

Catalog
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Heavy industrial power applications

Motor contactors and starters



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1 - Heavy Industrial Contactors and Starters, Type S, NEMA Style

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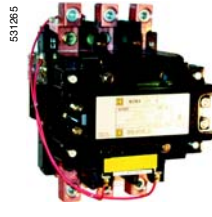
Applications

Type S NEMA Contactors and Starters



NEMA Size	00			0			1			2			
Continuous current ratings	9 A			18 A			27 A			45 A			
Motor	200 V	1.5 hp/1.1 kW			3 hp/2.2 kW			7.5 hp/5.5 kW			10 hp/7.5 kW		
	230 V	1.5 hp/1.1 kW			3 hp/2.2 kW			7.5 hp/5.5 kW			15 hp/11 kW		
	460 V	2 hp/1.5 kW			5 hp/3.7 kW			10 hp/7.5 kW			25 hp/18.5 kW		
	575 V	2 hp/1.5 kW			5 hp/3.7 kW			10 hp/7.5 kW			25 hp/18.5 kW		
Enclosures	Open			Open			Open			Open			
- NEMA 1: General purpose	NEMA 1			NEMA 1			NEMA 1			NEMA 1			
- NEMA 12: Dust-tight and drip-tight for industrial use	NEMA 12			NEMA 12			NEMA 12			NEMA 12			
Contactors	8502 SAO	8502 SAG	8502 SBA	8502 SBO	8502 SBG	8502 SBA	8502 SCO	8502 SCG	8502 SCA	8502 SDO	8502 SDG	8502 SDA	
Pages	1/6			1/6			1/6			1/6			
Reversing contactors	8702 SAO	8702 SAG	8702 SBA	8702 SBO	8702 SBG	8702 SBA	8702 SCO	8702 SCG	8702 SCA	8702 SDO	8702 SDG	8702 SDA	
Pages	1/7			1/7			1/7			1/7			
Starters	8536 SAO	8536 SAG	8536 SBA	8536 SBO	8536 SBG	8536 SBA	8536 SCO	8536 SCG	8536 SCA	8536 SDO	8536 SDG	8536 SDA	
Pages	1/8			1/8			1/8			1/8			
Reversing starters	8736 SAO	8736 SAG	8736 SBA	8736 SBO	8736 SBG	8736 SBA	8736 SCO	8736 SCG	8736 SCA	8736 SDO	8736 SDG	8736 SDA	
Pages	1/9			1/9			1/9			1/9			

Type S NEMA Contactors and Starters

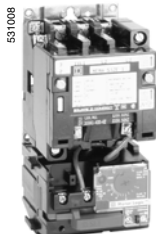


3	4	5	6	7
90 A	135 A	270 A	540 A	810 A
25 hp/18.5 kW 30 hp/22 kW 50 hp/37 kW 50 hp/37 kW	40 hp/30 kW 50 hp/37 kW 100 hp/75 kW 100 hp/75 kW	75 hp/55 kW 100 hp/75 kW 200 hp/150 kW 200 hp/150 kW	150 hp/110 kW 200 hp/150 kW 400 hp/300 kW 400 hp/300 kW	— 300 hp/220 kW 600 hp/450 kW 600 hp/450 kW
Open	Open	Open	Open	Open
NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1
NEMA 12	NEMA 12	NEMA 12	NEMA 12	NEMA 12
8502 SEO	8502 SFO	8502 SGO	8502 SHO	8502 SJO
8502 SEG	8502 SFG	8502 SGG	8502 SHG	8502 SJG
8502 SEA	8502 SFA	8502 SGA	8502 SHA	8502 SJA
1/6	1/6	1/6	1/6	1/6
8702 SEO	8702 SFO	8702 SGO	8702 SHO	8702 SJO
8702 SEG	8702 SFG	8702 SGG	8702 SHG	8702 SJG
8702 SEA	8702 SFA	8702 SGA	8702 SHA	8702 SJA
1/7	1/7	1/7	1/7	1/7
8536 SEO	8536 SFO	8536 SGO	8536 SHO	8536 SJO
8536 SEG	8536 SFG	8536 SGG	8536 SHG	8536 SJG
8536 SEA	8536 SFA	8536 SGA	8536 SHA	8536 SJA
1/8	1/8	1/8	1/8	1/8
8736 SEO	8736 SFO	8736 SGO	8736 SHO	8736 SJO
8736 SEG	8736 SFG	8736 SGG	8736 SHG	8736 SJG
8736 SEA	8736 SFA	8736 SGA	8736 SHA	8736 SJA
1/9	1/9	1/9	1/9	1/9

General



Type SCO 2
Size 1, 3-pole contactor



Starter with
Motor Logic
solid-state overload relay



Size 00, 0, 1
reversing contactor
(horizontal type)



Reversing starter with
Motor Logic
solid-state overload relay
(vertical type)

Full-voltage contactors

Class 8502 Type S magnetic contactors are used to switch heating loads, capacitors, transformers and electric motors where overload protection is provided separately. Class 8502 contactors are available in NEMA Sizes 00 to 7. Type S contactors are designed for operation up to ~ 600 V, 50 to 60 Hz.

Full-voltage starters

Class 8536 Type S magnetic starters are used for full-voltage starting and stopping of a.c. squirrel-cage motors. Motor overload protection is provided via solid-state overload relays. Type S starters are available in NEMA Sizes 00 to 7 and are designed for operation up to ~ 600 V, 50 to 60 Hz.

Full-voltage reversing contactors

Class 8702 Type S reversing magnetic contactors are used for starting, stopping and reversing a.c. motors where overload protection is provided separately. Class 8702 reversing contactors consist of two Class 8502 contactors mechanically and electrically interlocked. Open-type devices, Sizes 0 to 5, are available in either horizontal or vertical arrangements. Sizes 00, 6 and 7 are available as horizontal only. Enclosed devices Size 00 to 7 use horizontally arranged components. Type S reversing contactors are designed for operation up to ~ 600 V, 50 to 60 Hz.

Full-voltage reversing starters

Class 8736 Type S reversing magnetic starters are used for full-voltage starting, stopping and reversing of a.c. squirrel-cage motors. Class 8736 starters consist of one Class 8502 contactor and one Class 8536 starter mechanically and electrically interlocked. Open-type devices, Sizes 0 to 5, are available in either horizontal or vertical arrangements. Sizes 00, 6 and 7 are available as horizontal only. Enclosed devices use horizontally arranged components. Type S starters are designed for operation up to ~ 600 V, 50 to 60 Hz.

Characteristics

Environment

Class			8502, 8536, 8702, 8736									
Size			00	0	1	2	3	4	5	6	7	
Rated insulation voltage												
Conforming to UL, CSA		V	600									
Rated impulse withstand voltage			kV	5					10		18	
Conforming to standards			NEMA ICS-1, ICS-2, UL 508									
Product certifications												
Type S magnetic contactors and starters	UL	Yes										
	CSA	Yes										
	C €	Yes						No				
Ambient air temperature around the device	Storage	°C	0...40									
	Operation	°C	0...40									
Maximum operating altitude	Without derating	m	1300									
Operating position (1)	Without derating		± 90°							Vertical		

(1) $\pm 90^\circ$ degrees possible in relation to normal vertical mounting plane.

Characteristics (continued)**Pole characteristics**

Class		8502, 8536, 8702, 8736									
Size		00	0	1	2	3	4	5	6	7	
Number of poles	3-pole devices	3									
Rated operational voltage	Up to	V 600									
Frequency limits	Of the operational current	Hz 50/60									
Conventional rated thermal current		A 9	18	27	45	90	135	270	540	810	
Rated making capacity	At 600 V	10 x rated current									
Rated breaking capacity	At 600 V	10 x rated current									
Permissible short time rating	Service limit current	A 11	21	32	52	104	156	311	621	932	

a.c. control circuit characteristics

Class			8502, 8536, 8702, 8736								
Size			00	0	1	2	3	4	5	6	7
Rated control circuit voltage		V	600								
Average consumption 50 Hz	Inrush	VA	N/A	232	232	296	676	1260	1300	1495 (1)	–
	Sealed	VA	N/A	26	26	36	47	89	14	56 (1)	–
Average consumption 60 Hz	Inrush	VA	165	245	245	311	700	1185	1300	1780 (1)	1960 (1)
	Sealed	VA	33	27	27	37	46	85	14	48 (1)	59 (1)
Heat dissipation 50/60Hz	50 Hz	W	N/A	7.7	7.7	12	15	23.4	13	27	–
	60 Hz	W	6	7.8	7.8	14	14	22	13	32	36
Operating time (2)	Closing "C"	ms	9.1 - 23.2	8.4 - 20.1	8.4 - 20.1	14.6 - 27.6	17.3 - 32.3	13.0 - 43.9	40 - 60	57.0 - 74.0	43.8
	Opening "O"	ms	5.29 - 15.9	2.4 - 15.9	2.4 - 15.9	16.3 - 22.8	9.6 - 18.7	11.2 - 21.7	50 - 75	28.3 - 31.8	54.3
Mechanical life	In millions of op. cycles		6	10	10	10	5	3	2	1.5	0.5
Maximum operating rate (3)	In op. cycles per hour		9000	9000	9000	5400	4500	4500	180	180	180

Power circuit connections (connection via lug)

Type of lug		Screw clamp terminal			Box lug			Parallel groove		
Wire sizes (Min./max.)	Solid or stranded copper wire (AWG)	#14–#8	#14–#8	#14–#8	#14–#4	#14–#1/0	#8–250 kcmil	#4–500 kcmil	1 or 2, 250–500 kcmil per phase	1 to 4, 250–500 kcmil per phase

Control circuit connections (connection via lug)

Type of lug		Screw clamp terminal
Wire sizes (Min./max.)	Solid or stranded copper wire (AWG)	#16–#12

(1) Size 6 and 7 have a d.c. coil. The values shown are for the a.c. input to the d.c. power supply that provides power to the coil.

(2) The closing time "C" is measured from the moment that the coil supply is switched on to the initial contact of the main poles. The opening time "O" is measured from the moment that the coil supply is switched off to the moment that the main poles separate.

(3) Operating cycles are without a load (mechanical life).



8502 SCO 2 ●●●

3-pole contactors

NEMA Size	Standard power ratings of 3-phase motors 50/60 Hz								Contin- uous current ratings	Enclosure type <i>(1)</i>	Basic reference Add code indicating control circuit voltage <i>(2)</i> and optional variants <i>(3)</i>	Weight
	Motor volts											
	200 V		230 V		460 V		575 V					
	hp	kW	hp	kW	hp	kW	hp	kW	A			kg (lb)
00	1.5	1.1	1.5	1.1	2	1.5	2	1.5	9	Open	8502 SAO 12 ●●●	2 (4)
										NEMA 1	8502 SAG 12 ●●●	3 (7.5)
										NEMA 12	8502 SBA 2 ●●●	7 (15)
0	3	2.2	3	2.2	5	3.7	5	3.7	18	Open	8502 SBO 2 ●●●	2 (4)
										NEMA 1	8502 SBG 2 ●●●	3 (7.5)
										NEMA 12	8502 SBA 2 ●●●	7 (15)
1	7.5	5.5	7.5	5.5	10	7.5	10	7.5	27	Open	8502 SCO 2 ●●●	2 (4)
										NEMA 1	8502 SCG 2 ●●●	3 (7.5)
										NEMA 12	8502 SCA 2 ●●●	7 (15)
2	10	7.5	15	11	25	18.5	25	18.5	45	Open	8502 SDO 2 ●●●	3 (6.75)
										NEMA 1	8502 SDG 2 ●●●	7 (14.5)
										NEMA 12	8502 SDA 2 ●●●	10 (22)
3	25	18.5	30	22	50	37	50	37	90	Open	8502 SEO 2 ●●●	6 (14)
										NEMA 1	8502 SEG 2 ●●●	15 (34)
										NEMA 12	8502 SEA 2 ●●●	29 (65)
4	40	30	50	37	100	75	100	75	135	Open	8502 SFO 2 ●●●	8 (18)
										NEMA 1	8502 SFG 2 ●●●	24 (52)
										NEMA 12	8502 SFA 2 ●●●	31 (69)
5	75	55	100	75	200	150	200	150	270	Open	8502 SGO 2 ●●●	20 (45)
										NEMA 1	8502 SGG 2 ●●●	65 (143)
										NEMA 12	8502 SGA 2 ●●●	72 (160)
6	150	110	200	150	400	300	400	300	540	Open	8502 SHO 2 ●●●	32 (80)
										NEMA 1	8502 SHG 2 ●●●	103 (226)
										NEMA 12	8502 SHA 2 ●●●	103 (228)
7	—	—	300	220	600	450	600	450	810	Open	8502 SJO 2 ●●●	61 (135)
										NEMA 1	8502 SJG 2 ●●●	154 (340)
										NEMA 12	8502 SJA 2 ●●●	196 (433)

(1) Open: no enclosure ("O").

NEMA 1: General purpose enclosure ("G").

NEMA 12: Dust-tight and drip-tight industrial-use enclosure ("A").

(2) Standard control circuit voltage:

Volts	24	110	120	208	220	240	380	440	480	550	600
50 Hz	—	V02	—	—	V03	—	V05	V06	—	V07	—
60 Hz	V01	—	V02	V08	—	V03	—	—	V06	—	V07

24 V and 120 V coils require the addition of form "S" for separate control. Example: 8502 SAO 12 V01S.

(3) For optional variants, see pages 1/10 to 1/13.

531010



8702 SAO 4 ●●●
(horizontal type)

3-pole reversing contactors

NEMA Size	Standard power ratings of 3-phase motors 50/60 Hz								Contin-uous current ratings	Enclosure type (1)	Basic reference Add code indicating control circuit voltage (2) and optional variants (3)	Weight
	Motor volts											
	200 V		230 V		460 V		575 V					
	hp	kW	hp	kW	hp	kW	hp	kW	A			kg (lb)
00	1.5	1.1	1.5	1.1	2	1.5	2	1.5	9	Open/Horizontal Type	8702 SAO 4 ●●●	5 (12)
										NEMA 1	8702 SAG 4 ●●●	7 (16)
										NEMA 12	8702 SBA 4 ●●●	10 (23)
0	3	2.2	3	2.2	5	3.7	5	3.7	18	Open/Vertical Type	8702 SBO 12 ●●●	5 (12)
										Open/Horizontal Type	8702 SBO 4 ●●●	5 (12)
										NEMA 1	8702 SBG 4 ●●●	7 (16)
										NEMA 12	8702 SBA 4 ●●●	10 (23)
1	7.5	5.5	7.5	5.5	10	7.5	10	7.5	27	Open/Vertical Type	8702 SCO 7 ●●●	5 (12)
										Open/Horizontal Type	8702 SCO 8 ●●●	5 (12)
										NEMA 1	8702 SCG 8 ●●●	7 (16)
										NEMA 12	8702 SCA 4 ●●●	10 (23)
2	10	7.5	15	11	25	18.5	25	18.5	45	Open/Vertical Type	8702 SDO 1 ●●●	7 (16)
										Open/Horizontal Type	8702 SDO 2 ●●●	7 (16)
										NEMA 1	8702 SDG 2 ●●●	11 (24)
										NEMA 12	8702 SDA 1 ●●●	14 (31)
3	25	18.5	30	22	50	37	50	37	90	Open/Vertical Type	8702 SEO 1 ●●●	15 (35)
										Open/Horizontal Type	8702 SEO 2 ●●●	15 (35)
										NEMA 1	8702 SEG 2 ●●●	43 (95)
										NEMA 12	8702 SEA 1 ●●●	44 (96)
4	40	30	50	37	100	75	100	75	135	Open/Vertical Type	8702 SFO 1 ●●●	20 (45)
										Open/Horizontal Type	8702 SFO 3 ●●●	20 (45)
										NEMA 1	8702 SFG 3 ●●●	43 (95)
										NEMA 12	8702 SFA 1 ●●●	44 (96)
5	75	55	100	75	200	150	200	150	270	Open/Vertical Type	8702 SGO 1 ●●●	44 (98)
										Open/Horizontal Type	8702 SGO 3 ●●●	44 (98)
										NEMA 1	8702 SGG 3 ●●●	135 (298)
										NEMA 12	8702 SGA 1 ●●●	137 (302)
6	150	110	200	150	400	300	400	300	540	Open/Horizontal Type	8702 SHO 1 ●●●	88 (195)
										NEMA 1	8702 SHG 1 ●●●	181 (400)
										NEMA 12	8702 SHA 1 ●●●	222 (490)
7	—	—	300	220	600	450	600	450	810	Open/Horizontal Type	8702 SJO 1 ●●●	141 (310)
										NEMA 1	8702 SJG 1 ●●●	233 (514)
										NEMA 12	8702 SJA 1 ●●●	275 (607)

(1) Open: no enclosure ("O").

NEMA 1: General purpose enclosure ("G").

NEMA 12: Dust-tight and drip-tight industrial-use enclosure ("A").

(2) Standard control circuit voltage:

Volts	24	110	120	208	220	240	380	440	480	550	600
50 Hz	—	V02	—	—	V03	—	V05	V06	—	V07	—
60 Hz	V01	—	V02	V08	—	V03	—	—	V06	—	V07

24 V and 120 V coils require the addition of form "S" for separate control. Example: 8702 SAO 4 V01S.

(3) For optional variants, see pages 1/10 to 1/13.



8536 SAO 12 V02 H20

3-pole starters

NEMA Size	Standard power ratings of 3-phase motors 50/60 Hz								Contin- uous current ratings	Enclosure type ⁽¹⁾	Basic reference Add code indicating control circuit voltage ⁽²⁾ and optional variants ⁽³⁾ and “H” code ⁽⁴⁾	Weight
	Motor volts											
	200 V		230 V		460 V		575 V					
	hp	kW	hp	kW	hp	kW	hp	kW	A			kg (lb)
00	1.5	1.1	1.5	1.1	2	1.5	2	1.5	9	Open	8536 SAO 12 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	2 (4)
										NEMA 1	8536 SAG 12 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	3 (8)
										NEMA 12	8536 SBA 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	7 (16)
0	3	2.2	3	2.2	5	3.7	5	3.7	18	Open	8536 SBO 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	2 (4)
										NEMA 1	8536 SBG 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	4 (8)
										NEMA 12	8536 SBA 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	7 (16)
1	7.5	5.5	7.5	5.5	10	7.5	10	7.5	27	Open	8536 SCO 3 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	2 (4)
										NEMA 1	8536 SCG 3 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	3 (8)
										NEMA 12	8536 SCA 3 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	7 (16)
2	10	7.5	15	11	25	18.5	25	18.5	45	Open	8536 SDO 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	3 (6.75)
										NEMA 1	8536 SDG 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	7 (15.5)
										NEMA 12	8536 SDA 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	10 (23)
3	25	18.5	30	22	50	37	50	37	90	Open	8536 SEO 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	6 (14)
										NEMA 1	8536 SEG 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	17 (37)
										NEMA 12	8536 SEA 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	31 (68)
4	40	30	50	37	100	75	100	75	135	Open	8536 SFO 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	8 (18)
										NEMA 1	8536 SFG 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	25 (56)
										NEMA 12	8536 SFA 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	33 (73)
5	75	55	100	75	200	150	200	150	270	Open	8536 SGO 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	20 (45)
										NEMA 1	8536 SGG 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	73 (160)
										NEMA 12	8536 SGA 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	80 (177)
6	150	110	200	150	400	300	400	300	540	Open	8536 SHO 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	32 (80)
										NEMA 1	8536 SHG 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	105 (231)
										NEMA 12	8536 SHA 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	106 (233)
7	—	—	300	220	600	450	600	450	810	Open	8536 SJO 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	61 (135)
										NEMA 1	8536 SJG 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	130 (287)
										NEMA 12	8536 SJA 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	140 (309)

(1) Open: no enclosure ("O").

NEMA 1: General purpose enclosure ("G").

NEMA 12: Dust-tight and drip-tight industrial-use enclosure ("A").

(2) Standard control circuit voltage:

Volts	24	110	120	208	220	240	380	440	480	550	600
50 Hz	—	V02	—	—	V03	—	V05	V06	—	V07	—
60 Hz	V01	—	V02	V08	—	V03	—	—	V06	—	V07

24 V and 120 V coils require the addition of form "S" for separate control. Example: **8536 SAO 12 V01 H10S**.

(3) For optional variants, see pages 1/10 to 1/13.

(4) To complete the "H" code for solid-state overload relays, see page 1/10.



8736 SAO 16 V02 H20
(vertical type)

3-pole reversing starters

NEMA Size	Standard power ratings of 3-phase motors 50/60 Hz								Contin- uous current ratings	Enclosure type ⁽¹⁾	Basic reference Add code indicating control circuit voltage ⁽²⁾ and optional variants ⁽³⁾ and “H” code ⁽⁴⁾	Weight	
	Motor volts												
	200 V		230 V		460 V		575 V						
	hp	kW	hp	kW	hp	kW	hp	kW	A			kg (lb)	
00	1.5	1.1	1.5	1.1	2	1.5	2	1.5	9		Open/Horizontal Type	8736 SAO 16 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	6 (13)
											NEMA 1	8736 SAG 16 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	8 (17)
											NEMA 12	8736 SBA 4 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	11 (24)
0	3	2.2	3	2.2	5	3.7	5	3.7	18		Open/Vertical Type	8736 SBO 10 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	6 (13)
											Open/Horizontal Type	8736 SBO 4 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	6 (13)
											NEMA 1	8736 SBG 4 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	8 (17)
											NEMA 12	8736 SBA 4 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	11 (24)
1	7.5	5.5	7.5	5.5	10	7.5	10	7.5	27		Open/Vertical Type	8736 SCO 7 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	6 (13)
											Open/Horizontal Type	8736 SCO 8 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	6 (13)
											NEMA 1	8736 SCG 8 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	8 (17)
											NEMA 12	8736 SCA 4 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	11 (24)
2	10	7.5	15	11	25	18.5	25	18.5	45		Open/Vertical Type	8736 SDO 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	8 (18)
											Open/Horizontal Type	8736 SDO 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	8 (18)
											NEMA 1	8736 SDG 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	11 (25)
											NEMA 12	8736 SDA 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	15 (32)
3	25	18.5	30	22	50	37	50	37	90		Open/Vertical Type	8736 SEO 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	17 (38)
											Open/Horizontal Type	8736 SEO 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	17 (38)
											NEMA 1	8736 SEG 2 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	44 (98)
											NEMA 12	8736 SEA 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	45 (99)
4	40	30	50	37	100	75	100	75	135		Open/Vertical Type	8736 SFO 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	22 (48)
											Open/Horizontal Type	8736 SFO 3 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	22 (48)
											NEMA 1	8736 SFG 3 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	44 (98)
											NEMA 12	8736 SFA 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	45 (99)
5	75	55	100	75	200	150	200	150	270		Open/Vertical Type	8736 SGO 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	52 (115)
											Open/Horizontal Type	8736 SGO 3 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	52 (115)
											NEMA 1	8736 SGG 3 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	143 (315)
											NEMA 12	8736 SGA 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	145 (319)
6	150	110	200	150	400	300	400	300	540		Open/Horizontal Type	8736 SHO 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	91 (200)
											NEMA 1	8736 SHG 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	184 (405)
											NEMA 12	8736 SHA 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	225 (495)
7	—	—	300	220	600	450	600	450	810		Open/Horizontal Type	8736 SJO 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	143 (315)
											NEMA 1	8736 SJG 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	236 (521)
											NEMA 12	8736 SJA 1 ⁽²⁾ ⁽³⁾ ⁽⁴⁾	280 (618)

(1) Open: no enclosure ("O").

NEMA 1: General purpose enclosure ("G").

NEMA 12: Dust-tight and drip-tight industrial-use enclosure ("A").

(2) Standard control circuit voltage:

Volts	24	110	120	208	220	240	380	440	480	550	600
50 Hz	—	V02	—	—	V03	—	V05	V06	—	V07	—
60 Hz	V01	—	V02	V08	—	V03	—	—	V06	—	V07

24 V and 120 V coils require the addition of form "S" for separate control. Example: 8736 SAO 16 V01 H10S.

(3) For optional variants, see pages 1/10 to 1/13.

(4) To complete the "H" code for solid-state overload relays, see page 1/10.

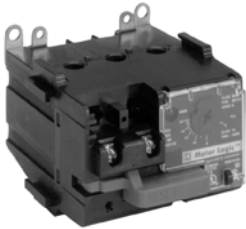
Contactors and Starters

Type S, NEMA-style

Variants – Motor Logic® Overload Relay

1

531123



H10

Variants – Motor Logic solid-state overload relays

Type	For use on	Description	Overload relay range	Suffix to the starter reference (1)	Weight kg (lb)
	Class	Enclosure Type			
Motor Logic solid state overload relays (no additional auxiliary contact)	8536, 8736	Open, NEMA 1, NEMA 12	Base unit, trip class 10	(2) H10	–
			Base unit, trip class 20	(2) H20	–
			Feature unit	(2) H30	–
Motor Logic solid state overload relays (with additional auxiliary contact)	8536, 8736	Open, NEMA 1, NEMA 12	Base unit, trip class 10	(2) H11	–
			Base unit, trip class 20	(2) H21	–
			Feature unit	(2) H31	–

(1) Example: **8536 SAO 12 V01 H10**.

(2) Standard current ranges, depending on contactor size:

Size	00	0	1	2	3	4	5	6	7
Current ranges A	3...9	6...18	9...27	15...45	30...90	40...135	90...270	180...540	270...810
								(3)	(4)

(3) Only available with feature unit.

(4) Only available with feature unit with auxiliary contact.

Associations

Contactor Size	Trip type	Motor Logic solid-state overload relays									
		No auxiliary contact	With auxiliary contact	No auxiliary contact	With auxiliary contact	No auxiliary contact	With auxiliary contact	No auxiliary contact	With auxiliary contact	No auxiliary contact	With auxiliary contact
00	Class 10	Size 00C (3–9 A) H10	H11	Size 00B (1.5–4.5 A) H108	H118						
	Class 20	H20	H21	H208	H218						
	Class 10/20 (selectable)	H30	H31	H308	H318						
0	Class 10	Size 0 (6–18 A) H10	H11	Size 00C (3–9 A) H109	H119	Size 00B (1.5–4.5 A) H108	H118				
	Class 20	H20	H21	H209	H219	H208	H218				
	Class 10/20 (selectable)	H30	H31	H309	H319	H308	H318				
1	Class 10	Size 1 (9–27 A) H10	H11	Size 0 (6–18 A) H100	H110	Size 00C (3–9 A) H109	H119	Size 00B (1.5–4.5 A) H108	H118		
	Class 20	H20	H21	H200	H210	H209	H219	H208	H218		
	Class 10/20 (selectable)	H30	H31	H300	H310	H309	H319	H308	H318		
2	Class 10	Size 2 (15–45 A) H10	H11	Size 1 (9–27 A) H101	H111	Size 0 (6–18 A) H100	H110	Size 00C (3–9 A) H109	H119	Size 00B (1.5–4.5 A) –	–
	Class 20	H20	H21	H201	H211	H200	H210	H209	H219	–	–
	Class 10/20 (selectable)	H30	H31	H301	H311	H300	H310	H309	H319	H308	H318
3	Class 10	Size 3 (30–90 A) H10	H11								
	Class 20	H20	H21								
	Class 10/20 (selectable)	H30	H31								
4	Class 10	Size 4 (45–135 A) H10	H11	Size 3 (30–90 A) H103	H113						
	Class 20	H20	H21	H203	H213						
	Class 10/20 (selectable)	H30	H31	H303	H313						
5	Class 10	Size 5 (90–270 A) H10	H11								
	Class 20	H20	H21								
	Class 10/20 (selectable)	H30	H31								

Available codes

Not available

Contactors and Starters
 Type S, NEMA-style
 Variants – Motor Logic® Plus overload relay

531202



B20

Variants – Motor Logic Plus solid-state overload relays					
Description	For use on Class/ Enclosure type	Motor Logic Plus current ranges	Factory modification	Suffix to the starter reference (1)	Weight
Motor Logic Plus solid-state overload relays	8536, 8736 Open type	A			kg (lb)
		0.5...2.3	No modification for 200–480 V	B20	—
			No modification for 600 V	B24	—
		2...9	No modification for 200–480 V	B30	—
			No modification for 600 V	B34	—
		6...27	No modification for 200–480 V	B40	—
			No modification for 600 V	B44	—
		10...45	No modification for 200–480 V	B50	—
			No modification for 600 V	B54	—
		20...90	No modification for 200–480 V	B60	—
			No modification for 600 V	B64	—
		60...135	No modification for 200–480 V	B70	—
			No modification for 600 V	B74	—
		120...270	No modification for 200–480 V	B80	—
			No modification for 600 V	B84	—
		240...540	No modification for 200–480 V	B90	—
			No modification for 600 V	B94	—

(1) Example: 8536 SAO 12 V01 B20S.

Contactors and Starters

Type S, NEMA-style Variants

1

Variants – Operators

Description	For use on		Colour/Marking	Suffix to the contactor or starter reference (1)	Weight kg (lb)
	Class	Enclosure type			
Push buttons	8502, 8536	NEMA 1, 12	"Start-Stop"	A	–
	8702, 8736	NEMA 1, 12	"Forward-Reverse-Stop"	A1	–
			"High-Low-Stop"	A2	–
Pilot lights without operating interlock (2)	8502, 8536, 8702, 8736	NEMA 1	Red	P1	–
			Green	P2	–
			Amber	P3	–
			Clear	P4	–
Push-to-test pilot lights without operating interlock (2)	8502, 8536, 8702, 8736	NEMA 12	Red	P21	–
			Green	P22	–
			Amber	P23	–
			Clear	P24	–
			Yellow	P25	–
LED pilot lights	8502, 8536, 8702, 8736	NEMA 1	Red	P51	–
			Green	P52	–
			Yellow	P55	–
Special wiring	8502, 8536, 8702, 8736	NEMA 1	Red/"Off"	P71	–
			Green/"On"	P72	–
Selector switches	8502, 8536, 8702, 8736	NEMA 1, NEMA 12	"Hand-Off-Auto"	C	–
	8702, 8736	NEMA 1, NEMA 12	"On-Off"	C6	–
			"Forward-Off-Reverse"	C14	–
			"Forward-Reverse"	C20	–

Variants – Transformers

Description	For use on		Functions	Suffix to the contactor or starter reference (1)	Weight kg (lb)
	Class	Enclosure type			
Separate control circuit	8502, 8536, 8702, 8736	NEMA 1, 12	Specify voltage and frequency	S	–
Fused control circuit without transformer	8502, 8536, 8702, 8736	NEMA 1, 12	One fuse	F	–
			Two fuses	F4	–
Control circuit transformers standard capacity (50/60 Hz) (3)	8502, 8536, 8702, 8736	NEMA 1, 12	Fuses: 2 (primary), 0 (secondary)	F4T (4)	–
			Fuses: 2 (primary), 1 (secondary)	FF4T	–
			Fuses: 1 (primary), 2 (secondary) (5)	F1F10T	–
			Fuses: 2 (primary), 2 (secondary)	F4F10T	–
Additional capacity (50/60 Hz) Two fuses in primary (3)	8502, 8536, 8702, 8736	NEMA 1, 12	100 VA additional capacity	F4T11 (6)	–
			200 VA additional capacity	F4T12 (6)	–
Additional capacity (50/60 Hz) Two fuses in primary and one fuse in secondary (3)	8502, 8536, 8702, 8736	NEMA 1, 12	100 VA additional capacity	FF4T11	–

(1) Example: **8536 SAG 12 V01 A P1 P2**. All suffixes are listed in alphanumeric order after the voltage code.

(2) Unless otherwise requested, the standard practice is to wire the red pilot light to indicate that the device is energized. No additional auxiliary contact is required. Also, standard practice is to wire the green pilot light to indicate that the device is de-energized. An additional normally closed auxiliary contact is required; please consult your regional sales office.

(3) Control circuit transformer selection table:

Primary-secondary	120-24 (7)	208-120	240-24 (7)	240-120	277-120	480-24 (7)	480-120	480-240	600-120
60 Hz	V89	V84	V82	V80	V85	V83	V81	V87	V86

Example: **8536 SAG 12 V81 F4T A P1 P2**.

(4) Not available with 24 V secondary on Size 3. Select appropriate transformer with secondary fuse protection. See transformer selection table.

(5) Single phase with one leg earthed, or earthed 3-phase applications only.

(6) Not available with 24 V secondary. Select appropriate transformer with secondary fuse protection. See transformer selection table for 24 V secondary restrictions.

(7) 24 V coils are not available on Sizes 4–7.

Variants – Auxiliary contacts

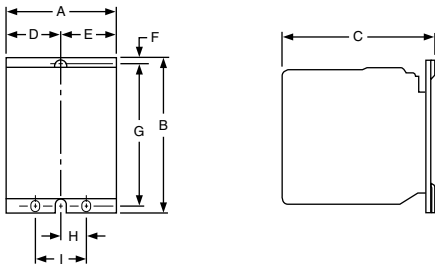
Description	For use on		Number of contacts				Suffix to the contactor or starter reference	Weight kg (lb)
	Class	Enclosure type	Forward contactor		Reverse contactor			
			N/O	N/C	N/O	N/C		
Auxiliary contacts for non-reversing contactors and non-reversing starters (1)	8502, 8536	NEMA 1, NEMA 12	–	1			X01	–
				2			X02	–
				3			X03	–
				4			X04	–
			1	–			X10	–
				1			X11	–
				2			X12	–
				3			X13	–
			2	–			X20	–
				1			X21	–
				2			X22	–
			3	–			X30	–
				1			X31	–
			4	–			X40	–
Auxiliary contacts standard no additional auxiliary contacts for reversing contactors and reversing starters	8702, 8736	NEMA 1, NEMA 12	1	–	–	–	X1000	–
			–	1	–	–	X0100	–
			2	–	–	–	X2000	–
			1	1	–	–	X1100	–
			–	2	–	–	X0200	–
			–	–	1	–	X0010	–
			1	–	1	–	X1010	–
			–	1	1	–	X0110	–
			2	–	1	–	X2010	–
			1	1	1	–	X1110	–
			–	2	1	–	X0210	–
			–	–	–	1	X0001	–
			1	–	–	1	X1001	–
			–	1	–	1	X0101	–
			2	–	–	1	X2001	–
			1	1	–	1	X1101	–
			–	2	–	1	X0201	–
			–	–	2	–	X0020	–
			1	–	2	–	X1020	–
			–	1	2	–	X0120	–
			2	–	2	–	X2020	–
			1	1	2	–	X1120	–
			–	2	2	–	X0220	–
			–	–	1	1	X0011	–
			1	–	1	1	X1011	–
			–	1	1	1	X0111	–
			2	–	1	1	X2011	–
			1	1	1	1	X1111	–
			–	2	1	1	X0211	–
			–	–	–	2	X0002	–
			1	–	–	2	X1002	–
			–	1	–	2	X0102	–
			2	–	–	2	X2002	–
			1	1	–	2	X1102	–
			–	2	–	2	X0202	–

(1) Maximum number of external auxiliary units (in addition to holding circuit contact):

Class 8502/8536/8702/8736	Maximum number
●●●● SA	4 N/O or N/C, if second internal auxiliary contact is not used
●●●● SB/SC/SD	4 N/O or N/C
	2 N/O or N/C plus 1 power-pole adder (single- or 2-pole, N/O or N/C)
	1 attached timer plus 1 power-pole adder (single- or 2-pole, N/O or N/C) plus 1 auxiliary contact
●●●● SE/SF/SG (Size 3 and Size 4)	4 N/O or N/C
●●●● SE/SF/SG (Size 5)	2 N/O or N/C plus 1 NEMA Size 0–1 or Size 2 power-pole adder (single- or 2-pole, N/O or N/C)
●●●● SH/SJ	4 N/O or N/C
	2 N/O or N/C plus 1 NEMA Size 0–1 or Size 2 power-pole adder (single- or 2-pole, N/O or N/C)

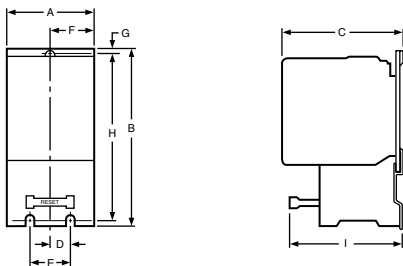
Dimensions in mm (25.4 mm = 1 inch)

Contactors 8502 S●O (Open)



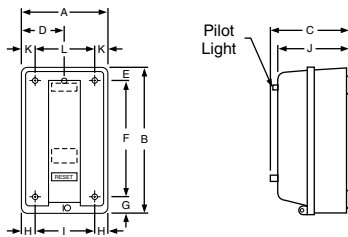
	A	B	C	D	E	F	G	H	I
8502 SAO	81.5	110.2	106.9	41.3	41.3	5.3	99.8	—	—
8502 SBO	81.5	110.2	106.9	41.3	41.3	5.3	99.8	—	—
8502 SCO	81.5	110.2	106.9	41.3	41.3	5.3	99.8	—	—
8502 SDO	125.2	130.2	125.2	54.6	54.6	5.3	116.6	13.5	26.9
8502 SEO	138.7	180.1	165.1	47.6	89.7	7.9	153.2	82.6	120.7
8502 SFO	152.4	207.8	165.1	52.3	99.8	7.9	177.8	91.2	134.9
8502 SGO	220.0	312.7	222.3	82.6	147.6	15.9	282.6	120.7	184.2
8502 SHO	267.7	712.7	228.6	89.7	185.7	128.5	471.4	120.7	184.2
8502 SJO	267.7	946.2	276.1	89.7	185.7	183.1	568.3	120.7	184.2

Starters 8536 S●O (Open)

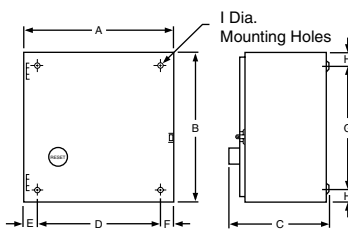


	A	B	C	D	E	F	G	H	I
8536 SAO	81.5	168.3	106.9	12.7	25.4	37.3	5.1	158.8	100.6
8536 SBO	81.5	168.3	106.9	12.7	25.4	37.3	5.1	158.8	100.6
8536 SCO	81.5	168.3	106.9	12.7	25.4	37.3	5.1	158.8	100.6
8536 SDO	109.5	198.4	125.2	12.7	25.4	52.3	5.2	186.4	103.1
8536 SEO	138.7	281.7	165.1	22.2	44.5	91.2	7.9	258.6	196.9
8536 SFO	152.4	327.0	165.1	46.0	44.5	99.8	7.9	284.0	146.1
8536 SGO	217.4	446.0	222.3	120.7	184.2	136.5	15.9	415.9	152.4
8536 SHO	313.4	712.7	228.6	120.7	184.2	146.8	128.5	471.4	220.5
8536 SJO	313.4	946.2	276.2	120.7	184.2	146.8	183.1	568.3	228.6

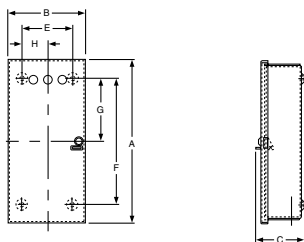
Contactors and starters 8502/8536 S●G (NEMA 1 General purpose enclosure)



	A	B	C	C	D	E	F	G	H	I	J	K	L
	8502 8536												
8502/8536 SAG	152.4	254.0	134.1	141.2	76.2	22.2	206.4	25.4	23.6	104.8	127.0	—	—
8502/8536 SBG	152.4	254.0	134.1	141.2	76.2	22.2	206.4	25.4	23.6	104.8	127.0	—	—
8502/8536 SCG	152.4	254.0	134.1	141.2	76.2	22.2	206.4	25.4	23.6	104.8	127.0	—	—
8502/8536 SDG	198.4	322.1	153.2	160.3	—	32.5	266.7	27.7	27.7	142.9	146.1	27.7	142.9
8502/8536 SEG	290.3	554.0	203.2	212.7	—	38.9	476.3	38.9	38.9	212.7	196.9	38.9	212.7



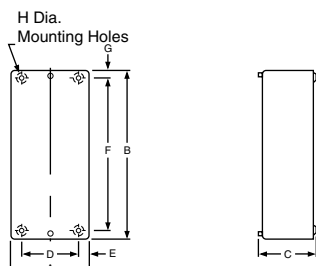
	A	B	C	C	D	E	F	G	H	I
	8502 8536									
8502/8536 SFG	285.8	639	228.6	228.6	218.2	31.8	31.8	566.7	36.3	11
8502/8536 SGG	437.1	1122.9	325.4	328.4	330.2	54.0	54.0	1016.0	54.0	14



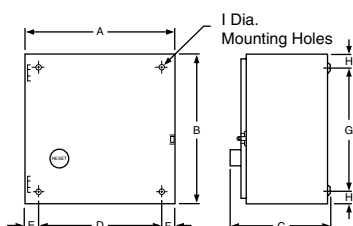
	A	B	C	D	E	F	G	H
8502/8536 SHG	1670.1	513.3	333.4	—	279.4	1638.3	60.3	139.7
8502/8536 SJG	2362.2	876.3	596.9	—	—	—	—	—

Dimensions in mm (25.4 mm = 1 inch)

Contactors and starters 8502/8536 S●G F4T (NEMA 1 General purpose enclosure with suffix F4T)



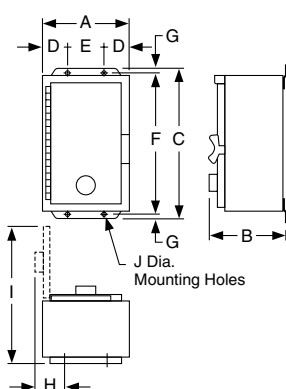
(1)	A	B	C	C	D	E	F	G	H
			8502	8536					
8502/8536 SBG ●●● F4T	161.0	403.2	127.0	141.2	118.1	21.3	365.1	19.1	7.1
8502/8536 SCG ●●● F4T	161.0	403.2	127.0	141.2	118.1	21.3	365.1	19.1	7.1



(1)	A	B	C	C	D	E	F	G	H	I
			8502	8536						
8502/8536 SDG ●●● F4T	377.8	358.8	192	194.3	323.9	26.9	26.9	304.8	26.9	7.9
8502/8536 SFG ●●● F4T	461.0	740.4	235.0	235.0	393.7	35.1	35.1	673.1	33.5	10.9

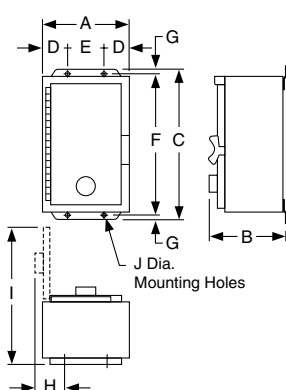
(1) For other products with form F4T:
8502/8536 SEG ●●● F4T uses 9070 GO transformer (see dimensions page 1/14).
8502/8536 SHG ●●● F4T and 8502/8536 SJG ●●● F4T are supplied as standard.

Contactors and starters 8502/8536 S●A (NEMA 12 Dust-tight enclosure)



	A	B	C	D	E	F	G	H	I	J
8502/8536 SBA	161.9	216.7	323.9	39.6	82.6	304.8	9.5	90.4	311.2	7.9
8502/8536 SCA	161.9	216.7	323.9	39.6	82.6	304.8	9.5	90.4	311.2	7.9
8502/8536 SDA	206.4	235.7	406.4	39.6	127.0	381.0	12.7	90.4	390.5	7.9
8502/8536 SEA	461.0	242.8	800.1	78.0	304.8	774.7	12.7	114.3	678.4	10.9
8502/8536 SFA	461.0	242.8	800.1	78.0	304.8	774.7	12.7	114.3	678.4	10.9
8502/8536 SGA	437.1	341.1	1193.8	104.8	228.6	1168.4	12.7	137.2	719.1	14.2
8502/8536 SHA	513.3	330.2	1651.0	104.8	304.8	1625.6	12.7	163.3	784.2	17.3
8502/8536 SJA	876.3	596.9	2362.2	-	-	-	-	-	-	-

Contactors and starters 8502/8536 S●A F4T (NEMA 12 Dust-tight enclosure with suffix F4T)

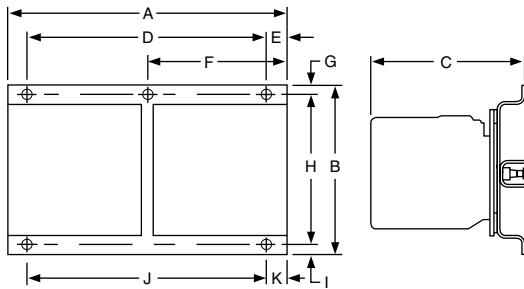


(1)	A	B	C	D	E	F	G	H	I	J
8502/8536 SBA ●●● F4T	301.6	203.2	342.9	71.4	171.5	323.9	9.5	99.1	466.7	7.9
8502/8536 SCA ●●● F4T	301.6	203.2	342.9	71.4	171.5	323.9	9.5	99.1	466.7	7.9
8502/8536 SDA ●●● F4T	377.8	206.4	406.4	65.0	247.7	381.0	9.5	92.7	546.1	7.9
8502/8536 SEA ●●● F4T	461.0	242.8	800.1	78.0	304.8	774.7	12.7	114.3	678.4	10.9
8502/8536 SFA ●●● F4T	461.0	242.8	800.1	78.0	304.8	774.7	12.7	114.3	678.4	10.9
8502/8536 SGA ●●● F4T	437.1	341.1	1193.8	104.8	228.6	1168.4	12.7	137.2	719.1	14.2

(1) 8502/8536 SHA ●●● F4T and 8502/8536 SJA ●●● F4T are supplied as standard.

Dimensions in mm (25.4 mm = 1 inch)

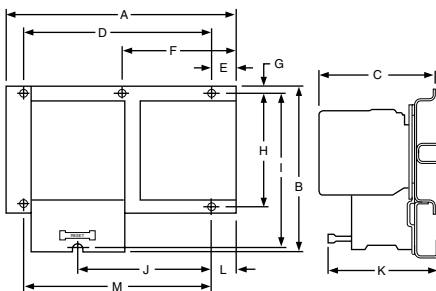
Reversing contactors and reversing starters 8702 S●O/8736 SJO (Open)



Reference/Mounting (1)	A	B	C	D	E	F	G	H	I	J	K
8702 SAO/Horizontal	181.0	127.0	134.9	—	—	86.4	11.7	110.2	4.6	139.7	22.9
8702 SBO/Horizontal	181.0	127.0	134.9	—	—	86.4	11.7	110.2	4.6	139.7	22.9
8702 SBO/Vertical	138.7	233.9	134.9	127.8	5.3	—	15.5	203.2	15.5	127.8	5.3
8702 SCO/Horizontal	181.0	127.0	134.9	—	—	86.4	11.7	110.2	4.6	139.7	22.9
8702 SCO/Vertical	138.7	233.9	134.9	127.8	5.3	—	15.5	203.2	15.5	127.8	5.3
8702 SDO/Horizontal	228.6	174.6	153.2	—	—	114.3	9.5	142.9	6.4	152.4	38.1
8702 SDO/Vertical	171.5	288.9	153.2	158.8	6.4	—	12.7	263.5	12.7	158.8	6.4
8702 SEO/Horizontal	322.8	202.2	177.8	298.5	12.2	—	12.2	177.8	12.2	298.5	12.2
8702 SEO/Vertical	182.9	482.6	177.8	158.8	12.2	—	25.7	431.8	24.9	158.8	12.2
8702 SFO/Horizontal	362.0	296.7	177.8	336.6	12.7	—	12.7	203.2	46.7	336.6	12.7
8702 SFO/Vertical	202.2	607.1	177.8	177.8	12.2	—	46.0	514.4	30.0	177.8	12.2
8702 SGO/Horizontal	490.5	411.0	238.1	457.2	16.5	—	26.2	355.6	29.2	457.2	16.5
8702 SGO/Vertical	273.1	864.6	238.1	241.3	15.9	—	31.8	812.8	29.2	241.3	15.9
8702 SHO/Horizontal	568.3	712.2	241.6	457.2	15.9	—	97.2	538.0	77.0	457.2	19.4
8702 SJO/Horizontal	616.0	946.2	350.8	501.7	38.4	—	—	762.0	—	—	—
8736 SJO/Horizontal	616.0	946.2	350.8	501.7	38.4	—	—	762.0	—	—	—

(1) Vertical type design differs from that shown on the corresponding NEMA size horizontal type figure, but dimensions listed apply to that figure.

Reversing contactors and reversing starters 8736 S●O (Open)

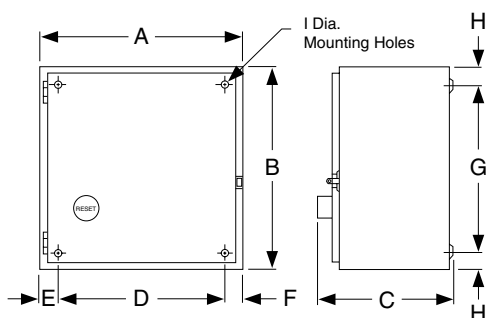


Reference/Mounting (1)	A	B	C	D	E	F	G	H	I	J	K	L	M
8736 SAO/Horizontal	181.0	175.3	134.9	—	—	86.4	11.9	110.2	157.7	115.1	128.5	16.7	—
8736 SBO/Horizontal	181.0	175.3	134.9	—	—	86.4	11.9	110.2	157.7	115.1	128.5	16.7	—
8736 SBO/Vertical	138.9	292.4	134.9	127.8	5.3	—	15.5	203.2	271.8	63.8	128.5	5.3	127.8
8736 SCO/Horizontal	181.0	175.3	134.9	—	—	86.4	11.9	110.2	157.7	115.1	128.5	16.7	—
8736 SCO/Vertical	138.9	292.4	134.9	127.8	5.3	—	15.5	203.2	271.8	63.8	128.5	5.3	127.8
8736 SDO/Horizontal	228.6	215.9	153.2	—	—	114.3	9.5	142.9	190.5	127.0	131.0	38.1	—
8736 SDO/Vertical	171.5	342.4	153.2	158.8	6.4	—	19.8	263.5	329.2	79.4	131.0	6.4	152.4
8736 SEO/Horizontal	322.8	297.4	177.8	298.5	12.2	—	12.2	273.1	273.1	298.5	158.8	12.2	298.5
8736 SEO/Vertical	185.7	565.2	177.8	158.8	12.2	—	25.7	527.1	—	158.8	158.8	12.2	158.8
8736 SFO/Horizontal	362.0	370.6	177.8	336.6	12.7	—	46.7	311.2	311.2	336.6	158.8	12.7	336.6
8736 SFO/Vertical	202.2	662.4	177.8	177.8	12.2	—	46.7	622.3	—	102.6	158.8	12.2	177.8
8736 SGO/Horizontal	490.5	530.9	238.1	457.2	16.5	—	32.5	482.6	482.6	457.2	168.3	15.9	457.2
8736 SGO/Vertical	273.1	994.4	238.1	241.3	16.5	—	32.5	946.2	946.2	241.3	168.3	15.9	241.3
8736 SHO/Horizontal	568.3	712.2	241.6	457.2	17.3	—	97.2	538.0	77.0	457.2	19.4	—	—

(1) Vertical type design differs from that shown on the corresponding NEMA size horizontal type figure, but dimensions listed apply to that figure.

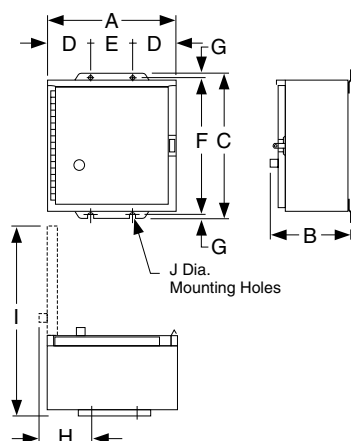
Dimensions in mm (25.4 mm = 1 inch)

Reversing contactors and reversing starters 8702/8736 S●G (NEMA 1 General purpose enclosure)



	A	B	C	C	D	E	F	G	H	I
			8702	8736						
8702/8736 SAG	301.6	301.6	188.0	191.3	247.7	26.9	26.9	247.7	26.9	7.9
8702/8736 SBG	301.6	301.6	188.0	191.3	247.7	26.9	26.9	247.7	26.9	7.9
8702/8736 SCG	301.6	301.6	188.0	191.3	247.7	26.9	26.9	247.7	26.9	7.9
8702/8736 SDG	377.8	358.8	192.0	194.3	323.9	26.9	26.9	304.8	26.9	7.9
8702/8736 SEG	461.0	740.6	235.0	235.0	393.7	33.7	33.7	673.1	33.7	11.1
8702/8736 SFG	461.0	740.6	235.0	235.0	393.7	33.7	33.7	673.1	33.7	11.1
8702/8736 SGG	894.3	1173.7	325.4	328.4	787.4	53.3	53.3	1066.8	53.3	14.2
8702/8736 SHG	919.7	1582.7	494.3	494.3	—	—	—	—	—	—
8702/8736 SJG	876.3	2362.2	596.9	596.9	—	—	—	—	—	—

Reversing contactors and reversing starters 8702/8736 S●A (NEMA 12 Dust-tight enclosure)



(1)	A	B	C	D	E	F	G	H	I	J
8702/8736 SBA	301.6	196.9	349.3	65.0	171.5	323.9	12.7	92.7	460.4	7.9
8702/8736 SCA	301.6	196.9	349.3	65.0	171.5	323.9	12.7	92.7	460.4	7.9
8702/8736 SDA	377.8	200.0	406.4	65.0	247.7	381.0	12.7	92.7	539.8	7.9
8702 SEA	461.2	235.0	800.1	78.0	304.8	774.7	12.7	93.5	678.4	10.9
8736 SEA	461.0	242.8	800.1	78.0	304.8	774.7	12.7	114.3	678.4	10.9
8702 SFA	461.2	235.0	800.1	78.0	304.8	774.7	12.7	93.5	678.4	10.9
8736 SFA	461.0	242.8	800.1	78.0	304.8	774.7	12.7	114.3	678.4	10.9
8702 SGA	889.5	333.4	1244.6	104.8	685.8	1219.2	12.7	134.9	1165.2	14.2
8736 SGA	889.5	353.8	1244.6	104.8	685.8	1219.2	12.7	155.6	1165.2	14.2
8702/8736 SHA	919.7	494.3	1580.1	—	—	—	—	—	—	—
8702/8736 SJA	876.3	596.9	2362.2	—	—	—	—	—	—	—

(1) Standard enclosure has space for a fused control transformer, suffix F4T, on 8702/8736 SBA, 8702/8736 SCA, 8702/8736 SDA.

2 - Heavy Industrial Combination Starters, Type S, NEMA-Style

Selection guide page 2/2

- Starters with disconnect switch or circuit breaker
 - General, characteristics page 2/4
- Starters with fusible disconnect switch, Class 8538 with Class H fuse clips and solid-state overload relay
 - References page 2/6
- Starters with fusible disconnect switch, Class 8538 with Class R fuse clips
 - References page 2/7
- Starters with Mag-Gard® circuit breaker, Class 8539
 - References page 2/8
- Starters with thermal-magnetic circuit breaker, Class 8539
 - References page 2/10
- Starters with non-fusible disconnect switch, Class 8538
 - References page 2/12
- Starters with fusible disconnect switch and Class H fuse clips Class 8538
 - References page 2/13
- Starters with fusible disconnect switch (Class R fuse clips) and solid-state overload relay, Class 8538
 - Associations page 2/14
- Starters with fusible disconnect switch and solid-state overload relay, Class 8538
 - Associations page 2/15
- Starters with Mag-Gard® circuit breaker, Class 8539 and solid-state overload relay
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- Starters with thermal-magnetic circuit breaker and solid-state overload relay
 - Associations page 2/18
- Accessories
 - Characteristics page 2/20
 - References page 2/21
- Starters with disconnect switch or circuit breaker
 - Dimensions page 2/22

Combination Starters

Type S, NEMA-style starters with
Disconnect switch or circuit breaker

2

Applications

Type S NEMA combination starters



NEMA Size

0

1

2

Standard motor power ratings 50/60 Hz

(1)	200 V (208 V)
	230 V (240 V)
	460 V (480 V)
	575 V (500 V)

Motor voltage (starter voltage)

3 hp/2.2 kW
3 hp/2.2 kW
5 hp/3.75 kW
5 hp/3.75 kW

7.5 hp/5.5 kW
7.5 hp/5.5 kW
10 hp/7.5 kW
10 hp/7.5 kW

10 hp/7.5 kW
15 hp/11 kW
25 hp/18.5 kW
25 hp/18.5 kW

Enclosures

- NEMA 1: General purpose
- NEMA 12: Dust-tight for industrial use

NEMA 1

NEMA 12

NEMA 1

NEMA 12

NEMA 1

NEMA 12

Fusible disconnect-switch starters
Class H fuse clips8538
SBG 1●8538
SBA ●●8538
SCG 1●8538
SCA ●●8538
SDG 1●8538
SDA ●●

Pages

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Fusible disconnect-switch starters
Class R fuse clips8538
SBG 3●8538
SBA ●●8538
SCG 3●8538
SCA ●●8538
SDG 3●8538
SDA ●●

Pages

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Non-fusible disconnect-switch starters

8538
SBG 118538
SBA ●18538
SCG 118538
SCA ●18538
SDG 118538
SDA ●1

Pages

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Circuit-breaker starters

8539
SBG 4●8539
SBA ●●8539
SCG 4●8539
SCA ●●8539
SDG 4●8539
SDA ●●

Pages

2/8 and 2/9

2/8 and 2/9

2/8 and 2/9

Thermal-magnetic circuit-breaker starters

8539
SBG ●8539
SBA ●●8539
SCG ●8539
SCA ●●8539
SDG ●8539
SDA ●●

Pages

2/10 and 2/11

2/10 and 2/11

2/10 and 2/11

(1) For circuit-breaker starters and thermal-magnetic circuit-breaker starters, see pages 2/8 to 2/11.

Type S NEMA combination starters



3	4	5	6	7
25 hp/18.5 kW 30 hp/22 kW 50 hp/37 kW 50 hp/37 kW	40 hp/30 kW 50 hp/37 kW 100 hp/75 kW 100 hp/75 kW	75 hp/55 kW 100 hp/75 kW 200 hp/150 kW 200 hp/150 kW	150 hp/110 kW 200 hp/150 kW 400 hp/300 kW 400 hp/300 kW	– 300 hp/220 kW 600 hp/450 kW 600 hp/450 kW
NEMA 1 NEMA 12	NEMA 1 NEMA 12	NEMA 1 NEMA 12	NEMA 1 NEMA 12	NEMA 1 NEMA 12
8538 SEG 1 ● 8538 SEA ●● 2/6	8538 SFG 1 ● 8538 SFA ●● 2/6	8538 SGG 1 ● 8538 SGA ●● 2/6	8538 SHG 1 ● 8538 SHA ●● 2/6	– – –
8538 SEG 3 ● 8538 SEA ●● 2/7	8538 SFG 3 ● 8538 SFA ●● 2/7	8538 SGG 3 ● 8538 SGA ●● 2/7	8538 SHG 3 ● 8538 SHA ●● 2/7	– – –
8538 SEG 11 ● 8538 SEA ●1 2/12	8538 SFG 11 ● 8538 SFA ●1 2/12	8538 SGG 11 ● 8538 SGA ●1 2/12	8538 SHG 11 ● 8538 SHA ●1 2/12	– – –
8539 SEG 4 ● 8539 SEA ●● 2/8 and 2/9	8539 SFG 4 ● 8539 SFA ●● 2/8 and 2/9	8539 SGG 4 ● 8539 SGA ●● 2/8 and 2/9	8539 SHG 4 ● 8539 SHA ●● 2/8 and 2/9	8539 SJG 4 ● 8539 SJA 5 ● 2/8 and 2/9
8539 SEG ● 8539 SEA ●● 2/10 and 2/11	8539 SFG ● 8539 SFA ●● 2/10 and 2/11	8539 SGG ● 8539 SGA ●● 2/10 and 2/11	8539 SHG ● 8539 SHA ●● 2/10 and 2/11	8539 SJG ● 8539 SJA ●● 2/10 and 2/11

General

Class 8538 and 8539 Type S combination starters combine the requirements of motor overload and short-circuit protection into one package. These starters are manufactured in accordance with NEMA standards and are UL listed. They are designed to operate up to ~ 600 V maximum, 50 to 60 Hz, and are available with solid-state overload relays.

Square D is one of the leaders in North America and Europe in providing starters that are verified by UL to comply with IEC 947-4-1 and Type 2 coordination. This means that the components of a motor branch circuit protective device (fuses and circuit-breaker), contactor and overload relay will be suitable for further use following a short-circuit fault allowing for replacement of components during normal scheduled maintenance. Class 8538 Type S combination starters, Sizes 0–5, with fusible disconnect switches, meet Type 2 performance criteria.

Disconnect-switch starters

Features:

- Interchangeable fuse clips, straight through wiring, solid earth/ground bar, space for a fused control transformer, provisions for adding disconnect switch electrical interlock, handle mechanism/door closing mechanism.

Switch-type combination starters are available with fusible or non-fusible disconnect switches in NEMA Sizes 0–6. The switch itself is constructed of a moulded, insulated material that delivers arc-quenching performance similar to that of high voltage switch-gear. The visible blade construction allows you to confirm the blade position at a glance. Many industries have standardized on this feature.

Sizes 0–2, non-fusible assemblies can be field converted to fusible designs easily and quickly. Factory-built fusible units accept the industry-standard Class H or R fuses. The various units have specific UL-listed short-circuit withstand ratings that range from 5000 to 100 000 A. Specific ratings are influenced by many components including the size of the disconnect switch and the type of fuses used with the switch.

Circuit-breaker starters

Features:

- Handle mechanism, door closing mechanism.

Options:

- Factory-installed auxiliary switch (provides remote indication of an open or tripped breaker), factory-supplied alarm switch (actuates bell alarms or warning light when breaker is tripped).

Square D provides both a thermal-magnetic circuit-breaker and a motor circuit protector in NEMA Sizes 0–7 for applications requiring a breaker-type combination starter. The most widely used over-current protection devices are thermal-magnetic circuit-breakers. Mag-Gard® motor circuit protectors are similar in construction, but provide only short-circuit protection. When Mag-Gard devices are used with motor starters, the adjustable instantaneous trip provides maximum motor protection based on specific amperage and application.

Type S combination starters using thermal-magnetic breakers carry a UL-listed short-circuit withstand rating from 5000 to 30 000 A. If a Mag-Gard Type GJL breaker is used, withstand ratings increase to 100 000 A. Specific ratings and listings may vary depending on the specific combination of components used in the assembly.

Characteristics

Environment																
Class		8538							8539							
Size		0	1	2	3	4	5	6	0	1	2	3	4	5	6	7
Rated insulation voltage																
Conforming to UL, CSA	V	600							600							
Rated impulse withstand voltage																
Class H or Class K fuses	kV	5				10		18	–							
Class R fuses	kV	100							–							
ITE circuit-breaker (FAL, KAL, LAL, MAL)	kV	–							10							
ITE circuit-breaker (GJL)	kV	–							65				–			
INST circuit-breaker (FAL, KAL, LAL, MAL)	kV	–							22 (1)		22			30 (3)		
INST circuit-breaker (GJL)	kV	–							100 (2)		–					
Product certifications																
UL, CSA																
(1) 22 kV rating for 0–480 V. 10 kV rating for 600 V.																
(2) 100 kV rating for 0–480 V. 10 kV rating for 600 V.																
(3) 30 kV rating for 0–480 V. 22 kV rating for 600 V.																

Electrical characteristics

UL-listed short-circuit ratings

Size	0	1	2	3	4	5	6	7
Disconnect-switch starters	8538 S●G 1●/S●A							
NEMA fuse class	Class H							
Enclosure (1)	Standard							
Available Ampere RMS symmetrical	A	5000			10 000		18 000	—
Disconnect-switch starters	8538 S●G 3●/S●A							
NEMA fuse class	Class R							
Enclosure (1)	Standard							
Available Ampere RMS symmetrical	A	100 000						—
Circuit-breaker starters	8539 S●G 4●/S●A							
Enclosure (1)	Standard							
Available Ampere RMS symmetrical	A	With GJL circuit-breaker: 100 000 (voltage 0–480 V) 10 000 (voltage 481–600 V)	With GJL circuit-breaker: 100 000 (voltage 0–480 V) 10 000 (voltage 481–600 V) 22 000 (8539 SGG 4● S8 and 8539 SDA ●● S8)	22 000				30 000 (voltage 0–480 V) 22 000 (voltage 481–600 V)
Thermal-magnetic circuit-breaker starters	8538 S●G ●/S●A							
Enclosure (1)	Standard							
Available Ampere RMS symmetrical	A	5000			10 000		18 000	30 000 (voltage 0–480 V) 22 000 (voltage 481–600 V)

Mag-Gard trip range

Circuit-breaker	GJL/FAL/KAL/LAL/MAL ●●●● M●●							
Suffix number/trip range	A	M01 = 9–33 M02 = 21–77 M03 = 45–165 M04 = 90–330 M05 = 150–550 M06 = 225–825 18M = 300–1100	25M = 625–1250 26M = 750–1500 29M = 875–1750 30M = 1000–2000 31M = 1125–2250 32M = 1250–2500 33M = 1500–3000			35M = 1750–3500 36M = 2000–4000 40M = 2500–5000 42M = 3000–6000 44M = 3500–7000		

Terminals

Size	0	1	2	3	4	5	6	7
Type	Line terminals on disconnect switch							
Type of lug	Box lug							
Wire	Switch	#14–#1/0 Cu/Al			#6–300 MCM Cu/Al	One #4–500 MCM Cu	–	–
size min.–max.	Circuit-breaker	#14–#4 Cu (2) #12–#4 Al or #14–#1/0 Cu #12–#1/0 Al #14–#1 Cu/#8–#1/0 Al (GJL Breaker)	#14–#1/0 Cu or #12–#1/0 Al #14–#1 Cu/#8–1/0 Al (GJL Breaker)	#14–#2 Cu #10–#2 Al (FA Brkr) #4–300 MCM Cu/Al (KA Breaker) #14–#1 Cu/#8–#1/0 Al (GJL Breaker)	#14–#1/0 Cu #12–#1/0 Al (LA Brkr) #4–300 MCM Cu/Al (KA Breaker)	#4–300 MCM Cu/Al (KA Breaker) x1 #1–600 MCM or x2 #1–250 MCM Cu/Al (LA Breaker)	x1 #1–600 MCM or x2 #1–250 MCM Cu/Al (LA Breaker) or x3 #3/0–500 MCM Cu/Al (MA Breaker)	x3 #3/0–500 MCM Cu/Al
Type	Power terminals on magnetic starter							
Type of lug	Screw clamp terminal	Box lug					Parallel groove	
Wire	Size min.–max.	#14–#8 Cu	#14–#4 Cu	#14–#0 Cu	#8–250 MCM Cu	#4–500 MCM Cu	250–500 MCM Cu (3)	250–500 MCM Cu
	Per terminal	1 or 2	1				1 or 2	1–4
Type	Control terminals on magnetic starter							
Type of lug	Screw clamp terminal							
Wire	Size min.–max.	#16–#12 Cu					#16–#12 Cu (4)	#16–#12 Cu
	Per terminal	2						

(1) Standard enclosure includes non-oversize NEMA 1 and 12.

(2) Use on FAL circuit-breakers rated 25 A or less.

(3) Order Class 9999 Type SAL-16 parts kit to convert power terminals to accept wire sizes 1/0–300 MCM.

(4) Terminal block range limited to #16–#14.

Combination Starters

Type S, NEMA-style starters with
Fusible disconnect switch, Class 8538
with Class H fuse clips and solid-state overload relay

531043



8538 SBG 12 ●●●

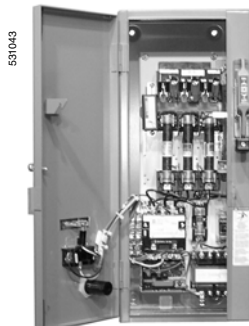
3-pole fusible full-voltage starters, non-reversing (Class H fuse clips)

NEMA Size	Standard power ratings of 3-phase motors 50/60 Hz								Fuse clip size	External reset	Basic reference Add code indicating control circuit voltage (2), optional variants (3) and H code (4)	Weight
	Motor volts (1) 200 V (208 V) 230 V (240 V) 460 V (480 V) 575 V (600 V)											
	hp	kW	hp	kW	hp	kW	hp	kW	A			kg (lb)
NEMA 1 general purpose enclosure												
0	3	2.2	3	2.2	—	—	—	—	30	—	8538 SBG 12 (2) (3) (4)	17 (38)
	—	—	—	—	5	3.75	5	3.75	30	—	8538 SBG 13 (2) (3) (4)	17 (38)
1	5	3.75	5	3.75	—	—	—	—	30	—	8538 SCG 12 (2) (3) (4)	17 (38)
	—	—	—	—	10	7.5	10	7.5	30	—	8538 SCG 14 (2) (3) (4)	17 (38)
	7.5	5.5	7.5	5.5	—	—	—	—	60	—	8538 SCG 13 (2) (3) (4)	17 (38)
2	10	7.5	15	11	—	—	—	—	60	—	8538 SDG 12 (2) (3) (4)	25 (54)
	—	—	—	—	15	11	15	11	30	—	8538 SDG 16 (2) (3) (4)	25 (54)
	—	—	—	—	25	18.5	25	18.5	60	—	8538 SDG 14 (2) (3) (4)	25 (54)
3	20	15	25	18.5	—	—	—	—	100	—	8538 SEG 15 (2) (3) (4)	46 (102)
	—	—	—	—	50	37	50	37	100	—	8538 SEG 13 (2) (3) (4)	46 (102)
	25	18.5	30	22	—	—	—	—	200	—	8538 SEG 12 (2) (3) (4)	46 (102)
4	40	30	50	37	—	—	—	—	200	—	8538 SFG 15 (2) (3) (4)	74 (163)
	—	—	—	—	100	75	100	75	200	—	8538 SFG 13 (2) (3) (4)	74 (163)
5	75	55	100	75	—	—	—	—	400	—	8538 SGG 15 (2) (3) (4)	204 (450)
	—	—	—	—	200	150	200	150	400	—	8538 SGG 13 (2) (3) (4)	204 (450)
6	150	110	200	150	—	—	—	—	600	—	8538 SHG 13 (2) (3) (4)	240 (530)
	—	—	—	—	400	300	400	300	600	—	8538 SHG 12 (2) (3) (4)	240 (530)
NEMA 12 dust-tight industrial-use enclosure												
0	3	2.2	3	2.2	—	—	—	—	30	With	8538 SBA 22 (2) (3) (4)	18 (40)
	—	—	—	—	5	3.75	5	3.75	30	Without	8538 SBA 12 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	30	With	8538 SBA 23 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	30	Without	8538 SBA 13 (2) (3) (4)	18 (40)
1	5	3.75	5	3.75	—	—	—	—	30	With	8538 SCA 22 (2) (3) (4)	18 (40)
	—	—	—	—	10	7.5	10	7.5	30	Without	8538 SCA 12 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	30	With	8538 SCA 24 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	30	Without	8538 SCA 14 (2) (3) (4)	18 (40)
	7.5	5.5	7.5	5.5	—	—	—	—	60	With	8538 SCA 23 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	60	Without	8538 SCA 13 (2) (3) (4)	18 (40)
2	10	7.5	15	11	—	—	—	—	60	With	8538 SDA 22 (2) (3) (4)	25 (55)
	—	—	—	—	15	11	15	11	30	Without	8538 SDA 12 (2) (3) (4)	25 (55)
	—	—	—	—	—	—	—	—	30	With	8538 SDA 26 (2) (3) (4)	25 (55)
	—	—	—	—	—	—	—	—	30	Without	8538 SDA 16 (2) (3) (4)	25 (55)
	—	—	—	—	25	18.5	25	18.5	60	With	8538 SDA 24 (2) (3) (4)	25 (55)
	—	—	—	—	—	—	—	—	60	Without	8538 SDA 14 (2) (3) (4)	25 (55)
3	20	15	25	18.5	—	—	—	—	100	With	8538 SEA 25 (2) (3) (4)	50 (111)
	—	—	—	—	50	37	50	37	100	Without	8538 SEA 15 (2) (3) (4)	50 (111)
	—	—	—	—	—	—	—	—	100	With	8538 SEA 23 (2) (3) (4)	50 (111)
	—	—	—	—	—	—	—	—	100	Without	8538 SEA 13 (2) (3) (4)	50 (111)
	25	18.5	30	22	—	—	—	—	200	With	8538 SEA 22 (2) (3) (4)	50 (111)
	—	—	—	—	—	—	—	—	200	Without	8538 SEA 12 (2) (3) (4)	50 (111)
4	40	30	50	37	—	—	—	—	200	With	8538 SFA 25 (2) (3) (4)	77 (170)
	—	—	—	—	—	—	—	—	200	Without	8538 SFA 15 (2) (3) (4)	77 (170)
	—	—	—	—	100	75	100	75	200	With	8538 SFA 23 (2) (3) (4)	77 (170)
	—	—	—	—	—	—	—	—	200	Without	8538 SFA 13 (2) (3) (4)	77 (170)
5	75	55	100	75	—	—	—	—	400	With	8538 SGA 25 (2) (3) (4)	207 (457)
	—	—	—	—	—	—	—	—	400	Without	8538 SGA 15 (2) (3) (4)	207 (457)
	—	—	—	—	200	150	200	150	400	With	8538 SGA 23 (2) (3) (4)	207 (457)
	—	—	—	—	—	—	—	—	400	Without	8538 SGA 13 (2) (3) (4)	207 (457)
6	150	110	200	150	—	—	—	—	600	With	8538 SHA 23 (2) (3) (4)	250 (552)
	—	—	—	—	—	—	—	—	600	Without	8538 SHA 13 (2) (3) (4)	250 (552)
	—	—	—	—	400	300	400	300	600	With	8538 SHA 22 (2) (3) (4)	250 (552)
	—	—	—	—	—	—	—	—	600	Without	8538 SHA 12 (2) (3) (4)	250 (552)

(1) (2) (3) (4) See page 2/8.

Combination Starters

Type S, NEMA-style starters with
Fusible disconnect switch, Class 8538
with Class R fuse clips



8538 SBG 32 ●●●

3-pole fusible full-voltage starters, non-reversing (Class R fuse clips)

NEMA Size	Standard power ratings of 3-phase motors 50/60 Hz								Fuse clip size	External reset	Basic reference Add code indicating control circuit voltage (2), optional variants (3) and H code (4)	Weight
	Motor volts (1) 200 V (208 V) 230 V (240 V) 460 V (480 V) 575 V (600 V)											
	hp	kW	hp	kW	hp	kW	hp	kW	A			kg (lb)
NEMA 1 general purpose enclosure												
0	3	2.2	3	2.2	—	—	—	—	30	—	8538 SBG 32 (2) (3) (4)	17 (38)
	—	—	—	—	5	3.75	5	3.75	30	—	8538 SBG 33 (2) (3) (4)	17 (38)
1	5	3.75	5	3.75	—	—	—	—	30	—	8538 SCG 32 (2) (3) (4)	17 (38)
	—	—	—	—	10	7.5	10	7.5	30	—	8538 SCG 34 (2) (3) (4)	17 (38)
	7.5	5.5	7.5	5.5	—	—	—	—	60	—	8538 SCG 33 (2) (3) (4)	17 (38)
2	10	7.5	15	11	—	—	—	—	60	—	8538 SDG 32 (2) (3) (4)	25 (54)
	—	—	—	—	15	11	15	11	30	—	8538 SDG 36 (2) (3) (4)	25 (54)
	—	—	—	—	25	18.5	25	18.5	60	—	8538 SDG 34 (2) (3) (4)	25 (54)
3	20	15	25	18.5	—	—	—	—	100	—	8538 SEG 35 (2) (3) (4)	46 (102)
	—	—	—	—	50	37	50	37	100	—	8538 SEG 33 (2) (3) (4)	46 (102)
	25	18.5	30	22	—	—	—	—	200	—	8538 SEG 32 (2) (3) (4)	46 (102)
4	40	30	50	37	—	—	—	—	200	—	8538 SFG 35 (2) (3) (4)	74 (163)
	—	—	—	—	100	75	100	75	200	—	8538 SFG 33 (2) (3) (4)	74 (163)
5	75	55	100	75	—	—	—	—	400	—	8538 SGG 35 (2) (3) (4)	204 (450)
	—	—	—	—	200	150	200	150	400	—	8538 SGG 33 (2) (3) (4)	204 (450)
6	150	110	200	150	—	—	—	—	600	—	8538 SHG 33 (2) (3) (4)	240 (530)
	—	—	—	—	400	300	400	300	600	—	8538 SHG 32 (2) (3) (4)	240 (530)
NEMA 12 dust-tight industrial-use enclosure												
0	3	2.2	3	2.2	—	—	—	—	30	With	8538 SBA 42 (2) (3) (4)	18 (40)
	—	—	—	—	5	3.75	5	3.75	30	Without	8538 SBA 32 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	30	With	8538 SBA 43 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	30	Without	8538 SBA 33 (2) (3) (4)	18 (40)
1	5	3.75	5	3.75	—	—	—	—	30	With	8538 SCA 42 (2) (3) (4)	18 (40)
	—	—	—	—	10	7.5	10	7.5	30	Without	8538 SCA 32 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	30	With	8538 SCA 44 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	30	Without	8538 SCA 34 (2) (3) (4)	18 (40)
	7.5	5.5	7.5	5.5	—	—	—	—	60	With	8538 SCA 43 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	60	Without	8538 SCA 33 (2) (3) (4)	18 (40)
2	10	7.5	15	11	—	—	—	—	60	With	8538 SDA 42 (2) (3) (4)	25 (55)
	—	—	—	—	15	11	15	11	30	Without	8538 SDA 32 (2) (3) (4)	25 (55)
	—	—	—	—	—	—	—	—	30	With	8538 SDA 46 (2) (3) (4)	25 (55)
	—	—	—	—	—	—	—	—	30	Without	8538 SDA 36 (2) (3) (4)	25 (55)
	—	—	—	—	25	18.5	25	18.5	60	With	8538 SDA 44 (2) (3) (4)	25 (55)
	—	—	—	—	—	—	—	—	60	Without	8538 SDA 34 (2) (3) (4)	25 (55)
3	20	15	25	18.5	—	—	—	—	100	With	8538 SEA 45 (2) (3) (4)	50 (111)
	—	—	—	—	50	37	50	37	100	Without	8538 SEA 35 (2) (3) (4)	50 (111)
	—	—	—	—	—	—	—	—	100	With	8538 SEA 43 (2) (3) (4)	50 (111)
	—	—	—	—	—	—	—	—	100	Without	8538 SEA 33 (2) (3) (4)	50 (111)
	25	18.5	30	22	—	—	—	—	200	With	8538 SEA 42 (2) (3) (4)	50 (111)
	—	—	—	—	—	—	—	—	200	Without	8538 SEA 32 (2) (3) (4)	50 (111)
4	40	30	50	37	—	—	—	—	200	With	8538 SFA 45 (2) (3) (4)	77 (170)
	—	—	—	—	100	75	100	75	200	Without	8538 SFA 35 (2) (3) (4)	77 (170)
	—	—	—	—	—	—	—	—	200	With	8538 SFA 43 (2) (3) (4)	77 (170)
	—	—	—	—	—	—	—	—	200	Without	8538 SFA 33 (2) (3) (4)	77 (170)
5	75	55	100	75	—	—	—	—	400	With	8538 SGA 45 (2) (3) (4)	207 (457)
	—	—	—	—	200	150	200	150	400	Without	8538 SGA 35 (2) (3) (4)	207 (457)
	—	—	—	—	—	—	—	—	400	With	8538 SGA 43 (2) (3) (4)	207 (457)
	—	—	—	—	—	—	—	—	400	Without	8538 SGA 33 (2) (3) (4)	207 (457)
6	150	110	200	150	—	—	—	—	600	With	8538 SHA 43 (2) (3) (4)	250 (552)
	—	—	—	—	400	300	400	300	600	Without	8538 SHA 33 (2) (3) (4)	250 (552)
	—	—	—	—	—	—	—	—	600	With	8538 SHA 42 (2) (3) (4)	250 (552)
	—	—	—	—	—	—	—	—	600	Without	8538 SHA 32 (2) (3) (4)	250 (552)

(1) (2) (3) (4) See page 2/8.

Combination Starters

Type S, NEMA-style starters with
Mag-Gard® circuit-breaker, Class 8539

531042



8539 SBG 41 ●●●

3-pole circuit-breaker starters, non-reversing

NEMA Size	Standard power ratings of 3-phase motors 50/60 Hz								Circuit-breaker	Basic reference Add code indicating control circuit voltage (2), optional variants (3) and "H" code (4)	Weight
	Motor volts (1)										
	200 V (208 V) 230 V (240 V) 460 V (480 V) 575 V (600 V)										
	hp	kW	hp	kW	hp	kW	hp	kW			kg (lb)
NEMA 1 general purpose enclosure											
0	0.3	0.2	0.3	0.2	1	0.75	1	0.75	GJL 36003 MO1	8539 SBG 41 (2) (3) (4)	17 (38)
	1	0.75	1	0.75	3	2.2	3	2.2	GJL 36007 MO2	8539 SBG 42 (2) (3) (4)	17 (38)
	3	2.2	3	2.2	5	3.7	5	3.7	GJL 36015 MO3	8539 SBG 43 (2) (3) (4)	17 (38)
1	0.3	0.2	0.3	0.2	1	0.75	1	0.75	GJL 36003 MO1	8539 SCG 41 (2) (3) (4)	17 (38)
	1	0.75	1	0.75	3	2.2	3	2.2	GJL 36007 MO2	8539 SCG 42 (2) (3) (4)	17 (38)
	3	2.2	3	2.2	7.5	5.5	10	7.5	GJL 36015 MO3	8539 SCG 43 (2) (3) (4)	17 (38)
	5	3.7	7.5	5.5	10	7.5	—	—	GJL 36030 MO4	8539 SCG 44 (2) (3) (4)	17 (38)
	7.5	5.5	—	—	—	—	—	—	GJL 36050 MO5	8539 SCG 45 (2) (3) (4)	17 (38)
2	3	2.2	3	2.2	7.5	5.5	10	7.5	GJL 36015 MO3	8539 SDG 41 (2) (3) (4)	25 (54)
	5	3.7	7.5	5.5	15	11	20	15	GJL 36030 MO4	8539 SDG 42 (2) (3) (4)	25 (54)
	10	7.5	10	7.5	25	18.5	25	18.5	GJL 36050 MO5	8539 SDG 43 (2) (3) (4)	25 (54)
	—	—	15	11	—	—	—	—	GJL 36075 MO6	8539 SDG 44 (2) (3) (4)	25 (54)
3	—	—	—	—	25	18.5	30	22	GJL 36050 MO5	8539 SEG 41 (2) (3) (4)	46 (102)
	25	18.5	30	22	30	22	50	37	FAL 36100 18M	8539 SEG 42 (2) (3) (4)	46 (102)
4	30	22	—	—	75	55	100	75	KAL 36250 25M	8539 SFG 42 (2) (3) (4)	74 (163)
	—	—	40	30	—	—	—	—	KAL 36250 26M	8539 SFG 43 (2) (3) (4)	74 (163)
	—	—	50	37	100	75	—	—	KAL 36250 29M	8539 SFG 44 (2) (3) (4)	74 (163)
5	—	—	—	—	—	—	125	90	KAL 36250 29M	8539 SGG 41 (2) (3) (4)	191 (420)
	50	37	—	—	—	—	150	110	KAL 36250 30M	8539 SGG 42 (2) (3) (4)	191 (420)
	—	—	60	45	125	90	—	—	KAL 36250 31M	8539 SGG 43 (2) (3) (4)	191 (420)
	60	45	75	55	150	110	200	150	LAL 36400 32M	8539 SGG 44 (2) (3) (4)	191 (420)
	75	55	—	—	—	—	—	—	LAL 36400 33M	8539 SGG 45 (2) (3) (4)	191 (420)
	—	—	100	75	200	150	—	—	LAL 36400 35M	8539 SGG 46 (2) (3) (4)	191 (420)
6	—	—	—	—	—	—	250	185	LAL 36400 35M	8539 SHG 42 (2) (3) (4)	200 (441)
	100	75	—	—	250	185	300	220	LAL 36400 36M	8539 SHG 43 (2) (3) (4)	200 (441)
	125	90	150	110	300	220	400	300	MAL 36600 40M	8539 SHG 44 (2) (3) (4)	200 (441)
	150	110	—	—	350	250	—	—	MAL 36600 42M	8539 SHG 45 (2) (3) (4)	200 (441)
	—	—	200	150	400	300	—	—	MAL 36600 44M	8539 SHG 46 (2) (3) (4)	200 (441)
7	—	—	—	—	—	—	500	370	MAL 36800 44M	8539 SJG 41 (2) (3) (4)	318 (702)
	—	—	250	185	500	370	600	450	MAL 36800 45M	8539 SJG 42 (2) (3) (4)	318 (702)
	—	—	300	220	600	450	—	—	MAL 361000 47M	8539 SJG 43 (2) (3) (4)	318 (702)

(1) Motor voltage (starter voltage).

(2) Standard control circuit voltage:

Volts	24	110	120	208	220	240	380	440	480	550	600
50 Hz	—	V02	—	—	V03	—	V05	V06	—	V07	—
60 Hz	V01 (5) (6)	—	V02 (5)	V08	—	V03	—	—	V06	—	V07

24 V and 120 V coils require the addition of form "S" for separate control. Example: **8559 SCG 41 V02 H10S**.

(3) For optional variants, see page 2/21.

(4) To complete "H" code for Motor Logic solid-state overload relays, see pages 2/13 to 2/19. Motor Logic Plus units are not available on combination starters.

(5) 24 V coils are not available on Sizes 4–6. On Sizes 0–3, where 24 V coils are available, suffix "S" (separate control) must be specified.

(6) These voltage codes must include suffix "S" (supplied at no charge). When specifying suffix "S", please supply motor voltage when ordering.

Combination Starters

Type S, NEMA-style starters with
Mag-Gard® circuit breaker, Class 8539

531042



8539 SBA 51 ●●●

3-pole circuit-breaker starters, non-reversing (continued)

NEMA Size	Standard power ratings of 3-phase motors 50/60 Hz								Circuit-breaker	External reset	Basic reference Add code indicating control circuit voltage (2), optional variants (3), and "H" code (4)	Weight
	Motor volts (1) 200 V (208 V) 230 V (240 V) 460 V (480 V) 575 V (600 V)											
	hp	kW	hp	kW	hp	kW	hp	kW				kg (lb)
NEMA 12 dust-tight industrial-use enclosure												
0	0.3	0.2	0.3	0.2	1	0.75	1	0.75	GJL 36003 MO1	With	8539 SBA 51 (2) (3) (4)	18 (40)
										Without	8539 SBA 41 (2) (3) (4)	18 (40)
	1	0.75	1	0.75	3	2.2	3	2.2	GJL 36007 MO2	With	8539 SBA 52 (2) (3) (4)	18 (40)
										Without	8539 SBA 42 (2) (3) (4)	18 (40)
1	3	2.2	3	2.2	5	3.7	5	3.7	GJL 36015 MO3	With	8539 SBA 53 (2) (3) (4)	18 (40)
										Without	8539 SBA 43 (2) (3) (4)	18 (40)
	0.3	0.2	0.3	0.2	1	0.75	1	0.75	GJL 36003 MO1	With	8539 SCA 51 (2) (3) (4)	18 (40)
										Without	8539 SCA 41 (2) (3) (4)	18 (40)
2	1	0.75	1	0.75	3	2.2	3	2.2	GJL 36007 MO2	With	8539 SCA 52 (2) (3) (4)	18 (40)
										Without	8539 SCA 42 (2) (3) (4)	18 (40)
	3	2.2	3	2.2	7.5	5.5	10	7.5	GJL 36015 MO3	With	8539 SCA 53 (2) (3) (4)	18 (40)
										Without	8539 SCA 43 (2) (3) (4)	18 (40)
3	5	3.7	7.5	5.5	10	7.5	—	—	GJL 36030 MO4	With	8539 SCA 54 (2) (3) (4)	18 (40)
										Without	8539 SCA 44 (2) (3) (4)	18 (40)
	7.5	5.5	—	—	—	—	—	—	GJL 36050 MO5	With	8539 SCA 55 (2) (3) (4)	18 (40)
										Without	8539 SCA 45 (2) (3) (4)	18 (40)
4	3	2.2	3	2.2	7.5	5.5	10	7.5	GJL 36015 MO3	With	8539 SDA 51 (2) (3) (4)	25 (55)
										Without	8539 SDA 41 (2) (3) (4)	25 (55)
	5	3.7	7.5	5.5	15	11	20	15	GJL 36030 MO4	With	8539 SDA 52 (2) (3) (4)	25 (55)
										Without	8539 SDA 42 (2) (3) (4)	25 (55)
5	10	7.5	10	7.5	25	18.5	25	18.5	GJL 36050 MO5	With	8539 SDA 53 (2) (3) (4)	25 (55)
										Without	8539 SDA 43 (2) (3) (4)	25 (55)
	—	—	15	11	—	—	—	—	GJL 36075 MO6	With	8539 SDA 54 (2) (3) (4)	25 (55)
										Without	8539 SDA 44 (2) (3) (4)	25 (55)
6	—	—	—	—	25	18.5	30	22	GJL 36050 MO5	With	8539 SEA 51 (2) (3) (4)	50 (111)
										Without	8539 SEA 41 (2) (3) (4)	50 (111)
	25	18.5	30	22	30	22	50	37	FAL 36100 18M	With	8539 SEA 52 (2) (3) (4)	50 (111)
										Without	8539 SEA 42 (2) (3) (4)	50 (111)
7	30	22	—	—	75	55	100	75	KAL 36250 25M	With	8539 SFA 52 (2) (3) (4)	77 (170)
										Without	8539 SFA 42 (2) (3) (4)	77 (170)
	—	—	40	30	—	—	—	—	KAL 36250 26M	With	8539 SFA 53 (2) (3) (4)	77 (170)
										Without	8539 SFA 43 (2) (3) (4)	77 (170)
8	—	—	50	37	100	75	—	—	KAL 36250 29M	With	8539 SFA 54 (2) (3) (4)	77 (170)
										Without	8539 SFA 44 (2) (3) (4)	77 (170)
	—	—	—	—	—	—	125	90	KAL 36250 29M	With	8539 SGA 51 (2) (3) (4)	200 (440)
										Without	8539 SGA 41 (2) (3) (4)	200 (440)
9	50	37	—	—	—	—	150	110	KAL 36250 30M	With	8539 SGA 52 (2) (3) (4)	200 (440)
										Without	8539 SGA 42 (2) (3) (4)	200 (440)
	—	—	60	45	125	90	—	—	KAL 36250 31M	With	8539 SGA 53 (2) (3) (4)	200 (440)
										Without	8539 SGA 43 (2) (3) (4)	200 (440)
10	60	45	75	55	150	110	200	150	LAL 36400 32M	With	8539 SGA 54 (2) (3) (4)	200 (440)
										Without	8539 SGA 44 (2) (3) (4)	200 (440)
	75	55	—	—	—	—	—	—	LAL 36400 33M	With	8539 SGA 55 (2) (3) (4)	200 (440)
										Without	8539 SGA 45 (2) (3) (4)	200 (440)
11	—	—	100	75	200	150	—	—	LAL 36400 35M	With	8539 SGA 56 (2) (3) (4)	200 (440)
										Without	8539 SGA 46 (2) (3) (4)	200 (440)
	—	—	—	—	—	—	250	185	LAL 36400 35M	With	8539 SHA 52 (2) (3) (4)	200 (441)
										Without	8539 SHA 42 (2) (3) (4)	200 (441)
12	100	75	—	—	250	185	300	220	LAL 36400 36M	With	8539 SHA 53 (2) (3) (4)	200 (441)
										Without	8539 SHA 43 (2) (3) (4)	200 (441)
	125	90	150	110	300	220	400	300	MAL 36600 40M	With	8539 SHA 54 (2) (3) (4)	200 (441)
										Without	8539 SHA 44 (2) (3) (4)	200 (441)
13	150	110	—	—	350	250	—	—	MAL 36600 42M	With	8539 SHA 55 (2) (3) (4)	200 (441)
										Without	8539 SHA 45 (2) (3) (4)	200 (441)
	—	—	200	150	400	300	—	—	MAL 36600 44M	With	8539 SHA 56 (2) (3) (4)	200 (441)
										Without	8539 SHA 46 (2) (3) (4)	200 (441)
14	—	—	—	—	—	—	500	370	MAL 36800 44M	With	8539 SJA 51 (2) (3) (4)	318 (702)
	—	—	250	185	500	370	600	450	MAL 36800 45M	With	8539 SJA 52 (2) (3) (4)	318 (702)
	—	—	300	220	600	450	—	—	MAL 361000 47M	With	8539 SJA 53 (2) (3) (4)	318 (702)

(1) (2) (3) (4) See page 2/8.

General, characteristics:
pages 2/4 and 2/5Dimensions:
pages 2/22 and 2/23

Combination Starters

Type S, NEMA-style starters with
Thermal-magnetic circuit breaker, Class 8539

531042



8539 SBG 1 ●●●

2

3-pole thermal-magnetic circuit-breaker starters, non-reversing

NEMA Size	Standard power ratings of 3-phase motors 50/60 Hz								3Circuit- breaker	External reset	Basic reference Add code indicating control circuit voltage (2), optional variants (3) and “H” code (4)	Weight	
	Motor volts (1)												
	200 V (208 V) 230 V (240 V) 460 V (480 V) 575 V (600 V)												
	hp	kW	hp	kW	hp	kW	hp	kW	Type	Rating			
NEMA 1 general purpose enclosure													kg (lb)
0	2	1.5	2	1.5	—	—	—	—	FAL	15	—	8539 SBG 1 (2) (3) (4)	17 (38)
	—	—	—	—	5	3.7	5	3.7	FAL	15	—	8539 SBG 2 (2) (3) (4)	17 (38)
	3	2.2	3	2.2	—	—	—	—	FAL	20	—	8539 SBG 3 (2) (3) (4)	17 (38)
1	5	3.7	—	—	—	—	—	—	FAL	35	—	8539 SCG 5 (2) (3) (4)	17 (38)
	7.5	5.5	—	—	—	—	—	—	FAL	50	—	8539 SCG 2 (2) (3) (4)	17 (38)
	—	—	5	3.7	—	—	—	—	FAL	30	—	8539 SCG 1 (2) (3) (4)	17 (38)
	—	—	7.5	5.5	—	—	—	—	FAL	45	—	8539 SCG 6 (2) (3) (4)	17 (38)
	—	—	—	—	7.5	5.5	10	7.5	FAL	20	—	8539 SCG 3 (2) (3) (4)	17 (38)
	—	—	—	—	10	7.5	—	—	FAL	25	—	8539 SCG 7 (2) (3) (4)	17 (38)
	—	—	—	—	—	—	7.5	5.5	FAL	15	—	8539 SCG 8 (2) (3) (4)	17 (38)
2	10	7.5	10	7.5	—	—	—	—	FAL	60	—	8539 SDG 1 (2) (3) (4)	25 (54)
	—	—	15	11	—	—	—	—	FAL	80	—	8539 SDG 7 (2) (3) (4)	25 (54)
	—	—	—	—	7.5	5.5	—	—	FAL	20	—	8539 SDG 3 (2) (3) (4)	25 (54)
	—	—	—	—	20	15	25	18.5	FAL	60	—	8539 SDG 4 (2) (3) (4)	25 (54)
	—	—	—	—	25	18.5	—	—	FAL	70	—	8539 SDG 5 (2) (3) (4)	25 (54)
	—	—	—	—	—	—	15	11	FAL	35	—	8539 SDG 8 (2) (3) (4)	25 (54)
	—	—	—	—	—	—	20	15	FAL	45	—	8539 SDG 9 (2) (3) (4)	25 (54)
	15	11	20	15	40	30	50	37	FAL	90	—	8539 SEG 3 (2) (3) (4)	46 (102)
3	20	15	25	18.5	50	37	—	—	FAL	100	—	8539 SEG 1 (2) (3) (4)	46 (102)
	25	18.5	30	22	—	—	—	—	KAL	110	—	8539 SEG 5 (2) (3) (4)	46 (102)
	—	—	—	—	30	22	40	30	FAL	80	—	8539 SEG 6 (2) (3) (4)	46 (102)
	—	—	—	—	—	—	30	22	FAL	60	—	8539 SEG 4 (2) (3) (4)	46 (102)
4	30	22	—	—	75	55	—	—	KAL	125	—	8539 SFG 3 (2) (3) (4)	74 (163)
	40	30	50	37	100	75	—	—	KAL	200	—	8539 SFG 4 (2) (3) (4)	74 (163)
	—	—	40	30	—	—	100	75	KAL	150	—	8539 SFG 1 (2) (3) (4)	74 (163)
	—	—	—	—	60	45	75	55	KAL	110	—	8539 SFG 5 (2) (3) (4)	74 (163)
	—	—	—	—	—	—	60	45	FAL	100	—	8539 SFG 6 (2) (3) (4)	74 (163)
5	50	37	—	—	—	—	150	110	LAL	200	—	8539 SGG 6 (2) (3) (4)	191 (420)
	60	45	75	55	150	110	200	150	LAL	250	—	8539 SGG 1 (2) (3) (4)	191 (420)
	75	55	—	—	—	—	—	—	LAL	300	—	8539 SGG 4 (2) (3) (4)	191 (420)
	—	—	60	45	125	90	—	—	LAL	225	—	8539 SGG 3 (2) (3) (4)	191 (420)
	—	—	100	75	200	150	—	—	LAL	350	—	8539 SGG 2 (2) (3) (4)	191 (420)
	—	—	—	—	—	—	125	90	KAL	200	—	8539 SGG 7 (2) (3) (4)	191 (420)
6	100	75	125	90	250	185	300	220	MAL	450	—	8539 SHG 4 (2) (3) (4)	220 (486)
	125	90	150	110	300	220	400	300	MAL	600	—	8539 SHG 3 (2) (3) (4)	220 (486)
	150	110	—	—	350	250	—	—	MAL	600	—	8539 SHG 5 (2) (3) (4)	220 (486)
	—	—	200	150	400	300	—	—	MAL	800	—	8539 SHG 7 (2) (3) (4)	220 (486)
	—	—	—	—	—	—	250	185	MAL	250	—	8539 SHG 6 (2) (3) (4)	220 (486)
	—	—	—	—	—	—	350	250	MAL	500	—	8539 SHG 2 (2) (3) (4)	220 (486)
7	—	—	250	185	500	370	600	450	MAL	900	—	8539 SJG 2 (2) (3) (4)	320 (706)
	—	—	300	220	600	450	—	—	MAL	1000	—	8539 SJG 3 (2) (3) (4)	320 (706)
	—	—	—	—	—	—	500	370	MAL	800	—	8539 SJG 1 (2) (3) (4)	320 (706)
NEMA 12 dust-tight industrial-use enclosure													
0	2	1.5	2	1.5	—	—	—	—	FAL	15	With	8539 SBA 11 (2) (3) (4)	18 (40)
	—	—	—	—	5	3.7	5	3.7	FAL	15	Without	8539 SBA 1 (2) (3) (4)	18 (40)
	—	—	—	—	5	3.7	5	3.7	FAL	15	With	8539 SBA 12 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	FAL	15	Without	8539 SBA 2 (2) (3) (4)	18 (40)
1	3	2.2	3	2.2	—	—	—	—	FAL	20	With	8539 SBA 13 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	FAL	20	Without	8539 SBA 13 (2) (3) (4)	18 (40)
	5	3.7	—	—	—	—	—	—	FAL	35	With	8539 SCA 15 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	FAL	35	Without	8539 SCA 5 (2) (3) (4)	18 (40)
	7.5	5.5	—	—	—	—	—	—	FAL	50	With	8539 SCA 12 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	FAL	50	Without	8539 SCA 2 (2) (3) (4)	18 (40)
	—	—	5	3.7	—	—	—	—	FAL	30	With	8539 SCA 11 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	FAL	30	Without	8539 SCA 1 (2) (3) (4)	18 (40)
	—	—	7.5	5.5	—	—	—	—	FAL	45	With	8539 SCA 16 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	FAL	45	Without	8539 SCA 6 (2) (3) (4)	18 (40)
	—	—	—	—	7.5	5.5	10	7.5	FAL	20	With	8539 SCA 13 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	FAL	20	Without	8539 SCA 3 (2) (3) (4)	18 (40)
2	—	—	—	—	10	7.5	—	—	FAL	25	With	8539 SCA 17 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	FAL	25	Without	8539 SCA 7 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	7.5	5.5	FAL	15	With	8539 SCA 18 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	FAL	15	Without	8539 SCA 8 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	FAL	15	With	8539 SCA 18 (2) (3) (4)	18 (40)
	—	—	—	—	—	—	—	—	FAL	15	Without	8539 SCA 8 (2) (3) (4)	18 (40)

(1) (2) (3) (4) See page 2/8.

Combination Starters

Type S, NEMA-style starters with
Thermal-magnetic circuit-breaker, Class 8539

531042



8539 SDA 11 ●●●

3-pole thermal-magnetic circuit-breaker starters, non-reversing

NEMA 12 dust-tight industrial-use enclosure (continued)

NEMA Size	Standard power ratings of 3-phase motors 50/60 Hz								Circuit- breaker		External reset	Basic reference Add code indicating control circuit voltage (2), optional variants (3) and “H” code (4)	Weight
	Motor volts (1)												
	200 V (208 V)		230 V (240 V)		460 V (480 V)		575 V (600 V)		Type	Rating			
	hp	kW	hp	kW	hp	kW	hp	kW		A		kg (lb)	
2	10	7.5	10	7.5	—	—	—	—	FAL	60	With	8539 SDA 11 (2) (3) (4)	25 (55)
											Without	8539 SDA 1 (2) (3) (4)	25 (55)
	—	—	15	11	—	—	—	—	FAL	80	With	8539 SDA 17 (2) (3) (4)	25 (55)
											Without	8539 SDA 7 (2) (3) (4)	25 (55)
	—	—	—	—	7.5	5.5	—	—	FAL	20	With	8539 SDA 13 (2) (3) (4)	25 (55)
											Without	8539 SDA 3 (2) (3) (4)	25 (55)
	—	—	—	—	20	15	25	18.5	FAL	60	With	8539 SDA 14 (2) (3) (4)	25 (55)
											Without	8539 SDA 4 (2) (3) (4)	25 (55)
	—	—	—	—	25	18.5	—	—	FAL	70	With	8539 SDA 15 (2) (3) (4)	25 (55)
											Without	8539 SDA 5 (2) (3) (4)	25 (55)
3	—	—	—	—	—	—	15	11	FAL	35	With	8539 SDA 18 (2) (3) (4)	25 (55)
											Without	8539 SDA 8 (2) (3) (4)	25 (55)
	—	—	—	—	—	—	20	15	FAL	45	With	8539 SDA 19 (2) (3) (4)	25 (55)
											Without	8539 SDA 9 (2) (3) (4)	25 (55)
	15	11	20	15	40	30	50	37	FAL	90	With	8539 SEA 13 (2) (3) (4)	50 (111)
											Without	8539 SEA 3 (2) (3) (4)	50 (111)
	20	15	25	18.5	50	37	—	—	FAL	100	With	8539 SEA 11 (2) (3) (4)	50 (111)
											Without	8539 SEA 1 (2) (3) (4)	50 (111)
	25	18.5	30	22	—	—	—	—	KAL	110	With	8539 SEA 15 (2) (3) (4)	50 (111)
											Without	8539 SEA 5 (2) (3) (4)	50 (111)
4	—	—	—	—	30	22	40	30	FAL	80	With	8539 SEA 16 (2) (3) (4)	50 (111)
											Without	8539 SEA 6 (2) (3) (4)	50 (111)
	—	—	—	—	—	—	30	22	FAL	60	With	8539 SEA 14 (2) (3) (4)	50 (111)
											Without	8539 SEA 4 (2) (3) (4)	50 (111)
	30	22	—	—	75	55	—	—	KAL	125	With	8539 SFA 13 (2) (3) (4)	77 (170)
											Without	8539 SFA 3 (2) (3) (4)	77 (170)
	40	30	50	37	100	75	—	—	KAL	200	With	8539 SFA 14 (2) (3) (4)	77 (170)
											Without	8539 SFA 4 (2) (3) (4)	77 (170)
	—	—	40	30	—	—	100	75	KAL	150	With	8539 SFA 11 (2) (3) (4)	77 (170)
											Without	8539 SFA 1 (2) (3) (4)	77 (170)
5	—	—	—	—	60	45	75	55	KAL	110	With	8539 SFA 15 (2) (3) (4)	77 (170)
											Without	8539 SFA 5 (2) (3) (4)	77 (170)
	—	—	—	—	—	—	60	45	FAL	100	With	8539 SFA 16 (2) (3) (4)	77 (170)
											Without	8539 SFA 6 (2) (3) (4)	77 (170)
	50	37	—	—	—	—	150	110	LAL	200	With	8539 SGA 16 (2) (3) (4)	200 (440)
											Without	8539 SGA 6 (2) (3) (4)	200 (440)
	60	45	75	55	150	110	200	150	LAL	250	With	8539 SGA 11 (2) (3) (4)	200 (440)
											Without	8539 SGA 1 (2) (3) (4)	200 (440)
	75	55	—	—	—	—	—	—	LAL	300	With	8539 SGA 14 (2) (3) (4)	200 (440)
											Without	8539 SGA 4 (2) (3) (4)	200 (440)
6	—	—	60	45	125	90	—	—	LAL	225	With	8539 SGA 13 (2) (3) (4)	200 (440)
											Without	8539 SGA 3 (2) (3) (4)	200 (440)
	—	—	100	75	200	150	—	—	LAL	350	With	8539 SGA 12 (2) (3) (4)	200 (440)
											Without	8539 SGA 2 (2) (3) (4)	200 (440)
	—	—	—	—	—	—	125	90	KAL	200	With	8539 SGA 17 (2) (3) (4)	200 (440)
											Without	8539 SGA 7 (2) (3) (4)	200 (440)
	100	75	125	90	250	185	300	220	MAL	450	With	8539 SHA 14 (2) (3) (4)	220 (486)
											Without	8539 SHA 4 (2) (3) (4)	220 (486)
	125	90	150	110	300	220	400	300	MAL	600	With	8539 SHA 13 (2) (3) (4)	220 (486)
											Without	8539 SHA 3 (2) (3) (4)	220 (486)
7	150	110	—	—	350	250	—	—	MAL	600	With	8539 SHA 15 (2) (3) (4)	220 (486)
											Without	8539 SHA 5 (2) (3) (4)	220 (486)
	—	—	200	150	400	300	—	—	MAL	800	With	8539 SHA 17 (2) (3) (4)	220 (486)
											Without	8539 SHA 7 (2) (3) (4)	220 (486)
	—	—	—	—	—	—	250	185	MAL	250	With	8539 SHA 16 (2) (3) (4)	220 (486)
											Without	8539 SHA 6 (2) (3) (4)	220 (486)
	—	—	—	—	—	—	350	250	MAL	500	With	8539 SHA 12 (2) (3) (4)	220 (486)
											Without	8539 SHA 2 (2) (3) (4)	220 (486)
	—	—	250	185	500	370	600	450	MAL	900	With	8539 SJA 12 (2) (3) (4)	320 (706)
											Without	8539 SJA 2 (2) (3) (4)	320 (706)
8	—	—	300	220	600	450	—	—	MAL	1000	With	8539 SJA 13 (2) (3) (4)	320 (706)
											Without	8539 SJA 3 (2) (3) (4)	320 (706)
	—	—	—	—	—	—	500	370	MAL	800	With	8539 SJA 11 (2) (3) (4)	320 (706)
											Without	8539 SJA 1 (2) (3) (4)	320 (706)

(1) (2) (3) (4) (5) See page 2/8.

Combination Starters

Type S, NEMA-style starters with
Non-fusible disconnect-switch, Class 8538

531268



8538 SBG 11 ●●●

3-pole non-fusible full-voltage starters, non-reversing

NEMA Size	Standard power ratings of 3-phase motors 50/60 Hz								External reset	Basic reference Add code indicating control circuit voltage (2), optional variants (3) and "H" code (4)	Weight
	Motor volts (1) 200 V (208 V) 230 V (240 V) 460 V (480 V) 575 V (600 V)										
	hp	kW	hp	kW	hp	kW	hp	kW			kg (lb)
NEMA 1 general purpose enclosure											
0	3	2.2	3	2.2	5	3.75	5	3.75	–	8538 SBG 11 (2) (3) (4)	17 (38)
1	7.5	5.5	7.5	5.5	10	7.5	10	7.5	–	8538 SCG 11 (2) (3) (4)	17 (38)
2	10	7.5	15	11	25	18.5	25	18.5	–	8538 SDG 11 (2) (3) (4)	25 (54)
3	25	18.5	30	22	50	37	50	37	–	8538 SEG 11 (2) (3) (4)	46 (102)
4	40	30	50	37	100	75	100	75	–	8538 SFG 11 (2) (3) (4)	74 (163)
5	75	55	100	75	200	150	200	150	–	8538 SGG 11 (2) (3) (4)	204 (450)
6	150	110	200	150	400	300	400	300	–	8538 SHG 11 (2) (3) (4)	–

NEMA 12 dust-tight industrial-use enclosure

0	3	2.2	3	2.2	5	3.75	5	3.75	With	8538 SBA 21 (2) (3) (4)	18 (40)
									Without	8538 SBA 11 (2) (3) (4)	18 (40)
1	7.5	5.5	7.5	5.5	10	7.5	10	7.5	With	8538 SCA 21 (2) (3) (4)	18 (40)
									Without	8538 SCA 11 (2) (3) (4)	18 (40)
2	10	7.5	15	11	25	18.5	25	18.5	With	8538 SDA 21 (2) (3) (4)	25 (55)
									Without	8538 SDA 11 (2) (3) (4)	25 (55)
3	25	18.5	30	22	50	37	50	37	With	8538 SEA 21 (2) (3) (4)	50 (111)
									Without	8538 SEA 11 (2) (3) (4)	50 (111)
4	40	30	50	37	100	75	100	75	With	8538 SFA 21 (2) (3) (4)	77 (170)
									Without	8538 SFA 11 (2) (3) (4)	77 (170)
5	75	55	100	75	200	150	200	150	With	8538 SGA 21 (2) (3) (4)	200 (441)
									Without	8538 SGA 11 (2) (3) (4)	200 (441)
6	150	110	200	150	400	300	400	300	With	8538 SHA 21 (2) (3) (4)	200 (441)
									Without	8538 SHA 11 (2) (3) (4)	200 (441)

(1) Motor voltage (starter voltage).

(2) Standard control circuit voltage:

Volts	24	110	120	208	220	240	380	440	480	550	600
50 Hz	–	V02	–	–	V03	–	V05	V06	–	V07	–
60 Hz	V01 (5) (6)	–	V02 (5)	V08	–	V03	–	–	V06	–	V07

24 V and 120 V coils require the addition of form "S" for separate control. Example: **8538 SCA 21 V03 H10S**.

(3) For optional variants, see page 2/21.

(4) To complete "H" code for Motor Logic solid-state overload relays, see pages 2/13 to 2/19. Motor Logic Plus units are not available on combination starters.

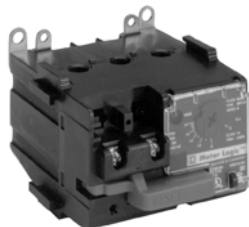
(5) 24 V coils are not available on Sizes 4–6. On Sizes 0–3, where 24 V coils are available, suffix "S" (separate control) must be specified.

(6) These voltage codes must include suffix "S" (supplied at no charge). When specifying suffix "S", please supply motor voltage when ordering.

Combination Starters

Type S, NEMA-style starters with
Fusible disconnect switch, Class 8538 with
Class H fuse clips

531123



H10

Variants for fusible disconnect-switch starters only (Class H fuse clips)

Motor Logic solid-state overload relays (1)

Type	For use on Fusible disconnect- switch starters Class 8538 with Class H fuse clips	Description	Overload relay range	Suffix to the starter reference (2)	Weight kg (lb)
Motor Logic solid- state overload relays	8538 S●G 1●,	Base unit, trip class 10	(3)	H10	—
	8538 S●A 1●,	Base unit, trip class 20	(3)	H20	—
	8538 S●A 2●, (except 8538 SDG 16, 8538 SDA 16/SDA 26)	Feature unit	(3)	H30	—
	8538 SBG 12/13,	Base unit, trip class 10	With 3...9 A overload relay	H109	—
	8538 SBA 12/22/13/23,	Base unit, trip class 20	With 3...9 A overload relay	H209	—
	8538 SCG 12/14,	Feature unit	With 1.5...4.5 A overload relay	H308	—
	8538 SCA 12/22/14/24,		With 3...9 A overload relay	H309	—
	8538 SDG 16, 8538 SDA 16/26				
	8538 SCG 12/14	Base unit, trip class 10	With 6...18 A overload relay	H100	—
	8538 SCA 12/22/14/24,	Base unit, trip class 20	With 6...18 A overload relay	H200	—
	8538 SDG 16	Feature unit	With 6...18 A overload relay	H300	—
	8538 SDA 16/26				
	8538 SDG 16,	Base unit, trip class 10	With 9...27 A overload relay	H101	—
	8538 SDA 16/26	Base unit, trip class 20	With 9...27 A overload relay	H201	—
		Feature unit	With 9...27 A overload relay	H301	—

(1) For Motor Logic solid-state overload relays, see pages 3/2 to 3/7.

(2) Example: **8538 SBG 12 V02 H10 S**.

(3) Standard current ranges, depending on contactor size:

Size	00	0	1	2	3	4	5	6	7
Current ranges A	3...9	6...18	9...27	15...45	30...90	45...135	90...270	180...540 (4)	270...810 (5)

(4) Only available with feature unit.

(5) Only available with feature unit with auxiliary contact.

Combination Starters

Type S, NEMA-style starters with
Fusible disconnect switch, Class 8538
(Class R fuse clips) with solid-state overload relay

Associations

Ratings		For use on	Motor Logic solid-state overload relays												
Motor voltage	NEMA Size		Class 10				Class 20				Class 10/20 (selectable)				
			8538	—	3–9 A	6–18 A	9–27 A	—	3–9 A	6–18 A	9–27 A	—	1.5–4.5 A	3–9 A	6–18 A
200 V	0	SBG 32, SBA 42/32	H10	H109			H20	H209			H30	H308	H309		
	1	SCG 32, SCA 42/32	H10	H109	H100		H20	H209	H200		H30	H308	H309	H300	
		SCG 33, SCA 43/33	H10				H20				H30				
	2	SDG 32, SDA 42/32	H10				H20				H30				
	3	SEG 35, SEA 45/35	H10				H20				H30				
		SEG 32, SEA 42/32	H10				H20				H30				
	4	SFG 35, SFA 45/35	H10				H20				H30				
	5	SGG 35, SGA 45/35	H10				H20				H30				
230 V	6	SHG 33, SHA 43/33	H10				H20				H30				
	0	SBG 32, SBA 42/32	H10	H109			H20	H209			H30	H308	H309		
	1	SCG 32, SCA 42/32	H10	H109	H100		H20	H209	H200		H30	H308	H309	H300	
		SCG 33, SCA 43/33	H10				H20				H30				
	2	SDG 32, SDA 42/32	H10				H20				H30				
	3	SEG 35, SEA 45/35	H10				H20				H30				
		SEG 32, SEA 42/32	H10				H20				H30				
	4	SFG 35, SFA 45/35	H10				H20				H30				
460 V	5	SGG 35, SGA 45/35	H10				H20				H30				
	6	SHG 33, SHA 43/33	H10				H20				H30				
	0	SBG 33, SBA 43/33	H10	H109			H20	H209			H30	H308	H309		
	1	SCG 34, SCA 44/34	H10	H109	H100		H20	H209	H200		H30	H308	H309	H300	
	2	SDG 36, SDA 46/36		H109	H100	H101		H209	H200	H201		H308	H309	H300	H301
	3	SDG 34, SDA 44/34	H10				H20				H30				
		SEG 33, SEA 43/33	H10				H20				H30				
	4	SFG 33, SFA 43/33	H10				H20				H30				
575 V	5	SGG 33, SGA 43/33	H10				H20				H30				
	6	SHG 32, SHA 42/32	H10				H20				H30				
	0	SBG 33, SBA 43/33	H10	H109			H20	H209			H30	H308	H309		
	1	SCG 34, SCA 44/34	H10	H109	H100		H20	H209	H200		H30	H308	H309	H300	
	2	SDG 36, SDA 46/36		H109	H100	H101		H209	H200	H201		H308	H309	H300	H301
	3	SDG 34, SDA 44/34	H10				H20				H30				
		SEG 33, SEA 43/33	H10				H20				H30				
	4	SFG 33, SFA 43/33	H10				H20				H30				

Available codes

Not available

Combination Starters

Type S, NEMA-style starters with
Non-fusible disconnect switch, Class 8538 with
solid-state overload relays

Associations												
Ratings		For use on	Motor Logic solid-state overload relays									
Motor voltage	NEMA Size		Class 10	Class 20			Class 10/20 (selectable)					
		8538	—	3–9 A	6–18 A	—	3–9 A	6–18 A	—	1.5–4.5 A	3–9 A	6–18 A
200 V	0	SBG 11, SBA 21/11	H10	H109		H20	H209		H30	H308	H309	
	1	SCG 11, SCA 21/11	H10	H109	H100	H20	H209	H200	H30	H308	H309	H300
	2	SDG 11, SDA 21/11	H10			H20			H30			
	3	SEG 11, SEA 21/11	H10			H20			H30			
	4	SFG 11, SFA 21/11	H10			H20			H30			
	5	SGG 11, SGA 21/11	H10			H20			H30			
	6	SHG 11, SHA 21/11	H10			H20			H30			
230 V	0	SBG 11, SBA 21/11	H10	H109		H20	H209		H30	H308	H309	
	1	SCG 11, SCA 21/11	H10	H109	H100	H20	H209	H200	H30	H308	H309	H300
	2	SDG 11, SDA 21/11	H10			H20			H30			
	3	SEG 11, SEA 21/11	H10			H20			H30			
	4	SFG 11, SFA 21/11	H10			H20			H30			
	5	SGG 11, SGA 21/11	H10			H20			H30			
	6	SHG 11, SHA 21/11	H10			H20			H30			
460 V	0	SBG 11, SBA 21/11	H10	H109		H20	H209		H30	H308	H309	
	1	SCG 11, SCA 21/11	H10	H109	H100	H20	H209	H200	H30	H308	H309	H300
	2	SDG 11, SDA 21/11	H10			H20			H30			
	3	SEG 11, SEA 21/11	H10			H20			H30			
	4	SFG 11, SFA 21/11	H10			H20			H30			
	5	SGG 11, SGA 21/11	H10			H20			H30			
	6	SHG 11, SHA 21/11	H10			H20			H30			
575 V	0	SBG 11, SBA 21/11	H10	H109		H20	H209		H30	H308	H309	
	1	SCG 11, SCA 21/11	H10	H109	H100	H20	H209	H200	H30	H308	H309	H300
	2	SDG 11, SDA 21/11	H10			H20			H30			
	3	SEG 11, SEA 21/11	H10			H20			H30			
	4	SFG 11, SFA 21/11	H10			H20			H30			
	5	SGG 11, SGA 21/11	H10			H20			H30			
	6	SHG 11, SHA 21/11	H10			H20			H30			

Available codes

Not available

Combination Starters

Type S, NEMA-style starters with
Mag-Gard® circuit breaker, Class 8539 with
solid-state overload relays

Associations

Ratings		For use on	Motor Logic solid-state overload relays												
Motor voltage	NEMA Size		Class 10				Class 20				Class 10/20 (selectable)				
			8539	—	3–9 A	6–18 A	9–27 A	—	3–9 A	6–18 A	9–27 A	—	1.5–4.5 A	3–9 A	6–18 A
200 V	0	SBG 41, SBA 51/41										H308			
		SBG 42, SBA 52/42		H109				H209				H308	H309		
		SBG 43, SBA 53/43		H109				H209					H309		
	1	SCG 41, SCA 51/41										H308			
		SCG 42, SCA 52/42		H109				H209				H308	H309		
		SCG 43, SCA 53/43			H100				H200					H300	
		SCG 44, SCA 54/44	H10				H20				H30				
		SCG 45, SCA 55/45	H10				H20				H30				
	2	SDG 41, SDA 51/41			H100				H200					H300	
		SDG 42, SDA 52/42				H101				H201					H301
		SDG 43, SDA 53/43	H10				H20				H30				
	3	SEG 42, SEA 52/42	H10				H20				H30				
	4	SFG 42, SFA 52/42	H10				H20				H30				
		SFG 43, SFA 53/43	H10				H20				H30				
	5	SGG 42, SGA 52/42	H10				H20				H30				
		SGG 44, SGA 54/44	H10				H20				H30				
		SGG 45, SGA 55/45	H10				H20				H30				
	6	SHG 43, SHA 53/43	H10				H20				H30				
		SHG 44, SHA 54/44	H10				H20				H30				
		SHG 45, SHA 55/45	H10				H20				H30				
230 V	0	SBG 41, SBA 51/41										H308			
		SBG 42, SBA 52/42		H109				H209				H308	H309		
		SBG 43, SBA 53/43		H109				H209					H309		
	1	SCG 41, SCA 51/41										H308			
		SCG 42, SCA 52/42		H109				H209				H308	H309		
		SCG 43, SCA 53/43			H100				H200					H300	
		SCG 44, SCA 54/44	H10				H20				H30				
	2	SDG 41, SDA 51/41			H100				H200					H300	
		SDG 42, SDA 52/42				H101				H201					H301
		SDG 43, SDA 53/43	H10				H20				H30				
		SDG 44, SDA 54/44	H10				H20				H30				
	3	SEG 42, SEA 52/42	H10				H20				H30				
	4	SFG 43, SFA 53/43	H10				H20				H30				
		SFG 44, SFA 54/44	H10				H20				H30				
	5	SGG 43, SGA 53/43	H10				H20				H30				
		SGG 44, SGA 54/44	H10				H20				H30				
		SGG 46, SGA 56/46	H10				H20				H30				
	6	SHG 44, SHA 54/44	H10				H20				H30				
		SHG 46, SHA 56/46	H10				H20				H30				
	7	SJG 42, SJA 52	H10				H20				H30				
		SJG 43, SJA 53	H10				H20				H30				

Available codes

Not available

Combination Starters

Type S, NEMA-style starters with
Mag-Gard® circuit breaker, Class 8539 with
solid-state overload relays

Associations (continued)

Ratings		For use on	Motor Logic solid-state overload relays													
Motor voltage	NEMA Size		Class 10				Class 20				Class 10/20 (selectable)					
			8539	—	3–9 A	6–18 A	9–27 A	—	3–9 A	6–18 A	9–27 A	—	1.5–4.5 A	3–9 A	6–18 A	9–27 A
460 V	0	SBG 41, SBA 51/41											H308			
		SBG 42, SBA 52/42		H109				H209				H308	H309			
		SBG 43, SBA 53/43		H109				H209					H309			
	1	SCG 41, SCA 51/41										H308				
		SCG 42, SCA 52/42		H109				H209				H308	H309			
		SCG 43, SCA 53/43			H100				H200						H300	
		SCG 44, SCA 54/44	H10				H20			H30						
	2	SDG 41, SDA 51/41			H100				H200						H300	
		SDG 42, SDA 52/42				H101				H201						H301
		SDG 43, SDA 53/43	H10				H20				H30					
	3	SEG 41, SEA 51/41	H10				H20				H30					
		SEG 42, SEA 52/42	H10				H20				H30					
	4	SFG 42, SFA 52/42	H10				H20				H30					
		SFG 44, SFA 54/44	H10				H20				H30					
	5	SGG 43, SGA 53/43	H10				H20				H30					
		SGG 44, SGA 54/44	H10				H20				H30					
		SGG 46, SGA 56/46	H10				H20				H30					
	6	SHG 43, SHA 53/43	H10				H20				H30					
		SHG 44, SHA 54/44	H10				H20				H30					
		SHG 45, SHA 55/45	H10				H20				H30					
		SHG 46, SHA 56/46	H10				H20				H30					
	7	SJG 42, SJA 52	H10				H20				H30					
SJG 43, SJA 53		H10				H20				H30						
575 V	0	SBG 41, SBA 51/41										H308				
		SBG 42, SBA 52/42		H109				H209				H308	H309			
		SBG 43, SBA 53/43		H109				H209					H309			
	1	SCG 41, SCA 51/41										H308				
		SCG 42, SCA 52/42		H109				H209				H308	H309			
		SCG 43, SCA 53/43			H100				H200						H300	
	2	SDG 41, SDA 51/41			H100				H200						H300	
		SDG 42, SDA 52/42				H101				H201						H301
		SDG 43, SDA 53/43	H10				H20				H30					
	3	SEG 41, SEA 51/41	H10				H20				H30					
		SEG 42, SEA 52/42	H10				H20				H30					
	4	SFG 42, SFA 52/42	H10				H20				H30					
		SFG 44, SFA 54/44	H10				H20				H30					
	5	SGG 41, SGA 51/41	H10				H20				H30					
		SGG 42, SGA 52/42	H10				H20				H30					
		SGG 44, SGA 54/44	H10				H20				H30					
	6	SHG 42, SHA 52/42	H10				H20				H30					
		SHG 43, SHA 53/43	H10				H20				H30					
		SHG 44, SHA 54/44	H10				H20				H30					
	7	SJG 41, SJA 51	H10				H20				H30					
		SJG 42, SJA 52	H10				H20				H30					

Available codes

Not available

Combination Starters

Type S, NEMA-style starters with
Thermal-magnetic circuit breaker
and solid-state overload relay

Associations

Ratings		For use on	Motor Logic solid-state overload relays										
Motor voltage	NEMA Size		Class 10			Class 20			Class 10/20 (selectable)				
		8539	–	3–9 A	6–18 A	–	3–9 A	6–18 A	–	1.5–4.5 A	3–9 A	6–18 A	
200 V	0	SBG 1, SBA 11/1		H109			H209			H308	H309		
		SBG 3, SBA 13/3	H10			H20			H30				
	1	SCG 5, SCA 15/5	H10			H20			H30				
		SCG 2, SCA 12/2	H10			H20			H30				
	2	SDG 1, SDA 11/1	H10			H20			H30				
	3	SEG 3, SEA 13/3	H10			H20			H30				
		SEG 1, SEA 11/1	H10			H20			H30				
		SEG 5, SEA 15/5	H10			H20			H30				
	4	SFG 3, SFA 13/3	H10			H20			H30				
		SFG 4, SFA 14/4	H10			H20			H30				
	5	SGG 6, SGA 16/6	H10			H20			H30				
		SGG 1, SGA 11/1	H10			H20			H30				
		SGG 4, SGA 14/4	H10			H20			H30				
	6	SHG 4, SHA 14/4	H10			H20			H30				
		SHG 3, SHA 13/3	H10			H20			H30				
		SHG 5, SHA 15/5	H10			H20			H30				
	230 V	0	SBG 1, SBA 11/1		H109			H209			H308	H309	
			SBG 3, SBA 13/3	H10			H20			H30			
1		SCG 1, SCA 11/1	H10			H20			H30				
		SCG 6, SCA 16/6	H10			H20			H30				
2		SDG 1, SDA 11/1	H10			H20			H30				
		SDG 7, SDA 17/7	H10			H20			H30				
3		SEG 3, SEA 13/3	H10			H20			H30				
		SEG 1, SEA 11/1	H10			H20			H30				
		SEG 5, SEA 15/5	H10			H20			H30				
4		SFG 1, SFA 11/1	H10			H20			H30				
		SFG 4, SFA 14/4	H10			H20			H30				
5		SGG 3, SGA 13/3	H10			H20			H30				
		SGG 1, SGA 11/1	H10			H20			H30				
		SGG 2, SGA 12/2	H10			H20			H30				
6		SHG 4, SHA 14/4	H10			H20			H30				
		SHG 3, SHA 13/3	H10			H20			H30				
		SHG 7, SHA 17/7	H10			H20			H30				
7		SJG 2, SJA 12	H10			H20			H30				
	SJG 3, SJA 13	H10			H20			H30					

Available codes

Not available

Combination Starters

Type S, NEMA-style starters with
Thermal magnetic circuit breaker
with solid-state overload relays

Associations (continued)

Ratings		For use on	Motor Logic solid-state overload relays									
Motor voltage	NEMA Size		Class 10			Class 20			Class 10/20 (selectable)			
			—	3–9 A	6–18 A	—	3–9 A	6–18 A	—	1.5–4.5 A	3–9 A	6–18 A
460 V	0	SBG 2, SBA 12/2		H109			H209			H308	H309	
	1	SCG 3, SCA 13/3			H100			H200				H300
		SCG 7, SCA 17/7			H100			H200				H300
	2	SDG 3, SDA 13/3	H10			H20			H30			
		SDG 4, SDA 14/4	H10			H20			H30			
		SDG 5, SDA 15/5	H10			H20			H30			
	3	SEG 6, SEA 16/6	H10			H20			H30			
		SEG 3, SEA 13/3	H10			H20			H30			
		SEG 1, SEA 11/1	H10			H20			H30			
	4	SFG 5, SFA 15/5	H10			H20			H30			
		SFG 3, SFA 13/3	H10			H20			H30			
		SFG 4, SFA 14/4	H10			H20			H30			
	5	SGG 3, SGA 13/3	H10			H20			H30			
		SGG 1, SGA 11/1	H10			H20			H30			
		SGG 2, SGA 12/2	H10			H20			H30			
	6	SHG 4, SHA 14/4	H10			H20			H30			
		SHG 3, SHA 13/3	H10			H20			H30			
		SHG 5, SHA 15/5	H10			H20			H30			
		SHG 7, SHA 17/7	H10			H20			H30			
	7	SJG 2, SJA 12	H10			H20			H30			
		SJG 3, SJA 13	H10			H20			H30			
575 V	0	SBG 2, SBA 12/2		H109			H209			H308	H309	
	1	SCG 8, SCA 18/8			H100			H200				H300
		SCG 3, SCA 13/3			H100			H200				H300
	2	SDG 8, SDA 18/8	H10			H20			H30			
		SDG 9, SDA 19/9	H10			H20			H30			
		SDG 4, SDA 14/4	H10			H20			H30			
	3	SEG 4, SEA 14/4	H10			H20			H30			
		SEG 6, SEA 16/6	H10			H20			H30			
		SEG 3, SEA 13/3	H10			H20			H30			
	4	SFG 6, SFA 16/6	H10			H20			H30			
		SFG 5, SFA 15/5	H10			H20			H30			
		SFG 1, SFA 11/1	H10			H20			H30			
	5	SGG 7, SGA 17/7	H10			H20			H30			
		SGG 6, SGA 16/6	H10			H20			H30			
		SGG 1, SGA 11/1	H10			H20			H30			
	6	SHG 6, SHA 16/6	H10			H20			H30			
		SHG 4, SHA 14/4	H10			H20			H30			
		SHG 2, SHA 12/2	H10			H20			H30			
		SHG 3, SHA 13/3	H10			H20			H20			
	7	SJG 1, SJA 11	H10			H20			H30			
		SJG 2, SJA 12	H10			H20			H30			

Available codes

Not available

Characteristics					
Class		9999			
Type		Single-pole electrical interlocks			
Electrical ratings		Make		Break	Continuous carrying current
Maximum current					
50/60 Hz	~ 120 V	A	40	15	15
	~ 240 V	A	20	10	15
	~ 480 V	A	10	8	15
	~ 600 V	A	8	6	15
Class		9999			
Type		2-pole electrical interlocks			
Electrical ratings		Make		Break	Continuous carrying current
Maximum current					
50/60 Hz	~ 120 V	A	30	3	10
		VA	3450	345	–
	~ 240 V	A	15	1.5	10
		VA	3450	345	–
	~ 480 V	A	7.5	0.75	10
		VA	3450	345	–
	~ 600 V	A	6	0.6	10
		VA	3450	345	–

Combination Starters

Type S, NEMA-style Accessories

Variants

Type	For use on	Description	Suffix to the starter reference (1)	Weight kg (lb)
Interlocks	Disconnect-switch starters 8538 S●● or circuit-breaker starters 8539 S●●	Single-pole	Y74	—
		2-pole	Y75	—
Control transformers	Disconnect-switch starters 8538 S●● or circuit-breaker starters 8539 S●●	Standard capacity	F4T	—
		50 VA additional capacity	F4T10	—
		100 VA additional capacity	F4T11	—
		200 VA additional capacity	F4T12	—

Interlocks

Type	For use on Class Type (2)	Description	Reference	Weight kg (lb)
Interlocks	8538 SB, SC, SD (Series B) (3)	Single-pole	9999 R6	—
		2-pole	9999 R7	—
	SD (Series C)	Single-pole	9999 R43	—
		2-pole	9999 R44	—
	SB, SC (Series C)	Single-pole	9999 R45	—
		2-pole	9999 R46	—
	SE, SF (Series A)	Single-pole	9999 R8	—
		2-pole	9999 R9	—
	SE (Series B and C)	Single-pole	9999 R41	—
		2-pole	9999 R42	—
	SF (Series B and C)	Single-pole	9999 R39	—
		2-pole	9999 R40	—
	SG	Single-pole	9999 R35	—
		2-pole	9999 R36	—
	SBA, SCA, SBG, SCG (Series D)	Single-pole	9999 TC11	—
		2-pole	9999 TC21	—
	SBAS8, SCAS8, SBGS8, SCGS8 (Series D), SDA, SDA (3), SDG, SDG (3) (Series D), SEA, SEG (Series D)	Single-pole	9999 TC10	—
		2-pole	9999 TC20	—
	8539 SB, SC, SD, SE, SF, SG (4)	Single-pole	9999 R26	—
		2-pole	9999 R27	—

(1) Example: **8538 SBG 12 V01 Y74**.

(2) Series A, B, C and D are product versions.

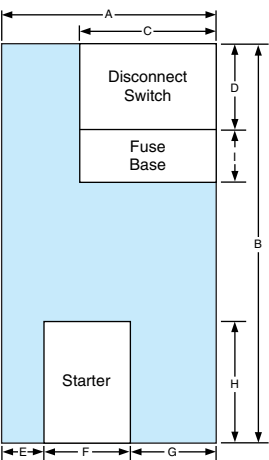
(3) Class 8538 type numbers ending in suffix "S8".

(4) No interlocks available when used with the GJL circuit-breaker.

Combination Starters
Type S, NEMA-style starters with
Disconnect switch or
Circuit breaker

Dimensions in mm (25.4 mm = 1 inch)

Combination starters 8538 S●G

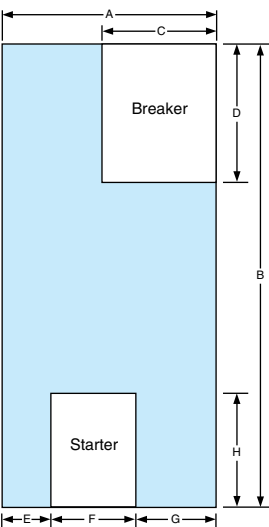


Available space for field requirements

	A	B	C	D	E	F	G	H	I
8538 SBG	175.3	469.9	175.3	165.1	0	88.9	86.4	175.3	101.6
8538 SCG	175.3	469.9	175.3	165.1	0	88.9	86.4	175.3	101.6
8538 SDG	200.7	558.8	190.5	177.8	78.7	121.9	0	195.6	152.4
8538 SEG	304.8	749.3	228.6	195.6	0	142.2	162.6	327.7	134.6
8538 SFG	330.2	990.6	279.4	292.1	0	177.8	152.4	330.2	228.6
8538 SGG (1)	439.4	1498.6	342.9	635.0	0	274.3	165.1	520.7	–
8538 SHG	812.8	2082.8	812.8	1016.0	0	330.2	482.6	889.0	–

(1) Combination starter does not contain a full-size panel. No usable panel space is available.

Combination starters 8539 S●G



Available space for field requirements

	A	B	C	D	E	F	G	H
8539 SBG	175.3	469.9	165.1	200.7	0	88.9	86.4	175.3
8539 SCG	175.3	469.9	165.1	200.7	0	88.9	86.4	175.3
8539 SDG	200.7	558.8	165.1	162.6	78.7	121.9	0	195.6
8539 SEG + FAL (1)	304.8	749.3	165.1	215.9	0	142.2	162.6	327.7
8539 SEG + KAL (1)	304.8	749.3	172.7	266.7	0	142.2	162.6	327.7
8539 SFG	330.2	990.6	172.7	317.5	0	177.8	152.4	330.2
8539 SGG + KAL (1) (2)	439.4	1498.6	172.7	584.2	0	274.3	165.1	520.7
8539 SGG + LAL (1) (2)	439.4	1498.6	228.6	622.3	0	274.3	165.1	520.7
8539 SHG + LAL (1)	812.8	2082.8	228.6	647.7	0	330.2	482.6	889.0
8539 SHG + MAL (1)	812.8	2082.8	317.5	1028.7	0	330.2	482.6	889.0

(1) Circuit-breaker.

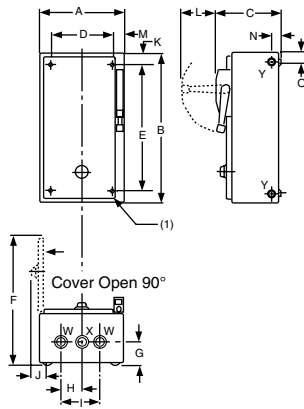
(2) Combination starter does not contain a full-size panel. No usable panel space is available.

Combination Starters

Type S, NEMA-style starters with
Disconnect switch or
Circuit breaker

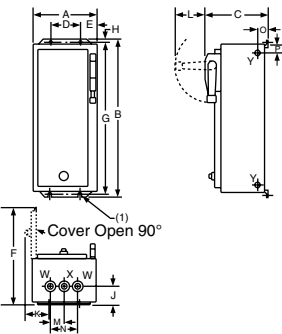
Dimensions in mm (25.4 mm = 1 inch)

Combination starters 8538/8539 SBG to SDG (NEMA 1 enclosure)



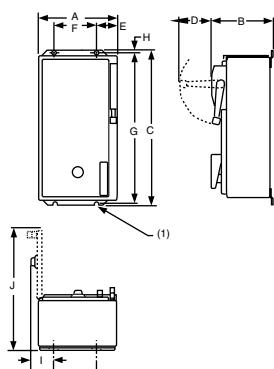
	A	B	C	D	E	F	G	H	I	J
8538/8539 SBG	241.3	571.5	211.8	161.9	520.7	372.1	46.0	42.7	76.2	58.7
8538/8539 SCG	241.3	571.5	211.8	161.9	520.7	372.1	46.0	42.7	76.2	58.7
8538/8539 SDG	266.7	660.4	243.6	187.3	609.6	429.3	54.0	50.8	101.6	25.4
	K	L	M	N	O	W	X	Y		
8538/8539 SBG	26.9	82.6	55.4	31.8	22.2	12.7–19.1	12.7–19.1	12.7		
8538/8539 SCG	26.9	82.6	55.4	31.8	22.2	12.7–19.1	12.7–19.1	12.7		
8538/8539 SDG	26.9	82.6	55.4	31.8	22.2	25.4–31.8	12.7–19.2	12.7		

Combination starters 8538/8539 SEG to SJG (NEMA 1 enclosure)



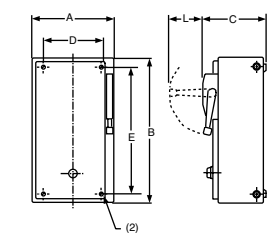
	A	B	C	D	E	F	G	H	J	K
8538 SEG	387.4	1066.8	269.0	235.0	76.2	576.8	1041.4	12.7	71.6	89.7
8539 SEG	387.4	1066.8	269.0	235.0	76.2	576.8	1041.4	12.7	71.6	89.7
8538/8539 SFG	406.4	1333.5	267.5	254.0	76.2	600.7	1308.1	12.7	71.6	89.7
8538 SGG	508.0	1981.2	393.7	304.8	101.6	746.8	1955.8	12.7	89.2	114.6
8539 SGG	508.0	1676.4	348.2	304.8	101.6	746.8	1651.0	12.7	89.2	114.6
8538/8539 SHG	914.4	2286.0	534.2	—	—	1050.9	—	—	—	—
8539 SJG	863.6	533.4	2286.0	—	—	1257.3	—	—	—	—
	L	M	N	O	W	X	Y			
8538 SEG	127.0	68.1	136.5	32.5	25.4–31.8	12.7–19.2	12.7			
8539 SEG	127.0	68.1	136.5	32.5	50.8–63.5	12.7–19.3	12.7			
8538/8539 SFG	127.0	68.1	136.5	32.5	63.5	12.7–19.4	12.7			
8538 SGG	235.0	80.8	—	—	12.7–19.1	76.2	—			
8539 SGG	127.0	80.8	—	—	12.7–19.2	76.2	—			
8538/8539 SHG	127.0	—	—	—	—	—	—			
8539 SJG	127.0	—	—	—	—	—	—			

Combination starters 8538/8539 S●A (NEMA 12 enclosure)



	A	B	C	D	E	F	G	H	I	J
8538/8539 SBA	241.3	211.8	609.6	82.6	63.5	114.3	596.9	15.0	112.5	363.5
8538/8539 SCA	241.3	211.8	609.6	82.6	63.5	114.3	596.9	15.0	112.5	363.5
8538/8539 SDA	266.7	243.6	704.9	82.6	63.5	139.7	685.8	9.5	104.8	420.6
8538/8539 SEA	387.4	269.0	1066.8	127.0	76.2	235.0	1041.4	12.7	128.5	566.7
8538 SFA	406.4	267.5	1333.5	127.0	76.2	254.0	1308.1	12.7	106.2	583.2
8539 SFA	406.4	267.5	1333.5	127.0	76.2	254.0	1308.1	12.7	131.6	583.2
8538 SGA	508.0	348.2	1981.2	235.0	101.6	304.8	1955.8	12.7	197.6	746.8
8539 SGA	508.0	348.2	1676.4	127.0	101.6	304.8	1651.0	12.7	197.6	696.0
8538/8539 SHA	914.4	431.8	2286.0	127.0	—	—	—	—	—	1203.3
8539 SJA	863.6	533.4	2286.0	127.0	—	—	—	—	—	1257.3

Combination starters 8538/8539 S●G ●● S8 and 8538/8539 S●A ●● S8 (NEMA 12 enclosure)



	A	B	C	D	E	L
8538/8539 S●G ●● S8	381.0	730.3	243.6	295.3	666.8	82.6
8538/8539 S●A ●● S8	381.0	787.4	278.4	228.6	768.4	82.6

(2) 0.31 in. (8 mm) dia. mounting holes.

(1) 0.31 in. (8 mm) dia. mounting holes for Sizes 0, 1, and 2, 0.44 in. (11 mm) dia. mounting holes for Sizes 3 and 4, 0.56 in. (14 mm) dia. mounting holes located on 14 external flanges for Size 5.

- Motor Logic® base unit
 - General, description. page 3/2
 - Characteristics page 3/3
 - References page 3/6
 - Dimensions page 3/8
- Motor Logic® feature unit
 - General, description. page 3/2
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 - Dimensions page 3/8
- Motor Logic® Plus programmable unit
 - General, description. page 3/2
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- Motor Logic® Plus II programmable unit
 - General, description. page 3/4
 - Characteristics page 3/5
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Solid-State Overload Relays

Motor Logic® base unit

Motor Logic® feature unit

Motor Logic® Plus programmable unit

General

Overload relays are intended to protect motors, controllers and branch-circuit conductors against excessive heating due to prolonged motor overcurrents up to and including locked rotor currents. Protection of the motor and the other branch-circuit components from higher currents, due to short-circuits or earth faults, is a function of the branch-circuit fuses, circuit-breakers or motor short-circuit protectors.

Electric motors make up a large percentage of power system loads. Market demands for reduced downtime and increased productivity have compelled the motor control industry to continuously evaluate motor protection technology. Technology advancements now allow the motor control industry to offer several options for motor protection.

This briefly reviews traditional motor protection technologies and discusses the new, electronic motor protection options. Important factors to consider in determining the appropriate overload protection include:

- Application requirements.
 - Cost per feature of a given technology.
 - Willingness and ability of all parts of the user's organization to embrace and implement the new technology.
- Motor failure may be the result of electrical or mechanical factors. A study commissioned by the Electrical Research Associates (ERA) of the United Kingdom indicated that the most common causes of motor failure are:

1 Overcurrent	30 %
2 Contamination	18 %
3 Single phasing	15 %
4 Bearing failure	12 %
5 Aging (natural wear)	10 %
6 Rotor fault	5 %
7 Miscellaneous	7 %

Failure modes 1, 3 and 7 are attributable to electrical issues. Modes 2, 4, 5 and 6 are the result of mechanical (and some manufacturing) issues.

Historically, motor protection provided with the controller was only able to address the electrical causes of motor failure. These electrical issues account for at least 45% of the most common causes of motor failure. Motor branch circuits are protected against short circuits (instantaneous overload currents) and steady-state or low-level sustained overloads. In the U.S., this protection is provided by the short-circuit protective device (SCPD) and the motor overload relay, when they are applied according to the National Electrical Code (NEC).

Motor Logic solid-state overload relay base unit

As the market leader in motor control products, Square D offers the Motor Logic solid-state overload relay base unit. It provides the most complete electronic overload protection available to date for the price.

Motor Logic solid-state overload relay feature unit

The Motor Logic solid-state overload relay feature unit offers the same features as the base unit, along with the following:

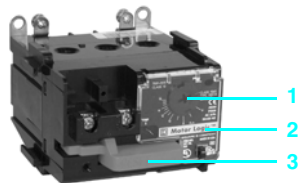
- Class II earth fault detection to protect motors from hard-to-find earth fault conditions.
- Switch-selectable trip class (Class 10 or Class 20) for application flexibility in a single unit.

Motor Logic Plus programmable solid-state overload relay

The Motor Logic Plus programmable solid-state overload relay is a fully programmable overload relay designed to monitor three-phase a.c. motor systems. It has 16 programming parameters of which eight can be viewed from the 3-digit alphanumeric LED display screen on the face of the overload relay. Additionally, these parameters can be viewed through the use of a personal computer for remote access to motor performance and adjustments.

Description

Motor Logic solid-state overload relays **9065 S●** include:



- 1 Adjustment dial
- 2 Tamper-proof cover
- 3 Reset button

Motor Logic Plus programmable solid-state overload relays **9065 SP** include:



- 1 Mode select switch (1)
- 2 3-digit alphanumeric LED display screen
- 3 Display/Program switch
- 4 Communication port (on side)
- 5 Reset/Program button

(1) Low voltage set point, High voltage set point, Voltage unbalance set point, Overcurrent trip point, Undercurrent trip point, Current unbalance trip point, Trip class (5, 10, 15, 20, 30), Rapid cycle timer (RD1), Overload restart delay (RD2), Underload restart delay (RD3), Number of restarts after an overload, Unbalance, Single phasing (manual or automatic), RS-485 address, Number of restarts after an underload fault, Underload trip delay and Earth fault trip point, Individual line voltages, Current levels, as well as Average voltage and Average current.

Environment

Conforming to standards		UL 508, NEMA ICS-2, IEC 60947-4-1
Product certifications		UL Listed, CSA certified, C€ marked
Ambient air temperature around the device	Storage	°C - 40...+ 80
	Operation	°C - 25...+ 70

Electrical characteristics

Motor Logic solid-state overload relays

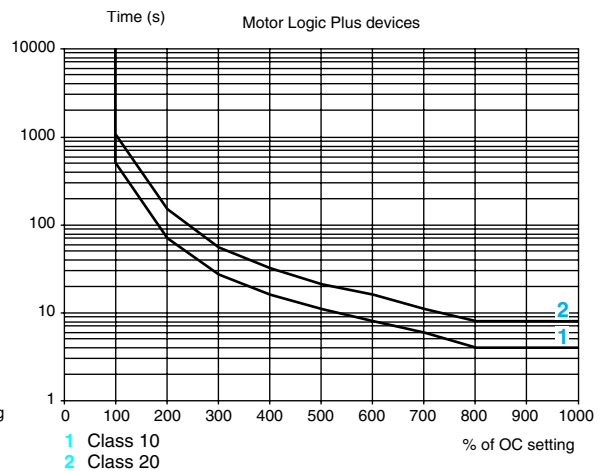
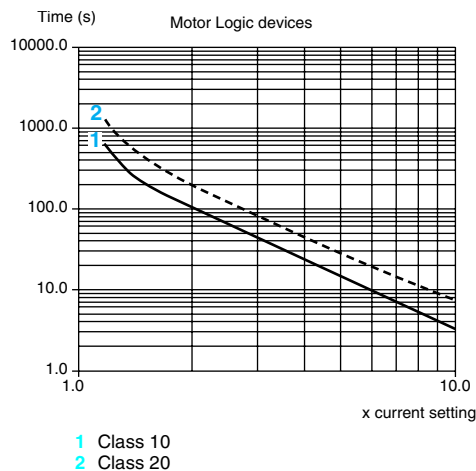
Class		9065
Type		S●B S●C S●0 S●1 S●2 S●3 S●4 S●5 ST 620 ST 720
Current ranges	A	1.5...4.5 3...9 6...18 9...27 15...45 30...90 45...135 90...270 180...540 270...810
Withstand rating (stand alone)	A	5000 RMS symmetrical, 600 V 10 000 RMS symmetrical, 600 V
Rated insulation voltage	~ V	600
Control voltage		Self-powered
Frequency limits	Hz	48...62
Trip contact ratings		A600/P300
Repeat trip time accuracy		± 2 %
Power wire connection		Through hole device # 14-4 AWG # 14-1/0 AWG # 8-250 MCM # 4-500 MCM 250-500 MCM (1 or 2 per phase) 250-500 MCM (1 to 4 per phase)
Control wire		# 16-12 AWG (two per terminal)
Lug kit power wire		# 14-8 AWG # 14-4 AWG # 14-1/0 AWG # 8-250 MCM N/A N/A N/A
DIN adapter		35 mm DIN rail, 7.5 mm track depth

Motor Logic Plus programmable solid-state overload relays

Class		9065
Type		SPB● SPC● SP 1● SP 2● SP 3● SP 4● SP 5● SP 6●
Current ranges	A	0.5...2.3 2...9 6...27 10...45 20...90 60...135 120...270 240...540
Withstand rating (stand alone)	A	100 000 (RMS symmetrical, 600 V) UL 100 000 (RMS symmetrical, 600 V) CSA
Rated insulation voltage	~ V	600
Control voltage	3-phase, 50/60 Hz	~ V 200 to 480, 500 to 600
Frequency limits	Hz	48...66
Trip contact ratings		B300
Repeat trip time accuracy	Voltage	± 0.5 % of nominal voltage
	Current	± 1 % (50 % min to 120 % max overcurrent)
Screen		3-digit alphanumeric LED display screen
Programming parameters		16
Power wire connection		Through-hole device
Control wire		# 12-22 AWG (two per terminal)
Lug kit power wire		# 1/0-14 AWG

Tripping curves

Average operating time related to multiples of the current setting





9065 SP2 with 9999 DN2



9999 MLPD



9999 MMS



9999CCKIT
(battery not included)

General

The Motor Logic Plus II programmable solid-state overload relay is separately powered from a 110/120 Vac, 50/60 Hz source. It has three internal current transformers for measuring phase currents from 0.5–90 A, and one internal zero-sequence current transformer for measuring earth ground faults up to 10 A. Current measurements from 90–540 A require the use of external CTs and result in a residual ground fault detection system. LED indicators on the front face of the overload relay display the product status and the states of the fault relay, the inputs, and the outputs. A reset button is located on the face for manual reset.

Four digital inputs are available via field wiring terminals. All digital inputs are internally pulled down to the board reference. One power terminal (P) is used to source the inputs to +24 Vdc. Inputs 1 and 4 can be used as standard digital inputs, or they can be independently configured through programming as PTC (positive temperature coefficient) and Reset inputs, respectively. When Input 1 is configured as a PTC input, the return reference is to the G terminal.

Three relay outputs are available via field wiring terminals: one Form C relay (single-pole, double-throw) for fault; and two Form A relays (single-pole, single-throw) for contactor control. A Form C relay has one normally open (N.O.) and one normally closed (N.C.) set of contacts that share a common terminal; when energized, both sets of contacts change state. The Form A relays are normally open and wired to share a common terminal; however, their operation is independent.

Two-wire Modbus® communication is internal to the overload relay and allows for direct connection to a Motor Logic Plus display (9999 MLPD)⁽¹⁾ or motor management system (9999 MMS) via the terminal blocks located on the front face. The DeviceNet communication module (9999 DN2) connects to the Sub-D connector on the right side of the product.

The Motor Logic Plus II programmable overload relay provides the following protection features for 3-phase (default) and single-phase motors:

- Thermal Overload
- Undercurrent
 - Programmable trip delay from 2 to 60 seconds
- Jam
- Current Unbalance (3-phase only)
 - Programmable from 2 to 25%
- Phase Loss (3-phase only)
- Ground Fault (enabled/disabled)
 - Zero sequence transformer core
 - Programmable from 1 to 10 A
 - Ground fault inhibit programmable from 1 to 255 seconds
- Reverse Phase (3-phase only)
- Single Phase (3-phase only)
- PTC Thermistor

Other features include:

- Programmable overload trip class: 5, 10, 15, 20, or 30
 - Manual and automatic reset option
 - Warning of impending faults
 - Motor thermal capacity
- Restart delay timers
 - Rapid cycle: programmable from 0 to 500 seconds
 - Motor cool down: programmable from 2 to 500 minutes
 - Dry well recovery: programmable from 2 to 500 minutes

Description

Motor Logic Plus II programmable solid-state overload relay **9065 SP2**



- 1 Status, Trip/Warn, and output LEDs
- 2 3 fault relay outputs
- 3 3 outputs
- 4 4 input LEDs
- 5 Sub-D connector for DeviceNet module (on side)
- 6 3 network terminals
- 7 4 digital inputs
- 8 Reset/Test Trip button

(1) The Motor Logic Plus display is powered using the cable configuration kit (9999CCKIT) and a 9 V battery (not included).

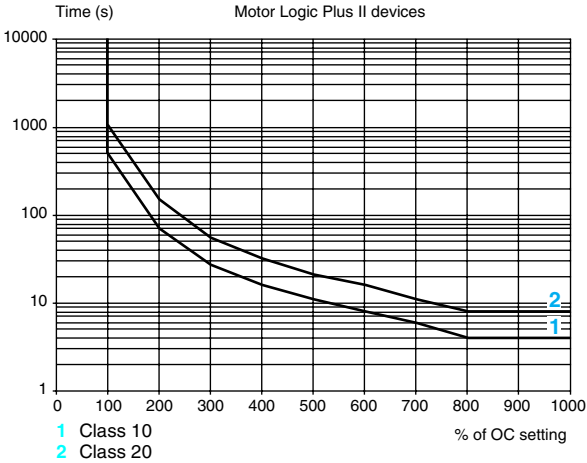
Trip Class (TC)

The trip class for overload protection, described in the following table, defines the trip delay upon detection of a thermal overload. (Refer to the tripping curves.) The motor and application determine the trip class. Consult the motor manufacturer for the proper setting.

Note: Class 20 is the default setting for all Motor Logic Plus units.

Trip Class	Application Description
5	Small, fractional-horsepower motors where acceleration time is almost instantaneous or where extremely quick trip times are required
10 (Fast Trip)	Hermetic refrigerant motors, compressors, submersible pumps, and general-purpose motors that reach rated speed in less than 4 seconds
15	Certain specialized applications
20 (Standard Trip)	Most NEMA general-purpose motors are protected by this setting
30 (Slow Trip)	Motors with long acceleration times (>10 seconds) or high-inertia loads
J Prefix	Programming any trip class with the J prefix enables jam protection. This additional protection is enabled 1 minute after the motor starts and provides a 2 second trip time for motors exceeding 400% of the overcurrent setting, regardless of trip class.

Tripping curves
Average operating time
related to multiples of the
current setting

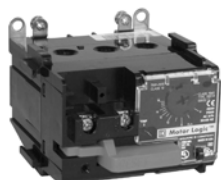


Solid-State Overload Relays

Motor Logic® base unit

Motor Logic® feature unit

531203



9065 SSC 10

3

Motor Logic solid-state overload relays base unit

NEMA Size 3-phase	Full-load current range	Open type	Reference	Weight
A				kg (lb)
Motor Logic base unit for separate mounting				
00C (1)	3...9	Trip Class 10	9065 SSC 10	0.5 (1)
		Trip Class 20	9065 SSC 20	0.5 (1)
0 (1)	6...18	Trip Class 10	9065 SS 010	0.5 (1.2)
		Trip Class 20	9065 SS 020	0.5 (1.2)
1 (1)	9...27	Trip Class 10	9065 SS 110	0.5 (1.2)
		Trip Class 20	9065 SS 120	0.5 (1.2)
2	15...45	Trip Class 10	9065 SS 210	0.7 (1.5)
		Trip Class 20	9065 SS 220	0.7 (1.5)
3	30...90	Trip Class 10	9065 SS 310	1.3 (2.9)
		Trip Class 20	9065 SS 320	1.3 (2.9)
4	45...135	Trip Class 10	9065 SS 410	1.6 (3.6)
		Trip Class 20	9065 SS 420	1.6 (3.6)
Motor Logic base unit for retrofitting existing Type S starters (2)				
00C (1)	3...9	Trip Class 10	9065 SSC 10	0.5 (1)
		Trip Class 20	9065 SSC 20	0.5 (1)
0 (1)	6...18	Trip Class 10	9065 SS 010	0.5 (1.2)
		Trip Class 20	9065 SS 020	0.5 (1.2)
1 (1)	9...27	Trip Class 10	9065 SS 110	0.5 (1.2)
		Trip Class 20	9065 SS 120	0.5 (1.2)
2	15...45	Trip Class 10	9065 SR 210	0.7 (1.5)
		Trip Class 20	9065 SR 220	0.7 (1.5)
3	30...90	Trip Class 10	9065 SR 310	1.3 (2.9)
		Trip Class 20	9065 SR 320	1.3 (2.9)
4	45...135	Trip Class 10	9065 SR 410	1.6 (3.6)
		Trip Class 20	9065 SR 420	1.6 (3.6)

Motor Logic solid-state overload relays feature unit

NEMA Size 1/3-pole	Full-load current range	Open type	Reference	Weight
A				kg (lb)
Motor Logic feature unit for separate mounting				
00B (1)	1.5...4.5	Trip Class 10/20	9065 SFB 20	0.5 (1)
00C (1)	3...9	Trip Class 10/20	9065 SFC 20	0.5 (1)
0 (1)	6...18	Trip Class 10/20	9065 SF 020	0.5 (1.2)
1 (1)	9...27	Trip Class 10/20	9065 SF 120	0.5 (1.2)
2	15...45	Trip Class 10/20	9065 SF 220	0.7 (1.5)
3	30...90	Trip Class 10/20	9065 SF 320	1.3 (2.9)
4	45...135	Trip Class 10/20	9065 SF 420	1.6 (3.6)
Motor Logic feature unit for retrofitting existing Type S starters (2)				
00B (1)	1.5...4.5	Trip Class 10/20	9065 SFB 20	0.5 (1)
00C (1)	3...9	Trip Class 10/20	9065 SFC 20	0.5 (1)
0 (1)	6...18	Trip Class 10/20	9065 SF 020	0.5 (1.2)
1 (1)	9...27	Trip Class 10/20	9065 SF 120	0.5 (1.2)
2	15...45	Trip Class 10/20	9065 ST 220	0.7 (1.5)
3	30...90	Trip Class 10/20	9065 ST 320	1.3 (2.9)
4	45...135	Trip Class 10/20	9065 ST 420	1.6 (3.6)
5 (3)	90...270	Trip Class 10/20	9065 ST 520	0.5 (1.2)
6 (3)	180...540	Trip Class 10/20	9065 ST 620	0.5 (1.2)
7 (3)	270...810	Trip Class 10/20	9065 ST 720	0.5 (1.2)

Kits

Type	Kit description	For use on	Reference	Weight kg (lb)
Lug-lug kit	For separate mounting	9065 S● (Sizes 00C/0/1 only)	9999 LLO	—
Lug-extender kit	For retrofitting existing Type S starters	9065 S● (Sizes 00C/0/1 only)	9999 LBO	—

(1) Size supplied without lugs.

(2) For Type S starter references, see pages 1/6 to 1/13.

(3) Replacement for Type S starters with an existing Motor Logic solid-state overload relay. Does not include primary current transformer or additional components.

Solid-State Overload Relays

Motor Logic® Plus programmable unit
Motor Logic® Plus II programmable unit



9065 SPB 4

Motor Logic Plus programmable solid-state overload relays

NEMA Size 3-phase	Product current range	Voltage	Reference	Weight
	A	V		kg (lb)
00	0.5...2.3	200...480 600	9065 SPB 4 9065 SPB 6	1 (3) 1 (3)
0	2...9	200...480 600	9065 SPC 4 9065 SPC 6	1 (3) 1 (3)
1	6...27	200...480 600	9065 SP 14 9065 SP 16	1 (3) 1 (3)
2	10...45	200...480 600	9065 SP 24 9065 SP 26	1 (3) 1 (3)
3	20...90	200...480 600	9065 SP 34 9065 SP 36	1 (3) 1 (3)
4 (1)	60...135	200...480 600	9065 SP 44 9065 SP 46	1 (3) 1 (3)
5 (2)	120...270	200...480 600	9065 SP 54 9065 SP 56	1 (3) 1 (3)
6 (3)	240...540	200...480 600	9065 SP 64 9065 SP 66	1 (3) 1 (3)

Variants of Type S starters

Description	Current range	Factory modification	Reference Suffix	Weight
	A			kg (lb)
Motor Logic Plus programmable solid-state overload relays (add to the starter reference) (4)	0.5...2.3	No modification for 200...480 V	B20	—
		No modification for 600 V	B24	—
	2...9	No modification for 200...480 V	B30	—
		No modification for 600 V	B34	—
	6...27	No modification for 200...480 V	B40	—
		No modification for 600 V	B44	—
	10...45	No modification for 200...480 V	B50	—
		No modification for 600 V	B54	—
	20...90	No modification for 200...480 V	B60	—
		No modification for 600 V	B64	—
	60...135	No modification for 200...480 V	B70	—
		No modification for 600 V	B74	—
	120...270	No modification for 200...480 V	B80	—
		No modification for 600 V	B84	—
	240...540	No modification for 200...480 V	B90	—
		No modification for 600 V	B94	—

Motor Logic Plus II programmable solid-state overload relays

NEMA Size 3-phase	Product current range	Voltage	Reference	Weight
	A	V		kg (lb)
00	0.5...2.3	600	9065 SP2 B6	1 (3)
0	2...9	600	9065 SP2 C6	1 (3)
1	6...27	600	9065 SP2 16	1 (3)
2	10...45	600	9065 SP2 26	1 (3)
3	20...90	600	9065 SP2 36	1 (3)
4 (1)	60...135	600	9065 SP2 46	1 (3)
5 (2)	120...270	600	9065 SP2 56	1 (3)
6 (3)	240...540	600	9065 SP2 66	1 (3)

Variants of Type S starters

Description	Current range	Factory modification	Reference Suffix	Weight
	A			kg (lb)
Motor Logic Plus programmable solid-state overload relays (add to the starter reference) (4)	0.5...2.3	No modification for 600 V	H50	—
	2...9	No modification for 600 V	H51	—
	6...27	No modification for 600 V	H52	—
	10...45	No modification for 600 V	H53	—
	20...90	No modification for 600 V	H54	—
	60...135	No modification for 600 V	H55	—
	120...270	No modification for 600 V	H56	—
	240...540	No modification for 600 V	H57	—

- (1) Size 4 requires the use of external current transformer. Ratio of 150: 5 recommended.
(2) Size 5 requires the use of external current transformer. Ratio of 300: 5 recommended.
(3) Size 6 requires the use of external current transformer. Ratio of 600: 5 recommended.
(4) For Type S Open style starter references, see pages 1/6 to 1/13.



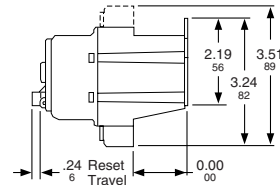
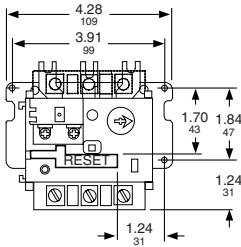
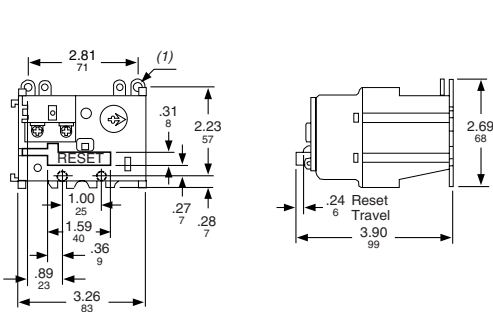
9065 SP2

Dimensions are $\frac{\text{inch}}{\text{mm}}$

Motor Logic solid-state overload relays

9065 S●10 / S●20

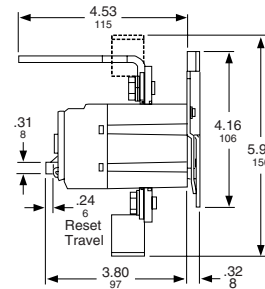
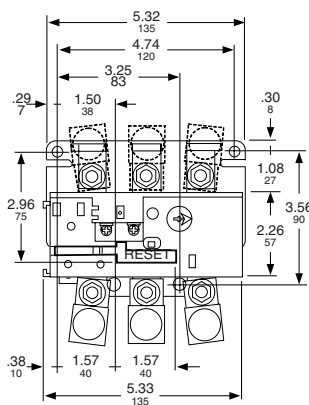
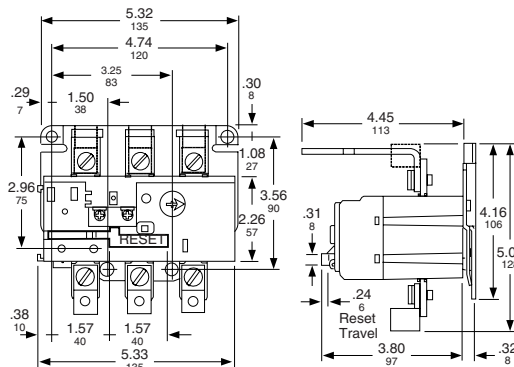
9065 SS 2●0 / SR 2●0 / SF 220 / ST 220



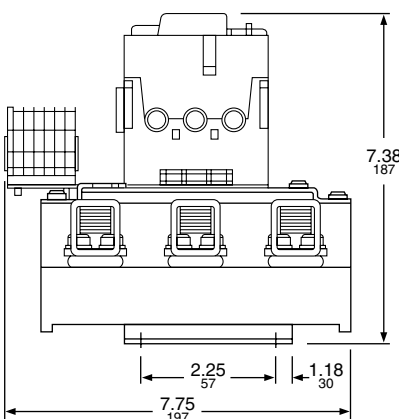
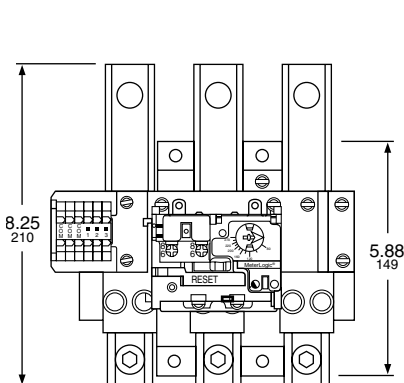
(1) 2 holes. 2 slots for 8-32 mounting screws.

9065 SS 3●0 / SR 3●0 / SF 320 / ST 320

9065 SS 4●0 / SR 4●0 / SF 420 / ST 420



9065 ST 520



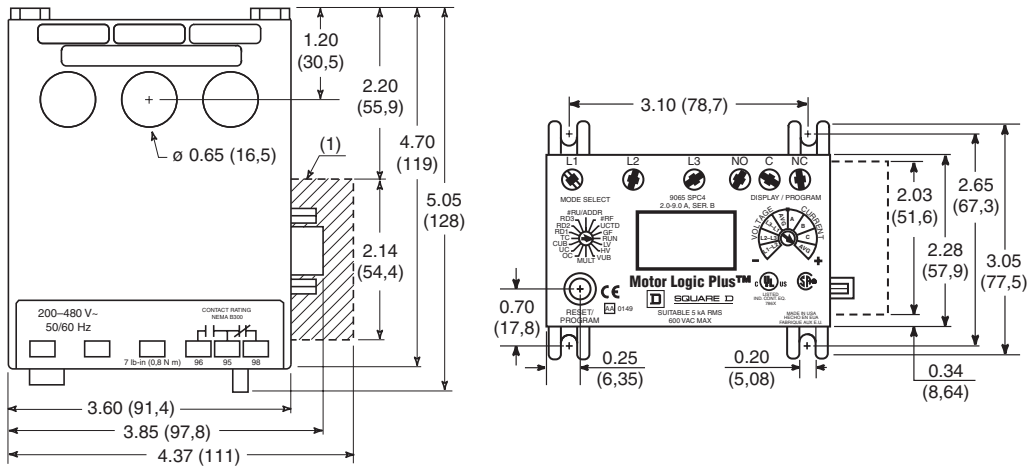
Solid-State Overload Relays

Motor Logic® Plus programmable unit
Motor Logic® Plus II programmable unit

Dimensions are $\frac{\text{inch}}{\text{mm}}$

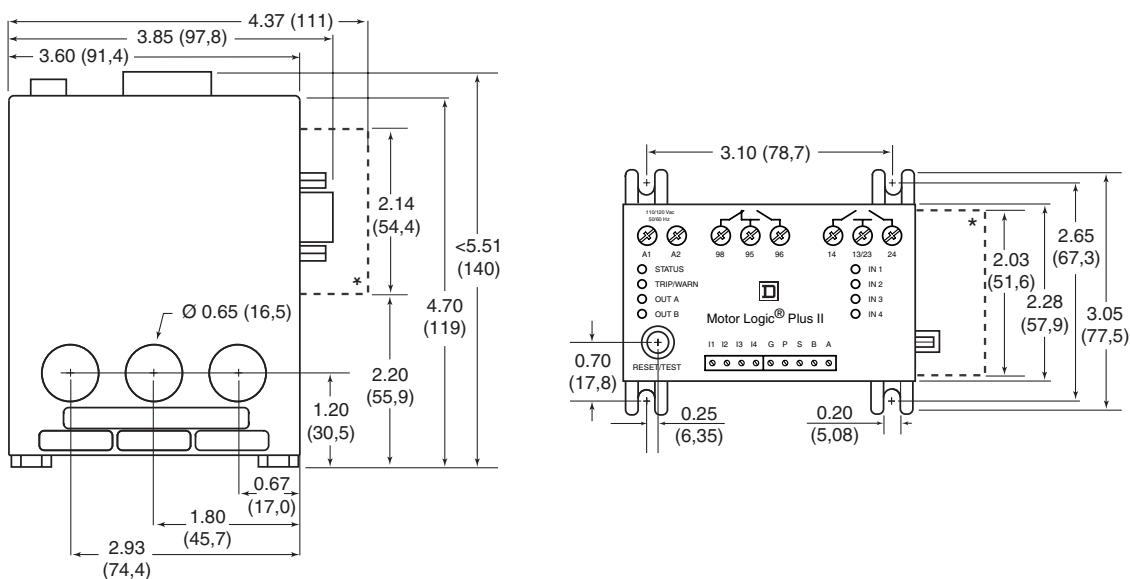
Motor Logic Plus programmable solid-state overload relays

9065 SPB / SPC / SP



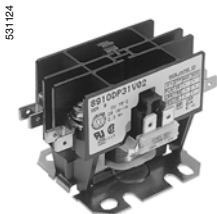
Motor Logic Plus II programmable solid-state overload relays

9065 SP2 ●6

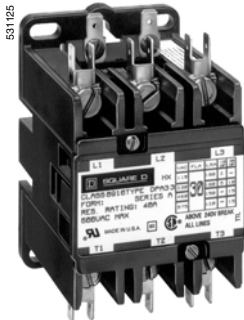


(1) Optional communication module.

- Types DP and DPA Class 8910
 - General page 4/2
 - Characteristics page 4/3
 - References page 4/4
 - Accessories page 4/6
 - Dimensions page 4/8



8910 DP 31 V02
Single-pole contactor



8910 DPA 33 V02
3-pole contactor



8910 DPA 23 V02 DFM1
Contactor with fuse block

General

Definite purpose contactors

Definite purpose contactors are ideal for heating, air conditioning, refrigeration, data processing and food service equipment. New compact single- and 2-pole contactors are available, as well as full-size 2-, 3- and 4-pole devices.

- Features:
- compact design,
- industry standard mounting,
- double break contacts,
- low coil VA,
- straight-through wiring,
- low cost,
- open contact constructions for easier contact inspection,
- optional cover over contacts.

They feature quick-connect terminals and binding head screws for easy wiring. Box lugs are standard on 40 A contactors and larger. An exclusive DIN track mounting option may reduce installation costs. Coils can be changed on the Type DPA contactors quickly without a tool. Auxiliary contact modules snap on either side of the Type DPA contactors.

Contactors with fuse blocks

The DPA fused-type contactor provides an integrally mounted fuse block with fuse clips electrically connected to the contactor. This factory assembled unit not only provides space savings but reduces installation cost as well, with only six field connections for a 3-pole unit and featuring one unit for two functions, i.e., short-circuit protection for branch circuits and remote or manual power circuit interruption. The fused contactor thus meets the provisions of the National Electric Code (NEC) Article 424 for overcurrent protection as well as limit controls for fixed electric space heating.

By a unique fuse clip arrangement, these devices can accommodate a variety of fuses for other electrical or electronic applications. This fused cover accommodates the Type SC 300 volt fuse, which is UL listed under Type G, as well as the standard 10 mm x 38 mm fuses (1).

Only UL-listed, Class G, K, H or J fuses meet branch circuit requirements when applied in accordance with NEC Article 240. Supplementary fuses shown may be used for additional equipment protection as defined in NEC 240-30. Consult the manufacturer of the selected fuse for proper application.

(1) Dimensions in mm (25.4 mm = 1 inch).

Characteristics															
Class		8910													
Type		DP 11/12	DP 21/22	DP 31/32	DP 41/42	DPA 12/13/14	DPA 22/23/24	DPA 32/33/34	DPA 42/43/44	DPA 52/53	DPA 62/63	DPA 72/73	DPA 92/93	DPA 122/123	
Environment															
Rated insulation voltage															
Conforming to UL, CSA		V	600												
Rated impulse withstand voltage		kV	5												
Conforming to standards															
NEMA ICS-1, ICS-2			Yes												
UL 508			Yes												
Product certifications															
UL			Yes												
CSA			Yes												
CE			Yes												
Ambient air temperature around the device														- 30...	
Storage		°C	0...65											+ 65	
Operation		°C	0...65											0...40	
Operating position															
Without derating			Vertical												
Pole characteristics															
Number of poles (P)			1, 2				2, 3, 4				2, 3				
Rated operational voltage															
Up to		V	600												
Frequency limits															
Of the operational current		Hz	50/60												
Conventional thermal current (FLA)		A	20	25	30	40	20	25	30	40	50	60	70	90	120
Rated making capacity (LRA)															
At 240 V		A	–				120	150	180	240	300	360	450	540	720
At 277 V		A	100	125	150	200	–								
At 480 V		A	100	125	150	150/200	100	125	150	200	250	300	375	450	600
At 600 V		A	80	100	120	150/160	80	100	120	160	200	240	300	360	480
Resistive rating															
At 600 V		A	30/30	30/35	40/40	50/50	25	35	40	50	62	75	94	120	
a.c. control circuit characteristics															
Rated control circuit voltage		V	600											24/600	
Average consumption 60Hz															
Inrush		VA	30				56 (1)				109		214		700
Sealed		VA	6				6 (1)				10		19		46
Heat dissipation 60 Hz															
Sealed		W	2.5				2.7 (2)				3.3		7.5		14
Mechanical durability (3)															
In thousands of operating cycles			500												
Power circuit connections															
Type of termination			Binding head screw		Screw clamp terminal	Box lug	Binding head screw			Box lug					
Wire sizes (Min./max.) (4)			#14 - #8			#14 - #6	#14 - #8			#14 - #6	#14 - #2		#14 - #1/0		
Control circuit connections															
Type of termination			.250" Quick connect				.250" Quick connect/binding head screw							Screw clamp terminal	
Wire sizes (Min./max.) (4)			#16 - #12												
(1) 4-pole has 109 VA inrush, 10 VA sealed.															
(2) 4-pole Watts are 3.3.															
(3) Operating cycles are without a load (mechanical durability).															
(4) Solid or stranded copper wire (AWG).															
External auxiliary contacts															
Type		9999 D10/D01/D11/D20/SX6/SX7/SX8/SX9/SX10													
Voltage	~ V	120 or less													
Making current	~ A	60 (35% power factor)													
Breaking current	~ A	6 (35% power factor)													
Continuous current	A	10													

Definite Purpose Contactors

Types DP and DPA Class 8910



8910 DPA 33

Full-load Amperes	Locked rotor Amperes			Resistive load Amperes	Motor power ratings								N/O poles	N/C poles (1)	Basic reference Add code indicating control circuit voltage (2)	Weight
	277V	480V	575V		115V single- phase		230V single- phase		230V 3-phase		460/575V 3-phase					
A	A	A	A	A	hp	kW	hp	kW	hp	kW	hp	kW				kg (lb)
Compact single-pole contactors																
20	100	100	80	25	1	1.1	2	1.5	—	—	—	—	1	—	8910 DP 11 (2)	0.2 (0.5)
25	125	125	100	30	2	1.5	3	2.2	—	—	—	—	1	—	8910 DP 21 (2)	0.2 (0.5)
30	150	150	120	40	2	1.5	3	2.2	—	—	—	—	1	—	8910 DP 31 (2)	0.2 (0.5)
40	240	200	160	50 (3)	2	1.5	5	3.7	—	—	—	—	1	—	8910 DP 41 (2)	0.2 (0.5)
Compact 2-pole contactors (4)																
20	100	100	80	30	1	1.1	2	1.5	—	—	—	—	2	—	8910 DP 12 (2)	0.2 (0.5)
25	125	125	100	35	2	1.5	3	2.2	—	—	—	—	2	—	8910 DP 22 (2)	0.2 (0.5)
30	150	150	120	40	2	1.5	5	3.7	—	—	—	—	2	—	8910 DP 32 (2)	0.2 (0.5)
40	240	200	160	50	2	1.5	5	3.7	—	—	—	—	2	—	8910 DP 42 (2)	0.2 (0.5)
2-, 3- and 4-pole contactors (4)																
20	120	100	80	25	1	1.1	2	1.5	5	3.7	7.5	5.5	2	—	8910 DPA 12 (2)	0.5 (1)
													3	—	8910 DPA 13 (2)	0.5 (1)
													4	—	8910 DPA 14 (2)	0.6 (1.3)
25	150	125	100	35	2	1.5	3	2.2	7.5	5.5	10	7.5	2	—	8910 DPA 22 (2)	0.5 (1)
													3	—	8910 DPA 23 (2)	0.5 (1)
													4	—	8910 DPA 24 (2)	0.6 (1.3)
30	180	150	120	40	2	1.5	5	3.7	10	7.5	15	11	2	—	8910 DPA 32 (2)	0.5 (1)
													3	—	8910 DPA 33 (2)	0.5 (1)
													4	—	8910 DPA 34 (2)	0.6 (1.3)
40	240	200	160	50	3	2.2	7.5	5.5	10	7.5	20	15	2	—	8910 DPA 42 (2)	0.5 (1)
													3	—	8910 DPA 43 (2)	0.5 (1)
													4	—	8910 DPA 44 (2)	0.7 (1.5)
50	300	250	200	62	3	2.2	10	7.5	15	11	30	22	2	—	8910 DPA 52 (2)	0.7 (1.5)
													3	—	8910 DPA 53 (2)	0.7 (1.5)
60	360	300	240	75	5	3.7	10	7.5	25	18.5	30	22	2	—	8910 DPA 62 (2)	0.7 (1.5)
													3	—	8910 DPA 63 (2)	0.7 (1.5)
75	450	375	300	94	5	3.7	15	11	25	18.5	40	30	2	—	8910 DPA 72 (2)	1.6 (3.5)
													3	—	8910 DPA 73 (2)	1.7 (3.7)
90	540	450	360	120	7.5	5.5	20	15	30	22	50	37	2	—	8910 DPA 92 (2)	1.4 (3)
													3	—	8910 DPA 93 (2)	1.7 (3.7)
120	720	600	480	120	10	7.5	25	18.5	40	30	75	55	2	—	8910 DPA 122 (2)	2 (4.4)
													3	—	8910 DPA 123 (2)	5.9 (13)
4-pole contactors (4)																
20	120	100	80	25	1	1.1	2	1.5	5	3.7	7.5	5.5	2	2	8910 DPA 14 (2) Y392	0.6 (1.3)
25	150	125	100	35	2	1.5	3	2.2	7.5	5.5	10	7.5	2	2	8910 DPA 24 (2) Y392	0.6 (1.3)
30	180	150	120	40	2	1.5	5	3.7	10	7.5	15	11	2	2	8910 DPA 34 (2) Y392	0.6 (1.3)
40	240	200	160	50	3	2.2	7.5	5.5	10	7.5	20	15	2	2	8910 DPA 44 (2) Y392	0.7 (1.5)

(1) N/C poles on outside. N/C poles open before N/O poles close.

(2) Standard control circuit voltage for 8910 DP/DPA:

Volts	24	110	120	208–240	220	277	440	480	550	600
50 Hz	V14	V02	—	—	V09	—	V06 (5)	—	V07 (6)	—
60 Hz	V14	—	V02	V09	—	V04	—	V06 (5)	—	V07 (6)

Standard control circuit voltage for 8910 DPA 122/DPA 123:

Volts	24	110	120	208	220	230–240	440	480	550	600
50 Hz	V12	V02	—	—	V03	—	V06	—	V07	—
60 Hz	V01 (7)	—	V02	V08	—	V03	—	V06	—	V07

(3) 50 A resistive limited to 277V. All others rated 40 A resistive (above 277V).

(4) Above 240V, all lines must be switched.

(5) Not available for Type 8910 DP 11 to 8910 DP 31 single-pole devices.

(6) Not available for Type 8910 DP single- and 2-pole devices.

(7) Only available on Types 8910 DPA 122/DPA 123.

Definite Purpose Contactors

Types DP and DPA Class 8910

531237



8910 DPA 23 V02 DFM1

Contactors with fuse blocks (1)

Contactors	Fuse		Dimen- sions (2)	Class	Suffix to the contactor reference (3)	Weight
	Rating	Maximum rating voltage				
	A	V	mm			kg (lb)
8910 DPA 13/23/33/43	3	600	10 x 38	CC	(3) DFC1	0.35 (0.8)
	60	480	10 x 57	G	(3) DFG1	0.35 (0.8)
	30	480	10 x 41	G	(3) DFG2	0.35 (0.8)
	30	250	14 x 51	H or K	(3) DFH1	0.35 (0.8)
	60	250	20 x 76	H or K	(3) DFH2	0.35 (0.8)
	30	600	20 x 57	J	(3) DFJ1	0.40 (0.9)
	60	600	26 x 60	J	(3) DFJ2	0.40 (0.9)
	30	600	10 x 38	M	(3) DFM1	0.40 (0.9)
	30	250	14 x 51	R	(3) DFR1	0.35 (0.8)
	60	250	20 x 76	R	(3) DFR2	0.35 (0.8)
	30	300	14 x 22	T	(3) DFT1	0.35 (0.8)
	60	300	14 x 22	T	(3) DFT2	0.35 (0.8)
	30	600	14 x 22	T	(3) DFT3	0.40 (0.9)
	60	600	25 x 39	T	(3) DFT4	0.40 (0.9)

(1) For dimensions, see page 4/9.

(2) Dimensions in mm (25.4 mm = 1 inch).

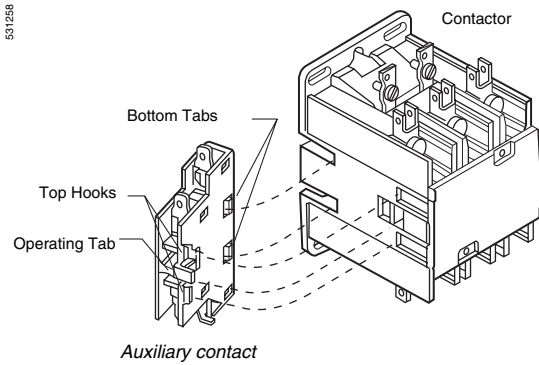
(3) 8910 DPA 13 or 23 or 33 or 43 plus standard control circuit voltage:

Volts	24	110	120	208–240	220	277	440	480	550	600
50 Hz	V14	V02	—	—	V09	—	V06	—	V07	—
60 Hz	V14	—	V02	V09	—	V04	—	V06	—	V07

Example: 8910 DPA 33 V02 DFG1.

Definite Purpose Contactors
Types DP and DPA Class 8910
Accessories

531258



External auxiliary contacts				
For use with	Description	Reference	Weight kg (lb)	
8910 DPA	1 N/O contact	9999 D10	0.03	(0.07)
	1 N/C contact	9999 D01	0.03	(0.07)
	1 N/O and 1 N/C contacts	9999 D11	0.04	(0.09)
	2 N/O contacts	9999 D20	0.04	(0.09)
8910 DPA 122/123	1 N/O contact	9999 SX6	0.03	(0.07)
	1 N/C contact	9999 SX7	0.03	(0.07)
	1 N/O and 1 N/C isolated contacts	9999 SX8	0.04	(0.09)
	1 N/O make before break contact	9999 SX9	0.03	(0.07)
	1 N/C make before break contact	9999 SX10	0.03	(0.07)

NEMA 1 general purpose enclosures				
For use with	Full-load Amperes	Poles	Reference	Weight
	A			kg (lb)
8910 DP (1)	20...40	1 and 2	9991 DPG1	1.1 (2.5)
8910 DPA	20...40	2 and 3	9991 DPG1	1.1 (2.5)
	50	2 and 3	9991 DPG2	1.8 (4)
	20...40	4	9991 DPG2	1.8 (4)
	60...75	2 and 3	9991 DPG3	3 (7)
	90...120	2 and 3	9991 DPG4	4 (9)

Variants			
Type	For use on	Suffix to the contactor reference (2)	Weight kg (lb)
Screw clamp terminal connectors	8910 DPA 1●/2●/3●	Y122	—
Box lugs	8910 DPA 1●/2●/3●	Y124	—
DIN mounting bracket attachment (35 mm wide)	8910 DPA 1●/2●/3●/4●/5●/6●	Y135	—

(1) Optional contact cover 9999 DRC1, only available for 8910 DP compact single-pole or 2-pole contactors.
(2) Example: 8910 DPA 12 V02 Y122.

Definite Purpose Contactors
Types DP and DPA Class 8910
Accessories

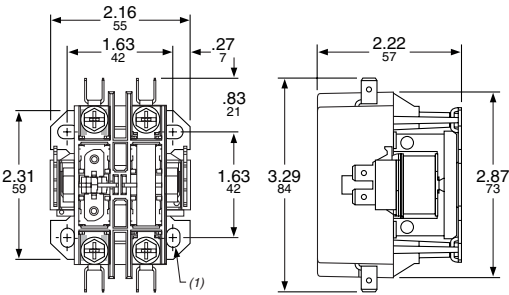
Replacement coils						
Type	For use on	Poles	Average consumption (60 Hz)		Basic reference Add code indicating control circuit voltage (1)	Weight kg (lb)
			Inrush	Sealed		
			VA	VA		
Replacement coils	8910 DPA 1●/2●/3●/4●	2 and 3	56	6	9998 DA1 ●●●	—
	8910 DPA ●4	4	109	10	9998 DA2 ●●●	—
	8910 DPA 5●/6●	2 and 3	109	10	9998 DA2 ●●●	—
	8910 DPA 7●/9●	2 and 3	214	19	9998 DA3 ●●●	—

Replacement parts kits				
Type	Kit description	For use on	Reference	Weight kg (lb)
Replacement parts kits	Contains the necessary movable and stationary contacts, contact springs and additional hardware for one pole	8910 DPA 1●	9998 DRC1	—
		8910 DPA 2●	9998 DRC2	—
		8910 DPA 3●	9998 DRC3	—
		8910 DPA 4●	9998 DRC4	—
		8910 DPA 5●	9998 DRC5	—
		8910 DPA 6●	9998 DRC6	—
		8910 DPA 7●	9998 DRC7	—
		8910 DPA 9●	9998 DRC9	—
		8910 DPA 12●	9998 DRC12	—

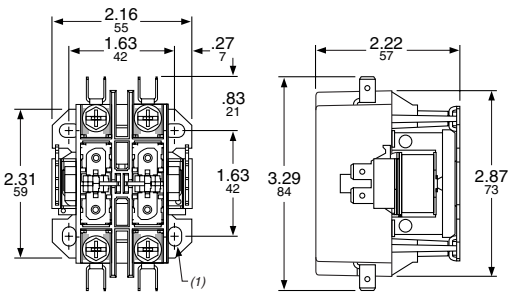
Miscellaneous parts										
Type	For use on						Reference			Weight kg (lb)
DIN mounting adaptor plate	8910 DPA						9999 DMB1			—
(1) Standard control circuit voltage:										
Volts	24	110	120	208–240	220	277	440	480	550	600
50 Hz	V14	V02	—	—	V09	—	V06	—	V07	—
60 Hz	V14	—	V02	V09	—	V04	—	V06	—	V07
Example: 9998 DA1 V02.										

Dimensions are $\frac{\text{inch}}{\text{mm}}$

8910 DP 11/21/31/41 (single-pole)

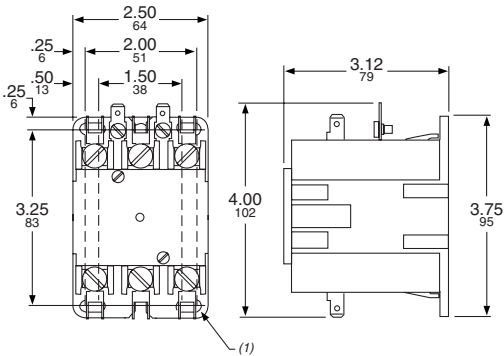


8910 DP 12/22/32/42 (2-pole)



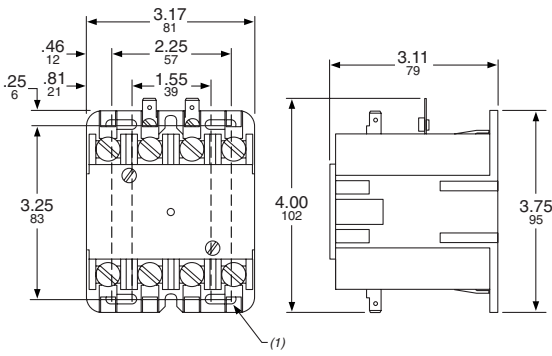
(1) Provisions for #10 or M5 mounting screws.

8910 DPA 12/13/22/23/32/33/42/43 (2 and 3-pole/20–40 A)



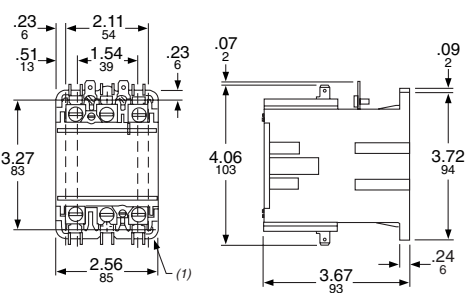
(1) Provisions for #10 or M5 mounting screws.

8910 DPA 14/24/34/44 (4-pole/20–40 A)



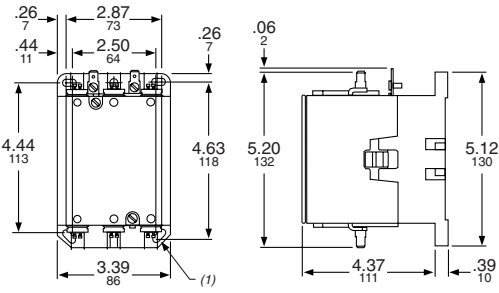
(1) Provisions for #10 or M5 mounting screws.

8910 DPA 50/60 (2 and 3-pole/50–60 A)



(1) Provisions for #10 or M5 mounting screws.

8910 DPA 70/90 (2 and 3-pole/75–90 A)

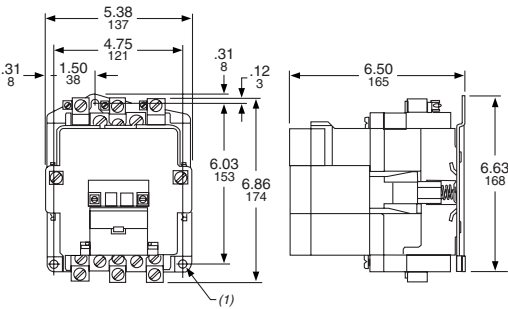


(1) Provisions for #10 or M5 mounting screws.

(1) Provisions for #10 or M5 mounting screws.

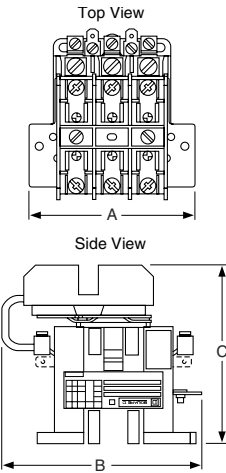
Dimensions are $\frac{\text{inch}}{\text{mm}}$

8910 DPA 122/123 (120 A)



(1) Provision for 1/4" mounting screw.

Contactors with fuse blocks



(2)	A	B	C
8910 DPA 3 DFC1	91	150	117
8910 DPA 3 DFG1	91	155	119
8910 DPA 3 DFG2	91	150	114
8910 DPA 3 DFH1	91	150	119
8910 DPA 3 DFH2	107	168	135
8910 DPA 3 DFJ1	91	150	132
8910 DPA 3 DFJ2	119	152	135
8910 DPA 3 DFM1	91	150	117
8910 DPA 3 DFR1	91	152	119
8910 DPA 3 DFR2	107	168	136
8910 DPA 3 DFT1	91	150	114
8910 DPA 3 DFT2	91	150	114
8910 DPA 3 DFT3	119	155	114
8910 DPA 3 DFT4	119	150	114

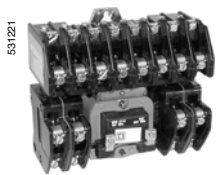
(2) Dimensions in mm (25.4 mm = 1 inch)

- Multipole lighting contactors, Types L, LX and S Class 8903
 - General, characteristics page 5/2
- Multipole lighting contactors, Types L and LX Class 8903
 - References page 5/4
- Multipole lighting contactors, Type S Class 8903
 - References page 5/5
- Multipole lighting contactors, Types L, LX and S Class 8903
 - Accessories page 5/7
 - Variants page 5/8
 - Dimensions page 5/10

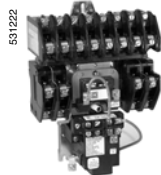
Lighting Contactors

Multipole lighting contactors Types L, LX and S Class 8903

General



8903 L ●
Electrically held



8903 LX ●
Mechanically held



8903 S ● ●
Electrically held



8903 S ● ●
Mechanically held

Lighting contactors have evolved from the need for more than just simple on-off manual control of lights. Today's requirements call for the development of new and varied types of control. Often the application will call for remote control of lighting from some distant location. This control may not be in addition to a master control station at a central location. Certain applications include the use of automatic control by time clocks or photoelectric cells. Whatever the need may be, applications are increasing and lighting contactors are designed to meet the ever-changing requirements.

Typical installations include:

- Parking lots.
- Industrial plants.
- Office buildings.
- Theatres and auditoriums.
- Hospitals and institutions.
- Shopping centres.
- Stadiums.
- Airports.

Multipole lighting contactors, Types L and LX Class 8903

Features:

- 30 A fluorescent lighting rating.
- 20 A tungsten lighting rating.
- Electrically and mechanically held.
- 2 to 12-pole versions.
- Field-convertible contacts with N/O and N/C indicators (8 N/C contacts maximum).

Multipole lighting contactors, Type S Class 8903

Features:

- 30...800 A lighting ratings.
- Electrically and mechanically held.
- 2- to 5-pole versions (5-pole to 200 A).
- UL-listed short-circuit rating up to 100 000 A.
- Mixed load ratings (lighting and motor).
- Factory-wired controls and clearly marked termination points.

Characteristics

Class		8903									
Type		L●/LX● SM● SP● SQ● SV● SX● SY● SZ● SJ●									
Environment											
Rated insulation voltage	Conforming to UL, CSA...	~V	600								
Conforming to standards			NEMA ICS-1, ICS-2, UL 508, CSA 22-2 n° 14								
Product certifications			UL, CSA								
Ambient air temperature around the device	Storage	°C	- 30...+ 65								
	Operation	°C	0...+ 40								
Max. operating altitude	Without derating	m	2000								
Operating position	Without derating		Vertical								
Power circuit connections											
Type of termination			Screw clamp terminal		Box lug						
Wire sizes (Min./max.) (AWG)	Solid or stranded copper wire		#14–#10	#14–#8	#14–#2 (1)	#14–#2/0 (1)	#6–350 MCM (1)	#4–600 MCM (1) (2)	#6–350 MCM (1) (3)	#4–600 MCM (1) (3)	#30/0–750MCM (1) (4)
(1) Solid or stranded aluminium wire. (2) Two wires #4–250 MCM. (3) Two holes. (4) Four holes.											
Control circuit connections											
Type of termination			Screw clamp terminal								
Wire sizes (Min./max.) Solid or stranded copper wire (AWG)			#16–#12								
Pole characteristics											
Number of poles (P)			2–12	2–5						2–3	
Rated operating voltage	Up to	~V	600								
Frequency limits	Of the operating current	Hz	50/60								
Conventional thermal current (FLA)		A	30	60		100	200	300	400	600	800
Rated making capacity	Tungsten	A	10 x rated current								
	Ballast	A	3 x rated current								
Resistance heating rating	At 600V	A	20	30	60	100	200	300	400	600	800
a.c. control circuit characteristics											
Rated control circuit voltage		~V	24–600 (2–6P) (8–12P)	24–600	24–600 (2–3P) 110–600 (4–5P)		110–600				
Average consumption 60Hz Electrically held	Inrush Sealed	VA VA	150/180 30/35	245 27	311/438 37/38	700/1185 41/89	1185 89	1300 14	1780 48	1960 59	
Average consumption 50Hz Electrically held	Inrush Sealed	VA VA	140/170 30/35	232 26	296/429 36/37	678/1260 47/89	1260 89	1300 14	1495 56	– –	
Heat dissipation 60Hz	Electrically held - Sealed	W	6.5/9.5	7.8	14/14	14/22	22	13	32	36	
Heat dissipation 50Hz	Electrically held - Sealed	W	–	7.7	12/12	15/23	23	–	27	–	
Inrush 60 Hz Mechanically held	Latch coil Unlatch coil	VA VA	150/180 25/25	245 140	311/438 140/140	700/973 550/550	973 550	2970	1530	2100	
Inrush 50 Hz Mechanically held	Latch coil Unlatch coil	VA VA	140/170 –	232	296/429	678/–	–	2970	1250		
Mechanical durability	Electrically held		4000	10,000	3000		2000		1500	500	
	In x 10 ³ of operating cycles Mechanically held		1000					500			

References:
pages 5/4 to 5/9

Dimensions:
pages 5/10 and 5/11

Lighting Contactors

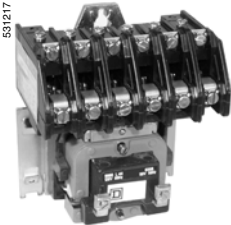
Multipole lighting contactors

Types L, LX and S Class 8903

Electrical characteristics (continued)										
Class		8903								
Type		LE/LX●	SM●	SP●	SQ●	SV●	SX●	SY●	SZ●	SJ●
Contactor continuous rating	A	30	30	60	100	200	300	400	600 (1)	800
~ Voltage ratings										
Tungsten lamp loads										
Single-pole to load	~ V	20 A/277	277					–		
2-pole to load on single-phase and 3-pole to load on 3-phase	~ V	20 A/480	480					–		
Ballast loads										
Single-pole to load	~ V	277 (2)	347							
2-pole to load on single-phase and 3-pole to load on 3-phase	~ V	480 (2)	600							
Resistive loads										
Single-pole to load	~ V	20 A/600	600							
2-pole to load on single-phase and 3-pole to load on 3-phase	~ V	20 A/600	600							
== Voltage ratings										
Tungsten lamp or resistance loads										
2-pole in series	== V		125	250				–		
3-pole in series	== V	20 A/250	250							
UL-listed short-circuit rating										
Contactors protected by fused disconnect switches										
Maximum Class RK5 fuse rating	A	30	30	60	100	200	400	400	–	–
Maximum voltage	V	600				480	600		–	–
Available Amperes (RMS sym)	kA	100							–	30 (5)
Contactors protected by circuit breakers										
Maximum circuit breaker rating	A	25	40	80/90	125	250/225	400	800	800	1200
Recommended circuit breaker type		Thermal-magnetic								
Maximum voltage	V	240/480	480/600/480		600/480			600		
Available Amperes (RMS sym)	kA	22/14	10/5/100	18/14/100	10/100	14/100	22/100	22		30
Kilowatt ratings (3)										
Voltage ~ 200 V	kW	6.9	10.3	20.7	34.6	69.2	103.9	138.5	207.8	277.1
~ 230 V	kW	7.9	11.9	23.9	39.8	79.6	119.5	159.3	239	318.7
~ 380 V	kW	13.1	19.7	39.4	65.8	131.6	197.4	263.2	394.9	526.5
~ 460 V	kW	15.9	23.9	47.8	79.8	159.3	239	318.6	478	637.4
~ 575 V	kW	19.9	30	60	99	199	299	398.4	597.6	796.7
Motor power ratings equivalent to NEMA Size contactor										
		–	Size 1	Size 2	Size 3	Size 4	Size 5	Size 6	Size 6	Size 7
Mixed load ratings										
Percent lighting (and/or resistive) load: 0%										
Motor voltage and phases (4)										
200 V / 3-phase Max. motor	hp	–	7.5	10	25	40	75	125	150	250
230 V / 3-phase Max. motor	hp	–	7.5	15	30	50	100	150	200	300
380 V / 3-phase Max. motor	hp	–	10	25	50	75	150	250	300	400
460...575 V / 3-phase Max. motor	hp	–	10	25	50	100	200	300	400	600
115 V / single-phase Max. motor	hp	–	2	3	7.5	–	–	–	–	–
230 V / single-phase Max. motor	hp	–	3	7.5	15	–	–	–	–	–
Percent lighting (and/or resistive) load: 75%										
200 V / 3-phase Max. non-motor	A	–	22.5	45	75	150	225	300	450	600
Max. motor	hp	–	1.5	3	5	15	20	30	50	60
230 V / 3-phase Max. non-motor	A	–	22.5	45	75	150	225	300	450	600
Max. motor	hp	–	2	3	7.5	15	25	30	50	75
380 V / 3-phase Max. non-motor	A	–	22.5	45	75	150	225	300	450	600
Max. motor	hp	–	3	7.5	10	30	40	60	75	125
460...575 V / 3-phase Max. non-motor	A	–	22.5	45	75	150	225	300	450	600
Max. motor	hp	–	3	10	15	30	50	75	100	150
115 V / single-phase Max. non-motor	A	–	22.5	45	75	–	–	–	–	–
Max. motor	hp	–	0.33	0.75	2	–	–	–	–	–
230 V / single-phase Max. non-motor	A	–	22.5	45	75	–	–	–	–	–
Max. motor	hp	–	0.75	2	3	–	–	–	–	–

- (1) 600 A devices are derated to 540 A for resistance heating loads when aluminium wire is used.
(2) Types L and LX contactors also have a ballast lamp rating of 15 A/~ 347 V when connected single-pole to load and a 600 V when connected 2-pole to load on single-phase and 3-pole to load on 3-phase.
(3) Resistance heating only (3-phase system).
(4) Select lighting contactor on basis of rated motor voltage, whether non-motor load is connected line-to-line or line-to-neutral.
(5) 30 kA also applies for Class J and Class K5, time-delay, 600 A maximum fuses. Additionally, 30 kA ratings apply to Class T, 1200 A maximum and Class L, 1600 A maximum fuses.

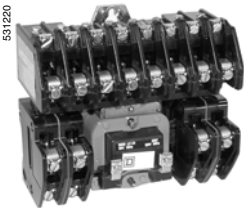
Lighting Contactors
Multipole lighting contactors
Types L and LX Class 8903



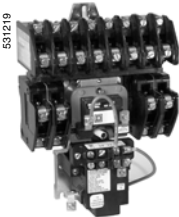
8903 LO 60



8903 LO 80



8903 LO 1200



8903 LXO 1200

Multipole lighting contactors, Types L and LX (4)									
Contact Ampere ratings	Number of poles	Enclosure type (1)				Basic reference (2) Add code indicating control circuit voltage (3) and enclosure type (5)		Weight	
A									kg (lb)
Electrically held									
30	2	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 L (2) 20 (3)		1.3 (2.8)	
	3	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 L (2) 30 (3)		1.3 (2.8)	
	4	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 L (2) 40 (3)		1.3 (2.8)	
	6	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 L (2) 60 (3)		1.5 (3.2)	
	8	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 L (2) 80 (3)		1.7 (3.7)	
	10	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 L (2) 1000 (3)		1.9 (4.1)	
	12	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 L (2) 1200 (3)		2 (4.4)	
Mechanically held									
30	2	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 LX (2) 20 (3)		2 (4.4)	
	3	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 LX (2) 30 (3)		2.1 (4.6)	
	4	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 LX (2) 40 (3)		2.1 (4.6)	
	6	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 LX (2) 60 (3)		2.3 (5)	
	8	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 LX (2) 80 (3)		2.4 (5.4)	
	10	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 LX (2) 1000 (3)		2.6 (5.8)	
	12	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")				8903 LX (2) 1200 (3)		2.8 (6)	
(1) Open : separate enclosures are available for these devices. Delivery time might be improved by ordering an open-type contactor and a separate Class 9991 enclosure; please consult your regional sales office. NEMA 1 : general purpose enclosure. NEMA 1+ : flush-mounting, general-purpose enclosure with plaster adjustment. NEMA 12 : dust-tight and drip-tight industrial-use enclosure.									
(2) Insert " O " for Open, " G " for NEMA 1, " F " for NEMA 1+, " A " for NEMA 12. Example: 8903 LO 20 V02 .									
(3) Standard control circuit voltage:									
Volts	24	110	120	208	220	240	277	440	480
50 Hz	—	V02	—	—	V03	—	—	V06	—
60 Hz	V01	—	V02	V08	—	V03	V04	—	V06
(4) All lighting contactors are provided with separate control as standard.									
(5) Factory conversion of N/O contacts to N/C, order following the example below. Example: for 2 N/O + 2 N/C (NEMA 1 enclosure) the reference is 8903 LG 22 . There is a maximum of eight N/C poles for Type 8903 L contactors and a maximum of six N/C poles for Type 8903 LX contactors (field conversion only). Versions are available with up to 12 N/C poles (factory only).									

Lighting Contactors

Multipole lighting contactors

Type S Class 8903



8903 SQO 1 ●●●

Multipole lighting contactors, Type S (4)

Contact Ampere ratings	Number of poles	Enclosure type (1)	Basic reference (2) Add code indicating control circuit voltage (3) and enclosure type	Weight kg (lb)
A				kg (lb)
Electrically held				
30	2	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SM (2) 1 (3)	1.4 (3.1)
	3	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SM (2) 2 (3)	1.4 (3.1)
	4	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SM (2) 3 (3)	1.7 (3.7)
	5	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SM (2) 4 (3)	1.7 (3.7)
60	2	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SP (2) 1 (3)	2.4 (5.3)
	3	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SP (2) 2 (3)	2.5 (5.5)
	4	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SP (2) 3 (3)	3.1 (6.9)
	5	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SP (2) 4 (3)	3.3 (7.2)
100	2	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SQ (2) 1 (3)	9.9 (22)
	3	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SQ (2) 2 (3)	9.9 (22)
	4	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SQ (2) 3 (3)	15.5 (34)
	5	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SQ (2) 4 (3)	28.4 (63)
200	2	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SV (2) 1 (3)	14.5 (32)
	3	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SV (2) 2 (3)	14.5 (32)
	4	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SV (2) 3 (3)	29.4 (65)
	5	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SV (2) 4 (3)	29.4 (65)
300	2	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SX (2) 1 (3)	23.6 (52)
	3	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SX (2) 2 (3)	31.3 (69)
400	2	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SY (2) 1 (3)	43.5 (96)
	3	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SY (2) 2 (3)	45 (99)
600	2	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SZ (2) 1 (3)	61.2 (135)
	3	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SZ (2) 2 (3)	63 (139)
800	2	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SJ (2) 1 (3)	85.2 (188)
	3	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SJ (2) 2 (3)	87.9 (193)

(1) **Open:** separate enclosures are available for 30, 60 and 100 A devices.

NEMA 1: general purpose enclosure.

NEMA 1+: flush-mounting, general-purpose enclosure with plaster adjustment.

NEMA 12: dust-tight and drip-tight industrial-use enclosure.

(2) Insert "O" for Open, "G" for NEMA 1, "F" for NEMA 1+, "A" for NEMA 12.

Example: **8903 SMO 1 V02**.

(3) Standard control circuit voltage:

Volts	24	110	120	208	220	240	277	440	480
50 Hz	—	V02	—	—	V03	—	—	V06	—
60 Hz	V01	—	V02	V08	—	V03	V04	—	V06

(4) All lighting contactors are provided with separate control as standard, except electrically held 400, 600 and 800 A devices. Electrically held 400, 600 and 800 A devices are provided with common control.

Lighting Contactors

Multipole lighting contactors

Type S, Class 8903

531224_1



8903 SMO 10 ●●●

Multipole lighting contactors, Type S (continued) (4)

Contact Ampere ratings	Number of poles	Enclosure type (1)	Basic reference (2) Add code indicating control circuit voltage (3) and enclosure type	Weight
A				kg (lb)
Mechanically held				
30	2	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SM (2) 10 (3)	2.9 (6.5)
	3	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SM (2) 11 (3)	2.7 (5.9)
	4	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SM (2) 12 (3)	3 (6.8)
	5	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SM (2) 13 (3)	3.8 (8.3)
60	2	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SP (2) 10 (3)	3.9 (8.6)
	3	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SP (2) 11 (3)	4 (8.8)
	4	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SP (2) 12 (3)	5.3 (11.7)
	5	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SP (2) 13 (3)	5.3 (11.7)
100	2	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SQ (2) 10 (3)	8 (18)
	3	Open ("O"), NEMA 1 ("G"), NEMA 1+ ("F"), NEMA 12 ("A")	8903 SQ (2) 11 (3)	8.4 (18.6)
	4	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SQ (2) 12 (3)	9.6 (21.1)
	5	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SQ (2) 13 (3)	9.6 (21.1)
200	2	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SV (2) 10 (3)	19.9 (43.8)
	3	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SV (2) 11 (3)	20.5 (45.4)
	4	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SV (2) 12 (3)	28.5 (62.9)
300	2	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SX (2) 13 (3)	31.2 (68.9)
	3	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SX (2) 14 (3)	31.2 (68.9)
400	2	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SY (2) 16 (3)	38.7 (85.4)
	3	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SY (2) 17 (3)	39 (86.2)
600	2	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SZ (2) 18 (3)	61.2 (135)
	3	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SZ (2) 19 (3)	63 (139)
800	2	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SJ (2) 10 (3)	85 (187.6)
	3	Open ("O"), NEMA 1 ("G"), NEMA 12 ("A")	8903 SJ (2) 11 (3)	87.9 (194)

(1) **Open:** separate enclosures are available for 30, 60 and 100 A devices.**NEMA 1:** general purpose enclosure.**NEMA 1+:** flush-mounting, general-purpose enclosure with plaster adjustment.**NEMA 12:** dust-tight and drip-tight industrial-use enclosure.

(2) Insert: "O" for Open, "G" for NEMA 1, "F" for NEMA 1+, "A" for NEMA 12.

Example: **8903 SMO 10 V02**.

(3) Standard control circuit voltage:

Volts	24	110	120	208	220	240	277	440	480
50 Hz	—	V02	—	—	V03	—	—	V06	—
60 Hz	V01	—	V02	V08	—	V03	V04	—	V06

(4) All lighting contactors are provided with separate control as standard, except electrically held 400, 600 and 800 A devices. Electrically held 400, 600 and 800 A devices are provided with common control.

Lighting Contactors

Multipole lighting contactors

Types L, LX and S Class 8903

Accessories



8903 L1L



8903 L1R



8903 L3L



8903 L3R

Kits

Type	Kit description	For use on	Reference	Weight kg (lb)
Power-pole adder kits				
Power-pole adder kits (used to add 30 A power poles to existing contactors when additional circuits are required)	Single pole	8903 LO 60/80	8903 L1L	—
		8903 LXO 60/80	8903 L1R	—
	Double pole	8903 LO 80/1000 (1)	8903 L3L	—
		8903 LXO 80/1000 (1)	8903 L3R	—
Single-pole and double-pole kits				
Single-pole kits (2)	1 N/O	8903 SM●	9999 SB6	—
		8903 SP● (3)	9999 SB21	—
	1 N/C	8903 SM●	9999 SB7	—
		8903 SP● (3)	9999 SB22	—
Double-pole kits (2)	1 N/O and 1 N/C	8903 SM●	9999 SB8	—
		8903 SP● (3)	9999 SB23	—
	2 N/O	8903 SM●	9999 SB9	—
		8903 SP● (3)	9999 SB24	—
	2 N/C	8903 SM●	9999 SB10	—
		8903 SP● (3)	9999 SB25	—
Solid neutral terminal block kits				
Solid neutral terminal block kits	30/60/100 A	8903 L/LX/SM/SP/SQ	9999 SN1	—
	200/300 A	8903 SV/SX	9999 SN2	—
	400/600/800 A	8903 SY/SZ/SJ	9999 SN3	—

Type	Kit description	For use on	Reference	Weight kg (lb)
Mechanically held				
Push button (On-Off)	NEMA 1 enclosure	8903 L●/LX●	9999 BLX + 9999 LXPB	—
		8903 SP●/SQ●/SV●/SX●/SY●/SZ●/SJ●	9001 KA2 + 9999 SA3 (4)	—
	NEMA 12 enclosure	8903 L●/LX●/SM●/SP●/SQ●/SV●/SX●/SY●/SZ●/SJ●	9001 KA2 + 9999 SA3 (4)	—
Selector switch (2-position)	NEMA 1 enclosure	8903 L●/LX●	9999 BLX + 9999 LXS	—
		8903 SM●/SP●/SQ●/SV●/SX●/SY●/SZ●/SJ●	9001 KN244 + 9001 KS11BH1	—
	NEMA 12 enclosure	8903 L●/LX●/SM●/SP●/SQ●/SV●/SX●/SY●/SZ●/SJ●	9001 KN244 + 9001 KS11BH1	—
Selector switch (3-position)	NEMA 1 enclosure	8903 L●/LX●	9999 BLX + 9999 SC2	—
	(must include two-wire control relay)	8903 SM●/SP●/SQ●/SV●/SX●/SY●/SZ●/SJ●	9001 KN260 + 9001 KS46BH2	—
	NEMA 12 enclosure	8903 L●/LX●/SM●/SP●/SQ●/SV●/SX●/SY●/SZ●/SJ●	9001 KN260 + 9001 KS46BH2	—
Two-wire control relay Suffix R6 (5)	—	8903 L●/LX●	9999 RLX + CA2SK11	—
		8903 SM●/SP●/SQ●/SV●/SX●/SY●/SZ●/SJ●	8501 X011	—
Electrically held				
Pilot lights (red)	NEMA 1 and NEMA 12 enclosures	8903 L●/LX●	9999 SP28R	—
		8903 SM●	9999 SP2R + 9999 SP28R	—
		8903 SP●	9999 SP3R + 9999 SP28R	—
		8903 SQ●	9999 SP14R + 9999 SP28R (6)	—
		8903 SV●/SX●/SY●/SZ●/SJ●	9999 SP28R + 9999 SP28R (7)	—
Push buttons (8)	NEMA 1 enclosure	8903 L●/LX●	9999 BLX + 9999 SA10	—
		8903 SM●/SP●	9999 SA10	—
		8903 SQ●/SV●/SX●/SY●/SZ●/SJ●	9999 SA3	—
	NEMA 12 enclosure	8903 L●/LX●/SM●/SP●/SQ●/SV●/SX●/SY●/SZ●/SJ●	9999 SA3	—
				—
Selector switch (2-position)	NEMA 1 enclosure	8903 L●/LX●	9999 BLX + 9999 SC22	—
		8903 SM●/SP●/SQ●	9999 SC22	—
		8903 SV●/SX●/SY●/SZ●/SJ●	9001 KN244 + 9001 KS11BH1	—
	NEMA 12 enclosure	8903 L●/LX●/SM●/SP●/SQ●/SV●/SX●/SY●/SZ●/SJ●	9001 KN244 + 9001 KS11BH1	—
Selector switch (3-position)	NEMA 1 enclosure	8903 L●/LX●	9999 BLX + 9999 SC2	—
		8903 SM●/SP●/SQ●	9999 SC2	—
		8903 SV●/SX●/SY●/SZ●/SJ●	9999 SC8	—
	NEMA 12 enclosure	8903 L●/LX●/SM●/SP●/SQ●/SV●/SX●/SY●/SZ●/SJ●	9999 SC8	—

(1) Single-pole power pole must be removed before double-pole power pole can be installed.

(2) A single-pole or double-pole kit can be added to any 2- or 3-pole, 30 or 60 A Type S lighting contactor to make a 4- or 5-pole device. Factory assembled 4- and 5-pole contactors use the basic 3-pole device with a single- or double-pole kit installed. Only one power pole can be added per contactor. Sufficient room is provided in all enclosure styles for the addition of the power pole kit.

(3) When power pole is added to a 60 A contactor (**8903 SP●**), a 4-pole coil is also required. 60 A power poles are suitable for use with copper or aluminium wire.

(4) Mechanically held contactors need two distinct signals to operate. It is necessary to add a N/O contact block to the Class 9999 Type SA3 push button kit.

(5) Form R6 available for 24 V, 120 V, 240 V and 277 V only.

(6) Choice for 2- or 3-pole only; for 4- or 5-pole, use Class **9999 SP15R**.

(7) The coil voltage must be the same as the pilot light rating. Kit contains one Class **9001 KP1R6** (120 V / 60 Hz) red pilot light control unit. For other voltages, refer to the Class **9001 KP** control section of the Digest.

(8) Requires holding circuit interlock or additional power pole on Type L devices.

Lighting Contactors
Multipole lighting contactors
Types L, LX and S Class 8903
Variants

Variants					
Type	Enclosure type	For use on	Description	Suffix to the lighting contactor reference (1)	Weight kg (lb)
"ON-OFF" push button	NEMA 1, NEMA 12	Mechanically held	Pulsed contact	A3	—
"ON-OFF" push button	Any	Electrically held	With holding circuit interlock	A12	—
"HAND-OFF-AUTO" selector switch	NEMA 1, NEMA 12	Electrically held, Mechanically held	(2)	C	—
"ON-OFF" selector switch	NEMA 1, NEMA 12	Electrically held, Mechanically held	(2)	C6	—
Control circuit fuses	Any	Electrically held,	1 fuse	F	—
		Mechanically held	2 fuses	F4	—
Control circuit transformers standard capacity (50/60 Hz) (3)	NEMA 1, NEMA 12	Electrically held,	Fuses: 2 (primary), 0 (secondary)	F4T	—
		Mechanically held	Fuses: 2 (primary), 1 (secondary)	FF4T	—
Additional capacity (50/60 Hz) Two fuses in primary and one fuse in secondary (3)	NEMA 1,	Electrically held,	100 VA additional capacity	FF4T11	—
	NEMA 12	Mechanically held	200 VA additional capacity	FF4T12	—
			300 VA additional capacity	FF4T13	—
Noise-reduced enclosure and shock-mounted panel	Any	Electrically held	—	G4	—
Addition of photoelectric receptacle	NEMA 1, NEMA 12	Electrically held	—	G10	—
			With photo-cell installed	G101	—
		Mechanically held	And relay R6 (4)	G10R6	—
			With photo-cell installed (4)	G101R6	—
Addition of terminal blocks (other than standard) (5)	Any	Electrically held,	Wired	G56●●	—
		Mechanically held	Unwired	G50●●	—
Bracketing for internally mounted pilot device	Any	Electrically held, Mechanically held	—	G53	—
Addition of time clock	NEMA 1,	Electrically held,	24 hour (120–127 V only)	K14	—
	NEMA 12	Mechanically held	24 hour w/day omission (120–127 V only)	K141	—
			7 day (120–127 V only)	K142	—
Addition of solid neutral terminal block	NEMA 1,	Electrically held,	—	N	—
	NEMA 12	Mechanically held	—		

(1) Example: 8903 LXG 20 V02 A3.
(2) To substitute a key operated selector switch, use suffix "C33" and specify positions, legend marking and key removal. This suffix must be used with another selector switch suffix.
(3) Control circuit transformer selection table:

Primary-secondary	120-24	208-120	240-24	240-120	277-120	480-24	480-120	480-240	600-120
60 Hz	V89	V84	V82	V80	V85	V83	V81	V87	V86

(4) Available for 24 V, 120 V, 240 V and 277 V applications only.
(5) At the end of suffix, ●● represents the number of terminals needed.

Lighting Contactors

Multipole lighting contactors

Types L, LX and S Class 8903

Variants

Variants (continued)					
Type	Enclosure type	For use on	Description	Suffix to the lighting contactor reference (1)	Weight kg (lb)
Red pilot light	Any	Electrically held, Mechanically held	—	P1	—
Two or more lights (each) (2)	Any	Electrically held, Mechanically held	—	P	—
Red push-to-test pilot light	Any	Electrically held, Mechanically held	—	P21	—
Interlock	Any	Electrically held, Mechanically held	Necessary for pilot light, one needed for each additional pilot light	(3)	—
Two-wire interfaces	Any	Mechanically held	(4)	R6	—
Addition of under- and overvoltage relay	Any	Electrically held, Mechanically held	—	R44	—
Three-wire control for long distance applications	Any	Mechanically held	(4)	R62	—
Auxiliary contacts (5)	Any	Electrically held, Mechanically held	0 N/O + 1 N/C	X01	—
			0 N/O + 2 N/C	X02	—
			0 N/O + 3 N/C	X03	—
			0 N/O + 4 N/C	X04	—
			1 N/O + 0 N/C	X10	—
			1 N/O + 1 N/C	X11	—
			1 N/O + 2 N/C	X12	—
			1 N/O + 3 N/C	X13	—
			2 N/O + 0 N/C	X20	—
			2 N/O + 1 N/C	X21	—
			2 N/O + 2 N/C	X22	—
			3 N/O + 0 N/C	X30	—
			3 N/O + 1 N/C	X31	—
Addition of DC coil to Type L (7 poles maximum)	Any	Electrically held	—	X40	—
			—	Y48	—
Coil transient suppressor (~ 120 V only)	Any	Electrically held, Mechanically held	—	Y145	—
Addition of lightning arrestor	Any	Electrically held, Mechanically held	—	Y1532	—
Substitute copper only lugs for standard	Any	Electrically held, Mechanically held	—	Y157	—
Substitute Anderson VC crimp style lugs for standard (per lug adder), specify lug	Any	Electrically held, Mechanically held	—	Y1574	—

(1) Example: **8903 LXG 20 V02 P1**.

(2) For electrically held enclosed devices, the first pilot light is wired in parallel with the coil. Operating interlocks are required for all additional pilot lights. Mechanically held devices require operating interlocks for all pilot lights.

(3) Do not use suffix "X" for any interlock which is wired in series with pilot light, but do specify how pilot light and interlock are to be wired into the circuit.

(4) Available for 24 V, 120 V, 240 V and 277 V applications only.

(5) Electrically held (Type L) multipole contactors cannot add interlocks. Additional poles can be used for the same function, however. Mechanically held (Type LX) contactors provide one double-throw auxiliary (or status) contact as standard.

Maximum number of external auxiliary units:

Contactors	Maximum number
8903 SM/SP	4 N/O or 4 N/C
	3 N/O or N/C plus 1 attached timer (on- or off-delay)
	2 N/O or N/C plus 1 power-pole adder (single- or 2-pole, N/O or N/C)
	1 attached timer plus 1 power-pole adder (single- or 2-pole, N/O or N/C) plus auxiliary contact
8903 SQ/SV/SY (Size 3 and Size 4)	4 N/O or N/C
	2 N/O or N/C plus 1 attached timer (on- or off-delay)
8903 SQ/SV/SY (Size 5)	3 N/O or N/C plus 1 attached timer (on- or off-delay)
	2 N/O or N/C plus 1 NEMA Size 0-1 or Size 2 power-pole adder (single- or 2-pole, N/O or N/C)
8903 SZ/SJ	4 N/O or N/C
	3 N/O or N/C plus 1 attached timer (on- or off-delay)
	2 N/O or N/C plus 1 NEMA Size 0-1 or Size 2 power-pole adder (single- or 2-pole, N/O or N/C)

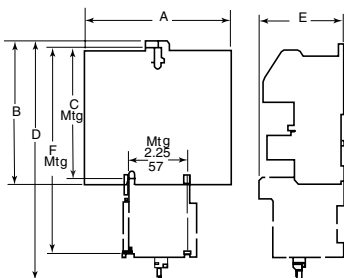
Lighting Contactors

Multipole lighting contactors

Types L, LX and S Class 8903

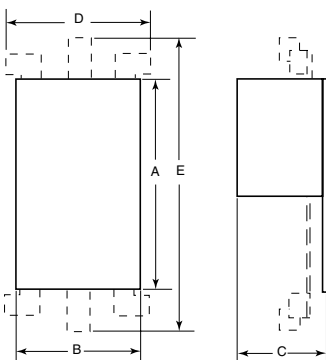
Dimensions in mm (25.4 mm = 1 inch)

8903 LO/LXO



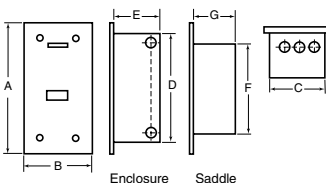
	A	B	C	D	E	F
8903 LO 20/30/40	73	127	117	–	79	–
8903 LO 60	108	127	117	–	79	–
8903 LO 80/1000/1200	143	127	117	–	79	–
8903 LXO 20/30/40	73	–	–	224	83	196
8903 LXO 60	108	–	–	224	83	196
8903 LXO 80/1000/1200	143	–	–	224	83	196

8903 S●O



	A	B	C	D	E
8903 SMO 1/2	110	82	107	–	–
8903 SMO 3/4	110	108	107	–	–
8903 SPO 1/2	135	110	125	–	–
8903 SPO 3/4	158	143	125	–	–
8903 SQO 1/2	180	139	165	–	–
8903 SQO 3/4	199	248	165	–	–
8903 SVO 1/2	232	152	165	–	–
8903 SVO 3/4	232	248	165	–	–
8903 SXO 1/2	313	220	222	–	–
8903 SYO 1/2	–	313	229	–	706
8903 SZO 1/2	–	313	229	–	706
8903 SJO 1/2	–	313	303	–	1085
8903 SMO 10/11	182	96	119	–	–
8903 SMO 12/13	182	116	119	–	–
8903 SPO 10/11	210	117	133	–	–
8903 SPO 12/13	221	150	133	–	–
8903 SQO 10/11	257	151	171	–	–
8903 SQO 12/13	268	248	171	–	–
8903 SVO 10/11	293	152	171	–	–
8903 SVO 12	293	248	171	–	–
8903 SXO 13/14	313	220	267	–	–
8903 SYO 16/17	–	220	267	–	533
8903 SZO 18/19	–	220	267	–	533
8903 SJO 10/11	–	220	303	–	898

8903 LF/LXF/S●F



Class/Type	Variants	A	B	C	D	E	F	G
8903 LF	F/R6/Y48	386	227	194	327	138	278	130
8903 LXF	F/R6/Y48	386	227	194	327	138	278	130
8903 LF	A3/A12/C/C6/P	610	445	381	489	181	–	–
8903 LXF	A3/A12/C/C6/P	610	445	381	489	181	–	–
8903 SMF	A12/C/C6/P/X	341	183	149	283	121	233	114
8903 SMF 1	X	341	183	149	283	121	233	114
8903 SMF 1/2/3/4	N	610	445	381	489	146	–	–
8903 SMF 1	A3/C/C6/N/P/R6	610	445	381	489	146	–	–
8903 SPF 1/2/3/4	A12/C/C6/P/X	386	227	194	327	138	278	130
8903 SPF 1	X	386	227	194	327	138	278	130
8903 SPF 1/2/3/4	N	610	445	381	489	146	–	–
8903 SPF 1	A3/C/C6/N/P/R6	610	445	381	489	146	–	–
8903 SQF	–	787	425	362	667	203	–	–

Lighting Contactors

Multipole lighting contactors

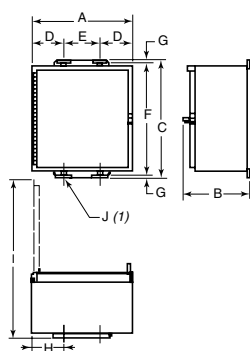
Types L, LX and S Class 8903

Dimensions in mm (25.4 mm = 1 inch)

8903 LG/LXG/S●G

Class/Type	Variants	Width	Height	Depth
8903 LG	A3/A12/C/C6/F/R6/Y48	198	322	153
8903 LXG	A3/A12/C/C6/F/R6/Y48	198	322	153
8903 LG	P	302	302	189
8903 LXG	P	302	302	189
8903 LG	K14/K141/K142	406	559	181
8903 LXG	K14/K141/K142	406	559	181
8903 SMG 1/2/3/4	A12/C/C6/P/X	152	254	134
8903 SMG 1	X	152	254	134
8903 SMG 1/2/3/4	N	378	359	192
8903 SMG 1	N/R6	378	359	192
8903 SMG 1	A3/C/C6/P	206	359	247
8903 SPG 1/2/3/4	A12/C/C6/P/X	198	322	153
8903 SPG	N/R6	378	359	192
8903 SPG 1	A3/C/C6/P/X	206	359	247
8903 SQG 1/2	A12/C/C6/F/P/X	286	639	288
8903 SQG 10/11	F/X	286	639	288
8903 SQG 1/2	N/R6/K●●●	461	740	234
8903 SQG 10/11	A3/C/C6/N/R6/K●●●	461	740	234
8903 SQG 3/4	A12/C/C6/F/P/X	286	639	288
8903 SQG 12/13	F/X	286	639	288
8903 SQG 3/4	K●●●	461	740	234
8903 SQG 12/13	A3/C/C6	461	740	234
8903 SQG 3/4	N/R6	563	994	260
8903 SQG 12/13	N/R6	563	994	260
8903 SVG	—	563	994	260
8903 SXG	—	437	1123	325
8903 SYG	—	513	1670	333
8903 SZG	—	513	1670	333
8903 SJG	—	876	2362	597

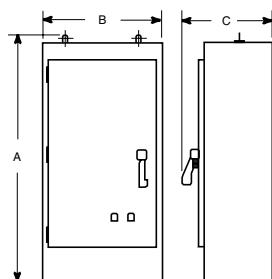
8903 LA/LXA/S●A



(1) 4 diameter mounting holes

Class/Type	Variants	A	B	C	D	E	F	G	H	I	J
8903 LA	F/R6/Y48	206	216	400	40	127	381	8	54	375	8
8903 LXA	F/R6/Y48	206	216	400	40	127	381	8	54	375	8
8903 LA	A3/A12/C/C6/P	302	197	343	97	108	324	10	125	460	8
8903 LXA	A3/A12/C/C6/P	302	197	343	97	108	324	10	125	460	8
8903 SMA 1/2/3/4	A12/C/C6/P/X	162	217	324	40	83	305	10	90	318	8
8903 SMA 1	F/P/X	162	217	324	40	83	305	10	90	318	8
8903 SMA 1/2/3/4	N/R6	378	200	406	65	248	381	13	93	540	8
8903 SMA 1	A3/C/C6/N/P/R6	378	200	406	65	248	381	13	93	540	8
8903 SPA 1/2/3/4	A12/C/C6/P/X	206	236	406	40	127	381	13	93	391	8
8903 SPA 1	A3/C/C6/P/X	206	236	406	40	127	381	13	93	391	8
8903 SPA 1/2/3/4	N/R6	378	200	400	65	248	381	10	93	540	8
8903 SPA 1	A3/C/C6/N/P/R6	378	200	400	65	248	381	10	93	540	8
8903 SQA 1/2	A12/C/C6/F/N/R6/P/X	461	234	800	78	305	775	13	93	678	11
8903 SQA 10/11	A3/C/C6/F/N/P/R6/X	461	234	800	78	305	775	13	93	678	11
8903 SQA 3/4	A12/C/C6/F/N/P/K●●●	461	234	800	78	305	775	13	93	678	11
8903 SQA 12/13	A3/C/C6/P/K●●●	461	234	800	78	305	775	13	93	678	11
8903 SQA 3/4	N/R6/K●●●	563	260	1054	78	406	1029	13	93	805	11
8903 SQA 12/13	N/R6/K●●●	563	260	1054	78	406	1029	13	93	805	11
8903 SVA	—	563	260	1054	78	406	1029	15	93	805	11
8903 SXA	—	437	339	1193	104	229	1168	13	117	719	14
8903 SYA	—	513	330	1651	104	305	1625	13	135	784	18
8903 SZA	—	513	330	1651	104	305	1625	13	135	784	18

8903 SJA



	A	B	C
8903 SJA	2362	876	597

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Manual Starters and Switches

Manual starters Class 2510

Manual switches Class 2510

Reversing drum switches Class 2601



2510 FG 2P



2510 KG 1A



2510 TBG 1



2601 AG2



2510 KO 2



2510 MBA 1

Manual starters Class 2510

Type F fractional motor power starters provide overload protection as well as manual "On-Off" control for small motors in a variety of industrial and commercial installations. Typical applications include fans, conveyors, pumps and small machine tools.

They are available in single- or 2-pole versions. Both single- and 2-pole versions are suitable for use with single-phase $\sim$ motors rated up to 1 hp. 2-pole starters may also be used with $\equiv$ motors rated up to 0.75 hp.

Note: Manual starters include motor overload protection. After tripping, the overload relay must be reset before the motor can restart.

Single units Type F

- Basic starters.
- Starters with handle guard/lock-off.

Duplex units Type F

- One starter in duplex enclosure.
- Two starters in one enclosure.
- Starters and "AUTO-OFF-HAND" selector switch.

Manual switches Class 2510

Type K motor-starting switches provide manual "On-Off" control of single- or 3-phase $\sim$ motors, where overload protection is not required or is provided separately. These devices are suitable for use with 3-phase $\sim$ motors rated up to 20 hp. Compact construction and a 600 V rating make these switches suitable for a wide range of industrial and commercial uses. Typical applications include small machine tools, pumps, fans, conveyors and many other types of electrical machinery. They may also be used on non-motor loads such as resistance heaters.

Note: Manual switches do not include motor overload or low-voltage protection. Should the power fail, the contacts will remain closed, and upon re-energization, **the motor will restart immediately.**

Non-reversing Type K

- With toggle operator.
- With removable key.

Integral Horsepower non-reversing Types T and M

Types T and M integral motor power manual starters provide convenient "On-Off" operation of small single-phase, 3-phase or $\equiv$ motors. Typical applications include small machine tools, pumps, fans and conveyors. They feature toggle or push button operators and reliable overload protection. Pilot lights and auxiliary contacts are available.

- Toggle (T) or push button (M) operators.
- Reliable overload protection.
- Pilot light and auxiliary contact available.

Reversing drum switches Class 2601

Reversing drum switches are designed to start and reverse motors by connecting them directly across-the-line. The devices may be used with squirrel-cage motors; single-phase $\sim$ motors designed for reversing service; and series, shunt and compound $\equiv$ motors. The applications should be such that across-the-line starting of the motors is not objectionable, unless other means is provided for limiting starting current and torque. Class 2601 drum switches are field convertible from maintained to pulsed operation.

The reversing drum switches are suited to manual reversing control applications, such as machine tools, woodworking machines and similar types of equipment. Examples include lathes, milling machines, planers, grinders, shapers and boring mills. Other possible applications include door operators, small hoists and conveyor belts.

Note: Reversing drum switches do not include motor overload or low-voltage protection. Should the power fail, the contacts will remain closed, and upon re-energization, **the motor will restart immediately;** however, if the drum switch is assembled for pulsed operation, the handle will stay in the selected position, and the handle position will determine the motor state.

Environment						
Class			2510/2601			
Type			F/K/T/M			
Conforming to standards	Enclosed unit		UL			
	Open unit		UL			
Product certifications			CSA			
Ambient air temperature around the device	Storage	°C	0...+ 40			
	Operation	°C	0...+ 40			
Electrical characteristics						
Class			2510			
Type			F			
Voltage rating		V	∼ 277 maximum (single- or 2-pole); ≡ 230 maximum (2-pole only)			
Continuous current rating		A	16			
Maximum Horsepower						
115–230 V	∼ Single-phase	Single-pole	hp/kW	1/0.75		
		2-pole	hp/kW	1/0.75		
	≡	2-pole only	hp/kW	0.75/0.55		
277 V	∼ Single-phase	Single-pole	hp/kW	1/0.75		
		2-pole	hp/kW	1/0.75		
	≡	2-pole only	hp/kW	–		
Class			2510			
Type			K●●1/K●●3	K●●2/K●●4	K●●5	K●●6
Number of poles			2	3	2	3
Number of phases			Single phase	Three phase	Single phase	Three phase
Voltage rating		V	∼ 600 maximum; ≡ 230 maximum			
Continuous current rating		A	30 at 600 V maximum			
Maximum motor power						
∼ rating	115 V	hp/kW	2/1.5	2/1.5	2/1.5	2/1.5
	230 V	hp/kW	2/1.5	7.5/5.6	3/2.2	7.5/5.6
	460 V	hp/kW	3/2.2	10/7.5	7.5/5.6	15/11.2
	575 V	hp/kW	3/2.2	10/7.5	10/7.5	20/14.9
≡ rating	90 V	hp/kW	1/0.75	1/0.75	1/0.75	1/0.75
	115 V	hp/kW	2/1.5	2/1.5	2/1.5	2/1.5
	230 V	hp/kW	1.5/1.1	1.5/1.1	1.5/1.1	1.5/1.1
Class			2510			
Type			TB●●/MB●●	TC●●/MC●●	MC●● 2	
Size			Available in NEMA Sizes M-0, M-1 and M-1P			
Number of poles			∼ : 2-pole single-phase; 3-pole 3-phase ≡ : 2-pole (without low voltage protection only)			
Voltage rating		V	∼ 600 maximum; ≡ 250 maximum			
Terminals						
Power terminals	Type of lug		Screw clamp terminal	Screw clamp terminal	Box lug	
	Wire Size (min.-max.)		#14–#8	#14–#8	#14–#6	
Auxiliary interlock terminals	Type of lug		Screw clamp terminal	Screw clamp terminal	Screw clamp terminal	
	Wire Size (min.-max.)		#16–#12	#16–#12	#16–#12	
Class			2601			
Type			AG2/AG2 S2/BG1/BG1 S4			
Voltage rating		V	∼ 600 maximum; ≡ 250 maximum			

Manual Starters and Switches

Manual starters Class 2510

531176



2510 FG 2P

Single units Type F

Type of operator	Number of poles	Features	Enclosure type (2)	Specification	Reference	Weight kg (lb)
Basic starters						
Toggle operator (1)	1	Standard	Open	–	2510 FO 1	0.14 (0.32)
			NEMA 1	Standard	2510 FG 1	0.35 (0.72)
				Oversized	2510 FGJ 1	0.49 (1.08)
		General purpose flush mounting (without pull box)		Grey flush plate	2510 FF 1	0.19 (0.42)
				Standard stainless steel flush plate	2510 FS 1	0.20 (0.44)
	2	Standard	Open	–	2510 FO 2	0.15 (0.33)
			NEMA 1	Standard	2510 FG 2	0.36 (0.80)
				Oversized	2510 FGJ 2	0.50 (1.11)
		General purpose flush mounting (without pull box)		Grey flush plate	2510 FF 2	0.20 (0.46)
				Standard stainless steel flush plate	2510 FS 2	0.20 (0.46)
	3	Standard	Open	–	2510 FO 3	0.15 (0.33)
			NEMA 1	Standard	2510 FG 3	0.35 (0.79)
				Oversized	2510 FGJ 3	0.36 (0.80)
		General purpose flush mounting (without pull box)		Grey flush plate	2510 FF 3	0.22 (0.50)
				Standard stainless steel flush plate	2510 FS 3	0.20 (0.45)
Removable key (1)	1	Standard	Open	–	2510 FO 3	0.15 (0.33)
			NEMA 1	Standard	2510 FG 3	0.35 (0.79)
				Oversized	2510 FGJ 3	0.36 (0.80)
		General purpose flush mounting (without pull box)		Grey flush plate	2510 FF 3	0.22 (0.50)
				Standard stainless steel flush plate	2510 FS 3	0.20 (0.45)
	2	Standard	Open	–	2510 FO 4	0.18 (0.40)
			NEMA 1	Standard	2510 FG 4	0.36 (0.80)
				Oversized	2510 FGJ 4	0.36 (0.80)
		General purpose flush mounting (without pull box)		Grey flush plate	2510 FF 4	0.22 (0.50)
				Standard stainless steel flush plate	2510 FS 4	0.20 (0.45)
	3	Standard	Open	–	2510 FO 4P	0.36 (0.80)
			NEMA 1	Standard	2510 FG 4P	0.36 (0.80)
				Oversized	2510 FGJ 4P	0.36 (0.80)
		General purpose flush mounting (without pull box)		Grey flush plate	2510 FF 4P	0.22 (0.50)
				Standard stainless steel flush plate	2510 FS 4P	0.20 (0.45)
	4	Standard	Open	–	2510 FO 4P	0.36 (0.80)
			NEMA 1	Standard	2510 FG 4P	0.36 (0.80)
				Oversized	2510 FGJ 4P	0.36 (0.80)
		General purpose flush mounting (without pull box)		Grey flush plate	2510 FF 4P	0.22 (0.50)
				Standard stainless steel flush plate	2510 FS 4P	0.20 (0.45)
	5	Standard	Open	–	2510 FO 5P	0.36 (0.80)
			NEMA 1	Standard	2510 FG 5P	0.36 (0.80)
				Oversized	2510 FGJ 5P	0.36 (0.80)
		General purpose flush mounting (without pull box)		Grey flush plate	2510 FF 5P	0.22 (0.50)
				Standard stainless steel flush plate	2510 FS 5P	0.20 (0.45)

(1) One thermal unit required.

(2) Open: no enclosure,

NEMA 1: general purpose enclosure surface mounting.

Single units Type F (continued)

Type of operator	Number of poles	Features	Enclosure type (2)	Specification	Reference	Weight kg (lb)
Starters with handle guard/lock-off						
Toggle operator (1)	1	Standard	NEMA 1 (3)	Standard	2510 FG 5	0.36 (0.80)
				Oversized	2510 FGJ 5	0.50 (1.11)
		With red pilot light	NEMA 1 (3)	Standard	2510 FG 5P	0.37 (0.82)
				Oversized	2510 FGJ 5P	0.52 (1.15)
	2	Standard	NEMA 1 (3)	Standard	2510 FG 6	0.37 (0.82)
				Oversized	2510 FGJ 6	0.51 (1.13)
		With red pilot light	NEMA 1 (3)	Standard	2510 FG 6P	0.38 (0.84)
				Oversized	2510 FGJ 6P	0.53 (1.17)

Duplex units Type F

One starter in duplex enclosure

Toggle operator (1)	2	Standard	NEMA 1	Standard	2510 FG 02	0.50 (1.10)
		With red pilot light	NEMA 1	Standard	2510 FG 02P	0.51 (1.12)
Removable key (1)	2	With red pilot light	NEMA 1	Standard	2510 FG 04P	0.51 (1.12)

Two starters in one enclosure

Toggle operator (1)	2 for each starter	Standard	NEMA 1	Standard	2510 FG 22	0.70 (1.54)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 FF 22	0.70 (1.54)
			With red pilot light on each starter	NEMA 1	Standard	2510 FG 22P
		General purpose flush mounting (without pull box)		Grey flush plate	2510 FF 22P	0.70 (1.54)
		Standard stainless steel flush plate		2510 FS 22P	0.70 (1.54)	
		Removable key (4)	2 for each starter	With red pilot light on each starter	NEMA 1	Standard
General purpose flush mounting (without pull box)	Grey flush plate				2510 FF 44P	0.70 (1.54)
Standard stainless steel flush plate	2510 FS 44P				0.70 (1.54)	

Starters and "AUTO-OFF-HAND" selector switch (~ only)

Toggle operator (1)	1	Standard	NEMA 1	Standard	2510 FG 71	0.81 (1.79)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 FF 71	0.73 (1.61)
			With red pilot light	NEMA 1	Standard	2510 FG 71P
		With red pilot light	General purpose flush mounting (without pull box)	Grey flush plate	2510 FF 71P	0.80 (1.76)
			Standard stainless steel flush plate	2510 FS 71P	0.80 (1.76)	
	2	Standard	NEMA 1	Standard	2510 FG 72	0.80 (1.76)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 FF 72	0.80 (1.76)
			With red pilot light	NEMA 1	Standard	2510 FG 72P
		With red pilot light	General purpose flush mounting (without pull box)	Grey flush plate	2510 FF 72P	0.80 (1.76)
			Standard stainless steel flush plate	2510 FS 72P	0.80 (1.76)	
Removable key (1)	2	With red pilot light	NEMA 1	Standard	2510 FG 74P	0.80 (1.76)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 FF 74P	0.80 (1.76)
			Standard stainless steel flush plate	2510 FS 74P	0.80 (1.76)	

(1) One thermal unit required.

(2) NEMA 1: general purpose enclosure surface mounting.

(3) For general purpose flush mounting enclosure (without pull box), order basic starter plus separate handle guard kit, reference is **2510 FL1**.

(4) Two thermal units required.

Manual Starters and Switches

Manual starters Class 2510

Non-reversing Type K (1)

Type of operator	Number of poles	Features	Enclosure type (2)	Specification	Reference	Weight kg (lb)
Toggle operator	2	Standard	Open	—	2510 KO 1	0.15 (0.35)
			NEMA 1	Standard	2510 KG 1	0.38 (0.85)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 KF 1	0.22 (0.50)
				Standard stainless steel flush plate	2510 KS 1	0.20 (0.46)
		With red pilot light ~ 115 V	Open	—	2510 KO 1A (3)	0.16 (0.37)
			NEMA 1	Standard	2510 KG 1A	0.38 (0.84)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 KF 1A	0.30 (0.66)
				Standard stainless steel flush plate	2510 KS 1A	0.23 (0.52)
		With red pilot light ~ 230 V	Jumbo stainless steel flush plate		2510 KSJ 1A	0.30 (0.66)
					2510 KO 1B (3)	0.18 (0.39)
					2510 KG 1B	0.38 (0.84)
					2510 KF 1B	0.30 (0.66)
	3	Standard	Open	—	2510 KO 2	0.18 (0.39)
			NEMA 1	Standard	2510 KG 2	0.30 (0.66)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 KF 2	0.30 (0.66)
				Standard stainless steel flush plate	2510 KS 2	0.30 (0.66)
		With red pilot light ~ 208...277 V	Open	—	2510 KO 2B (3)	0.20 (0.44)
			NEMA 1	Standard	2510 KG 2B	0.39 (0.86)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 KF 2B	0.30 (0.66)
				Standard stainless steel flush plate	2510 KS 2B	0.30 (0.66)
		With red pilot light ~ 440...600 V	Jumbo stainless steel flush plate		2510 KSJ 2B	0.30 (0.66)
					2510 KO 2C (3)	0.18 (0.40)
					2510 KG 2C	0.40 (0.88)
					2510 KF 2C	0.30 (0.66)
					2510 KS 2C	0.30 (0.66)
					2510 KSJ 2C	0.30 (0.66)
	2	Standard	Open	—	2510 KO 5	0.17 (0.38)
			NEMA 1	Standard	2510 KG 5	0.34 (0.75)
		With red pilot light ~ 115 V	Open	—	2510 KO 5A	0.30 (0.66)
			NEMA 1	Standard	2510 KG 5A	0.30 (0.66)
		With red pilot light ~ 230 V	Open	—	2510 KO 5B	0.30 (0.66)
			NEMA 1	Standard	2510 KG 5B	0.30 (0.66)
	3	Standard	Open	—	2510 KO 6	0.17 (0.39)
			NEMA 1	Standard	2510 KG 6	0.39 (0.87)
		With red pilot light ~ 115 V	Open	—	2510 KO 6B	0.20 (0.44)
			NEMA 1	Standard	2510 KG 6B	0.30 (0.66)
		With red pilot light ~ 230 V	Open	—	2510 KO 6C	0.30 (0.66)
			NEMA 1	Standard	2510 KG 6C	0.40 (0.88)

(1) See motor power ratings table page 6/3.

(2) Open: no enclosure,

NEMA 1: general purpose enclosure surface mounting.

(3) Do not use as replacement parts for devices. For replacement unit, order Type **2510 KO 1** or **2510 KO 2** and separate pilot light kit, see page 6/9.



2510 KG 1A



2510 KO 2

Manual Starters and Switches

Manual starters Class 2510

Non-reversing Type K (continued) (1)

Type of operator	Number of poles	Features	Enclosure type (2)	Specification	Reference	Weight kg (lb)
Removable key	2	Standard	Open	—	2510 KO 3	0.16 (0.35)
			NEMA 1	Standard	2510 KG 3	0.40 (0.88)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 KF 3	0.30 (0.66)
				Standard stainless steel flush plate	2510 KS 3	0.30 (0.66)
		With red pilot light ~ 115 V	Open	—	2510 KO 3A	0.17 (0.37)
			NEMA 1	Standard	2510 KG 3A	0.40 (0.88)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 KF 3A	0.30 (0.66)
				Standard stainless steel flush plate	2510 KS 3A	0.30 (0.66)
				Jumbo stainless steel flush plate	2510 KSJ 3A	0.30 (0.66)
		With red pilot light ~ 230 V	Open	—	2510 KO 3B	0.16 (0.35)
			NEMA 1	Standard	2510 KG 3B	0.40 (0.88)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 KF 3B	0.30 (0.66)
				Standard stainless steel flush plate	2510 KS 3B	0.30 (0.66)
				Jumbo stainless steel flush plate	2510 KSJ 3B	0.30 (0.66)
	3	Standard	Open	—	2510 KO 4	0.18 (0.39)
			NEMA 1	Standard	2510 KG 4	0.39 (0.87)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 KF 4	0.22 (0.50)
				Standard stainless steel flush plate	2510 KS 4	0.25 (0.55)
		With red pilot light ~ 208...277 V	Open	—	2510 KO 4B	0.18 (0.39)
			NEMA 1	Standard	2510 KG 4B	0.40 (0.88)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 KF 4B	0.30 (0.66)
				Standard stainless steel flush plate	2510 KS 4B	0.30 (0.66)
				Jumbo stainless steel flush plate	2510 KSJ 4B	0.30 (0.66)
		With red pilot light ~ 440...600 V	Open	—	2510 KO 4C	0.20 (0.44)
			NEMA 1	Standard	2510 KG 4C	0.40 (0.88)
			General purpose flush mounting (without pull box)	Grey flush plate	2510 KF 4C	0.30 (0.66)
				Standard stainless steel flush plate	2510 KS 4C	0.30 (0.66)
				Jumbo stainless steel flush plate	2510 KSJ 4C	0.30 (0.66)

(1) See motor power ratings table page 6/3.

(2) Open: no enclosure,

NEMA 1: general purpose enclosure surface mounting.

53179



2510 TBG 1

53180



2510 MBA 1

Integral Horsepower non-reversing Types T and M

Type of operator	Number of poles	NEMA Size	Ratings			Enclosure type ⁽¹⁾	Reference	Weight
			Motor voltage	Max. power				
				3-phase	Single-phase			
			V	hp/kW	hp/kW			kg (lb)
Toggle operator	~ 2	M-0	115	–	1/0.75	Open	2510 TBO 1	1 (3)
			230		2/1.5	NEMA 1	2510 TBG 1 ⁽²⁾	2 (5)
		M-1	115	–	2/1.5	Open	2510 TCO 1	1 (3)
			230		3/2.2	NEMA 1	2510 TCG 1	2 (5)
		M-1P	115	–	3/2.2	Open	2510 TCO 2	1 (3)
			230		5/3.7	NEMA 1	2510 TCG 2	2 (5)
	~ 3	M-0	200...230, 380...575	3/2.2 (230 V), 5/3.7 (575 V)	–	Open	2510 TBO 2	1 (3)
						NEMA 1	2510 TBG 2 ⁽²⁾	2 (5)
		M-1	200...230, 380...575	7.5/5.5 (230 V), 10/7.5 (575 V)	–	Open	2510 TCO 3	1 (3)
						NEMA 1	2510 TCG 3	2 (5)
	≡ 2	M-0	115	1/0.75	1/0.75	Open	2510 TBO 4	1 (3)
			230	1.5/1.1	1.5/1.1	NEMA 1	2510 TBG 4	2 (5)
		M-1	115	1.5/1.1	1.5/1.1	Open	2510 TCO 5	1 (3)
			230	2/1.5	2/1.5	NEMA 1	2510 TCG 5	2 (5)
Push-button	~ 2	M-0	115	–	1/0.75	Open	2510 MBO 1	1 (3)
			230		2/1.5	NEMA 1	2510 MBG 1 ⁽²⁾	2 (5)
						NEMA 12	2510 MBA 1 ⁽³⁾	4 (9)
		M-1	115	–	2/1.5	Open	2510 MCO 1	1 (3)
			230		3/2.2	NEMA 1	2510 MCG 1	2 (5)
						NEMA 12	2510 MCA 1	4 (9)
	~ 3	M-0	115	–	3/2.2	Open	2510 MCO 2	1 (3)
			230		5/3.7	NEMA 1	2510 MCG 2	2 (5)
						NEMA 12	2510 MCA 2	4 (9)
		M-1	200...230, 380...575	3/2.2 (230 V), 5/3.7 (575 V)	–	Open	2510 MBO 2	1 (3)
						NEMA 1	2510 MBG 2 ⁽²⁾	2 (5)
						NEMA 12	2510 MBA 2 ⁽³⁾	4 (9)
	≡ 2	M-0	200...230, 380...575	7.5/5.5 (230 V), 10/7.5 (575 V)	–	Open	2510 MCO 3	1 (3)
						NEMA 1	2510 MCG 3	2 (5)
						NEMA 12	2510 MCA 3	4 (9)
		M-1	200...230, 380...575	7.5/5.5 (230 V), 10/7.5 (575 V)	–	Open	2510 MBO 4	1 (3)
						NEMA 1	2510 MBG 4	2 (5)
						NEMA 12	2510 MBA 4	4 (9)
	≡ 2	M-0	115	1/0.75	1/0.75	Open	2510 MBO 5	1 (3)
			230	1.5/1.1	1.5/1.1	NEMA 1	2510 MBG 5	2 (5)
						NEMA 12	2510 MBA 5	4 (9)
		M-1	115	1.5/1.1	1.5/1.1	Open	2510 MCO 5	1 (3)
			230	2/1.5	2/1.5	NEMA 1	2510 MCG 5	2 (5)
						NEMA 12	2510 MCA 5	4 (9)

(1) Open: no enclosure.

NEMA 1: general purpose enclosure surface mounting.

NEMA 12: dust-tight and drip-tight industrial-use enclosure.

(2) For a NEMA 1 enclosed starter approved for group motor installations, order a larm switch: 2-pole 2510 TBL 1, 3-pole 2510 TBL 2.

Larm switch w/LVP: 2-pole 2510 TBL 21, 3-pole 2510 TBL 22.

(3) Approved for group motor installations per NEC 430-53(c).

531181



2601 AG2

Reversing drum switches

Voltage	Standard power ratings						Reference	Weight
	~ single-phase		~ 3-phase		---			
V	hp	kW	hp	kW	hp	kW		kg (lb)
NEMA 1 general purpose enclosure								
115	1.5	1.1	—	—	0.25	0.185	2601 AG2	0.6 (1.32)
200/230	—	—	2	1.5	—	—		
230	2	1.5	—	—	0.25	0.185		
460/575	—	—	2	1.5	—	—		
115	1.5	1.1	—	—	2	1.5	2601 BG1	1.1 (2.38)
200/230	—	—	5	3.7	—	—		
230	3	2.2	—	—	2	1.5		
460/575	5	3.7	7.5	5.5	—	—		
NEMA 1 maintained and pulsed (1)								
115	1.5	1.1	—	—	0.25	0.185	2601 AG2 S2	0.6 (1.32)
200/230	—	—	2	1.5	—	—		
230	2	1.5	—	—	0.25	0.185		
460/575	—	—	2	1.5	—	—		
115	1.5	1.1	—	—	2	1.5	2601 BG1 S4	1.1 (2.38)
200/230	—	—	5	3.7	—	—		
230	3	2.2	—	—	2	1.5		
460/575	5	3.7	7.5	5.5	—	—		

Kits

Replacement contact kits (for manual starters, Types T and M Class 2510)

Type	NEMA Size	Series	Number of poles	Service bulletin	Reference	Weight kg (lb)
Replacement contact kits	M-0	A or B	2 or 3	312AS	9998 ML1	—
	M-1	A or B	2 or 3	312AS	9998 ML2	—
	M-1P	A or B	2	312AS	9998 ML2	—

Pilot light kits (for manual starters, Types F and K Class 2510)

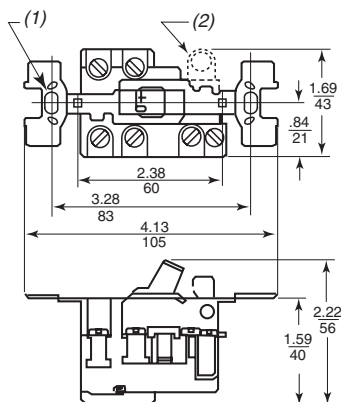
Type	For use on	Voltage	Pilot light	Reference	Weight kg (lb)
Pilot light kits	2510 FF/FG	~ 115–240 V	Red	9998 PL10	—
			Green	9998 PL10G	—
	2510 KF/KG (2)	~ 110–120 V	Red	9998 PL11	—
			Green	9998 PL11G	—
		~ 208–227 V	Red	9998 PL12	—
			Green	9998 PL12G	—
		~ 440–600 V	Red	9998 PL13	—
			Green	9998 PL13G	—

(1) Maintained-"Forward". Pulsed-"Reverse". Not field convertible.

(2) Lens cannot be replaced.

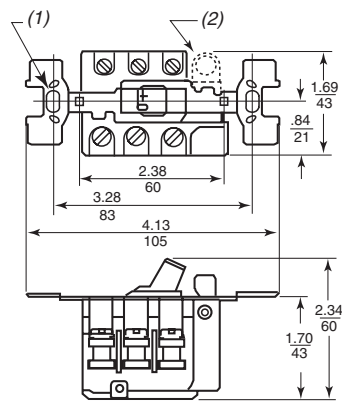
Dimensions are $\frac{\text{inch}}{\text{mm}}$

2510 FO 1/1P/2 (Open)



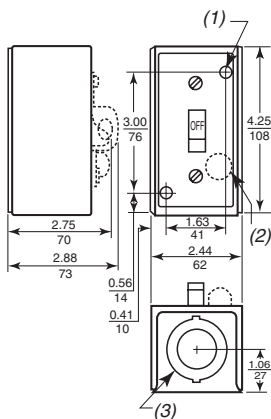
- (1) 2 mounting holes for #6-32 screws.
(2) Pilot light.

2510 KO 1/1A/2/2B/2C, 2510 KO 5/5A/5B/6/6B/6C (Open)



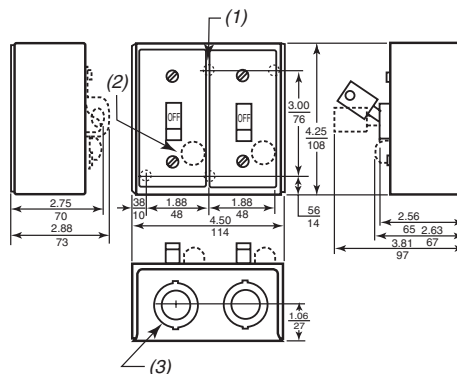
- (1) 2 mounting holes for #6-32 screws.
(2) Pilot light.

2510 FG/KG (NEMA 1 Surface mounting)



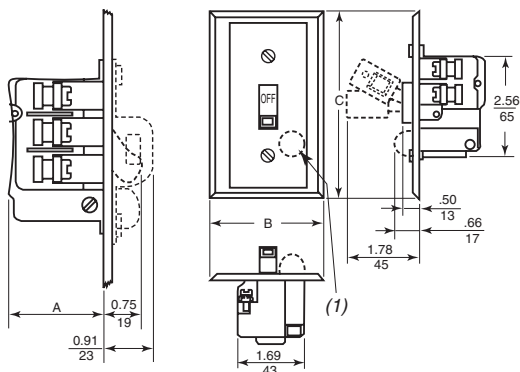
- (1) 2 x 0.25" diameter mounting holes 25/6.
(2) Pilot light.
(3) 1/2 -3/4" conduit knockout, both ends.

2510 FG 0●●/2●●/44P/7●● (NEMA 1)



- (1) 4 x 0.25" diameter mounting holes.
(2) Pilot light.
(3) 1/2 -3/4" conduit knockout, both ends.

2510 FF/FS/FSJ/KF/KS/KSJ (NEMA 1 Flush mounting)



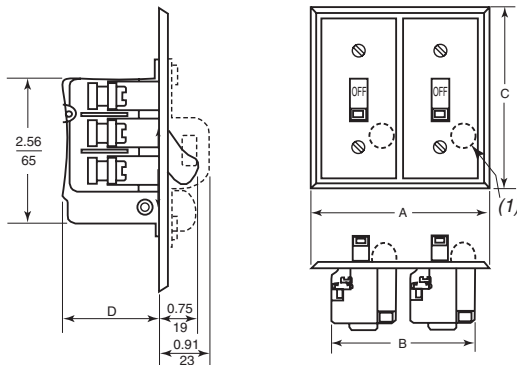
- (1) Pilot light.

(2)	A	B	C
2510 FF 1/1P/2/2P	36.5	69.9	114.3
2510 FS 1/1P/2/2P	36.5	69.9	114.3
2510 FSJ 1P/2P	36.5	88.9	133.4
2510 FF 3/4/4P	36.5	69.9	114.3
2510 FS 3/3P/4/4P	36.5	69.9	114.3
2510 FSJ 3P/4P	36.5	88.9	133.4
2510 KF 1/1A/1B/2/2B/2C	44.5	69.9	114.3
2510 KS 1/1A/1B/2/2B/2C	44.5	69.9	114.3
2510 KSJ 1A/1B/2B/2C	44.5	88.9	133.4
2510 KF 3/3A/3B/4/4B/4C	44.5	69.9	114.3
2510 KS 3/3A/3B/4/4B/4C	44.5	69.9	114.3
2510 KSJ 3A/4B/4C	44.5	88.9	133.4

(2) Dimensions in mm (25.4 mm = 1 inch).

Dimensions are $\frac{\text{inch}}{\text{mm}}$

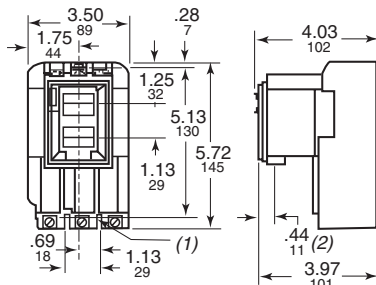
2510 FF 22/44/7●, 2510 FS 22/44/7● (General purpose flush mounting plate)



(1) Pilot light.

2510 T●O ●/M●O ● (Open)

Sizes M-0, M-1 and M-1P

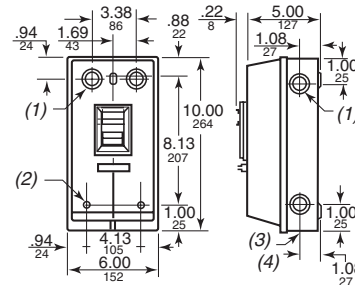


(1) 3 prov. for #10 mounting screws.

(2) Travel to reset.

2510 TCG 2/MCG 2 (NEMA 1)

Size M-1P



(1) 3 x 0.22 diameter mounting holes.

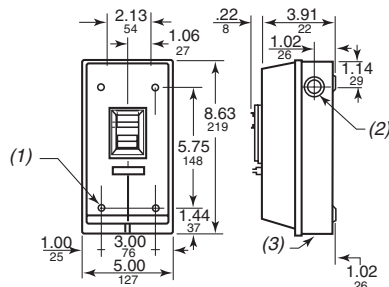
(2) 6 x 0.50 - 0.75 knockouts

(3) 1 x 0.50 - 0.75 knockouts

(4) 2 x 0.75 - 1.00 knockouts Top and bottom.

2510 TBG ●/TCG ●/MBG ●/MCG ● (NEMA 1)

Sizes M-0 and M-1



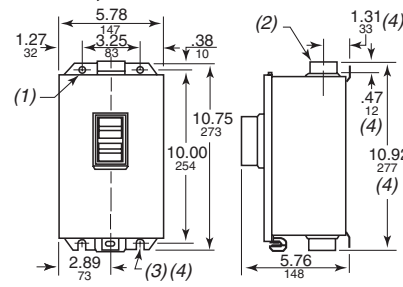
(1) 4 x 0.22 diameter mounting holes.

(2) 0.50 - 0.75 knockouts Each side.

(3) 1 x 0.50 - 0.75 knockouts and 2 x 0.75 - 1.00 knockouts

2510 M●A ● (NEMA 12)

Sizes M-0, M-1 and M-1P



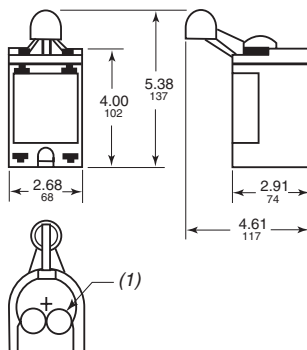
(1) 2 x 0.31 diameter mounting holes.

(2) 0.75 conduit hub top and bottom.

(3) 2 x 0.31 wide slots.

(4) NEMA 4 only.

2601 AG2/AG2 S2/BG1/BG1 S4 (NEMA 1)



(1) 2 x 0.50" knockouts

General characteristics:
pages 6/2 and 6/3

References:
pages 6/4 to 6/9

- Separate enclosures
 - References page 7/2
- Magnetic coils
 - References page 7/8
- Replacement parts kits
 - References page 7/12
- Cover-mounted control units
 - References page 7/14
- Auxiliary contacts
 - References page 7/18
- Power-pole adder kits, Timer attachments, Control circuit fuse holders, Transient suppression modules
 - References page 7/20
- Compression lugs, Terminal blocks
 - References page 7/21

Accessories for Heavy Industrial NEMA Style Controls

Separate enclosures

NEMA 1 rated (general purpose) separate enclosures

The NEMA 1 rated general purpose separate enclosures listed below, when used with open style components, are equivalent to a standard factory-assembled control device.

For use with	Type	Number of poles	Reference	Weight kg (lb)
Manual starters	2510 F, 2510 K	All	9991 EN 1	0.2 (0.5)
	2510 M (Sizes M-0 and M-1)	All	9991 MG 1	1.1 (2.4)
	2510 M (Size M-1P)	All	9991 MG 2	0.5 (1)
Contactors	8502 SAO/SBO/SCO	2...4	9991 SCG 7	1.8 (4)
	8502 SDO	2...4	9991 SDG 7	3.6 (8)
	8502 SEO	2...4	9991 SEG 7	10.4 (23)
	8502 SFO	2...4	9991 SFG 8	15.4 (34)
Starters	8536 SAO/SBO/SCO	2...4	9991 SCG 8	1.8 (4)
	8536 SDO	2...4	9991 SDG 8	3.6 (8)
	8536 SEO	2...4	9991 SEG 8 (1)	10.4 (23)
	8536 SFO	2...4	9991 SFG 8 (1)	15.4 (34)
	8536 SGO	3	9991 SGG 8 (1) (5)	51 (112)
Lighting contactors	8903 LO, 8903 LXO	All	9991 LXG 1 (6)	3.6 (8)
	8903 SMO	All	9991 SCG 7 (2)	1.8 (4)
	8903 SPO	All	9991 SDG 7 (2)	3.6 (8)
	8903 SQO	All	9991 SFG 8 (2)	15.4 (34)
	8903 SVO	All	9991 SFG 4	16.3 (36)
Definite purpose contactors	8910 DP	1...2	9991 DPG 1	1.1 (2.5)
	8910 DPA 12/13/22/23, 8910 DPA 32/33/42/43	2...3	9991 DPG 1	1.1 (2.5)
	8910 DPA 14/24/34/44, 8910 DPA 52/53	2...4	9991 DPG 2	1.8 (4)
	8910 DPA 62/63	2...3	9991 DPG 3	3.6 (8)
	8910 DPA 72/73/92/93, 8910 DPA 122/123	2...3	9991 DPG 4	10.4 (23)
Reversing contactors	8702 SAO/SBO/SCO	All	9991 SCG 9 (3)	7.3 (16)
	8702 SDO	All	9991 SDG 9 (3)	10.9 (24)
Reversing starters	8736 SAO/SBO/SCO	All	9991 SCG 9	7.3 (16)
	8736 SDO	All	9991 SDG 9	10.9 (24)

NEMA 12 rated (dust-tight and drip-tight) separate enclosures

Separate enclosures can be used with open-style devices for field assembly of enclosed controls. These enclosures, plus the open style components, are equivalent to a factory-assembled device.

For use with	Type	NEMA Size or current rating	Number of closing plates	Reference	Weight kg (lb)
Manual starters	2510 MBO, 2510 MCO	M-0, M-1, M-1P	—	9991 MA 1	2.3 (5)
Contactors (4)	8502 SAO/SBO/SCO	0, 1	2	9991 SCA 11	4.5 (10)
	8502 SDO	2	2	9991 SDA 11	6.8 (15)
	8502 SEO	3	3	9991 SEA 11	23.1 (51)
	8502 SFO	4	3	9991 SFA 11	23.1 (51)
Starters	8536 SAO/SBO/SCO	0, 1	2	9991 SCA 11	4.5 (10)
	8536 SDO	2	2	9991 SDA 11	6.8 (15)
	8536 SEO	3	3	9991 SEA 11 (1)	23.1 (51)
	8536 SFO	4	3	9991 SFA 11 (1)	23.1 (51)
Lighting contactors (4)	8903 LO, 8903 LXO	30 A	2	9991 SDA 11	6.8 (15)
	8903 SMO	30 A	2	9991 SCA 11	4.5 (10)
	8903 SPO	60 A	2	9991 SDA 11	6.8 (15)
	8903 SQO	100 A	3	9991 SEA 11 (1)	23.1 (51)
Reversing contactors (4)	8702 SAO/SBO/SCO	0, 1	3	9991 SCA 12	9.1 (20)
	8702 SDO	2	3	9991 SDA 12	11.3 (25)
Reversing starters	8736 SAO/SBO/SCO	0, 1	3	9991 SCA 12	9.1 (20)
	8736 SDO	2	3	9991 SDA 12	11.3 (25)

(1) Enclosure suitable for starter with solid-state overload relays only.

(2) For electrically held contactors only.

(3) For horizontally arranged Class 8702 contactors and Class 8922 breakers, replace the reset assembly with a Class 9001 Type K51 closing plate.

(4) For contactors, replace reset assembly with an appropriate closing plate; for NEMA 12 use Class 9001 Type K51 closing plate.

(5) Series B starter enclosure.

(6) If cover-mounted control units are required, select an oversized enclosure listed on page 7/4.

DF 531381



9991 SCG 8

DF 531382

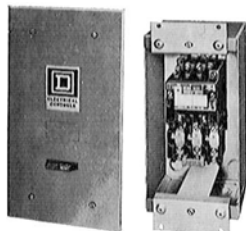


9991 SCA 11

Accessories for Heavy Industrial NEMA Style Controls

Separate enclosures

DF 531983



9991 SCF 2

Flush-mounting separate enclosures

Flush-mounting, general-purpose separate enclosures for Type S Sizes 0–2 (30–60 A) are provided with knock-outs in the cover for field assembly of one Class 9999 push button or selector switch kit and one Class 9999 pilot light kit. For Type S Size 3 (100 A), three closing plates are provided for installation of Class 9001 Type K oil-tight control units.

For use with	Type	NEMA Size or current rating	Type	Reference	Weight kg (lb)
Manual starters	2510 MBO, 2510 MCO	M-0, M-1, M-1P	Flush plates standard	9991 MF 1 (1)	3.2 (7)
				9991 MF 2 (2)	0.9 (2)
Contactors (3)	8502 SBO, 8502 SCO	0, 1	Standard	9991 SCF 11	4.5 (10)
			Stainless steel (4)	9991 SCF 12	4.5 (10)
			Mounting strap	9991 SCF 2	3.6 (8)
			Pull box	9991 SCF 1	3.6 (8)
	8502 SDO	2	Standard	9991 SDF 11	7.7 (17)
			Stainless steel (4)	9991 SDF 12	1.4 (3.1)
			Mounting strap	9991 SDF 2	4.5 (10)
			Pull box	9991 SDF 1	4.5 (10)
	8502 SEO	3	Standard	9991 SEF 11 (5)	21.8 (48)
			Standard	9991 SCF 11	4.5 (10)
			Stainless steel (4)	9991 SCF 12	4.5 (10)
			Mounting strap	9991 SCF 2	3.6 (8)
Starters	8536 SBO, 8536 SCO	0, 1	Pull box	9991 SCF 1	3.6 (8)
			Standard	9991 SDF 11	7.7 (17)
			Stainless steel (4)	9991 SDF 12	1.4 (3.1)
			Mounting strap	9991 SDF 2	4.5 (10)
	8536 SDO	2	Pull box	9991 SDF 1	4.5 (10)
			Standard	9991 SDF 13	7.7 (17)
			Mounting strap	9991 SDF 2	4.5 (10)
			Pull box	9991 SDF 1	4.5 (10)
	8903 LO, 8903 LXO	30 A	Standard	9991 SCF 11	4.5 (10)
			Mounting strap	9991 SCF 2	3.6 (8)
			Pull box	9991 SCF 1	3.6 (8)
	8903 SMO 1/2/3/4	30 A	Standard	9991 SCF 13	3.6 (8)
			Mounting strap	9991 SCF 2	3.6 (8)
			Pull box	9991 SCF 1	3.6 (8)
	8903 SMO 10/11/12/13	30 A	Standard	9991 SDF 11	7.7 (17)
			Mounting strap	9991 SDF 2	4.5 (10)
			Pull box	9991 SDF 1	4.5 (10)
	8903 SPO 1/2/3/4	60 A	Standard	9991 SDF 13	7.7 (17)
			Mounting strap	9991 SDF 2	4.5 (10)
			Pull box	9991 SDF 1	4.5 (10)
Lighting contactors (3)	8903 SPO 10/11/12/13	60 A	Standard	9991 SDF 13	7.7 (17)
			Mounting strap	9991 SDF 2	4.5 (10)
			Pull box	9991 SDF 1	4.5 (10)
	8903 SQO	100 A	Standard	9991 SEF 11 (5)	21.8 (48)

(1) With pull box and plaster adjustment.

(2) Without pull box but with mounting strap.

(3) For contactors, replace the reset assembly with an appropriate closing plate. For flush mounting, use Class 9999 Type SG2, except for Class 9991 Type SDF 11, which requires a Class 9001 Type K51 or K11 closing plate. Class 9991 Type SEF 11 is designed for contactors only; reset closing plates are not required.

(4) The standard cabinet has a brushed finish. For electropolished finish, specify Form G16. Example: **9991 SCF 12 G16**.

(5) Enclosure complete.

Accessories for Heavy Industrial NEMA Style Controls

Separate enclosures for addition of control circuit transformer, Control circuit transformers

Separate enclosures for addition of control circuit transformer

The Class 9991 enclosures listed below accept an open-type, Class 8502 or 8536 Type S, NEMA Size 0, 1, 1P or 2 contactor or starter, together with a fused-control circuit transformer (suffix F4T) to allow field assembly of enclosed controllers. In the cover of the Class 9991 Type SCG 1 enclosure, knock-outs are provided for field addition of Class 9999 cover-mounted control units. All other Class 8502 and 8536 enclosures include a panel with space and drilling for an open-type device and a fused control-circuit transformer. In addition, three closing plates are included in each cover for easy installation of Class 9001 Type K or SK control units. Oversized enclosures for open-type, Class 8903 Type L and LX and Type S (30 and 60 A), electrically and mechanically held lighting contactors include a panel with space and drilling for an open-type contactor and fused control-circuit transformer (suffix F4T) and/or an auxiliary relay for use with single-pole pilot devices (suffix R6). When an auxiliary relay is required, use a Class 8501 Type XO 11 relay. Three closing plates are provided as standard for easy installation of Class 9001 Type K or SK control units.

Note : a Class 9991 Type SCG 1, NEMA 1 separate enclosure can also be used for Class 8903 Type SMO (30 A) electrically held lighting contactor if suffix F4T (control transformer), with or without cover control units, is required.

For use with	Type	NEMA Size or current rating	Number of poles	Enclosure type (1)	Reference	Weight kg (lb)
Contactors (2)	8502 SAO/SBO/SCO	0, 1	1...5	NEMA 1	9991 SCG 1	3.6 (8)
				NEMA 12	9991 SCA 4	8.3 (18.2)
	8502 SDO	2	2...5	NEMA 1	9991 SDG 4	9.5 (21)
				NEMA 12	9991 SDA 4	10.4 (23)
Starters	8536 SAO/SBO/SCO	0, 1	1...5	NEMA 1	9991 SCG 1	3.6 (8)
				NEMA 12	9991 SCA 4	8.3 (18.2)
	8536 SDO	2	2...5	NEMA 1	9991 SDG 4	9.5 (21)
				NEMA 12	9991 SDA 4	10.4 (23)
Lighting contactors	8903 LO, 8903 LXO	30 A	All	NEMA 1	9991 SDG 3	6.8 (15)
				NEMA 12	9991 SDA 3	9.1 (20)
	8903 SMO	30 A	1...5	NEMA 1	9991 SDG 3	6.8 (15)
				NEMA 12	9991 SDA 3	9.1 (20)
	8903 SPO	60 A	2...5	NEMA 1	9991 SDG 3	6.8 (15)
				NEMA 12	9991 SDA 3	9.1 (20)

Control circuit transformers

For use with	Type	NEMA Size or current rating	Number of poles	Transformer type	Reference	Weight kg (lb)
Contactors (2)	8502 SAO/SBO/SCO	0, 1	1...3	Standard, 50 VA	9070 T50	—
				Extra capacity, 100 VA	9070 T100 (3)	—
				Extra capacity, 150 VA	9070 T150 (3)	—
			4 and 5	Standard, 100 VA	9070 T100 (3)	—
				Extra capacity, 150 VA	9070 T150 (3)	—
	8502 SDO	2	2...5	Standard, 100 VA	9070 T100	—
				Extra capacity, 150 VA	9070 T150	—
				Extra capacity, 300 VA	9070 T300	—
				Standard, 50 VA	9070 T50	—
				Extra capacity, 100 VA	9070 T100 (3)	—
Starters	8536 SAO/SBO/SCO	0, 1	1...3	Extra capacity, 150 VA	9070 T150 (3)	—
				Standard, 100 VA	9070 T100 (3)	—
				Extra capacity, 150 VA	9070 T150 (3)	—
			4 and 5	Standard, 100 VA	9070 T100 (3)	—
				Extra capacity, 150 VA	9070 T150 (3)	—
				Extra capacity, 300 VA	9070 T300	—
	8536 SDO	2	2...5	Standard, 100 VA	9070 T100	—
				Extra capacity, 150 VA	9070 T150	—
				Extra capacity, 300 VA	9070 T300	—
				Standard, 50 VA	9070 T50	—
				Extra capacity, 100 VA	9070 T100 (3)	—
				Extra capacity, 150 VA	9070 T150 (3)	—
Lighting contactors	8903 LO	30 A	All	Standard, 50 VA	9070 T50	—
				Extra capacity, 100 VA	9070 T100 (3)	—
				Extra capacity, 150 VA	9070 T150 (3)	—
	8903 LXO	30 A	All	Standard, 50 VA	9070 T50	—
				Extra capacity, 100 VA	9070 T100 (3)	—
				Extra capacity, 150 VA	9070 T150 (3)	—
	8903 SMO	30 A	1...3	Standard, 100 VA	9070 T100 (3)	—
				Extra capacity, 150 VA	9070 T150 (3)	—
				Extra capacity, 300 VA	9070 T300	—
			4 and 5	Standard, 100 VA	9070 T100	—
				Extra capacity, 150 VA	9070 T150	—
				Extra capacity, 300 VA	9070 T300	—
	8903 SPO	60 A	2...5	Standard, 100 VA	9070 T100	—
				Extra capacity, 150 VA	9070 T150	—
				Extra capacity, 300 VA	9070 T300	—

(1) NEMA 1: general purpose enclosure. NEMA 12: dust-tight and drip-tight industrial-use enclosure.

(2) For contactors (Class 8502), a separate closing plate is provided with each enclosure to replace the reset mechanism, with the exception of Class 9991 Type SCG 1, which requires a separate reset closing plate, Class 9999 Type SG2.

(3) For mounting in a 9991 SCG 1 enclosure, a Class 9991 Type S1 adapter bracket is also required.

DF 551389



9991 SCG 1

Accessories for Heavy Industrial
NEMA Style Controls
Fuse block, Control unit kits

Fuse block (for use with Class CC fuses)				
For use with	Type	NEMA Size or current rating	Reference	Weight kg (lb)
Contactors	8502 SBO/SCO/SDO	0...2	9999 SFR 4	—
Starters	8536 SBO/SCO/SDO	0...2	9999 SFR 4	—
Lighting contactors	8903 LO/LXO/SMO/SPO	30...60 A	9999 SFR 4	—

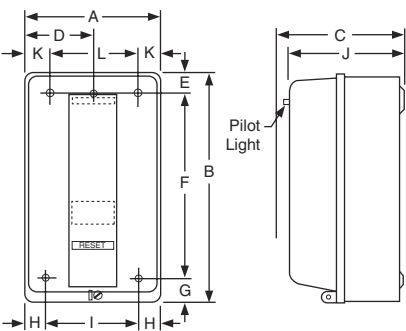
Control unit kits				
Class 9001 Type K oil-tight/water-tight control units can be easily installed in NEMA 12, separate enclosures provided with closing plates.				
When installing control units, simply remove the closing plates and install the appropriate Class 9001 Type K components. Convenient control unit kits, complete with assembled and pre-wired operators for quick installation, are available as Class 9999 user modification kits.				
Class 9001 Type SK, NEMA 4X, corrosion-resistant control units may be used as an alternative.				

Kits Control function	Kit contents Description	Reference	Quantity	Reference	Weight kg (lb)
"Start-Stop" push button	Start operator	9001 KR 1B	1	9999 SA 3	—
	Stop operator	9001 KR 1R	1		
	"Start" legend plate	9001 KN 201	1		
	"Stop" legend plate	9001 KN 202	1		
	Contact block	9001 KA 1	2		
"Hand-Off-Auto" selector switch	Selector operator switch	9001 KS 43B	1	9999 SC 8	—
	"Hand-Off-Auto" legend plate	9001 KN 260	1		
	Contact block	9001 KA 1	1		
Pilot light (120 V)	Red pilot light	9001 KP 1R31	1	9999 SP 28R	—

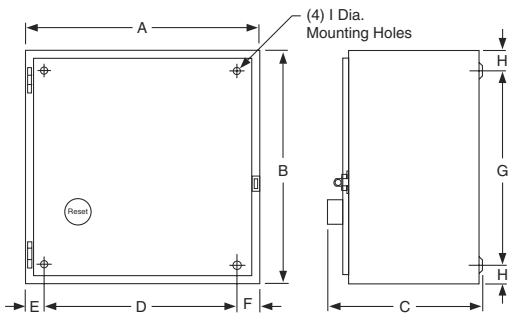
Accessories for Heavy Industrial
NEMA Style Controls
Separate enclosures

Dimensions in mm (25.4 mm = 1 inch)

NEMA 1 rated (general purpose) separate enclosures

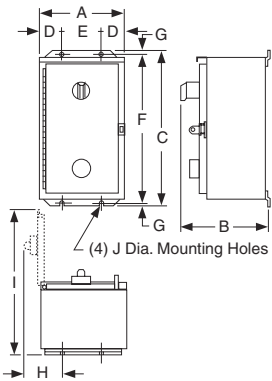


	Mounting A screws	B	C	D	E	F	G	H	I	J	K	L	
9991 SCG 7	3 x # 10	152	254	134	76	22	206	25	24	105	127	–	–
9991 SDG 7	4 x 6.4	198	322	153	–	28	267	28	28	143	146	28	143
9991 SEG 7/8	4 x 9.5	286	554	203	–	39	476	39	39	213	197	39	213
9991 SCG 8/DPG 2	3 x # 10	152	254	141	76	22	206	25	24	105	127	–	–
9991 SDG 8/DPG 3	4 x 6.4	198	322	160	–	28	267	28	28	143	146	28	143
9991 LXG 1	–	198	322	153	–	28	267	28	28	143	146	28	143
9991 DPG 1	–	127	216	102	–	–	–	–	–	–	–	–	–
9991 DPG 4	4 x 9.5	286	554	213	–	39	476	39	39	213	197	39	213



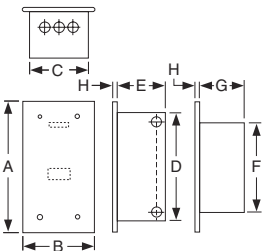
	Mounting A screws	B	C	D	E	F	G	H	I	J	K	L	
9991 SFG 8	4 x 11.1	286	639	228	218	32	32	567	36	11	–	–	–
9991 SGG 8	–	502	1129	363	–	–	–	–	–	–	–	–	–
9991 SCG 9	4 x 7.9	302	302	188	248	27	27	248	27	8	–	–	–
9991 SDG 9	4 x 7.9	378	359	192	324	27	27	305	27	8	–	–	–

NEMA 12 rated (dust-tight and drip-tight) separate enclosures



	For use with	A	B	C	D	E	F	G	H	I	J
9991 MA 1		140	273	114	-	-	-	-	-	-	-
9991 SCA 11		162	217	324	40	83	305	10	90	318	8
9991 SDA 11		206	236	406	40	127	381	13	90	391	8
9991 SEA 11		461	235	800	78	305	775	13	93	678	11
9991 SEA 11	8536 SEO	461	243	800	78	305	775	13	114	678	11
9991 SFA 11	8536 SFO	461	243	800	78	305	775	13	114	678	11
9991 SFA 11		461	235	800	78	305	775	13	93	678	11
9991 SCA 12		336	363	225	-	-	-	-	-	-	-
9991 SDA 12		387	413	230	-	-	-	-	-	-	-

Flush mounting separate enclosures

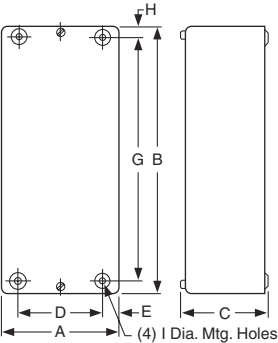


	A	B	C	D	E	F	G	H
9991 MF 1	140	292	102	-	-	-	-	-
9991 MF 2	140	292	89	-	-	-	-	-
9991 SCF 11	341	183	149	283	121	233	114	10
9991 SCF 12	244	419	99	-	-	-	-	-
9991 SCF 2	175	378	154	-	-	-	-	-
9991 SCF 1	175	378	154	-	-	-	-	-
9991 SDF 11	386	227	194	327	138	278	130	10
9991 SDF 12	244	419	99	-	-	-	-	-
9991 SDF 2	175	378	154	-	-	-	-	-
9991 SDF 1	256	416	152	-	-	-	-	-
9991 SEF 11	787	425	362	667	203	-	-	5
9991 SDF 13	386	227	194	327	138	278	130	10
9991 SCF 13	337	178	146	-	-	-	-	-

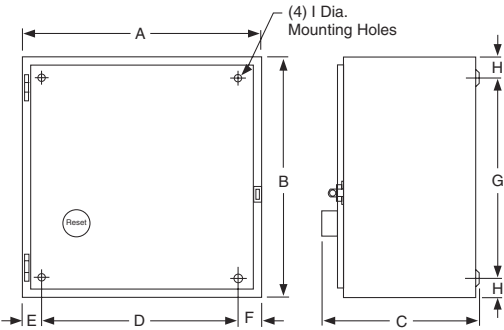
References:
pages 7/2 and 7/5

Dimensions in mm (25.4 mm = 1 inch)

Separate enclosures for addition of control circuit transformer



	Mounting screws	A	B	C	D	E	F	G	H	I
9991 SCG 1	4 x 7.1	161	403	132	118	21	365	19	7	9



	For use with	Mounting screws	A	B	C	D	E	F	G	H	I
9991 SDG 4	8502 SDO	4 x 7.9	378	359	192	324	27	27	305	27	8
9991 SDG 4	8536 SDO	4 x 7.9	378	359	194	324	27	27	305	27	8
9991 SDG 3		4 x 7.9	378	359	192	324	27	27	305	27	8

	A	B	C	D	E	F	G	H	I
9991 SCA 4	336	363	225	-	-	-	-	-	-
9991 SDA 4	387	413	230	-	-	-	-	-	-
9991 SDA 3	387	413	230	-	-	-	-	-	-

Accessories for Heavy Industrial
NEMA Style Controls
Magnetic coils

Replacement a.c. magnetic coils for magnetic contactors and starters								
Equipment to be serviced				Frequency	Voltage	Reference	Weight	
Device	Type	NEMA Size or current rating	Number of poles					
				Hz	V		kg (lb)	
Latch coils for present-design magnetic contactors and starters Classes: 8502, 8536, 8538, 8539, 8702, 8736, 8903, 8910	L	30 A	2 to 6	50	24	9998 L 24	—	
	LX	30 A	2 to 4		110–115	9998 L 44	—	
					120	9998 L 45	—	
					208	9998 L 52	—	
					220	9998 L 53	—	
					240	9998 L 54	—	
					380	9998 L 60	—	
					440	9998 L 62	—	
					480	9998 L 63	—	
					550	9998 L 65	—	
					600	9998 L 66	—	
			60		24	9998 L 23	—	
					120	9998 L 44	—	
					208	9998 L 50	—	
					240	9998 L 53	—	
					277	9998 L 55	—	
					300	9998 L 56	—	
					480	9998 L 62	—	
					600	9998 L 65	—	
	L	30 A	8 to 12	50	24	9998 LH 24	—	
	LX	30 A	6 to 12		110–115	9998 LH 44	—	
					120	9998 LH 45	—	
					220	9998 LH 53	—	
					240	9998 LH 54	—	
					440	9998 LH 62	—	
					550	9998 LH 65	—	
			60		24	9998 LH 23	—	
					120	9998 LH 44	—	
					208	9998 LH 50	—	
					240	9998 LH 53	—	
					277	9998 LH 55	—	
					480	9998 LH 62	—	
					600	9998 LH 65	—	
	SA (1) Series B	00	All	50	110–115	9998 SAC 45	—	
					220	9998 SAC 54	—	
					440	9998 SAC 62	—	
					550	9998 SAC 65	—	
				60		24	9998 SAC 23	—
						120	9998 SAC 45	—
						208	9998 SAC 52	—
						240	9998 SAC 54	—
						277	9998 SAC 55	—
						380	9998 SAC 59	—
						480	9998 SAC 62	—
						600	9998 SAC 65	—

(1) For use on Type S Series B devices only.

Accessories for Heavy Industrial NEMA Style Controls

Magnetic coils

Replacement a.c. magnetic coils for magnetic contactors and starters (continued)

Equipment to be serviced				Frequency	Voltage	Reference	Weight
Device	Type	NEMA Size or current rating	Number of poles				
				Hz	V		kg (lb)
Latch coils for present-design magnetic contactors and starters Classes: 8502, 8536, 8538, 8539, 8702, 8736, 8903	SA (Series A), SB, SC, SM	00, 0, 1, 1P, and 30 A	All	50	24	31041-400-22	—
					110–115	31041-400-42	—
					120	31041-400-43	—
					220	31041-400-51	—
					240	31041-400-53	—
					380	31041-400-57	—
					440	31041-400-60	—
					480	31041-400-61	—
					550	31041-400-62	—
					600	31041-400-64	—
				60	24	31041-400-20	—
					120	31041-400-42	—
					208	31041-400-48	—
					220	31041-400-51	—
					240	31041-400-51	—
					277	31041-400-52	—
					380	31041-400-56	—
					440	31041-400-58	—
					480	31041-400-60	—
					550	31041-400-61	—
					600	31041-400-62	—
SD, SP	2 and 60 A	2 and 3	50	50	24	31063-409-17	—
					110–115	31063-409-38	—
					120	31063-409-39	—
					220	31063-409-47	—
					240	31063-409-48	—
					380	31063-409-54	—
					440	31063-409-57	—
					550	31063-409-60	—
					600	31063-409-61	—
			60	60	24	31063-409-16	—
					120	31063-409-38	—
					208	31063-409-44	—
					220	31063-409-47	—
					240	31063-409-47	—
					277	31063-409-49	—
					440	31063-409-57	—
					480	31063-409-57	—
					550	31063-409-60	—
					600	31063-409-60	—
			4 and 5	50	24	31063-400-17	—
					110–115	31063-400-38	—
					120	31063-400-39	—
					220	31063-400-47	—
					240	31063-400-48	—
					380	31063-400-54	—
					440	31063-400-57	—
					550	31063-400-60	—
					600	31063-400-61	—
			60	60	24	31063-400-16	—
					120	31063-400-38	—
					208	31063-400-44	—
					220	31063-400-47	—
					240	31063-400-47	—
					277	31063-400-49	—
					380	31063-400-53	—
					440	31063-400-57	—
					480	31063-400-57	—
					550	31063-400-60	—
					600	31063-400-60	—

Accessories for Heavy Industrial
NEMA Style Controls
Magnetic coils

Replacement a.c. magnetic coils for magnetic contactors and starters (continued)								
Equipment to be serviced				Frequency	Voltage	Reference	Weight	
Device	Type	NEMA Size or current rating	Number of poles					
				Hz	V		kg (lb)	
Latch coils for present-design magnetic contactors and starters Classes: 8502, 8536, 8538, 8539, 8702, 8736, 8903, 8910	SE, SQ, DPA 12	3, 20 A and 100 A	2 and 3	50	24	31074-400-17	—	
					110–115	31074-400-38	—	
					120	31074-400-39	—	
					220	31074-400-47	—	
					240	31074-400-48	—	
					380	31074-400-54	—	
					440	31074-400-57	—	
					550	31074-400-60	—	
					600	31074-400-61	—	
				60	24	31074-400-16	—	
					120	31074-400-38	—	
					208	31074-400-44	—	
					220	31074-400-47	—	
					240	31074-400-47	—	
					277	31074-400-49	—	
					380	31074-400-53	—	
					440	31074-400-57	—	
					480	31074-400-57	—	
					500	31074-400-58	—	
					550	31074-400-60	—	
					600	31074-400-60	—	
				4 and 5	50	110–115	31091-400-38	—
						120	31091-400-39	—
						220	31091-400-47	—
						240	31091-400-48	—
						380	31091-400-54	—
						440	31091-400-57	—
						480	31091-400-58	—
						550	31091-400-60	—
						600	31091-400-61	—
					60	120	31091-400-38	—
						208	31091-400-44	—
						220	31091-400-47	—
						240	31091-400-47	—
						277	31091-400-49	—
						380	31091-400-53	—
Latch coils for present-design magnetic contactors and starters Classes: 8502, 8536, 8538, 8539, 8702, 8736, 8903	SF, SV	4 and 200 A	All	50	110–115	31091-400-38	—	
					120	31091-400-39	—	
					220	31091-400-47	—	
					240	31091-400-48	—	
					380	31091-400-54	—	
					440	31091-400-57	—	
					480	31091-400-58	—	
					550	31091-400-60	—	
					600	31091-400-61	—	
				60	120	31091-400-38	—	
					208	31091-400-44	—	
					240	31091-400-47	—	
					277	31091-400-49	—	
					380	31091-400-53	—	
					480	31091-400-57	—	
					600	31091-400-60	—	

Accessories for Heavy Industrial NEMA Style Controls

Replacement a.c. magnetic coils for magnetic contactors and starters (continued)

Equipment to be serviced				Frequency	Voltage	Reference	Weight	
Device	Type	NEMA Size or current rating	Number of poles					
				Hz	V		kg (lb)	
Latch coils for present-design magnetic contactors and starters Classes: 8502, 8536, 8538, 8539, 8702, 8736, 8903	SG, SX	5 and 300 A (Series A)	All	50	110–115	31096-400-09	—	
					120	31096-400-10	—	
					220	31096-400-18	—	
					380	31096-400-22	—	
					440	31096-400-24	—	
					550	31096-400-29	—	
					600	31096-400-30	—	
					60	120	31096-400-09	—
				208		31096-400-15	—	
				240		31096-400-18	—	
				277		31096-400-19	—	
				380		31096-400-21	—	
				480		31096-400-24	—	
				600		31096-400-29	—	
				5 and 300 A (Series B)		50	110–115	31096-320-50
					120		31096-320-50	—
		220	31096-320-52		—			
		240	31096-320-52		—			
		380	31096-320-54		—			
		440	31096-320-55		—			
		480	31096-320-55		—			
		60	110–115		31096-320-50		—	
			120		31096-320-50	—		
			208		31096-320-51	—		
			220		31096-320-52	—		
			240		31096-320-52	—		
			277		31096-320-53	—		
			380		31096-320-54	—		
			440		31096-320-55	—		
		480	31096-320-55		—			
		SH, SJ	6 and 7	2 and 3	All system voltages		31104-400-50	—
			SY, SZ, SJ (1)	400, 600 and 800 A	2 and 3	All system voltages		31104-400-50
SY, SZ, SJ (2)	400, 600 and 800 A		50	110–115	31104-418-09	—		
				220	31104-418-18	—		
		440		31104-418-24	—			
		550		31104-418-29	—			
		60		110–115	31104-418-09	—		
				120	31104-418-09	—		
				208	31104-418-15	—		
				220	31104-418-18	—		
	240		31104-418-18	—				
	277		31104-418-19	—				
	440		31104-418-24	—				
	480		31104-418-24	—				
	550	31104-418-29	—					
	600	31104-418-29	—					

(1) Electrically held.

(2) *Mechanically held.*

Accessories for Heavy Industrial
NEMA Style Controls
Replacement parts kits

Magnetic contactor and starter contact kits for present designs

Class 9998 replacement parts kits are available for servicing Square D relays, contactors and starters. Each kit contains the necessary movable and stationary contacts, contact springs (when required; NEMA Size 3 and above do not include contact springs, and springs are not available), and additional hardware required to service the devices listed below. When servicing devices having more poles than contained in the corresponding kit, it may be necessary to order an additional kit.

Equipment to be serviced				Reference	Weight
Class	Type	NEMA Size or current rating	Number of poles in kit		kg (lb)
8502, 8536, 8538, 8539, 8702, 8736, 8903	SA (Series B)	00	3	9998 SJ 1	—
	SB	0	3	9998 SL 2	—
			4	9998 SL 12	—
	SB, SC (power-pole adder)	0 and 1	1	9998 SL 22	—
	SC	1 and 1P	3	9998 SL 3	—
		1	4	9998 SL 13	—
	SD	2	3	9998 SL 4	—
			4	9998 SL 14	—
	SD (power-pole adder)	2	1	9998 SL 24	—
	SE	3	2	9998 SL 6	—
			3	9998 SL 7	—
	SF	4	2	9998 SL 8	—
			3	9998 SL 9	—
	SG	5	2	9998 SL 10	—
			3	9998 SL 11	—
	SH	6	2	9998 SL 25	—
			3	9998 SL 26	—
	SJ	7	2	9998 SL 30	—
			3	9998 SL 31	—
	L (Series C) and LX (Series B)	30 A	4	9998 RA 5B	—
8903	SM	30 A	3	9998 SL 3	—
			4	9998 SL 13	—
	SP	60 A	3	9998 SL 4	—
			4	9998 SL 14	—
	SQ	100 A	2	9998 SL 6	—
			3	9998 SL 7	—
	SV	200 A	2	9998 SL 8	—
			3	9998 SL 9	—
	SX	300 A	2	9998 SL 10	—
			3	9998 SL 11	—
	SY	400 A	2	9998 SL 25	—
			3	9998 SL 26	—
	SZ	600 A	2	9998 SL 32	—
			3	9998 SL 33	—
	SJ	800 A	2	9998 SL 30	—
			3	9998 SL 31	—

Manual starter contact kits

Equipment to be serviced				Reference	Weight
Class	Type	NEMA Size	Number of poles in kit		kg (lb)
2510	M, T	M-0	3	9998 ML 1	—
		M-1 and M-1P	3	9998 ML 2	—

Replacement control transformers (150 VA)

Equipment to be serviced			Voltage		Reference	Weight
Class	Type	NEMA Size	50 Hz	60 Hz		
			V	V		kg (lb)
8502, 8536	S	6	220/440-110	240/480-120	31104-512-50	—
			—	208-120	31104-512-52	—
			—	277-120	31104-512-53	—
			380-110	—	31104-512-54	—
			550-110	600-120	31104-512-51	—
			110-110	120-120	31104-512-55	—
			220-110	240-120	31104-512-56	—

Accessories for Heavy Industrial NEMA Style Controls

Replacement parts kits
Universal baseplates

Replacement control transformers (200 VA)

Equipment to be serviced			Voltage		Reference	Weight
Class	Type	NEMA Size	50 Hz	60 Hz		
			V	V		kg (lb)
8502, 8536	S	7	220/440-110	240/480-120	31123-501-50	—
			—	208-120	31123-501-52	—
			—	277-120	31123-501-53	—
			380-110	—	31123-501-54	—
			550-110	600-120	31123-501-51	—
			110-110	120-120	31123-501-55	—
			220-110	240-120	31123-501-56	—

Replacement contact kits

Equipment to be serviced				Reference	Weight
Class	Type	Current rating	Number of poles		kg (lb)
8910	DPA 5	50 A	1	9998 DRC 5	—
	DPA 6	60 A	1	9998 DRC 6	—
	DPA 7	75 A	1	9998 DRC 7	—
	DPA 9	90 A	1	9998 DRC 9	—
	DPA 123	120 A	1	9998 DRC 12	—

Universal baseplates

A universal baseplate may be used to retrofit a Square D Type S NEMA starter into an application which is currently using a competitive NEMA starter. The universal baseplate is a metal plate which attaches to the panel in the location of the starter to be replaced. The Type S starter then mounts to the baseplate. It is available for NEMA Sizes 00 to 4, and mounting screws are provided with each plate.

The universal baseplate adapter allows the Type S starter to replace the following competitive starters:

Type	Competitive starter	NEMA Size	Reference	Weight
				kg (lb)
Universal baseplates	Allen Bradley 509	0 and 1	9998 UB 01	—
		2	9998 UB 02	—
		3	9998 UB 03	—
		4	9998 UB 04	—
	Allen Bradley 709	1	9998 UB 01	—
		2	9998 UB 02	—
		3	9998 UB 03	—
		4	9998 UB 04	—
	Cutler Hammer Freedom Series	00, 0, 1	9998 UB 01	—
		2	9998 UB 02	—
		3	9998 UB 03	—
		4	9998 UB 04	—
	Furnas ESP100	0 and 1	9998 UB 01	—
		2	9998 UB 02	—
		3	9998 UB 03	—
		4	9998 UB 04	—
	Furnas INNOVA	0 and 1	9998 UB 01	—
		2	9998 UB 02	—
		3	9998 UB 03	—
		4	9998 UB 04	—
	General Electric CR306	00, 0, 1	9998 UB 01	—
		2	9998 UB 02	—
		3	9998 UB 03	—
		4	9998 UB 04	—

Accessories for Heavy Industrial
NEMA Style Controls
Cover-mounted control unit kits

DF 531371



9999 SA2

DF 531372



9999 SA3

DF 531373



9999 SC2

Class 9999 cover-mounted push button, selector switch and pilot light control unit kits can be easily field installed in a NEMA 1 or 12, Type S contactor or starter enclosure cover. Knockouts or removable closing plates are provided with many enclosure covers for convenient field installation of control units. Kits are supplied with leads and clearly illustrated instructions.

The Class 9999 cover-mounted control unit kits are identical to the factory-installed units.

Push button kits for NEMA 1 enclosures

For use with				Description	Reference	Weight kg (lb)
Class	Type	NEMA Size or current rating	Number of poles			
8502 and 8536	SA, SB, SC	00, 0, 1 and 1P	All	Start-Stop	9999 SA2	—
	SD	2	All	On-Off	9999 SA10	—
	SE	3	All			—
	SF to SJ	4 to 7	All	Start-Stop	9999 SA3	—
8538, 8539, 8702, 8736	SB and SC	0 and 1	All	Start-Stop	9999 SA2	—
	SD	2	All	On-Off	9999 SA10	—
	SE	3	All			—
	SF	4	All			—
8903 (electrically held)	SG to SJ	5 to 7	All	Start-Stop	9999 SA3	—
				On-Off	9999 SA3	—
	LX (1)	30 A	All	On-Off	9999 LXPB (2)	—
	SM	30 A	All	Start-Stop	9999 SA2 (3)	—
	SP	60 A	All	On-Off	9999 SA10 (3)	—
	SQ	100 A	All			—
	SJ, SV, SX, SY and SZ	200 to 800 A	All	Start-Stop	9999 SA3 (3)	—
				On-Off	9999 SA3 (3)	—

Selector switch kits for NEMA 1 enclosures

For use with				Description	Reference	Weight kg (lb)
Class	Type	NEMA Size or current rating	Number of poles			
8502 and 8536	SA, SB, SC	00, 0, 1 and 1P	All	Hand-Off-Auto	9999 SC2	—
	SD	2	All	On-Off	9999 SC22	—
	SE	3	All			—
8502 and 8536	SF to SJ	4 to 7	All	Hand-Off-Auto	9999 SC8	—
8538, 8539, 8702, 8736	SB and SC	0 and 1	All	Hand-Off-Auto	9999 SC2	—
	SD	2	All	On-Off	9999 SC22	—
	SE	3	All			—
	SF	4	All			—
	SG to SJ	5 to 7	All	Hand-Off-Auto	9999 SC8	—
						—
						—
						—
8903 (electrically held)	LX (1)	30 A	All	On-Off	9999 LXS (2)	—
	SM	30 A	All	Hand-Off-Auto	9999 SC2	—
	SP	60 A	All	On-Off	9999 SC22	—
	SQ	100 A	All			—
	SJ, SV, SX, SY and SZ	200 to 800 A	All	Hand-Off-Auto	9999 SC8	—
						—
						—
						—

(1) For Class 8903 Type LX, NEMA 12 control unit kits, refer to the Class 8903 section.

(2) To mount a control unit in a NEMA 1 enclosure, a Class 9999 Type BLX bracket is also required.

(3) Also requires N/O auxiliary contact for holding circuit contact when used on Class 8903 electrically held lighting contactors.

Accessories for Heavy Industrial NEMA Style Controls

Cover-mounted control unit kits

DF 531374



9999 SP 2R

Red pilot light ⁽¹⁾ kits for NEMA 1 enclosures

For use with				Description	Reference	Weight kg (lb)
Class	Type	NEMA Size or current rating	Number of poles			
8502 and 8536	SA, SB and SC	00, 0, 1 and 1P	All	With control transformer	9999 SP 28R	—
				Standard	9999 SP 2R	—
	SD	2	All	With control transformer	9999 SP 28R	—
				Standard	9999 SP 3R	—
	SE	3	2 and 3	With control transformer	9999 SP 28R	—
				Standard	9999 SP 4R	—
	SE	3	4 and 5	With control transformer	9999 SP 28R ⁽³⁾	—
				Standard	9999 SP 5R	—
	SF	4	All	With control transformer	9999 SP 28R ⁽³⁾	—
				Standard	9999 SP 28R	—
8538, 8539, 8702, 8736	SB and SC	0 and 1	All	With control transformer	9999 SP 12R	—
				Standard	9999 SP 12R	—
	SD	2	All	With control transformer	9999 SP 13R	—
				Standard	9999 SP 13R	—
	SE	3	All	With control transformer	9999 SP 14R	—
				Standard	9999 SP 14R	—
	SF	4	All	With control transformer	9999 SP 15R	—
				Standard	9999 SP 15R	—
	SG to SJ	5 to 7	All	With control transformer	9999 SP 28R ⁽³⁾	—
				Standard	9999 SP 28R ⁽³⁾	—
8903 (electrically held)	LX ⁽²⁾	30 A	All	With control transformer	9999 SP 28R ⁽³⁾	—
				Standard	9999 SP 2R	—
	SM	30 A	All	With control transformer	9999 SP 28R	—
				Standard	9999 SP 3R	—
	SP	60 A	All	With control transformer	9999 SP 28R	—
				Standard	9999 SP 3R	—
			2 and 3	With control transformer	9999 SP 28R ⁽³⁾	—
				Standard	9999 SP 28R	—
	SQ	100 A	4 and 5	With control transformer	9999 SP 28R ⁽³⁾	—
				Standard	9999 SP 28R	—
	SJ, SV, SX, SY and SZ	200 to 800 A	All	With control transformer	9999 SP 28R ⁽³⁾	—
				Standard	9999 SP 28R ⁽³⁾	—

(1) A green lens is included in the red pilot light kits. If you order a 9999 SP 28R kit, you will receive both a red and a green lens with the pilot light.

(2) For Class 8903 Type LX NEMA 12 rated control unit kits, refer to the Class 8903 section.

(3) The coil voltage must be the same as the pilot light rating. The kit contains one Class 9001 Type KP1R31120V, 60 Hz red pilot light control unit. For other voltages, refer to the Class 9001 Type KP section of the Digest.

Accessories for Heavy Industrial NEMA Style Controls

Cover-mounted control unit kits

Push button kits for NEMA 12 enclosures

For use with				Description (1)	Reference	Weight
Class	Type	NEMA Size or current rating	Number of poles			kg (lb)
8502, 8536 8538, 8539, 8702, 8736 8903 (electrically held)	SA, SB, SC	00, 0, 1 and 1P	All	Start-Stop or On-Off	9999 SA3	—
	SD	2	All			
	SE	3	All			
	SF	4	All			
	SG to SJ	5 to 7	All			
	SB and SC	0 and 1	All			
	SD	2	All			
	SE	3	All			
	SF	4	All			
	SG to SJ	5 to 7	All			
	LX (2)	30 A	All			
	SM	30 A	All			
	SP	60 A	All			
	SQ	100 A	All			
	SJ, SV, SX, SY and SZ	200 to 800 A	All			

Selector switch kits for NEMA 12 enclosures

For use with				Description (1)	Reference	Weight
Class	Type	NEMA Size or current rating	Number of poles			kg (lb)
8502, 8536 8538, 8539, 8702, 8736 8903 (electrically held)	SA, SB, SC	00, 0, 1 and 1P	All	Hand-Off-Auto	9999 SC8	—
	SD	2	All			
	SE	3	All			
	SF	4	All			
	SG to SJ	5 to 7	All			
	SB and SC	0 and 1	All			
	SD	2	All			
	SE	3	All			
	SF	4	All			
	SG to SJ	5 to 7	All			
	LX (2)	30 A	All			
	SM	30 A	All			
	SP	60 A	All			
	SQ	100 A	All			
	SJ, SV, SX, SY and SZ	200 to 800 A	All			

(1) User-made openings are required in order to field install these modification kits on standard 8502, 8536 Type S Sizes 0 to 2, and 8903 Sizes 30 to 60 A NEMA 12 enclosures

(2) For Class 8903 Type LX NEMA 12 control unit kits, refer to the Class 8903 section.

Accessories for Heavy Industrial NEMA Style Controls

Cover-mounted control unit kits

Red pilot light ⁽¹⁾ kits for NEMA 12 enclosures

For use with				Description (2)	Reference	Weight kg (lb)
Class	Type	NEMA Size or current rating	Number of poles			
8502, 8536	SA, SB, SC	00, 0, 1 and 1P	All	120 V, 60 Hz	9999 SP 28R (3)	—
8538, 8539, 8702, 8736	SD	2	All			
8903 (electrically held)	SE	3	All			
	SF	4	All			
	SG to SJ	5 to 7	All			
	SB and SC	0 and 1	All			
	SD	2	All			
	SE	3	All			
	SF	4	All			
	SG to SJ	5 to 7	All			
	LX (4)	30 A	All			
	SM	30 A	All			
	SP	60 A	All			
	SQ	100 A	All			
	SJ, SV, SX, SY and SZ	200 to 800 A	All			

Closing plates for NEMA 1 enclosures

For use with			Description	Reference	Weight kg (lb)
Class	Type	NEMA Size or current rating			
8502, 8536, 8903	SA to SE or SM to SP	00 to 3 or 30 to 60 A	For pilot light or reset Slip-on cover, NEMA 1 enclosure	9999 SG2	—
			For push button or selector switch Slip-on cover, NEMA 1 enclosure	9999 SG3	—
8538 and 8539	SB to SF	0 to 4	For push button or selector switch Hinged cover, NEMA 1 enclosure	9999 SG1	—
			For pilot light Hinged cover, NEMA 1 enclosure	9999 SG2	—

(1) A green lens is included in the red pilot light kits. If you order a 9999 SP 28R kit, you will receive both a red and a green lens with the pilot light.

(2) User-made openings are required in order to field install these modification kits on standard 8502, 8536 Type S Sizes 0 to 2, and 8903 Sizes 30 to 60 A NEMA 12 enclosures.

(3) The coil voltage must be the same as the pilot light rating. Kit contains one Class 9001 Type KP1R31120V, 60 Hz red pilot light control unit. For other voltages, refer to the Class 9001 Type KP section of the Digest.

(4) For Class 8903 Type LX NEMA 12 control unit kits, refer to the Class 8903 section.

Characteristics

Class		9999		
Type		SX 11/SX 12		
Contact ratings		Make	Break	Continuous current
Maximum current (50/60 Hz)		(35% power factor)	(35% power factor)	
~ 120 V or less	A	30	3	3
		3600 VA	360 VA	3 A
~ 120...600 V				
Class		9999		
Type		SX 6 to SX 10/SX 13 to SX 17		
Contact ratings		Make	Break	Continuous current
Maximum current (50/60 Hz)		(35% power factor)	(35% power factor)	
~ 120 V or less	A	60	6	10
		7200 VA	720 VA	10 A
~ 120...600 V				

References

Internal contact kits

Class 9999 Type SX 11 internal contact kit is a replacement unit for the N/O holding circuit contact supplied as standard on Type S, Sizes 00–2, three-phase starters and contactors. The Class 9999 Type SX 12 is a replacement unit for the N/C electrical contact supplied as standard on Type S, Sizes 00–2, mechanically interlocked devices. Internal contacts are also used on Class 2510 Types M and T manual starters. The internal contacts can be used for other applications as long as the electrical rating is not exceeded.

For use with			Internal non-convertible contacts	Reference	Weight kg (lb)
Class	Type	NEMA Size			
8502, 8702, 8536, 8736	SA to SD	00 to 2	1 N/O contact	9999 SX 11 (1)	–
			1 N/C contact	9999 SX 12 (1)	–

External contact kits

Class 9999 Type SX 6 external auxiliary contact is supplied as standard for the N/O holding circuit contact on Type S Sizes 3 to 7 contactors and starters. Additional auxiliary contacts can be added to Type S contactors, starters and lighting contactors. These contacts mount on either side of the basic contactor and are available with convertible or non-convertible contacts. The contacts of the convertible version can be changed from N/O to N/C or vice versa in the field. The non-convertible version has fixed contacts, either N/O or N/C.

To determine the number of auxiliary contacts that can be added to each Type S contactor or starter, refer to the contactor and starter section.

For use with			External field convertible contacts	Reference	Weight kg (lb)
Class	Type	NEMA Size			
8502, 8702, 8536, 8736	SA to SJ	00 to 7	1 N/O contact	9999 SX 6	—
			1 N/C contact	9999 SX 7	—
			1 N/O and 1 N/C isolated contacts	9999 SX 8	—
			1 N/O overlapping contact	9999 SX 9 (2)	—
			1 N/C overlapping contact	9999 SX 10 (2)	—
For use with			External non-convertible contacts	Reference	Weight kg (lb)
Class	Type	NEMA Size			
8502, 8702, 8536, 8736	SA to SJ	00 to 7	1 N/O contact	9999 SX 13	—
			1 N/C contact	9999 SX 14	—
			1 N/O and 1 N/C isolated contacts	9999 SX 15	—
			1 N/O overlapping contact	9999 SX 16 (2)	—
			1 N/C overlapping contact	9999 SX 17 (2)	—

(1) Types SX 11 and SX 12 are not applicable on NEMA Sizes 3 or larger. Internal contacts can also be used on Class 2510 Types M and T manual starters.

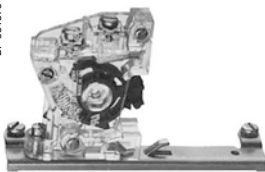
(2) Types SX 9 and SX 10 or Types SX 16 and SX 17 must be used together and mounted on the same side of the contactor. They are suitable for applications where it is necessary for a normally open contact to overlap a normally closed contact.

DF 531376



9999 SX 11

DF 531375



9999 SX 6

Accessories for Heavy Industrial NEMA Style Controls

Auxiliary contacts,
Adapter, Remote reset module

Isolated auxiliary contacts for Motor Logic solid-state overload relays

Overload relay auxiliary contacts are available factory installed or in kit form for field installation on Motor Logic solid-state overload relays.

These contacts may be used for isolated alarm contact applications.

For use with			External field convertible contact	Reference	Weight kg (lb)
Class	Type	NEMA Size			
9065	SS, SR, SF, ST	00B to 7	N/O or N/C auxiliary contact	9999 AC 04	–

Adapter

The adapter enables the Motor Logic solid-state overload relay to be mounted on a 35 mm mounting rail.

For use with			Reference	Weight kg (lb)
Class	Type	NEMA Size		
9065	SS or SF	00B, 00C, 0 and 1	9999 DA 01	–

Remote reset module

The remote reset module can be easily field installed on solid-state overload relays. This module will allow the overload relay to be reset from a remote location.

For use with			Description	Reference	Weight kg (lb)
Class	Type	NEMA Size			
9065	SS, SR, SF, ST	00B to 7	Remote reset module	9999 RR 04 (1)	–
	SS, SR, SF, ST	3 and 4	Top mounting bracket	9999 RB 34 (1) (2)	–

(1) ~ 120 V power required.

(2) To be used for mounting the remote reset module on the top of the solid-state overload relay.

Accessories for Heavy Industrial NEMA Style Controls

Power-pole adder kits, Timer attachments,
Control circuit fuse holders,
Transient suppression modules



9999 SB 6

Power-pole adder kits

One single- or double-circuit power pole kit may be field added to a basic 2- or 3-pole Type S contactor or starter, Size 0–2, or a 30–60 A lighting contactor. The ratings for these power-pole adders correspond to the NEMA contact ratings found in the contactor and starter section or lighting contactor section. A 2- or 3-pole contactor or starter will accept only one single- or double-circuit unit. A power pole cannot be used on 4- or 5-pole devices or devices which are mechanically interlocked. For adding a power pole to a Size 2 or 60 A device, a coil change is required. When adding Sizes 0 to 2 power pole kits to a Size 3 to 7 or 100 to 800 A device, an adapter bracket (9999 SBT 1) is required. The Class 9999 Types SB 6 to SB 15 power pole kits are suitable for copper wire only. Types SB 21 to SB 25 are supplied with lugs suitable for copper and aluminum wire.

Description	For use with			Reference	Weight kg (lb)
	Class	Type	NEMA Size or current rating		
1 N/O power-pole adder	8502, 8702, 8536, 8736, 8903	SB, SC, SM	0, 1 and 30 A	9999 SB 6	–
		SD	2	9999 SB 11 (1)	–
		SP	60 A	9999 SB 21 (1)	–
1 N/C power pole adder	8502, 8702, 8536, 8736, 8903	SB, SC, SM	0, 1 and 30 A	9999 SB 7	–
		SD	2	9999 SB 12 (1)	–
		SP	60 A	9999 SB 22 (1)	–
1 N/O and 1 N/C power-pole adder	8502, 8702, 8536, 8736, 8903	SB, SC, SM	0, 1 and 30 A	9999 SB 8	–
		SD	2	9999 SB 13 (1)	–
		SP	60 A	9999 SB 23 (1)	–
2 N/O power-pole adders	8502, 8702, 8536, 8736, 8903	SB, SC, SM	0, 1 and 30 A	9999 SB 9	–
		SD	2	9999 SB 14 (1)	–
		SP	60 A	9999 SB 24 (1)	–
2 N/C power pole adders	8502, 8702, 8536, 8736, 8903	SB, SC, SM	0, 1 and 30 A	9999 SB 10	–
		SD	2	9999 SB 15 (1)	–
		SP	60 A	9999 SB 25 (1)	–

Adapter bracket

Description	For use with			Reference	Weight kg (lb)
	Class	Type	NEMA Size or current rating		
Adapter bracket	8502, 8702, 8536, 8736, 8903	SE to SJ and SQ to SZ	3 to 7 and 100 to 800 A	9999 SBT 1	–

Control circuit fuse holders

The control circuit fuse holder is designed to be used on Type S contactors and starters, Sizes 00 to 7, when either one or two control circuit fuses, 600 V maximum, are required. The Type SF 3 and SF 4 fuse holders accept standard 600 V Bussmann Type KTK or equivalent fuses (10 mm x 38 mm), 6 A maximum. Type SFR 3 and SFR 4 fuse holders accept Class CC 600 V Bussmann Type KTK-R or equivalent fuses only.

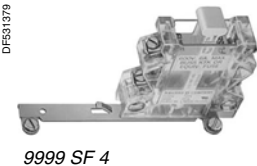
Type	For use with		Description (2)	Reference	Weight kg (lb)
	Class	NEMA Size			
Control circuit fuse holders	8502, 8702, 8536, 8736	00 to 7	Single-fuse unit	9999 SF 3	–
			Single-fuse unit for Class CC fuse	9999 SFR 3	–
			Two-fuse unit	9999 SF 4	–
			Two-fuse unit for Class CC fuses	9999 SFR 4	–

Transient suppression modules

The transient suppression module is designed to be used where the transient voltage, generated when opening the coil circuit, interferes with the proper operation of nearby integrated or solid-state control circuits. The module consists of a RC circuit and is designed to suppress the coil voltage transients to approximately 200% of peak coil supply voltage. The module is wired across the coil for Type S, Sizes 00 to 5 and is designed for coil voltages of 120 V only.

Type	For use with		Reference	Weight kg (lb)
	Class	NEMA Size		
Transient suppression modules	8502, 8702, 8536, 8736	00 to 2	9999 ST 1	–
		3 to 5	9999 ST 2	–

(1) To order a Size 2 or 60 A power pole kit complete with a new starter coil, specify suffix Y118, plus the voltage and frequency.
Example: **Class 9999 Type SB11 Form Y118, 120 volts, 60 Hz.**
(2) Fuses not included.



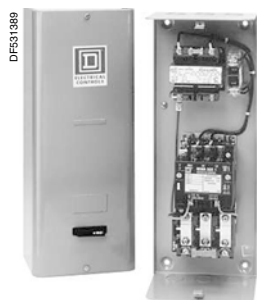
9999 SF 4



9999 ST 1

Accessories for Heavy Industrial NEMA Style Controls

Compression lugs Terminal block



Class 8903
with compression
lugs installed



9999 T7

Compression lugs

A Class 9999 Type AL hardware kit is required to install Versa-Crimp® compression lugs on Class 8903 Type S, 100 to 800 A lighting contactors. The lugs are suitable for both copper and aluminum wire.

One VCEL lug is required for each line or load terminal. Each Class 9999 Type AL hardware kit includes mounting hardware for 3 terminals, line or load side.

Example: to install compression lugs on a 300 A 3-pole device, line and load sides, order 6 x VCEL-060-12H1 lugs and 2 x Class 9999 Type AL 11 hardware kits.

For use with			Versa-Crimp catalogue number	Material	Wire range (min.-max.)	Number of poles	Reference	Weight kg (lb)
Class	Type	Current rating						
8903	SQ	100 A	VCEL-021-14S1	Al/Cu	8-1/0	—	(1)	—
		200 A	VCEL-022-516H1	Al/Cu	1-2/0	2 poles	9999 AL 13	—
	SV	200 A	VCEL-024-516H1	Al/Cu	2/0-4/0	3 poles	9999 AL 14	—
						4 poles	9999 AL 15	—
			VCEL-024-516H1	Al/Cu	2/0-4/0	2 poles	9999 AL 13	—
						3 poles	9999 AL 14	—
			VCEL-024-516H1	Al/Cu	2/0-4/0	4 poles	9999 AL 15	—
						2 poles	9999 AL 13	—
			VCEL-030-516H1	MCM Al/Cu	4-300	3 poles	9999 AL 14	—
						4 poles	9999 AL 15	—
			VCEL-030-516H1	MCM Al/Cu	4-300	2 poles	9999 AL 13	—
						3 poles	9999 AL 14	—
			VCEL-030-516H1	MCM Al/Cu	4-300	4 poles	9999 AL 15	—
	SX	300 A	VCEL-050-12H1	MCM Al/Cu	2/0-500	—	9999 AL 11	—
						—	9999 AL 11	—
			VCEL-060-12H1	MCM Al	400-600	—	9999 AL 11	—
						—	9999 AL 11	—
			VCEL-075-12H1	MCM Cu	400-500	—	9999 AL 11	—
						—	9999 AL 11	—
			VCEL-075-12H1	MCM Al	500-750	—	9999 AL 11	—
						—	9999 AL 11	—
			VCEL-075-12H1	MCM Cu	500	—	9999 AL 11	—
						—	9999 AL 11	—
	SY, SZ	400, 600 A	VCEL-060-12H2 (2)	MCM Al	400-600	—	9999 AL 12	—
						—	9999 AL 12	—
			VCEL-060-12H2 (2)	MCM Cu	400-500	—	9999 AL 12	—
						—	9999 AL 12	—
			VCEL-075-12H2 (2)	MCM Al	500-750	—	9999 AL 12	—
						—	9999 AL 12	—
			VCEL-075-12H2 (2)	MCM Cu	500	—	9999 AL 12	—
						—	9999 AL 12	—
	SJ	800 A	—	—	—	—	(3)	—

Terminal block

The terminal block provides easy wiring of a "Hand-Off-Auto" selector switch or "Start-Stop" push buttons with separate control. The terminal block requires no panel space. It simply snaps onto Type S, Sizes 00-4 contactors and starters by two tabs and is secured to the left-hand coil terminal.

For use with			Reference	Weight kg (lb)
Class	Type	NEMA Size		
8502, 8702, 8536, 8736	SA to SF	00 to 4	9999 T7	—

(1) Not required.

(2) One or two lugs may be mounted on each terminal.

(3) Compression lugs for these devices are available only as a factory modification. Order: suffix **Y1574**. Specify the wire size, up to 750 MCM Al or 500 MCM Cu, and the number of terminals.

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■ Addressespage 8/2



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Afghanistan	Contacts are assured by	Schneider Electric India		
Albania	Contacts are assured by	Schneider Electric Austria		
Algeria	■ Schneider Electric	voie A Lot C22 Zone industrielle Rouiba - Alger	Tel. : +213 21 92 97 02 à 09 Fax : +213 21 92 97 00 à 01	
Andorra	Contacts are assured by	Schneider Electric France		
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Anguilla	Contacts are assured by	Schneider Electric Dominican Rep.		
Antartica	Contacts are assured by	Schneider Electric Brazil		
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Argentina	■ Schneider Argentina	Viamonte 2850 - 1678 Caseros (provincia Buenos Aires)	Tel.: +54 1 716 88 88 Fax: +54 1 716 88 33	www.schneider-electric.com.ar
Armenia	Contacts are assured by	Schneider Electric Russian Fed.		
Aruba	Contacts are assured by	Schneider Electric Dominican Rep.		
Australia	■ Schneider Electric (Australia) Pty. Limited	2 Solent Circuit Norwest Business Park Baulkham Hill _ NSW 2153	Tel.: +61 298 51 28 00 Fax: +61 296 29 83 40	www.schneider.com.au
Austria	■ Schneider Austria Ges.m.b.H.	Birostrasse 11 1239 Wien	Tel.: +431 610 540 Fax: +431 610 54 54	www.schneider-electric.at
Azerbaijan	Contacts are assured by	Schneider Electric Russian Fed.		
Bahamas	■ Schneider Electric	Union Village PO Box 3901 - Nassau	Tel. : +1 242 327 42 91 Fax : +1 242 327 42 91	www.squared.com
Bahrain	■ Schneider Electric	Floor 1 - Juma Building Abu Horaira Avenue PO Box 355 - 304 Manama	Tel.: +97 322 7897 Fax: +97 321 8313	
Bangladesh	Contacts are assured by	Schneider Electric India		
Barbados	Contacts are assured by	Schneider Electric Dominican Rep.		
Belarus	■ Schneider Electric Industries SA	Prospect Macherova 5, of. 202 220004 Minsk	Tel. : +375 172 23 75 50 Fax : +375 172 23 97 61	
Belgium	■ Schneider Electric nv/sa	Dieweg 3 B - 1180 Brussels	Tel.: +3223737711 Fax: +3223753858	www.schneider-electric.be
Belize	Contacts are assured by	Schneider Electric USA		
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Brazil	■ Schneider Electric Brazil Ltda.	Avenida Das Nações Unidas 23223 Jurubatuba - CEP 04795-907 São Paulo-SP	Tel.: +55 55 24 52 33 Fax: +55 55 22 51 34	www.schneider-electric.com.br
Brunei (Darussalam)	Contacts are assured by	Schneider Electric Singapore		
Bulgaria	■ Schneider Electric	Expo 2000, Boulevard Vaptzarov 1407 Sofiav	Tel.: +3592 919 42 Fax: +3592 962 44 39	www.schneiderelectric.bg
Burkina Faso	Contacts are assured by	Schneider Electric Ivory Coast		
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Cameroon	■ Schneider Electric Cameroon	166, rue de l'Hôtel de Ville BP12087 - Douala	Tel.: +237 343 38 84 Fax: +237 343 11 94	
Canada	■ Schneider Canada	19, Waterman Avenue M4 B1Y2 Toronto - Ontario	Tel.: +1 416 752 8020 Fax: +1 416 752 4203	www.schneider-electric.ca
Cape Verde	Contacts are assured by	Schneider Electric Senegal		
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Chile	■ Schneider Electric Chile S.A.	Avda. Pdtte Ed. Frei Montalva, 6001-31 Conchalí - Santiago	Tel.: +56 2 444 3000 Fax: +56 2 423 9335	www.schneider-electric.co.cl
China	■ Schneider Beijing	Landmark bldg-Room 1801 8 North Dong Sanhuan Rd Chaoyang District 100004 Beijing	Tel.: +86 10 65 90 69 07 Fax: +86 10 65 90 00 13	www.schneider-electric.com.cn



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Christmas island	Contacts are assured by	Schneider Electric Australia		
Cocos (Keeling) islands	Contacts are assured by	Schneider Electric Australia		
Colombia	■ Schneider Electric de Colombia S.A.	Calle 45A #102-48 Bogota DC	Tel.: +57 1 426 97 00 Fax: +57 1 426 97 40	
Comoros	Contacts are assured by	Schneider Electric la Reunion		
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Costa Rica	■ Schneider Centroamérica Ltda.	1.5 kms oeste de la Embajada Americana, Pavas, San José, Costa Rica C.A. Apartado: 4123-1000 San Jose	Tel.: +506 232-60-55 Fax: +506 232-04-26	www.schneider-ca.com
Croatia	■ Schneider Electric SA	Fallerovo Setaliste 22 HR - 10000 Zagreb	Tel.: +385 1 367 100 Fax: +385 1 367 111	
Cuba	■ Schneider Electric	Bureau de Liaison de La Havane Calle 36- N°306-Apto1 Entre 3ra y 5ta Avenida Miramar Playa Habana	Tel.: +53 724 15 59 Fax: +53 724 12 17	
Cyprus	■ Schneider Electric Cyprus	28 General Timayia Avenue Kyriakos Building, Block #A301 Larnaca 6046	Tel.: +00357 248 12646 Fax: +00357 246 37382	
Czech Republic	■ Schneider Electric CZ, s.r.o.	Thámová 13 Praha 8 - 186 00	Tel.: +420 2 810 88 111 Fax: +420 2 24 81 08 49	www.schneider-electric.cz
Democratic Rep. of Congo	Contacts are assured by	Schneider Electric Cameroon		
Denmark	■ Schneider Electric A/S	Baltorpbakken 14 DK-2750 Ballerup	Tel.: +45 44 73 78 88 Fax: +45 44 68 5255	www.schneider-electric.dk
Djibouti	Contacts are assured by	Schneider Electric Egypt		
Dominican Republic	■ Schneider Electric	Calle Jacinto Manon Esq. Federico Geraldino Edificio D' Roca Plaza Suite 402, Ens. Paraiso - Santo Domingo	Tel.: +1 809 334 66 63 Fax: +1 809 334 66 68	
Ecuador	■ Schneider Electric Ecuador SA	Av.Republica del Salvador 1082 y Nac Edificio Mansion Blanca-Quito	Tel. : +593 2 224 42 42 Fax : +593 2 224 42 94	
Egypt	■ Schneider Electric Egypt sae	68, El Tayaran Street Nasr City, 11371 - Cairo	Tel.: +20 24 01 01 19 Fax: +20 24 01 66 87	www.schneider.com.eg
El Salvador	Contacts are assured by	Schneider Electric USA		
Equatorial Guinea	Contacts are assured by	Schneider Electric Cameroon		
Eritrea	Contacts are assured by	Schneider Electric Egypt		
Estonia	■ Lexel Electric	Ehitajate tee 110 EE 12618 Tallinn	Tel. : +372 650 97 00 Fax : +372 650 97 22	
Ethiopia	Contacts are assured by	Schneider Electric Egypt		
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Finland	■ Schneider Electric Oy	Sinimäentie 14 02630 Espoo	Tel. : +358 9 527 000 Fax : +358 9 5270 0376	www.schneider-electric.fi
France	■ Schneider Electric SA	5, rue Nadar 92500 Rueil Malmaison	Tel.: +33 (0)1 41 29 82 00 Fax: +33 (0)1 47 51 80 20	www.schneider-electric.fr
French Polynesia	Contacts are assured by	Schneider Electric Australia		
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Germany	■ Schneider Electric GmbH	Gothaer Straße 29 D-40880 Ratingen	Tel.: +49210 240 40 Fax: +492 10 240 49 256	www.schneiderelectric.de
Ghana	■ Schneider Electric Ghana	PMB Kia 3rd Floor Opeibea House Airport Commercial Center Liberation road - Accra	Tel. : +233 21 70 11 687 Fax : +233 21 77 96 22	
Gibraltar	Contacts are assured by	Schneider Electric Spain		
Greece	■ Schneider Electric AE	14th km - RN Athens-Lamia GR - 14564 Kifissia	Tel.: +302 106 29 52 00 Fax: +302 106 29 52 10	www.schneider-electric.com.gr
Greenland	Contacts are assured by	Schneider Electric United States		
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Honduras	Contacts are assured by	Schneider Electric United States		
Hong Kong	■ Schneider Electric (Hong Kong) Ltd	Room 3108-28, 31th Floor, Sun Hung Kai Centre, 30 Harbour Road, Wanchai	Tel.: +852 25 65 06 21 Fax: +852 28 11 10 29	
Hungary	■ Schneider Electric Hungária Villamossági Rt.	Fehérvári út 108 – 112 H-1116 Budapest	Tel.: +36 1 382 26-06 Fax: +36 1 206 1429	www.schneider-electric.hu
Iceland	Contacts are assured by	Schneider Electric Denmark		
India	■ Schneider Electric India	Max House, 1 Dr Jha Marg, Okhla 110 020 New Dehli	Tel. : +91 11 631 85 84 Tel. : +91 11 631 71 61	www.schneiderelectric-in.com
Indonesia	■ P.T. Schneider Indonesia	Ventura Building 7th Floor Jalan R.A. Kartini Kav.26 Cilandak - 12430 Jakarta	Tel.: +62 +21 750 44 06 Fax: +62 +21 750 44 15/ 16	www.schneider-electric.co.id
Iran (Islamic Republic of)	■ Telemecanique Iran	1047 Avenue VALI ASSR P.O. Box 15875-3547 15116 Teheran	Tel.: +98 218 71 01 42 Fax: +98 218 71 81 87	
Irak	■ Schneider Electric Industries SA	38050 Grenoble Cedex 9	Tel.: +33 04 76 60 54 27 Fax: +33 04 76 60 56 60	
Ireland	■ Schneider Electric Ireland	Maynooth Road Cellbridge - Co. Kildare	Tel.: +353+0 1 6012200 Fax: +353+0 1 6012201	www.schneiderelectric.ie
Italy	■ Schneider Electric S.p.A.	Centro Direzionale Colleoni Palazzo Sirio - Viale Colleoni, 7 20041 Agrate Brianza (Mi)	Tel.: +39 39 655 8111 Fax: +39 39 605 6237	www.schneiderelectric.it
Ivory Coast	■ Schneider Electric Afrique de l'Ouest	Rue Pierre et Marie Curie 18 BP 2027 Abidjan 18	Tel.: +225 21 75 00 10 Fax: +225 21 75 00 30	
Jamaica	■ Schneider Electric	Shop#5, Plaza Dunrobin 30 Dunrobin Avenue - Kingstown	Tel. : +1876 755 41 27 Tel. : +931 87 74	
Japan	■ Schneider Electric Japan Ltd	Torigoe F. Bldg 1-8-2, Torigoe Taito-Ku - 111-0054 Tokyo	Tel.: +81 358 35 35 81 Fax: +81 358 35 35 85	www.schneider-electric.co.jp
Jordan	■ Schneider Electric Industr. Jordan	Jordan University Street Abu Al Haj Commercial Complex 2nd Floor - Office # 202 - Amman	Tel.: 962 65 16 78 87 Fax: 962 65 16 79 1	
Kazakstan	■ Schneider Electric Kazakhstan Liaison Office	Prospekt Abaia 157 off 9 480009 Almaty	Tel. : +7 327 250 93 88 Tel. : +7 327 250 63 70	
Kenya	■ Schneider East Africa	Power Technics Complex Monbasa Road - PO Box 46345 Nairobi	Tel. : +254 2.824.156 Fax : +254 2.824.157	
Kiribati	Contacts are assured by	Schneider Electric Australia		
Korea	■ Schneider Electric Korea Ltd	3Floor, Cheil Bldg., 94-46, 7-Ka Youngdeungpodong, Youngdeungpo-ku 150-037 Seoul	Tel. : +82 2 2630 9700 Fax : +82 2 2630 9800	www.csinfo.co.kr/schneider/
Kuwait	■ Schneider Electric Kuwait	Al Gaas Tower - Sharq 2nd Floor PO Box 20092 - 13 061 Safat	Tel.: +965 240 75 46 Fax: +965 240 75 06	
Kyrgyz Republic	Contacts are assured by	Schneider Electric Russian Fed.		
Laos	Contacts are assured by	Schneider Electric Thailand		
Latvia	■ Lexel Electric	60A A.Deglava str. LV1035 Riga	Tel. : +371 780 23 74/75 Fax : +371 754 62 80	
Lebanon	■ Schneider Electric Liban	Tabaris, Avenue Charles Malek Immeuble Ashada, 8 P.O. Box 166223 - Beyrouth	Tel. : +961 1 20 46 20 Tel. : +961 1 20 31 19	
Lesotho	Contacts are assured by	Schneider Electric South Africa		
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Loro Sae	Contacts are assured by	Schneider Electric Australia		
Luxembourg	■ Schneider Electric Industrie SAS	Agence de Metz 1, Rue Graham Bell - BP n° 35190 57075 Metz cedex 3 - France	Tel.: 33 03 87 39 06 03 Fax: 33 03 87 74 25 96	www.schneider-electric.fr
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Martinique	■ Schneider Electric	Schneider Electric Immeuble Cottrell - ZI de la Lézarde 97232 Le Lamentin	Tel.: +05 96 51 06 00 Fax: +05 96 51 11 26	
Mauritania	Contacts are assured by	Schneider Electric Senegal		
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Netherlands Antilles	Contacts are assured by	Schneider Electric Dominican Rep.		
New Caledonia	Contacts are assured by	Schneider Electric Australia		
New Zealand	■ Schneider Electric (NZ) Ltd	14 Charann Place Avondale P.O. Box 15355 - New Lynn Auckland	Tel. : +64 9 829 04 90 Fax : +64 9 829 04 91	www.schneider-electric.co.nz
Nicaragua	Contacts are assured by	Schneider Electric United States		
Niger	Contacts are assured by	Schneider Electric Ivory Coast		
Nigeria	■ Schneider Electric Nigeria Limited	Biro plaza - 8th Floor - Plot 634 Abeyemo Alakija Street Victoria Islan - Lagos	Tel. : +234 1 2702973 Fax : +234 1 2702976	
Niue	Contacts are assured by	Schneider Electric Australia		
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Norway	■ Schneider Electric Norge A/S	Solgaard Skog 2 Postboks 128 - 1501 Moss	Tel.: +47 6924 9700 Fax: +47 6925 7871	www.schneider-electric.no
Oman	■ Schneider Electric CA	c/o Arab Development Co PO Box 439 - 113 Muscat	Tel.: +968 77 163 64 Fax: +968 77 104 49	
Pakistan	■ Schneider Electric Pakistan	43-L, 2nd floor, M.M. Alam Road, Gulberg II - Lahore	Tel.: +92 42 5754471 à 73 Fax: +92 42 5754474	
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Philippines	■ Schneider Electric Philippines, Inc	5th Floor, ALCO Building 391 Sen, Gil Puyat Avenue Makati 1209	Tel. : +632 896 6063 Fax : +632 896 7229	
Pitcairn	Contacts are assured by	Schneider Electric Australia		
Poland	■ Schneider Electric Polska Sp. z o.o.	ul. Lubinowa 4a 03-878 - Warszawa	Tel.: +48 22 511 8 200 Fax: +48 22 511 8 210	www.schneider-electric.pl
Portugal	■ Schneider Electric Portugal	Av. do Forte, 3 Edifício Suécia II, Piso 3-A CP 2028 Carnaxide 2795 Linda-A-Velha	Tel.: +351 21 416 5800 Fax: +351 21 416 5857	www.schneiderelectric.pt
Puerto Rico	Contacts are assured by	Schneider Electric United States		
Qatar	■ Schneider Electric Qatar Branch	c/o Khalifa Bin Fahred Al Thani Trad. and Co - P.O. Box 4484 Doha	Tel.: +97 4424358 Fax: +97 4424358	
Reunion	■ Schneider Electric	Immeuble Futura, 190, rue des 2 canons BP 646 - 97497 Sainte Clothilde	Tel.: +262 28 14 28 Fax: +262 28 39 37	
Romania	■ Schneider Electric	Bd Ficusului n°42 Apimondia, Corp.A, et.1, Sector 1 Bucuresti	Tel.: +401 203 06 50 Fax: +401 232 15 98	www.schneider-electric.ro
Russian Federation	■ Schneider Electric ZAO	Enisseyskaya 37 129 281 Moscow	Tel.: +7095 797 40 00 Fax: +7095 797 40 03	www.schneider-electric.ru
Rwanda	Contacts are assured by	Schneider Electric Kenya		
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Saudi Arabia	■ Schneider Electric	Second Industrial City P.O. Box 89249 - 11682 Riyadh	Tel.: +966 1 265 1515 Fax: +966 1 265 1860	
Senegal	■ Schneider Electric Sénégal	BP 15952 - Dakar-Fann Rond point N'Gor - Dakar	Tel.: +221 820 68 05 Fax: +221 820 58 50	
Seychelles	Contacts are assured by	Schneider Electric Reunion		
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Singapore	■ Schneider Electric Singapore Pte Ltd	10 Ang Mo Kio Street 65 #02-17/20 TechPoint Singapore 569059	Tel.: +65 484 78 77 Fax: +65 484 78 00	www.schneider-electric.com.sg
Slovak Republic	■ Schneider Electric Slovakia spol s.r.o.	Borekova 10 SK-821 06 Bratislava	Tel. : +02 45 52 40 10 and 40 30 Fax : +02 45 52 40 00	www.schneider-electric.sk
Slovenia	■ Schneider Electric, d.o.o.	Dunasjka 47 1000 Ljubljana	Tel. : +386 1 23 63 555 Fax : +386 1 23 63 559	www.schneider-electric.si
Solomon islands	Contacts are assured by	Schneider Electric Australia		
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South Africa	■ Schneider Electric South Africa (PTY) Ltd	Private Bag X139 Halfway House 1685 - Midrand.	Tel.: +27 11 254 6400 Fax: +27 11 315 8830	www.schneider-electric.co.za
Spain	■ Schneider Electric España, S.A.	Pl. Dr. Letamendi, 5-7 08007 Barcelona	Tel.: +34 93 484 3100 Fax: +34 93 484 3308	www.schneiderelectric.es
Sri Lanka	■ Schneider Electric Industries SA	Liaison office SRI Lanka Level 3B Valiant towers 46/7 Nawam Mawatha-Colombo 2	Tel. : +94 77 48 54 89	www.schneiderelectric-in.com
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Sweden	■ Schneider Electric AB	Djupdalsvägen 17/19 19129 Sollentuna	Tel.: +46 8 623 84 00 Fax: +46 8 623 84 85	www.schneider-electric.se
Switzerland	■ Schneider Electric (Switzerland) S.A.	Scherenwaldstrasse 11 CH - 3063 Ittigen	Tel.: +41 31 917 3333 Fax: +41 31 917 3355	www.schneider-electric.ch
Syrian Arab Republic	■ Schneider Electric Syria	Elba Street - Malki Gheibeh and Qassas bldg, 1st floor PO Box 33876-Damascus	Tel. : +963 11 37 49 88 00 Fax : +963 11 37 17 55 9	



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Taiwan, Republic of China	■ Schneider Electric Taiwan Co Ltd	2Fl., N°37, Ji-Hu Road, Nei-Hu Dist., Taipei 114	Tel.: +886 2 8751 6388 Fax: +886 2 8751 6389	www.schneider-electric.com.tw
Tajikistan	Contacts are assured by	Schneider Electric Russian Fed.		
Tanzania, United Rep. of	Contacts are assured by	Schneider Electric Kenya		
Thailand	■ Schneider (Thailand) Ltd	20th Floor Richmond Building 75 Sukhumvit 26 Road, Klongtoey Bangkok 10110	Tel.: +662 204 9888 Fax: +662 204 9816	www.schneider-electric.co.th
Togo	Contacts are assured by	Schneider Electric Ivory Coast		
Tokelau	Contacts are assured by	Schneider Electric Australia		
Tonga	Contacts are assured by	Schneider Electric Australia		
Trinidad & Tobago	■ Schneider Electric	6, 1st Street West Ext. Beaulieu Avenue Trincity Trinidad West Indies	Tel.: 1868 640 42 04 Fax: 1868 640 42 04	
Tunisia	■ Schneider Electric Tunisia	Rue du Lac Oubeira 1053 Les Berges du Lac - Tunis	Tel.: +216 71 960 477 Fax: +216 71 960 342	
Turkey	■ Schneider Elektrik Sanayi Ve Ticaret A.S.	Tütüncü Mehmet Efendi Cad. N°:110 Kat 1-2 - 81080 Göztepe - Istanbul	Tel.: +90 21 63 86 95 70 Fax: +90 21 63 86 38 75	www.schneiderelectric.com.tr
Turkmenistan	■ Schneider Electric Turkmenistan Liaison Office	rue Neitralny Turkmenistan 28, off.326/327 74 000 Achgabad	Tel.: +993 12 46 29 52 Fax: +993 12 46 29 52	
Turks & Caicos islands	Contacts are assured by	Schneider Electric Dominican Rep.		
Tuvalu	Contacts are assured by	Schneider Electric Australia		
Uganda	Contacts are assured by	Schneider Electric Kenya		
Ukraine	■ Schneider Electric	Rue Krechtchalik 2 252601 Kiev	Tel.: +380 44 462 04 25 Fax: +380 44 462 04 24	www.schneider-electric.com.ua
United Arab Emirates	■ Schneider Electric Abu Dhabi	PO Box 29580 Office Floor 2/Lulu Street Al Marina Plaza Tower Abu Dhabi	Tel.: +9712 6 339444 Fax: +9712 6 316606	
United Kingdom	■ Schneider Electric Ltd	Braywick House East Windsor Road - Maidenhead Berkshire SL6 1 DN	Tel.: +44 (0)1 628 508 500 Fax: +44 (0)1 628 508 508	www.schneider.co.uk
United States	■ Schneider Electric	North American Division 1415 Roselle Road Palatine - IL 60067	Tel.: +1 847 397 2600 Fax: +1 847 925 7500	www.squared.com
Uruguay	■ Schneider Electric Uruguay S.A.	Ramon Masini 3190 Montevideo	Tel.: +59 82 707 2392 Fax: +59 82 707 2184	
Uzbekistan	Contacts are assured by	Schneider Electric Russian Fed.		
Vanuatu	Contacts are assured by	Schneider Electric Australia		
Vatican city St./Holy See	Contacts are assured by	Schneider Electric Italy		
Venezuela	■ Schneider Mg SD TE, S.A	Calle 162/ Piso 2 Edificio Centro Cynamid La Urbina, 1070 - 75319 Caracas	Tel.: +58 2 241 13 44 Fax: +58 2 243 60 09	www.schneider-electric.com.ve
Viet Nam	■ R.R.O. of Schneider Electric Industries S.A.S. in Viet Nam	Unit 2.9, 2nd Floor, e-Town Building 364 Cong Hoa Street Tan Binh District - Ho Chi Minh City	Tel.: +84 8 8103 103 Fax: +84 8 8120 477	
Virgin islands	Contacts are assured by	Schneider Electric Dominican Rep.		
Wallis & Futuna islands	Contacts are assured by	Schneider Electric Australia		
Western Sahara	Contacts are assured by	Schneider Electric Morocco		
Yemen	Contacts are assured by	Schneider Electric U.A.E.		
Yugoslavia	■ Schneider Electric Jugoslavija d.o.o.	Ratarski put 27d 11186 Belgrade	Tel.: +381 11 192 414 Fax: +381 11 107 125	
Zambia	■ Schneider Zambia	Zambia Office c/o Matipi Craft Center Building Plot 1036 - Accra Road PO Box 22792 - Kitwe	Tel.: +260 222 22 52 Fax: +260 222 83 89	
Zimbabwe	■ Schneider Electric	Zimbabwe Liaison Office 75A Second Street (corner Livingstone Avenue) Harare	Tel.: +263 4 707 179/180 Fax: +263 4 707 176	

Schneider Electric Industries SAS

Headquarters

89, bd Franklin Roosevelt
92506 Rueil Malmaison Cedex
France

<http://www.schneider-electric.com>

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