



Bulletin 150

- SMC PLUS Smart Motor Controller
 - 24...1000 A Ratings
 - 3 Start Modes
 - Options Include:
 - Pump Control
 - SMB Smart Motor Braking
 - Slow Speed with Braking
 - Accu-Stop
 - Preset Slow Speed
 - Soft Stop

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Description

The SMC PLUS Solid-State Motor Controller provides microcomputer controlled starting for standard three-phase squirrel-cage induction motors. Three standard modes of operation are available within a single controller:

- Soft Start with Selectable Kickstart
- Current Limit Start
- Full Voltage Start

The SMC PLUS Controller is available for motors rated 1...1000 A; 200...480V, or 200...600V, 50 and 60 Hz. In addition to motors, the SMC PLUS Controller can be used to control resistive loads.

Energy Saver

This is a standard feature with the SMC PLUS Controller. It is used to save energy on applications where the motor is lightly loaded or unloaded for long periods of time. The Energy Saver is a built-in feature of the controller. **It does not require additional panel space or external wiring.** And, it does not require a complicated setup procedure.

For prices, consult your local Allen-Bradley Sales Office or the Master Price List.

Approvals:

CE Marked (Open Type) Per Low Voltage Directive 73/23/EEC, 93/68/EEC
CSA Certified (Open Type)
(File No. LR1234)
UL Listed (Open Type) (File No. E96956)

Optional SMC Easy Ship Program

- Non-Combination Controllers — Cat. Nos. printed in **blue** will ship in two working days.
- Combination Controllers — Cat. Nos. printed in **blue** will ship in four working days.
- Contact your distributor for availability.
- Orders for multiple quantities may increase lead time.



Your order must include:

- Cat. No. of the controller selected.
- Modifications.
- If required, Cat. No. of any options or accessories.

The controller provides the following modes of operation: soft start with selectable kickstart, current limit start, or full voltage start.

Soft Start

This method has the most general application. The motor is raised to an initial torque value. The initial torque is adjustable between 5 and 90% of locked rotor torque. The motor voltage is gradually increased during the acceleration ramp time, which can be adjusted from 2...30 seconds. These customer settings are set for the best starting performance over the required load range.

Soft Start with Selectable Kickstart

A kickstart or boost can be provided. Kickstart is intended to provide a current pulse of 550% of full load current and is adjustable from 0.4...2 seconds. This will allow the motor to develop additional torque at start for loads which may need a boost to get started.

Current Limit Start

This starting mode is used when it is necessary to limit the maximum starting current. This can be adjusted for 50...500% of full load amps.

Full Voltage Start

This mode is used for applications requiring across-the-line starting. The ramp time is set for less than 1/4 second.

Description of Options ❶

The following options are available in the SMC PLUS Controller. **Only one option may be added to the standard unit.**

Pump Control

The Pump Control option is used to reduce surges in a pumping system during starting and stopping of a centrifugal pump by smoothly accelerating and decelerating the motor at a selectable rate. The microcomputer analyzes the motor variables and generates control commands which control the motor in such a way to reduce the possibility of surges occurring in the system.

The starting time is adjustable from 2...30 seconds and the stopping time is adjustable from 2...120 seconds.

SMB Smart Motor Braking ❷

The Smart Motor Braking option provides motor braking for applications which require the motor to stop faster than a coast to rest. It is a microcomputer based braking system which applies braking current to a standard squirrel-cage induction motor. Braking is achieved without an additional contactor or power devices and provides automatic zero speed shut-off without a timer, sensor or tachometer. The strength of the braking current is adjustable from 150% to 400% of full load current.

Slow Speed with Braking ❷

The Slow Speed with Braking option is used on applications which require forward slow speed for positioning and alignment and also require braking control to stop. Slow speed adjustments are 7% (LOW) or 15% (HIGH) of rated speed. Slow speed acceleration current (available for 2 seconds) is adjustable from 50...400% of full load current. Running current is adjustable

from 50...450% of full load current. Braking current is adjustable from 150... 400%. Kickstart is not available.

Accu-Stop ❷❸

The Accu-Stop option is used in applications requiring controlled position stopping. During stopping, braking torque is applied to the motor until it reaches preset slow speed (7 or 15% of rated speed) and holds the motor at this speed until a stop command is given. Braking torque is then applied until the motor reaches zero speed. Braking current is adjustable from 150...400% of full load current. Slow Speed Current is adjustable from 50...450% of full load current. Slow speed can be selected for either 7% (LOW) or 15% (HIGH).

Accu-Stop with Slow Speed at Start ❷❸

The Accu-Stop option can also allow the motor to operate at the preset slow speed when Slow Speed Start is selected. This minimizes the jogging required to position a load. The start command will then ramp the voltage from the preset slow speed to full speed. The operation of Accu-Stop is the same as explained previously.

Preset Slow Speed

The Preset Slow Speed option can be used on applications which require a slow speed (for example, moving material into position). The preset slow speed can be set by a DIP switch for either LOW (7% of base speed) or HIGH (15% of base speed) in the forward direction. It can also be set for LOW (10% of base speed) or HIGH (20% of base speed) in the reverse direction without a reversing contactor. The direction of rotation is DIP switch selectable.

The slow speed current limit is adjustable from 50...450% of full load current.

Soft Stop ❷

The Soft Stop option can be used on applications which require an extended coast to rest. It is designed for frictional type loads that tend to stop suddenly when voltage is removed from the motor. The voltage ramp down time can be set from 2...60 seconds. The load will stop when the motor voltage drops to a point where the load torque is greater than the motor torque.

- ❶ Only one option may be added to the standard unit.
- ❷ Not intended to be used as an emergency stop. Refer to the applicable standards for emergency stop requirements.
- ❸ Accu-Stop control is not available when a bypass contactor is used.

Open and Non-Combination

[illegible]

Combination

152B

WA

B

A

56

8L4

Enclosure Type

WA NEMA Type 1
WB NEMA Type 1 Ventilated
WJ NEMA Type 12
WH NEMA Type 3R
WS NEMA Type 4X (Stainless Steel)

Line Voltage

A 240V AC
B 480V AC
C 600V AC
H 200V AC

Options (Select only one)

A Soft Stop
B Pump Control
C Preset Slow Speed
D SMB Smart Motor Braking
E Accu-Stop
F Slow Speed with Braking

Bulletin Number

152B Solid-State Controller with Fusible Disconnect and Isolating Contactor
152H Solid-State Controller with Fusible Disconnect
152R Solid-State Controller with Fusible Disconnect and Reversing Contactor
153B Solid-State Controller with Circuit Breaker and Isolating Contactor
153H Solid-State Controller with Circuit Breaker
153R Solid-State Controller with Circuit Breaker and Reversing Contactor

Horsepower

Cat. No.	HP Rating	Cat. No.	HP Rating	Cat. No.	HP Rating	Cat. No.	HP Rating	Cat. No.	HP Rating
39	5	44	25	49	75	56	250	61	500
40	7.5	45	30	50	100	57	300	62	600
41	10	46	40	51	125	58	350	63	700
42	15	47	50	52	150	59	400	65	800
43	20	48	60	54	200	60	450	67	1000

Options

8L4 Max. 480V AC, Line-Mounted Protective Module
8L6 Max. 600V AC, Line-Mounted Protective Module
8M4 Max. 480V AC, Load-Mounted Protective Module
8M6 Max. 600V AC, Load-Mounted Protective Module
8B4 Max. 480V AC, Line- and Load-Mounted Protective Modules
8B6 Max. 600V AC, Line- and Load-Mounted Protective Modules

Open Type Controllers

Up to 480V AC

Current Rating (A)	kW ❶		HP ❷			Cat. No. ❸
	230V AC 50 Hz	400V AC 50 Hz	200V AC 60 Hz	230V AC 60 Hz	460V AC 60 Hz	
24	5.5	11	1...5	1...7.5	1...15	150-A24NBD
35	10	18.5	1...10	1...10	1...25	150-A35NBD
54	15	22	1...15	1...20	1...40	150-A54NBD
97	25	45	5...30	5...30	5...75	150-A97NBD
135	37	75	5...40	5...50	5...100	150-A135NBD
180	51	90	5...60	5...60	5...150	150-A180NBD
240	75	132	5...75	5...75	5...200	150-A240NBD
360	110	200	5...125	5...150	5...300	150-A360NBD
500	150	257	5...150	5...200	5...400	150-A500NBD
650	200	355	5...200	5...250	5...500	150-A650NBD
720	220	400	5...250	5...300	5...600	150-A720NBD
850	257	475	10...300	10...350	10...700	150-A850NBD
1000	315	530	10...350	10...400	10...800	150-A1000NBD

Up to 600V AC

Current Rating (A)	kW ❶			HP ❷				Cat. No. ❸
	230V AC 50 Hz	400V AC 50 Hz	500V AC 50 Hz	200V AC 60 Hz	230V AC 60 Hz	460V AC 60 Hz	575V AC 60 Hz	
24	5.5	11	15	1...5	1...7.5	1...15	1...20	150-A24NCD
35	10	18.5	22	1...10	1...10	1...25	1...30	150-A35NCD
54	15	22	37	1...15	1...20	1...40	1...50	150-A54NCD
97	25	45	63	5...30	5...30	5...75	5...75	150-A97NCD
135	37	75	90	5...40	5...50	5...100	5...125	150-A135NCD
180	51	90	132	5...60	5...60	5...150	5...150	150-A180NCD
240	75	132	160	5...75	5...75	5...200	5...250	150-A240NCD
360	110	200	250	5...125	5...150	5...300	5...350	150-A360NCD
500	150	257	355	5...150	5...200	5...400	5...500	150-A500NCD
650	200	355	475	5...200	5...250	5...500	5...600	150-A650NCD
720	220	400	500	5...250	5...300	5...600	5...700	150-A720NCD
850	257	475	600	10...300	10...350	10...700	10...800	150-A850NCD
1000	315	530	710	10...350	10...400	10...800	10...1000	150-A1000NCD

- ❶ The minimum rating is: 0.7 kW for devices with current ratings of 54 A or less; 4 kW for devices rated 97...720 A; 7.5 kW for devices rated 850 A and greater.
- ❷ HP ratings at motor terminal voltages for 208, 480 and 600 line volts, respectively.
- ❸ Controllers are shipped from the factory preset for soft start mode, 10 s acceleration, energy saver inactive, motor stall inactive, and control power 100...240V AC, 50/60 Hz.

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IP30 (Type 1) Enclosed Non-Combination Controllers



SMC Easy Ship program Cat. Nos. are printed in blue.
See page 7-27.

Bulletin 150 (Non-Combination Controller) — The SMC PLUS Controller requires a separate 100...240V, 50/60 Hz single-phase control source. A thermal overload is not included. Terminals are provided for a separate thermal overload relay connection to the control circuit. Enclosures other than those listed are available. Consult your local Allen-Bradley Sales Office.

Up to 480V AC

Current Rating (A)	kW ❶		HP ❷			Cat. No. ❸	Dimension Code
	230V AC 50 Hz	400V AC 50 Hz	200V AC 60 Hz	230V AC 60 Hz	460V AC 60 Hz		
24	5.5	11	1...5	1...7.5	1...15	150-A24JBD	Q
35	10	15	1...10	1...10	1...25	150-A35JBD	Q
54	15	22	1...15	1...20	1...40	150-A54JBD	Q
97	25	45	5...30	5...30	5...75	150-A97BBD	R
135	37	55	5...40	5...50	5...100	150-A135BBD	T
180	51	90	5...60	5...60	5...150	150-A180BBD	T
240	75	110	5...75	5...75	5...200	150-A240BBD	T
360	110	200	5...125	5...150	5...300	150-A360BBD	U
500	150	250	5...150	5...200	5...400	150-A500BBD	W
650	200	355	5...200	5...250	5...500	150-A650BBD	X
720	220	400	5...250	5...300	5...600	150-A720BBD	X
850	257	450	10...300	10...350	10...700	150-A850BBD	X
1000	315	500	10...350	10...400	10...800	150-A1000BBD	X

Up to 600V AC

Current Rating (A)	kW ❶			HP ❷				Cat. No. ❸	Dimension Code
	230V AC 50 Hz	400V AC 50 Hz	500V AC 50 Hz	200V AC 60 Hz	230V AC 60 Hz	460V AC 60 Hz	575V AC 60 Hz		
24	5.5	11	15	1...5	1...7.5	1...15	1...20	150-A24JCD	Q
35	10	18.5	22	1...10	1...10	1...25	1...30	150-A35JCD	Q
54	15	22	37	1...15	1...20	1...40	1...50	150-A54JCD	Q
97	25	45	63	5...30	5...30	5...75	5...75	150-A97BCD	R
135	37	75	90	5...40	5...50	5...100	5...125	150-A135BCD	T
180	51	90	132	5...60	5...60	5...150	5...150	150-A180BCD	T
240	75	132	160	5...75	5...75	5...200	5...250	150-A240BCD	T
360	110	200	250	5...125	5...150	5...300	5...350	150-A360BCD	U
500	150	257	355	5...150	5...200	5...400	5...500	150-A500BCD	W
650	200	355	475	5...200	5...250	5...500	5...600	150-A650BCD	X
720	220	400	500	5...250	5...300	5...600	5...700	150-A720BCD	X
850	257	475	600	10...300	10...350	10...700	10...800	150-A850BCD	X
1000	315	530	710	10...350	10...400	10...800	10...1000	150-A1000BCD	X

❶ The minimum rating is: 0.7 kW for devices with current ratings of 54 A or less; 4 kW for devices rated 97...720 A; 7.5 kW for devices rated 850 A and greater.

❷ HP ratings at motor terminal voltages for 208, 480 and 600 line volts, respectively.

❸ Controllers are shipped from the factory preset for soft start mode, 10 second acceleration, energy saver inactive, motor stall active, and control power 100...240V AC, 50/60 Hz.

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IP65 (Type 4) Enclosed Non-Combination Controllers

Bulletin 150 (Non-Combination Controller) — The SMC PLUS Controller requires a separate 100...240V, 50/60 Hz single-phase control source. A thermal overload is not included. Terminals are provided for a separate thermal overload relay connection to the control circuit. Enclosures other than those listed are available. Consult your local Allen-Bradley Sales Office.

Up to 480V AC

Current Rating (A)	kW ❶		HP ❷			Cat. No. ❸❹	Dimension Code
	230V AC 50 Hz	400V AC 50 Hz	200V AC 60 Hz	230V AC 60 Hz	460V AC 60 Hz		
24	5.5	11	1...5	1...7.5	1...15	150-A24FBD	Q
35	10	18.5	1...10	1...10	1...25	150-A35FBD	Q
54	15	22	1...15	1...20	1...40	150-A54FBD	Q
97	25	45	5...30	5...30	5...75	150-A97FBD	S
135	37	75	5...40	5...50	5...100	150-A135FBD	T
180	51	90	5...60	5...60	5...150	150-A180FBD	T
240	75	132	5...75	5...75	5...200	150-A240FBD	U
360	110	200	5...125	5...150	5...300	150-A360FBD	V
500	150	257	5...150	5...200	5...400	150-A500FBD	X
650	200	355	5...200	5...250	5...500	150-A650FBD	Z1
720	220	400	5...250	5...300	5...600	150-A720FBD	Z1
850	257	475	10...300	10...350	10...700	150-A850FBD	Z1
1000	315	530	10...350	10...400	10...800	150-A1000FBD	Z1

Up to 600V AC

Current Rating (A)	kW ❶			HP ❷				Cat. No. ❸❹	Dimension Code
	230V AC 50 Hz	400V AC 50 Hz	500V AC 50 Hz	200V AC 60 Hz	230V AC 60 Hz	460V AC 60 Hz	575V AC 60 Hz		
24	5.5	11	15	1...5	1...7.5	1...15	1...20	150-A24FCD	Q
35	10	18.5	22	1...10	1...10	1...25	1...30	150-A35FCD	Q
54	15	22	37	1...15	1...20	1...40	1...50	150-A54FCD	Q
97	25	45	63	5...30	5...30	5...75	5...75	150-A97FCD	S
135	37	75	90	5...40	5...50	5...100	5...125	150-A135FCD	T
180	51	90	132	5...60	5...60	5...150	5...150	150-A180FCD	T
240	75	132	160	5...75	5...75	5...200	5...250	150-A240FCD	V
360	110	200	250	5...125	5...150	5...300	5...350	150-A360FCD	V
500	150	257	355	5...150	5...200	5...400	5...500	150-A500FCD	X
650	200	355	475	5...200	5...250	5...500	5...600	150-A650FCD	Z1
720	220	400	500	5...250	5...300	5...600	5...700	150-A720FCD	Z1
850	257	475	600	10...300	10...350	10...700	10...800	150-A850FCD	Z1
1000	315	530	710	10...350	10...400	10...800	10...1000	150-A1000FCD	Z1

- ❶ The minimum rating is: 0.7 kW for devices with current ratings of 54 A or less; 4 kW for devices rated 97...720 A; 7.5 kW for devices rated 850 A and greater.
- ❷ HP ratings at motor terminal voltages for 208, 480 and 600 line volts, respectively.
- ❸ Controllers are shipped from the factory preset for soft start mode, 10 second acceleration, energy saver inactive, motor stall inactive, and control power 100...240V AC, 50/60 Hz.
- ❹ 97...1000 A Type 4 SMC PLUS Smart Motor Controllers include Bulletin 100 bypass contactors wired for 120V AC 50/60 Hz.

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IP54 (Type 12) Enclosed Non-Combination Controllers



SMC Easy Ship program Cat. Nos. are printed in blue. See page 7-27.

Bulletin 150 (Non-Combination Controller) — The SMC PLUS Controller requires a separate 100...240V, 50/60 Hz single-phase control source. A thermal overload is not included. Terminals are provided for a separate thermal overload relay connection to the control circuit. Enclosures other than those listed are available. Consult your local Allen-Bradley Sales Office.

Up to 480V AC

Current Rating (A)	kW ❶		HP ❷			Cat. No. ❸❹	Dimension Code
	230V AC 50 Hz	400V AC 50 Hz	200V AC 60 Hz	230V AC 60 Hz	460V AC 60 Hz		
24	5.5	11	1...5	1...7.5	1...15	150-A24JBD	Q
35	10	18.5	1...10	1...10	1...25	150-A35JBD	Q
54	15	22	1...15	1...20	1...40	150-A54JBD	Q
97	25	45	5...30	5...30	5...75	150-A97JBD	S
135	37	75	5...40	5...50	5...100	150-A135JBD	T
180	51	90	5...60	5...60	5...150	150-A180JBD	T
240	75	132	5...75	5...75	5...200	150-A240JBD	U
360	150	200	5...125	5...150	5...300	150-A360JBD	V
500	132	257	5...150	5...200	5...400	150-A500JBD	X
650	200	355	5...200	5...250	5...500	150-A650JBD	Z
720	220	400	5...250	5...300	5...600	150-A720JBD	Z1
850	257	475	10...300	10...350	10...700	150-A850JBD	Z1
1000	315	530	10...350	10...400	10...800	150-A1000JBD	Z1

Up to 600V AC

Current Rating (A)	kW ❶			HP ❷				Cat. No. ❸❹	Dimension Code
	230V AC 50 Hz	400V AC 50 Hz	500V AC 50 Hz	200V AC 60 Hz	230V AC 60 Hz	460V AC 60 Hz	575V AC 60 Hz		
24	5.5	11	15	1...5	1...7.5	1...15	1...20	150-A24JCD	Q
35	10	18.5	22	1...10	1...10	1...25	1...30	150-A35JCD	Q
54	15	22	37	1...15	1...20	1...40	1...50	150-A54JCD	Q
97	25	45	63	5...30	5...30	5...75	5...75	150-A97JCD	S
135	37	75	90	5...40	5...50	5...100	5...125	150-A135JCD	T
180	51	90	110	5...60	5...60	5...150	5...150	150-A180JCD	T
240	75	132	160	5...75	5...75	5...200	5...250	150-A240JCD	V
360	110	200	250	5...125	5...150	5...300	5...350	150-A360JCD	V
500	150	257	355	5...150	5...200	5...400	5...500	150-A500JCD	X
650	200	355	475	5...200	5...250	5...500	5...600	150-A650JCD	Z
720	220	400	500	5...250	5...300	5...600	5...700	150-A720JCD	Z1
850	257	475	600	10...300	10...350	10...700	10...800	150-A850JCD	Z1
1000	315	530	710	10...350	10...400	10...800	10...1000	150-A1000JCD	Z1

- ❶ The minimum rating is: 0.7 kW for devices with current ratings of 54 A or less; 4 kW for devices rated 97...720 A; 7.5 kW for devices rated 850 A and greater.
- ❷ HP ratings at motor terminal voltages for 208, 480 and 600 line volts, respectively.
- ❸ Controllers are shipped from the factory preset for soft start mode, 10 second acceleration, energy saver inactive, motor stall inactive, and control power 100...240V AC, 50/60 Hz.
- ❹ 97...1000 A Type 12 SMC PLUS Smart Motor Controllers include Bulletin 100 Bypass Contactors wired for 120V AC 50/60 Hz.

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Enclosed Combination Controllers ❶

Bulletin 152H/153H (Combination Controller) — Includes a 120V control transformer and a three-pole thermal overload relay less elements. Where isolating or bypass contactors are required, Bulletin 100 contactors are used (through 600 A). Enclosures other than those listed are available. Consult your local Allen-Bradley Sales Office.

HP	Nominal Current (A)	IP30 (Type 1) Vented Enclosure With Fusible Disconnect ❷		IP54 (Type 12) Enclosed Combination Controller With Fusible Disconnect and Bypass Contactor ❸	
		Dimension Code	Cat. No.	Dimension Code	Cat. No. ❹
480V AC, 60 Hz					
15	24	S	152H-WAB-42 ❺	S	152H-WJB-42 ❻
20	30	T	152H-WAB-43 ❺	T	152H-WJB-43 ❻
25	35	T	152H-WAB-44 ❺	T	152H-WJB-44 ❻
30	40	T	152H-WAB-45 ❺	T	152H-WJB-45 ❻
40	54	T	152H-WAB-46 ❺	T	152H-WJB-46 ❻
50	70	U	152H-WBB-47	U	152H-WJB-47
60	82	U	152H-WBB-48	U	152H-WJB-48
75	97	U	152H-WBB-49	U	152H-WJB-49
100	125	V	152H-WBB-50	V	152H-WJB-50
125	156	W	152H-WBB-51	W	152H-WJB-51
150	180	W	152H-WBB-52	W	152H-WJB-52
200	240	W	152H-WBB-54	W	152H-WJB-54
250	302	X2	152H-WBB-56	X2	152H-WJB-56
300	360	X2	152H-WBB-57	X2	152H-WJB-57
350	410	Y1	152H-WBB-58	Y2	152H-WJB-58
400	477	Y1	152H-WBB-59	Y2	152H-WJB-59
450	525	Z1	152H-WBB-60	Z2	152H-WJB-60
500	575	Z1	152H-WBB-61	Z2	152H-WJB-61
600	675	Z1	152H-WBB-62	Z2	152H-WJB-62
700	800	Z1	152H-WBB-63	Z3	152H-WJB-63
800	915	Z1	152H-WBB-65	Z3	152H-WJB-65
600V AC, 60 Hz					
20	24	S	152H-WAC-43 ❺	S	152H-WJC-43 ❻
25	28	T	152H-WAC-44 ❺	T	152H-WJC-44 ❻
30	35	T	152H-WAC-45 ❺	T	152H-WJC-45 ❻
40	40	T	152H-WAC-46 ❺	T	152H-WJC-46 ❻
50	54	T	152H-WAC-47 ❺	T	152H-WJC-47 ❻
60	65	U	152H-WBC-48	U	152H-WJC-48
75	80	U	152H-WBC-49	U	152H-WJC-49
100	115	V	152H-WBC-50	V	152H-WJC-50
125	125	V	152H-WBC-51	V	152H-WJC-51
150	170	W	152H-WBC-52	W	152H-WJC-52
200	200	W	152H-WBC-54	W	152H-WJC-54
250	240	X2	152H-WBC-56	X2	152H-WJC-56
300	310	X2	152H-WBC-57	X2	152H-WJC-57
350	360	Y1	152H-WBC-58	Y2	152H-WJC-58
400	385	Y1	152H-WBC-59	Y2	152H-WJC-59
450	450	Z1	152H-WBC-60	Z2	152H-WJC-60
500	500	Z1	152H-WBC-61	Z2	152H-WJC-61
600	600	Z1	152H-WBC-62	Z2	152H-WJC-62
700	700	Z1	152H-WBC-63	Z3	152H-WJC-63
800	800	Z1	152H-WBC-65	Z3	152H-WJC-65
1000	1000	Z1	152H-WBC-67	Z3	152H-WJC-67

- ❶ 208V and 240V Controllers are available. Consult your local Allen-Bradley Sales Office.
- ❷ See page 7-43 for fuse clip size and type information.
- ❸ Accu-Stop Control is not available when a bypass contactor is used.
- ❹ Bypass contactors are used to bypass the SMC PLUS Controller when the motor has reached full speed.
- ❺ Includes internal circulating fan rather than enclosure ventilation.
- ❻ Includes internal circulating fan rather than bypass contactor.

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Enclosed Combination Controllers ①



SMC Easy Ship program Cat. Nos. are printed in blue. See page 7-27.

Bulletin 152H/153H (Combination Controller) — Includes a 120V control transformer and a three-pole thermal overload relay less elements. Where isolating or bypass contactors are required, Bulletin 100 contactors are used (through 600 A). Enclosures other than those listed are available. Consult your local Allen-Bradley Sales Office.

HP	Nominal Current	IP30 (Type 1) Vented Enclosed Combination Controllers with Circuit Breaker ②		IP54 (Type 12) Enclosed Combination Controller with Circuit Breaker and Bypass Contactor ②	
		Dimension Code	Cat. No.	Dimension Code	Cat. No. ③④
480V AC, 60 Hz					
15	24	S	153H-WAB-42 ⑤	S	153H-WJB-42 ⑤
20	30	T	153H-WAB-43 ⑤	T	153H-WJB-43 ⑤
25	35	T	153H-WAB-44 ⑤	T	153H-WJB-44 ⑤
30	40	T	153H-WAB-45 ⑤	T	153H-WJB-45 ⑤
40	54	T	153H-WAB-46 ⑤	T	153H-WJB-46 ⑤
50	70	U	153H-WBB-47	U	153H-WJB-47
60	82	U	153H-WBB-48	U	153H-WJB-48
75	97	U	153H-WBB-49	U	153H-WJB-49
100	125	V	153H-WBB-50	V	153H-WJB-50
125	156	W	153H-WBB-51	W	153H-WJB-51
150	180	W	153H-WBB-52	W	153H-WJB-52
200	240	W	153H-WBB-54	W	153H-WJB-54
250	302	X2	153H-WBB-56	X	153H-WJB-56
300	360	X2	153H-WBB-57	X	153H-WJB-57
350	410	Y1	153H-WBB-58	Y1	153H-WJB-58
400	477	Y1	153H-WBB-59	Y1	153H-WJB-59
450	525	Y2	153H-WBB-60	Z	153H-WJB-60
500	575	Y2	153H-WBB-61	Z	153H-WJB-61
600	675	Y2	153H-WBB-62	Z	153H-WJB-62
700	800	Z	153H-WBB-63	Z	153H-WJB-63
800	915	Z	153H-WBB-65	Y3	153H-WJB-65
600V AC, 60 Hz					
20	24	S	153H-WAC-43 ⑤	S	153H-WJC-43 ⑤
25	28	T	153H-WAC-44 ⑤	T	153H-WJC-44 ⑤
30	35	T	153H-WAC-45 ⑤	T	153H-WJC-45 ⑤
40	40	T	153H-WAC-46 ⑤	T	153H-WJC-46 ⑤
50	54	T	153H-WAC-47 ⑤	T	153H-WJC-47 ⑤
60	65	U	153H-WBC-48	U	153H-WJC-48
75	80	U	153H-WBC-49	U	153H-WJC-49
100	115	V	153H-WBC-50	V	153H-WJC-50
125	125	V	153H-WBC-51	V	153H-WJC-51
150	170	W	153H-WBC-52	W	153H-WJC-52
200	200	W	153H-WBC-54	W	153H-WJC-54
250	240	X2	153H-WBC-56	W	153H-WJC-56
300	310	X2	153H-WBC-57	X	153H-WJC-57
350	360	Y1	153H-WBC-58	Y1	153H-WJC-58
400	385	Y1	153H-WBC-59	Y1	153H-WJC-59
450	450	Y2	153H-WBC-60	Z	153H-WJC-60
500	500	Y2	153H-WBC-61	Z	153H-WJC-61
600	600	Y2	153H-WBC-62	Z	153H-WJC-62
700	700	Z	153H-WBC-63	Z	153H-WJC-63
800	800	Z	153H-WBC-65	Y3	153H-WJC-65
1000	1000	Z	153H-WBC-67	Y3	153H-WJC-67

① 208V and 240V Controllers are available. Consult your local Allen-Bradley Sales Office.

② See page 7-43 for circuit breaker size and rating plug size.

③ Accu-Stop Control is not available when a bypass contactor is used.

④ Bypass contactors are used to bypass the SMC PLUS Controller when the motor has reached full speed.

⑤ Includes internal circulating fan rather than enclosure ventilation.

⑥ Includes internal circulating fan rather than bypass contactor.

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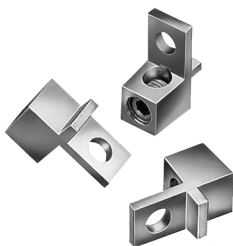
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Protective Modules (Field Modifications) ❶❷

	Nominal Current Rating (A)	Description	Field Modification Cat. No.
	24...54	480V Protective Module	150-N84
		600V Protective Module	150-N86
	97...360	480V Protective Module	150-N84L
		600V Protective Module	150-N86L

Terminal Lug Kits (97...1000 A)

	Nominal Current Rating (A)	Conductor Range	Total No. of Terminal Lugs Possible Each Side		Pkg. Qty.	Cat. No.
			Line Side	Load Side		
	97...135	#6...4/0 AWG	3	3	3	199-LF1
	180...360	#6...4/0 AWG	6	6	3	199-LF1
	500	#4...500MCM AWG	6	6	3	199-LG1
	650...720	#4...500MCM AWG	9	9	3	199-LG1
	850...1000	(2) 1/0...500MCM AWG	6	6	3	199-LJ1

IEC Terminal Covers (Field Modification)

	Description	Field Modification Cat. No.
	IEC line or load terminal covers for 97...135 A devices (includes line and load termination covers)	150-NT1
	IEC line and load terminal covers for 180...360 A devices (includes line and load termination covers)	150-NT2

- ❶ The same protective module mounts on the line or load side of the SMC PLUS. For applications requiring both line and load side protection, two protective modules must be ordered.
- ❷ Protective modules are standard on 500...1000 A units.



SMC Easy Ship program options are printed in blue. See page 7-27.

Option	Description	Cat. No. Modification
Soft Stop ①②③	Provides a ramp down time of 2...60 seconds for applications which require an extended coast-to-rest.	A ④
Pump Control ①②	Provides smooth motor acceleration and deceleration, reducing surges caused by the starting and stopping of centrifugal pumps. Starting time is adjustable from 2...30 seconds, and stopping time is adjustable from 2...120 seconds.	B ④
Preset Slow Speed ①②	Provides a preset slow speed for positioning or alignment applications. Preset speeds can be selected at either 7% or 15% of rated motor speed, in the forward direction, 10% or 20% in the reverse direction. The direction of the motor is dip switch selectable. Slow speed current is adjustable from 50...450% of full load current.	C ④
SMB Smart Motor Braking ①②③	Provides a microcomputer based braking system which applies three-phase braking current to a standard squirrel-cage induction motor. The strength of the braking current is adjustable from 150...400% of full load motor current.	D ④
Accu-Stop ①②③⑤	Provides precise stopping control for positioning or to minimize jogging to stop. A three-phase braking current is applied to the motor (adjustable from 150...400% of full load current) until it reaches a preset slow speed (either 7% or 15% of rated motor-speed). The motor is held at this speed until a stop command is given. Braking torque is then applied until the motor reaches zero speed. Slow speed current is adjustable from 50...450% of full load current.	E ④
Slow Speed with Braking ①②③⑤	Provides forward slow speed for positioning and alignment, and braking control to stop.	F ④

- ① Only one option may be added to the standard unit.
- ② Observe the thermal rating of the AC induction motor.
- ③ Not intended to be used as an emergency stop. Refer to the applicable standards for emergency stop requirements.
- ④ Add the designated letter to the end of the Cat. No. For example, to add the Pump Control Option: **Cat. No. 150-24NBD** becomes **Cat. No. 150-A24NBDB** or **Cat. No. 152B-WBB-56** becomes **Cat. No. 152B-WBBB-56** for combination style.
- ⑤ Accu-stop Control is not available when a bypass contactor is used.
- ⑥ Kickstart is not available with this option.



SMC Easy Ship program descriptions are printed in **blue**. See page 7-27.

Option	Description	Cat. No. Modification
Push Buttons	Start-Stop Push Button	-1
	Start-Stop Push Button with H-O-A Selector Switch	-1F
	Soft Stop Push Button ❶	-1XA
	Pump Stop Push Button ❶	-1XB
	Slow Speed Push Button ❶	-1XC
	Brake Push Button ❶	-1XD
	Accu-Stop/Slow Speed Push Button ❶	-1XE
	Emergency Stop	-1E
Selector Switch	Fault Reset	-FR
	Hand-Off-Auto Selector Switch	-3
	SMC-Off-Bypass Selector Switch	-3B
Pilot Lights	Forward-Off-Reverse Selector Switch	-3R
	Transformer Pilot Light (Red Lens — Easy Ship Program) ❷	-4
Control Circuit Transformer	Push-to-Test Pilot Light ❷	-5
	Control Circuit Transformer (fused primary and secondary)	-6P
Protective Modules ❸	Additional 100 VA Control Circuit Transformer (fused primary and secondary)	-6PX
	24...54 A, 480V Line Side Protective Module	-8L4
	97...360 A, 480V Line Side Protective Module	
	24...54 A, 600V Line Side Protective Module	-8L6
	97...360 A, 600V Line Side Protective Module	
	24...54 A, 480V Load Side Protective Module	-8M4
	97...360 A, 480V Load Side Protective Module	
	24...54 A, 600V Load Side Protective Module	-8M6
	97...360 A, 600V Load Side Protective Module	
	24...54 A, 480V Both Line and Load Side Protective Modules	-8B4
Overload Relay ❹❺	97...360 A, 480V Both Line and Load Side Protective Modules	
	24...54 A, 600V Both Line and Load Side Protective Modules	-8B6
	97...360 A, 600V Both Line and Load Side Protective Modules	
	Three-pole thermal overload relay for 24...35 A units	-OL
	Three-pole thermal overload relay for 54 A units	
	Three-pole thermal overload relay for 97...135 A units	
External Overload Relay Reset ❻	Three-pole thermal overload relay for 180...360 A units	
	Three-pole thermal overload relay for 500 units	
	Three-pole thermal overload relay for 650...850 A units	
	Three-pole thermal overload relay for 1000 A units	
Overload Auxiliary Contact	24...54 A Overload Relay Reset	-7
	97...240 A Overload Relay Reset	
	360...1000 A Overload Relay Reset	
Isolation	N.O. Overload Relay Auxiliary Contact	-9
	N.C. Overload Relay Auxiliary Contact	-9A
	Isolation Contactor	❶

- ❶ Option push buttons are only available when the corresponding option module is selected. For example, **Cat. No. 150-A24JBDA-1XA**.
- ❷ Specify pilot light lens color. Options: **Amber, Blue, Clear, Green, Red, and White**. For example, **-4R** for a red lens.
- ❸ Line and Load Side Protective Modules are standard on 500...1000 A units.
- ❹ Three-pole thermal overload for Bulletin 150 enclosed controllers only. Overload is standard on Bulletins 152 and 153.
- ❺ Three-pole thermal overload does not include heater elements.
- ❻ External Overload Relay Reset is available with Bulletins 152, 153, and enclosed Bulletin 150 devices with overload option only.
- ❼ To order a non-combination or combination enclosed controller with an isolation contactor, add the letter "B" to the bulletin prefix. See pages 7-29...7-30. Bulletin 100 contactors are used through 600 A. Enclosure dimensions are subject to change. Consult factory for dimensions.

Option	Description	Cat. No. Modification
Reversing Contactor	Reversing Contactor	❶
NEMA Bypass Contactor ❷	NEMA Bypass for 24...97 A units	-NB
	NEMA Bypass for 135...180 A units	
	NEMA Bypass for 240 A unit	
	NEMA Bypass for 360 A unit	
	NEMA Bypass for 500 A unit	
	NEMA Bypass for 650 A unit	
NEMA Isolation Contactor ❷	NEMA Bypass for 24...97 A units	-NI
	NEMA Bypass for 135...180 A units	
	NEMA Bypass for 240 A unit	
	NEMA Bypass for 360 A unit	
	NEMA Bypass for 500 A unit	
	NEMA Bypass for 650 A unit	
Power Factor Correction Capacitors ❸	2 kVAR	-PFCC❹
	2.5 kVAR	
	3 kVAR	
	4 kVAR	
	5 kVAR	
	6 kVAR	
	7 kVAR	
	7.5 kVAR	
	8 kVAR	
	9 kVAR	
	10 kVAR	
	11 kVAR	
	12.5 kVAR	
	14 kVAR	
	15 kVAR	
	16 kVAR	
	17.5 kVAR	
	18 kVAR	
	20 kVAR	
	22.5 kVAR	
	25 kVAR	
	27.5 kVAR	
	30 kVAR	
	32.5 kVAR	
	35 kVAR	
	37.5 kVAR	
	40 kVAR	
	42.5 kVAR	
	45 kVAR	
	47.5 kVAR	
	50 kVAR	

❶ To order a non-combination or combination enclosed controller with a reversing contactor, add an "R" to the bulletin prefix. See pages 7-29...7-30. Bulletin 104 contactors are used through 500 A @ 480V. Enclosure dimensions are subject to change. Consult factory for dimensions.

❷ 720, 850, 1000 A units currently use a NEMA Contactor.

❸ Power Factor Correction Capacitor to include Power Capacitors with 3-phase Class J Time-Delay Fusing and appropriately sized contactor.

❹ To order Power Factor Correction Capacitors indicate kVAR rating. For example: -PFCC30kVAR.

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Option	Description	Cat. No. Modification
Power Factor Correction Contactor ❶	Power Factor Correction Capacitor Contactor	-PFCCC
SCR Fusing	Fast acting current limiting SCR fusing for 24 A unit	-SCR
	Fast acting current limiting SCR fusing for 35 A unit	
	Fast acting current limiting SCR fusing for 54 A unit	
	Fast acting current limiting SCR fusing for 97...135 A units	
	Fast acting current limiting SCR fusing for 180 A unit	
	Fast acting current limiting SCR fusing for 240 A unit	
	Fast acting current limiting SCR fusing for 360 A unit	
	Fast acting current limiting SCR fusing for 500 A unit	
	Fast acting current limiting SCR fusing for 650...720 A units	
	Fast acting current limiting SCR fusing for 850 A unit	
	Fast acting current limiting SCR fusing for 1000 A unit	
Panel Board Type Ammeter	Single-phase panel board type ammeter for 24 A units	-85AA
	Single-phase panel board type ammeter for 35...97 A units	
	Single-phase panel board type ammeter for 135...240 A units	
	Single-phase panel board type ammeter for 360 A units	
	Single-phase panel board type ammeter for 500...650 A units	
	Single-phase panel board type ammeter for 720...1000 A units	
	Panel board type ammeter with switch for monitoring all three phases	-86AA
Panel Board Type Voltmeter	Single-phase panel board type voltmeter	-85AV
	Panel board type voltmeter with switch for monitoring all three phases	-86AV
Elapsed Time Meter	Elapsed time meter	-85T
Unwired Control Relays ❷	Bulletin 700CF 4-pole relay — 2 N.O. and 2 N.C.	-89F22
	Bulletin 700CF 4-pole relay — 3 N.O. and 1 N.C.	-89F31
	Bulletin 700CF 4-pole relay — 4 N.O.	-89F40
Control Relays	On-Delay	-89FOD
	Off-Delay	-89FOFD
Auxiliary Contacts ❸	N.O. auxiliary contacts for 24...240 A units	-90
	N.O. auxiliary contacts for 360...1000 A units	
	N.C. auxiliary contacts for 24...240 A units	-91
	N.C. auxiliary contacts for 360...1000 A units	
	1 N.O. ... 1 N.C. auxiliary contacts for 24...240 A units	-901
	1 N.O. ... 1 N.C. auxiliary contacts for 360...1000 A units	
Disconnect Auxiliary ❹	N.O. disconnect auxiliary mounted on operating mechanism	-98
	N.C. disconnect auxiliary mounted on operating mechanism	-99
Circuit Breaker	Internal N.O. circuit breaker auxiliary	-98X
Disconnect Auxiliary ❺	Internal N.C. circuit breaker auxiliary	-99X
High Interrupting Circuit Breaker	High Interrupting Circuit Breaker for 24...54 A units	-HICB
	High Interrupting Circuit Breaker for 97...180 A units	
	High Interrupting Circuit Breaker for 240 A units	
	High Interrupting Circuit Breaker for 360 A units	
	High Interrupting Circuit Breaker for 500 A units	
	High Interrupting Circuit Breaker for 650...720 A units	
	High Interrupting Circuit Breaker for 850...1000 A units	

- ❶ Only the contactor will be provided. For motor horsepower above 500 consult factory for sizing and pricing.
❷ Instantaneous auxiliary contacts on Bulletin 700CF relays are non-convertible.
❸ Available only with enclosed Bulletin 150, 152 and 153 devices with an isolation contactor or bypass contactor. Maximum of four (4) auxiliary contacts.
❹ Available only with Bulletin 152 and 153 devices. Maximum of two (2) disconnect auxiliaries.
❺ Available only with Bulletin 153 devices. Maximum of two (2) disconnect auxiliaries.

Option	Description	Cat. No. Modification
Shunt Trip ❶	Circuit Breaker Shunt Trip for 24...54 A units	-754
	Circuit Breaker Shunt Trip for 97...135 A units	
	Circuit Breaker Shunt Trip for 180...240 A units	
	Circuit Breaker Shunt Trip for 360...500 A units	
	Circuit Breaker Shunt Trip for 650...850 A units	
	Circuit Breaker Shunt Trip for 1000 A units	
Additional Load Circuit Breakers	Additional load circuit breakers to be installed in panel. Customer is to stipulate size and quantity.	-ALCB
Line Voltage Monitor	Bulletin 813S Line Voltage Monitor	-813S
Thermistor Protection Relay	Bulletin 817 Thermistor Protection Relay	-817
Smart Motor Manager	Bulletin 825 Smart Motor Manager and Bulletin 825 Converter Module	-SMM
IQ1000 Protective Relay	Cutler-Hammer IQ1000 Protective Relay	-IQ1000
Multilin 269 Plus	GE Multilin 269 Plus Protective Relay	-269PLUS
Transducer Output	4...20 mA output signal proportional to 1...100% motor FLC	-TO
Ground Fault Protection	Bulletin 1409 Arcing Ground Fault Relay and Sensor for applications up to 400 HP	-GFP
Motor Winding Heater ❷	Bulletin 1410 Motor Winding Heater for applications up to 600 HP	-MWH
Lightning Arrestor	Lightning Surge Protection	-LA
Strip Heater	Cabinet Strip Heater with Thermostat	-SH
Service Entrance Label	Service Entrance Label	-SEL
U.L. Label	U.L. Label	-UL
Unwired Terminal Blocks	Panel Mounted Unwired Terminal Blocks 6 or 12 position	-TB6
		-TB12
Panel Mount	Components mounted on enclosure mounting plate only	-PM
Specified Panel Dimensions	Customer is to stipulate panel dimensions	-SPD
Enclosure Color (Custom Paint)	Customer is to stipulate paint color for enclosure	-EC
Enclosure Shock Mounts	Ship Board — MIL-S-901D	-SM
Enclosure Type NEMA 3R ❸	Enclosure Type NEMA 3R Non-Combination	
Enclosure Type NEMA 3R ❹	Enclosure Type NEMA 3R Combination	
Enclosure Type NEMA 4X Stainless Steel ❺	Enclosure Type NEMA 4X Stainless Steel Non-Combination	
Enclosure Type NEMA 4X Stainless Steel ❻	Enclosure Type NEMA 4X Stainless Steel Combination	
Air Conditioning	AC Unit mounted on enclosure	-AC
Wiring Diagrams	AutoCad Drawing of panel wiring	-WD
Print Approval ❽	Customer Requested Print Approval Drawings	-PA

❶ Available only with Bulletin 153 devices.

❷ Requires an isolation contactor on the output of the SMC.

❸ To order a non-combination or combination enclosed controller with a NEMA 3R enclosure, add an "H" to the enclosure type prefix. Example: **Cat. No. 152H-B240HBD-54**. See pages 7-29...7-30. Enclosure dimensions are subject to change. Consult factory for dimensions. Enclosure price adder is to be added to NEMA 12 non-combination or combination price.

❹ To order a non-combination or combination enclosed controller with a NEMA 4X stainless steel enclosure, add an "S" to the enclosure type prefix. Example: **Cat. No 152H-B240SBD-54**. See pages 7-29...7-30. Enclosure dimensions are subject to change. Consult factory for dimensions.

❺ Order to be released to manufacturing upon return of signed approval drawing.

Electrical Ratings								
Cat. No.	150-A24...	150-A35...	150-A54...	150-A97...	150-A135...	150-A180...	150-A240...	
Rated Operating Voltage		200...480V or 200...600V						
Rated Operating Current (A)		24	35	54	97	135	180	240
Maximum Heat Dissipation (Watts)		110	150	200	285	490	660	935
Cable Size ❶	Power Terminals	2.5...25 mm ² #14...#4 AWG		16...120 mm ² #6...#4/0 AWG		16...120 mm ² #6...#4/0 AWG		
	Control Terminals	1.5...4.0 mm ² (#18...#12 AWG) all sizes						
Thermal Capacity		NEMA MG1 IEC 34 (S1)						
Control Module Voltage		Single Phase 100...240V 50/60 Hz						
	Power Requirements	30 VA	30 VA	30 VA	30 VA	30 VA	30 VA	30 VA
	Heatsink Fan	—	—	—	45 VA	45 VA	45 VA	45 VA
Auxiliary Contact Rating		N.O. 240V AC Max., 24V Min., Make 4700 VA, Break 470 VA N.C. 240V AC Max., 24V Min., Make 2750 VA, Break 275 VA						
Electrical Design Specifications/Test Requirements								
Repetitive Peak Inverse Voltage Rating		(208...480V) 1400V (208...600V) 1600V						
Selectable Across-the-Line Starting		1/4 second						
Selectable Soft Start Times		2, 5, 10, 20, 25 & 30 seconds						
Stall Trip Time Corresponding to Start Times		5, 7, 10, 20, 25 & 30 seconds						
Selectable Kickstart Times		0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0						
Selectable Current Limit Starting		50...500% of Full Load Current						
Selectable Soft Stop Times		2, 5, 10, 20, 25, 30, 40, 50, 60 seconds						
Selectable Pump Starting Times		2, 5, 10, 20, 25, 30 seconds						
Selectable Pump Stopping Times		2, 4, 5, 10, 20, 25, 30, 40, 50, 60, 80, 100, 120 seconds						
Selectable Preset Slow Speed		7% & 15% forward speed; 10% or 20% reverse speed; 50...450% of Full Load Current						
Selectable SMB Smart Motor Braking		150...400% of Full Load Current						
Selectable Accu-Stop		150...400% of Full Load Current						
Selectable Slow Speed with Braking		150...400% of Full Load Current						
Noise & RF Immunity		Surge Transient Peak 3000V. Showering Arc 1500V						
DV/DT Protection		RC Snubber Network						
Transient Protection		Metal Oxide Varistors: (220 Joules @ 24 A...360 A; 220 Joules @ 480V 500 A...1000 A & 300 Joules @ 600V 500 A...1000 A)						

Fuse Clip Sizing and Type for Fusible Combination Controllers ②③

Horsepower @ 480V	Fuse Clip Size/Type	Fuse Size Range (A)	Horsepower @ 480V	Fuse Clip Size/Type	Fuse Size Range (A)
15	30 A/Class R	0...30	200	400 A/Class R	201...400
20	60 A/Class R	31...60	250	400 A/Class R	401...600
25	60 A/Class R	31...60	300	600 A/Class R	401...600
30	60 A/Class R	31...60	350	1200 A/Class L	601...1600
40	100 A/Class R	61...100	400	1200 A/Class L	601...1600
50	100 A/Class R	61...100	450	1200 A/Class L	601...1600
60	200 A/Class R	101...200	500	1200 A/Class L	601...1600
75	200 A/Class R	101...200	600	1200 A/Class L	601...1600
100	200 A/Class R	101...200	700	1200 A/Class L	601...1600
125	400 A/Class R	101...200	800	1200 A/Class L	601...1600
150	400 A/Class R	201...400			

Circuit Breaker Sizes and Rating Plug Sizes

Horsepower @ 480V	Circuit Breaker Size (A)/ Rating Plug Size (A)	Interrupting Rating in Symmetrical Amps @ 480V	Horsepower @ 480V	Circuit Breaker Size (A)/ Rating Plug Size (A)	Interrupting Rating in Symmetrical Amps @ 480V
15	150/50	14,000	200	400/400	35,000
20	150/50	14,000	250	600/500	35,000
25	150/60	14,000	300	600/600	35,000
30	150/70	14,000	350	800/800	35,000
40	150/100	14,000	400	800/800	50,000
50	150/125	14,000	450	1200/1000	50,000
60	250/150	25,000	500	1200/1200	50,000
75	250/175	25,000	600	1200/1200	50,000
100	250/225	25,000	700	2000/1600	65,000
125	250/250	25,000	800	2000/2000	65,000
150	400/300	35,000			

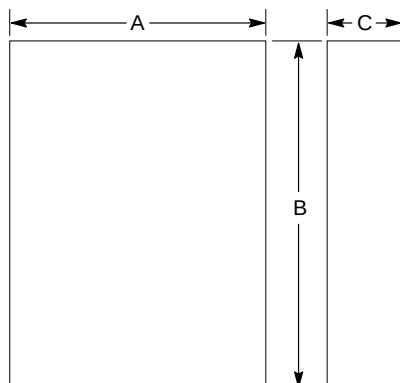
- ① 97...1000 A units require addition of appropriate lugs.
 ② Consult NEC Handbook for proper fuse sizing guidelines.
 ③ Optional fuse clip sizes and types are available upon request. Consult your local Allen-Bradley Sales Office.

Functional Design Specifications									
Cat. No.			150-A24...	150-A35...	150-A54...	150-A97...	150-A135...	150-A180...	150-A240...
Standard Features	Set-up	Wiring Adjustments	The SMC PLUS controller may be wired with or without a motor starter. The SMC PLUS controller is configured with DIP switches and rotary digital switches.						
	Starting	3 modes Protection	Soft Start with Kickstart, Current Limit, Full Voltage in one unit. The controller has pre-start and run protection from phase loss and shorted SCRs.						
		Status and Diagnostic Indicators	Dual purpose LEDs are provided to indicate the status of the unit. The LEDs indicate Control Voltage Present, Running Mode, Starting Mode, Stopping Mode, Energy Saver, Start Fault, Stalled Motor, Temperature Fault and Line Fault.						
	Running	Protection	Stall protection available during starting and run condition for additional motor protection.						
		Energy Level	Built-in energy saver available for low load conditions.						
	Set-up	Wiring	2- and 3-wire control for a wide variety of applications.						
Auxiliary Contacts			Configurable auxiliary contacts provided for either up-to-speed or instantaneous operation. 1 N.O. – 1 N.C. auxiliary contact provided as standard.						
Optional Features	Soft Stop		Extended coast to rest to minimize load shifting. Ramp down time is adjustable from 2 to 60 seconds.						
	Pump Control		Reduces surges in a pumping system during starting and stopping. Starting time is adjustable from 2...30 seconds. Stopping time is adjustable from 2...120 seconds.						
	Preset Slow Speed		Slow speed for positioning material. The Preset Slow Speed can be set for Low (7% of base speed), High (15% of base speed), Reverse Low (10% of base speed) or Reverse High (20% of base speed). Slow speed current can be adjusted to 50...450% of full load current.						
	SMB Smart Motor Braking		Provides motor braking for applications which require the motor to stop quickly. Braking current is adjustable from 150...400% of full load current.						
	Accu-Stop		Combines Smart Motor Braking and Preset Slow Speed. Braking current is adjustable from 150...400% of full load current. Slow speed can be set for either Low (7% of base speed) or High (15% of base speed).						
	Slow Speed with Braking		Combines Smart Motor Braking and Preset Slow Speed for applications that require slow set-up speeds and braking to a stop.						
Mechanical Design Specifications/Test Requirements									
Resistance to Vibration			2.5 G for 60 minutes						
Resistance to Shock			30 G for 11 mSecs						
Construction			Power Poles:	Thermoset Moldings 24...135 A Heatsink hockey puck thyristor 180...1000 A					
			Control Modules:	Thermoset & Thermoplastic Moldings					
			Metal Parts:	Anodized Aluminum, Plated Brass, Copper or Painted Steel					
Terminals			Power Terminals:	Up to -A54: 6.0 mm hole with clamp screw -A97 & -A135 Line & Load: One 11.5 mm (0.453) dia. hole each -A180, -A240 & -A360 Line & Load: One 10.5 mm (0.413) dia. hole each -A500 Line & Load: Two 13.5 mm (0.531) dia. hole each -A650 & -A720 Line & Load: Three 13.1 mm (0.515) dia. hole each -A850 & -A1000 Line & Load: Six 13.1 mm (0.515) dia. hole each					
			Control Terminals:	UNC 6-32 Screw with self-tilting clamp plate					
			Power Terminal Marking:	NEMA, CENELEC EN50 012					
Environmental									
Temperature	Operating Storage		0...+50°C (+32...+122°F) -40...+85°C (-40...+185°F)						
Altitude			2000 meters (6560 feet)						
Humidity			5...95% Relative Humidity (non-condensing)						

Electrical Ratings							
Cat. No.		150-A360...	150-A500...	150-A650...	150-A720...	150-A850...	150-A1000...
Rated Operating Voltage		200V...480V or 200V...600V					
Rated Operating Current	(A)	360	500	650	720	850	1000
Maximum Heat Dissipation	(Watts)	1170	1400	2025	2250	2400	2760
Cable Size	Power Terminals	2x16...120 mm ² #6...#4/0 AWG		25 mm ² ...240 mm ² #4...#500 MCM		50...240 mm ² 1/0...500 MCM	
	Control Terminals	1.5...4.0 mm ² (#18...#12 AWG) all sizes					
Thermal Capacity		NEMA MG1 IEC 34 (S1)					
Control Module Voltage		110...120V 50/60 Hz or 220...240V 50/60 Hz					
	Power Requirements	30 VA	30 VA	30 VA	30 VA	30 VA	30 VA
	Heatsink Fan	45 VA	145 VA	320 VA	320 VA	320 VA	320 VA
Auxiliary Contact Rating		N.O. 240V AC Max., 24V Min., Make 4700 VA, Break 470 VA N.O. 240V AC Max., 24V Min., Make 2750 VA, Break 275 VA					
Electrical Design Specifications/Test Requirements							
Repetitive Peak Inverse Voltage Rating		480V...1400V 600V...1600V					
Selectable Across-the-Line Starting		1/4 second					
Selectable Soft Start Times		2, 5, 10, 20, 25 & 30 seconds					
Stall trip time corresponding to Start Times		5, 7, 10, 20, 25 & 30 seconds					
Selectable Kickstart Times		0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0					
Selectable Current Limit Starting		50...500% of Full Load Current					
Selectable Soft Stop Times		2, 5, 10, 20, 25, 30, 40, 50, 60 seconds					
Selectable Pump Starting Times		2, 5, 10, 20, 25, 30 seconds					
Selectable Pump Stopping Times		2, 4, 5, 10, 20, 25, 30, 40, 50, 60, 80, 100, 120 seconds					
Selectable Preset Slow Speed		7% & 15% forward speed; 10% or 20% reverse speed; 5%...450% of Full Load Current					
Selectable SMB Smart Motor Braking		150...400% of Full Load Current					
Selectable Accu-Stop		150...400% of Full Load Current					
Selectable Slow Speed with Braking		150...400% of Full Load Current					
Noise & RF Immunity		Surge Transient Peak 3400V. Showering Arc 1500V					
DV/DT Protection		RC Snubber Network					
Transient Protection		Metal Oxide Varistors: (220 Joules @ 24 A...360 A; 220 Joules @ 480V 500...1000 A & 300 Joules @ 600V 500...1000 A)					
Mechanical Design Specifications/Test Requirements							
Resistance to Vibration		2.5 G for 60 minutes					
Resistance to Shock		30 G for 11 mSecs					
Construction		Power Poles: Thermoset Moldings 24...135 A Heatsink hockey puck thyristor 180...1000 A Control Modules: Thermoset & Thermoplastic Moldings Metal Parts: Anodized Aluminum, Plated Brass, Copper or Painted Steel					
Terminals		Power Terminals: Up to -A54: 6.0 mm hole with clamp screw -A97 & -A135 Line & Load: One 11.5 mm (0.453) dia. hole each -A180, -A240 & -A360 Line & Load: One 10.5 mm (0.413) dia. hole each -A500 Line & Load: Two 13.5 mm (0.531) dia. hole each -A650 & -A720 Line & Load: Three 13.1 mm (0.515) dia. hole each -A850 & -A1000 Line & Load: Six 13.1 mm (0.515) dia. hole each Control Terminals: UNC 6-32 Screw with self-tilting clamp plate Power Terminal Marking: NEMA, CENELEC EN50 012					
Environmental							
Temperature	Operating Storage	0...+50°C (+32...+122°F) -40...+85°C (-40...185°F)					
Altitude		2000 meters (6560 feet)					
Humidity		5...95% Relative Humidity (non-condensing)					

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

Enclosed Type Controllers



Enclosed Type Controllers ①②

Dimension Code	Dimensions in Millimeters (Inches)		
	A Width	B Height	C Depth
	Non-Combination Controller		
Q	406 (16)	609 (24)	228 (9)
R	610 (24)	762 (30)	254 (10)
S	610 (24)	762 (30)	305 (12)
T	762 (30)	915 (36)	305 (12)
U	915 (36)	1219 (48)	305 (12)
V	965 (38)	1524 (60)	305 (12)
W	635 (25)	2286 (90)	508 (20)
X	889 (35)	2286 (90)	508 (20)
Y	1397 (55)	2286 (90)	508 (20)
Z	1524 (60)	2286 (90)	508 (20)
Z1	1778 (70)	2286 (90)	508 (20)

Open Type Controllers

Controller	Dimensions in Millimeters (Inches)			Approx. Ship Wt. kg (lbs)
	Width	Height	Depth	
24 A	155 (6-1/16)	180 (7-1/8)	160 (6-1/4)	4.5 (10)
35 A	215 (8-7/16)	240 (9-1/2)	170 (6-5/8)	6.8 (15)
54 A	245 (9-5/8)	290 (11-7/16)	200 (7-13/16)	11.3 (25)
97 A	248 (9-3/4)	336 (13-1/4)	230 (9-1/16)	10.4 (23)
135 A	248 (9-3/4)	336 (13-1/4)	230 (9-1/16)	11.8 (26)
180 A	273 (10-3/4)	560 (22-1/16)	268 (10-9/16)	25 (55)
240 A	273 (10-3/4)	560 (22-1/16)	268 (10-9/16)	30 (65)
360 A	273 (10-3/4)	560 (22-1/16)	268 (10-9/16)	30 (65)
500 A	508 (20)	609.6 (24)	304.8 (12)	40.8 (90)

Combination Controllers with Fusible Disconnect

S	559 (22)	609.6 (24)	203.2 (8)
T	813 (32)	914 (36)	304.8 (12)
U & V	965 (38)	1219 (48)	304.8 (12)
W	965 (38)	1524 (60)	304.8 (12)
X1	762 (30)	2286 (90)	508 (20)
X2	965 (38)	1524 (60)	356 (14)
Y1	1143 (45)	2286 (90)	508 (20)
Y2	1270 (50)	2286 (90)	508 (20)
Z1	1397 (55)	2286 (90)	508 (20)
Z2	1778 (70)	2286 (90)	508 (20)
Z3	2667 (105)	2286 (90)	508 (20)

Combination Controllers with Circuit Breaker

S	559 (22)	609.6 (24)	203.2 (8)
T & U	813 (32)	914 (36)	304.8 (12)
V	965 (38)	1219 (48)	304.8 (12)
W	965 (38)	1524 (60)	304.8 (12)
X	762 (30)	2286 (90)	508 (20)
Y1	889 (35)	2286 (90)	508 (20)
Y2	1397 (55)	2286 (90)	508 (20)
Y3	2667 (105)	2286 (90)	508 (20)
Z	1778 (70)	2286 (90)	508 (20)

① All dimensions are subject to change.

② Any options added to enclosed controllers may change size of enclosure. Consult your local Allen-Bradley Sales Office.