



Ft Wainwright Fuel Control Panel Datasheet Submittal

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a subsidiary of



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Fuel Transfer Control Panel

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Enclosure

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AC Uninterruptible Power Supply (UPS)

DC Power Supply

Pushbutton

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Fused Terminal Block

Fuses

Wiring Duct

CONCEPT, TYPE 4 AND 12 (S-2961)



INDUSTRY STANDARDS

Wall-mounting brackets required to maintain UL/CSA external mounting requirement.

Concept solid single-door, door with window and flush-mount models

UL 508A Listed; Type 4, 12; File No. E61997
cUL Listed per CSA C22.2 No. 94; Type 4, 12; File No. E61997

NEMA/EEMAC Type 4, 12, 13
IEC 60529, IP66

Concept two-door models

UL 508A Listed; Type 12; File No. E61997
cUL Listed per CSA C22.2 No. 94; Type 12; File No. E61997

NEMA/EEMAC Type 12
IEC 60529, IP55

APPLICATION

Concept Enclosures are ideal for machine control applications. With streamlined styling, flush quarter-turn latches and an attractive, durable finish. Available in solid or window single-door and two-door landscape, flush-mount and sloped-top versions for application and mounting flexibility. Two-door landscape models provide full-width access and easy panel installation.

SPECIFICATIONS

- 16 or 14 gauge steel
- Seams continuously welded and ground smooth
- Corner-formed doors
- Simple easy-to-remove and install hinge pins with captivation clip
- High-torque threadless studs and fasteners on door
- Minimum-width body flange provides maximum door opening
- Door opens 210 degrees
- External formed body flange
- Panel mounting studs fit optional CONCEPT panels and other accessories
- Mounting holes in back of body for direct mounting or optional external mounting brackets
- Removable door with hidden hinges for clean, aesthetic appearance
- Seamless foam-in-place gasket
- Quarter-turn slotted latch(es)
- Door alignment device on doors wider than 30 in.
- Four hinges on 60-in.-high enclosures
- Grounding stud on body; bonding provision on door (except window-door models)
- Provisions on door for optional high-impact thermoplastic data pocket
- Hardware kit with panel mounting nuts, panel grounding hardware and sealing washers
- Installation instructions provided

Single-Door and Window-Door Models:

- 3-point latch system on enclosures with height equal to or greater than 42-in. with quarter-turn, slotted latch

Flush-Mount Models:

- Mounting frame extends completely around enclosure

Two-Door Models:

- Overlapping door design provides full-width access
- Three-point latch system on right-hand hinged door with quarter-turn, slotted latch

FINISH

Two standard finishes are available: ANSI 61 gray or RAL 7035 textured light-gray polyester powder paint inside and out.

ACCESSORIES

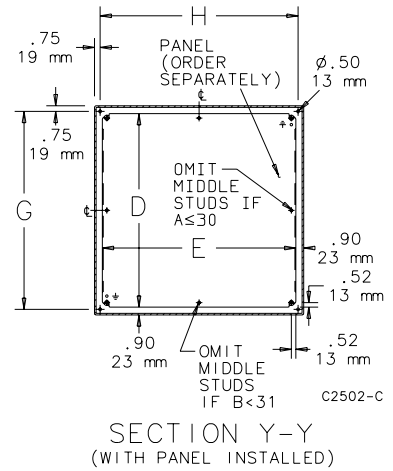
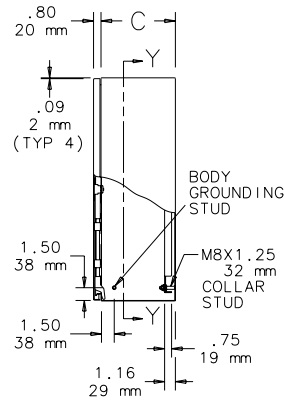
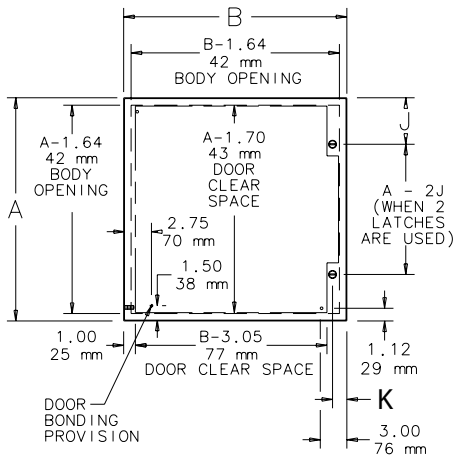
Concept Panels
Door Stop Kit
Handles
Lock Inserts
Mounting-Bracket Kits
Padlock Insert
Padlock Handle
HF Side-Mount Filter Fans

MODIFICATION AND CUSTOMIZATION

Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

BULLETIN: CW1

Catalog Number	AxBxC in./mm	Finish	Door Ga.	Body Ga.	CONCEPT Panel	Conductive CONCEPT Panel	Panel Size D x E in./mm	Mounting G x H in./mm	Latches qty.	Latches style	J in./mm	K in./mm
CSD362410LG	36.00 x 24.00 x 10.00 914 x 610 x 254	RAL 7035 Lt. Gray	14	16	CP3624	CP3624G	34.20 x 22.20 869 x 564	34.50 x 22.50 876 x 572	2	Quarter-turn	5.00 127	1.45 37
CSD363010	36.00 x 30.00 x 10.00 914 x 762 x 254	ANSI 61 Gray	14	14	CP3630	CP3630G	34.20 x 28.20 869 x 716	34.50 x 28.50 876 x 724	2	Quarter-turn	5.00 127	1.45 37
CSD363010LG	36.00 x 30.00 x 10.00 914 x 762 x 254	RAL 7035 Lt. Gray	14	14	CP3630	CP3630G	34.20 x 28.20 869 x 716	34.50 x 28.50 876 x 724	2	Quarter-turn	5.00 127	1.45 37
CSD363610	36.00 x 36.00 x 10.00 914 x 914 x 254	ANSI 61 Gray	14	14	CP3636	CP3636G	34.20 x 34.20 869 x 869	34.50 x 34.50 876 x 876	2	Quarter-turn	5.00 127	1.45 37
CSD363610LG	36.00 x 36.00 x 10.00 914 x 914 x 254	RAL 7035 Lt. Gray	14	14	CP3636	CP3636G	34.20 x 34.20 869 x 869	34.50 x 34.50 876 x 876	2	Quarter-turn	5.00 127	1.45 37
CSD422410	42.00 x 24.00 x 10.00 1067 x 610 x 254	ANSI 61 Gray	14	14	CP2442	CP2442G	22.20 x 40.20 564 x 1021	40.50 x 22.50 1029 x 572	1	3-point	21.00 533	1.70 43
CSD422410LG	42.00 x 24.00 x 10.00 1067 x 610 x 254	RAL 7035 Lt. Gray	14	14	CP2442	CP2442G	22.20 x 40.20 564 x 1021	40.50 x 22.50 1029 x 572	1	3-point	21.00 533	1.70 43
CSD423010	42.00 x 30.00 x 10.00 1067 x 762 x 254	ANSI 61 Gray	14	14	CP4230	CP4230G	40.20 x 28.20 1021 x 716	40.50 x 28.50 1029 x 724	1	3-point	21.00 533	1.70 43
CSD423010LG	42.00 x 30.00 x 10.00 1067 x 762 x 254	RAL 7035 Lt. Gray	14	14	CP4230	CP4230G	40.20 x 28.20 1021 x 716	40.50 x 28.50 1029 x 724	1	3-point	21.00 533	1.70 43
CSD423610	42.00 x 36.00 x 10.00 1067 x 914 x 254	ANSI 61 Gray	14	14	CP4236	CP4236G	40.20 x 34.20 1021 x 869	40.50 x 34.50 1029 x 876	1	3-point	21.00 533	1.70 43
CSD423610LG	42.00 x 36.00 x 10.00 1067 x 914 x 254	RAL 7035 Lt. Gray	14	14	CP4236	CP4236G	40.20 x 34.20 1021 x 869	40.50 x 34.50 1029 x 876	1	3-point	21.00 533	1.70 43
CSD482410	48.00 x 24.00 x 10.00 1219 x 610 x 254	ANSI 61 Gray	14	14	CP4824	CP4824G	46.20 x 22.20 1173 x 564	46.50 x 22.50 1181 x 572	1	3-point	24.00 610	1.70 43
CSD482410LG	48.00 x 24.00 x 10.00 1219 x 610 x 254	RAL 7035 Lt. Gray	14	14	CP4824	CP4824G	46.20 x 22.20 1173 x 564	46.50 x 22.50 1181 x 572	1	3-point	24.00 610	1.70 43
CSD483010	48.00 x 30.00 x 10.00 1219 x 762 x 254	ANSI 61 Gray	14	14	CP3048	CP3048G	28.20 x 46.20 716 x 1174	46.50 x 28.50 1181 x 28.50	1	3-point	24.00 610	1.70 43
CSD483010LG	48.00 x 30.00 x 10.00 1219 x 762 x 254	RAL 7035 Lt. Gray	14	14	CP3048	CP3048G	28.20 x 46.20 716 x 1174	46.50 x 28.50 1181 x 28.50	1	3-point	24.00 610	1.70 43
CSD483610	48.00 x 36.00 x 10.00 1219 x 914 x 254	ANSI 61 Gray	14	14	CP4836	CP4836G	46.20 x 34.20 1173 x 869	46.50 x 34.50 1181 x 876	1	3-point	24.00 610	1.70 43
CSD483610LG	48.00 x 36.00 x 10.00 1219 x 914 x 254	RAL 7035 Lt. Gray	14	14	CP4836	CP4836G	46.20 x 34.20 1173 x 869	46.50 x 34.50 1181 x 876	1	3-point	24.00 610	1.70 43
CSD603610	60.00 x 36.00 x 10.00 1524 x 914 x 254	ANSI 61 Gray	14	14	CP6036	CP6036G	58.20 x 34.20 1478 x 869	58.50 x 34.50 1486 x 876	1	3-point	30.00 762	1.70 43
CSD603610LG	60.00 x 36.00 x 10.00 1524 x 914 x 254	RAL 7035 Lt. Gray	14	14	CP6036	CP6036G	58.20 x 34.20 1478 x 869	58.50 x 34.50 1486 x 876	1	3-point	30.00 762	1.70 43
CSD201612	20.00 x 16.00 x 12.00 508 x 406 x 305	ANSI 61 Gray	16	16	CP2016	CP2016G	18.20 x 14.20 462 x 361	18.50 x 14.50 470 x 1029	1	Quarter-turn	10.00 254	1.45 37
CSD201612LG	20.00 x 16.00 x 12.00 508 x 406 x 305	RAL 7035 Lt. Gray	16	16	CP2016	CP2016G	18.20 x 14.20 462 x 361	18.50 x 14.50 470 x 1029	1	Quarter-turn	10.00 254	1.45 37
CSD202012	20.00 x 20.00 x 12.00 508 x 508 x 305	ANSI 61 Gray	16	16	CP2020	CP2020G	18.20 x 18.20 462 x 462	18.50 x 18.50 470 x 470	1	Quarter-turn	10.00 254	1.45 37
CSD202012LG	20.00 x 20.00 x 12.00 508 x 508 x 305	RAL 7035 Lt. Gray	16	16	CP2020	CP2020G	18.20 x 18.20 462 x 462	18.50 x 18.50 470 x 470	1	Quarter-turn	10.00 254	1.45 37
CSD242012	24.00 x 20.00 x 12.00 610 x 508 x 305	ANSI 61 Gray	16	16	CP2420	CP2420G	22.20 x 18.20 564 x 462	22.50 x 18.50 572 x 470	1	Quarter-turn	12.00 305	1.45 37
CSD242012LG	24.00 x 20.00 x 12.00 610 x 508 x 305	RAL 7035 Lt. Gray	16	16	CP2420	CP2420G	22.20 x 18.20 564 x 462	22.50 x 18.50 572 x 470	1	Quarter-turn	12.00 305	1.45 37
CSD242412	24.00 x 24.00 x 12.00 610 x 610 x 305	ANSI 61 Gray	14	16	CP2424	CP2424G	22.20 x 22.20 564 x 564	22.50 x 22.50 572 x 572	2	Quarter-turn	5.00 127	1.45 37
CSD242412LG	24.00 x 24.00 x 12.00 610 x 610 x 305	RAL 7035 Lt. Gray	14	16	CP2424	CP2424G	22.20 x 22.20 564 x 564	22.50 x 22.50 572 x 572	2	Quarter-turn	5.00 127	1.45 37
CSD243012	24.00 x 30.00 x 12.00 610 x 762 x 305	ANSI 61 Gray	14	16	CP3024	CP3024G	28.20 x 22.20 716 x 564	22.50 x 28.50 572 x 724	2	Quarter-turn	5.00 127	1.45 37
CSD243012LG	24.00 x 30.00 x 12.00 610 x 762 x 305	RAL 7035 Lt. Gray	14	16	CP3024	CP3024G	28.20 x 22.20 716 x 564	22.50 x 28.50 572 x 724	2	Quarter-turn	5.00 127	1.45 37
CSD302412	30.00 x 24.00 x 12.00 762 x 610 x 305	ANSI 61 Gray	14	16	CP3024	CP3024G	28.20 x 22.20 716 x 564	28.50 x 22.50 724 x 572	2	Quarter-turn	5.00 127	1.45 37
CSD302412LG	30.00 x 24.00 x 12.00 762 x 610 x 305	RAL 7035 Lt. Gray	14	16	CP3024	CP3024G	28.20 x 22.20 716 x 564	28.50 x 22.50 724 x 572	2	Quarter-turn	5.00 127	1.45 37
CSD303012	30.00 x 30.00 x 12.00 762 x 762 x 305	ANSI 61 Gray	14	14	CP3030	CP3030G	28.20 x 28.20 716 x 716	28.50 x 28.50 724 x 724	2	Quarter-turn	5.00 127	1.45 37
CSD303012LG	30.00 x 30.00 x 12.00 762 x 762 x 305	RAL 7035 Lt. Gray	14	14	CP3030	CP3030G	28.20 x 28.20 716 x 716	28.50 x 28.50 724 x 724	2	Quarter-turn	5.00 127	1.45 37
CSD362412	36.00 x 24.00 x 12.00 914 x 610 x 305	ANSI 61 Gray	14	16	CP3624	CP3624G	34.20 x 22.20 869 x 564	34.50 x 22.50 876 x 572	2	Quarter-turn	5.00 127	1.45 37
CSD362412LG	36.00 x 24.00 x 12.00 914 x 610 x 305	RAL 7035 Lt. Gray	14	16	CP3624	CP3624G	34.20 x 22.20 869 x 564	34.50 x 22.50 876 x 572	2	Quarter-turn	5.00 127	1.45 37
CSD363012	36.00 x 30.00 x 12.00 914 x 762 x 305	ANSI 61 Gray	14	14	CP3630	CP3630G	34.20 x 28.20 869 x 716	34.50 x 28.50 876 x 724	2	Quarter-turn	5.00 127	1.45 37
CSD363012LG	36.00 x 30.00 x 12.00 914 x 762 x 305	RAL 7035 Lt. Gray	14	14	CP3630	CP3630G	34.20 x 28.20 869 x 716	34.50 x 28.50 876 x 724	2	Quarter-turn	5.00 127	1.45 37
CSD363612	36.00 x 36.00 x 12.00 914 x 914 x 305	ANSI 61 Gray	14	14	CP3636	CP3636G	34.20 x 34.20 869 x 869	34.50 x 34.50 876 x 876	2	Quarter-turn	5.00 127	1.45 37
CSD363612LG	36.00 x 36.00 x 12.00 914 x 914 x 305	RAL 7035 Lt. Gray	14	14	CP3636	CP3636G	34.20 x 34.20 869 x 869	34.50 x 34.50 876 x 876	2	Quarter-turn	5.00 127	1.45 37
CSD423012	42.00 x 30.00 x 12.00 1067 x 762 x 305	ANSI 61 Gray	14	14	CP4230	CP4230G	40.20 x 28.20 1021 x 716	40.50 x 28.50 1029 x 724	1	3-point	21.00 533	1.70 43
CSD423012LG	42.00 x 30.00 x 12.00 1067 x 762 x 305	RAL 7035 Lt. Gray	14	14	CP4230	CP4230G	40.20 x 28.20 1021 x 716	40.50 x 28.50 1029 x 724	1	3-point	21.00 533	1.70 43
CSD423612	42.00 x 36.00 x 12.00 1067 x 914 x 305	ANSI 61 Gray	14	14	CP4236	CP4236G	40.20 x 34.20 1021 x 869	40.50 x 34.50 1029 x 876	1	3-point	21.00 533	1.70 43





Connection: Infeed, 2-pole. Through wiring, 2-pole

Follow-up time of the motion detector: 3 min.

Light colour: 5300 K (neutral white)

Dimensions: 396 x 33 x 40 mm (15.6 x 1.3 x 1.6)

Lamp type: LED

Power consumption: 5.1 W max.

Luminosity: 550 lm

Operating temperature: -20 ... +55 °C (-4 ... 131 °F)

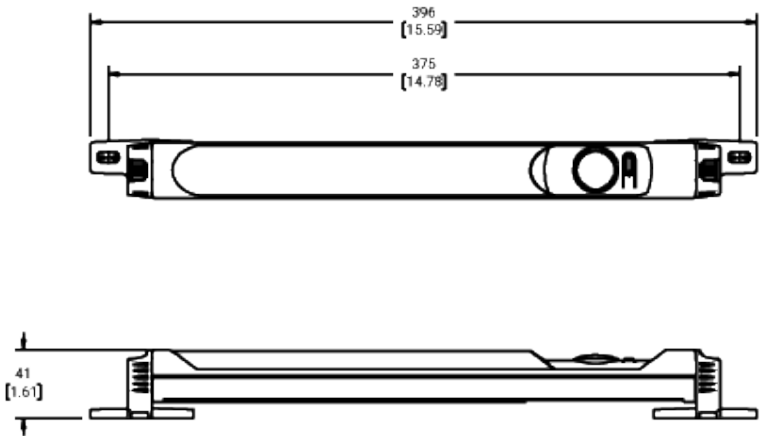
Protection degree: IP20

Operating voltage: 24 - 240 V (AC/DC) (+/- 10%)

Description: A compact LED light specially designed for nVent HOFFMAN enclosures. Designed to fit 25mm mounting profile and accessory channel. May be fitted horizontally or vertically. The light allows up to 4 lights to be connected to each other in a daisy chain. Model ending with "M" includes motion sensor. Magnetic attachment as accessory. Lights and cables sold separately.

Protection: II / III

Operating voltage	Width	Item no.
24-240V (AC/DC) (+/- 10%)	396 mm (15.6)	CEL550
24-240V (AC/DC) (+/- 10%)	396 mm (15.6)	CEL550M



89235839

Compact LED Light Connection Cable, CELC

Compact LED Light Through Wire, CELC



Colour: Black, Orange

Design: Infeed, with through wiring 2-pole cables

Description: To save time and easily mount the compact LED lights, use these pre-fabricated cables.

Connection	Type	Length	Colour	Pack quantity	Item no.	Region
Infeed	Connection cable for compact LED enclosure lights	3000 mm (118)	Black	1	CELC3001PBUL	NA
Infeed	Connection cable for compact LED enclosure lights	3000 mm (118)	Black	1	CELC3001PB	EU
Infeed	Connection cable for compact LED enclosure lights	3000 mm (118)	Orange	1	CELC3001PO	EU
Through-wiring	Through wiring cable for LED enclosure lights	1000 mm (39)	Black	1	CELC1001TBUL	NA
Through-wiring	Through wiring cable for LED enclosure lights	1000 mm (39)	Black	1	CELC1001TB	EU
Through-wiring	Through wiring cable for LED enclosure lights	1000 mm (39)	Orange	1	CELC1001TO	EU

CompactLogix 5370 L3 Controllers

The CompactLogix 5370 L3 controller comes with:

- Dual Ethernet ports for linear and ring topologies.
- USB port for firmware updates and programming.
- Support for 1769 Compact I/O.



Use the 1769-L30ER-NSE controller for mining applications. You can deplete the residual stored energy of the 1769-L30ER-NSE controller to 200 μ J or less before you transport it into or out of a mine. The 1769-L30ER-NSE controller does not maintain the real-time clock on power cycle.

Characteristic	1769-L30ER 1769-L30ERK	1769-L30ERM 1769-L30ERMK	1769-L30ER-NSE	1769-L33ER 1769-L33ERK	1769-L33ERM 1769-L33ERMK	1769-L36ERM	1769-L37ERM 1769-L37ERMK	1769-L38ERM 1769-L38ERMK
Available user memory	1 MB	1 MB	1 MB No capacitor	2 MB	2 MB	3 MB	4 MB	5 MB
Memory card	1784-SD1 (1 GB), shipped with controller 1784-SD2 (2 GB)							
Communication ports	2 EtherNet/IP 1 USB							
EtherNet/IP connections	256 EtherNet/IP 120 TCP							
EtherNet/IP nodes supported, max	16			32		48	64	80
Axes supported, max ⁽¹⁾	Not Applicable	100	Not Applicable	Not Applicable	100	100		
CIP Drive axes (position loop) supported, max	Not Applicable	4	Not Applicable	Not Applicable	8	16		
Module expansion capacity	8 1769 modules 1 bank of modules			16 1769 modules 2 banks of modules		30 1769 modules 3 banks of modules		
Battery	None							
Power supply distance rating	4 modules			4 modules		4 modules		
Programming software support	Version 20 - For controllers that use firmware revision 20. Version 21 or later - For controllers that use firmware revision 21 or later.						Version 31 or later	

(1) Any combination of CIP Drive, Virtual, Consumed, Regenerative AC/DC Converter and Non-Regenerative AC/DC Converter axis types.

These controllers replace previous catalog numbers.

New Controller ^{(1) (2)}	Replaces Previous Controller	Differences
1769-L30ER 1769-L30ERM 1769-L30ER-NSE	1769-L31 1769-L32C ⁽³⁾ 1769-L32E	Additional memory Integrated motion on EtherNet/IP support (1769-L30ERM, 1769-L33ERM, 1769-L36ERM) USB port instead of RS-232 port Dual-port EtherNet/IP support SD card instead of CompactFlash card
1769-L33ER 1769-L33ERM	1769-L35CR ⁽³⁾ 1769-L35E 1768-L43	
1769-L36ERM	1768-L45 Any previous 1769-L3x and 1769-L4x controller.	

(1) Typically, you can use any of the new controllers that are listed in each row as replacements for any of the previous controllers that are listed in the corresponding cell to the right. For example, you can replace a 1769-L32E controller with a 1769-L30ER, 1769-L30ERM, or 1769-L30ER-NSE controller. In some rare cases, system configuration helps to prevent controller replacement as shown in the previous table. For example, if your system uses a 1769-L32E controller with 12 expansion modules, you cannot replace that controller with a 1769-L30ER, 1769-L30ERM, or 1769-L30ER-NSE controller. Those controllers support no more than eight expansion modules. You must replace the 1769-L32E controller with a 1769-L33ER, 1769-L33ERM, or 1769-L36ERM controller.

We recommend that before you upgrade your controllers, consider your application requirements to verify that the replacements that are listed previously apply.

(2) If you require Serial communication, consider a CompactLogix 5380 solution with the 5069-SERIAL module.

(3) Requires converting from ControlNet connections to EtherNet/IP connections.

CompactLogix Communication Options

You can configure your system for information exchange between a range of devices and computing platforms and operating systems. Select a CompactLogix controller with integrated communication or the appropriate communication module.

For detailed specifications, see:

- CompactLogix 5380, Compact GuardLogix 5380, and CompactLogix 5480 Controllers Specifications Technical Data, publication [5069-TD002](#)
- Compact 5000 I/O Modules and EtherNet/IP Adapters Specifications Technical Data, publication [5069-TD001](#)
- CompactLogix Controllers Specifications Technical Data, publication [1769-TD005](#).
- CompactLogix Communication Modules Specifications Technical Data, publication [1769-TD007](#).

EtherNet/IP Communication Options

The Ethernet Industrial network protocol (EtherNet/IP) is an open industrial-networking standard that supports real-time I/O messaging and message exchange. The EtherNet/IP network uses off-the-shelf Ethernet communication chips and physical media.

Dual-port EtherNet/IP support embeds switch technology directly in the controller to so the controller can operate on star, linear, or ring EtherNet/IP topologies.

CompactLogix Controller EtherNet/IP Communication Options

Cat. No.	Description	Communication Rate	Logix Resources ^{(1), (2)}	TCP/IP Connections
5069-L306ER, 5069-L306ERM	CompactLogix 5380 controller with embedded dual Ethernet ports	10/100 Mbps, 1 Gbps ⁽³⁾	16	—
5069-L310ER, 5069-L310ER-NSE, 5069-L310ERM, 5069-L310ERMK			24	
5069-L320ER, 5069-L320ERM, 5069-L320ERMK			40	
5069-L330ER, 5069-L330ERM, 5069-L330ERMK			60	
5069-L340ER, 5069-L340ERM			90	
5069-L350ERM, 5069-L350ERMK			120	
5069-L380ERM			150	
5069-L3100ERM			180	
5069-L306ERS2, 5069-L306ERS2, 5069-L306ERS3	Compact GuardLogix 5380 controller with embedded dual Ethernet ports	10/100 Mbps, 1 Gbps ⁽⁴⁾	16	—
5069-L310ERS2, 5069-L310ERS2K, 5069-L310ERS2, 5069-L310ERS2K, 5069-L310ERS3, 5069-L310ERS3K			24	
5069-L320ERS2, 5069-L320ERS2, 5069-L320ERS2K, 5069-L320ERS2K, 5069-L320ERS3, 5069-L320ERS3K, 5069-L320ERP			40	
5069-L330ERS2, 5069-L330ERS2, 5069-L330ERS2K, 5069-L330ERS2K, 5069-L330ERS3, 5069-L330ERS3K			60	
5069-L340ERS2, 5069-L340ERS2, 5069-L340ERS3, 5069-L340ERP			90	
5069-L350ERS2, 5069-L350ERS2, 5069-L350ERS2K, 5069-L350ERS2K, 5069-L350ERS3, 5069-L350ERS3K			120	
5069-L380ERS2, 5069-L380ERS2, 5069-L380ERS3			150	
5069-L3100ERS2, 5069-L3100ERS2, 5069-L3100ERS3			180	
5069-L430ERMW	CompactLogix 5480 controller with embedded Ethernet ports	10/100 Mbps, 1 Gbps ⁽⁵⁾	60	—
5069-L450ERMW			120	
5069-L4100ERMW			180	
5069-L4200ERMW			250	

CompactLogix Controller EtherNet/IP Communication Options (continued)

Cat. No.	Description	Communication Rate	Logix Resources ^{(1), (2)}	TCP/IP Connections
1769-L16ER-BB1B	CompactLogix 5370 L1 controller with embedded dual Ethernet ports, POINT I/O form factor	10/100 Mbps	4 nodes 256 EtherNet/IP connections	120
1769-L18ER-BB1B 1769-L18ERM-BB1B, 1769-L18ERM-BB1BK			8 nodes 256 EtherNet/IP connections	
1769-L19ER-BB1B, 1769-L19ER-BB1BK				
1769-L24ER-QB1B 1769-L24ER-QBFC1B 1769-L24ER-QBFC1BK	CompactLogix 5370 L2 controller with embedded dual Ethernet ports, 1769 Compact I/O form factor	10/100 Mbps	8 nodes 256 EtherNet/IP connections	120
1769-L27ERM-QBFC1B		10/100 Mbps	16 nodes 256 EtherNet/IP connections	
1769-L30ER, 1769-L30ERK, 1769-L30ERM, 1769-L30ERMK, 1769-L30ERMS	CompactLogix 5370 L3 controller with embedded dual Ethernet ports	10/100 Mbps	16 nodes 256 EtherNet/IP connections	120
1769-L33ER, 1769-L33ERK, 1769-L33ERM, 1769-L33ERMS, 1769-L33ERMK, 1769-L33ERMSK, 1769-L33ERMO, 1769-L33ERMOS			32 nodes 256 EtherNet/IP connections	
1769-L36ERM, 1769-L36ERMS, 1769-L36ERMO, 1769-L36ERMOS			48 nodes 256 EtherNet/IP connections	
1769-L37ERM, 1769-L37ERMS, 1769-L37ERMK, 1769-L37ERMSK, 1769-L37ERMO, 1769-L37ERMOS			64 nodes 256 EtherNet/IP connections	
1769-L38ERM, 1769-L38ERMS, 1769-L38ERMK, 1769-L38ERMSK, 1769-L38ERMO, 1769-L38ERMOS			80 nodes 256 EtherNet/IP connections	

- (1) The number of nodes that are listed for CompactLogix 5370, CompactLogix 5380, Compact GuardLogix 5380, CompactLogix 5480 controllers represents the maximum number of EtherNet/IP nodes you can include in a Logix Designer application project. For example, in a controller project that uses a 1769-L18ERM-BB1B controller, you can add as many as eight EtherNet/IP nodes to the project.
- (2) The maximum number of nodes that are listed represents when the controller is used with the Logix Designer application, version 31 or later. Some controllers can be used with earlier Logix Designer application versions. The maximum number of nodes that a controller supports can be fewer in the Logix Designer application, versions 30 or earlier.
- (3) Network performance in a CompactLogix 5380 system is optimal if the 1 Gbps network communication rate is used. However, many Ethernet devices do not support the 1 Gbps network communication rate. You must consider how the different maximum network communication rates impact your CompactLogix 5380 control system when you design the system.
- (4) Network performance in a Compact GuardLogix 5380 system is optimal if the 1 Gbps network communication rate is used. However, many Ethernet devices do not support the 1 Gbps network communication rate. You must consider how the different maximum network communication rates impact your Compact GuardLogix 5380 control system when you design the system.
- (5) Network performance in a CompactLogix 5480 system is optimal if the 1 Gbps network communication rate is used. However, many Ethernet devices do not support the 1 Gbps network communication rate. You must consider how the different maximum network communication rates impact your CompactLogix 5480 control system when you design the system.

EtherNet/IP Modes

These controllers offer multiple EtherNet/IP modes:

- CompactLogix 5380
- Compact GuardLogix 5380
- CompactLogix 5480 (Dual-IP mode enabled by default)

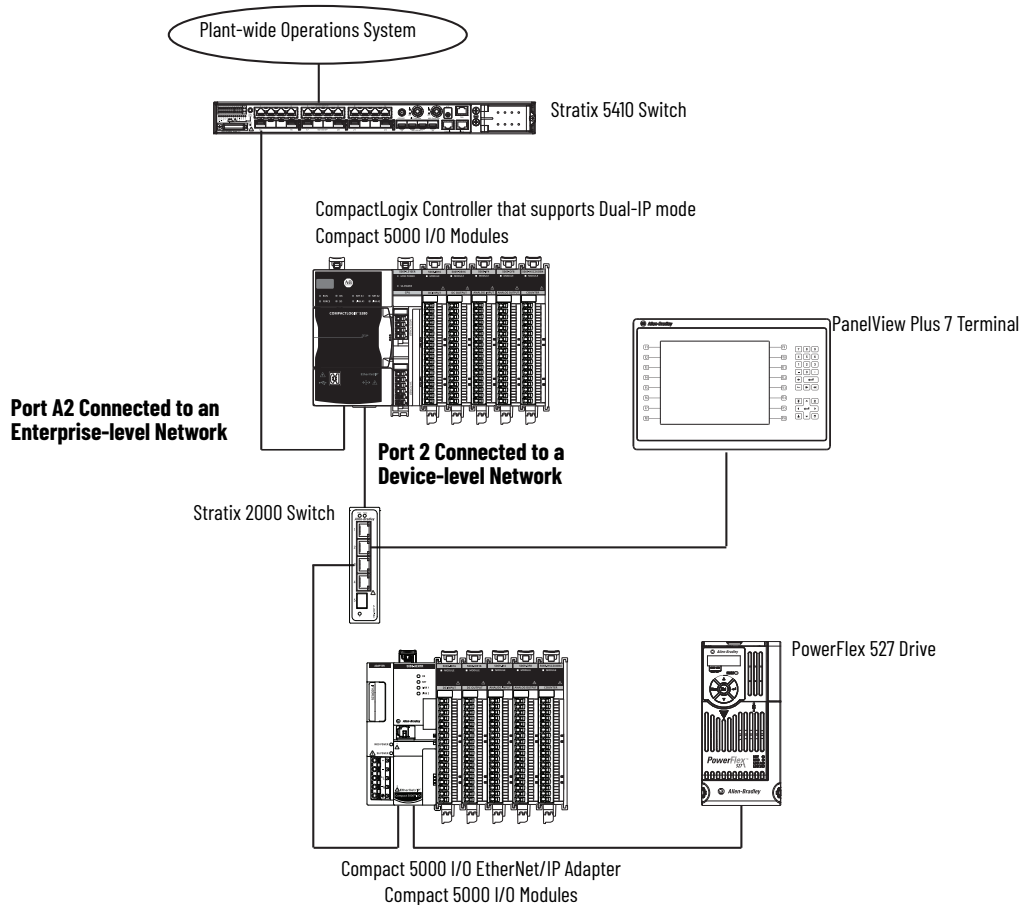
For more information on EtherNet/IP modes, see the following:

- CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, publication [5069-UM001](#)
- CompactLogix 5480 Controllers User Manual, publication [5069-UM002](#)

Dual-IP Mode

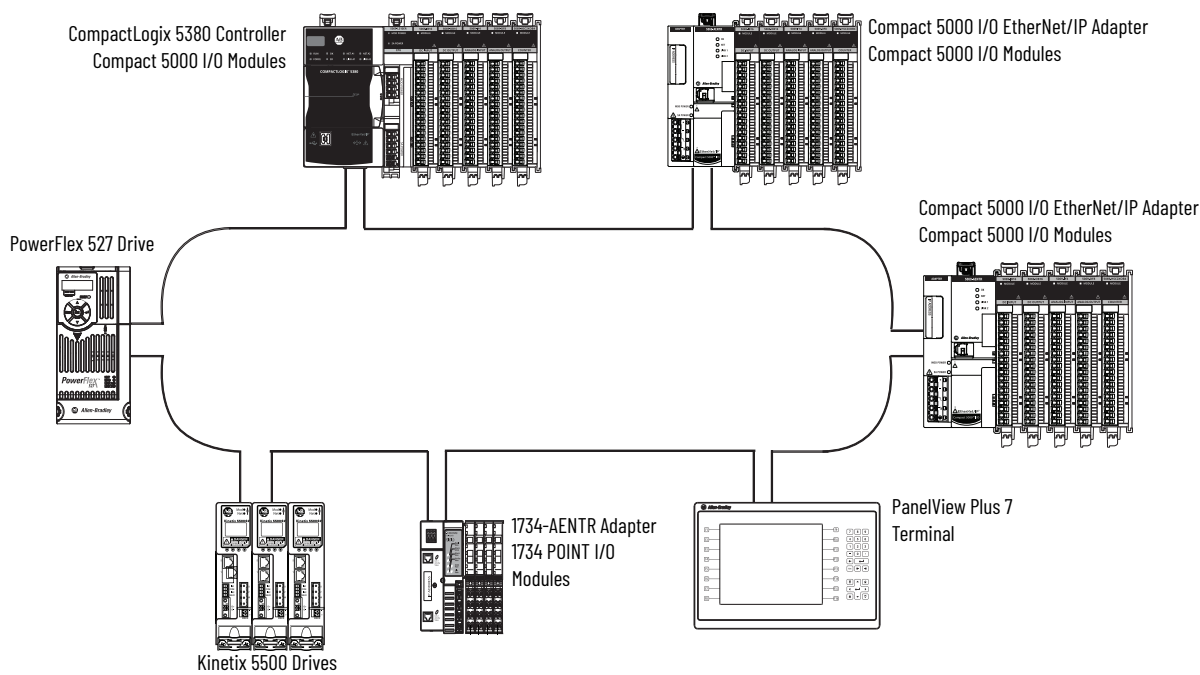
Dual-IP mode lets you configure the embedded Ethernet ports to connect to separate EtherNet/IP networks, that is, an enterprise-level network and a device-level network. The machine internal network is isolated from factory network. In this mode, each port requires its own network configurations that include some restrictions. For example, when you set IP addresses in Dual-IP mode, you cannot overlap IP addresses between the ports.

Dual-IP Mode with Enterprise-level and Device-level Network Connections



Linear/DLR Mode

In Linear/DLR mode, the controller connects to only one network. Linear/DLR mode supports any EtherNet/IP network topology—linear, DLR, or star.



DeviceNet Communication Options

The DeviceNet network is an open, low-level network that provides connections between simple industrial devices (such as sensors and actuators) and higher-level devices (such as controllers and computers).

Cat. No.	Description	Communication Rate	Number of Nodes
1769-SDN 1769-SDNK ⁽¹⁾	1769 Compact I/O DeviceNet scanner	125 Kbps (500 m, max) 250 Kbps (250 m, max) 500 Kbps (100 m, max)	64

(1) Module has conformal coating.

Serial Communication Options

These CompactLogix controllers support serial communication.

Cat. No.	Serial Options
1769-L16ER-BB1B, 1769-L18ER-BB1B, 1769-L18ERM-BB1B, 1769-L18ERM-BB1BK, 1769-L19ER-BB1B, 1769-L19ER-BB1BK	1734-232ASC module for an RS-232 serial interface 1734-485 ASC module for an RS-422 and RS-485 serial device
1769-L24ER-QB1B, 1769-L24ER-QBFC1B, 1769-L24ER-QBFC1BK	1769-ASCII module for an ASCII interface to RS-232, RS-422, and RS-485 devices 1769-SM2 module for a Modbus RTU interface
1769-L27ERM-QBFC1B	
1769-L30ER, 1769-L30ERK, 1769-L30ERM, 1769-L30ERMK, 1769-L30ERMS	
1769-L33ER, 1769-L33ERK, 1769-L33ERM, 1769-L33ERMS, 1769-L33ERMO, 1769-L33ERMOS, 1769-L33ERMK, 1769-L33ERMSK	
1769-L36ERM, 1769-L36ERMS, 1769-L36ERMO, 1769-L36ERMOS	
1769-L37ERM, 1769-L37ERMS, 1769-L37ERMK, 1769-L37ERMSK, 1769-L37ERMO, 1769-L37ERMOS	
1769-L38ERM, 1769-L38ERMS, 1769-L38ERMK, 1769-L38ERMSK, 1769-L38ERMO, 1769-L38ERMOS	5069-SERIAL module for an ASCII, Modbus, DF1, and DH485 interface to RS-232, RS-422, and RS-485 devices
5069-L306ER, 5069-L306ERM, 5069-L306ERS2, 5069-L306ERMS2, 5069-L306ERMS3, 5069-L310ER, 5069-L310ER-NSE, 5069-L310ERM, 5069-L310ERMK, 5069-L310ERS2, 5069-L310ERS2K, 5069-L310ERMS2, 5069-L310ERMS2K, 5069-L310ERMS3, 5069-L310ERMS3K, 5069-L320ER, 5069-L320ERM, 5069-L320ERMK, 5069-L320ERS2, 5069-L320ERMS2, 5069-L320ERS2K, 5069-L320ERMS2K, 5069-L320ERMS3, 5069-L320ERMS3K, 5069-L320ERP, 5069-L330ER, 5069-L330ERM, 5069-L330ERMK, 5069-L330ERS2, 5069-L330ERMS2, 5069-L330ERS2K, 5069-L330ERMS2K, 5069-L330ERMS3, 5069-L330ERMS3K, 5069-L340ER, 5069-L340ERM, 5069-L340ERS2, 5069-L340ERMS2, 5069-L340ERMS3, 5069-L340ERP, 5069-L350ERM, 5069-L350ERMK, 5069-L350ERS2, 5069-L350ERMS2, 5069-L350ERS2K, 5069-L350ERMS2K, 5069-L350ERMS3, 5069-L350ERMS3K, 5069-L380ERM, 5069-L380ERS2, 5069-L380ERMS2, 5069-L380ERMS3, 5069-L3100ERM, 5069-L3100ERS2, 5069-L3100ERMS2, 5069-L3100ERMS3	
5069-L430ERMW, 5069-L450ERMW, 5069-L4100ERMW, 5069-L4200ERMW	

Modbus Support

To access a Modbus TCP network, connect through the embedded Ethernet port of the CompactLogix 5370 or CompactLogix 5380 controllers and execute a ladder logic routine. For more information, see Knowledgebase document 470365 at <http://www.rockwellautomation.com/knowledgebase/>.

To access a Modbus RTU network via a CompactLogix 5370 or Compact GuardLogix 5370 L3 controller, connect through a 1769-SM2 module, or Encompass™ partner, ProSoft ModBus module, or Gateway and execute a ladder logic routine. For more information, see Using Logix 5000 Controllers as Masters or Slaves on Modbus Application Solution, publication [CIG-AP129](#).

To access a Modbus RTU network via a CompactLogix 5380, Compact GuardLogix 5380 controller, or CompactLogix 5480 controller, connect through a 5069-SERIAL module and execute a ladder logic routine. For more information, see the Compact 5000 I/O Serial Module User Manual, publication [5069-UM003](#).

Local I/O Modules

These CompactLogix controllers support local I/O modules. The local I/O modules that are supported is different based on controller type.

Cat. No.	Local I/O Options
5069-L306ER, 5069-L306ERM, 5069-L310ER, 5069-L310ER-NSE, 5069-L310ERM, 5069-L310ERMK, 5069-L320ER, 5069-L320ERM, 5069-L320ERMK, 5069-L320ERP, 5069-L330ER, 5069-L330ERM, 5069-L330ERMK, 5069-L340ER, 5069-L340ERM, 5069-L340ERP, 5069-L350ERM, 5069-L350ERMK, 5069-L380ERM, 5069-L3100ERM	Compact 5000 I/O modules
5069-L306ERS2, 5069-L306ERMS2, 5069-L310ERS2, 5069-L310ERS2K, 5069-L310ERMS2, 5069-L310ERMS2K, 5069-L320ERS2, 5069-L320ERS2K, 5069-L320ERMS2, 5069-L320ERMS2K, 5069-L330ERS2, 5069-L330ERS2K, 5069-L330ERMS2, 5069-L330ERMS2K, 5069-L340ERS2, 5069-L340ERMS2, 5069-L350ERS2, 5069-L350ERS2K, 5069-L350ERMS2, 5069-L350ERMS2K, 5069-L380ERS2, 5069-L380ERMS2, 5069-L3100ERS2, 5069-L3100ERMS2	
5069-L306ERMS3, 5069-L310ERMS3, 5069-L310ERMS3K, 5069-L320ERMS3, 5069-L320ERMS3K, 5069-L330ERMS3, 5069-L330ERMS3K, 5069-L340ERMS3, 5069-L350ERMS3, 5069-L350ERMS3K, 5069-L380ERMS3, 5069-L3100ERMS3	
5069-L430ERMW, 5069-L450ERMW, 5069-L4100ERMW, 5069-L4200ERMW	
1769-L16ER-BB1B, 1769-L18ER-BB1B, 1769-L18ERM-BB1B, 1769-L18ERM-BB1BK, 1769-L19ER-BB1B, 1769-L19ER-BB1BK	Embedded I/O modules 1734 POINT I/O modules
1769-L24ER-QB1B, 1769-L24ER-QBFC1B, 1769-L24ER-QBFC1BK, 1769-L27ERM-QBFC1B	Embedded I/O modules 1769 Compact I/O modules
1769-L30ER, 1769-L30ERK, 1769-L30ERM, 1769-L30ERMK, 1769-L30ER-NSE, 1769-L33ER, 1769-L33ERK, 1769-L33ERMK, 1769-L33ERM, 1769-L36ERM, 1769-L37ERM, 1769-L37ERMK, 1769-L38ERM, 1769-L38ERMK	1769 Compact I/O modules
1769-L30ERMS, 1769-L33ERMS, 1769-L33ERMSK, 1769-L36ERMS, 1769-L37ERMS, 1769-L37ERMSK, 1769-L38ERMS, 1769-L38ERMSK	1769 Compact I/O modules

Compact 5000 I/O Modules

You can install Compact 5000 I/O modules as local I/O modules in a CompactLogix 5380, Compact GuardLogix 5380, or CompactLogix 5480 control system.

The Compact 5000 I/O architecture provides a wide range of input and output modules to span many applications, from high-speed digital to process control. The architecture uses Producer/Consumer technology that allows input information and output status to be shared among multiple Logix 5000 controllers.

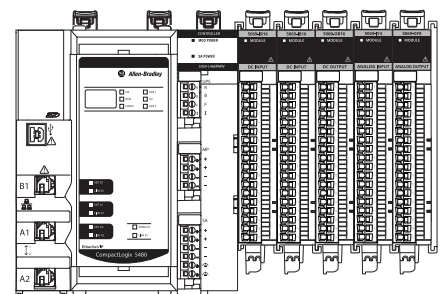
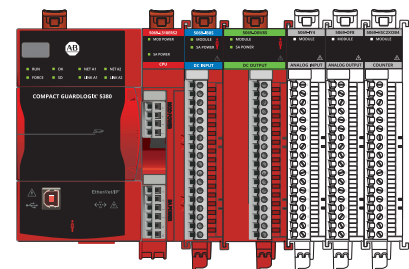
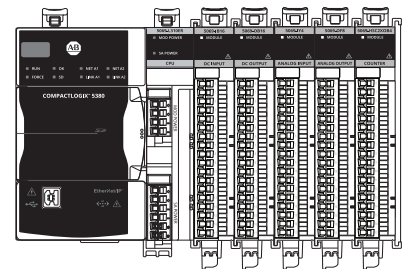
The Compact 5000 I/O modules are installed to the right of a CompactLogix 5380, Compact GuardLogix 5380, or CompactLogix 5480 controller and require removable terminal blocks (RTBs) to connect field-side wiring. The RTBs that are used with Compact 5000 I/O modules are sold separately. See [Removable Terminal Blocks on page 30](#) for the RTBs that are available for Compact 5000 I/O modules.

You can use Compact 5000 I/O safety modules with Compact GuardLogix 5380 controllers only. You cannot use them with CompactLogix 5380 or 5480 controllers.

The modules draw system-side power, which is known as Module (MOD) power, and field-side power, which is known as Sensor/Actuator (SA) power from the controller through the system backplane as needed. The modules then pass the remaining power to the next module in the system.

The following apply when you use Compact 5000 I/O modules:

- You cannot use Compact 5000 I/O modules with the other CompactLogix controllers.
- Some restrictions that apply when you use Compact 5000 I/O modules with Compact GuardLogix 5380 controllers. For more information, see the CompactLogix 5380 and Compact GuardLogix Controllers User Manual, publication [5069-UM001](#) and the Compact 5000 I/O Digital Modules User Manual, publication [5069-UM004](#).



1769 AC Digital Modules

Cat. No.	Inputs/Outputs	Voltage Category	Operating Voltage Range	Backplane Current	Power Supply Distance Rating
1769-IA8I 1769-IA8IK ⁽²⁾	8 inputs, individually isolated	100/120V AC	79...132V AC, 47...63 Hz	90 mA @ 5.1V ⁽¹⁾	8
1769-IA16 1769-IA16K ⁽²⁾	16 inputs	100/120V AC	79...132V AC, 47...63 Hz	115 mA @ 5.1V	8
1769-IM12	12 inputs	200/240V AC	159...265V AC, 47...63 Hz	100 mA @ 5.1V	8
1769-OA8	8 outputs	100/240V AC	85...265V AC 47...63 Hz	145 mA @ 5.1V	8
1769-OA16 1769-OA16K ⁽²⁾	16 outputs	100/240V AC	85...265V AC 47...63 Hz	225 mA @ 5.1V	8

(1) Maximum is 190 mA.

(2) Module has conformal coating.

1769 DC Digital Modules

Cat. No.	Inputs/Outputs	Voltage Category	Operating Voltage Range	Backplane Current	Power Supply Distance Rating
1769-IG16	16 inputs	5V DC TTL	4.5...5.5V DC	120 mA @ 5.1V	8
1769-IQ16 1769-IQ16K ⁽¹⁾	16 inputs	24V DC sink/source	10...30V DC @ 30 °C (86 °F) 10...26.4V DC @ 60 °C (140 °F)	115 mA @ 5.1V	8
1769-IQ16F	16 inputs, high speed	24V DC sink/source	10...30V DC @ 30 °C (86 °F) 10...26.4V DC @ 60 °C (140 °F)	100 mA @ 5.1V	8
1769-IQ32 1769-IQ32K ⁽¹⁾	32 inputs	24V DC sink/source	10...30V DC @ 30 °C (86 °F) 10...26.4V DC @ 60 °C (140 °F)	170 mA @ 5.1V	8
1769-IQ32T	32 inputs	24V DC sink/source	20.4...26.4V DC @ 60 °C (140 °F)	170 mA @ 5.1V	8
1769-IQ6XOW4	6 inputs 4 outputs	24V DC sink/source input AC/DC normally open relay contact outputs	10...30V DC @ 30 °C (86 °F) 10...26.4V DC @ 60 °C (140 °F)	105 mA @ 5.1V 50 mA @ 24V	8
1769-OB8 1769-OB8K ⁽¹⁾	8 outputs	24V DC source	20.4...26.4V DC	145 mA @ 5.1V	8
1769-OB16 1769-OB16K ⁽¹⁾	16 outputs	24V DC source	20.4...26.4V DC	200 mA @ 5.1V	8
1769-OB16P	16 outputs, protected	24V DC source	20.4...26.4V DC	160 mA @ 5.1V	8
1769-OB32 1769-OB32K ⁽¹⁾	32 outputs	24V DC source	20.4...26.4V DC	300 mA @ 5.1V	6
1769-OB32T	32 outputs	24V DC source	10.2...26.4V DC	220 mA @ 5.1V	8
1769-OG16	16 outputs	5V DC TTL	4.5...5.5V DC	200 mA @ 5.1V	8
1769-OV16	16 outputs	24V DC sink	20.4...26.4V DC	200 mA @ 5.1V	8
1769-OV32T	32 outputs	24V DC sink	10.2...26.4V DC	300 mA @ 5.1V	8

(1) Module has conformal coating.

1769 Contact Output Modules

Cat. No.	Inputs/Outputs	Operating Voltage Range	Backplane Current	Power Supply Distance Rating
1769-OW8	8 outputs	5...265V AC 5...125V DC	125 mA @ 5.1V 100 mA @ 24V	8
1769-OW8I 1769-OW8IK ⁽¹⁾	8 outputs, individually isolated	5...265V AC 5...125V DC	125 mA @ 5.1V 100 mA @ 24V	8
1769-OW16 1769-OW16K ⁽¹⁾	16 outputs	5...265V AC 5...125V DC	205 mA @ 5.1V 180 mA @ 24V	8

(1) Module has conformal coating.

1769 Analog Modules

Cat. No.	Inputs/Outputs	Range	Resolution	Backplane Current	Power Supply Distance Rating
1769-IF4 1769-IF4K ⁽¹⁾	4 inputs, differential or single-ended	±10V 0...10V 0...5V 1...5V 0...20 mA 4...20 mA	14 bits (unipolar) 14 bits plus sign (bipolar)	120 mA @ 5.1V 60 mA @ 24V	8
1769-IF4I 1769-IF4IK ⁽¹⁾	4 inputs, differential or single-ended, individually isolated	±10V 0...10V 0...5V 1...5V 0...20 mA 4...20 mA	16 bits (unipolar) 15 bits plus sign (bipolar)	145 mA @ 5.1V 125 mA @ 24V	8
1769-IF8 1769-IF8K ⁽¹⁾	8 inputs, differential or single-ended	±10V 0...10V 0...5V 1...5V 0...20 mA 4...20 mA	16 bits (unipolar) 15 bits plus sign (bipolar)	120 mA @ 5.1V 70 mA @ 24V	8
1769-IF16C 1769-IF16CK ⁽¹⁾	16 inputs, single-ended	0...20 mA 4...20 mA	16 bits (unipolar) 15 bits plus sign (bipolar)	190 mA @ 5.1V 70 mA @ 24V	8
1769-IF16V 1769-IF16VK ⁽¹⁾	16 inputs, single-ended	±10V 0...10V 0...5V 1...5V	16 bits (unipolar) 15 bits plus sign (bipolar)	190 mA @ 5.1V 70 mA @ 24V	8
1769-IF4XOF2 1769-IF4XOF2K ⁽¹⁾	4 inputs, differential or single-ended 2 outputs, single-ended	0...10V 0...20 mA	Input: 8 bits plus sign Output: 8 bits plus sign	120 mA @ 5.1V 160 mA @ 24V	8
1769-IF4FXOF2F	4 inputs, fast differential or single-ended 2 outputs, fast single-ended	±10V 0...10V 0...5V 1...5V 0...20 mA 4...20 mA	Input: 14 bits (unipolar) 14 bits plus sign (bipolar) Output: 13 bits (unipolar) 13 bits plus sign (bipolar)	220 mA @ 5.1V 120 mA @ 24V	8
1769-OF2 1769-OF2K ⁽¹⁾	2 outputs, single-ended	±10V 0...10V 0...5V 1...5V 0...20 mA 4...20 mA	14 bits (unipolar) 14 bits plus sign (bipolar)	120 mA @ 5.1V 120 mA @ 24V	8

Cat. No.	Inputs/Outputs	Range	Resolution	Backplane Current	Power Supply Distance Rating
1769-OF4 1769-OF4K ⁽¹⁾	4 outputs, single-ended	±10V 0...10V 0...5V 1...5V 0...20 mA 4...20 mA	15 bits plus sign unipolar and bipolar	120 mA @ 5.1V 170 mA @ 24V	8
1769-OF4CI 1769-OF4CIK ⁽¹⁾	4 outputs, differential, individually isolated	0...20 mA 4...20 mA	16 bits (unipolar)	165 mA @ 5V 110 mA @ 24V	8
1769-OF4VI 1769-OF4VIK ⁽¹⁾	4 outputs, differential, individually isolated	±10V 0...10V 0...5V 1...5V	15 bits plus sign (bipolar)	145 mA @ 5.1V 75 mA @ 24V	8
1769-OF8C 1769-OF8CK ⁽¹⁾	8 outputs, single-ended	0...20 mA 4...20 mA	16 bits (unipolar)	140 mA @ 5.1V 145 mA @ 24V	8
1769-OF8V 1769-OF8VK ⁽¹⁾	8 outputs, single-ended	±10V 0...10V 0...5V 1...5V	16 bits plus sign (bipolar)	145 mA @ 5.1V 125 mA @ 24V	8

(1) Module has conformal coating.

1769 Analog RTD and Thermocouple Modules

Cat. No.	Inputs/Outputs	Sensors Supported	Backplane Current	Power Supply Distance Rating
1769-IR6 1769-IR6K ⁽¹⁾	6 RTD inputs	100, 200, 500, 1000 Ω Platinum 385 100, 200, 500, 1000 Ω Platinum 3916 120 Ω Nickel 618 120 Ω Nickel 672 10 Ω Nickel-iron 518 0...150 Ω 0...500 Ω 0...1000 Ω 0...3000 Ω	100 mA @ 5.1V 45 mA @ 24V	8
1769-IT6 1769-IT6K ⁽¹⁾	6 thermocouple inputs	Thermocouple types B, C, E, J, K, N, R, S, T ±50V ±100V	100 mA @ 5.1V 45 mA @ 24V	8 ⁽²⁾

(1) Module has conformal coating.

(2) To reduce the effects of electrical noise, install the 1769-IT6 module at least two slots away from the AC power supplies.

1769 Communication and Specialty Modules

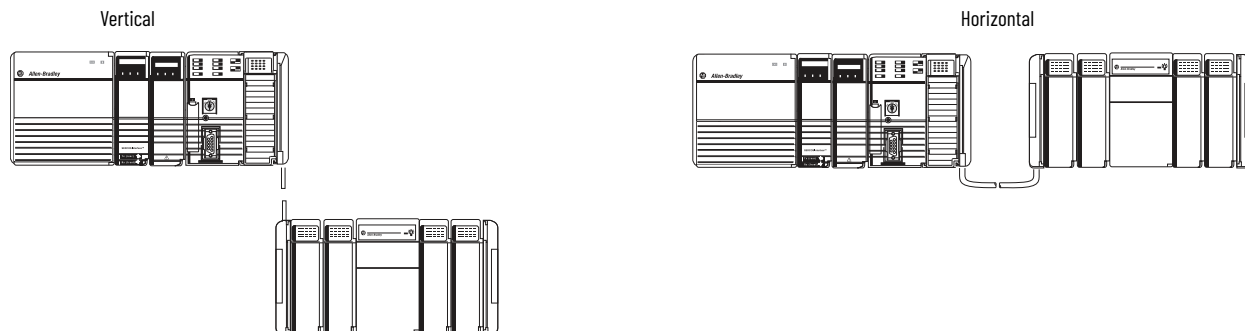
Cat. No.	Description	Backplane Current	Power Supply Distance Rating
1769-AENTR 1769-AENTRK ⁽¹⁾	The adapter connects 1769 Compact I/O modules to a linear or DLR network and uses two copper network ports to connect to the network.	500 mA @ 5V	5
1769-ARM	Use a 1769-ARM address reserve module to reserve module slots. After creating an I/O configuration and user program, you can remove and replace any I/O module in the system with a 1769-ARM module. You must first inhibit the removed module in the Logix Designer application.	60 mA @ 5.1V	8
1769-ASCII	The 1769-ASCII module, a general-purpose two-channel ASCII interface, provides a flexible network interface to a wide variety of RS-232, RS-485, and RS-422 ASCII devices. The module provides the communication connections to the ASCII device.	425 mA @ 5.1V	4
1769-BOOLEAN	Use the 1769-BOOLEAN module in applications that require repeatability, such as material handling and packaging, when there is a requirement to activate an output that is based on the transition of an input. If the Boolean expression is true, the output is directed to the ON state. If the Boolean expression is false, the output channel is directed to the OFF state. There are four operators that you can configure as OR, AND, XOR, or none.	220 mA @ 5.1V	8
1769-HSC	Use the 1769-HSC when you need: • A counter module that can react to high-speed input signals. • To generate rate and time-between-pulses (pulse interval) data. • As many as two channels of quadrature or four channels of pulse/count inputs.	245 mA @ 5.1V	4
1769-SM1	The Compact I/O to DPI™ or SCANport™ module connects to PowerFlex 7-class drives, other DPI-based host devices, and SCANport-based host devices such as 1305 and 1336 PLUS™ II drives.	280 mA @ 5.1V	6
1769-SM2	The Compact I/O to DSI/Modbus module connects to PowerFlex 4-class drives and to other Modbus RTU slave devices, such as PowerFlex 7-class drives with 20-COMM-H RS-485 HVAC adapters.	350 mA @ 5.1V	4

(1) Module has conformal coating.

1769 Expansion Cables

If you divide 1769 modules into multiple banks, make sure:

- Each bank needs its own power supply.
- To use expansion cables to connect the banks.
- The last I/O bank requires an end cap.



How you orient I/O banks determines the expansion cables that you must connect the I/O banks.

If You Add a	And Connect the Chassis	Use This Cable ⁽¹⁾
Second bank	Right to left	1769-CRL _x
	Right to right	1769-CRR _x
Third bank	Right to left	1769-CRL _x
	Right to right	1769-CRR _x
	Left to left	1769-CLL _x

(1) Where $x = 1$ for 1 ft (305 mm) or 3 for 3.28 ft (1 m).

1769 End Caps

The final 1769 Compact I/O bank requires an end cap on the end without the expansion cable. The CompactLogix 5370 L2 controller comes with a right-end cap, so you do not need to order one separately.

- Right end cap, catalog number 1769-ECR
- Right end cap with conformal coating, catalog number 1769-ECRK
- Left end cap, catalog number 1769-ECL
- Left end cap with conformal coating, catalog number 1769-ECLK

1769 Wiring Systems

As an alternative to buying removable terminal blocks (RTBs) and connecting the wires yourself, you can buy a wiring system of:

- Interface modules (IFMs) that provide the output terminal blocks for digital I/O modules. Use the prewired cables that match the I/O module to the IFM.
- Analog interface modules (AIFMs) that provide the output terminal blocks for analog I/O modules. Use the prewired cables that match the I/O module to the AIFM.
- I/O module-ready cables. One end of the cable assembly is an RTB that plugs into the front of the I/O module. The other end has individually color-coded conductors that connect to a standard terminal block.

Removable Terminal Kits

You can order removable terminal kits with the CompactLogix 5370 L1 and L2 controllers separately. The kits are used to connect wiring to the controllers. The following table describes the kits.

Cat. Nos.	Controllers Supported	Description
1769-RTB45	CompactLogix 5370 L1	• Four 10-pin connectors that are used to connect wiring to the embedded digital I/O module of the controller. • One 5-pin connector that is used to connect an external 24V DC power source to the controller.
1769-RTB40DIO	CompactLogix 5370 L2	Four 10-pin connectors that are used to connect wiring to the embedded digital I/O module of the controller.
1769-RTB40AIO	1769-L24ER-QBFC1B and 1769-L27ERM-QBFC1B	Four 10-pin connectors that are used to connect wiring to the embedded analog I/O module of the controller.

CompactLogix Power Supplies

Select power supplies based on the controller and the number of additional I/O banks.

For a	Select
CompactLogix 5370 L3 controller	- One 1769 power supply for the controller and local I/O modules. - One 1769 power supply for each additional bank of I/O modules.
CompactLogix 5370 L2 controller	No power supply as it is integrated to the controller package.
CompactLogix 5370 L1 controller	No power supply as it is integrated to the controller package.
CompactLogix 5380 controller	None
Compact GuardLogix 5380 controller	External power supplies must be used to transfer MOD power and SA power to the system. The external power supplies are connected to a MOD power RTB and an SA power RTB that is installed on the controller. IMPORTANT: When you use Compact GuardLogix 5380 controllers, you must use SELV/PELV-rated power supplies for MOD power and SA power. Additionally, you can only use DC SA power with Compact GuardLogix 5380 controllers.
CompactLogix 5480	None External power supplies must be used to transfer MOD power and SA power to the system. The external power supplies are connected to a MOD power RTB and an SA power RTB that is installed on the controller. External uninterruptible power supply can be used to provide power to the UPS RTB that is installed on the controller. You can connect an external uninterruptible power supply (UPS) to the UPS RTB to save the program if power is lost. IMPORTANT: The UPS lets the controller save the program but not the state of the program. We recommend that you use a 1606 switched mode uninterruptible power supply, for example, the 1606-XLS240-UPS power supply.

Power Supplies

Cat. No.	Description	Voltage Category	Operating Voltage Range
1769-PA2 1769-PA2K ⁽¹⁾	1769 Compact I/O expansion power supply	120V/220V AC	85...265V AC
1769-PB2 1769-PB2K ⁽¹⁾		24V DC	19.2...31.2V DC
1769-PA4 1769-PA4K ⁽¹⁾		120V/220V AC	85...265V AC or 170...265V AC (switch selectable) 47...63 Hz
1769-PB4 1769-PB4K ⁽¹⁾		24V DC	19.2...31.2V DC

(1) Module has conformal coating.

For detailed specifications, see Compact Power Supplies Specifications Technical Data, publication [1769-TD008](#).

PanelView Plus 7 Performance Terminals

Catalog Numbers 2711P-T7C22D9P, 2711P-T7C22D9P-B, 2711P-T7C22A9P, 2711P-T7C22A9P-B, 2711P-B7C22D9P, 2711P-B7C22D9P-B, 2711P-B7C22A9P, 2711P-B7C22A9P-B, 2711P-T9W22D9P, 2711P-T9W22D9P-B, 2711P-T9W22A9P, 2711P-T9W22A9P-B, 2711P-T10C22D9P, 2711P-T10C22D9P-B, 2711P-T10C22A9P, 2711P-T10C22A9P-B, 2711P-B10C22D9P, 2711P-B10C22D9P-B, 2711P-B10C22A9P, 2711P-B10C22A9P-B, 2711P-T12W22D9P, 2711P-T12W22D9P-B, 2711P-T12W22A9P, 2711P-T12W22A9P-B, 2711P-T15C22D9P, 2711P-T15C22D9P-B, 2711P-T15C22A9P, 2711P-T15C22A9P-B, 2711P-B15C22D9P, 2711P-B15C22D9P-B, 2711P-B15C22A9P, 2711P-B15C22A9P-B, 2711P-T19C22D9P, 2711P-T19C22D9P-B, 2711P-T19C22A9P, 2711P-T19C22A9P-B, 2711P-T9W22D9P-BSHK, 2711P-T12W22D9P-BSHK, 2711P-T7C22D9PK, 2711P-T9W22D9PK, 2711P-T10C22D9PK, 2711P-T12W22D9PK, 2711P-T15C22D9PK, 2711P-T19C22D9PK, 2711P-B15C22D9PK, 2711P-T12W22D9P-BM001, 2711P-T12W22D9P-BM002, 2711P-T12W22D9P-BM003, 2711P-T12W22D9P-BM004, 2711P-T12W22D9P-BM005, 2711P-T12W22D9P-BM006, 2711P-T12W22D9P-BM007, 2711P-T12W22D9P-BM008, 2711P-T12W22D9P-BM009, 2711P-T12W22D9P-BM010, 2711P-T12W22D9P-BM011, 2711P-T12W22D9P-BM012, 2711P-T12W22D9P-BM013, 2711P-T12W22D9P-BM014, 2711P-T12W22D9P-BM015, 2711P-T12W22D9P-BM016

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The PanelView™ Plus 7 Performance terminals are operator interface devices. They monitor and control devices that are attached to ControlLogix® and CompactLogix™ 5370 controllers on an EtherNet/IP™ network. Animated graphic and text displays provide operators a view into the operating state of a machine or process. Operators interact with the control system by using touch screen or keypad input.



The PanelView Plus 7 Performance terminals include these features and capabilities:

- FactoryTalk® View Machine Edition software, version 8.1, provides a familiar environment for creating HMI applications
- Windows CE operating system with desktop access for configuration and third-party applications
- Connection to ControlLogix or CompactLogix 5370 controllers
- Ethernet communication that can support Device Level Ring (DLR), linear, or star network topologies
- Web browser, Microsoft® file viewers, text editor, PDF viewer, remote desktop connection, and media player on the terminal desktop
- Conformal-coating available for all DC power, touch-only terminals, and the 15-in. DC power, keypad and touch terminal
- Stainless steel, hygienic, brandless, DC-power, and conformal-coating are available for the 9-in. wide-screen, touch-only units and the 12-in. wide-screen, touch-only units
- On-machine mounting available for the 12.1-in. wide-screen, touch-only terminal

Summary of Changes

This publication contains new and updated information as indicated in the following table.

Topic	Page
Updated the Certifications table.	3

Environmental Specifications

This table lists environmental specifications for the PanelView Plus 7 Performance terminals and the ArmorView™ Plus 7 terminal (which includes a 12.1-in PanelView Plus 7 Performance terminal).

Attribute	Value
Temperature, operating	6.5-in., 9-in., 10.4-in., 12.1-in., and 15-in. terminals 0...55 °C (32...131 °F) 19-in. terminals 0...50 °C (32...122 °F) ArmorView Plus 7 terminal 0...45 °C (32...113 °F) ambient
Temperature, nonoperating	-25...+70 °C (-13...+158 °F) ⁽¹⁾
Heat dissipation	Typical BTU measurements were taken at 25 °C (77 °F): • 6.5-in. DC (touch, and touch with keypad), 51 BTU (typical) • 6.5-in. AC (touch, and touch with keypad), 53 BTU (typical) • 9-in. DC, 55 BTU (typical) • 9-in. AC, 58 BTU (typical) • 10.4-in. DC (touch, and touch with keypad), 51 BTU (typical) • 10.4-in. AC (touch, and touch with keypad), 56 BTU (typical) • 12.1-in. DC, 60 BTU (typical) • 12.1-in. AC, 67 BTU (typical) • 15-in. DC (touch, and touch with keypad), 61 BTU (typical) • 15-in. AC (touch, and touch with keypad), 68 BTU (typical) • 19-in. DC, 114 BTU (typical) • 19-in. AC, 119 BTU (typical)
Altitude, operating	2000 m (6562 ft) ⁽¹⁾
Relative humidity	5...95% without condensation ⁽¹⁾
Vibration	6.5-in., 9-in., 10.4-in., 12.1-in. terminals, and 12.1-in. terminals in the ArmorView Plus 7 enclosure 0.012 pk-pk, 10...57 Hz 2 g peak at 57...500 Hz 15-in. and 19-in. terminals 0.006 pk-pk, 10...57 Hz 1 g peak at 57...640 Hz
Shock, operating	15 g at 11 ms ⁽²⁾
Shock, nonoperating	30 g at 11 ms ⁽²⁾
Enclosure ratings	NEMA and UL Type 12, 13, 4X, also rated IP66 as Classified by UL ⁽³⁾⁽⁴⁾
Airborne contaminants	For PanelView Plus 7 Performance conformal-coated PCBA level products with catalog numbers that end in K, product meets or exceeds the following requirement: • ANSI/ISA 71.04.2013 G3 environment Tested in accordance with: ASTM B845-97

(1) These values are the same for the ArmorView Plus 7 terminal.

(2) These values are the same for the ArmorView Plus 7 terminal when the VESA mount is used. When the arm mount coupling is used, the values are 5 g at 11 ms.

(3) For the ArmorView Plus 7 terminal, the enclosure ratings are 12, 13, 4, or 4X (see the ArmorView Plus 7 Installation Instructions, publication [2711P-IN013](#) for more detail) and IP66 as classified by UL.

(4) The PanelView Plus 7 Performance Stainless Steel, Series B terminals are also rated IP69 as Classified by UL and tested for IP69K according to ISO 20653.

Resistance to Chemicals

The outer surfaces of the terminal including the bezel, touch screen overlay, and panel gasket seal are tested for chemical resistance. Some of the chemicals can cause discoloration, but they do not interfere with the operation of the terminal.



For more information on chemical resistance of the product, go to <https://rockwellautomation.custhelp.com> and search the Knowledgebase for keywords 'Chemical Resistance PanelView Plus'.

IMPORTANT Do not operate the terminal in direct sunlight. Direct exposure to ultraviolet light can discolor the touch screen.

Certifications

This table lists certifications for the PanelView Plus 7 Performance terminals.

Certification ⁽¹⁾	Value
CE (EMC)	European Union 2014/35/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers
CE (LVD) ⁽²⁾	European Union 2014/30/EU Low Voltage Directive, compliant with: • EN 61131-2; Programmable Controllers
c-UL-us	The PanelView Plus 7 Performance terminals hold these certifications: - c-UL-us Listed Industrial Control Equipment for use in Hazardous Locations (E10314) per standards ANSI / ISA 12.12.01 and CSA C22.2 No. 213, rated: – Class I, Div 2, Groups A, B, C, D – Class II, Div 2, Groups F and G – Class III, Div 1 – Class III, Div 2 - Enclosure type ratings per UL50 and CSA C22.2 No. 94.2-07. - Enclosure ingress protection that is classified by UL per IEC 60529. The ArmorView Plus 7 terminal holds the following certifications: - c-UL-us listed Industrial Control Equipment for US and Canada (E113724) per standards UL 61010-1, UL 61010-2-201, CAN/CSA-C22.2 No. 61010-1, and CAN/CSA-C22.2 No. 61010-2-201. - Enclosure type ratings per UL50 and CSA C22.2 No. 94.2-07. - Enclosure ingress protection that is classified by UL per IEC 60529.
EtherNet/IP	ODVA conformance that is tested to EtherNet/IP specifications
KCC	Certificate of compliance
NSF	Stainless Steel Series B Terminals only, compliant with: • NSF/ANSI/3-A 14159-1; Hygiene Requirements for the Design of Meat and Poultry Processing Equipment • NSF/ANSI 169; Special Purpose Food Equipment and Devices
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Emissions
RoHS	China RoHS, Turkey RoHS, European RoHS 2011/65/EU
EAC	Certificate of compliance

(1) When marked. See the Product Certification link at rok.auto/certification for Declarations of Conformity, Certificates, and other certification details.

(2) This certification is not available for the ArmorView Plus 7 terminal.

Technical Specifications

The tables in this section provide technical specifications for the PanelView Plus 7 Performance terminals.

PanelView Plus 7 Performance 7-in and 9-in Terminals

Attribute	6.5-in. Touch 2711P--T7C22D9P, 2711P--T7C22D9P-B ⁽¹⁾ 2711P-T7C22A9P, 2711P-T7C22A9P-B 2711P-T7C22D9PK ⁽²⁾		6.5-in. Touch with Keypad 2711P-B7C22D9P, 2711P-B7C22D9P-B ⁽¹⁾ 2711P-B7C22A9P, 2711P-B7C22A9P-B		9-in. Touch 2711P-T9W22D9P, 2711P-T9W22D9P-B ⁽¹⁾ 2711P-T9W22A9P, 2711P-T9W22A9P-B 2711P-T9W22D9PK ⁽²⁾	
Operator input	Touch		Touch with keypad		Touch	
Conformal-coated	Yes		—		Yes	
Display type	TFT Color					
Display size, diagonal	6.5-in.			9-in. widescreen		
Viewing area (W x H)	132 x 99 mm (5.2 x 3.9 in.)			196 x 118 mm (7.7 x 4.6 in.)		
Display resolution	640 x 480 VGA, 18-bit color graphics			800 x 480 WVGA, 18-bit color graphics		
Aspect ratio	4:3			5:3		
Brightness, typical	300 cd/m ² (Nits)					
Backlight life	White light-emitting diode, solid state Life: 50,000 h min at 40 °C (104 °F) to half-brightness, backlight is not replaceable					
Touch screen	Analog resistive Actuation rating: 1 million presses Operating force: 100 grams					
Battery (real-time clock backup)	Accuracy: ±2 minutes per month. Battery life: 4 years min at 25 °C (77 °F) Replacement: CR2032 lithium coin cell					
Memory: • System • User	• 1 GB RAM and 512 MB storage • 80 MB, approx, nonvolatile storage for applications					
Secure Digital (SD) card slot	One SD card slot for external storage; supports cat. no. 1784-SDx and 1784-SDHCx cards					
USB ports: • Host • Device	• Two USB high-speed 2.0 host ports (type A) support removable flash drives for external storage • One high-speed 2.0 device port (type B) that will be functional in a future release					
Operating system	Windows CE with Extended Features and MS Office Viewers (includes FTP, VNC client server, ActiveX controls, PDF reader, third-party device support)					
Ethernet ports	Two 10/100Base-T, Auto MDI/MDI-X Ethernet ports that support Device Level Ring (DLR), linear, or star network topologies					
Software	FactoryTalk View Studio for Machine Edition, FactoryTalk ViewPoint, version 2.6 or later					
Electrical						
Input voltage	24V DC nom (18...30V DC)	100...240V AC	24V DC nom (18...30V DC)	100...240V AC	24V DC nom (18...30V DC)	100...240V AC
Power consumption	50 W max (2.1 A at 24V DC)	105VA	50 W max (2.1 A at 24V DC)	105VA	50 W max (2.1 A at 24V DC)	105VA
Power supply	Supports (SELV) and (PELV) 24V DC supplies ⁽³⁾	—	Supports (SELV) and (PELV) 24V DC supplies ⁽³⁾	—	Supports (SELV) and (PELV) 24V DC supplies ⁽³⁾	—
Mechanical						
Weight, approx	1.2 kg (2.65 lb)		1.47 kg (3.25 lb)		1.58 kg (3.48 lb)	
Dimensions, approx (H x W x D)	170 x 212 x 69.6 mm 6.69 x 8.35 x 2.74 in.		179 x 285 x 69.6 mm 7.05 x 11.22 x 2.74 in.		190 x 280 x 69.6 mm 7.48 x 11.02 x 2.74 in.	
Cutout dimensions, approx (H x W)	142 x 184 mm 5.59 x 7.24 in.		142 x 237 mm 5.59 x 9.33 in.		162 x 252 mm 6.38 x 9.92 in.	

(1) Catalog numbers with a -B extension denote terminals that exclude the Allen-Bradley brand marking. Customers can put their own brand labels on these terminals.

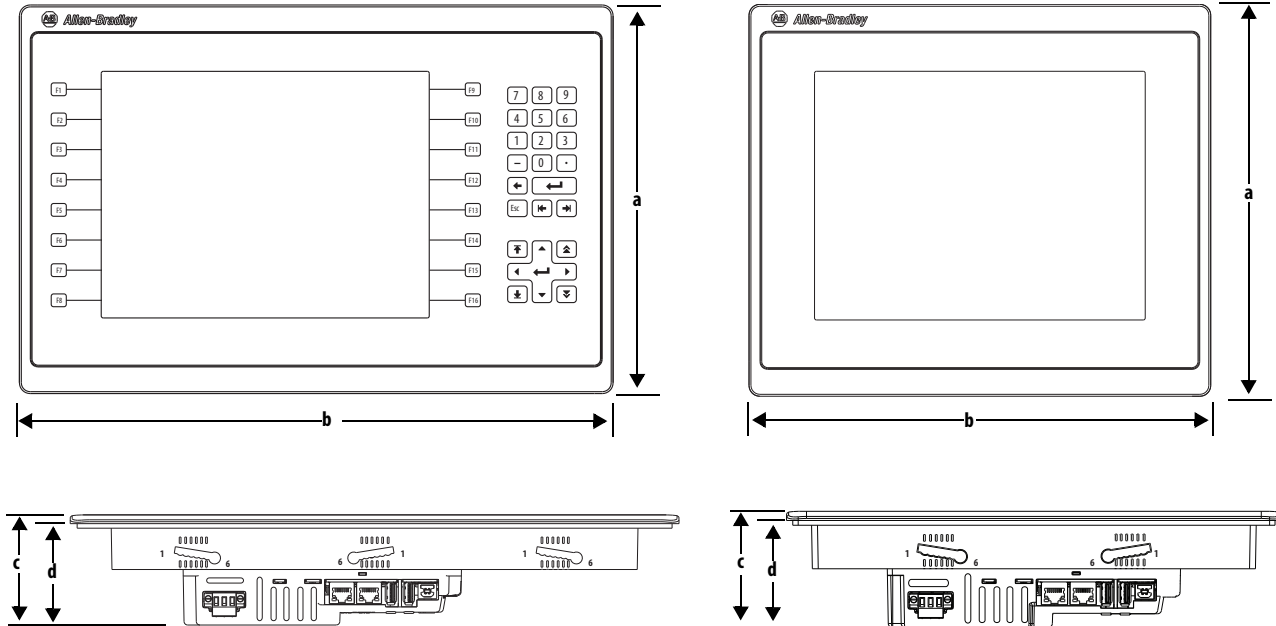
(2) Catalog numbers that end with a K denote terminals that are conformal coated.

(3) DC-powered terminals support safety extra low voltage (SELV) and protective extra low voltage (PELV) 24V DC power supplies such as cat. nos. 1606-XLP95E, 1606-XLP100E, 2711P-RSACDIN.

Product Dimensions

This section provides product dimensions. The PanelView Plus 7 Performance 10.4-inch touch and combination keypad with touch devices are shown for illustrative purposes. Stainless steel terminals use different mounting clips, but the dimensions are the same. All other terminal sizes look similar. Dimensions for the 12.1-in. ArmorView Plus 7 terminal can be found on [page 10](#).

PanelView Plus 7 Performance Terminal Dimensions - 10.4-in. Model



PanelView Plus 7 Performance Terminal Dimensions

Terminal Size	Input Type	Height (a) mm (in.)	Width (b) mm (in.)	Overall Depth (c) mm (in.)	Mounted Depth (d) mm (in.)
6.5-in.	Key/touch	179 (7.05)	285 (11.22)	69.6 (2.74)	63.6 (2.50)
	Touch	170 (6.69)	212 (8.35)		
9-in.	Touch	190 (7.48)	280 (11.02)		
10.4-in.	Key/touch	252 (9.92)	385 (15.16)		
	Touch	252 (9.92)	297 (11.69)		
12.1-in.	Touch	246 (9.69)	340 (13.39)		
15-in.	Key/touch	322 (12.68)	484 (19.06)		
	Touch	318 (12.52)	381 (15.00)		
19-in.	Touch	411 (16.18)	485 (19.09)		



When mounted in a panel, the front of the bezel extends less than 6.36 mm (0.25 in.) from the front of the panel.

5-Port Unmanaged Industrial Ethernet Switch - 10/100 Mbps, Ruggedized, -40° to 75°C, EIP QoS, DIN/Wall Mount, TAA

MODEL NUMBER: NFI-U05A



Industrial-grade switch expands Ethernet connectivity to factory floors and other environments with space constraints and wide temperature ranges.

Features

5-Port Unmanaged Ethernet Switch Connects Your Devices to a LAN

This space-saving switch with EIP QoS transmits data over an Ethernet network. Five auto-negotiating 10/100 Mbps ports send data only to the devices designated to receive it, which improves the efficiency and potential throughput of the network.

Ethernet/IP Quality of Service (EIP QoS)

The EIP QoS control mechanism is widely used for Ethernet/IP data streams. Based on the application requirements, this feature helps provide different priorities for different users or data streams. This helps ensure that the performance of data streams deliver at a certain level. **Note:** While NFI-U05A does support QoS, the feature is handled automatically by our product. If you want to control network traffic flow or prioritize specific ports to your personal preference, you must use a router in your network with a QoS tool to achieve this level of control.

Ruggedized Metal Housing Built to Last in Harsh Environments

The compact NFI-U05A adds 10/100 Mbps Ethernet capacity to your industrial and commercial applications, such as factory floors, warehouse operations and other environments with space constraints and wide temperature ranges. The industrial-grade high-strength case withstands vibration, shock and free fall. It can also operate in extreme temperatures ranging from -40 to 75 degrees Celsius (-40 to 167 degrees Fahrenheit).

Unmanaged Switch Requires Little to No Configuration

Quickly connect your network devices with little to no configuration. LEDs indicate when the switch is powered on and which Ethernet ports are showing activity. The NFI-U05A supports MAC address auto-learning and auto-aging for efficient routing, as well as automatic MDI/MDI-X crossover detection for plug-and-play functionality. IEEE 802.3x flow control allows smooth transmission of large files.

Works with the Most Popular Web Browsers

The NFI-U05A is browser-based and works independently from the connected computer's operating system. Because switch compatibility is based on common hardware standards, rather than system software dependencies, the NFI-U05A accommodates most platforms. Preferred web browsers include Google Chrome (on both Windows and macOS) and Microsoft Edge (Windows only).

Highlights

- 5 auto-negotiable 10/100 Mbps RJ45 ports connect devices over a LAN
- EIP QoS control mechanism, widely used for Ethernet/IP data stream
- Industrial-grade switch supports operating temperature range of -40° to 75°C
- Easy-to-read LEDs indicate connection and activity status for all Ethernet ports
- Compliant with the Federal Trade Agreements Act (TAA) for GSA Schedule purchases

Package Includes

- NFI-U05A 5-Port Unmanaged Industrial Switch
- DIN rail-mounting clip (pre-installed)
- Wall-mounting bracket (pre-installed)
- Owner's manual



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Flexible Mounting Options

The open-type device may be DIN mounted using the pre-installed rail clip, which mounts firmly to any standard 35 mm DIN rail. It may also be wall mounted using the rear mounting holes. A 3-pin 12–48VDC terminal block supplies power input. Device power must be supplied by SELV circuit.

TAA-Compliant for GSA Schedule Purchases

The NFI-U05A is compliant with the Federal Trade Agreements Act (TAA), which makes it eligible for GSA (General Services Administration) Schedule and other federal procurement contracts.

Specifications

OVERVIEW	
UPC Code	037332282033
Product Type	Unmanaged Industrial Ethernet Switch with EIP QOS
INPUT	
Maximum Input Amps Details	Maximum of 0.15A DC. The device power shall be supplied by SELV circuit
Voltage Compatibility (VDC)	From 12~48
Power Source	3-Pin Terminal Block
POWER	
Power Consumption (Watts)	3.00
CONNECTIONS	
Number of Ports	5
Ports	5
Ports Detail	5x 10/100Base-T
PoE Supported Ports	0
Network Switch Ports	(5) 10/100 (RJ45)
USER INTERFACE, ALERTS & CONTROLS	
LED Indicators	1- PWR(Green): for Power; 2- 100(Green): for Ethernet speed 100Mbps; 3- LNK/ACT(Green): for data transmitting/receiving
PHYSICAL	
Primary Form Factor	DIN-Rail; Wall-mount
Color	Black
Material of Construction	Aluminum casing
Shipping Dimensions (hwd / in.)	2.44 x 5.04 x 9.33
Shipping Dimensions (hwd / cm)	6.20 x 12.80 x 23.70
Shipping Weight (lbs.)	0.68
Shipping Weight (kg)	0.31



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Unit Dimensions (hwd / in.)	4.300 x 0.920 x 2.910
Unit Dimensions (hwd / cm)	10.9 x 2.2 x 7.3
Unit Weight (lbs.)	0.42
Unit Weight (kg)	0.19
ENVIRONMENTAL	
Operating Temperature Range	-40° to 167°F (-40° to 75°C)
Storage Temperature Range	-40° to 185°F (-40° to 85°C)
Relative Humidity	5% to 95% (Non-Condensing)
COMMUNICATIONS	
Network Compatibility	100 Mbps (Fast Ethernet)
Network Compatibility Details	Auto-negotiable
Switching Capacity	1Gbps
Switching Capacity Details	200Mbps Per Port with Full Duplex
FEATURES & SPECIFICATIONS	
Jumbo Frames	0
Console Port	No
MAC Auto Learning	Yes
RMON	No
SNMP	No
Storm Control	No
DHCP Snooping	No
Auto MDI/MDIX Crossover Detection	Yes
STANDARDS & COMPLIANCE	
Product Certifications	NOM (Mexico)
Product Compliance	CE (Europe); FCC (USA); IEEE 802.1p Class of Service (Europe); IEEE 802.3 10Base-T; IEEE 802.3 Auto-Negotiation; IEEE 802.3u 100Base-TX/FX; IEEE 802.3x Flow Control; REACH; RoHS; Trade Agreements Act (TAA)
WARRANTY & SUPPORT	
Product Warranty Period (Worldwide)	3-year limited warranty

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Eaton 850VA 510W 120V AC DIN Rail Industrial UPS - Hardwire Input/Output

MODEL NUMBER: DIN850AC



DIN rail UPS battery backup offers network-grade power protection for industrial and machine control installations.

Features

Flexible Power Protection for Smart Industrial Applications

The DIN850AC standby UPS system with hardwire AC input/output delivers reliable power and battery backup for computing, networking, control and storage equipment in factories, warehouses, edge computing locations and automated manufacturing and fabrication facilities. The rugged compact housing withstands demanding conditions and integrates seamlessly and securely into electrical enclosures in any non-traditional IT environment.

Ideal for Factory Floors and Extreme Temperatures

Get full use of the DIN850AC's power capacity because there is no derating based on its operating temperature range of 0°C (32°F) to 50°C (122°F), which expands the number of locations in which it can be used. Built to fit into small spaces, the DIN850AC is a UL 508 recognized component for use in industrial panels. Its pre-installed clamp enables quick mounting to a 35 mm DIN rail. Its fanless design reduces noise and increases reliability.

Reliable Battery Backup Keeps You Operational Through Power Outages

Power outages not only drain productivity from the factory floor, but they also damage expensive equipment. The DIN850AC protects productivity by providing enough runtime to maintain operation during a brief power outage and protects equipment by allowing it to complete an operation during an extended outage. It also prevents brownouts, overvoltages, surges and line noise from damaging equipment that could destroy data and contribute to costly downtime.

Convenient Automatic Restart

The DIN850AC automatically restarts when AC power is restored after an outage, eliminating the need for a costly site visit.

Stay in Control of Your Operation

LEDs on the front panel confirm normal operation and indicate alarm or fault status. Remote on/off and a battery indicator mode can help you avoid maintenance surprises. The DIN850AC is compatible with PowerAlert® Office software for UPS monitoring and control via USB connection.

Easy Preventative Maintenance and Initial Troubleshooting

The DIN850AC's self-test capability and user-replaceable internal battery can extend the life of the UPS and minimize disruption to operations. A resettable circuit breaker helps prevent dangerous system overloads.

Highlights

- Recommended for industrial locations where temperatures range within 0°C and 50°C
- Protects equipment against blackouts, brownouts, overvoltages, surges and line noise
- Keeps power running during brief outages to allow time for safe system shutdown
- Restarts automatically when power is restored, eliminating a costly site visit
- Built-in clamp mounts easily to a "top hat" 35mm DIN rail with no mounting screws or brackets required

Package Includes

- DIN850AC 850VA 510W 120V DIN Rail Industrial UPS
- USB communication cable
- Safety card
- Owner's manual



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Specifications

OVERVIEW	
UPC Code	037332274922
UPS Type	Standby
INPUT	
Input Phase	Single-Phase
Rated input current (Maximum Load)	10A
Nominal Input Voltage(s) Supported	120V AC
UPS Input Connection Type	Hardwire
UPS Input Connection Description	Recommended 14 AWG 194°F(90°C) rated copper wire
Input Circuit Breakers	10A
Recommended Electrical Service	15A 120V
OUTPUT	
Output Capacity (VA)	850
Output Capacity (kVA)	0.85
Output Capacity (Watts)	510
Output Capacity (kW)	0.51
Power Factor	0.6
Nominal Voltage Details	120v nominal output in battery mode
Frequency Compatibility	50 / 60 Hz
Frequency Compatibility Details	50 or 60Hz +/- 10% (Auto-sensing)
Output Voltage Regulation (Battery Mode)	+/- 10%
Output AC Waveform (AC Mode)	Sine wave
Output AC Waveform (Battery Mode)	PWM sine wave
Nominal Output Voltage(s) Supported	120V
Output Receptacles	(1) Hardwire
BATTERY	
Battery Type	Valve Regulated Lead Acid (VRLA)
Runtime Full Load (min.)	2 min. (510W)
Runtime Half Load (min.)	7 min. (255W)
Expandable Runtime	No



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DC System Voltage (VDC)	12
Battery Recharge Rate (Included Batteries)	0.7A Maximum; Less than 8 hours from 10% to 90%
Battery Access	Top-mounted battery access panel
Internal UPS Replacement Battery Cartridge	RBC12V9ET
USER INTERFACE, ALERTS & CONTROLS	
Switches	Power ON/OFF/TEST - Momentary push button
Alarm Cancel Operation	Press and hold On/Off/Test button for 1 second
Audible Alarm	Yes
LED Indicators	ALARM - RED - Flashes when the battery needs to be recharged and tested. SOLID RED when the unit is subjected to an overload condition. YELLOW - ON SOLID when the UPS is supplying battery power to the loads. GREEN - ON SOLID GREEN when the line input voltage is normal.
SURGE / NOISE SUPPRESSION	
EMI / RFI AC Noise Suppression	Yes
AC Suppression Joule Rating	588
PHYSICAL	
Primary Form Factor	DIN-Rail
Cooling Method	Convection
Shipping Dimensions (hwd / in.)	15.87 x 7.95 x 7.72
Shipping Weight (kg)	6.00
UPS Housing Material	Steel
Unit Dimensions (hwd / in.)	5.220 x 12.280 x 5.500
Unit Weight (lbs.)	12.125
Unit Weight (kg)	5.50
ENVIRONMENTAL	
Operating Temperature Range	32° to 122°F (0° to 50°C)
Storage Temperature Range	5° to 122°F (-15° to 50°C)
Relative Humidity	0% to 95%, Non-Condensing
AC Mode BTU / Hr. (Full Load)	52.169
AC Mode Efficiency Rating (100% Load)	97%
Operating Elevation	0-10000 ft. (0-3000 m)
Audible Noise	40 dBA at 1 meter
COMMUNICATIONS	
PowerAlert Software	PowerAlert Office



Powering Business Worldwide

Communications Cable	USB 2.0 Cable
Network Management Card Description	Network management not supported
Communications Interface	(1) USB (HID enabled)
Emergency Power Off (EPO)/Remote On-Off (ROO)	Yes
LINE / BATTERY TRANSFER	
Transfer Time	<8ms typical, 10ms max
Low Voltage Transfer to Battery Power (Setpoint)	87V
High Voltage Transfer to Battery Power (Setpoint)	144V
FEATURES & SPECIFICATIONS	
Cold Start (Startup in Battery Mode During a Power Failure)	Cold Start operation supported
High Availability UPS Features	Surge/noise protection
Green Energy-Saving Features	Greater than 95% efficiency - GREEN UPS; High efficiency economy mode operation
APPLICATIONS	
UPS Applications	Extreme Temperature Applications; Industrial
STANDARDS & COMPLIANCE	
Product Certifications	CAN/CSA-C22.2 No. 107.3 (Canada); CSA (Canada); ICES (Canada); UL 1778; UL 508
Product Compliance	FCC Part 15 Class B (USA); RoHS
WARRANTY & SUPPORT	
Product Warranty Period (Worldwide)	2-year limited warranty

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CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□



Highlights & Features

- Universal AC input voltage range
- Power will not de-rate for the entire input voltage range
- Power Boost of 150% for 5 seconds
- Full corrosion resistant aluminium casing
- Extreme low temperature cold start at -40°C
- Conformal coating on PCBAs to protect against common dust and chemical pollutants
- Hazardous Locations approval to ATEX and Class I, Div 2 (DRP024V120W1BA)
- Certified according to IEC/EN/UL 62368-1

Safety Standards



CB Certified for worldwide use

Model Number: DRP024V120W1B□
Unit Weight: 0.72 kg (1.59 lb)
Dimensions (L x W x D): 121 x 50 x 123.1 mm
 (4.76 x 1.97 x 4.85 inch)

General Description

The CliQ II DIN rail power supply series from one of the world's leading power supply companies, Delta Electronics Group, offers output voltage of 24 V. These products are encased in rugged yet lightweight full aluminium body that can withstand shock and vibration according to IEC 60068-2 standard. The series of single phase products can operate over a wide temperature range of -25°C to +80°C. These products also feature universal AC input voltage range from 85 Vac to 264 Vac and the power will not de-rate throughout the entire range. Another great feature is the conformal coating on the PCBA which allows selected models to be certified to ATEX and Class I, Div 2 for use in hazardous locations. The design conforms to harmonic current emission IEC/EN 61000-3-2, Class A.

Model Information

CliQ II DIN Rail Power Supply

Model Number	Input Voltage Range	Rated Output Voltage	Rated Output Current
DRP024V120W1B□	85-264Vac (120-375Vdc)	24 Vdc	5.00 A

Model Numbering

DR	P	024V	120W	1	B	□
DIN Rail	Power Supply	Output Voltage	Output Power	Single Phase	CliQ II Series	A - Metal Case, with Class I, Div 2 N - Metal Case, without Class I, Div 2

CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

Specifications

Input Ratings / Characteristics

Nominal Input Voltage	100-240 Vac
Input Voltage Range	85-264 Vac
Nominal Input Frequency	50-60 Hz
Input Frequency Range	47-63 Hz
DC Input Voltage Range*	120-375 Vdc
Input Current	< 2.20 A @ 115 Vac, < 1.10 A @ 230 Vac
Efficiency at 100% Load	> 89.0% @ 115 Vac, > 90.0% @ 230 Vac
Max Power Dissipation	0% load < 0.7 W @ 115 Vac, < 1.0W @ 230 Vac
	100% load < 15.0 W @ 115 Vac, < 13.5 W @ 230 Vac
Max Inrush Current (Cold Start)	< 35 A @ 115 Vac & 230 Vac
Leakage Current	< 1 mA @ 240 Vac

*Fulfills the test conditions for DC input. DC input safety approval can be obtained upon request.

Output Ratings / Characteristics**

Nominal Output Voltage	24 Vdc
Factory Set Point Tolerance	24 Vdc $\pm$ 2%
Output Voltage Adjustment Range	24-28 Vdc
Output Current	5.00 A (continuously operating at 24 V) 7.50 A (Power Boost for 5 seconds at 24 V, refer to the details in the Functions section)
Output Power	120 W (continuously operating at 24 V) 180 W (Power Boost for 5 seconds at 24 V, refer to the details in the Functions section)
Line Regulation	< 0.5% (@ 85-264 Vac input, 100% load)
Load Regulation	< 1.0% (@ 85-264 Vac input, 0-100% load)
PARD*** (20 MHz)	< 150 mVpp
Rise Time	< 100 ms @ nominal input (100% load)
Start-up Time	< 1,000 ms @ nominal input (100% load)
Hold-up Time	> 20 ms @ 115 Vac, > 115 ms @ 230 Vac (100% load)
Dynamic Response (Overshoot & Undershoot O/P Voltage)	$\pm$ 5% @ 85-264 Vac input, 0-100% load (Slew Rate: 0.1 A/ μ s, 50% duty cycle @ 5 Hz to 1 KHz)
Start-up with Capacitive Loads	10,000 μ F Max

**For power de-rating from 50°C to 80°C, see power de-rating on page 3.

***PARD is measured with an AC coupling mode, 5cm wires, and in parallel with 0.1 μ F ceramic capacitor & 47 μ F electrolytic capacitor.

CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

Mechanical

Case Cover / Chassis	Aluminium
Dimensions (L x W x D)	121 x 50 x 123.1 mm (4.76 x 1.97 x 4.85 inch)
Unit Weight	0.72 kg (1.59 lb)
Indicator	Green LED
Cooling System	Convection
Terminal	Input
	Output
Wire	Input / Output
Mounting Rail	Standard TS35 DIN Rail in accordance with EN 60715
Noise (1 Meter from power supply)	Sound Pressure Level (SPL) < 40dBA

Environment

Surrounding Air Temperature	Operating	-25°C to +80°C (Cold Start at -40°C)
	Storage	-40°C to +85°C
Power De-rating	Vertical Mounting	> 50°C de-rate power by 2.5% / °C
	Horizontal Mounting	> 50°C de-rate power by 2.5% / °C
Operating Humidity		5 to 95% RH (Non-Condensing)
Operating Altitude		0 to 2,500 Meters (8,200 ft.)
Shock Test	Non-Operating	IEC 60068-2-27, 30 G (300 m/S ²) for a duration of 18ms, 1 time per direction, 2 times in total
Vibration	Non-Operating	IEC 60068-2-6, 10Hz to 500 Hz @ 30 m/S ² (3 G peak); 60 min per axis for all X, Y, Z direction
Over Voltage Category	III	According to IEC/EN 62477-1 / EN 60204-1 (clearance and creepage distances) and IEC 62103 (safety part)
Pollution Degree		2

Protections

Overvoltage	< 32 V, ±10%, SELV Output, Hiccup Mode, Non-Latching (Auto-Recovery)
Overload / Overcurrent	> 150% of rated load current, Hiccup Mode, Non-Latching (Auto-Recovery)
Over Temperature	< 80°C Surrounding Air Temperature @ 100% load, Non-Latching (Auto-Recovery)
Short Circuit	Hiccup Mode, Non-Latching (Auto-Recovery when the fault is removed)
Internal Fuse at L pin	T4AH
Degree of Protection	IP20
Protection Against Shock	Class I with PE* connection

*PE: Primary Earth

CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

Reliability Data

MTBF	> 800,000 hrs. as per Telcordia SR-332 I/P: 115 Vac, O/P: 100% load, Ta: 25°C
Expected Cap Life Time	10 years (115 Vac & 230 Vac, 50% load @ 40°C)

Safety Standards / Directives

Electrical Equipment of Machines		EN 60204-1 (over voltage category III)
Electrical Equipment for Use in Electrical Power Installations		IEC/EN 62477-1 / IEC 62103
Safety Entry Low Voltage		SELV (IEC 60950-1)
Electrical Safety	SIQ Bauart	EN 60950-1, EN 62368-1
	UL/cUL recognized	UL 60950-1 and CSA C22.2 No. 60950-1 (File No. E191395) UL 62368-1 and CSA C22.2 No. 62368-1 (File No. E191395)
	CB Scheme	IEC 60950-1, IEC 62368-1
Industrial Control Equipment	UL/cUL listed	UL 508 and CSA C22.2 No. 107.1-01 (File No. E315355)
	CSA	CSA C22.2 No. 107.1-01 (File No. 181564)
Hazardous Location / ATEX (For DRP024V120W1BA)	cCSAus	CSA C22.2 No. 213-M1987, ANSI / ISA 12.12.01:2011 [Class I, Division 2, Group A, B, C, D T4, Ta = -25°C to +80°C (> +50°C derating)]
	ATEX	EN 60079-0:2009, EN 60079-15:2010 [ II 3G Ex nA nC IIC T4 Gc, Ta = -25°C to +80°C (> +50°C derating)]
		Certificate No. EPS 12 ATEX 1 491 X
CCC		GB9254, GB17625.1 and GB4943.1 仅适用于海拔 2000m 以下地区安全使用
CE		In conformance with EMC Directive 2014/30/EU and Low Voltage Directive 2014/35/EU For DRP024V120W1BA: In conformance with Equipment for explosive atmospheres (ATEX) directive 2014/34/EU
UKCA		In conformance with 2016 No. 1101. The Electrical Equipment (Safety) Regulations 2016 and 2016 No. 1091 The Electromagnetic Compatibility Regulations 2016
Galvanic Isolation	Input to Output	4.0KVac
	Input to Ground	1.5KVac
	Output to Ground	1.5KVac

CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

EMC

Emissions (CE & RE)		Generic Standards: CISPR 32, EN 55032, KN 32 (for DRP024V120W1BN), CISPR 11, EN 55011, FCC Title 47: Class B
Component Power Supply for General Use		EN 61204-3
Immunity		Generic Standards: EN 55024, KN 35 (for DRP024V120W1BN), EN 61000-6-1, EN 61000-6-2
Electrostatic Discharge	IEC 61000-4-2	Level 4 Criteria A ¹⁾ Air Discharge: 15 kV Contact Discharge: 8 kV
Radiated Field	IEC 61000-4-3	Level 3 Criteria A ¹⁾ 80 MHz-1 GHz, 10 V/M, 80% modulation (1 kHz)
Electrical Fast Transient / Burst	IEC 61000-4-4	Level 3 Criteria A ¹⁾ 2 kV
Surge	IEC 61000-4-5	Level 3 Criteria A ¹⁾ Common Mode ²⁾ : 2 kV Differential Mode ³⁾ : 1 kV
Conducted	IEC 61000-4-6	Level 3 Criteria A ¹⁾ 150 kHz-80 MHz, 10 Vrms
Power Frequency Magnetic Fields	IEC 61000-4-8	Criteria A ¹⁾ 30 A/Meter
Voltage Dips and Interruptions	IEC 61000-4-11	100% dip; 1 cycle (20 ms); Self Recoverable
Low Energy Pulse Test (Ring Wave)	IEC 61000-4-12	Level 3 Criteria A ¹⁾ Common Mode ²⁾ : 2 kV Differential Mode ³⁾ : 1 kV
Harmonic Current Emission		IEC/EN 61000-3-2, Class A
Voltage Fluctuation and Flicker		IEC/EN 61000-3-3

1) Criteria A: Normal performance within the specification limits

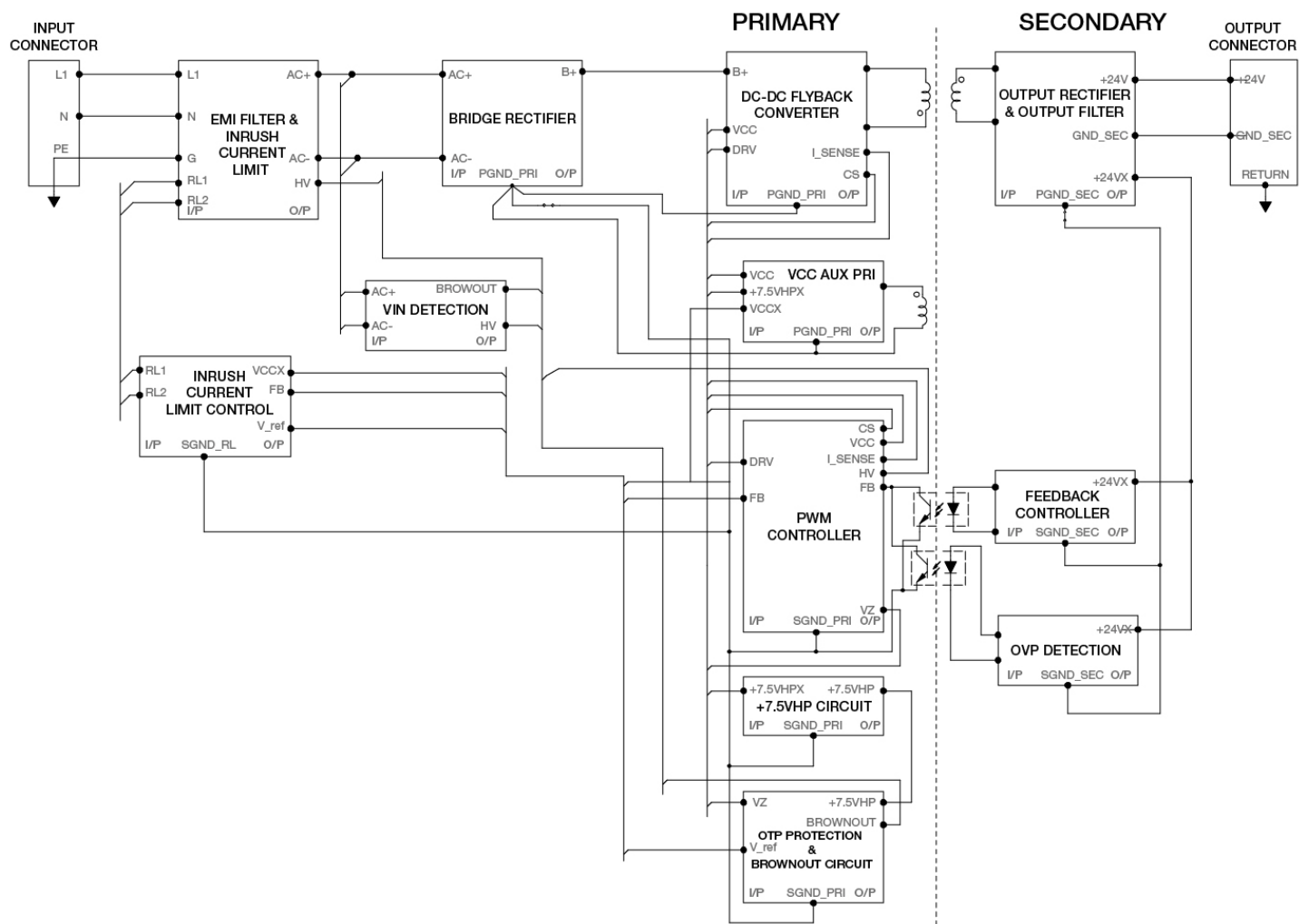
2) Asymmetrical: Common mode (Line to earth)

3) Symmetrical: Differential mode (Line to line)

CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

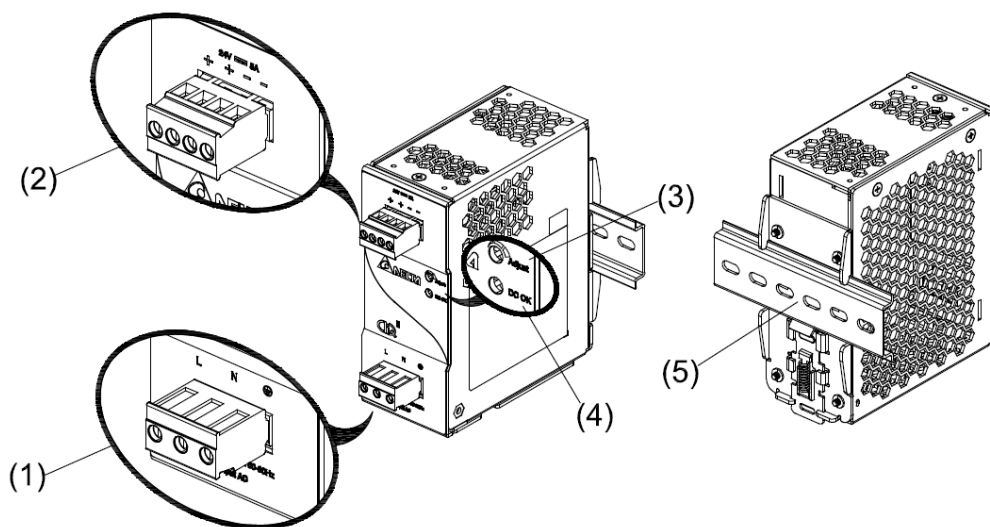
Block Diagram



CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

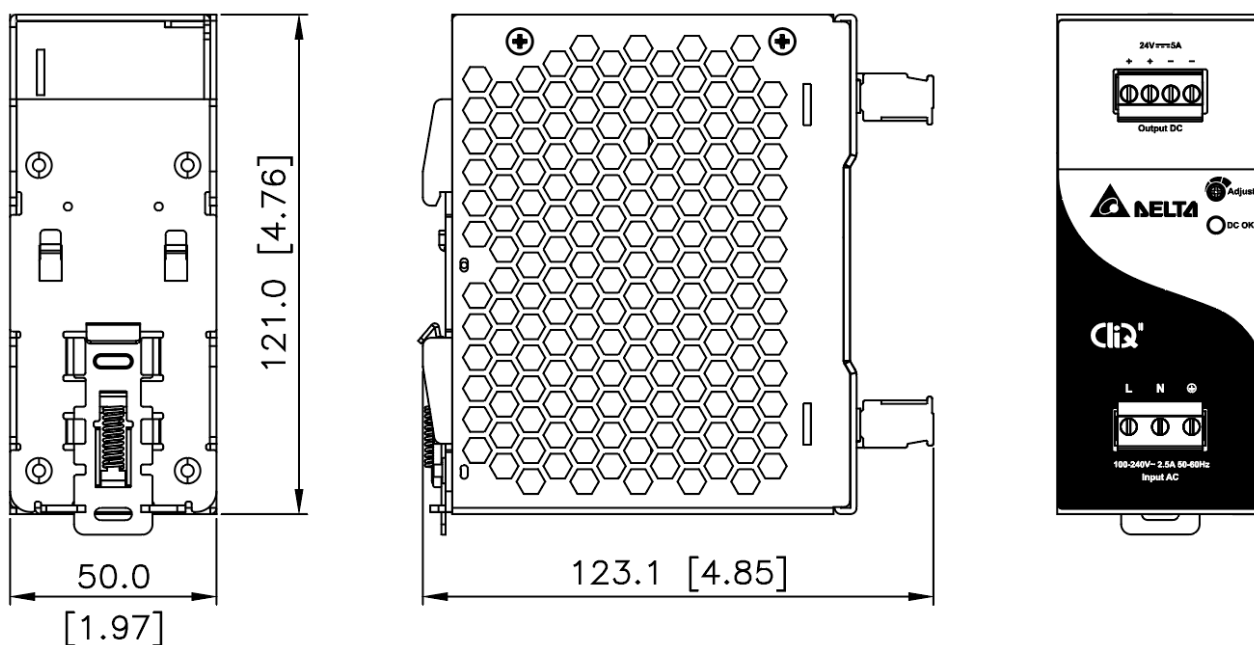
Device Description



- 1) Input terminal block connector
- 2) Output terminal block connector
- 3) DC Voltage adjustment potentiometer
- 4) DC OK control LED (Green)
- 5) Universal mounting rail system

Dimensions

L x W x D: 121 x 50 x 123.1 mm (4.76 x 1.97 x 4.85 inch)



CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

Engineering Data

Output Load De-rating VS Surrounding Air Temperature

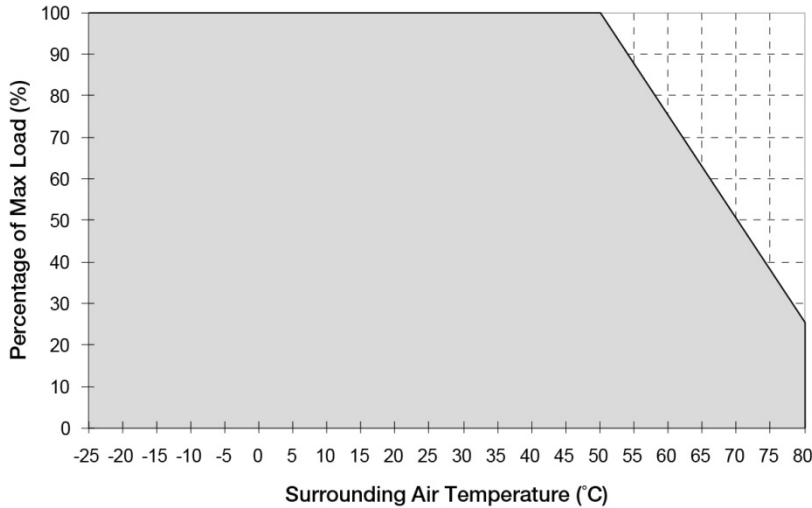
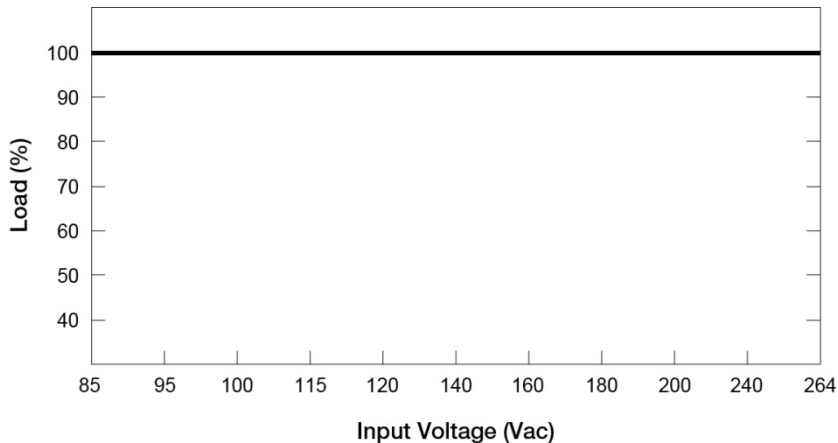


Fig. 1 De-rating for Vertical and Horizontal Mounting Orientation
 > 50°C de-rate power by 2.5% / °C

Note

1. Power supply components may degrade, or be damaged, when the power supply is continuously used outside the shaded region, refer to the graph shown in Fig. 1.
2. If the output capacity is not reduced when the surrounding air temperature exceeds its specification as defined on Page 3 under "Environment", the device may run into Over Temperature Protection. When activated, the output voltage will go into bouncing mode and will recover when the surrounding air temperature is lowered or the load is reduced as far as necessary to keep the device in working condition.
3. In order for the device to function in the manner intended, it is also necessary to keep a safety distance as recommended in the safety instructions while the device is in operation.
4. Depending on the surrounding air temperature and output load delivered by the power supply, the device can be very hot!
5. If the device has to be mounted in any other orientation, please contact info@deltapsu.com for more details.

Output Load De-rating VS Input Voltage



- No output power de-rating across the entire input voltage range

CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

Assembly & Installation

The power supply unit (PSU) can be mounted on 35 mm DIN rails in accordance with EN 60715. The device should be installed with input terminal block at the bottom.

Each device is delivered ready to install.

Mounting

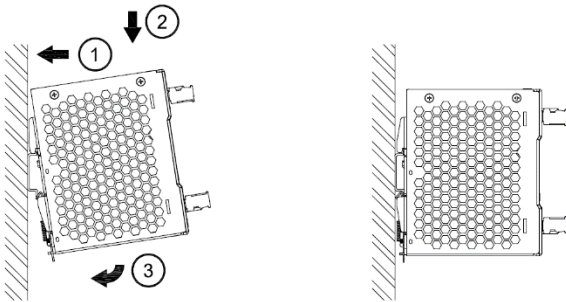


Fig. 2.1 Mounting

Snap on the DIN rail as shown in Fig. 2.1:

1. Tilt the unit upwards and insert it onto the DIN rail.
2. Push downwards until stopped.
3. Press against the bottom front side for locking.
4. Shake the unit slightly to ensure that it is secured.

Dismounting

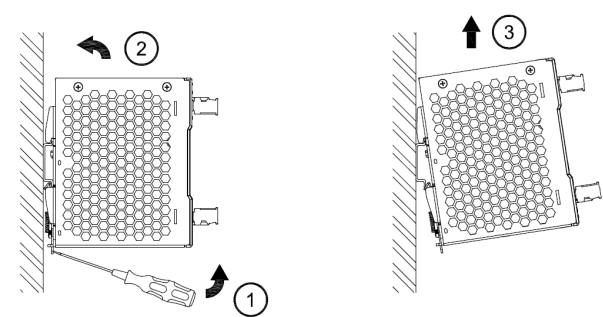


Fig. 2.2 Dismounting

To uninstall, pull or slide down the latch with screw driver as shown in Fig. 2.2. Then slide the power supply unit (PSU) in the opposite direction, release the latch and pull out the power supply unit (PSU) from the rail.

Connection

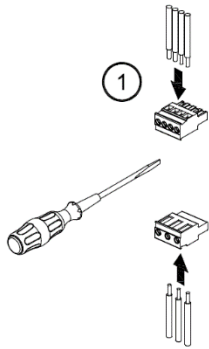


Fig. 3.1

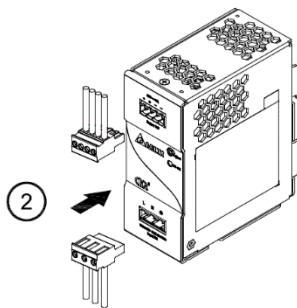


Fig. 3.2

CAUTION: Must tighten wire to housing (Fig. 3.1) before plugging into the terminal block connection (Fig. 3.2).

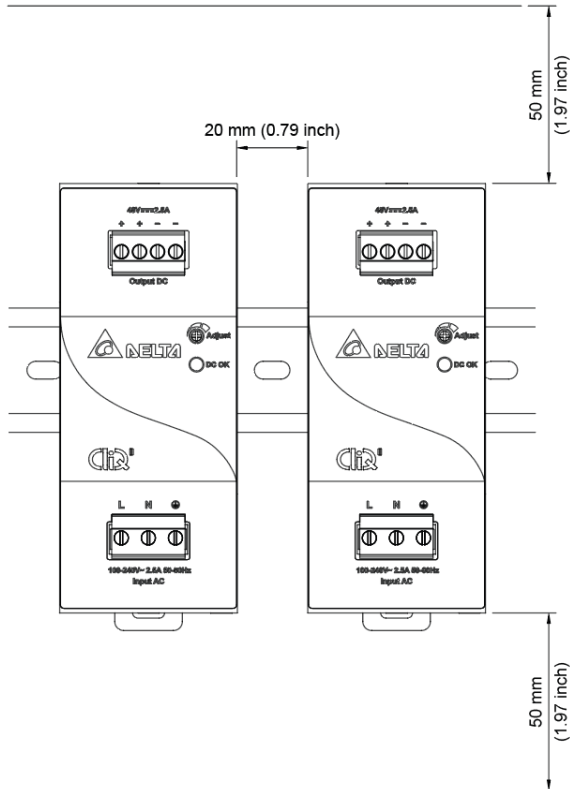
In accordance to EN 60950 / UL 60950 and EN 62368 / UL 62368, flexible cables require ferrules. Use appropriate copper cables designed to sustain operating temperature of 60°C / 75°C or more to fulfill UL requirements.

CliQ II DIN Rail Power Supply

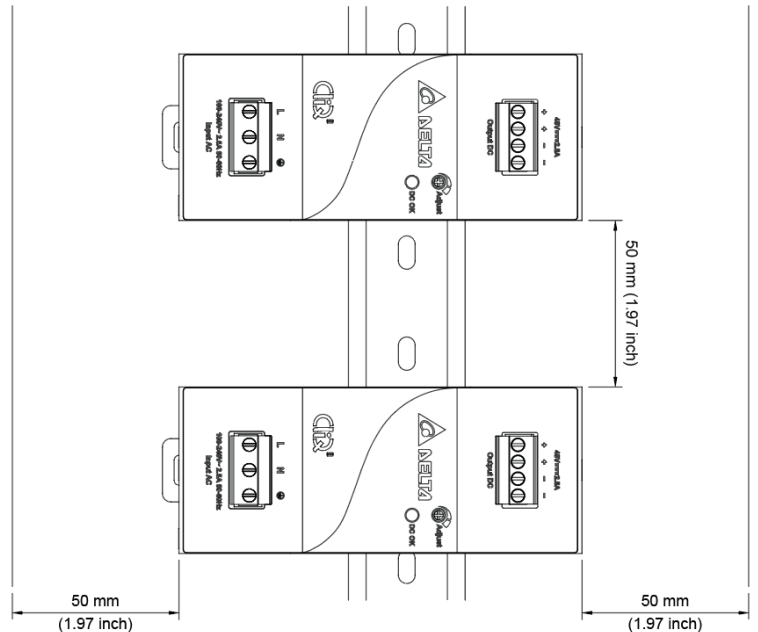
24 V 120 W 1 Phase / DRP024V120W1B□

Safety Instructions

■ Vertical Mounting



■ Horizontal Mounting



- ALWAYS switch mains of input power OFF before connecting and disconnecting the input voltage to the unit. If mains are not turned OFF, there is risk of explosion / severe damage.
- To guarantee sufficient convection cooling, please refer the following instructions to ensure sufficient clearance around the device.
Vertical Mounting: 50 mm (1.97 inch) above and below the device as well as a lateral distance of 20 mm (0.79 inch) to other units.
Horizontal Mounting: 50 mm (1.97 inch) above and below the device as well as a lateral distance of 50 mm (1.97 inch) to other units.
- Note that the enclosure of the device can become very hot depending on the surrounding air temperature and load of the power supply. Risk of burns!
- Only plug in and unplug connectors when power is turned off!
- DO NOT insert any objects into the unit.
- Hazardous voltages may be present for up to 5 minutes after the input mains voltage is disconnected. Do not touch the unit during this time.
- The power supplies are built in units and must be installed in a cabinet or room (condensation free environment and indoor location) that is relatively free of conductive contaminants.
- CAUTION: "For use in a controlled environment".

For DRP024V120W1BA:

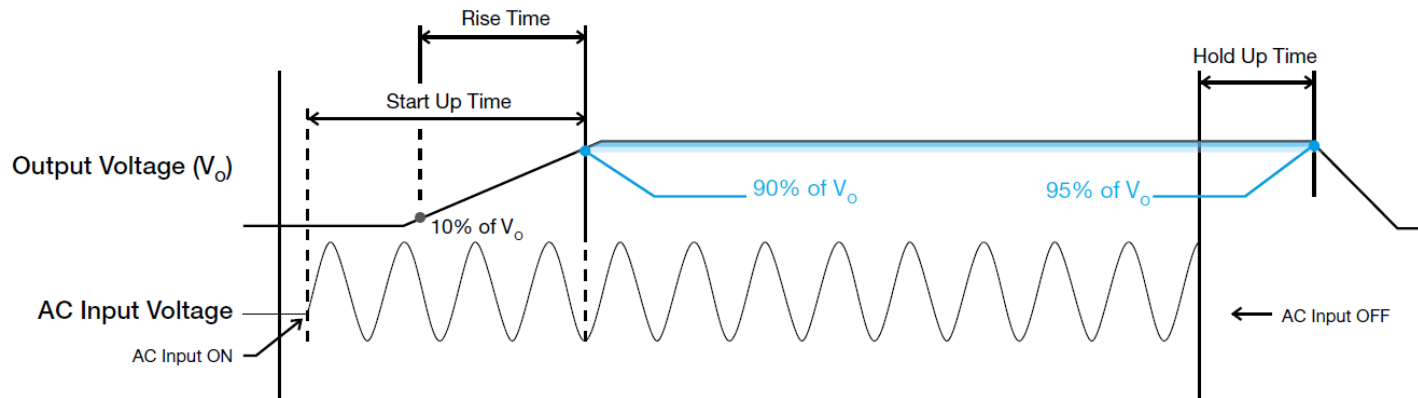
- The power supplies unit must be installed in an IP54 enclosure or cabinet in the final installation. The enclosure or cabinet must comply with EN 60079-0 or EN 60079-15.
- Warning: Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2.
- Warning: Explosion Hazard - Do not disconnect equipment or adjust potentiometer unless the power has been switched off or the area is known to be non-hazardous.

CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

Functions

- Graph illustrating the Start-up Time, Rise Time, and Hold-up Time



Start-up Time

The time required for the output voltage to reach 90% of its final steady state set value, after the input voltage is applied.

Rise Time

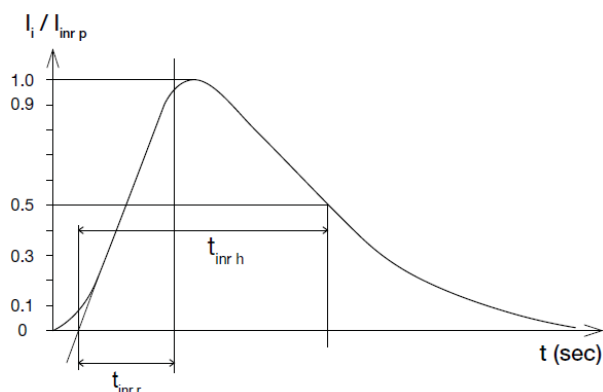
The time required for the output voltage to change from 10% to 90% of its final steady state set value.

Hold-up Time

Time between the collapse of the AC input voltage, and the output falling to 95% of its steady state set value.

Inrush Current

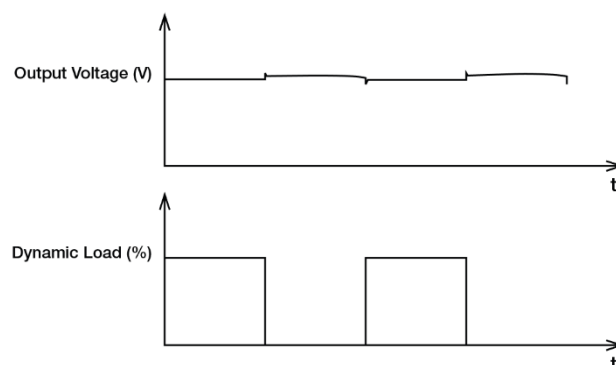
Inrush current is the peak, instantaneous, input current measured and, occurs when the input voltage is first applied. For AC input voltages, the maximum peak value of inrush current will occur during the first half cycle of the applied AC voltage. This peak value decreases exponentially during subsequent cycles of AC voltage.



Dynamic Response

The power supply output voltage will remain within $\pm 5\%$ of its steady state value, when subjected to a dynamic load from 0% to 100% of its rated current.

- 50% duty cycle / 5 Hz to 1 KHz



CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

Power Boost

Power Boost is the reserve power available constantly that allows reliable startup to support sudden and short spike of loads with high inrush current typically during turn on to remove the need of more expensive higher rated power supply unit. After the output has reached its steady state set value, the power supply can support surge loads with a higher short-term power demand up to 150% of maximum rated load (I_o Max), for a maximum duration of 5 seconds. The Power Boost is also available to repeatedly basis with according to the condition of an average (R.M.S) output power shall not exceed continuous operating condition or refer to duty cycle calculation below.

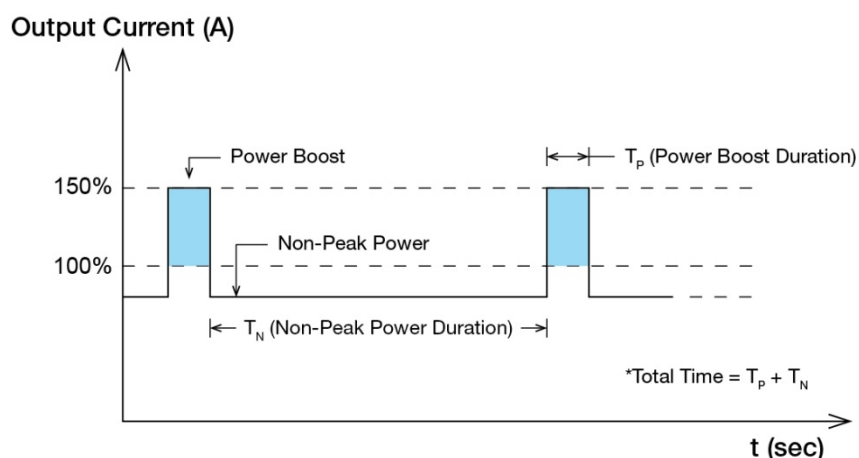


Fig. 4 Duty Cycle Calculation

$$\text{Duty cycle (\%)} = \frac{T_p}{\text{Total Time}}$$

$$\text{Average Output Power (P}_{Avg}\text{)} = \frac{(\text{Power Boost} \times T_p) + (\text{Non-Peak Power} \times T_N)}{\text{Total Time}}$$

OR

$$\text{Non-Peak Power} = \frac{(\text{P}_{Avg} \times \text{Total Time}) - (\text{Power Boost} \times T_p)}{T_N}$$

■ An example of Power Boost and Average Output Power

Power Boost	Peak Power (W _P)	Power Boost Duration (T _P)	Duty Cycle	Non-Peak Power (W _N)	Non-Peak Power Duration (T _N)	Total Time (T)
150%	180	5 sec	10%	113W	45 sec	50 sec
150%	180	5 sec	35%	88W	9.3 sec	14.3 sec
120%	144	10 sec	20%	114W	40 sec	50 sec
120%	144	10 sec	35%	107W	18.5 sec	28.5 sec

It is not recommended to prolong the duration of Power Boost to be longer than the specified duty cycle calculation, this may cause damage to the PSU.

External Input Protection Device

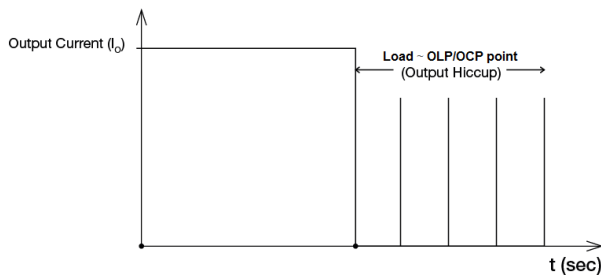
The unit is protected at the L pin, with an internal fuse that cannot be replaced. The power supply has been tested and approved on 20A (UL) and 16A (IEC) branch circuits without additional protection device. An external protection device is only required if the supplying branch has an ampacity greater than above. Thus, if an external protective device is necessary, or, utilized, please refer a minimum value of 10A B- or 6A C- characteristic breaker.

CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

Overload & Overcurrent Protections (Auto-Recovery)

The power supply's Overload (OLP) and Overcurrent (OCP) Protections will be activated when output current (I_o) exceeds its specification as defined on Page 3 under "Protections". In such occurrence, the output voltage (V_o) will start to droop and once the power supply has reached its maximum power limit, the protection is activated and the power supply will go into "Hiccup mode" (Auto-Recovery). The power supply will recover once the fault condition of the OLP and OCP is removed and I_o is back within the specifications.



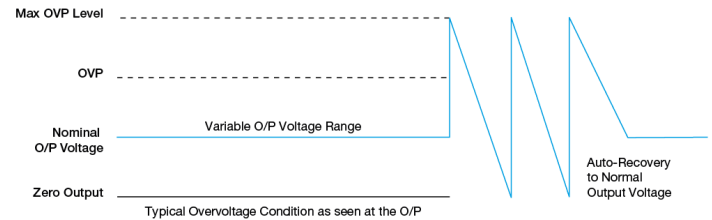
It is not recommended to prolong the duration of I_o when it is less than OLP/OCP point, but greater than 100%, since it may cause damage to the PSU.

Short Circuit Protection (Auto-Recovery)

The power supply's output OLP/OCP function also provides protection against short circuits. When a short circuit is applied, the output current will operate in "Hiccup mode", as shown in the illustration in the OLP/OCP section on this page. The power supply will return to normal operation after the short circuit is removed.

Overvoltage Protection (Auto-Recovery)

The power supply's overvoltage circuit will be activated when its internal feedback circuit fails. The output voltage shall not exceed its specifications defined on Page 3 under "Protections".



Over Temperature Protection (Auto-Recovery)

As mentioned above, the power supply also has Over Temperature Protection (OTP). In the event of a higher operating temperature at 100% load, the power supply will run into OTP when the operating temperature is beyond what is recommended in the de-rating graph. When activated, the output voltage will go into bouncing mode until the temperature drops to its normal operating temperature as recommended in the de-rating graph.

CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

Operating Mode

■ Redundant Operation

In order to ensure proper redundant operation for the power supply unit (PSU), the output voltage difference between the two units must be kept at 0.45~0.50 V for 24 V supplies. Follow simple steps given below to set them up for the redundant operation:

Step 1.

Measure output voltage of PSU 1 and PSU 2. If PSU 1 is the master unit, then V_O of PSU 1 must be higher than PSU 2. In order to set the output voltage, individually connect the power supply to 50% of rated load at any line voltage from 85-264 Vac, and set the PSU 1 and PSU 2 output voltage.

Step 2.

Connect the power supply units PSU 1 and PSU 2 to Vin 1 & Vin 2, respectively, of the DRR-20N (or 20A) module shown on the diagram on the right.

Step 3.

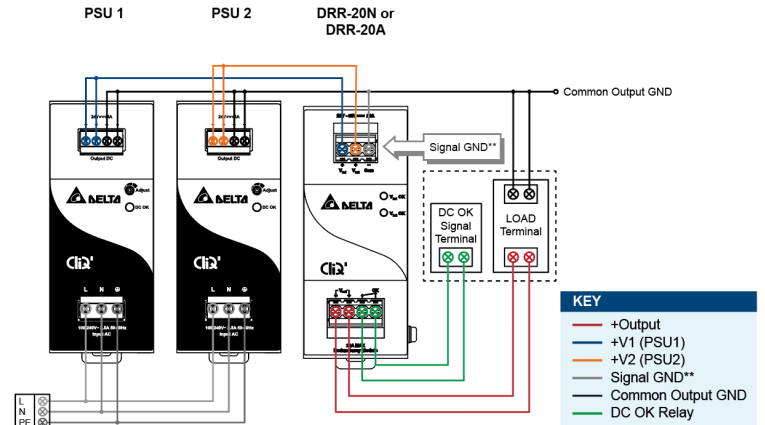
Connect the system load from V_{out} . Please note that output voltage V_{out} from DRR module will be = V_O (output voltage of power supply) – V_{drop}^* (in DRR module).

* V_{drop} will vary from 0.60V to 0.90V (Typical 0.65V) depending on the load current and surrounding air temperature.

■ Parallel Operation

The power supply units (PSUs) can also be used for parallel operation in order to increase the output power. The difference in output voltage between the two units must be kept to within 25 mV of each other. This difference must be verified with the same output load connected independently to each unit.

Parameters such as EMI, inrush current, leakage current, PARD, start up time will be different from those on the datasheet, when two units are connected in parallel. The user will need to verify that any differences will still allow the two power supplies connected in parallel will work properly in their product/application.



**The Signal GND in the DRR module is for the built-in LED and DC OK signals. The Output GND terminals from the two PSU's do not need to be connected to the Signal GND terminal.

Fig. 5 Redundant Operation Connection Diagram

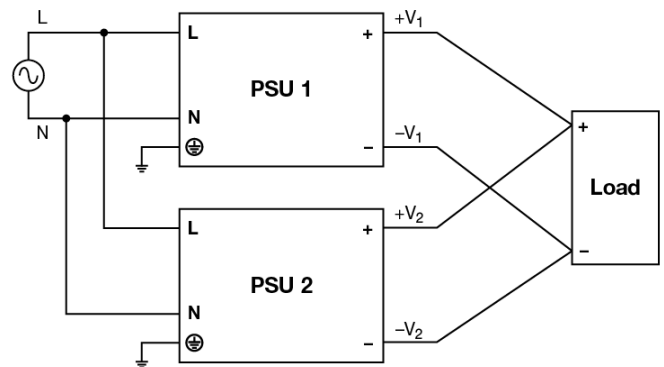


Fig. 6 Parallel Operation Connection Diagram

CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

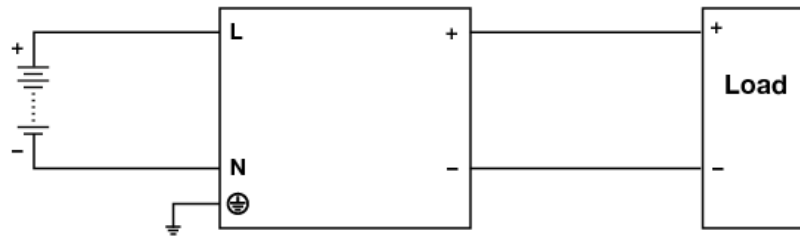


Fig. 7 DC Input Operation Connection Diagram

■ DC Input Operation

Step 1.
Use a battery or similar DC source.

Step 2.
Connect +pole to L and -pole to N.

Step 3.
Connect the PE terminal to an earth wire or to the machine ground.

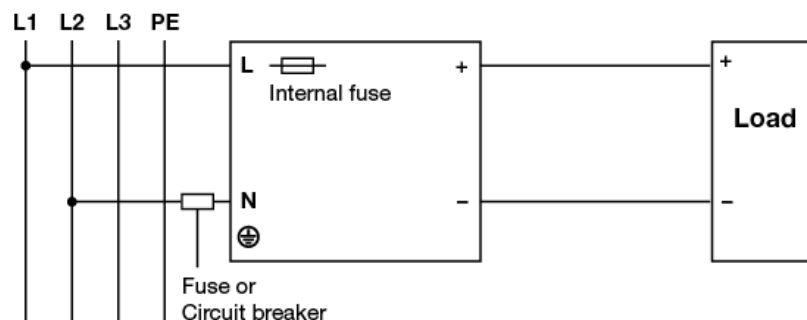


Fig. 8 2 of 3 Phase System Input Operation Connection Diagram

■ 2 of 3 Phase System Input Operation

Delta's CliQ II can use on 2 of 3 phase system. Please refer to the following step.

Step 1.
The input voltage applied from Line to Neutral is below the maximum rated input. The input voltage shall be below 240 Vac +10%.

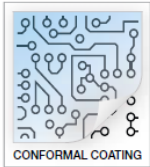
Step 2.
The external protector is needed on N (Neutral) input line to secure a safety. N line does not have internal fuse protection. An appropriate fuse or circuit breaker should be connected in series with N input line connection like the following.

CliQ II DIN Rail Power Supply

24 V 120 W 1 Phase / DRP024V120W1B□

Others

Conformal Coating



The Protective Coating Technology

Delta Electronics Group has designed the perfect dipping technique which penetrates everywhere including under device, and prevents leakage. The conformal coating dipping can be applied to PCBAs or circuit board. The coating preserves the performance of precision electronic primarily by preventing ionizable contaminants such as salt from reaching circuit nodes, where the material slumps around sharp edges. This can be a problem especially in highly conversing atmosphere.

PFC – Norm EN 61000-3-2



Line Current Harmonic content

Typically, the input current waveform is not sinusoidal due to the periodical peak charging of the input capacitor. In industrial environment, complying with EN 61000-3-2 is only necessary under special conditions. Complying to this standard can have some technical drawbacks, such as lower efficiency as well as some commercial aspects such as higher purchasing costs. Frequently, the user does not profit from fulfilling this standard, therefore, it is important to know whether it is mandatory to meet this standard for a specific application.

Attention

Delta provides all information in the datasheets on an "AS IS" basis and does not offer any kind of warranty through the information for using the product. In the event of any discrepancy between the information in the catalog and datasheets, the datasheets shall prevail (please refer to www.DeltaPSU.com for the latest datasheets information). Delta shall have no liability of indemnification for any claim or action arising from any error for the provided information in the datasheets. Customer shall take its responsibility for evaluation of using the product before placing an order with Delta.

Delta reserves the right to make changes to the information described in the datasheets without notice.

Manufacturer and Authorized Representatives Information

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Delta Electronics (Thailand) PCL.
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United Kingdom

Delta Electronics Europe Limited
1 Redwood Court, Peel Park Campus,
East Kilbride, Glasgow, G74 5PF, United Kingdom

Momentary Contact Devices – Non-illuminated



Flush Head Unit
Cat. No. 800T-A1A



Extended Head Unit
Cat. No. 800T-B6A

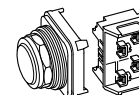


Booted Unit
Cat. No. 800H-R2A



Bootless Flush Head Unit
Cat. No. 800H-AR1A

800 **T** **A** **1** **A**
 a b c d e f



a	
Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b	
Fingersafe Guards	
Code	Description
Blank	No guards
C	Guard on terminals

c		
Operator Type		
800T Code	Description	800H Code
A	Flush head	AR
B	Extended head	BR
D	Mushroom head	DR
DX	Mushroom head (no color cap)	DRX
—	Bootless guarded head	GR
—	Booted head	R ⁽²⁾

d	
Color Cap	
Code	Description
Blank	Used only when Operator Type DX/DRX is ordered
1	Green
2	Black
3	Orange ⁽¹⁾
4	Gray ⁽¹⁾
5	White ⁽¹⁾
6	Red
7	Blue
9	Yellow

(1) Not available for booted operators.

(2) Underlying operators are extended head. Boot material is chlorosulfonated polyethylene.

e	
Special Mushroom Head	
Code	Description
J	Jumbo mushroom head (plastic)
L ⁽¹⁾	Jumbo mushroom head (metal)

Note: Special mushroom head options only apply to mushroom head operator type code D/DR (Table c).

f	
Contact Blocks	
Code	Description
Blank	No contacts
Standard	
D1	1 N.O.
D2	1 N.C.
D3	1 N.O.E.M.
D4	1 N.C.L.B.
D5	1 N.O. (Mini)
D6	1 N.C. (Mini)
A1	1 N.C.L.B. - 1 N.O.
A2	2 N.O. ⁽²⁾
A4	2 N.C.
A7	1 N.C.L.B. - 1 N.C.
A	1 N.O. - 1 N.C.
B	2 N.O. - 2 N.C.

f (cont'd)	
Contact Blocks	
Code	Description
PentTUFF™ (Low Voltage)	
D1V	1 N.O.
D2V	1 N.C.
D3V	1 N.O.E.M.
D4V	1 N.C.L.B.
AV	1 N.O. - 1 N.C.
BV	2 N.O. - 2 N.C.
Time Delay	
T	1 N.O. Depress close, delayed opening
S	1 N.C. Depress open, delayed closure
Snap Action ⁽³⁾	
M	1 N.O. - 1 N.C.
N	2 N.O. - 2 N.C.

f (cont'd)	
Contact Blocks	
Code	Description
Class I, Div. 2 – Explosion-protected	
AF	1 N.O. - 1 N.C.
BF	2 N.O. - 2 N.C.
Class I, Div. 2 – Logic Reed	
D1R	1 N.O.
D2R	1 N.C.
A2R	2 N.O. ⁽²⁾
A4R	2 N.C.
AR	1 N.O. - 1 N.C.
BR	2 N.O. - 2 N.C.
Class I, Div. 2 – Stackable Sealed Switch	
D1Y	1 N.O.
D2Y	1 N.C.
AY	1 N.O. - 1 N.C.
BY	2 N.O. - 2 N.C.

Time Delay Contacts
Series C field installable kits can only be used with Series T or later operators. Adjustable range of 0.5...15 s + 25%. Maximum continuous current I_{th} 5 A.

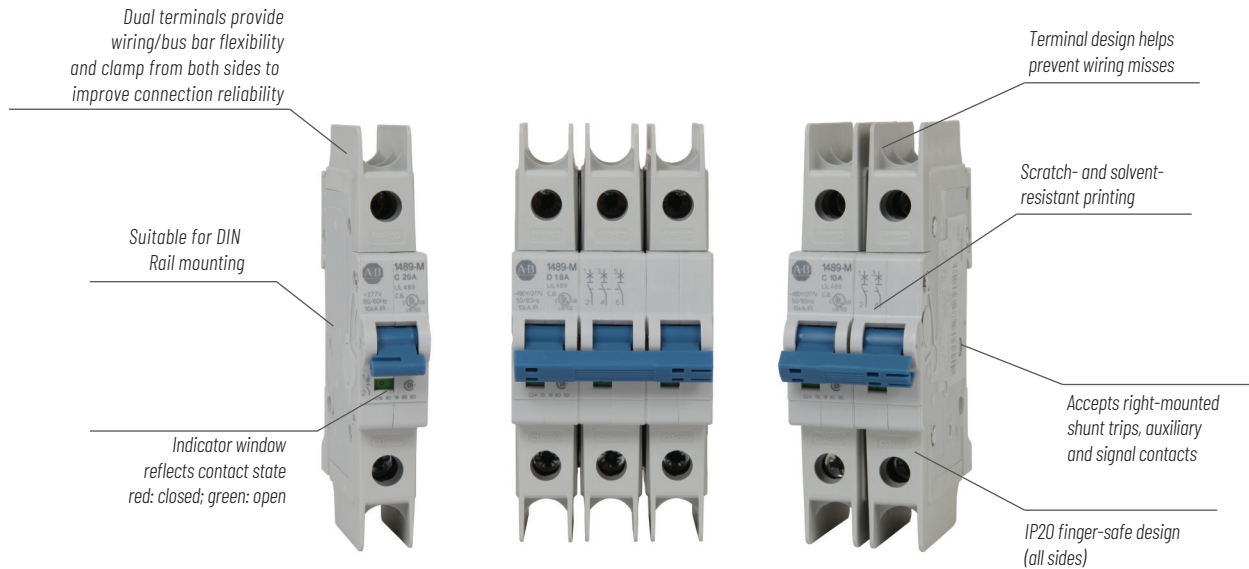
Snap Action Contacts
Snap-action contacts feature a quick make, quick break snap-action mechanism that is only available on factory-assembled units. Maximum continuous current I_{th} 10 A.

(1) Jumbo mushroom head (metal) is only available in colors green, black, red, and yellow.

(2) A2 and A2R contact blocks cannot be stacked upon, but can stack on other contact blocks.

(3) Snap action contact blocks only available with flush and extended head operators in the colors green, black, or red.

1489-M Circuit Breakers



Bulletin 1489-M thermal-magnetic Circuit Breakers are approved for branch circuit protection in the United States and Canada, and are certified as Miniature Circuit Breakers for IEC applications.

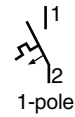
These branch protectors are compatible with many accessories to meet diverse application needs, including UL 508 Listed bus bars for convenience in panel assembly, auxiliary contacts, signal contacts and shunt trips for versatility, and lockout attachments for safety during maintenance.

- Current limiting
- Fast breaking time
- High rated voltage
- Dual terminals provide a more secure connection of up to four wires, or two wires and a bus bar
- Superior shock and vibration resistance to help prevent nuisance tripping
- Terminal design helps prevent wiring misses by directing wires into the terminal openings, even while tightening
- Reversible line and load connections
- Single and multi-pole toggle mount lock out attachments available for Lockout/Tagout (LOTO)
- RoHS compliant and fully recyclable device
- Suitable for extreme ambient conditions

1489-M Circuit Breakers	
Rated Voltage	UL/CSA: Max. 480Y/277V AC IEC: U_e 230/400V AC
Interrupting Capacity	UL/CSA: 10 kA IEC: 15 kA
Current Ratings	0.5...63 A
Poles	1, 2, 3
Trip Curves	C, D
Standards Compliance	UL 489 CSA C22.2 No. 5.1 EN 60947-2 GB 14048.2
Certifications	UL Listed, File No. E197878 CSA Certified, File No. 259391 CE Marked VDE Certified CCC Certified RoHS Compliant

Product Selection

1-Pole Circuit Breakers

Photo/ Wiring Diagram	UL/CSA Max. Voltage	IEC/EN Max. Voltage	Continuous Current Rating (I_n)	Trip Curve C Inductive 5...10 I_n	Trip Curve D Highly Inductive 10...20 I_n	
			[A]	Cat. No.	Cat. No.	
 	277V AC, 48V DC	230V AC	0.5	1489-M1C005	1489-M1D005	
			1	1489-M1C010	1489-M1D010	
			1.6	1489-M1C016	1489-M1D016	
			2	1489-M1C020	1489-M1D020	
			3	1489-M1C030	1489-M1D030	
			4	1489-M1C040	1489-M1D040	
			5	1489-M1C050	1489-M1D050	
			6	1489-M1C060	1489-M1D060	
			7	1489-M1C070	1489-M1D070	
			8	1489-M1C080	1489-M1D080	
			10	1489-M1C100	1489-M1D100	
			13	1489-M1C130	1489-M1D130	
			15	1489-M1C150	1489-M1D150	
			16	1489-M1C160	1489-M1D160	
			20	1489-M1C200	1489-M1D200	
			25	1489-M1C250	1489-M1D250	
			30	1489-M1C300	1489-M1D300	
			32	1489-M1C320	1489-M1D320	
			35	1489-M1C350	1489-M1D350	
	C Curve: 277V AC, 48V DC D Curve: 240V AC, 48V DC		40	1489-M1C400	1489-M1D400	
	240V AC, 48V DC		50	1489-M1C500	1489-M1D500	
			60	1489-M1C600	1489-M1D600	
			63	1489-M1C630	1489-M1D630	

Specifications

Electrical Ratings					
Poles				1, 2, 3	
Tripping characteristics				C, D	
Rated current (I_n)				0.5...63 A	
Rated frequency [f]				50/60 Hz	
Rated insulation voltage U_i per IEC/EN 60664-1				250V AC (phase to ground) 440V AC (phase to phase)	
Overvoltage category				III	
Pollution degree				3	
Data per UL/CSA					
Rated voltage	AC	1-pole	C Curve	0.5...40 A	277V AC
				50...63 A	240V AC
			D Curve	0.5...35 A	277V AC
				40...63 A	240V AC
		2-, 3-pole	C Curve	0.5...40 A	480Y/277V AC
				50...63 A	240V AC
			D Curve	0.5...35 A	480Y/277V AC
				40...63 A	240V AC
	DC	1-pole			48V DC
		2-pole			96V DC (2-pole in series)
Rated interrupting capacity per UL 489					10 kA
Reference temperature for tripping characteristics					40 °C
Electrical endurance					6,000 operations (AC and DC); 1 cycle (1s - ON, 9s - OFF)
Data per IEC/EN 60947-2					
Rated operational voltage (U_o)	1-pole				230V AC
	2-, 3-pole				400 V AC
Highest supply or utilization voltage (U_{max})	AC	1-pole			253/440V AC
		2-, 3-pole			440V AC
	DC ⁽¹⁾	1-pole			48V DC
		2-pole			96V DC
Min. operating voltage					12V AC, 12V DC
Rated ultimate short-circuit breaking capacity (I_{cu})					15 kA
Rated service short-circuit breaking capacity (I_{cs})					≤ 40 A: 11.25 kA > 40 A: 7.5 kA
Rated impulse withstand voltage U_{imp} . (1.2/50μs)					4 kV (test voltage 6.2 kV at sea level, 5 kV at 2,000 m)
Dielectric test voltage					2 kV (50/60Hz, 1 min.)
Reference temperature for tripping characteristics					30 °C
Electrical endurance 1 cycle (2s - ON, 13s - OFF, I_n ≤ 32 A), 1 cycle (2s - ON, 28s - OFF, I_n > 32 A)					I_n < 30 A: 20,000 ops. (AC) I_n ≥ 30 A: 10,000 ops. (AC) 1,000 ops. (DC)

(1) Self-declared IEC DC ratings.

Mechanical Data		
Housing		Insulation group II, RAL 7035
Indicator window		red ON/green OFF
Protection degree per EN 60529		IP20, IP40 in enclosure with cover
Mechanical endurance		20,000 operations
Shock resistance per IEC/EN 60068-2-27		25 g - 2 shocks - 13 ms
Vibration resistance per IEC/EN 60068-2-6		5g - 20 cycles at 5...150...5 Hz with load 0.8 I _n
Environmental		
Environmental conditions (damp heat) per IEC/EN 60068-2-30		28 cycles with 55°C/90-96% and 25°C/95-100%
Ambient temperature ⁽²⁾		-25...+55 °C (-13...+131 °F)
Storage temperature		-40...+70 °C (-40...+158 °F)
Installation		
Terminal		Dual terminal
Cross-section of wire ⁽³⁾ - solid, stranded (front/back terminal slot)		35/35 mm ²
		18...4/18...10 AWG
Cross-section of wire - flexible (front/back terminal slot)		25/10 mm ²
Multi-wire rating per UL, CSA		1 wire, 18...4 AWG
		2-4 wires ⁽⁴⁾ , 18...10 AWG
Cross-section of bus bars (back terminal slot)		10 mm ²
Tightening torque	IEC	2.8 N•m
	UL/CSA	AWG 18...16: 13.3 in•lb, AWG 14...10: 17.7 in•lb, AWG 8...4: 39.8 in•lb
Screwdriver		No. 2 Pozidriv
Mounting		DIN Rail (EN 60715, 35 mm) with fast clip
Mounting position		Any
Supply		Optional
Approximate Dimensions and Weight		
Pole dimension (H x D x W)		111 x 69 x 17.5 mm (4.37 x 2.72 x 0.69")
Pole weight		125 g (4.4 oz.)
Combination with Auxiliary Elements		
Auxiliary contact		Yes
Signal contact		Yes
Shunt trip		Yes

(2) Refer to the ambient temperature derating tables.

(3) 35 mm self-declared, not included in IEC/EN approval.

(4) Wires must be of like size and stranding. Up to two wires per terminal slot.

Power Loss Due to Current

Rated Current [A]	Power Loss Per Pole [W]	Rated Current [A]	Power Loss Per Pole [W]
0.5	1.4	15	2.4
1	1.4	16	2.5
1.6	1.8	20	2.5
2	1.8	25	3.2
3	1.6	30	3.5
4	1.8	32	3.7
5	1.9	35	4.1
6	2.0	40	4.5
7	1.1	50	4.5
8	1.5	60	4.9
10	2.1	63	5.4
13	2.3	—	—

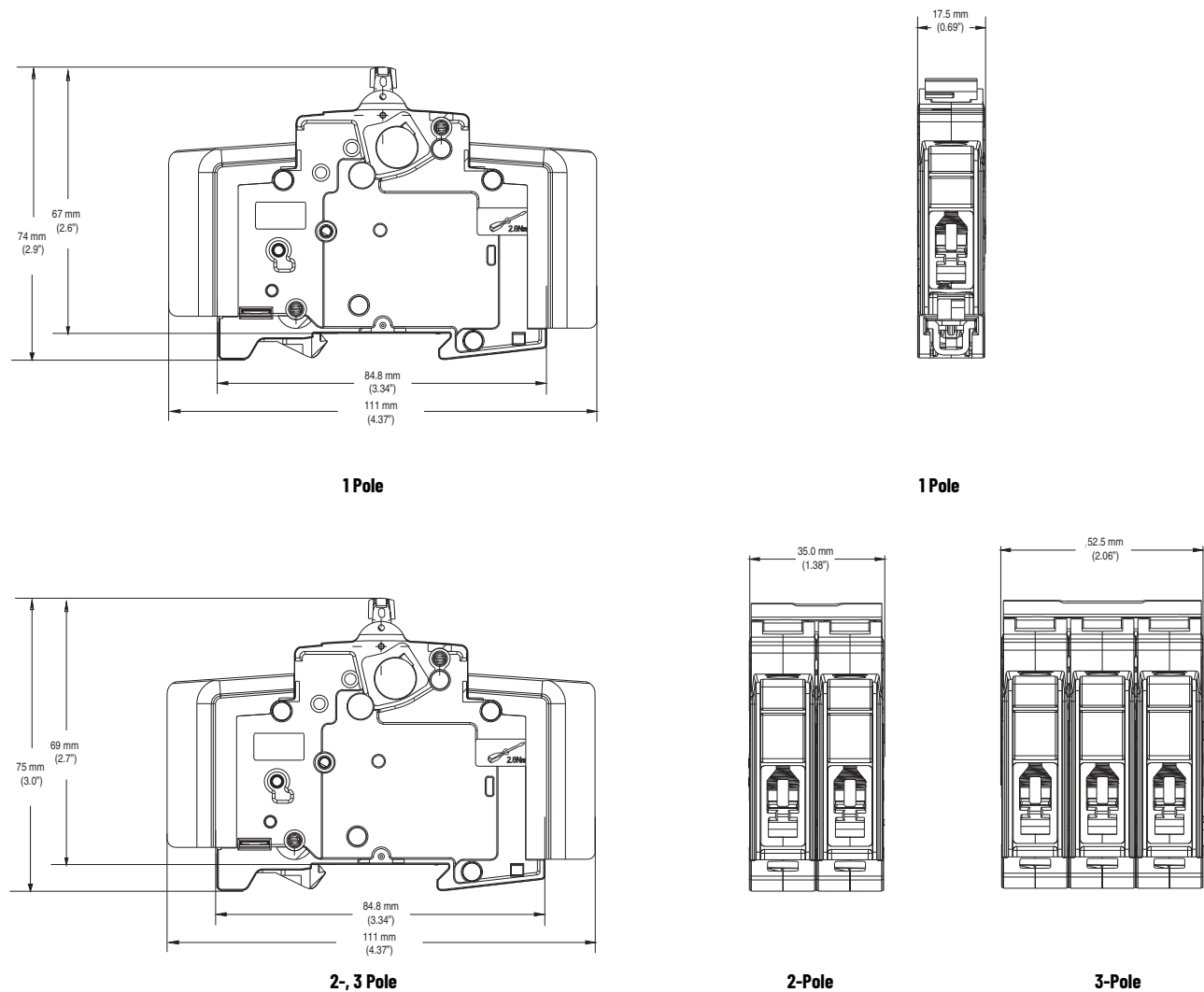
Zero-stack Derating

The installation of several miniature circuit breaker side by side with rated current on all poles requires a correction factor to the rated current (not required if spacers are used).

No. of Adjacent Devices	Factor
1	1
2,3	0.9
4,5	0.8
≥ 6	0.75

Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



Application Information

Circuit Voltage

The Bulletin 1489-M circuit breakers are rated by voltage class. Applications should not exceed the listed voltage and current range.

Circuit Frequency

The Bulletin 1489-M circuit breakers may be applied to frequencies of 50 Hz and 60 Hz without derating. For applications above 60 Hz, contact Rockwell Automation with specific application information for the derating of the circuit breakers.

Available Short Circuit Current

The Bulletin 1489-M circuit breakers should only be applied in those applications in which the available short-circuit (or fault) current is less than or equal to 10 kA (US/Canada) and 15 kA (IEC).

Tripping Characteristics

The trip curve characteristics are shown on the following pages. The trip bands shown for each breaker represent current tripping limits for a circuit breaker and are within the limits established by UL.

The standard tripping characteristic for Bulletin 1489-M is Type C. Type C has a magnetic trip activated at 5-10 times the rated current of the circuit breaker. The reference temperature for the thermal tripping characteristics is 30 °C. The Type C characteristic will suit most applications.

In rare occurrences when the Type C characteristic does not fully meet the application, Type D magnetic trip characteristic is available, allowing for transients approximately twice as high as the standard Type C.

For a specific current at 30 °C, a circuit breaker will open ("clear the circuit") automatically at some total time that will be within the minimum and maximum time shown on the curves. For example, a one-pole, 15 A, Bulletin 1489-M circuit breaker trips in not less than 1 s and not more than 200 s on a 30 A current. Because the UL standard defines this time spread, users should not specify exact tripping time. The lower current portion of the curves (upper left) depicts the time to trip due to thermal action and reflect overload protection of the wire and connect load. The higher current portion of the curves (lower right) depicts the trip due to magnetic action of the circuit breaker and reflects protection due to short circuit level currents.

Application Considerations

The following is a discussion of application considerations related to North American applications. When applying product to IEC regional requirements, follow IEC practices and guidelines.

The selection of a specific ampere rating for a specific application is dependent on the type of load and duty cycle and is governed by the National Electrical Code (Canadian Electrical Code) and UL/CSA. In general, the codes require that overcurrent protection is at the current supply and at points where wire sizes are reduced. In addition, the codes state that conductors be protected according to their current carrying capacity. There are specific situations that require application consideration, such as motor circuit, and guidelines for the selection for transformer protection.

The Bulletin 1489-M circuit breakers are "non-100% rated" as defined by UL 489, para 7.1.4.2. As such, the circuit breaker's rating should be loaded to no more than 80% if used with continuous loads.

Line and load may be reversed. The Bulletin 1489-M circuit breaker may be bottom fed.

Branch Circuits

Bulletin 1489-M circuit breakers may be used to protect branch circuits. A branch circuit is the wiring portion of a system extending beyond the final overcurrent device protecting the circuit. Guidelines established in NEC, CEC, UL, and CSA should be used to determine the specific device. For example:

Motor Branch Circuit

Bulletin 1489-M circuit breakers are not horsepower rated because they are able to safely interrupt currents far in excess of the locked rotor value for a selected motor. This ability is recognized in the codes and standards and is also established by the UL and CSA tests described in UL 489 and CSA C22.2 No. 5 standards.

The size of a Bulletin 1489-M circuit breaker should be determined following the guidelines for an Inverse Time Circuit Breaker.

References: NEC 430.51 and UL 489. Also see CEC and appropriate Canadian Standards.

Transformer Protection

Bulletin 1489-M circuit breakers may be used for transformer protection following the guidelines established.

References: NEC 450 and UL 489. Also see CEC and appropriate Canadian Standards.

Heater Load, Lighting, and Other Load Protection Bulletin 1489-M circuit breakers may be used for protection of heater loads, lighting loads, and other loads following the guidelines established.

References: NEC Article 31 and UL 508A. Also see CEC and appropriate Canadian Standards.

SWD Rating

The Bulletin 1489-M breakers (0.5 ... 20 A) are rated as Switch Duty (SWD) and as such may be applied to switch fluorescent lighting loads up to their current and voltage maximum.

Coordinated Overcurrent Protection

Where an orderly shutdown is required to minimize the hazards to personnel and equipment, a system of coordination based upon the faulted or overloaded circuit is isolated by selective operation of only the overcurrent protective device closest to the overcurrent condition. The user should select devices that meet this requirement. *References: NEC 240.12. Also see CEC.*

HACR Rating

Bulletin 1489-M Circuit Breakers are rated as Heating, Air Conditioning and Refrigeration circuit breakers as defined by UL 489, paragraph 6.7 and may be used in this type of application.

Current Limiting

Bulletin 1489-M Circuit Breakers are rated as current limiting circuit breakers as defined by UL 489, paragraph 8.6.

The Bulletin 1489-M line features the ability to achieve short circuit interruptions far more effectively than conventional breakers. In conventional circuit breakers, the short circuit interruption time required is approximately one or two half cycles of an AC sine wave. When the contacts open, the resulting arc continues to burn until the current level passes through zero. The arc may re-ignite because of the insufficient width of the contact gap. The current that flows until the arc is extinguished produces a heating effect proportional to the I^2t value (let-through-energy) of the fault current.

The Bulletin 1489-M device is designed to substantially reduce the amount of let-through-current and the resulting let-through-energy that can damage protected components. The Bulletin 1489-M has the ability to interrupt short circuit current within the first half cycle of the fault. Limiting let-through current and energy will protect against the harmful effects of overcurrent and is focused primarily on avoiding excessive heat and mechanical damage.

Both of these factors are proportional to the square of the current. Thermal energy is proportional to the square of the RMS value and magnetic forces are proportional to the square of the peak value. The most effective way to provide protection is to substantially limit let-through-energy. This provides the following advantages:

- Far less damage at the location of the short circuit.
- Fast electric separation of a faulty unit from the system, especially power supplies connected in parallel that are switched off when the voltage of the power bus drops below a certain level.
- Far less wear on the miniature circuit breaker itself. This means more safe interruptions.
- Better protection of all components in the short circuit path.
- Far wider range of selective action when used with an upstream protective device. (No nuisance shut downs from feeder line interruptions, causing a blackout in all connected branches.)

Ambient Temperature Derating

- The Bulletin 1489-M circuit breakers are rated in RMS amperes at a 40 °C (104 °F) ambient temperature per UL 489/CSA C22.2 No. 5. This temperature is used as the ambient temperature external to an industrial enclosure.
- If a circuit breaker is applied in a temperature that exceeds the 40 °C (104 °F) ambient rating, then the circuit breaker should be derated using the table below. For IEC 60947-2 standard, the products carry an ambient rating of 30 °C.
- Follow standard IEC application considerations for temperature rating in different ambient temperatures.
- Application below 0° C is for non-condensing atmosphere. Care should be taken for applications below 0 °C. These devices are not certified to operate correctly in the presence of ice.

Bulletin 1489-M

Temperature Derating, UL

Reference temperature = 40 °C

Current Rating (A)	Ambient temperature (°C)									
	-25	-20	-10	0	10	20	30	40	50	55
0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5
1	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1	1.0	0.9
1.6	2.0	2.0	1.9	1.8	1.8	1.7	1.7	1.6	1.5	1.5
2	2.5	2.4	2.4	2.3	2.2	2.1	2.1	2	1.9	1.9
3	3.7	3.7	3.6	3.4	3.3	3.2	3.1	3	2.9	2.8
4	5.0	4.9	4.7	4.6	4.4	4.3	4.1	4	3.9	3.8
5	6.2	6.1	5.9	5.7	5.6	5.4	5.2	5	4.8	4.7
6	7.4	7.3	7.1	6.9	6.7	6.4	6.2	6	5.8	5.7
7	8.7	8.6	8.3	8.0	7.8	7.5	7.3	7	6.7	6.6
8	9.9	9.8	9.5	9.2	8.9	8.6	8.3	8	7.7	7.6
10	12.4	12.2	11.9	11.5	11.1	10.7	10.4	10	9.6	9.4
13	16.1	15.9	15.4	14.9	14.4	14.0	13.5	13	12.5	12.3
15	18.6	18.3	17.8	17.2	16.7	16.1	15.6	15	14.4	14.2
16	19.8	19.6	19.0	18.4	17.8	17.2	16.6	16	15.4	15.1
20	24.8	24.4	23.7	23.0	22.2	21.5	20.7	20	19.3	18.9
25	31.0	30.6	29.6	28.7	27.8	26.9	25.9	25	24.1	23.6
30	37.2	36.7	35.6	34.4	33.3	32.2	31.1	30	28.9	28.3
32	39.7	39.1	37.9	36.7	35.6	34.4	33.2	32	30.8	30.2
35	43.4	42.8	41.5	40.2	38.9	37.6	36.3	35	33.7	33.1
40	49.6	48.9	47.4	45.9	44.4	43.0	41.5	40	38.5	37.8
50	62.0	61.1	59.3	57.4	55.6	53.7	51.9	50	48.2	47.2
60	74.4	73.3	71.1	68.9	66.7	64.4	62.2	60	57.8	56.7
63	78.2	77.0	74.7	72.3	70.0	67.7	65.3	63	60.7	59.5

Bulletin 1489-M

Temperature Derating, IEC

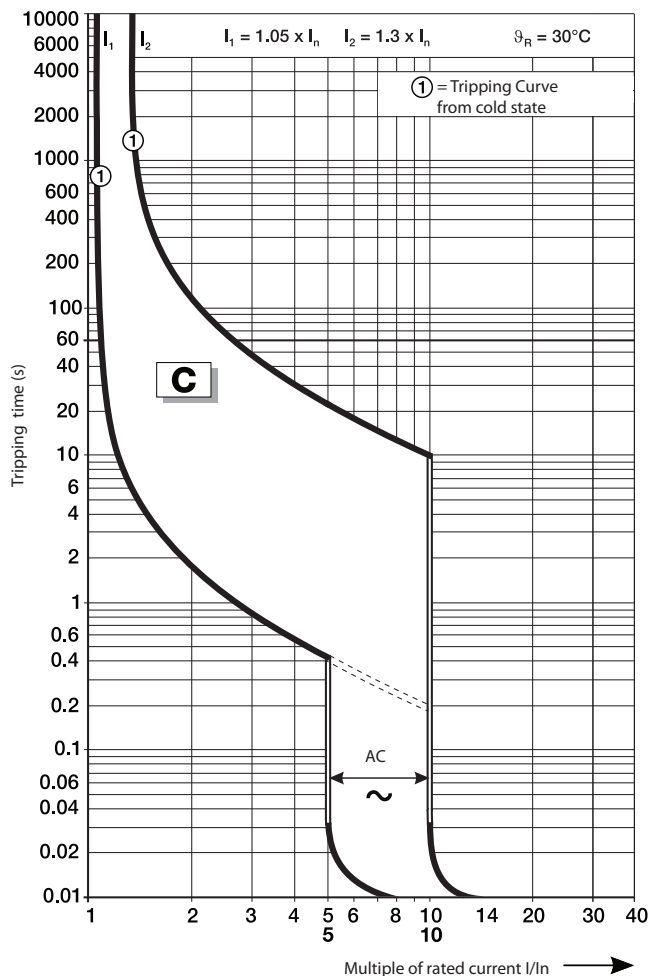
Reference temperature = 30 °C

Current Rating (A)	Ambient temperature (°C)									
	-25	-20	-10	0	10	20	30	40	50	55
0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
1	1.2	1.2	1.1	1.1	1.1	1.0	1	1.0	0.9	0.9
1.6	1.9	1.9	1.8	1.8	1.7	1.7	1.6	1.5	1.5	1.5
2	2.4	2.4	2.3	2.2	2.1	2.1	2	1.9	1.9	1.8
3	3.6	3.6	3.4	3.3	3.2	3.1	3	2.9	2.8	2.7
4	4.8	4.7	4.6	4.4	4.3	4.1	4	3.9	3.7	3.6
5	6.0	5.9	5.7	5.6	5.4	5.2	5	4.8	4.6	4.5
6	7.2	7.1	6.9	6.7	6.4	6.2	6	5.8	5.6	5.4
7	8.4	8.3	8.0	7.8	7.5	7.3	7	6.7	6.5	6.4
8	9.6	9.5	9.2	8.9	8.6	8.3	8	7.7	7.4	7.3
10	12.0	11.9	11.5	11.1	10.7	10.4	10	9.6	9.3	9.1
13	15.6	15.4	14.9	14.4	14.0	13.5	13	12.5	12.0	11.8
15	18.1	17.8	17.2	16.7	16.1	15.6	15	14.4	13.9	13.6
16	19.3	19.0	18.4	17.8	17.2	16.6	16	15.4	14.8	14.5
20	24.1	23.7	23.0	22.2	21.5	20.7	20	19.3	18.5	18.2
25	30.1	29.6	28.7	27.8	26.9	25.9	25	24.1	23.2	22.7
30	36.1	35.6	34.4	33.3	32.2	31.1	30	28.9	27.8	27.2
32	38.5	37.9	36.7	35.6	34.4	33.2	32	30.8	29.6	29.0
35	42.1	41.5	40.2	38.9	37.6	36.3	35	33.7	32.4	31.8
40	48.1	47.4	45.9	44.4	43.0	41.5	40	38.5	37.0	36.3
50	60.2	59.3	57.4	55.6	53.7	51.9	50	48.2	46.3	45.4
60	72.2	71.1	68.9	66.7	64.4	62.2	60	57.8	55.6	54.5
63	75.8	74.7	72.3	70.0	67.7	65.3	63	60.7	58.3	57.2

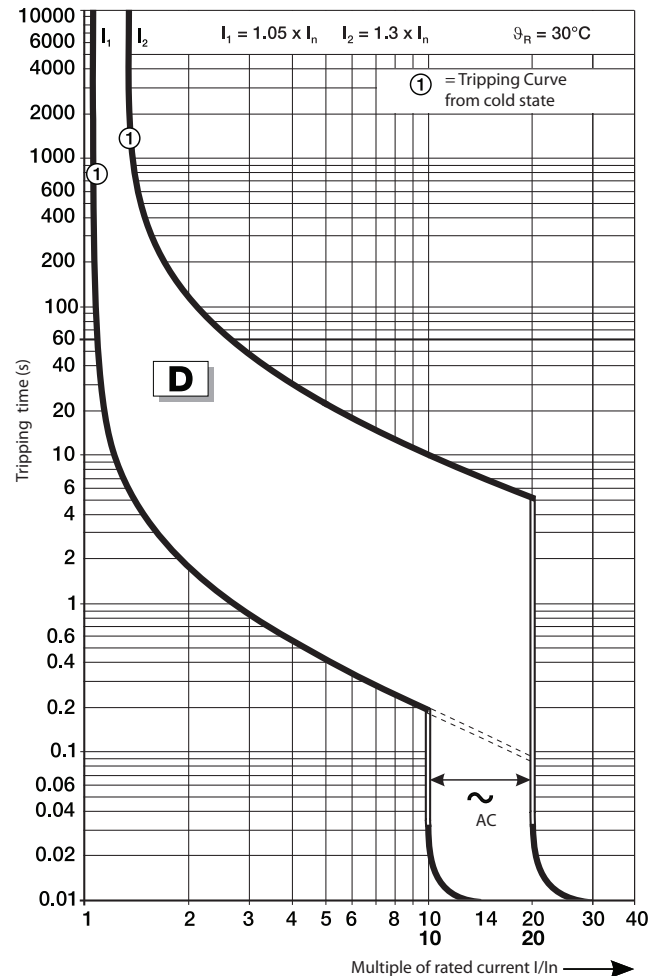
Tripping Characteristics

- DC trip curves – When using 1489-M_L on DC applications or DC loads, please refer to AC trip curves and times and use a factor of 1.5 for the magnetic instantaneous trip times the continuous current rating (I_n).
- For C trip curve = 7.5 to 15 multiple of the rated current (I / I_n).
- For D trip curve = 15 to 30 multiple of the rated current (I / I_n).
- The thermal trip times remain the same for both AC and DC applications.

C Curve

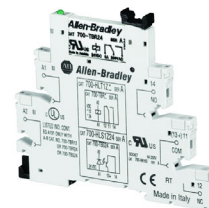


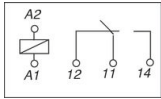
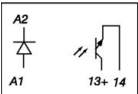
D Curve



700-HL Terminal Block Relay

- Relay and socket assembled interface modules for high density interposing or isolation applications
- Screw terminal and spring-clamp bases
- 6 A relay, choice of silver or gold contacts
- 2 A solid-state relay — DC output
- 2 A solid-state relay — AC output
- SPDT (relay), 1 N.O. (solid-state)
- Built-in retainer clip and snap-in marker lever
- Standard LED, reverse polarity protection, and surge protection
- Externally replaceable relay modules
- Unique leakage current suppression version to address industry concerns of nuisance coil turn-on or contact non-drop out when connecting to PLCs with leakage current
- Available with hazardous location certification



Standard built-in Features: • LED • Reverse Polarity Protection for DC Inputs • Coil Surge Protection⁽¹⁾				
	Cat. No. 700-HLT1Z24	Cat. No. 700-HLT2Z24	Cat. No. 700-HLS1Z24	Cat. No. 700-HLS11Z24
Specifications			(3) 	
Output Type	SPDT (1 C/O); $I_{th} = 6A^{(2)}$		1 N.O. solid-state; $I_{th} = 2 A, 24V DC$ or $I_{th} = 2 A, 240V AC$	
Recommended Tightening Torque	0.5 N•m max. (4.4 lb•in)			
Wire Range	Screw Terminal: 0.14 mm ² ...2.5 mm ² (#26...#14 AWG), Spring Terminal: 0.2 mm ² ...2.5 mm ² (#24...#14 AWG)			
Approvals	UL, cULus, cURus, ABS, CE			

(1) Diode surge protection provided.

(2) For Gold-plated contacts: Add the letter "X" at the end of the catalog number. For example: if Cat. No. 700-HLT1Z24 is required with gold plating, the new cat. no. is 700-HLT1Z24X.

(3) Reverse polarity on the output terminals of the solid-state relay will result in the output being "ON" regardless of the state of the input voltage.

Input Voltage	Pkg. Qty.	Cat. No. (Screw Terminals)	Cat. No. (Spring Clamp Terminals)	Pkg. Quantity	Cat. No. (Screw Terminals) (DC Output)	Cat. No. (Spring Clamp Terminals) (DC Output)	Cat. No. (Screw Terminals) (AC Output)
12V DC	10	(2) 700-HLT1Z12	700-HLT2Z12	—	—	—	—
24V DC	10	(2) 700-HLT1Z24	700-HLT2Z24	10	(2) 700-HLS1Z24	700-HLS2Z24	700-HLS11Z24
48V DC	10	(2) 700-HLT1Z48	700-HLT2Z48	10	(2) 700-HLS1Z48	700-HLS2Z48	700-HLS11Z48
12V AC/DC	10	700-HLT1U12	700-HLT2U12	—	—	—	—
24V AC/DC	10	700-HLT1U24	700-HLT2U24	—	—	—	—
48V AC/DC	10	700-HLT1U48	700-HLT2U48	—	—	—	—
110/125V AC/DC	10	700-HLT1U1	700-HLT2U1	10	(2) 700-HLS1U1	700-HLS2U1	700-HLS11U1
220...240V AC/DC	10	700-HLT1U2	700-HLT2U2	10	(2) 700-HLS1U2	700-HLS2U2	700-HLS11U2
240V AC	10	700-HLT1A2	—	—	—	—	—

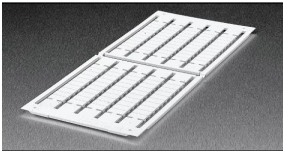
Input Voltage	Pkg. Qty.	Cat. No. (Screw Terminals)	Cat. No. (Spring Clamp Terminals)	Pkg. Quantity	Cat. No. (Screw Terminals) (DC Output)	Cat. No. (Spring Clamp Terminals) (DC Output)	Cat. No. (Screw Terminals) (AC Output)
Built-in LCSC (leakage current suppression circuit) 120V AC and 125V DC ⁽¹⁾	10	(2) 700-HLT1L1	—	10	(2) 700-HLS1L1	—	700-HLS1L1
Built-in LCSC (leakage current suppression circuit) 240V AC ⁽¹⁾	10	(2) 700-HLT1L2	—	10	(2) 700-HLS1L2	—	700-HLS1L2
Hazardous Location Certification 24V DC	10	700-HLT1Z24-EX	—	10	700-HLS1Z24-EX	—	—
Hazardous Location Certification 12V DC	10	700-HLT1Z12-EX	—	10	—	—	—
Hazardous Location Certification 110/125V AC/DC	10	700-HLT1U1-EX	—	10	700-HLS1U1-EX	—	—

(1) Leakage current suppression up to 2.2 mA off state current.

(2) Electromechanical relay to solid-state relay interchangeability is possible.

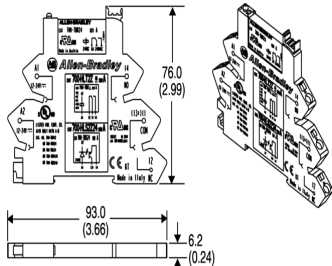
Accessories - 700-HLT, -HLS Relays

Photo	Description	Pkg. Quantity	Socket Input Voltage	Cat. No.
	Replacement Relays⁽¹⁾ Order must be for 20 relays or multiples of 20.	20	12V AC/DC	700-TBR12
			24V AC/DC	700-TBR24
			48V AC/DC	700-TBR48
			110/125V AC/DC 220...240V AC/DC	700-TBR60
	Replacement SSR 4-blade miniature relay for use with 1 N.O. SSR DC output. Order multiples of 20.	20	24V DC	700-TBS24
	Replacement SSR 4-blade miniature relay for use with 1 N.O. SSR AC output. Order multiples of 20.	20	48V DC, 110/125V AC/DC 220...240V AC/DC	700-TBS60
			24V DC	700-TBS124
	Replacement SSR 4-blade miniature relay for use with 1 N.O. SSR AC output. Order must be for 20 relays or multiples of 20.	20	48V DC 110/125V AC/DC 220...240V AC/DC	700-TBS160
	20-Way Jumper Can be cut to required length. $I_{th} = 36 \text{ A max per 20-way jumper.}$	1	Color	
			Red	700-TBJ20R
			Grey	700-TBJ20G
			Blue	700-TBJ20B

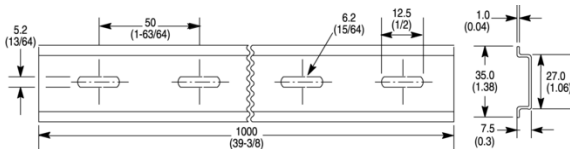
Photo	Description	Pkg. Quantity	Socket Input Voltage	Cat. No.
	End Barrier Used for visual inspection of groups, safe separation of neighboring 700-HL modules that end with jumpers.	10	Black	700-HN177
	Snap-in Marker These snap-in markers have a 6 x 10 mm surface and snap into the ejection lever for the relay. For custom markers, contact your local Rockwell Automation sales office or Allen-Bradley distributor for more information.	100	Blank	1492-MC6X10

(1) For gold-plated contacts: Add the letter "X" at the end of the catalog number. For example: if Cat. No. 700-TBR24 is required with gold plating, the new cat. no. is 700-TBR24X.

Dimensions - 700-HL Relays



700-HL Spring Terminal Design Single Wire: 0.2 mm2 . . . 2.5 mm2 (#24 AWG . . . #14 AWG) Wire Type: Solid or stranded, copper only.Strip Length: 9 mm (11/32 in.)



Cat. No. 199-DR1 DIN Mounting Rail Series B, Cat. No. 199-DR4 DIN Mounting Rail Series B has no mounting holes.

Specifications - 700-HLT Relays

Cat. No. 700-HLT... (Relay Output)							
Electrical Ratings							
Pilot Duty Rating	B 300, R 300						
Rated Thermal Current (I_{th})	1-Pole — 6 A						
Rated Insulation Voltage (U_i)	250V IEC, 300V UL/CSA						
Contacts	1-Pole						
	Inductive V AC	24VAC, 1-phase	30 A	▶] [◀ Make	5 A	◀] [▶ Break	
		120VAC, 1-phase	30 A		3 A		
		240VAC, 1-phase	15 A		1.5 A		
	Inductive V DC	24VDC	DC-13, 1.0 A				
		125VDC	DC-13, 0.2 A				
		240VDC	DC-13, 0.1 A				
	Resistive Make, Break, and Continuous	24VDC	6.0 A				
		250VAC	6.0 A				
		240VDC	0.1 A				
Inductive Load	AC-15 250V, 3 A N.O. Contact, 1.5 A N.C. Contact DC-13 24V, 1 A N.O., and N.C. Contact						

Cat. No. 700-HLT.. (Relay Output)							
Min. Permissible Contact Ratings	12V, 6 mA (72 mW) for Silver Contacts, 8V, 2.5 mA (20 mW) for Gold Contacts						
Permissible Coil Voltage Variation	Pickup:	85...110% of Nominal Voltage at 50 Hz 85...110% of Nominal Voltage at 60 Hz 80...110% of Nominal Voltage at DC				Must Dropout Voltage:	10% of Nominal Voltage at AC 5% of Nominal Voltage at DC
Power Consumption ±10%	AC DC	0.3VA 0.2 W					
Design Specification / Test Requirements							
Dielectric Withstand Voltage	Pole to Pole (VRMS)	1000V					
	Contact to Coil (VRMS)	4000V					
Input Voltage	12V AC/DC	24V AC/DC	48V AC/DC	120V AC/DC	240V AC/DC	120VLCSC	240VLCSC
Impedance(Ohms)	1K	2 K	6 K	26 K	56 K	16 K	35 K
Mechanical							
Degree of Protection	IP20						
Mechanical Life Operations	1 x 10 ⁷						
Electrical Life Operations	6 A Resistive: 100 000 min. 24V DC, 1 A Inductive: 200 000 min. 120V AC 1 A Inductive: 300 000 min.						
Switching Frequency Operations (no-load)	10 cycles/sec						
Coil Voltages	See Overview/Product Selection						
Operating Time at Nominal Voltage at 20 °C (ms)	Pickup	7 ms					
	Dropout	3 ms					
Maximum Operating Rate (full load = 6 A)	6 cycles/min.						
Coil Surge Protection	Per EN 61000-4.5; Surge Immunity (801-5) Class III: 2 kV common and 1 kV differential mode						
Environmental							
Temperature	Operating	−40...+55 °C					
	Storage	−40...+100 °C					
Altitude	2000 m (6560 ft)						
Construction							
Insulating Material	Molded High Dielectric Material						
Enclosure	RelayIP67						
Contact Material	Silver Tin Ox, AgSnO ₂ or Silver with Gold Plating, AgSnO ₂ + Au						
Terminal Markings on Socket	In accordance with EN50 0005						
Certifications	cULus Listed (File No. E3125, E14843 Guide NLDX/NLDX7) with Allen-Bradley socket, CE Marked, ABS (American Bureau of Shipping)						
Standards	EN 61810-1, CSA 22.2, UL 508, NEMA IEE MAC Compliant, ICS-2 Compliant						
Hazardous Location Approvals	Class 1, Zn 2, Groups IIC, Ex nC IIC T5 Ta < 55 °C						
	UL Listed (UL60079-15)	700-HLT1Z12-EX (12V DC supply) 700-HLT1Z24-EX, 700-HLS1Z24-EX (24V DC supply) 700-HLT1U1-EX, 700-HLS1U1-EX (110V/125V AC/DC supply)					
	CSA Certified ⁽¹⁾ (CAN/CSA E60079-15)	700-HLT1Z12-EX (12V DC supply) 700-HLT1Z24-EX, 700-HLS1Z24-EX (24V DC supply)					

(1) Product shall be installed in an enclosure providing at least IP54 protection. Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40%.

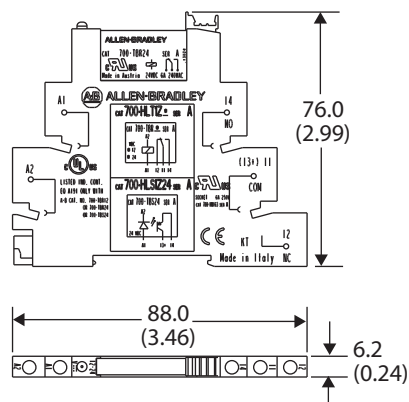
Cat. No. 700-HLS... (Solid-state Output)			
Electrical			
Rated Thermal Current (I_{th})		2 A (DC output)	2 A (AC output)
Rated Insulation Voltage (U_i)	250V IEC, 300V UL/CSA		

Cat. No. 700-HLS... (Solid-state Output)						
Control Circuit	Min. Control Voltage	80% nominal voltage				
	Maximum Control Voltage	110% nominal voltage				
	Control Current	9 mA ±10% (24V) 4 mA ±10% (120/240V)				
	Release Voltage	0.4 x nominal voltage (24V), 0.35 x nominal voltage (120/240V)				
	Min. Control Circuit Resistance	3200 ohms (24V), 16k ohms (120V), 32k ohms (240V)		2500 ohms (24V), 12k ohms (120V), 24kohms (240V)		
Outputs	Load Voltage Range	0...24VDC		24...240VAC		
	Max. Repetitive Blocking Voltage	33V		600V		
	Max. Switching Current (inductive/ resistive)	2 A DC		1 A AC		
	On State Voltage Drop @ Max. Switching Current	<120 mV DC		<1V AC		
	Leakage Current	max. 100 µA (@U = 24V)				
Power Consumption ±10%	AC	0.6VA(120V), 1VA(240V)				
	DC	0.2 W		0.3 W		
Design Specification/Test Requirements						
Dielectric Withstand Voltage	Pole to Pole (VRMS)	2500V				
	Contact to Coil (VRMS)	2500V				
Input Voltage	24V DC	48VDC	120V AC/DC	240V AC/DC	120VLCSC	240VLCSC
Impedance(Ohms)	2K	9 K	26 K	58 K	16 K	35 K
Mechanical						
Degree of Protection	IP20					
Input Voltages	See Overview/Product Selection					
Operating Time at Nominal Voltage at 20 °C (ms)	Turn on Time	30 µs (DC only input voltage), 7 ms (AC/DC input voltage)				
	Drop Out Time	350 µs (DC only input voltage), 10 ms (AC/DC input voltage)				
Maximum Operating Rate	300 Hz					
Environmental						
Temperature	Operating	-20...+55 °C				
	Storage	-40...+70 °C				
Altitude	2000 m (6560 ft)					
Construction						
Insulating Material	Molded High-Dielectric Material					
Enclosure	RelayIP67					
Terminal Markings on Socket	In accordance with EN50 0005					
Certifications	cULus Listed (File No. E14843, Guide NLDX/NLDX7), CE Marked, ABS (American Bureau of Shipping)					
Standards	UL 508, CSA C22.2 No. 14, EN 61810-1					
Hazardous Location Approvals	Class 1, Zn 2, Groups IIC, Ex nC IIC T5 Ta < 55 °C					
	UL Listed (UL60079-15)	700-HLT1Z24-EX, 700-HLS1Z24-EX (24V DC supply) 700-HLT1U1-EX, 700-HLS1U1-EX (110V/125V AC/DC supply)				
	CSA Certified ⁽¹⁾ (CAN/CSA60079-15)	700-HLT1Z24-EX, 700-HLS1Z24-EX (24V DC supply)				

(1) Product shall be installed in an enclosure providing at least IP54 protection. Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40%.

Dimensions - 700-HLT, -HLS Relays

Approximate dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



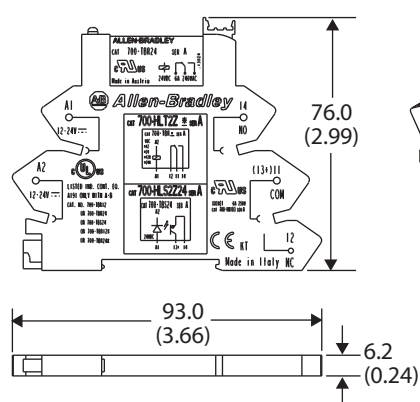
700-HLT / -HLS Screw Terminal Design

Single Wire: 0.14 mm² ... 2.5 mm² (#26 AWG ... #14 AWG)

Double Wire: 2 x 0.14 mm² ... 2 x 1.5 mm² (2 x #26 AWG ... 2 x #16 AWG)

Wire Type: Solid or stranded, copper only

Strip Length: 9 mm (11/32 in). Torque: 0.5 N·m (4.4 lb·in)



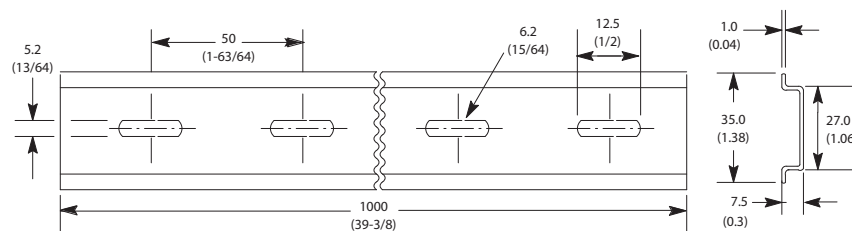
700-HLT / -HLS Spring Terminal Design

Single Wire: 0.2 mm² ... 2.5 mm² (#24 AWG ... #14 AWG)

Wire Type: Solid or stranded, copper only

Strip Length: 9 mm (11/32 in.)

Dimensions - 700-HLT, -HLS Relay Accessories



Cat. No. 199-DR1 DIN Mounting Rail Series B

Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

Cat. No.	A	B	C	D	Approx. Shipping Wt.	Pkg. Qty.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lb)	10/pkg
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lb)	5/pkg

Screw Connection Terminal Blocks

Standard Feed-Through Blocks

1492-J3					1492-J4				1492-J6			
Dimensions are not intended to be used for manufacturing purposes. Note: Height dimension is measured from top of rail to top of terminal block.												
Specifications	Feed-through terminal block				Feed-through terminal block				Feed-through terminal block			
Certifications		CSA	IEC	ATEX		CSA	IEC	ATEX		CSA	IEC	ATEX
Voltage Rating	600V AC/DC		800V AC/DC	550V AC/DC	600V AC/DC		800V AC/DC	690V AC/DC	600V AC/DC		800V AC/DC	550V AC/DC
Maximum Current	25 A	20 A	24 A	21 A	35 A	25 A	32 A	28 A	50 A	41 A	36 A	
Wire Range (Rated Cross Section)	#22...12 AWG	#26...12 AWG	2.5 mm ²	2.5 mm ² (#20...14 AWG)	#22...10 AWG	#26...10 AWG	4 mm ²	4 mm ² (#20...12 AWG)	#22...8 AWG	6 mm ²	6 mm ² (#20...10 AWG)	
Wire Strip Length	0.39 in. (10 mm)				0.39 in. (10 mm)				0.47 in. (12 mm)			
Recommended Tightening Torque	4.5...7.1 lb•in (0.5...0.8 N•m)				9.0 lb•in (1.0 N•m)				14.2 lb•in (1.6 N•m)			
Density	59 pcs/ft (196 pcs/m)				49 pcs/ft (163 pcs/m)				37 pcs/ft (123 pcs/m)			
Housing Temperature Range	-58...+248 °F (-50...+120 °C)				-58...+248 °F (-50...+120 °C)				-58...+248 °F (-50...+120 °C)			
Short-Circuit Current Rating	See page 12-42											
Terminal Blocks	Cat. No.		Pkg Qty.		Cat. No.		Pkg Qty.		Cat. No.		Pkg Qty.	
Color:	Grey	1492-J3	100	→	1492-J4	100	→	1492-J6	100	→	1492-J6	100
	Red	1492-J3-RE	100	→	1492-J4-RE	100	→	1492-J6-RE	100	→	1492-J6-RE	100
	Blue	1492-J3-B	100	→	1492-J4-B	100	→	1492-J6-B	100	→	1492-J6-B	100
	Black	1492-J3-BL	100	→	1492-J4-BL	100	→	1492-J6-BL	100	→	1492-J6-BL	100
	Green	1492-J3-G	100	→	1492-J4-G	100	→	1492-J6-G	100	→	1492-J6-G	100
	Yellow	1492-J3-Y	100	→	1492-J4-Y	100	→	1492-J6-Y	100	→	1492-J6-Y	100
	Orange	1492-J3-OR	100	→	1492-J4-OR	100	→	1492-J6-OR	100	→	1492-J6-OR	100
	Brown	1492-J3-BR	100	→	1492-J4-BR	100	→	1492-J6-BR	100	→	1492-J6-BR	100
	White	1492-J3-W	100	→	1492-J4-W	100	→	1492-J6-W	100	→	1492-J6-W	100
	Violet	1492-J3-V	100	→	1492-J4-V	100	→	—	—	→	—	—
Mounting Rails:	199-DR1		10	→	199-DR1	10	→	199-DR1	10	→	199-DR1	10
1 m Symmetrical DIN (Steel)	1492-DR5		10	→	1492-DR5	10	→	1492-DR5	10	→	1492-DR5	10
1 m Symmetrical DIN (Aluminum)	1492-DR6		2	→	1492-DR6	2	→	1492-DR6	2	→	1492-DR6	2
1 m Hi-Rise Sym. DIN (Aluminum)	1492-DR7		2	→	1492-DR7	2	→	1492-DR7	2	→	1492-DR7	2
1 m Angled Hi-Rise Sym. DIN (Steel)	1492-DR7		2	→	1492-DR7	2	→	1492-DR7	2	→	1492-DR7	2
End Barriers	Grey	1492-EBJ3	50	→	1492-EBJ3	50	→	1492-EBJ3	50	→	1492-EBJ3	50
	Blue	1492-EBJ3-B	50	→	1492-EBJ3-B	50	→	1492-EBJ3-B	50	→	1492-EBJ3-B	50
	Yellow	1492-EBJ3-Y	50	→	1492-EBJ3-Y	50	→	1492-EBJ3-Y	50	→	1492-EBJ3-Y	50
End Anchors and Retainers:	1492-EAJ35		100	→	1492-EAJ35	100	→	1492-EAJ35	100	→	1492-EAJ35	100
DIN Rail — Normal Duty	1492-EAHJ35		50	→	1492-EAHJ35	50	→	1492-EAHJ35	50	→	1492-EAHJ35	50
DIN Rail — Heavy Duty	1492-EAHJ35		50	→	1492-EAHJ35	50	→	1492-EAHJ35	50	→	1492-EAHJ35	50
Screwless End Retainer	1492-ERL35		20	→	1492-ERL35	20	→	1492-ERL35	20	→	1492-ERL35	20
Jumpers:	1492-CJJ5-10		20	→	1492-CJJ6-10	20	→	1492-CJJ8-10	20	→	1492-CJJ8-10	20
Screw Center Jumper — 10-pole	1492-CJJ5-4		50	→	1492-CJJ6-4	50	→	1492-CJJ8-4	50	→	1492-CJJ8-4	50
Screw Center Jumper — 4-pole	1492-CJJ5-3		50	→	1492-CJJ6-3	50	→	1492-CJJ8-3	50	→	1492-CJJ8-3	50
Screw Center Jumper — 3-pole	1492-CJJ5-2		50	→	1492-CJJ6-2	50	→	1492-CJJ8-2	50	→	1492-CJJ8-2	50
Screw Center Jumper — 2-pole	1492-CJJ5-2		50	→	1492-CJJ6-2	50	→	1492-CJJ8-2	50	→	1492-CJJ8-2	50
Plug-in Center Jumper — 50-Pole	1492-CJLJ5-50		10	→	1492-CJLJ6-41 (41-pole)	10	→	—	—	→	—	—
Plug-in Center Jumper — 10-Pole	1492-CJLJ5-10		20	→	1492-CJLJ6-10	20	→	—	—	→	—	—
Plug-in Center Jumper — 9-Pole	1492-CJLJ5-9		20	→	—	—	→	—	—	→	—	—
Plug-in Center Jumper — 8-Pole	1492-CJLJ5-8		20	→	—	—	→	—	—	→	—	—
Plug-in Center Jumper — 7-Pole	1492-CJLJ5-7		20	→	—	—	→	—	—	→	—	—
Plug-in Center Jumper — 6-Pole	1492-CJLJ5-6		20	→	—	—	→	—	—	→	—	—
Plug-in Center Jumper — 5-Pole	1492-CJLJ5-5		20	→	—	—	→	—	—	→	—	—
Plug-in Center Jumper — 4-Pole	1492-CJLJ5-4		60	→	1492-CJLJ6-4	60	→	—	—	→	—	—
Plug-in Center Jumper — 3-Pole	1492-CJLJ5-3		60	→	1492-CJLJ6-3	60	→	—	—	→	—	—
Plug-in Center Jumper — 2-Pole	1492-CJLJ5-2		60	→	1492-CJLJ6-2	60	→	—	—	→	—	—
Insulated Side Jumper — 24-Pole	1492-SJ5B-24		50	→	—	—	→	—	—	→	—	—
Insulated Side Jumper — 10-Pole	1492-SJ5B-10		50	→	—	—	→	—	—	→	—	—
Screw Type Jumper Notching Tool	1492-T1		1	→	1492-T1	1	→	1492-T1	1	→	1492-T1	1
Other Accessories:	1492-EBJ16		20	→	1492-EBJ16	20	→	1492-EBJ16	20	→	1492-EBJ16	20
Partition Plate	1492-TPS23		20	→	1492-TPS23L	50	→	1492-TPS23L	50	→	1492-TPS23L	50
Test Plug Socket	1492-TPS23		20	→	1492-TPS23L	50	→	1492-TPS23L	50	→	1492-TPS23L	50
Test Plug	1492-TP23		20	→	1492-TP23	20	→	1492-TP23	20	→	1492-TP23	20
Test Plug (Stackable)	1492-TPJ5		25	→	1492-TPJ6	25	→	—	—	→	—	—
Electrical Warning Plate	1492-EWPJ5		25	→	1492-EWPJ5	25	→	1492-EWPJ8	50	→	1492-EWPJ8	50
Marking Systems:	1492-M5X12 (144/card)		5	→	1492-M6X12 (120/card)	5	→	1492-MR8X12 (84/card)	5	→	1492-MR8X12 (84/card)	5
Snap-in Marker Cards	1492-M5X5 (200/card)		5	→	1492-M6X5 (200/card)	5	→	1492-M8X5 (160/card)	5	→	1492-M8X5 (160/card)	5

* Use of center jumpers may affect spacings, requiring derating of terminal blocks. See page 12-83 for details.

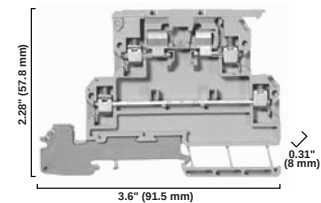
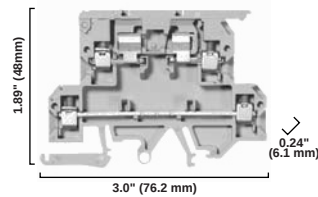
Screw Connection Terminal Blocks

Fuse Blocks, Continued

1492-JD3FB

1492-JDG3FB

Dimensions are not intended to be used for manufacturing purposes.
Note: Height dimension is measured from top of rail to top of terminal block.



Specifications		Two-level terminal block with feed-through circuit and hinged-arm fuse circuit		Three-Level terminal block with feed-through circuit, hinged-arm fuse circuit, and ground point			
Certifications			CSA	IEC		CSA	IEC
Voltage Rating		300V AC/DC		500V AC/DC	300V AC/DC		500V AC/DC
Maximum Fuse Circuit Current	10 A	10 A/250V		6.3 A*	10 A	10 A/250V	
Feed-through Circuit	20 A	25 A			20 A	25 A	
Wire Range (Rated Cross Section)		#22...12 AWG	#26...12 AWG	0.5...4 mm²	#22...12 AWG	#26...12 AWG	0.5...4 mm²
Fuse Size (Not Supplied)		5 x 20 mm			5 x 20 mm		
Wire Strip Length		0.35 in. (9 mm)			0.35 in. (9 mm)		
Recommended Tightening Torque		5.5 lb•in. (0.6 N•m)			5.5 lb•in. (0.6 N•m)		
Density		38 pcs/ft (125 pcs/m)			38 pcs/ft (125 pcs/m)		
Housing Temperature Range		-58...+248 °F (-50...+120 °C)			-58...+248 °F (-50...+120 °C)		
Short-Circuit Current Rating		See page 12-43					
Terminal Blocks		Cat. No.		Pkg Qty.	Cat. No.		Pkg Qty.
Color:	Grey	1492-JD3FB		50	1492-JDG3FB		50
Accessories		Cat. No.		Pkg Qty.	Cat. No.		Pkg Qty.
Mounting Rails:		199-DR1		10	199-DR1		10
1 m Symmetrical DIN (Steel)		199-DR1		10	199-DR1		10
1 m Symmetrical DIN (Aluminum)		1492-DR5		10	1492-DR5		10
1 m Hi-Rise Sym. DIN (Aluminum)		1492-DR6		2	1492-DR6		2
1 m Angled Hi-Rise Sym. DIN (Steel)		1492-DR7		2	1492-DR7		2
End Barrier	Grey	1492-EBJD3FB		20	1492-EBJD3FB		20
End Anchors:		1492-ERL35		20	1492-ERL35		20
Screwless End Retainer		1492-ERL35		20	1492-ERL35		20
DIN Rail - Normal Duty		1492-EAJ35		100	1492-EAJ35		100
DIN Rail - Heavy Duty		1492-EAHJ35		50	1492-EAHJ35		50
Jumpers:		1492-SJ8A-4		50	1492-SJ8A-4		50
Side Jumper — 4-pole		1492-SJ8A-4		50	1492-SJ8A-4		50
Side Jumper — 3-pole		1492-SJ8A-3		50	1492-SJ8A-3		50
Side Jumper — 2-pole		1492-SJ8A-2		50	1492-SJ8A-2		50
Group Marking		1492-GM35		25	1492-GM35		25
Rail Mount Group Marking Carrier		1492-GM35		25	1492-GM35		25
End Anchor Top Marker Carrier*		1492-GMC		50	1492-GMC		50
Cat. No. 1492-GMC Top Marker Tag		1492-M5X30 (20/card)		5	1492-M5X30 (20/card)		5
Marking Systems:		1492-M7X12 (108/card)		5	1492-M7X12 (108/card)		5
Snap-in marker cards (Handle)		1492-M7X12 (108/card)		5	1492-M7X12 (108/card)		5
Snap-in marker cards (Handle)		1492-MR6X8 (120/card)		5	1492-MR6X8 (120/card)		5
Snap-in marker cards (Side)		1492-M6X5 (200/card)		5	1492-M6X5 (200/card)		5

* IEC standards for 5 x 20 mm fuses do not include ratings above 6.3 A.

* The Bulletin 1492-GMC marker carrier installs directly on the top of a 1492-EAJ35 end anchor or a 1492-ERL35 end retainer for group marking purposes.

GMA

5 mm x 20 mm Fast-acting glass tube fuses



Agency information

- UL Listed, Guide JDYX, File E19180, 63mA-6A
- UL Recognized, Guide JDYX2, File E19180, 7-15A
- CSA Certified, Class 1422-01, File 53787, 63mA-6A
- PSE Approval, 1A-15A

Ordering

- Specify packaging, product, and option code
- Ratings above 6.3A have a 0.8 mm diameter lead
- With TR2 packaging code, lead wire length is 19.05 mm

Product features

- Fast-acting, low breaking capacity
- Optional axial leads available
- 5 x 20mm physical size
- Glass tube, silver-plated (63mA-315mA) and nickel-plated (500mA-15A) brass endcap construction
- Designed to UL/CSA 248-14

Electrical Characteristics		
Rated Current	% of Amp Rating	Opening Time
63mA - 15A	100%	None
	135%	60 minutes maximum
	200%	2 minutes maximum

Specifications							
Product Code	Amp Rating	Voltage Rating Vac	Interrupting Rating (amps)*		Typical DC Cold Resistance (Ω)**	Typical Pre-Arc I ² t Vac†	Maximum Voltage Drop (mV)‡
			250Vac	125Vac			
GMA-63-R	63mA	250	35	10,000	15.750	0.00024	4700
GMA-100-R	100mA	250	35	10,000	7.840	0.0001	4300
GMA-125-R	125mA	250	35	10,000	4.895	0.0024	2600
GMA-200-R	200mA	250	35	10,000	2.500	0.001	3400
GMA-250-R	250mA	250	35	10,000	1.735	0.018	2200
GMA-300-R	300mA	250	35	10,000	0.906	0.019	470
GMA-315-R	315mA	250	35	10,000	0.839	0.019	450
GMA-500-R	500mA	250	35	10,000	0.454	0.15	230
GMA-600-R	600mA	250	35	10,000	0.256	0.32	200
GMA-750-R	750mA	250	35	10,000	0.186	0.47	200
GMA-800-R	800mA	250	35	10,000	0.170	0.70	180
GMA-1-R	1	250	35	10,000	0.163	0.48	300
GMA-1.25-R	1.25	250	100	10,000	0.122	0.84	290
GMA-1.5-R	1.5	250	100	10,000	0.090	1.6	270
GMA-1.6-R	1.6	250	100	10,000	0.080	2.0	260
GMA-2-R	2	250	100	10,000	0.066	3.1	250
GMA-2.5-R	2.5	250	100	10,000	0.046	4.9	240
GMA-3-R	3	250	100	10,000	0.039	8.8	215
GMA-3.15-R	3.15	125	-	10,000	0.036	9.7	210
GMA-3.5-R	3.5	125	-	10,000	0.030	13	210
GMA-4-R	4	125	-	10,000	0.026	19	205
GMA-5-R	5	125	-	10,000	0.021	29	200
GMA-6-R	6	125	-	10,000	0.017	45	180
GMA-7-R	7	125	-	200	0.012	150	110
GMA-8-R	8	125	-	200	0.009	280	110
GMA-10-R	10	125	-	200	0.006	280	110
GMA-15-R	15	125	-	150	0.004	950	100

* Interrupting ratings: Interrupting ratings for 63mA - 6A were measured at 70% - 80% power factor on AC. The interrupting ratings for 7A - 15A were measured at 100% power factor on AC.

** DC Cold Resistance (Measured at <10% of rated current)

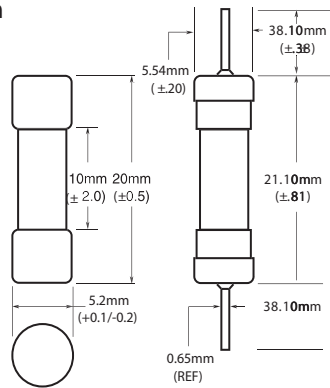
† Typical Pre-Arching I²t (I²t was measured at listed interrupting rating and rated voltage)

‡ Maximum Voltage drop (Voltage drop was measured at 20°C ambient temperature at rated current)

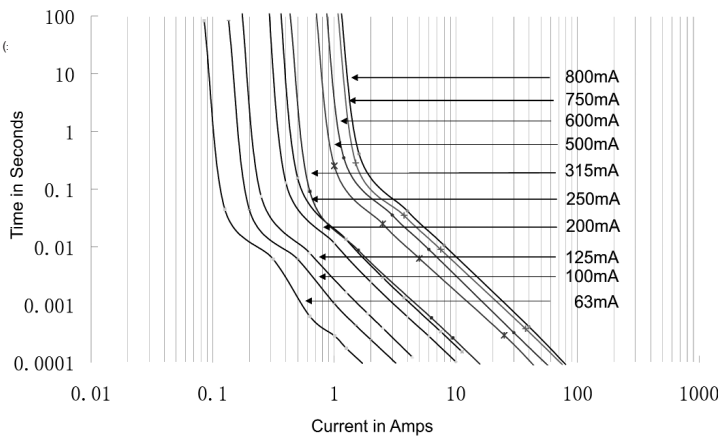


Powering Business Worldwide

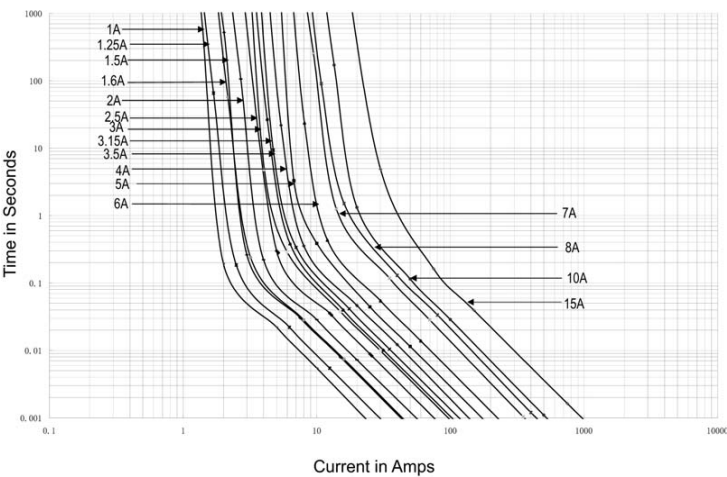
Dimensions - mm



Time-Current Curve – GMA-R 63mA-800mA



Time-Current Curve – GMA-R 1-15A



Packaging Code	
Packaging Code	Description
BK	100 fuses packed into a cardboard carton
BK1	1000 fuses packed into a poly bag
TR2	1500 fuses packed into tape on a reel (19.05mm lead wire length)

Option Code	
Option Code	Description
V	Axial leads - copper tinned wire with nickel-plated brass overcaps

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

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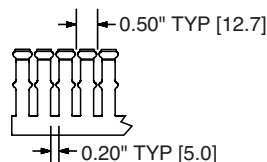
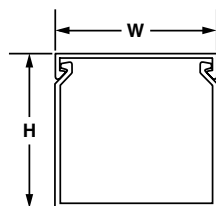
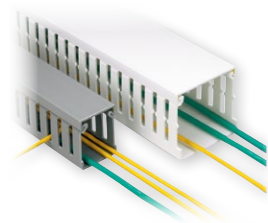
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Features and Benefits – Panduit® Type F Narrow Slot Wiring Duct

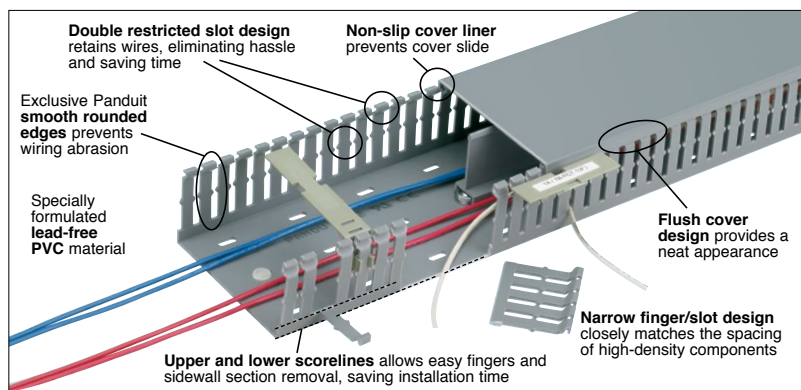


Panduit® Type F Narrow Slot Wiring Duct

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0



Multiple slot restrictors present with 2" and greater duct wall height.



- Conforms with NFPA 79-2015 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet

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Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.	
	In.	mm	In.	mm					
F.75X1.5LG6	0.94 x 1.57	23.6 x 39.9	0.20	5.0	C.75LG6	6	120	120	
F1X1LG6	1.25 x 1.13	32.0 x 28.7			C1LG6				
F1X1.5LG6	1.25 x 1.62	32.0 x 41.1			C1LG6				
F1X2LG6	1.25 x 2.12	32.0 x 53.8			C1LG6				
F1X3LG6	1.25 x 3.13	32.0 x 79.4			C1LG6				
F1X4LG6	1.25 x 4.10	32.0 x 104.1			C1LG6		60		
F1.5X1.5LG6	1.75 x 1.62	44.5 x 41.1			C1.5LG6		120		
F1.5X2LG6	1.75 x 2.12	44.5 x 53.8			C1.5LG6				
F1.5X3LG6	1.75 x 3.12	44.5 x 79.2			C1.5LG6		60		
F1.5X4LG6	1.75 x 4.10	44.5 x 104.1			C1.5LG6				
F2X2LG6	2.25 x 2.12	57.2 x 53.8			C2LG6		120		
F2X3LG6	2.25 x 3.14	57.2 x 79.8			C2LG6	6	60		
F2X4LG6	2.25 x 4.10	57.2 x 104.1			C2LG6				
F2X5LG6	2.25 x 5.10	57.2 x 129.5			C2LG6				
F2.5X3LG6	2.75 x 3.12	69.9 x 79.2			C2.5LG6		120		
F3X2LG6	3.25 x 2.12	82.6 x 53.8			C3LG6				
F3X3LG6	3.25 x 3.13	82.6 x 78.7			C3LG6		60		
F3X4LG6	3.25 x 4.10	82.6 x 104.1			C3LG6				
F3X5LG6	3.25 x 5.10	82.6 x 129.5			C3LG6				
F4X3LG6	4.25 x 3.12	108.0 x 79.2			C4LG6				
F4X4LG6	4.25 x 4.10	108.0 x 104.1			C4LG6				
F4X5LG6	4.25 x 5.10	108.0 x 129.5			C4LG6				
F6X4LG6	6.25 x 4.15	158.8 x 105.4			C6LG6				

Part number shown for LG (Light Gray). For other sizes and color availability visit www.panduit.com.
Base and cover sold separately.

*"H" dimension includes duct and cover.

www.panduit.com