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Find the *Rockwell / Allen-Bradley 281D-F12Z-10C-CR-3FR* at our website: *Click HERE*

Bulletin 280D/281D

Bulletin 280D/281D ArmorStart Distributed Motor Controller — Safety Version



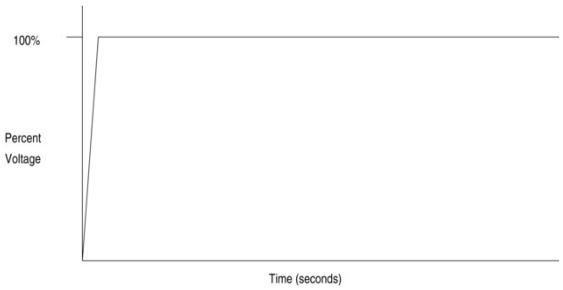
- On-Machine starting solution
- Full-voltage and reversing
- Four digital inputs and two digital outputs
- Horsepower range 0.5…10 Hp (0.37…7.5 kW)
- Robust IP67/NEMA Type 4 enclosure rating⋆
- Quick disconnect connections for I/O, communications, motor, and three-phase power
- Gland plate entry: conduit entrance or ArmorConnect power media
- LED status indication
- DeviceNet communications
- Local logic technology using DeviceLogix
- Peer-to-peer communication (ZIP)
- Factory installed option:
    - Hand/Off/Auto (HOA) keypad configuration

⋆ To maintain enclosure rating, any unused openings or receptacles must be sealed. Refer to Accessories section.

Mode of Operation

Full-Voltage Start

This method is used in applications requiring across-the-line starting. Full in-rush current and locked-rotor torque are realized. The ArmorStart Bulletin 280 offers full-voltage starting, and the Bulletin 281 offers full-voltage starting for reversing applications.



The Bulletin 280/281 ArmorStart Distributed Motor Controller is an integrated, pre-engineered, starter for full-voltage and reversing applications. Its modular design offers simplicity in wiring using quick disconnects for the I/O, communications, and motor connection. Optional quick disconnects for control and three-phase power, fully integrates the plug-n-play solution. As standard, the ArmorStart offers four inputs and two outputs to be used with sensors and actuators. The ArmorStart Distributed Motor Controller offers as standard, a local at-motor disconnect means by incorporating the Bulletin 140M Motor Circuit Protector. This eliminates the need for additional components that would otherwise be required in each motor branch circuit. The ArmorStart Distributed Motor Controllers are listed as suitable for Group Motor installations.

ArmorStart Safety Version

The safety version of the ArmorStart provides a safety solution integrated into DeviceNet safety installations. The Bulletin 280/281 Safety ArmorStart achieves Category 4 functionality by using redundant contactors. The Safety ArmorStart offers quick disconnects via the gland plate to the 1732DS-IB8XOBV4 safety I/O module. The Bulletin 1732DS Guard Safety I/O inputs will monitor the status of the safety-rated contactors inside the ArmorStart. The Bulletin 1732DS Guard Safety I/O outputs provide 24V DC power to the ArmorStart.

Note: The Bulletin 280/281 Safety ArmorStart is suitable for safety applications up to Safety Category 4 PLe (TÜV assessment per ISO 13849-1:2008). TÜV compliance letter is available upon request.

Note: For additional information regarding the 1732DS-IB8XOBV4 safety I/O module, see publication 1791DS-UM001*.

Overload Protection

The Bulletin 280/281 ArmorStart Distributed Motor Controller incorporates, as standard, electronic motor overload protection. This overload protection is accomplished electronically with an I^2_t algorithm. The ArmorStart's overload protection is programmable via the communication network, providing the user with flexibility. The overload trip class can be selected for class 10, 15, or 20 protection. Ambient insensitivity is inherent in the electronic design of the overload.

Fault Diagnostics

Fault diagnostics capabilities built in the ArmorStart Distributed Motor Controller help you pinpoint a problem for easy troubleshooting and quick re-starting.

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- Short Circuit
- Overload
- Phase Loss
- Control Power Loss
- Control Power Fuse Detection
- I/O Fault

- Output Power Fuse Detection
- Overtemperature
- Phase Imbalance
- DeviceNet Power Loss
- EEPROM Fault
- Hardware Fault

DeviceLogix - Local logic control

DeviceLogix provides local control over the device's discrete and network I/O. It consists of function blocks, inputs, outputs, and actual hardware data, including fault and status bits.

Motor Cable

A 3-meter unshielded, 4-conductor cordset is provided with every ArmorStart Distributed Motor Controller.

Factory-Installed Option

HOA Selector Keypad

The HOA Selector Keypad allows local start/stop control.

Standards Compliance

UL 508
CSA C22.2, No. 14
EN/IEC 60947-4
EN/IEC 60947-4-1
CE Marked per Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/EC
CCC
ODVA for DeviceNet

Certifications

cULus (File No. E3125, Guides NLDX, NLDX7)

280 D – F 12S – 10 C – CR – Option 1
a b c d e f g h

a	
Bulletin Number	
Code	**Description**
280	Full Voltage Starter
281	Reversing Starter

b	
Communications	
Code	**Description**
D	DeviceNet™

c	
Enclosure Type	
Code	**Description**
F	Type 4 (IP67)

d	
Contactor Size/Control Voltage	
Code	**Description**
12S	24V DC
23S	

e	
Short Circuit Protection (Motor Circuit Protector)	
Code	**Description**
10	10 A Rated Device
25	25 A Rated Device

f	
Overload Selection Current Range	
Code	**Description**
B	0.5...2.5 A
C	1.1...5.5 A
D	3.2...16 A

g				
Control and 3-Phase Power Connections/Motor Cable Connection (CR: Conduit/Round Media) or (RR: Round/Round Media)				
Code		**Description**		
		Control Power§	**3-Phase Power**	**Motor Cable**
CR	blank	Round Media (Male Receptacle)	Conduit Entrance	3 m, unshielded cordset male 90°
CR	W ⋆	Round Media (Male Receptacle)	Conduit Entrance	No cable
RR	blank	Round Media (Male Receptacle)	Round Media (Male Receptacle)	3 m, unshielded cordset male 90°
RR	W ⋆	Round Media (Male Receptacle)	Round Media (Male Receptacle)	No cable

h	
Option 1	
Code	**Description**
3	Hand/Off/Auto Selector Keypad
3FR	Hand/Off/Auto Selector Keypad with Forward/Reverse

⋆ See Accessories on Motor and Brake Cables for extended motor cable lengths.
§ Control power is provided by the Guard I/O Safety Module. Refer to accessories on DeviceNet Media Δ for proper media selction.

DeviceNet Network Communications

Full-voltage starters — IP67/NEMA Type 4 with conduit entrance, Up to 460V AC

Current Rating [A]	kW		Hp			24V DC Control Voltage
	230V AC 50 Hz	400V AC 50 Hz	200V AC 60 Hz	230V AC 60 Hz	460V AC 60 Hz	Cat. No.
0.5...2.5	0.37	0.75	0.5	0.5	1	280D-F12S-10B-CR
1.1...5.5	1.1	2.2	1	1	3	280D-F12S-10C-CR
3.2...16	4	7.5	3	5	10	280D-F23S-25D-CR

Full-voltage starters — IP67/NEMA Type 4 with quick disconnects for ArmorConnect power media, Up to 460V AC

Current Rating [A]	kW		Hp			24V DC Control Voltage
	230V AC 50 Hz	400V AC 50 Hz	200V AC 60 Hz	230V AC 60 Hz	460V AC 60 Hz	Cat. No.
0.5...2.5	0.37	0.75	0.5	0.5	1	280D-F12S-10B-RR
1.1...5.5	1.1	2.2	1	1	3	280D-F12S-10C-RR
3.2...16	4	7.5	3	5	10	280D-F23S-25D-RR

Reversing starters — IP67/NEMA Type 4 with conduit entrance, Up to 460V AC

Current Rating [A]	kW		Hp			24V DC Control Voltage
	230V AC 50 Hz	400V AC 50 Hz	200V AC 60 Hz	230V AC 60 Hz	460V AC 60 Hz	Cat. No.
0.5...2.5	0.37	0.75	0.5	0.5	1	281D-F12S-10B-CR
1.1...5.5	1.1	2.2	1	1	3	281D-F12S-10C-CR
3.2...16	4	7.5	3	5	10	281D-F23S-25D-CR

Reversing starters — IP67/NEMA Type 4 with quick disconnects for ArmorConnect power media, Up to 460V AC

Current Rating [A]	kW		Hp			24V DC Control Voltage
	230V AC 50 Hz	400V AC 50 Hz	200V AC 60 Hz	230V AC 60 Hz	460V AC 60 Hz	Cat. No.
0.5...2.5	0.37	0.75	0.5	0.5	1	281D-F12S-10B-RR
1.1...5.5	1.1	2.2	1	1	3	281D-F12S-10C-RR
3.2...16	4	7.5	3	5	10	281D-F23S-25D-RR

Ordering Instructions

Basic Steps

1. Select the enclosure rating.
2. Select controller power rating using the motor nameplate voltage and FLA.
3. Select the control power rating.
4. Choose conduit entry: CR or quick disconnect RR..
5. Select options, if necessary.
6. Select any needed network and I/O cable products from the Accessories.
   NOTE: Select a cap for any unused I/O point or receptacle to maintain the environmental rating.

7. When gland CR* is selected, refer to the gland hole dimensions and procure a fitting from your local distributor.
8. When gland RR* is selected, refer to ArmorConnect power media.
   - Select ArmorConnect 3-phase power: drop, tee, and trunk cable.
   - Select locking clips to prevent tampering.
9. To achieve SIL3 Ple Category 4, select the approved ArmorBlock Guard I/O module catalog number 1732DS-IB8XOBV4.
10. Select the ArmorBlock Guard I/O recommended cables and connectors.
11. When the Bulletin 284D Safety version is selected, the DB1 option and SB option are provided as standard. If these features are not required, refer to the Accessories section for approved sealing cap.

Options – Factory Installed

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Description		Cat. No. Modification
	Hand/Off/Auto Selector Keypad (Bulletin 280)	-3
	Hand/Off/Auto Selector Keypad with Forward/Reverse Function (Bulletin 281)	-3FR
	Supplied ArmorStart without motor cable	-CRW
	ArmorConnect Power Media Connectivity, ArmorStart supplied without motor cable	-RRW

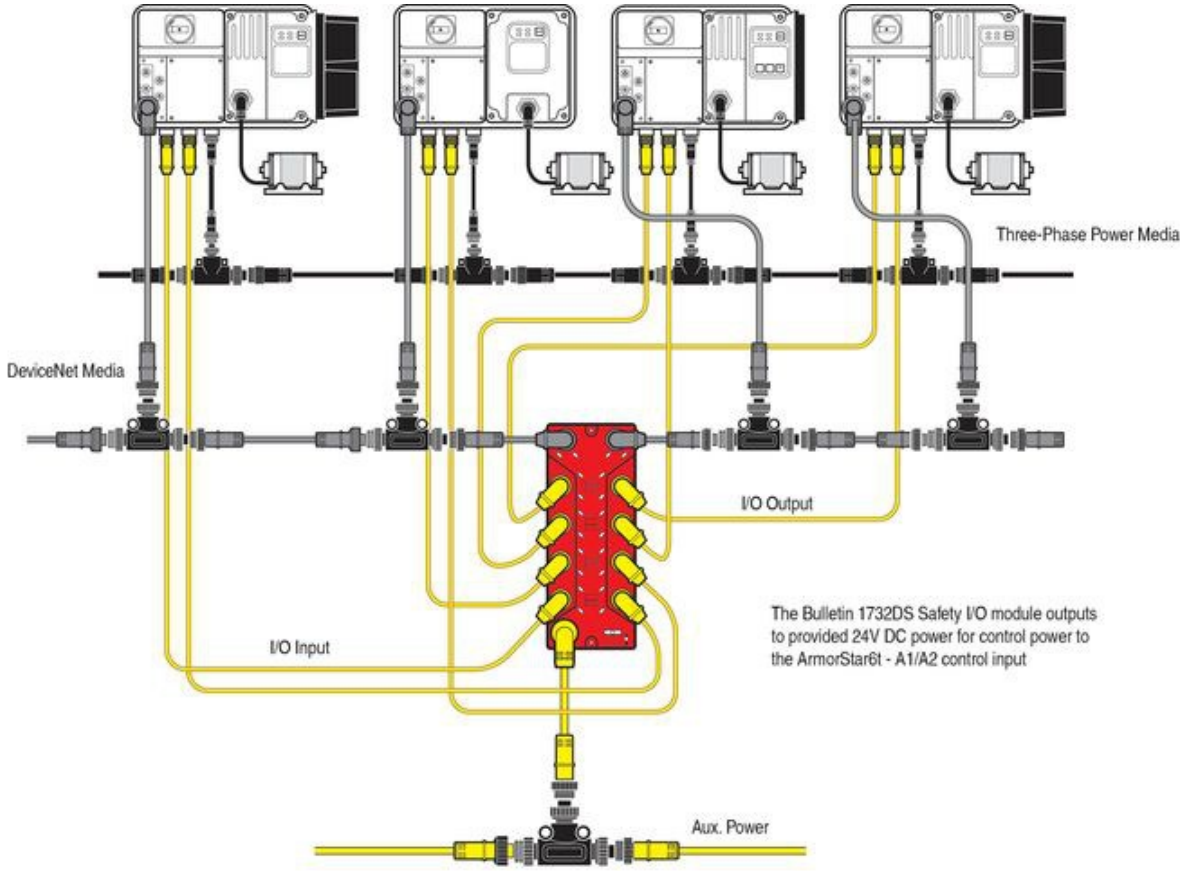
Safety I/O Module and TÜV Requirements

ArmorStart Safety-Related Parts

Each ArmorStart Safety Distributed motor controller is intended to be combined with the Cat. No. 1732DS-IB8XOBV4 safety I/O module to form a subsystem that is part of the overall machine stop function. The motor controllers are connected to the safety I/O module through specified cable assemblies. The combination of one of these controllers, the safety module, and the specified interconnecting cables are referred to as the ArmorStart Safety-Related Parts. The catalog numbers for each of these components is specified below. The combination of these components is shown below. The safety I/O module and PLC program must be configured appropriately to meet TÜV CAT4 PLe certification. Refer to the user manual for details.

Catalog Number	Description
280...S* * - denotes safety version of Bulletin 280	Bulletin 280 Distributed Motor Controller - controller is full-voltage, non-reversing
281...S* * - denotes safety version of Bulletin 281	Bulletin 281 Distributed Motor Controller - controller is full-voltage, reversing
284...S* * - denotes safety version of Bulletin 284	Bulletin 284 Distributed Motor Controller - controller is variable-frequency AC drive
1732DS-IB8XOBV4	Guard I/O DeviceNet Safety Module
889D-F4AEDM-1* or equivalent For standard lengths, replace * symbol with 0M3 (1 ft), 1 (1 m), 2 (2 m), 5 (5 m) or 10 (10m).	For use with: SM Connector - Patch cable between Safety I/O module input and ArmorStart connector labeled “SM”. This provides status feedback to the safety system. A1/A2 connector - Patch cable assembly between Safety I/O module output and ArmorStart connector labeled “A1/A2”. This provides coil power to contactors and and ArmorStart power supply. See On-Machine Connectivity Catalog for complete cable selection information.

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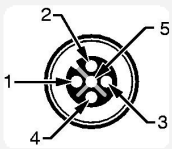


The Bulletin 1732DS Safety I/O module inputs will monitor the status of the safety-related contactors inside the ArmorStart - SM safety monitor input

ArmorBlock® Guard I/O™ Modules

Description		Cat. No. Modification
	ArmorBlock® Guard I/O™ provides all the advantages of traditional distributed I/O for safety systems, but has an IP67 package that can be mounted directly on your machine. You can use Guard Safety I/O with any safety controller that communicates on DeviceNet using CIP Safety for the control and monitoring of safety circuits. Guard I/O detects circuit failures at each I/O point while providing detailed diagnostics directly to the controller. For assistance and example configuration, see the Safety Accelerator for GuardLogix Systems at www.ab.com	1732DS-IB8XOBV4

*1732DS ArmorBlock Guard I/O Micro Connector Pin Assignments*Δ

Input Configuration		Female	Output Configuration	
Pin	Signal		Pin	Signal
1	Test Output n+1		1	Output +24V DC Power
2	Safe Input n+1		2	Output n+1 (Sinking)
3	Input Common		3	Output Power Common
4	Safe Input n		4	Output n (Sourcing)
5	Test Output n		5	Output Power Common

Δ ArmorStart Safety version uses a 4-pin male connector, pin 5 is not used. Either a 4- or 5-pin patch cord can be used.

1732DS ArmorBlock Guard I/O Mini Connector Pin Assignments

ArmorBlock Guard I/O DeviceNet Configuration			
Pin	**Signal**	**Male**	**Female**
1	Drain		
2	V+ (Red)		
3	V- (Black)		
4	CAN_H (White)		
5	CAN_L (Blue)		

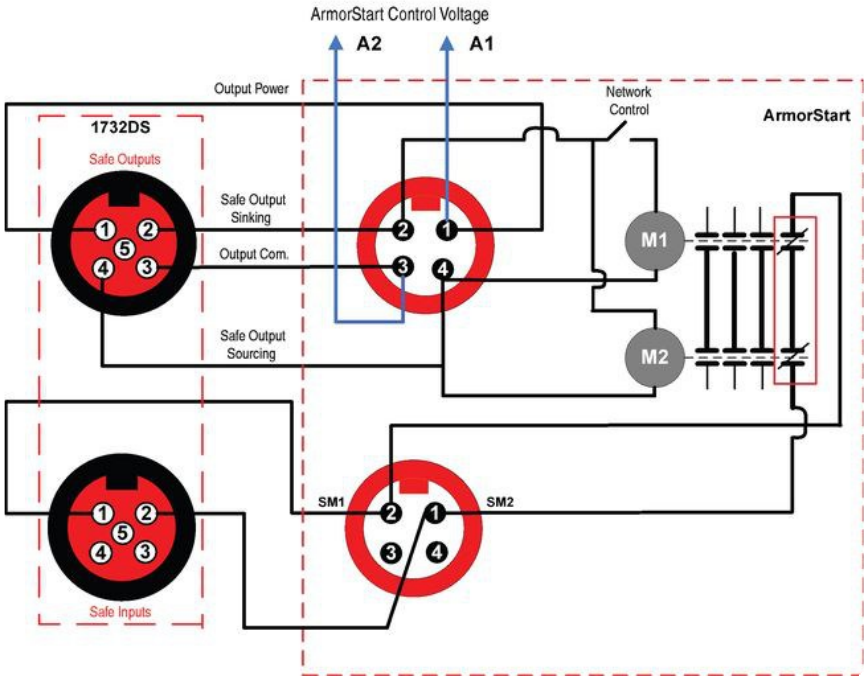
ArmorBlock Guard I/O Power Configuration		
Pin	**Signal**	**Male**
1	Output +24V dc Power (Red)	
2	Input +24V dc Power (Green)	
3	Input Power Common (White)	
4	Output Power Common (Black)	

ArmorBlock Guard I/O Recommended Compatible Cables and Connectors⋆

Description			Cat. No.
	DC Micro (M12) Male Cordset		889D-F4HJ-‡
	Five-pin M12 patchcord, 1 m (39.37 in.)	PVC jacket offers good oil and chemical resistance	889D-F4AEDM-*
		TPE jacket material for good oil, chemical, and weld slag resistance	889D-F4HJDM-§
	M12 Terminal Chamber—Straight Male		871A-TS4-DM
	M12 Terminal Chamber—Right Angle Male		871A-TR4-DM

⋆ All cables must use 5-pin connections for ArmorBlock Guard I/O M12 input compatibility.
‡ Replace symbol with 0M3 (0.3 m), 2 (2 m), or 5 (5 m) for standard cable length.
§ Replace symbol with 1 (1 m), 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable length.

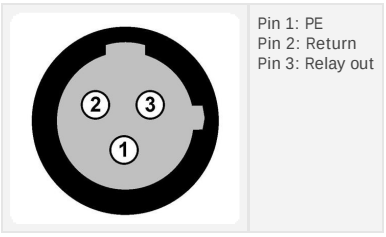
ArmorStart Safety Version and Guard I/O Module Connection Diagram



Connections

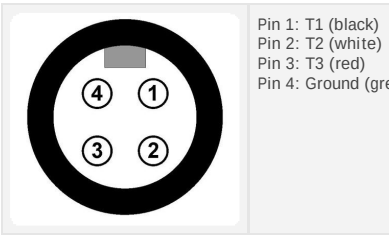
ArmorStart Receptacle Pin Outs

Receptacle Connections for Output, DeviceNet or ArmorPoint Version (M12)



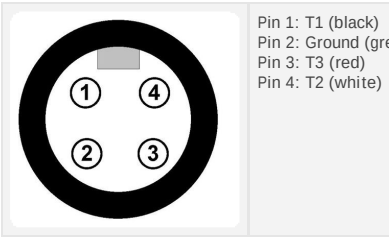
Pin 1: PE
Pin 2: Return
Pin 3: Relay out

Receptacle Connections for Motor Connector - 3 Hp or less (M22)



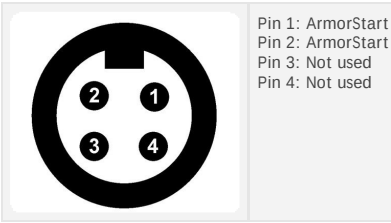
Pin 1: T1 (black)
Pin 2: T2 (white)
Pin 3: T3 (red)
Pin 4: Ground (green/yellow)

Receptacle Connections for Motor Connector - 10 Hp or greater (M35)



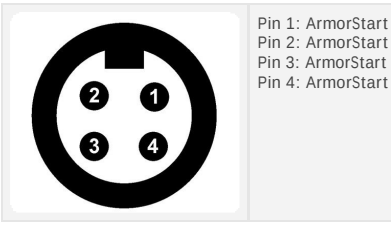
Pin 1: T1 (black)
Pin 2: Ground (green/yellow)
Pin 3: T3 (red)
Pin 4: T2 (white)

Receptacle Connections for Safety Monitor Outputs to Bulletin 1732DS-* (SM1/SM2) (M12)



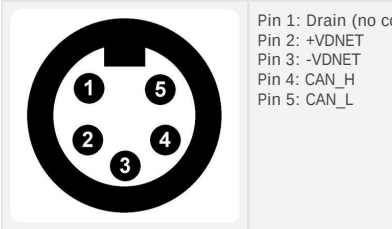
Pin 1: ArmorStart SM1 (brown)
Pin 2: ArmorStart SM2 (white)
Pin 3: Not used
Pin 4: Not used

Receptacle Connections for Safety (Bulletin 1732DS) Power (A1/A2) (M12)



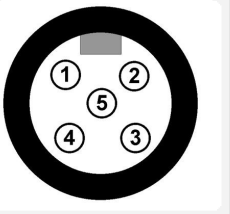
Pin 1: ArmorStart A1 (brown)
Pin 2: ArmorStart P (white)
Pin 3: ArmorStart A2 (blue)
Pin 4: ArmorStart M (black)

Receptacle Connections for DeviceNet Connector



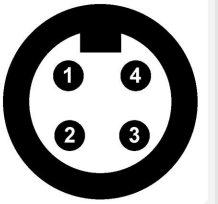
Pin 1: Drain (no connection)
Pin 2: +VDNET
Pin 3: -VDNET
Pin 4: CAN_H
Pin 5: CAN_L

Receptacle Connections for Input (M12)



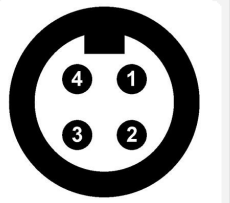
Pin 1: +24V (A3 or DNET)
Pin 2: Input 1,3
Pin 3: Common
Pin 4: Input 0,2
Pin 5: NC (no connection)

Receptacle Connections for Incoming 3-phase Power - 10 A Short Circuit Protection (M22)



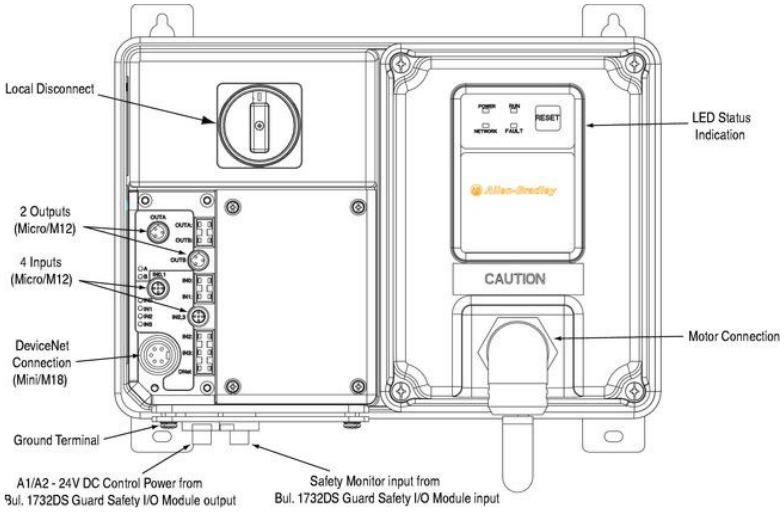
Pin 1: L1 (black)
Pin 2: L2 (white)
Pin 3: L3 (red)
Pin 4: Ground (green/yellow)

Receptacle Connections for Incoming 3-phase Power - 25 A Short Circuit Protection (M35)

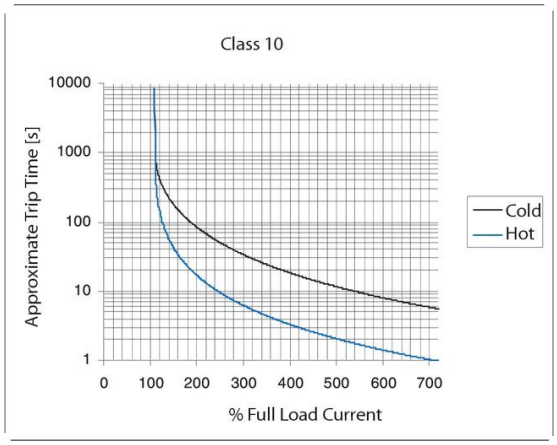


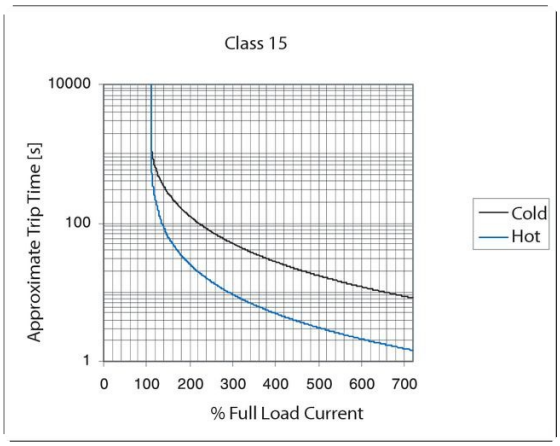
Pin 1: L1 (black)
Pin 2: Ground (green/yellow)
Pin 3: L3 (red)
Pin 4: L2 (white)

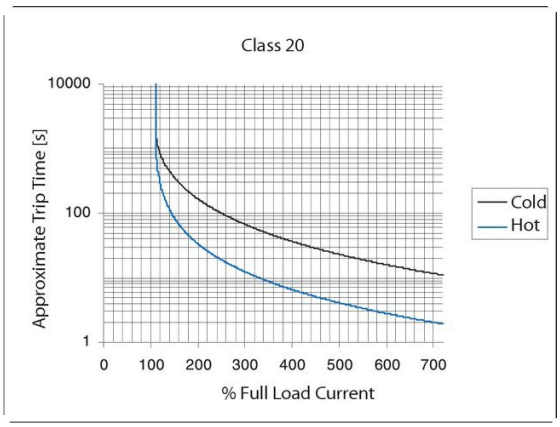
Bulletin 280D/281D Safety ArmorStart with DeviceNet Communications



Overload Curves







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Electrical Ratings			UL/NEMA			IEC	
Power Circuit	Rated Operation Voltage		380Y/220...480Y/277V AC			380Y/220...480Y/277V AC	
	Rate Insulation Voltage		600V				
	Rated Impulsed Voltage		4 kV				
	Dielectric Withstand		2200V AC			2500V AC	
	Operating Frequency		50/60 Hz				
	Utilization Category		–			AC-3	
	Protection Against Shock		–			IP2X	
	Rated Operating Current Max.		280D/281D-___-10B-*			2.5 A	
			280D/281D-___-10C-*			5.5 A	
			280D/281D-___-10D-*			16 A	
Control Circuit	Rated Operation Voltage		24V DC (+10%, -15%) A2 (should be grounded at voltage source)				
	Rate Insulation Voltage		250V				
	Rated Impulsed Voltage		–			4 kV	
	Dielectric Withstand		1500V AC			2000V AC	
	Overvoltage Category		–			III	
	Operating Frequency		50/60 Hz				
Short Circuit Protection	Short Circuit Protection Device (SCPD) Performance Type 1	Any Type CR or DR Gland	**Current Rating**	**Short Circuit Protection**		**Voltage**	
						480Y/277V	480V
			0.24...1.2 A	10A, 10B, 10C	Sym. Amps RMS	65 kA	65 kA
			0.5...2.5 A		Max. Circuit Breaker	100 A	60 A
			1.1...5.5 A		Max. Fuse	100 A	60 A
			3.2...16 A	25D	Sym. Amps RMS	30 kA	30 kA
					Max. Circuit Breaker	100 A	60 A
					Max. Fuse	100 A	60 A
		Any Type RR Gland	**Current Rating**	**Short Circuit Protection**		**Voltage**	
						480Y/277V	480V
			0.24...1.2 A	10A, 10B, 10C	Sym. Amps RMS	45 kA	65 kA 65 kA
			0.5...2.5 A		Max. Circuit Breaker	30 A♠	NA NA
			1.1...5.5 A		Max. Fuse - Non-time Delay - Time Delay	40 AΔ 20 AΔ	40 AΔ 40 AΔ 20 AΔ 20 AΔ
			3.2...16 A	25D	Sym. Amps RMS	NA	30 kA 30 kA
					Max. Circuit Breaker	NA	100 A♦ 60 A♦
					Max. Fuse	NA	100 AΔ 60 AΔ
	SCPD List		Size per NFPA 70 (NEC) or NFPA 79 for Group Motor Applications				

Δ Type J, CC, and T fuses only.

♦ Only when used with Bulletin 140U-H frame.

♠ Only when used with Bulletin 140U-D6D3-xxx frame or smaller.

Power Requirements			
	Units	**Without HOA**	**With HOA**
Control Voltage	Volts	24V DC	
Contactor (Pick Up)	Amps	1.09	
Contactor (Hold In)	Amps	0.30	
Total Control Power (Pick Up)	VA (W)	(26 W)	
Total Control Power (Hold In)	VA (W)	(7.2 W)	
External Devices powered by Control Voltage			
Outputs (2) (1 A max. each)	Amps	2	2
Total Control (Pick Up) with max outputs	VA (W)	(65 W)	(73 W)
Total Control (Hold In) with max outputs	VA (W)	(50 W)	(58 W)

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Input Ratings	Rated Operation Voltage	24V DC	
	Input On-State Voltage Range	10...26V DC	
	Input On-State Current	3.0 mA @ 10V DC	
		7.2 mA @ 24V DC	
	Input Off-State Voltage Range	0...5V DC	
	Input Off-State Current	<1.5 mA	
	Input Filter — Software Selectable		
	Off to On	Settable from 0...64 ms in 1 ms increments	
	On to Off	Settable from 0...64 ms in 1 ms increments	
	Input Compatibility	N/A	IEC 1+
	Number of Inputs	4	
	Sensor Source		
	Voltage Status Only	11...25V DC from DeviceNet	
	Current Available	50 mA max. per input, 200 mA total	
Output Ratings (Sourced from Control Circuit)	Rated Operation Voltage	240V AC/30V DC	240V AC/30V DC
	Rate Insulation Voltage	250V	250V
	Dielectric Withstand	1500V AC	2000V AC
	Operating Frequency	50/60 Hz	50/60 Hz
	Type of Control Circuit	Electromechanical relay	
	Type of Current	AC/DC	
	Conventional Thermal Current I_{th}	Total of both outputs ≤ 2 A	
	Type of Contacts	Normally open (N.O.)	
	Number of Contacts	2	

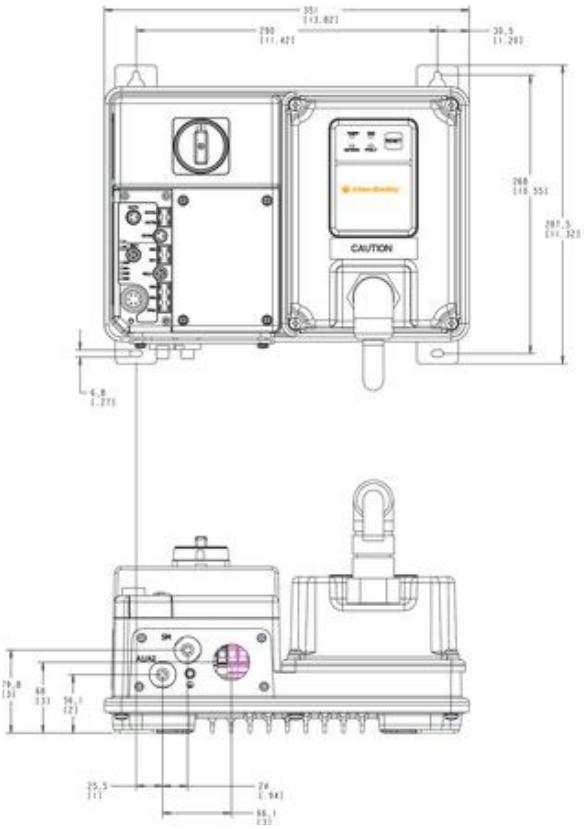
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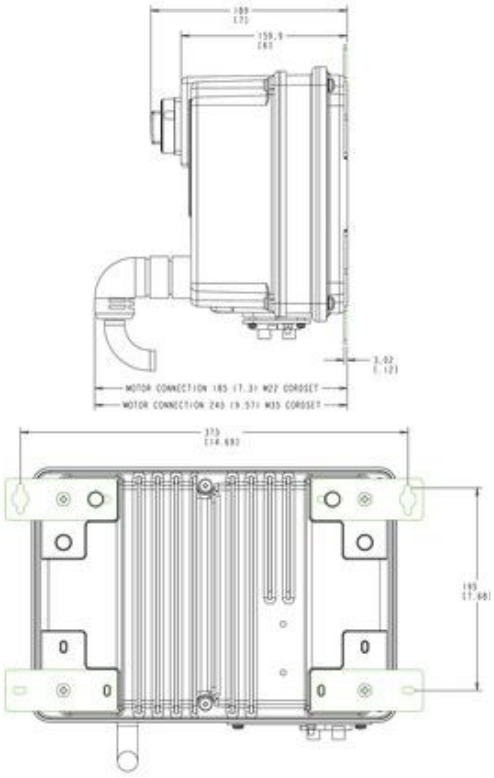
		UL/NEMA	IEC
Environmental	Operating Temperature Range	-20...+40 °C (-4...+104 °F)	
	Storage and Transportation Temperature Range	-25....+85 °C (-13...+185 °F)	
	Altitude	2000 m	
	Humidity	5...95% (non-condensing)	
	Pollution Degree	3	
	Enclosure Ratings	NEMA 4/12/13	IP67
	Approximate Shipping Weight	6.8 kg (15 lb)	
Mechanical	**Resistance to Shock**		
	Operational	15 G	
	Non-Operational	30 G	
	Resistance to Vibration		
	Operational	1 G, 0.15 mm (0.006 in.) displacement	
	Non-Operational	2.5 G, 0.38 mm (0.015 in.) displacement	
	Power and Ground Terminals		
	Wire Size	Primary terminal: (#16 ...#10 AWG) Secondary terminal: (#18 ...#10 AWG)	Primary terminal: 1.5...5.3 mm2 Secondary terminal: 0.8...5.3 mm2
	Tightening Torque	Primary terminal: 10.8 lb•in Secondary terminal: 4.5 lb•in	Primary Terminal: 1.2 N•m Secondary terminal: 0.5 N•m
	Wire Strip Length	0.35 in. (9 mm)	
	Disconnect Lock Out	Maximum of 5/16 in. (8 mm) lock shackle or hasp. The hasp should not exceed 5/16 in. (8 mm) when closed, or damage will occur to the disconnect guard.	
Other Rating	**EMC Emission Levels**		
	Conducted Radio Frequency Emissions	Class A	
	Radiated Emissions	Class A	
	EMC Immunity Levels		
	Electrostatic Discharge	4 kV contact and 8 kV Air	
	Radio Frequency Electromagnetic Field	10V/m	
	Fast Transient	2 kV	
	Surge Transient	1 kV $_{L-L}$, 2 kV $_{L-N}$ (earth)	
	Overload Characteristics		
	Overload Current Range	280D/281D-___-10B-*	0.5...2.5 A
		280D/281D-___-10C-*	1.1...5.5 A
		280D/281D-___-10D-*	3.2...16 A
	Trip Classes	10, 15, 20	
	Trip Rating	120% of FLC setting	
	Number of poles	3	
	DeviceNet Specifications		
	DeviceNet Supply Voltage Rating	Range 11...25V DC, 24V DC nominal	
	DeviceNet Input Current	167 mA @ 24V DC - 4.0 W	
		364 mA @ 11V DC - 4.0 W	
	External Devices powered by DeviceNet	Sensors inputs 4 x 50 mA - total 200 mA	
	Total w/max Sensor Inputs (4)	367 mA @ 24V DC - 8.8 W	
	DeviceNet Input Current Surge	15 A for 250 µs	
	DeviceNet Communications		
	Baud Rates	125, 250, 500 kbps	
	Distance Maximum	500 m (1630 ft) @ 125 kbps	
		200 m (656 ft) @ 250 kbps	
		100 m (328 ft) @ 500 kbps	
	Certifications	cULus (File No. E3125, Guides NLDX, NLDX7) UL 508 CSA C22.2, No. 14 EN/IEC 60947-4, EN/IEC 60947-4-1 CE Marked per Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/ECC	

Dimensions for Bulletin 280D Safety Product with Conduit Entrance

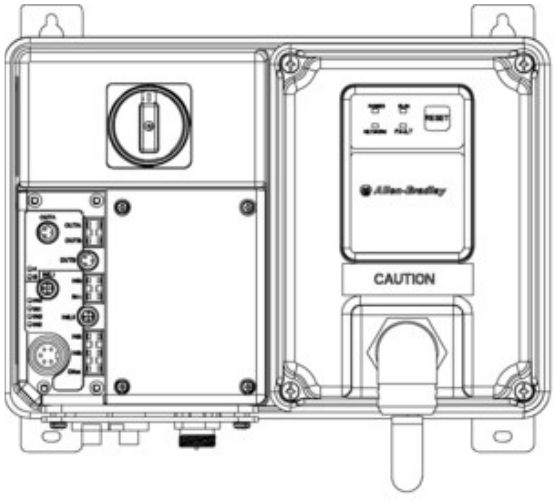
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Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes. All dimensions are subject to change.

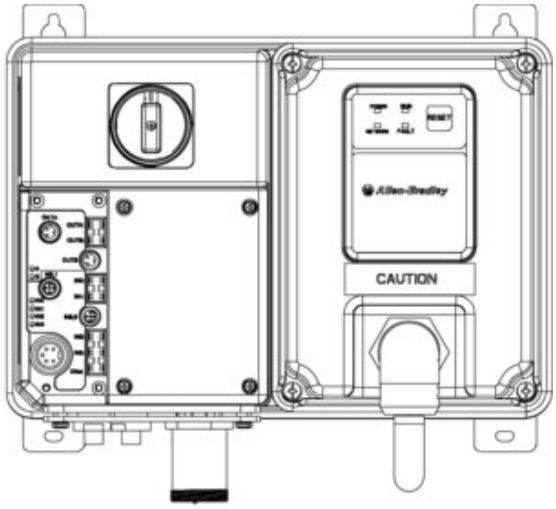




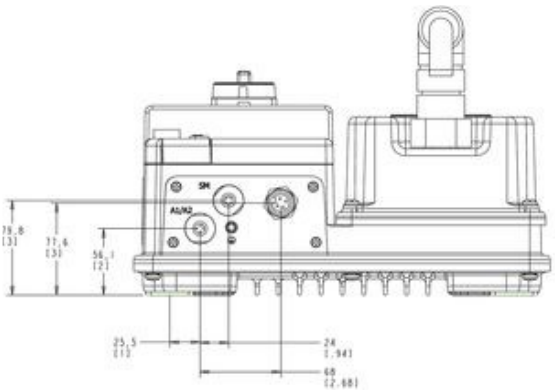
Dimensions for Bulletin 280D Safety with ArmorConnect Connectivity

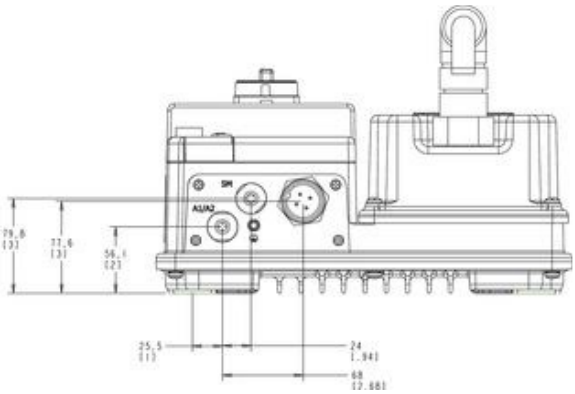


10 A short circuit protection rating

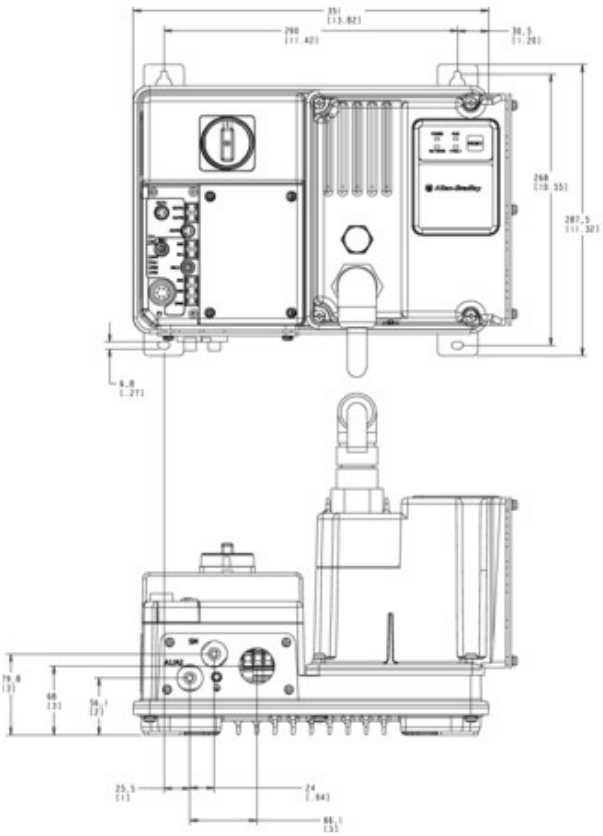


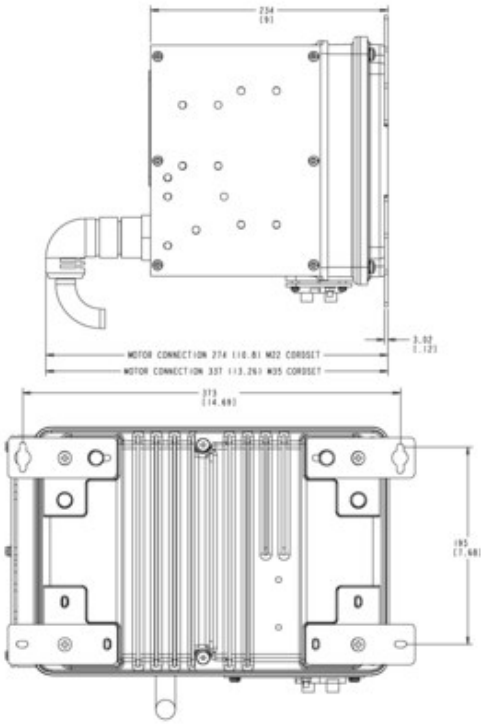
25 A short circuit protection rating



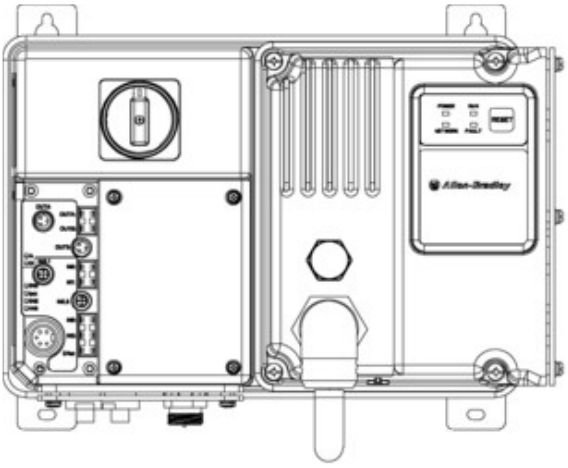


Dimensions for Bulletin 281D Safety Product with Conduit Entrance

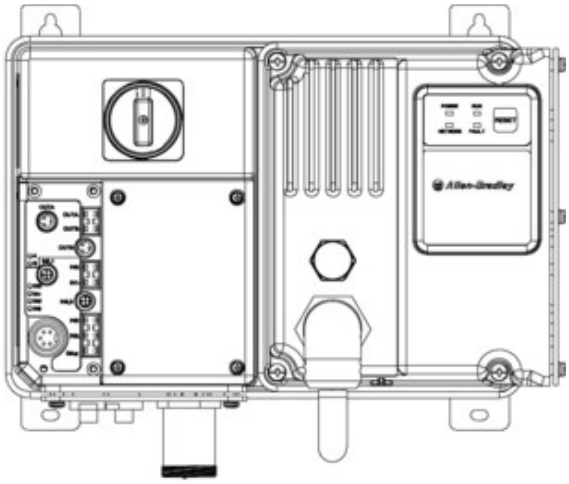




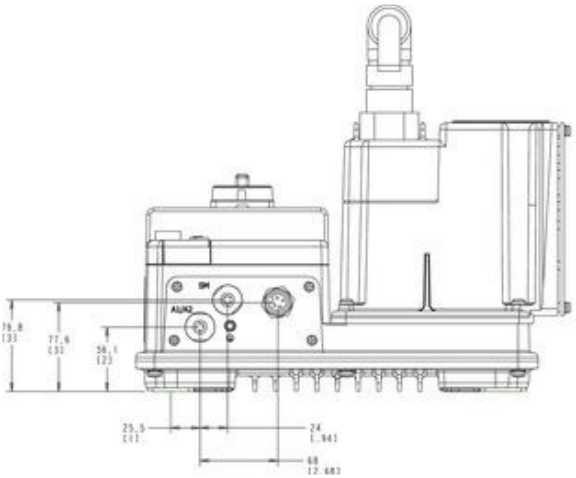
Dimensions for Bulletin 281D Safety Product with ArmorConnect Connectivity

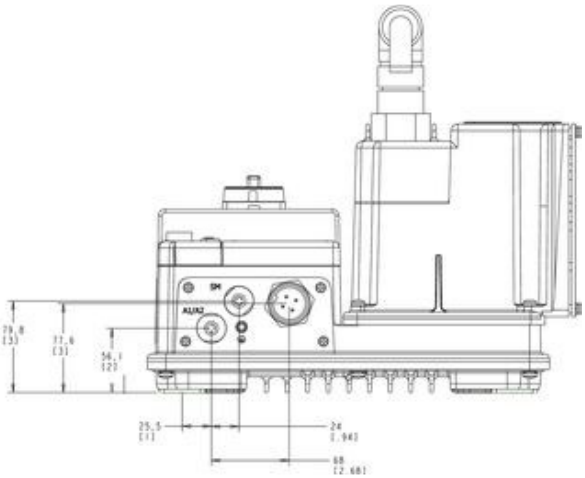


10 A short circuit protection rating



25 A short circuit protection rating





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