Power

Safety ArmorStart® Distributed Motor Controllers

Bulletin 280D/281D

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

Description

The Bulletin 280/281 ArmorStart Distributed Motor Controller is an integrated, pre-engineered, starter for full-voltage and reversing applications. The ArmorStart offers a robust IP67/NEMA Type 4 enclosure design, which is suitable for water wash-down environments. The modular plug-and-play design offers simplicity in wiring the installation. The quick disconnects for the I/O, communications, and motor connection reduce the wiring time and eliminate wiring errors. The ArmorStart offers as standard, four DC inputs and two relay outputs to be used with sensors and actuators respectively, for monitoring and controlling the application process. The ArmorStart's LED status indication and built-in diagnostics capabilities allows ease of maintenance and troubleshooting. The optional Hand/Off/Auto (HOA) keypad allows for local start/stop control at the ArmorStart Distributed Motor Controller.

The Bulletin 280/281 ArmorStart Distributed Motor Controller offers short-circuit protection per UL 508 and IEC 60947. The ArmorStart is rated for local-disconnect service by incorporating the Bulletin 140 Motor Protector as the local-disconnect, eliminating the need for additional components. The ArmorStart Distributed Motor Controllers are suitable for group motor installations.

Safety ArmorStart

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 a quick connects via the gland plate to the 1732DS-IB8XOBV4 safety I/O module. The Bulletin 1732DS Safety I/O inputs will monitor the status of the safety rated contactors inside the ArmorStart. The Bulletin 1732DS Safety I/O outputs to provide 24V DC power for control 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*-EN-P.

Features

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

Certifications

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

Standards Compliance

UL 508	CSA C22.2, No. 14
EN/IEC 60947-1	CCC

CE Marked per Low Voltage Directive 73/23/EEC and EMC Directive 89/336/EEC

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.

Description of Features

Inputs

The inputs are single keyed (two inputs per connector), which are sourced from DeviceNet power (24V DC), with LED status indication.

Outputs

Two dual-key relay output connectors are supplied as standard. The outputs are sourced from the control voltage power, which is 24V DC with LED status indication.

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^2t 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.

Gland Plate Entrance

The ArmorStart product offers two different methods for connecting incoming three-phase power to the device. One method offered is the traditional conduit entrance which provides a 1 in. conduit hole opening for wiring three-phase power. The second method offers connectivity to the ArmorConnect power media. A factory-installed receptacle is provided for connectivity to both three-phase power media.

Motor Cable

With every Bulletin 280/281 ArmorStart Distributed Motor Controller, a 3-meter unshielded 4-conductor cordset is provided with each unit as standard.

LED Status Indication

The LED Status Indication provides four status LEDs and a Reset button. The LEDs provide status indication for the following:

- **POWER LED**
  The LED is illuminated solid green when control power is present and with the proper polarity
- **RUN LED**
  This LED is illuminated solid green when a start command and control power are present
- **NETWORK LED**
  This bicolor (red/green) LEDs indicates the status of the communication link
- **FAULT LED**
  Indicates Controller Fault (trip) condition
- The "Reset Button" as a local trip reset.

Fault Diagnostics

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

- 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

Cat. No. Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; not all combinations will produce a valid catalog number.

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	

∗ See Accessories on page 6-4 for extended motor cable lengths.

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	Conduit Entrance	Conduit Entrance	3 m, unshielded cordset male 90°
CR	W ∗	Conduit Entrance	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

Product Selection

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

	kW		Hp			24V DC Control Voltage
Current Rating [A]	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 and DeviceNet communications, Up to 460V AC

	kW		Hp			24V DC Control Voltage
Current Rating [A]	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 and DeviceNet communications, Up to 460V AC

	kW		Hp			24V DC Control Voltage
Current Rating [A]	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 and DeviceNet communications, Up to 460V AC

	kW		Hp			24V DC Control Voltage
Current Rating [A]	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

Options – Factory Installed

Description				Cat. No. Modification
	Hand/Off/Auto Selector Keypad			-3
	Hand/Off/Auto Selector Keypad with Forward/Reverse Function			-3FR
	Supplied without motor cable		**Enclosure Rating** IP67	-CRW
	Connectivity to ArmorConnect Power Media supplied without motor cable	**Short Circuit Protection Rating** 10 A 25 A	**Enclosure Rating** IP67	-RRW

Accessories

Sealing Caps

Description	For Use With	Cat. No.
Plastic Sealing Cap (M12)∗	Input I/O Connection	1485A-M12
AC Micro Aluminum Sealing Cap - External∗	Output I/O Connection	889A-RMCAP

∗ To achieve IP67 rating, sealing caps must be installed on all unused I/O connections.

Cables

Description	Cable Rating	Length [m (ft)]	Cat. No.
Extended Motor Cable Cordsets			
90° M22 Motor Cordset	IP67/NEMA Type 4	6 (19.6)	280-MTR22-M6
		14 (45.9)	280-MTR22-M14
90° M35 Motor Cordset	IP67/NEMA Type 4	6 (19.6)	280-MTR35-M6
		14 (45.9)	280-MTR35-M14

DeviceNet Media ♣

Description		Length [m (ft)]	Cat. No.
			Sealed
	KwikLink pigtail drops are Insulation Displacement Connector (IDC) with integral Class 1 round cables for interfacing devices or power supplies to flat cable.	1 (3.3)	1485P-P1E4-B1-N5
		2 (6.5)	1485P-P1E4-B2-N5
		3 (9.8)	1485P-P1E4-B3-N5
		6 (19.8)	1485P-P1E4-B6-N5
	DeviceNet Mini- T-Port Tap	Left Keyway	**1485P-P1N5-MN5KM**
		Right Keyway	1485P-P1N5-MN5NF

Description		Connector	Cat. No.
	Grey PVC Thin Cable	Mini Straight Female Mini Straight Male	1485G-P❄N5-M5
		Mini Straight Female Mini Right Angle Male	1485G-P❄W5-N5
		Mini Right Angle Female Mini Straight Male	1485G-P❄M5-Z5
		Mini Right Angle Female Mini Straight Male	1485G-P❄W5-Z5
	Thick Cable	Mini Straight Female Mini Straight Male	1485C-P‡N5-M5
		Mini Straight Female Mini Right Angle Male	1485C-P‡W5-N5
		Mini Right Angle Female Mini Straight Male	1485C-P‡M5-Z5
		Mini Right Angle Female Mini Straight Male	1485C-P‡W5-Z5

Description		Length [m (ft)]	Cat. No.
	DeviceNet Configuration Terminal Used to interface with objects on a DeviceNet network, includes 1 m communications cable	1 (3.3)	193-DNCT
	Communication cable, color-coded bare leads	1 (3.3)	193-CB1
	Communication cable, microconnector (male)	1 (3.3)	193-CM1
	Panel Mount Adapter/Door Mount Bezel Kit	—	193-DNCT-BZ1

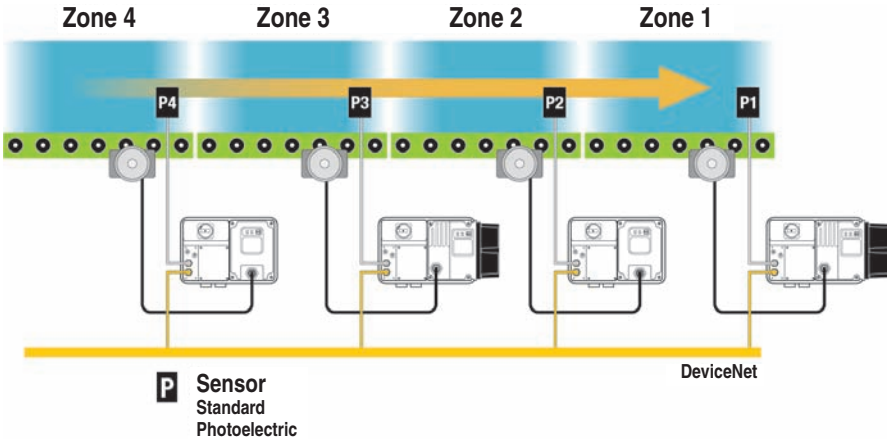
♣ See publication M116-CA001_-EN-P for complete cable selection information.
❄ Replace symbol with desired length in meters (Example: **1485G-P1N5-M5** for a 1 m cable). Standard cable lengths: 1, 2, 3, 4, 5, and 6 m.
‡ Replace symbol with desired length in meters (Example: **1485C-P1N5-M5** for a 1 m cable). Standard cable lengths: 1, 2, 3, 4, 5, 6, 8, 10, 12, 18, 24, and 30 m.

Sensor Media ⌘

Description		ArmorStart I/O Connection	Pin Count	Connector	Cat. No.
	DC Micro Patchcord	Input	5-pin	Straight Female Straight Male	889D-F4ACDM-➢
				Straight Female Right Angle Male	889D-F4ACDE-➢
	DC Micro V-Cable	Input	5-pin	Straight Female	879D-F4ACDM-➢
				Right Angle Male	879D-R4ACM-➢
	AC Micro Patchcord	Output	3-pin	Straight Female Straight Male	889R-F3AERM-➢
				Straight Female Right Angle Male	889R-F3AERE-➢

⌘ See the On-Machine Connectivity catalog for complete cable selection information.
➢ Replace symbol with desired length in meters (Example: **889D-F4ACDM-1** for a 1 m cable). Standard cable lengths: 1, 2, 5, and 10 m.
NOTE: Stainless steel versions may be ordered by adding an **S** to the cat. no. (Example: **889DS-F4ACDM-1**)

Peer-to-Peer Communications



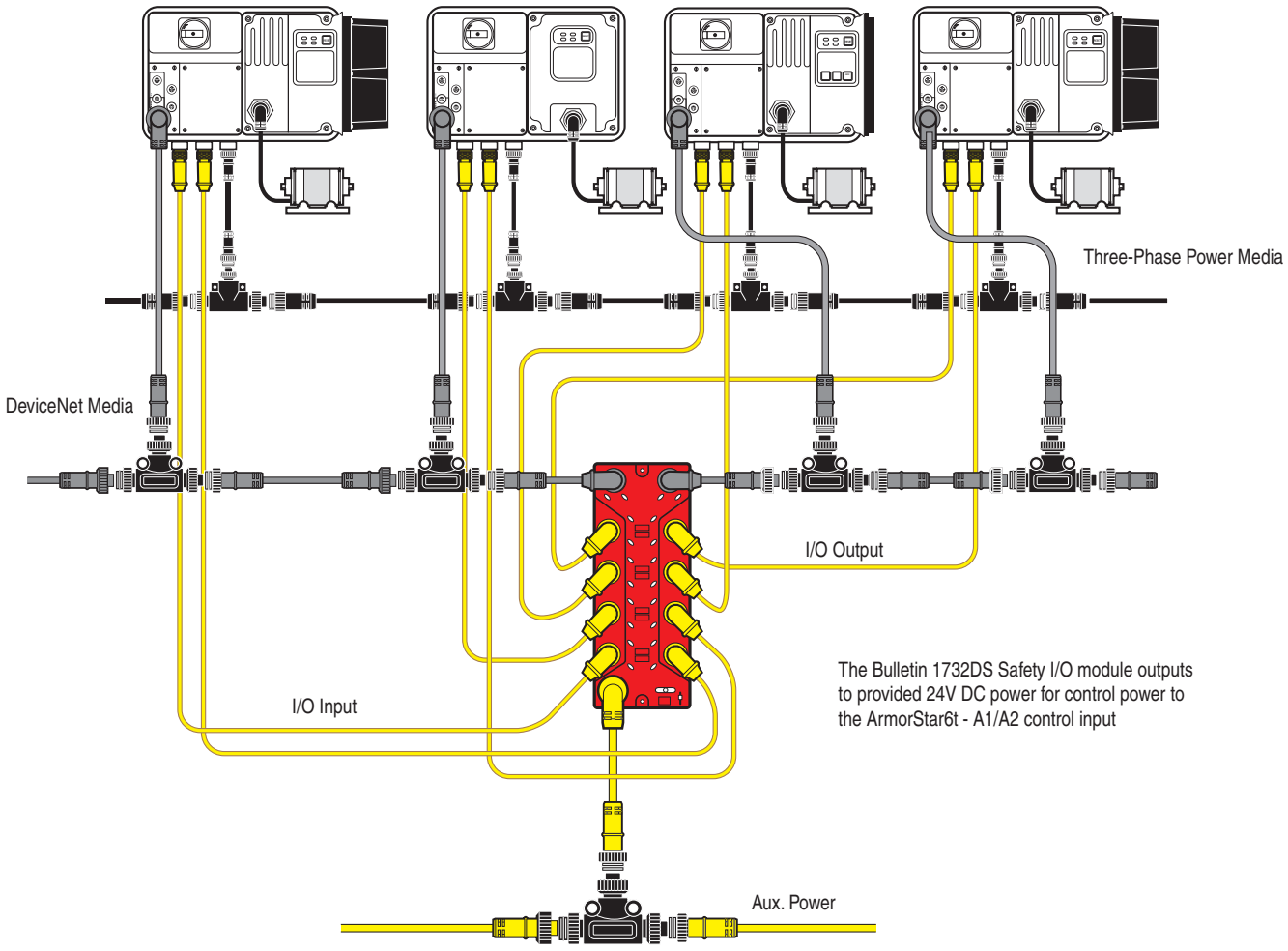
The Zone Control capabilities of ArmorStart Distributed Motor Controller is ideal for large horsepower (0.5…10 Hp) motored conveyors. The ArmorStart Distributed Motor Controllers have built-in DeviceNet Communications, DeviceLogix technology, and the added Zone Interlocking Parameters (ZIP) which allows one ArmorStart to consume data directly from up to four other DeviceNet nodes without going through the network scanner. These direct communications between conveyor zones are beneficial in a merge, diverter, and accumulation conveyor applications.

Safety I/O Module and TÜV Requirements

ArmorStart Safety-Related Parts

Each ArmorStart Safety Distributed motor controller is intended to be combined with the 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 part numbers for each of these components is specified below. The combination of these components is shown in Figure E.1. The safety I/O module and PLC program must be configured as outlined. See configuration of Safety I/O Module and PLC program.

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-F4HJDM-*, 889D-F4AEDM-* or equivalent * - denotes length	• SM cable assembly - Interconnecting cable assembly between safety module input and ArmorStart controller connector labeled “SM”. Assembly provides contactor position feedback. • A1/A2 cable assembly - Interconnecting cable assembly between safety module output and ArmorStart controller connector labeled “A1/A2”. Assembly provides output contactor coil power and controller power supply.



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

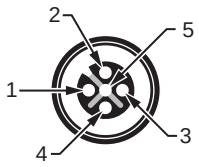
	Description	Cat. No.
	ArmorBlock Guard I/O provides all the advantages of traditional distributed I/O for safety systems, but has an IP67 package that can be mounted directly on your machine. On-machine safety I/O reduces wiring time and startup costs for safety controller applications by eliminating electrical boxes and simplifying cable installation. The ArmorBlock family provides industrially hardened I/O blocks that you can mount directly on equipment near sensors or actuators. Wiring the I/O to the sensors and actuators is easy using pre-wired quick disconnect cables. You can use Guard 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. With CIP Safety, you can easily integrate safety and standard control systems by using safety and standard messages on the same wire. The 1732DS ArmorBlock Guard I/O family consists of 24V DC digital I/O modules that communicate on DeviceNet networks. The I/O connectors are sealed M12 micro style while the network and auxiliary power connectors are sealed mini style. Plus, the ArmorBlock Guard I/O uses the same input and output M12 pin configuration as standard ArmorBlock and Maxum®.	1732DS-IB8XOBV4

Specifications

Description	24V DC Input/Output Module on DeviceNet Networks
Current Consumption	85 mA @ 24V DC
I/O Operating Voltage Range	19.2V…28.8 V DC (24V DC, -20…+20%)
Digital Inputs	
Number of Inputs	8 safety single-channel or 4 safety dual-channel
Input Type	current sinking
Voltage, On-State Input, Min.	11V DC
Voltage, Off-State Input, Max.	5V DC
Current, On-State Input, Min.	3.3 mA
Digital Outputs	
Number of Outputs	4 safety solid-state
Output Type	dual channel, current sourcing/current sinking pair
Output Current Rating	2.0 A max per point
Short Circuit Protection	Yes
Standard Pulse Test Outputs	
Number of Pulse Test Sources	8
Pulse Test Output Current	0.7 A per point
Short Circuit Protection	Yes
General	
Temperature, operating	-20…+60 °C (-4…+140 °F)
Relative Humidity	10…95% non-condensing
Vibration	0.76 mm @ 10…500 Hz
Shock, operating	30 g
Enclosure Protection	IP67
Dimensions (HxWxD), Metric	179 x 70 x 68.7 mm∗
Dimensions (HxWxD), Imperial	7.05 x 2.76 x 2.71 in.∗
Weight, Metric	600 g
Weight, Imperial	1.2 lb
Certifications❄	UL, CE, C-Tick, CSA, UL NRGF, ODVA Conformance, TÜV certified for functional safety up to SIL 3 and Cat. 4, PLe

∗ Includes terminal block.
❄ When product is marked. See the Product Certification link at http://www.ab.com/certification for Declarations of Conformity, Certificates, and other certification details.
All specifications are subject to change. Refer to product installations instructions.

1732DS ArmorBlock Guard I/O Micro Connector Pin Assignments

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

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-❄
	DC Micro Style Patchcord	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.

Specifications

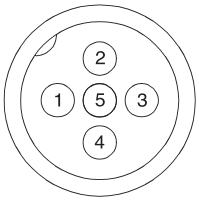
Electrical Ratings			UL/NEMA	IEC
Power Circuit	Rated Operation Voltage		380Y/220…480Y/277V AC	380Y/220…480Y/277V AC
	Rate Insulation Voltage		600V	
	Rated Impulsed Voltage		4 kV	
	Dielectric Withstand		2200V AC	2500V AC
	Operating Frequency		50/60 Hz	
	Utilization Category		—	AC-3
	Protection Against Shock		—	IP2X
	Rated Operating Current Max.		2.5 A	
			5.5 A	
			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	SCPD Performance Type 1 Sym. Amps RMS @ 480Y/277V	**Current Rating**		
		0.5…2.5 A	65 kA	
		1.1…5.5 A		
		3.2…16 A	30 kA	
	SCPD List		Size per NEC Group Motor	—

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)

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 Ith	Total of both outputs ≤ 2 A	
	Type of Contacts	Normally open (N.O.)	
	Number of Contacts	2	
ArmorPoint Ratings	Backplane Current Load	400 mA	

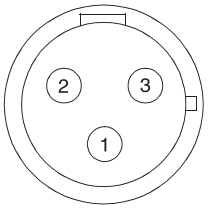
		UL/NEMA	IEC
Environmental	Operating Temperature Range	-20…+40 °C (-4…+104 °F)	
	Storage and Transportation Temperature Range	–25….+85 °C (–13…+185 °F)	
	Altitude	2000 m	
	Humidity	5…95% (non-condensing)	
	Pollution Degree	3	
	Enclosure Ratings	NEMA 4/12/13	IP67
	Approximate Shipping Weight	6.8 kg (15 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 mm^2 Secondary terminal: 0.8…5.3 mm^2
	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	9 mm (0.35 in.)	
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	0.5…2.5 A	
		1.1…5.5 A	
		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) UL 508 EN/IEC 60947-4-1 CE Marked per Low Voltage Directive 73/23/EEC and EMC Directive 89/336/EEC	

External Connections for Input Connector



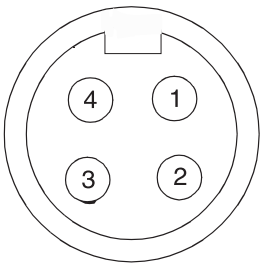
Pin 1: +V Out
Pin 2: Input
Pin 3: Comm
Pin 4: Input
Pin 5: NC (No Connection)

External Connections for Output Connector



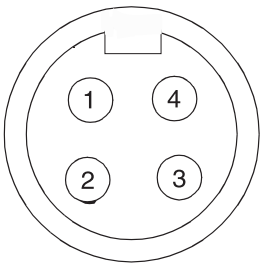
Pin 1: PE
Pin 2: Return
Pin 3: Relay Out

External Connections for Motor Connector (≤ 3 Hp @ 460V AC)



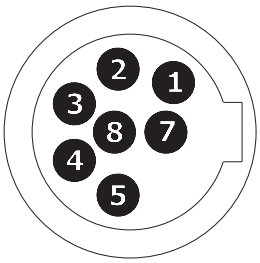
Pin 1: T1 - Black
Pin 2: T2 - White
Pin 3: T3 - Red
Pin 4: Ground - Green/Yellow

External Connections for Motor Connector (> 3 Hp @ 460V AC)



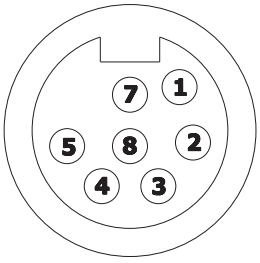
Pin 1: T1 - Black
Pin 2: Ground - Green/Yellow
Pin 3: T3 - Red
Pin 4: T2 - White

External Connections for ArmorPoint Interface (IN)



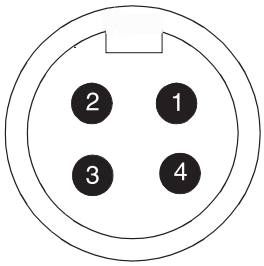
Pin 1: CAN High
Pin 2: Common
Pin 3: +5V
Pin 4: CAN Low
Pin 5: Enable In
Pin 7: Common
Pin 8: PE

External Connections for ArmorPoint Interface (OUT)



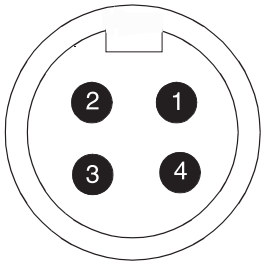
Pin 1: CAN High
Pin 2: Common
Pin 3: +5V
Pin 4: CAN Low
Pin 5: Enable Out
Pin 7: Common
Pin 8: NC (No Connection)

Safety Monitor Input (SM1/SM2)



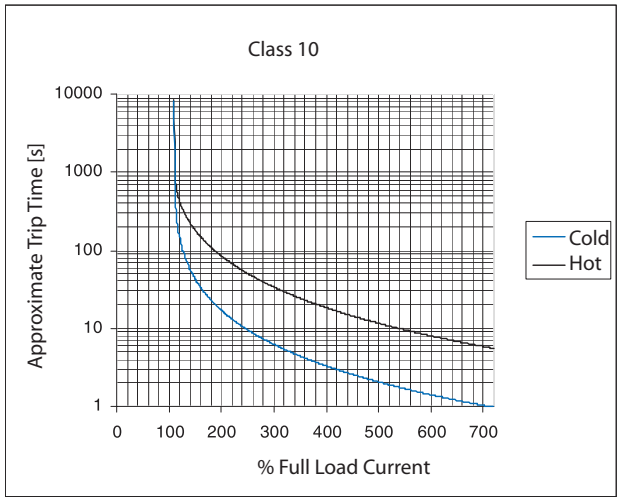
Pin 1: SM2 - White
Pin 2: SM1 - Brown
Pin 3: NC (No Connection)
Pin 4: NC (No Connection)

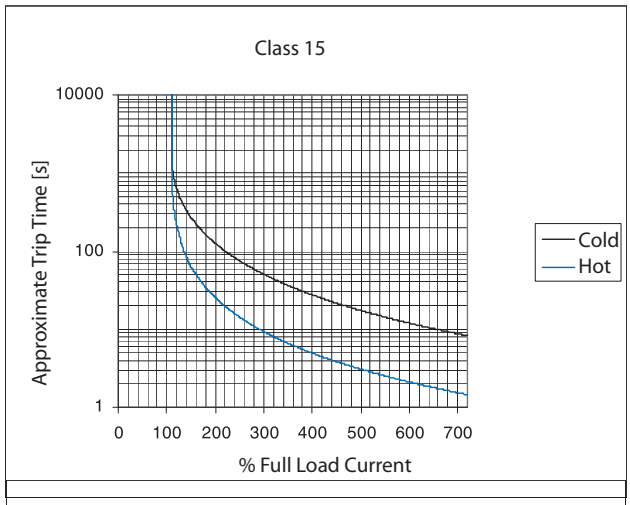
External Connections for Safety Input Power (A1/A2)

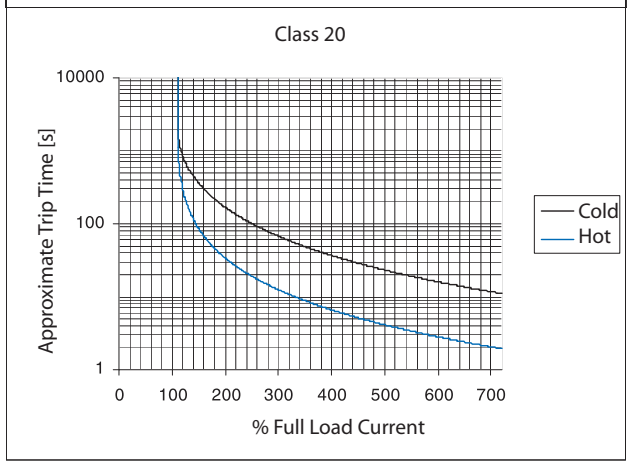


Pin 1: M - White
Pin 2: A1 - Brown
Pin 3: P - Black
Pin 4: A2 - Blue

Overload Curves



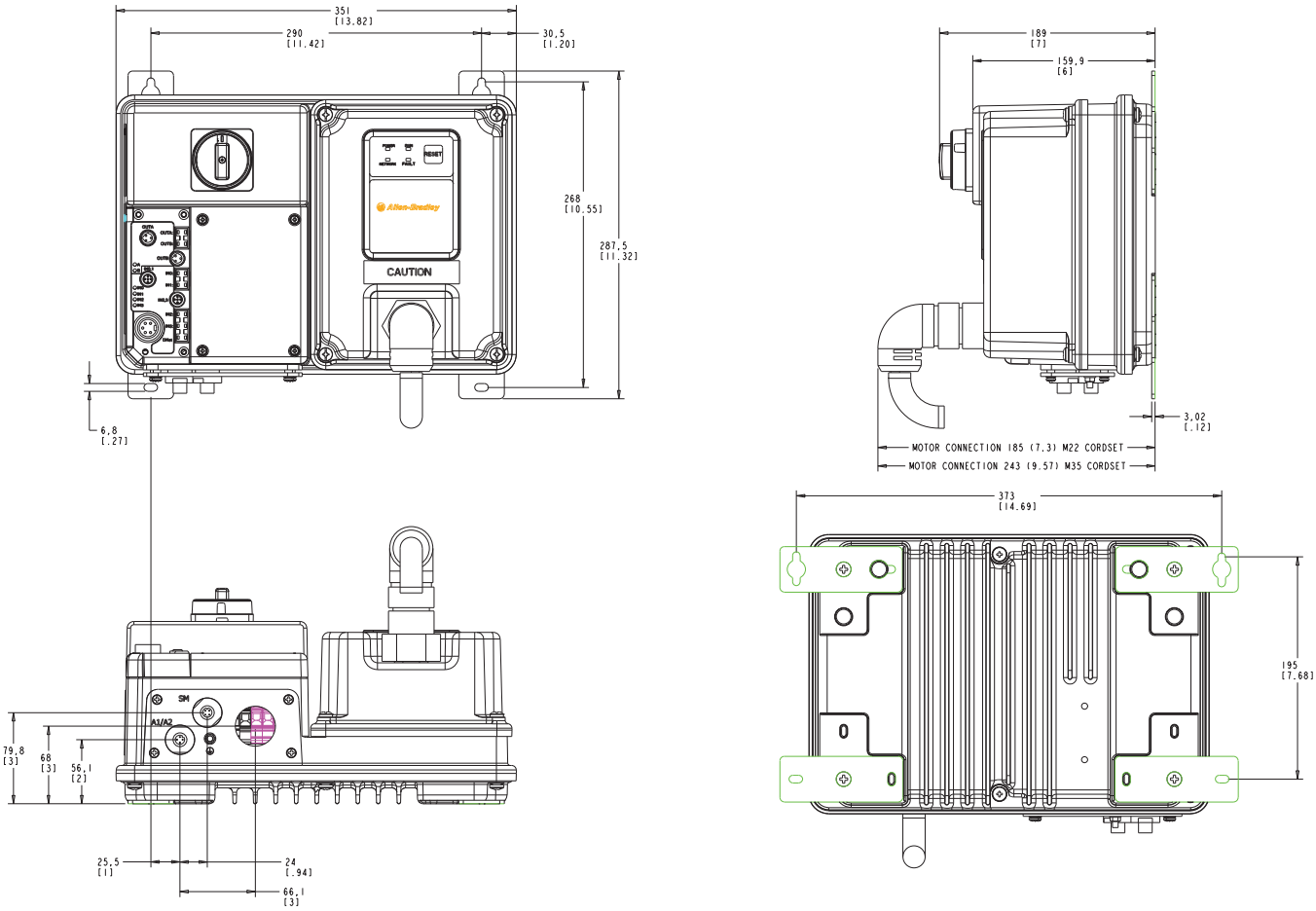




Approximate Dimensions

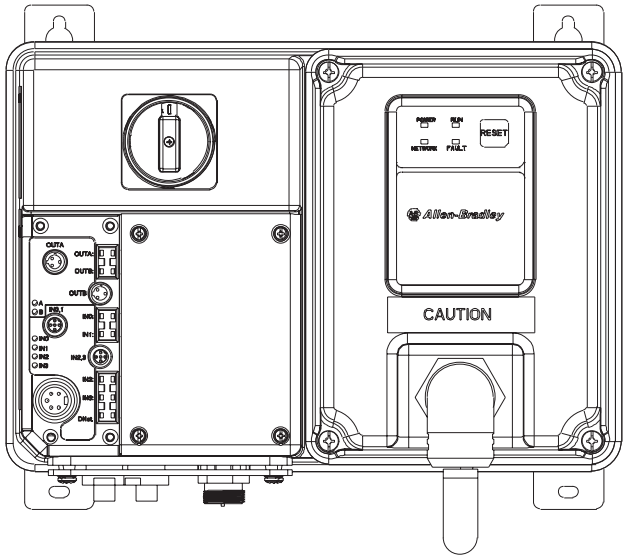
Dimensions for IP67/NEMA Type 4 with Conduit Entrance

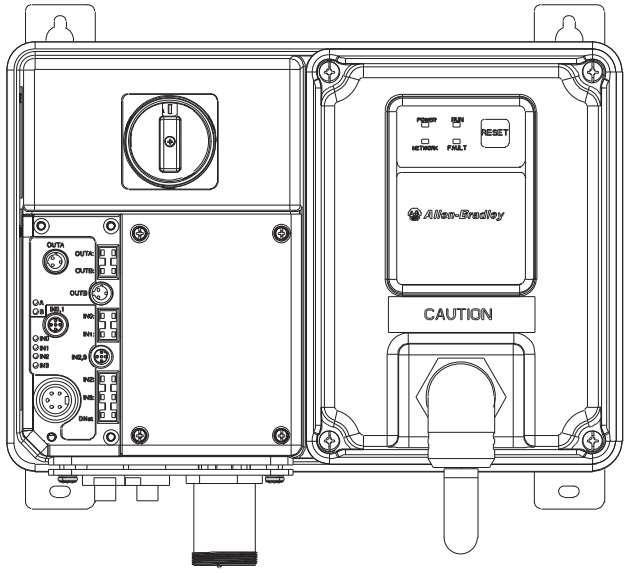
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes. All dimensions are subject to change.

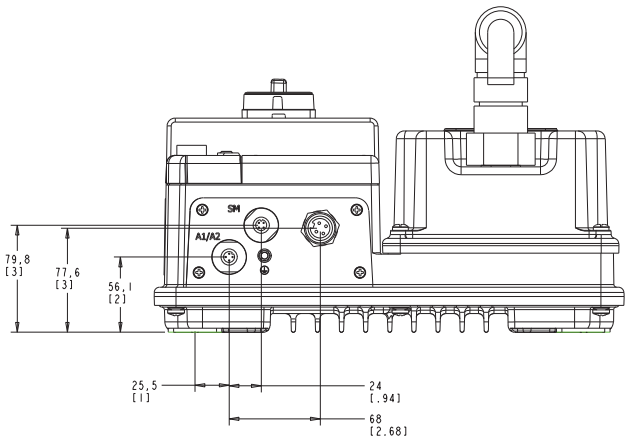


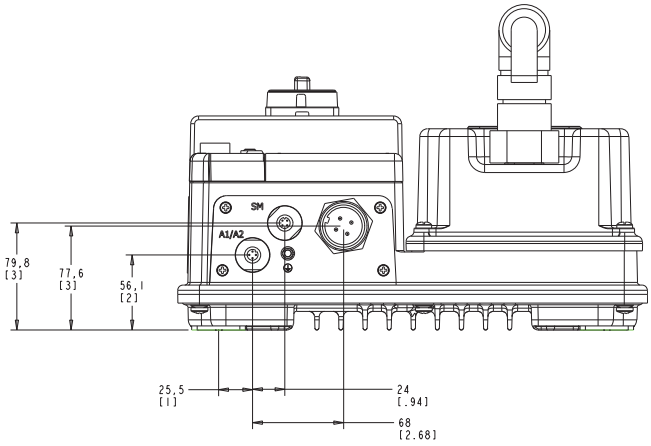
Dimensions for IP67/NEMA Type 4 with ArmorConnect Connectivity

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



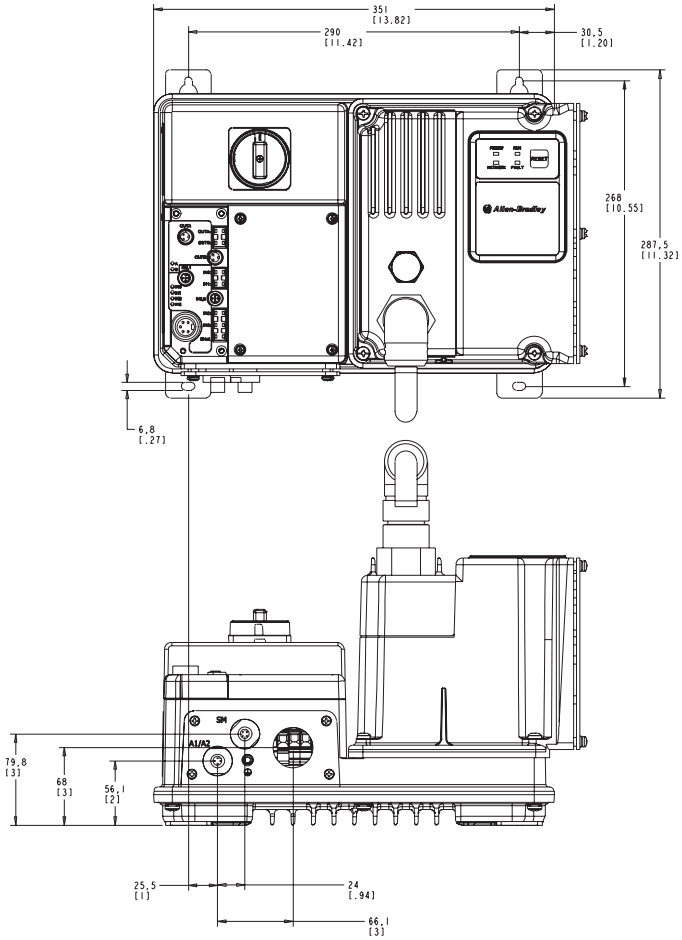


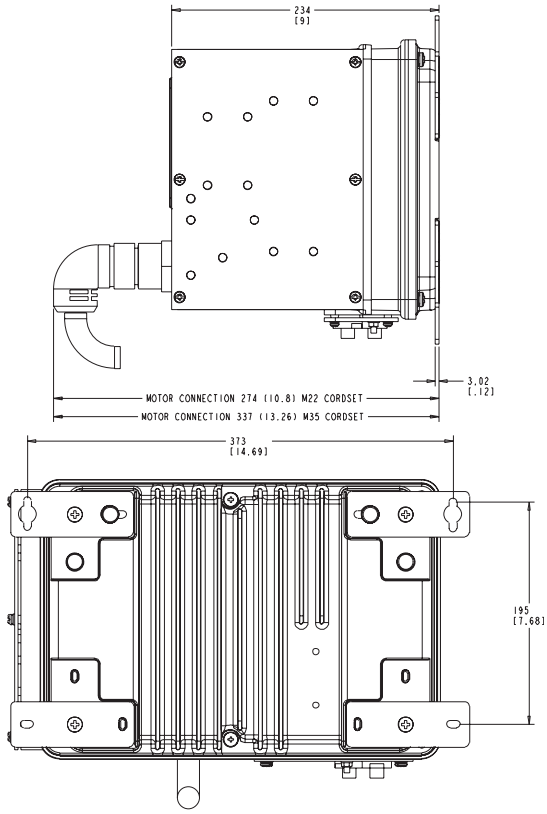




Dimensions for Reversing, IP67/NEMA Type 4 with Conduit Entrance

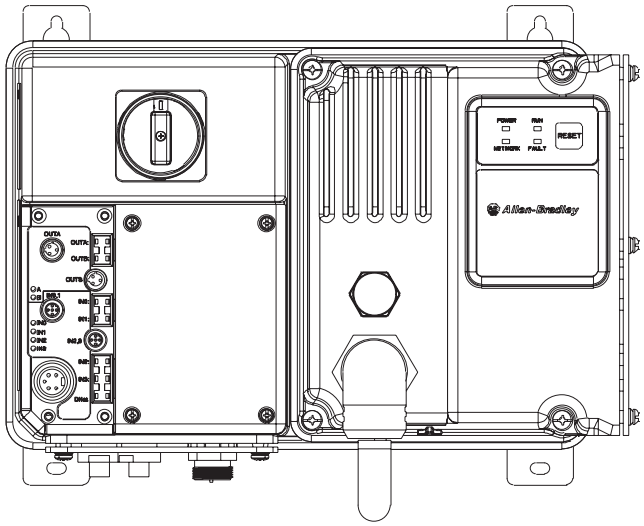
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes. All dimensions are subject to change.

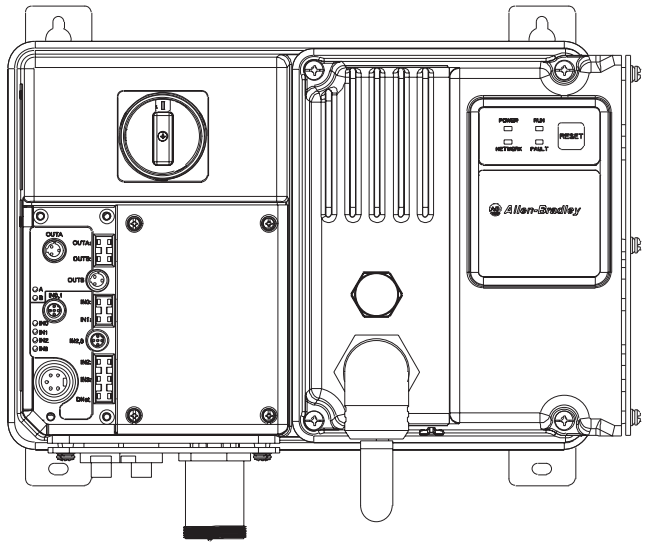


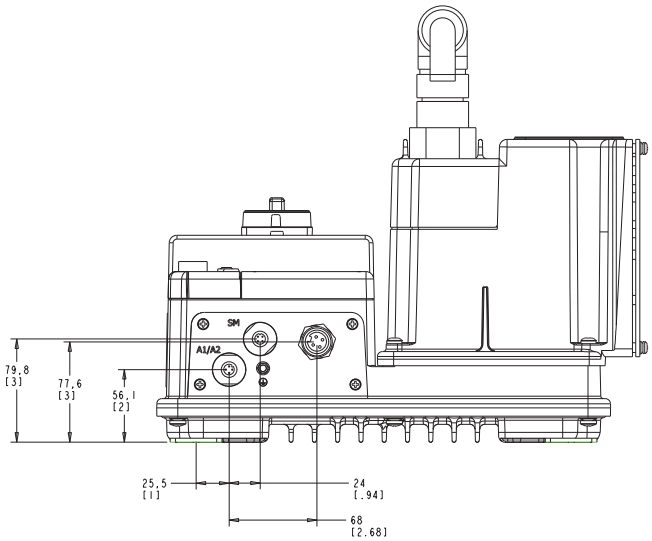


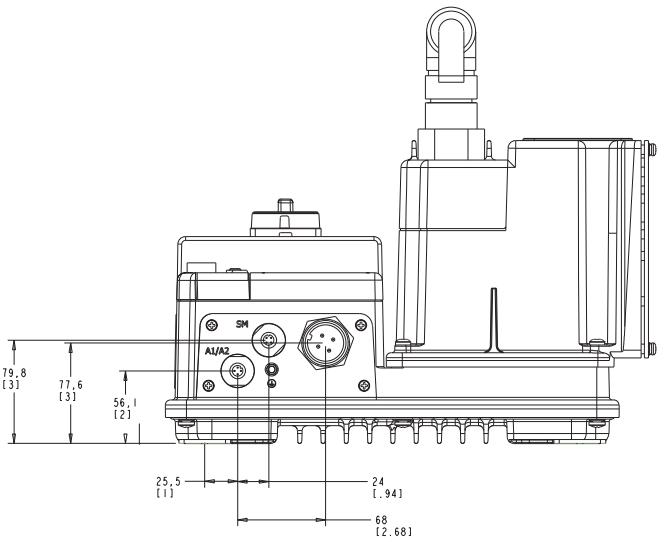
Dimensions for Reversing, IP67/NEMA Type 4 with ArmorConnect Connectivity

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









Safety ArmorStart® Distributed Motor Controllers

Bulletin 284D

Bulletin 284D ArmorStart Distributed Motor Controller - Safety Version

Description

The Bulletin 284 ArmorStart Distributed Motor Controller is an integrated, pre-engineered starter for variable frequency AC drive applications. The ArmorStart offers a robust IP67/NEMA Type 4 enclosure design, which is suitable for water wash-down environments. The modular plug-and-play design offers simplicity in wiring the installation. The quick disconnects for the I/O, communication, and motor connection reduce the wiring time and eliminate wiring errors. The ArmorStart offers, as standard, four DC inputs and two relay outputs to be used with sensors and actuators respectively, for monitoring and controlling the application process. The ArmorStart's LED status indication and built-in diagnostics capabilities allows ease of maintenance and troubleshooting. The optional Hand/Off/Auto (HOA) keypad allows for local start/stop control at the ArmorStart Distributed Motor Controller.

The Bulletin 284 ArmorStart Distributed Motor Controller offers short circuit protection per UL 508C and IEC 60947-1. The ArmorStart is rated for local-disconnect service by incorporating the Bulletin 140 Motor Protector as the local-disconnect, eliminating the need for additional components. The ArmorStart Distributed Motor Controllers are suitable for group motor installations.

Safety ArmorStart

The safety version of the ArmorStart provides a safety solution integrated into DeviceNet Safety installations. The Bulletin 284 Safety ArmorStart achieves Category 4 functionality by using redundant contactors. The Safety ArmorStart offers a quick connects via the gland plate to the 1732DS-IB8XOBV4 safety I/O module. The Bulletin 1732DS Safety I/O inputs will monitor the status of the safety rated contactors inside the ArmorStart. The Bulletin 1732DS Safety I/O outputs to provide 24V DC power for control power to the ArmorStart.

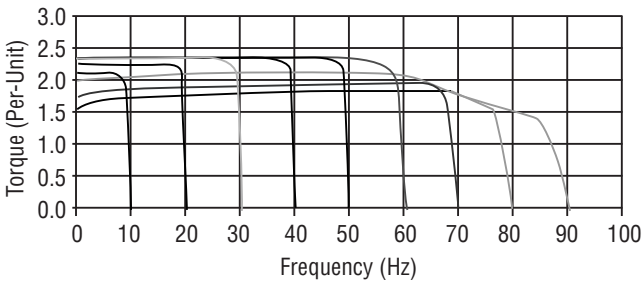
Note: The Bulletin 284 Safety ArmorStart is suitable for safety applications up to Safety Category 4 PLe (TÜV assessment per ISO 13849-1:2008). TÜV compliance letter is available upon request.

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

Mode of Operation

Sensorless Vector Control (SVC)

Sensorless vector control provides exceptional speed regulation and very high levels of torque across the entire speed range of the drive.



ArmorStart with Sensorless Vector Control — 3 Hp, High Speed

Additional Features

- Eight Preset Speeds
- Skip Frequency
- Flying Start
- Auto Restart
- Process Control Loop (PID)
- Step Logic Functionality
- Timer/Counter Functions

Features

- On-Machine starting solution
- Variable frequency AC drive using PowerFlex® technology
- Horsepower range 0.5…5 Hp (0.4…3.3 kW)
- Robust IP67/NEMA Type 4 enclosure rating
- Modular plug and play design
- Quick disconnect connections for I/O, communications, motor, and three-phase power
- Four inputs and two outputs (expandable with ArmorPoint)
- LED status indication
- DeviceNet communications
- DeviceLogix component technology
- Peer-to-peer communications (ZIP)
- Factory installed options:
  - EMI filter
  - Dynamic brake connector
  - Hand/Off/Auto (HOA) keypad configuration
  - Source brake contactor
  - Shielded motor cable
  - Output contactor
  - Hand/Off/Auto (HOA) Keypad Configuration
  - EMI Filter
  - Dynamic Brake Connector
  - Output Contactor
  - Control Brake Contactor
  - Source Brake Contactor
  - Shielded Motor Cable
  - Safety Monitor
  - 0…10V Analog Input

Standards Compliance

UL 508C
CSA C22.2, No. 14
EN/IEC 60947-1, EN 50178, EN 61800-3
CE Marked per Low Voltage Directive 73/23/EEC and EMC Directive 89/336/EEC

Certifications

cULus (File No. E207834, Guide NMMS, NMMS7)

Description of Features

Overload Protection

The Bulletin 284 ArmorStart Distributed Motor Controller incorporates, as standard, electronic motor overload protection. This overload protection is accomplished electronically with an I^2t algorithm. The ArmorStart's overload protection is programmable via the communication network providing the user with flexibility. The overload trip class allows for class 10 overload protection. Ambient insensitivity is inherent in the electronic design of the overload.

Gland Plate Entrance

The ArmorStart product offers two different methods for connecting incoming three-phase power to the device. One method offered is the traditional conduit entrance which provides a 1 in. conduit hole opening for wiring three-phase power. The second method offers connectivity to the ArmorConnect power media. A factory installed receptacle is provided for connectivity to three-phase power media.

Motor Cable

With every Bulletin 284 ArmorStart Distributed Motor Controller, a 3 m unshielded 4-conductor cordset is provided with each unit as standard. If the optional EMI filter is selected, a 3 m shielded 4-conductor cordset is provided with each unit as standard.

LED Status Indication

The LED Status Indication provides four status LEDs and a Reset button. The LEDs provide status indication for the following:

- **POWER LED**
  The LED is illuminated solid green when control power is present and with the proper polarity
- **RUN LED**
  This LED is illuminated solid green when a start command and control power are present
- **NETWORK LED**
  This bicolor (red/green) LEDs indicates the status of the communication link
- **FAULT LED**
  Indicates Controller Fault (trip) condition
- The "Reset Button" as a local trip reset.

Inputs

The inputs are single keyed (two inputs per connector), which are sourced from DeviceNet power (24V DC), with LED status indication.

Outputs

Two dual-key relay output connectors are supplied as standard. The outputs are sourced from the control voltage power, which is 24V DC with LED status indication.

Fault Diagnostics

Fault diagnostics capabilities built into the Bulletin 284 ArmorStart Distributed Motor Controller help you pinpoint a problem for easy troubleshooting and quick re-starting.

- Short Circuit
- Overload
- Phase Short
- Ground Fault
- Stall
- Control Power Loss
- Control Power Fuse Protection
- I/O Fault
- Overcurrent
- Brake Fuse Protection
- Overtemperature
- Output Fuse Protection
- DeviceNet Power Loss
- Internal Communication Fault
- DC Bus Fault
- EEPROM Fault
- Hardware Fault
- Restart Retries
- Miscellaneous Fault

Factory Installed Options

HOA Selector Keypad with Jog Function

The HOA Selector Keypad with Jog Function allows for local start/stop control with capabilities to JOG and to Forward/Reverse motor direction.

EMI Filter

The EMI Filter option is required if the Bulletin 284 ArmorStart Distributed Motor requires to be CE compliant. If the EMI Filter is selected, a 3–meter shielded 4–conductor cordset is provided as standard. This option is only available with sensorless vector control.

Dynamic Brake Connector

A 3 m, 3-pin cable for connection to a dynamic brake module is provided as standard when this option is selected. See Accessories on page 6-22 for available dynamic brake modules.

Source Brake Contactor

An internal contactor is used to switch the electromechanical motor brake on/off. The motor brake is powered from the main power circuit. A customer accessible 3.0 A fuse is provided to protect the brake cable. A 3-meter, 3-pin cable for connection to the motor, is provided as standard when this option is selected.

Shielded Motor Cable

A 3-meter shielded 4-conductor cordset is provided instead of the 3-meter unshielded 4-conductor cordset. If the EMI Filter is selected, a 3-meter shielded 4-conductor cordset is provided as standard.

Cat. No. Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; not all combinations will produce a valid catalog number.

284	D	–	F	V	D2P3	S	–	10	–	CR	–	Option 1	–	Option 2	–	Option 3
a	*b*		*c*	*d*	*e*	*f*		*g*		*h*		*i*		*j*		*k*

a

Bulletin Number	
Code	Description
284	VFD Starter

b

Communications	
Code	Description
D	DeviceNet™

c

Enclosure Type	
Code	Description
F	Type 4 (IP67)

d

Torque Performance Mode	
Code	Description
V	Sensorless Vector Control and Volts per Hertz

e

Output Current	
Code	Description
D1P4	1.4 A, 0.4 kW, 0.5 Hp
D2P3	2.3 A, 0.75 kW, 1.0 Hp
D4P0	4.0 A, 1.5 kW, 2.0 Hp
D6P0	6.0 A, 2.2 kW, 3.0 Hp
D7P6	7.6 A, 3.3 kW, 5.0 Hp

f

Control Voltage	
Code	Description
S	24V DC

g

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

h

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	Conduit Entrance	Conduit Entrance	3 m, unshielded cordset male 90°
CR	N	Conduit Entrance	Conduit Entrance	3 m, shielded cordset male 90°
CR	W ∗	Conduit Entrance	Conduit Entrance	No cable
RR	blank	Round Media (Male Receptacle)	Round Media (Male Receptacle)	3 m, unshielded cordset male 90°
RR	N	Round Media (Male Receptacle)	Round Media (Male Receptacle)	3 m, shielded cordset male 90°
RR	W ∗	Round Media (Male Receptacle)	Round Media (Male Receptacle)	No cable

∗ See Accessories on page 6-21 for extended motor and brake cable lengths.

i

Option 1	
Code	Description
3	Hand/Off/Auto Selector Keypad with Jog Function

j

Option 2		
Code		Description
DB1	blank	Connectivity to IP67 DB Resistor
SB	blank	Source Brake Contactor
SB	W ∗	No cable

k

Option 3	
Code	Description
EMI	EMI Filter

Product Selection

IP67/NEMA Type 4 with conduit entrance, DeviceNet communications, Sensorless Vector Control, and Volts per Hertz torque performance, Up to 480V AC

Input Voltage	3-Phase kW Rating	3-Phase Hp Rating	Output Current	24V DC Control Voltage Cat. No.
380…480V, 50/60 Hz 3-Phase	0.4	0.5	1.4	284D-FVD1P4S-10-CR
	0.75	1	2.3	284D-FVD2P3S-10-CR
	1.5	2	4	284D-FVD4P0S-10-CR
	2.2	3	6	284D-FVD6P0S-25-CR
	3	5	7.6	284D-FVD7P6S-25-CR

IP67/NEMA Type 4 with quick disconnects for ArmorConnect power media, DeviceNet communications, Sensorless Vector Control, and Volts per Hertz torque performance, Up to 480V AC

Input Voltage	3-Phase kW Rating	3-Phase Hp Rating	Output Current	24V DC Control Voltage Cat. No.
380…480V, 50/60 Hz 3-Phase	0.4	0.5	1.4	284D-FVD1P4S-10-RR
	0.75	1	2.3	284D-FVD2P3S-10-RR
	1.5	2	4	284D-FVD4P0S-10-RR
	2.2	3	6	284D-FVD6P0S-25-RR
	3	5	7.6	284D-FVD7P6S-25-RR

Options – Factory Installed

Description				Cat. No. Modification
	Hand/Off/Auto Selector Keypad			-3
	EMI Filter			-EMI
	Shielded motor cable		**Enclosure Rating**	-CRN
	Supplied without motor cable		IP67	-CRW
	Supplied with source brake cable			-SB
	Supplied without source brake cable			-SBW
	Dynamic Brake Connector			-DB1
	Connectivity to ArmorConnect Power Media supplied with shielded motor cable	**Short Circuit Protection Rating**	**Enclosure Rating**	-RRN
		10 A	IP67	
		25 A		
	Connectivity to ArmorConnect Power Media supplied without motor cable	10 A		-RRW
		25 A		

Accessories

Sealing Caps

Description	For Use With	Cat. No.
Plastic Sealing Cap (M12)✶	Input I/O Connection	1485A-M12
AC Micro Aluminum Sealing Cap - External✶	Output I/O Connection	889A-RMCAP

✶ To achieve IP67 rating, sealing caps must be installed on all unused I/O connections.

Cables

Description	Cable Rating	Length [m (ft)]	Cat. No.
Extended Motor Cable Cordsets			
90° M22 Motor Cordset	IP67/NEMA Type 4	6 (19.6)	280-MTR22-M6
		14 (45.9)	280-MTR22-M14
Shielded Motor Cable Cordsets			
90° M22 Motor Cordset	IP67/NEMA Type 4	6 (19.6)	**284-MTRS22-M6**
90° M22 Motor Cordset	IP67/NEMA Type 4	14 (45.9)	284-MTRS22-M14
Extended Brake Cable Cordsets			
90° M25 Source Brake Cable	IP67/NEMA Type 4	6 (19.6)	285-BRC25-M6
90° M25 Source Brake Cable	IP67/NEMA Type 4	14 (45.9)	285-BRC25-M14

Sensor Media ⌘

Description		ArmorStart I/O Connection	Pin Count	Connector	Cat. No.
	DC Micro Patchcord	Input	5-pin	Straight Female Straight Male	889D-F4ACDM-➤
				Straight Female Right Angle Male	889D-F4ACDE-➤
	DC Micro V-Cable	Input	5-pin	Straight Female	879D-F4ACDM-➤
				Right Angle Male	879D-R4ACM-➤
	AC Micro Patchcord	Output	3-pin	Straight Female Straight Male	889R-F3AERM-➤
				Straight Female Right Angle Male	889R-F3AERE-➤

⌘ See the On-Machine Connectivity catalog for complete cable selection information.
➤ Replace symbol with desired length in meters (Example: 889D-F4ACDM-1 for a 1 m cable). Standard cable lengths: 1, 2, 5, and 10 m.
Note: Stainless steel versions may be ordered by adding an "S" to the cat. no. (Example: 889DS-F4ACDM-1).

DeviceNet Media ♣

Description		Length [m (ft)]	Cat. No.
			Sealed
	KwikLink pigtail drops are Insulation Displacement Connector (IDC) with integral Class 1 round cables for interfacing devices or power supplies to flat cable	1 (3.3)	1485P-P1E4-B1-N5
		2 (6.5)	1485P-P1E4-B2-N5
		3 (9.8)	1485P-P1E4-B3-N5
		6 (19.8)	1485P-P1E4-B6-N5
	DeviceNet Mini- T-Port Tap	Left Keyway	**1485P-P1N5-MN5KM**
		Right Keyway	1485P-P1N5-MN5NF

Description		Connector	Cat. No.
	Gray PVC Thin Cable	Mini Straight Female Mini Straight Male	1485G-P❄N5-M5
		Mini Straight Female Mini Right Angle Male	1485G-P❄W5-N5
		Mini Right Angle Female Mini Straight Male	1485G-P❄M5-Z5
		Mini Right Angle Female Mini Straight Male	1485G-P❄W5-Z5
	Thick Cable	Mini Straight Female Mini Straight Male	1485C-P‡N5-M5
		Mini Straight Female Mini Right Angle Male	1485C-P‡W5-N5
		Mini Right Angle Female Mini Straight Male	1485C-P‡M5-Z5
		Mini Right Angle Female Mini Straight Male	1485C-P‡W5-Z5

Description		Length [m (ft)]	Cat. No.
	DeviceNet Configuration Terminal Used to interface with objects on a DeviceNet network. Includes 1 m communications cable.	1 (3.3)	193-DNCT
	Communication cable, color-coded bare leads	1 (3.3)	193-CB1
	Communication cable, microconnector (male)	1 (3.3)	193-CM1
	Panel Mount Adapter/Door Mount Bezel Kit	—	193-DNCT-BZ1

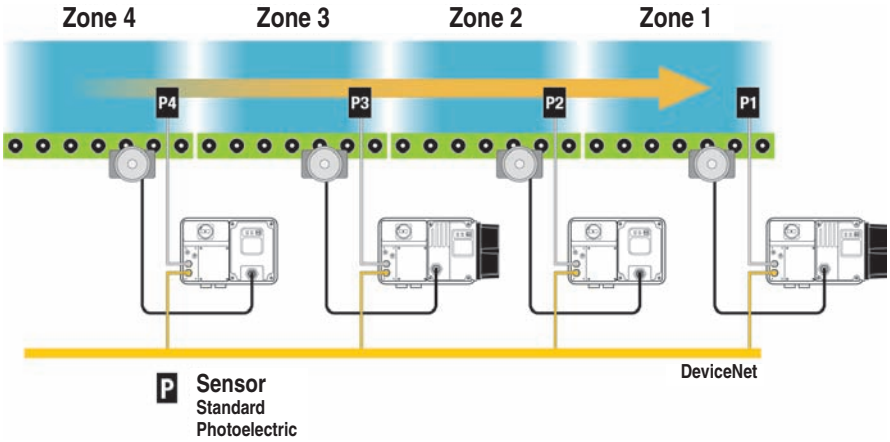
♣ See publication M116-CA001_-EN-P for complete cable selection information.
❄ Replace symbol with desired length in meters (Example: **1485G-P1N5-M5** for a 1 m cable). Standard cable lengths: 1, 2, 3, 4, 5, and 6 m.
‡ Replace symbol with desired length in meters (Example: **1485C-P1N5-M5** for a 1 m cable). Standard cable lengths: 1, 2, 3, 4, 5, 6, 8, 10, 12, 18, 24, and 30 m.

IP67 Dynamic Brake Resistors – 400…480V AC Input Drives

Drive and Motor Size kW (Hp)	Cat. No.	Resistance⌘ [Ω ± 5%]	Continuous Power kW	Max. Energy kJ	Max. Braking Torque % of Motor	Application Type 1		Application Type 2	
						Braking Torque % of Motor	Duty Cycle§ %	Braking Torque % of Motor	Duty Cycle§ %
0.37 (0.5)	284R-360P500-M∗	360	0.086	17	305%	100%	47%	150%	31%
0.75 (1)	284R-360P500-M∗	360	0.086	17	220%	100%	23%	150%	15%
1.5 (2)	284R-360P500-M∗	360	0.086	17	110%	100%	12%	110%	11%
2.2 (3)	284R-120P1K2-M∗	120	0.26	52	197%	100%	24%	150%	16%
4 (5)	284R-120P1K2-M∗	120	0.26	52	124%	100%	13%	124%	10%

∗ Indicates cable length (0.5 m or 1.0 m).
⌘ Always check the resistor ohms against the minimum resistance for the drive being used.
§ The duty cycle listed is based on full speed to zero speed deceleration. For constance regen at full speed, the duty cycle capability is half of the listed value. Application Type 1 represents maximum capability up to 100% braking torque where possible. Application Type 2 represents more than 100% braking torque where possible, up to a mximum of 150%.

Peer-to-Peer Communications



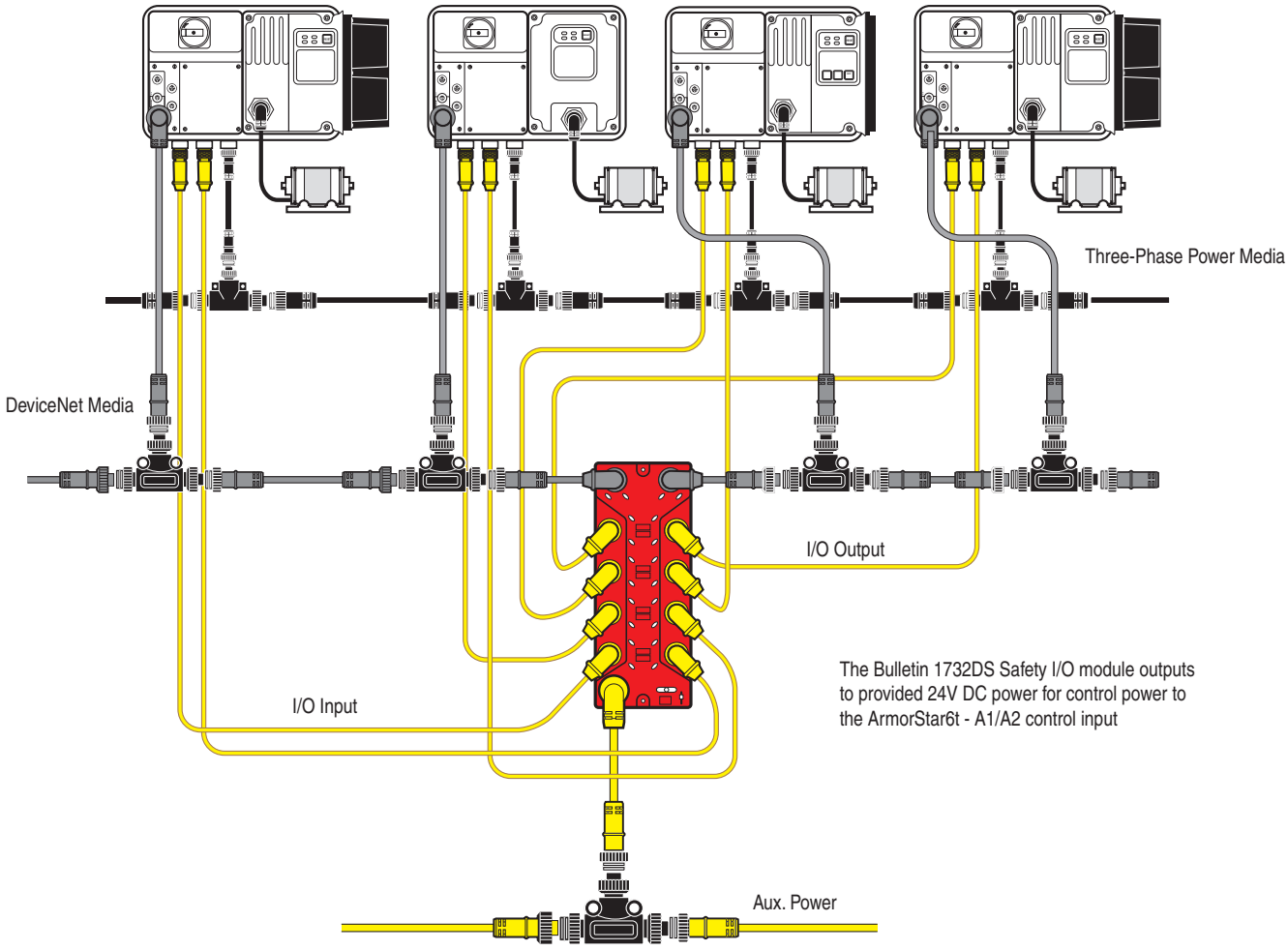
The Zone Control capabilities of ArmorStart Distributed Motor Controller is ideal for large horsepower (0.5…10 Hp) motored conveyors. The ArmorStart Distributed Motor Controllers have built-in DeviceNet Communications, DeviceLogix technology, and the added Zone Interlocking Parameters (ZIP) which allows one ArmorStart to consume data directly from up to four other DeviceNet nodes without going through the network scanner. These direct communications between conveyor zones are beneficial in a merge, diverter, and accumulation conveyor applications.

Safety I/O Module and TÜV Requirements

ArmorStart Safety-Related Parts

Each ArmorStart Safety Distributed motor controller is intended to be combined with the 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 part numbers for each of these components is specified below. The combination of these components is shown in Figure E.1. The safety I/O module and PLC program must be configured as outlined. See configuration of Safety I/O Module and PLC program.

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-F4HJDM-*, 889D-F4AEDM-* or equivalent * - denotes length	• SM cable assembly - Interconnecting cable assembly between safety module input and ArmorStart controller connector labeled “SM”. Assembly provides contactor position feedback. • A1/A2 cable assembly - Interconnecting cable assembly between safety module output and ArmorStart controller connector labeled “A1/A2”. Assembly provides output contactor coil power and controller power supply.



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

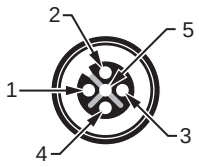
	Description	Cat. No.
	ArmorBlock Guard I/O provides all the advantages of traditional distributed I/O for safety systems, but has an IP67 package that can be mounted directly on your machine. On-machine safety I/O reduces wiring time and startup costs for safety controller applications by eliminating electrical boxes and simplifying cable installation. The ArmorBlock family provides industrially hardened I/O blocks that you can mount directly on equipment near sensors or actuators. Wiring the I/O to the sensors and actuators is easy using pre-wired quick disconnect cables. You can use Guard 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. With CIP Safety, you can easily integrate safety and standard control systems by using safety and standard messages on the same wire. The 1732DS ArmorBlock Guard I/O family consists of 24V DC digital I/O modules that communicate on DeviceNet networks. The I/O connectors are sealed M12 micro style while the network and auxiliary power connectors are sealed mini style. Plus, the ArmorBlock Guard I/O uses the same input and output M12 pin configuration as standard ArmorBlock and Maxum.	1732DS-IB8XOBV4

Specifications

Description	24V DC Input/Output Module on DeviceNet Networks
Current Consumption	85 mA @ 24V DC
I/O Operating Voltage Range	19.2V…28.8 V DC (24V DC, -20…+20%)
Digital Inputs	
Number of Inputs	8 safety single-channel or 4 safety dual-channel
Input Type	current sinking
Voltage, On-State Input, Min.	11V DC
Voltage, Off-State Input, Max.	5V DC
Current, On-State Input, Min.	3.3 mA
Digital Outputs	
Number of Outputs	4 safety solid-state
Output Type	dual channel, current sourcing/current sinking pair
Output Current Rating	2.0 A max per point
Short Circuit Protection	Yes
Standard Pulse Test Outputs	
Number of Pulse Test Sources	8
Pulse Test Output Current	0.7 A per point
Short Circuit Protection	Yes
General	
Temperature, operating	-20…+60 °C (-4…+140 °F)
Relative Humidity	10…95% non-condensing
Vibration	0.76 mm @ 10…500 Hz
Shock, operating	30 g
Enclosure Protection	IP67
Dimensions (HxWxD), Metric	179 x 70 x 68.7 mm∗
Dimensions (HxWxD), Imperial	7.05 x 2.76 x 2.71 in.∗
Weight, Metric	600 g
Weight, Imperial	1.2 lb
Certifications❄	UL, CE, C-Tick, CSA, UL NRGF, ODVA Conformance, TÜV certified for functional safety up to SIL 3 and Cat. 4, PLe

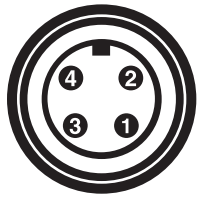
∗ Includes terminal block.
❄ When product is marked. See the Product Certification link at http://www.ab.com/certification for Declarations of Conformity, Certificates, and other certification details.
All specifications are subject to change. Refer to product installations instructions.

1732DS ArmorBlock Guard I/O Micro Connector Pin Assignments

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

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-❄
	DC Micro Style Patchcord	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.

Specifications

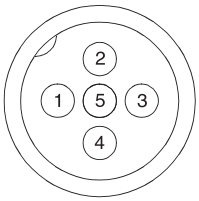
Electrical Ratings		UL/NEMA			IEC		
Power Circuit	Rated Operation Voltage	200…575V			200…500V		
	Rate Insulation Voltage	600V			600V		
	Rated Impulsed Voltage	6 kV			6 kV		
	Dielectric Withstand	2200V AC			2500V AC		
	Operating Frequency	50/60 Hz			50/60 Hz		
	Utilization Category	N/A			AC-3		
	Protection Against Shock	N/A			IP2X		
Control Circuit	Rated Operation Voltage	24V DC (+10%, -15%) A2 (should be grounded at voltage source)					
		120V AC (+10%, -15%) A2 (should be grounded at voltage source)					
		240V AC (+10%, -15%) A2 (should be grounded at voltage source)					
	Rate Insulation Voltage	250V			250V		
	Rated Impulsed Voltage	—			4 kV		
	Dielectric Withstand	1500V AC			2000V AC		
	Overvoltage Category	—			III		
	Operating Frequency	50/60 Hz					
Short Circuit Protection	SCPD performance Type 1	**Current Rating**	**Voltage**	480Y/277V	480/480V	600Y/347V	600V
		10 A	Sym. Amps RMS	65 kA	65 kA	30 kA	30 kA
		25 A		30 kA	30 kA	30 kA	30 kA
	SCPD List	Size per NEC Group Motor			—		

Power Requirements			
	Units	**No Options**	**w/ Brake Contactor**
Control Voltage	Volts	24V DC	
Total Control VA (Pick Up)	VA (W)	(11 W)	(16 W)
Total Control VA (Hold In)	VA (W)	(11 W)	(16 W)
External Devices powered by Control Voltage			
Outputs (2) (1 A max. each)	Amps	2	
Total Control VA (Pick Up) with max outputs	VA (W)	(59 W)	(64 W)
Total Control VA (Hold In) with max outputs	VA (W)	(59 W)	(64 W)

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 Ith	Total of both outputs ≤ 2 A	
	Type of Contacts	Normally open (N.O.)	
	Number of Contacts	2	
ArmorPoint Ratings	Backplane Current Load	400 mA	

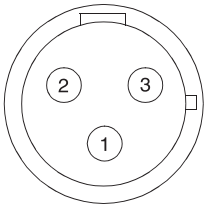
		UL/NEMA	IEC
Environmental	Operating Temperature Range	-20…+40 °C (-4…+104 °F)	
	Storage and Transportation Temperature Range	–25….+85 °C (–13…+185 °F)	
	Altitude	1000 m	
	Humidity	5…95% (non-condensing)	
	Pollution Degree	3	
	Enclosure Ratings	NEMA 4/12/13	IP67
		NEMA 4X	IP69K
	Approximate Shipping Weight	13.6 kg (30 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	
	Wire Size	Primary terminal: (16 …10 AWG) Secondary terminal: (18 …10 AWG)	Primary terminal: 1.3…5.3 mm^2 Secondary terminal: 0.8…5.3 mm^2
	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)	
	Control and Safety Monitor Inputs		
	Wire Size	(18…10 AWG)	1.0…4.0 mm^2
	Tightening Torque	6.2 lb•in	0.7 N•m
	Wire Strip Length	0.35 in. (9 mm)	
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 (12) $_{L-L}$, 2 kV (2) $_{L-N}$ (earth)	
	Overload Characteristics		
	Trip Class	10	
	Overload Protection	I^2t overload protection - 150% for 60 s, 200% for 30 s	
	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. E207834) UL 508C EN/IEC 60947-1, EN 50178, EN 61800-3 CE Marked per Low Voltage Directive 73/23/EEC and EMC Directive 89/336/EEC	

External Connections for Input Connector



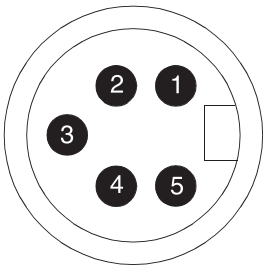
Pin 1: +V Out
Pin 2: Input
Pin 3: Comm
Pin 4: Input
Pin 5: NC (No Connection)

External Connections for Output Connector



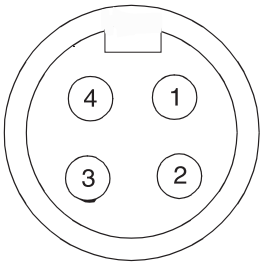
Pin 1: PE
Pin 2: Return
Pin 3: Relay Out

External Connections for DeviceNet Connector



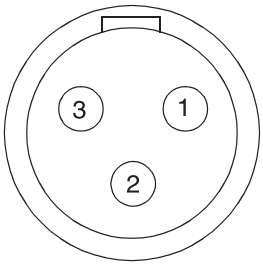
Pin 1: Drain (Not Connected)
Pin 2: +VDNET
Pin 3: -VDNET
Pin 4: CAN_H
Pin 5: CAN_L

External Connections for Motor Connector



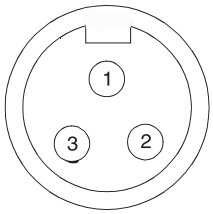
Pin 1: T1 - Black
Pin 2: T2 - White
Pin 3: T3 - Red
Pin 4: Ground - Green/Yellow

External Connections for Brake Contactor Connector



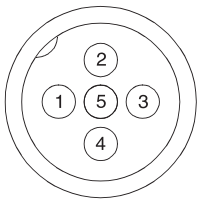
Pin 1: L1 - Black
Pin 2: GND - Green/Yellow
Pin 3: L2 - White

External Connections for Dynamic Brake Connection



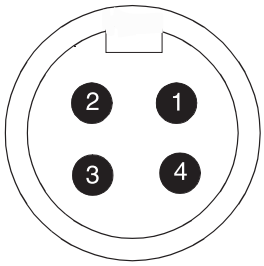
Pin 1: GND - Green/Yellow
Pin 2: BR+ - Black
Pin 3: BR- - White

External Connections for 0...10V Analog Input



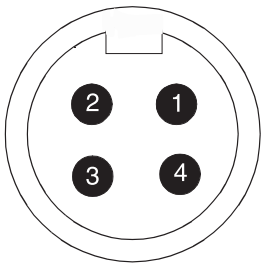
Pin 1: 10VDC
Pin 2: 0...10V Input
Pin 3: Analog Common
Pin 4: Analog Output
Pin 5: NC (No Connection)

Safety Monitor Input (SM1/SM2)



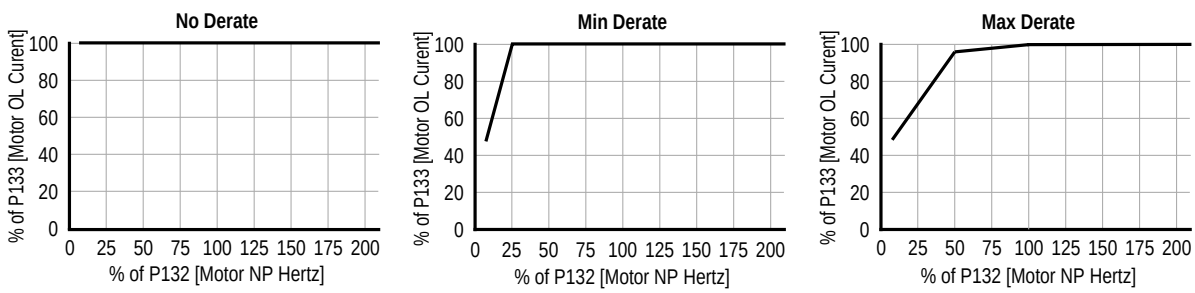
Pin 1: SM2 - White
Pin 2: SM1 - Brown
Pin 3: NC (No Connection)
Pin 4: NC (No Connection)

External Connections for Safety Input Power (A1/A2)



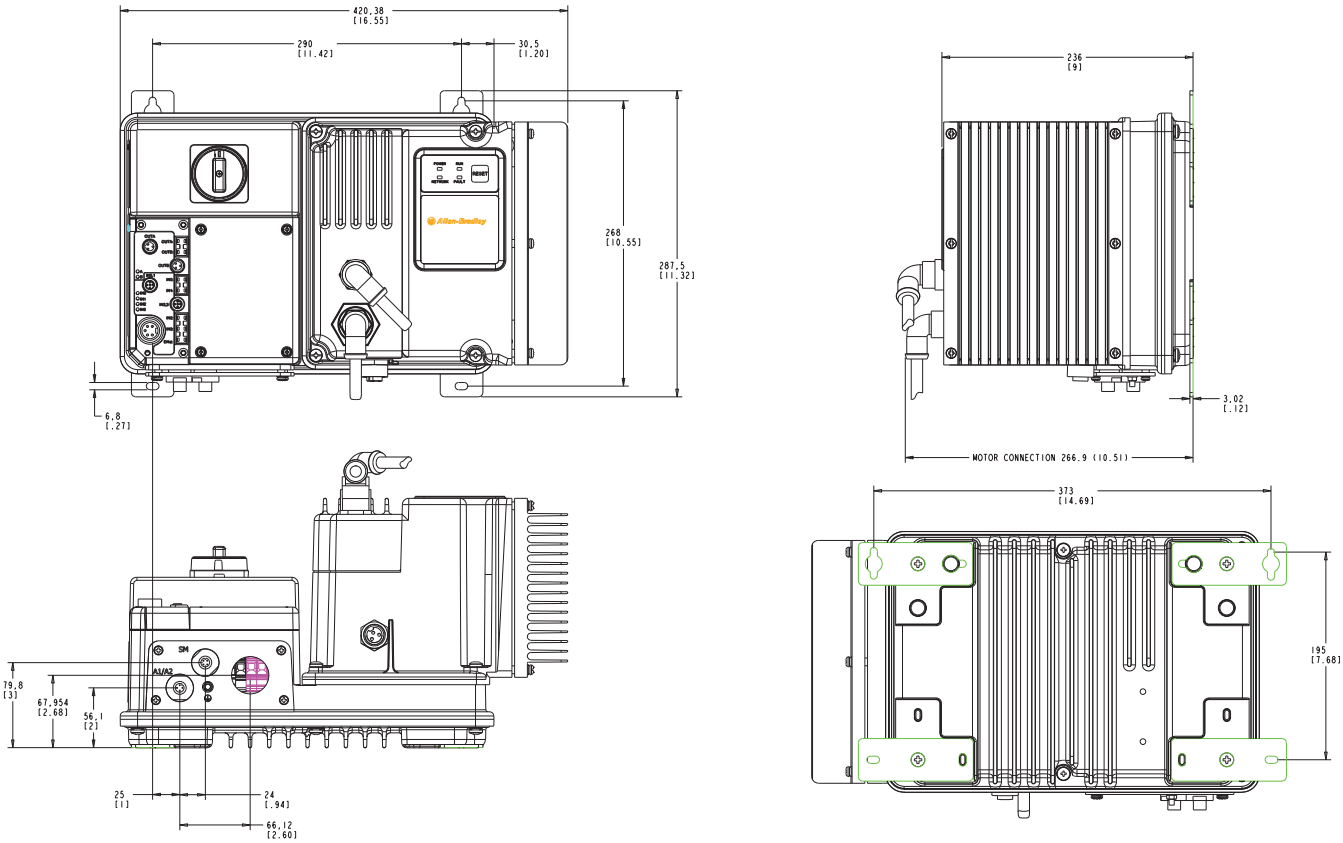
Pin 1: M - White
Pin 2: A1 - Brown
Pin 3: P - Black
Pin 4: A2 - Blue

Overload Curves



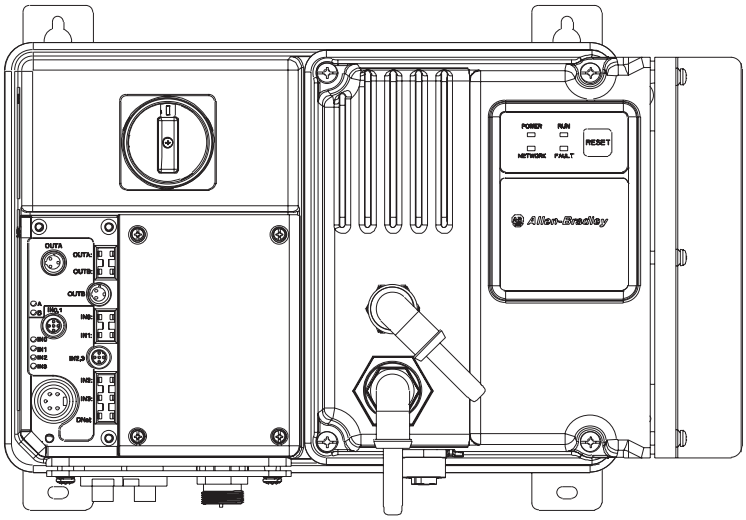
Dimensions for Safety Product, 2 Hp and below @ 460V AC, IP67/NEMA Type 4 with Conduit Entrance

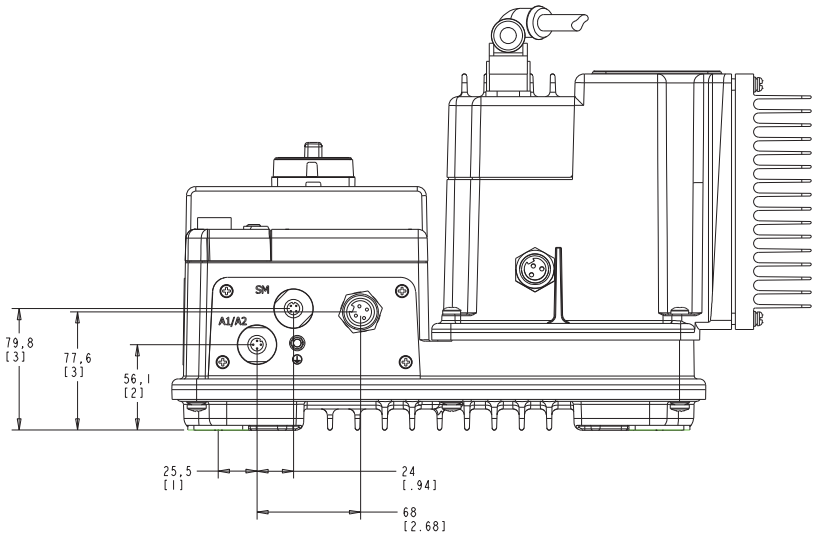
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes. All dimensions are subject to change.



Dimensions for Safety Product, 2 Hp and below @ 460V AC, NEMA Type 4 with ArmorConnect™ Connectivity

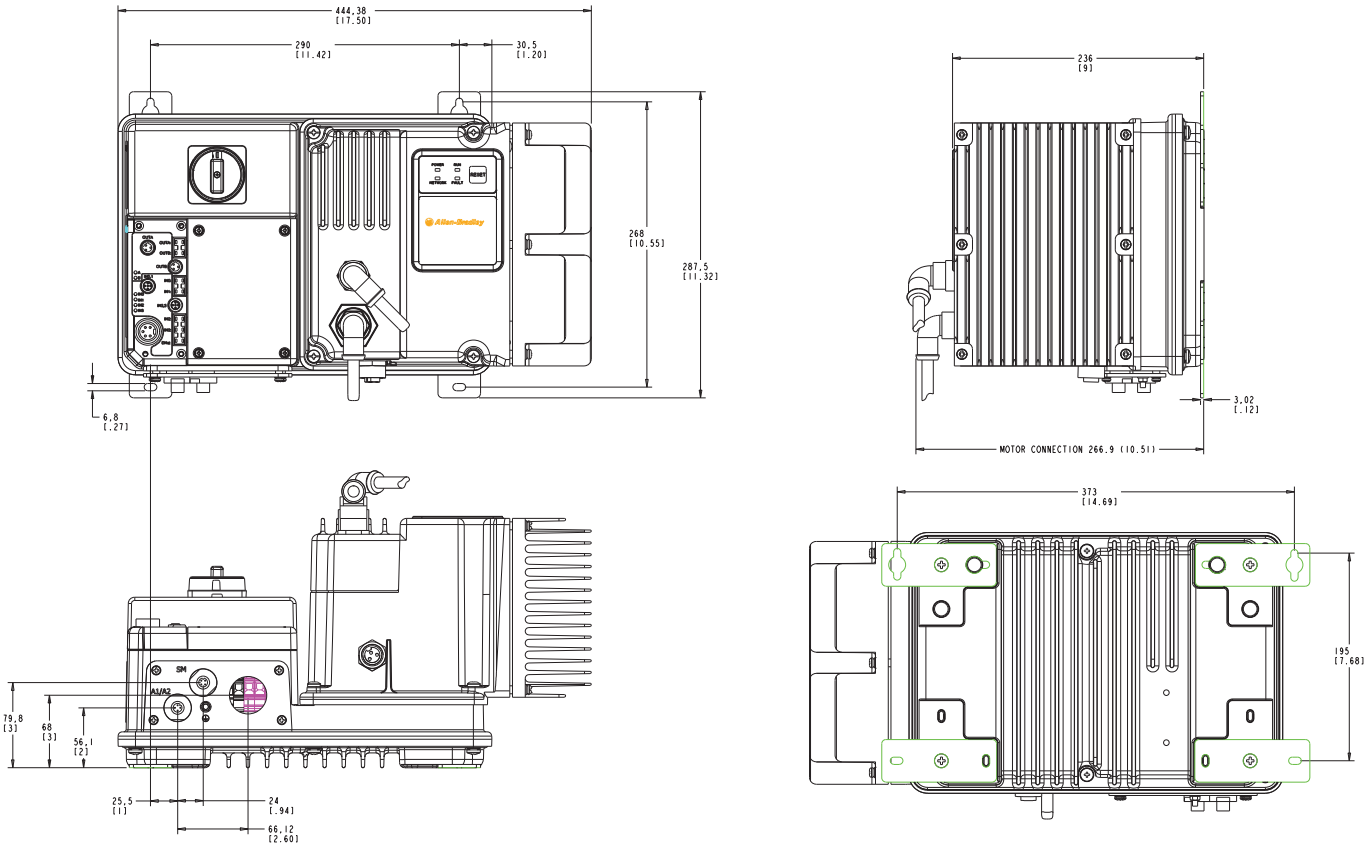
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes. All dimensions are subject to change.





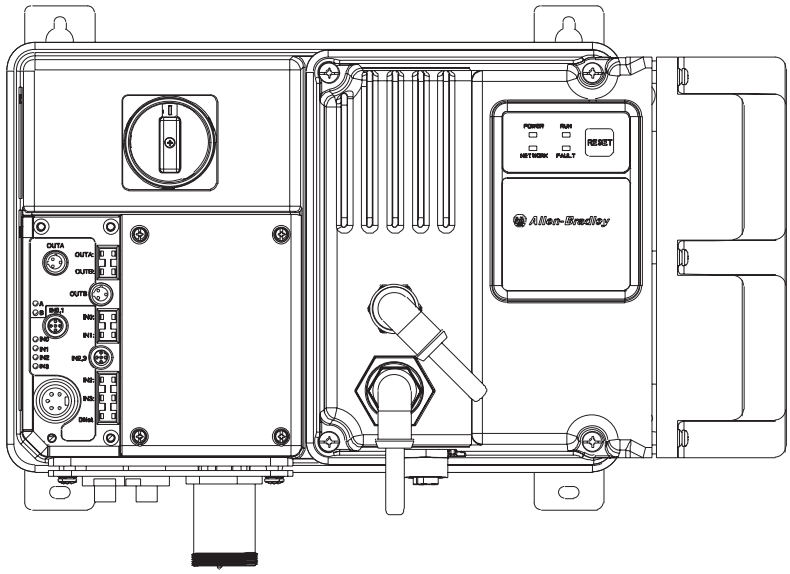
Dimensions for Safety Product, 3 Hp and above @ 460V AC, IP67/NEMA Type 4 with Conduit Entrance

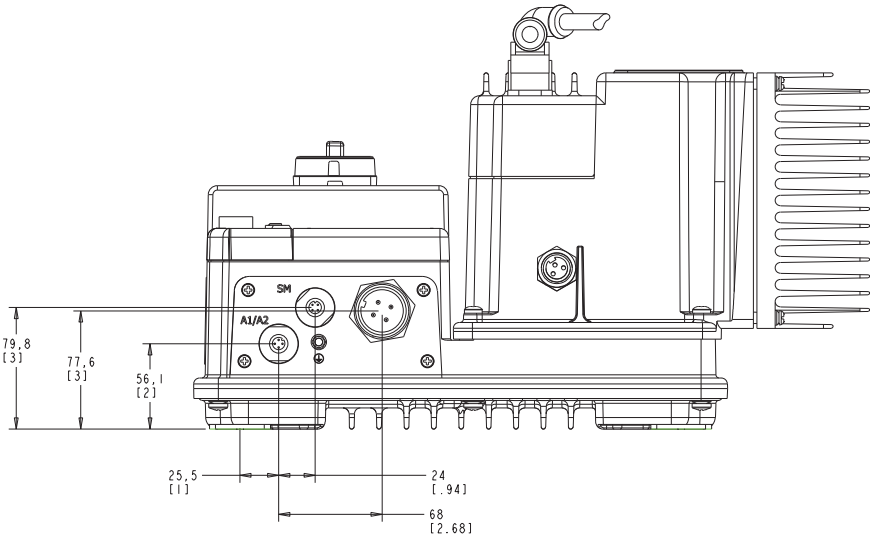
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes. All dimensions are subject to change.



Dimensions for Safety Product, 3 Hp and above @ 460V AC, IP67/NEMA Type 4 with ArmorConnect Connectivity

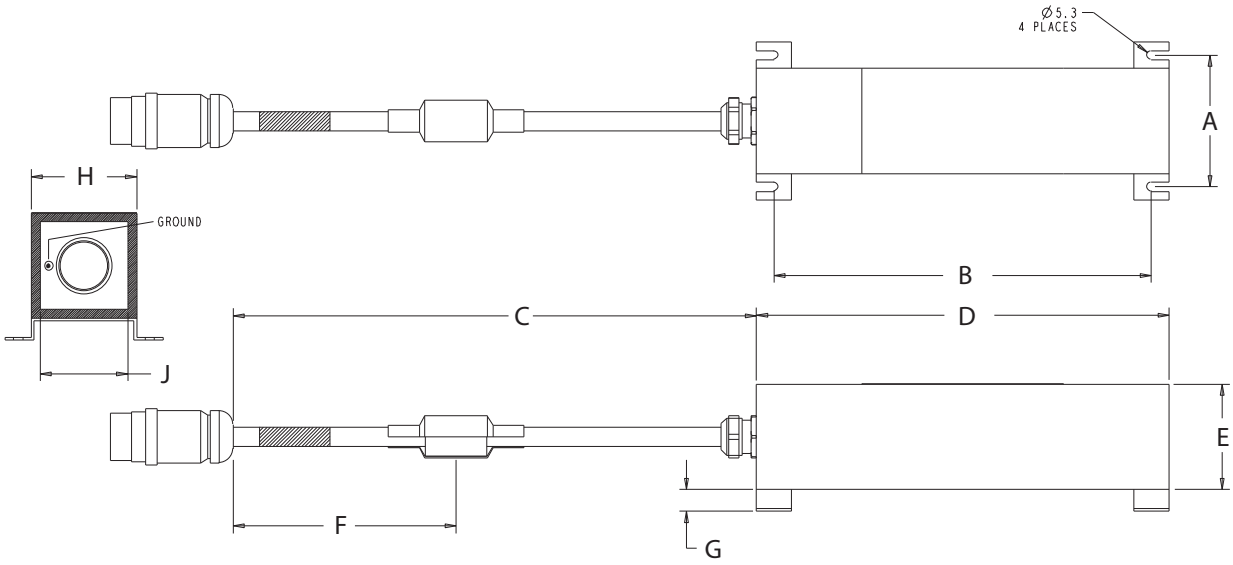
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes. All dimensions are subject to change.





Dynamic Brake Resistors

Dimensions are in millimeters. Dimensions are not intended to be used for manufacturing purposes.



Cat. No.	A	B	C	D	E	F	G	H	J
284R-091P500	75±3	215±5	*	235±5	60±2	127	12.54	60±2	50±1.5
284R-360P500		215±5		235±5					
284R-120P1K2		420±5		440±5					

* Length is user-selectable based on a suffix added to the catalog number. For a length of 500±10 mm, add **-M05** to the end of the catalog number. For a length of 1000±10 mm, add **-M1** to the end of the catalog number.

Help improve machine uptime and reduce wear and tear with safety-rated PowerFlex and Kinetix drives

The requirement for a machine to be placed in a safe state often needs to be done with a high level of confidence. Many times this is necessary to perform routine maintenance, correct a mechanical problem, or in some cases it may happen very frequently as part of the normal machine process cycle (e.g. punch press). Finding a way to do this without removing power from the system and performing a lockout / tagout procedure can improve process up-time, and reduce wear and stress on mechanical and electrical components. Also, providing an efficient way to exercise functional safety can reduce the chances of safety system tampering.

Safe Torque-Off

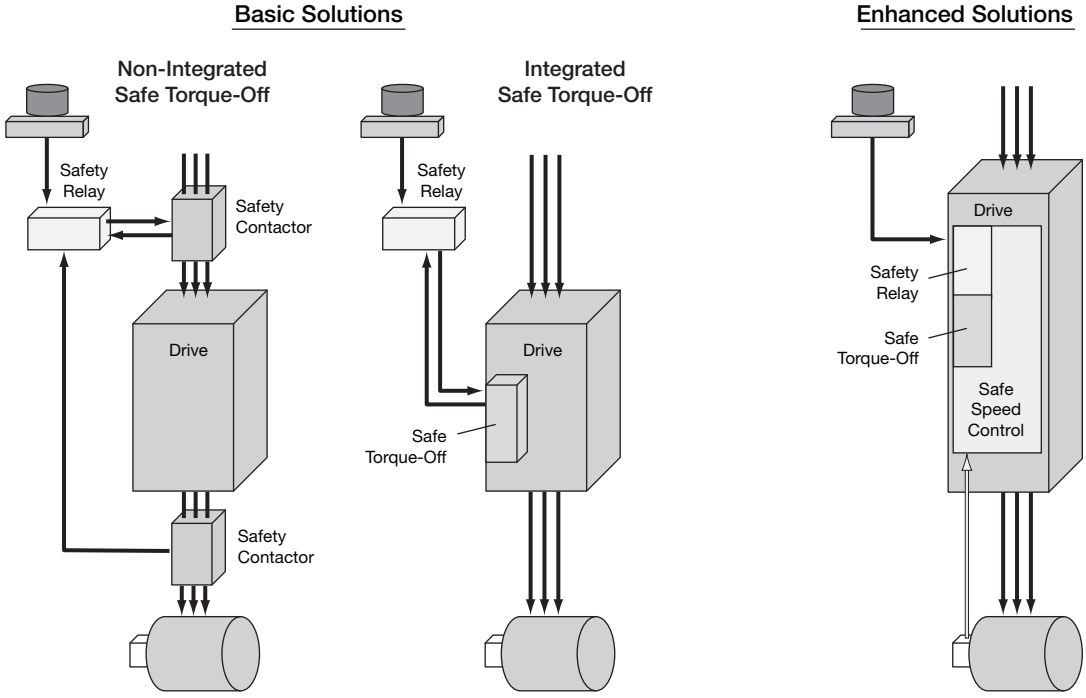
For many drive applications, simple removal of torque is all that is necessary to perform the desired task (e.g. maintenance). This function is referred to as Safe Torque-Off (also known as DriveGuard or GuardMotion), and can be accomplished with the use of a standard drive, along with external safety components (e.g. safety contactors) to place the system in a safe state. Some of the PowerFlex and Kinetix drive products reduce the amount of external safety components by integrating safe torque-off functionality inside the drive. Using the integrated solution simplifies the safety circuit design, and reduces panel space and cost. In either case, whether the function is implemented inside or outside the drive, it can be designed to meet the requirements of relevant safety standards.

Safe Speed Monitor

For applications able to benefit from more advanced safety features, Allen-Bradley offers a Safe Speed Monitor option that uses machine or motor velocity feedback for even greater flexibility in how safety can be deployed. This new offering helps provide safety zone access while there is limited motion. By reducing and monitoring the speed of an application, an operator may safely inspect and perform a process operation or maintenance work without stopping the machine, resulting in reduced downtime and reduced production waste. The Safe Speed Monitor is configurable for following functions:

- Safe Torque-Off
- Stop Categories 0, 1 and 2
- Safe Stop
- Safe Limited Speed
- Safe Maximum Speed
- Safe Maximum Acceleration
- Safe Direction
- Zero Speed Monitoring
- Door Control and Monitoring
- Enabling Switch Input

In addition to the safe monitoring of speed dependent functions, the Safe Speed Monitor integrates the functionality of a safety monitoring relay, providing direct inputs for interfacing door locks, light curtains, E-Stop pushbuttons, enabling switches, and key switches. While this can be accomplished with a standard drive and a separate speed monitoring relay (Allen-Bradley MSR57), select PowerFlex and Kinetix drives are capable of integrating this functionality internally, again simplifying the safety system, and reducing panel space and cost.



Safety Solutions for PowerFlex® Drives

Overview

The Allen-Bradley PowerFlex 40P, 70, 700H, 700L, 700S, 753 and 755 offer certified safety options to help provide integral, cost-effective, and certified protection for AC drive control.

All safety options are available as a kit for user installation.

	PowerFlex 40P	PowerFlex 70	PowerFlex 700H
			
Safe Torque-Off	✓	✓	✓
Safe Speed Functions (speed, accel, direction, etc.)			
Safety Category 3	✓	✓	✓
Safety Category 4			
Performance Level d	✓	✓	✓
Performance Level e			
SIL Claim Level 3			
Stop Categories 0 and/or 1	✓	✓	✓
Stop Category 2			
200…240V Ratings	0.37…7.5 kW (0.5…10 Hp)	0.37…18.5 kW (0.5…25 Hp)	–
380…480V Ratings	0.37…11 kW (0.5…15 Hp)	0.37…37 kW (0.5…50 Hp)	132…1200 kW (200…1900 Hp)
500…600V Ratings	0.75…11 kW (1…15 Hp)	0.37…37 kW (0.5…50 Hp)	160…2000 kW (250…900 Hp)
690V Ratings	–	–	160…2000 kW (150…2400 Hp)
Safe Torque-Off Board *(User Installed)*	20A-DG01	20A-DG02	NA
Safety Category	ISO/EN13849-1 (EN954-1), Category 3	ISO/EN13849-1 (EN954-1), Category 3	NA
Safe Speed Monitor *(User Installed)*	NA	NA	NA
Safety Category	NA	NA	NA
ATEX Safe-Off *(User Installed)*	NA	NA	20C-DG1
Safety Category	NA	NA	EN954-1, Category 5
Motor Control	• Volts per Hertz • Sensorless Vector Control	• Vector Control w/FORCE™ Technology • Volts per Hertz • Sensorless Vector Control	• Volts per Hertz • Sensorless Vector Control

❄ Also available with embedded logix controller - DriveLogix 5730.

‡ Frames 9…13 are functionally approved by TUV, but not certified.

PowerFlex 700S ❄	PowerFlex 700L w/700S Control	PowerFlex 753	PowerFlex 755
			
✓	✓	✓	✓
		✓	✓
✓	✓	✓	✓
		✓	✓
✓	✓	✓	✓
		✓	✓
		✓	✓
✓	✓	✓	✓
		✓	✓
0.75…66 kW (1…100 Hp)	–	–	–
0.75…800 kW (1…1250 Hp) ‡	200…860 kW (300…1150 Hp)	0.75…250 kW (1…350 Hp)	0.75…250 kW (1…350 Hp)
0.75…1500 kW (1…1600 Hp) ‡	345…650 kW (465…870 Hp)	NA	NA
45…1500 kW (50…1600 Hp) ‡	355…657 kW (475…881 Hp)	NA	NA
20D-P2-DG01	20D-P2-DG01	20-750-S	20-750-S
ISO/EN13849-1 (EN954-1), Category 3	ISO/EN13849-1 (EN954-1), Cat. 3	ISO/EN13849-1 (EN954-1), Category 3	ISO/EN13849-1 (EN954-1), Category 3
NA	NA	20-750-S1	20-750-S1
NA	NA	ISO/EN 13849-1 PLe/SIL3 Cat. 4	ISO/EN 13849-1 PLe/SIL3 Cat. 4
NA	NA	NA	NA
NA	NA	NA	NA
• Vector Control w/FORCE™ Technology • Volts per Hertz • Permanent Magnet Motor Control	• Available with PowerFlex 700 Vector Control or PowerFlex 700S Phase II Control Boards	• Vector Control w/FORCE™ Technology • Volts per Hertz • Sensorless Vector Control • Adjustable Voltage Control	• Vector Control w/FORCE™ Technology • Volts per Hertz • Sensorless Vector Control • Permanent Magnet Motor Control

Safety Solutions for PowerFlex® Drives

PowerFlex 40P AC Drive

The PowerFlex 40P AC drive addresses user needs for closed loop control with an option for Category 3 Safe Torque-off in a compact and cost effective design. Based on the popular PowerFlex 40 this drive is designed to meet global OEM and end-user demands for flexibility, space savings and ease of use. This drive is a cost-effective alternative for speed or basic position control of applications such as diverters, smart conveyors, packaging machines, palletizers, drafting machines, ring spinning machines and synthetic fiber spinning machines and shares common options and accessories with the PowerFlex 40.

Ratings	200…240V:	0.37…7.5 kW / 0.5…10 Hp / 2.3…33 A
	380…480V:	0.37…11 kW / 0.5…15 Hp / 1.4…24 A
	500…600V:	0.75…11 kW / 1…15 Hp / 1.7…19 A
Motor Control	• V/Hz control • Sensorless Vector Control	
Communications	Integral RS 485, Common Industrial Protocol	
User Interface	4 digit display, 3 additional LED indicators and scroll/reset button, optional Remote Human Interface Modules (HIM) or PC interface for programming	
Enclosures	IP20, IP30, Flange Mount	
Safety	DriveGuard Safe Torque-Off / EN 954-1 Cat. 3	
Additional Features	• Speed control with and without encoder feedback • Fiber application specific features • StepLogic allows operation as an independent position controller	
Certifications	• UL • CE (240 and 480V Ratings) • cUL • C-Tick • TÜV FS ISO/EN13849-1 (EN954-1) with Safe Torque-Off option	
Options	See page 6-39	

200…240V AC, Three-Phase Drives (50/60 Hz, No Filter)

Drive Ratings				IP20/NEMA Type Open	IP20 Plate Drive	IP20 Flange Mount ∗
kW	Hp	Output Current A	Frame Size	Cat. No.	Cat. No.	Cat. No.
0.4	0.5	2.3	B	22D-B2P3N104	22D-B2P3H204	22D-B2P3F104
0.75	1	5	B	22D-B5P0N104	22D-B5P0H204	22D-B5P0F104
1.5	2	8	B	22D-B8P0N104	22D-B8P0H204	22D-B8P0F104
2.2	3	12	B	22D-B012N104	22D-B012H204	22D-B012F104
3.7	5	17.5	B	22D-B017N104	22D-B017H204	22D-B017F104
5.5	7.5	24	C	22D-B024N104	22D-B024H204	22D-B024F104
7.5	10	33	C	22D-B033N104	22D-B033H204	22D-B033F104

∗ Meets IP40/54/65 (NEMA 1/12/4/4X) when installed in an enclosure of like rating.

380…480V AC, Three-Phase Drives (50/60 Hz, No Filter)

Drive Ratings				IP20/NEMA Type Open	IP20 Plate Drive	IP20 Flange Mount ∗
kW	Hp	Output Current A	Frame Size	Cat. No.	Cat. No.	Cat. No.
0.4	0.5	1.4	B	22D-D1P4N104	22D-D1P4H204	22D-D1P4F104
0.75	1	2.3	B	22D-D2P3N104	22D-D2P3H204	22D-D2P3F104
1.5	2	4	B	22D-D4P0N104	22D-D4P0H204	22D-D4P0F104
2.2	3	6	B	22D-D6P0N104	22D-D6P0H204	22D-D6P0F104
4	5	10.5	B	22D-D010N104	22D-D010H204	22D-D010F104
5.5	7.5	12	C	22D-D012N104	22D-D012H204	22D-D012F104
7.5	10	17	C	22D-D017N104	22D-D017H204	22D-D017F104
11	15	24	C	22D-D024N104	22D-D024H204	22D-D024F104

∗ Meets IP40/54/65 (NEMA 1/12/4/4X) when installed in an enclosure of like rating.

500…600V AC, Three-Phase Drives (50/60 Hz, No Filter)

Drive Ratings				IP20/NEMA Type Open	IP20 Plate Drive	IP20 Flange Mount ✶
kW	Hp	Output Current A	Frame Size	Cat. No.	Cat. No.	Cat. No.
0.75	1	1.7	B	22D-E1P7N104	22D-E1P7H204	22D-E1P7F104
1.5	2	3	B	22D-E3P0N104	22D-E3P0H204	22D-E3P0F104
2.2	3	4.2	B	22D-E4P2N104	22D-E4P2H204	22D-E4P2F104
4	5	6.6	B	22D-E6P6N004	22D-E6P6H204	22D-E6P6F104
5.5	7.5	9.9	C	22D-E9P9N104	22D-E9P9H204	22D-E9P9F104
7.5	10	12	C	22D-E012N104	22D-E012H204	22D-E012F104
11	15	19	C	22D-E019N104	22D-E019H204	22D-E019F104

✶ Meets IP40/54/65 (NEMA 1/12/4/4X) when installed in an enclosure of like rating.

Options

Human Interface Modules and Accessories

Description	Cat. No.
Remote (Panel Mount) LCD Display, Digital Speed Control, CopyCat Capable. Includes 2.0 meter cable. IP66, NEMA Type 4X/12 - Indoor Use Only.	22-HIM-C2S §
Remote Handheld, LCD Display, Full Numeric Keypad, Digital Speed Control, CopyCat Capable. Includes 1.0 meter cable. IP30, NEMA Type 1. Panel mount with optional Bezel Kit.	22-HIM-A3
Remote Handheld, Wireless Interface Module with Bluetooth® Technology. IP30, NEMA Type 1. Panel Mount with optional Bezel Kit.	22-WIM-N1
Remote (Panel Mount), Wireless Interface Module with Bluetooth Technology. IP66, NEMA Type 4X/12 - Indoor Use Only.	22-WIM-N4S
Bezel Kit. Panel Mount for LCD Display, Remote Handheld Unit. IP30, NEMA Type 1. Includes a 22-RJ45CBL-C20 cable.	22-HIM-B1
DSI HIM Cable (DSI HIM to RJ45 cable)	
1.0 Meter (3.3 Feet) DSI HIM Cable (DSI HIM to RJ45 cable)	22-HIM-H10
2.9 Meter (9.51 Feet) DSI HIM Cable (DSI HIM to RJ45 cable)	22-HIM-H30

§ The 22-HIM-C2S is smaller than the 22-HIM-C2 and cannot be used as a direct replacement.

Communication Option Kits

Description	Cat. No.
ControlNet™ Communication Adapter	22-COMM-C ♣
DeviceNet™ Communication Adapter	22-COMM-D ♣
EtherNet/IP™ Communication Adapter	22-COMM-E ♣
LonWorks® Communication Adapter	22-COMM-L ♣
PROFIBUS™ DP Communication Adapter	22-COMM-P ♣
Serial Converter Module (RS485 to RS232). Provides serial communication via DF1 protocol for use with DriveExplorer and DriveExecutive™ software. Includes DSI to RS232 serial converter, 1203-SFC serial cable, 22-RJ45CBL-C20 cable, and DriveExplorer Lite CD.	22-SCM-232
Serial Cable. 2.0 meter with a locking low profile connector. Connects the serial converter to a 9-pin sub-miniature D female computer connector.	1203-SFC
Serial Null Modem Adapter. Use when connecting the serial converter to DriveExplorer on a handheld PC.	1203-SNM
Universal Serial Bus™ (USB) Converter includes 2m USB, 20-HIM-H10 & 22-HIM-H10 Cables	1203-USB
DSI Cable. 2.0 meter RJ45 to RJ45 cable, male to male connectors.	22-RJ45CBL-C20
Splitter Cable. RJ45 one to two port splitter cable.	AK-U0-RJ45-SC1
Terminal Block. RJ45 two position terminal block (6 pieces) with two 120 Ohm terminating resistors (loose).	AK-U0-RJ45-TB2P
Terminating Resistors. 120 Ohm resistor embedded in an RJ45 connector (2 pieces).	AK-U0-RJ45-TR1
DSI External Communications Kit. External mounting kit for 22-COMM Communication Adapters.	22-XCOMM-DC-BASE
External Communications Kit Power Supply Optional 100…240V AC Power Supply for External DSI Communications Kit.	20-XCOMM-AC-PS1
Compact I/O Module (3 Channel)	1769-SM2
Communication Adapter Cover Houses the Communication Adapter for B & C Frame drives. Note: Cover adds 25 mm (0.98 in.) to the overall depth of the drive.	
Frame B Drive	22D-CCB ➢
Frame C Drive	22D-CCC ➢

♣ Requires a Communication Adapter Cover when used with Frame B & C PowerFlex 40/40P drives or Frame C PowerFlex 400 drives.
➢ If IP30, NEMA/UL Type 1 is required, a 22-JBCB (Frame B drives) or 22-JBCC (Frame C drives) must also be ordered.

Safety Options

Description	Cat. No.
DriveGuard Safe Torque-Off	20A-DG01

Terminators

Description ✶	Cat. No.
for use with 3.7 kW (5 Hp) & below drives	1204-TFA1
for use with 1.5 kW (2 Hp) & up drives	1204-TFB2

✶ Refer to Appendix A of publication *DRIVES-IN001* for selection information.

Reflected Wave Reduction Modules w/Common Mode Choke

Description ✶	Cat. No.
17A with Common Mode Choke	1204-RWC-17-A

✶ Refer to Appendix A of publication *DRIVES-IN001* for selection information.

Reflected Wave Reduction Modules

Voltage	ND kW	ND Hp	Cat. No.
380… 480V AC	2.2…4	3…5	1321-RWR8-DP
	4	5	1321-RWR12-DP
	5.5	7.5	1321-RWR18-DP
	7.5	10	1321-RWR25-DP
	11	15	1321-RWR25-DP
500… 600V AC	4	5	1321-RWR8-EP
	5.5	7.5	1321-RWR12-EP
	7.5	10	1321-RWR18-EP
	11	15	1321-RWR25-EP

Dynamic Brake Resistors

Drive Rating			Minimum Resistance ⌘	Resistance ⌘	
Voltage	kW	Hp	Ohms ±10%	Ohms ±5%	Cat. No. ✦
200…240V, 50/60 Hz, Three-Phase	0.4	0.5	48	91	AK-R2-091P500
	0.75	1	48	91	AK-R2-091P500
	1.5	2	48	91	AK-R2-091P500
	2.2	3	32	47	AK-R2-047P500
	3.7	5	19	47	AK-R2-047P500
	5.5	7.5	13	30	AK-R2-030P1K2
	7.5	10	10	30	AK-R2-030P1K2
380…480V, 50/60 Hz, Three-Phase	0.4	0.5	97	360	AK-R2-360P500
	0.75	1	97	360	AK-R2-360P500
	1.5	2	97	360	AK-R2-360P500
	2.2	3	97	120	AK-R2-120P1K2
	4.0	5	77	120	AK-R2-120P1K2
	5.5	7.5	55	120	AK-R2-120P1K2
	7.5	10	39	120	AK-R2-120P1K2
	11	15	24	120	❖AK-R2-120P1K2
500…600V, 50/60 Hz, Three-Phase	0.75	1	120	360	AK-R2-360P500
	1.5	2	120	360	AK-R2-360P500
	2.2	3	82	120	AK-R2-120P1K2
	4.0	5	82	120	AK-R2-120P1K2
	5.5	7.5	51	120	AK-R2-120P1K2
	7.5	10	51	120	AK-R2-120P1K2
	11	15	51	120	❖AK-R2-120P1K2

⌘ Verify resistor Ohms against minimum resistance for drive being used.
✦ Resistors listed are rated 5% duty cycle.
❖ Requires two resistors wired in parallel.

IP30, NEMA/UL Type 1 Conversion Kit

Description	Frame	Cat. No.
Converts IP20 drive to IP30, NEMA/UL Type 1 enclosure. Includes conduit box, mounting screws and plastic top panel.	B	22-JBAB
	C	22-JBAC
Converts IP20 drive to IP30, NEMA/UL Type 1 enclosure. Includes communication option conduit box, mounting screws and plastic top panel.	B	22-JBCB
	C	22-JBCC

Spare Parts

Description		Cat. No.
Fan Replacement Kits	Fan Replacement Kit - Frame B, 1 Fan	SK-U1-FAN1-B1
	Fan Replacement Kit - Frame B, 2 Fans	SK-U1-FAN2-B1
	Fan Replacement Kit - Frame C, 1 Fan	SK-U1-FAN1-C1
	Fan Replacement Kit - Frame C, 1 Fan, 15 Hp	SK-U1-FAN1-C2
Covers	Encoder Terminal Cover (All Frames)	SK-U1-DCVR4-EN
	Frame B Cover with Power Terminal Guard	SK-U1-DCVR3-B1
	Frame C Cover with Power Terminal Guard	SK-U1-DCVR3-C1

EMC Filters (Required to Meet CE Certification)

Drive Ratings			S Type Filter	L Type Filter
Input Voltage	kW	Hp	Cat. No. ✶	Cat. No. ‡
200…240V, 50/60 Hz, Single-Phase	0.4	0.5	❄	–
	0.75	1	❄	–
	1.5	2	❄	–
	2.2	3	❄	–
200…240V, 50/60 Hz, Three-Phase	0.4	0.5	➢22-RF021-BS	22-RF021-BL
	0.75	1	➢22-RF021-BS	22-RF021-BL
	1.5	2	➢22-RF021-BS	22-RF021-BL
	2.2	3	➢22-RF021-BS	22-RF021-BL
	3.7	5	➢22-RF021-BS	22-RF021-BL
	5.5	7.5	22-RF034-CS	22-RF034-CL
	7.5	10	22-RF034-CS	22-RF034-CL
380…480V, 50/60 Hz, Three-Phase	0.4	0.5	22-RF012-BS	22-RF012-BL
	0.75	1	22-RF012-BS	22-RF012-BL
	1.5	2	22-RF012-BS	22-RF012-BL
	2.2	3	22-RF012-BS	22-RF012-BL
	3.7	5	22-RF012-BS	22-RF012-BL
	5.5	7.5	22-RF018-CS	22-RF018-CL
	7.5	10	22-RF018-CS	22-RF018-CL
	11	15	22-RF026-CS	22-RF026-CL
500…600V, 50/60 Hz, Three-Phase	0.75	1	–	22-RF8P0-BL
	1.5	2	–	22-RF8P0-BL
	2.2	3	–	22-RF8P0-BL
	4.0	5	–	22-RF8P0-BL
	5.5	7.5	–	22-RF015-CL
	7.5	10	–	22-RF015-CL
	11	15	–	22-RF024-CL

✶ This filter is suitable for use with a cable length of up to 10 meters for Class A and 1 meter for Class B environments.
❄ Drives are available in these ratings with internal "S Type" filters.
‡ This filter is suitable for use with a cable length of up to 100 meters for Class A and 5 meters for Class B environments.
➢ Filter must be Series B or later.

The PowerFlex 70 offers a compact package of power, control and operator interface, designed to meet the demands for space, simplicity and reliability. This drive provides a broad spectrum of features, allowing you to easily integrate it into your architecture and configure it for most application needs.

Ratings	200…240V:	0.37…18.5 kW / 0.5…25 Hp / 2.2…70 A
	380…480V:	0.37…37 kW / 0.5…50 Hp / 1.1…72 A
	500…600V:	0.37…37 kW / 0.5…50 Hp / 0.9…52 A
Motor Control	• V/Hz control • Sensorless Vector Control • Flux Vector Control	
Communications	Common Industrial Protocol	
User Interface	HIM (option)	
Enclosures	IP20, Flange Mount, IP66 / NEMA 4X	
Safety	DriveGuard Safe Torque-Off / EN 954-1 Cat. 3	
Additional Features	• Speed and torque control with and without encoder feedback • Pjump and Traverse for Fibers application	
Certifications	• UL • cUL • IEC (Designed to Meet) • CE (excluding 600V) • C-Tick (excluding 600V) • NSF Certified (IP66, NEMA/UL Type 4X/12 only) • TÜV FS ISO/EN13849-1 (EN954-1) with Safe Torque-Off option • RINA Certified • ABS • Lloyd's Register • SEMI F47	
Options	See pages 6-65…6-74	

Panel Mount - IP 20, NEMA/UL Type 1, No HIM

200...240V AC, Three-Phase Drives

240V AC Input						208V AC Input ❄							
Output Amps			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps			Normal Duty kW	Heavy Duty kW	Cat. No.	with Filter	Frame Size
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.					
2.2	2.4	3.3	0.5	0.33	20AB2P2A0AYNNNC0	2.5	2.7	3.7	0.37	0.25	20AB2P2A0AYNNNC0	N	A
2.2	2.4	3.3	0.5	0.33	20AB2P2A0AYNANC0	2.5	2.7	3.7	0.37	0.25	20AB2P2A0AYNANC0	Y	B
4.2	4.8	6.4	1	0.75	20AB4P2A0AYNNNC0	4.8	5.5	7.4	0.75	0.55	20AB4P2A0AYNNNC0	N	A
4.2	4.8	6.4	1	0.75	20AB4P2A0AYNANC0	4.8	5.5	7.4	0.75	0.55	20AB4P2A0AYNANC0	Y	B
6.8	9	12	2	1.5	20AB6P8A0AYNNNC0	7.8	10.3	13.8	1.5	1.1	20AB6P8A0AYNNNC0	N	B
6.8	9	12	2	1.5	20AB6P8A0AYNANC0	7.8	10.3	13.8	1.5	1.1	20AB6P8A0AYNANC0	Y	B
9.6	10.6	14.4	3	2	20AB9P6A0AYNNNC0	11	12.1	16.5	2.2	1.5	20AB9P6A0AYNNNC0	N	B
9.6	10.6	14.4	3	2	20AB9P6A0AYNANC0	11	12.1	16.5	2.2	1.5	20AB9P6A0AYNANC0	Y	B
15.3	17.4	23.2	5	3	20AB015A0AYNANC0	17.5	19.2	26.2	4	3	20AB015A0AYNANC0	Y	C
22	24.2	33	7.5	5	20AB022A0AYNANC0	25.3	27.8	37.9	5.5	4	20AB022A0AYNANC0	Y	D
28	33	44	10	7.5	20AB028A0AYNANC0	32.2	37.9	50.6	7.5	5.5	20AB028A0AYNANC0	Y	D
42	46.2	63	15	10	20AB042A0AYNANC0	43	55.5	74	11	7.5	20AB042A0AYNANC0	Y	D
54	63	84	20	15	20AB054A0AYNANC0	62.1	72.4	96.6	15	11	20AB054A0AYNANC0	Y	E
70	81	108	25	20	20AB070A0AYNANC0	78.2	93.1	124	18.5	15	20AB070A0AYNANC0	Y	E

❄ Drive must be programmed to lower voltage to obtain the currents shown.

Panel Mount - IP 20, NEMA/UL Type 1, No HIM (continued)

380...480V AC, Three-Phase Drives

480V AC Input						400V AC Input							
Output Amps			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps			Normal Duty kW	Heavy Duty kW	Cat. No.	with Filter	Frame Size
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.					
1.1	1.2	1.6	0.5	0.33	20AD1P1A0AYNNNC0	1.3	1.4	1.9	0.37	0.25	20AC1P3A0AYNNNC0	N	A
1.1	1.2	1.6	0.5	0.33	20AD1P1A0AYNANC0	1.3	1.4	1.9	0.37	0.25	20AC1P3A0AYNANC0	Y	B
2.1	2.4	3.2	1	0.75	20AD2P1A0AYNNNC0	2.1	2.4	3.2	0.75	0.55	20AC2P1A0AYNNNC0	N	A
2.1	2.4	3.2	1	0.75	20AD2P1A0AYNANC0	2.1	2.4	3.2	0.75	0.55	20AC2P1A0AYNANC0	Y	B
3.4	4.5	6	2	1.5	20AD3P4A0AYNNNC0	3.5	4.5	6	1.5	1.1	20AC3P5A0AYNNNC0	N	A
3.4	4.5	6	2	1.5	20AD3P4A0AYNANC0	3.5	4.5	6	1.5	1.1	20AC3P5A0AYNANC0	Y	B
5	5.5	7.5	3	2	20AD5P0A0AYNNNC0	5	5.5	7.5	2.2	1.5	20AC5P0A0AYNNNC0	N	B
5	5.5	7.5	3	2	20AD5P0A0AYNANC0	5	5.5	7.5	2.2	1.5	20AC5P0A0AYNANC0	Y	B
8	8.8	12	5	3	20AD8P0A0AYNNNC0	8.7	9.9	13.2	4	3	20AC8P7A0AYNNNC0	N	B
8	8.8	12	5	3	20AD8P0A0AYNANC0	8.7	9.9	13.2	4	3	20AC8P7A0AYNANC0	Y	B
11	12.1	16.5	7.5	5	20AD011A0AYNANC0	11.5	13	17.4	5.5	4	20AC011A0AYNANC0	Y	C
14	16.5	22	10	7.5	20AD014A0AYNANC0	15.4	17.2	23.1	7.5	5.5	20AC015A0AYNANC0	Y	C
22	24.2	33	15	10	20AD022A0AYNANC0	22	24.2	33	11	7.5	20AC022A0AYNANC0	Y	D
27	33	44	20	15	20AD027A0AYNANC0	30	33	45	15	11	20AC030A0AYNANC0	Y	D
34	40.5	54	25	20	20AD034A0AYNANC0	37	45	60	18.5	15	20AC037A0AYNANC0	Y	D
40	51	68	30	25	20AD040A0AYNANC0	43	56	74	22	18.5	20AC043A0AYNANC0	Y	D
52	60	80	40	30	20AD052A0AYNANC0	60	66	90	30	22	20AC060A0AYNANC0	Y	E
65	78	104	50	40	20AD065A0AYNANC0	72	90	120	37	30	20AC072A0AYNANC0	Y	E

500...600V AC, Three-Phase Drives

600V AC Input							
Output Amps			Normal Duty Hp	Heavy Duty Hp	Cat. No.	with Filter	Frame Size
Cont.	1 Min.	3 Sec.					
0.9	1	1.4	0.5	0.33	20AE0P9A0AYNNNC0	N	A
1.7	1.9	2.6	1	0.75	20AE1P7A0AYNNNC0	N	A
2.7	3.6	4.8	2	1	20AE2P7A0AYNNNC0	N	A
3.9	4.3	5.8	3	1.5	20AE3P9A0AYNNNC0	N	B
6.1	6.7	9.1	5	3	20AE6P1A0AYNNNC0	N	B
9	9.9	13.5	7.5	5	20AE9P0A0AYNNNC0	N	C
11	13.5	18	10	7.5	20AE011A0AYNNNC0	N	C
17	18.7	25.5	15	10	20AE017A0AYNNNC0	N	D
22	25.5	34	20	15	20AE022A0AYNNNC0	N	D
27	33	44	25	20	20AE027A0AYNNNC0	N	D
32	40.5	54	30	25	20AE032A0AYNNNC0	N	D
41	48	64	40	30	20AE041A0AYNANC0	N	E
52	61.5	82	50	40	20AE052A0AYNANC0	N	E

Wall / Machine Mount - IP66, NEMA/UL Type 4X/12, with HIM, For Indoor Use

200...240V AC, Three-Phase Drives

240V AC Input						208V AC Input ❄							
Output Amps			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps			Normal Duty kW	Heavy Duty kW	Cat. No.	with Filter	Frame Size
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.					
2.2	2.4	3.3	0.5	0.33	20AB2P2C3AYNNNC0	2.5	2.7	3.7	0.37	0.25	20AB2P2C3AYNNNC0	N	B
2.2	2.4	3.3	0.5	0.33	20AB2P2C3AYNANC0	2.5	2.7	3.7	0.37	0.25	20AB2P2C3AYNANC0	Y	B
4.2	4.8	6.4	1	0.75	20AB4P2C3AYNNNC0	4.8	5.5	7.4	0.75	0.55	20AB4P2C3AYNNNC0	N	B
4.2	4.8	6.4	1	0.75	20AB4P2C3AYNANC0	4.8	5.5	7.4	0.75	0.55	20AB4P2C3AYNANC0	Y	B
6.8	9	12	2	1.5	20AB6P8C3AYNNNC0	7.8	10.3	13.8	1.5	1.1	20AB6P8C3AYNNNC0	N	B
6.8	9	12	2	1.5	20AB6P8C3AYNANC0	7.8	10.3	13.8	1.5	1.1	20AB6P8C3AYNANC0	Y	B
9.6	10.6	14.4	3	2	20AB9P6C3AYNNNC0	11	12.1	16.5	2.2	1.5	20AB9P6C3AYNNNC0	N	B
9.6	10.6	14.4	3	2	20AB9P6C3AYNANC0	11	12.1	16.5	2.2	1.5	20AB9P6C3AYNANC0	Y	B
15.3	17.4	23.2	5	3	20AB015C3AYNANC0	17.5	19.2	26.2	4	3	20AB015C3AYNANC0	Y	D
22	24.2	33	7.5	5	20AB022C3AYNANC0	25.3	27.8	37.9	5.5	4	20AB022C3AYNANC0	Y	D
28	33	44	10	7.5	20AB028C3AYNANC0	32.2	37.9	50.6	7.5	5.5	20AB028C3AYNANC0	Y	D
42	46.2	63	15	10	20AB042C3AYNANC0	43	55.5	74	11	7.5	20AB042C3AYNANC0	Y	D
54	63	84	20	15	20AB054C3AYNANC0	62.1	72.4	96.6	15	11	20AB054C3AYNANC0	Y	E
70	81	108	25	20	20AB070C3AYNANC0	78.2	93.1	124	18.5	15	20AB070C3AYNANC0	Y	E

❄ Drive must be programmed to lower voltage to obtain the currents shown.

380...480V AC, Three-Phase Drives

480V AC Input						400V AC Input							
Output Amps			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps			Normal Duty kW	Heavy Duty kW	Cat. No.	with Filter	Frame Size
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.					
1.1	1.2	1.6	0.5	0.33	20AD1P1C3AYNNNC0	1.3	1.4	1.9	0.37	0.25	20AC1P3C3AYNNNC0	N	B
1.1	1.2	1.6	0.5	0.33	20AD1P1C3AYNANC0	1.3	1.4	1.9	0.37	0.25	20AC1P3C3AYNANC0	Y	B
2.1	2.4	3.2	1	0.75	20AD2P1C3AYNNNC0	2.1	2.4	3.2	0.75	0.55	20AC2P1C3AYNNNC0	N	B
2.1	2.4	3.2	1	0.75	20AD2P1C3AYNANC0	2.1	2.4	3.2	0.75	0.55	20AC2P1C3AYNANC0	Y	B
3.4	4.5	6	2	1.5	20AD3P4C3AYNNNC0	3.5	4.5	6	1.5	1.1	20AC3P5C3AYNNNC0	N	B
3.4	4.5	6	2	1.5	20AD3P4C3AYNANC0	3.5	4.5	6	1.5	1.1	20AC3P5C3AYNANC0	Y	B
5	5.5	7.5	3	2	20AD5P0C3AYNNNC0	5	5.5	7.5	2.2	1.5	20AC5P0C3AYNNNC0	N	B
5	5.5	7.5	3	2	20AD5P0C3AYNANC0	5	5.5	7.5	2.2	1.5	20AC5P0C3AYNANC0	Y	B
8	8.8	12	5	3	20AD8P0C3AYNNNC0	8.7	9.9	13.2	4	3	20AC8P7C3AYNNNC0	N	B
8	8.8	12	5	3	20AD8P0C3AYNANC0	8.7	9.9	13.2	4	3	20AC8P7C3AYNANC0	Y	B
11	12.1	16.5	7.5	5	20AD011C3AYNANC0	11.5	13	17.4	5.5	4	20AC011C3AYNANC0	Y	D
14	16.5	22	10	7.5	20AD014C3AYNANC0	15.4	17.2	23.1	7.5	5.5	20AC015C3AYNANC0	Y	D
22	24.2	33	15	10	20AD022C3AYNANC0	22	24.2	33	11	7.5	20AC022C3AYNANC0	Y	D
27	33	44	20	15	20AD027C3AYNANC0	30	33	45	15	11	20AC030C3AYNANC0	Y	D
34	40.5	54	25	20	20AD034C3AYNANC0	37	45	60	18.5	15	20AC037C3AYNANC0	Y	D
40	51	68	30	25	20AD040C3AYNANC0	43	56	74	22	18.5	20AC043C3AYNANC0	Y	D
52	60	80	40	30	20AD052C3AYNANC0	60	66	90	30	22	20AC060C3AYNANC0	Y	E
65	78	104	50	40	20AD065C3AYNANC0	72	90	120	37	30	20AC072C3AYNANC0	Y	E

Wall / Machine Mount - IP66, NEMA/UL Type 4X/12, with HIM, For Indoor Use (continued)

500...600V AC, Three-Phase Drives

600V AC Input							
Output Amps							
Cont.	1 Min.	3 Sec.	Normal Duty Hp	Heavy Duty Hp	Cat. No.	with Filter	Frame Size
0.9	1	1.4	0.5	0.33	20AE0P9C3AYNNNC0	N	B
1.7	1.9	2.6	1	0.75	20AE1P7C3AYNNNC0	N	B
2.7	3.6	4.8	2	1	20AE2P7C3AYNNNC0	N	B
3.9	4.3	5.8	3	1.5	20AE3P9C3AYNNNC0	N	B
6.1	6.7	9.1	5	3	20AE6P1C3AYNNNC0	N	B
9	9.9	13.5	7.5	5	20AE9P0C3AYNNNC0	N	D
11	13.5	18	10	7.5	20AE011C3AYNNNC0	N	D
17	18.7	25.5	15	10	20AE017C3AYNNNC0	N	D
22	25.5	34	20	15	20AE022C3AYNNNC0	N	D
27	33	44	25	20	20AE027C3AYNNNC0	N	D
32	40.5	54	30	25	20AE032C3AYNNNC0	N	D
41	48	64	40	30	20AE041C3AYNANC0	N	E
52	61.5	82	50	40	20AE052C3AYNANC0	N	E

Wall / Machine Mount - IP54, NEMA/UL Type 12, with HIM

200...240V AC, Three-Phase Drives

240V AC Input					208V AC Input ❄							
Output Amps			Normal Duty Hp	Heavy Duty Hp	Output Amps			Normal Duty kW	Heavy Duty kW	Cat. No.	with Filter	Frame Size
Cont.	1 Min.	3 Sec.			Cont.	1 Min.	3 Sec.					
54	63	84	20	15	62.1	72.4	96.6	15	11	20AB054G3AYNANC0	Y	E
70	81	108	25	20	78.2	93.1	124	18.5	15	20AB070G3AYNANC0	Y	E

❄ Drive must be programmed to lower voltage to obtain the currents shown.

380...480V AC, Three-Phase Drives

480V AC Input						400V AC Input							
Output Amps			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps			Normal Duty kW	Heavy Duty kW	Cat. No.	with Filter	Frame Size
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.					
52	60	80	40	30	20AD052G3AYNANC0	60	66	90	30	22	20AC060G3AYNANC0	Y	E
65	78	104	50	40	20AD065G3AYNANC0	72	90	120	37	30	20AC072G3AYNANC0	Y	E

500...600V AC, Three-Phase Drives

600V AC Input							
Output Amps							
Cont.	1 Min.	3 Sec.	Normal Duty Hp	Heavy Duty Hp	Cat. No.	with Filter	Frame Size
41	48	64	40	30	20AE041G3AYNANC0	Y	E
52	61.5	82	50	40	20AE052G3AYNANC0	Y	E

Flange Mount - Front Chassis = IP20, NEMA/UL Type 1, Heatsink = IP66, NEMA/UL Type 4X/12, No HIM

200...240V AC, Three-Phase Drives

240V AC Input						208V AC Input ❄							
Output Amps			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps			Normal Duty kW	Heavy Duty kW	Cat. No.	with Filter	Frame Size
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.					
2.2	2.4	3.3	0.5	0.33	20AB2P2F0AYNNNC0	2.5	2.7	3.7	0.37	0.25	20AB2P2F0AYNNNC0	N	A
2.2	2.4	3.3	0.5	0.33	20AB2P2F0AYNANC0	2.5	2.7	3.7	0.37	0.25	20AB2P2F0AYNANC0	Y	B
4.2	4.8	6.4	1	0.75	20AB4P2F0AYNNNC0	4.8	5.5	7.4	0.75	0.55	20AB4P2F0AYNNNC0	N	A
4.2	4.8	6.4	1	0.75	20AB4P2F0AYNANC0	4.8	5.5	7.4	0.75	0.55	20AB4P2F0AYNANC0	Y	B
6.8	9	12	2	1.5	20AB6P8F0AYNNNC0	7.8	10.3	13.8	1.5	1.1	20AB6P8F0AYNNNC0	N	B
6.8	9	12	2	1.5	20AB6P8F0AYNANC0	7.8	10.3	13.8	1.5	1.1	20AB6P8F0AYNANC0	Y	B
9.6	10.6	14.4	3	2	20AB9P6F0AYNNNC0	11	12.1	16.5	2.2	1.5	20AB9P6F0AYNNNC0	N	B
9.6	10.6	14.4	3	2	20AB9P6F0AYNANC0	11	12.1	16.5	2.2	1.5	20AB9P6F0AYNANC0	Y	B
15.3	17.4	23.2	5	3	20AB015F0AYNANC0	17.5	19.2	26.2	4	3	20AB015F0AYNANC0	Y	C
22	24.2	33	7.5	5	20AB022F0AYNANC0	25.3	27.8	37.9	5.5	4	20AB022F0AYNANC0	Y	D
28	33	44	10	7.5	20AB028F0AYNANC0	32.2	37.9	50.6	7.5	5.5	20AB028F0AYNANC0	Y	D
42	46.2	63	15	10	20AB042F0AYNANC0	43	55.5	74	11	7.5	20AB042F0AYNANC0	Y	D
54	63	84	20	15	20AB054F0AYNANC0	62.1	72.4	96.6	15	11	20AB054F0AYNANC0	Y	E
70	81	108	25	20	20AB070F0AYNANC0	78.2	93.1	124	18.5	15	20AB070F0AYNANC0	Y	E

❄ Drive must be programmed to lower voltage to obtain the currents shown.

380...480V AC, Three-Phase Drives

480V AC Input						400V AC Input							
Output Amps			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps			Normal Duty kW	Heavy Duty kW	Cat. No.	with Filter	Frame Size
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.					
1.1	1.2	1.6	0.5	0.33	20AD1P1F0AYNNNC0	1.3	1.4	1.9	0.37	0.25	20AC1P3F0AYNNNC0	N	A
1.1	1.2	1.6	0.5	0.33	20AD1P1F0AYNANC0	1.3	1.4	1.9	0.37	0.25	20AC1P3F0AYNANC0	Y	B
2.1	2.4	3.2	1	0.75	20AD2P1F0AYNNNC0	2.1	2.4	3.2	0.75	0.55	20AC2P1F0AYNNNC0	N	A
2.1	2.4	3.2	1	0.75	20AD2P1F0AYNANC0	2.1	2.4	3.2	0.75	0.55	20AC2P1F0AYNANC0	Y	B
3.4	4.5	6	2	1.5	20AD3P4F0AYNNNC0	3.5	4.5	6	1.5	1.1	20AC3P5F0AYNNNC0	N	A
3.4	4.5	6	2	1.5	20AD3P4F0AYNANC0	3.5	4.5	6	1.5	1.1	20AC3P5F0AYNANC0	Y	B
5	5.5	7.5	3	2	20AD5P0F0AYNNNC0	5	5.5	7.5	2.2	1.5	20AC5P0F0AYNNNC0	N	B
5	5.5	7.5	3	2	20AD5P0F0AYNANC0	5	5.5	7.5	2.2	1.5	20AC5P0F0AYNANC0	Y	B
8	8.8	12	5	3	20AD8P0F0AYNNNC0	8.7	9.9	13.2	4	3	20AC8P7F0AYNNNC0	N	B
8	8.8	12	5	3	20AD8P0F0AYNANC0	8.7	9.9	13.2	4	3	20AC8P7F0AYNANC0	Y	B
11	12.1	16.5	7.5	5	20AD011F0AYNANC0	11.5	13	17.4	5.5	4	20AC011F0AYNANC0	Y	C
14	16.5	22	10	7.5	20AD014F0AYNANC0	15.4	17.2	23.1	7.5	5.5	20AC015F0AYNANC0	Y	C
22	24.2	33	15	10	20AD022F0AYNANC0	22	24.2	33	11	7.5	20AC022F0AYNANC0	Y	D
27	33	44	20	15	20AD027F0AYNANC0	30	33	45	15	11	20AC030F0AYNANC0	Y	D
34	40.5	54	25	20	20AD034F0AYNANC0	37	45	60	18.5	15	20AC037F0AYNANC0	Y	D
40	51	68	30	25	20AD040F0AYNANC0	43	56	74	22	18.5	20AC043F0AYNANC0	Y	D
52	60	80	40	30	20AD052F0AYNANC0	60	66	90	30	22	20AC060F0AYNANC0	Y	E
65	78	104	50	40	20AD065F0AYNANC0	72	90	120	37	30	20AC072F0AYNANC0	Y	E

❄ Drive must be programmed to lower voltage to obtain the currents shown.

Flange Mount - Front Chassis = IP20, NEMA/UL Type 1, Heatsink = IP66, NEMA/UL Type 4X/12, No HIM (continued)

500...600V AC, Three-Phase Drives

600V AC Input							
Output Amps							
Cont.	1 Min.	3 Sec.	Normal Duty Hp	Heavy Duty Hp	Cat. No.	with Filter	Frame Size
0.9	1	1.4	0.5	0.33	20AE0P9F0AYNNNC0	N	A
1.7	1.9	2.6	1	0.75	20AE1P7F0AYNNNC0	N	A
2.7	3.6	4.8	2	1	20AE2P7F0AYNNNC0	N	A
3.9	4.3	5.8	3	1.5	20AE3P9F0AYNNNC0	N	B
6.1	6.7	9.1	5	3	20AE6P1F0AYNNNC0	N	B
9	9.9	13.5	7.5	5	20AE9P0F0AYNNNC0	N	C
11	13.5	18	10	7.5	20AE011F0AYNNNC0	N	C
17	18.7	25.5	15	10	20AE017F0AYNNNC0	N	D
22	25.5	34	20	15	20AE022F0AYNNNC0	N	D
27	33	44	25	20	20AE027F0AYNNNC0	N	D
32	40.5	54	30	25	20AE032F0AYNNNC0	N	D
41	48	64	40	30	20AE041F0AYNANC0	N	E
52	61.5	82	50	40	20AE052F0AYNANC0	N	E

Ratings	380…480V:	132…1200 kW / 200…1900 Hp / 261…2150 A
	500…600V:	160…2000 kW / 250…900 Hp / 261…820 A
	690V:	160…2300 kW / 150…2400 Hp / 170…2250 A
Motor Control	• V/Hz control • Sensorless Vector Control	
Communications	Common Industrial Protocol	
User Interface	HIM (option)	
Enclosures	IP21	
Safety	DriveGuard Safe Torque-Off / EN954-1 Cat. 3	
Certifications	• UL • cUL • ATEX Certified with Safe Torque-Off • IEC (Designed to Meet) - with Rittal Enclosure • CE - with Rittal Enclosure • C-Tick • TÜV FS ISO/EN13849-1 (EN954-1) with Safe Torque-Off option	
Options	See pages 6-65…6-74	

The PowerFlex 700H drive is ideal for high power applications requiring speed control performance. This drive provides excellent torque at low speeds for demanding speed control applications and has configurable control modes for a wide variety of applications. The PowerFlex 700H also has an ATEX certified option for drives that operate in potentially explosive environments.

IP21, NEMA Type 1

380…480V AC, Three-Phase Drives with 24V DC I/O

480V AC Input						400V AC Input						Frame Size
Output Amps ✶			Normal Duty Hp	Heavy Duty Hp	Cat. No. §➢	Output Amps ✶			Normal Duty kW	Heavy Duty kW	Cat. No. §➢	
Cont.	1 Min.	2 Sec. ❄				Cont.	1 Min.	2 Sec. ❄				
261 (205)	287 (308)	410 (410)	200	150	20CD261A0ANNBNA0	261 (205)	287 (308)	410 (410)	132	110	20CC261A0ANNBNA0	9
300 (245)	330 (368)	450 (490)	250	200	20CD300A0ANNBNA0	300 (245)	330 (368)	450 (490)	160	132	20CC300A0ANNBNA0	9
385 (300)	424 (450)	600 (600)	300	250	20CD385A0ANNBNA0	385 (300)	424 (450)	600 (600)	200	160	20CC385A0ANNBNA0	10
460 (385)	506 (578)	770 (770)	350	300	20CD460A0ANNBNA0	460 (385)	506 (578)	770 (770)	250	200	20CC460A0ANNBNA0	10
500 (420)	550 (630)	750 (840)	450	350	20CD500A0ANNBNA0	500 (420)	550 (630)	750 (840)	250	250	20CC500A0ANNBNA0	10
590 (520)	649 (780)	956 (956)	500	450	20CD590A0ANNBNA0	590 (520)	649 (780)	956 (956)	315	250	20CC590A0ANNBNA0	11
650 (590)	715 (885)	1062 (1062)	500	500	20CD650A0ANNBNA0	650 (590)	715 (885)	1062 (1062)	355	315	20CC650A0ANNBNA0	11
730 (650)	803 (975)	1095 (1170)	600	500	20CD730A0ANNBNA0	730 (650)	803 (975)	1095 (1170)	400	355	20CC730A0ANNBNA0	11
820 (730)	902 (1095)	1230 (1314)	700	600	20CD820A0ANNBNA0	820 (730)	902 (1095)	1230 (1314)	450	400	20CC820A0ANNBNA0	12
920 (820)	1012 (1230)	1380 (1476)	800	700	20CD920A0ANNBNA0	920 (820)	1012 (1230)	1380 (1476)	500	450	20CC920A0ANNBNA0	12
1030 (920)	1133 (1370)	1555 (1600)	900	800	20CD1K0A0ANNBNA0	1030 (920)	1133 (1370)	1555 (1600)	560	500	20CC1K0A0ANNBNA0	12
1150 (1030)	1265 (1545)	1620 (1620)	1000	900	20CD1K1A0ANNBNA0	1150 (1030)	1265 (1545)	1620 (1620)	630	560	20CC1K1A0ANNBNA0	13
1300 (1150)	1430 (1725)	2079 (2079)	1200	1000	20CD1K3A0ANNBNA0	1300 (1150)	1430 (1725)	2079 (2079)	710	630	20CC1K3A0ANNBNA0	13
1450 (1200)	1595 (1800)	2175 (2400)	1250	1000	20CD1K4A0ANNBNA0	1450 (1200)	1595 (1800)	2175 (2400)	800	710	20CC1K4A0ANNBNA0	13
1770 (1600)	1947 (2400)	2655 (2880)	1500	1400	20CD1K7A0ANNENA0	1770 (1600)	1947 (2400)	2655 (2880)	1000	900	20CC1K7A0ANNENA0	14
2150 (1940)	2365 (2910)	3225 (3492)	1900	1700	20CD2K1A0ANNENA0	2150 (1940)	2365 (2910)	3225 (3492)	1200	1100	20CC2K1A0ANNENA0	14

✶ These drives have dual current ratings; normal duty applications and heavy duty applications (in parenthesis). The drive may be operated at either rating.
❄ The 2 sec. output current is only available at initial start or drive operating at light load.
§ Frames 10 & up include a Rittal enclosure.
➢ Drives listed do not include a Control and I/O option.

IP21, NEMA Type 1 (continued)

600…690V AC, Three-Phase Drives with 24V DC I/O

600V AC Input						690V AC Input						Frame Size
Output Amps ✶			Normal Duty Hp	Heavy Duty Hp	Cat. No. §➢	Output Amps ✶			Normal Duty kW	Heavy Duty kW	Cat. No. §➢	
Cont.	1 Min.	2 Sec. ❄				Cont.	1 Min.	2 Sec. ❄				
170 (144)	187 (216)	245 (245)	150	150	20CE170A0ANNBNA0	170 (144)	187 (216)	245 (245)	160	132	20CF170A0ANNBNA0	9
208 (170)	230 (250)	289 (289)	200	150	20CE208A0ANNBNA0	208 (170)	230 (250)	289 (289)	200	160	20CF208A0ANNBNA0	9
261 (208)	287 (312)	375 (375)	250	200	20CE261A0ANNBNA0	261 (208)	287 (312)	375 (375)	250	200	20CF261A0ANNBNA0	10
325 (261)	358 (392)	470 (470)	350	250	20CE325A0ANNBNA0	325 (261)	358 (392)	470 (470)	315	250	20CF325A0ANNBNA0	10
385 (325)	424 (488)	585 (585)	400	350	20CE385A0ANNBNA0	385 (325)	424 (488)	585 (585)	355	315	20CF385A0ANNBNA0	10
416 (325)	458 (488)	585 (585)	450	350	20CE416A0ANNBNA0	416 (325)	458 (488)	585 (585)	400	315	20CF416A0ANNBNA0	10
460 (385)	506 (578)	693 (693)	500	400	20CE460A0ANNBNA0	460 (385)	506 (578)	693 (693)	450	355	20CF460A0ANNBNA0	11
502 (460)	552 (690)	828 (828)	500	500	20CE502A0ANNBNA0	502 (460)	552 (690)	828 (828)	500	450	20CF502A0ANNBNA0	11
590 (502)	649 (753)	885 (904)	600	500	20CE590A0ANNBNA0	590 (502)	649 (753)	885 (904)	560	500	20CF590A0ANNBNA0	11
650 (590)	715 (885)	1062 (1062)	700	650	20CE650A0ANNBNA0	650 (590)	715 (885)	1062 (1062)	630	560	20CF650A0ANNBNA0	12
750 (650)	825 (975)	1170 (1170)	800	700	20CE750A0ANNBNA0	750 (650)	825 (975)	1170 (1170)	710	630	20CF750A0ANNBNA0	12
820 (750)	902 (975)	1170 (1170)	900	700	20CE820A0ANNBNA0	820 (750)	902 (975)	1170 (1170)	800	630	20CF820A0ANNBNA0	12
920 (820)	1012 (1230)	1380 (1410)	1000	900	20CE920A0ANNBNA0	920 (820)	1012 (1230)	1380 (1410)	900	800	20CF920A0ANNBNA0	13
1030 (920)	1133 (1380)	1545 (1755)	1100	1000	20CE1K0A0ANNBNA0	1030 (920)	1133 (1380)	1545 (1755)	1000	900	20CF1K0A0ANNBNA0	13
1180 (1030)	1298 (1463)	1755 (1755)	1300	1100	20CE1K1A0ANNBNA0	1180 (1030)	1298 (1463)	1755 (1755)	1100	1000	20CF1K1A0ANNBNA0	13
1500 (1300)	1650 (1950)	2250 (2340)	1600	1400	20CE1K5A0ANNENA0	1500 (1300)	1650 (1950)	2250 (2340)	1500	1300	20CF1K5A0ANNENA0	14
1900 (1500)	2090 (2250)	2700 (2700)	2000	1600	20CE1K9A0ANNENA0	1900 (1500)	2090 (2250)	2700 (2700)	1900	1500	20CF1K9A0ANNENA0	14
2250 (1900)	2475 (2782)	3335 (3335)	2400	2000	20CE2K2A0ANNENA0	2250 (1900)	2475 (2782)	3335 (3335)	2300	1900	20CF2K2A0ANNENA0	14

✶ These drives have dual current ratings; normal duty applications and heavy duty applications (in parenthesis). The drive may be operated at either rating.
❄ The 2 sec. output current is only available at initial start or drive operating at light load.
§ Frames 10 & up include a Rittal enclosure.
➢ Drives listed do not include a Control and I/O option.

IP20, NEMA Type 1, MCC

380…480V AC, Three-Phase Drives with 24V DC I/O

480V AC Input						400V AC Input						Frame Size
Output Amps ✶			Normal Duty Hp	Heavy Duty Hp	Cat. No. ➢	Output Amps ✶			Normal Duty kW	Heavy Duty kW	Cat. No. ➢	
Cont.	1 Min.	2 Sec. ❄				Cont.	1 Min.	2 Sec. ❄				
385 (300)	424 (450)	600 (600)	300	250	20CD385B0ANNBNA0	385 (300)	424 (450)	600 (600)	200	160	20CD385B0ANNBNA0	10
460 (385)	506 (578)	770 (770)	350	300	20CD460B0ANNBNA0	460 (385)	506 (578)	770 (770)	250	200	20CD460B0ANNBNA0	10
500 (420)	550 (630)	750 (840)	450	350	20CD500B0ANNBNA0	500 (420)	550 (630)	750 (840)	250	250	20CD500B0ANNBNA0	10
590 (520)	649 (780)	956 (956)	500	450	20CD590B0ANNBNA0	590 (520)	649 (780)	956 (956)	315	250	20CD590B0ANNBNA0	11
650 (590)	715 (885)	1062 (1062)	500	500	20CD650B0ANNBNA0	650 (590)	715 (885)	1062 (1062)	355	315	20CD650B0ANNBNA0	11
730 (650)	803 (975)	1095 (1170)	600	500	20CD730B0ANNBNA0	730 (650)	803 (975)	1095 (1170)	400	355	20CD730B0ANNBNA0	11
820 (730)	902 (1095)	1230 (1314)	700	600	20CD820B0ANNBNA0	820 (730)	902 (1095)	1230 (1314)	450	400	20CD820B0ANNBNA0	12
920 (820)	1012 (1230)	1380 (1476)	800	700	20CD920B0ANNBNA0	920 (820)	1012 (1230)	1380 (1476)	500	450	20CD920B0ANNBNA0	12
1030 (920)	1133 (1370)	1555 (1600)	900	800	20CD1K0B0ANNBNA0	1030 (920)	1133 (1370)	1555 (1600)	560	500	20CD1K0B0ANNBNA0	12

✶ These drives have dual current ratings; normal duty applications and heavy duty applications (in parenthesis). The drive may be operated at either rating.
❄ The 2 sec. output current is only available at initial start or drive operating at light load.
➢ Drives listed do not include a Control and I/O option.

600V AC, Three-Phase Drives with 24V DC I/O

600V AC Input						Frame Size
Output Amps ✶			Normal Duty Hp	Heavy Duty Hp	Cat. No. ➢	
Cont.	1 Min.	2 Sec. ❄				
261 (208)	287 (312)	375 (375)	250	200	20CE261B0ANNBNA0	10
325 (261)	358 (392)	470 (470)	350	250	20CE325B0ANNBNA0	10
385 (325)	424 (488)	585 (585)	400	350	20CE385B0ANNBNA0	10
416 (325)	458 (488)	585 (585)	450	350	20CE416B0ANNBNA0	10
460 (385)	506 (578)	693 (693)	500	400	20CE460B0ANNBNA0	11
502 (460)	552 (690)	828 (828)	500	500	20CE502B0ANNBNA0	11
590 (502)	649 (753)	885 (904)	600	500	20CE590B0ANNBNA0	11
650 (590)	715 (885)	1062 (1062)	700	650	20CE650B0ANNBNA0	12
750 (650)	825 (975)	1170 (1170)	800	700	20CE750B0ANNBNA0	12
820 (750)	902 (975)	1170 (1170)	900	700	20CE820B0ANNBNA0	12

✶ These drives have dual current ratings; normal duty applications and heavy duty applications (in parenthesis). The drive may be operated at either rating.
❄ The 2 sec. output current is only available at initial start or drive operating at light load.
➢ Drives listed do not include a Control and I/O option.

IP54, NEMA Type 12, Rittal

380…480V AC, Three-Phase Drives with 24V DC I/O

480V AC Input						400V AC Input						Frame Size
Output Amps ✶			Normal Duty Hp	Heavy Duty Hp	Cat. No. ➢	Output Amps ✶			Normal Duty kW	Heavy Duty kW	Cat. No. ➢	
Cont.	1 Min.	2 Sec. ❄				Cont.	1 Min.	2 Sec. ❄				
385 (300)	424 (450)	600 (600)	300	250	20CD385H0ANNBNA0	385 (300)	424 (450)	600 (600)	200	160	20CC385H0ANNBNA0	10
460 (385)	506 (578)	770 (770)	350	300	20CD460H0ANNBNA0	460 (385)	506 (578)	770 (770)	250	200	20CC460H0ANNBNA0	10
500 (420)	550 (630)	750 (840)	450	350	20CD500H0ANNBNA0	500 (420)	550 (630)	750 (840)	250	250	20CC500H0ANNBNA0	10
590 (520)	649 (780)	956 (956)	500	450	20CD590H0ANNBNA0	590 (520)	649 (780)	956 (956)	315	250	20CC590H0ANNBNA0	11
650 (590)	715 (885)	1062 (1062)	500	500	20CD650H0ANNBNA0	650 (590)	715 (885)	1062 (1062)	355	315	20CC650H0ANNBNA0	11
730 (650)	803 (975)	1095 (1170)	600	500	20CD730H0ANNBNA0	730 (650)	803 (975)	1095 (1170)	400	355	20CC730H0ANNBNA0	11
820 (730)	902 (1095)	1230 (1314)	700	600	20CD820H0ANNBNA0	820 (730)	902 (1095)	1230 (1314)	450	400	20CC820H0ANNBNA0	12
920 (820)	1012 (1230)	1380 (1476)	800	700	20CD920H0ANNBNA0	920 (820)	1012 (1230)	1380 (1476)	500	450	20CC920H0ANNBNA0	12
1030 (920)	1133 (1370)	1555 (1600)	900	800	20CD1K0H0ANNBNA0	1030 (920)	1133 (1370)	1555 (1600)	560	500	20CC1K0H0ANNBNA0	12
1150 (1030)	1265 (1545)	1620 (1620)	1000	900	20CD1K1H0ANNBNA0	1150 (1030)	1265 (1545)	1620 (1620)	630	560	20CC1K1H0ANNBNA0	13
1300 (1150)	1430 (1725)	2079 (2079)	1200	1000	20CD1K3H0ANNBNA0	1300 (1150)	1430 (1725)	2079 (2079)	710	630	20CC1K3H0ANNBNA0	13
1450 (1200)	1595 (1800)	2175 (2400)	1250	1000	20CD1K4H0ANNBNA0	1450 (1200)	1595 (1800)	2175 (2400)	800	710	20CC1K4H0ANNBNA0	13
1770 (1600)	1947 (2400)	2655 (2880)	1500	1400	20CD1K7H0ANNENA0	1770 (1600)	1947 (2400)	2655 (2880)	1000	900	20CC1K7H0ANNENA0	14
2150 (1940)	2365 (2910)	3225 (3492)	1900	1700	20CD2K1H0ANNENA0	2150 (1940)	2365 (2910)	3225 (3492)	1200	1100	20CC2K1H0ANNENA0	14

✶ These drives have dual current ratings; normal duty applications and heavy duty applications (in parenthesis). The drive may be operated at either rating.
❄ The 2 sec. output current is only available at initial start or drive operating at light load.
➢ Drives listed do not include a Control and I/O option.

600…690V AC, Three-Phase Drives with 24V DC I/O

600V AC Input						690V AC Input						Frame Size
Output Amps ✶			Normal Duty Hp	Heavy Duty Hp	Cat. No. ➢	Output Amps ✶			Normal Duty kW	Heavy Duty kW	Cat. No. ➢	
Cont.	1 Min.	2 Sec. ❄				Cont.	1 Min.	2 Sec. ❄				
261 (208)	287 (312)	375 (375)	250	200	20CE261H0ANNBNA0	261 (208)	287 (312)	375 (375)	250	200	20CF261H0ANNBNA0	10
325 (261)	358 (392)	470 (470)	350	250	20CE325H0ANNBNA0	325 (261)	358 (392)	470 (470)	315	250	20CF325H0ANNBNA0	10
385 (325)	424 (488)	585 (585)	400	350	20CE385H0ANNBNA0	385 (325)	424 (488)	585 (585)	355	315	20CF385H0ANNBNA0	10
416 (325)	458 (488)	585 (585)	450	350	20CE416H0ANNBNA0	416 (325)	458 (488)	585 (585)	400	315	20CF416H0ANNBNA0	10
460 (385)	506 (578)	693 (693)	500	400	20CE460H0ANNBNA0	460 (385)	506 (578)	693 (693)	450	355	20CF460H0ANNBNA0	11
502 (460)	552 (690)	828 (828)	500	500	20CE502H0ANNBNA0	502 (460)	552 (690)	828 (828)	500	450	20CF502H0ANNBNA0	11
590 (502)	649 (753)	885 (904)	600	500	20CE590H0ANNBNA0	590 (502)	649 (753)	885 (904)	560	500	20CF590H0ANNBNA0	11
650 (590)	715 (885)	1062 (1062)	700	650	20CE650H0ANNBNA0	650 (590)	715 (885)	1062 (1062)	630	560	20CF650H0ANNBNA0	12
750 (650)	825 (975)	1170 (1170)	800	700	20CE750H0ANNBNA0	750 (650)	825 (975)	1170 (1170)	710	630	20CF750H0ANNBNA0	12
820 (750)	902 (975)	1170 (1170)	900	700	20CE820H0ANNBNA0	820 (750)	902 (975)	1170 (1170)	800	630	20CF820H0ANNBNA0	12
920 (820)	1012 (1230)	1380 (1410)	1000	900	20CE920H0ANNBNA0	920 (820)	1012 (1230)	1380 (1410)	900	800	20CF920H0ANNBNA0	13
1030 (920)	1133 (1380)	1545 (1755)	1100	1000	20CE1K0H0ANNBNA0	1030 (920)	1133 (1380)	1545 (1755)	1000	900	20CF1K0H0ANNBNA0	13
1180 (1030)	1298 (1463)	1755 (1755)	1300	1100	20CE1K1H0ANNBNA0	1180 (1030)	1298 (1463)	1755 (1755)	1100	1000	20CF1K1H0ANNBNA0	13
1500 (1300)	1650 (1950)	2250 (2340)	1600	1400	20CE1K5H0ANNENA0	1500 (1300)	1650 (1950)	2250 (2340)	1500	1300	20CF1K5H0ANNENA0	14
1900 (1500)	2090 (2250)	2700 (2700)	2000	1600	20CE1K9H0ANNENA0	1900 (1500)	2090 (2250)	2700 (2700)	1900	1500	20CF1K9H0ANNENA0	14
2250 (1900)	2475 (2782)	3335 (3335)	2400	2000	20CE2K2H0ANNENA0	2250 (1900)	2475 (2782)	3335 (3335)	2300	1900	20CF2K2H0ANNENA0	14

✶ These drives have dual current ratings; normal duty applications and heavy duty applications (in parenthesis). The drive may be operated at either rating.
❄ The 2 sec. output current is only available at initial start or drive operating at light load.
➢ Drives listed do not include a Control and I/O option.

The PowerFlex 700S offers optimized integration for the most demanding stand-alone and coordinated drive control and drive system applications. The PowerFlex 700S offers a DriveLogix option which combines the powerful performance and flexible control of PowerFlex AC drives with a high-performance Logix engine to produce a highly functional, cost-effective drive and control solution.

Ratings	200…240V:	0.75…66 kW / 1…100 Hp / 4.2…260 A
	380…480V:	0.75…800 kW / 1…1250 Hp / 2.1…1450 A
	500…600V:	0.75…1500 kW / 1…1600 Hp / 1.7…1500 A
	690V:	45…1500 kW / 50…1600 Hp / 77…1500 A
Motor Control	• V/Hz control • Vector Control with FORCE Technology (with and without encoder) • Permanent Magnet Motor Control	
Communications	Common Industrial Protocol	
User Interface	HIM (option)	
Enclosures	IP20, IP21	
Safety	DriveGuard Safe Torque-Off / EN 954-1 Cat. 3	
Additional Features	• Integrated position loop for simple indexing to electronic line shaft applications • SynchLink for high speed data transfer and synchronization • Multiple motor feedback options • DriveLogix	
Certifications	• UL • cUL • CE • C-Tick • IEC (Designed to Meet) • TÜV FS ISO/EN13849-1 (EN954-1) with Safe Torque-Off option • RINA, Frames 1…10	
Options	See pages 6-65…6-74	

IP20, NEMA/UL Type 1

200…240V AC, Three-Phase Drives

240V AC Input						208V AC Input ✶						Frame Size
Output Amps			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps			Normal Duty kW	Heavy Duty kW	Cat. No.	
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.				
4.2	4.8	6.4	1	0.75	20DB4P2A0EYNANANE	4.8	5.6	7	0.75	0.37	20DB4P2A0EYNANANE	1
6.8	9	12	2	1.5	20DB6P8A0EYNANANE	7.8	10.4	13.8	1.5	0.75	20DB6P8A0EYNANANE	1
9.6	10.6	14.4	3	2	20DB9P6A0EYNANANE	11	12.1	17	2.2	1.5	20DB9P6A0EYNANANE	1
15.3	16.8	23	5	3	20DB015A0EYNANANE	17.5	19.3	26.3	4	2.2	20DB015A0EYNANANE	1
22	24.2	33	7.5	5	20DB022A0EYNANANE	25.3	27.8	38	5.5	4	20DB022A0EYNANANE	1
28	33	44	10	7.5	20DB028A0EYNANANE	32.2	38	50.6	7.5	5.5	20DB028A0EYNANANE	2
42	46.2	63	15	10	20DB042A0EYNANANE	48.3	53.1	72.5	11	7.5	20DB042A0EYNANANE	3
52	63	80	20	15	20DB052A0EYNANANE	56	64	86	15	11	20DB052A0EYNANANE	3
70	78	105	25	20	20DB070A0ENNANANE	78.2	86	117.3	18.5	15	20DB070A0ENNANANE	4 §
80	105	136	30	25	20DB080A0ENNANANE	92	117.3	156.4	22	18.5	20DB080A0ENNANANE	4 §
104 (80) ❄	115 (120)	175 (160)	40	30	20DB104A0ENNANANE	120 (92)	132 (138)	175 (175)	30	22	20DB104A0ENNANANE	5 §
130 (104) ❄	143 (156)	175 (175)	50	40	20DB130A0ENNANANE	130 (104)	143 (156)	175 (175)	30	30	20DB130A0ENNANANE	5 §
154 (130) ❄	169 (195)	231 (260)	60	50	20DB154A0ENNANANE	177 (150)	195 (225)	266 (300)	45	37	20DB154A0ENNANANE	6 §
192 (154) ❄	211 (231)	288 (308)	75	60	20DB192A0ENNANANE	221 (177)	243 (266)	308 (308)	55	45	20DB192A0ENNANANE	6 §
260 (205) ❄	286 (305)	390 (410)	100	75	20DB260A0ENNANANE	260 (205)	286 (305)	390 (410)	66	55	20DB260A0ENNANANE	6 §

✶ Drive must be programmed to lower voltage to obtain higher currents shown.

❄ These drives have dual current ratings; one for normal duty applications, and one for heavy duty applications (in parenthesis). The drive may be operated at either rating.

§ Also available with internal Brake IGBT (20DxxxxA0E **Y** NANANE).

380…480V AC, Three-Phase Drives

480V AC Input						400V AC Input						Frame Size
Output Amps			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps			Normal Duty kW	Heavy Duty kW	Cat. No.	
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.				
2.1	2.4	3.2	1	0.75	20DD2P1A0EYNANANE	2.1	2.4	3.2	0.75	0.55	20DC2P1A0EYNANANE	1
3.4	4.5	6	2	1.5	20DD3P4A0EYNANANE	3.5	4.5	6	1.5	0.75	20DC3P5A0EYNANANE	1
5	5.5	7.5	3	2	20DD5P0A0EYNANANE	5	5.5	7.5	2.2	1.5	20DC5P0A0EYNANANE	1
8	8.8	12	5	3	20DD8P0A0EYNANANE	8.7	9.9	13.2	4	2.2	20DC8P7A0EYNANANE	1
11	12.1	16.5	7.5	5	20DD011A0EYNANANE	11.5	13	17.4	5.5	4	20DC011A0EYNANANE	1
14	16.5	22	10	7.5	20DD014A0EYNANANE	15.4	17.2	23.1	7.5	5.5	20DC015A0EYNANANE	1
22	24.2	33	15	10	20DD022A0EYNANANE	22	24.2	33	11	7.5	20DC022A0EYNANANE	1
27	33	44	20	15	20DD027A0EYNANANE	30	33	45	15	11	20DC030A0EYNANANE	2
34	40.5	54	25	20	20DD034A0EYNANANE	37	45	60	18.5	15	20DC037A0EYNANANE	2
40	51	68	30	25	20DD040A0EYNANANE	43	56	74	22	18.5	20DC043A0EYNANANE	3
52	60	80	40	30	20DD052A0EYNANANE	56	64	86	30	22	20DC056A0EYNANANE	3
65	78	104	50	40	20DD065A0EYNANANE	72	84	112	37	30	20DC072A0EYNANANE	3
77 (65) ❄	85 (98)	116 (130)	60	50	20DD077A0ENNANANE	85 (72)	94 (108)	128 (144)	45	37	20DC085A0ENNANANE	4 §
96 (77) ❄	106 (116)	144 (154)	75	60	20DD096A0ENNANANE	105 (85)	116 (128)	158 (170)	55	45	20DC105A0ENNANANE	5 §
125 (96) ❄	138 (144)	163 (168)	100	75	20DD125A0ENNANANE	125 (96)	138 (144)	163 (168)	55	45	20DC125A0ENNANANE	5 §
–	–	–	–	–	–	140 (105)	154 (158)	210 (210)	75	55	20DC140A0ENNANANE	5 §
156 (125) ❄	172 (188)	233 (250)	125	100	20DD156A0ENNANANE	170 (140)	187 (210)	255 (280)	90	75	20DC170A0ENNANANE	6 §
180 (156) ❄	198 (234)	270 (312)	150	125	20DD180A0ENNANANE	205 (170)	220 (255)	289 (313)	110	90	20DC205A0ENNANANE	6 §
248 (180) ❄	273 (270)	372 (360)	200	150	20DD248A0ENNANANE	260 (205)	286 (308)	390 (410)	132	110	20DC260A0ENNANANE	6 §
261 (205) ❄	287 (308)	410 (410)	200	150	20DD261A0ENNBNANE	261 (205)	287 (308)	410 (410)	132	110	20DC261A0ENNBNANE	9
300 (245) ❄	330 (368)	450 (490)	250	200	20DD300A0ENNBNANE	300 (245)	330 (368)	450 (490)	160	130	20DC300A0ENNBNANE	9
385 (300) ❄	424 (450)	600 (600)	300	250	20DD385A0ENNBNANE	385 (300)	424 (450)	600 (600)	200	160	20DC385A0ENNBNANE	10
460 (385) ❄	506 (578)	770 (770)	350	300	20DD460A0ENNBNANE	460 (385)	506 (578)	770 (770)	250	200	20DC460A0ENNBNANE	10
500 (420) ❄	550 (630)	750 (840)	450	350	20DD500A0ENNBNANE	500 (420)	550 (630)	750 (840)	250	250	20DC500A0ENNBNANE	10
590 (520) ❄	649 (780)	956 (956)	500	450	20DD590A0ENNBNANE	590 (520)	649 (780)	956 (956)	315	250	20DC590A0ENNBNANE	11
650 (590) ❄	715 (885)	1062 (1062)	500	500	20DD650A0ENNBNANE	650 (590)	715 (885)	1062 (1062)	355	315	20DC650A0ENNBNANE	11
730 (650) ❄	803 (975)	1095 (1170)	600	500	20DD730A0ENNBNANE	730 (650)	803 (975)	1095 (1170)	400	355	20DC730A0ENNBNANE	11
820 (730) ❄	902 (1095)	1230 (1314)	700	600	20DD820A0ENNBNANE	820 (730)	902 (1095)	1230 (1314)	450	400	20DC820A0ENNBNANE	12
920 (820) ❄	1012 (1230)	1380 (1476)	800	700	20DD920A0ENNBNANE	920 (820)	1012 (1230)	1380 (1476)	500	450	20DC920A0ENNBNANE	12
1030 (920) ❄	1133 (1370)	1555 (1600)	900	800	20DD1K0A0ENNBNANE	1030 (920)	1133 (1370)	1555 (1600)	560	500	20DC1K0A0ENNBNANE	12
1150 (1030) ❄	1265 (1545)	1620 (1620)	1000	900	20DD1K1A0ENNBNANE	1150 (1030)	1265 (1545)	1620 (1620)	630	560	20DC1K1A0ENNBNANE	13
1300 (1150) ❄	1430 (1725)	2079 (2079)	1200	1000	20DD1K3A0ENNBNANE	1300 (1150)	1430 (1725)	2079 (2079)	710	630	20DC1K3A0ENNBNANE	13
1450 (1200) ❄	1595 (1800)	2175 (2400)	1250	1000	20DD1K4A0ENNBNANE	1450 (1200)	1595 (1800)	2175 (2400)	800	710	20DC1K4A0ENNBNANE	13

❄ These drives have dual current ratings; one for normal duty applications, and one for heavy duty (in parenthesis). The drive may be operated at either rating.
§ Also available with internal Brake IGBT (20DxxxxA0E **Y** NANANE).

500…690V AC, Three-Phase Drives

500…600V AC Input ♣						690V AC Input ♣						
Output Amps			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps			Normal Duty kW	Heavy Duty kW	Cat. No.	Frame Size
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.				
1.7	2	2.6	1	0.5	20DE1P7A0EYNANANE	–	–	–	–	–	–	1
2.7	3.6	4.8	2	1	20DE2P7A0EYNANANE	–	–	–	–	–	–	1
3.9	4.3	5.9	3	2	20DE3P9A0EYNANANE	–	–	–	–	–	–	1
6.1	6.7	9.2	5	3	20DE6P1A0EYNANANE	–	–	–	–	–	–	1
9	9.9	13.5	7.5	5	20DE9P0A0EYNANANE	–	–	–	–	–	–	1
11	13.5	18	10	7.5	20DE011A0EYNANANE	–	–	–	–	–	–	1
17	18.7	25.5	15	10	20DE017A0EYNANANE	–	–	–	–	–	–	1
22	25.5	34	20	15	20DE022A0EYNANANE	–	–	–	–	–	–	2
27	33	44	25	20	20DE027A0EYNANANE	–	–	–	–	–	–	2
32	40.5	54	30	25	20DE032A0EYNANANE	–	–	–	–	–	–	3
41	48	64	40	30	20DE041A0EYNANANE	–	–	–	–	–	–	3
52	61.5	82	50	40	20DE052A0EYNANANE	52	57	78	50	40	20DF052A0ENNANANE	3 ➢
62	78	104	60	50	20DE062A0EYNANANE	60	66	90	55	45	20DF062A0ENNANANE	4 ➢§
77 (63) ❄	85 (94)	116 (126)	75	60	20DE077A0ENNANANE	82 (60)	90 (90)	120 (123)	75	55	20DF082A0ENNANANE	5 §
99 (77) ❄	109 (116)	126 (138)	100	75	20DE099A0ENNANANE	98 (82)	108 (123)	127 (140)	90	75	20DF098A0ENNANANE	5 §
125 (99) ❄	138 (149)	188 (198)	125	100	20DE125A0ENNANANE	119 (98)	131 (147)	179 (196)	110	90	20DF119A0ENNANANE	6 §
144 (125) ❄	158 (188)	216 (250)	150	125	20DE144A0ENNANANE	142 (119)	156 (179)	213 (238)	132	110	20DF142A0ENNANANE	6 §
170 (144) ❄	187 (216)	245 (245)	150	150	20DE170A0ENNBNANE	170 (144)	187 (216)	245 (245)	160	132	20DF170A0ENNBNANE	9
208 (170) ❄	230 (250)	289 (289)	200	150	20DE208A0ENNBNANE	208 (170)	230 (250)	289 (289)	200	160	20DF208A0ENNBNANE	9
261 (208) ❄	287 (312)	375 (375)	250	200	20DE261A0ENNBNANE	261 (208)	287 (312)	375 (375)	250	200	20DF261A0ENNBNANE	10
325 (261) ❄	358 (392)	470 (470)	350	250	20DE325A0ENNBNANE	325 (261)	358 (392)	470 (470)	315	250	20DF325A0ENNBNANE	10
385 (325) ❄	424 (488)	585 (585)	400	350	20DE385A0ENNBNANE	385 (325)	424 (488)	585 (585)	355	315	20DF385A0ENNBNANE	10
416 (325) ❄	458 (488)	585 (585)	450	350	20DE416A0ENNBNANE	416 (325)	458 (488)	585 (585)	400	315	20DF416A0ENNBNANE	10
460 (385) ❄	506 (578)	693 (693)	450	400	20DE460A0ENNBNANE	460 (385)	506 (578)	693 (693)	450	355	20DF460A0ENNBNANE	11
502 (460) ❄	552 (690)	828 (828)	500	450	20DE502A0ENNBNANE	502 (460)	552 (690)	828 (828)	500	450	20DF502A0ENNBNANE	11
590 (502) ❄	649 (753)	904 (904)	600	500	20DE590A0ENNBNANE	590 (502)	649 (753)	904 (904)	560	500	20DF590A0ENNBNANE	11
650 (590) ❄	715 (885)	1062 (1062)	700	650	20DE650A0ENNBNANE	650 (590)	715 (885)	1062 (1062)	630	560	20DF650A0ENNBNANE	12
750 (650) ❄	825 (975)	1170 (1170)	800	700	20DE750A0ENNBNANE	750 (650)	825 (975)	1170 (1170)	710	630	20DF750A0ENNBNANE	12
820 (750) ❄‡	902 (975)	1170 (1170)	900	700	20DE820A0ENNBNANE	820 (750)	902 (975)	1170 (1170)	800	630	20DF820A0ENNBNANE	12
920 (820) ❄	1012 (1230)	1380 (1410)	1000	900	20DE920A0ENNBNANE	920 (820)	1012 (1230)	1380 (1410)	900	800	20DF920A0ENNBNANE	13
1030 (920) ❄	1133 (1380)	1545 (1755)	1100	1000	20DE1K0A0ENNBNANE	1030 (920)	1133 (1380)	1545 (1755)	1000	900	20DF1K0A0ENNBNANE	13
1180 (1030) ❄	1298 (1463)	1755 (1755)	1300	1100	20DE1K1A0ENNBNANE	1180 (1030)	1298 (1463)	1755 (1755)	1100	1000	20DF1K1A0ENNBNANE	13
1500 (1300) ❄	1650 (1950)	2250 (2340)	1600	1400	20DE1K5A0ENNBNANE	1500 (1300)	1650 (1950)	2250 (2340)	1500	1300	20DF1K5A0ENNBNANE	14

❄ These drives have dual current ratings; one for normal duty applications, and one for heavy duty applications (in parenthesis). The drive may be operated at either rating.
‡ 600V class drives at 820 amps (ND) such as 20DF820 & 20DE820 are only capable of producing 95% of starting torque under 10 Hz.
§ Also available with internal Brake IGBT (20DxxxxA0E **Y** NANANE).
♣ CE Certification testing has not been performed on 600V class drives Frames 1…4.
➢ 690V drives are Frame 5.

IP21, NEMA/UL Type 1, MCC

380…480V AC, Three-Phase Drives

480V AC Input						400V AC Input						Frame Size
Output Amps ❄			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps ❄			Normal Duty kW	Heavy Duty kW	Cat. No.	
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.				
385 (300)	424 (450)	600 (600)	300	250	20DD385B0ENNBNANE	385 (300)	424 (450)	600 (600)	200	160	20DC385B0ENNBNANE	10
460 (385)	506 (578)	770 (770)	350	300	20DD460B0ENNBNANE	460 (385)	506 (578)	770 (770)	250	200	20DC460B0ENNBNANE	10
500 (420)	550 (630)	750 (840)	450	350	20DD500B0ENNBNANE	500 (420)	550 (630)	750 (840)	250	250	20DC500B0ENNBNANE	10
590 (520)	649 (780)	956 (956)	500	450	20DD590B0ENNBNANE	590 (520)	649 (780)	956 (956)	315	250	20DC590B0ENNBNANE	11
650 (590)	715 (885)	1062 (1062)	500	500	20DD650B0ENNBNANE	650 (590)	715 (885)	1062 (1062)	355	315	20DC650B0ENNBNANE	11
730 (650)	803 (975)	1095 (1170)	600	500	20DD730B0ENNBNANE	730 (650)	803 (975)	1095 (1170)	400	355	20DC730B0ENNBNANE	11
820 (730)	902 (1095)	1230 (1314)	700	600	20DD820B0ENNBNANE	820 (730)	902 (1095)	1230 (1314)	450	400	20DC820B0ENNBNANE	12
920 (820)	1012 (1230)	1380 (1476)	800	700	20DD920B0ENNBNANE	920 (820)	1012 (1230)	1380 (1476)	500	450	20DC920B0ENNBNANE	12
1030 (920)	1133 (1370)	1555 (1600)	900	800	20DD1K0B0ENNBNANE	1030 (920)	1133 (1370)	1555 (1600)	560	500	20DC1K0B0ENNBNANE	12

❄ These drives have dual current ratings; one for normal duty applications, and one for heavy duty (in parenthesis). The drive may be operated at either rating.

500…690V AC, Three-Phase Drives

600V AC Input						
Output Amps ❄			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Frame Size
Cont.	1 Min.	3 Sec.				
261 (208)	287 (312)	375 (375)	250	200	20DE261B0ENNBNANE	10
325 (261)	358 (392)	470 (470)	350	250	20DE325B0ENNBNANE	10
385 (325)	424 (488)	585 (585)	400	350	20DE385B0ENNBNANE	10
416 (325)	458 (488)	585 (585)	450	350	20DE416B0ENNBNANE	10
460 (385)	506 (578)	693 (693)	450	400	20DE460B0ENNBNANE	11
502 (460)	552 (690)	828 (828)	500	450	20DE502B0ENNBNANE	11
590 (502)	649 (753)	904 (904)	600	500	20DE590B0ENNBNANE	11
650 (590)	715 (885)	1062 (1062)	700	650	20DE650B0ENNBNANE	12
750 (650)	825 (975)	1170 (1170)	800	700	20DE750B0ENNBNANE	12
820 (750) ‡	902 (975)	1170 (1170)	900	700	20DE820B0ENNBNANE	12

❄ These drives have dual current ratings; one for normal duty applications, and one for heavy duty applications (in parenthesis). The drive may be operated at either rating.

‡ 600V class drives at 820 amps (ND) such as 20DF820 & 20DE820 are only capable of producing 95% of starting torque under 10 Hz.

Ratings	380…480V:	200…860 kW / 300…1150 Hp / 360...1250 A
	500…600V:	345…650 kW / 465…870 Hp / 425…800 A
	690V:	355…657 kW / 475…881 Hp / 380…705 A
Motor Control	Select PowerFlex 700 or PowerFlex 700S Control	
Communications	Common Industrial Protocol	
User Interface	HIM (option)	
Enclosures	IP00, IP20	
Safety	DriveGuard Safe Torque-Off / EN 954-1 Cat. 3 with PowerFlex 700S control	
Additional Features	SynchLink and DriveLogix functionality with PowerFlex 700S control	
Certifications	• UL • cUL • IEC (Designed to Meet) • CE • TÜV FS ISO/EN13849-1 (EN954-1) with PowerFlex 700S control	
Options	See pages 6-65…6-74	

The PowerFlex 700L is available with the PowerFlex 700 or PowerFlex 700S control in a fully regenerative, liquid-cooled power structure. This powerful combination offers great performance and high power capabilities in a small package along with low harmonics.

Available as a panel mount unit or in a cabinet, this liquid cooled drive features regenerative braking which is ideal for precise, high-response speed and position control, continuous holdback, rapid deceleration and stopping of high inertia loads. Instead of wasting energy with resistor braking technology, regenerative braking actually puts the energy back into the system to be used by other equipment.

400V AC, Three-Phase Drives

Output Amps			Nominal Power Ratings				IP20, NEMA/UL Type 1 ∗	
400V AC Input			Normal Duty		Heavy Duty			
Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp	Cat. No.	Frame Size
360	396	540	200	268	150	200	20LC360N0ENNAN10WA	2
650	715	975	370	500	270	365	20LC650A0ENNAN10WA	3A
1250	1375	1875	715	960	525	700	20LC1K2A0ENNAN10WA	3B

∗ Frames 3A and 3B Only. Frame 2 drives are IP00, NEMA/UL Type Open.

480V AC, Three-Phase Drives

Output Amps			Nominal Power Ratings				IP20, NEMA/UL Type 1 ∗	
480V AC Input			Normal Duty		Heavy Duty			
Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp	Cat. No.	Frame Size
360	396	540	224	300	175	235	20LD360N0ENNAN10WA	2
650	715	975	445	600	325	440	20LD650A0ENNAN10WA	3A
1250	1375	1875	860	1150	630	845	20LD1K2A0ENNAN10WA	3B

∗ Frames 3A and 3B Only. Frame 2 drives are IP00, NEMA/UL Type Open.

600V AC, Three-Phase Drives

Output Amps			Nominal Power Ratings				IP20, NEMA/UL Type 1	
600V AC Input			Normal Duty		Heavy Duty			Frame Size
Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp	Cat. No.	
425	470	640	345	465	255	345	20LE425A0ENNAN10WA	3A
800	885	1200	650	870	480	640	20LE800A0ENNAN10WA	3B

690V AC, Three-Phase Drives

Output Amps			Nominal Power Ratings				IP20, NEMA/UL Type 1	
690V AC Input			Normal Duty		Heavy Duty			Frame Size
Cont.	1 Min.	3 Sec.	kW	Hp	kW	Hp	Cat. No.	
380	420	570	355	475	260	350	20LF380A0ENNAN10WA	3A
705	780	1060	657	881	485	650	20LF705A0ENNAN10WA	3B

Cooling Loops

Drive Requirements		Supply Loop Requirements			Liquid to Liquid Heat Exchanger ❄
Frame Size	Heat Dissipation into Liquid	Minimum Flow @ Pressure ✶	Maximum Pressure	Temperature Range	Cat. No.
2	7,900 W	15.1 LPM @ 0.83 bar (4 GPM @ 12 PSI)	8.62 bar (125 PSI)	0…40 °C (32…104 °F)	20L-LL13K-P75A
3A	12,000 W	22.7 LPM @ 0.83 bar (6 GPM @ 12 PSI)	8.62 bar (125 PSI)	0…35 °C (32…95 °F)	20L-LL13K-P75A
3B	24,000 W	56.8 LPM @ 0.83 bar (15 GPM @ 12 PSI)	8.62 bar (125 PSI)	0…35 °C (32…95 °F)	20L-LL24K-1P0A

✶ The minimum pressure applies to the pressure drop across the drive and does not take into account additional pressure drop in the system such as piping or hosing.

❄ Recommended cooling loops shown are based on a single drive per cooling loop. Consult your local Rockwell Automation sales office or Allen-Bradley distributor for use of multiple drives on one cooling loop.

Hose Kits

Hose Length [m (ft.)]	Hoses per Kit	Drive Side Coupling Size	Heat Exchanger Side Coupling Size	Used with …	Hose Kit Cat. No. ‡
3 (10)	2	0.75 in.	0.75 in.	Frame 2 and 13 kW HEX	20L-GH10-B1
9.1 (30)	2	0.75 in.	0.75 in.	Frame 2 and 13 kW HEX	20L-GH30-B1
3 (10)	2	1 in.	1 in. with 90° Elbow	Frame 3A and 13 kW HEX	20L-GH10-A2
9.1 (30)	2	1 in.	1 in. with 90° Elbow	Frame 3A and 13 kW HEX	20L-GH30-A2
3 (10)	2	1 in.	1 in.	Frame 3B and 24 kW HEX	20L-GH10-A1
9.1 (30)	2	1 in.	1 in.	Frame 3B and 24 kW HEX	20L-GH30-A1

‡ Each hose kit contains (2) hoses and the appropriate connectors.

Designed for general purpose applications, the PowerFlex 753 AC drive offers multiple options and features along with the added benefit of simple integration. The PowerFlex 753 comes standard with built-in I/O making it a cost effective solution ideal for OEMs and system integrators looking to reduce engineering costs, deliver machines to market faster and meet end-user demand for more productive and safer machines.

Ratings	380…480V: 0.75…250 kW / 1…350 Hp / 2.1…456 A
Motor Control	• V/Hz Control • Adjustable Voltage Control • Vector Control with FORCE Technology • Sensorless Vector Control
Communications	Common Industrial Protocol
User Interface	HIM (option)
Enclosures	IP00/IP20, Flange Mount, IP54/NEMA/UL Type 12
Safety	• Safe Torque-Off / EN 954-1 Cat. 3 • Safe Speed Monitor PLe/SIL3 Cat. 4
Additional Features	• DeviceLogix • Preventative Diagnostics • Standard I/O with 3 Digital In, 1 Analog In, 1 Analog Out, 1 Relay & 1 Transistor Out • Three option slots for I/O, feedback, safety, auxiliary control power, communications • Indexing • Pump Jack and Pump Off for oil well applications • Pjump and Traverse for Fibers application • Conformal Coating
Certifications	• UL • cUL • CE • C-Tick • SEMI F47 • GOST-R • TÜV FS ISO/EN13849-1 (EN954-1) with Safe Torque-Off option • Meets material restrictions specified in the RoHS directive
Options	See pages 6-65…6-74

IP00/IP20, NEMA/UL Type Open ❄

380…480V AC, Three-Phase Drives

480V AC Input						400V AC Input						Frame Size
Output Amps ‡			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps ‡			Normal Duty kW	Heavy Duty kW	Cat. No. ✶	
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.				
2.1	3.1	3.7	1	1	20F11ND2P1AA0NNNNN	2.1	3.1	3.7	0.75	0.75	20F11NC2P1JA0NNNNN	2
3.4	5.1	6.1	2	2	20F11ND3P4AA0NNNNN	3.5	5.2	6.3	1.5	1.5	20F11NC3P5JA0NNNNN	2
5	7.5	9	3	3	20F11ND5P0AA0NNNNN	5	7.5	9.0	2.2	2.2	20F11NC5P0JA0NNNNN	2
8	12	14.4	5	5	20F11ND8P0AA0NNNNN	8.7	13	15.6	4	4	20F11NC8P7JA0NNNNN	2
11	16.5	19.8	7.5	7.5	20F11ND011AA0NNNNN	11.5	17.2	20.7	5.5	5.5	20F11NC011JA0NNNNN	2
14 (11)	15.4 (16.5)	21 (21)	10	7.5	20F11ND014AA0NNNNN	15.4 (11.5)	16.9 (17.3)	23.1 (23.1)	7.5	5.5	20F11NC015JA0NNNNN	2
22 (14)	24.2 (21)	33 (33)	15	10	20F11ND022AA0NNNNN	22 (15.4)	24.2 (23.1)	33 (33)	11	7.5	20F11NC022JA0NNNNN	2
27 (22)	29.7 (33)	40.5 (40.5)	20	15	20F11ND027AA0NNNNN	30 (22)	33 (33)	45 (45)	15	11	20F11NC030JA0NNNNN	3
34 (27)	37.4 (40.5)	51 (51)	25	20	20F11ND034AA0NNNNN	37 (30)	40.7 (45)	55.5 (55.5)	18.5	15	20F11NC037JA0NNNNN	3
40 (34)	44 (51)	60 (61.2)	30	25	20F11ND040AA0NNNNN	43 (37)	47.3 (55.5)	64.5 (66.6)	22	18.5	20F11NC043JA0NNNNN	3
52 (40)	57.2 (60)	78 (78)	40	30	20F11ND052AA0NNNNN	60 (43)	66 (66)	90 (90)	30	22	20F11NC060JA0NNNNN	4
65 (52)	71.5 (78)	97.5 (97.5)	50	40	20F11ND065AA0NNNNN	72 (60)	79.2 (90)	108 (108)	37	30	20F11NC072JA0NNNNN	4
77 (65)	84.7 (97.5)	115.5 (117)	60	50	20F11ND077AA0NNNNN	85 (72)	93.5 (108)	127.5 (129.6)	45	37	20F11NC085JA0NNNNN	5
96 (77)	105.6 (115.5)	144 (144)	75	60	20F11ND096AA0NNNNN	104 (85)	114.4 (127.5)	156 (156)	55	45	20F11NC104JA0NNNNN	5
125 (96)	137.5 (144)	187.5 (187.5)	100	75	20F1AND125AN0NNNNN	140 (104)	154 (156)	210 (210)	75	55	20F1ANC140JN0NNNNN	6
156 (125)	171.6 (187.5)	234 (234)	125	100	20F1AND156AN0NNNNN	170 (140)	187 (210)	255 (255)	90	75	20F1ANC170JN0NNNNN	6
186 (156)	204.6 (234)	279 (280.8)	150	125	20F1AND186AN0NNNNN	205 (170)	225.5 (255)	307.5 (307.5)	110	90	20F1ANC205JN0NNNNN	6
248 (186)	272.8 (279)	372 (372)	200	150	20F1AND248AN0NNNNN	260 (205)	286 (307.5)	390 (390)	132	110	20F1ANC260JN0NNNNN	6
302 (248)	332.2 (372)	453 (453)	250	200	20F1AND302AN0NNNNN	302 (260)	332.2 (390)	453 (468)	160	132	20F1ANC302JN0NNNNN	7
361 (302)	397.1 (453)	541.5 (543.6)	300	250	20F1AND361AN0NNNNN	367 (302)	403.7 (453)	550.5 (550.5)	200	160	20F1ANC367JN0NNNNN	7
415 (361)	456.5 (541.5)	622.5 (649.8)	350	300	20F1AND415AN0NNNNN	456 (367)	501.6 (550.5)	684 (684)	250	200	20F1ANC456JN0NNNNN	7

✶ The 11th character determines default Filtering and Common Mode Cap jumper configuration. "J" = Installed, "A" = Removed.

❄ Frames 2…5 are IP20, Frames 6…7 are IP00.

‡ Some drives have dual current ratings; one for normal duty applications, and one for heavy duty applications (in parenthesis). The drive may be operated at either rating.

IP54, NEMA/UL Type 12

380…480V AC, Three-Phase Drives

480V AC Input						400V AC Input						Frame Size
Output Amps ‡			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps ‡			Normal Duty kW	Heavy Duty kW	Cat. No.	
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.				
2.1	3.1	3.7	1	1	20F11GD2P1AA0NNNNN	2.1	3.1	3.7	0.75	0.75	20F11GC2P1∗A0NNNNN	2
3.4	5.1	6.1	2	2	20F11GD3P4AA0NNNNN	3.5	5.2	6.3	1.5	1.5	20F11GC3P5∗A0NNNNN	2
5	7.5	9	3	3	20F11GD5P0AA0NNNNN	5	7.5	9.0	2.2	2.2	20F11GC5P0∗A0NNNNN	2
8	12	14.4	5	5	20F11GD8P0AA0NNNNN	8.7	13	15.6	4	4	20F11GC8P7∗A0NNNNN	2
11	16.5	19.8	7.5	7.5	20F11GD011AA0NNNNN	11.5	17.2	20.7	5.5	5.5	20F11GC011∗A0NNNNN	2
14 (11)	15.4 (16.5)	21 (21)	10	7.5	20F11GD014AA0NNNNN	15.4 (11.5)	16.9 (17.3)	23.1 (23.1)	7.5	5.5	20F11GC015∗A0NNNNN	2
22 (14)	24.2 (21)	33 (33)	15	10	20F11GD022AA0NNNNN	22 (15.4)	24.2 (23.1)	33 (33)	11	7.5	20F11GC022∗A0NNNNN	2
27 (22)	29.7 (33)	40.5 (40.5)	20	15	20F11GD027AA0NNNNN	30 (22)	33 (33)	45 (45)	15	11	20F11GC030∗A0NNNNN	3
34 (27)	37.4 (40.5)	51 (51)	25	20	20F11GD034AA0NNNNN	37 (30)	40.7 (45)	55.5 (55.5)	18.5	15	20F11GC037∗A0NNNNN	3
40 (34)	44 (51)	60 (61.2)	30	25	20F11GD040AA0NNNNN	43 (37)	47.3 (55.5)	64.5 (66.6)	22	18.5	20F11GC043∗A0NNNNN	3
52 (40)	57.2 (60)	78 (78)	40	30	20F11GD052AA0NNNNN	60 (43)	66 (66)	90 (90)	30	22	20F11GC060∗A0NNNNN	4
65 (52)	71.5 (78)	97.5 (97.5)	50	40	20F11GD065AA0NNNNN	72 (60)	79.2 (90)	108 (108)	37	30	20F11GC072∗A0NNNNN	5
77 (65)	84.7 (97.5)	115.5 (117)	60	50	20F11GD077AA0NNNNN	85 (72)	93.5 (108)	127.5 (129.6)	45	37	20F11GC085∗A0NNNNN	5
96 (77)	105.6 (115.5)	144 (144)	75	60	20F1AGD096AN0NNNNN	104 (85)	114.4 (127.5)	156 (156)	55	45	20F1AGC104∗N0NNNNN	6
125 (96)	137.5 (144)	187.5 (187.5)	100	75	20F1AGD125AN0NNNNN	140 (104)	154 (156)	210 (210)	75	55	20F1AGC140∗N0NNNNN	6
156 (125)	171.6 (187.5)	234 (234)	125	100	20F1AGD156AN0NNNNN	170 (140)	187 (210)	255 (255)	90	75	20F1AGC170∗N0NNNNN	6
186 (156)	204.6 (234)	279 (280.8)	150	125	20F1AGD186AN0NNNNN	205 (170)	225.5 (255)	307.5 (307.5)	110	90	20F1AGC205∗N0NNNNN	6
248 (186)	272.8 (279)	372 (372)	200	150	20F1AGD248AN0NNNNN	260 (205)	286 (307.5)	390 (390)	132	110	20F1AGC260∗N0NNNNN	7
302 (248)	332.2 (372)	453 (453)	250	200	20F1AGD302AN0NNNNN	302 (260)	332.2 (390)	453 (468)	160	132	20F1AGC302∗N0NNNNN	7
361 (302)	397.1 (453)	541.5 (543.6)	300	250	20F1AGD361AN0NNNNN	367 (302)	403.7 (453)	550.5 (550.5)	200	160	20F1AGC367∗N0NNNNN	7
415 (361)	456.5 (541.5)	622.5 (649.8)	350	300	20F1AGD415AN0NNNNN	456 (367)	501.6 (550.5)	684 (684)	250	200	20F1AGC456∗N0NNNNN	7

∗ The 11th character determines default Filtering and Common Mode Cap jumper configuration. "J" = Installed, "A" = Removed.

‡ Some drives have dual current ratings; one for normal duty applications, and one for heavy duty applications (in parenthesis). The drive may be operated at either rating.

Flange Mount
Front = IP20, NEMA/UL Type Open, Back/Heatsink = IP66, NEMA/UL Type 4X

380…480V AC, Three-Phase Drives

480V AC Input						400V AC Input						
Output Amps ‡			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps ‡			Normal Duty kW	Heavy Duty kW	Cat. No.	Frame Size
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.				
2.1	3.1	3.7	1	1	20F11FD2P1AA0NNNNN	2.1	3.1	3.7	0.75	0.75	20F11FC2P1∗A0NNNNN	2
3.4	5.1	6.1	2	2	20F11FD3P4AA0NNNNN	3.5	5.2	6.3	1.5	1.5	20F11FC3P5∗A0NNNNN	2
5	7.5	9	3	3	20F11FD5P0AA0NNNNN	5	7.5	9.0	2.2	2.2	20F11FC5P0∗A0NNNNN	2
8	12	14.4	5	5	20F11FD8P0AA0NNNNN	8.7	13	15.6	4	4	20F11FC8P7∗A0NNNNN	2
11	16.5	19.8	7.5	7.5	20F11FD011AA0NNNNN	11.5	17.2	20.7	5.5	5.5	20F11FC011∗A0NNNNN	2
14 (11)	15.4 (16.5)	21 (21)	10	7.5	20F11FD014AA0NNNNN	15.4 (11.5)	16.9 (17.3)	23.1 (23.1)	7.5	5.5	20F11FC015∗A0NNNNN	2
22 (14)	24.2 (21)	33 (33)	15	10	20F11FD022AA0NNNNN	22 (15.4)	24.2 (23.1)	33 (33)	11	7.5	20F11FC022∗A0NNNNN	2
27 (22)	29.7 (33)	40.5 (40.5)	20	15	20F11FD027AA0NNNNN	30 (22)	33 (33)	45 (45)	15	11	20F11FC030∗A0NNNNN	3
34 (27)	37.4 (40.5)	51 (51)	25	20	20F11FD034AA0NNNNN	37 (30)	40.7 (45)	55.5 (55.5)	18.5	15	20F11FC037∗A0NNNNN	3
40 (34)	44 (51)	60 (61.2)	30	25	20F11FD040AA0NNNNN	43 (37)	47.3 (55.5)	64.5 (66.6)	22	18.5	20F11FC043∗A0NNNNN	3
52 (40)	57.2 (60)	78 (78)	40	30	20F11FD052AA0NNNNN	60 (43)	66 (66)	90 (90)	30	22	20F11FC060∗A0NNNNN	4
65 (52)	71.5 (78)	97.5 (97.5)	50	40	20F11FD065AA0NNNNN	72 (60)	79.2 (90)	108 (108)	37	30	20F11FC072∗A0NNNNN	4
77 (65)	84.7 (97.5)	115.5 (117)	60	50	20F11FD077AA0NNNNN	85 (72)	93.5 (108)	127.5 (129.6)	45	37	20F11FC085∗A0NNNNN	5
96 (77)	105.6 (115.5)	144 (144)	75	60	20F11FD096AA0NNNNN	104 (85)	114.4 (127.5)	156 (156)	55	45	20F11FC104∗A0NNNNN	5

∗ The 11th character determines default Filtering and Common Mode Cap jumper configuration. "J" = Installed, "A" = Removed.

‡ Some drives have dual current ratings; one for normal duty applications, and one for heavy duty applications (in parenthesis). The drive may be operated at either rating.

Note: Frames 6…7 require a user installed flange kit with an IP00, NEMA/UL Type Open drive.

Designed for ease of integration, application flexibility and performance the PowerFlex 755 AC drive provides improved functionality across many manufacturing systems. The PowerFlex 755 AC drive is designed to maximize user's investment and help improve productivity. Ideal for applications that require safety, high motor control performance, and application flexibility, the PowerFlex 755 is highly functional and cost effective solution.

Ratings	380…480V: 0.75…250 kW / 1…350 Hp / 2.1…456 A
Motor Control	• V/Hz Control • Vector Control with FORCE Technology • Sensorless Vector Control • Permanent Magnet Motor Control
Communications	Embedded EtherNet/IP port standard, Common Industrial Protocol
User Interface	HIM (option)
Enclosures	IP00/IP20, Flange Mount, IP54/NEMA/UL Type 12
Safety	• Safe Torque-Off PLe/SIL3 Cat. 3 • Safe Speed Monitor PLe/SIL3 Cat. 4
Additional Features	• DeviceLogix • Preventative Diagnostics • Five option slots for I/O, feedback, safety, auxiliary control power, communications • Accurate positioning with PCAM, Indexer, Electronic Gearing, and speed/position profiling • Incremental and Absolute feedback supported • TorqProve for lifting applications • Conformal Coating
Certifications	• UL • cUL • CE • C-Tick • SEMI F47 • GOST-R • TÜV FS ISO/EN13849-1 (EN954-1) with Safe Torque-Off option • Meets material restrictions specified in the RoHS directive
Options	See pages 6-65…6-74

IP00/IP20, NEMA/UL Type Open ❄

380…480V AC, Three-Phase Drives

480V AC Input						400V AC Input						Frame Size
Output Amps ‡			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps ‡			Normal Duty kW	Heavy Duty kW	Cat. No. ✶	
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.				
2.1	3.1	3.7	1	1	20G11ND2P1AA0NNNNN	2.1	3.1	3.7	0.75	0.75	20G11NC2P1✶A0NNNNN	2 §
3.4	5.1	6.1	2	2	20G11ND3P4AA0NNNNN	3.5	5.2	6.3	1.5	1.5	20G11NC3P5✶A0NNNNN	2 §
5	7.5	9	3	3	20G11ND5P0AA0NNNNN	5	7.5	9.0	2.2	2.2	20G11NC5P0✶A0NNNNN	2 §
8	12	14.4	5	5	20G11ND8P0AA0NNNNN	8.7	13	15.6	4	4	20G11NC8P7✶A0NNNNN	2 §
11	16.5	19.8	7.5	7.5	20G11ND011AA0NNNNN	11.5	17.2	20.7	5.5	5.5	20G11NC011✶A0NNNNN	2 §
14 (11)	15.4 (16.5)	21 (21)	10	7.5	20G11ND014AA0NNNNN	15.4 (11.5)	16.9 (17.3)	23.1 (23.1)	7.5	5.5	20G11NC015✶A0NNNNN	2
22 (14)	24.2 (21)	33 (33)	15	10	20G11ND022AA0NNNNN	22 (15.4)	24.2 (23.1)	33 (33)	11	7.5	20G11NC022✶A0NNNNN	2
27 (22)	29.7 (33)	40.5 (40.5)	20	15	20G11ND027AA0NNNNN	30 (22)	33 (33)	45 (45)	15	11	20G11NC030✶A0NNNNN	3
34 (27)	37.4 (40.5)	51 (51)	25	20	20G11ND034AA0NNNNN	37 (30)	40.7 (45)	55.5 (55.5)	18.5	15	20G11NC037✶A0NNNNN	3
40 (34)	44 (51)	60 (61.2)	30	25	20G11ND040AA0NNNNN	43 (37)	47.3 (55.5)	64.5 (66.6)	22	18.5	20G11NC043✶A0NNNNN	3
52 (40)	57.2 (60)	78 (78)	40	30	20G11ND052AA0NNNNN	60 (43)	66 (66)	90 (90)	30	22	20G11NC060✶A0NNNNN	4
65 (52)	71.5 (78)	97.5 (97.5)	50	40	20G11ND065AA0NNNNN	72 (60)	79.2 (90)	108 (108)	37	30	20G11NC072✶A0NNNNN	4
77 (65)	84.7 (97.5)	115.5 (117)	60	50	20G11ND077AA0NNNNN	85 (72)	93.5 (108)	127.5 (129.6)	45	37	20G11NC085✶A0NNNNN	5
96 (77)	105.6 (115.5)	144 (144)	75	60	20G11ND096AA0NNNNN	104 (85)	114.4 (127.5)	156 (156)	55	45	20G11NC104✶A0NNNNN	5
125 (96)	137.5 (144)	187.5 (187.5)	100	75	20G1AND125AN0NNNNN	140 (104)	154 (156)	210 (210)	75	55	20G1ANC140✶N0NNNNN	6
156 (125)	171.6 (187.5)	234 (234)	125	100	20G1AND156AN0NNNNN	170 (140)	187 (210)	255 (255)	90	75	20G1ANC170✶N0NNNNN	6
186 (156)	204.6 (234)	279 (280.8)	150	125	20G1AND186AN0NNNNN	205 (170)	225.5 (255)	307.5 (307.5)	110	90	20G1ANC205✶N0NNNNN	6
248 (186)	272.8 (279)	372 (372)	200	150	20G1AND248AN0NNNNN	260 (205)	286 (307.5)	390 (390)	132	110	20G1ANC260✶N0NNNNN	6
302 (248)	332.2 (372)	453 (453)	250	200	20G1AND302AN0NNNNN	302 (260)	332.2 (390)	453 (468)	160	132	20G1ANC302✶N0NNNNN	7
361 (302)	397.1 (453)	541.5 (543.6)	300	250	20G1AND361AN0NNNNN	367 (302)	403.7 (453)	550.5 (550.5)	200	160	20G1ANC367✶N0NNNNN	7
415 (361)	456.5 (541.5)	622.5 (649.8)	350	300	20G1AND415AN0NNNNN	456 (367)	501.6 (550.5)	684 (684)	250	200	20G1ANC456✶N0NNNNN	7

✶ The 11th character determines default Filtering and Common Mode Cap jumper configuration. "J" = Installed, "A" = Removed.

❄ Frames 2…5 are IP20, Frames 6…7 are IP00.

‡ These drives have dual current ratings; one for normal duty applications, and one for heavy duty applications (in parenthesis). The drive may be operated at either rating.

§ Contact your local Rockwell Automation sales office or Allen-Bradley distributor for availability.

IP54, NEMA/UL Type 12

380…480V AC, Three-Phase Drives

480V AC Input						400V AC Input						Frame Size
Output Amps ‡			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps ‡			Normal Duty kW	Heavy Duty kW	Cat. No. ∗	
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.				
2.1	3.1	3.7	1	1	20G11GD2P1AA0NNNNN	2.1	3.1	3.7	0.75	0.75	20G11GC2P1∗A0NNNNN	2 §
3.4	5.1	6.1	2	2	20G11GD3P4AA0NNNNN	3.5	5.2	6.3	1.5	1.5	20G11GC3P5∗A0NNNNN	2 §
5	7.5	9	3	3	20G11GD5P0AA0NNNNN	5	7.5	9.0	2.2	2.2	20G11GC5P0∗A0NNNNN	2 §
8	12	14.4	5	5	20G11GD8P0AA0NNNNN	8.7	13	15.6	4	4	20G11GC8P7∗A0NNNNN	2 §
11	16.5	19.8	7.5	7.5	20G11GD011AA0NNNNN	11.5	17.2	20.7	5.5	5.5	20G11GC011∗A0NNNNN	2 §
14 (11)	15.4 (16.5)	21 (21)	10	7.5	20G11GD014AA0NNNNN	15.4 (11.5)	16.9 (17.3)	23.1 (23.1)	7.5	5.5	20G11GC015∗A0NNNNN	2
22 (14)	24.2 (21)	33 (33)	15	10	20G11GD022AA0NNNNN	22 (15.4)	24.2 (23.1)	33 (33)	11	7.5	20G11GC022∗A0NNNNN	2
27 (22)	29.7 (33)	40.5 (40.5)	20	15	20G11GD027AA0NNNNN	30 (22)	33 (33)	45 (45)	15	11	20G11GC030∗A0NNNNN	3
34 (27)	37.4 (40.5)	51 (51)	25	20	20G11GD034AA0NNNNN	37 (30)	40.7 (45)	55.5 (55.5)	18.5	15	20G11GC037∗A0NNNNN	3
40 (34)	44 (51)	60 (61.2)	30	25	20G11GD040AA0NNNNN	43 (37)	47.3 (55.5)	64.5 (66.6)	22	18.5	20G11GC043∗A0NNNNN	3
52 (40)	57.2 (60)	78 (78)	40	30	20G11GD052AA0NNNNN	60 (43)	66 (66)	90 (90)	30	22	20G11GC060∗A0NNNNN	4
65 (52)	71.5 (78)	97.5 (97.5)	50	40	20G11GD065AA0NNNNN	72 (60)	79.2 (90)	108 (108)	37	30	20G11GC072∗A0NNNNN	5
77 (65)	84.7 (97.5)	115.5 (117)	60	50	20G11GD077AA0NNNNN	85 (72)	93.5 (108)	127.5 (129.6)	45	37	20G11GC085∗A0NNNNN	5
96 (77)	105.6 (115.5)	144 (144)	75	60	20G1AGD096AN0NNNNN	104 (85)	114.4 (127.5)	156 (156)	55	45	20G1AGC104∗N0NNNNN	6
125 (96)	137.5 (144)	187.5 (187.5)	100	75	20G1AGD125AN0NNNNN	140 (104)	154 (156)	210 (210)	75	55	20G1AGC140∗N0NNNNN	6
156 (125)	171.6 (187.5)	234 (234)	125	100	20G1AGD156AN0NNNNN	170 (140)	187 (210)	255 (255)	90	75	20G1AGC170∗N0NNNNN	6
186 (156)	204.6 (234)	279 (280.8)	150	125	20G1AGD186AN0NNNNN	205 (170)	225.5 (255)	307.5 (307.5)	110	90	20G1AGC205∗N0NNNNN	6
248 (186)	272.8 (279)	372 (372)	200	150	20G1AGD248AN0NNNNN	260 (205)	286 (307.5)	390 (390)	132	110	20G1AGC260∗N0NNNNN	7
302 (248)	332.2 (372)	453 (453)	250	200	20G1AGD302AN0NNNNN	302 (260)	332.2 (390)	453 (468)	160	132	20G1AGC302∗N0NNNNN	7
361 (302)	397.1 (453)	541.5 (543.6)	300	250	20G1AGD361AN0NNNNN	367 (302)	403.7 (453)	550.5 (550.5)	200	160	20G1AGC367∗N0NNNNN	7
415 (361)	456.5 (541.5)	622.5 (649.8)	350	300	20G1AGD415AN0NNNNN	456 (367)	501.6 (550.5)	684 (684)	250	200	20G1AGC456∗N0NNNNN	7

∗ The 11th character determines default Filtering and Common Mode Cap jumper configuration. "J" = Installed, "A" = Removed.

‡ Some drives have dual current ratings; one for normal duty applications, and one for heavy duty applications (in parenthesis). The drive may be operated at either rating.

§ Contact your local Rockwell Automation sales office or Allen-Bradley distributor for availability.

Flange Mount
Front = IP20, NEMA/UL Type Open, Back/Heatsink = IP66, NEMA/UL Type 4X

380…480V AC, Three-Phase Drives

480V AC Input						400V AC Input						Frame Size
Output Amps ‡			Normal Duty Hp	Heavy Duty Hp	Cat. No.	Output Amps ‡			Normal Duty kW	Heavy Duty kW	Cat. No. ∗	
Cont.	1 Min.	3 Sec.				Cont.	1 Min.	3 Sec.				
2.1	3.1	3.7	1	1	20G11FD2P1AA0NNNNN	2.1	3.1	3.7	0.75	0.75	20G11FC2P1∗A0NNNNN	2 §
3.4	5.1	6.1	2	2	20G11FD3P4AA0NNNNN	3.5	5.2	6.3	1.5	1.5	20G11FC3P5∗A0NNNNN	2 §
5	7.5	9	3	3	20G11FD5P0AA0NNNNN	5	7.5	9.0	2.2	2.2	20G11FC5P0∗A0NNNNN	2 §
8	12	14.4	5	5	20G11FD8P0AA0NNNNN	8.7	13	15.6	4	4	20G11FC8P0∗A0NNNNN	2 §
11	16.5	19.8	7.5	7.5	20G11FD011AA0NNNNN	11.5	17.2	20.7	5.5	5.5	20G11FC011∗A0NNNNN	2 §
14 (11)	15.4 (16.5)	21 (21)	10	7.5	20G11FD014AA0NNNNN	15.4 (11.5)	16.9 (17.3)	23.1 (23.1)	7.5	5.5	20G11FC015∗A0NNNNN	2
22 (14)	24.2 (21)	33 (33)	15	10	20G11FD022AA0NNNNN	22 (15.4)	24.2 (23.1)	33 (33)	11	7.5	20G11FC022∗A0NNNNN	2
27 (22)	29.7 (33)	40.5 (40.5)	20	15	20G11FD027AA0NNNNN	30 (22)	33 (33)	45 (45)	15	11	20G11FC030∗A0NNNNN	3
34 (27)	37.4 (40.5)	51 (51)	25	20	20G11FD034AA0NNNNN	37 (30)	40.7 (45)	55.5 (55.5)	18.5	15	20G11FC037∗A0NNNNN	3
40 (34)	44 (51)	60 (61.2)	30	25	20G11FD040AA0NNNNN	43 (37)	47.3 (55.5)	64.5 (66.6)	22	18.5	20G11FC043∗A0NNNNN	3
52 (40)	57.2 (60)	78 (78)	40	30	20G11FD052AA0NNNNN	60 (43)	66 (66)	90 (90)	30	22	20G11FC060∗A0NNNNN	4
65 (52)	71.5 (78)	97.5 (97.5)	50	40	20G11FD065AA0NNNNN	72 (60)	79.2 (90)	108 (108)	37	30	20G11FC072∗A0NNNNN	4
77 (65)	84.7 (97.5)	115.5 (117)	60	50	20G11FD077AA0NNNNN	85 (72)	93.5 (108)	127.5 (129.6)	45	37	20G11FC085∗A0NNNNN	5
96 (77)	105.6 (115.5)	144 (144)	75	60	20G11FD096AA0NNNNN	104 (85)	114.4 (127.5)	156 (156)	55	45	20G11FC104∗A0NNNNN	5

∗ The 11th character determines default Filtering and Common Mode Cap jumper configuration. "J" = Installed, "A" = Removed.

‡ Some drives have dual current ratings; one for normal duty applications, and one for heavy duty applications (in parenthesis). The drive may be operated at either rating.

Note: Frames 6…7 require a user installed flange kit with an IP00, NEMA/UL Type Open drive.

§ Contact your local Rockwell Automation sales office or Allen-Bradley distributor for availability.

Human Interface and Wireless Interface Modules


Blank Plate


20-HIM-A3


20-HIM-A5


20-HIM-A6


20-HIM-C3S


20-HIM-C5S


20-HIM-C6S


20-WIM-N1


20-WIM-N4S

Human Interface and Wireless Interface Modules

Description	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
No HIM (Blank Plate), Handheld/Local (Drive Mount)	20-HIM-A0	✓	✓	✓	✓	✓
LCD Display, Full Numeric Keypad, Handheld/Local (Drive Mount)	20-HIM-A3	✓	✓	✓	✓	
LCD Display, Programmer Only, Handheld/Local (Drive Mount)	20-HIM-A5	✓	✓	✓	✓	
Enhanced, LCD, Full Numeric, Handheld/Local (Drive Mount)	20-HIM-A6	✓	✓	✓	✓	✓
Remote (Panel Mount) LCD Display, Full Numeric Keypad ∗❄	20-HIM-C3S	✓	✓	✓	✓	
Remote (Panel Mount) LCD Display, Programmer Only ∗❄	20-HIM-C5S	✓	✓	✓	✓	
Enhanced, LCD, Full Numeric ∗❄	20-HIM-C6S	✓	✓	✓	✓	✓
Wireless Interface Module, Handheld/Local (Drive Mount)	20-WIM-N1	✓	✓	✓	✓	✓
Wireless Interface Module, Remote (Panel Mount) ∗❄	20-WIM-N4S	✓	✓	✓	✓	✓

∗ IP66, NEMA Type 4X/12 - For indoor use only.
❄ Includes a 1202-C30 interface cable (3 meters) for connection to drive.

Human Interface Module Accessories

Description	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
Bezel Kit for LCD HIMs, NEMA Type 1 ❄	20-HIM-B1	✓	✓	✓	✓	✓
PowerFlex HIM Interface Cable, 1 m (39 in) §	20-HIM-H10	✓	✓	✓	✓	✓
Comm Option Cable Kit (Male-Male)						
0.33 m (1.1 ft)	1202-C03	✓	✓	✓	✓	✓
1 m (3.3 ft)	1202-C10	✓	✓	✓	✓	✓
3 m (9.8 ft)	1202-C30	✓	✓	✓	✓	✓
9 m (29.5 ft)	1202-C90	✓	✓	✓	✓	✓
Cable Kit (Male-Female) ♣						
0.33 m (1.1 ft)	1202-H03	✓	✓	✓	✓	✓
1 m (3.3 ft)	1202-H10	✓	✓	✓	✓	✓
3 m (9.8 ft)	1202-H30	✓	✓	✓	✓	✓
9 m (29.5 ft)	1202-H90	✓	✓	✓	✓	✓
DPI™ Cable Kit with Connectors, Tools and 100 m (328 ft) Cable	1202-CBL-KIT-100M	✓	✓	✓	✓	✓
DPI Cable Connector Kit	1202-TB-KIT-SET	✓	✓	✓	✓	✓
DPI/SCANport™ One to Two Port Splitter Cable	1203-S03	✓	✓	✓	✓	✓

❄ Includes a 1202-C30 interface cable (3 meters) for connection to drive.
§ Required only when HIM is used as handheld or remote.
♣ Required in addition to 20-HIM-H10 for distances up to a total maximum of 10 m (32.8 ft).

Communication Accessories

Description	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
Serial Null Modem Adapter	1203-SNM	✓	✓	✓	✓	✓
Smart Self-powered Serial Converter (RS232) includes 1203-SFC and 1202-C10 Cables	1203-SSS	✓	✓	✓	✓	✓
Universal Serial Bus™ (USB) Converter includes 2 m USB, 20-HIM-H10 & 22-HIM-H10 Cables	1203-USB	✓	✓	✓	✓	✓
ControlNet Ex Right-Angle T-Tap	1786-TPR			✓	✓	✓
Communication Carrier Card	20-750-20COMM					✓

Communication Option Kits

Description	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
BACnet® MS/TP RS485 Communication Adapter	20-COMM-B	✓	✓			
ControlNet™ Communication Adapter (Coax)	20-COMM-C	✓	✓	✓	✓	✓ ‡
ControlNet™ Communication Adapter (Coax) Conformal Coat	20-COMM-C-MX3	✓	✓	✓	✓	✓ ‡
DeviceNet Option Module	20-750-DNET					✓
DeviceNet™ Communication Adapter	20-COMM-D	✓	✓	✓	✓	✓ ‡
DeviceNet™ Communication Adapter Conformal Coat	20-COMM-D-MX3	✓	✓	✓	✓	✓ ‡
EtherNet/IP™ Communication Adapter	20-COMM-E	✓	✓	✓	✓	✓ ‡
EtherNet/IP™ Communication Adapter Conformal Coat	20-COMM-E-MX3	✓	✓	✓	✓	✓ ‡
HVAC Communication Adapter	20-COMM-H	✓	✓	✓ ⌘		✓ ⌘‡
Interbus™ Communication Adapter	20-COMM-I	✓	✓	✓	✓	✓ ‡
CANopen® Communication Adapter	20-COMM-K	✓	✓	✓	✓	✓ ‡
LonWorks® Communication Adapter	20-COMM-L	✓	✓			
Modbus/TCP Communication Adapter	20-COMM-M	✓	✓	✓	✓	✓ ‡
PROFIBUS™ DP Communication Adapter	20-COMM-P	✓	✓	✓	✓	✓ ‡
ControlNet™ Communication Adapter (Fiber)	20-COMM-Q	✓	✓	✓	✓	✓ ‡
Remote I/O Communication Adapter	20-COMM-R	✓	✓	✓	✓	✓ ‡
Remote I/O Communication Adapter Conformal Coat	20-COMM-R-MX3	✓	✓	✓	✓	✓ ‡
RS485 DF1 Communication Adapter	20-COMM-S	✓	✓	✓	✓	✓ ‡
RS485 DF1 Communication Adapter Conformal Coat	20-COMM-S-MX3	✓	✓	✓	✓	✓ ‡
External Communications Kit Power Supply	20-XCOMM-AC-PS1	✓	✓	✓	✓	✓
DPI External Communications Kit	20-XCOMM-DC-BASE	✓	✓	✓	✓	✓
External DPI I/O Option Board ➢	20-XCOMM-IO-OPT1	✓	✓	✓	✓	✓
Compact I/O Module (3 Channel)	1769-SM1	✓	✓	✓	✓	✓
DriveLogix ControlNet Communication Adapter (Coax) ❄	1788-CNC			✓	✓ ✦	
DriveLogix Comm Option, ControlNet Redundant (Coax) ❄	1788-CNCR			✓	✓ ✦	
DriveLogix Comm Option, ControlNet (Fiber) ❄	1788-CNF			✓	✓ ✦	
DriveLogix Comm Option, ControlNet Redundant (Fiber) ❄	1788-CNFR			✓	✓ ✦	
DriveLogix Comm Option, DeviceNet (Open Conn.) ❄	1788-DNBO			✓	✓ ✦	
DriveLogix Comm Option, EtherNet/IP (Twisted Pair) ❄	1788-ENBT			✓	✓ ✦	
DriveLogix5730 Comm Option, Embedded EtherNet/IP	20D-DL2-ENET0			✓	✓ ✦	

➢ For use only with DPI External Communications Kits 20-XCOMM-DC-BASE.
⌘ Only Modbus RTU can be used (PowerFlex 700 - Vector Control only).
❄ For use with DriveLogix option only. Requires Logix Expansion Board (20D-DL2-LEB0).
‡ Requires a Communication Carrier Card (20-750-20COMM). Refer to page 6-67 for compatibility details.
✦ When using a PowerFlex 700S control.

Feedback Options

Description	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
5V/12V Encoder ❖	20A-ENC-1	✓				
12V/5V Encoder	20B-ENC-1				✓ ♠	
12V/5V Encoder with Conformal Coat	20B-ENC-1-MX3					
Multi-Device Interface ➢	20D-MDI-C2			✓	✓ ✦	
2nd Encoder, 5V/12V ➢	20D-P2-ENC0			✓	✓ ✦	
Resolver ➢	20D-RES-A1			✓	✓ ✦	
Stegmann High Resolution Hyperface Encoder ➢	20D-STEG-B1			✓	✓ ✦	
Heidenhain High Resolution EnDat Encoder	20D-HEID-D0			✓	✓ ✦	
Incremental Encoder	20-750-ENC-1					✓
Dual Incremental Encoder	20-750-DENC-1					✓
Universal Feedback (includes Stegmann, Heidenhain, SSI, Biss, Incremental)	20-750-UFB-1					✓ ✶

❖ Works only with PowerFlex 70 Enhanced Control.
➢ Requires Expanded Cassette
♠ When using a PowerFlex 700 with Vector Control.
✶ PowerFlex 755 only.
✦ When using a PowerFlex 700S control.

PowerFlex 750-Series Legacy Communication Options

Most legacy communication adapters (20-COMM) can be used with the PowerFlex 755. However, the restrictions stated below do apply.

Adapter	Accesses Ports 1…6 for I/O	Accesses Port 7…14 Devices	Supports Drive Add On Profiles	Supports Asian-Languages ➢
20-COMM-B	Not Compatible			
20-COMM-C	✓❄	✓ v3.001 §	✓ ♣	✓ v3.001 §
20-COMM-D		✓ v2.005 §	Not Compatible	
20-COMM-E		✓ v4.001 §	✓ ♣	✓ v4.001 §
20-COMM-H	✓‡	Not Compatible		
20-COMM-I	✓❄			
20-COMM-K				
20-COMM-L	Not Compatible			
20-COMM-M	✓❄	✓ v2.001 §	Not Compatible	✓ v2.001 §
20-COMM-P		Not Compatible		
20-COMM-Q		✓ v3.001 §	✓ ♣	✓ v3.001 §
20-COMM-R		Not Compatible		
20-COMM-S				

❄ Controller must be capable of reading/writing 32-bit floating point (REAL) values.
‡ Only works in the Modbus RTU mode.
§ Requires this adapter firmware version or higher.
♣ Requires firmware version v1.05 or higher of the drive Add On Profiles for RSLogix 5000 version v16 or higher.
➢ Chinese, Japanese, and Korean languages are supported at the time of publication.

I/O Option Kits

Description	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
24V DC Digital Inputs (6) w/Analog I/O (4), Slot A ⌘	20C-DA1-A		✓			
115V AC Digital Inputs (6) w/Analog I/O (4), Slot A ⌘	20C-DA1-B		✓			
115V AC Digital Outputs (3), Slot B ⌘	20C-DO1		✓			
24V DC I/O with 2 Analog In, 2 Analog Out, 6 Digital In and 2 Relay Outputs	20-750-2262C-2R					✓
115V AC I/O with 2 Analog In, 2 Analog Out, 6 Digital In and 2 Relay Outputs	20-750-2262D-2R					✓
24V DC I/O with 2 Analog In, 2 Analog Out, 6 Digital In, 3 Digital Out, 1 Relay & 2 Transistor Outputs	20-750-2263C-1R2T					✓

⌘ Only one card allowed per slot.

Safety Options

Description	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
DriveGuard Safe Torque-Off	20A-DG01	✓				
DriveGuard Safe Torque-Off w/2nd Encoder	20D-P2-DG01			✓	✓ ✦	
DriveGuard Safe Torque-Off (ATEX capable) ⌘	20C-DG1		✓			
Safe Torque-Off	20-750-S					✓
Safe Speed Monitor	20-750-S1					✓

⌘ Only one card allowed per slot.
✦ When using PowerFlex 700S control.

PowerFlex 750-Series Option Kits

Description		Frame	Cat. No.	Used with PowerFlex Drive				
				70	700H	700S	700L	753/755
Flange Adapter Kits	Converts Open Type drive to external heatsink (flange) with NEMA/UL Type 1 integrity backside ✶	2	20-750-FLNG1-F2					✓
		3	20-750-FLNG1-F3					✓
		4	20-750-FLNG1-F4					✓
		5	20-750-FLNG1-F5					✓
	Converts Open Type drive to external heatsink (flange) with NEMA/UL Type 4X/12 integrity backside	6	20-750-FLNG4-F6					✓
		7	20-750-FLNG4-F7					✓
EMC Option Kits	EMC Plate with Core	2	20-750-EMC1-F2					✓
	EMC Plate with Core	3	20-750-EMC1-F3					✓
	EMC Plate with Cores	4	20-750-EMC1-F4					✓
	EMC Plate with Cores	5	20-750-EMC1-F5					✓
	EMC Core	2	20-750-EMC2-F2					✓
	EMC Core	3	20-750-EMC2-F3					✓
	EMC Cores	4…5	20-750-EMC2-F45					✓
NEMA/UL Type 1 Option Kits	NEMA/UL Type 1 Kit	2	20-750-NEMA1-F2					✓
	NEMA/UL Type 1 Kit	3	20-750-NEMA1-F3					✓
	NEMA/UL Type 1 Kit	4	20-750-NEMA1-F4					✓
	NEMA/UL Type 1 Kit	5	20-750-NEMA1-F5					✓
	NEMA/UL Type 1 Kit	6	20-750-NEMA1-F6					✓
	NEMA/UL Type 1 Kit	7	20-750-NEMA1-F7					✓
DC Bus Bar Option Kits	DC Bus Bars	6	20-750-DCBB1-F6					✓
		7	20-750-DCBB1-F7					✓

✶ This kit is for use with IP20, NEMA/UL Type 0 drives and **will not provide** an air-tight or water-tight seal. Where sealing is required (e.g. contaminated, dirty or wet environments), a drive with an "F" enclosure option must be used.

Other Options

Description	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
115V AC Interface	AK-M9-115VAC-1	✓				
Frame E Flange Gasket	AK-M9-GASKET1-E4	✓				
Service Connection Board ❄	SK-M9-SCB1	✓				
Removable I/O Terminal Block	SK-G9-TB1-S1					
Removable Encoder Terminal Block	SK-G9-TB1-ENC1					
Touch Cover - Converts IP00/Open Type drive to IP20/NEMA/UL Type 1. No wiring space provided.	20-OPT-TC		✓			
Top Hat- Converts IP00/Open Type drive to IP20/NEMA/UL Type 1. Allows for wiring space.	20-OPT-TH		✓			
Auxiliary Control Power Supply	20-24V-AUX1			✓		
24V Aux Power Supply	20-750-APS					✓
PowerFlex 700S Phase II Control with Expanded Cassette	20D-P2-CKE1			✓	✓ ✦	
PowerFlex 700S Phase II Control with Slim Cassette	20D-P2-CKS1			✓		
PowerFlex 700S DriveLogix5730 Phase II Control with Expanded Cassette	20D-DL2-CKE1			✓	✓ ✦	
PowerFlex 700S DriveLogix5730 Phase II Control with Slim Cassette	20D-DL2-CKS1			✓		

❄ Provides temporary DPI/HIM connection for NEMA/UL Type 1 and Flange drives with cover removed.
✦ When using PowerFlex 700S control and Expanded Cassette.

SynchLink™ Accessories

Description ✶	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
SynchLink Board	20D-P2-SLB0			✓	✓ ✦	
SynchLink Fiber Base Block	1751-SLBA			✓	✓ ✦	
SynchLink 4-port Fiber Splitter Block	1751-SL4SP			✓	✓ ✦	
SynchLink Fiber Bypass Switch Block	1751-SLBP			✓	✓ ✦	
2x1 Meter Fiber Link for Power Monitor/SynchLink	1403-CF001			✓	✓ ✦	
2x3 Meter Fiber Link for Power Monitor/SynchLink	1403-CF003			✓	✓ ✦	
2x5 Meter Fiber Link for Power Monitor/SynchLink	1403-CF005			✓	✓ ✦	
10 Meter Fiber Link for Power Monitor/SynchLink	1403-CF010			✓	✓ ✦	
20 Meter Fiber Link for Power Monitor/SynchLink	1403-CF020			✓	✓ ✦	
50 Meter Fiber Link for Power Monitor/SynchLink	1403-CF050			✓	✓ ✦	
100 Meter Fiber Link for Power Monitor/SynchLink	1403-CF100			✓	✓ ✦	
250 Meter Fiber Link for Power Monitor/SynchLink	1403-CF250			✓	✓ ✦	

✶ Refer to publication number 1769-SG001 for details on SynchLink.
✦ When using PowerFlex 700S control.

DriveLogix Option Kits

Description	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
Logix Expansion board for DriveLogix5730 ➢	20D-DL2-LEB0			✓	✓ ✦	
Industrial Compact Flash 64 MB Memory Card for DriveLogix5730	1784-CF64			✓	✓ ✦	

➢ Requires Expanded Cassette.
✦ When using PowerFlex 700S control.

DriveLogix I/O Cables

Description	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
DriveLogix5730 - Compact I/O cable, 3.28 ft. (1 meter), Left Bus Cap ➢§	20D-DL2-CL3			✓	✓ ✦	
DriveLogix5730 - Compact I/O cable, 3.28 ft. (1 meter), Right Bus Cap ➢§	20D-DL2-CR3			✓	✓ ✦	
Logix5000 RS-232 Programming Cable	1756-CP3			✓	✓ ✦	

➢ Requires Expanded Cassette.
§ Refer to Publication 1769-SG001 for details and selection of Compact I/O.
✦ When using PowerFlex 700S control.

PowerFlex 70 Small Duty Internal Dynamic Brake Resistors

Limited duty resistors mount directly to the back surface of the drive and require no extra panel space. Internal resistors are non-destructive and do not require a resistor overheat external safety circuit.

PowerFlex 70 AC Drive			Small Duty Internal DB Resistor								
								Application Type 1		Application Type 2	
Normal Duty∗ [kW (Hp)]	Heavy Duty∗ [kW (Hp)]	Min DB Res [Ohms ±10%]	Cat. No.	Resistance ❄ [Ohms ±5%]	Continuous Power [kW]	Max Energy [kJ]	Max Braking Torque [% of ND Motor]	Braking Torque [% of ND Motor]	Duty Cycle	Braking Torque [% of ND Motor]	Duty Cycle
200…240 Volt AC Input Drives											
0.37 (0.5)	0.25 (0.33)	33	20AB-DB1-A	62	0.048	8.3	307%	100%	25.9%	150%	17.3%
0.75 (1.0)	0.55 (0.75)	33	20AB-DB1-A	62	0.048	7.3	300%	100%	12.8%	150%	8.5%
1.5 (2.0)	1.1 (1.5)	33	20AB-DB1-B	62	0.028	0.8	160%	100%	3.7%	150%	2.5%
2.2 (3.0)	1.5 (2.0)	33	20AB-DB1-B	62	0.028	0.8	109%	100%	2.5%	109%	2.3%
4.0 (5.0)	3.0 (3.0)	30	20AB-DB1-C	62	0.040	0.8	60%	60%	3.3%	N/A	N/A
5.5 (7.5)	4.0 (5.0)	21	20AB-DB1-D	22	0.036	0.9	117%	100%	1.3%	117%	1.1%
7.5 (10)	5.5 (7.5)	21	20AB-DB1-D	22	0.036	0.9	86%	86%	1.1%	N/A	N/A
400…480 Volt AC Input Drives											
0.37 (0.5)	0.25 (0.33)	68	20AD-DB1-A	115	0.048	8.3	320%	100%	25.9%	150%	17.3%
0.75 (1.0)	0.55 (0.75)	68	20AD-DB1-A	115	0.048	9.0	259%	100%	12.8%	150%	8.5%
1.5 (2.0)	1.1 (1.5)	68	20AD-DB1-A	115	0.048	2.4	243%	100%	6.4%	150%	4.3%
2.2 (3.0)	1.5 (2.0)	68	20AD-DB1-B	115	0.028	0.9	206%	100%	2.5%	150%	1.7%
4.0 (5.0)	3.0 (3.0)	68	20AD-DB1-B	115	0.028	0.9	129%	100%	1.4%	129%	1.1%
5.5 (7.5)	4.0 (5.0)	74	20AD-DB1-C	115	0.04	0.9	94%	94%	1.5%	N/A	N/A
7.5 (10)	5.5 (7.5)	74	20AD-DB1-C	115	0.04	0.9	69%	69%	1.5%	N/A	N/A
11 (15)	7.5 (10)	44	20AD-DB1-D	62	0.036	0.8	87%	87%	0.8%	N/A	N/A
15 (20)	11 (15)	31	20AD-DB1-D	62	0.036	0.8	64%	64%	0.8%	N/A	N/A
500…600 Volt AC Input Drives											
0.37 (0.5)	0.25 (0.33)	117	20AD-DB1-A	115	0.048	8.3	287%	100%	25.9%	150%	17.3%
0.75 (1.0)	0.55 (0.75)	117	20AD-DB1-A	115	0.048	9.0	263%	100%	12.8%	150%	8.5%
1.5 (2.0)	1.1 (1.5)	117	20AD-DB1-A	115	0.048	2.4	243%	100%	6.4%	150%	4.3%
2.2 (3.0)	1.5 (2.0)	117	20AD-DB1-B	115	0.028	0.9	202%	100%	2.5%	150%	1.7%
4.0 (5.0)	3.0 (3.0)	80	20AD-DB1-B	115	0.028	0.9	193%	100%	1.4%	150%	0.9%
5.5 (7.5)	4.0 (5.0)	80	20AD-DB1-C	115	0.04	0.9	147%	100%	1.5%	147%	1.0%
7.5 (10)	5.5 (7.5)	80	20AD-DB1-C	115	0.04	0.9	108%	100%	1.1%	108%	1.0%
11 (15)	7.5 (10)	48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15 (20)	11 (15)	48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

∗ Duty cycle listed is based on full speed to zero speed deceleration. For constant regen at full speed, duty cycle capability is half of what is listed. Application Type 1 represents maximum capability up to 100% braking torque where possible. Application Type 2 represents more than 100% braking torque where possible, up to a maximum of 150%.

❄ Always check resistor Ohms against minimum resistance for drive being used.

PowerFlex 70 Medium Duty External Dynamic Brake Resistors

These resistors provide a larger duty cycle capability than the internal type. Includes an internal thermal switch for use in external safety circuit.

PowerFlex 70 AC Drive			Medium Duty External DB Resistor								
								Application Type 1		Application Type 2	
Normal Duty✶ [kW (Hp)]	Heavy Duty✶ [kW (Hp)]	Min DB Res [Ohms ±10%]	Cat. No.	Resistance ❄ [Ohms ±5%]	Continuous Power [kW]	Max Energy [kJ]	Max Braking Torque [% of ND Motor]	Braking Torque [% of ND Motor]	Duty Cycle	Braking Torque [% of ND Motor]	Duty Cycle
200…240 Volt AC Input Drives											
0.37 (0.5)	0.25 (0.33)	33	AK-R2-091P500	91	0.086	17	293%	100%	46%	150%	31%
0.75 (1.0)	0.55 (0.75)	33	AK-R2-091P500	91	0.086	17	218%	100%	23%	150%	15%
1.5 (2.0)	1.1 (1.5)	33	AK-R2-091P500	91	0.086	17	109%	100%	11%	109%	11%
2.2 (3.0)	1.5 (2.0)	33	AK-R2-047P500	47	0.166	33	144%	100%	15%	144%	11%
4.0 (5.0)	3.0 (3.0)	30	AK-R2-047P500	47	0.166	33	79%	79%	11%	N/A	N/A
5.5 (7.5)	4.0 (5.0)	23	AK-R2-030P1K2	30	0.26	52	90%	90%	10%	N/A	N/A
7.5 (10)	5.5 (7.5)	23	AK-R2-030P1K2	30	0.26	52	66%	66%	10%	N/A	N/A
400…480 Volt AC Input Drives											
0.37 (0.5)	0.25 (0.33)	68	AK-R2-360P500	360	0.086	17	305%	100%	47%	150%	31%
0.75 (1.0)	0.55 (0.75)	68	AK-R2-360P500	360	0.086	17	220%	100%	23%	150%	15%
1.5 (2.0)	1.1 (1.5)	68	AK-R2-360P500	360	0.086	17	110%	100%	12%	110%	11%
2.2 (3.0)	1.5 (2.0)	68	AK-R2-120P1K2	120	0.26	52	197%	100%	24%	150%	16%
4.0 (5.0)	3.0 (3.0)	68	AK-R2-120P1K2	120	0.26	52	124%	100%	13%	124%	10%
5.5 (7.5)	4.0 (5.0)	74	AK-R2-120P1K2	120	0.26	52	90%	90%	10%	N/A	N/A
7.5 (10)	5.5 (7.5)	74	AK-R2-120P1K2	120	0.26	52	66%	66%	10%	N/A	N/A
11 (15) ‡	7.5 (10) ‡	44	‡	60	0.52	104	90%	90%	10%	N/A	N/A
15 (20) ‡	11 (15) ‡	31	‡	60	0.52	104	66%	66%	10%	N/A	N/A
500…600 Volt AC Input Drives											
0.37 (0.5)	0.25 (0.33)	117	AK-R2-360P500	360	0.086	17	274%	100%	46%	150%	31%
0.75 (1.0)	0.55 (0.75)	117	AK-R2-360P500	360	0.086	17	251%	100%	23%	150%	15%
1.5 (2.0)	1.1 (1.5)	117	AK-R2-360P500	360	0.086	17	172%	100%	11%	150%	8%
2.2 (3.0)	1.5 (2.0)	117	AK-R2-120P1K2	120	0.26	52	193%	100%	24%	150%	16%
4.0 (5.0)	3.0 (3.0)	80	AK-R2-120P1K2	120	0.26	52	185%	100%	13%	150%	9%
5.5 (7.5)	4.0 (5.0)	80	AK-R2-120P1K2	120	0.26	52	141%	100%	9%	141%	7%
7.5 (10)	5.5 (7.5)	80	AK-R2-120P1K2	120	0.26	52	103%	100%	7%	103%	7%
11 (15) ‡	7.5 (10) ‡	48	‡	60	0.52	104	141%	100%	9%	141%	7%
15 (20) ‡	11 (15) ‡	48	‡	60	0.52	104	103%	100%	7%	103%	7%

✶ Duty cycle listed is based on full speed to zero speed deceleration. For constant regen at full speed, duty cycle capability is half of what is listed. Application Type 1 represents maximum capability up to 100% braking torque where possible. Application Type 2 represents more than 100% braking torque where possible, up to a maximum of 150%.

❄ Always check resistor Ohms against minimum resistance for drive being used.

‡ For 11 and 15 kW (15 and 20 Hp) applications, use two 7.5 kW (10 Hp) size resistors wired in parallel.

Internal Dynamic Brake Resistor Kits

These resistors have a limited duty cycle. Refer to the PowerFlex Dynamic Braking Selection Guide to determine if an internal resistor will be sufficient for your application. An external resistor may be required.

Drive Input Voltage	Brake Resistance [Ω]	Frame	Cat. No.	Used with PowerFlex Drive				
				70	700H	700S	700L	753/755
208…240V AC	62	0	20BB-DB1-0			✓		
	62	1 (except 7.5 Hp)	20BB-DB1-1			✓		
	22	1 (7.5 Hp)	20BB-DB2-1			✓		
	22	2	20BB-DB1-2			✓		
380…600V AC	115	0	20BD-DB1-0			✓		
	115	1	20BD-DB1-1			✓		
	68	2	20BD-DB1-2			✓		
	68	2	20-750-DB1-D2					✓

Dynamic Brake, Chopper Only Kits

Voltage	Rating	Peak Transistor Current Rating [A]	Minimum DB Resistance [Ohms]	Cat. No.	Used with PowerFlex Drive				
					70	700H	700S	700L	753/755
200…240V AC	18A	50	9	1336-WA018			✓		
	70A	200	2.3	1336-WA070			✓		
	115A	400	1.25	1336-WA115			✓		
380…480V AC	9A	25	37	1336-WB009		✓	✓		✓
	35A	100	9	1336-WB035		✓	✓		✓
	110A	400	2.5	1336-WB110		✓	✓		✓
500…600V AC	9A	25	46	1336-WC009		✓	✓		
	35A	75	15.5	1336-WC035		✓	✓		
	85A	400	3	1336-WC085		✓	✓		

Terminators

Description ❄	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
for use with 3.7 kW (5 Hp) & below drives	1204-TFA1	✓		✓	✓	✓
for use with 1.5 kW (2 Hp) & up drives	1204-TFB2	✓	✓	✓	✓	✓

❄ Refer to Appendix A of publication Drives-IN001 for selection information.

Reflected Wave Reduction Modules w/Common Mode Choke

Description ❄	Cat. No.	Used with PowerFlex Drive				
		70	700H	700S	700L	753/755
17A with Common Mode Choke	1204-RWC-17-A	✓	✓	✓		✓

❄ Refer to Appendix A of publication Drives-IN001 for selection information.

Reflected Wave Reduction Modules

Voltage	ND kW	ND Hp	Cat. No.	Used with PowerFlex Drive				
				70	700H	700S	700L	753/755
380…480V AC	4	5	1321-RWR8-DP	✓		✓		✓
	5.5	7.5	1321-RWR12-DP	✓		✓		✓
	7.5	10	1321-RWR18-DP	✓		✓		✓
	11	15	1321-RWR25-DP	✓		✓		✓
	15	20	1321-RWR35-DP	✓		✓		✓
	18.5	25	1321-RWR35-DP	✓		✓		✓
	22	30	1321-RWR45-DP	✓		✓		✓
	30	40	1321-RWR55-DP	✓		✓		✓
	37	50	1321-RWR80-DP	✓		✓		✓
	45	60	1321-RWR80-DP			✓		✓
	55	75	1321-RWR100-DP			✓		✓
	75	100	1321-RWR130-DP			✓		✓
	75	100	1321-RWR160-DP			✓		
	90	125	1321-RWR160-DP			✓		✓
	110	150	1321-RWR200-DP			✓		✓
	149	200	1321-RWR250-DP		✓	✓		✓
	149	200	1321-RWR320-DP			✓		
	187	250	1321-RWR320-DP		✓	✓		✓
500…600V AC	4	5	1321-RWR8-EP	✓		✓		
	5.5	7.5	1321-RWR8-EP			✓		
	5.5	7.5	1321-RWR12-EP	✓				
	7.5	10	1321-RWR12-EP	✓		✓		
	11	15	1321-RWR18-EP	✓		✓		
	15	20	1321-RWR25-EP	✓		✓		
	18.5	25	1321-RWR25-EP			✓		
	18.5	25	1321-RWR35-EP	✓				
	22	30	1321-RWR35-EP	✓		✓		
	30	40	1321-RWR45-EP	✓		✓		
	37	50	1321-RWR55-EP	✓		✓		
	45	60	1321-RWR80-EP			✓		
	55	75	1321-RWR80-EP			✓		
	75	100	1321-RWR100-EP			✓		
	90	125	1321-RWR130-EP			✓		
	110	150	1321-RWR160-EP			✓		
	110	150	1321-RWR200-EP			✓		
	149	200	1321-RWR200-EP			✓		

1492 Wiring System Modules and Cables

Wiring System Modules and Cables provide an easy means to extend drive control wiring. A pre-wired cable (available in various lengths) plugs into the appropriate drive I/O terminal block. The remaining cable end plugs into the Wiring Module which provides a terminal block for direct I/O connection. See publication 1492-TD008 for detailed information.

1492 Wiring Module and Cable Selection

Drive I/O	Wiring Module Description	Wiring Module Cat. No.		PowerFlex 700H Cable (see below)	PowerFlex 700S Cable (see below)	Used with PowerFlex Drive				
		Fixed Terminal Block	Removable Terminal Block			70	700H	700S	700L	753/755
Analog I/O (TB1)	6 Channel Isolated - 3 Terminals/Ch.	1492-AIFM6S-3	1492-RAIFM6S-3	1492-ACABxxxZ7H	1492-ACABxxxZ7S		✓	✓		
DC Discrete Digital I/O (TB2)	Standard, 264V AC/DC	1492-IFM20F	1492-RIFM20F	1492-CABxxxA7H	1492-CABxxxA7S		✓	✓		
	Narrow Standard, 132V AC/DC	1492-IFM20FN	1492-RIFM20FN	1492-CABxxxA7H	1492-CABxxxA7S		✓	✓		
	Extra Terminals (2 per I/O), 264V AC/DC	1492-IFM20F-2	1492-RIFM20F-2	1492-CABxxxA7H	1492-CABxxxA7S		✓	✓		
AC Discrete Digital I/O (20C-DA1-B & 20C-DO1)	Standard, 264V AC/DC	1492-IFM20F	1492-RIFM20F	1492-CABxxxB7H	1492-CABxxxB7H		✓			
	Narrow Standard, 132V AC/DC	1492-IFM20FN	1492-RIFM20FN	1492-CABxxxB7H	1492-CABxxxB7H		✓			
	Extra Terminals (2 per I/O), 264V AC/DC	1492-IFM20F-2	1492-RIFM20F-2	1492-CABxxxB7H	1492-CABxxxB7H		✓			
Encoder	2 Channel Encoder Input - 4 Outputs	1492-AIFMCE4	–	1492-ACABxxxX7S	1492-ACABxxxX7S			✓		
	2 Channel Fused Encoder Input - 4 Fused Outputs	1492-AIFMCE4-F	–	1492-ACABxxxX7S	1492-ACABxxxX7S			✓		

1492 Pre-Wired Cable Assemblies

Description	PowerFlex 700H Cat. No.	PowerFlex 700S Cat. No.	Used with PowerFlex Drive				
			70	700H	700S	700L	753/755
Pre-Wired Cable for Analog I/O							
0.5 m (1.6 ft)	1492-ACAB005Z7H	1492-ACAB005Z7S		✓	✓		
1.0 m (3.3 ft)	1492-ACAB010Z7H	1492-ACAB010Z7S		✓	✓		
2.5 m (8.2 ft)	1492-ACAB025Z7H	1492-ACAB025Z7S		✓	✓		
5.0 m (16.4 ft)	1492-ACAB050Z7H	1492-ACAB050Z7S		✓	✓		
Pre-Wired Cable for Discrete DC I/O							
0.5 m (1.6 ft)	1492-CAB005A7H	1492-CAB005A7S		✓	✓		
1.0 m (3.3 ft)	1492-CAB010A7H	1492-CAB005A7S		✓	✓		
2.5 m (8.2 ft)	1492-CAB025A7H	1492-CAB025A7S		✓	✓		
5.0 m (16.4 ft)	1492-CAB050A7H	1492-CAB050A7S		✓	✓		
Pre-Wired Cable for Discrete AC I/O							
0.5 m (1.6 ft)	1492-CAB005B7H	–		✓			
1.0 m (3.3 ft)	1492-CAB010B7H	–		✓			
2.5 m (8.2 ft)	1492-CAB025B7H	–		✓			
5.0 m (16.4 ft)	1492-CAB050B7H	–		✓			
Pre-Wired Cable for Encoder							
0.5 m (1.6 ft)	–	1492-ACAB005X7S			✓		
1.0 m (3.3 ft)	–	1492-ACAB010X7S			✓		
2.5 m (8.2 ft)	–	1492-ACAB025X7S			✓		
5.0 m (16.4 ft)	–	1492-ACAB050X7S			✓		

Servo Drive Comparison

Kinetix® Integrated Motion systems help increase machine productivity with GuardMotion™ technology. GuardMotion is the basis for safety innovations integrated into Kinetix motion products. Safe-off, also known as Safe Torque-off, helps machine builders and manufacturers implement machine solutions that provide safety and maximum availability. Tasks such as machine setup, cleaning, removal of jams and other typical maintenance work that previously required power-down conditions can now be accomplished without removing power from the entire machine. With the Safe-off capability, the drive output is safely disabled to eliminate motor torque. As a result, users enjoy faster machine restart and shorter machine downtime. In addition, components such as output contactors can be eliminated, simplifying machine design and reducing both panel space requirements and overall system cost.

Kinetix 6200 and Kinetix 6500 drives offer Safe Speed Monitoring, as well as Safe-off capability.

GuardMotion drives can be identified by the GuardMotion logo on the front label of the drive.

Drive Features	Kinetix 300	Kinetix 6500	Kinetix 6200	Kinetix 6000	Kinetix 7000
Main Characteristics	• Single-axis • EtherNet/IP • Safe Torque-off Control	• Multi-axis • Common Bus • Modular Design • Safe Speed Monitoring		• Multi-axis • Common Bus • Safe-Off Control	• Multi-axis • Common Bus • Safe-Off Control
Drive Configuration	Single-axis	1…8 axes on Bulletin 2094 power rail		1…8 axes on Bulletin 2094 power rail	Single-axis
Input Voltage	120V/240V/480V	324…528V AC, Three-phase (460V systems)		195…265V AC, Three-phase (230V systems) 324…528V AC, Three-phase (460V systems)	324…528V AC, Three-phase
Common Bus Follower Input Voltage	Not Applicable	458…747V DC (460V systems)		275…375V DC (230V systems) 458…747V DC (460V systems)	450…750V DC
Continuous Output Power (inverter)	0.4…3 kW	1.8…6.6 kW (460V systems)		1.2…11 kW (230V systems) 1.8…22 kW (460V systems)	22…149 kW
Continuous Output Current (inverter)	2…12 A rms	2.8…10.3 A rms (460V systems)		3.7…34.6 A rms (230V systems) 2.8…34.6 A rms (460V systems)	40…248 A rms
Drive Digital Inputs	• Enable, Overtravel ± • High Speed Registration (1) • Configurable (8)	• Enable, Home, Overtravel ± • High Speed Registration (2/axis)			• Enable, Home, Overtravel ± • High Speed Registration (2)
Drive Digital Outputs	• Ready • Configurable (4)	Motor Brake Relay Output (with suppression)			
DPI Connector	Not applicable	Not applicable		• DriveExplorer • HIM	
Programming	• Built-in Web Server • RSLogix 5000 Software (Ladder Diagram, Structured Text, and Sequential Function Charts)	RSLogix 5000 Software (Ladder Diagram, Structured Text, and Sequential Function Charts)			
Logix Module Compatibility	• ControlLogix® and CompactLogix™ EtherNet/IP Adapter Modules	• 1756-EN2F, 1756-EN2T, 1756-EN2TR, 1756-EN3TR	• 1756-M03SE, 1756-M08SE, 1756-M16SE • 1768-M04SE		
I/O Control	EtherNet/IP	EtherNet/IP	Fiber-optic SERCOS	Fiber-optic SERCOS	
Feedback	• High-resolution absolute multi-turn and single-turn encoder • Incremental Encoder • Auxiliary axis for master gearing mode	• High-resolution absolute multi-turn and single-turn encoder • Incremental Encoder • Heidenhain EnDat Encoder • Feedback-only auxiliary axis		• High-resolution absolute multi-turn and single-turn encoder • Incremental encoder • Resolver • Feedback-only auxiliary axis	• High-resolution absolute multi-turn and single-turn encoder • Incremental encoder • Feedback-only auxiliary axis
Rotary Motor Compatibility	• MP-Series (Bulletin MPL/MPF/MPS/MPM) • TL-Series (Bulletin TLY)	• MP-Series (Bulletin MPL/MPF/MPS/MPM) • RDD-Series Direct Drive Motors		• MP-Series (Bulletin MPL/MPF/MPS/MPM) • RDD-Series Direct Drive Motors • TL-Series	• HPK-Series • MP-Series (Bulletin MPL and MPM) • RDD-Series Direct Drive Motors
Linear Motor Compatibility	Not applicable	• LDC-Series		• LDC-Series	Not applicable
Linear Actuator Compatibility	• MP-Series Linear Stages • MP-Series Electric Cylinders • TL-Series Electric Cylinders	• MP-Series Linear Stages • MP-Series Multi-axis Linear Stages • MP-Series Electric Cylinders		• MP-Series Linear Stages • MP-Series Multi-axis Linear Stages • MP-Series Electric Cylinders	Not applicable
Accessory Compatibility	• 2097 Shunt Resistors • 2097 AC Line Filter Modules • 2097 I/O Terminal Block • 2097 Memory Module Programmer	• 2094 Line Interface Modules • 2090 Resistive Brake Modules • 1394 External Shunt Modules • 1336 External Active Shunt Modules (dynamic brake)		• 2094 Line Interface Modules • 2090 Resistive Brake Modules • 1394 External Shunt Modules • 1336 External Active Shunt Modules (dynamic brake)	• 8720MC Regenerative PS • 8720MC Line Reactor • 1336 External Active Shunt • 1336 Brake Chopper Module • 2094 Line Interface Modules

Safety Solutions for Kinetix® Servo Drives

Kinetix 300 Drives

Features

- PLd, Category 3 per ISO 13849-1
- Stop Category 0 per EN 60204-1
- Removable terminals
- Common solution for any power range

Kinetix 300 Specifications

Standards	IEC/EN 60204-1, ISO 13849-1
Category	PLd, Category 3 per ISO 13849-1
Certifications	CE, cUL, and TÜV functional safety
Safety Inputs	Insulated, compatible with single-ended output (+24V DC)
Enable Voltage Range	20…24V DC
Disable Voltage Range	0…1.0V DC
Input Impedance	6.8 k Ω
Safety Status	Isolated Open Collector (Emitter is grounded.)
Output Load Capability	100 mA
Response Time	Less than 1 ms
Recommended Conductor Size Terminal Screw	Stranded Wire with Ferrule: 0.75 mm² (18 AWG) Solid Wire: 1.5 mm² (16 AWG)
Recommended Torque Terminal Screw	0.2 N•m (1.8 lb•in)
Safety Status	Isolated Open Collector (Emitter is grounded.)
User Manual	Kinetix® 300 User Manual, publication 2097-UM001

Description

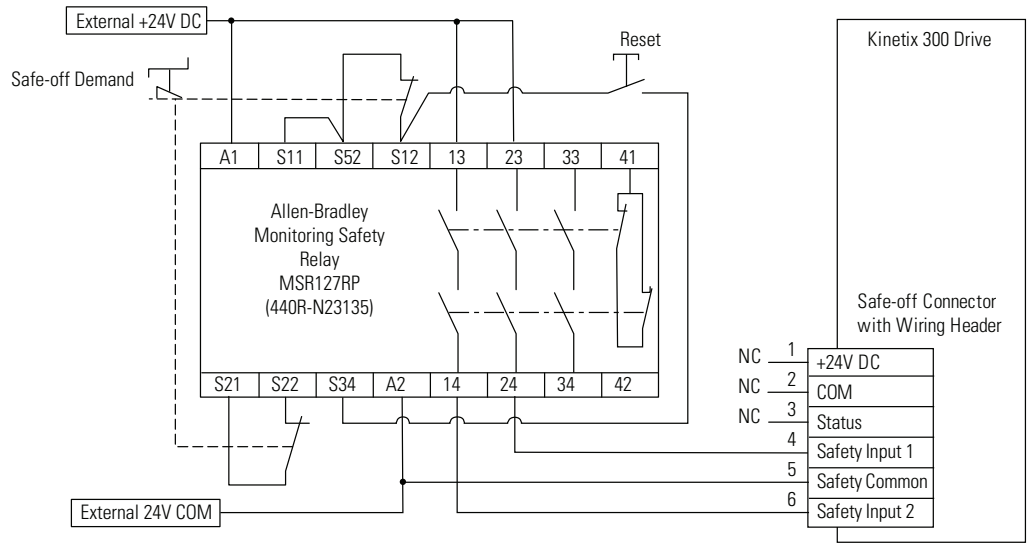
Kinetix® 300 EtherNet/IP Indexing servo drives help protect personnel and increase machine productivity with Safe Torque-off functionality. The Kinetix 300 drive implements solid-state safety circuits for excellent reliability.

Cat. No. 2097-	V31-PR0	V31-PR2	V32-PR0	V32-PR2	V32-PR4	V33-PR1	V33-PR3	V33-PR5	V33-PR6	V34-PR3	V34-PR5	V34-PR6
AC Input Voltage	120/240V rms (1-Phase)		240V rms (1-Phase)			240V rms (1-Phase or 3-Phase)				480V rms (3-Phase)		
AC Input Frequency	48…62 Hz											
Main AC Input Current Nominal (rms)	9.7 A (120V input) 5.0 A (240V input)	16.8 A (120V input) 8.6 A (240V input)	5.0 A	8.6 A	15 A	3.0 A	5.0 A	8.7 A	13.9 A	2.7 A	5.5 A	7.9 A
Back-up Control Power Input	20…26V DC											
Continuous Power Output	400 W	800 W	400 W	800 W	1.7 kW	500 W	1.0 kW	2.0 kW	3.0 kW	1.0 kW	2.0 kW	3.0 kW
Continuous Output Current (rms)	2.0 A	4.0 A	2.0 A	4.0 A	8.0 A	2.0 A	4.0 A	8.0 A	12.0 A	2.0 A	4.0 A	6.0 A
Peak Current (rms) 3 s	6.0 A	12.0 A	6.0 A	12.0 A	24.0 A	6.0 A	12.0 A	24.0 A	36.0 A	6.0 A	12.0 A	18.0 A
Module Size Specifications												
Height (mm)	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5	190.5
Width (mm)	68	68.5	68	68.5	86.8	68	68.5	94.4	68	68.5	94.4	68
Depth (mm)	185.1	185.1	229.6	229.6	229.6	185.1	185.1	185.1	229.6	185.1	185.1	229.6

Kinetix 300 Stop Category 0 Configuration

The Kinetix 300 drive is shown with a single-axis relay in a Stop Category 0 configuration.

Kinetix 300 Relay Configuration Stop Category 0



Accessories

Safe-off Headers for Kinetix 300 Drives

Description	Cat. No.
Spare Connector Header Set	2097-CONN1

Safety Solutions for Kinetix® Servo Drives

Kinetix 6200 and Kinetix 6500 Drives

Kinetix 6200

Kinetix 6500

Safe Speed Servo Drives

Description

Kinetix® 6200 and Kinetix® 6500 servo drives have safety features that help improve machine operating efficiencies by providing safer access to guarded areas while a machine or process continues operation under limited conditions. Leveraging the proven performance of the Kinetix 6000 family, these drives include features such as safe stop, zero speed monitoring, safe direction monitoring, and safe maximum acceleration monitoring. Control modules couple with IAM and AM power modules to provide drive status indicators and an interface to I/O, communication, safety functionality, and feedback.

The Kinetix 6200 features a SERCOS interface, while the Kinetix 6500 provides EtherNet/IP network connectivity. Both drives offer Safe Torque-off or Safe Speed Monitoring options.

Features

- TÜV-certified up to and including SIL3 per IEC 61508 and PLe per ISO 13849-1
- Reduce panel space and eliminate wiring between external safety monitor and the drive because of the drive's embedded safety
- Interchangeable control modules let you easily transform from Safe-off to Safe Speed functionality or from SERCOS interface™ to EtherNet/IP networking
- Embedded, dual-channel monitoring capability
- Includes automatic, manual, or manual monitored reset
- Supports cascaded system via solid state safety outputs
- Uses the same Allen-Bradley motors and actuators as the Kinetix 6000, including the MP-series low inertia, medium inertia, stainless steel and food grade motors, RDD-series direct drive motors, LDC-series linear motors, MP-series linear stages, MP-series electric cylinders

Kinetix 6200 and Kinetix 6500 Specifications

Standards	IEC/EN 60204-1, ISO12100, IEC 61508, IEC 61800-5-2
Category	PLe and Cat. 4 per EN ISO 13849-1
Safety Integrity Level	SIL3 per IEC 61508 and EN62061
Certifications	C-Tick, CE, cUL, and TÜV functional safety
Safety Inputs	5
PFd(t) for 20-year interval	Single-encoder configuration: 10.3E-04 Dual-encoder configuration: 4.15E-04
PFh(t) for 20-year interval	Single-encoder configuration: 5.88E-09 Dual-encoder configuration: 2.37E-09
Overspeed Response Time	user-configurable
Recommended Conductor Size Terminal Screw	0.25…0.75 mm² (24…18 AWG)
Recommended Torque Terminal Screw	0.22…0.25 N•m (1.9…2.0 lb•in)
Safety Reference Manual	• Kinetix 6200 and Kinetix 6500 Safe Speed Monitoring Safety Reference Manual, Publication 2094-RM001 • Kinetix 6200 and Kinetix 6500 Safe Torque-off Safety Reference Manual, Publication 2094-RM002

Kinetix 6200 and Kinetix 6500 IAM Power Module (460V) Specifications

IAM Power Module	2094-BC01-MP5-M	2094-BC01-M01-M	2094-BC02-M02-M
AC Input Voltage	324…528V rms 3-Phase (360…480 nom)		
AC Input Frequency	47…63 Hz		
Main AC Input Current Nominal (rms)	10 A	10 A	24 A
DC Input Voltage (Common Bus follower)	458…747V DC		
DC Input Current (Common Bus follower)	9 A	9 A	22.6 A
Control Power AC Input Voltage	95…264V rms single-phase (230V nominal)		
Continuous Output Current to Bus (Adc)	9 A	9 A	22.6 A
Intermittent Output Current to Bus (Adc)	20 A	20 A	38 A
Continuous Power Output to Bus (nominal)	6 kW	6 kW	15 kW
Module Size Specifications			
Height (mm)	290	290	290
Width (mm)	125	125	125
Depth (mm)	290	290	290

Kinetix 6200 and Kinetix 6500 AM Power Module (460V) Specifications

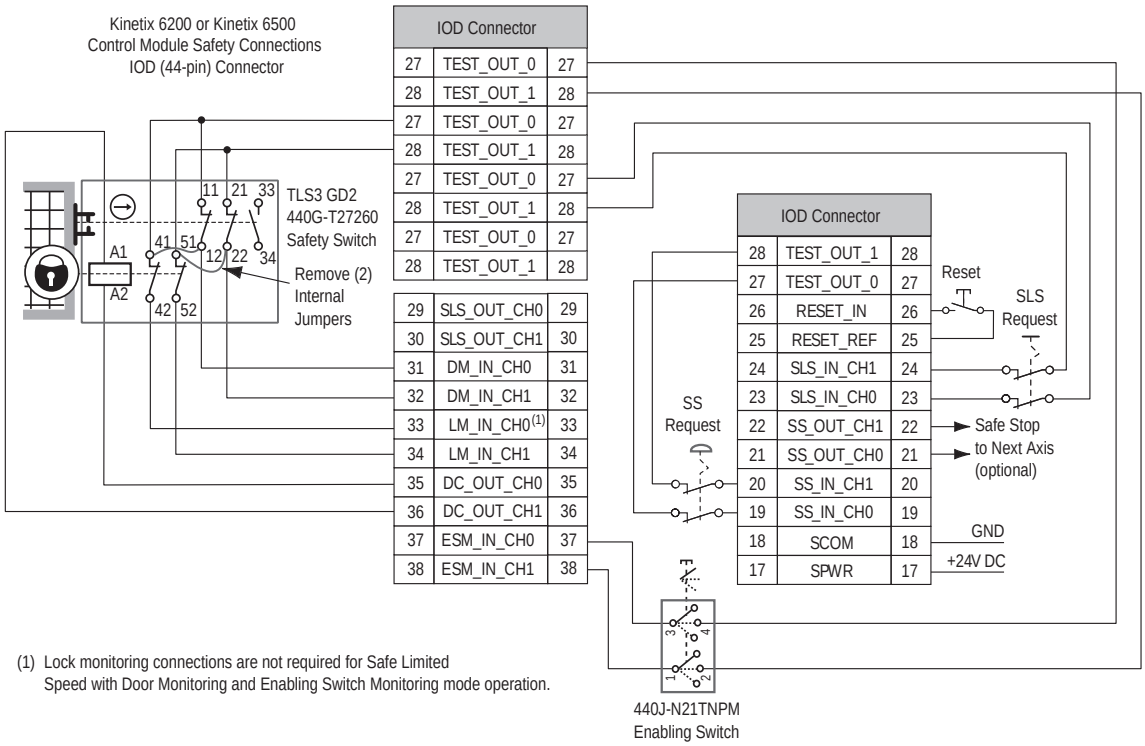
AM Power Modules	2094-BMP5-M (2094-BC01-MP5-M)	2094-BM01-M (2094-BC01-M01-M)	2094-BM02-M (2094-BC02-M02-M)
Continuous Output Current (rms)	2.8 A	6.1 A	10.3 A
Continuous Output Current (0-peak)	4.0 A	8.6 A	14.6 A
Peak Output Current (rms)	7.0 A	15.3 A	25.8 A
Peak Output Current (0-peak)	9.9 A	21.6 A	36.4 A
Maximum Seconds at Peak			
Continuous Power Output (nominal)	1.8 kW	3.9 kW	6.6 kW
Module Size Specifications			
Height (mm)	290	290	290
Width AM (mm)	70	70	70
Depth (mm)	290	290	290

Kinetix 6200 and Kinetix 6500 Control Module Specifications

Cat. No.	2094-SE02F-M00-S1	2094-SE02F-M00-S0	2094-EN02D-M01-S1	2094-EN02D-M01-S0
Drive Family	Kinetix 6200		Kinetix 6500	
Control/Communication	SERCOS interface		EtherNet/IP networking	
Safety Features	Safe Speed Monitoring	Safe Torque-off	Safe Speed Monitoring	Safe Torque-off
Connectors	• IOD connector for I/O, safety, and auxiliary feedback • MF connector for motor feedback			

Kinetix 6200 Safe Limited Speed with Door Monitoring and Enabling Switch Monitoring Configuration

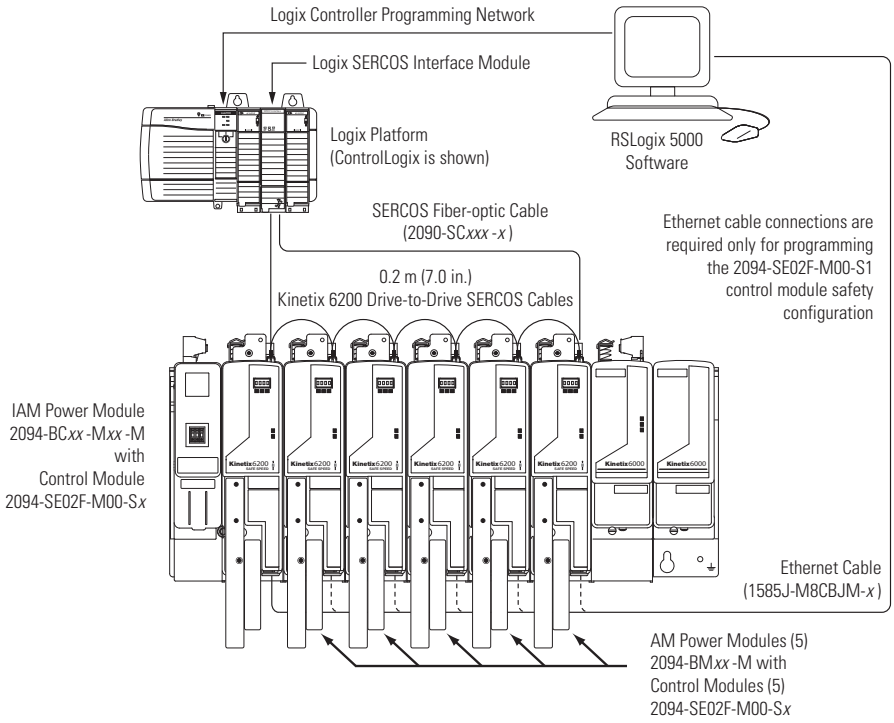
The Kinetix 6200 drive is shown wired for Safe Limited Speed with Door Monitoring and Enabling Switch Monitoring, one of 11 user-selectable operating modes, based on combinations of available safety functions. The proper configuration of this speed monitoring mode in RSLogix™ 5000 software is required.



(1) Lock monitoring connections are not required for Safe Limited Speed with Door Monitoring and Enabling Switch Monitoring mode operation.

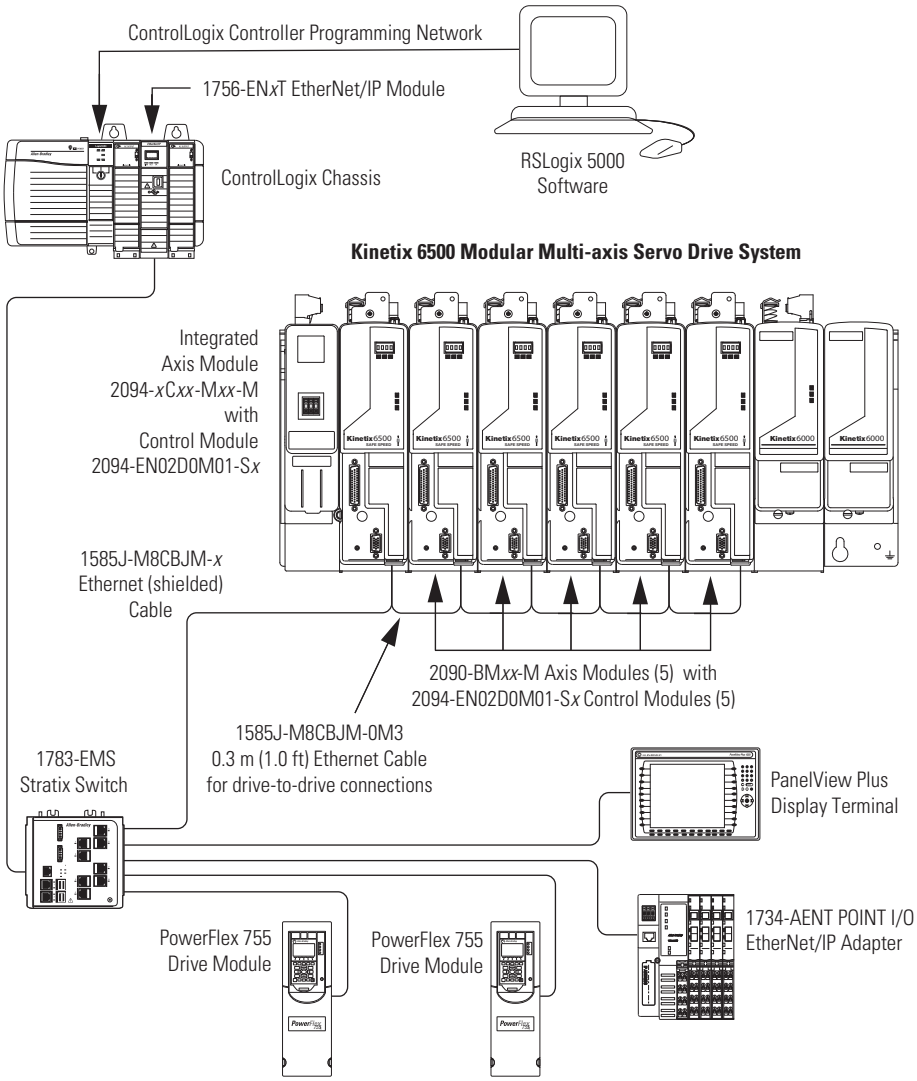
Kinetix 6200 Communication Configuration (SERCOS)

This Kinetix 6200 drive configuration uses the SERCOS interface for configuring the Logix module and Ethernet for diagnostics and configuring safety functions.



Kinetix 6500 Star Communication Configuration (EtherNet/IP)

In this Kinetix 6500 drive configuration, the devices are connected using star topology. Each device is connected directly to the switch, making this topology fault tolerant. The 2094 power rail modules and other devices operate independently. The loss of one device does not impact the operation of the other devices.



Accessories

Drive-to-drive SERCOS Cables for Kinetix 6200 Drives

From this drive	To this drive	Cat. No.
2094-BCxx-Mxx-M or 2094-BMxx-M	2094-BMxx-M	2090-SCEPO-2
2094-BCxx-Mxx-M or 2094-BMxx-M	2094-BMxx-S	2090-SCEPO-1
2094-BCxx-Mxx-S or 2094-BMxx-S	2094-BMxx-S	2090-SCEPO-1
2094-BCxx-Mxx-S or 2094-BMxx-S	2094-BMxx-M	2090-SCEPO-2

For I/O, Safety, Motor Feedback, and Auxiliary Feedback connections on Kinetix 6200 and Kinetix 6500 Safe Speed drives, use the 44-pin Low-profile Connector Kit, catalog number 2090-K6CK-D44M.

A 1585J-M8CBJM-x (shielded) Ethernet cable is required for programming and safety configuration of the Kinetix 6200 and Kinetix 6500 drive via RSLogix 5000 software.

Safety Solutions for Kinetix® Servo Drives

Kinetix 6000 and Kinetix 7000 Drives

Kinetix 6000

Kinetix 7000

Description

The Kinetix® 6000 multi-axis servo drive provides power simplicity to handle even the most demanding applications quickly, easily, and cost-effectively. The compact size, simplified wiring, easy-to-use components, and integrated Safe-off capability make Kinetix 6000 drives an ideal choice for both OEMs and end-users.

The Kinetix® 7000 high power servo drive is designed to accommodate the most demanding requirements and extends the benefits of Kinetix Integrated Motion, and Safe-off capability to applications up to 149 kW. The Kinetix 7000 high power drive supports three-phase AC input power (380…480V AC) and DC input for common bus applications.

Features

- Category 3 per EN 954-1
- SIL3 per IEC 61508
- Stop Category 0 per EN 60204-1
- Stop Category 1 per EN 60204-1 (requires safety relay with time delay outputs)
- Two positive-guided, mechanically linked safety auxiliary contacts for monitoring
- Removable terminals
- Common solution for any power range

Kinetix 6000 and Kinetix 7000 Specifications

Standards	EN 954-1, EN ISO 13849-2, EN 60204-1, EN 50178, EN 61800-3, IEC 61508
Category	PLe and Cat. 3 per EN ISO 13849-1
Safety Integrity Level	SIL3 per IEC 61508
Certifications	C-Tick, CE, cUL, and TÜV functional safety
Safety Inputs	Two N.C.
PFd(t) for 20-year interval	4.75E-07
PFh(t) for 20-year interval	5.43E-12
Coil Pull-in Voltage	24V DC (Nom.), 18V DC (Min.), 26.4V DC (Max.)
Coil Drop-out Voltage	0V DC (Min.), 2.4V DC (Max.)
Coil Resistance	720 Ω (Nom.), 648 Ω (Min.), 792 Ω (Max.)
Coil Current	33.3 mA (Nom.), 55.0 mA (Max.)
Coil Pull-in Time:	25 ms
Coil Drop-out Time:	20 ms
Response Time	25 ms
Recommended Conductor Size Terminal Screw	Stranded Wire with Ferrule: 0.75 mm² (18 AWG) Solid Wire 1.5 mm² (16 AWG)
Recommended Torque Terminal Screw	0.235 N•m (2.0 lb•in)
Mechanical Life	10,000,000 operations
Safety Reference Manual	Publication GMC-RM002

Kinetix 6000 (230V Models) with GuardMotion Specifications

IAM Converters (2094-)	AC05-MP5-S	AC05-M01-S	AC09-M02-S	AC16-M03-S	AC32-M05-S
AC Input Voltage	195…264V rms 3-Phase				
AC Input Frequency	47…63 Hz				
Main AC Input Current Nominal (rms)	10 A	10 A	19 A	36 A	71 A
DC Input Voltage (Common Bus follower)	275…375V DC				
DC Input Current (Common Bus follower)	10 A	10 A	19 A	36 A	71 A
Control Power AC Input Voltage	95…264V rms Single-Phase (115/230V nominal)				
Continuous Output Current to Bus (Adc)	10 A	10 A	19 A	36 A	71 A
Intermittent Output Current to Bus (Adc)	20 A	20 A	38 A	72 A	142 A
Continuous Power Output to Bus (nominal)	3 kW	3 kW	6 kW	11.3 kW	22.5 kW
IAM and AM Inverters (2094-)	**AC05-MP5-S and AMP5-S**	**AC05-M01-S and AM01-S**	**AC09-M02-S and AM02-S**	**AC16-M03-S and AM03-S**	**AC32-M05-S and AM05-S**
Continuous Output Current (rms)	3.7 A	6.0 A	10.6 A	17.3 A	34.6 A
Continuous Output Current (0-peak)	5.2 A	8.5 A	15 A	24.5 A	48.9 A
Peak Output Current (rms)	7.4 A	12.0 A	21.2 A	34.6 A	51.9 A
Peak Output Current (0-peak)	10.5 A	17.0 A	30.0 A	48.9 A	73.4 A
Maximum Seconds at Peak	2.5	2.5	2.5	2.5	2.5
Continuous Power Output (nominal)	1.2 kW	1.9 kW	3.4 kW	5.5 kW	11 kW
Module Size Specifications					
Height (mm)	200	200	200	300	300
Width AM (mm)	70	70	70	70	70
Width IAM (mm)	125	125	125	125	195
Depth (mm)	195	195	195	195	195

Kinetix 6000 (460V Models) with GuardMotion Specifications

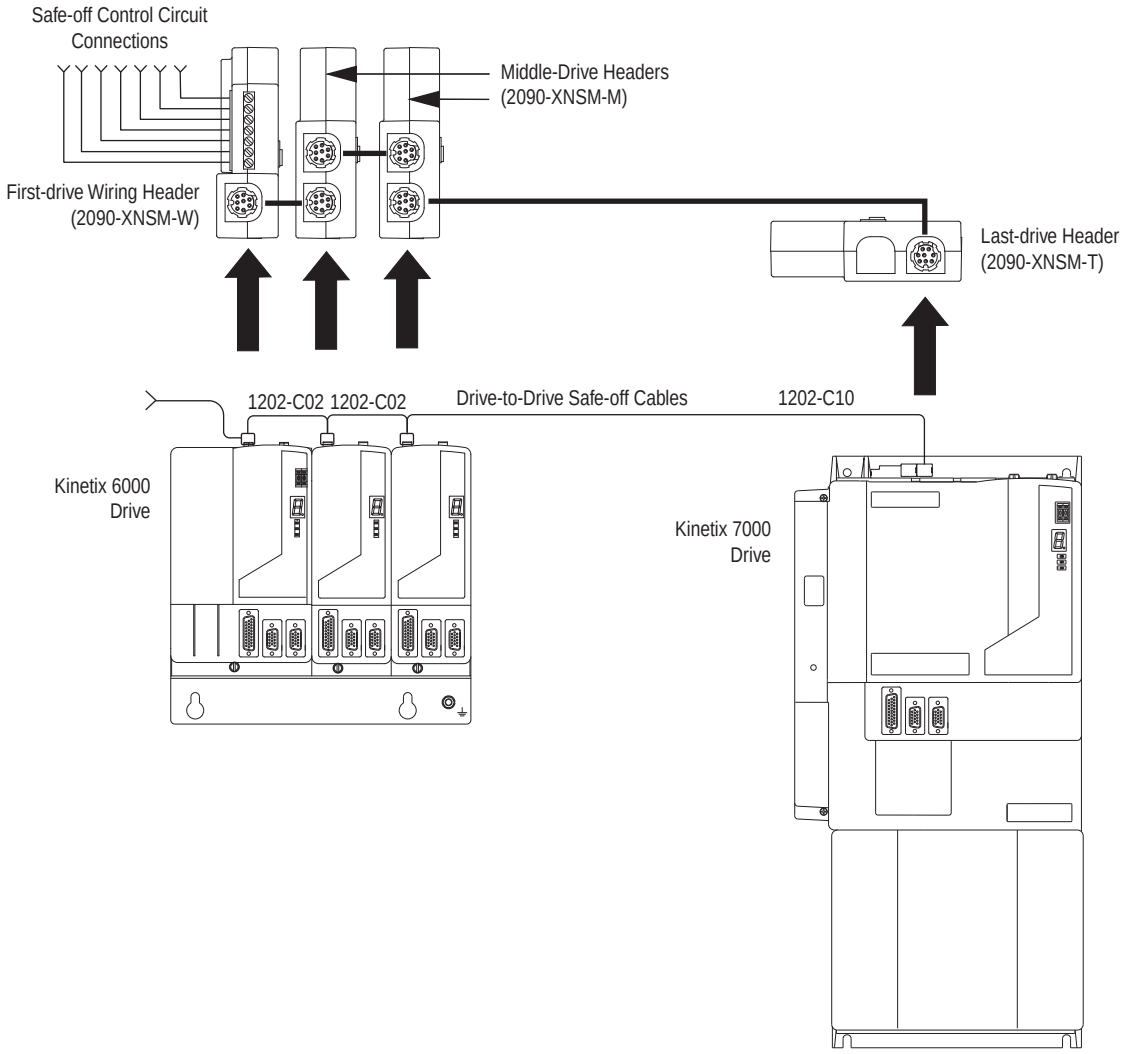
IAM Converters (2094-)	BC01-MP5-S	BC01-M01-S	BC02-M02-S	BC04-M03-S	BC07-M05-S
AC Input Voltage	324-528V rms 3-Phase				
AC Input Frequency	47…63 Hz				
Main AC Input Current Nominal (rms)	10 A	10 A	24 A	44 A	71 A
DC Input Voltage (Common Bus follower)	458…747V DC				
DC Input Current (Common Bus follower)	10 A	10 A	24 A	43 A	71 A
Control Power AC Input Voltage	95…264V rms Single-Phase (115/230V nominal)				
Continuous Output Current to Bus (Adc)	10 A	10 A	24 A	43 A	71 A
Intermittent Output Current to Bus (Adc)	20 A	20 A	48 A	86 A	142 A
Continuous Power Output to Bus (nominal)	6 kW	6 kW	15 kW	27.6 kW	45 kW
IAM and AM Inverters (2094-)	**BC01-MP5-S and BMP5-S**	**BC01-M01-S and BM01-S**	**BC02-M02-S and BM02-S**	**BC04-M03-S and BM03-S**	**BC07-M05-S and BM05-S**
Continuous Output Current (rms)	2.8 A	6.1 A	10.3 A	21.2 A	34.6 A
Continuous Output Current (0-peak)	4.0 A	8.6 A	14.6 A	30.0 A	48.9 A
Peak Output Current (rms)					
Series A	4.2 A	9.2 A	15.5 A	31.8 A	51.9 A
Series B	7.0 A	15.3 A	25.8 A	31.8 A	51.9 A
Peak Output Current (0-peak)					
Series A	5.9 A	12.9 A	21.8 A	45.0 A	73.4 A
Series B	9.9 A	21.6 A	36.4 A	45.0 A	73.4 A
Maximum Seconds at Peak	2.5	2.5	2.5	2.5	2.5
Continuous Power Output (nominal)	1.8 kW	3.9 kW	6.6 kW	13.5 kW	22 kW
Module Size Specifications					
Height (mm)	250	250	250	250	310
Width AM (mm)	70	70	70	140	140
Width IAM (mm)	125	125	125	195	195
Depth (mm)	260	260	260	260	260

Kinetix 7000 Specifications

2099-	BM06-S	BM07-S	BM08-S	BM09-S	BM10-S	BM11-S	BM12-S
AC Input Voltage @ 47…63 Hz	380…480V AC +/- 10%						
AC Input Frequency	47…63 Hz						
DC Input Voltage	450…750V DC						
Main AC Input Current (rms)	36.7 A	47.7 A	59.6 A	90.1 A	117 A	169 A	233 A
DC Input Current	42.9 A	55.7 A	69.7 A	105 A	137 A	204 A	281 A
Control Power Input	18…30V DC						
Continuous Power Output	22 kW	30 kW	37 kW	56 kW	75 kW	112 kW	149 kW
Continuous Power Output	30 Hp	40 Hp	50 Hp	75 Hp	100 Hp	150 Hp	200 Hp
Continuous Output Current (rms)	40 A	52 A	65 A	96 A	125 A	180 A	248 A
Continuous Output Current (0-peak)	56 A	73 A	92 A	135 A	176 A	254 A	351 A
Peak Current (rms) 60 s	51 A	60 A	78 A	115 A	138 A	234 A	273 A
Peak Current (0-peak) 60 s	72 A	84.8 A	110 A	162.6 A	195 A	331 A	386 A
Peak Current (rms) 3 s	68 A	80 A	104 A	154 A	163 A	312 A	372 A
Peak Current (0-peak) 3 s	96 A	113 A	147 A	217.7 A	230.5 A	441 A	526 A
Drive Height (mm)	517.5	517.5	517.5	644.5	690.3	977.1	977.1
Drive Depth (mm)	224	224	224	287	287	283	283
Drive Width (mm)	254	254	254	332	332	429	429

Safe-off Multi-Axis Configuration

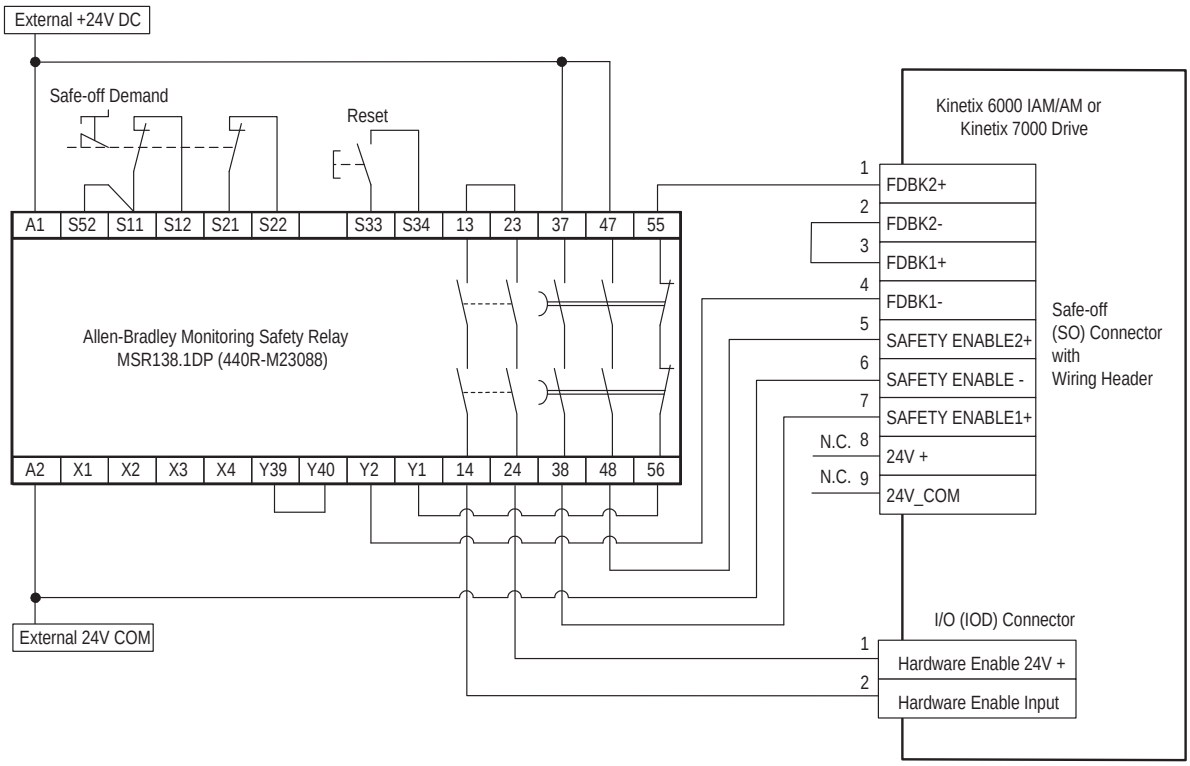
Kinetix 6000 to Kinetix 7000 Safe-off Multi-Axis Configuration



Stop Category 1 Configuration (Kinetix 6000 or Kinetix 7000)

Single-Axis Relay Configuration

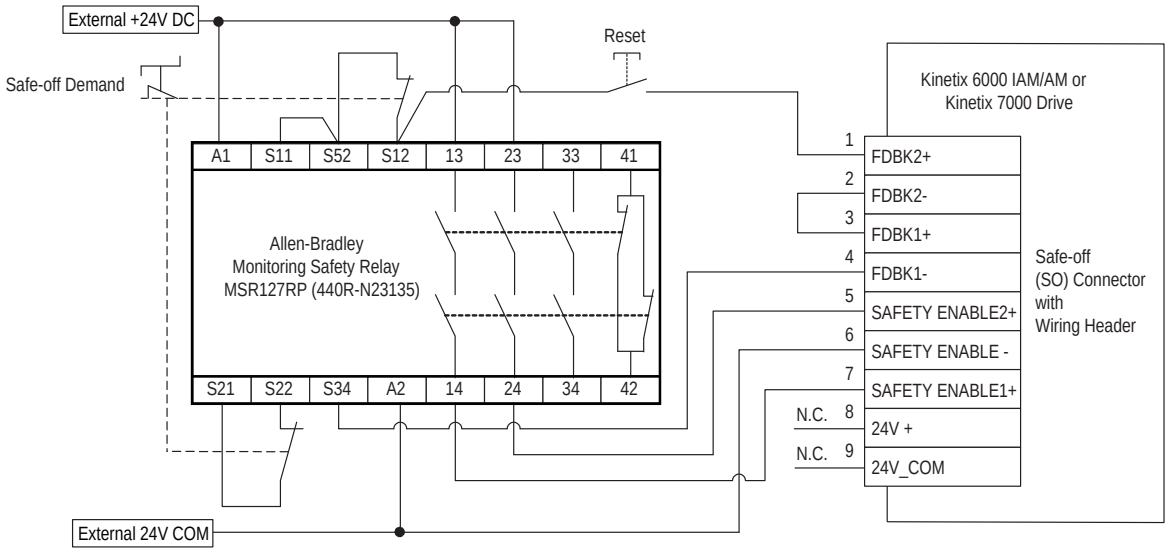
The Kinetix 6000 or Kinetix 7000 drive Safe-off connector is wired to an Allen-Bradley safety relay. The proper configuration in RSLogix™ 5000 software is required.



Stop Category 0 Configuration (Kinetix 6000 or Kinetix 7000)

Single-Axis Relay Configuration

The Kinetix 6000 or Kinetix 7000 drive Safe-off connector is wired to an Allen-Bradley safety relay.



You can use an Allen-Bradley GuardPLC™ or GuardLogix® controller instead of the safety relay to provide the safety logic for more complex safety systems.

Accessories

Safe-off Headers for Kinetix 6000 or Kinetix 7000 Drives

Description	Cat. No.
Safe-off wiring header for the first drive in multiple safety drive configurations (optional)	2090-XNSM-W
Safe-off middle header for the first drive-to-drive connections in multiple safety drive configurations with three or more drives (optional)	2090-XNSM-M
Safe-off terminating header for the last in multiple safety drive configurations (optional)	2090-XNSM-T

Safe-off Interface Cables for Kinetix 6000 or Kinetix 7000 Drives

Safe-off interface cables are required for making connections with 2090-XNSM-W, -M, and -T headers.

Description	Cat. No.
Drive-to-drive safety cable, 200 mm (7.9 in.), for connecting single-wide Kinetix 6000 modules.	1202-C02
Drive-to-drive safety cable, 350 mm (13.8 in.), for connecting double-wide Kinetix 6000 modules.	1202-C03
Drive-to-drive safety cable, 1050 mm (41.3 in.), for connections. • between Kinetix 6000 power rail and Kinetix 7000 drive. • between two Kinetix 6000 power rails. • between two Kinetix 7000 drives.	1202-C10

Because of the current capacity limitation of the Safe-off cable connectors, multiple Safe-off drive configurations must not exceed eight Kinetix 6000 or Kinetix 7000 drive modules.

The Allen-Bradley CENTERLINE ArcShield arc-resistant controller provides rugged process control for applications requiring a higher level of personnel protection. ArcShield products are compliant to the IEEE C37.20.7 standard, and provide Type 2 protection during an arc flash.

The ArcShield controller safely redirects the arc flash energy out the top of the unit and away from personnel. This level of protection is also maintained when the low voltage door is open for maintenance purposes.

The ArcShield products have a robust enclosure design which contain the arc flash energy and exhaust materials until vents on top of the enclosure open. Once opened, the vents provide a path for materials to exit the enclosure. An overhead plenum is used to direct the materials to a safe location, away from personnel near the equipment. The low voltage panel is reinforced and sealed, to prevent arc flash exhaust materials from entering this compartment.

As standard, a plenum exhaust section is provided with each new ArcShield order. The plenum exhaust section can be mounted on either the left or right end of the line-up, and it extends 1016 mm (40 in.) past the end of the line-up.

As the ArcShield may have an impact on horsepower ratings, please contact your local Rockwell Automation sales office or Allen-Bradley distributor to confirm.

Features

- Reinforced cabinet and power cell door closure mechanism
- Multi-point latching mechanism, reinforced cross bracing and gasket sealing
- Reinforced back plates — added support plates secured with multiple bolts increase rigidity and security
- Reinforced low voltage panel to withstand arc flash energy and shield maintenance personnel while working in the isolated low voltage compartment
- Arc “Pressure Relief” vent to direct gases and material away from personnel during an arc flash
- Available with removable arc exhaust plenum

ArcShield Controller Specifications

Bulletin Number	Controller Size	Approximate Mounting Dimensions [mm (in.)]			Approx. Weight [kg (lb)]
		Width	Depth ♣	Height	
1512A	200/400/450 ✶	660 (26)/ 914 (36)	914 (36)	3264 (128.5)	627 (1380)/ 860 (1900)
	200/400/450 ❄	1118 (44)	914 (36)	3264 (128.5)	1107 (2435)
	600 ✶	914 (36)	914 (36)	3264 (128.5)	773 (1700)
	600 ❄	1372 (54)	914 (36)	3264 (128.5)	1250 (2750)
	800	1575 (62)	914 (36)	3264 (128.5)	907 (2000)
1512AT	200/400/450 ✶	660 (26)/	914 (36)	3264 (128.5)	627 (1380)/ 773 (1700)
	600 ✶	914 (36)	914 (36)	3264 (128.5)	773 (1700)
	800 ✶	1575 (62)	914 (36)	3264 (128.5)	907 (2000)
1512B	200/400 ✶	914 (36)	914 (36)	3264 (128.5)	1050 (2310)
	200/400 ❄	1372 (54)	914 (36)	3264 (128.5)	1530 (3365)
1512BT	200/400 ✶	914 (36)	914 (36)	3264 (128.5)	1050 (2310)
1562E	200/400 ✶	914 (36)	914 (36)	3264 (128.5)	886 (1950)
	200/400 ❄	1372 (54)	914 (36)	3264 (128.5)	1364 (3000)
1591A	457 (18) ‡	457 (18)	914 (36)	2311 (91)	432 (950)
	457 (18) §	457 (18)	914 (36)	3264 (128.5)	464 (1020)
	914 (36) ✶	914 (36)	914 (36)	3264 (128.5)	732 (1610)
	914 (36) §	914 (36)	914 (36)	3264 (128.5)	732 (1610)

✶ Arc resistant with plenum.
❄ Arc resistant with plenum, plus PFCC option.
‡ Arc resistant without plenum.
§ Arc resistant with plenum c/w low voltage panel.
♣ Overhead arc plenums are 1168 mm (460 in.), mounted on top and flush to the rear of the structures.

Medium Voltage Arc Resistant Motor Control Center Specifications

		CENTERLINE 1500 Motor Control Center with ArcShield	CENTERLINE 1500 Motor Control Center with IntelliCENTER Technology and ArcShield
			
General	Enclosure Types Available	Arc Resistant NEMA/UL Type 12	Arc Resistant NEMA/UL Type 12
	Section Height	2300 mm (91 in.) plus Plenum	2300 mm (91 in.) plus Plenum
	Section Width	660, 914, 1372, 1575, 2032, 2540 mm (26, 36, 54, 62, 80, 100 in.)	660, 914, 1372, 1575, 2032, 2540 mm (26, 36, 54, 62, 80, 100 in.)
	Section Depth	914 mm (36 in.)	914 mm (36 in.)
	Horizontal Bus Current Rating	1200, 2000, or 3000 A	1200, 2000, or 3000 A
	Vertical Bus Current Rating	400, 600, or 800 A	400, 600, or 800 A
	Bus Short Circuit Rating	60 kA RMS SYM	60 kA RMS SYM
MCC Units Available	ArcShield Controllers	Yes	Yes
	Full Voltage Non-reversing Starters	Yes	Yes
	Full Voltage Reversing Starters	Yes	Yes
	Starters for 2-Speed Motors	Yes	Yes
	Electronic Soft Starters	Yes	Yes
	Variable Speed Drives	N/A	N/A
	Power Monitoring Equipment	Yes	Yes
	PLC and Controller Units	Yes	Yes
	Transformer Units	Yes	Yes
Intelligent Motor Control Features	Built-in Network Media	No	Yes
	IntelliCENTER Software	No	Yes, preconfigured software with: • Elevation View • Monitor View • Event Logger • Electronic System Documentation • ActiveX Objects for HMI use
Preconfigured Network	Pre-Tested Network Connections	No	Yes
	Rich Data	No	Yes
	Advanced Diagnostics	No	Yes
	Network Interfaces	No	• DeviceNet™ • Ethernet • ControlNet™ • PROFIBUS • Modbus Plus™
	Remote Access Motor Control Data	No	Yes

CENTERLINE 2100 Motor Control Centers with ArcShield

Reduce your risk of arc flash injury through the use of the industry leading arc containment design, which has been tested to meet the arc resistant standards for medium voltage equipment, IEEE C37.20.7: IEEE Guide for Testing Medium-Voltage Metal- Enclosed Switchgear for Internal Arcing Faults.

ArcShield enhances the CENTERLINE 2100 Motor Control Center (MCC) and is the first low voltage MCC to offer arc-containing features. ArcShield helps provide you with Type 2 accessibility and improves protection for your personnel against internal arcing faults. With Type 2 accessibility, personnel are shielded at the front, rear and sides of the enclosure in the unlikely event of an arcing fault.

Arc resistant baffles for the CENTERLINE 2100 MCCs with ArcShield allow you to have an arc resistant MCC with a wider range of MCC units, even units that require venting, such as variable frequency drives (VFDs). Arc resistant baffles allow air flow to help dissipate the heat and still provide Type 2 accessibility.

CENTERLINE 2100 MCCs with ArcShield are available on the quick delivery program; allowing your order to go directly to the factory and ship in as little as four weeks.

Contain Arc Flashes

Arc-containment door latches help deliver an extra level of protection by allowing pressure relief and keeping the doors from detaching from the structure. Manual or automatic shutters and insulated bus covers help reduce fault propagation within your MCC. The lower horizontal bus ratings and incoming protection sized for your MCC, help reduce the amount of arc flash energy in your application. By containing an arc flash, your potential exposure to hazardous conditions can be reduced.

Reduce Electrical Shock Hazards

CENTERLINE 2100 MCCs are designed to enhance safe operation by helping isolate you from potentially hazardous voltages by providing a solid grounding system and helping minimize potential electrical shock hazards. Additional options such as IntelliCENTER® software, DeviceNet™ ports, blown fuse indicators, exterior windows on unit doors, infrared inspection ports and finger-safe component barriers can help you create a safer working environment by reducing your potential to make contact with energized components.

CENTERLINE 2500 Motor Control Centers with ArcShield

The CENTERLINE 2500 MCC is designed to meet the needs of your global facilities operating in Latin America, Asia, Europe and other areas of the world where motor control centers must meet IEC standards. With more intelligent components and more options than other MCC manufacturers, you get a total power, control and information solution packaged for your local specifications, built on a common platform.

CENTERLINE 2500 MCCs with ArcShield offers you better protection against harmful arc flash hazards. Using a CENTERLINE 2500 MCC with ArcShield helps protect your personnel if an arc flash were to occur within an MCC.

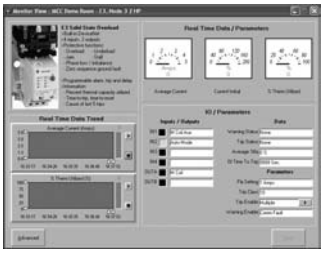
CENTERLINE 2500 MCC with ArcShield provides personnel and assembly protection per IEC/TR 61641:2008 for arcing durations up to 300 ms (available for systems at 415V (max), with 65 kA (max) available current).

In combination with the standard safety features built into every CENTERLINE 2500 MCC, choosing ArcShield provides additional benefits, including:

- Enclosures with no front ventilation
- Pressure relief system designed to exhaust gases through the top of the enclosure, away from personnel
- Arc containment latches on all doors capable of withstanding the high internal pressure generated by an arc blast
- Insulated power bus closing plates included at the ends of each MCC lineup
- For even more protection, optical and current sensing technology for use with crowbar or shunt trip devices is available as an option.

IntelliCENTER Technology

Minimize Entry into Arc Flash Boundary



IntelliCENTER technology helps enhance personnel safety

- Advanced diagnostics of IntelliCENTER software provide remote access to your MCC data for troubleshooting, minimizing your need for entry in the arc flash boundary zone
- With the ability to remotely monitor MCC, you can perform many routine maintenance tasks without "suiting up," reducing personnel exposure to hazardous energy levels
- IntelliCENTER Software can warn of failures before they occur – increasing your ability to respond proactively before a hazardous situation occurs

Arc Resistant

CENTERLINE® Low Voltage Motor Control Centers with ArcShield™

Low Voltage Arc Resistant Motor Control Center Specifications

		CENTERLINE 2100 Motor Control Center with ArcShield 		CENTERLINE 2500 Motor Control Center with ArcShield 
General	Enclosure Types	NEMA 1, 1G, 3R, 4, 12		IP 20, 40, 42, 54
	Section Height	2286 mm (90 in.)		2300 mm (91 in.)
	Section Width (for plug-in units)	508 mm (20 in.) - 635 mm (25 in.) available with 229 mm (9 in.) wireway		700, 800, 900 or 1000 mm (28, 32, 36, or 40 in.)
	Section Load Capacity	600 or 1200 A		600 or 1200 A
	Arc Resistant Rating	**Device Limited**	**Arc Duration 100 ms or less**	N/A
	Rated Voltage	600V	480V	up to 690V
	Horizontal Bus Current Rating	600…1200 A	600…3000 A	800…3200 A
	Section Depth (for plug-in units)	381 or 508 mm (15 or 20 in.)	508 mm (20 in.)	600 or 800 mm (24 or 32 in.)
	Short Circuit Withstand Rating	42000 or 65000 A rms symmetrical		Up to 65000 A rms symmetrical
Available Equipment for MCC Units	Full Voltage Non-reversing Starters	Yes		Yes
	Full Voltage Reversing Starters	Yes		Yes
	Starters for 2-speed motors	Yes		Yes
	Soft Starters	Yes		Yes
	Variable Frequency Drives	Yes		Yes
	Mains and Feeders	Yes		Yes
	PLC & Controller Units	Yes		Yes
	Lighting Panels	Yes		Yes
	Transformer Units	Yes		Yes
IntelliCENTER Technology	Built-in Network	Yes, DeviceNet™ Class 1, 600V, 8 A		Yes, DeviceNet Class 1, 600V, 8 A
	Network Interfaces	• EtherNet/IP • ControlNet™ • PROFIBUS • Modbus Plus™		• EtherNet/IP • ControlNet • PROFIBUS • Modbus Plus
	Preconfigured Network	Yes		Yes
	Pre-tested Network Connections	Yes		Yes
	Advanced Diagnostics	Yes		Yes
	IntelliCENTER Software	Preconfigured Software with • Elevation View • Monitor View • Event Log • Electronic System Documentation • ActiveX Objects for HMI Use		Preconfigured Software with • Elevation View • Monitor View • Event Log • Electronic System Documentation • ActiveX Objects for HMI Use
	Remote Access to Motor Control Data	Yes		Yes
	Detailed Device Information	Yes		Yes

Bulletin 100S/104S Safety Contactors

Bulletin 100S-C/104S-C safety contactors provide mechanically linked positively guided contacts, required in feedback circuits of modern safety applications. The mechanically linked N.C. auxiliary contacts will not change state when a power pole welds. In addition, the gold-plated bifurcated auxiliary contacts are ideally suited for low-energy applications or feedback control circuits with multiple series-connected N.C. auxiliary contacts.

- Mechanically linked N.C. auxiliary contacts
- Front-mounted auxiliary contacts:
  Gold bifurcated
  Permanently fixed
  Protective cover to prevent manual operation
  Red contact housing foreasy identification
  Incorporates IEC 60947-5-1 “Mechanically Linked” or IEC 60947-4-1 "Mirror Contact" symbol
- AC and DC operating coils
- SUVA Third-Party certification

Standards Compliance

EN50205
CSA C22.2 No. 14
UL 508
EN/IEC 60947-4
IEC 60947-4-1 Annex H — Mirror Contacts
IEC 60947-5-1 Annex L — Mechanically Linked Contacts

Certifications

SUVA Third-Party Certified
CE Marked
cULus Listed (File No. E3125;
Guide NLDX, NLDX7)

Your order must include: cat. no. of the contactor specified with coil voltage code and, if required, cat. no. of any accessories and/or replacement coils.

3-Pole AC- and DC-Operated Contactors

I_e [A]		Ratings for Switching AC Motors — AC-2, AC-3, AC-4										Aux. Contacts		
		3-Phase kW (50 Hz)				Hp (60 Hz)								
						1-Phase		3-Phase						
AC-3	AC-1	230V	400V/ 415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C.	Cat. No.✶❄
9	32	3	4	4	4	1/2	1-1/2	2	2	5	7-1/2	0	5	100S-C09⊗05BC
												1	4	100S-C09⊗14BC
12	32	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	0	5	100S-C12⊗05BC
												1	4	100S-C12⊗14BC
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	15	0	5	100S-C16⊗05BC
												1	4	100S-C16⊗14BC
23	32	7.5	11	13	10	2	3	5	7-1/2	15	15	0	5	100S-C23⊗05BC
												1	4	100S-C23⊗14BC
30	65	10	15	15	15	2	5	7-1/2	10	20	25	0	4	100S-C30⊗04BC
												1	4	**100S-C30⊗14BC**
37	65	11	18.5/20	20	18.5	3	5	10	10	25	30	0	4	100S-C37⊗04BC
												1	4	**100S-C37⊗14BC**
43	85	13	22	25	22	3	7-1/2	10	15	30	30	0	4	100S-C43⊗04BC
												1	4	**100S-C43⊗14BC**
60	100	18.5	32	37	32	5	10	15	20	40	50	0	4	‡ 100S-C60⊗04BC
												1	4	‡ **100S-C60⊗14BC**
72	100	22	40	45	40	5	15	20	25	50	60	0	4	‡ 100S-C72⊗04BC
												1	4	‡ **100S-C72⊗14BC**
85	100	25	45	55	45	7-1/2	15	25	30	60	60	0	4	‡ 100S-C85⊗04BC
												1	4	‡ **100S-C85⊗14BC**
97	130	30	55	55	55	10	15	30	30	75	75	0	4	‡ **100S-C97⊗04BC**
												1	4	‡ **100S-C97⊗14BC**

✶ For other contact configurations and full product details, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.
❄ If standard cross-stamped front-mount auxiliary contacts are required, remove the letter "B" before the letter "C" in the cat. no. Example: Cat. No. **100S-C09⊗05BC** becomes Cat. No. **100S-C09⊗05C**.
‡ Bifurcated front-mount auxiliary contacts on Cat. Nos. **100S-C60…C97** conform to mirror contact performance only.
⊗ Coil Voltage Code, see page 6-94

4-Pole AC- and DC-Operated Contactors

Ratings for Switching AC Motors												Contact Configuration				
		AC-2, AC-3, AC-4				Hp (60 Hz)						Main Pole		Auxillary Contacts		
I_e [A]		3-Phase kW (50 Hz)❄														
						1-Phase		3-Phase ❄								
AC-3	AC-1	230V	400V/ 415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C.	N.O.	N.C.	Cat. No.✶‡
9	32	3	4	4	4	1/2	1-1/2	2	2	5	7-1/2	4	0	0	4	100S-C09⊗404BC
												3	1	0	4	100S-C09⊗304BC
12	32	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	4	0	0	4	100S-C12⊗404BC
												3	1	0	4	100S-C12⊗304BC
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	15	4	0	0	4	100S-C16⊗404BC
												3	1	0	4	100S-C16⊗304BC
23	32	7.5	11	13	10	2	3	5	7-1/2	15	15	4	0	0	4	100S-C23⊗404BC
												3	1	0	4	100S-C23⊗304BC

✶ For other contact configurations, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

❄ Three-phase ratings only apply to contactors with at least three N.O. power poles.

⊗ Coil Voltage Code, see page 6-94

‡ If standard cross-stamped front-mount auxiliary contacts are required, remove the letter "B" before the letter "C" in the cat. no. Example: Cat. No. **100S-C09⊗404BC** becomes Cat. No. **100S-C09⊗404C**.

Reversing AC- and DC-Operated Contactors

- 3 Main Contacts
- Includes Mechanical/Electrical Interlock
- Includes Reversing Power Wiring

I_e [A]		Ratings for Switching AC Motors AC-2, AC-3, AC-4										Aux. Contacts Installed per Contactor		
		3-Phase kW (50 Hz)				Hp (60 Hz)								
						1-Phase		3-Phase						
AC-3	AC-1	230V	400V/ 415V	500V	690V	115V	230V	200V	230V	460V	575V	N.O.	N.C. ‡	Cat. No.∗❄
9	32	3	4	4	4	1/2	1-1/2	2	2	5	7-1/2	0	6	104S-C09⊗012BC
												1	5	104S-C09⊗210BC
12	32	4	5.5	5.5	5.5	1/2	2	3	3	7-1/2	10	0	6	104S-C12⊗012BC
												1	5	104S-C12⊗210BC
16	32	5.5	7.5	7.5	7.5	1	3	5	5	10	15	0	6	104S-C16⊗012BC
												1	5	104S-C16⊗210BC
23	32	7.5	11	13	10	2	3	5	7-1/2	15	15	0	6	104S-C23⊗012BC
												1	5	104S-C23⊗210BC
30	65	10	15	15	15	2	5	7-1/2	10	20	25	0	5	104S-C30⊗010BC
												1	5	104S-C30⊗210BC
37	65	11	18.5/20	20	18.5	3	5	10	10	25	30	0	5	104S-C37⊗010BC
												1	5	104S-C37⊗210BC
43	85	13	22	25	22	3	7-1/2	10	15	30	30	0	5	104S-C43⊗010BC
												1	5	104S-C43⊗210BC
60	100	18.5	32	37	32	5	10	15	20	40	50	0	5	§ 104S-C60⊗010BC
												1	5	§ 104S-C60⊗210BC
72	100	22	40	45	40	5	15	20	25	50	60	0	5	§ 104S-C72⊗010BC
												1	5	§ 104S-C72⊗210BC
85	100	25	45	55	45	7-1/2	15	25	30	60	60	0	5	§ 104S-C85⊗010BC
												1	5	§ 104S-C85⊗210BC
97	130	30	55	55	55	10	15	30	30	75	75	0	5	§ 104S-C97⊗010BC
												1	5	§ 104S-C97⊗210BC

∗ For other contact configurations, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

❄ If standard cross-stamped front-mount auxiliary contacts are required, remove the letter "B" before the letter "C" in the cat. no. Example: Cat. No. **104S-C09⊗05BC** becomes Cat. No. **104S-C09⊗05C**.

‡ One of the N.C. auxiliary contacts is supplied as part of the mechanical/electrical interlock.

§ Bifurcated front-mount auxiliary contacts on Cat. Nos. **104S-C60…C97** conform to mirror contact performance only.

⊗ Coil Voltage Code, see page 6-94

⊗ Coil Voltage Code and Terminal Position

The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No. Example: 120V, 60Hz: **Cat. No. 100S-C09⊗05BC** becomes **Cat. No.100S-C09D05BC.**

[V]	12	24	32	36	42	48	100	100-110	110	120	127	200	200-220	208	208-240	220-230
AC, 50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	L	—	—	F
AC, 60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	H	L	—
AC, 50/60 Hz	–	KJ	—	—	—	KY	KP	—	KD	—	—	KG	KL‡	—	—	KL‡

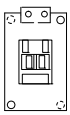
[V]	230	230-240	240	277	347	380	380-400	400	400-415	440	480	500	550	600
AC, 50 Hz	—	VA	T	—	—	—	N	—	G	B	—	M	C	—
AC, 60 Hz	—	—	A	T	I	E	—	—	—	N	B	—	—	C
AC, 50/60 Hz	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—

‡ Not available in 100S/104S-C97 contactors

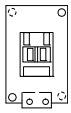
[V]			9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
100S/104S-C09…C43	Standard	DC	ZR	ZQ	ZJ	ZW	ZY	ZZ	ZB	ZG	ZE	ZD	ZP	ZS	ZA	ZF	ZT
	with Integrated Diode		—	—	DJ	—	—	—	—	—	—	—	—	—	—	—	—
	Electronic with Integrated Diode		—	—	EJ	—	—	—	—	—	—	—	—	—	—	—	—
100S/104S-C60…C97	with Integrated Diode		DR	DQ	DJ	DW	DY	DZ	DB	DG	DE	DD	DP	DS	DA	DF	DT

Coil Terminal Position

- All contactors are delivered with the coil terminals located on the **line side.**
- For **load side** coil terminations, insert a **U** prior to the coil voltage code.
  Example: **Cat. No. 100S-C09UD05BC.**

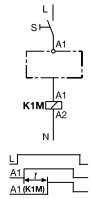
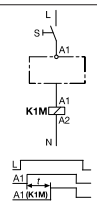
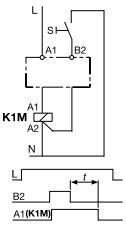
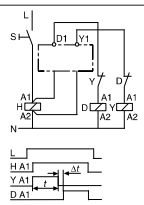
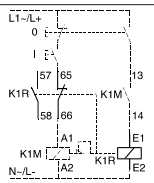


Cat. No. 100S-C09⊗05C Line Side



Cat. No. 100S-C09U⊗05C Load Side

Control Modules (For 100S-C09…C97 contactors)

	Description		Connection Diagrams	For Use With	Cat. No.
	**Pneumatic Timing Modules** Pneumatic timing element contacts switch after the delay time. The contacts on the main control relay continue to operate without delay.	**On-Delay** 0.3…30 s Range 1.8…180 s Range		100-C or 700-CF with AC or 24V DC electronic coils	100-FPTA30 100-FPTA180
		Off-Delay 0.3…30 s Range 1.8…180 s Range		100-C all, 700-CF all	100-FPTB30 100-FPTB180
	**Electronic Timing Modules — On-Delay** Delay of the contactor or control relay solenoid. The contactor or control relay is energized at the end of the delay time.	**On-Delay** 1…30 s Range 1…30 s Range 10…180 s Range 110…240V, 50/60 Hz 110…250V DC		100-C with 24…48V DC coils, 700-CF with DC coils	100-ETA3 100-ETA30 100-ETA180
		On-Delay 0.1…3 s Range 1…30 s Range 10…180 s Range 24…48V DC		100-C with 24…48V DC coils, 700-CF with DC coils	100-ETAZJ3 100-ETAZJ30 100-ETAZJ180
	**Electronic Timing Modules — Off-Delay** Delay of the contactor or control relay solenoid. After interruption of the control signal, the contactor or control relay is deenergized at the end of the delay time.	**Off-Delay** 0.3…3 s Range 1…30 s Range 10…180 s Range 24V, 50/60 Hz		100-C09…C37, 700-CF with 24V 50/60 Hz coils	100-ETBKJ3 100-ETBKJ30 100-ETBKJ180
		Off-Delay 0.3…3 s Range 1…30 s Range 10…180 s Range 110…240V, 50/60 Hz		100-C, 700-CF with 110…240V 50/60 Hz coils	100-ETB3 100-ETB30 100-ETB180
	**Electronic Timing Modules** Delay of the contactor solenoid. Contactor K 3 (Y) is de-energized (off) and K 2 (D) is energized (on) after the end of the set Y end time. (Switching delay at 50 ms.) Continuous adjustment range High repeat accuracy	**Transition Time Y Contactor** 1…30 s Range 110…240V, 50/60 Hz		100-C with 110…240V AC, 50/60 Hz coils	100-ETY30
	**Mechanical Interlocks** For interlocking of two contactors. Common interlock for all Bul. 100-C contactor sizes Interlocking of different sizes possible Mechanical and electrical interlocking possible in one module by means of integrated auxiliary contacts 9 mm dovetail connector included	Mechanical only without auxiliary contacts		100-C (except 100-C40, -C90)	100-MCA00
		Mechanical/ electrical with 2 N.C. auxiliary contacts		100-C (except 100-C40, -C90)	100-MCA02
	**Mechanical Latch** Following contactor latching, the contactor coil is immediately de-energized (off) by the N.C. auxiliary contact (65-66). Electrical or manual release 1 N.O. + 1 N.C. auxiliary contacts Suitable for all Bul. 100-C contactor sizes, 9…97 A	Maximum command duration 0.03…10 s		100-C with AC coils (except 100-C90)	100-FL11⊗

Package Quantity = 1

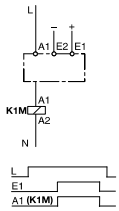
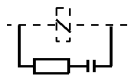
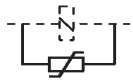
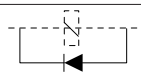
⊗ Coil Voltage Code

The cat. no. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: 120V, 60 Hz: **Cat. No. 100-FL11**⊗ becomes **Cat. No. 100-FL11D**.

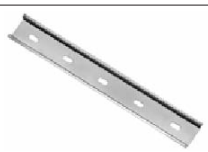
[V]∗	24V	48V	100V	110V	120V	230-240V	240V	277V	380-400V	400-415V	440V	480V
AC, 50 Hz	K	Y	KP	D	—	VA	T	—	N	G	B	—
AC, 60 Hz	J	—	—	—	D	—	A	T	—	—	N	B

∗ For special voltages, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

Control Modules (For 100S-C09…C97 contactors), Continued

	Description		Voltage Range	Connection Diagrams	For Use With	Cat. No.
	**DC Interface (Electronic)** Interface between the DC control signal (PLC) and the AC operating mechanism of the contactor. Requires no additional surge suppression on the relay coils		Input: 12V DC Output: 110…240V AC		100-C with AC coils 110…240V AC	100-JE12
			Input: 18…30V DC Output: 110…240V AC			100-JE
			Input: 48V DC Output: 110…240V AC			100-JE48
	**Surge Suppressors** For limitation of coil switching transients. Plug-in, coil mounted. Suitable for all 100-C contactor sizes, 9…85 A. RC, varistor, and diode versions.	**RC Module** AC operating mechanism	24…48V AC, 50/60 Hz		100-C with AC coils	100-FSC48
			110…280V AC, 50/60 Hz			100-FSC280
			380…480V AC, 50/60 Hz			100-FSC480
		Varistor Module AC/DC operating mechanism	12…55V AC/ 12…77V DC		100-C with AC or DC coils	100-FSV55
			56…136V AC/ 78…180V DC		100-C with AC or DC coils	100-FSV136
			137…277V AC/ 181…350V DC		100-C with AC or DC coils	100-FSV277
			278…575V AC		100-C with AC or DC coils	100-FSV575
		Diode Module DC operating mechanism	12…250V DC		100-C with DC coils	100-FSD250

Assembly Components (For 100S-C09…C97 contactors)

	Description	For Use With	Pkg. Quantity*	Cat. No.
 ***Cat. No. 100-S0***	**Dovetail Connectors** For use in contactor and starter assemblies. Single Connector — 0 mm Spacing	100-C	10	100-S0
	Dovetail Connectors For use in contactor and starter assemblies. Dual Connector — 9 mm Spacing			100-S9
 ***Cat. No. 100-SCCA***	**Protective Covers** Provides protection against unintended manual operation For contactors and front mounted auxiliary contacts, pneumatic timers and latches	100-C all	1	**100-SCCA**
 ***Cat. No. 100-SCFA***		100-FA, -FB, -FC, -FP, -FL;	10	**100-SCFA**
 ***Cat. No. 105-PW23***	**Reversing Power Wiring Kits** For reversing connection with a solid-state or thermal overload relay	100-C09…C23	1	105-PW23
		100-C30…C37		105-PW37
		100-C43		105-PW43
		100-C60…C97		105-PW85
	**DIN (#3) symmetrical rail** 35 x 7.5 x 1 m	100-C	10	199-DR1

* Must be ordered in multiples of package quantities.

Marking Systems (For 100S-C09…C97 contactors)

	Description	Pkg. Qty.∗	Cat. No.
	**Label Sheet** 105 self-adhesive paper labels each, 6 x 17 mm	10	100-FMS
	**Marking Tag Sheet** 160 perforated paper labels each, 6 x 17 mm, to be used with a transparent cover	10	100-FMP
	Transparent Cover To be used with marking tag sheets	100	100-FMC
	**Marking Tag Adapters** To be used with marking tag: System V4/V5	100	100-FMA1
	Marking Tag Adapters To be used with marking tag: System 1492 W	100	100-FMA2

∗ Must be ordered in multiples of package quantities.

Terminal Kits (For 100S-C09…C97 contactors)

	Description	Max. Current Ratings and Wire Sizes		Pkg. Qty.∗	Cat. No.
	**Stab Connector Kit** Dual stab (0.250 in.) for 100-C coil terminals For 100-C09…C97 contactors			20	199-SC2
	**Stab Connector Kit** Dual stab (0.250 in.) for 100-C power terminals For 100-C09…C23 contactors			100	199-SC10
	**3-Pole Terminal Lug Kit** For Cat. No. 100-C09…C23 (Line side)	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	45 A (4…16 mm²❄, fine stranded w/ferrule) 45 A (4…25 mm², coarse stranded/solid) 40 A (#10…4 AWG, stranded/solid)	1	100-CTN23
	3-Pole Terminal Lug Kit For Cat. No. 100-C09…C23 (Load side)	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	45 A (4…16 mm²❄, fine stranded w/ferrule) 45 A (4…25 mm², coarse stranded/solid) 40 A (#10…4 AWG, stranded/solid)	1	100-CTL23
	3-Pole Terminal Lug Kit For Cat. No. 100-C30…C37 (Line side)	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	60 A (4…16 mm²❄, fine stranded w/ferrule) 60 A (4…25 mm², coarse stranded/solid) 55 A (#10…4 AWG, stranded/solid)	1	100-CT37
	**1-Pole Terminal Lug Kit** For Cat. No. 100-C43	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	90 A (6…35 mm², fine stranded w/ferrule) 90 A (6…50 mm², coarse stranded/solid) 75 A (#8…2 AWG, stranded/solid)	3	100-CT43
	1-Pole Terminal Lug Kit For Cat. No. 100-C60…C97	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	130 A (10…70 mm², fine stranded w/ferrule) 130 A (10…95 mm², coarse stranded/solid) 130 A (#8…2/0 AWG, stranded/solid)	3	100-CT85
	**3-Pole Paralleling Kit** For Cat. No. 100-C09…C23	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	100 A (35…70 mm², fine stranded w/ferrule) 100 A (35…95 mm², coarse stranded/solid) 100 A (#0…2/0 AWG, stranded/solid)	2	100-CP23
	3-Pole Paralleling Kit For Cat. No. 100-C30…C37	IEC @ 40 °C IEC @ 40 °C UL/CSA (Encl.)	150 A (35…70 mm², fine stranded w/ferrule) 150 A (35…95 mm², coarse stranded/solid) 150 A (#0…2/0 AWG, stranded/solid)	2	100-CP37

∗ Must be ordered in package quantities.
❄ 16 mm² max. according to IEC 60947; actual max. 25 mm².

Bulletin 100S-D Safety Contactors



Bulletin 100S-D safety contactors were designed to address the needs of modern safety applications requiring feedback and monitoring of the energy isolating switchgear used in hazardous motion loads. The 100S-D meets these needs through its "mirror contact" design. If a power contact welds, the N.C. auxiliary contacts will not change state. This feature provides reliable indication about the open/closed status of the main power poles. In addition, the gold-plated bifurcated auxiliary contacts are ideally suited for low-energy applications or feedback control circuits with multiple series-connected N.C. auxiliary contacts.

- 63…500 kW @400V
- 75…600 Hp @460V
- 100…700 Hp @575V
- Electronic and conventional coils
  - AC & DC
  - Integrated PLC interface
  - Low power pick-up & hold-in
  - Wide voltage ranges
- Complete range of accessories
- Environmentally friendly
- Compact dimensions

Standards Compliance

IEC 60947-4-1
IEC 60947-4 Annex F
IEC 60947 Type “2” Coordination
CSA C22.2 No. 14
UL 508

Certifications

CE Marked
cULus Listed (File No. E 41850, Guide NLDX, NLDX7)
SUVA Certified

Your order must include: cat. no. of the contactor specified with coil voltage code and, if required, cat. no. of any accessories and/or replacement coils.

Product Selection

3-Pole AC-Operated Contactors

I_e [A]		Switching of 3-phase motors AC-2, AC-3										Coil Type	Auxiliary contacts		Cat. No.➢
60 °C	40 °C	kW (50 Hz)∗						Hp (60 Hz)					N.O.	N.C.❄	
AC-3	AC-1	230V	400V	415V	500V	690V	1000V	200V	230V	460V	575V				
115	250	37	63	66/75§	80	110	55	40	40	75	100	Conventional	2	2	100S-D115⊗22BC
115	250	37	63	66/75§	80	110	55	40	40	75	100	Electronic	2	2	100S-D115⊗22BC
140	250	45	78	82/90§	80/100 ‡	110/132 ‡	75	40	50	100	125	Conventional	2	2	100S-D140⊗22BC
140	250	45	78	82/90§	80/100 ‡	110/132 ‡	75	40	50	100	125	Electronic	2	2	100S-D140⊗22BC
180	250	55	101	100§	90/125 ‡	132/160 ‡	90	50	60	150	150	Conventional	2	2	100S-D180⊗22BC
180	250	55	101	100§	90/125 ‡	132/160 ‡	90	50	60	150	150	Electronic	2	2	100S-D180⊗22BC
210	350	63	118	110§	205	200	110	60	75	150	200	Electronic	2	2	100S-D210⊗22BC
250	350	80	140	150§	250	250	133	75	100	200	250	Electronic	2	2	100S-D250⊗22BC
300	450	90	170	160§	290	300	160	100	125	250	300	Electronic	2	2	100S-D300⊗22BC
420	540	132	238	250	420	425	220	150	175	350	400	Electronic	2	2	100S-D420⊗22BC
630	800	200	355	355	500	500	—	200	250	500	600	Electronic	2	2	100S-D630⊗22BC
860	1000	250	500	500	500	600	—	250	300	600	700	Electronic	2	2	100S-D860⊗22BC

∗ Preferred values according to IEC 60072-1.
❄ The N.C. contacts meet IEC 60947-4 Annex F requirements for mirror contact performance. The N.C. mirror contacts are wired in series or parallel and must be used as monitoring contacts with feedback to the safety circuit.
‡ Higher kW rating only applies to contactors with electronic coil.
➢ If standard cross-stamped front-mount auxiliary contacts are required, remove the letter "B" before the letter "C" in the cat. no. Example: Cat. No. **100S-D95⊗22BC** becomes Cat. No. **100S-D95⊗22C**.
§ 415V: Values for AC-3 and AC-4 lifespan -25%

⊗ **Coil Voltage Codes: see page 6-99**

3-Pole DC-Operated Contactors

I_e [A]		Switching of 3-phase motors AC-2, AC-3										Auxiliary contacts		Coil Type	Conventional Coil Cat. No.❄	Electronic Coil Cat. No.➢
60 °C	40 °C	kW (50 Hz) ✶						Hp (60 Hz)				N.O.	N.C. ❄ ✶			
AC-3	AC-1	230V	400V	415V	500V	690V	1000 V	200V	230V	460V	575V					
115	250	37	63	75	80	110	63	40	40	75	100	3	2/1L	Conventional	100S-D115⊗33LC‡ ❄	100S-D115⊗22BC
140	250	45	78	75	80/100§	110/132§	75	40	50	100	125	3	2/1L	Conventional	100S-D140⊗33LC‡ ❄	100S-D140⊗22BC
180	250	55	101	100	90/125§	132/160§	90	50	60	150	150	3	2/1L	Conventional	100S-D180⊗33LC‡ ❄	100S-D180⊗22BC
210	350	63	118	110	205	200	110	60	75	150	200	2	2	Electronic	—	100S-D210⊗22BC
250	350	80	140	150	250	250	133	75	100	200	250	2	2	Electronic	—	100S-D250⊗22BC
300	450	90	170	160	290	300	160	100	125	250	300	2	2	Electronic	—	100S-D300⊗22BC
420	540	132	238	250	420	425	220	150	175	350	400	2	2	Electronic	—	100S-D420⊗22BC
630	800	200	355	355	500	500	—	200	250	500	600	2	2	Electronic	—	100S-D630⊗22BC
860	1000	250	500	500	500	600	—	250	300	600	700	2	2	Electronic	—	100S-D860⊗22BC

✶ Preferred values according to IEC 60072-1.
❄ The N.C. contacts meet IEC 60947-4 Annex F requirements for mirror contact performance. The N.C. mirror contacts are wired in series or parallel and must be used as monitoring contacts with feedback to the safety circuit.
‡ For conventional DC coil only. The pickup winding must be interconnected with the N.C. late-breaking auxiliary contacts.
§ Higher kW rating only applies to contactors with electronic coil.
➢ If standard cross-stamped front-mount auxiliary contacts are required, remove the letter "B" before the letter "C" in the Cat. No. Example: Cat. No. **100S-D95⊗22BC** becomes Cat. No. **100S-D95⊗22C**.

⊗ Coil Voltage Codes

Conventional Coil	[V]	24	48	100	110	120	200	208	220 …230	230	240	277	380 …400	415	440	480	500	550	600
100S-D115…100S-D180	AC, 50 Hz	K	Y	—	D	—	—	—	A	—	T	—	N	B	G	—	M	C	—
	AC, 60 Hz	J	X	—	—	D	—	H	—	—	A	T	—	—	N	B	—	—	C
100S-D115	AC, 50/60 Hz	—	—	KP	KN	—	KG	—	KL	KF	KA	KT	—	—	—	—	—	—	—

Electronic Coil w/ PLC Interface§	[V]	24	42…64	100	110… 130	200	208… 277	200… 220	230… 250	277	380… 415	380… 440	440… 480	380… 500	500
100S-D115…100S-D300	AC, 50/60 Hz	EJ♣	EY	EP	ED	EG	EA	—	—	—	—	VN	—	EN	—
100S-D420	AC, 50/60 Hz	—	—	EP	ED	EG	EA	—	—	—	—	—	—	EN	—
100S-D630…100S-D860	AC, 50/60 Hz	—	—	EP	ED	EG	—	EG	EA	ET	EN	—	EB	—	EM

Conventional Coil	[V]	24	48	110	125	220	250
100S-D115…100S-D180 ‡	DC	ZJ	ZY	ZD	ZS	ZA	ZT

Electronic Coil w/ EI Interface ♣	[V]	24	48…72	110…130	200…255
100S-D115…100S-D300	DC	EZJ	EZY	EZD	EZA
100S-D420	DC	—	—	EZD	EZA
100S-D630…860	DC	—	—	ED	EA

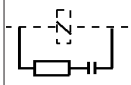
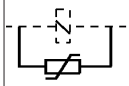
§ Signal voltage of the Cat. No. 100S-D… electronic interface U_e: 24V DC/I^e: 15 mA
Pick-up voltage: 13.0V DC…30.2V DC
Drop-out voltage: -3.0V DC…+5.0V DC
♣ Not available with 100S-D300.

Marking Systems (For 100S-D95…D860 contactors)

	Description	Pkg. Qty.§	Cat. No.
	**Label Sheet** 105 self-adhesive paper labels each, 6 x 17 mm	10	100-FMS
	**Marking Tag Sheet** 160 perforated paper labels each, 6 x 17 mm, to be used with a transparent cover	10	100-FMP
	Transparent Cover To be used with marking tag sheets	100	100-FMC
	**Marking Tag Adapters** To be used with marking tag: System V4/V5 System V4 / V5 System 1492 W	100 100	100-FMA1 100-FMA2

❧ ★◆▲▼ ❁❄ ❑❒❄❄❒❄❄ ✻■ ❒❁❄❄❁❁❄ ❑◆❁■▼✻▼✻❄▲✎

Suppressor Modules

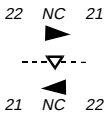
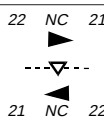
	Description	Connection Diagram	Suppressor Rating	For Use With	Cat. No.
	**Suppressor Module for Bul. 100-D Contactors** • For limiting surge voltage when coil circuits are interrupted • Supplied as standard on all conventional DC coil contactors and all electronic coil contactors (as part of the supply module or delivered with separate suppressor module)		**RC Module (AC control) for contactors with conventional coil** 21...48V, 50 Hz; 24...55V, 60 Hz	100-D115...100-D180	100-DFSC48
			95...110V, 50 Hz; 110...127V, 60 Hz		100-DFSC110
			180...277V, 50 Hz; 208...277V, 60 Hz		100-DFSC240
			380...550V, 50 Hz; 440...600V, 60 Hz		100-DFSC550
			**Varistor Module for contactors with conventional coil** 55V AC	100-D115...100-D180	100-DFSV55
			56...136V AC		100-DFSV136
			137...277V AC		100-DFSV277
			278...600V AC		100-DFSV575
			208...277V AC∗	100-D115...100-D180	100-DFSV550

∗ For overvoltage category IV (IEC 947 for 100-D...-EI) e.g., lightning protection requirements.
Package Quantity = 1

Connecting Components

	Description	For Use With		Cat. No.
	**Terminal Lugs** Set of two Protection class IP2X per IEC 60529 and DIN 40 050	100-D115		100-DTB110
		100-D140, 100-D180, 100-D115E…D180E, 193-EC_F, 193-EE_F		100-DTB180
		100-D210...100-D420, 193-EC_G, 193-EF2C, 193-EE_G		100-DTB420
	**Terminal Lugs (UL/CSA), Copper Frame** Set of three	100-D115		**100-DL110**
		100-D115E, 193-EC_F, 193-EE_F		**100-DLE110**
		100-D140, 100-D180, 193-EC_F, 193-EE_F		**100-DL180**
		100-D210…100-D420, 193-EC_G, 193-EE_G		**100-DL420**
		100-D630, 100-D860, 193-EC_H, 193-EE_H		**100-DL630**
		100-D630, 100-D860, 193-EC_H, 193-EE_H		**100-DL860**
	**Control Circuit Terminal** 2 x 2.5 mm²	Connects to Cat. Nos. 100-D115...D180		100-DAT1
		Connects to Cat. Nos. 100-D210...D420		100-DAT2
	**Terminal Shields** Set of two Protection class IP10 per IEC 60529 and DIN 40 050 For direct-on-line, reversing, two-speed, and wye-delta/star-delta assemblies	100-D115		100-DTS110
		100-D140, 100-D180, 100-D115-E…100-D180-E		100-DTS180
		100-D210...100-D420		100-DTS420
	**Terminal Covers** Protection class IP20 per IEC 60529 and DIN 40 050 For direct-on-line, reversing, two-speed, and wye-delta/star-delta assemblies	100-D115…100-D180, 193-EC_F, 193-EE_F		100-DTC180
		100-D210...100-D420, 193-EC_G, 193-EE_G		100-DTC420
		100-D630…100-D860, 193-EC_H, 193-EE_H		100-DTC860
	**Mounting Plate** Galvanized steel plate for starter combinations For direct-on-line, reversing, two-speed, wye-delta/star-delta, and Dahlander assemblies	100-D115...100-D180	Direct-on-line	100-DMS180
			Reversing, two-speed or changeover	100-DMU180
			Y-Δ or Dahlander	100-DMY180
		100-D210...100-D420	Direct-on-line	100-DMS420
			Reversing, two-speed or changeover	100-DMU420
			Y-Δ or Dahlander	100-DMY420
		100-D630...100-D860	Direct-on-line	100-DMS860
			Reversing, two-speed or changeover	100-DMU860
			Y-Δ or Dahlander	100-DMY860
	Mounting Plate For two-speed or changeover switches	For interlocking between 100-C60…C97 and 100-D115…D180 contactors		100-DMU85

Interlocks

	Description	Circuit Diagram	For Use With	Cat. No.
	**Interlock — Mechanical Only** No additional space required		100-D115…100-D420	100-DMA00
	**Interlock — Dual Electrical/Mechanical** No additional space required Two N.C. auxiliary contacts		100-D115…100-D860	100-DMD02
	Interlock — Mechanical Only No additional space required		100-D115…100-D860	100-DMD00
	Interlock — Mechanical Only Provides interlocking between Bul. 100-C and Bul. 100-D contactors		100-C60…100-C97 between 100-D115…100-D180	100-DMC00
	Interlock — Dual Electrical/Mechanical Provides interlocking between Bul. 100-C and Bul. 100-D contactors Two N.C. auxiliary contacts		100-C60…100-C97 between 100-D115…100-D180	100-DMC02

Package Quantity = 1

Specifications

Coil Type :	Conventional	100S/104S-C										
		09	12	16	23	30	37	43	60	72	85	97
	Conventional	X	X	X	X	X	X	X	X	X	X	X
	Electronic — EI	—	—	—	—	—	—	—	—	—	—	—
Conductor Cross Sections - Main Contacts Terminal type					✶			❄			‡	
	(1) conductor [mm²]	1…4				2.5…10		2.5…16	2.5…35			2.5…35
	(2) conductors [mm²]	1…4				2.5…10		2.5…10	2.5…25			2.5…35
	(1) conductor [mm²]	1.5…6				2.5…16		2.5…25	2.5…50			2.5…50
	(2) conductors [mm²]	1.5…6				2.5…16		2.5…16	2.5…35			2.5…50
	b max. [mm]	—				—		—	—			
	c max. [mm]	—				—		—	—			
	s max. [mm]	—				—		—	—			
	Ø min. [mm]	—				—		—	—			
Recommended torque	[N•m]	1.5…2.5				2.5…3.5		2.5…3.5	4…6			
Cross section per UL/CSA	[AWG]	16…10				14…4		14…4	14…1			
Recommended torque	[lb•in]	13.3…22				22…31		22…31	40…53			
With terminal lug kit		—				—		—	—			
Cross section per UL/CSA	[AWG]	—				—		—	—			
Recommended torque	[lb•in]	—				—		—	—			
With Frame Terminal Block		—				—		—	—			
	top opening [mm²]	—				—		—	—			
	bottom opening [mm²]											
	top opening [mm²]	—				—		—	—			
	bott. opening [mm²]											
	b max. [mm]	—				—		—	—			
	s top [mm]											
	s bottom [mm]											
Recommended torque	[N•m]	—				—		—	—			
Cross section per UL/CSA top	[AWG]	—				—		—	—			
bottom	[AWG]	—				—		—	—			
Recommended torque	[lb•in]	—				—		—	—			

✶ Pozidriv No. 2 / Blade No. 3 screw
❄ Pozidriv No. 2 / Blade No. 4 screw
‡ Hexagonal socket screw

100S-D									
115	115	140	180	210	250	300	420	630	860
X	—	X	X	—	—	—	—	—	—
—	X	X	X	X	X	X	X	X	X
 §	 §			 §				 §	
— —	— —			— —				— —	— —
— —	— —			— —				— —	— —
20	25			30				52	52
10	12.5			15				22	22
5	5			6				2 x 8	2 x 8
6.1	8.3			10.5				13	13
8…10	10…12			16				68	68
—	—			—				—	—
70…90	90…110			130…150				600	600
100-DL110‡	100-DLE110‡	100-DL180‡		100-DL420‡				100-DL630	100-DL860
8…2/0	8…2/0	6…300 MCM		(2x) 4…350 MCM				(2X) 2/0… 500MCM	(4X) 2/0… 500MCM
90	90	250		250				400	400
100-DTB110‡	100-DTB180‡			100-DTB420✶				—	—
16…35 16…70	16…35 16…95			25…240♣ 25…240				—	—
16…50 16…95	16…50 16…120			25…300 25…300				—	—
16 3…9 3…12	20 3…9 3…14			25 4…20 4…20				—	—
8…10	10…12			20…25				—	—
6…1 / 0 AWG	6…1 / 0 AWG			4 AWG…600 MCM				—	—
6…3 / 0 AWG	6 AWG…250 MCM			4 AWG…600 MCM				—	—
70…90	90…110			180…220				—	—

✶ Pozidriv No. 2 / Blade No. 3 screw
‡ Hexagonal socket screw
§ Hexagonal screw
♣ 25…95 mm² with sleeve per DIN 46228

Coil Data

			100S/104S-C										
			09	12	16	23	30	37	43	60	72	85	97
	Conventional		X	X	X	X	X	X	X	X	X	X	X
Coil Type	Electronic — EI		—	—	—	—	—	—	—	—	—	—	—
Operating Limits													
50 Hz, 60 Hz, 50/60 Hz	pick-up	[x *Us*]	0.85…1.1						0.85….1.1				
	dropout	[x *Us*]	0.3…0.6						0.3…0.6				
DC (conventional)	pick-up	[x *Us*]	0.8…1.1						0.8…1.1				
	dropout	[x *Us*]	0.1…0.6						0.1…0.6				
DC (electronic)	pick-up	[x *Us*]	0.7…1.25							—			
	dropout	[x *Us*]	0.1…0.5							—			
Coil Consumption													
50 Hz, 60 Hz, 50/60 Hz	pick-up	[VA/W]	70/50			70/50	80/60		130/90	200/110			
	hold-in	[VA/W]	8/2.6			9/3	9/3		10/3.2	16/4.5			
DC (conventional)	pick-up	[W]	6.5			9.2	9.2		10.1	200			
	hold-in	[W]	6.5			9.2	9.2		10.1	4.5			
DC (electronic)	pick-up (avg/peak)	[W]	10/22				10/22		10.1	—			
	hold-in	[W]	1.5						10.1	—			
Operating Times													
AC	closing delay	[ms]	15…30			15…30	15…30		15…30	20…40			
	opening delay	[ms]	10…60			10…60	10…60		10…60	10…60			
With RC module	opening delay	[ms]	10…60			10…60	10…60		10…60	10…60			
DC (conventional)	closing delay	[ms]	40…70			40…70	50…80		50…80	20…40			
	opening delay	[ms]	7…15			7…15	7…15		7…15	—			
With integ. diode	opening delay	[ms]	14…20			17…23	17…23		17…23	≤ 220V 20…35			
With external diode	opening delay	[ms]	70…95			80…125	80…125		80…125	≤ 220V 80…125			
DC (electronic)	closing delay	[ms]	20…40							—			
	opening delay	[ms]	20…40							—			
Max. Ripple			± 15%							—			

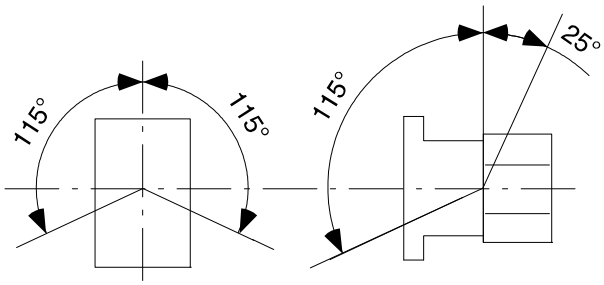
			100S-D										
			115	140/180	95	110	140	180	210	250	300	420	630	860
	Conventional		X	X	—	—	—	—	—	—	—	—	—	—
Coil Type	Electronic — EI		—	—	X	X	X	X	X	X	X	X	X	X
Operating Limits														
50 Hz, 60 Hz, 50/60 Hz	pick-up	[x *Us*]	0.85…1.1		0.85…1.1								0.8…1.1	
	dropout	[x *Us*]	0.3…0.6		0.3…0.5								0.3…0.8	
DC control	pick-up	[x *Us*]	0.85…1.1		0.85…1.1								0.85…1.1	
	dropout	[x *Us*]	0.3…0.6		0.3…0.5								0.3…0.8	
Coil Consumption														
50 Hz, 60 Hz, 50/60 Hz	pick-up	[VA/W]	650/310		380/240∗							490/270∗	1915/1720∗	
	hold-in	[VA/W]	50/10		13/6							18/7	33/30	
DC control	pick-up	[W]	540		265∗							340∗	1980∗	
	hold-in	[W]	8		6							7	30	
Operating Times														
AC	closing delay	[ms]	20…47		20…45								60…100	
	opening delay	[ms]	6…12		25…110								70…145	
With RC module	opening delay	[ms]	9…18		—								—	
DC	closing delay	[ms]	27…47		25…50								60…100	
	opening delay	[ms]	12…20		35…110								70…145	
With integrated diode	opening delay	[ms]	12…20		—								—	
With external diode	opening delay	[ms]	—		—							—	—	

∗ Electronic coil drives are designed to minimize power requirements, but this control may exhibit a higher inrush (540 W, < 10 ms) when energizing. This must be taken into account for the proper sizing of supply devices, all-or-nothing relays and cross-sections of coil supply lines. Please contact your local Rockwell Automation sales office or Allen-Bradley distributor for detailed information.

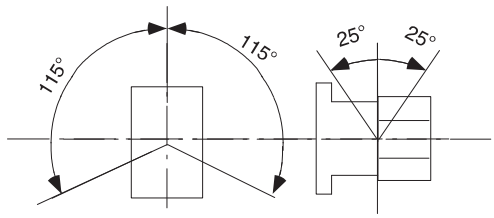
Bulletin 100S-C/104S-C Approximate Dimensions

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

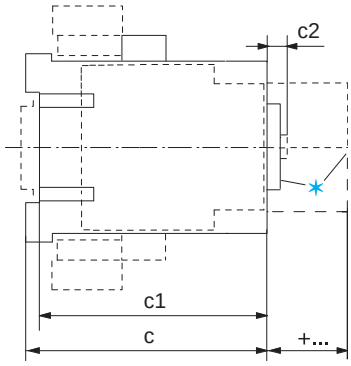
Mounting Position



AC contactors and DC contactors with electronic coils



DC contactors



AC Contactors and DC Contactors with Electronic Coils

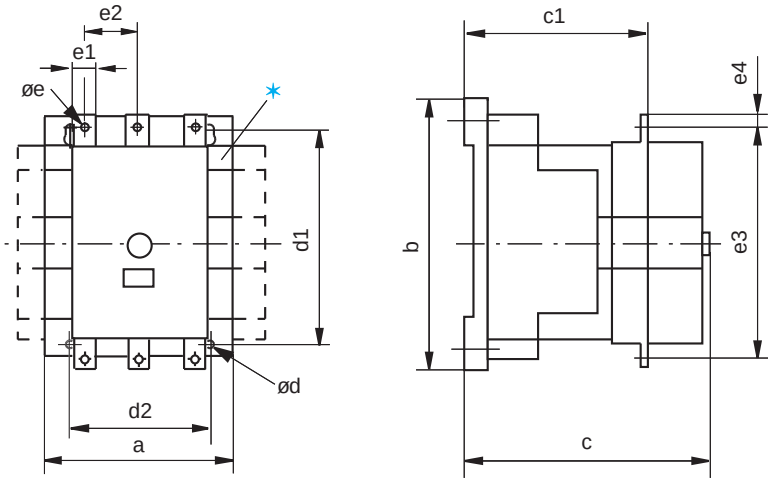
Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100S-C09...100S-C23	45 (1-25/32)	81 (3-3/16)	119.5 (4-3/4)	114.5 (4-43/64)	6 (15/64)	2-4.5 (2-3/16)	60 (2-23/64)	35 (1-3/8)
100S-C30, 100S-C37	45 (1-25/32)	81 (3-3/16)	136.5 (5-37/64)	131.6 (5-11/32)	6.5 (1/4)	2-4.5 (2-3/16)	60 (2-23/64)	35 (1-3/8)
100S-C43	54 (2-1/8)	81 (3-3/16)	139.5 (5-11/16)	134.6 (5-29/64)	6.5 (1/4)	2-4.5 (2-3/16)	60 (2-23/64)	45 (1-25/32)
100S-C60...100S-C97	72 (2-53/64)	122 (4-51/64)	156 (6-11/32)	150.5 (6-1/8)	8.5 (21/64)	4-5.4 (4-7/32)	100 (3-15/16)	55 (2-11/64)

DC Contactors

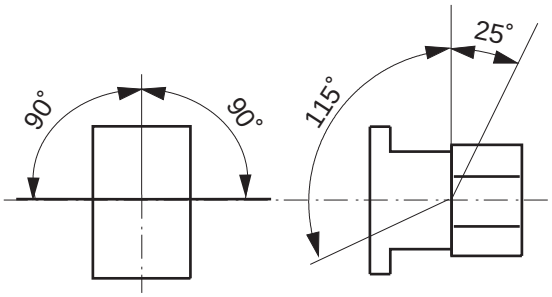
Cat. No.	a	b	c	c1	c2	Ød	d1	d2
100S-C09Z...100S-C16Z	45 (1-25/32)	81 (3-3/16)	145.5 (5-49/64)	140.5 (5-37/64)	6 (15/64)	2-4.5 (2-3/16)	60 (2-23/64)	35 (1-3/8)
100S-C23Z	45 (1-25/32)	81 (3-3/16)	162.5 (6-7/16)	158 (6-1/4)	6 (15/64)	2-4.5 (2 -3/16)	60 (2-23/64)	35 (1-3/8)
100S-C30Z...100S-C37Z	45 (1-25/32)	81 (3-3/16)	180.5 (7-5/32)	175.5 (6-61/64)	6.5 (1/4)	2-4.5 (2-3/16)	60 (2-23/64)	35 (1-3/8)
100S-C43Z	54 (2-1/8)	81 (3-3/16)	183.5 (7-17/64)	179 (7-3/32)	6.5 (1/4)	2-4.5 (2-3/16)	60 (2-23/64)	45 (1-25/32)
100S-C60D...100S-C97D	72 (2-53/64)	122 (4-51/64)	156 (6-11/32)	150.5 (6-1/8)	8.5 (21/64)	4-5.4 (4-7/32)	100 (3-15/16)	55 (2-11/64)

Bulletin 100S-D Contactors and Accessories

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



Mounting Position



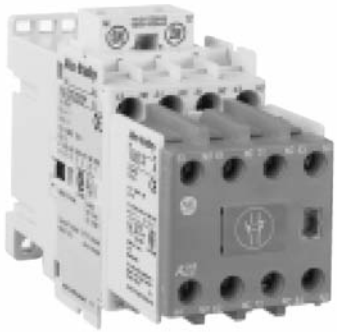
Cat. No.	a	b	c	c1	Ød	d1	d2	Øe	e1	e2	e3	e4
100S-D115	120	170	156	110.5	5.2	145	100	M6	16	38.5	147	8
100S-D115E...100S-D180E, 100S-D140, 100S-D180	120	170	156	110.5	5.2	145	100	M8	20	39	160	10
100S-D210E...100S-D420E	155	205	180	110.5	6.5	180	130	M10	25	48	193	12.5
100S-D630E...100S-D860E	255	310	265	110.5	10	230	225	M12	40	70	291	22

Contactor with		mm
Auxiliary contact block ∗	100-DS1... 100-DS2...	a a + 13.5 each
Mechanical Interlock	100-DM...	a + a
Frame terminal block	100-DTB110 100-DTB180 100-DTB420	b + 7 each b + 7 each b + 8.5 each
Label holder		c...+ 5

∗ Conventional DC coil contactors will have an additional auxiliary contact block that will add 13.5 mm to the “a” dimension on the right-hand side.

Safety Control Relays

Bulletin 700S-CF



Description

Bulletin 700S-CF Safety Control Relays provide mechanically or mirror contact performance, which are required in feedback circuits for safety applications. Bifurcated contacts are ideal for low energy feedback safety dircuits where high contact reliability is required.

Features

- IEC industrial safety relay
- Mechanically linked contacts as per IEC 60947-5-1
- Third party certification SUVA
- Red cover and mechanically linked contact symbol on front face
- Gold plated, bifurcated version for low level switching applications
- Permanently fixed front mounted auxiliary contact block

Standards Compliance

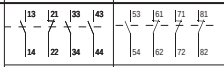
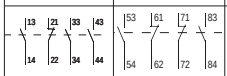
EN/IEC 60947-1, -5-1
UL 508
CSA C22.2 No. 14

Certifications

cULus Listed (File No. E14840, Guide NKCR/NKCR7)
CE Marked

Product Selection

Type CF and CFB Safety Control Relays — 8-Pole AC Coil Voltage (Ratings for 700S-CF Only)

AC-12			AC-15							Connection Diagrams		Contacts		Standard Contacts (Main) Gold-Plated Bifurcated (Front) Cat. No.	Gold-Plated Bifurcated, All Contacts Cat. No.❄
I_{th} [A]			I_e [A]												
	40 °C	60 °C	24/48V	120V	240V	400V	500V	600V	690V	Main Contacts	Auxiliary Contacts	N.O.	N.C.		
Main Contacts	20	20	10	10	10	6	2.5	1	1			4	4	**700S-CF440⊗BC**	**700S-CFB440⊗C**
												5	3	700S-CF530⊗BC	700S-CFB530⊗C
Adder Deck Contacts	10	6	6	6	5	3	1.6	1	1			6	2	**700S-CF620⊗BC**	700S-CFB620⊗C

❄ Ratings for Bulletin 700CFB and CFM are on page 6-104

⊗ AC Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 700S-CF440⊗BC** becomes **Cat. No. 700S-CF440DBC** for 120V, 60 Hz.

[V]	12	24	32	36	42	48	100	100-110	110	120	127	200	200-220	208	208-240	220-230
50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	L	—	—	F
60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	H	L	—
50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	KG	KL	—	—	KL

[V]	230	230-240	240	277	347	380	380-400	400	400-415	440	480	500	550	600
50 Hz	—	VA	T	—	—	—	N	—	G	B	—	M	C	—
60 Hz	—	—	A	T	I	E	—	—	—	N	B	—	—	C
50/60 Hz	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—

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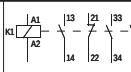
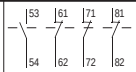
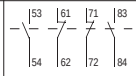
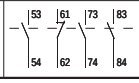
Publication S117-CA001A-EN-P

Type CF and CFB Safety Control Relays — 8-Pole DC Coil Voltage (Ratings for 700S-CF Only)

AC-12			AC-15							Connection Diagrams		Contacts		Standard Contacts (Main) Gold-Plated Bifurcated (Front) Cat. No.∗	Gold Plated Bifurcated, All Contacts Cat. No.∗
I_{th} [A]			I_e [A]												
	40 °C	60 °C	24/48V	120V	240V	400V	500V	600V	690V	Main Contacts	Auxiliary Contacts	No. of N.O. Contacts	No. of N.C. Contacts		
Main Contacts	20	20	10	10	10	6	2.5	1	1			4	4	**700S-CF440⊗BC**	**700S-CFB440⊗C**
												5	3	700S-CF530⊗BC	700S-CFB530⊗C
Adder Deck Contacts	10	6	6	6	5	3	1.6	1	1			6	2	**700S-CF620⊗BC**	700S-CFB620⊗C

∗ Ratings for Bulletin 700-CFB and 700-CFM are on page 6-104

⊗ DC Coil Voltage Code

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **700S-CF440⊗C** becomes **Cat. No. 700S-CF440ZJC** for 24V DC.

[V]	9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
Standard	**ZR**	**ZQ**	**ZJ**	**ZW**	**ZY**	**ZZ**	**ZB**	**ZG**	**ZE**	**ZD**	**ZP**	**ZS**	**ZA**	**ZF**	**ZT**
Standard with diode	—	—	DJ	—	—	—	—	—	—	—	—	—	—	—	—
Electronic with diode	—	—	EJ	—	—	—	—	—	—	—	—	—	—	—	—

Specifications

			Cat. No. 700S-CF	Aux. Contact (Front-mounted)
Mechanical Life		[Mil]	15	15
Electrical Life	AC-15 (240V, 3 A)	[Mil]	1.5	1.5
Weight	AC Coil	[g]	390	—
Terminal Cross-Sections				
Terminal Type				
Terminal Size per IEC 60947-1			2 x A4	2 x A4
 Solid/ Stranded‡	1 Conductor	[mm²]	1.5…6	0.5…2.5
	2 Conductor	[mm²]	1.5…6	0.75…2.5
Max. Wire Size per UL/CSA		**[AWG]**	16…10	18…14
Tightening Torque		[lb·in]	13.3…22	8.9…13.3
Tightening Torque		[N·m]	1.5…2.5	1…1.5

‡ For 16 or more strands, end ferrule is required

DC Switching Ratings for 700S-CF Main Poles in Series (Resistive Load at 60 °C)

	1 pole	2 poles	3 poles
24/48V	25/20 A	25 A	25 A
125V	6 A	25 A	25 A
220V	1.5 A	8 A	25 A
440V	0.4 A	1 A	3 A

Specifications, Continued

			Main Relay Cat. Nos. 700-CF, 700S-CF	Front Mounted Standard Auxiliary Contacts	Main Relay Cat. No. 700-CFB, 700S-CFB	Master Relay Cat. No. 700-CFM	Front Mounted Bifurcated Auxiliary Contacts	Side-mounted Auxiliary Contacts
Contact Ratings — NEMA			A600, P600	A600, Q600	A600, Q600	2 x A600, P600	A600, Q600	A600, Q600
Min. Contact Rating			17V, 10 mA	17V, 5 mA	8V, 5 mA	—	5V, 3 mA	17V, 10 mA
Contact Ratings — IEC AC-15 (solenoids, contactors) at rated voltage IEC 60947-5-1		24V	10 A	6 A	3 A	15 A	3 A	6 A
		48V	10 A	6 A	3 A	15 A	3 A	6 A
		120V	10 A	6 A	3 A	15 A	3 A	6 A
		240V	10 A	5 A	3 A	15 A	3 A	5 A
		400V	6 A	3 A	2 A	7.5 A	2 A	3 A
		480V/500V	2.5 A	1.6 A	1.2 A	5 A	1.2 A	1.6 A
		600V	1 A	1 A	0.7 A	2 A	0.7 A	1 A
		690V	1 A	1 A	0.7 A	2 A	0.7 A	1 A
AC-12 (Control of resistive loads) IEC 60947-5-1	**40 °C**	***I*th**	20 A	10 A	10 A	20 A	10 A	10 A
		230 V	8 kW					
		400 V	14 kW					
		690 V	24 kW					
	60 °C	***I*th**	20 A	6 A	6 A	20 A	6 A	6 A
		230V	8 kW					
		400V	14 kW					
		690V	24 kW					
DC-12 Switching DC Loads L/R < 1ms, Resistive Loads IEC 60947-5-1		24V	15 A	10 A	6 A	20 A	6 A	6 A
		48V	10 A	9 A	3.2 A	20 A	3.2 A	3.2 A
		110V	6 A	3.5 A	1 A	8 A	1 A	1 A
		220V	1 A	0.7 A	0.5 A	1.5 A	0.5 A	0.5 A
		440V	0.4 A	0.2 A	0.2 A	0.4 A	0.2 A	0.2 A
DC-13 IEC 60947-5-1, Solenoids and contactors		24V	5 A	5 A	2.5 A	5 A	2.5 A	5 A
		48V	3 A	3 A	1.5 A	3 A	1.5 A	3 A
		110V	1.2 A	1.2 A	0.6 A	1.2 A	0.6 A	1.2 A
		220V	0.6 A	0.6 A	0.3 A	0.6 A	0.3 A	0.6 A
		440V	0.3 A	0.15 A	0.15 A	0.3 A	0.15 A	0.15 A

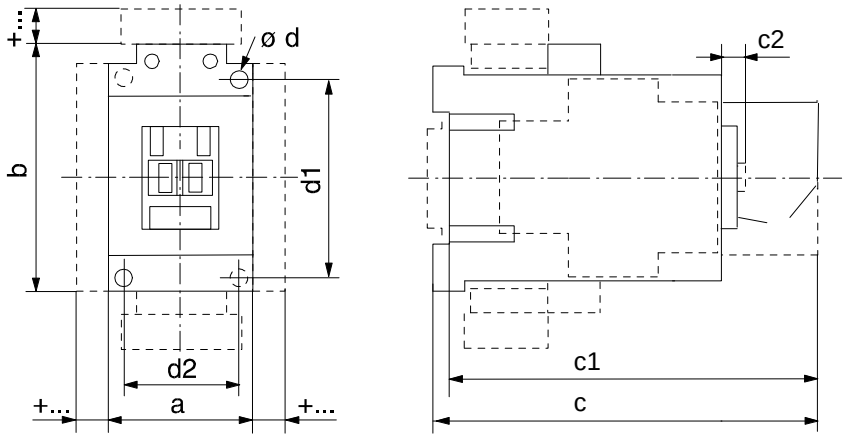
∗ Side mounted auxiliary contacts provide “mirror contact” performance with main poles only.

	Location of welded N.O. contacts	State of N.C. Contacts if N.O. contact welds		
		Main	Front aux.	Side aux.
Mechanically Linked Contacts❄	Main	Open	Open	Open∗
	Front aux.	Open	Open	—

❄ Defined in IEC 60947-5-1 annex L. Mechanically linked is a relationship between contacts of opposite types (i.e., N.O. and N.C.).

Approximate Dimensions

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



AC and DC EJ Safety Control Relays

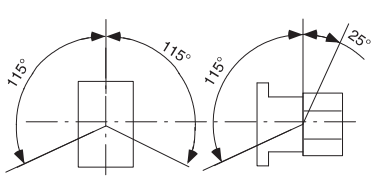
Cat. No.	a	b	c	c1	c2	Ød	d1	d2
700S-CF	45	81	119.5	114.5	6	2 - 4.5	60	35
	(1-25/32)	(3-3/16)	(4-3/4)	(4-43/64)	(1/4)	(2 - 3/16)	(2-23/64)	(1-25/64)

DC Safety Control Relays

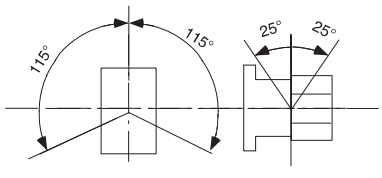
Cat. No.	a	b	c	c1	c2	Ød	d1	d2
700S-CF	45	81	145.5	140.5	6	2 - 4.5	60	35
	(1-25/32)	(3-3/16)	(5-49/64)	(5-37/64)	(1/4)	(2 - 3/16)	(2-23/64)	(1-25/64)

Safety Control Relays with	mm	[in.]
Auxiliary contact block for side mounting 1- or 2-pole	a + 9	(a + 23/64)
Electronic Timing Module on coil terminal side	b + 24	(b + 15/16)
Interface Module on coil terminal side	b + 9	(b + 23/64)
Surge Suppressor on coil terminal side	b + 3	(b + 1/8)
Labeling with label sheet	+ 0	(+ 0)
Marking tag sheet with clear cover	+ 0	(+ 0)
Marking tag adapter for System Bul. 1492W	+ 5.5	(+ 7/32)

Mounting Position



AC and DC E Safety Control Relays



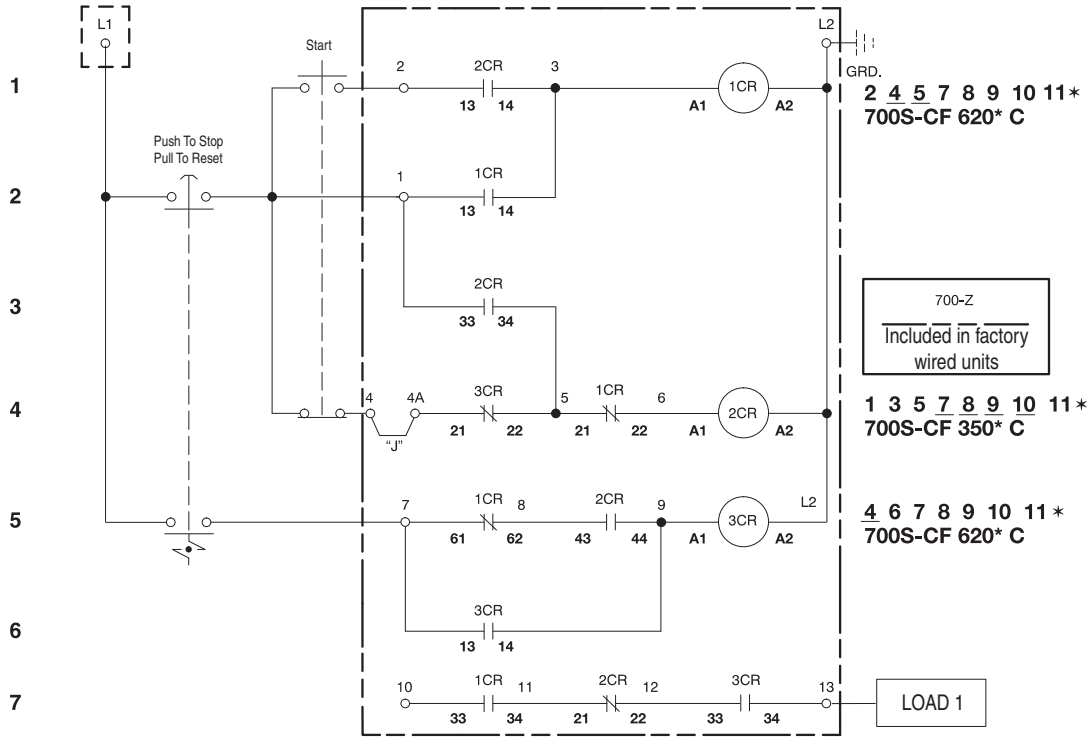
DC Safety Control Relays

Safety Relay Circuit With 5 Safety Outputs

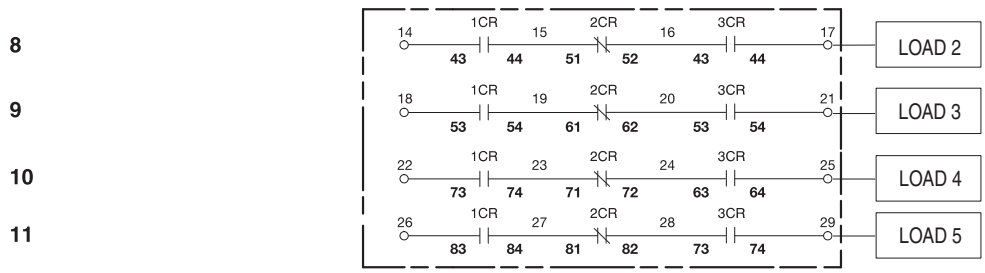
- Use for E-stop control. E-stop will work properly if any one fault occurs (a fault could be one welded contact or one undesired open connection such as a loose wire).
- High output switching capability and long contact life.
- Circuit complies with EN 954 categories 1, 2, 3, 4.
- Helps prevent restart of the 5 safety outputs if there is a single fault anywhere in the system.
- Use (3) 700S-CF relays and this diagram to construct the circuit

Basic Circuit
(1) Output Circuit (3 Relays, 9 Terminal Blocks)

Basic Circuit
(1) Output Circuit (3 Relays, 9 Terminal Blocks)



(5) Output Circuit (3 Relays, 17 Terminal Blocks)



* Numbers shown are the line numbers where the contacts for this relay appear.
Contact your local Rockwell Automation sales office or Allen-Bradley distributor for availability.

Features

- Mechanically linked contacts meet IEC 947-5-1-L
- 2…12 poles – all mechanically linked
- Red cover for easy identification of safety circuits
- Tamper resistant cover helps prevent changes which could jeopardize safety
- IEC mechanically linked contacts symbol displayed on front
- Visual indication of contact state
- Ideal for use in safety circuits

Certifications

cULus Listed (File No. E14840, Guide NKCR/NKCR7)
CE Certified
ABS Certified

Standards Compliance

UL 508
CSA C22.2 No. 14

Product Selection

Bulletin 700S-P (10 A) Safety Control Relays — AC and DC Coil Voltages

Contacts		AC Coils	24V DC Coils	
		Open Type Panel Mount Relay Rail Mount	Open Type Panel Mount Relay Rail Mount	Open Type DIN Rail Mount
N.O.	N.C.	Cat. No.∗	Cat. No.∗	Cat. No.∗
3	1	700S-P310⊗	700S-DCP310Z24	700S-DCP310DZ24
2	2	**700S-P220⊗**	700S-DCP220Z24	700S-DCP220DZ24
7	1	700S-P710⊗	700S-DCP710Z24	700S-DCP710DZ24
6	2	700S-P620⊗	700S-DCP620Z24	700S-DCP620DZ24
5	3	700S-P530⊗	700S-DCP530Z24	700S-DCP530DZ24
4	4	**700S-P440⊗**	700S-DCP440Z24	700S-DCP440DZ24
3	5	700S-P350⊗	700S-DCP350Z24	700S-DCP350DZ24
10	2	700S-P1020⊗	700S-DCP1020Z24	700S-DCP1020DZ24

Bulletin 700S-PK (20 A) Safety Control Relays

Contacts		Coil Voltage	Cat. No.
N.O.	N.C.		
7	1	110V AC	700S-PK710A1
6	2	110V AC	700S-PK620A1
5	3	110V AC	700S-PK530A1
4	4	110V AC	700S-PK440A1
3	5	110V AC	700S-PK350A1
10	2	110V AC	700S-PK1020A1
3	1	110V AC	700S-PK310A1
7	1	24V DC	700S-DCPK710Z24
6	2	24V DC	700S-DCPK620Z24
5	3	24V DC	700S-DCPK530Z24
4	4	24V DC	700S-DCPK440Z24
3	5	24V DC	700S-DCPK350Z24
10	2	24V DC	700S-DCPK1020Z24
3	1	24V DC	700S-DCPK310Z24

⊗AC Coil Voltage Code

The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No.
Example: **Cat. No. 700S-P310** becomes **Cat. No. 700S-P310A1** for a 120V AC coil.

[V]	24	115...120	230...240	460...480
60 Hz	A24	**A1**	A2	A4

∗ For other coil voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

IEC 947-5-1 Annex L has 2 requirements for a relay to meet for mechanically linked contacts:
1.) If a N.O. contact welds, all the N.C. contacts will remain open and meet a 2500V impulse test.
2.) If a N.C. contact welds, all the N.O. contacts will remain open and meet a 2500V impulse test.
Bul. Nos. 700S-P and 700S-DCP relays meet these requirements including the 2500V impulse test.
The relays shown on this page are shipped from the factory with the Bul. 700-CPS safety cartridge installed and cannot be converted to N.O. or N.C. in the Field.

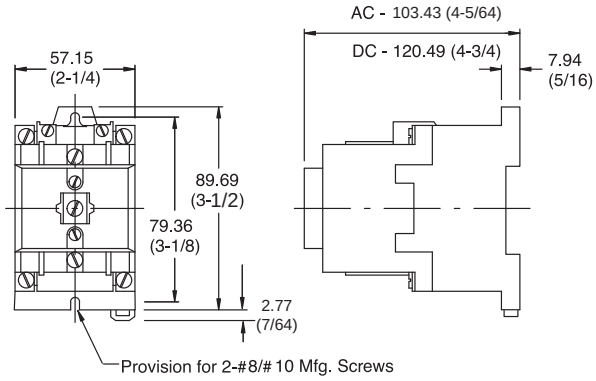
Specifications

Type			700S-P						700S-PK					
Electrical														
Contact Rating Continuous			10 A @ 600V AC 5 A @ 600V DC						20 A @ 600V AC 10 A @ 600V DC					
Ratings Make/Break	AC		NEMA A600						NEMA A600					
	DC		NEMA P600						NEMA P600					
Minimum Contact Switching Ratings			10V, 50 mA						3 Hp @ 240V AC - N.O. 2 Hp @ 240V AC - N.O./N.C. 1 HP @ 120V AC - N.O./N.C. 20 A resistive heating to 600V AC 20 A Tungsten lighting load to 480V AC					
DC Switching	Contacts in Series		Volts DC						Volts DC					
			24V	64V	125V	250V	500V	600V	24V	64V	125V	250V	500V	600V
	1		5 A	2.2 A	1.1 A	0.55 A	0.24 A	0.2 A	10 A	5 A	2.2 A	0.55 A	0.24 A	0.2 A
	2		10 A	10 A	5 A	2 A	0.7 A	0.5 A	20 A	10 A	5 A	2 A	0.7 A	0.5 A
	3		—	—	7 A	3 A	1.5 A	1.0 A	—	15 A	7 A	3 A	1.5 A	1.0 A
	4		—	—	10 A	5 A	2.5 A	1.5 A	—	20 A	10 A	5 A	2.5 A	1.5 A
Coil Voltage Range*	AC		85…110%						85…110%					
	DC		80…110%						80…110%					
	Battery Charging		85…115%						85…115%					
Coil Consumption			50 Hz			60 Hz			50 Hz			60 Hz		
	AC	Inrush	132 VA			138 VA			132 VA			138 VA		
		Sealed	19.3 VA			19 VA			19.3 VA			19 VA		
	DC	Inrush	12.7 W						12.7 W					
		Sealed	12.7 W						12.7 W					
Additional Contact Rating for AC Single-Phase Loads			—						3 HP @ 240V AC - N.O. 2 HP @ 240V AC - N.O./N.C. 1 HP @ 130V AC - N.O./N.C. 20 A Resistive Heating to 600V AC 20 A Tungsten Lighting Load to 480V AC Cartridge Cat. No. Bulletin 700S-CMS					
Mechanical														
Mechanically Linked Contacts			All contacts are mechanically linked per IEC 947-5-1 annex L for 2 to 12 poles						All contacts are mechanically linked per IEC 947-5-1 annex L for 2 to 12 poles					
Operating Time	Pickup		AC – 10…20 ms DC – 30…50 ms						AC – 10…20 ms DC – 30…50 ms					
	Dropout		AC – 10…20 ms DC – 20…33 ms						AC – 10…20 ms DC – 20…33 ms					
Mechanical Life			10 million operations											
Construction														
Contact Arrangement			2 to 12 Poles, Double Break Contacts N.O. or N.C. (8 N.C. Maximum)						2 to 12 Poles, Convertible to N.O. or N.C. (8 N.C. Maximum)					
Contact Material/Design			Silver Nickel/Bifurcated						Silver Cadmium Oxide					
Mounting			Panel mount or mount on 700-MP Relay or DIN Rail Horizontal Mounting Recommended						Panel mount or mount on 700-MP Relay or DIN Rail Horizontal Mounting Recommended					
Environmental														
Temperature	Operating‡		–20…+65 °C (–4…+149 °F)						–20…+65 °C (–4…+149 °F)					
	Storage		–40…+65 °C (–40…+149 °F)						–40…+65 °C (–40…+149 °F)					
Wire Terminations														
Wire size per UL/CSA			#18 AWG…(2) #12 AWG						#18 AWG…(2) #12 AWG					
Tightening Torque			8…12 lb•in (0.9…1.4 N•m)						8…12 lb•in (0.9…1.4 N•m)					

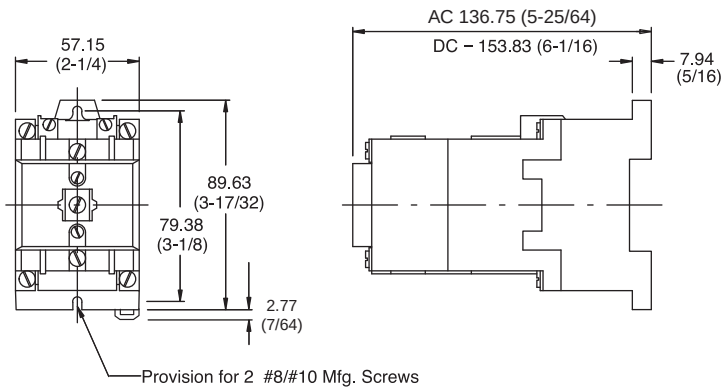
* Coil voltage required for proper operation (percent of rated coil voltage).
‡ Temperature inside the panel.

Approximate Dimensions

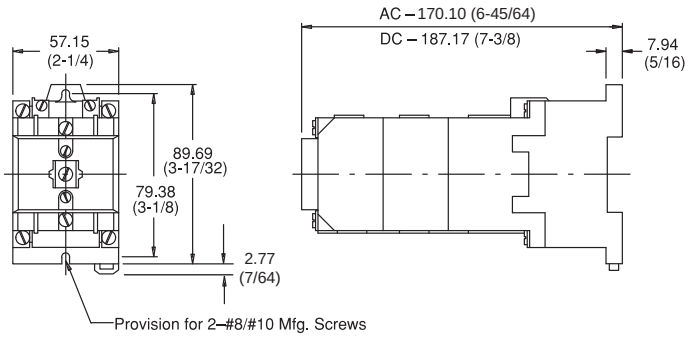
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



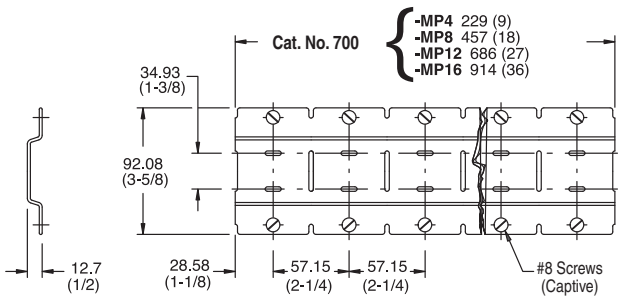
2- and 4-pole Bulletin 700S-P Relay — Approximate Shipping Weight AC – 0.68 kg (1.5 lb), DC – 1.34 kg (2.95 lb)



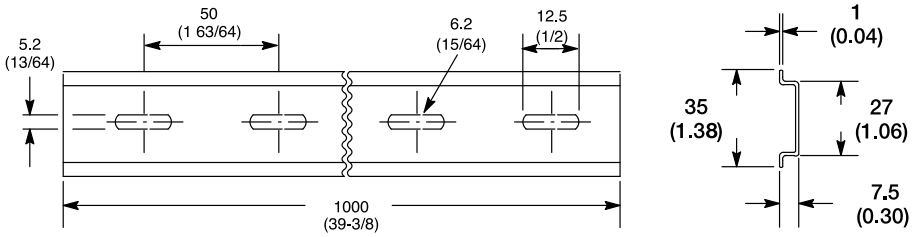
6- and 8-pole Bulletin 700S-P Relay Approximate Shipping Weight AC – 0.79 kg (1.75 lb), DC – 1.45 kg (3.20 lb)



10- and 12-pole Bulletin 700S-P, Approximate Shipping Weight AC – 1.02 kg (2.25 lb), DC – 1.68 kg (3.7 lb)



Relay Rail



DIN Rail

Safety Starter

Bulletin 109S

Description

The Bulletin 109S Safety Starter combines many features of the standard Bulletin 109 Enclosed Starter with a redundant contactor. The redundant safety contactor makes the Bulletin 109S suitable for use in Category 3 and 4 safety circuits. The safety circuit interface is designed to work with Safety Monitoring Relays, Safety PLC and GuardLogix, allowing the typical safety circuit to control higher switching currents and motor loads (9…860 A). This makes the safety system integration quicker and easier to apply by using a modular approach to the safety solution.

Features

- Positive-guided auxiliary contacts (9…85 A) and mirrored auxiliary contacts (95…860 A)
- 24V DC or 120V AC (50/60 Hz) control voltage
- Cover-mounted green pilot light (illuminated when output is on)
- Up to 600V line voltage
- Options similar to the standard Bulletin 109 enclosed starters
- Optional overload relay (E1 Plus and E3)

Specifications

Input Line Voltage Range	600V AC maximum
Control Voltage Range	24V DC or 110/120V AC (50/60 Hz)
Enclosure Rating	Type 12 (IP54) Open frame
System Operational Limits	+10%, -15% of the line voltage
Estimated Component Life	1,000,000 operations
Storage Temperature [C (F)]	-40…+80° (-40…176°)
Operating Temperature, Ambient—C (F)	-25…+40° (-13…104°)
Relative Humidity	90% noncondensing
Approvals	CE Marked for all applicable directives cULus
Standards/Certifications	Redundant contactors suitable for use in Category 3 or 4 systems UL 508A

Product Selection

Bulletin 109S cat. nos. can be configured by selecting the appropriate codes from the tables below.

109S — C30 J 1 1CD — 1E
a b c d e

a

Contactor Size	
Code	Amps [A]
C09	9
C12	12
C16	16
C23	23
C30	30
C37	37
C43	43
C60	60
C72	72
C85	85
D95	95
D110	110
D140	140
D180	180
D210	210
D250	250
D300	300
D420	420
D630	630
D860	860

b

Enclosure Type∗	
Code	Description
J	Type 12/IP54
N	Open (no enclosure) Components are mounted on a sub-panel

∗ Other enclosure types are available upon request.

c

Control Voltage	
Code	Description
1	24V DC DJ = 9…85 A EZJ = 95…300 A 420…860 = Not available
2	120V AC D = 9…85 A ED = 95…860 A

d

E3 Plus Overload Relay (193-ECxxx)❄		
Code	Load Rating Amps [A]	Starter
1PB	0.4…2.0	C09…C23
1AB	1…5	
1BB	3…15	
1CB	5…25	
1AD	1…5	C30…C43
1BD	3…15	
1CD	5…25	
1DD	9…45	
1DE	9…45	C60…C85
1EE	18…90	
1FF	28…140	D95…D180
1GF	42…210	
1GG	42…210	D210…D420
1HG	60…302	
1JG	84…420	
1KH	125…630	D630…D860
1LH	172…860	

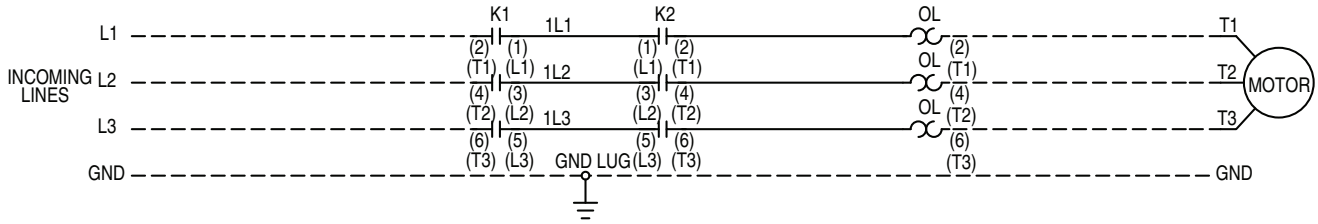
E1 Plus Overload Relay (193-Exxx)❄		
Code	Load Rating Amps [A]	Starter
EAB	0.1…0.5	C09…C23
EBB	0.2…1.0	
ECB	1…5	
EDB	3.2…16	
EEB	5.4…27	
EED	5.4…27	C30…C43
EFD	9…45	
EGE	18…90	C60…C85
EHF	30…150	D95…D180
EJF	40…200	
EJG	40…200	D210…D420
EKG	60…100	
ELG	100…500	
EMH	120…600	D630…D860
ENH	160…800	

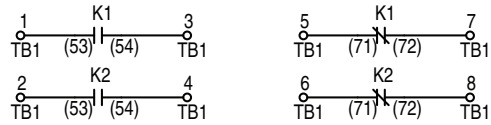
❄ If the overload relay configuration code field is left blank, an overload relay will not be provided.

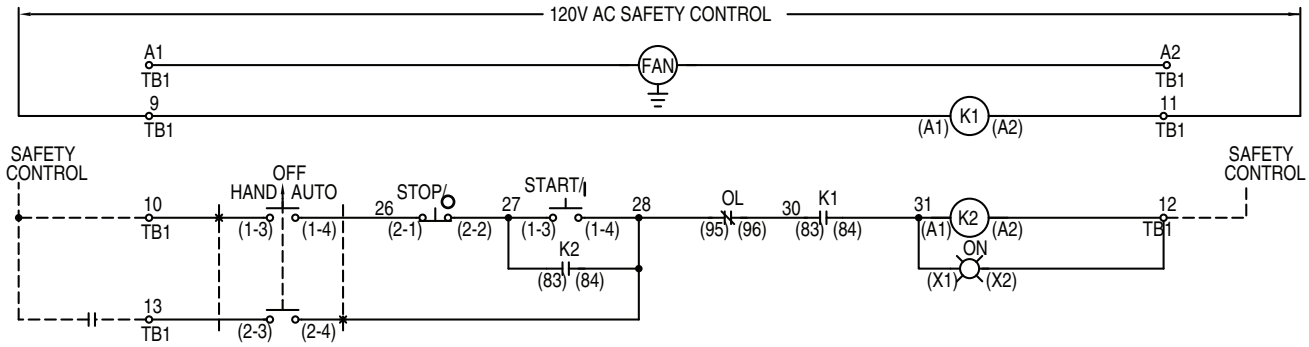
e

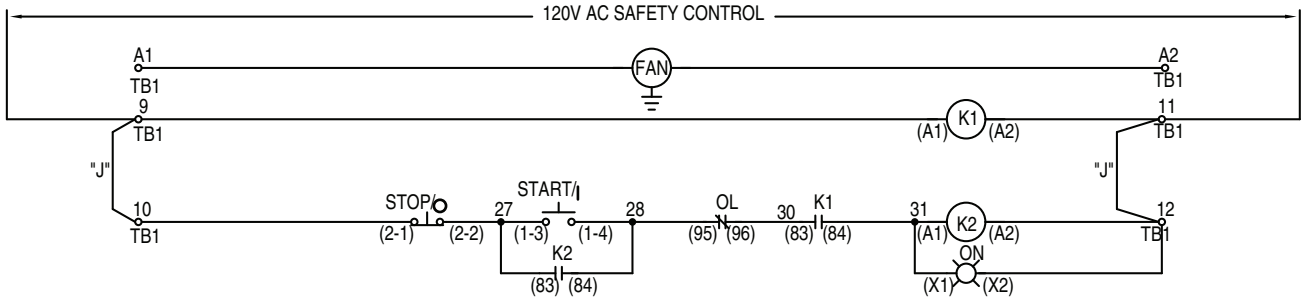
Operator Devices	
Code	Description
1	Stop/Start PB
1E	On/Off PB
3	Hand/Off/Auto SS
3E	On/Off SS
4R	Red Pilot Light
Blank	No options

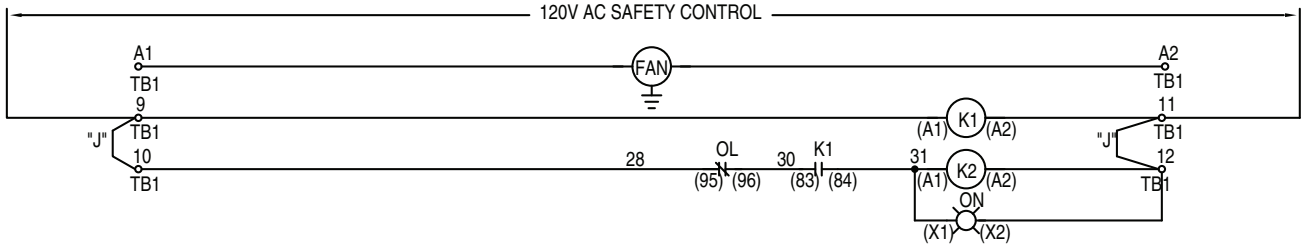
Typical Wiring Diagrams











Description

The Bulletin 2041 Safety Power Control combines safety circuits and power control of the redundant contactors and a safety relay. The Bulletin 2041 is TÜV certified for category 4 safety circuits. The safety circuit interface is designed to work with either light curtain outputs or safety interlock switches. The Bulletin 2041 also interfaces with Safety Monitoring Relays, Safety PLC, and GuardLogix solutions to allow for control of power circuits from 9…860 A at 600V maximum. This makes system integration quicker and easier by using a modular approach to the safety solution.

Features

- Positive-guided auxiliary contacts (9…85 A) and mirrored auxiliary contacts (95…860 A)
- 24V DC or 120V AC (50/60 Hz) control voltage
- Cover-mounted green pilot light (illuminated when output is on)
- Up to 600V line voltage
- Optional overload relay (E1 Plus and E3)

Specifications

Input Line Voltage Range	600V AC maximum
Control Voltage Range	24V DC or 110/120V AC (50/60 Hz)
Enclosure Rating	Type 12 (IP54) Open Frame
System Operational Limits	+10%, -15% of the line voltage
Estimated Component Life	1,000,000 operations
Storage Temperature [C (F)]	-40…+80° (-40…176°)
Operating Temperature, Ambient [C (F)]	-25…+40° (-13…104°)
Relative humidity	90% noncondensing
Approvals	CE Marked for all applicable directives TÜV Category 4 cULus
Standards/Certifications	Category 4 systems UL 508A

Product Selection

Bulletin 2041 cat. nos. can be configured by selecting the appropriate codes from the tables below.

2041 — C30 J 1 1CD — 7B
a b c d e

a

Contactor Size	
Code	Amps [A]
C09	9
C12	12
C16	16
C23	23
C30	30
C37	37
C43	43
C60	60
C72	72
C85	85
D95	95
D110	110
D140	140
D180	180
D210	210
D250	250
D300	300
D420	420
D630	630
D860	860

b

Enclosure Type	
Code	Description
J	Type 12/IP54
N	Open (no enclosure) components are mounted on a sub-panel

c

Control Voltage	
Code	Description
1	24V DC DJ = 9…85 A EZJ = 95…300 A 420…860 = Not available
2	120V AC D = 9…85 A ED = 95…860 A

d

E3 Plus Overload Relay (193-ECxxx)*		
Code	Load Rating Amps [A]	Starter
1PB	0.4…2.0	C09…C23
1AB	1…5	
1BB	3…15	
1CB	5…25	
1AD	1…5	C30…C43
1BD	3…15 A	
1CD	5…25	
1DD	9…45	
1DE	9…45	C60…C85
1EE	18…90	
1FF	28…140	D95…D180
1GF	42…210	
1GG	42…210	D210…D420
1HG	60…302	
1JG	84…420	
1KH	125…630	D630…D860
1LH	172…860	

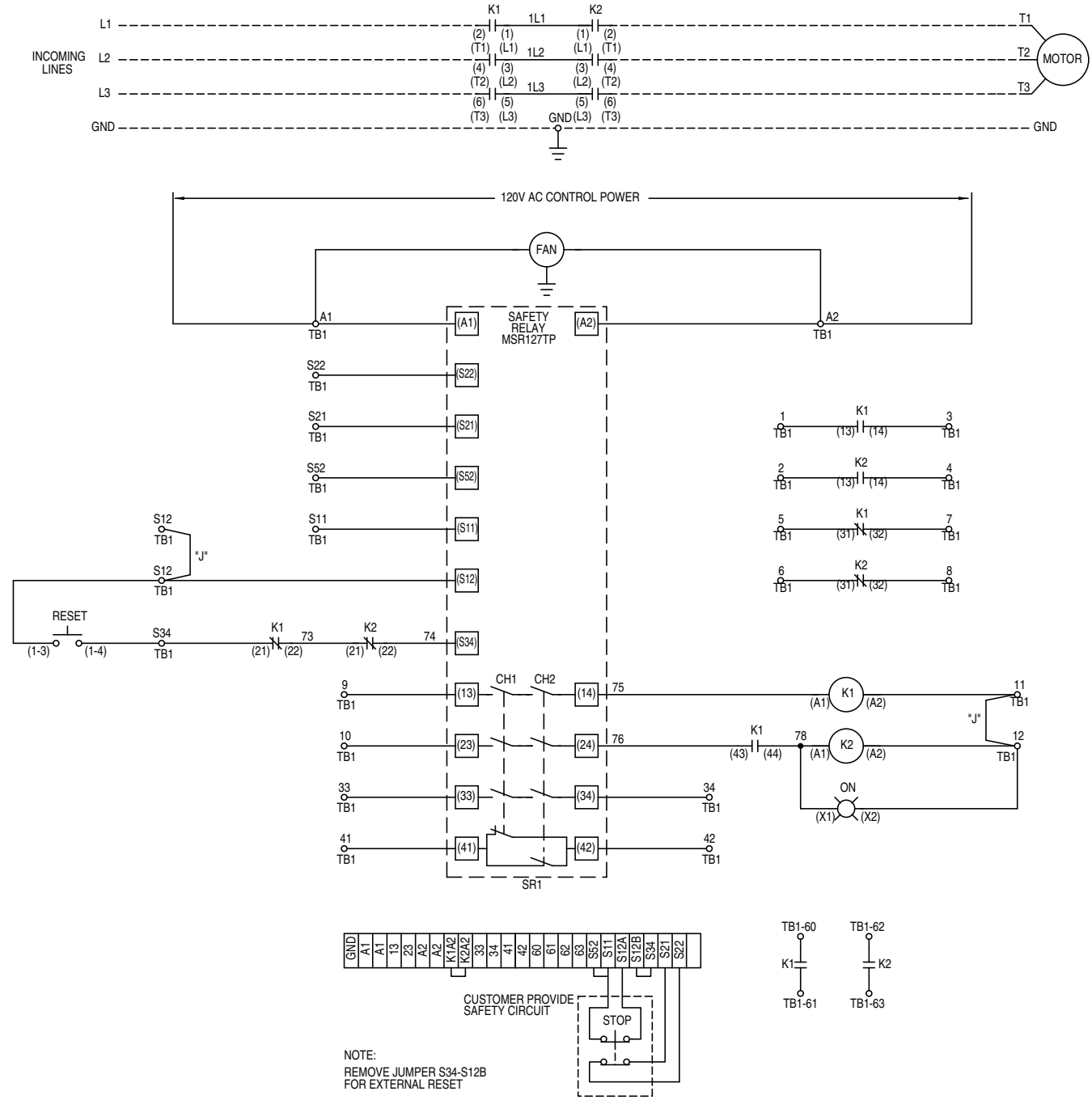
E1 Plus Overload Relay (193-Exxx)*		
Code	Load Rating Amps [A]	Starter
EAB	0.1…0.5	C09…C23
EBB	0.2…1.0	
ECB	1…5	
EDB	3.2…16	
EEB	5.4…27	
EED	5.4…27	C30…C43
EFD	9…45	
EGE	18…90	C60…C85
EHF	30…150	D95…D180
EJF	40…200	
EJG	40…200	D210…D420
EKG	60…100	
ELG	100…500	
EMH	120…600	D630…D860
ENH	160…800	

* If the overload relay configuration code field is left blank, an overload relay will not be provided.

e

Operator Devices	
Code	Description
Blank	No options
7B	Front mount safety reset
4R	Red pilot light (replaces standard green)

Typical Wiring Diagram

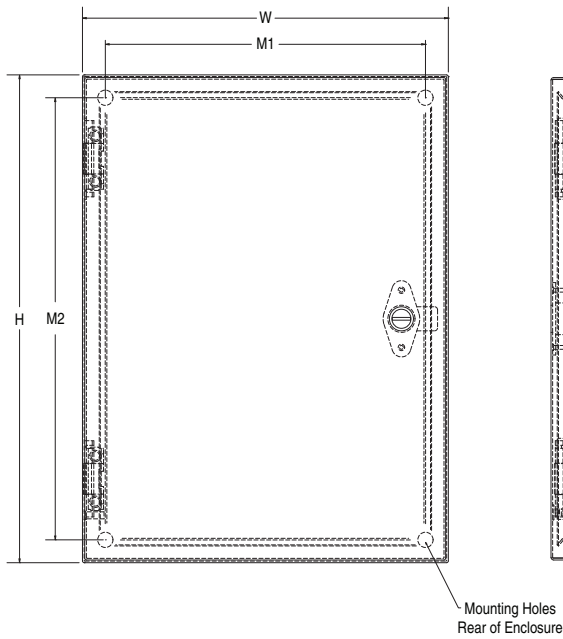


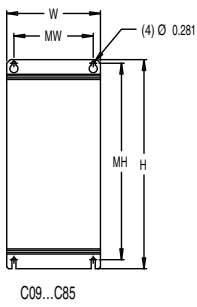
Approximate Dimensions [mm (in.)]

Dimensions are not intended to be used for manufacturing purposes.

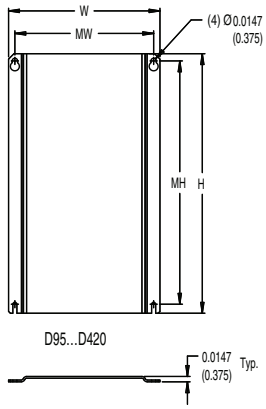
Type 12 Enclosure				
Contactor Size	Panel Dimensions (H x W x D)	(M2) Height [mm (in.)]	(M1) Width [mm (in.)]	Mounting Holes [mm (in.)]
C09…C16	12 x 10 x 8	324 (12.75)	203 (8.0)	8 (0.31)
C23…C30	16 x 12 x 10	368 (14.5)	267 (10.5)	13 (0.5)
C37…C43	16 x 12 x 10	368 (14.5)	267 (10.5)	13 (0.5)
C60…C85	16 x 12 x 10	368 (14.5)	267 (10.5)	13 (0.5)
C95…D180	24 x 24 x 10	572 (22.5)	572 (22.5)	13 (0.5)
D210	24 x 24 x 10	572 (22.5)	572 (22.5)	13 (0.5)
D250…D300	24 x 24 x 10	572 (22.5)	572 (22.5)	13 (0.5)
D420	24 x 24 x 10	572 (22.5)	572 (22.5)	13 (0.5)
D630…D860	36 x 30 x 12	572 (22.5)	724 (28.5)	13 (0.5)

Open Panel				
Contactor Size	Panel Dimensions (H x W x D)	(MH) Height [mm (in.)]	(MW) Width [mm (in.)]	Mounting Holes [mm (in.)]
C09…C16	14.5 x 6.5 x 6.1	349 (13.75)	140 (5.5)	7 (0.281)
C23…C30	14.5 x 6.5 x 7.5	349 (13.75)	140 (5.5)	7 (0.281)
C37…C43	14.5 x 6.5 x 7.6	349 (13.75)	140 (5.5)	7 (0.281)
C60…C85	14.5 x 6.5 x 6.5	349 (13.75)	140 (5.5)	7 (0.281)
C95…D180	18 x 10.5 x 6.5	429 (16.875)	242 (9.525)	9.5 (0.375)
D210	23 x 12 x 7.5	538 (21.175)	283 (11.125)	9.5 (0.375)
D250…D300	23 x 12 x 7.5	538 (21.175)	283 (11.125)	9.5 (0.375)
D420	23 x12 x 7.5	538 (21.175)	283 (11.125)	9.5 (0.375)
D630…D860	35 x 17 x 11.3	432 (17.0)	410 (16.125)	9.5 (0.375)

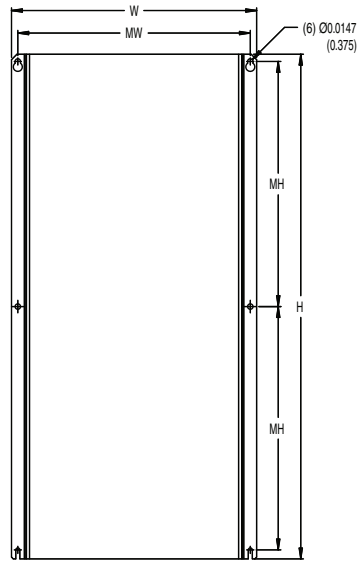




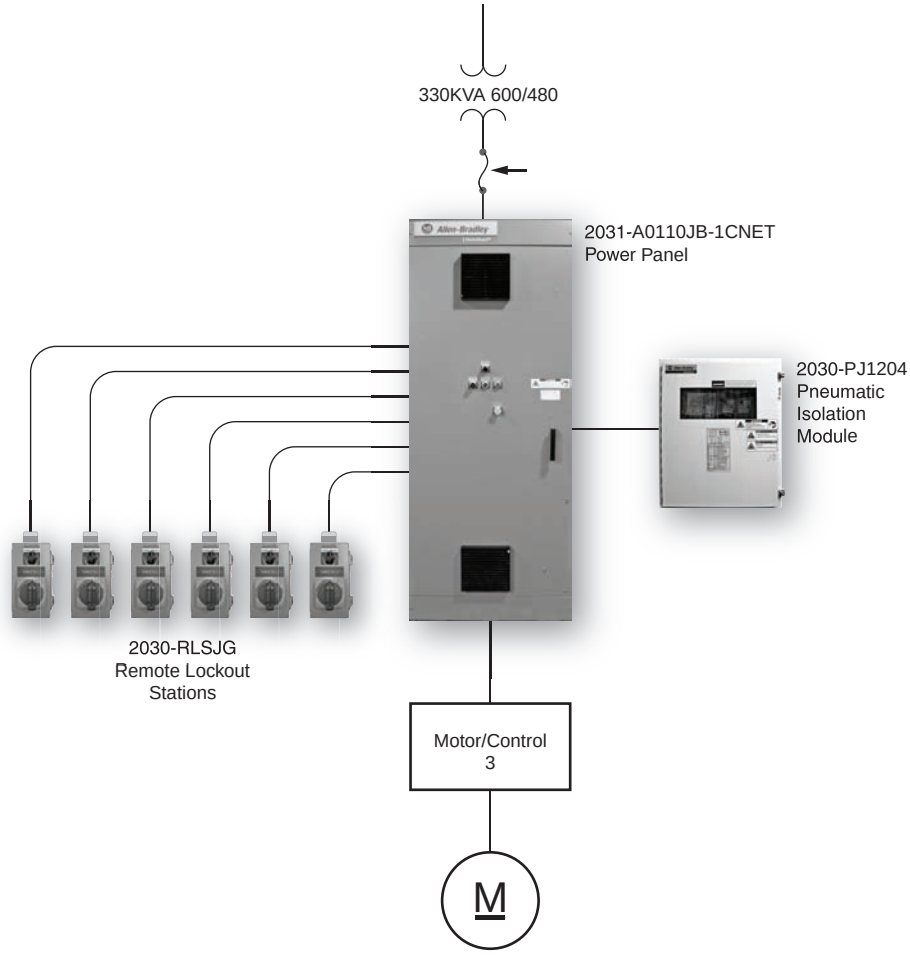
C09...C85



D95...D420



D630...D860



Typical System

Description

The ElectroGuard system is designed to simplify the Lock Out/Tag Out (LOTO) task performed by a machine operator or maintenance personnel. The ElectroGuard system can control single or multiple energy sources simultaneously. Simplifying the procedure helps increase the likelihood that personnel will perform the LOTO on large processors or drive systems.

The ElectroGuard system can be configured with modules to provide:

- Electrical energy isolation (ElectroGuard Power Panel).
- Pneumatic energy isolation (Pneumatic Isolation Module).
- Hydraulic energy isolation (Hydraulic Isolation Module).
- Multiple lockout points (Remote Lockout Stations).
- Control of multiple systems (System Multiplexer/Permissive or Dual RLS).
- Interface to safety-gate interlocks (Verification Module).

The ElectroGuard allows the system engineer to design LOTO into the system. Locating the Remote Lockout Stations (RLS) at hazard entry points can result in the shortest down time during set-up or maintenance.

Standard Features

- System is designed to prevent accumulation of faults.
- Standard system provides for four RLS on the 23…85 A systems and up to six RLS on the 110…1200 A systems.
- Verification light on the RLS (no light means no entry).
- Meets International Standard EN 954-1/ISO 13849-1, TÜV certified Category 4 system.
- Pneumatic and hydraulic ready.

Optional Features

- Expansion modules allow for additional RLS connections.
- Pneumatic and hydraulic energy isolation.
- System multiplexer/permissive module allows for control of multiple energy sources simultaneously.
- Network communication option provides the control system with status.

Specifications

Certifications	cULus TÜV Rheinland Certified CE marked for all applicable directives
Standards	IEC/EN 60204-1 IEC/EN 60439-1 Category 4 to EN 954-1/ISO 13849-1 98/37/EC Machinery Directive 89/336/EC EMC Directive 73/23/EC Low Voltage Directive UL508A
Estimated Component Life Remote Lockout Station Power Contactors (Isolation & Grounding)	23… 85 A: 2,000,000 operations 110…1200 A: 1,000,000 operations
Storage Temperature [C (F)]	-10…+60° (14…140°)
Operating Temperature [C (F)]	0…+40° (32…104°)
Relative Humidity (noncondensing)	90% (Ambient)
Power Panel Construction	NEMA Type 12/IP54 UL Type 4/IP66 UL Type 4x MCC (Bulletin 2100) with and without Bus
Expansion Module Construction	4-port: Supports up to 4 remote lockout stations 10 port: Supports up to 10 remote lockout stations
Safety Isolation System Inputs	Remote Lockout Stations
Input Options	Safety Mats, Light Curtains, and E-Stop Stations
System Operational Limits	+10%, -15% of the line voltage

Sequence of Operation

After using the normal stopping method of the machine or process, the machine operator turns a Remote Lockout Station (RLS) handle from the ON to the OFF position.

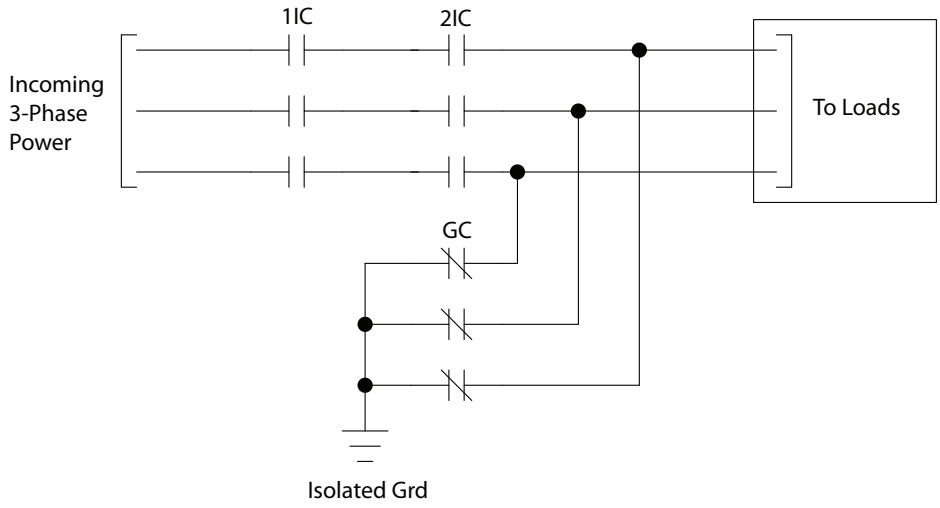
The RLS signals the:

1. Isolation contactors (1IC and 2IC) to drop out, isolating the supply voltage from the loads (see Power Circuit below).

2. The grounding contactor (GC) is then energized, connecting the load to ground (see Power Circuit). The grounding contactor and the isolation contactors are both electrically and mechanically interlocked.

3. The System Isolated light will then illuminate on the RLS to indicate the system is isolated.

4. The person performing the LOTO then applies a lock to the RLS, locking it in the OFF position. The equipment is now locked out.



Power Circuit

Communication

The optional Communication Module allows the ElectroGuard system to communicate status to the process or machine control system. Although the communication module can be field installed, it is recommended that this option be ordered as part of the ElectroGuard system. The customer is responsible for configuring and programming their control system to receive the status signals from the ElectroGuard.

Status signals available:
- Overall system status
- Remote lockout station (status of each station)
- Pneumatic or hydraulic isolation modules (if used)
- Other optional safety input devices

Current networks available∗:
- DeviceNet™
- Remote I/O
- ControlNet™
- Ethernet IP
- PROFIBUS

See the ElectroGuard or accessories for ordering instructions.

IMPORTANT	The communication option allows a remote PLC to receive status signals from the ElectroGuard safety isolation system.

Door Mounted Metering

Optional door mounted ampere meter, volt meter, or both, are available as factory installed options. They provide visual indication of line side system current and voltage. See the ElectroGuard or accessories for ordering instructions.

Expansion Module

Expansion Modules are used to add more Remote Lockout Stations in addition to the base inputs (four remote lockout stations for 23…85 A units and six for the 110…1200 A systems). See expansion module section for details.

Multiplexer and Multiplexer Permissive

The Multiplexer Module allows the Remote Lockout Station to control two or more ElectroGuard systems. The permissive function allows the equipment control system to determine if the ElectroGuard can be locked out. See Multiplexer and Multiplexer Permissive section for sequence of operation and details.

IMPORTANT	Only one of these options can be installed in the power panel, and are not available on the 23…85 A units, or 2031-A0630JX or 2031-A860JX units.

Product Selection

ElectroGuard cat. nos. can be configured by selecting the appropriate codes from the tables below.

2302	—	A	0420	J	B	—	29J	—	1TD
a		*b*	*c*	*d*	*e*		*f*		*g*

a

Safety Type	
Code	Description
2031	Noncombination
2032	Fusible Disconnect
2033	Thermal-Magnetic Circuit Breaker

b

Construction Code	
Code	Description
A	Free-standing enclosure
B§	Motor control center enclosure for North America with line side incoming power cables and 1200 A load side outgoing bus∗.
F§	Motor control center enclosure for North America with line side incoming power cables and 600 A load side outgoing bus∗.
M§	Motor control center enclosure for North America with 600 A line side incoming bus∗ and outgoing power cables.
S§	Motor control center enclosure for North America with 1200 A line side incoming bus∗ and outgoing power cables.

∗ Bus Type: copper with tin plating.
§ Only available in NEMA Type 12/IP54.

c

Ampere Rating (AC-3)	Ratings∗ 3-Phase Max. Hp rating (60Hz)				3-Phase Max. kW rating (50 Hz)				2032 Fuse Clip Options❄	2033 Circuit Breaker Options‡
	200V	230V	460V	575V	230V	400V	500V	600V		
0023	5	7.5	15	15	7.5	11	11	11	24B, 24J, 25B, 25J	39, 39k, 40, 40k, 41, 41k, 42, 42k
0043	10	15	30	30	13	22	22	22	25B, 25J, 26B, 26J	40, 40k, 41, 41k, 42, 42k, 43, 43k, 44, 44k, 45
0085	25	30	60	60	25	45	45	45	26B, 26J, 27B, 27D, 27J	42, 42k, 43, 43k, 44, 44k, 45, 46, 46k, 47, 47k, 48, 48k
0110	40	40	74	100	32	55	63	100	27B, 27D, 27J, 28B, 28D, 28J	45, 46, 46k, 49, 49k, 50k
0180	50	60	150	150	55	90	110	160	27B, 27D, 27J, 28B, 28D, 28J	47, 47k, 48, 48k, 50k, 51, 51k, 52, 52k, 55k
0210	60	75	—	200	63	110	150	200	28B, 28D, 28J	48, 48k, 49, 49k, 53, 53k, 54, 54k, 59k
0300	100	125	250	300	90	160	200	300	28B, 28D, 28J, 29B, 29D, 29J	49, 49k, 50k, 51, 51k, 53, 53k, 54, 54k, 55k, 56, 56k, 57, 57k, 58, 58k, 59, 59k
0420	150	175	350	400	132	220	300	425	29B, 29D, 29J, 30B, 30D, 30L	51, 51k, 52, 52k, 53, 53k, 55k, 57, 57k, 58, 58k, 59, 59k, 60, 60k, 61, 61k, 62, 62k, 63, 63k, 64k
0630	200	250	500	600	200	355	450	500	30B, 30D, 30L, 31B, 31D, 32B, 34L	53, 53k, 54, 54k, 55k, 56, 56k, 59, 59k, 60, 60k, 61, 61k, 62, 62k, 63, 63k, 64k, 65k, 66k
0860	250	300	600	700	250	500	560	600	31D, 32B, 34L	56, 56k, 57, 57k, 58k, 59k, 60k, 61k, 62k, 63, 63k, 64k, 65k, 66k
1200	450	450	900	900	391	710	888	1043	31D, 34L	57, 57k, 58, 58k, 59, 59k, 60, 60k, 61k, 62k, 63, 63k, 64k, 65k, 66k

∗ Consult your local Rockwell Automation sales office or Allen-Bradley distributor for additional options.
❄ Available for 2032 fusible discconect only.
‡ Available for 2033 Thermal-Magnetic circuit breaker. Consult your local Rockwell Automation sales office or Allen-Bradley distributor for additional options.

d

Enclosure Type	
Code	Description
C§	Type 4X watertight stainless steel
F§	Type 4 watertight painted steel/IP65
J	Type 12 dusttight/IP54

§ Cooling to be supplied by customer.

e

Input Line Voltage	
Code	Description
A	240V 60 Hz/220V 50 Hz
B	480V 60 Hz/440V 50 Hz
C	600V 60 Hz/550V 50 Hz
G	400…415V 50 Hz
H	208V/60 Hz
M	500V 50 Hz
N	380…400V 50 Hz

f

2032 Fuse Clip Rating/Type♣		
Code	Rated Amps [A]	Fuse Type
24B	32 A	BS88
24J	30 A	Class J
25B	60 A	BS88
25J	60 A	Class J
26B	100 A	BS88
26J	100 A	Class J
27B	200 A	BS88
27D	160 A	DIN
27J	200 A	Class J
28D	250 A	DIN
28J	400 A	Class J
29B	400 A	BS88
29D	400 A	DIN
29J	600 A	Class J
30B	600 A	BS88
30D	630 A	DIN
30L	800 A	Class L
31B	800 A	BS88
1D	1600 A	DIN
32B	1250 A	BS88
34L	2000 A	Class L

♣ Fuse to be supplied by customer per local electrical code.

f

2033 Circuit Breaker Hp/kW Rating➢			
Code	Hp	Code	Power
39	5 Hp	39k	4 kW
40	7.5 Hp	40k	5.5 kW
41	10 Hp	41k	7.5 kW
42	15 Hp	42k	11 kW
43	20 Hp	43k	13 kW
44	25 Hp	44k	15 kW
45	30 Hp	—	—
46	40 Hp	46k	22 kW
47	50 Hp	47k	25 kW
48	60 Hp	48k	32 kW
49	75 Hp	49k	37 kW
—	—	50k	45 kW
51	125 Hp	51k	55 kW
52	150 Hp	52k	63 kW
53	175 Hp	53k	75 kW
54	200 Hp	54k	90 kW
—	—	55k	100 kW
56	250 Hp	56k	110 kW
57	300 Hp	57k	132 kW
58	350 Hp	58k	150 kW
59	400 Hp	59k	160 kW
60	450 Hp	60k	185 kW
61	500 Hp	61k	200 kW
62	600 Hp	62k	220 kW
63	700 Hp	63k	250 kW
—	—	64k	300 kW
—	—	65k	355 kW
66	900 Hp	66k	390 kW

➢ Consult your local Rockwell Automation sales office or Allen-Bradley distributor for additional circuit breaker options.

g

Factory-Installed Options	
Code	Description
1AM⌘	Single-phase ampere meter
3AM⌘	3-phase ampere meter
1VM✦	Single-phase voltmeter
3VM✦	3-phase voltmeter
1COM❖	Remote I/O module (16 points of I/O)
1CNET❖	ControlNet™ module (16 points of I/O)
1DNET❖	DeviceNet™ module (16 points of I/O)
1ENET❖	EtherNet module (16 points of I/O)
1PNET❖	PROFIBUS module (16 points of I/O)
1TD	Control module with factory-set 30-second time delay
1EUF♠	Four port expansion module
1EUT♠	Ten port expansion module
1SYS♠	System multiplexer module
1SYSP♠	System multiplexer permissive module
1HPM♠	Hydraulic/pneumatic multiplexer module

⌘ Only one can be selected for current monitoring.
✦ Only one can be selected for voltage monitoring.
❖ Only one of these can be installed in ElectroGuard.
♠ No module can be installed in the 23 A, 43 A and 85 A units and the 2031-x0630xx and 2931-x860xx units.

Replacement Control Module

2030-CH0085x

2030-CH0085x-ITD

2030-CH1200x

2030-CH1200x-ITD

x = See table "e" for input line voltages

1-1/2 in. Pneumatic Isolation Module

Pneumatic Isolation Module

The ElectroGuard Safety Isolation System is available with an optional means of isolating the pneumatic energy source for the machine or process. The Pneumatic Isolation Module is designed to work in conjunction with the power panel. This option blocks the pneumatic line leading to the pneumatic hazard. The valve then bleeds or dumps the residual pneumatic energy leading to the machine. After the valve is in the blocked position and the pressure drops to less than five psi (pounds per square inch), a signal is sent to the power panel indicating the pneumatic energy is isolated. The system isolated light, located on the Remote Lockout Station (RLS) that was switched to the OFF position, is then illuminated.

Hydraulic Isolation Module

Hydraulic Isolation Module

The ElectroGuard Safety Isolation System is available with an optional means of isolating the hydraulic energy source for the machine or process. The Hydraulic Isolation Module is designed to work in conjunction with the power panel. The valve blocks the hydraulic line leading to the hydraulic hazard. Then the residual hydraulic energy is returned to the tank. After the valve is in the blocked position and the pressure drops to less than 100 psi (pounds per square inch), a signal is sent to the power panel indicating the hydraulic energy is isolated. The system isolated light, located on the RLS that was switched to the OFF position, is then illuminated.

Bulletin 2030 Pneumatic and Hydraulic Isolation Modules

2030—	P	J	120	4
	a	*b*		*c*

a

Product Descriptor	
Code	Description
P	Pneumatic isolation module
H	Hydraulic isolation module

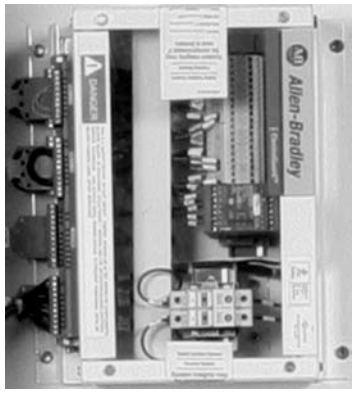
b

Enclosure Type	
Code	Description
C	Type 4X watertight stainless steel
F	Type 4 watertight painted steel/IP65
J	Type 12 dusttight/IP54

c

Port Size			
Code	Description	Pneumatic CFM at 90 PSI	Hydraulic GPM
2	1/2 in. NPT	160	❄
3	3/4 in. NPT	380	25
4	1 in. NPT	650	❄
5	1-1/4 SAE #20 straight thread	✶	120
6	1-1/2 in. NPT	1750	❄

✶ Not available in Pneumatic Isolation Module
❄ Not available in Hydraulic Isolation Module
CFM = Cubic feet per minute
GPM = Gallons per minute
NPT = National pipe thread
SAE = Society of Automotive Engineers



4-Port Expansion Module

Optional Expansion Module

Optional Expansion Modules are available for applications requiring more than the maximum allowable Remote Lockout Stations (RLS) (e.g. more than four for 23…85 A systems or more than six for 110…1200 A systems). The Expansion Modules are available in 4- or 10-port configurations. This allows up to four RLSs for a 4-port and ten RLSs for a 10-port module. An example would be adding a 4-port expansion module to a 23A ElectroGuard. This then allows up to seven RLSs to connect to the system.

Expansion Modules may be ordered with an adjustable time-delay feature (1…30 seconds) in order to allow time for the machine operator to shut down drives or other equipment that requires a controlled stop after a RLS handle has been turned to the OFF position. Consult your Rockwell Automation sales office or Allen-Bradley distributor for other time settings. Enclosed Expansion Modules are available with optional Flex modules to provide status communication to a remote PLC. Communication can be via ethernet, ControlNet, DeviceNet, Profibus or Remote I/O.

NOTE: The status communication option allows a remote PLC to receive status signals from the Expansion Module.

Bulletin 2030 Expansion Module

2030—	EU	N	F	1CNET	1TD
	a	*b*	*c*	*d*	*d*

a

Product Descriptor	
Code	**Description**
EU	Expansion module

b

Enclosure Type	
Code	**Description**
C	Type 4X watertight stainless steel
F	Type 4 watertight painted steel/IP65
J	Type 12 dusttight/IP54
N	Open type

c

Number of Expansion Ports	
Code	**Description**
F	4-port
T	10-port

d

Options	
Code	**Description**
1COM	Flex I/O module (16 points of I/O)
1CNET	ControlNet™ module
1DNET	DeviceNet™ module
1ENET	EtherNet module
1PNET	PROFIBUS module
1TD	Expansion module with factory-set 30-second time delay

Remote Lockout Station

Remote Lockout Station

The Remote Lockout Station (RLS) is a key component of the ElectroGuard system. The RLS is typically located at the hazard location and provides the signal to the power panel to initiate the LOTO process. The RLS is available in several configuration and enclosure types.

Dual Remote Lockout Station

The Dual Remote Lockout Station functions the same as a single or standard Remote Lockout Station. The difference between a single and a dual RLS is that the dual RLS can be used to control two ElectroGuard systems from the same RLS. A good example of this is a machine that has two separate incoming power sources. Using a dual RLS and two ElectroGuard both ElectroGuard can be controlled from the same station.

Bulletin 2030 Remote Lockout Station

2030 — RLS	J	G	D
	a	*b*	*c*

a

Enclosure Type	
Code	**Description**
C	Type 4X watertight stainless steel
F	Type 4 watertight painted steel/IP65
J	Type 12 dusttight/IP54
E	Type 7 and 9 hazardous location bolted

b

System Isolated Light Color	
Code	**Color**
G	Green

c

Dual RLS	
Code	**Description**
D	Dual
Blank	Single

Replacement Switch Module: 2030-RSA1

Verification Module

Verification Module

The optional Verification Module (VM) is connected between the solenoid locking safety switch, similar to a Guardmaster Atlas™ 5 and the Remote Lockout Station (RLS) input on an ElectroGuard system. When the VM receives the system isolated signal from the ElectroGuard, the VM provides the signal to the solenoid on the Atlas 5, unlocking the Atlas 5 and allowing access to the machine.

Once the Atlas 5 is unlocked, the VM provides a redundant signal to the ElectroGuard emulating a RLS that has been switched to the OFF position. The emulated signal is then switched to the on state, to indicate the gate has been closed. If all of the RLSs connected to the ElectroGuard are switched to the ON position and the safety gate is closed, the ElectroGuard will attempt to lock the gate and restore energy the machine. If the verification module has not verified the gate is locked, the energy is removed from the machine and the locking process is repeated.

Specifications

Dry Contact (B300 6A/125V AC or P300 3A/24V DC) provided to control solenoid voltage.

Bulletin 2030 Verification Module

2030 — VM (*a*) C (*b*)

a

Product Description	
Code	Description
VM	Verification module

b

Enclosure Type	
Code	Description
C	Type 4X watertight stainless steel
J	Type 12 dusttight/IP54

Multiplexer/Permissive Module

When multiple energy sources must be controlled simultaneously or the system must be stopped at a pre-determined stopping point, the LOTO process becomes more complicated with multi-step procedures and locks. The Hydraulic/Pneumatic Multiplexer and the system Multiplexer/Permissive Module were developed to help provide simultaneous control of multiple hazards from a single lockout point.

Coordination between the process or drive system control and the LOTO process, is a concern. In a typical system, a signal from the LOTO device is sent to the control system. This provides indication that the device has been switched to the OFF position. This requires the person switching the device to ensure the process or machine has stopped. Ideally this would be coordinated so the power is not disconnected until the process or drive system is at an acceptable stopping point. The addition of the Permissive function to the System Multiplexer allows the control system to signal the ElectroGuard system when it is at the desired stopping point. This function would only allow the stopping function (i.e., the control system can not restore power). That function can only be accomplished via the RLSs attached to the System Multiplexer/Permissive Module.

The diagram below depicts a system with multiple motors or drives that require a synchronized lockout. This system also requires that the power to the drives must be maintained during certain phases of the process. The control system is interfaced with the ElectroGuard systems via the Permissive option in the System Multiplexer/Permissive Module. This allows the control system to delay disconnecting power until the drives are at an allowable point in the process.

Functional Description

The System Multiplexer Module allows a Remote Lockout Station (RLS) to control up to four ElectroGuard systems simultaneously. The System Multiplexer Module will accept up to six RLS inputs. If there is a need to control more than four ElectroGuard systems, the System Multiplexer Modules can be daisy-chained as shown in the drawing below. For applications where more than four RLSs are required, an expansion module may be used.

The System Multiplexer Module is also available with a Permissive option. The Permissive option allows the machine controlling the process or drive system to bring the machine or process to a pre-determined stopping point prior to removal of power by the ElectroGuard system. Once the ElectroGuard system isolates the energy, the machine control can not re-energize the ElectroGuard.

Bulletin 2030 Multiplexer/Permissive Module

2030-MLX — J (a) F (b) SYS (c)

a

Enclosure Type	
Code	Description
C	Type 4X watertight stainless steel
F	Type 4 watertight painted steel/IP65
J	Type 12 dusttight/IP54
N	Open
M	Open Type installed in ElectroGuard∗

∗ Can be installed in most 110…1200 A systems

b

Number of Systems to Control	
Code	Description
F	4 systems

c

System Type	
Code	Description
SYS	EG system
SYSP	EG system with permissive option
HPM	Hydraulic/pneumatic module

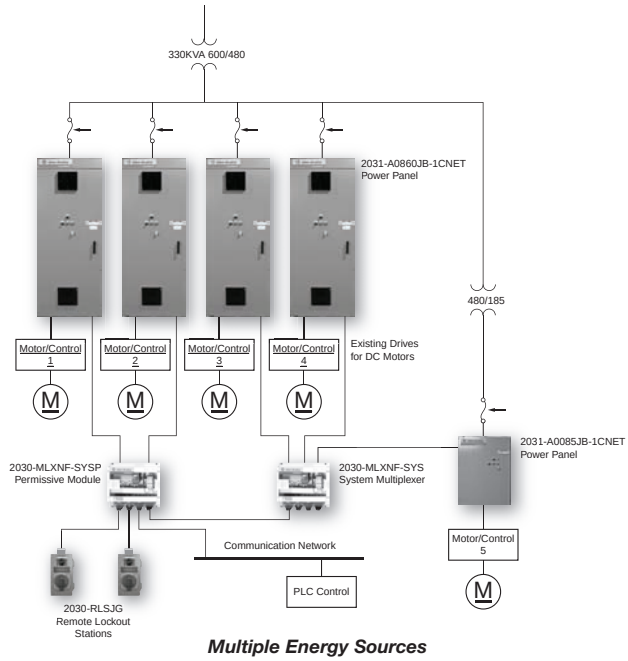
Sequence of Events for System Multiplexer Module:

1. When a RLS is turned OFF, the outputs of the System Multiplexer Module are switched to the off or open state, see diagram below.
2. This signal is connected to the input of the ElectroGuard systems initiating the isolation process.
3. When all of the ElectroGuard systems are in the isolated state the System Multiplexer Module sends the Isolated signal to the RLS and the RLS System Isolated pilot light will be illuminated.

Sequence of Events for System Multiplexer Module with Permissive Option:

1. A PLC output is connected to the System Multiplexer/Permissive Module. This signal is used by the System Multiplexer/Permissive Module as a heart beat. This holds the output of the System Multiplexer/Permissive Module in the on or closed state, holding the ElectroGuard system in the on or non-isolated state.
2. When a RLS is turned OFF, a signal is transmitted to the control system via a PLC connection on the RLS auxiliary contacts, see diagram below. Note that the outputs of the System Multiplexer/Permissive Module remain in the on or closed state.
3. When the customer's control system is at a predetermined stopping point, the control system, via the PLC output, is turned to an off state (no heart beat) and the outputs of the System Multiplexer/Permissive Module are then switched to the off or open state.
4. The system isolation function is then initiated on all of the ElectroGuard systems simultaneously.
5. When all of the ElectroGuard systems are in the isolated state, the System Multiplexer/Permissive Module sends the Isolated signal to the RLS and the RLS System Isolated pilot light on the RLS will be illuminated. The RLS now has control of the ElectroGuard and the energy can only be restored to the machine or process by switching all of the RLSs connected to the multiplexers to the on state.

   NOTE: Modification to the logic in the customer's control system is required if the Permissive option is used. See user manual for details.



Multiple Energy Sources

System Selection Process

1. Determine the catalog number of the Safety Isolation System based on the rating of the load(s) to which it will be connected as follows:
   — If the Safety Isolation System is connected to a single motor load, the horsepower or kilowatt rating of the system should be determined as follows:
   a. Select the Safety Isolation System that meets or exceeds the horsepower or kilowatt rating of the load at the required voltage and frequency.
   — If the Safety Isolation System is connected to two or more motors or one or more motors in combination with other loads; the horsepower or kilowatt rating of the system should be determined as follows:
   b. Identify the types of loads (i.e. motor, resistive) and the values of the currents of each of the loads (i.e. steady-state current for resistive loads, full-load and locked-rotor currents for motor loads) to be connected to the Safety Isolation System.
   c. Sum the full-load currents of all the motor loads to be connected to the Safety Isolation System. To this value add the current values of all resistive loads to be connected to the Safety Isolation System. This value is the combined load full-load current.
   d. Find the horsepower or kilowatt rating of a single motor with a full-load current value greater than or equal to the combined load full-load current value determined in step b.
   e. Select the Safety Isolation System that meets or exceeds this horsepower or kilowatt rating at the required voltage and frequency.
   f. Sum the locked-rotor currents of all the motor loads to be connected to the Safety Isolation System. To this value add the current values of all resistive loads to be connected to the Safety Isolation System. This value is the combined load locked-rotor current.
   g. Find the horsepower or kilowatt rating of a single motor with a locked-rotor current value greater than or equal to the combined load locked-rotor current value determined in step e.
   h. Select the Safety Isolation System that meets or exceeds this horsepower or kilowatt rating at the required voltage and frequency.
   i. Compare the ratings of the Safety Isolation Systems selected in steps d and g. Select the larger of the two systems for your application.
2. Determine how many Remote Lockout Stations are required for the application.
3. Determine how many Expansion Modules (if any) are required for the application.
4. Pick suitable enclosure type(s) for the Safety Isolation System Power Panel, Remote Lockout Stations and enclosed modules (e.g., Expansion Modules, Pneumatic and Hydraulic Isolation Module).
5. Determine what, if any, factory-installed options are required for the application (e.g. Pneumatic Isolation, Hydraulic Isolation, Status Communication to remote PLC, metering).

Bulletin 194E IEC Load Switches

Description

Bulletin 194E load switches are designed for use as local motor isolation and disconnect switch applications. Available with 3- and 6-pole versions with add-on additional poles, grounding and neutral terminals and auxiliary contacts, Bulletin 194Es share the same operating handles as the Bulletin 194L Control and Load Switches. Bulletin 194E switches are offered in two mounting styles, Front/Door and Base/DIN configurations for a variety of installations. Switch body styles for Bulletin 194E base-mounted switches include standard interlock shaft; Bulletin 194E front-mounted switches include standard shaft. Two-position OFF-ON switch is used to connect or disconnect a variety of inductive loads, including solenoids, valves, magnetic starters, relays, and motors. Handles featuring marked legend plates are available in Selector-Knob, Disk-Style, Rectangular-Style and Key-Operated versions. Selector-Knob versions are available in three sizes. Most handles are available in colors of Grey/Black or Red/Yellow and have padlockable versions.

- Suitable as At-Motor Disconnect Switch (UL508)
- 16, 25, 32, 40, 63, 80, 100 A Inductive Load-Rated Switches
- IP66/ UL Type 1/3/3R/12 Operating Handles
- IP2LX Finger-Safe Terminals
- 3- and 6-Pole Versions; Add-on Accessory Poles to Make 4-, 5-, 7- and 8-Pole Units
- Front/Door or DIN/Base Mounting Configurations
- Available in OFF-ON and Changeover Configurations
- 3- and 6-Pole Enclosed Switches
- Optional Thermoplastic Enclosures
- Positive-Guided Actuation
- Padlockable Handles Available (up to 3 padlocks)

Standards Compliance

IEC 60947-1
IEC 60947-3 Low-voltage switchgear and control gear part 3
UL 508
CSA: C22.2 No. 14

Certifications

UL Listed (File No. E14841, Guide NLRV)
CSA Certified (LR 13908)
IEC, VDE and BS
CE
RINA — Italian Naval Registry

Cat. No. Explanation

194E 16…100 A Small-Frame Switches (Handles listed on page 6-137)

3-Pole Base Mount

3-Pole Front Mount

6-Pole Base Mount

6-Pole Front Mount

194E – A 32 –1753

a b c

a

Installation Type	
Code	Description
A	Base/DIN Mounting
E	Front/Door Mounting

b

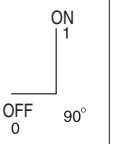
Load Size	
Code	Description
16	16 A
25	25 A
32	32 A
40	40 A
63	63 A
80	80 A
100	100 A

c

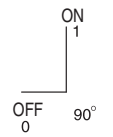
Function/Circuit Diagram Ref. #		
Code	Function	Description
1753	OFF/ON	3-Pole, 2-Position (90°)
1756	OFF/ON	6-Pole, 2-Position (90°)
1783	OFF/ON	3-Pole, 2-Position (90° - inverted)
3753	Changeover	3-Pole, 3-Position (90°)

Product Selection

Frequently Ordered* OFF-ON 3-Pole Switch (includes operating shaft) (Handles listed on page 6-137)

Function Switching Angle	Contact Target Configuration X = Contact Closed O = Contact Open			Rated Current [A]	AC23A Rated Power [kW] at 690V AC 50 Hz	Hp @ 480V AC 60 Hz 3 Ø	OFF-ON 3-Pole Switch (includes operating shaft)	
		Handle Position					Base-Mounted	Front-Mounted
	No. of Circuits	OFF/0	ON/1				Cat. No.	Cat. No.
	1 2 3	O O O	X X X	16	7.5	7.5	194E-A16-1753	194E-E16-1753
				25	11	10	194E-A25-1753	194E-E25-1753
				32	15	15	194E-A32-1753	194E-E32-1753
				40	18.5	20	194E-A40-1753	194E-E40-1753
				63	22	25	194E-A63-1753	194E-E63-1753
				80	37	40	194E-A80-1753	194E-E80-1753
				100	45	50	194E-A100-1753	194E-E100-1753

Frequently Ordered* OFF-ON 6-Pole Switch (includes operating shaft) (Handles listed on page 6-137)

Function Switching Angle	Contact Target Configuration X = Contact Closed O = Contact Open			Rated Current [A]	AC23A Rated Power [kW] at 690V AC 50 Hz	Hp @ 480V AC 60 Hz 3 Ø	OFF-ON 6-Pole Switch (includes operating shaft)	
		Handle Position					Base-Mounted	Front-Mounted
	No. of Circuits	OFF/0	ON/1				Cat. No.	Cat. No.
	1 2 3 4 5 6	O O O O O O	X X X X X X	16	7.5	7.5	**194E-A16-1756**	**194E-E16-1756**
				25	11	10	**194E-A25-1756**	**194E-E25-1756**
				32	15	15	**194E-A32-1756**	**194E-E32-1756**
				40	18.5	20	**194E-A40-1756**	**194E-E40-1756**
				63	22	25	**194E-A63-1756**	**194E-E63-1756**
				80	37	40	**194E-A80-1756**	**194E-E80-1756**
				100	45	50	**194E-A100-1756**	**194E-E100-1756**

* See Catalog No. Explanation for more load size and change-over switch options.

Bulletin 194E/194L Handles (for use with Bulletin 194E Switches)

Color	Handles (Includes Legend Plate and Control Knob)			
Red/Yellow (Emergency Stop colors)	 *Type I (IP66, UL Type 3/3R/12)*	 *Type L (IP66, UL Type 3/3R/12) With Locking For One Padlock (Padlock Not Included)*	 *Type N (IP66, UL Type 3/3R/12)*	**Bulletin 194L handles are available in both screw fixing and 22.5 mm mounting hole style.**
Black/Grey (Standard Operation colors)	 *Type A (IP66, UL Type 3/3R/12)*	 *Type E (IP66, UL Type 3/3R/12) With Locking For One Padlock (Padlock Not Included)*	 *Type G (IP66, UL Type 3/3R/12)*	 *Type S (IP66, UL Type 3/3R/12)*

Cat. No. Explanation

194L – HE 6 N – 175
a b c d

a

Code	Installation Type
HC	22.5 mm Mounting Hole Style Handle✶ (for use with front-mounted switches)
HE	Screw-Mounting Handle (for use with front- and base-mounted switches)

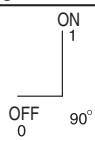
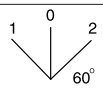
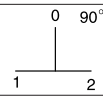
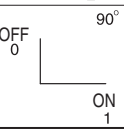
b

Code	Use with Handle Type	Handle Legend Plate Size	Use With 194E Switch Size
4	A, E, I, L❄	48 x 48 mm (1-57/64 x 1-57/64 in.)	194E-16…63 A
	S	48 x 62 mm (1-57/64 x 2-7/16 in.)	194E-25…63 A
6	A, E, I, L	64 x 64 mm (2-33/64 x 2-33/64 in.)	194E-25…100 A
	G, N❄‡	67 x 67 mm (2-41/64 x 2-41/64 in.)	194E-25…100 A
	S	64 x 78 mm (2-33/64 x 3-5/64 in.)	194E-25…100 A
8	A, I	88 x 88 mm (3-15/32 x 3-15/32 in.)	194E-40…100 A
	G, N	90 x 90 mm (3-35/64 x 3-35/64 in.)	194E-40…100 A

c

Code	Legend Plate Type	Color
A	Square	Grey/Black
I	Square	Red/Yellow
E	Square/Lockable	Grey/Black
L	Square/Lockable	Red/Yellow
G	Disc/Lockable (up to 3 locks)	Grey/Black
N	Disc/Lockable (up to 3 locks)	Red/Yellow
S	Large Square with extra legend area	Grey/Black

d

Code	Description	Legend Marking
175	O-I	
175I	OFF-ON	
350	1-0-2 (Reversing)	
375	0-1-2 (90 degrees) (Changeover)	
178	O-I	
178I	OFF-ON	

✶ For 22.5 mm mounting hole style handle (code HC), select either handle type A, E, I, or L with 48 x 48 mm legend plate size (code 4) only or handle type G or N with 64 x 64 mm legend plate size (code 6) only.
❄ Order 194E- 16A Type G and N handles as Cat. No. 194**E**-HE4N-175 or 194**E**-HE4G-175
‡ Use Type G and N with ON-OFF function only (table "d", code -175)

Frequently Ordered 194L Handles — OFF-ON Base/Front-Mounted 3- and 6-Pole Switch Handles (Switch Body listed on page 6-136)

Handle Type	Degree of Protection	Handle Color	Bezel Plate Size	For Use With	Legend Plate Marking	Cat. No.
E	IP66 (UL Type 1) (UL Type 3/3R/12)	Black/Grey	48 x 48 mm (1-57/64 x 1-57/64 in.)	194E-16…63 A 194L-E12…40 A, -1753 194L-A12…40 A, -1753	0-1	194L-HE4E-175
					OFF-ON	**194L-HE4E-175I**
L		Red/Yellow	48 x 48 mm (1-57/64 x 1-57/64 in.)	194E-16…63 A 194L-E12…40 A, -1753 194L-A12…40 A, -1753	0-1	194L-HE4L-175
					OFF-ON	**194L-HE4L-175I**
G	IP66 (UL Type 3/3R/12)	Black/Grey	54 x 54 mm (2-1/8 x 2-1/8 in.)	194E-16 A	0-1 OFF-ON	194E-HE4G-175
			67 x 67 mm (2-41/64 x 2-41/64 in.)	194E-25…100 A 194L-E12…40 A, -1753 194L-A12…40 A, -1753	0-1 OFF-ON	194L-HE6G-175
			88 x 88 mm (3-15/32 x 3-15/32 in.)	194E-40…100 A	0-1 OFF-ON	194L-HE8G-175
N		Red/Yellow	54 x 54 mm (2-1/8 x 2-1/8 in.)	194E-16 A	0-1 OFF-ON	194E-HE4N-175
			67 x 67 mm (2-41/64 x 2-41/64 in.)	194E-25…100 A 194L-E12…40 A, -1753 194L-A12…40 A, -1753	0-1 OFF-ON	194L-HE6N-175
			88 x 88 mm (3-15/32 x 3-15/32 in.)	194E-40…100 A	0-1 OFF-ON	**194L-HE8N-175**
L	IP66 (UL Type 3/3R/12)	Red/Yellow	48 x 48 mm (1-57/64 x 1-57/64 in.)	194L-E12…40 A, -1753	0-1	194L-HC4L-175
					OFF-ON	**194L-HC4L-175I**

Bulletin 194E Open and Enclosed Switch Kits Cat. No. Explanation

194E – Y 32 –1753– 6N

a b c d

a

Code	Installation Type
A	Base/DIN Mounting, open type switch
E	Front/Door Mounting, open type switch
Y	Enclosed Base Mounting Switch With Handle (Uses IP66 ABS thermoplastic enclosure)

c

Code	Configuration
1753	3-Pole OFF/ON (90°)
1756	6-Pole OFF/ON (90°)

b

Code	Load Size
16	16 A*
25	25 A
32	32 A
40	40 A
63	63 A
80	80 A
100	100 A

* For 16 A Enclosed Switch: use "16M" (3-pole enclosure has M16/20 knockouts, 6-pole 16 A enclosure has M25/32 knockouts). For 25/32 A Enclosed Switch with M20/25 metric knockouts: use “25M” or “32M”.

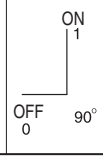
d

Code	Handle Style
4N	194E-HE4N-175 (use with 16 A Switch)
4G	194E-HE4G-175 (use with 16 A Switch)
4A	194L-HE4A-175 (use with 16…100 A Switch)
6N	194L-HE6N-175 (use with 25…100 A Switch)
6G	194L-HE6G-175 (use with 25…100 A Switch)
6A	194L-HE6A-175 (use with 25…100 A Switch)

Frequently Ordered Switch Kits — OFF-ON Front- and Base-Mounted 3-Pole Switch With Cat. No. 194L-HE6N-175 Red/Yellow Handle

	Function Switching Angle	Rated Current [A]	AC23A Rated Power [kW] at 690V AC	HP @ 480V AC 60 Hz, 3-Phase	Base-Mounted Cat. No.	Front-Mounted Cat. No.
 		25	7.5	10	**194E-A25-1753-6N**	**194E-E25-1753-6N**
		32	11	15	**194E-A32-1753-6N**	**194E-E32-1753-6N**
		63	18.5	25	194E-A63-1753-6N	**194E-E63-1753-6N**

Base-Mounting Distribution Switches (handles are pre-assembled to switch)

	Function Switching Angle	No. of Circuits	Contact Target OFF/0	Contact Target ON/1	Handle Color	Legend Plate Marking	Lockable (One Padlock)	Rated Current [A]	AC23A Rated Power [kW] at 690V AC	Hp @ 480V AC 60 Hz, 3-Phase	Cat. No.
		1 2 3	O O O	X X X	Red/Yellow	0-1	Yes	25	11	—	**194E-A25-1753-R**
					Black/Grey	0-1	No			—	**194E-A25-1753-Q**
					Red/Yellow	0-1	Yes	32	15	—	**194E-A32-1753-R**
					Black/Grey	0-1	No			—	**194E-A32-1753-Q**

Frequently Ordered Enclosures — 3- and 6-Pole Enclosed Switches With Cat. No. 194L-HE6N-175 Red/Yellow Operating Handles

	No. of Poles	Function Switching Angle	Rated Current [A]	Handle Color	Cat. No.
 *Uses Base-Mounted Switches*	3		16	Red/Yellow	**194E-Y16-1753-4N**
			25		**194E-Y25-1753-6N**
			32		**194E-Y32-1753-6N**
			40		**194E-Y40-1753-6N**
	6		25	Red/Yellow	**194E-Y25-1756-6N**

IEC Load Switches

Bulletin 194E

Bulletin 194E Enclosed Disconnect Load Switches with 194R Handles (with Defeater, suitable for 3 padlocks)

194E-FA Painted Steel Enclosure UL Type 3/4/12, IP66	194E-CA Stainless Steel Enclosure UL Type 4/4X, IP66	194E-KA Non-Metallic Enclosure UL Type 3/4/4X, IP66	194E-AA Metallic Enclosure UL Type 1, IP54	194E-GA Painted Steel Enclosure UL Type 3/4/12, IP66	194E-DA Stainless Steel Enclosure UL Type 4/4X, IP66
					

Cat. No. Explanation ✶❄

194E – FA 32 E – P11 – P11 – 6

a b c d d e

a

Code	Enclosure Type
FA	UL Type 3/4/12, IP66 Painted Steel, Hinged, for 16…100 A switches
GA	UL Type 3/4/12, IP66 Painted Steel, Hinged, in 6 x 6 x 4 in. size, for 16…32 A 3-pole switches ‡
CA	UL Type 4/4X, IP66 Stainless Steel, Hinged, for 16…100 A switches
DA	UL Type 4/4X, IP66 Stainless Steel, Hinged, in 6 x 6 x 4 in. size, for 16…32 A 3-pole switches ‡
KA	UL Type 3/4/4X, IP66 Non-Metallic, for 16…100 A switches
AA	UL Type 1, IP54 Painted Steel, Hinged, for 16…100 A switches (Same enclosure as FA without gasketing)

b

Code	Load Size
16	16 A
20	25 A
32	32 A
40	40 A
63	63 A
80	80 A
00	100 A

c

Code	Handle Color (194R-HS _ _)
Blank	Grey/Black
E	Red/Yellow

d

Code	Left Side + Right Side Modifications✶
Blank	No Option
-P11	1 N.O. + 1 N.C. Auxiliary Contacts
-PL11	1 N.O. + 1 N.C.L.B. Auxiliary Contacts
-P22	2 N.O. + 2 N.C. Auxiliary Contacts
-PD10	1 N.O. E.B.
-NP	Additional Pole
-PE	Grounding Pole
-TN	Neutral Pole

e

Code	Switch Type
Blank	3-pole switch
-6	6-pole switch§

✶ Modifications: Up to two suffix codes may be added to an enclosed disconnect load switch. See Guidelines, page 6-141. If only one accessory is chosen, it is mounted on the left side of the switch.
❄ To order the cat. no. 194E-FA40/FA63 or 194E-CA40/CA63 in the larger 80/100A sized enclosure, add an "X" after the handle color. For example, Cat. No. **194E-FA40E** becomes Cat. No. **194E-FA40**EX.
‡ GA and DA type enclosures: use with 3-pole 16…32 A switches only.
§ Special order; allow for longer delivery time.

Frequently Ordered Bulletin 194E Enclosed Switches with Bulletin 194R Handle

Description	Rated Current [A]	Dimension Reference	Handle Color	Cat. No.✶
Stainless steel enclosure, IP66/Type 4/4X	25	A1	Black	194E-CA20
			Red/Yellow	194E-CA20E
	32	A1	Black	194E-CA32
			Red/Yellow	194E-CA32E
	63	A1	Black	194E-CA63
			Red/Yellow	194E-CA63E
	25	A1	Black	194E-FA20
			Red/Yellow	194E-FA20E
	32	A1	Black	194E-FA32
			Red/Yellow	194E-FA32E
	40	A1	Black	**194E-FA40**
			Red/Yellow	194E-FA40E
	25	C1	Black	194E-KA20
			Red/Yellow	194E-KA20E

✶ Modifications: Up to two suffix codes may be added to an enclosed disconnect load switch. See Guidelines, page 6-141. If only one accessory is chosen, it is mounted on the left side of the switch.

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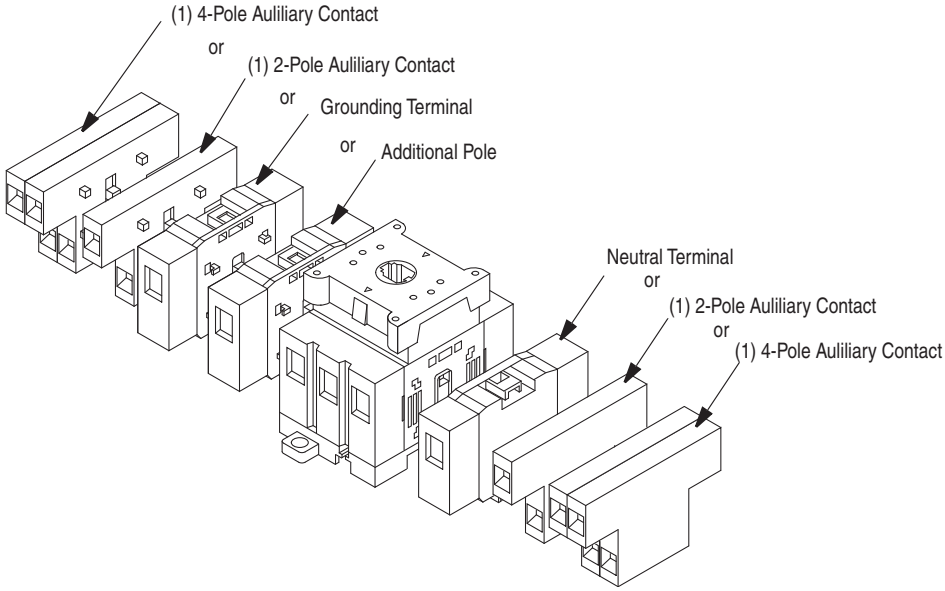
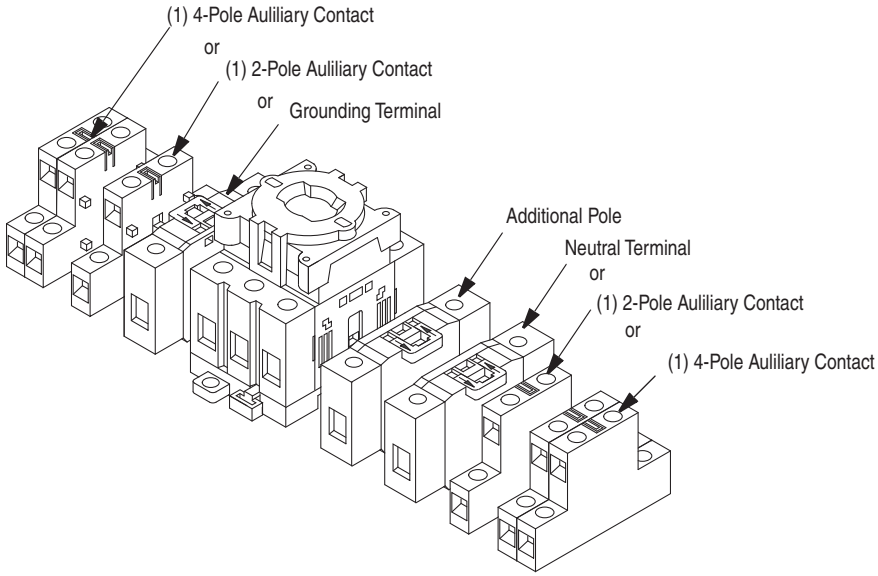
Accessories

IEC Load Switch Accessories

194E-E16...100 A, Front/Door Mounting



194E-A16...100 A, Base/DIN Rail Mounting



Accessory Configuration Guidelines

Accessory drawings represent modular, snap-on features of Bulletin 194E accessories. They are not suggesting possible accessory configurations. Use the following guidelines for choosing 194E accessory configurations.

- Up to two accessories may be added to the Bulletin 194E switch body.
- For the 194E 25, 32, 40, or 63 A switches, the early break auxiliary contact (-PD10) may only be used in the following configurations:
  As a single unit on either side of the switch
  As a single unit on a side when used with a switch + 4th pole (-NP)
  As a single unit on a side when used with a switch + ground terminal (-PE)
  As a single unit on a side when used with a switch + neutral terminal (-TN)
  No other auxiliary contact may be used in combinations with an early break auxiliary contact (-PD10)
- Other combinations of auxiliary contacts are permissable.
- For the 194E 80 and 100 A switches, any combination of auxiliary contacts, 4th pole, ground terminal, neutral terminal, and -PD10 is permissable.

IEC Load Switches

Bulletin 194E

Auxiliary Contacts	No. of Auxiliary Contacts	For Use With	Cat. No.∗
	1 N.O. + 1 N.C.	194E-A16...100	194E-A-P11
		194E-E16...100	194E-E-P11
	1 N.O. + 1 N.C.L.B.	194E-A16...100	194E-A-PL11
		194E-E16...100	194E-E-PL11
	2 N.O. + 2 N.C.	194E-A16...100	194E-A-P22
		194E-E16...100	194E-E-P22
	1 N.O.E.B.	194E-A16	194E-A16-PD10
		194E-A25...100	194E-A-PD10
		194E-E16	194E-E16-PD10
		194E-E25...100	194E-E-PD10

Additional Pole, 1 N.O.	For Use With	Cat. No.∗
	194E-A16	194E-A16-NP
	194E-A25	194E-A25-NP
	194E-A32	194E-A32-NP
	194E-A40	194E-A40-NP
	194E-A63	194E-A63-NP
	194E-A80	194E-A80-NP
	194E-A100	194E-A100-NP
	194E-E16	194E-E16-NP
	194E-E25	194E-E25-NP
	194E-E32	194E-E32-NP
	194E-E40	194E-E40-NP
	194E-E63	194E-E63-NP
	194E-E80	194E-E80-NP
	194E-E100	194E-E100-NP

Earthing/Grounding Terminal	For Use With	Cat. No.∗
	194E-A16	194E-A16-PE
	194E-A25/32	194E-A32-PE
	194E-A40/63	194E-A63-PE
	194E-A80/100	194E-A100-PE
	194E-E16	194E-E16-PE
	194E-E25/32	194E-E32-PE
	194E-E40/63	194E-E63-PE
	194E-E80/100	194E-E100-PE

Neutral Terminal	For Use With	Cat. No.∗
	194E-A16	194E-A16-TN
	194E-A25/32	194E-A32-TN
	194E-A40/63	194E-A63-TN
	194E-A80/100	194E-A100-TN
	194E-E16	194E-E16-TN
	194E-E25/32	194E-E32-TN
	194E-E40/63	194E-E63-TN
	194E-E80/100	194E-E100-TN

∗ A maximum of two side-mount accessories may be added to a Bulletin 194E switch (one on each side).

6-Pole Mechanical Coupling∗❄	For Use With	Cat. No.
	194E-16	**194E-G3821**
	194E-25/32	**194E-G3660**
	194E-40/63	**194E-G3661**
	194E-80/100	**194E-G3662**

∗ User must order (2) Bulletin 194E 3-Pole Switches separately.

❄ Coupling for changeover switch not available. Changeover switch must be ordered as a factory-assembled device (e.g., 194E-A25-3753).

ABS Thermoplastic Enclosure — IP66, For High-Impact Applications (grounding screw included)	No. of Poles	For Use With	Cat. No.
	3…4	194E-A25/32	**194L-G3572**
	3…4	194EA-40/63	**194E-G3663**
	6	194EA-25/32	
	6	194EA-40/63	**194E-G3665**
	3…4	194EA-80/100	

Noryl Thermoplastic Enclosures — IP66, For Corrosion-Prone Applications (grounding screw included)	No. of Poles	For Use With	Cat. No.
	3…4	194E-A25/32	**194L-G3576**
	6	194EA-25/32	**194E-G3664**
	3…4	194EA-40/63	
	6	194EA-40/63	**194E-G3666**
	3…4	194EA-80/100	

Description	For Use With	Pkg. Qty.	Cat. No.
Additional Earth/Ground and Neutral Terminals — For Thermoplastic Enclosure	194L-G3663, G3664, G3665, G3666	5	**194E-G3673**
	194L-G3572 and G3676	5	**194E-G3653**

Terminal Covers	No. of Poles	For Use With	Cat. No.
	1	194E-16	194E-16-C1
	3	194E-16	194E-16-C3
		194E-25/32	194E-25-C3
		194E-40/63	194E-40-C3
		194E-80/100	194E-80-C3
	4	194E-25/32	194E-25-C4
		194E-40/63	194E-40-C4
		194E-80/100	194E-80-C4

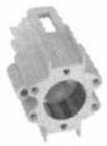
Operating Shafts

	Length	Construction	Pkg. Qty.	Cat. No.
 *Standard Shaft (for front-mount switches)*	34 mm (1-11/32 in.)	Plastic	5	**194L-G3380**
	36.5 mm (1-7/16 in.)	Metal	5	**194E-G3688**
 *Interlock Shaft (for base-mount switches)*	44 mm (1-47/64 in.) (Standard Length)	Plastic	5	194L-G2830
		Metal		**194E-G3687**
	52 mm (2-3/64 in.)	Plastic		194L-G3194
		Metal		**194E-G3707**
	57 mm (2-15/64 in.)	Plastic		194L-G3195

Bulletin 194E Load Switch Cat. No. Shaft Selection for use with 194E and 194L Thermoplastic Enclosures

Rated Current [A]	3-Pole Switches (-1753 suffix)		6-Pole Switches (-1756 suffix)		Changeover Switches (-3753 suffix)	
	194E-E…	194E-A…	194E-E…	194E-A…	194E-E…	194E-A…
16	plastic shaft (Cat. No. 194L-G3380)	plastic shaft (Cat. No. 194L-G2830)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)
25	plastic shaft (Cat. No. 194L-G3380)	plastic shaft (Cat. No. 194L-G2830)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)
32	plastic shaft (Cat. No. 194L-G3380)	plastic shaft (Cat. No. 194L-G2830)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)
40	plastic shaft (Cat. No. 194L-G3380)	plastic shaft (Cat. No. 194L-G2830)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)
63	plastic shaft (Cat. No. 194L-G3380)	plastic shaft (Cat. No. 194L-G2830)	metallic shaft (Cat. No. 194L-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)
80	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)
100	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)	metallic shaft (Cat. No. 194E-G3688)	metallic shaft (Cat. No. 194E-G3687)

Shaft Extension Kits



Shaft Extension

Length	For Use With	Pkg. Qty.	Cat. No.
24 mm (15/16 in.) Per Extension	194E-A…	10	194L-G2853

Length	For Use With	Pkg. Qty.	Cat. No.
110…235 mm (4-21/64…9-1/4 in.)	194E-A…	1	194L-G3393
230…350 mm (9-3/64…13-51/64 in.)			194L-G3394

Metal Shaft Adaptor Kits — For use with 194R Type 4/4X Handles

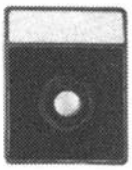
	For Use With	Pkg. Qty.	Cat. No.
 Metal shaft adaptor kits — for use with 194R Type 4/4X handles kit includes bezel adapter and 194R-R1 operating shaft. Operating handle (Cat. No. 194R-HS4) must be ordered separately.	194E-A…	1	**194E-G3675**
 Metal Shaft Extension For modification of Cat. No. 194L-G3393/ G3394 when used with any switches other than 2-position, 90° rotation.	194E-A…	10	**194L-G3399**

Other Accessories

194L/194E 22.5 mm Mounting Hole Style Handles (Type B, D) (For Front-Mounted Switches)

	Description		Cat. No.
 *Type B*	22.5 mm Mounting Hole Style Handles (IP65) Handle Style: Knob Lever with Latch (For Use With 194E-E25…100 A, -1753) or 194L-E12…40 A		194L-HCB-001
 *Type D*	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12…40 A, 194E-E16…63 A, -1753		194L-HCDC-001
	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12…40 A, 194E-E16…63 A, -1753		194L-HCDD-001
	22.5 mm Mounting Hole Style Handles Key Removal Position (Includes Latch) For Use With 194L-E 12…40 A, 194E-E16…63 A, -1753		194L-HCDG-001

Accessory Description		Pkg. Qty.	Cat. No.
	Control Knob, Black, with Locking Facility (Use 1/4 in. max. hasp lock.) (Locks in 0°, 90°, 180°, and 270° positions)	10	**194L-G2864N**
	Control Knob, Red, with Locking Facility (Use 1/4 in. max. hasp lock)		**194L-G2864R**

Accessory Description			Pkg. Qty.	Cat. No.
		Control Knob, Type P Control Knob, Black, 31 mm (1-7/32 in.) Diameter	5	**194L-G2888N**
		Control Knobs, Type P Control Knob, Red, 31 mm (1-7/32 in.) Diameter		**194L-G2888R**
 *Standard Black Control Knob*	 *Rectangular Front Frame*	Control Knob, Black, L = 37.5 mm (1-31/64 in.)	5	**194L-G3154N**
		Control Knob, Black, L = 48 mm (1-57/64 in.)		**194L-G3155N**
		Control Knob, Red, L = 37.5 mm (1-31/64 in.)		**194L-G3154R**
		Control Knob, Red, L = 48 mm (1-57/64 in.)		**194L-G3155R**
		Rectangular front frame with blank nameplate L = 48 x 62 mm (1-57/64 x 2-7/16 in.)	10	**194L-G3196**
		Rectangular front frame with blank nameplate L = 64 mm x 78 mm (2-33/64 in. x 3-5/64 in.)		**194L-G3197**

Additional Legend Plates/Frames

Color	Legend Size	For Use With	Pkg. Quantity	Legend Plate Marking	Cat. No.
Black/Grey	19.2 mm x 49 mm 3/4 in. x 1-59/64 in.	Size 6 Type G and N style handles, Cat. Nos. 194L-HE6G/N	5	(Blank)	194L-G3667
				MAIN SWITCH	**194L-G3667A**
				HAUPSCHALTER	**194L-G3667B**
				INTERR. PRINCIPALE	**194L-G3667C**
				INTERR. PRINCIPAUX	**194L-G3667D**
				INTERR. PRINCIPAL	**194L-G3667E**
				HUVUDBRYTARE	**194L-G3667F**
				WAHLSCHALTER	**194L-G3667G**
				EMERGENCY OFF	**194L-G3667H**
Black/Grey	18 mm x 84 mm 11/16 in. x 3-5/16 in.	Size 8 Type G and N style handles, Cat. Nos. 194L-HE8G/N	5	(Blank)	194L-G3515
				MAIN SWITCH	**194L-G3515A**
				HAUPTSCHALTER	**194L-G3515B**
				INTERR. PRINCIPALE	**194L-G3515C**
				INTERR. PRINCIPAUX	**194L-G3515D**
				INTERR. PRINCIPAL	**194L-G3515E**
				HUVUDBRYTARE	**194L-G3515F**
				WAHLSCHALTER	**194L-G3515G**
				EMERGENCY OFF	**194L-G3515H**

Legend Plates with Bezel	Legend Plate Color	Pkg. Quantity	Legend Plate Marking ∗		
			0-1	OFF-ON	Blank Legend Plate
			Cat. No.	Cat. No.	Cat. No.
	Silver	10	**194L-A4-175**	**194L-A4-175I**	**194L-A4-000**
			194L-A6-175	**194L-A6-175I**	**194L-A6-000**
			194L-A8-175	**194L-A8-175I**	**194L-A8-000**
	Yellow		**194L-I4-175**	**194L-I4-175I**	**194L-I4-000**
			194L-I6-175	**194L-I6-175I**	**194L-I6-000**
			194L-I8-175	**194L-I8-175I**	**194L-I8-000**

∗ Custom-Engraved legend plates available. To order, use publication 194L-PP002*.

Shaft for Enclosures

Enclosure Type	Suitable For			Suitable For		
	194L (Base-Mounted Switches)	No. of Contacts	Shaft	Use with 194E Switch	No. of Poles	Shaft Required
194L-G3572	194L-A12(16)	1/2	194L-G3195	194E-A25(32)	3 and 4	194L-G3194
194L-G3576	194L-A12(16)	3/4	Standard			
	194L-A20(25)	1/2	194L-G3194			
(95 x 150 x 86 mm)	194L-A20(25)	3/4	Standard			
194L-G3573	194L-A12(16)	5/6	194L-G3195			
194L-G3577	194L-A12(16)	7/8	194L-G3194			
	194L-A12(16)	9/10	Standard	—	—	—
	194L-A20(25)	5/6	194L-G3194			
(95 x 150 x 111 mm)	194L-A20(25)	7/8	Standard			
194E-G3663				194E-A40(63)	3 and 4	194L-G3194
194E-G3664	—	—	—	194E-A25(32)	6	Standard
(125 x 180 x 105 mm)						
194E-G3665				194E-A80(100)	3 and 4	194E-G3707
194E-G3666	—	—	—	194E-A40(63)	6	Standard
(175 x 230 x 120 mm)						

Accessory Combinations in Enclosure

Enclosure Type	Switch	No. of Poles	Shaft	Aux. Contacts (single or double)	Additional Pole Block	On Switch		On Enclosure	
						Neutral Terminal Block	Ground Terminal Block	Neutral Terminal Block	Ground Terminal Block
194L-G3572 (ABS) 194L-G3576 (Noryl) (95 x 150 x 86 mm)	194E-A25(32)	3	194L-G3194	X	X				
				X		X			
				X			X		
					X		X		
						X	X		
				X				X	
				X					X
								X	X
194E-G3663 (ABS) 194E-G3664 (Noryl) (125 x 180 x 105 mm)	194E-A40(63)	3	194L-G3194	X	X			X	X
				X		X		X	X
				X			X	X	X
					X		X	X	X
						X	X	X	X
					X		X	X	X
	194E-A25(32)	6	194E-G3707					X	X
194E-G3665 (ABS) 194E-G3666 (Noryl) (175 x 230 x 120 mm)	194E-A80(100)	3	194E-G3707	X	X			X	X
				X		X		X	X
				X			X	X	X
					X		X	X	X
						X	X	X	X
					X		X	X	X
	194E-A40(63)	6	194E-G3707	1L+1R				X	X

Electrical Ratings

Performance Data				16 A	25 A	32 A	40 A	63 A	80 A	100 A	Aux. Contacts
				IEC Applications							
Rated operational voltage (U_e): IEC✶			[V]	690	690	690	690	690	690	690	690
Rated operational voltage (U_e): UL, CSA			[V]	600	600	600	600	600	600	600	600
Rated isolation voltage (U_i): IEC/UL, CSA			[V]	690/600	690/600	690/600	690/600	690/600	690/600	690/600	690/600
Rated impulse voltage (U_{imp}): UL, CSA			[kV]	8	8	8	8	8	8	8	8
Test voltage, (U_i) 1 minute			[kV]	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost power per pole			[W]	0.58	1.0	1.5	1.6	2.4	3.6	5.5	0.4
Rated frequency			[Hz]	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Conventional free air thermal current I^{th}✶			[A]	25	40	50	63	75	100	120	12
Conventional enclosed thermal current I^e✶			[A]	20	32	40	50	63	80	100	10
Rated current I^e✶											
AC-1/ AC-21A	Non-inductive or only slightly inductive loads / Switching of resistive loads with slight overload		[A]	16	25	32	40	63	80	100	10
Rated power P_e											
AC-23A	Occasional switching of 3Ø motors and other highly inductive loads (criterion for selecting main switches)	230V	[kW]	5.5	7.5	7.5	15	18.5	22	30	—
		400V	[kW]	7.5	11	15	22	30	37	55	—
		690V	[kW]	7.5	11	15	18.5	22	37	45	—
AC-3	Squirrel-cage motors; starting and stopping of running motors	230V	[kW]	4	5.5	7.5	11	15	18.5	22	—
		400V	[kW]	5.5	7.5	11	15	18.5	30	37	—
		690V	[kW]	5.5	7.5	11	15	18.5	30	22	—
Short circuit current (co-ordination type 2)			[kA]	20	20	15	20	15	30	25	—
Rated conditional short-circuit current			[A]	20	25	35	50	63	80	100	—
Maximum fuse rating of circuit (type g,G)		400/415V	[A]	800	900	900	1300	1300	2500	2500	—
Rated short-time current I_{cw} (1 s)											
Rated breaking capacity AC23A (cosϕ 0.45)		230V	[A]	156	296	296	484	484	780	780	—
		400V	[A]	120	256	256	504	504	800	800	—
		690V	[A]	70	136	136	196	196	376	376	—
DC switching capacity											
Rated current I^e	1 pole	48V	[A]	20	25	32	40	63	80	100	—
		110V	[A]	5	5	6	8	10	16	20	
		220V	[A]	1	1	1	1.5	15	3	3	
		440V	[A]	0.5	0.5	0.5	0.6	0.6	0.7	0.7	
DC-21A	For resistive loads, T ≤ 1 ms U_e max = 660V	2 poles in series	96V	[A]	20	25	32	40	63	80	100	—
			110V	[A]	20	23	25	32	50	70	80	
			220V	[A]	5	5	6	8	10	16	20	
			440V	[A]	1	1	1	1.5	1.5	3	3	
			600V	[A]	0.6	0.6	0.6	0.8	0.8	1	1	
		3 poles in series	110V	[A]	20	25	32	40	63	80	100	—
			220V	[A]	13	13	15	20	28	50	63	
			440V	[A]	2.2	2.2	2.2	3.6	3.6	6.5	6.5	
			600V	[A]	1.3	1.5	1.5	2	2	3	3	
Rated power P_e											
DC-23A, DC-3, DC-5		3 poles in series	90V	[kW]	1	1.3	1.5	2.9	4.1	5.1	7.2	—
	For inductive loads, T ≤ 15 ms		110V	[kW]	1	1.1	1.3	2.2	3.3	5.5	7	
			220V	[kW]	0.8	0.9	1.1	1.7	2	3.5	4.4	
			440V	[kW]	0.6	0.6	0.6	0.9	0.9	1.1	1.1	
			600V	[kW]	0.4	0.4	0.4	0.5	0.5	0.9	0.9	

✶ See standards compliance listed on page 6-134.
❄ Suitable also for SEV 500.

Electrical Ratings, Continued

Performance Data			16 A	25 A	32 A	40 A	63 A	80 A	100 A	Aux. Contacts
UL/CSA Applications										
Continuous current		[A]	16	25	32	40	63	80	100	—
Heavy Pilot Duty		[AC]	A600	A600	A600	—	—	—	—	A600
Standard Duty		[DC]	—	—	—	—	—	—	—	Q600
Motor rating 60 Hz	120V, 1P	FLA	16	16	16	24	34	56	80	
		Hp	1	1	1	2	3	5	7.5	
	240V, 1P	FLA	12	12	17	17	28	50	68	
		Hp	2	2	3	3	5	10	15	—
Single-phase (2 poles)	480V, 1P	FLA	8.5	8.5	14	21	26	34	68	
		Hp	3	3	5	7.5	10	15	30	
	600V, 1P	FLA	11.2	11.2	11.2	16	20	27	44	
		Hp	5	5	5	7.5	10	15	25	
Three-phase	120V, 3P	FLA	13.6	13.6	19.2	30.4	40	56	84	
		Hp	2	2	3	5	7.5	10	15	
	240V, 3P	FLA	9.6	15.2	22	28	42	68	80	
		Hp	3	5	7.5	10	15	25	30	
	480V, 3P	FLA	11	14	21	27	34	52	65	—
		Hp	7.5	10	15	20	25	40	50	
	600V, 3P	FLA	11	11	17	22	27	52	52	
		Hp	10	10	15	20	25	50	50	

Mechanical Data

Performance Data			16 A	25…32 A	40…63 A	80…100 A	Aux. Contacts
Protection class according to IEC 529							
Motor rating 60 Hz							
handles			IP66	IP66	IP66	IP66	IP66
switch bodies			IP20	IP20	IP20	IP20	IP20
Mechanical life		[million operations]	0.2	0.2	0.2	0.2	0.2
Max wire gauges							
Terminal size per IEC 947-1			A4	A6	A7	A9	2xA2
rigid wire	1/2 conductor	AWG mm²	(1)16…10/(2)16…12 (1)1…10/(2)1…4	(1)14…8/(2)14…10 (1)1.5…16/(2)1.5…6	(1)12…4/(2)12…8 (1)2.5…25/(2)2.5…16	(1)10…1/(2)10…4 (1)4…50/(2)4…25	18…14 0.75…2.5
fine strands	1/2 conductor	AWG mm²	(1)16…8/(2)16…12 (1)1.5…6/(2)1.5…4	(1)14…8/(2)14…10 (1)1.5…10/(2)1…6	(1)12…4/(2)12…8 (1)2.5…16/(2)2.5…10	(1)10…1/(2)10…6 (1)4…35/(2)4…16	18…14 0.5…2.5

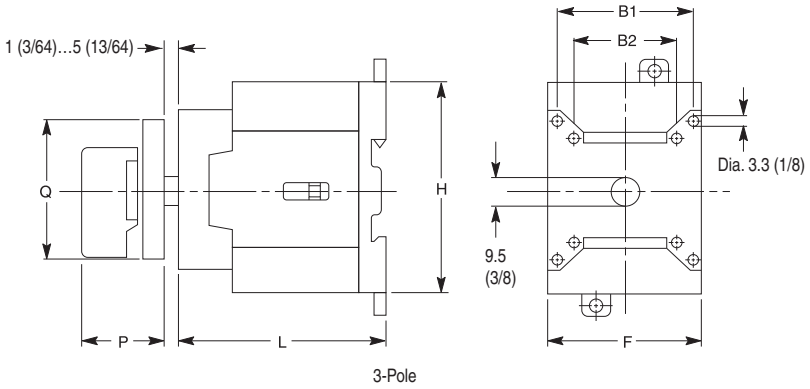
Environmental Data

Storage	–40…+80 °C (–40…+176 °F)
Operation	–25…+60 °C (–13…+140 °F)

Approximate Dimensions

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

Front Installation Cat. No. 194E-E...

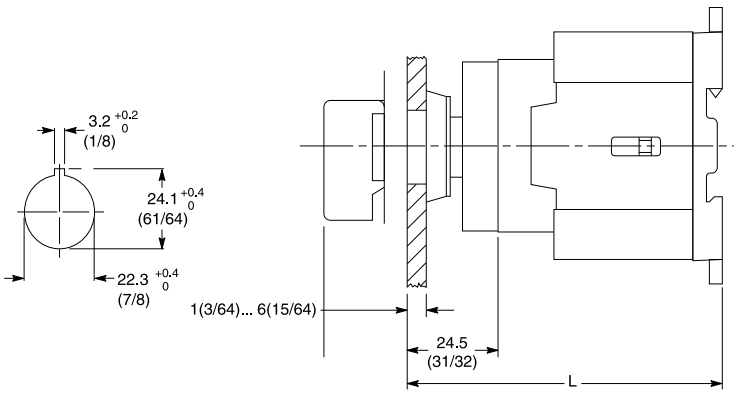


Handles		
Cat. No.	P	Q
194L-HE4A	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4I	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4S	28 (1-7/64)	48 x 62 (1-57/64 x 2-7/16)
194E-HE4N	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194E-HE4G	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194L-HE6A	28 (1-7/64)	64 x 64 (2-33/64 x 3-5/64)
194L-HE6I	28 (1-7/64)	64 x 64 (2-33/64 x 3-5/64)
194L-HE6S	28 (1-7/64)	64 x 78 (2-33/64 x 3-5/64)
194L-HE6N	34 (1-11/32)	67 x 67 (2-41/64 x 2-41/64)
194L-HE6G	34 (1-11/32)	67 x 67 (2-41/64 x 2-41/64)

Switch Body						
Use with Cat. No.	B1✶	B2	F	H	L ❄	G
194E-E16	28 (1-7/64)	N/A	36 (1-37/64)	63 (2-31/64)	51 (2)	90 (3-35/64)
194E-E25/32	36 (1-27/64)	N/A	45 (1-25/32)	64 (2-33/64)	60 (2-3/8)	90 (3-1/2)
194E-E40/63	48 (1-57/64)	36 (1-27/64)	54 (2-1/8)	72 (2-27/32)	74 (2-29/32)	108 (4-1/4)
194E-E80/100	48 (1-57/64)	36 (1-27/64)	72 (2-27/32)	90 (3-35/64)	90 (3-35/64)	144 (5-11/16)

✶ Does not apply to 194E-40/63A, 6-Pole Switches. Use B2 dimensions for 6-pole devices.
❄ For 6-pole switches, add 1 in. to the "L" dimension.

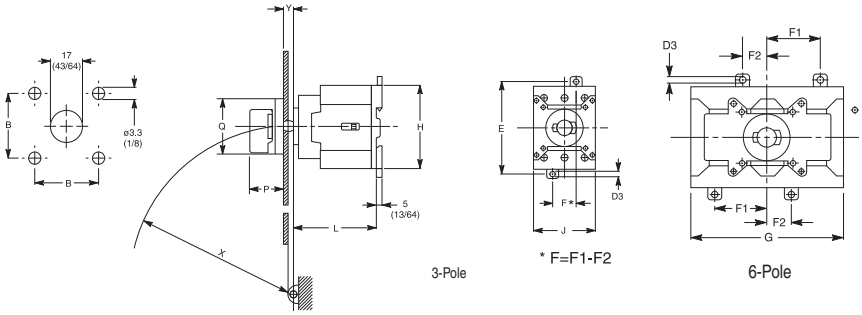
Cat. No. 194E-E Switch Body with Cat. No. 194L-HC4A Handle for 22.5 mm Hole Mounting Style



Type	L
194E-E16	76 (3)
194E-E25/32	84.5 (3-21/64)
194E-E40/63	98.5 (3-7/8)
194E-E80/100	114.5 (4-33/64)

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

Base Mounting Cat. No. 194E-A...



Handles		
Cat. No.	P	Q
194L-HE4A	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4I	28 (1-7/64)	48 x 48 (1-57/64 x 1-57/64)
194L-HE4S	28 (1-7/64)	48 x 62 (1-57/64 x 2-7/16)
194E-HE4N	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194E-HE4G	34 (1-11/32)	54 x 54 (2-1/8 x 2-1/8)
194L-HE6A	28 (1-7/64)	64 x 64 (2-33/64 x 3-5/64)
194L-HE6I	28 (1-7/64)	64 x 64 (2-33/64 x 3-5/64)
194L-HE6S	28 (1-7/64)	64 x 78 (2-33/64 x 3-5/64)
194L-HE6N	34 (1-11/32)	67 x 67 (2-41/64 x 2-41/64)
194L-HE6G	34 (1-11/32)	67 x 67 (2-41/64 x 2-41/64)

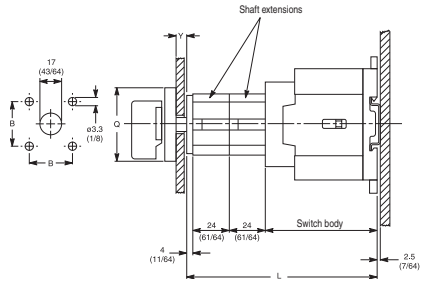
Cover Requirements				
For Use With	Y min.	X ≥	Y max.	X ≥
194E-A16	5 (13/64)	142 (5-19/32)	9.5 (3/8)	90 (3-35/64)
194E-A25/32	5 (13/64)	142 (5-19/32)	9.5 (3/8)	90 (3-35/64)
194E-A40/63	2.5 (7/64)	150 (5-29/32)	9.5 (3/8)	90 (3-35/64)
194E-A80/100	2.5 (7/64)	150 (5-29/32)	9.5 (3/8)	90 (3-35/64)

Switch Body								
Use With Cat. No.	D3	E	F1	F2	G	H	L❄	J
194E-A16	4.5 (3/16)	70 (2-49/64)	45 (1-25/32)	12.5 (31/64)	90 (3-35/64)	63 (2-31/64)	80 (3-5/32)	36 (1-27/64)
194E-A25/32	4.5 (3/16)	70 (2-49/64)	30 (1-3/16)	15 (19/32)	90 (3-1/2)	64 (2-33/64)	59 (2-5/16)	45 (1-25/32)
194E-A40/63	4.5 (3/16)	80 (3-5/32)	37 (1-15/32)	17 (43/64)	108 (4-1/4)	72 (2-27/32)	73 (2-55/64)	54 (2-1/8)
194E-A80/100	5.6 (7/32)	95 (3-3/4)	48.5 (1-29/32)	23.5 (59/64)	144 (5-11/16)	90 (3-35/64)	89 (3-1/2)	72 (2-27/32)

❄ For 6-pole switches, add 1 in. to the "L" dimension.

Base Mounting Cat. No. 194E-A...

Cat. No. 194E-A... Switch Body with Cat. No. 194L-G2853 Shaft Extension



Shaft	Y
194L-G2830	2.5...9.5 (7/64...3/8)
194L-G3194	9...18 (23/64...23/32)
194L-G3195	14...23 (9/16)...(29/32)

Switch Body				
	Cat. No.			
L ✶	194E-A 16	194E-A 25/32	194E-A 40/63	194E-A 80/100
With 1 shaft extension	79 (3-7/64)	88 (3-15/32)	102 (4-1/32)	118 (4-21/32)
With 2 shaft extensions	103 (4-37/64)	112 (4-27/64)	126 (4-31/32)	142 (5-19/32)
With 3 shaft extensions	127 (5)	136 (5-23/64)	150 (5-29/32)	166 (6-35/64)
With 4 shaft extensions	151 (6-61/64)	160 (6-5/16)	174 (6-55/64)	190 (7-31/64)
With 5 shaft extensions	175 (7-57/64)	184 (7-1/4)	198 (7-51/64)	214 (8-7/16)
With 6 shaft extensions	199 (8-27/32)	208 (8-13/64)	222 (8-3/4)	238 (9-3/8)

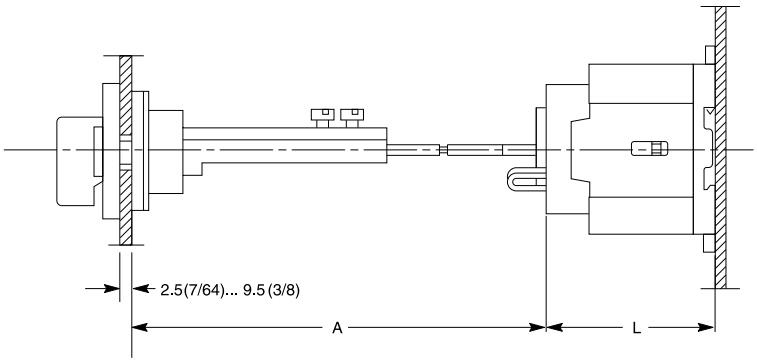
✶ For 6-pole switches, add 1 in. to the "L" dimension.

Handles			
Type	B	Q	P
194L-HE4A	36 (1-27/64)	48 x 48 (1-57/64 x 1-57/64)	28 (1-7/64)
194L-HE4I	36 (1-27/64)	48 x 48 (1-57/64 x 1-57/64)	28 (1-7/64)
194E-HE4G	28 (1-7/64)	54 x 54 (2-1/8 x 2-1/8)	34 (1-11/32)
194E-HE4N	28 (1-7/64)	54 x 54 (2-1/8 x 2-1/8)	34 (1-11/32)
194L-HE6A	48 (1-57/64)	64 x 64 (2-33/64 x 2-33/64)	28 (1-7/64)
194L-HE6I	48 (1-57/64)	64 x 64 (2-33/64 x 2-33/64)	28 (1-7/64)
194L-HE6N	48 (1-57/64)	67 x 67 (2-41/64 x 2-41/64)	34 (1-11/32)
194L-HE6G	48 (1-57/64)	67 x 67 (2-41/64 x 2-41/64)	34 (1-11/32)

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

Base Installation Cat. No. 194E-A...

Cat. No. 194E-A Switch Body with Metal Shaft Extension



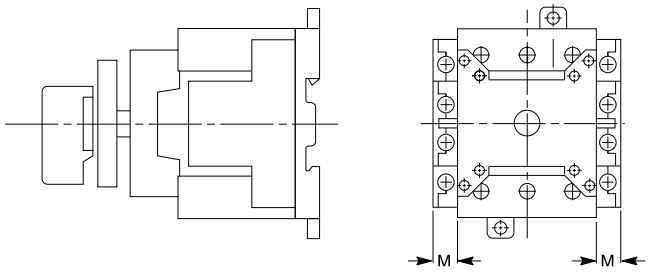
Cat. No.	A
194L-G3393	110...235 (4-11/32...9-1/4)
194L-G3394	230...350 (9-1/16...13-25/32)

Cat. No.	L*
194E-A16	51 (2)
194E-A25/32	60 (2-3/8)
194E-A40/63	74 (2-59/64)
194E-A80/100	90 (3-35/64)

* For 6-pole switches, add 1 in. to the "L" dimension.

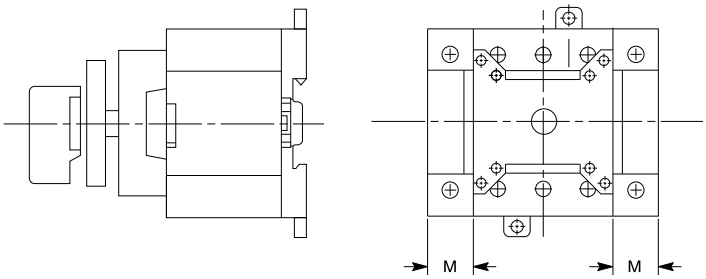
Base and Front Installation

Cat. No. 194E... with Auxiliary Contact Block Installed



Contacts	M
1 N.O. + 1 N.C.	9 (23/64)
2 N.O. + 2 N.C.	18 (23/32)

Cat. No. 194E... with 4-Pole, Ground and Neutral Terminals

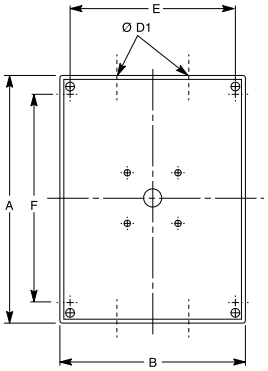


Cat. No.	M
194E-16	12.5 (31/64)
194E-25/32	14 (9/16)
194E-40/63	17.5 (11/16)
194E-80/100	22 (7/8)

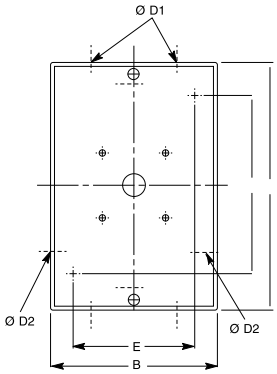
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Base Mounting Cat. No. 194E-A...

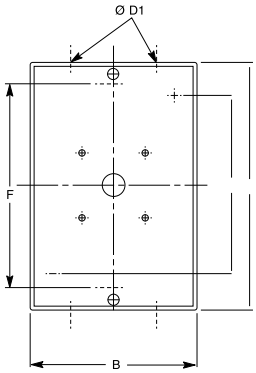
Thermoplastic Enclosures



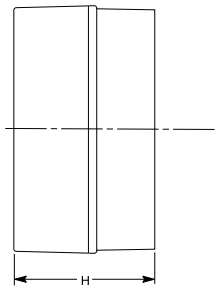
Cat. No. 194L-3665



Cat. No. 194L-3572



Cat. No. 194L-3563



Enclosure Base View

Complete Switches		Enclosures		Height A	Width B	Knockouts❄ ØD1		Mounting Holes‡		Depth H
		ABS	Noryl							
Cat. No.	Poles	Cat. No.						E	F	
194E-Y16	3 and 4	✶	✶	118 (4-21/32)	66 (2-19/32)	M16/M20 16/20 mm	PG11/PG16 18.5/22.5 mm	50 (1-31/32)	105 (4-9/65)	70 (2-49/65)
	6	194E-G3663	194E-G3664	180 (7-3/32)	125 (4-59/64)	M25/M30 25/30 mm	PG21/PG29 28.5/37.5 mm	On Center	145 (5-23/32)	105 (4-1/8)
194E-Y25/32	3 and 4	194L-G3572	194L-G3576	150 (5-29/32)	95 (3-3/4)	PG16/PG21 22.5/28.5 mm		60 (2-3/8)	115 (4-17/32)	86 (3-3/8)
	6	194E-G3663	194E-G3664	180 (7-3/32)	125 (4-59/64)	PG21/PG29 28.5/37.5 mm		On Center	145 (5-23/32)	105 (4-1/8)
194E-Y40/63	3 and 4	194E-G3663	194E-G3664	180 (7-3/32)	125 (4-59/64)	PG21/PG29 28.5/37.5 mm		On Center	145 (5-23/32)	105 (4-1/8)
	6	194E-G3665	194E-G3666	230 (9-1/16)	175 (6-57/64)	PG29/PG36 37.5/47.5 mm		155 (6-3/32)	195 (4-11/16)	120 (4-47/64)
194E-Y80/100	3 and 4	194E-G3665	194E-G3666	230 (9-1/16)	175 (6-57/64)	PG29/PG36 37.5/47.5 mm		155 (6-3/32)	195 (4-11/16)	120 (4-47/64)

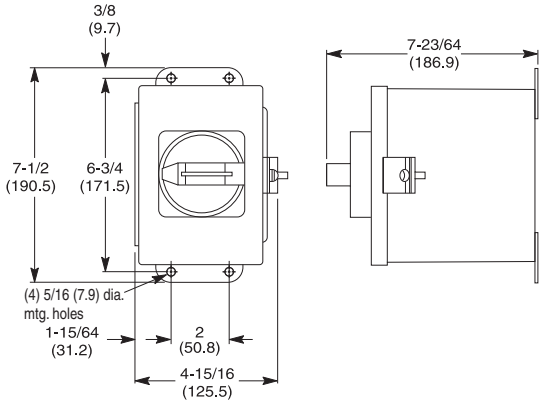
✶ Empty enclosures not available for purchase.
❄ Cat. No. 194E-A16 units have 1 knockout on each end. all others have 2 knockouts on each end. A letter "M" in the catalog number indicates metric knockouts; the unit is otherwise supplied with PG knockouts.
‡ All mounting holes have a 4.2 mm (5/32 in.) diameter.

No. of Extensions	Cat. No. 194E-A 20/32...	Cat. No. 194E-A 40/63...	Cat. No. 194E-A 80/00...
With 1 extension	96 (3-25/32)	107 (4-7/32)	114 (4-31/64)
With 2 extensions	120 (4-23/32)	131 (5-5/32)	138 (5-7/16)
With 3 extensions	144 (5-43/64)	155 (6-7/64)	162 (6-3/8)
With 4 ✶ extensions	168 (6-39/64)	179 (7-3/64)	186 (7-21/64)
With 5 ✶ extensions	192 (7-9/16)	203 (8)	210 (8-17/64)
With 6 ✶ extensions	216 (8-1/2)	227 (8-15/16)	234 (9-7/32)

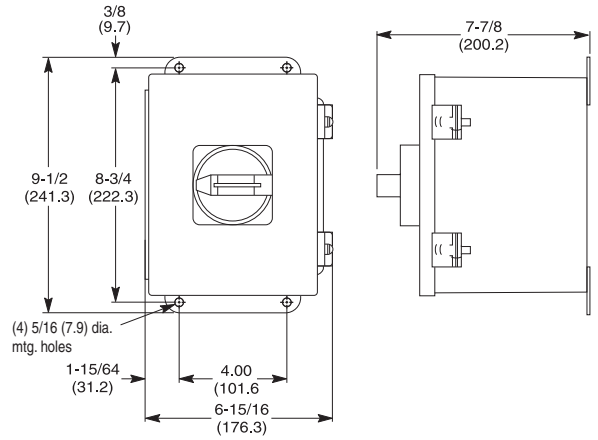
✶ When more than 4 modules are used, attach the first one to the switch body using the screws supplied with the extension (Cat. No. 194L-G2853).

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

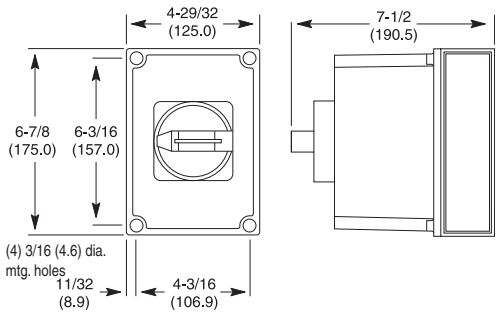
194E Enclosed Switches with 194R Handles



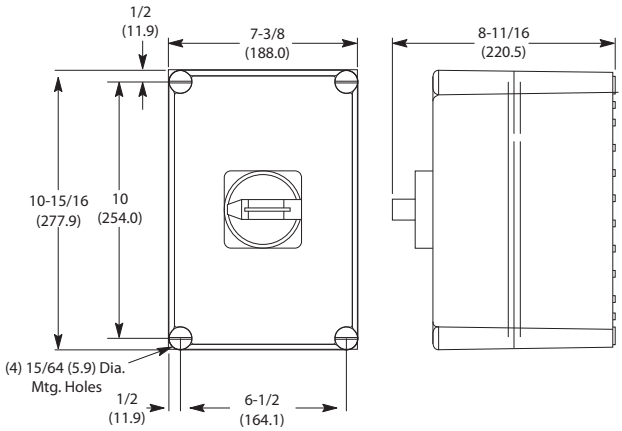
Cat. Nos. 194E-CA16...63, 194E-FA16...63, 194E-AA16...63



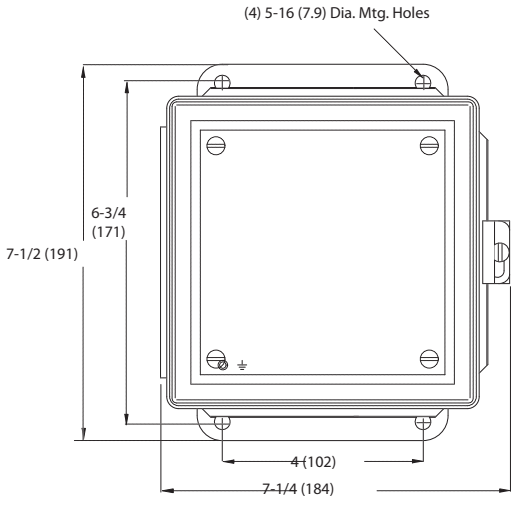
Cat. Nos. 194E-CA80...00, 194E-FA80...00, 194E-AA80...00
Cat. Nos. 194E-CA40X...63X, 194E-FA40X...63X, 194E-AA40X...63X

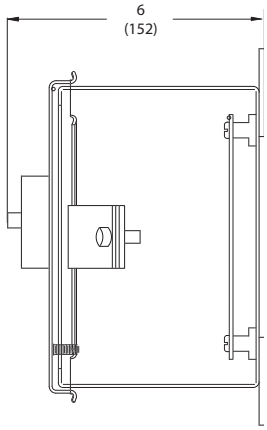


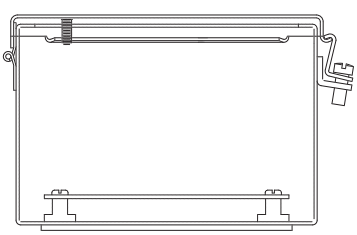
Cat. No. 194E-KA16...63



Cat. No. 194E-KA80...00







Cat. No. 194E-DA16...32, 194E-GA16...32

Bulletin 194E IEC Load Switches

Bulletin 194E load switches are designed for use as local motor isolation and for disconnect switch applications. They are available in 3- and 4-pole versions with add-on grounding and neutral terminals and auxiliary contacts.

Bulletin 194E switches are offered in two mounting styles, Front/Door and Base/DIN configurations, for a variety of installations. Switch body styles for Bulletin 194E base-mounted switches include standard interlock shaft; Bulletin 194E front-mounted switches include standard shaft.

- At-Motor Disconnect Switch (UL508)
- 125, 160, 250, 315 A Versions of Inductive Load-Rated Switches
- IP66/UL Type 1/3/3R/12 Operating Handles
- IP2LX Finger-Safe Terminals
- 3- and 4-Pole Versions
- Front/Door or DIN/Base Mounting Configurations
- OFF-ON Configurations
- Box Lug and Bolt-on Terminals Available
- Switches Include Operating Shaft
- Suitable as Motor Disconnect

Standards Compliance

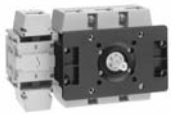
IEC 207
IEC 60947-1
IEC 60947-3 Low-voltage switchgear and control gear part 3
UL 508
CSA C22.2, No. 14

Certifications

cULus Listed (Box Lug Version) (UL File No. E14841, Guide NLRV, NLRV7)
UR Recognized (Bolt-on Version) (UL File No. E 14841 NLRV2, NLRV8)
CE

Overview

Bulletin 194E Switches — 125...315 A

OFF-ON Switch — with Box Lugs (UL Listed)		OFF-ON Switch — with Bolt-on Wiring (UR Recognized))	
 *3-pole Base Mounted*	 *3-pole Front Mounted*	 *3-pole Base Mounted*	 *3-pole Front Mounted*
 *4-pole Base Mounted*	 *4-pole Front Mounted*	 *4-pole Base Mounted*	 *4-pole Front Mounted*

Cat. No. Explanation

194E – A 125 –1753
a b c

a

Installation Type	
Code	Description
A	Base Mounting w/Box Lugs — UL Listed*
B	Base Mounting w/Bolt-on Wiring — UR Recognized*
E	Front Mounting w/Box Lugs — UL Listed
F	Front Mounting w/Bolt-on Wiring — UR Recognized

* 20 cm shaft included with switch

b

Load Size	
Code	Description
125	125 A
160	160 A
250	250 A
315	315 A

c

Configuration		
Code	Function	Description
1753	OFF-ON	3-Pole, 2-position (90 degrees)
1754	OFF-ON	4-Pole, 2-position (90 degrees)

Product Selection

Frequently Ordered 194E Switches

(see Cat. No. Explanation for additional load sizes in 3- and 4-pole configurations)

Description	No. of Poles	Rated Current	AC23 Rated kw 690V AC 50 Hz	Hp @ 480V AC 60 Hz 3 Ø	Cat. No.
Base-mounting switch w/ box lugs — 125 A	3	125	45	60	* 194E-A125-1753
Base-mounting switch w/ box lugs — 160 A		160	55	60	* 194E-A160-1753
Base-mounting switch w/ box lugs — 250 A		250	90	75	* 194E-A250-1753
Base-mounting switch w/ box lugs — 315 A	4	315	110	100	* 194E-A315-1754
Base-mounting switch w/ bolt-on wiring — 250 A	3	250	45	75	* **194E-B250-1753**
Base-mounting switch w/ bolt-on wiring — 315 A		315	45	100	* **194E-B315-1753**
Front-mounting switch w/ box lugs — 160 A		160	37	60	194E-E160-1753
Front-mounting switch w/ bolt-on wiring — 160 A	4	160	37	60	**194E-F160-1754**
Front-mounting switch w/ bolt-on wiring — 250 A		250	45	75	**194E-F250-1754**
Front-mounting switch w/ bolt-on wiring — 315 A		315	45	100	**194E-F315-1754**

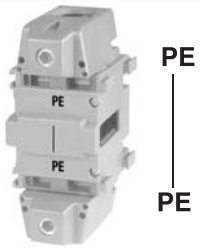
* 20 cm shaft included with switch.

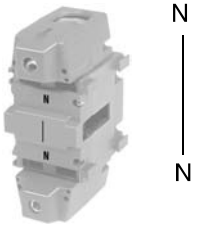
Accessories

Handles 194E - 125...315 A

Handles with Screw Fixing (Includes Legend Plate and Control Knob)	Degree of Protection	Color	Legend Plate Size	For Use With	Legend Marking	Cat. No.
 *Type A*	IP65 (UL Type 3/3R/12)	Black/Grey	88 x 88 mm 3-15/32 x 3-15/32 in.	194E-125...315 A		194E-HE8A-175
			130 x 130 mm 5-1/8 x 5-1/8 in.			194E-HE13A-175
 *Type I*		Red/Yellow	88 x 88 mm 3-15/32 x 3-15/32 in.			194E-HE8I-175
			130 x 130 mm 5-1/8 x 5-1/8 in.			194E-HE13I-175
 *Type G*		Black/Grey	90 x 90 mm 3-35/64 x 3-35/64 in.	194E-125...315 A		194E-HE8G-175
			135 x 135 mm 5-5/16 x 5-5/16 in.			194E-HE13G-175
 *Type N*		Red/Yellow	90 x 90 mm 3-35/64 x 3-35/64 in.			194E-HE8N-175
			135 x 135 mm 5-5/16 x 5-5/16 in.			194E-HE13N-175

Auxiliary Contacts - 2 N.O. / 1 N.C.	For Use With	Cat. No.
	194E-A125-160,194E-B125-160	194E-AB-P21-160
	194E-A250-315,194E-B250-315	194E-AB-P21-315
	194E-E125-160,194E-F125-160	194E-EF-P21-160
	194E-E250-315,194E-F250-315	194E-EF-P21-315

Earthing/Grounding Terminal	For Use With	Cat. No.
	194E-A125-160,194E-E125-160	194E-AE160-PE
	194E-A250-315,194E-E250-315	194E-AE315-PE
	194E-B125-160,194E-F125-160	**194E-BF160-PE**
	194E-B250,194E-F250	**194E-BF250-PE**
	194E-B315,194E-F315	**194E-BF315-PE**

Neutral Terminal	For Use With	Cat. No.
	194E-A125-160,194E-E125-160	194E-AE160-TN
	194E-A250-315,194E-E250-315	194E-AE315-TN
	194E-B125-160,194E-F125-160	**194E-BF160-TN**
	194E-B250,194E-F250	**194E-BF250-TN**
	194E-B315,194E-F315	**194E-BF315-TN**

Shaft Extension	Length	For Use With	Cat. No.
	40 cm	194E-A or 194E-B 125…315 A Base-Mounted Switches	194E-AB40

Terminal Cover	For Use With		Cat. No.
	194E-A125-160 194E-E125-160	2 covers per pole	194E-AE125-C1
	194E-A250-315 194E-E250-315	2 covers per pole	194E-AE250-C1
	194E-B125-160 194E-F125-160	2 covers per pole	194E-BF125-C1
	194E-B250-315 194E-F250-315	2 covers per pole	194E-BF250-C1

Legend

Additional Name Plate and Frame

	Color	Legend Size	For Use With	Legend Marking	Pkg. Qty.	Cat. No.
	Black/Grey	18 x 84 mm 11/16 x 3-5/16 in.	Size 8 Type G and N Style Handles, Cat. Nos. 194L-HE8G/N 88 mm x 88 mm 90 mm x 90 mm 130 mm x 130 mm 135 mm x 135 mm legend frames	MAIN SWITCH	5	**194L-G3515A**
				HAUPTSCHALTER		**194L-G3515B**
				INTERR. PRINCIPALE		**194L-G3515C**
				INTERR. PRINCIPAUX		**194L-G3515D**
				INTERR. PRINCIPAL		**194L-G3515E**
				HUVUDBRYTARE		**194L-G3515F**
				WAHLSCHALTER		**194L-G3515G**
	Black/Grey			EMERGENCY OFF		**194L-G3515H**

Specifications

IEC Performance Data for 194E

				194E-125	194E-160	194E-250	194-315
Rated insulation voltage U_i: ✶			[V]	1000	1000	1000	1000
Rated impulse withstand voltage U_{imp}			[kV]	8	8	8	8
Test voltage 1 min			[kV]	3.5	3.5	3.5	3.5
Rated voltage U_e ✶❄			[V]	1000	1000	1000	1000
Rated frequency			[Hz]	50/60	50/60	50/60	50/60
Rated thermal current I^{th} open			[A]	125	160	250	315
Rated thermal current I_{the} enclosed			[A]	125	160	250	315
Rated current I^e							
AC-1 /	Non-inductive or slightly induc. load		[A]	125	160	250	315
AC-21A	Switching of resistive loads with slight overload						
Rated power P_e							
AC-23A	Occasional switching of motor and other highly inductive loads	230V	[kW]	30	30	37	55
		400V	[kW]	45	55	90	110
		690V	[kW]	37	37	45	45
AC-3	Squirrel-cage motors: starting and stopping of running motors	230V	[kW]	22	30	37	45
		400V	[kW]	37	45	55	75
		690V	[kW]	30	37	45	45
Conditional rated short-circuit current		400/415V	[kA]	30	30	30	30
Max. fuse rating of circuit (type gG)			[A]	125	160	250	315
Rated short-time current I_{cw} 1S			[A]	2500	3000	4600	5800
Rated breaking capacity		230V	[A]	800	900	1600	1800
AC-23A (cos ϕ 0.45)		400V	[A]	750	850	1380	1650
		690V	[A]	340	340	400	400

✶ Valid for line with grounded common neutral termination, overvoltage category III, pollution degree 3. Other values on request.
❄ Not suitable for load-switching applications (AC-20 A) above 690V.

IEC Performance Data for 194E, Continued

DC Switching Capacity							
				194E-125	194E-160	194E-250	194E-315
Rated current I^e							
	Rated voltage [V]	No. Poles in series					
DC-21A	60	3	[A]	125	160	250	315
For resistive loads T≤1 ms	110	3	[A]	110	140	220	280
	220	3	[A]	45	55	85	110
	Rated voltage [V]	No. Poles in series					
	110	4	[A]	125	160	250	315
	220	4	[A]	80	100	150	200
	440	4	[A]	16	20	32	40
Rated power P_e							
	Rated voltage [V]	No. Poles in series					
DC-22A, DC-3	24	4	[kW]	3	3.8	6	7.5
For Inductive loads T≤2.5 ms	48	4	[kW]	6	7.5	12	15
	60	4	[kW]	7.5	9.5	15	19
	110	4	[kW]	10	12.5	20	25
	220	4	[kW]	4.5	5.5	8	10
Rated Power P_e							
	Rated voltage [V]	No. Poles in series					
DC-23A, DC-5	24	4	[kW]	3	3.8	6	7.5
For Inductive loads T≤15 ms	48	4	[kW]	6	7.5	12	15
	60	4	[kW]	7.5	9.5	15	19
	110	4	[kW]	8.8	11	17.5	22
	220	4	[kW]	2.5	3.5	5.5	7

UL CSA Performance Data for 194E

			194E-125	194E-160	194E-250	194E-315
Rated Insulation Voltage		[V]	600	600	600	600
Rated voltage		[V]	600	600	600	600
Continuous current		[A]	150	200	250	300
Ampere rating for general use		[A]	150	200	250	300
Heavy Pilot Duty		[AC]				
Standard Duty		[DC]				
Motor rating 60Hz						
1-phase (2 poles)	120V, 1 P	[FLA]	80	100	135	180
		[Hp]	7.5	10	15	20
	240V, 1 P	[FLA]	88	110	136	155
		[Hp]	20	25	30	35
	480V, 1 P	[FLA]	78	88	99	108
		[Hp]	35	40	45	50
	600V, 1 P	[FLA]	62	70	86	104
		[Hp]	35	40	50	60
3-Phase	120V, 3 P	[FLA]	84	108	160	208
		[Hp]	15	20	30	40
	240V, 3 P	[FLA]	8	104	154	192
		[Hp]	30	40	60	75
	480V, 3 P	[FLA]	77	77	96	124
		[Hp]	60	60	75	100
	600V, 3 P	[FLA]	62	62	77	99
		[Hp]	60	60	75	100

Mechanical Data

				194E-125	194E-160	194E-250	194E-315
Handles				IP66	IP66	IP66	IP66
Protection class according to IEC 529				—	—	—	—
Front side Front unit				IP66	IP66	IP66	IP66
Box lugs∗				IP20	IP20	IP20	IP20
Bolt-on	straight version∗			IP20	IP20	IP20	IP20
	bent version			—	—	—	—
Mechanical life			[Million operations]	0.1	0.1	0.075	0.075
Box lugs — max. wire gauges				—	—	—	—
Terminal sizes according to IEC 947-1	Gauge No.			B11	B11	B14	B14
Fine strands, 1 conductor	Max.		mm^2	70	70	150	150
	Min.		mm^2	16	16	25	25
Rigid wire, 1 conductor	Max.		mm^2	95	95	185	185
	Min.		mm^2	10	10	16	16
Wire gauges according to UL/CSA	Max.		AWG	3/0	3/0	—	—
			MCM	—	—	350	350
	Min.		AWG	8	8	4	4

∗ When provided with terminal covers.

Certifications

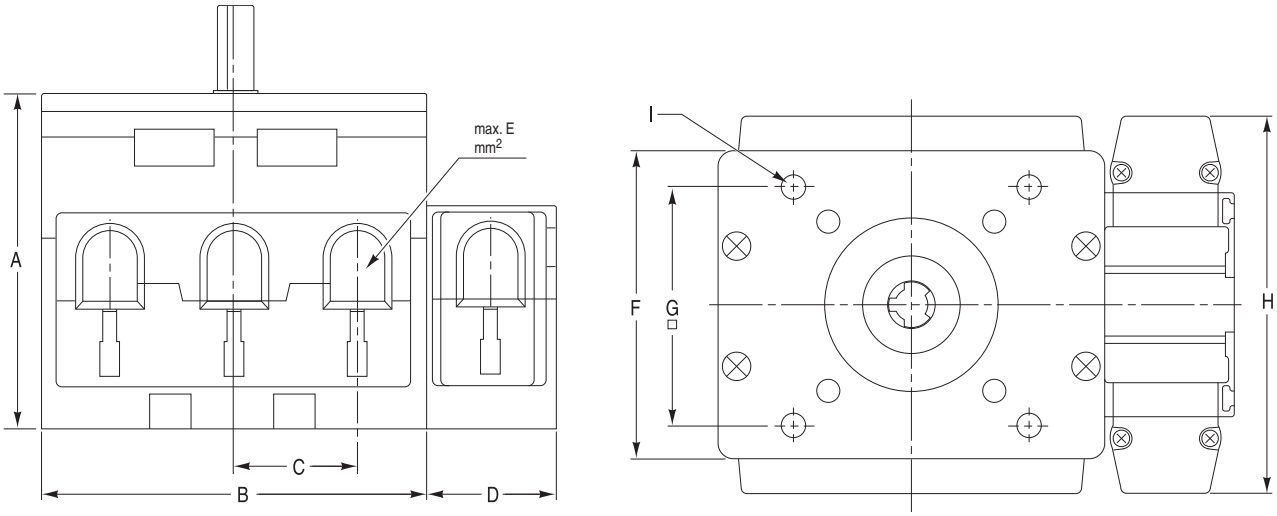
Catalog No. or Designation		UL-Listed (marked with UL)	UR-Recognized (marked with UR)	UL-Listed for Canada (marked with cUL)	UR-Recognized for Canada (marked with cUR)	CE
194E-A125	194E-E125	A	—	A	—	A
194E-A160	194E-E160	A	—	A	—	A
194E-A250	194E-E250	A	—	A	—	A
194E-A315	194E-E315	A	—	A	—	A
194E-B125	194E-F125	—	A	—	A	A
194E-B160	194E-F160	—	A	—	A	A
194E-B250	194E-F250	—	A	—	A	A
194E-B315	194E-F315	—	A	—	A	A
Aux. switch blocks		Z	Z	Z	Z	Z
Ground terminal		Z	Z	Z	Z	Z
Neutral terminal		Z	Z	Z	Z	Z

A = Certified
Z = accessories are covered by the approval for the switch

Approximate Dimensions

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

Front-Installation Box Lugs, 3- and 4-Pole

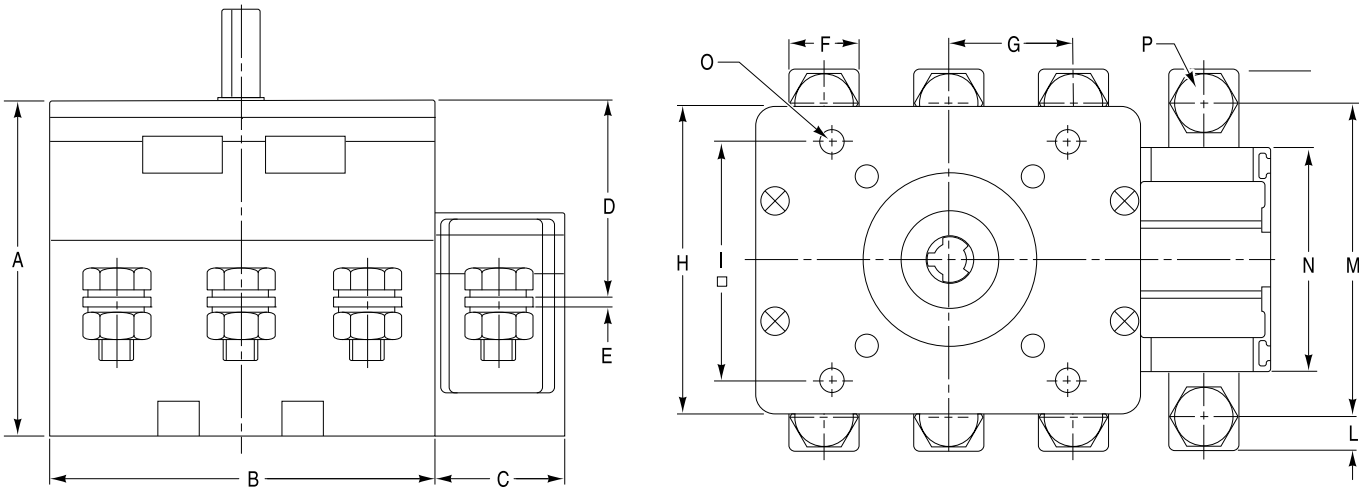


Switch Body 194E-E

[A]	A	B	C	D	E	F	G	H	I∗
125	91 (3-19/32)	112 (4-13/32)	36 (1-13/32)	38 (1-1/2)	95 (3-23/64)	88 (3-7/16)	68 (2-11/16)	108 (4-1/4)	M5
160	91 (3-19/32)	112 (4-13/32)	36 (1-13/32)	38 (1-1/2)	95 (3-23/64)	88 (3-7/16)	68 (2-11/16)	108 (4-1/4)	M5
250	103 (4-3/64)	145 (5-23/32)	44 (1-23/32)	52.5 (2-1/16)	185 (7-9/32)	88 (3-7/16)	68 (2-11/16)	120 (4-11/16)	M5
315	103 (4-3/64)	145 (5-23/32)	44 (1-23/32)	52.5 (2-1/16)	185 (7-9/32)	88 (3-7/16)	68 (2-11/16)	120 (4-11/16)	M5

∗ M5 x 0.8 bolts supplied with switch. Threaded hole.

Front-Installation Bolt-on Terminals, 3- and 4-Pole



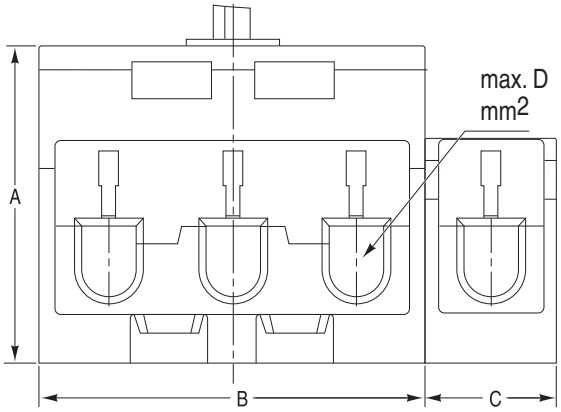
Switch Body 194E-F

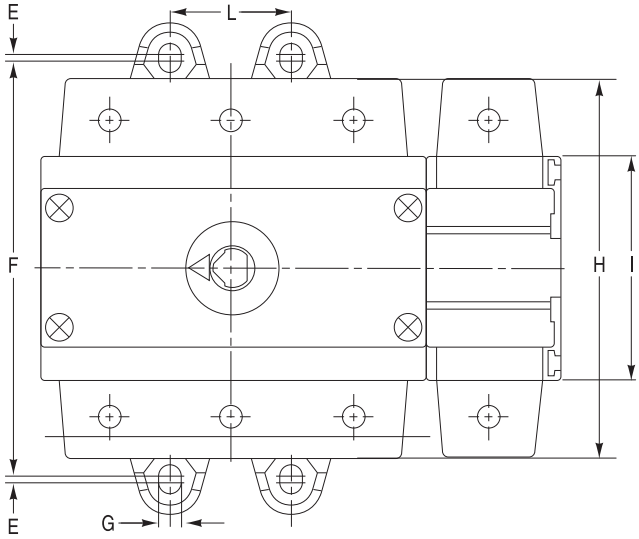
[A]	A	B	C	D	E	F	G	H	I	L	M	N	O∗	P❄
125	91 (3-19/32)	112 (4-3/32)	38 (1-1/2)	65.5 (2-9/16)	3 (1/8)	2 (3/32)	36 (1-13/32)	88 (3-7/16)	68 (2-11/16)	10 (13/32)	90 (3-17/32)	64 (2-17/32)	M5	M10
160	91 (3-19/32)	112 (4-3/32)	38 (1-1/2)	65.5 (2-9/16)	3 (1/8)	2 (3/32)	36 (1-13/32)	88 (3-7/16)	68 (2-11/16)	10 (13/32)	90 (3-17/32)	64 (2-17/32)	M5	M10
250	103 (4-3/64)	145 (5-23/32)	52.5 (1-22/32)	60.4 (2-3/8)	4 (5/32)	2 (3/32)	44 (1-23/32)	88 (3-7/16)	68 (2-11/16)	13 (1/2)	100 (3-15/16)	70 (2-3/4)	M5	M12
315	103 (4-3/64)	145 (5-23/32)	52.5 (1-22/32)	60.4 (2-3/8)	4 (5/32)	2 (3/32)	52 (2-1/16)	88 (3-7/16)	68 (2-11/16)	13 (1/2)	100 (3-15/16)	70 (2-3/4)	M5	M12

∗ M5 x 0.8 bolts supplied with switch. Threaded hole.
❄ Bolts and nuts supplied with switch. Through-hole.

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

Base-Mounting Box Lugs, 3- and 4-Pole

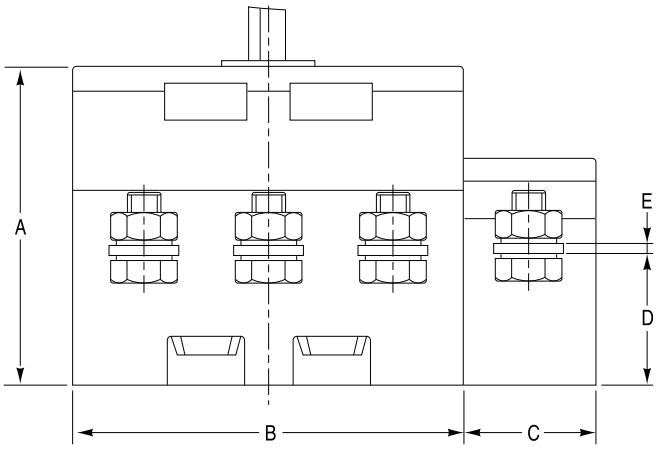


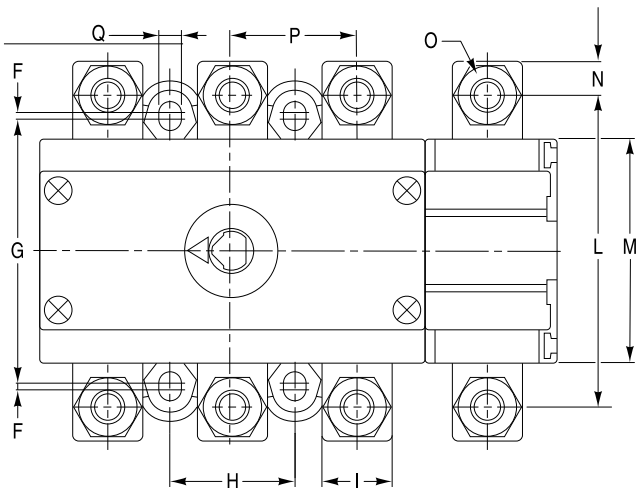


Switch Body 194E-A

[A]	A	B	C	D	E	F	G	H	I	L
125	91 (3-19/32)	112 (4-13/32)	38 (1-1/2)	95 (3-23/64)	2 (3/32)	118 (4-5/8)	6.4 (1/4)	108 (4-1/4)	64 (2-17/32)	36 (1-13/32)
160	91 (3-19/32)	112 (4-13/32)	38 (1-1/2)	95 (3-23/64)	2 (3/32)	118 (4-5/8)	6.4 (1/4)	108 (4-1/4)	64 (2-17/32)	36 (1-13/32)
250	98 (3-27/32)	145 (5-23/32)	52.5 (1-23/32)	185 (7-9/32)	2 (3/32)	140 (5-1/2)	6.4 (1/4)	126 (4-15/16)	70 (2-3/4)	44 (2-1/16)
315	98 (3-27/32)	145 (5-23/32)	52.5 (1-23/32)	185 (7-9/32)	2 (3/32)	140 (5-1/2)	6.4 (1/4)	126 (4-15/16)	70 (2-3/4)	44 (2-1/16)

Base-Mounting Bolt-on Terminals, 3- and 4-Pole



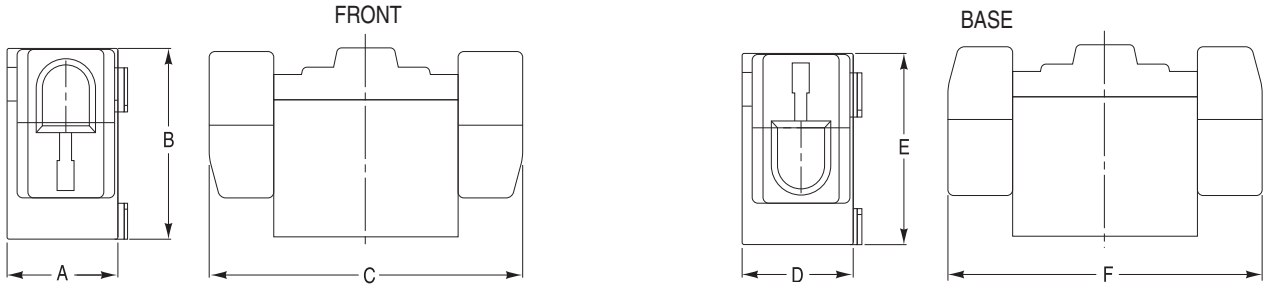


Switch Body 194E-B

[A]	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q
125	91 (3-19/32)	112 (4-3/32)	38 (1-1/2)	36.5 (1-7/16)	3 (1/8)	2 (3/32)	76 (3)	36 (1-13/32)	20 (3/4)	90 (3-17/32)	64 (2-17/32)	10 (13/32)	M10 (3/8)	36 (1-13/32)	6.4 (1/4)
160	91 (3-19/32)	112 (4-3/32)	38 (1-1/2)	36.5 (1-7/16)	3 (1/8)	2 (3/32)	76 (3)	36 (1-13/32)	20 (3/4)	90 (3-17/32)	64 (2-17/32)	10 (13/32)	M10 (3/8)	36 (1-13/32)	6.4 (1/4)
250	98 (3-27/64)	145 (5-23/32)	52.5 (1-22/32)	38.6 (1-1/2)	4 (5/32)	2 (3/32)	80 (3-1/8)	44 (1-23/32)	26 (1-1/64)	100 (3-15/16)	70 (2-3/4)	13 (1/2)	M12 (15/32)	44 (1-23/32)	6.4 (1/4)
315	98 (3-27/64)	145 (5-23/32)	52.5 (1-22/32)	38.6 (1-1/2)	4 (5/32)	2 (3/32)	80 (3-1/8)	44 (1-23/32)	26 (1-1/64)	100 (3-15/16)	70 (2-3/4)	13 (1/2)	M12 (15/32)	52 (2-1/16)	6.4 (1/4)

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

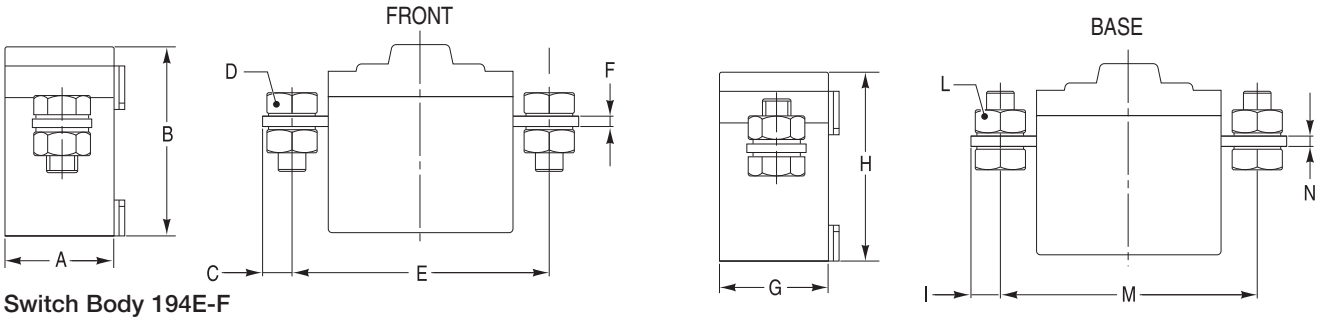
Box Ground and Neutral Terminal



Switch Body 194E-F

[A]	A	B	C	D	E	F
125	37.8 (1-1/2)	64 (2-17/32)	108 (4-1/4)	37.8 (1-1/2)	64 (2-17/32)	108 (4-1/4)
160	37.8 (1-1/2)	64 (2-17/32)	108 (4-1/4)	37.8 (1-1/2)	64 (2-17/32)	108 (4-1/4)
250	52.3 (2-1/16)	71.1 (2-25/32)	126 (4-15/16)	52.3 (2-1/16)	80.6 (3-1/8)	126 (4-15/16)
315	52.3 (2-1/16)	71.1 (2-25/32)	126 (4-15/16)	52.3 (2-1/16)	80.6 (3-1/8)	126 (4-15/16)

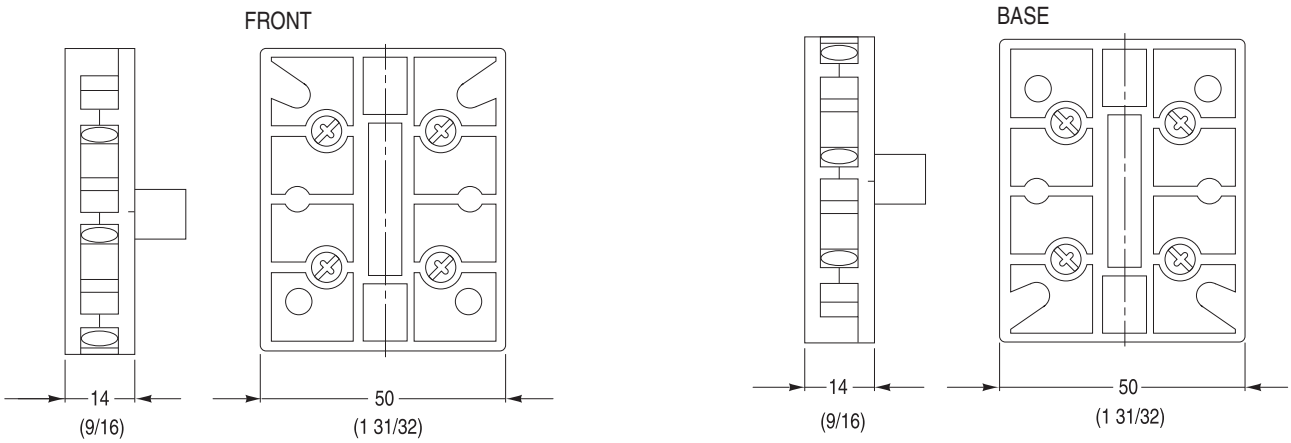
Bolt Ground and Neutral Terminal



Switch Body 194E-F

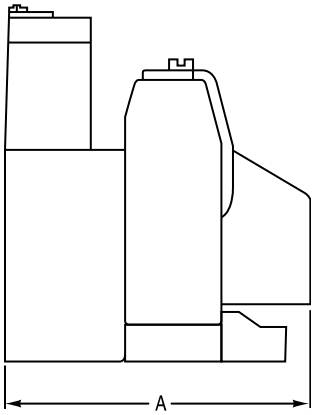
[A]	A	B	C	D	E	F	G	H	I	L	M	N
125	37.8 (1-1/2)	64 (2-17/32)	10 (13/32)	M10 (13/32)	90 (3-17/32)	3 (1/8)	37.8 (1-1/2)	64 (2-17/32)	10 (13/32)	M10 (13/32)	90 (3-17/32)	3 (1/8)
160	37.8 (1-1/2)	64 (2-17/32)	10 (13/32)	M10 (13/32)	90 (3-17/32)	3 (1/8)	37.8 (1-1/2)	64 (2-17/32)	10 (13/32)	M10 (13/32)	90 (3-17/32)	3 (1/8)
250	52.3 (2-1/16)	68 (2-21/32)	13 (1/2)	M12 (15/32)	100 (3-15/16)	4 (5/32)	52.3 (2-1/16)	68 (2-21/32)	13 (1/2)	M12 (15/32)	100 (3-15/16)	4 (5/32)
315	52.3 (2-1/16)	68 (2-21/32)	13 (1/2)	M12 (15/32)	100 (3-15/16)	4 (5/32)	52.3 (2-1/16)	68 (2-21/32)	13 (1/2)	M12 (15/32)	100 (3-15/16)	4 (5/32)

Auxiliary Contacts

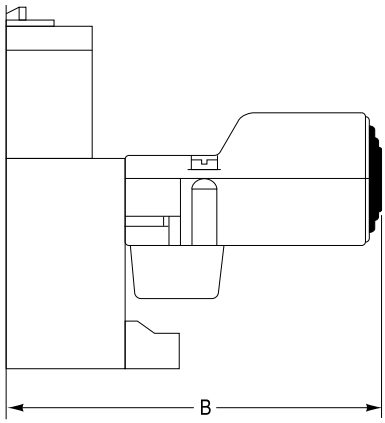


Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Terminal Cover

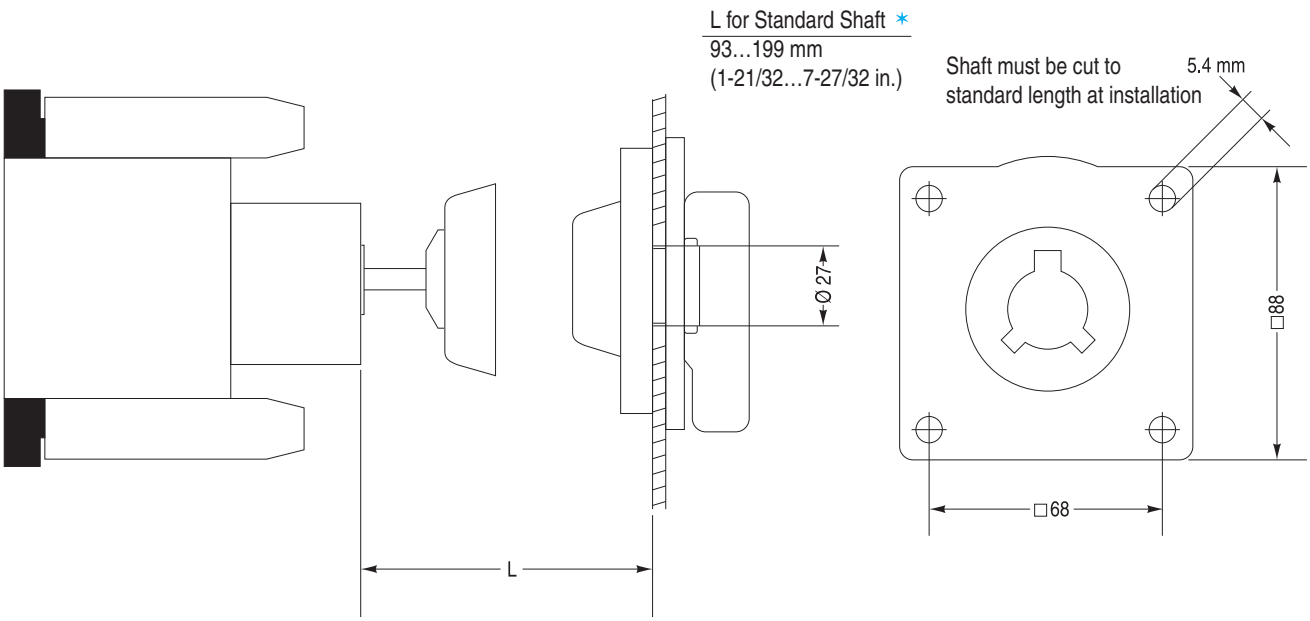


Switch Body 194E-F



[A]	A	B
125	76.2 (3)	95 (3-3/4)
160	76.2 (3)	95 (3-3/4)
250	88 (3-15/32)	109.5 (4-5/16)
315	88 (3-15/32)	109.5 (4-5/16)

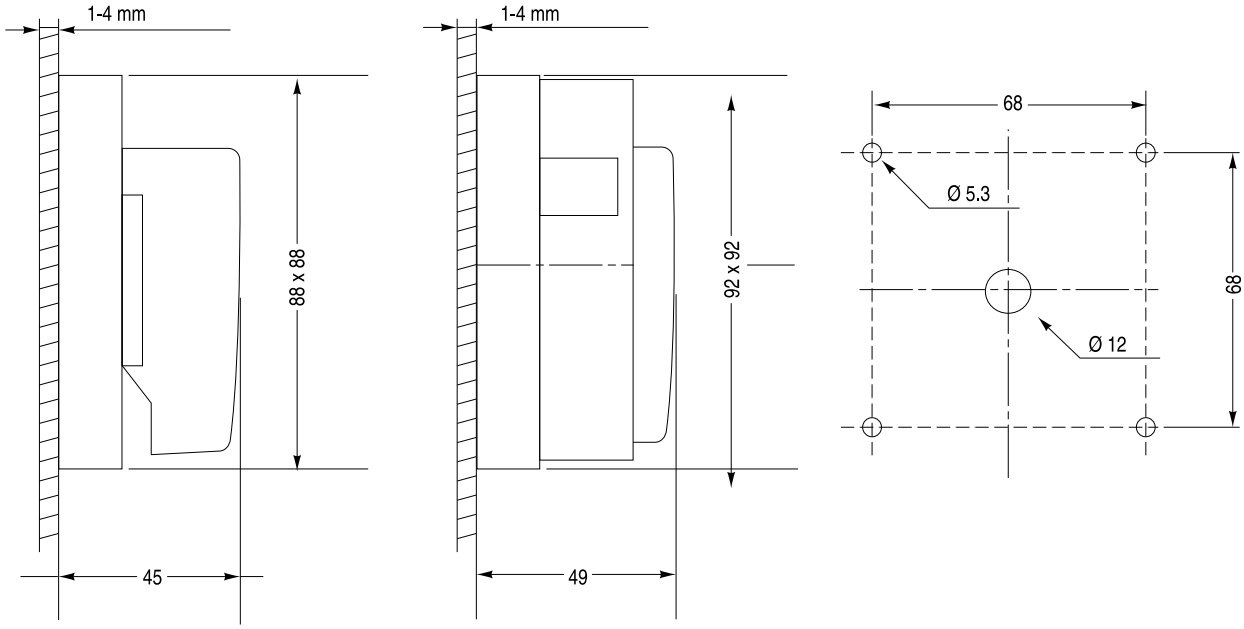
Door Clutches



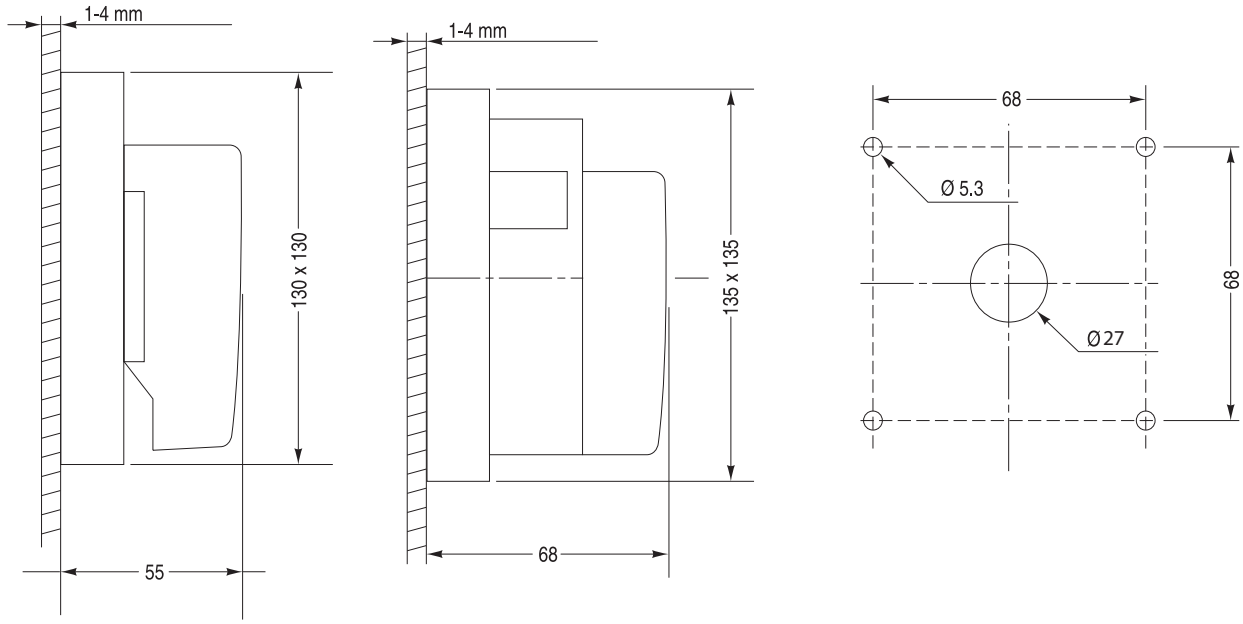
* Use Cat. No. 194E-AB40 shaft extension accessory to extend beyond the standard shaft length.

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

Handles (Type 194E-HE-8A-8I-8G-8N)



Handles (Type 194E-HE-13A-13I-13G-13N)



Type A and I

Type G and N

Additional Name Plate

Frame and legend snaps on to handle bezel. Fits size 8 and 13 handles.