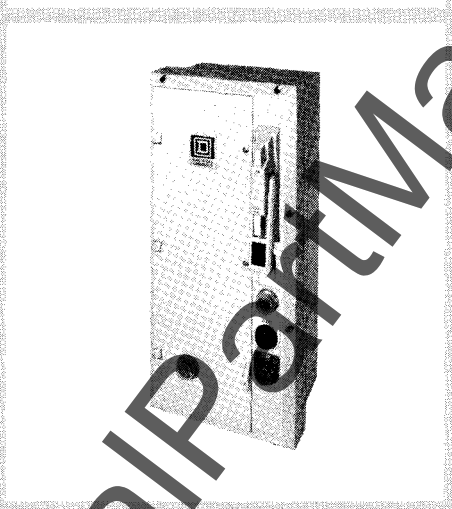
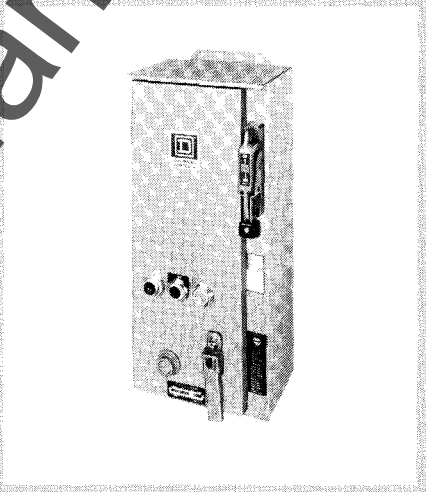




Combination Starters

CONTENTS

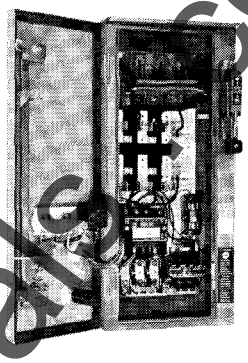
CLASS 8538

AC COMBINATION STARTERS
FUSIBLE DISCONNECT SWITCH TYPE

JANUARY, 1982

UL LISTED ♦

The disconnect switch type combination starter design utilizes a flange operated visible blade switch. Interchangeable fuse clips, straight through wiring, three overloads as standard, space for a fused control transformer with additional capacity and provisions for adding a disconnect switch electrical interlock are key features of this starter.



Fusible Combination Starter in NEMA 12 Enclosure

LINE VOLTAGE TYPE, NON-REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

Ratings				General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) NEMA Type 4		Watertight, Dusttight and Corrosion Resistant Enclosure NEMA Type 4X▲		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12◐✤		
Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Fuse Clip Size Amps	Type	Price*	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
200 (208)	3	0	30	SBG-12	$ 376.	SBW-12	$ 760.	SBW-22	$ 876.	SBA-22	SBA-12	$ 472.
	5	1	30	SCG-12	396.	SCW-12	780.	SCW-22	896.	SCA-22	SCA-12	492.
	7½		60	SCG-13	404.	SCW-13	788.	SCW-23	908.	SCA-23	SCA-13	500.
	10	2	60	SDG-12	624.	SDW-12	1216.	SDW-22	1340.	SDA-22	SDA-12	760.
	20	3	100	SEG-15	1052.	SEW-15	2084.	SEW-25	2292.	SEA-25	SEA-15	1228.
	25		200	SEG-12	1140.	SEW-12	2172.	.....	.....	SEA-22	SEA-12	1316.
	40	4	200	SFG-15	2020.	SFW-15	3340.	.....	.....	SFA-25	SFA-15	2508.
	75	5	400	SGG-15	4526.	SGW-15	7894.	.....	.....	SGA-25	SGA-15	5710.
	150	6	600	SHG-13	11986.	SHW-13	15186.	.....	.....	SHA-23	SHA-13	13366.
230 (240)	3	0	30	SBG-12	376.	SBW-12	760.	SBW-22	876.	SBA-22	SBA-12	472.
	5	1	30	SCG-12	396.	SCW-12	780.	SCW-22	896.	SCA-22	SCA-12	492.
	7½		60	SCG-13	404.	SCW-13	788.	SCW-23	908.	SCA-23	SCA-13	500.
	15	2	60	SDG-12	624.	SDW-12	1216.	SDW-22	1340.	SDA-22	SDA-12	760.
	25	3	100	SEG-15	1052.	SEW-15	2084.	SEW-25	2292.	SEA-25	SEA-15	1228.
	30		200	SEG-12	1140.	SEW-12	2172.	.....	.....	SEA-22	SEA-12	1316.
	50	4	200	SFG-15	2020.	SFW-15	3340.	.....	.....	SFA-25	SFA-15	2508.
	100	5	400	SGG-15	4526.	SGW-15	7894.	.....	.....	SGA-25	SGA-15	5710.
	200	6	600	SHG-13	11986.	SHW-13	15186.	.....	.....	SHA-23	SHA-13	13366.
460-575 (480-600)	5	0	30	SBG-13	384.	SBW-13	768.	SBW-23	884.	SBA-23	SBA-13	480.
	10	1	30	SCG-14	404.	SCW-14	788.	SCW-24	908.	SCA-24	SCA-14	500.
	15	2	30	SDG-16	628.	SDW-16	1220.	SDW-26	1344.	SDA-26	SDA-16	764.
	25		60	SDG-14	636.	SDW-14	1228.	SDW-24	1352.	SDA-24	SDA-14	772.
	50	3	100	SEG-13	1072.	SEW-13	2104.	SEW-23	2314.	SEA-23	SEA-13	1248.
	100	4	200	SFG-13	2036.	SFW-13	3356.	.....	.....	SFA-23	SFA-13	2524.
	200	5	400	SGG-13	4526.	SGW-13	7894.	.....	.....	SGA-23	SGA-13	5710.
	400	6	600	SHG-12	11986.	SHW-12	15186.	.....	.....	SHA-22	SHA-12	13366.

*** Prices do not include thermal units.**
◐ NEMA Type 12 enclosures may be field modified for outdoor applications.
▲ NEMA Type 4X hubs are included with each starter at no additional cost.

✤ HAZARDOUS LOCATIONS

NEMA Type 12 devices are available U.L. Listed for use in Class II, Division 2, Group G and Class III, Divisions 1 and 2 locations. Request Form G2-1. No additional charge.

ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Horsepower, voltage, phase, frequency and full load current of motor.
3. Control voltage and frequency if different from line voltage.
4. Any factory modifications and forms required.

THERMAL UNITS

Thermal units should be ordered separately. Standard trip thermal units are priced at **$6.00** each.

♦UL LISTED
SHORT CIRCUIT WITHSTAND RATINGS‡

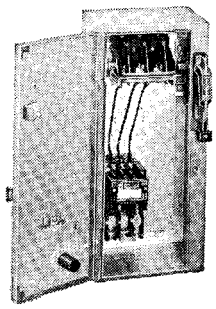
NEMA Size	Available Amperes RMS Symmetrical
0-3	5,000
4-5	10,000
6	18,000

‡ NEMA Type 4X devices are not UL Listed.

CLASS 8538

AC COMBINATION STARTERS

NON-FUSIBLE DISCONNECT SWITCH TYPE■



Non-Fusible Combination Starter in NEMA 1 Enclosure

The disconnect switch type combination starter design utilizes a flange operated visible blade switch. Size 0-2, non-fusible combination starters can be converted to a fusible type. All NEMA Type 1, 4 and 12 enclosures have the same size enclosure for fusible and non-fusible combination starters. Therefore, space is available for the conversion to a fusible type. UL listed except NEMA Type 4X. Short circuit withstand rating not applicable.

LINE VOLTAGE TYPE, NON-REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

RATINGS			General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) **NEMA Type 4**		Watertight, Dusttight and Corrosion Resistant Enclosure **NEMA Type 4X▲**		Dusttight and Driptight, Industrial Enclosure **NEMA Type 12◐✚**		
Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Type	Price*	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
200 (208)	3	0	SBG-11	$ 364.	SBW-11	$ 748.	SBW-21	$ 860.	SBA-21	SBA-11	$ 460.
	7½	1	SCG-11	384.	SCW-11	768.	SCW-21	884.	SCA-21	SCA-11	480.
	10	2	SDG-11	608.	SDW-11	1200.	SDW-21	1320.	SDA-21	SDA-11	744.
	25	3	SEG-11	1012.	SEW-11	2044.	SEW-21	2248.	SEA-21	SEA-11	1188.
	40	4	SFG-11	1952.	SFW-11	3272.	.....	.....	SFA-21	SFA-11	2440.
	75	5	SGG-11	4382.	SGW-11	7750.	.....	.....	SGA-21	SGA-11	5566.
	150	6	SHG-11	11562.	SHW-11	14762.	.....	.....	SHA-21	SHA-11	12942.
230 (240)	3	0	SBG-11	364.	SBW-11	748.	SBW-21	860.	SBA-21	SBA-11	460.
	7½	1	SCG-11	384.	SCW-11	768.	SCW-21	884.	SCA-21	SCA-11	480.
	15	2	SDG-11	608.	SDW-11	1200.	SDW-21	1320.	SDA-21	SDA-11	744.
	30	3	SEG-11	1012.	SEW-11	2044.	SEW-21	2248.	SEA-21	SEA-11	1188.
	50	4	SFG-11	1952.	SFW-11	3272.	.....	.....	SFA-21	SFA-11	2440.
	100	5	SGG-11	4382.	SGW-11	7750.	.....	.....	SGA-21	SGA-11	5566.
	200	6	SHG-11	11562.	SHW-11	14762.	.....	.....	SHA-21	SHA-11	12942.
460-575 (480-600)	5	0	SBG-11	364.	SBW-11	748.	SBW-21	860.	SBA-21	SBA-11	460.
	10	1	SCG-11	384.	SCW-11	768.	SCW-21	884.	SCA-21	SCA-11	480.
	25	2	SDG-11	608.	SDW-11	1200.	SDW-21	1320.	SDA-21	SDA-11	744.
	50	3	SEG-11	1012.	SEW-11	2044.	SEW-21	2248.	SEA-21	SEA-11	1188.
	100	4	SFG-11	1952.	SFW-11	3272.	.....	.....	SFA-21	SFA-11	2440.
	200	5	SGG-11	4382.	SGW-11	7750.	.....	.....	SGA-21	SGA-11	5566.
	400	6	SHG-11	11562.	SHW-11	14762.	.....	.....	SHA-21	SHA-11	12942.

*** Prices do not include thermal units.**
◐ NEMA Type 12 enclosures may be field modified for outdoor applications.
▲ NEMA Type 4X hubs are included with each starter at no additional cost. NEMA Type 4X devices are not UL Listed.
■ UL Listed

✚ HAZARDOUS LOCATIONS

NEMA Type 12 devices are available U.L. Listed for use in Class II, Division 2, Group G and Class III, Divisions 1 and 2 locations. Request Form G2-1. No additional charge.

UL LISTED FOR 100,000A ‡

AC COMBINATION STARTERS

FUSIBLE DISCONNECT SWITCH TYPE WITH CLASS R FUSE CLIPS

LINE VOLTAGE TYPE, NON-REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

RATINGS				General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) **NEMA Type 4**		Watertight, Dusttight and Corrosion Resistant Enclosure **NEMA Type 4X▲**		Dusttight and Driptight Industrial Enclosure **NEMA Type 12◐✚**		
Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Fuse Clip Size Amps.	Type	Price*	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
200 (208)	3	0	30	SBG-32	$ 382.	SBW-32	$ 766.	SBW-42	$ 880.	SBA-42	SBA-32	$ 478.
	5	1	30	SCG-32	402.	SCW-32	786.	SCW-42	904.	SCA-42	SCA-32	498.
	7½	1	60	SCG-33	410.	SCW-33	794.	SCW-43	912.	SCA-43	SCA-33	506.
	10	2	60	SDG-32	630.	SDW-32	1222.	SDW-42	1344.	SDA-42	SDA-32	766.
	20	3	100	SEG-35	1064.	SEW-35	2096.	SEW-45	2306.	SEA-45	SEA-35	1240.
	25	3	200	SEG-32	1152.	SEW-32	2184.	.....	.....	SEA-42	SEA-32	1328.
	40	4	200	SFG-35	2032.	SFW-35	3352.	.....	.....	SFA-45	SFA-35	2520.
	75	5	400	SGG-35	4554.	SGW-35	7922.	.....	.....	SGA-45	SGA-35	5738.
	150	6	600	SHG-33	12014.	SHW-33	15214.	.....	.....	SHA-43	SHA-33	13394.
230 (240)	3	0	30	SBG-32	382.	SBW-32	766.	SBW-42	880.	SBA-42	SBA-32	478.
	5	1	30	SCG-32	402.	SCW-32	786.	SCW-42	904.	SCA-42	SCA-32	498.
	7½	1	60	SCG-33	410.	SCW-33	794.	SCW-43	912.	SCA-43	SCA-33	506.
	15	2	60	SDG-32	630.	SDW-32	1222.	SDW-42	1344.	SDA-42	SDA-32	766.
	25	3	100	SEG-35	1064.	SEW-35	2096.	SEW-45	2306.	SEA-45	SEA-35	1240.
	30	3	200	SEG-32	1152.	SEW-32	2184.	.....	.....	SEA-42	SEA-32	1328.
	50	4	200	SFG-35	2032.	SFW-35	3352.	.....	.....	SFA-45	SFA-35	2520.
	100	5	400	SGG-35	4554.	SGW-35	7922.	.....	.....	SGA-45	SGA-35	5738.
	200	6	600	SHG-33	12014.	SHW-33	15214.	.....	.....	SHA-43	SHA-33	13394.
460-575 (480-600)	5	0	30	SBG-33	390.	SBW-33	774.	SBW-43	890.	SBA-43	SBA-33	486.
	10	1	30	SCG-34	410.	SCW-34	794.	SCW-44	912.	SCA-44	SCA-34	506.
	15	2	30	SDG-36	634.	SDW-36	1226.	SDW-46	1348.	SDA-46	SDA-36	770.
	25	2	60	SDG-34	642.	SDW-34	1234.	SDW-44	1358.	SDA-44	SDA-34	778.
	50	3	100	SEG-33	1084.	SEW-33	2116.	SEW-43	2328.	SEA-43	SEA-33	1260.
	100	4	200	SFG-33	2048.	SFW-33	3368.	.....	.....	SFA-43	SFA-33	2536.
	200	5	400	SGG-33	4554.	SGW-33	7922.	.....	.....	SGA-43	SGA-33	5738.
	400	6	600	SHG-32	12014.	SHW-32	15214.	.....	.....	SHA-42	SHA-32	13394.

*** Prices do not include thermal units.**
◐ NEMA Type 12 enclosures may be field modified for outdoor applications.
▲ NEMA Type 4X hubs are included with each starter at no additional cost.
‡ Available amperes RMS symmetrical. NEMA Type 4X devices are not UL Listed.

✚ HAZARDOUS LOCATIONS

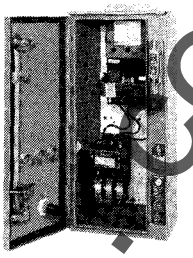
NEMA Type 12 devices are available U.L. Listed for use in Class II, Division 2, Group G and Class III, Divisions 1 and 2 locations. Request Form G2-1. No additional charge.

CLASS 8539

AC COMBINATION STARTERS

MAG-GARD® MOTOR CIRCUIT PROTECTOR TYPE

JANUARY, 1982



UL LISTED◆ FOR 22,000A OR 100,000A

NOTE: The type number selections are listed for motors with typical locked rotor inrush characteristics. For selection restrictions refer to the "motor code letter" table below★

LINE VOLTAGE TYPE, NON-REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE, 600 VOLTS AC MAXIMUM — 50-60 HERTZ

Ratings				General Purpose Enclosure NEMA Type 1		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) NEMA Type 4		Watertight Dusttight and Corrosion Resistant Enclosure NEMA Type 4X▲		For Hazardous Locations— SPIN TOP® Enclosure Class I Groups C & D Class II Groups E, F & G NEMA Types 7 and 9†		Dusttight and Driptight Industrial Use Enclosure NEMA Type 12◐✤		
Motor Voltage (Starter Voltage)	H.P. Range Poly-phase	NEMA Size	Catalog Number (See page 222 for Breaker Adjustment Range)	Type	* Price	Type	* Price	Type	* Price	Type	* Price	With External Reset	Without External Reset	* Price
200 (208)	¼-⅓ ½-1 1½-3	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41 SBG-42 SBG-43	$ 508.	SBW-41 SBW-42 SBW-43	$ 892.	SBW-51 SBW-52 SBW-53	$1024.	SBR-41 SBR-42 SBR-43	$1078.	SBA-51 SBA-52 SBA-53	SBA-41 SBA-42 SBA-43	$ 604.
	¼-⅓ ½-1 1½-3 5 7½	1	FAL36003-11M FAL36007-12M FAL36015-13M FAL36030-15M FAL36050-16M	SCG-41 SCG-42 SCG-43 SCG-44 SCG-45	528.	SCW-41 SCW-42 SCW-43 SCW-44 SCW-45	912.	SCW-51 SCW-52 SCW-53 SCW-54 SCW-55	1048.	SCR-41 SCR-42 SCR-43 SCR-44 SCR-45	1104.	SCA-51 SCA-52 SCA-53 SCA-54 SCA-55	SCA-41 SCA-42 SCA-43 SCA-44 SCA-45	624.
	1½-3 5 7½-10	2	FAL36015-13M FAL36030-15M FAL36050-16M	SDG-41 SDG-42 SDG-43	748.	SDW-41 SDW-42 SDW-43	1340.	SDW-51 SDW-52 SDW-53	1474.	SDR-41 SDR-42 SDR-43	1474.	SDA-51 SDA-52 SDA-53	SDA-41 SDA-42 SDA-43	884.
	15-25	3	FAL36100-18M	SEG-42	1088.	SEW-42	2120.	SEW-52	2332.	SER-42	2436.	SEA-52	SEA-42	1264.
	30 40	4	KAL36225-25M KAL36225-26M	SFG-42 SFG-43	2388.	SFW-42 SFW-43	3708.	SFW-52 SFW-53	4080.	SFR-42 SFR-43	3796.	SFA-52 SFA-53	SFA-42 SFA-43	2876.
	50 60 75	5	KAL36225-30M LAL36400-32M LAL36400-33M	SGG-42 SGG-44 SGG-45	5538.	SGW-42 SGW-44 SGW-45	8906.	....	....	SGR-42 SGR-44 SGR-45	8250.	SGA-52 SGA-54 SGA-55	SGA-42 SGA-44 SGA-45	6418.
	100 125 150	6	LAL36400-36M MAL36600-40M MAL36600-42M	SHG-43 SHG-44 SHG-45	12026.	SHW-43 SHW-44 SHW-45	14026.	....	....	SHR-43 SHR-44 SHR-45	19124.	SHA-53 SHA-54 SHA-55	SHA-43 SHA-44 SHA-45	13106.
230 (240)	¼-⅓ ½-1 1½-3	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41 SBG-42 SBG-43	508.	SBW-41 SBW-42 SBW-43	892.	SBW-51 SBW-52 SBW-53	1024.	SBR-41 SBR-42 SBR-43	1078.	SBA-51 SBA-52 SBA-53	SBA-41 SBA-42 SBA-43	604.
	¼-⅓ ½-1 1½-3 5-7½	1	FAL36003-11M FAL36007-12M FAL36015-13M FAL36030-15M	SCG-41 SCG-42 SCG-43 SCG-44	528.	SCW-41 SCW-42 SCW-43 SCW-44	912.	SCW-51 SCW-52 SCW-53 SCW-54	1048.	SCR-41 SCR-42 SCR-43 SCR-44	1104.	SCA-51 SCA-52 SCA-53 SCA-54	SCA-41 SCA-42 SCA-43 SCA-44	624.
	1½-3 5-7½ 10 15	2	FAL36015-13M FAL36030-15M FAL36050-16M FAL36100-18M	SDG-41 SDG-42 SDG-43 SDG-44	748.	SDW-41 SDW-42 SDW-43 SDW-44	1340.	SDW-51 SDW-52 SDW-53 SDW-54	1474.	SDR-41 SDR-42 SDR-43 SDR-44	1474.	SDA-51 SDA-52 SDA-53 SDA-54	SDA-41 SDA-42 SDA-43 SDA-44	884.
	15-30	3	FAL36100-18M	SEG-42	1088.	SEW-42	2120.	SEW-52	2332.	SER-42	2436.	SEA-52	SEA-42	1264.
	40 50	4	KAL36225-26M KAL36225-29M	SFG-43 SFG-44	2388.	SFW-43 SFW-44	3708.	SFW-53 SFW-54	4080.	SFR-43 SFR-44	3796.	SFA-53 SFA-54	SFA-43 SFA-44	2876.
	60 75 100	5	KAL36225-31M LAL36400-32M LAL36400-35M	SGG-43 SGG-44 SGG-46	5538.	SGW-43 SGW-44 SGW-46	8906.	....	....	SGR-43 SGR-44 SGR-46	8250.	SGA-53 SGA-54 SGA-56	SGA-43 SGA-44 SGA-46	6418.
	125-150 200	6	MAL36600-40M MAL36600-44M	SHG-44 SHG-46	12026.	SHW-44 SHW-46	14026.	....	....	SHR-44 SHR-46	19124.	SHA-54 SHA-56	SHA-44 SHA-46	13106.
	250 300	7	MAL36600-45M MAL36600-47M	SJG-42 SJG-43	16242.	SJW-42 SJW-43	18242.	....	....	....	....	SJA-52 SJA-53	....	17322.

***Prices do not include thermal units.**
◐NEMA Type 12 enclosures may be field modified for outdoor applications.
†Size 6 device uses Killark Electric bolted enclosure; not U.L. Listed.
▲NEMA Type 4X hubs are included with each starter at no additional cost.

★MOTOR CODE LETTER TABLE

Horsepower	Motor Code Letters
½ or less	A-L
¾ — 1½	A-K
2 — 3	A-J
5 — 25	A-H
30 — 125	A-G
150 or more	A-F

For other motors a special thermal trip circuit breaker with magnetic trip settings for the specific motor is required. When ordering combination starters for these special applications, specify the complete motor horsepower, voltage, frequency, full load current and **code letter** (or locked rotor current) to assure proper selection. This special circuit breaker will be listed as Form Y53-8.

◆UL LISTED SHORT CIRCUIT WITHSTAND RATINGS‡

NEMA Size	Voltage	Available Amperes RMS Symmetrical
0 & 1	0-480	22,000
0 & 1	481-600	10,000
2-6	600	22,000
7	0-480	30,000
7	481-600	22,000
0-3 With CLM See Page 14	600	100,000
0-3 NEMA 7 & 9	600	5,000
4-5 NEMA 7 & 9	600	10,000

‡NEMA Type 4X is not UL Listed.

✤ HAZARDOUS LOCATIONS

NEMA Type 12 devices are available U.L. Listed for use in Class II, Division 2, Group G and Class III, Divisions 1 and 2 locations. Request Form G2-1. No additional charge.

AC COMBINATION STARTERS

MAG-GARD® MOTOR CIRCUIT PROTECTOR TYPE

CLASS 8539

UL LISTED◆ FOR 22,000A OR 100,000A

NOTE: The type number selections are listed for motors with typical locked rotor inrush characteristics.

LINE VOLTAGE TYPE, NON-REVERSING — WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE, 600 VOLTS AC MAXIMUM — 50-60 HERTZ

Ratings				General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) **NEMA Type 4**		Watertight, Dusttight and Corrosion Resistant Enclosure **NEMA Type 4X▲**		For Hazardous Locations SPIN TOP® Enclosure Class I Groups C & D Class II Groups E, F & G **NEMA Types 7 and 9†**		Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12◐✤**		
Motor Voltage (Starter Voltage)	H.P. Range Poly-phase	NEMA Size	Catalog Number (See below for Breaker Adjustment Range)	Type	Price*	Type	Price*	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
460 (480)	¼-1 1½-3 5	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41 SBG-42 SBG-43	$ 508.	SBW-41 SBW-42 SBW-43	$ 892.	SBW-51 SBW-52 SBW-53	$1024.	SBR-41 SBR-42 SBR-43	$1078.	SBA-51 SBA-52 SBA-53	SBA-41 SBA-42 SBA-43	$ 604.
	¼-1 1½-3 5-7½ 10	1	FAL36003-11M FAL36007-12M FAL36015-13M FAL36030-15M	SCG-41 SCG-42 SCG-43 SCG-44	528.	SCW-41 SCW-42 SCW-43 SCW-44	912.	SCW-51 SCW-52 SCW-53 SCW-54	1048.	SCR-41 SCR-42 SCR-43 SCR-44	1104.	SCA-51 SCA-52 SCA-53 SCA-54	SCA-41 SCA-42 SCA-43 SCA-44	624.
	5-7½ 10-15 20-25	2	FAL36015-13M FAL36030-15M FAL36050-16M	SDG-41 SDG-42 SDG-43	748.	SDW-41 SDW-42 SDW-43	1340.	SDW-51 SDW-52 SDW-53	1474.	SDR-41 SDR-42 SDR-43	1474.	SDA-51 SDA-52 SDA-53	SDA-41 SDA-42 SDA-43	884.
	20-25 30-50	3	FAL36050-16M FAL36100-18M	SEG-41 SEG-42	1088.	SEW-41 SEW-42	2120.	SEW-51 SEW-52	2332.	SER-41 SER-42	2436.	SEA-51 SEA-52	SEA-41 SEA-42	1264.
	60-75 100	4	KAL36225-25M KAL36225-29M	SFG-42 SFG-44	2388.	SFW-42 SFW-44	3708.	SFW-52 SFW-54	4080.	SFR-42 SFR-44	3796.	SFA-52 SFA-54	SFA-42 SFA-44	2876.
	125 150 200	5	KAL36225-31M LAL36400-32M LAL36400-35M	SGG-43 SGG-44 SGG-46	5538.	SGW-43 SGW-44 SGW-46	8906.	.....	....	SGR-43 SGR-44 SGR-46	8250.	SGA-53 SGA-54 SGA-56	SGA-43 SGA-44 SGA-46	6418.
	250 300 350 400	6	LAL36400-36M MAL36600-40M MAL36600-42M MAL36600-44M	SHG-43 SHG-44 SHG-45 SHG-46	12026.	SHW-43 SHW-44 SHW-45 SHW-46	14026.	.....	....	SHR-43 SHR-44 SHR-45 SHR-46	19124.	SHA-53 SHA-54 SHA-55 SHA-56	SHA-43 SHA-44 SHA-45 SHA-46	13106.
	500 600	7	MAL36800-45M MAL361000-47M	SJG-42 SJG-43	16242.	SJW-42 SJW-43	18242.	....	....	....	....	SJA-52 SJA-53	....	17322.
	700-900	8	PAF■	KG-1	24170.	KW-1	26170.	.....	....	.....	....	KA-1	.....	25250.
575 (600)	¼-1 1½-3 5	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41 SBG-42 SBG-43	508.	SBW-41 SBW-42 SBW-43	892.	SBW-51 SBW-52 SBW-53	1024.	SBR-41 SBR-42 SBR-43	1078.	SBA-51 SBA-52 SBA-53	SBA-41 SBA-42 SBA-43	604.
	¼-1 1½-3 5-10	1	FAL36003-11M FAL36007-12M FAL36015-13M	SCG-41 SCG-42 SCG-43	528.	SCW-41 SCW-42 SCW-43	912.	SCW-51 SCW-52 SCW-53	1048.	SCR-41 SCR-42 SCR-43	1104.	SCA-51 SCA-52 SCA-53	SCA-41 SCA-42 SCA-43	624.
	5-10 15-20 25	2	FAL36015-13M FAL36030-15M FAL36050-16M	SDG-41 SDG-42 SDG-43	748.	SDW-41 SDW-42 SDW-43	1340.	SDW-51 SDW-52 SDW-53	1474.	SDR-41 SDR-42 SDR-43	1474.	SDA-51 SDA-52 SDA-53	SDA-41 SDA-42 SDA-43	884.
	25-30 40-50	3	FAL36050-16M FAL36100-18M	SEG-41 SEG-42	1088.	SEW-41 SEW-42	2120.	SEW-51 SEW-52	2332.	SER-41 SER-42	2436.	SEA-51 SEA-52	SEA-41 SEA-42	1264.
	60-100	4	KAL36225-25M	SFG-42	2388.	SFW-42	3708.	SFW-52	4080.	SFR-42	3796.	SFA-52	SFA-42	2876.
	125 150 200	5	KAL36225-29M KAL36225-30M LAL36400-32M	SGG-41 SGG-42 SGG-44	5538.	SGW-41 SGW-42 SGW-44	8906.	....	....	SGR-41 SGR-42 SGR-44	8250.	SGA-51 SGA-52 SGA-54	SGA-41 SGA-42 SGA-44	6418.
	250 300 350-400	6	LAL36400-35M LAL36400-36M MAL36600-40M	SHG-42 SHG-43 SHG-44	12026.	SHW-42 SHW-43 SHW-44	14026.	....	....	SHR-42 SHR-43 SHR-44	19124.	SHA-52 SHA-53 SHA-54	SHA-42 SHA-43 SHA-44	13106.
	500 600	7	MAL36600-44M MAL36800-45M	SJG-41 SJG-42	16242.	SJW-41 SJW-42	18242.	....	....	....	....	SJA-51 SJA-52	....	17322.
	700-900	8	PAF■	KG-1	24170.	KW-1	26170.	.....	....	.....	....	KA-1	.....	25250.

*Prices do not include thermal units.
◐NEMA Type 12 enclosures may be field modified for outdoor applications.
■Circuit breaker ratings for Size 7 and 8 devices are dependent on H.P. and voltage supplied at time of order entry.
†Size 6 device uses Kirlark Electric bolted enclosure; not U.L. Listed.
▲NEMA Type 4X hubs are included with each starter at no additional cost.

MAG-GARD TRIP RANGE

Suffix Number	Range Amps.	Suffix Number	Range Amps.	Suffix Number	Range Amps.
11M	8-28	25M	625-1250	33M	1500-3000
12M	18-70	26M	750-1500	35M	1750-3500
13M	50-180	29M	875-1750	36M	2000-4000
15M	100-350	30M	1000-2000	40M	2500-5000
16M	150-580	31M	1125-2250	42M	3000-6000
18M	300-1100	32M	1250-2500	44M	3500-7000

◆UL LISTED SHORT CIRCUIT WITHSTAND RATINGS‡

NEMA Size	Voltage	Available Amperes RMS Symmetrical
0 & 1	0-480	22,000
0 & 1	481-600	10,000
2-6	600	22,000
7	0-480	30,000
7	481-600	22,000
0-3 With CLM See Page 14	600	100,000
0-3 NEMA 7 & 9	600	5,000
4-5 NEMA 7 & 9	600	10,000

‡NEMA Type 4X is not UL Listed.

✤ HAZARDOUS LOCATIONS

NEMA Type 12 devices are available U.L. Listed for use in Class II, Division 2, Group G and Class III, Divisions 1 and 2 locations. Request Form G2-1. No additional charge.

CLASS 8538

COMBINATION STARTERS IN OVERSIZED ENCLOSURES

JANUARY, 1982

LINE VOLTAGE TYPE, NON-REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

UL LISTED ♦

3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

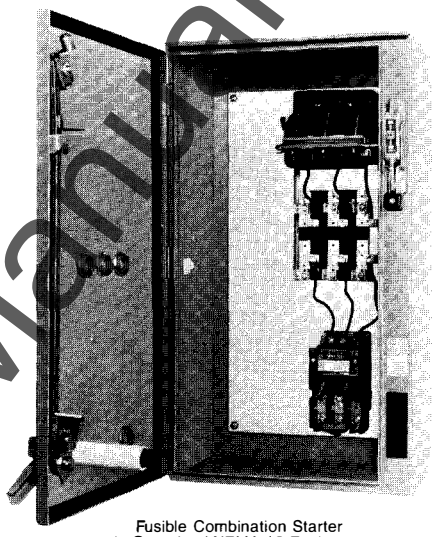
CLASS 8538 NON-FUSIBLE DISCONNECT SWITCH TYPE

Ratings				General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight Enclosure Stainless Steel **NEMA Type 4**		Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12✤**		
Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Fuse Clip Size Amps	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
200 (208)	3	0	NONE	SBG-11-S8	**$464.**	SBW-11-S8	**$1048.**	SBA-21-S8	SBA-11-S8	**$640.**
	7½	1	NONE	SCG-11-S8	**484.**	SCW-11-S8	**1068.**	SCA-21-S8	SCA-11-S8	**660.**
	10	2	NONE	SDG-11-S8	**708.**	SDW-11-S8	**1500.**	SDA-21-S8	SDA-11-S8	**924.**
230 (240)	3	0	NONE	SBG-11-S8	**464.**	SBW-11-S8	**1048.**	SBA-21-S8	SBA-11-S8	**640.**
	7½	1	NONE	SCG-11-S8	**484.**	SCW-11-S8	**1068.**	SCA-21-S8	SCA-11-S8	**660.**
	15	2	NONE	SDG-11-S8	**708.**	SDW-11-S8	**1500.**	SDA-21-S8	SDA-11-S8	**924.**
460-575 (480-600)	5	0	NONE	SBG-11-S8	**464.**	SBW-11-S8	**1048.**	SBA-21-S8	SBA-11-S8	**640.**
	10	1	NONE	SCG-11-S8	**484.**	SCW-11-S8	**1068.**	SCA-21-S8	SCA-11-S8	**660.**
	25	2	NONE	SDG-11-S8	**708.**	SDW-11-S8	**1500.**	SDA-21-S8	SDA-11-S8	**924.**

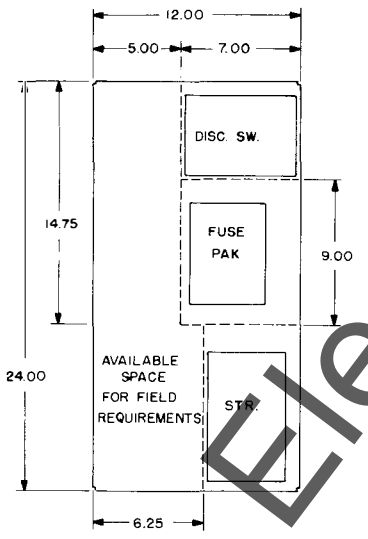
CLASS 8538 FUSIBLE DISCONNECT SWITCH TYPE

200 (208)	3	0	30	SBG-12-S8	**$476.**	SBW-12-S8	**$1060.**	SBA-22-S8	SBA-12-S8	**$652.**
	5	1	30	SCG-12-S8	**496.**	SCW-12-S8	**1080.**	SCA-22-S8	SCA-12-S8	**672.**
	7½	1	60	SCG-13-S8	**504.**	SCW-13-S8	**1088.**	SCA-23-S8	SCA-13-S8	**680.**
	10	2	60	SDG-12-S8	**724.**	SDW-12-S8	**1516.**	SDA-22-S8	SDA-12-S8	**940.**
230 (240)	3	0	30	SBG-12-S8	**476.**	SBW-12-S8	**1060.**	SBA-22-S8	SBA-12-S8	**652.**
	5	1	30	SCG-12-S8	**496.**	SCW-12-S8	**1080.**	SCA-22-S8	SCA-12-S8	**672.**
	7½	1	60	SCG-13-S8	**504.**	SCW-13-S8	**1088.**	SCA-23-S8	SCA-13-S8	**680.**
	15	2	60	SDG-12-S8	**724.**	SDW-12-S8	**1516.**	SDA-22-S8	SDA-12-S8	**940.**
460-575 (480-600)	5	0	30	SBG-13-S8	**484.**	SBW-13-S8	**1068.**	SBA-23-S8	SBA-13-S8	**660.**
	10	1	30	SCG-14-S8	**504.**	SCW-14-S8	**1088.**	SCA-24-S8	SCA-14-S8	**680.**
	15	2	30	SDG-16-S8	**728.**	SDW-16-S8	**1520.**	SDA-26-S8	SDA-16-S8	**944.**
	25	2	60	SDG-14-S8	**736.**	SDW-14-S8	**1528.**	SDA-24-S8	SDA-14-S8	**952.**

UP TO 190 SQ. IN. PANEL SPACE FOR CUSTOMER USE



Fusible Combination Starter
In Oversized NEMA 12 Enclosure



3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

CLASS 8538 FUSIBLE DISCONNECT SWITCH TYPE WITH CLASS R FUSE CLIPS

Ratings				General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight Enclosure Stainless Steel **NEMA Type 4**		Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12✤**		
Motor Voltage (Starter Voltage)	Max. HP Poly-phase	NEMA Size	Fuse Clip Size Amps	Type	Price*	Type	Price*	With External Reset Type	Without External Reset Type	Price*
200 (208)	3	0	30	SBG-32-S8	**$482.**	SBW-32-S8	**$1064.**	SBA-42-S8	SBA-32-S8	**$658.**
	5	1	30	SCG-32-S8	**502.**	SCW-32-S8	**1086.**	SCA-42-S8	SCA-32-S8	**678.**
	7½	1	60	SCG-33-S8	**510.**	SCW-33-S8	**1094.**	SCA-43-S8	SCA-33-S8	**686.**
	10	2	60	SDG-32-S8	**730.**	SDW-32-S8	**1522.**	SDA-42-S8	SDA-32-S8	**946.**
230 (240)	3	0	30	SBG-32-S8	**482.**	SBW-32-S8	**1066.**	SBA-42-S8	SBA-32-S8	**658.**
	5	1	30	SCG-32-S8	**502.**	SCW-32-S8	**1086.**	SCA-42-S8	SCA-32-S8	**678.**
	7½	1	60	SCG-33-S8	**510.**	SCW-33-S8	**1094.**	SCA-43-S8	SCA-33-S8	**686.**
	15	2	60	SDG-32-S8	**730.**	SDW-32-S8	**1522.**	SDA-42-S8	SDA-32-S8	**946.**
460-575 (480-600)	5	0	30	SBG-33-S8	**490.**	SBW-33-S8	**1074.**	SBA-43-S8	SBA-33-S8	**666.**
	10	1	30	SCG-34-S8	**510.**	SCW-34-S8	**1094.**	SCA-44-S8	SCA-34-S8	**686.**
	15	2	30	SDG-36-S8	**734.**	SDW-36-S8	**1526.**	SDA-46-S8	SDA-36-S8	**950.**
	25	2	60	SDG-34-S8	**742.**	SDW-34-S8	**1534.**	SDA-44-S8	SDA-34-S8	**958.**

✤ HAZARDOUS LOCATIONS

NEMA Type 12 devices are available U.L. Listed for use in Class II, Division 2, Group G and Class III, Divisions 1 and 2 locations. Request Form G2-1. No additional charge.

♦UL LISTED SHORT CIRCUIT WITHSTAND RATING

Fuse Clip Type	Available Amperes RMS Symmetrical
Standard	5,000
Class R	100,000

Class 8538 Non-Fusible disconnect switch type UL listed. Short circuit withstand rating not applicable.

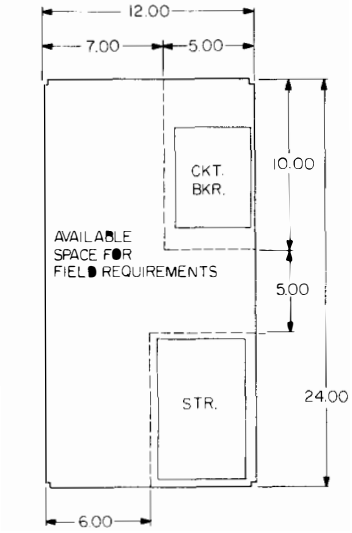
Disconnect switch type combination starters in oversized enclosures are provided with a 60 ampere disconnect switch as standard.

COMBINATION STARTERS IN OVERSIZED ENCLOSURES

LINE VOLTAGE TYPE, NON-REVERSING WITH THREE MELTING ALLOY OVERLOAD RELAYS

CLASS 8539

UL LISTED ♦



3 POLE — 600 VOLTS MAX. — 50-60 HERTZ

CLASS 8539 MAG-GARD● MOTOR CIRCUIT PROTECTOR TYPE

Motor Voltage (Starter Voltage)	Ratings H.P. Range Polyphase	NEMA Size	Catalog Number (See page 232 for Breaker Adjustment Range)	General Purpose Enclosure NEMA Type 1 Type	Price*	Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) NEMA Type 4 Type	Price*	Dusttight and Driptight Industrial Use Enclosure NEMA Type 12● ✚ With External Reset Type	Without External Reset Type	Price*
200 (208)	¼-⅓ ½-1 1½-3	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41-S8 SBG-42-S8 SBG-43-S8	**$608.**	SBW-41-S8 SBW-42-S8 SBW-43-S8	**$1192.**	SBA-51-S8 SBA-52-S8 SBA-53-S8	SBA-41-S8 SBA-42-S8 SBA-43-S8	**$ 784.**
	¼-⅓ ½-1 1½-3 5 7½	1	FAL36003-11M FAL36007-12M FAL36015-13M FAL36030-15M FAL36050-16M	SCG-41-S8 SCG-42-S8 SCG-43-S8 SCG-44-S8 SCG-45-S8	**628.**	SCW-41-S8 SCW-42-S8 SCW-43-S8 SCW-44-S8 SCW-45-S8	**1212.**	SCA-51-S8 SCA-52-S8 SCA-53-S8 SCA-54-S8 SCA-55-S8	SCA-41-S8 SCA-42-S8 SCA-43-S8 SCA-44-S8 SCA-45-S8	**804.**
	1½-3 5 7½-10	2	FAL36015-13M FAL36030-15M FAL36050-16M	SDG-41-S8 SDG-42-S8 SDG-43-S8	**848.**	SDW-41-S8 SDW-42-S8 SDW-43-S8	**1640.**	SDA-51-S8 SDA-52-S8 SDA-53-S8	SDA-41-S8 SDA-42-S8 SDA-43-S8	**1064.**
230 (240)	¼-⅓ ½-1 1½-3	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41-S8 SBG-42-S8 SBG-43-S8	**608.**	SBW-41-S8 SBW-42-S8 SBW-43-S8	**1192.**	SBA-51-S8 SBA-52-S8 SBA-53-S8	SBA-41-S8 SBA-42-S8 SBA-43-S8	**784.**
	¼-⅓ ½-1 1½-3 5-7½	1	FAL36003-11M FAL36007-12M FAL36015-13M FAL36030-15M	SCG-41-S8 SCG-42-S8 SCG-43-S8 SCG-44-S8	**628.**	SCW-41-S8 SCW-42-S8 SCW-43-S8 SCW-44-S8	**1212.**	SCA-51-S8 SCA-52-S8 SCA-53-S8 SCA-54-S8	SCA-41-S8 SCA-42-S8 SCA-43-S8 SCA-44-S8	**804.**
	1½-3 5-7½ 10 15	2	FAL36015-13M FAL36030-15M FAL36050-16M FAL36100-18M	SDG-41-S8 SDG-42-S8 SDG-43-S8 SDG-44-S8	**848.**	SDW-41-S8 SDW-42-S8 SDW-43-S8 SDW-44-S8	**1640.**	SDA-51-S8 SDA-52-S8 SDA-53-S8 SDA-54-S8	SDA-41-S8 SDA-42-S8 SDA-43-S8 SDA-44-S8	**1064.**
460 (480)	¼-1 1½-3 5	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41-S8 SBG-42-S8 SBG-43-S8	**608.**	SBW-41-S8 SBW-42-S8 SBW-43-S8	**1192.**	SBA-51-S8 SBA-52-S8 SBA-53-S8	SBA-41-S8 SBA-42-S8 SBA-43-S8	**784.**
	¼-1 1½-3 5-7½ 10	1	FAL36003-11M FAL36007-12M FAL36015-13M FAL36030-15M	SCG-41-S8 SCG-42-S8 SCG-43-S8 SCG-44-S8	**628.**	SCW-41-S8 SCW-42-S8 SCW-43-S8 SCW-44-S8	**1212.**	SCA-51-S8 SCA-52-S8 SCA-53-S8 SCA-54-S8	SCA-41-S8 SCA-42-S8 SCA-43-S8 SCA-44-S8	**804.**
	5-7½ 10-15 20-25	2	FAL36015-13M FAL36030-15M FAL36050-16M	SDG-41-S8 SDG-42-S8 SDG-43-S8	**848.**	SDW-41-S8 SDW-42-S8 SDW-43-S8	**1640.**	SDA-51-S8 SDA-52-S8 SDA-53-S8	SDA-41-S8 SDA-42-S8 SDA-43-S8	**1064.**
575 (600)	¼-1 1½-3 5	0	FAL36003-11M FAL36007-12M FAL36015-13M	SBG-41-S8 SBG-42-S8 SBG-43-S8	**608.**	SBW-41-S8 SBW-42-S8 SBW-43-S8	**1192.**	SBA-51-S8 SBA-52-S8 SBA-53-S8	SBA-41-S8 SBA-42-S8 SBA-43-S8	**784.**
	¼-1 1½-3 5-10	1	FAL36003-11M FAL36007-12M FAL36015-13M	SCG-41-S8 SCG-42-S8 SCG-43-S8	**628.**	SCW-41-S8 SCW-42-S8 SCW-43-S8	**1212.**	SCA-51-S8 SCA-52-S8 SCA-53-S8	SCA-41-S8 SCA-42-S8 SCA-43-S8	**804.**
	5-10 15-20 25	2	FAL36015-13M FAL36030-15M FAL36050-16M	SDG-41-S8 SDG-42-S8 SDG-43-S8	**848.**	SDW-41-S8 SDW-42-S8 SDW-43-S8	**1640.**	SDA-51-S8 SDA-52-S8 SDA-53-S8	SDA-41-S8 SDA-42-S8 SDA-43-S8	**1064.**

*** Prices do not include thermal units.**
● NEMA Type 12 enclosures may be field modified for outdoor applications.

♦UL LISTED
SHORT CIRCUIT WITHSTAND RATINGS

NEMA Size	Voltage	Available Amperes RMS Symmetrical
0 & 1	0-480	22,000
0 & 1	481-600	10,000
2	600	22,000
0-2 With CLM See P. 14	600	100,000

Combination starters in oversized enclosures provide additional panel space for customer or factory installation of control transformers, fuse blocks, relays, timers and other auxiliary equipment.

All have three Type "K" holes for installation of pushbuttons or pilot lights provided as standard.

✚ HAZARDOUS LOCATIONS

NEMA Type 12 devices are available U.L. Listed for use in Class II, Division 2, Group G and Class III, Divisions 1 and 2 locations. Request Form G2-1. No additional charge.

CLASS 8539

AC COMBINATION STARTERS — THERMAL MAGNETIC CIRCUIT BREAKER TYPE

JANUARY, 1982

UL LISTED ♦

LINE VOLTAGE TYPE, NON-REVERSING — WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE, 600 VOLTS AC MAXIMUM — 50-60 HERTZ

Ratings					General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) **NEMA Type 4**		Watertight Dusttight and Corrosion Resistant Enclosure **NEMA Type 4X△**		For Hazardous Locations SPIN TOP® Enclosure Class I Groups C & D Class II Groups E, F & G **NEMA Types 7 and 9**		Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12** (Type 3 and 3R)◐✤		
Motor Voltage (Starter Voltage)	Max. H.P. Poly-phase	NEMA Size	Circuit Breakers Type	Circuit Breakers Ampere Rating	Type	* Price	Type	* Price	Type	* Price	Type	* Price	With External Reset Type	Without External Reset Type	* Price
200 (208)	2 3	0	FAL‡	15 20	SBG-1 SBG-3	$ 392.	SBW-1 SBW-3	$ 776.	SBW-11 SBW-13	$ 892.	SBR-1 SBR-3	$ 972.	SBA-11 SBA-13	SBA-1 SBA-3	$ 488.
	5 7½	1	FAL‡	35 50	SCG-5 SCG-2	412.	SCW-5 SCW-2	796.	SCW-15 SCW-12	916.	SCR-5 SCR-2	990.	SCA-15 SCA-12	SCA-5 SCA-2	508.
	10	2	FAL‡	60	SDG-1	632.	SDW-1	1224.	SDW-11	1348.	SDR-1	1358.	SDA-11	SDA-1	768.
	15 20 25	3	FAL FAL KAL	90 100 110	SEG-3 SEG-1 SEG-5	1088.	SEW-3 SEW-1 SEW-5	2120.	SEW-13 SEW-11 SEW-15	2332.	SER-3 SER-1 SER-5	2436.	SEA-13 SEA-11 SEA-15	SEA-3 SEA-1 SEA-5	1264.
	30 40	4	KAL	125 175	SFG-3 SFG-4	2388.	SFW-3 SFW-4	3708.	SFW-13 SFW-14	4080.	SFR-3 SFR-4	3796.	SFA-13 SFA-14	SFA-3 SFA-4	2876.
	50 60 75	5	LAL	200 250 300	SGG-6 SGG-1 SGG-4	5538.	SGW-6 SGW-1 SGW-4	8906.	.....	.....	SGR-6 SGR-1 SGR-4	8250.	SGA-16 SGA-11 SGA-14	SGA-6 SGA-1 SGA-4	6418.
	100 125 150	6	MAL	450 600 700	SHG-4 SHG-3 SHG-5	12026	SHW-4 SHW-3 SHW-5	14026.	.....	.....	.....	.....	SHA-14 SHA-13 SHA-15	SHA-4 SHA-3 SHA-5	13106.
230 (240)	2 3	0	FAL‡	15 20	SBG-1 SBG-3	392.	SBW-1 SBW-3	776.	SBW-11 SBW-13	892.	SBR-1 SBR-3	972.	SBA-11 SBA-13	SBA-1 SBA-3	488.
	5 7½	1	FAL‡	30 45	SCG-1 SCG-6	412.	SCW-1 SCW-6	796.	SCW-11 SCW-16	916.	SCR-1 SCR-6	990.	SCA-11 SCA-16	SCA-1 SCA-6	508.
	10 15	2	FAL‡	60 80	SDG-1 SDG-7	632.	SDW-1 SDW-7	1224.	SDW-11 SDW-17	1348.	SDR-1 SDR-7	1358.	SDA-11 SDA-17	SDA-1 SDA-7	768.
	20 25 30	3	FAL FAL KAL	90 100 110	SEG-3 SEG-1 SEG-5	1088.	SEW-3 SEW-1 SEW-5	2120.	SEW-13 SEW-11 SEW-15	2332.	SER-3 SER-1 SER-5	2436.	SEA-13 SEA-11 SEA-15	SEA-3 SEA-1 SEA-5	1264.
	40 50	4	KAL	150 175	SFG-1 SFG-4	2388.	SFW-1 SFW-4	3708.	SFW-11 SFW-14	4080.	SFR-1 SFR-4	3796.	SFA-11 SFA-14	SFA-1 SFA-4	2876.
	60 75 100	5	LAL	225 250 350	SGG-3 SGG-1 SGG-2	5538.	SGW-3 SGW-1 SGW-2	8906.	.....	.....	SGR-3 SGR-1 SGR-2	8250.	SGA-13 SGA-11 SGA-12	SGA-3 SGA-1 SGA-2	6418.
	125 150 200	6	MAL	450 600 800	SHG-4 SHG-3 SHG-7	12026.	SHW-4 SHW-3 SHW-7	14026.	.....	.....	.....	.....	SHA-14 SHA-13 SHA-17	SHA-4 SHA-3 SHA-7	13106.
	250 300	7	MAL	800 1000	SJG-2 SJG-3	16242.	SJW-2 SJW-3	18242.	.....	.....	.....	.....	SJA-12 SJA-13	.....	17322.

***Prices do not include thermal units.**

◐NEMA Type 12 enclosures may be field modified for outdoor applications.

△NEMA Type 4X hubs are included with each starter at no additional cost.

‡Rated 250 Volts Max.

✤ HAZARDOUS LOCATIONS

NEMA Type 12 devices are available U.L. Listed for use in Class II, Division 2, Group G and Class III, Divisions 1 and 2 locations. Request Form G2-1. No additional charge.

♦ UL LISTED SHORT CIRCUIT WITHSTAND RATINGS ■

NEMA Size	Available Amperes RMS Symmetrical
0-3	5,000
4-5	10,000
6	18,000
0-480 V	30,000
481-600 V	22,000

■NEMA Type 4X devices are not UL Listed.

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ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Horsepower, voltage, phase, frequency and full load current of motor.
3. Control voltage and frequency if different from line voltage.
4. Any special features required, see "Factory Modifications and Forms."

THERMAL UNITS

Thermal units should be ordered separately. For selection see "Overload and Short Circuit Protection." All devices listed above require three thermal units.

AC COMBINATION STARTERS — THERMAL MAGNETIC CIRCUIT BREAKER TYPE

UL LISTED ♦ CLASS 8539

LINE VOLTAGE TYPE, NON-REVERSING — WITH THREE MELTING ALLOY OVERLOAD RELAYS

3 POLE, 600 VOLTS AC MAXIMUM — 50-60 HERTZ

Ratings					General Purpose Enclosure **NEMA Type 1**		Watertight and Dusttight Enclosure Stainless Steel (Sizes 0-5) **NEMA Type 4**		Watertight Dusttight and Corrosion Resistant Enclosure **NEMA Type 4X△**		For Hazardous Locations SPIN TOP® Enclosure Class I Groups C & D Class II Groups E, F & G **NEMA Types 7 and 9**		Dusttight and Driptight Industrial Use Enclosure **NEMA Type 12** (Type 3 and 3R)◐✚		
Motor Voltage (Starter Voltage)	Max. H.P. Poly-phase	NEMA Size	Circuit Breakers Type	Circuit Breakers Ampere Rating	Type	* Price	Type	* Price	Type	* Price	Type	* Price	With External Reset Type	Without External Reset Type	* Price
460 (480)	5	0	FAL	15	SBG-2	$ 508.	SBW-2	$ 892.	SBW-12	$1024.	SBR-2	$1078.	SBA-12	SBA-2	$ 604.
	7½ 10	1	FAL	20 25	SCG-3 SCG-7	528.	SCW-3 SCW-7	912.	SCW-13 SCW-17	1048.	SCR-3 SCR-7	1104.	SCA-13 SCA-17	SCA-3 SCA-7	624.
	15 20 25	2	FAL	40 60 70	SDG-3 SDG-4 SDG-5	748.	SDW-3 SDW-4 SDW-5	1340.	SDW-13 SDW-14 SDW-15	1474.	SDR-3 SDR-4 SDR-5	1474.	SDA-13 SDA-14 SDA-15	SDA-3 SDA-4 SDA-5	884.
	30 40 50	3	FAL	80 90 100	SEG-6 SEG-3 SEG-1	1088.	SEW-6 SEW-3 SEW-1	2120.	SEW-16 SEW-13 SEW-11	2332.	SER-6 SER-3 SER-1	2436.	SEA-16 SEA-13 SEA-11	SEA-6 SEA-3 SEA-1	1264.
	60 75 100	4	KAL	110 125 175	SFG-5 SFG-3 SFG-4	2388.	SFW-5 SFW-3 SFW-4	3708.	SFW-15 SFW-13 SFW-14	4080.	SFR-5 SFR-3 SFR-4	3796.	SFA-15 SFA-13 SFA-14	SFA-5 SFA-3 SFA-4	2876.
	125 150 200	5	LAL	225 250 350	SGG-3 SGG-1 SGG-2	5538.	SGW-3 SGW-1 SGW-2	8906.	....	.....	SGR-3 SGR-1 SGR-2	8250.	SGA-13 SGA-11 SGA-12	SGA-3 SGA-1 SGA-2	6418.
	250 300 350 400	6	MAL	450 600 700 800	SHG-4 SHG-3 SHG-5 SHG-7	12026.	SHW-4 SHW-3 SHW-5 SHW-7	14026.	....	.....	....	.....	SHA-14 SHA-13 SHA-15 SHA-17	SHA-4 SHA-3 SHA-5 SHA-7	13106.
	500 600	7	MAL	800 1000	SJG-2 SJG-3	16242.	SJW-2 SJW-3	18242.	....	.....	....	.....	SJA-12 SJA-13	....	17322.
	900	8	PAF	▲	KG-1	24170.	KW-1	26170.	.....	.....	....	.....	KA-1	.....	25250.
575 (600)	5	0	FAL	15	SBG-2	508.	SBW-2	892.	SBW-12	1024.	SBR-2	1078.	SBA-12	SBA-2	604.
	7½ 10	1	FAL	15 20	SCG-8 SCG-3	528.	SCW-8 SCW-3	912.	SCW-18 SCW-13	1048.	SCR-8 SCR-3	1104.	SCA-18 SCA-13	SCA-8 SCA-3	624.
	15 20 25	2	FAL	35 45 60	SDG-8 SDG-9 SDG-4	748.	SDW-8 SDW-9 SDW-4	1340.	SDW-18 SDW-19 SDW-14	1474.	SDR-8 SDR-9 SDR-4	1474.	SDA-18 SDA-19 SDA-14	SDA-8 SDA-9 SDA-4	884.
	30 40 50	3	FAL	60 80 90	SEG-4 SEG-6 SEG-3	1088.	SEW-4 SEW-6 SEW-3	2120.	SEW-14 SEW-16 SEW-13	2332.	SER-4 SER-6 SER-3	2436.	SEA-14 SEA-16 SEA-13	SEA-4 SEA-6 SEA-3	1264.
	60 75 100	4	FAL KAL KAL	100 110 150	SFG-6 SFG-5 SFG-1	2388.	SFW-6 SFW-5 SFW-1	3708.	SFW-16 SFW-15 SFW-11	4080.	SFR-6 SFR-5 SFR-1	3796.	SFA-16 SFA-15 SFA-11	SFA-6 SFA-5 SFA-1	2876.
	125 150 200	5	KAL LAL LAL	175 200 250	SGG-7 SGG-6 SGG-1	5538.	SGW-7 SGW-6 SGW-1	8906.	....	.....	SGR-7 SGR-6 SGR-1	8250.	SGA-17 SGA-16 SGA-11	SGA-7 SGA-6 SGA-1	6418.
	250 300 350 400	6	MAL	350 450 500 600	SHG-6 SHG-4 SHG-2 SHG-3	12026.	SHW-6 SHW-4 SHW-2 SHW-3	14026.	....	.....	....	.....	SHA-16 SHA-14 SHA-12 SHA-13	SHA-6 SHA-4 SHA-2 SHA-3	13106.
	500 600	7	MAL	700 800	SJG-1 SJG-2	16242.	SJW-1 SJW-2	18242.	....	.....	....	.....	SJA-11 SJA-12	....	17322.
	900	8	PAF	▲	KG-1	24170.	KW-1	26170.	.....	.....	....	.....	KA-1	.....	25250.

***Prices do not include thermal units.**
◐NEMA Type 12 enclosures may be field modified for outdoor applications.
△NEMA Type 4X hubs are included with each starter at no additional cost.
▲Circuit breaker rating for Size 8 device is dependent on H.P. and voltage supplied at time of order entry. MAG-GARD® circuit breakers are standard. Thermal Magnetic circuit breakers can be supplied upon request.

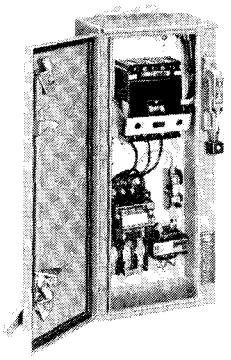
✚ HAZARDOUS LOCATIONS

NEMA Type 12 devices are available U.L. Listed for use in Class II, Division 2, Group G and Class III, Divisions 1 and 2 locations. Request Form G2-1. No additional charge.

♦UL LISTED SHORT CIRCUIT WITHSTAND RATINGS‡

NEMA Size	Available Amperes RMS Symmetrical
0-3	5,000
4-5	10,000
6	18,000
7	
0-480V	30,000
481-600V	22,000

‡NEMA Type 4X devices are not UL Listed.



Circuit Breaker Type Combination Starter in NEMA 12 Enclosure

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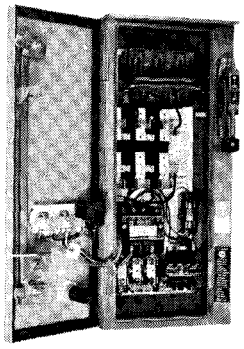
CLASS
8538
8539

AC COMBINATION STARTERS
APPLICATION DATA

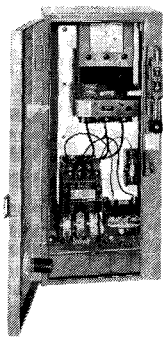
JANUARY, 1982

With minor exceptions, the National Electrical Code requires a disconnecting means for every motor. Combination starters provide the disconnect to meet this requirement and also provide a Class 8536 magnetic starter all in one enclosure.

A combination starter provides many advantages over a separate disconnect and starter. The single device takes up less room, makes a neater installation, is quicker to install and provides greater safety for operating personnel. Square D offers both switch and circuit breaker versions, either reversing or non-reversing.



Fusible Combination Starter with Control Transformer in NEMA Type 12 Enclosure



Circuit Breaker Combination Starter in NEMA Type 1 Enclosure

Class 8538 — Disconnect Switch Type, Non-Reversing

Class 8539 — Thermal Magnetic and MAG-GARD® Motor Circuit Protector Type, Non-Reversing

Class 8738 — Disconnect Switch Type, Reversing

Class 8739 — Thermal Magnetic and MAG-GARD® Motor Circuit Protector Type, Reversing

RATINGS

Poles — Three pole disconnect and starter for polyphase applications. For single phase applications, use standard three pole combination and reconnect for single phase.

Voltage — 600 volts ac maximum.

Frequency — Coils available for application on 50 or 60 hertz. Contacts can be applied at any hertz.

Magnetic Coils — Are designed to operate satisfactorily on line voltages of 85% to 110% of rated voltage.

Horsepower Ratings — All starters are rated in accordance with NEMA Standards. For complete data on contact ratings, refer to the Class 8536 application data section.

TERMINALS

NEMA Size	Type	Line Terminals On Disconnect			Power Terminals On Magnetic Starter			Control Terminals On Magnetic Starter		
		Type of Lug	Wire Size Min.-Max. Switch	Wire Size Min.-Max. Circuit Breaker	Type of Lug	Wire Size Min.-Max.	Wires Per Terminal	Type of Lug	Wire Size Min.-Max.	Wires Per Terminal
0 & 1	SB & SC	Box Lug	#14—#2 Copper #10—#2 Aluminum	#14—#4 Copper△ #12—#4 Aluminum or #14—#1/0 Copper #12—#1/0 Aluminum	Pressure Wire	#14—#8 Copper	1 or 2	Pressure Wire	#16—#12 Copper	2
2	SD	Box Lug	#14—#2 Copper #10—#2 Aluminum	#14—#1/0 Copper #12—#1/0 Aluminum	Box Lug	#14—#4 Copper	1	Pressure Wire	#16—#12 Copper	2
3	SE	Box Lug	#10—#00 Copper #6—#0 Aluminum	#14—#1/0 Copper #12—#1/0 Aluminum (FA Breaker) #4—300 MCM Copper or Aluminum (KA Breaker)	Box Lug	#6—#0 Copper	1	Pressure Wire	#16—#12 Copper	2
4	SF	Box Lug	#6—300 MCM Copper or Aluminum	#14—#1/0 Copper #12—#1/0 Aluminum (FA Breaker) #4—300 MCM Copper or Aluminum (KA Breaker)	Box Lug	#8—250 MCM Copper	1	Pressure Wire	#16—#12 Copper	2
5	SG	Box Lug	One #4—500 MCM Copper	#4—300 MCM Copper or Aluminum (KA Breaker) (1)#1—600 MCM or (2)#1—250 MCM Copper or Aluminum (LA Breaker)	Box Lug	#4—500 MCM Copper	1	Pressure Wire	#16—#12 Copper	2
6	SH	Box Lug	....	(1)#1—600 MCM or (2)#1—250 MCM Copper or Aluminum (LA Breaker) (3)#3/0—500 MCM Copper or Aluminum (MA Breaker)	Parallel Groove	250—500 MCM Copper◐	1 or 2	Pressure Wire	#16—#12 Copper▲	2
7	J Series A & B	Box Lug	....	(3)#3/0—500 MCM Copper or Aluminum	Clam Shell	350—500 MCM Copper	1 or 2	Pressure Wire	#16—#12 Copper	2
8	K Series A & B	Box Lug	....	#3/0—750 MCM Copper or Aluminum	Clam Shell	350—500 MCM Copper	1 or 2	Pressure Wire	#16—#12 Copper	2

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

▲Terminal block range limited to #16-#14.

△Use on FAL circuit breakers rated 25 amps. or less.

MAGNETIC STARTERS

The basic magnetic starters used in combination starters are 3 pole Class 8536 (for non-reversing) and 3 pole Class 8736 (for reversing) devices.

Complete application data is given in the Class 8536 and 8736 sections.

MAINTENANCE OF EQUIPMENT

The appropriate service bulletins listed below are included with each starter. Additional copies are available.

NEMA Size	Type	Service Bulletin Number		
		Starter	Disconnect Switch	Circuit Breaker
0	SB	277AS	281AS	284AS
1	SC	278AS	281AS	284AS
2	SD	279AS	464AS	284AS
3	SE	305AS	371AS	313AS
4	SF	306AS	358AS	313AS
5	SG	328AS	474AS	316AS
6	SH	342AS	473AS	317AS
7	SJ	397AS	—	—
8	K Series A & B	8502-3	—	—

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AC COMBINATION STARTERS
REPLACEMENT PARTS & MODIFICATION KITS

CLASS 8538 8539

REPLACEMENT PARTS LIST

NEMA Size	Starter Class 8536	Contact Kit Class 9998	Coils (60 Hz)				
			Specification Number	Coil Suffix			
				120 V	208 V	240 V	◆ 480 V	600 V
0	SBO-2	SL-2	31041-400	42	48	51	60	62
1	SCO-3	SL-3	31041-400	42	48	51	60	62
2	SDO-1	SL-4	31063-409	38	44	47	57	60
3	SEO-1	SL-7	31074-400	38	44	47	57	60
4	SFO-1	SL-9	31091-400	38	44	47	57	60
5	SGO-1	SL-11	31096-400	09	15	18	24	29
6	SHO-2	SL-26	31104-400	50	50	50	50	50
7	SJO-2	SL-31	31104-400	50	50	50	50	50
8	KO-1	KA-81	*31030-034	01	01	01	01	01

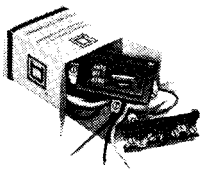
*Size 8 Series A & B Starters require 2 coils each.

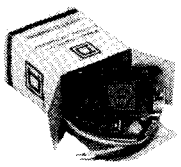
MODIFICATIONS — COVER MOUNTED CONTROL UNITS

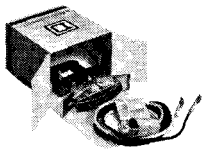
NEMA Type 1 Enclosures — Knockouts are provided in the cover to accept factory or field installed Class 9999 control units. The table below lists the kits for field installation.

NEMA Types 4 and 12 Enclosures — Three punched holes are provided in the cover to accept factory or field installation of Class 9001 Type K control units. These holes are covered with Class 9001 closing plates. When installing Class 9001 Type K control units in NEMA Type 4 enclosures, Class 9001 Type KU water-tight caps must be used. For further details and pricing of these units, see the Class 9001 Section.

Type of Control Unit For NEMA 1 Enclosures	NEMA Size	Starter Type	Class 9999 Type	Class 9999 Price
Start-Stop push buttons	0-4	SB-SF	SA-2	$32.
Hand-Off-Auto selector switch	0-4	SB-SF	SC-2	32.
On-Off selector switch	0-4	SB-SF	SC-22	32.
Closing plate for above knockouts	0-4	SB-SF	SG-1	4.
Red pilot light	0, 1	SB-SC	SP-12R	60.
	2	SD	SP-13R	60.
	3	SE	SP-14R	60.
	4	SF	SP-15R	60.
Closing plate for above pilot light	0-4	SB-SF	SG-2	4.
Size 5 and 6 devices are provided with three punched holes with closing plates for use with Class 9001 Type K oil-tight units	5-6	SG-SH	....	...


Selector Switch Kit


Push Button Kit


Pilot Light Kit

MODIFICATIONS — STARTER RESET KITS

Class 9066 Type RA and RB reset kits make it possible to replace or add external reset mechanisms to NEMA 1, NEMA 4 and NEMA 12 enclosed combination starters.

Type of Enclosure	Size 0, 1		Size 2		Sizes 3 & 4		Size 5		Size 6	
	Class 9066 Type	Price	Class 9066 Type	Price	Class 9066 Type	Price	Class 9066 Type	Price	Class 9066 Type	Price
NEMA 1 & 12	RB-1	$12.	RB-2	$12.	RA-1	$16.	RA-3	$24.	RA-1	$16.
NEMA 4	Use correct Type RA or RB kit listed above and Class 9066 Type W-1 kit at $8. list each.									

CLASS
8538
8539

AC COMBINATION STARTERS

DISCONNECT SWITCH & CIRCUIT BREAKER TYPES APPLICATION DATA FOR TYPES SB-SH, SJ AND K

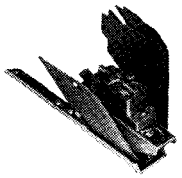
JANUARY, 1982

MODIFICATIONS — DISCONNECT SWITCH AND BREAKER INTERLOCKS

A one or two pole electrical interlock can be added to the disconnect switch or circuit breaker. Thus if a separate control circuit is used, the magnetic starter can be de-energized when the disconnect is thrown to the OFF position. See table below for proper interlock selection.

DISCONNECT SWITCH AND BREAKER INTERLOCKS

Class	Starter Size	Series	Interlock Description			
			Single Pole		Two Pole	
			Class 9999 Type	Price	**Class 9999 Type**	Price
8538 8738	0, 1	A	R-6	**$ 30.**	R-7	**$ 58.**
	0, 1	C	R-45	**30.**	R-46	**58.**
	2	A and B	R-6	**30.**	R-7	**58.**
	2	C	R-43	**30.**	R-44	**58.**
	3, 4	A	R-8	**34.**	R-9	**64.**
	3	B	R-41	**36.**	R-42	**48.**
	4	B	R-39	**34.**	R-40	**64.**
	5	A	R-35	**106.**	R-36	**136.**
	6	A	R-26	**34.**	R-27	**64.**
8539 8739	0-7	A	R-26	**34.**	R-27	**64.**



An electrical interlock may also be factory installed in either a disconnect switch or circuit breaker combination starter. Specify Form Y74 for single pole, or Form Y75 for two pole interlocks.

DISCONNECT SWITCH AND BREAKER INTERLOCK ELECTRICAL RATINGS

Class 9999 Type R-6, 8, 26, 35, 39, 41, 43 & 45 AC — 50 or 60 Hz				**Class 9999** Type R-7, 9, 27, 36, 40, 42, 44 & 46 AC — 50 or 60 Hz					
	Maximum Current				Maximum Current				
Volts	Make	Break	Continuous Carrying Current	Volts	Make		Break		Continuous Carrying Current
	Amps.	Amps.	Amps.		Amps.	VA	Amps.	VA	Amps.
120	40	15	15	120	30	3450	3	345	10
240	20	10	15	240	15	3450	1.5	345	10
480	10	8	15	480	7.5	3450	.75	345	10
600	8	6	15	600	6	3450	.6	345	10

Internal Auxiliary Switch—Circuit breakers can be supplied with a factory installed auxiliary switch for remote indication of an open and/or tripped or a closed breaker. One (specify Form Y74-1) or two (specify Form Y75-1) auxiliary switches can be supplied. The switches are supplied with normally open and normally closed circuits with a common connection. Contacts must be used on the same polarity and are rated 15 amps. at 240 volts AC. The auxiliary switches are located internally and are furnished with 19-20 inch long leads.

Alarm Switch — The alarm switch only operates when the breaker is tripped. It is used to actuate bell alarms and warning lights. The alarm switch is factory installed only (specify Form Y74-2) and consists of a single pole single throw switch which is normally open except when the breaker is tripped. The contacts are rated 4 amps at 240 volts AC. This switch is located in the breaker and is supplied with 19-20 inch long leads.

MODIFICATIONS — CONTROL CIRCUIT TRANSFORMER

Transformer Selection — Space and drilling are provided in all disconnect switch and circuit breaker combination starters in NEMA Type 1, 4 and 12 enclosures for the field addition (or factory installation) of a Class 9070 control circuit transformer and Class 9080 type PF-1 fuse block. The transformers used with the standard three-pole starters are given in the table below. Consult field office for transformer additions to NEMA 4X and NEMA 7 & 9 enclosures.

NEMA Size	Starter Type	Transformer Selection		
		Standard Capacity (Form FT)	100 VA Additional Capacity (Form FT-11)	200 VA Additional Capacity (Form FT-12)
		Class 9070 Type	Class 9070 Type	Class 9070 Type
0 & 1	SB & SC	EO-1	GO-3	GO-4◆
2	SD	GO-2	GO-4	GO-4
3	SE	EO-3	EO-4	EO-51
4	SF	EO-4	EO-51	EO-51
5	SG	EO-1 and 8501 Relay	EO-3 and 8501 Relay	EO-4 and 8501 Relay
6	SH	EO-3-S2 is Standard	EO-3-S2 and EO-2	EO-3-S2 and EO-4
7	SJ	EO-19-S2 is Standard	EO-19-S2 and EO-2	EO-19-S2 and EO-4
8	K	EO-51	EO-61	EO-61

◆Uses oversized enclosure.

Fuse Block Mounting Brackets — The standard capacity transformer, Class 9070 Type EO-1, for the Size 0 and 1 starters mounts directly to the right of the magnetic starter. If it is desired to mount other control components in this space, the standard transformer can be installed by the factory or in the field beneath the main fuse block. The fuse block is raised off the panel on mounting brackets to provide space beneath for the Class 9070 Type EO-1 transformer.

Factory installed, this transformer mounting is identified as Form FT-9. The mounting brackets only, for field installation, are listed in the following table.

MOUNTING BRACKETS

NEMA Size	Class 9999	
	Type	Price
0 & 1	SF-11	**$8.**

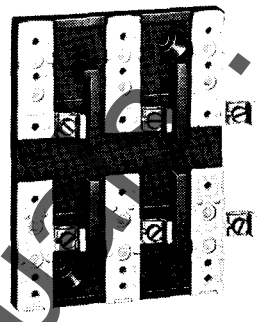
USER MODIFICATION KITS
FOR CLASSES 8538 AND 8738 TYPES SB-SF AND B-F

CLASS 8538 8539

FUSE BLOCK KIT

Class 8538 and 8738 Type S non-fusible combination starters can be converted to the fusible type by the installation of a Class 9999 Type SF fuse block kit. Both fusible and non-fusible combination starters have the same size enclosure in NEMA Types 1, 4 and 12 construction permitting this conversion. The fuse clips ARE NOT included with the fuse block and should be ordered separately from the table below.

Kit Description	Starter NEMA Size	Class 9999 Type	Price
Fuse block kit to convert disconnect switch in Class 8538 and 8738 combination starters from non-fusible to fusible. Does not include fuse clips.....	0, 1 2	SF-1 SF-2	**$14.** **17.**

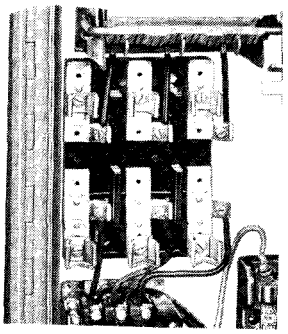


Fuse Block

FUSE CLIP KITS

Disconnect switches for fusible Class 8538 and Class 8738 combination starters with flange mounted operating mechanisms have interchangeable fuse clips in NEMA 1, 4 and 12 enclosures, Sizes 0-2. The current Series B NEMA Size 3 and 4 combination starters do not have interchangeable fuse clips; but can be converted to Class R by use of the 9999 SR4 kit. Spacing of fuse clips can be changed from 250 to 600V or vice versa on all sizes. Class 9422 Types RC-5, RD-5, also come equipped with interchangeable fuse clips. The spacing of the fuse clips can be changed from 250 volt fuse spacing to 600 volt fuse spacing or vice versa and the size of the fuse clips can be changed by the use of a kit. The kit contains six fuse clip assemblies and necessary hardware required for conversion. the fusible horsepower rating can thus be changed easily, affording greater flexibility with minimum stock of parts.

NEMA Starter Size	Disconnect Ampere Rating	NEMA Class H Fuses				NEMA Class R Fuses				NEMA Class J Fuses		
		Fuse Clip Ratings—Amps.		Class 9999 Type	Price	Fuse Clip Ratings—Amps.		Type	Price	Fuse Clip Rating Amps.	Class 9999 Type	Price
		250V. Max.	600 V. Max.			250 V. Max.	600 V. Max.			600 V. Max.		
0 & 1	30	0-30	....	S1	**$ 6.00**	0-30	....	SR-1	**$ 9.20**	....	....	....
0	30	....	0-30	S2	**10.00**	....	0-30	SR-2	**12.00**	0-30	SJ-2	**$25.00**
1	30	31-60	0-30	S2	**10.00**	31-60	0-30	SR-2	**12.00**	0-30	SJ-2	**25.00**
2	60	31-60	0-30	S2	**10.00**	31-60	0-30	SR-2	**12.00**	0-30	SJ-2	**25.00**
2	60	....	31-60	S3	**14.00**	....	31-60	SR-3	**17.00**	31-60	SJ-3	**30.00**
3	100	61-100	61-100	S4◆	**40.80**	61-100	61-100	SR-4✱	**12.00**	61-100	SJ-4	**49.00**
3	100	101-200	....	S5◆	**75.60**	101-200	....	SR-4✱	**12.00**	101-200	SJ-5	**75.60**
4	200	101-200	101-200	S5◆	**75.60**	101-200	101-200	SR-4✱	**12.00**	101-200	SJ-5	**75.60**
5	400	....	....	....	....	201-400	201-400	SR-5✱	**28.00**	....	....	....



Interchangeable Fuse Clips

✱ Fuse clips are not provided in the Type SR-4 and SR-5 kits. On new installations Class 9999 Type S fuse clips must also be purchased. Three non-removable pins are supplied and installed only in the latest production devices which have a hole in the lower fuse clips.
◆ Can not be used in current Series B 8538s.

FUSE SELECTION

Fuse Selection — Fuse clips furnished in standard Square D combination controllers are sized to accept Class K5 or RK5 time delay fuses, since they are the most frequently used fuses for motor circuits. A time delay fuse rating of 125% or 175% of motor full-load current is normally recommended. However, fuse ratings for motor circuits must not exceed the limitations given in NEC 430-52 and additional restrictions which may be listed in instructions supplied with the controller.

For Size 0 through 3 controllers, Class H non-time delay fuses whose rating does not exceed 300% of motor full-load current may also be used if available short-circuit current does not exceed 5,000 RMS symmetrical amperes. (Larger fuse clips may be required.) For size 4 through 6 controllers Class K5 or RK5 fuses are required, since Class H fuses do not provide adequate short-circuit protection.

If use of Class J or L fuses is desired, consult local field office. For additional information regarding recommended and maximum fuse ratings see "Overload and Short Circuit Protection Selector."

Interchangeable Fuse Clips — On all sizes, the spacing of the fuse clips can be changed from 250 to 600 volts or vice versa. On NEMA Sizes 0-2, the ampere size of the fuse clips can also be changed.

Fuse clips can be changed on NEMA Sizes 0-2 by the use of a Class Type S or SR fuse clip kit.

Class H Fuse Clips — Supplied as standard in combination starters and will accept Class H, K1, K5, RK1 and RK5 fuses.

Class R Fuse Clips — Class R fuse clips are rejection type clips and will accept only Class R fuses. Field installation of Class R fuse clips requires the use of a Class 9999 Type SR fuse clip kit. Class 9999 Types SR-1, SR-2 and SR-3 kits include three Class H clips and three Class R rejection clips. Types SR-4 and SR-5 kits include only the non-removable pins and are installable only on the latest production of combination starters which have a hole in the lower fuse clips. Once Class R clips are installed, the device cannot be converted back to Class H clips without great difficulty and expense.

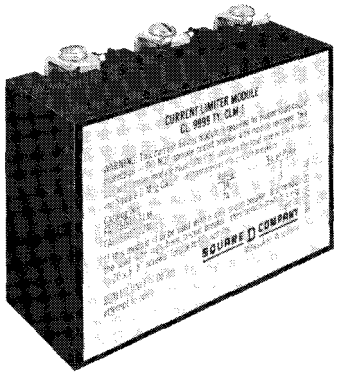
CLASS
8539

AC COMBINATION STARTERS

MAG-GARD® MOTOR CIRCUIT PROTECTOR TYPE WITH CURRENT LIMITING MODULE

JANUARY, 1982

UL LISTED FOR 100,000A



Current Limiting Module

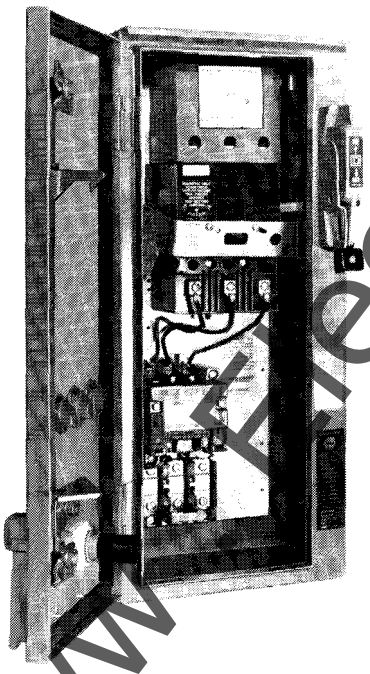
Classes 8539 and 8739 combination starters NEMA Sizes 0-3, NEMA Types 1, 4 and 12 with a factory added Current Limiting Module (CLM) are UL Listed for use on systems having an available fault current of 100,000 amperes RMS symmetrical.

The CLM is designed for use with FA frame MAG-GARD® circuit breakers. There are three types of modules:

Class 9999 Type CLM-1 for 3 and 7 amp MAG-GARD® circuit breakers
Class 9999 Type CLM-2 for 15 and 30 amp MAG-GARD® circuit breakers
Class 9999 Type CLM-3 for 50 and 100 amp MAG-GARD® circuit breakers

Each type module has a rejection feature. (For example: A CLM-3 cannot be installed in place of a CLM-1 or CLM-2.) The CLM installation does not require an oversized or non-standard enclosure.

The addition of a CLM to an existing non-Form Y126-1 Mag-Gard® combination starter will increase the controller's fault withstandability level. The device will not be UL Listed at the higher level, however.



CLASS 8539 TYPE SBA
with MAG-GARD® motor circuit protector and current limiting module

ORDERING INFORMATION

A combination starter with the CLM is obtained by:

1. Selecting a NEMA Size 0-3, NEMA Type 1, 4, or 12 Mag-Gard® combination starter based on voltage and motor horsepower from the 8539 or 8739 tables.
2. Requesting Form Y126-1. Adder is **$120.** D1A.

Replacement CLM's are available as follows:

Class and Type	MAG-GARD® Circuit Breaker Size	Price and Discount
9999 CLM-1	3 or 7 amperes	**$92** D1B
9999 CLM-2	15 or 30 amperes	**$92** D1B
9999 CLM-3	50 or 100 amperes	**$92** D1B

AC COMBINATION STARTERS
DISCONNECT SWITCH & CIRCUIT BREAKER TYPES

CLASS 8538 8539

APPROXIMATE DIMENSIONS AND SHIPPING WEIGHTS

NEMA 1 ENCLOSURE — FIGURE 1

NEMA Size	Class	Type	DIMENSIONS IN INCHES* A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Top & Bottom W	Top & Bottom X	Sides Y	Wt. (Lbs.)
0-1	8538 & 8539	SBG SCG	9 5/8	21 5/8◆	8 11/32	6 3/8	19 1/2◆	14 21/32	1 13/16	1 11/16	3 3/8	2 5/16	1 1/16	3 1/8	2 3/16	1 1/4	7/8	½-¾	½-¾	½	38
2	8538 & 8539	SDG	10 5/8	26 1/8	9 19/32	7 3/8	24	16 29/32	2 1/8	2	4	2 5/16	1 1/16	3 1/8	2 3/16	1 1/4	7/8	1-1¼	½-¾	½	54
3	8538 & 8539	SEG●	15 13/32	33 21/32	10 21/32	11 7/8	31	22 23/32	2 29/32	2 11/16	5 3/8	3¼	1 11/32	4 29/32	2 1/32	1 5/32	2 5/32	1-1¼ 2-2½	½-¾	½	102
4	8538	SFG	16 5/32	43 5/32	10 19/32	12 5/8	40½	23 21/32	2 29/32	2 11/16	5 3/8	2 5/8	1 11/32	4 7/8	2 7/32	1 9/32	2 9/32	2½	½-¾	½	158
	8539	SFG	15 13/32	33 21/32	10 21/32	11 7/8	31	22 23/32	2 29/32	2 11/16	5 5/8	3¼	1 11/32	3 5/16	2 7/32	1 7/32	2 9/32	1-1¼ 2-2½	½-¾	½	120
5	8538	SGG	20¼	67	15½	15	66	29 13/32	3 9/16	3 3/16	....	6 9/32	½	9 7/32	2 5/8	....	....	¾ †	3	....	....
	8539	SGG	20¼	55	11 29/32	15	54	27 13/32	3 9/16	3 3/16	....	6 9/32	½	9 7/32	2 5/8	....	....	¾ †	3	....	420
6▲	8538 & 8539	SHG	36	80	21 1/32	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

† Left side only.
● 8538 SEG-12, 32 use SFG enclosure.

NEMA 4 ENCLOSURE — FIGURE 2

NEMA Size	Class	Type	DIMENSIONS IN INCHES* A	B	C	D	E	F	G	H	I	J	K	L	Bottom W	Top & Bot X	Wt. (Lbs.)
0-1	8538 & 8539	SBW SCW	9 5/8	8 11/32	23 17/64◆	3 7/8	2 11/16	4¼	22 1/2◆	19/32	4	1 5/8	2 5/16	14 9/32	¾ Hub	1 Hub	40
2	8538 & 8539	SDW	10 5/8	9 19/32	28 3/16	3 7/8	3 3/16	4¼	27	19/32	4½	2	2 5/8	16 17/32	¾ Hub	1½ Hub	55
3	8538 & 8539	SEW■	15 3/8	10 9/16	36 3/16	4 29/32	3 3/16	9	35	19/32	6 3/16	2 9/16	3 3/16	22 3/16	¾ Hub	2½ Hub	111
4	8538	SFW	16 1/8	10 17/32	45 11/16	4 7/8	3 9/16	9	44½	19/32	4 27/32	2 9/16	3 3/16	22 31/32	¾ Hub	2½ Hub	158
	8539	SFW	15 3/8	10 9/16	36 3/16	3 5/16	3 3/16	9	35	19/32	5 3/16	2 9/16	3 3/16	22 3/16	¾ Hub	2½ Hub	120
5	8538	SGW	20¼	15½	67 3/32	9 7/32	2 5/8	15	66	3/16	6 9/32	3	3½	29 13/32	¾ Hub	3½ Hub	....
	8539	SGW	20¼	11 29/32	55 3/32	4 29/32	2 5/8	15	54	7/16	6 9/32	3	3½	27 13/32	¾ Hub	3½ Hub	440
6▲	8538 & 8539	SHW	36	21 1/32	88	....	....	....	....	....	....	....	....	....	....	....	....

■ 8538 SEW-12, 32 use SFW enclosure.

NEMA 12 ENCLOSURE — FIGURE 3

NEMA Size	Class	Type	DIMENSIONS IN INCHES* A	B	C	D	E	F	G	H	I	J	Wt. (Lbs.)
0-1	8538 & 8539	SBA SCA	9 5/8	8 11/32	23¼◆	3 7/8	2 11/16	4¼	22½◆	3/8	4 7/16	14 5/16	40
2	8538 & 8539	SDA	10 5/8	9 5/16	27¾	3 7/8	3 3/16	4¼	27	3/8	4 15/16	16 9/16	55
3	8538 & 8539	SEA◐	15 13/32	10 19/32	36	4 29/32	3 7/32	9	35	½	5 3/16	22 5/16	111
4	8538	SFA	16 5/32	10 7/8	45½	4 7/8	3 19/32	9	44½	½	5 5/16	22 31/32	158
	8539	SFA	15 13/32	10 19/32	36	4 29/32	3 7/32	9	35	½	5 3/16	22 5/16	120
5	8538	SGA	20¼	15½	67	9 7/32	2 5/8	15	66	½	6 9/32	29 13/32	....
	8539	SGA	20¼	11 29/32	55	4 29/32	2 5/8	15	54	½	6 9/32	27 13/32	440
6▲	8538 & 8539	SHA	36	21 1/32	80	....	....	....	....	....	....	....	....

▲ Size 6 enclosures are floor mounting.
* Above dimensions include space for control circuit transformers.
●8538 SEA-12, 22, 32, 42 use SFA enclosure.
◆ Dimension in table for 8538 Series A and 8539 Series A thru C only. For 8538 Series B & C and 8539 Series D devices (manufactured only after Jan. 1, 1982) add 1" to NEMA 1 B and E dimensions and NEMA 4 and 12 C and G dimensions.

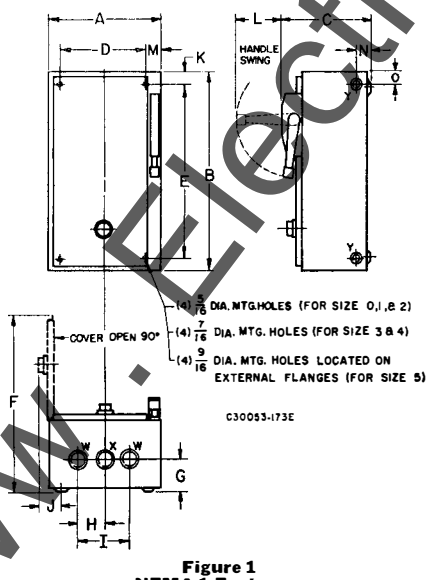


Figure 1
NEMA 1 Enclosure

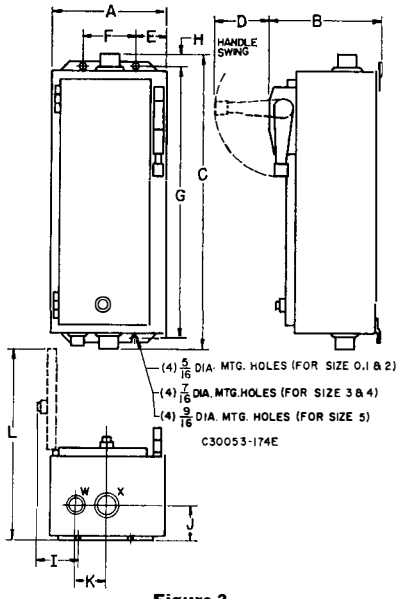


Figure 2
NEMA 4 Enclosure

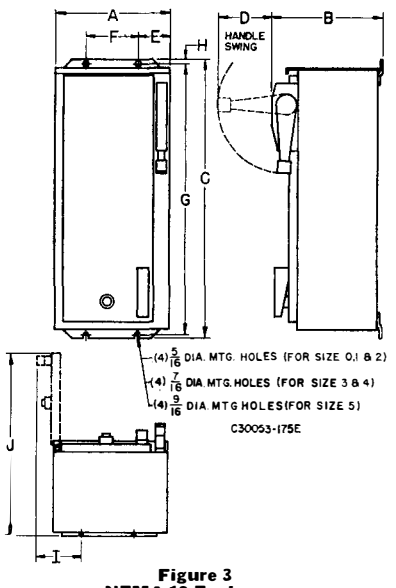


Figure 3
NEMA 12 Enclosure

AC COMBINATION STARTERS
DISCONNECT SWITCH & CIRCUIT BREAKER TYPES

NEMA 4X ENCLOSURE — FIGURE 1

NEMA Size	Class	Type	Dimensions In Inches* A	B	C	D	E	F	G	H	I	J	Wt. (lbs)
0-1	8538 & 8539	SBW SCW	11.41	10.60	26.13	4.75	1.77	7.88	25.38	.38	2.33	15.62	45
2	8538	SDW	15.41	11.60	28.00	4.75	1.77	11.88	27.25	.38	2.33	20.62	60
	8539	SDW	11.41	10.60	26.13	4.75	1.77	7.88	25.38	.38	2.33	15.62	50
3	8538 & 8539	SEW	25.41	11.60	28.00	4.75	1.83	21.75	27.25	.38	2.39	30.62	90
4	8539	SFW	25.41	11.60	28.00	4.75	1.83	21.75	27.25	.38	2.39	30.62	95

*Dimensions also for Form FT (standard control transformer), Form FT11 (100 VA extra capacity) and Form FT12 (200 VA extra capacity).

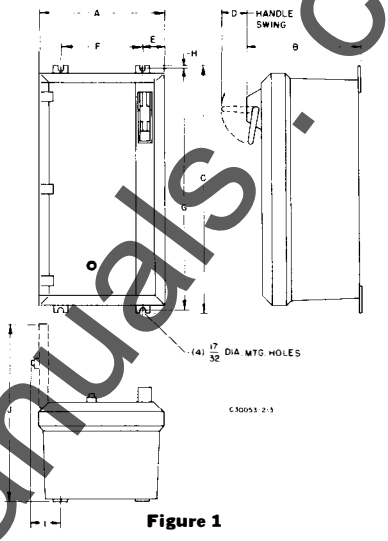


Figure 1

Hubs are supplied with each NEMA 4X combination starter as follows: (Not installed)

NEMA Size	Quantity	Hub Size
0 & 1	1 2	¾" 1"
2	1 2	¾" 1½"
3 & 4	1 2	¾ 2½"

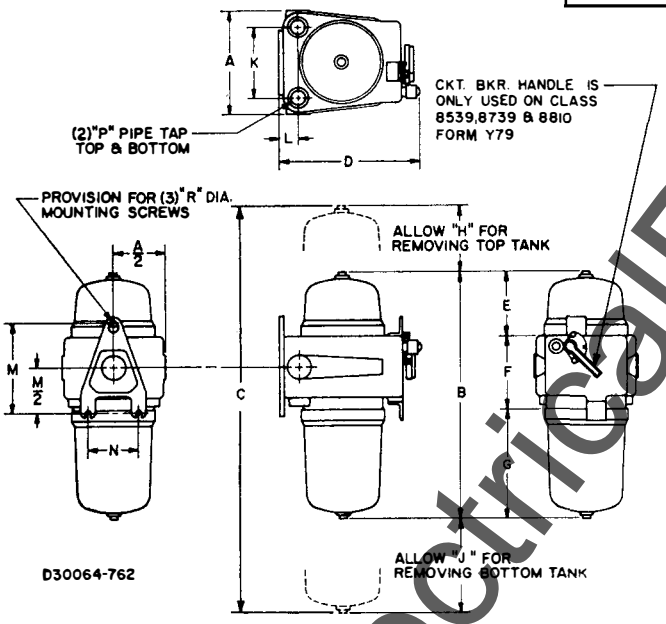
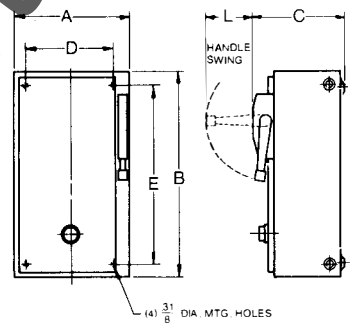


Figure 2

COMBINATION STARTERS IN OVERSIZED ENCLOSURES



NEMA Size	NEMA Type Encl.	Dimensions In Inches Wide A	High B	Deep C	Handle L	Mounting D	Mounting E
0-2	1	15⅛	28⅞	9⅝	3⅞	11⅝	26¼
	4	15⅛	31	9⅝	3⅞	4¼	29¾
	12	15⅛	30½	11	3⅞	4¼	29¾

CLASS 8539 — NEMA 7 & 9 ENCLOSURE — FIGURE 2

NEMA Size	Type	Dimensions in Inches A	B*	B†	C*	C†	D	E*	E†	F	G	H*	H†	J	K	L	M	N	P	R	Wt. (Lbs.)
0-1	SBR SCR	10⅝	26 1/16	31 1/16	35 1/16	47 1/16	14 1/16	6¾	11¾	7 1/16	11⅝	2	9	7⅝	7⅜	2 1/16	9⅜	5¼	1¼	⅜	70
2	SDR	12	30 5/16	35 5/16	43 13/16	55 13/16	16¾	7¼	12¼	7 1/16	15⅜	3	9	11½	8½	2 1/16	9⅜	5¼	1½	⅜	100
3-4	SER SFR	16⅛	38½	41½	61	67½	20¼	9⅛	12⅛	8⅝	20¾	4½	8	18	12	2⅝	11	5½	2½	½	165 195
5	SGR	20¾	63⅛	63⅛	104⅝	104⅝	25¾	24⅝	24⅝	13⅞	24⅝	20	20	21½	14⅜	4¾	17	8	4	⅝	375

*Without control transformer.
†With control transformer (Form FT).

SEPTEMBER, 1963

AC COMBINATION STARTERS—LINE VOLTAGE TYPE

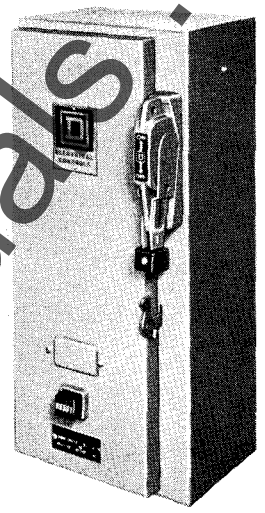
APPLICATION

With minor exceptions the National Electrical Code requires a disconnect means for every motor. The Class 8538 and Class 8539 combination starters consist of a Class 8536 magnetic starter and a disconnect means, all in a common enclosure. Class 8538 starters include a visible blade disconnect switch, either fusible or non-fusible, while Class 8539 starters include a thermal-magnetic trip circuit breaker.

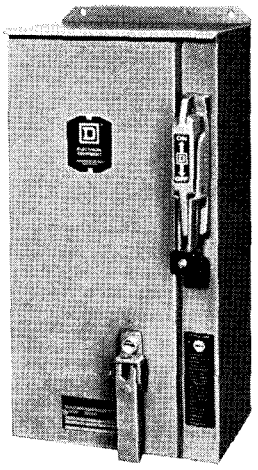
A single enclosure has many advantages over separate starters and disconnects. The single device takes up less mounting space and makes a neat as well as compact electrical installation. Installation and wiring costs are less, because wiring between the disconnect and starter is made at the factory, and only a single device need be mounted. Should it be necessary to relocate the machine, the cost of moving and relocating a single control is reduced.

A combination starter provides greater safety for the operator because the cover of the enclosing case is interlocked with the external operating handle of the disconnect means. The door cannot be opened with the disconnect means closed. With the disconnect means open, access to all parts may be had, but no hazard is involved, inasmuch as there are no parts connected to the power line. This safety feature cannot be obtained with separately enclosed devices. In addition, the cabinet is provided with a means for padlocking the disconnect in the "Off" position.

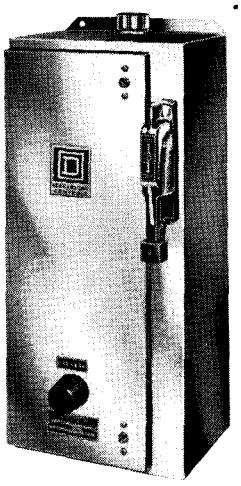
Line voltage combination starters are used where full voltage starting torque may be safely applied to the driven machine, and where the resulting current inrush is not objectionable. If starting torque must be reduced, or current inrush limited, a reduced voltage starter should be used. Line voltage combination starters may also be used as primary switches for slip ring (wound rotor) motors, when manual speed regulators are provided for the secondary circuit.



NEMA 1
General
purpose
enclosure



NEMA 12
Industrial
use
enclosure



NEMA 4
Stainless
steel
water-tight

MAGNETIC STARTERS

The magnetic starters used in these combination starters are Class 8536 magnetic starters described under Tab 8536 of the Motor Control Catalog. All the features of overload protection, ratings, and operation which apply to Class 8536 starters will also apply to Class 8538 and to Class 8539 combination starters. Those standard features will not be repeated here.

DISCONNECT OPERATING MECHANISM

Depending upon the starter size and type of enclosure, several different disconnect operating mechanisms are used in the combination starter line. Flange mounted, front operated, or side operated, disconnect operating mechanisms are used.

FEATURES OF FLANGE MOUNTED OPERATING MECHANISMS

The flange mounted disconnect operating mechanism is used on all Classes 8538 and 8539 combination starters Sizes 0-4 in NEMA 1, 12 and 4 (Stainless Steel) enclosures. Increased safety for both maintenance and operating personnel is a key feature of this design. Here is a disconnect operating mechanism, originated by Square D, which has become an industry standard. The features of this mechanism are listed in the following paragraphs.

Disconnect Handle does not Separate from the Disconnect Switch or Circuit Breaker Proper when the Door is Opened. This eliminates the possible hazard of false indication of the disconnect position should the door be left ajar. The disconnect handle is always in control of the disconnect with the door open or closed.

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Disconnect can be locked in the "Off" Position with the Door Open or Closed with from One to Three Padlocks. The door can be opened with the disconnect locked "Off" but the disconnect cannot be forced closed under any condition. Electrical maintenance personnel can work on the electrical equipment, yet other maintenance personnel are safe with the disconnect locked off. Safe maintenance is thus a key feature of this design. Rugged construction eliminates breakage of the operating mechanism assembly.

For Application Which Require the Disconnect be Locked in the "ON" Position a blind hole is provided in the upper flange of the disconnect handle pivot housing. The blind hole must be drilled through to allow insertion of a padlock. This feature is particularly important in air conditioning, refrigeration and chemical process applications where the starter must continue to run.

Up and Down Movement of the Operating Handle is a Normal Movement for all Personnel. All guess work about the position of the disconnect is eliminated. A color coded knob on the operating handle also tells at a glance the switch or breaker position. In the "ON" position with the handle up, the knob on the handle shows red and in the "OFF" position with the handle down, the knob shows black. A clearly marked "ON-OFF" nameplate is provided with arrows showing the direction of handle movement and position.

The Enclosure Door Cannot be opened with the Disconnect in the "ON" Position unless a By-pass is Operated. With the disconnect in the "ON" position, a by-pass must be operated with a screw driver to open the door. This feature alerts personnel to the fact that the disconnect is "ON". With the disconnect in the "OFF" position only the door latch need be raised to gain entry to the NEMA 1 enclosure. The NEMA 12 enclosed devices have a special door closing mechanism which will be explained in a later paragraph.

The disconnect cannot be operated with the door open unless the cover interlock is deliberately voided. Personnel thus cannot accidently turn "ON" the disconnect with the door open. Simply pulling down on the operating handle turns the disconnect "OFF" with the door open or closed.

FRONT OPERATING MECHANISM

A front operated disconnect mechanism is used on Class 8538 sheet steel NEMA 4 enclosures. All Class 8539 combination starters in NEMA 4 and NEMA 9 sheet steel and cast iron enclosures also use a front operating mechanism. When the operating handle is thrown to the "ON" position, an interlock prevents the enclosure door or cover from being opened. The disconnect can be locked in the "OFF" position.

The Class 8539 Spin Top enclosure combination starter uses a front operated circuit breaker mechanism. The operating handle is in the center collar section of this enclosure. The disconnect can be locked in the "OFF" position.

SIDE OPERATING MECHANISM

The Class 8538 NEMA 4 cast iron enclosure uses a side operated disconnect switch operating mechanism. Class 8538 NEMA 9 enclosures in both sheet steel and cast iron also utilize a side operated mechanism. The Size 5 Class 8538 combination starter utilizes a side operated disconnect mechanism in NEMA 1 and 12 enclosures.

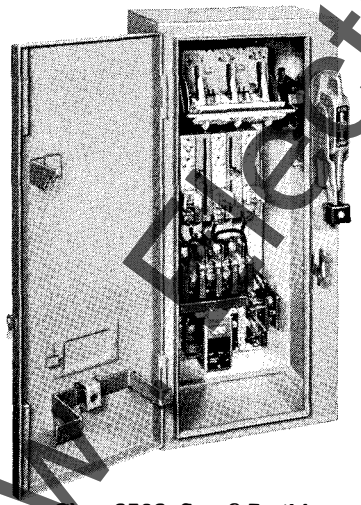
The side operating handle can be locked in the "OFF" position to prevent unauthorized operation. When the handle is thrown to the "ON" position an interlock prevents the enclosure door or cover from being opened.

FEATURES OF DOOR CLOSING MECHANISM

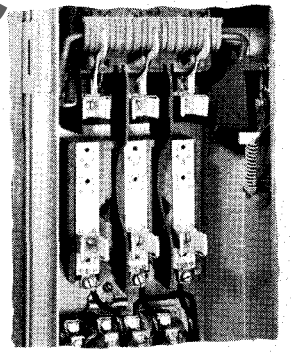
(Used on NEMA 12 enclosures only)

An all new door closing mechanism is used on all Classes 8538 and 8539 combination starters in a NEMA 12 enclosure in Sizes 0-4. This door closing mechanism used in conjunction with the flange mounted disconnect operating mechanism allows easy opening and closing of the enclosure door and yet provides the dust-tight seal required for NEMA 12 construction. Features of this mechanism are listed in the following paragraphs.

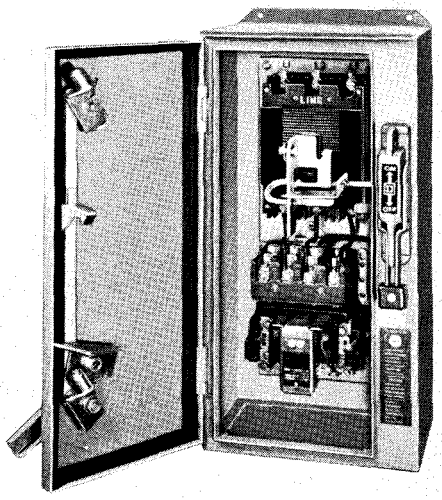
The Door Closing Mechanism Allows Opening of the Door Only After use of a Screwdriver. This feature dis-



Class 8538, Size 0 Fusible in general purpose enclosure



Interchangeable fuse clips (Size 1 shown)



Class 8539, Size 1 in NEMA 12 enclosure

courages unauthorized personnel from entering the enclosure. With the disconnect switch or circuit breaker in the "Off" position, the slotted screw in the door handle must be turned counterclockwise with a screwdriver while turning the handle and opening the door. The door can be opened with the disconnect padlocked in the "Off" position.

No Tool is Required to Close and Seal the Door. Closing is accomplished by pushing the door closed and turning the door handle. No cover bolts need be secured to seal the door. Rollers are used on the top and bottom of the door sealing bar providing an almost friction-free sealing mechanism which permits the use of extremely high sealing pressure without undue force on the handle. Extra heavy construction insures a tight seal even after extremely long and rough service. Slamming the door regardless of the door handle position does no damage to the door closing mechanism.

The Door Must be Completely Closed Before the Disconnect can be Thrown to the "ON" Position. The sealing of the door is assured as the disconnect cannot be turned "On" with the door just partially latched — it must be completely sealed by turning the door handle to the vertical position. Thus, the dust-tight and oil-tight feature required in a NEMA 12 industrial use enclosure is always insured.

OTHER FEATURES

(NEMA 1, 4 (Stainless Steel) and 12 Enclosures — Sizes 0-4)

The Enclosure Door can be Padlocked Closed. A simple door latch on the NEMA 1 enclosure allows padlocking the enclosure door independent of the disconnect operating mechanism. The NEMA 12 enclosure door can be padlocked closed by slipping the lock through the door opening handle.

Class 9999 Push Button and Selector Switch Kits can be Added in the Field in the Cover of the General Purpose Enclosure. Class 9001 Type T oil-tight push button, selector switch and pilot light units can be added in the field (or factory installed) in the cover of the NEMA 12 industrial use enclosure door. Class 9001 Type T units are also used with the NEMA 4 enclosure.

Straight Through Wiring Provided. The three line terminals are located at the top of the enclosure and the three load terminals are at the bottom. The T2 terminal is provided at the bottom of the enclosure by a terminal block located adjacent to the right hand overload relay. Generous wiring space at the top, bottom and sides of the enclosure make for easy wiring.

The Third Overload Relay can easily be Added. Field installation of the third overload relay with a Class 9065 overload relay can easily be accomplished. The T2 terminal block can be removed and the third overload relay substituted.

A Disconnect Switch or Circuit Breaker Interlock can be Provided for Either Factory or Field Installation. Either a single or double pole disconnect interlock is available and can easily be added in the field with a Class 9999 interlock kit. Thus, if a separate control circuit is used, the starter can be de-energized when the disconnect is thrown to the "OFF" position.

The Spacing of Fuse Clips can be Changed on all Class 8538 fusible type starters (NEMA 1, 4 (Stainless Steel) and NEMA 12 enclosures) from 250 volt fuse spacing to 600 volt fuse spacing or vice versa. The fuse clip size can be changed with one of the Class 9999 Type S fuse clip kits. The kits contain six fuse clips and mounting screws required for such conversion. The fuse clip block is clearly marked with the ampere and voltage rating for the various fuse clip locations. The fusible starter horsepower ratings can thus be changed affording greater flexibility with a minimum of time and stocking of parts.

MODIFICATIONS

There are many modifications available for addition to combination starters which can be factory, and in many cases, field installed. Some of the more popular modifications are listed in the following paragraphs. These modifications apply to all types of enclosures and sizes of starters.

Push Button in Cover (Form A) — Combination starters in all sizes are available with a "Start-Stop" momentary contact push button mounted in the cover of the starter enclosure for external operation. Where this arrangement is convenient from the operating standpoint, installation economies are obtained through the elimination of a separate push button station and its wiring. Separately mounted push buttons may also be connected in parallel with the one included with the starter.

Selector Switch in Cover (Form C) — Where motors are automatically controlled by a 2-wire pilot device, independent manual means for starting and stopping is frequently desirable. For such an application, a 3 position, maintained contact selector switch is used. In one position a circuit is manually completed to the magnet coil of the starter, permitting operation independent of the automatic pilot device. A second position opens the control circuit so that the starter cannot be energized. A third position connects the pilot device to the starter to govern starter operation.

Additional Electrical Interlocks (Form X) are available in arrangement and number to satisfy every practical need. They will be installed at the factory, if specified on the order, but can be easily installed in the field. Interlocks for installation by users are listed in catalog section Class 9999.

Low Voltage Control Circuits may be used to provide additional operator safety by providing magnet coils which operate at low voltage. This feature is available in either of two ways:

a. **Form S** involves a starter whose control circuit is wired for operation from a power source other than that which feeds the motor. The separate source may be at a lower voltage than the power source, but can be at the same voltage.

b. **Form FT** uses a built-in control circuit transformer having a 120 volt secondary. Short circuit protection for the transformer is provided by a fuse in one secondary lead of the transformer. Push buttons or other pilot devices will, therefore, operate at 120 volts, even though the main source of power is at a higher potential.

ENCLOSURES

A contributing factor to the long life and satisfactory operation of a motor controller is the enclosure. In order to shield electrically live parts from accidental contact, some sort of an enclosure is always necessary, with this function normally being filled by a general purpose sheet steel enclosure. However, dusty, wet or even hazardous atmospheres will require an enclosure satisfactory for that type of location. As a result these starters are available in a number of enclosure types.

NEMA 1 — General Purpose Enclosures are intended to prevent accidental contact with live parts, and are suitable for general indoor use where normal atmospheric conditions prevail.

These enclosures are constructed of heavy sheet steel, furnished in a standard gray enamel on the outside and baked aluminum on the inside.

Where greater dust resistance is required, these NEMA 1 enclosures are available with felt cover gaskets to make them somewhat more dust resistant.

NEMA 4 — Water-tight Enclosures are intended for use in locations where the starter is subjected to splashing or dripping water. They are not suitable for submersion in water.

AC Combination Starters—Line Voltage Type — SEPTEMBER, 1963

Enclosures are usually cast iron, but may be of sheet steel. Covers are hinged and fastened to the case by swing bolts. Gaskets, compressed between the box and cover, form a water-tight seal at that point. All NEMA 4 enclosures are furnished with a corrosion resistant finish. Threaded hubs or drillings are provided for all conduit entrances.

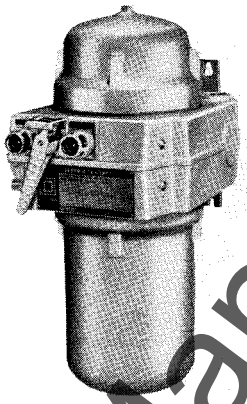
NEMA 4 — Stainless Steel Water-tight Enclosures are fabricated from AISI No. 304 stainless steel. Sizes 0-4 feature the flange mounted disconnect operator while the Size 5 has a front mounted operating handle. Covers are hinged at one side and held securely by two quarter turn screw operated latches at the other side.

A new finishing process uses two coats of a special thermo setting acrylic enamel which is baked on to provide a hard, glossy surface very nearly the same color as unpainted stainless steel. This results in an attractive, yet durable finish which gives greatly increased protection from corrosion and resists abrasion damage.

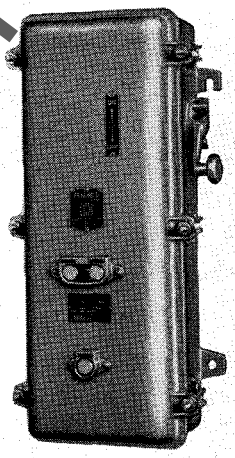
Atmospheres in meat packing plants, breweries, tanneries, bakeries, dairies and many other industries pose special corrosion problems. Stainless steel enclosures give these combination starters corrosion protection from excess moisture, salt spray, foodstuffs, fatty acids, sterilizing solutions, nitric acid, most of the organic chemicals and dyestuffs, and a variety of inorganic chemicals.

NEMA 12 — Dust-tight Industrial Use Enclosures are of sheet steel, provided with cover gaskets to exclude dust. They meet the requirement for both NEMA 5 enclosures and for NEMA 12 enclosures as specified in NEMA Standards.

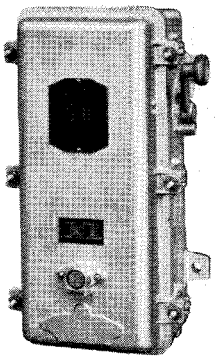
Dust-tight enclosures are suitable for use in steel mills, coke plants, foundries and other similar locations where non-hazardous dusts are present.



Class 8539 Spin Top NEMA 7 and 9



Class 8538 NEMA 9



Classes 8538 and 8539 NEMA 4

ENCLOSURES FOR HAZARDOUS LOCATIONS

Spin Top Enclosure — NEMA Type 7 and 9 — Class I, Groups C and D and Class II, Groups E, F, and G. These enclosures are built in accordance with the requirements of Underwriters' Specifications for Class I, Groups C and D, and Class II, Groups E, F, and G, hazardous locations, covered by Article 500 of The National Electrical Code. They are of a three section design consisting of a center collar section plus an upper and lower tank. Each is an individual casting of high density aluminum alloy, thereby obtaining maximum strength and minimum weight.

Threaded joints between the collar section and the tanks provide a flame-tight seal. Acme threads are used to minimize the possibility of stripped threads and positively prevent cross-threading. The arrangement of external threads on the collar section and internal threads on the tanks plus a drip ring on the collar section prevents water from entering at the threads. These threaded joints are also dust-tight, weatherproof and water-tight without the use of gaskets. Threaded joints are factory lubricated with a silicone grease to permit tank removal at temperatures as low as — 70° F. This grease also prevents thread corrosion.

Operating shafts for reset mechanisms, push button stations, and housings for pilot lights are all stainless steel thread-in-thread construction. When starters are ordered less push button stations, and it is desired to add a push button station in the collar section later, the installation is simple because a threaded and plugged hole in the collar section is provided for future installation of those accessories. Similar provisions can be furnished for field installation of one or two pilot lights at slight additional charge.

Two conduit drillings are provided in both the bottom and in the top of the collar section. Pads are provided so that conduit openings can be tapped in both sides and in the rear. A ½" tapped and plugged opening is furnished in each tank for addition of a drain and breather, if required.

Maintenance is easily accomplished. The mounting frame containing the starter is easily installed and removed by means of a slide and hook arrangement. Lugs on each tank permit easy and rapid removal. With the tanks removed the starters are fully exposed for inspection or maintenance.

Bolted Type Construction — NEMA Type 9 — Class II, Groups E, F, and G. These enclosures are of cast iron with machined sealing surfaces or of sheet steel with suitable flame resistant gaskets, and are built in accordance with the requirements of Underwriters' Specifications for Class II, Groups E, F, and G hazardous locations, covered by Article 500 of the National Electrical Code. Typical installations are found in flour and feed mills, grain elevators and sugar mills.

NOVEMBER, 1963
Supersedes 8538-8539 Dimension Sheet Page 1, dated September, 1957 and Class 8538 Dimension Sheet Page 0.1 and 0.2 dated August, 1960
(Minor Revision 6/64)

AC COMBINATION STARTERS
CLASS 8538 — WITH FUSIBLE OR NON-FUSIBLE DISCONNECT
CLASS 8539 — WITH CIRCUIT BREAKER

Approximate Dimensions — Not for Construction

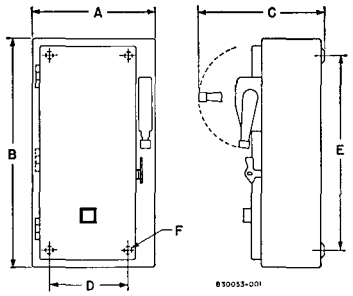


Diagram 1

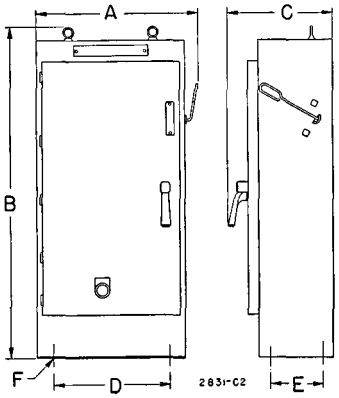


Diagram 2

Class 8538 — NEMA 1 Enclosure

Class 8538 Fusible and Non-Fusible	Diagram 1 A	B	C	D	E	F	Weight
Sizes 0 and 1 Str. Non-Fusible ..... (Also Form FT)	9 1/8	18 1/8	12 3/16	5 7/8	16	5/16	34
Sizes 0 and 1 Str. Fusible ..... (Also Non-Fusible Form FT-1 *)	9 1/8	20 5/8	12 3/16	5 7/8	18	5/16	37
Sizes 0 and 1 Str. Fusible Form FT (Also Form FT-1 *)	9 1/8	25 1/8	12 3/16	5 7/8	23	5/16	45
Size 2 Str. Non-Fusible.....	10 5/8	19 1/8	12 7/8	7 3/8	17	5/16	40
Size 2 Str. Fusible..... (Also Non-Fusible Form FT)	10 5/8	26 1/8	12 7/8	7 3/8	24	5/16	43
Size 2 Str. Fusible Form FT..... (Also Non-Fusible Form FT-1 *)	10 5/8	31 1/8	12 7/8	7 3/8	29	5/16	53
Size 2 Str. Fusible Form FT-1 *.....	10 5/8	34 1/8	12 7/8	7 3/8	32	5/16	60
Size 3 Str. Non-Fusible.....	14 3/16	25 3/16	16 19/32	10 1/4	22 1/2	7/16	90
Size 3 Str. Fusible..... (AlsoNon-Fusible Form FT & FT-1 †)	14 3/16	33 3/16	16 19/32	10 1/4	30 1/2	7/16	102
Size 3 Str. Fusible Form FT & FT-1 †	14 3/16	39 3/16	16 19/32	10 1/4	36 1/2	7/16	112
Size 4 Str. Non-Fusible & Form FT.	16 11/16	30 3/16	18 3/32	12 3/4	27 1/2	7/16	130
Size 4 Str. Fusible and Form FT.... (Also Non-Fusible Form FT-1 †)	16 11/16	41 3/16	18 3/32	12 3/4	38 1/2	7/16	150
Size 4 Str. Fusible Form FT-1 †....	16 11/16	49 3/16	18 3/32	12 3/4	46 1/2	7/16	165

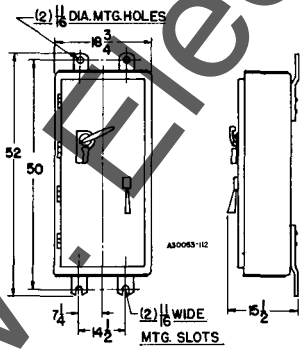
All Form FT dimensions are for 50/60 cycle transformers. Consult factory for 25 cycle Form FT dimensions.

*Form FT-1 with extra capacity for 100 watt work lamp.

†Form FT-1 with extra capacity for 100 or 200 watt work lamp. (For Size 3 also 300 watt work lamp).

●**Class 8538 — NEMA 1 Enclosure Size 5**

Size	Dim.	Diagram 2 GG & GAG-1 & -3,	GG & GAG-2 & -4,
5	A	29 1/4	29 1/4
	B	71	84
	C	19 1/2	19 1/2
	D	24	24
	E	11 1/2	11 1/2
	F	11/16	11/16
	Weight	580	620



Class 8539
Types GG & GAG-1 thru -9
Weight — 420

Class 8539 — NEMA 1 Enclosure

Class 8539	Diagram 1 A	B	C	D	E	F	Weight
Size 0 or 1 Str.....	9 1/8	18 1/8	12 3/16	5 7/8	16	5/16	29
Size 0 or 1 Str. Form FT or FT-1.. (100 VA additional capacity)	9 1/8	23 1/8	12 3/16	5 7/8	21	5/16	35
Size 0 or 1 Str. Form FT-1..... (200 VA additional capacity)	9 1/8	25 1/8	12 3/16	5 7/8	23	5/16	40
Size 2 Str.....	10 5/8	21 1/8	12 7/8	7 3/8	19	5/16	40
Size 2 Str. Form FT or FT-1..... (200 VA additional capacity)	10 5/8	27 1/8	12 7/8	7 3/8	25	5/16	50
Size 3 Str..... (Also Form FT or FT-1, 100 VA additional capacity)	14 21/32	31 5/32	14 15/32	11 1/8	28 1/2	7/16	. . .
Size 4 Str..... (Also Form FT or FT-1, 100 VA additional capacity)	14 21/32	31 5/32	14 15/32	11 1/8	28 1/2	7/16	....

All Form FT dimensions are for 50 /60 cycle transformers. Consult factory for 25 cycle Form FT dimensions.

●Changed since previous issue.

Dimensions are in Inches. All Weights are Approximate Shipping Weights in Pounds and are for Starters without Form FT unless Otherwise Noted.

NOVEMBER, 1963
Supersedes 8538-8539 Dimension Sheet
Page 2, dated September, 1957
(Minor Correction—5/67)

AC COMBINATION STARTERS
CLASS 8538 — WITH FUSIBLE OR NON-FUSIBLE DISCONNECT
CLASS 8539 — WITH CIRCUIT BREAKER

Approximate Dimensions — Not for Construction

Class 8538 — NEMA 12 Enclosure

Class 8538 Fusible and Non-Fusible	Diagram 4						
	A	B	C	D	E	F	Weight
Size 0 and 1 Str. Non-Fusible..... (Also Form FT)	9 1/8	19 3/4	12 3/16	7	19	5/16	34
Size 0 and 1 Str. Fusible..... (Also Non-Fusible Form FT-1 ∗)	9 1/8	21 3/4	12 3/16	7	21	5/16	38
Size 0 and 1 Str. Fusible Form FT.. (Also Form FT-1 ∗)	9 1/8	26 3/4	12 3/16	7	26	5/16	42
Size 2 Str. Non-Fusible.....	10 5/8	20 3/4	12 7/8	8 1/2	20	5/16	43
Size 2 Str. Fusible..... (Also Non-Fusible Form FT)	10 5/8	27 3/4	12 7/8	8 1/2	27	5/16	49
Size 2 Str. Fusible Form FT..... (Also Non-Fusible Form FT-1 ∗)	10 5/8	32 3/4	12 7/8	8 1/2	32	5/16	55
Size 2 Str. Fusible Form FT-1 ∗....	10 5/8	35 3/4	12 7/8	8 1/2	35	5/16	60
Size 3 Str. Non-Fusible.....	14 5/16	27 7/16	16 1/2	11	●26 5/8	7/16	105
Size 3 Str. Fusible..... (AlsoNon-Fusible Form FT & FT-1 †)	14 5/16	35 7/16	16 1/2	11	34 5/8	7/16	111
Size 3 Str. Fusible Form FT & FT-1 †	14 5/16	41 7/16	16 1/2	11	40 5/8	7/16	120
Size 4 Str. Non-Fusible and Form FT	16 11/16	32 7/16	18	13 1/2	31 5/8	7/16	140
Size 4 Str. Fusible and Form FT.... (Also Non-Fusible Form FT-1 †)	16 11/16	43 7/16	18	13 1/2	42 5/8	7/16	160
Size 4 Str. Fusible Form FT-1 †....	16 11/16	51 7/16	18	13 1/2	50 5/8	7/16	175

All Form FT dimensions are for 50/60 cycle transformers. Consult factory for 25 cycle Form FT dimensions.

∗Form FT-1 with extra capacity for 100 watt work lamp.

†Form FT-1 with extra capacity for 100 or 200 watt work lamp. (For Size 3 also 300 watt work lamp).

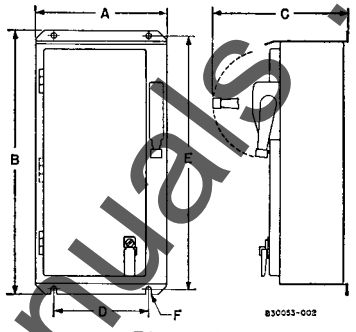


Diagram 4

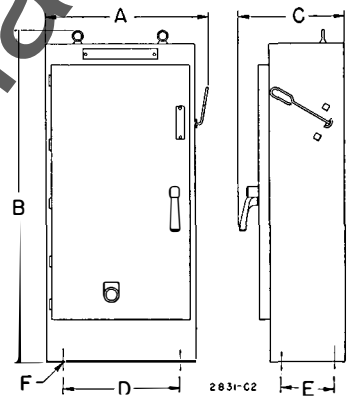


Diagram 5

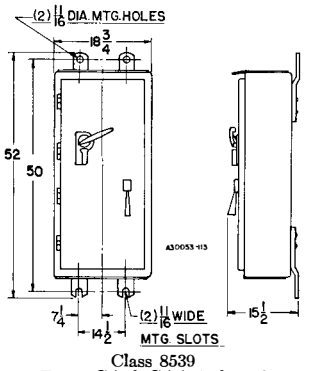
Class 8538 — NEMA 12 Enclosure Size 5

Size	Dim.	Diagram 5	
		GA & GAA-1, -3, -21 & -23	GA & GAA-2, -4, -22 & -24
5	A	29 1/4	29 1/4
	B	71	84
	C	19 1/2	19 1/2
	D	23 3/4	24
	E	12 1/2	11 1/2
	F	11/16	11/16
	Weight	620	700

Class 8539 — NEMA 12 Enclosure

Class 8539	Diagram 4						
	A	B	C	D	E	F	Weight
Size 0 or 1 Str.....	9 1/8	19 3/4	12 3/16	7	19	5/16	30
Size 0 or 1 Str. Form FT or FT-1... (100 VA additional capacity)	9 1/8	24 3/4	12 3/16	7	24	5/16	35
Size 0 or 1 Str. Form FT-1..... (200 VA additional capacity)	9 1/8	26 3/4	12 3/16	7	26	5/16	40
Size 2 Str.....	10 5/8	22 3/4	12 7/8	8 1/2	22	5/16	44
Size 2 Str. Form FT or FT-1..... (200 VA additional capacity)	10 5/8	28 3/4	12 7/8	8 1/2	28	5/16	50
Size 3 Str..... (Also Form FT or FT-1, 100 VA additional capacity)	14 11/16	33 7/16	14 15/32	11 1/2	32 5/8	7/16	....
Size 4 Str..... (Also Form FT or FT-1, 100 VA additional capacity)	14 11/16	33 7/64	14 15/32	11 1/2	32 5/8	7/16	....

All Form FT dimensions are for 50/60 cycle transformers. Consult factory for 25 cycle Form FT dimensions.



Class 8539
Types GA & GAA-1 thru -9
Weight — 440

All Weights are Approximate Shipping Weights in Pounds and are for Starters without Form FT unless otherwise Noted. Dimensions are in Inches.

●Revised

AC COMBINATION STARTERS
CLASS 8538 — WITH FUSIBLE OR NON-FUSIBLE DISCONNECT
CLASS 8539 — WITH CIRCUIT BREAKER

Approximate Dimensions — Not for Construction

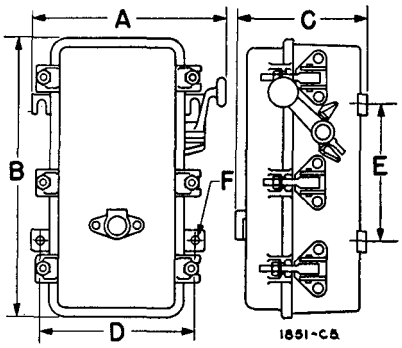


Diagram 7

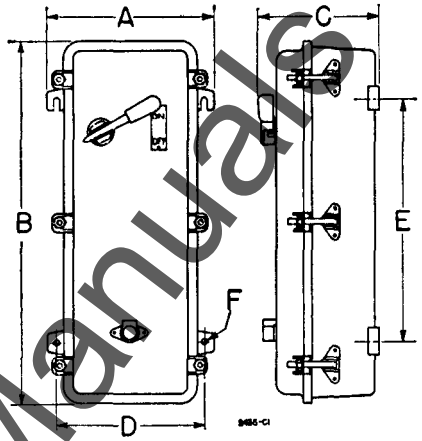


Diagram 8

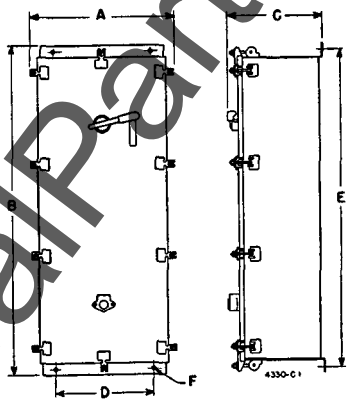


Diagram 9

CLASS 8538 — WITH FUSIBLE OR NON-FUSIBLE DISCONNECT — NEMA TYPE 9

Size	Dim. Types	Diagram 7 CE-1	Size	Dim. Types	Diagram 7 DE-1	Size	Dim. Types	Diagram 7 EE-1
1	A	12	2	A	12 7/8	3	A	17 5/8
	B	19		B	25 1/16		B	33 15/16
	C	7 17/32		C	7 5/8		C	9 11/16
	D	9		D	10		D	13 5/8
	E	11 1/2		E	16 3/4		E	23
	F	1/16		F	1/16		F	9/16

CLASS 8539 — WITH CIRCUIT BREAKER — NEMA TYPE 9

Size	Dim. Types	Diagram 8 BE-1 to BE-3 CE-3 to CE-6	Size	Dim. Types	Diagram 8 DE-2 DE-5 to DE-10	Size	Dim. Types	Diagram 8 EE-1 to EE-9	Size	Dim. Types	Diagram 9 FE-1 to FE-8	Size	Dim. Types	Diagram 9 GE-1 to GE-9
0 and 1	A	10 1/2	2	A	11 1/2	3	A	15 3/8	4	A	15 5/8	5	A	20 7/8
	B	19		B	25 1/16		B	33 15/16		B	34 1/4		B	52
	C	8		C	8 1/8		C	10 1/8		C	10 3/4		C	14 1/2
	D	9		D	10		D	13 3/8		D	9		D	14 1/2
	E	11 1/2		E	16 3/4		E	23		E	32 3/4		E	50
	F	1/16		F	1/16		F	9/16		F	9/16		F	11/16

Dimensions are in Inches.

AC COMBINATION STARTERS
CLASS 8538 — WITH FUSIBLE OR NON-FUSIBLE DISCONNECT
CLASS 8539 — WITH CIRCUIT BREAKER

LOCATION AND SIZE OF KNOCKOUTS AND CONDUIT DRILLING

Approximate Dimensions — Not for Construction

KNOCKOUT SIZES AND LOCATIONS FOR NEMA 1 AND GENERAL PURPOSE WITH FELT GASKET ENCLOSURES (SEE DIAGRAM 11)

Contactor Size	Knockout Size and Location					
	½″	½″-¾″	1″-1¼″	1″-1¼″-1½″	2½″	3″
0 and 1	D, E, I, J	A, B, C, F G, H				
2	D, E, I, J	B, G	A, C, F, H			
3	D, E, I, J	B, G		A, C, F, H		
4	D, E, I, J	B, G			A, C, F, H	
5 *	D, E, I, J	B, G				A, C, F, H

*No knockouts are provided on Class 8538 cabinets of this size. This is a floor mounted cabinet, and cable entrance is provided for through the open bottom.

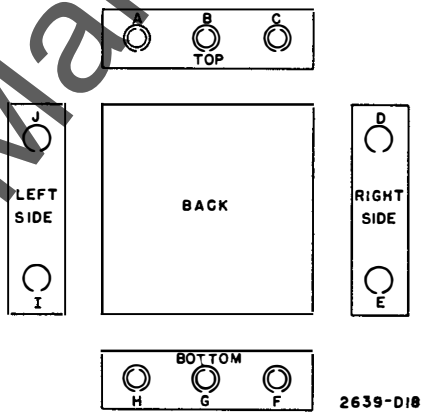


Diagram 11

THREADED CONDUIT ENTRANCE SIZE AND LOCATION FOR CLASS 8538 NEMA 9 ENCLOSURES (SEE DIAGRAM 12)

Contactor Size	Pipe Tap Size					Dimension	
	¾″-14	1″-11½	2″-11½	2½″-8	3½″-8	Y	X
1	F	B, E				1¾″	2 ″
2	F	B, E				1¾″	2⅛″
3	F		B, E			2⅛″	2½″
4	F			B, E		2⅞″	3¼″

THREADED CONDUIT ENTRANCE SIZE AND LOCATION FOR CLASS 8539 NEMA 9 ENCLOSURES (SEE DIAGRAM 12)

Contactor Size	Pipe Tap Size					Dimension	
	¾″-14	1″-11½	2″-11½	2½″-8	3½″-8	Y	X
1	F	B, E				1¾″	2 ″
2	F	B, E				1¾″	2 ″
3	F		B, E			2⅛″	2½″
4	F			B,E		2⅞″	3¼″
5	F				B, E	3½″	4 ″

NEMA 12 enclosures are furnished without knockouts or other conduit entrances.

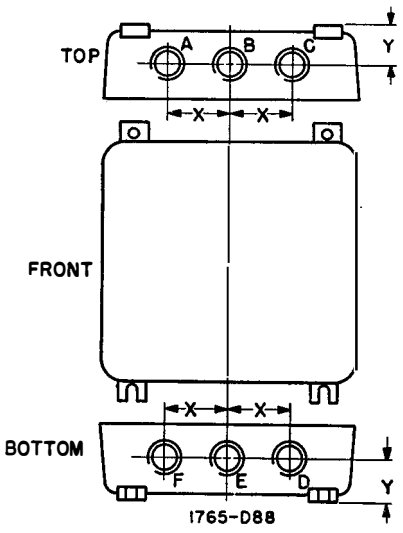


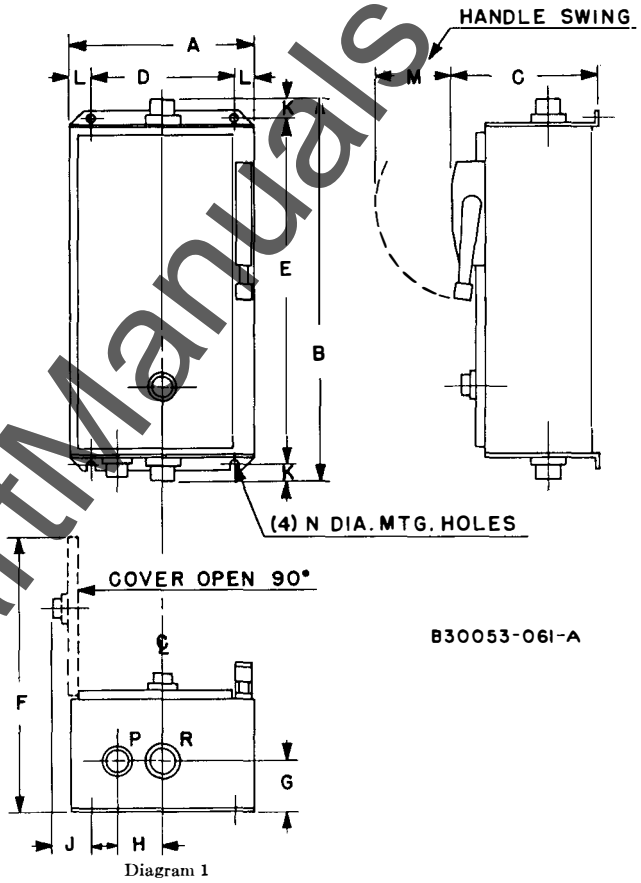
Diagram 12

Dimensions are in Inches.

AC COMBINATION STARTERS WITH NEMA 4 *Stainless Steel* ENCLOSURE

CLASS 8538 — WITH FUSIBLE OR NON-FUSIBLE DISCONNECT
CLASS 8539 — WITH CIRCUIT BREAKER

Approximate Dimensions
Not for Construction



B30053-061-A

Diagram 1

†**CLASS 8538 — WITH FUSIBLE OR NON-FUSIBLE DISCONNECT** (Dimensions in Inches)

Type	Diag.	A	B	C	D	E	F	G	H	J	K	L	M	N	Hub Size Top & Bottom at R (Diag. 1)	Hub Size Bottom Only at P (Diag. 1)
BW-11, CW-11	1	9 3/16	17 1/4	8 11/32	7	16	13 1/4	1 7/16	2	2 13/16	5/8	1 3/32	3 7/8	5/16	1 "–11 1/2	3/4"–14
BW-12, 13 CW-12 thru 14, 19	1	9 3/16	22 1/4	8 11/32	7	21	13 1/4	1 7/16	2	2 13/16	5/8	1 3/32	3 7/8	5/16	1 " 11 1/2	3/4"–14
DW-11	1	10 11/16	21 1/4	9 1/32	8 1/2	20	15 7/16	1 13/16	2 3/8	2 13/16	5/8	1 3/32	3 7/8	5/16	1 1/2"–11 1/2	3/4"–14
DW-12 thru 15	1	10 11/16	28 1/4	9 1/32	8 1/2	27	15 7/16	1 13/16	2 3/8	2 13/16	5/8	1 3/32	3 7/8	5/16	1 1/2"–11 1/2	3/4"–14
EW-11	1	14 3/16	27 3/8	11 3/32	11	26 3/8	20 1/2	2 1/16	2 5/8	3 5/16	1/2	1 19/32	5 7/16	7/16	2 "–11 1/2	3/4"–14
EW-12 thru 14	1	14 3/16	35 3/8	11 3/32	11	34 3/8	20 1/2	2 1/16	2 5/8	3 5/16	1/2	1 19/32	5 7/16	7/16	2 "–11 1/2	3/4"–14
FW-11	1	16 11/16	32 3/4	12 19/32	13 1/2	31 3/8	24 1/2	2 5/16	2 7/8	3 5/16	11/16	1 19/32	5 7/16	7/16	2 1/2"– 8	3/4"–14
FW-12 thru 15	1	16 11/16	43 3/4	12 19/32	13 1/2	42 3/8	24 1/2	2 5/16	2 7/8	3 5/16	11/16	1 19/32	5 7/16	7/16	2 1/2"– 8	3/4"–14

†**CLASS 8539 — WITH CIRCUIT BREAKER DISCONNECT** (Dimensions in Inches)

BW-11 thru 13 CW-11 thru 13	1	9 3/16	20 1/4	8 11/32	7	19	13 1/4	1 5/8	2 5/16	2 13/16	5/8	1 3/32	3 7/8	5/16	1 "–11 1/2	3/4"–14
DW-12, 15 thru 20	1	10 11/16	23 1/4	9 1/32	8 1/2	22	15 7/16	2 1/16	2 3/4	2 13/16	5/8	1 3/32	3 7/8	5/16	1 1/2"–11 1/2	3/4"–14
EW-11 thru 19	1	14 11/16	33 7/16	10 19/32	11 1/2	32 3/8	21	2 5/16	2 7/8	3 7/16	17/32	1 19/32	3 7/8	7/16	2 "–11 1/2	3/4"–14
FW-11 thru 18	1	14 11/16	33 3/4	10 19/32	11 1/2	32 3/8	21	2 5/16	2 7/8	3 7/16	11/16	1 19/32	3 7/8	7/16	2 1/2"– 8	3/4"–14

†Dimensions shown also apply to equivalent devices with bimetallic overload relays.