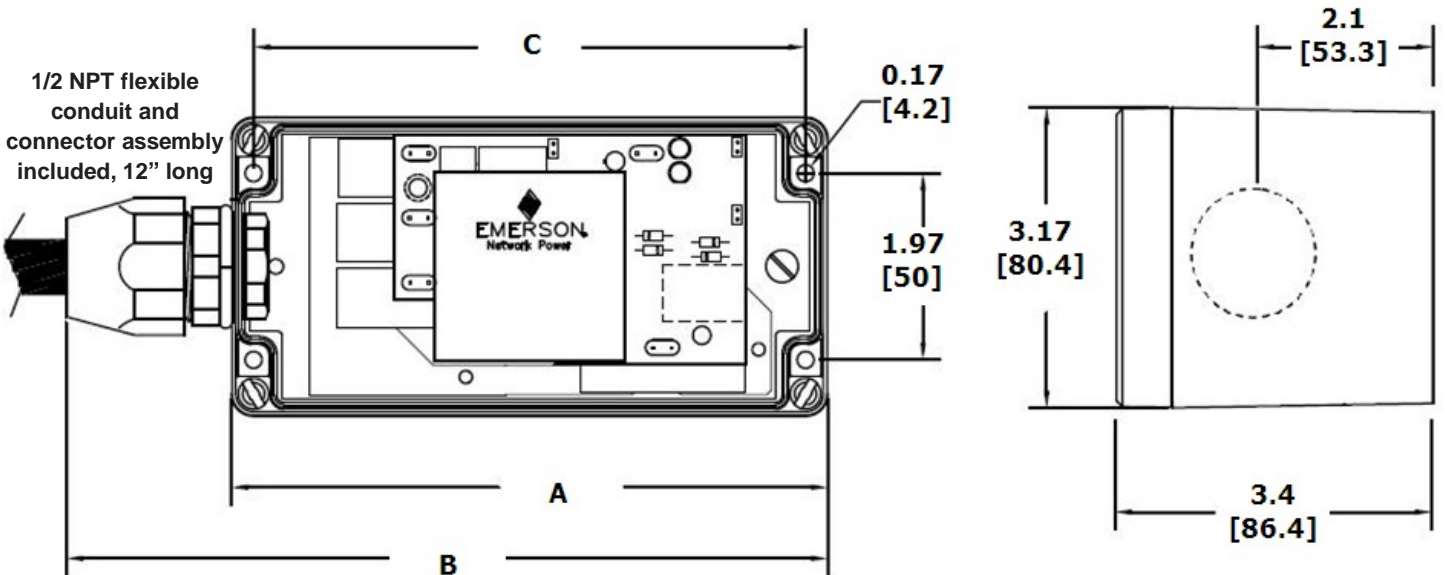
The optional DIN Rail mounting kit allows the 420 SPD to be installed on standard 35mm industrial Din Rail. Individual clips mount to the bottom of the enclosure using 6-32 hardware included.

Part Number: **420-DIN**
(Sold separately)



DIMENSIONAL INFORMATION

Modes of Protection	A	B	C	Weight
Reduced Mode Units ("B", "E", "F")	3.24 [82.2]	5.00 [126.9]	2.76 [70.0]	1.2 lbs [0.54kg]
All Mode Units ("A")	6.30 [160]	8.04 [204.2]	5.83 [148.0]	1.9 lbs [0.86kg]



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