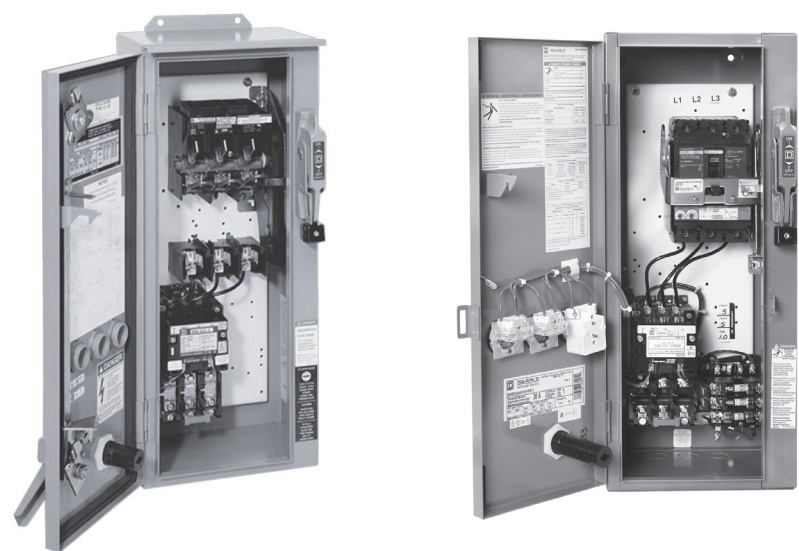


Combination Starters

NEMA Style

Catalog
8538CT9701R08/17
2017
Class 8538/8539, 8738/8739



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Non-Reversing Combination Starters, NEMA Style

General Information

Class 8538 and 8539 Type S combination starters combine the requirements of motor overload and short-circuit protection into one package. These starters are manufactured in accordance with NEMA standards and are UL Listed (although some Form numbers may not be listed—contact your local Square D™ representative for information). Class 8538 and 8539 combination starters are designed to operate at 600 Vac maximum, 50 to 60 Hz—and come standard with melting alloy overload relays. Bimetallic and solid-state overload relays are available as options (see pages 45–46).

Type 2 Coordination

Square D brand is one of the leaders in North America and Europe in providing starters that are verified by UL to comply with IEC 947-4-1 and Type 2 coordination. This means that the controller components—the contactor, the overload relay, and the motor branch circuit protective device (fuses or circuit breaker)—will be suitable for further use following a short-circuit fault (even though contact welding is recognized but can be easily broken). This allows for replacement of components during normal scheduled maintenance.

Square D starters and specified fuses have been tested by UL and CSA (at 100,000 A fault current) for operation at 600 Vac. Class 8538 Type S combination starters, NEMA Size 0–5, with fusible disconnect switches have tested to Type 2 performance criteria.

Class 8538 Disconnect Switch Type

Class 8538 combination starters can be furnished with either a fusible or non-fusible disconnect switch. Class 8538 combination starters are available in NEMA Size 0–6.

The design of the fusible disconnect switch combination starter uses a flange-operated visible blade switch. Interchangeable fuse clips, straight-through wiring, space for a fused control transformer with additional capacity, and provisions for adding a disconnect switch electrical interlock are key features of the combination starters.

The fusible disconnect switch device can be furnished with Class R fuse clips, increasing the short-circuit rating to 100,000 A.

Size 0–2 non-fusible combination starters can be converted to a fusible type. See catalog 9999CT9701 for fuse block kits and fuse kits.

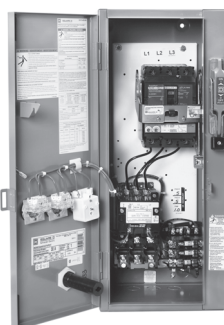
Class 8539 Electronic Motor Circuit Protector (MCP) or Thermal-Magnetic Circuit Breaker Type

Class 8539 combination starters can be furnished with either an electronic motor circuit protector (MCP) or a thermal-magnetic circuit breaker. Class 8539 combination starters are available in NEMA Size 0–7.

The circuit breakers in Class 8539 combination starters can be furnished with a factory installed auxiliary switch for remote indication of an open/tripped or closed circuit breaker. For one auxiliary switch, specify **Form Y74**. For two auxiliary switches, specify **Form Y75**. The switches are furnished with normally open and normally closed circuits with a common connection. Contacts must be used on the same polarity and are rated 15 A at 240 Vac.

An alarm switch can be factory installed only—specify **Form Y742**. The alarm switch is used to actuate bell alarms and warning lights. It operates only when the circuit breaker is tripped. The alarm switch consists of a normally open single-pole, single-throw switch. The contacts are rated 4 A at 240 Vac.

Circuit breaker combination starters have short-circuit interrupting ratings up to 100,000 A. See page 39 for details.



Combination Starters

Class 8538, 8539—Non-Reversing—General Information

Enclosures—Class 8538 and 8539 combination starters are available in the following enclosures:

- NEMA 1 General Purpose
- NEMA 4 & 4X Watertight and Dusttight Stainless Steel
- NEMA 4X Watertight, Dusttight, and Corrosion Resistant Glass-Polyester
- NEMA 12/3R Dusttight and Driptight for Industrial Use

These enclosures have three holes (30.5 mm) as standard for installation of Class 9001 Type K push buttons, pilot lights, and other cover-mounted control units.

The NEMA 4 & 4X stainless steel enclosures (Sizes 0–5) have a brushed finish. Sizes 6–7 are painted sheet-steel enclosures and are rated NEMA 4 only. Hubs come standard on NEMA 4X enclosures.

NEMA 12 enclosures can be field modified for outdoor applications. Specify **Form G26** for NEMA 3R (no additional charge). See page 19 for additional information.

Oversize Enclosures—Class 8538 disconnect switch type and Class 8539 electronic motor circuit protector (MCP), Sizes 0–2, are also available in NEMA 1, 4 & 4X, and 12/3R oversize enclosures. The oversize enclosures provide additional panel space for customer installation of control transformers, fuse blocks, terminal blocks, relays, and other auxiliary equipment.

Coil Voltages—AC coils are available for application at 50–60 Hz. The coils for NEMA Size 00–5 devices are designed to operate satisfactorily on line voltages of 85–110% of rated voltage. NEMA Size 6–7 contactors come with a DC coil operated by a solid-state rectifier circuit, which is powered by an AC source and designed to operate satisfactorily on line voltages of 90–110% of rated voltage.

NOTE: A voltage code is required when ordering combination starters. Polyphase combination starters with 24 Vac or 120 Vac coil voltages come wired for **separate control**.

Auxiliary Contacts—Additional auxiliary contacts can be added to Type S starters. Refer to page 37 for the maximum number of auxiliary units and the Form designations for factory-installed auxiliary contacts. See catalog 9999CT9701 for auxiliary contact kits for field installation.

Type S Accessories—Additional accessories such as fuse blocks, fuse clip kits, disconnect switch and circuit breaker interlocks, and cover-mounted control units are available as field modifications. See catalog 9999CT9701. For factory modifications (Forms), see page 42.

Overload Protection

Type S magnetic starters are used for full-voltage starting and stopping of AC squirrel cage motors. Motor overload protection for three-phase starter applications can be provided through one of four options, as follows:

Solid-State Overload Relay Protection (Motor Logic™ SSOLR)—These ambient insensitive overload relays are available on Sizes 00–6 and standard on Size 7. They provide phase loss and phase unbalance protection. To order, add Form **H30** (for selectable trip class 10 or 20 protection). For more information about Motor Logic SSOLRs, see page 45 and catalog 9065CT9701. (Product catalog number example: 8536SCO3V06**H30**)

Adapted Bimetallic Overload Relay (NEMA Sizes 00–1)—The adapted bimetallic motor starter consists of a specially designed adapter. It attaches with bus bars to the Type S NEMA contactor and holds the IEC-style bimetallic overload relay (type LRD or LR3D). This starter configuration can be ordered by adding Form **E** (adapter only) to the standard catalog number. The LRD or LR3D bimetallic overload relay must be purchased separately, based on the motor FLA, and installed in the field in order to operate the starter. For more information—including how to order the adapted bimetallic overload relay as a factory installed option—see page 45 and catalog 9065CT9701. (Product catalog number example: 8536SCO3V06**E**)

TeSys™ T Motor Management System (NEMA Sizes 1–6)—The flexible TeSys T system integrates seamlessly into your automation system through five major communication protocols. The TeSys T system can predict what will happen in the process, as it accurately monitors current, voltage, and power over a wide range. This option is available for control voltages of 24 Vac or 100–240 Vac. For additional information about the TeSys T Motor Management System, see page 46 and catalog 9065CT9701.

NOTE: The full catalog number contains a four-character Form number (for example, 8536SCO3V06**H616**).

Melting Alloy Thermal Overload Relays—Melting alloy type thermal overload blocks are installed as part of the starter, and thermal elements must be selected and installed separately in order to operate the starter. For a three-phase motor, three thermal units must be ordered using the tables in catalog 9065CT9701. The catalog number includes no Form number (for example, 8536SCO3V06).

Combination Starters

Class 8538—Fusible Disconnect Switch Type

Fusible, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

For Class J fuse clip, use Form Y1072 (no additional charge).

Table 1: Class 8538 Fusible Full Voltage Type (Class H and K Fuse Clips), with Motor Logic SSOLR (replace ●●● with the voltage code)



Motor Voltage (Starter Voltage)	Ratings			Enclosure				
	Max. Hp Poly-phase	NEMA Size	Fuse Clip Size (A)	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304) (Sizes 0-5) ^[1]	NEMA 4X Watertight, Dusttight, and Corrosion Resistant Polyester	NEMA 12/3R Industrial Use Dusttight and Driptight ^[2]	
				Type ^[3]	Type ^[3]	Type ^[3]	With External Reset	Without External Reset
200 (208)	3	0	30	SBG12●●●H30 ^[4]	SBW12●●●H30 ^[4]	SBW22●●●H30 ^[4]	SBA22●●●H30 ^[4]	SBA12●●●H30 ^[4]
	5	1	30	SCG12●●●H30 ^[4]	SCW12●●●H30 ^[4]	SCW22●●●H30 ^[4]	SCA22●●●H30 ^[4]	SCA12●●●H30 ^[4]
	7.5		60	SCG13●●●H30 ^[4]	SCW13●●●H30 ^[4]	SCW23●●●H30 ^[4]	SCA23●●●H30 ^[4]	SCA13●●●H30 ^[4]
	10	2	60	SDG12●●●H30	SDW12●●●H30	SDW22●●●H30 ^[4]	SDA22●●●H30	SDA12●●●H30
	20	3	100	SEG15●●●H30	SEW15●●●H30	SEW25●●●H30	SEA25●●●H30	SEA15●●●H30
	25		200	SEG12●●●H30	SEW12●●●H30	—	SEA22●●●H30	SEA12●●●H30
	40	4	200	SFG15●●●H30	SFW15●●●H30	—	SFA25●●●H30	SFA15●●●H30
	75	5	400	SGG15●●●H30	SGW15●●●H30	—	SGA25●●●H30	SGA15●●●H30
230 (240)	150	6	600	SHG13●●●H30	SHW13●●●H30	—	SHA23●●●H30	SHA13●●●H30
	3	0	30	SBG12●●●H30 ^[4]	SBW12●●●H30 ^[4]	SBW22●●●H30 ^[4]	SBA22●●●H30 ^[4]	SBA12●●●H30 ^[4]
	5	1	30	SCG12●●●H30 ^[4]	SCW12●●●H30 ^[4]	SCW22●●●H30 ^[4]	SCA22●●●H30 ^[4]	SCA12●●●H30 ^[4]
	7.5		60	SCG13●●●H30 ^[4]	SCW13●●●H30 ^[4]	SCW23●●●H30 ^[4]	SCA23●●●H30 ^[4]	SCA13●●●H30 ^[4]
	10	2	60	SDG12●●●H30 ^[4]	SDW12●●●H30	SDW22●●●H30 ^[4]	SDA22●●●H30	SDA12●●●H30
	25	3	100	SEG15●●●H30	SEW15●●●H30	SEW25●●●H30	SEA25●●●H30	SEA15●●●H30
	30		200	SEG12●●●H30	SEW12●●●H30	—	SEA22●●●H30	SEA12●●●H30
	50	4	200	SFG15●●●H30	SFW15●●●H30	—	SFA25●●●H30	SFA15●●●H30
460 (480)	100	5	400	SGG15●●●H30	SGW15●●●H30	—	SGA25●●●H30	SGA15●●●H30
	200	6	600	SHG13●●●H30	SHW13●●●H30	—	SHA23●●●H30	SHA13●●●H30
	5	0	30	SBG13●●●H30 ^[4]	SBW13●●●H30 ^[4]	SBW23●●●H30 ^[4]	SBA23●●●H30 ^[4]	SBA13●●●H30 ^[4]
	10	1	30	SCG14●●●H30 ^[4]	SCW14●●●H30 ^[4]	SCW24●●●H30 ^[4]	SCA24●●●H30 ^[4]	SCA14●●●H30 ^[4]
	15	2	30	SDG16●●●H30 ^[4]	SDW16●●●H30 ^[4]	SDW26●●●H30 ^[4]	SDA26●●●H30 ^[4]	SDA16●●●H30 ^[4]
	25		60	SDG14●●●H30	SDW14●●●H30	SDW24●●●H30	SDA24●●●H30	SDA14●●●H30
	50	3	100	SEG13●●●H30	SEW13●●●H30	SEW23●●●H30	SEA23●●●H30	SEA13●●●H30
	100	4	200	SFG13●●●H30	SFW13●●●H30	—	SFA23●●●H30	SFA13●●●H30
575 (600)	200	5	400	SGG13●●●H30	SGW13●●●H30	—	SGA23●●●H30	SGA13●●●H30
	400	6	600	SHG12●●●H30	SHW12●●●H30	—	SHA22●●●H30	SHA12●●●H30
	5	0	30	SBG13●●●H30 ^[4]	SBW13●●●H30 ^[4]	SBW23●●●H30 ^[4]	SBA23●●●H30 ^[4]	SBA13●●●H30 ^[4]
	10	1	30	SCG14●●●H30 ^[4]	SCW14●●●H30 ^[4]	SCW24●●●H30 ^[4]	SCA24●●●H30 ^[4]	SCA14●●●H30 ^[4]
	15	2	30	SDG16●●●H30 ^[4]	SDW16●●●H30 ^[4]	SDW26●●●H30 ^[4]	SDA26●●●H30 ^[4]	SDA16●●●H30 ^[4]
	25		60	SDG14●●●H30	SDW14●●●H30	SDW24●●●H30	SDA24●●●H30	SDA14●●●H30
	50	3	100	SEG13●●●H30	SEW13●●●H30	SEW23●●●H30	SEA23●●●H30	SEA13●●●H30
	100	4	200	SFG13●●●H30	SFW13●●●H30	—	SFA23●●●H30	SFA13●●●H30
	200	5	400	SGG13●●●H30	SGW13●●●H30	—	SGA23●●●H30	SGA13●●●H30
	400	6	600	SHG12●●●H30	SHW12●●●H30	—	SHA22●●●H30	SHA12●●●H30



File E152395
CCN NKJH7



File LR584
Class 3211 04

Note:
Some units are not
CSA certified.
Consult the factory.

^[1] Size 6 starter enclosures are NEMA 4 painted sheet steel.

^[2] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

^[3] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 5 on page 8.

^[4] **Form H30**, with the possibility of a fourth character to select a lower FLA range (for example, **H308**). See page 45.

NOTE: Some control transformers may require the use of oversize enclosures. Refer to Table 71 on page 44 for control transformer selection.

Combination Starters Class 8538—Fusible Disconnect Switch Type

Table 2: Class 8538 Fusible Disconnect Switch Type (Class H Fuse Clips), Single Phase ^[1], with Melting Alloy Overload Relay (see Thermal Unit Selection)

Motor Voltage	Ratings					Enclosure				
	Max. Hp	Coil Voltage	NEMA Size	Poles	Fuse Clip Size (A)	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304)	NEMA 4X Watertight, Dusttight, and Corrosion Resistant Polyester	NEMA 12/3R ^[2] Industrial Use Dusttight and Driptight	
						Type	Type	Type	With External Reset	Without External Reset
120	1	120	0	2	30	SBG62V02	SBW62V02	SBW65V02	SBA65V02	SBA62V02
	2		1		30	SCG62V02	SCW62V02	SCW65V02	SCA65V02	SCA62V02
	3		2		60	SDG62V02	SDW62V02	SDW65V02	SDA65V02	SDA62V02
240	2	240	0	2	30	SBG62V03	SBW62V03	SBW65V03	SBA65V03	SBA62V03
	3		1		30	SCG62V03	SCW62V03	SCW65V03	SCA65V03	SCA62V03
	7.5		2		60	SDG62V03	SDW62V03	SDW65V03	SDA65V03	SDA62V03

^[1] Single-phase units require one thermal unit. They are not available with solid-state overload relays (Form H**).
Not included in the Laser™ Delivery program.

^[2] NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

Non-Fusible, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 3: Class 8538 Non-Fusible Full Voltage Type, Non-Reversing, with Motor Logic SSOLR (replace ... with the voltage code)

Ratings			Enclosure				
Motor Voltage (Starter Voltage)	Max. Hp Polyphase	NEMA Size	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304) (Sizes 0–5) ^[1]	NEMA 4X Watertight, Dusttight, and Corrosion Resistant Polyester	NEMA 12/3R ^[2] Industrial Use Dusttight and Driptight	
			Type ^[3]	Type ^[3]	Type ^[3]	With External Reset	Without External Reset
200 (208)	3	0	SBG11●●●H30 ^[4]	SBW11●●●H30 ^[4]	SBW21●●●H30 ^[4]	SBA21●●●H30 ^[4]	SBA11●●●H30 ^[4]
	7.5	1	SCG11●●●H30 ^[4]	SCW11●●●H30 ^[4]	SCW21●●●H30 ^[4]	SCA21●●●H30 ^[4]	SCA11●●●H30 ^[4]
	10	2	SDG11●●●H30	SDW11●●●H30	SDW21●●●H30	SDA21●●●H30	SDA11●●●H30
	25	3	SEG11●●●H30	SEW11●●●H30	SEW21●●●H30	SEA21●●●H30	SEA11●●●H30
	40	4	SFG11●●●H30	SFW11●●●H30	—	SFA21●●●H30	SFA11●●●H30
	75	5	SGG11●●●H30	SGW11●●●H30	—	SGA21●●●H30	SGA11●●●H30
	150	6	SHG11●●●H30	SHW11●●●H30	—	SHA21●●●H30	SHA11●●●H30
230 (240)	3	0	SBG11●●●H30 ^[4]	SBW11●●●H30 ^[4]	SBW21●●●H30 ^[4]	SBA21●●●H30 ^[4]	SBA11●●●H30 ^[4]
	7.5	1	SCG11●●●H30 ^[4]	SCW11●●●H30 ^[4]	SCW21●●●H30 ^[4]	SCA21●●●H30 ^[4]	SCA11●●●H30 ^[4]
	15	2	SDG11●●●H30	SDW11●●●H30	SDW21●●●H30	SDA21●●●H30	SDA11●●●H30
	30	3	SEG11●●●H30	SEW11●●●H30	SEW21●●●H30	SEA21●●●H30	SEA11●●●H30
	50	4	SFG11●●●H30	SFW11●●●H30	—	SFA21●●●H30	SFA11●●●H30
	100	5	SGG11●●●H30	SGW11●●●H30	—	SGA21●●●H30	SGA11●●●H30
	200	6	SHG11●●●H30	SHW11●●●H30	—	SHA21●●●H30	SHA11●●●H30
460 (480)	5	0	SBG11●●●H30 ^[4]	SBW11●●●H30 ^[4]	SBW21●●●H30 ^[4]	SBA21●●●H30 ^[4]	SBA11●●●H30 ^[4]
	10	1	SCG11●●●H30 ^[4]	SCW11●●●H30 ^[4]	SCW21●●●H30 ^[4]	SCA21●●●H30 ^[4]	SCA11●●●H30 ^[4]
	25	2	SDG11●●●H30	SDW11●●●H30	SDW21●●●H30	SDA21●●●H30	SDA11●●●H30
	50	3	SEG11●●●H30	SEW11●●●H30	SEW21●●●H30	SEA21●●●H30	SEA11●●●H30
	100	4	SFG11●●●H30	SFW11●●●H30	—	SFA21●●●H30	SFA11●●●H30
	200	5	SGG11●●●H30	SGW11●●●H30	—	SGA21●●●H30	SGA11●●●H30
	400	6	SHG11●●●H30	SHW11●●●H30	—	SHA21●●●H30	SHA11●●●H30
575 (600)	5	0	SBG11●●●H30 ^[4]	SBW11●●●H30 ^[4]	SBW21●●●H30 ^[4]	SBA21●●●H30 ^[4]	SBA11●●●H30 ^[4]
	10	1	SCG11●●●H30 ^[4]	SCW11●●●H30 ^[4]	SCW21●●●H30 ^[4]	SCA21●●●H30 ^[4]	SCA11●●●H30 ^[4]
	25	2	SDG11●●●H30	SDW11●●●H30	SDW21●●●H30	SDA21●●●H30	SDA11●●●H30
	50	3	SEG11●●●H30	SEW11●●●H30	SEW21●●●H30	SEA21●●●H30	SEA11●●●H30
	100	4	SFG11●●●H30	SFW11●●●H30	—	SFA21●●●H30	SFA11●●●H30
	200	5	SGG11●●●H30	SGW11●●●H30	—	SGA21●●●H30	SGA11●●●H30
	400	6	SHG11●●●H30	SHW11●●●H30	—	SHA21●●●H30	SHA11●●●H30

^[1] Size 6 starter enclosures are NEMA 4 painted sheet steel.

^[2] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

^[3] Replace the three bullets (•••) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 5 on page 8.

^[4] Form H30, with the possibility of a fourth character to select a lower FLA range (for example, H308). See page 45.

Combination Starters

Class 8538—Fusible Disconnect Switch Type

Table 4: Class 8538 Non-Fusible Disconnect Switch Type, Single Phase [1], with Melting Alloy Overload Relay (see Thermal Unit Selection)

Motor Voltage	Ratings				NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304)	Enclosure		
	Max. Hp	Coil Voltage	NEMA Size	Poles			NEMA 4X Watertight, Dusttight, and Corrosion Resistant Polyester	NEMA 12/3R [2] Industrial Use Dusttight and Driptight	
					Type	Type	Type	With External Reset	Without External Reset
120	1	120	0	2	SBG61V02	SBW61V02	SBW64V02	SBA64V02	SBA61V02
	2		1		SCG61V02	SCW61V02	SCW64V02	SCA64V02	SCA61V02
	3		2		SDG61V02	SDW61V02	SDW64V02	SDA64V02	SDA61V02
240	2	240	0	2	SBG61V03	SBW61V03	SBW64V03	SBA64V03	SBA61V03
	3		1		SCG61V03	SCW61V03	SCW64V03	SCA64V03	SCA61V03
	7.5		2		SDG61V03	SDW61V03	SDW64V03	SDA64V03	SDA61V03

[1] Single-phase units require one thermal unit. They are not available with solid-state overload relays (Form H**).
Not included in the Laser™ Delivery program.

[2] NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

NOTE: Some control transformers may require the use of oversize enclosures. Refer to Table 71 on page 44 for control transformer selection.

Table 5: Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24 [1]	—	V01
120 [1]	110	V02
208	—	V08
240	220	V03
277 [1]	—	V04
480	440	V06
600	550	V07
Specify	Specify	V99

[1] **Form S** (no charge) must be included with these voltage codes where a separate source of voltage is used for the control coil (for example, order as 8538SCG11V02H30**S**).

Note that **24 V** coils are **not** available on Sizes 4–7.

NOTE: For voltage codes used with control transformers, see Table 71 on page 44.

Combination Starters

Class 8538—Fusible Disconnect Switch Type with Class R Fuse Clips

Class R Fuse Clips, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 6: Class 8538 Fusible (with Class R Fuse Clips) Full Voltage Type, Non-Reversing, with Motor Logic SSOLR (100,000 AIC Rated) (replace ●●● with the voltage code)

Motor Voltage (Starter Voltage)	Ratings			Enclosure				
	Max. Hp Polyphase	NEMA Size	Fuse Clip Size (A)	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304) (Sizes 0–5) [1]	NEMA 4 & 4X Watertight, Dusttight, and Corrosion Resistant Polyester	NEMA 12/3R Industrial Use Dusttight and Driptight [2]	
				Type [3]	Type [3]	Type [3]	With External Reset	Without External Reset
200 (208)	3	0	30	SBG32●●●H30[4]	SBW32●●●H30[4]	SBW42●●●H30[4]	SBA42●●●H30[4]	SBA32●●●H30[4]
	5	1	30	SCG32●●●H30[4]	SCW32●●●H30[4]	SCW42●●●H30[4]	SCA42●●●H30[4]	SCA32●●●H30[4]
	7.5	1	60	SCG33●●●H30[4]	SCW33●●●H30[4]	SCW43●●●H30[4]	SCA43●●●H30[4]	SCA33●●●H30[4]
	10	2	60	SDG32●●●H30	SDW32●●●H30[4]	SDW42●●●H30[4]	SDA42●●●H30[4]	SDA32●●●H30[4]
	20	3	100	SEG35●●●H30	SEW35●●●H30	SEW45●●●H30	SEA45●●●H30	SEA35●●●H30
	25	3	200	SEG32●●●H30	SEW32●●●H30	—	SEA42●●●H30	SEA32●●●H30
	40	4	200	SFG35●●●H30	SFW35●●●H30	—	SFA45●●●H30	SFA35●●●H30
	75	5	400	SGG35●●●H30	SGW35●●●H30	—	SGA45●●●H30	SGA35●●●H30
	150	6	600	SHG33●●●H30	SHW33●●●H30	—	SHA43●●●H30	SHA33●●●H30
230 (240)	3	0	30	SBG32●●●H30[4]	SBW32●●●H30[4]	SBW42●●●H30[4]	SBA42●●●H30[4]	SBA32●●●H30[4]
	5	1	30	SCG32●●●H30[4]	SCW32●●●H30[4]	SCW42●●●H30[4]	SCA42●●●H30[4]	SCA32●●●H30[4]
	7.5	1	60	SCG33●●●H30[4]	SCW33●●●H30[4]	SCW43●●●H30[4]	SCA43●●●H30[4]	SCA33●●●H30[4]
	15	2	60	SDG32●●●H30	SDW32●●●H30	SDW42●●●H30	SDA42●●●H30	SDA32●●●H30
	25	3	100	SEG35●●●H30	SEW35●●●H30	SEW45●●●H30	SEA45●●●H30	SEA35●●●H30
	30	3	200	SEG32●●●H30	SEW32●●●H30	—	SEA42●●●H30	SEA32●●●H30
	50	4	200	SFG35●●●H30	SFW35●●●H30	—	SFA45●●●H30	SFA35●●●H30
	100	5	400	SGG35●●●H30	SGW35●●●H30	—	SGA45●●●H30	SGA35●●●H30
	200	6	600	SHG33●●●H30	SHW33●●●H30	—	SHA43●●●H30	SHA33●●●H30
460 (480)	5	0	30	SBG33●●●H30[4]	SBW33●●●H30[4]	SBW43●●●H30[4]	SBA43●●●H30[4]	SBA33●●●H30[4]
	10	1	30	SCG34●●●H30[4]	SCW34●●●H30[4]	SCW44●●●H30[4]	SCA44●●●H30[4]	SCA34●●●H30[4]
	15	2	30	SDG36●●●H30[4]	SDW36●●●H30[4]	SDW46●●●H30[4]	SDA46●●●H30[4]	SDA36●●●H30[4]
	25	2	60	SDG34●●●H30	SDW34●●●H30	SDW44●●●H30	SDA44●●●H30	SDA34●●●H30
	50	3	100	SEG33●●●H30	SEW33●●●H30	SEW43●●●H30	SEA43●●●H30	SEA33●●●H30
	100	4	200	SFG33●●●H30	SFW33●●●H30	—	SFA43●●●H30	SFA33●●●H30
	200	5	400	SGG33●●●H30	SGW33●●●H30	—	SGA43●●●H30	SGA33●●●H30
	400	6	600	SHG32●●●H30	SHW32●●●H30	—	SHA42●●●H30	SHA32●●●H30
	—	—	—	—	—	—	—	—
575 (600)	5	0	30	SBG33●●●H30[4]	SBW33●●●H30[4]	SBW43●●●H30[4]	SBA43●●●H30[4]	SBA33●●●H30[4]
	10	1	30	SCG34●●●H30[4]	SCW34●●●H30[4]	SCW44●●●H30[4]	SCA44●●●H30[4]	SCA34●●●H30[4]
	15	2	30	SDG36●●●H30[4]	SDW36●●●H30[4]	SDW46●●●H30[4]	SDA46●●●H30[4]	SDA36●●●H30[4]
	25	2	60	SDG34●●●H30	SDW34●●●H30	SDW44●●●H30	SDA44●●●H30	SDA34●●●H30
	50	3	100	SEG33●●●H30	SEW33●●●H30	SEW43●●●H30	SEA43●●●H30	SEA33●●●H30
	100	4	200	SFG33●●●H30	SFW33●●●H30	—	SFA43●●●H30	SFA33●●●H30
	200	5	400	SGG33●●●H30	SGW33●●●H30	—	SGA43●●●H30	SGA33●●●H30
	400	6	600	SHG32●●●H30	SHW32●●●H30	—	SHA42●●●H30	SHA32●●●H30
	—	—	—	—	—	—	—	—

[1] Size 6 starter enclosures are NEMA 4 painted sheet steel.

[2] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

[3] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 8 on page 10.

[4] Form H30, with the possibility of a fourth character to select a lower FLA range (for example, H308). See page 45.

Combination Starters

Class 8538—Fusible Disconnect Switch Type with Class R Fuse Clips

Table 7: Class 8538 Fusible Disconnect Switch Type (Class R Fuses), Single Phase [1], with Melting Alloy Overload Relay

Motor Voltage	Ratings					Enclosure				
	Max. Hp	Coil Voltage	NEMA Size	Poles	Fuse Clip Size (A)	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel	NEMA 4X Watertight, Dusttight, and Corrosion Resistant Polyester	NEMA 12/3R Industrial Dusttight and Driptight With External Reset	NEMA 12/3R Industrial Dusttight and Driptight Without External Reset
						Type	Type	Type	Type	Type
120	1	120	0	2	30	SBG63V02	SBW63V02	SBW66V02	SBA66V02	SBA63V02
	2		1		30	SCG63V02	SCW63V02	SCW66V02	SCA66V02	SCA63V02
	3		2		60	SDG63V02	SDW63V02	SDW66V02	SDA66V02	SDA63V02
240	2	240	0	2	30	SBG63V03	SBW63V03	SBW66V03	SBA66V03	SBA63V03
	3		1		30	SCG63V03	SCW63V03	SCW66V03	SCA66V03	SCA63V03
	7.5		2		60	SDG63V03	SDW63V03	SDW66V03	SDA66V03	SDA63V03

[1] Single-phase units require one thermal unit. They are not available with solid-state overload relays (Form H**).
Not included in the Laser™ Delivery program.

NOTE: Some control transformers may require the use of oversize enclosures. See Table 71 on page 44 for control transformer selection.

Table 8: Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24 ^[1]	—	V01
120 ^[1]	110	V02
208	—	V08
240	220	V03
277 ^[1]	—	V04
480	440	V06
600	550	V07
Specify	Specify	V99

[1] **Form S** (no charge) must be included with these voltage codes where a separate source of voltage is used for the control coil (for example, order as 8538SCG32V02H30S). Note that **24 V** coils are **not** available on Sizes 4–7.

NOTE: For voltage codes used with control transformers, see Table 71 on page 44.

Combination Starters

Class 8538—Disconnect Switch Type in Oversize Enclosure, NEMA Size 0–2

Oversize Enclosures, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 9: Class 8538 with Oversize Enclosures (replace ●●● with the voltage code)

Motor Voltage (Starter Voltage)	Ratings			Enclosure			
	Max. Hp Polyphase	NEMA Size	Fuse Clip Size (A)	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight, Stainless Steel (304)	NEMA 12/3R ^[5] , Industrial Use, Dusttight and Driptight	
				Type ^[3]	Type ^[3]	With External Reset	Without External Reset
Type ^[3]							
Class 8538 Non-Fusible Disconnect Switch Type—NEMA Size 0–2 ^{[1], [2]}							
200 (208)	3	0	N/A	SBG11S8●●●H30 ^[4]	SBW11S8●●●H30 ^[4]	SBA21S8●●●H30 ^[4]	SBA11S8●●●H30 ^[4]
	7.5	1	N/A	SCG11S8●●●H30 ^[4]	SCW11S8●●●H30 ^[4]	SCA21S8●●●H30 ^[4]	SCA11S8●●●H30 ^[4]
	10	2	N/A	SDG11S8●●●H30	SDW11S8●●●H30	SDA21S8●●●H30	SDA11S8●●●H30
230 (240)	3	0	N/A	SBG11S8●●●H30 ^[4]	SBW11S8●●●H30 ^[4]	SBA21S8●●●H30 ^[4]	SBA11S8●●●H30 ^[4]
	7.5	1	N/A	SCG11S8●●●H30 ^[4]	SCW11S8●●●H30 ^[4]	SCA21S8●●●H30 ^[4]	SCA11S8●●●H30 ^[4]
	15	2	N/A	SDG11S8●●●H30	SDW11S8●●●H30	SDA21S8●●●H30	SDA11S8●●●H30
460 (480)	5	0	N/A	SBG11S8●●●H30 ^[4]	SBW11S8●●●H30 ^[4]	SBA21S8●●●H30 ^[4]	SBA11S8●●●H30 ^[4]
	10	1	N/A	SCG11S8●●●H30 ^[4]	SCW11S8●●●H30 ^[4]	SCA21S8●●●H30 ^[4]	SCA11S8●●●H30 ^[4]
	25	2	N/A	SDG11S8●●●H30	SDW11S8●●●H30	SDA21S8●●●H30	SDA11S8●●●H30
575 (600)	5	0	N/A	SBG11S8●●●H30 ^[4]	SBW11S8●●●H30 ^[4]	SBA21S8●●●H30 ^[4]	SBA11S8●●●H30 ^[4]
	10	1	N/A	SCG11S8●●●H30 ^[4]	SCW11S8●●●H30 ^[4]	SCA21S8●●●H30 ^[4]	SCA11S8●●●H30 ^[4]
	25	2	N/A	SDG11S8●●●H30	SDW11S8●●●H30	SDA21S8●●●H30	SDA11S8●●●H30
Class 8538 Fusible Disconnect Switch Type—NEMA Size 0–2 ^{[1], [2]}							
200 (208)	3	0	30	SBG12S8●●●H30 ^[4]	SBW12S8●●●H30 ^[4]	SBA22S8●●●H30 ^[4]	SBA12S8●●●H30 ^[4]
	5	1	30	SCG12S8●●●H30 ^[4]	SCW12S8●●●H30 ^[4]	SCA22S8●●●H30 ^[4]	SCA12S8●●●H30 ^[4]
	7.5	1	60	SCG13S8●●●H30 ^[4]	SCW13S8●●●H30 ^[4]	SCA23S8●●●H30 ^[4]	SCA13S8●●●H30 ^[4]
	10	2	60	SDG12S8●●●H30	SDW12S8●●●H30	SDA22S8●●●H30	SDA12S8●●●H30
230 (240)	3	0	30	SBG12S8●●●H30 ^[4]	SBW12S8●●●H30 ^[4]	SBA22S8●●●H30 ^[4]	SBA12S8●●●H30 ^[4]
	5	1	30	SCG12S8●●●H30 ^[4]	SCW12S8●●●H30 ^[4]	SCA22S8●●●H30 ^[4]	SCA12S8●●●H30 ^[4]
	7.5	1	60	SCG13S8●●●H30 ^[4]	SCW13S8●●●H30 ^[4]	SCA23S8●●●H30 ^[4]	SCA13S8●●●H30 ^[4]
	15	2	60	SDG12S8●●●H30	SDW12S8●●●H30	SDA22S8●●●H30	SDA12S8●●●H30
460 (480)	5	0	30	SBG13S8●●●H30 ^[4]	SBW13S8●●●H30 ^[4]	SBA23S8●●●H30 ^[4]	SBA13S8●●●H30 ^[4]
	10	1	30	SCG14S8●●●H30 ^[4]	SCW14S8●●●H30 ^[4]	SCA24S8●●●H30 ^[4]	SCA14S8●●●H30 ^[4]
	15	2	30	SDG16S8●●●H30 ^[4]	SDW16S8●●●H30 ^[4]	SDA26S8●●●H30 ^[4]	SDA16S8●●●H30 ^[4]
	25	2	60	SDG14S8●●●H30	SDW14S8●●●H30	SDA24S8●●●H30	SDA14S8●●●H30
575 (600)	5	0	30	SBG13S8●●●H30 ^[4]	SBW13S8●●●H30 ^[4]	SBA23S8●●●H30 ^[4]	SBA13S8●●●H30 ^[4]
	10	1	30	SCG14S8●●●H30 ^[4]	SCW14S8●●●H30 ^[4]	SCA24S8●●●H30 ^[4]	SCA14S8●●●H30 ^[4]
	15	2	30	SDG16S8●●●H30 ^[4]	SDW16S8●●●H30 ^[4]	SDA26S8●●●H30 ^[4]	SDA16S8●●●H30 ^[4]
	25	2	60	SDG14S8●●●H30	SDW14S8●●●H30	SDA24S8●●●H30	SDA14S8●●●H30
Class 8538 Fusible Disconnect Switch Type with Class R Fuse Clips—NEMA Size 0–2 ^{[1], [2]}							
200 (208)	3	0	30	SBG32S8●●●H30 ^[4]	SBW32S8●●●H30 ^[4]	SBA42S8●●●H30 ^[4]	SBA32S8●●●H30 ^[4]
	5	1	30	SCG32S8●●●H30 ^[4]	SCW32S8●●●H30 ^[4]	SCA42S8●●●H30 ^[4]	SCA32S8●●●H30 ^[4]
	7.5	1	60	SCG33S8●●●H30 ^[4]	SCW33S8●●●H30 ^[4]	SCA43S8●●●H30 ^[4]	SCA33S8●●●H30 ^[4]
	10	2	60	SDG32S8●●●H30	SDW32S8●●●H30	SDA42S8●●●H30	SDA32S8●●●H30
230 (240)	3	0	30	SBG32S8●●●H30 ^[4]	SBW32S8●●●H30 ^[4]	SBA42S8●●●H30 ^[4]	SBA32S8●●●H30 ^[4]
	5	1	30	SCG32S8●●●H30 ^[4]	SCW32S8●●●H30	SCA42S8●●●H30	SCA32S8●●●H30
	7.5	1	60	SCG33S8●●●H30	SCW33S8●●●H30 ^[4]	SCA43S8●●●H30 ^[4]	SCA33S8●●●H30 ^[4]
	15	2	60	SDG32S8●●●H30	SDW32S8●●●H30	SDA42S8●●●H30	SDA32S8●●●H30
460 (480)	5	0	30	SBG33S8●●●H30 ^[4]	SBW33S8●●●H30 ^[4]	SBA43S8●●●H30 ^[4]	SBA33S8●●●H30 ^[4]
	10	1	30	SCG34S8●●●H30 ^[4]	SCW34S8●●●H30 ^[4]	SCA44S8●●●H30 ^[4]	SCA34S8●●●H30 ^[4]
	15	2	30	SDG36S8●●●H30 ^[4]	SDW36S8●●●H30 ^[4]	SDA46S8●●●H30 ^[4]	SDA36S8●●●H30 ^[4]
	25	2	60	SDG34S8●●●H30	SDW34S8●●●H30	SDA44S8●●●H30	SDA34S8●●●H30
575 (600)	5	0	30	SBG33S8●●●H30 ^[4]	SBW33S8●●●H30 ^[4]	SBA43S8●●●H30 ^[4]	SBA33S8●●●H30 ^[4]
	10	1	30	SCG34S8●●●H30 ^[4]	SCW34S8●●●H30 ^[4]	SCA44S8●●●H30 ^[4]	SCA34S8●●●H30 ^[4]
	15	2	30	SDG36S8●●●H30 ^[4]	SDW36S8●●●H30 ^[4]	SDA46S8●●●H30 ^[4]	SDA36S8●●●H30 ^[4]
	25	2	60	SDG34S8●●●H30	SDW34S8●●●H30	SDA44S8●●●H30	SDA34S8●●●H30

^[1] For Size 3–5 starters in oversize NEMA 1, 4, or 12 enclosures, contact the factory for pricing and TAG number.

^[2] Not included in the Laser™ Delivery program.

^[3] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 10 on page 12.

^[4] **Form H30**, with the possibility of a fourth character to select a lower FLA range (for example, **H308**). See page 45.

^[5] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

NOTE: Some control transformers may require the use of oversize enclosures. Refer to Table 71 on page 44 for control transformer selection.

Combination Starters

Class 8538—Disconnect Switch Type in Oversize Enclosure, NEMA Size 0–2

Table 10: Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24 ^[1]	—	V01
120 ^[1]	110	V02
208	—	V08
240	220	V03
277 ^[1]	—	V04
480	440	V06
600	550	V07
Specify	Specify	V99

^[1] **Form S** (no charge) must be included with these voltage codes where a separate source of voltage is used for the control coil (for example, order as 8538SCG11S8V02H30S). Note that **24 V** coils are **not** available on Sizes 4–7.

NOTE: For voltage codes used with control transformers, see Table 71 on page 44.

Combination Starters

Class 8539—Electronic Motor Circuit Protector (MCP)

Electronic MCP, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 11: Class 8539 Full Voltage Type, Non-Reversing, 200–240 V, with Motor Logic SSOLR (replace ●●● with the voltage code)

Motor Voltage (Starter Voltage)	Ratings			Enclosure				
	Hp Range Polyphase	NEMA Size	Circuit Breaker [1]	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304) (Sizes 0–5) [2]	NEMA 4 & 4X Watertight, Dusttight, and Corrosion Resistant Polyester	NEMA 12/3R Industrial Use Dusttight and Driptight [3]	
				Type [4]	Type [4]	Type [4]	With External Reset	Without External Reset
200 (208)	0.25–3	0	HLL36030M71	SBG43●●●H30 [5]	SBW43●●●H30 [5]	SBW53●●●H30 [5]	SBA53●●●H30 [5]	SBA43●●●H30 [5]
	0.25–5	1	HLL36030M71	SCG44●●●H30 [5]	SCW44●●●H30 [5]	SCW54●●●H30 [5]	SCA54●●●H30 [5]	SCA44●●●H30 [5]
	7.5		HLL36050M72	SCG45●●●H30 [5]	SCW45●●●H30 [5]	SCW55●●●H30 [5]	SCA55●●●H30 [5]	SCA45●●●H30 [5]
	1.5–5	2	HLL36030M71	SDG42●●●H30 [5]	SDW42●●●H30 [5]	SDW52●●●H30 [5]	SDA52●●●H30 [5]	SDA42●●●H30 [5]
	7.5–10		HLL36050M72	SDG43●●●H30	SDW43●●●H30	SDW53●●●H30	SDA53●●●H30	SDA43●●●H30
	15–25	3	HLL36100M73	SEG42●●●H30	SEW42●●●H30	SEW52●●●H30	SEA52●●●H30	SEA42●●●H30
	30–40	4	JLL36250M75	SFG44●●●H30	SFW44●●●H30	SFW54●●●H30	SFA54●●●H30	SFA44●●●H30
	50–60	5	JLL36250M75	SGG44●●●H30	SGW44●●●H30	—	SGA54●●●H30	SGA44●●●H30
	75		LJL36400M36	SGG45●●●H30	SGW45●●●H30	—	SGA55●●●H30	SGA45●●●H30
	100	6	LJL36400M36	SHG43●●●H30	SHW43●●●H30	—	SHA53●●●H30	SHA43●●●H30
	125–150		LJL36600M42	SHG45●●●H30	SHW45●●●H30	—	SHA55●●●H30	SHA45●●●H30
230 (240)	0.25–3	0	HLL36030M71	SBG43●●●H30 [5]	SBW43●●●H30 [5]	SBW53●●●H30 [5]	SBA53●●●H30 [5]	SBA43●●●H30 [5]
	0.25–7.5	1	HLL36030M71	SCG44●●●H30 [5]	SCW44●●●H30 [5]	SCW54●●●H30 [5]	SCA54●●●H30 [5]	SCA44●●●H30 [5]
	1.5–7.5	2	HLL36030M71	SDG42●●●H30 [5]	SDW42●●●H30 [5]	SDW52●●●H30 [5]	SDA52●●●H30 [5]	SDA42●●●H30 [5]
	10		HLL36050M72	SDG43●●●H30	SDW43●●●H30	SDW53●●●H30	SDA53●●●H30	SDA43●●●H30
	15		HLL36100M73	SDG44●●●H30	SDW44●●●H30	SDW54●●●H30	SDA54●●●H30	SDA44●●●H30
	15–30	3	HLL36100M73	SEG42●●●H30	SEW42●●●H30	SEW52●●●H30	SEA52●●●H30	SEA42●●●H30
	40–50	4	JLL36250M75	SFG44●●●H30	SFW44●●●H30	SFW54●●●H30	SFA54●●●H30	SFA44●●●H30
	60	5	JLL36250M75	SGG44●●●H30	SGW44●●●H30	—	SGA54●●●H30	SGA44●●●H30
	75–100		LJL36400M36	SGG46●●●H30	SGW45●●●H30	—	SGA55●●●H30	SGA45●●●H30
	125–150	6	LJL36600M42	SHG45●●●H30	SHW45●●●H30	—	SHA55●●●H30	SHA45●●●H30
	200		PLL34080M68	SHG46●●●H30	SHW46●●●H30	—	SHA56●●●H30	SHA46●●●H30
	250–300	7	PLL36100M69	SJA43●●●H30	SJW43●●●H30	—	SJA53●●●H30	—

[1] See Digest Section 7 for the circuit breaker adjustment range.

[2] Size 6 and 7 enclosures are NEMA 4 sheet steel.

[3] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

[4] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 12.

[5] **Form H30**, with the possibility of a fourth character to select a lower FLA range (for example, **H308**). See page 45.

NOTE: Some control transformers may require the use of oversize enclosures. Refer to Table 71 on page 44 for control transformer selection.

Standard unit



File E152395
CCN NKJH, NKJH7

Table 12: Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24 [1]	—	V01
120 [1]	110	V02
208	—	V08
240	220	V03
277 [1]	—	V04
480	440	V06
600	550	V07
Specify	Specify	V99

[1] **Form S** (no charge) must be included with these voltage codes where a separate source of voltage is used for the control coil (for example, 8539SCG41V02S). Note that **24 V** coils are **not** available on Sizes 4–7.

NOTE: For voltage codes used with control transformers, see Table 71 on page 44.

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Combination Starters

Class 8539—Electronic Motor Circuit Protector (MCP)

Electronic MCP, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 13: Class 8539 Full Voltage Type, Non-Reversing, 460–600 V, with Motor Logic SSOLR (replace ●●● with the voltage code)

Motor Voltage (Starter Voltage)	Ratings			Enclosure				
	Hp Range Polyphase	NEMA Size	Circuit Breaker [1]	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304) (Sizes 0–5)[2]	NEMA 4 & 4X Watertight, Dusttight, and Corrosion Resistant Polyester	NEMA 12/3R [3] Industrial Use Dusttight and Driptight	
				Type [4]	Type [4]	Type [4]	With External Reset	Without External Reset
460 (480)	0.25–5	0	HLL36030M71	SBG43●●●H30 [5]	SBW43●●●H30 [5]	SBW53●●●H30 [5]	SBA53●●●H30 [5]	SBA43●●●H30 [5]
	0.25–10	1	HLL36030M71	SCG44●●●H30 [5]	SCW44●●●H30 [5]	SCW54●●●H30 [5]	SCA54●●●H30 [5]	SCA44●●●H30 [5]
	5–15	2	HLL36030M71	SDG42●●●H30 [5]	SDW42●●●H30 [5]	SDW52●●●H30 [5]	SDA52●●●H30 [5]	SDA42●●●H30 [5]
	20–25		HLL36050M72	SDG43●●●H30	SDW43●●●H30	SDW53●●●H30	SDA53●●●H30	SDA43●●●H30
	20–25	3	HLL36050M72	SEG41●●●H30	SEW41●●●H30	SEW51●●●H30	SEA51●●●H30	SEA41●●●H30
	30–50		HLL36100M73	SEG42●●●H30	SEW42●●●H30	SEW52●●●H30	SEA52●●●H30	SEA42●●●H30
	60–100	4	JLL36250M75	SFG44●●●H30	SFW44●●●H30	SFW54●●●H30	SFA54●●●H30	SFA44●●●H30
	125	5	JLL36250M75	SGG44●●●H30	SGW44●●●H30	—	SGA54●●●H30	SGA44●●●H30
	150–200		LJL36400M36	SGG45●●●H30	SGW45●●●H30	—	SGA55●●●H30	SGA45●●●H30
	250–350	6	LJL36600M42	SHG45●●●H30	SHW45●●●H30	—	SHA55●●●H30	SHA45●●●H30
	400		PLL34080M68	SHG46●●●H30	SHW46●●●H30	—	SHA56●●●H30	SHA46●●●H30
	500	7	PLL36080M68	SJA42●●●H30	SJW42●●●H30	—	SJA52●●●H30	—
	600		PLL36100M69	SJA43●●●H30	SJW43●●●H30	—	SJA53●●●H30	—
575 (600)	0.25–5	0	HLL36030M71	SBG43●●●H30 [5]	SBW43●●●H30 [5]	SBW53●●●H30 [5]	SBA53●●●H30 [5]	SBA43●●●H30 [5]
	0.25–10	1	HLL36030M71	SCG44●●●H30 [5]	SCW44●●●H30 [5]	SCW54●●●H30 [5]	SCA54●●●H30 [5]	SCA44●●●H30 [5]
	5–20	2	HLL36030M71	SDG42●●●H30 [5]	SDW42●●●H30 [5]	SDW52●●●H30 [5]	SDA52●●●H30 [5]	SDA42●●●H30 [5]
	25		HLL36050M72	SDG43●●●H30	SDW43●●●H30	SDW53●●●H30	SDA53●●●H30	SDA43●●●H30
	25–30	3	HLL36050M72	SEG41●●●H30	SEW41●●●H30	SEW51●●●H30	SEA51●●●H30	SEA41●●●H30
	40–50		HLL36100M73	SEG42●●●H30	SEW42●●●H30	SEW52●●●H30	SEA52●●●H30	SEA42●●●H30
	60–100	4	JLL36250M75	SFG44●●●H30	SFW44●●●H30	SFW54●●●H30	SFA54●●●H30	SFA44●●●H30
	125–150	5	JLL36250M75	SGG44●●●H30	SGW44●●●H30	—	SGA54●●●H30	SGA44●●●H30
	200		LJL36400M36	SGG45●●●H30	SGW45●●●H30	—	SGA55●●●H30	SGA45●●●H30
	250	6	LJL36400M36	SHG43●●●H30	SHW43●●●H30	—	SHA53●●●H30	SHA43●●●H30
	300–400		LJL36600M42	SHG45●●●H30	SHW45●●●H30	—	SHA55●●●H30	SHA45●●●H30
	500–600	7	PLL34100M69	SJG41●●●H30	SJW41●●●H30	—	SJA51●●●H30	—

[1] See Digest Section 7 for the circuit breaker adjustment range.

[2] Size 6 and 7 enclosures are NEMA 4 only, painted sheet steel.

[3] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

[4] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 14.

[5] **Form H30**, with the possibility of a fourth character to select a lower FLA range (for example, **H308**). See page 45.

NOTE: Some control transformers may require the use of oversize enclosures. Refer to Table 71 on page 44 for control transformer selection.

Table 14: Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24 [1]	—	V01
120 [1]	110	V02
208	—	V08
240	220	V03
277 [1]	—	V04
480	440	V06
600	550	V07
Specify	Specify	V99

[1] **Form S** (no charge) must be included with these voltage codes where a separate source of voltage is used for the control coil (for example, order as 8539SCG41V02S). Note that **24 V** coils are **not** available on Sizes 4–7.

NOTE: For voltage codes used with control transformers, see Table 71 on page 44.

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Class 8539—Electronic Motor Circuit Protector (MCP) in Oversize Enclosure, NEMA Size 0–2

Electronic MCP, Oversize, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

NOTE: Some control transformers may require the use of oversize enclosures. Refer to Table 71 on page 44 for control transformer selection.

**Table 15: Class 8539 Electronic Motor Circuit Protectors (MCP) in Oversize Enclosure, NEMA Size 0–2 [1]
Full Voltage Type, Non-Reversing with Motor Logic SSOLR (replace ●●● with the voltage code)**

Motor Voltage (Starter Voltage)	Ratings			Enclosure			
	Hp Range Polyphase	NEMA Size	Circuit Breaker [2]	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304)	NEMA 12/3R Industrial Use Dusttight and Driptight [3]	
				Type[4]	Type[4]	With External Reset Type[4]	Without External Reset Type[4]
200 (208)	0.25–3	0	HLL36030M71	SBG43S8●●●H30[5]	SBW43S8●●●H30[5]	SBA53S8●●●H30[5]	SBA43S8●●●H30[5]
	0.25–5 7.5	1	HLL36030M71 HLL36050M72	SCG44S8●●●H30[5] SCG45S8●●●H30[5]	SCW44S8●●●H30[5] SCW45S8●●●H30[5]	SCA54S8●●●H30[5] SCA55S8●●●H30[5]	SCA44S8●●●H30[5] SCA45S8●●●H30[5]
	1.5–5 7.5–10	2	HLL36030M71 HLL36050M72	SDG42S8●●●H30[5] SDG43S8●●●H30	SDW42S8●●●H30[5] SDW43S8●●●H30	SDA52S8●●●H30[5] SDA53S8●●●H30	SDA42S8●●●H30[5] SDA43S8●●●H30
	0.25–3	0	HLL36030M71	SBG43S8●●●H30[5]	SBW43S8●●●H30[5]	SBA53S8●●●H30[5]	SBA43S8●●●H30[5]
230 (240)	0.25–7.5	1	HLL36030M71	SCG44S8●●●H30[5]	SCW44S8●●●H30[5]	SCA54S8●●●H30[5]	SCA44S8●●●H30[5]
	1.5–7.5 10 15	2	HLL36030M71 HLL36050M72 HLL36100M73	SDG42S8●●●H30[5] SDG43S8●●●H30 SDG44S8●●●H30	SDW42S8●●●H30[5] SDW43S8●●●H30 SDW44S8●●●H30	SDA52S8●●●H30[5] SDA53S8●●●H30 SDA54S8●●●H30	SDA42S8●●●H30[5] SDA43S8●●●H30 SDA44S8●●●H30
	0.25–5	0	HLL36030M71	SBG43S8●●●H30[5]	SBW43S8●●●H30[5]	SBA53S8●●●H30[5]	SBA43S8●●●H30[5]
	0.25–10	1	HLL36030M71	SCG44S8●●●H30[5]	SCW44S8●●●H30[5]	SCA54S8●●●H30[5]	SCA44S8●●●H30[5]
460 (480)	5–15 20–25	2	HLL36030M71 HLL36050M72	SDG42S8●●●H30[5] SDG43S8●●●H30	SDW42S8●●●H30[5] SDW43S8●●●H30	SDA52S8●●●H30[5] SDA53S8●●●H30	SDA42S8●●●H30[5] SDA43S8●●●H30
	0.25–5	0	HLL36060M71	SBG43S8●●●H30[5]	SBW43S8●●●H30[5]	SBA53S8●●●H30[5]	SBA43S8●●●H30[5]
	0.25–10	1	HLL36030M71	SCG44S8●●●H30[5]	SCW44S8●●●H30[5]	SCA54S8●●●H30[5]	SCA44S8●●●H30[5]
	5–20 25	2	HLL36030M71 HLL36050M72	SDG42S8●●●H30[5] SDG43S8●●●H30	SDW42S8●●●H30[5] SDW43S8●●●H30	SDA52S8●●●H30[5] SDA53S8●●●H30	SDA42S8●●●H30[5] SDA43S8●●●H30

[1] Not included in the Laser™ Delivery program.

[2] See Digest Section 7 for the circuit breaker adjustment range.

[3] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

[4] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 16.

[5] Form H30, with the possibility of a fourth character to select a lower FLA range (for example, H308). See page 45.

Table 16: Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24 [1]	—	V01
120 [1]	110	V02
208	—	V08
240	220	V03
277 [1]	—	V04
480	440	V06
600	550	V07
Specify	Specify	V99

[1] **Form S** (no charge) must be included with these voltage codes where a separate source of voltage is used for the control coil (for example, order as 8539SCG41S8V02S). Note that **24 V** coils are **not** available on Sizes 4–7.

NOTE: For voltage codes used with control transformers, see Table 71 on page 44.

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Class 8539—Thermal-Magnetic Circuit Breaker

Thermal-Magnetic, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 17: Class 8539 Full Voltage, Thermal-Magnetic Circuit Breaker Type, Non-Reversing, with Motor Logic SSOLR (replace ●●● with the voltage code)

Motor Voltage (Starter Voltage)	Max. Hp Poly-phase	Ratings		Enclosure					
		NEMA Size	Circuit Breaker		NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304) (Sizes 0–5) [1]	NEMA 4 & 4X Watertight, Dusttight and Corrosion Resistant Polyester	NEMA 12/3R [2] Dusttight and Driptight Industrial Use	
			Type	Rating (A)				With External Reset	Without External Reset
200 (208)	2	0	HLL36015	15	SBG1●●●H30[4]	SBW1●●●H30[4]	SBW11●●●H30[4]	SBA11●●●H30[4]	SBA1●●●H30[4]
	3		HLL36020	20	SBG3●●●H30[4]	SBW3●●●H30[4]	SBW13●●●H30[4]	SBA13●●●H30[4]	SBA3●●●H30[4]
	5	1	HLL36035	35	SCG5●●●H30[4]	SCW5●●●H30[4]	SCW15●●●H30[4]	SCA15●●●H30[4]	SCA5●●●H30[4]
	7.5		HLL36050	50	SCG2●●●H30[4]	SCW2●●●H30[4]	SCW12●●●H30[4]	SCA12●●●H30[4]	SCA2●●●H30[4]
	10	2	HLL36060	60	SDG1●●●H30	SDW1●●●H30	SDW11●●●H30	SDA11●●●H30	SDA1●●●H30
	15		HLL36100	100	SEG3●●●H30	SEW3●●●H30	SEW13●●●H30	SEA13●●●H30	SEA3●●●H30
	20	3	HLL36125	125	SEG1●●●H30	SEW1●●●H30	SEW11●●●H30	SEA11●●●H30	SEA1●●●H30
	25		HLL36150	150	SEG5●●●H30	SEW5●●●H30	SEW15●●●H30	SEA15●●●H30	SEA5●●●H30
	30	4	JLL36200	200	SFG3●●●H30	SFW3●●●H30	SFW13●●●H30	SFA13●●●H30	SFA3●●●H30
	40		JLL36250	250	SFG4●●●H30	SFW4●●●H30	SFW14●●●H30	SFA14●●●H30	SFA4●●●H30
	50	5	JLL36250	250	SGG6●●●H30	SGW6●●●H30	—	SGA16●●●H30	SGA6●●●H30
	60–75		LLL36400U33X	400	SGG4●●●H30	SGW4●●●H30	—	SGA14●●●H30	SGA4●●●H30
	100–125	6	LLL36600U33X	600	SHG4●●●H30	SHW4●●●H30	—	SHA14●●●H30	SHA4●●●H30
	150		MJL36800	800	SHG5●●●H30	SHW5●●●H30	—	SHA15●●●H30	SHA5●●●H30
230 (240)	2	0	HLL36015	15	SBG1●●●H30[4]	SBW1●●●H30[4]	SBW11●●●H30[4]	SBA11●●●H30[4]	SBA1●●●H30[4]
	3		HLL36020	20	SBG3●●●H30[4]	SBW3●●●H30[4]	SBW13●●●H30[4]	SBA13●●●H30[4]	SBA3●●●H30[4]
	5	1	HLL36035	35	SCG5●●●H30[4]	SCW5●●●H30[4]	SCW15●●●H30[4]	SCA15●●●H30[4]	SCA1●●●H30[4]
	7.5		HLL36045	45	SCG6●●●H30[4]	SCW6●●●H30[4]	SCW16●●●H30[4]	SCA16●●●H30[4]	SCA6●●●H30[4]
	10	2	HLL36060	60	SDG1●●●H30	SDW1●●●H30	SDW11●●●H30	SDA11●●●H30	SDA1●●●H30
	15		HLL36090	90	SDG7●●●H30	SDW7●●●H30	SDW17●●●H30	SDA17●●●H30	SDA7●●●H30
	20	3	HLL36100	100	SEG3●●●H30	SEW3●●●H30	SEW13●●●H30	SEA13●●●H30	SEA3●●●H30
	25–30		HLL36150	150	SEG5●●●H30	SEW5●●●H30	SEW15●●●H30	SEA15●●●H30	SEA5●●●H30
	40	4	JLL36225	225	SFG1●●●H30	SFW1●●●H30	SFW11●●●H30	SFA11●●●H30	SFA1●●●H30
	50		JLL36250	250	SFG4●●●H30	SFW4●●●H30	SFW14●●●H30	SFA14●●●H30	SFA4●●●H30
	60	5	JLL36250	250	SGG6●●●H30	SGW6●●●H30	—	SGA16●●●H30	SGA6●●●H30
	75		LLL36400U33X	400	SGG4●●●H30	SGW4●●●H30	—	SGA14●●●H30	SGA4●●●H30
	100	6	LLL36600U33X	600	SGG2●●●H30	SGW2●●●H30	—	SGA12●●●H30	SGA2●●●H30
	125		LLL36600U33X	600	SHG4●●●H30	SHW4●●●H30	—	SHA14●●●H30	SHA4●●●H30
	150–200	7	MJL36800	800	SHG5●●●H30	SHW5●●●H30	—	SHA15●●●H30	SHA5●●●H30
	250–300		PKL36100	1200	SJG3●●●H30	SJW3●●●H30	—	SJA13●●●H30	—

[1] Size 6 and 7 enclosures are NEMA 4 only, painted sheet steel.

[2] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

[3] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes listed in Table 18.

[4] Form H30, with the possibility of a fourth character to select a lower FLA range (for example, H308). See page 45.

Table 18: Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24 ^[1]	—	V01
120 ^[1]	110	V02
208	—	V08
240	220	V03
277 ^[1]	—	V04
480	440	V06
600	550	V07
Specify	Specify	V99

NOTE: For voltage codes used with control transformers, see Table 71 on page 44.

[1] Form S (no charge) must be included with these voltage codes where a separate source of voltage is used for the control coil (for example, order as 8539SCG5V02S). Note that 24 V coils are not available on Sizes 4–7.

NOTE: Some control transformers may require the use of oversize enclosures. Refer to Table 71 on page 44 for control transformer selection.

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Class 8539—Thermal-Magnetic Circuit Breaker

Thermal-Magnetic, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 19: Class 8539 Line Voltage, Thermal-Magnetic Circuit Breaker Type, Non-Reversing, with Motor Logic SSOLR (replace ●●● with the voltage code)

Motor Voltage (Starter Voltage)	Ratings				Enclosure				
	Max. Hp Poly-phase	NEMA Size	Circuit Breaker		NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304) (Sizes 0–5) ^[1]	NEMA 4 & 4X Watertight, Dusttight and Corrosion Resistant Polyester	NEMA 12/3R Industrial Use Dusttight and Driptight ^[2]	
			Type	Rating (A)				Type ^[3]	Type ^[3]
460 (480)	5	0	HLL36015	15	SBG1●●●H30 ^[4]	SBW1●●●H30 ^[4]	SBW11●●●H30 ^[4]	SBA11●●●H30 ^[4]	SBA1●●●H30 ^[4]
	7.5	1	HLL36025	25	SCG3●●●H30 ^[4]	SCW3●●●H30 ^[4]	SCW13●●●H30 ^[4]	SCA13●●●H30 ^[4]	SCA3●●●H30 ^[4]
	10		HLL36030	30	SCG7●●●H30 ^[4]	SCW7●●●H30 ^[4]	SCW17●●●H30 ^[4]	SCA17●●●H30 ^[4]	SCA7●●●H30 ^[4]
	15	2	HLL36045	45	SDG3●●●H30	SDW3●●●H30	SDW13●●●H30	SDA13●●●H30	SDA3●●●H30
	20		HLL36060	60	SDG1●●●H30	SDW1●●●H30	SDW11●●●H30	SDA11●●●H30	SDA1●●●H30
	25		HLL36070	70	SDG5●●●H30	SDW5●●●H30	SDW15●●●H30	SDA15●●●H30	SDA5●●●H30
	30	3	HLL36080	80	SEG7●●●H30	SEW7●●●H30	SEW17●●●H30	SEA17●●●H30	SEA7●●●H30
	40		HLL36100	100	SEG3●●●H30	SEW3●●●H30	SEW13●●●H30	SEA13●●●H30	SEA3●●●H30
	50		HLL36150	150	SEG5●●●H30	SEW5●●●H30	SEW15●●●H30	SEA15●●●H30	SEA5●●●H30
	60	4	JLL36150	150	SFG5●●●H30	SFW5●●●H30	SFW15●●●H30	SFA15●●●H30	SFA5●●●H30
	75		JLL36200	200	SFG3●●●H30	SFW3●●●H30	SFW13●●●H30	SFA13●●●H30	SFA3●●●H30
	100		JLL36250	250	SFG4●●●H30	SFW4●●●H30	SFW14●●●H30	SFA14●●●H30	SFA4●●●H30
	125–150	5	LLL36400U33X	400	SGG4●●●H30	SGW4●●●H30	—	SGA14●●●H30	SGA4●●●H30
	200		LLL36600U33X	600	SGG2●●●H30	SGW2●●●H30	—	SGA12●●●H30	SGA2●●●H30
250	6	LLL36600U33X	600	SHG4●●●H30	SHW4●●●H30	—	SHA14●●●H30	SHA4●●●H30	
300–400		MJL36800	800	SHG5●●●H30	SHW5●●●H30	—	SHA15●●●H30	SHA5●●●H30	
500–600	7	PLL36120	1200	SJG3●●●H30	SJW3●●●H30	—	SJA13●●●H30	—	
575 (600)	5	0	HLL36015	15	SBG1●●●H30 ^[4]	SBW1●●●H30 ^[4]	SBW11●●●H30 ^[4]	SBA11●●●H30 ^[4]	SBA1●●●H30 ^[4]
	7.5	1	HLL36020	20	SCG8●●●H30 ^[4]	SCW8●●●H30 ^[4]	SCW18●●●H30 ^[4]	SCA18●●●H30 ^[4]	SCA8●●●H30 ^[4]
	10		HLL36025	25	SCG3●●●H30 ^[4]	SCW3●●●H30 ^[4]	SCW13●●●H30 ^[4]	SCA13●●●H30 ^[4]	SCA3●●●H30 ^[4]
	15	2	HLL36035	35	SDG8●●●H30	SDW8●●●H30	SDW18●●●H30	SDA18●●●H30	SDA8●●●H30
	20		HLL36045	45	SDG3●●●H30	SDW3●●●H30	SDW13●●●H30	SDA13●●●H30	SDA3●●●H30
	25		HLL36060	60	SDG1●●●H30	SDW1●●●H30	SDW11●●●H30	SDA11●●●H30	SDA1●●●H30
	30	3	HLL36070	70	SEG4●●●H30	SEW4●●●H30	SEW14●●●H30	SEA14●●●H30	SEA4●●●H30
	40		HLL36090	90	SEG6●●●H30	SEW6●●●H30	SEW16●●●H30	SEA16●●●H30	SEA6●●●H30
	50		HLL36100	100	SEG3●●●H30	SEW3●●●H30	SEW13●●●H30	SEA13●●●H30	SEA3●●●H30
	60–75	4	JLL36150	150	SFG5●●●H30	SFW5●●●H30	SFW15●●●H30	SFA15●●●H30	SFA5●●●H30
	100		JLL36250	250	SFG4●●●H30	SFW4●●●H30	SFW14●●●H30	SFA14●●●H30	SFA4●●●H30
	125–150	5	JLL36250	250	SGG6●●●H30	SGW6●●●H30	—	SGA16●●●H30	SGA6●●●H30
	200		LLL36400U33X	400	SGG4●●●H30	SGW4●●●H30	—	SGA14●●●H30	SGA4●●●H30
	250–350	6	LLL36600U33X	600	SHG4●●●H30	SHW4●●●H30	—	SHA14●●●H30	SHA4●●●H30
400	MJL36800		800	SHG5●●●H30	SHW5●●●H30	—	SHA15●●●H30	SHA5●●●H30	
500–600	7	PKL36100	1200	SJG2●●●H30	SJW2●●●H30	—	SJA12●●●H30	—	

^[1] Size 6 and 7 enclosures are NEMA 4 only, painted sheet steel.

^[2] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

^[3] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes listed in Table 18 on page 16.

^[4] Form H30, with the possibility of a fourth character to select a lower FLA range (for example, H30B). See page 45.

Table 20: Single-Phase^[1] Thermal-Magnetic Circuit Breaker Type, Class 8539

Ratings							Enclosure				
Motor Voltage	Max. Hp	Coil Voltage	NEMA Size	Poles	Circuit Breaker		NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304) (Sizes 0–2)	NEMA 4 & 4X Watertight, Dusttight and Corrosion Resistant Polyester	NEMA 12/3R ^[2] Dusttight and Driptight Industrial Use	
					Type	Rating (A)				With External Reset	Without External Reset
					Type	Rating (A)	Type	Type	Type	Type	
120	1	120	0	2	HLL26030	30	SBG72V02	SBW72V02	SBW75V02	SBA75V02	SBA72V02
	2		1		HLL26050	50	SCG72V02	SCW72V02	SCW75V02	SCA75V02	SCA72V02
	3		2		HLL26080	80	SDG71V02	SDW71V02	SDW74V02	SDA71V02	
240	2	240	0	2	HLL26025	25	SBG71V03	SBW71V03	SBW74V03	SBA74V03	SBA71V03
	3		1		HLL26035	35	SCG71V03	SCW71V03	SCW74V03	SCA74V03	SCA71V03
	7.5		2		HLL26080	80	SDG71V03	SDW71V03	SDW74V03	SDA74V03	SDA71V03

NOTE: Some control transformers may require the use of oversize enclosures. Refer to Table 71 on page 44 for control transformer selection.

^[1] Single phase units require one thermal unit and are not available with solid-state overload relays (Form Hxx).

Not included in the Laser™ Delivery program.

^[2] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

Combination Starters

Class 8538, 8539—Approximate Dimensions, Shipping Weights

Dimensions for Non-Reversing Combination Starters

NEMA 1 Enclosures

NOTE: The dimensions in Tables 21 and 22 include space for Form **FF4T** (standard control transformer). An oversize enclosure may be required for Form **FF4T11** (100 VA additional capacity) and Form **FF4T12** (200 VA additional capacity). See Table 57 on page 38 for replacement transformer selection.

Table 21: Sizes 0–2, NEMA 1 Enclosure—See Figure 1

NEMA Size	Class	Type	Dimensions, in.																	Top & Bottom		Sides	Wt. (lb)
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	W	X	Y		
0–1	8538	SBG, SCG	9.5	22.5	8.34	6.38	20.5	14.66	1.81	1.69	3	2.31	1.06	3.25	2.19	1.25	0.88	—	0.5–0.75	0.5–0.75	0.5	38	
	8539	SBG, SCG	9.5	22.5	9.84	6.38	20.5	14.66	1.81	1.69	3	2.31	1.06	3.25	2.19	1.25	0.88	—	0.5–0.75	0.5–0.75	0.5	38	
2	8538, 8539	SDG	10.5	26	9.59	7.38	24	16.91	2.13	2	4	2.31	1.06	3.25	2.19	1.25	0.88	—	1–1.25	0.5–0.75	0.5	54	

Table 22: Sizes 3–6, NEMA 1 Enclosure—See Figure 2

NEMA Size	Type	Class	Dimensions, in.																	Top & Bottom		Sides Y	Wt. (lb)
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	W	X			
3 ^[1]	8538, 8539	SEG	15.25	42	10.59	9.25	3	22.72	41	0.5	—	2.83	3.53	5	2.69	5.38	1.28	0.91	1–1.25 2–2.5	0.5–0.75	0.5	102	
4	8538	SFG	16	52.5	10.53	10	3	23.66	51.5	0.5	—	2.83	3.53	5	2.69	5.38	1.28	0.91	2.5	0.5–0.75	0.5	163	
	8539	SFG	16	52.5	10.53	10	3	23.66	51.5	0.5	—	2.83	3.53	5	2.69	5.38	1.28	0.91	2.5	0.5–0.75	0.5	163	
5	8538	SGG	20	78	15.5	12	4	29.41	77	0.5	—	3.52	4.61	9.25	3.19	—	—	—	0.5– 0.75 ^[2]	3	—	450	
	8539	SGG	20	66	13.72	12	4	29.41	65	0.5	—	3.52	4.61	5	3.19	—	—	—	0.5–0.75	3	—	420	
6 ^[3]	8538, 8539	SHG	36	90	21.03	—	—	41.38	—	—	—	—	—	5	—	—	—	—	—	—	—	—	

^[1] For Class 8538 Size 3 devices with 200 A fuse clips, use the dimensions for Class 8538 Size 4 devices.

^[2] Left side only.

^[3] Size 6 enclosures are floor mounting.

Figure 1: NEMA 1 Enclosure Sizes 0–2

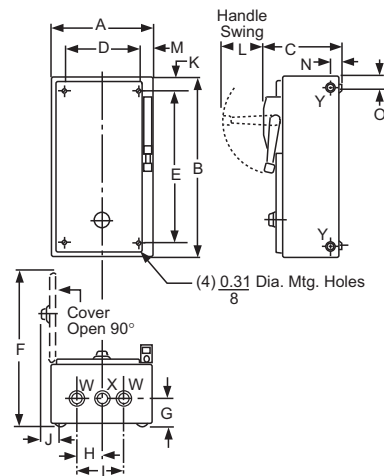
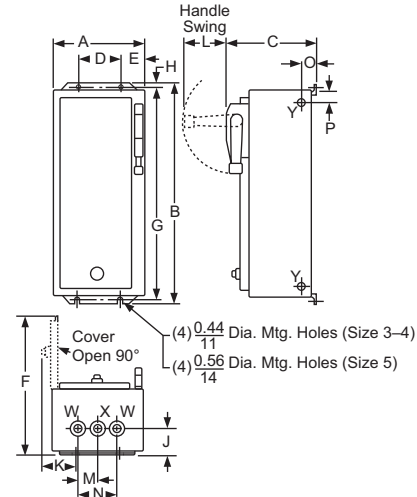


Figure 2: NEMA 1 Enclosure Sizes 3–6



Combination Starters

Class 8538, 8539—Approximate Dimensions, Shipping Weights

NEMA 12/3R Enclosures

Modifying NEMA 12 for Outdoor Applications (not for use in salt air or corrosive environments)

Field Modifications for NEMA 3 dusttight, raintight, and sleet resistant outdoor applications are as follows: Watertight conduit hubs or equivalent provision for watertight connection at the conduit entrance shall be used.

Field Modifications for NEMA 3R rainproof and sleet resistant outdoor applications are as follows:

1. Watertight conduit hubs or equivalent provision for watertight connection at the conduit entrance, when the conduit enters at a level higher than the lowest live part, shall be used.
2. Drain holes of 1/8 inch diameter shall be added to the bottom of the enclosure.

Table 23: NEMA 12/3R Enclosure (see Figure 3)
Dimensions include space for control circuit transformers.

NEMA Size	Class	Type	Dimensions, in.										Wt. (lb)
			A	B	C	D	E	F	G	H	I	J	
0-1	8538	SBA SCA	9.5	8.34	24	3.25	2.5	4.5	23.5	0.59	4.44	14.31	40
	8539	SBA SCA	9.5	9.84	24	3.25	2.5	4.5	23.5	0.59	4.44	14.31	40
2	8538, 8539	SDA	10.5	9.59	27.75	3.25	2.5	5.5	27	0.38	4.13	16.56	55
3 ^[1]	8538, 8539	SEA	15.25	10.59	42	5	3	9.25	41	0.5	5.06	22.31	111
4	8538	SFA	16	10.53	52.5	5	3	10	51.5	0.5	4.19	22.97	170
	8539	SFA	16	10.53	52.5	5	3	10	51.5	0.5	5.19	22.97	170
5	8538	SGA	20	13.72	78	9.25	4	12	77	0.5	7.78	29.41	—
	8539	SGA	20	13.72	66	5	4	12	65	0.5	7.78	27.41	440
6 ^[2]	8538, 8539	SHA	36	17	90	5	—	—	—	—	—	47.38	—

^[1] For Class 8538 Size 3 devices with 200 A fuse clips, use the dimensions for Class 8538 Size 4 devices.

^[2] Size 6 enclosures are floor mounting.

Oversize Enclosures

Table 24: NEMA 1, 4, 4X Stainless, and 12 Oversize Enclosures—See Figure 4

NEMA Size	NEMA Enclosure	Dimensions, in.					
		Wide	High	Deep	Handle	Mounting	
0-2	1	15	28.75	9.59	3.25	11.63	26.25
	4	15	30.03	9.59	3.25	10	29.75
	12	15	31	10.97	3.25	9	30.25

Figure 3: NEMA 12/3R Enclosure

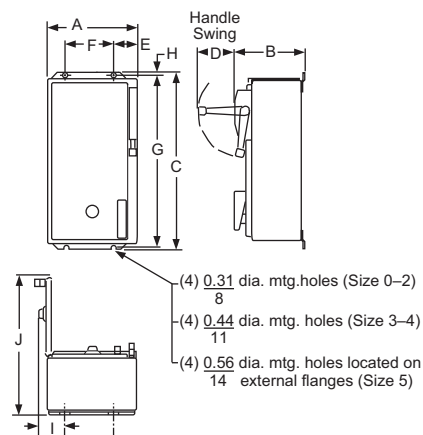
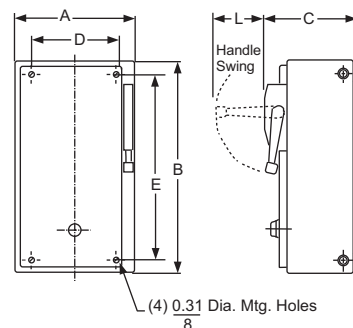


Figure 4: Class 8538 and 8539 In Oversize Enclosures—NEMA 1, 4 & 4X Stainless, 12/3R



Combination Starters

Class 8538, 8539—Approximate Dimensions, Shipping Weights

NEMA 4, 4X Enclosures (for oversize enclosures, see page 19)

Figure 5:
NEMA 4X
Polyester Enclosure

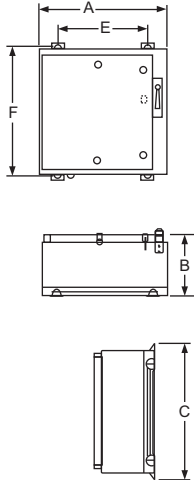


Table 25: NEMA 4X Polyester Enclosure (see Figure 5)

NEMA Size	Class	Type	Dimensions, in. [1]				
			A	B	C	E	F
0-1	8538	SBW	13.72	11.4	26.94	6.25	25.75
0-1	8539	SCW					
		SDW					
0-2	8738, 8739	SBW	25.25	11.4	27.00	17.88	25.75
2	8538, 8539	SCW					
		SDW					
3-4	8538, 8738 8539, 8739	SEW SFW [2]	26.31	11.4	33.50	18.50	32.25

[1] Dimensions include space for Form **FF4T** (standard control transformer) and Form **FF4T10** (50 VA additional capacity). An oversize enclosure may be required for other control transformers.

[2] 8539 Size 4 only.

Table 26: Information on Hubs

Hubs are furnished with each NEMA 4X combination starter as shown in this table. Note that hubs are only installed in stainless steel enclosures; they are not installed in polyester enclosures.

NEMA Size	Hub Size, Quantity = 1	Hub Size, Quantity = 2
0-1	0.75 in.	1.00 in.
2	0.75 in.	1.50 in.
3-4	0.75 in.	2.50 in.

Table 27: NEMA 4 and 4X Stainless Steel Enclosure (see Figure 6)

NEMA Size	Class	Type	Dimensions, in. [1]												Bottom W (Hub)	Top & Bottom X (Hub)	Wt. (lb)
			A	B	C	D	E	F	G	H	I	J	K	L			
0-1	8538	SBW	9.5	8.34	24.06	3.25	2.5	4.5	23.5	0.59	3.03	1.31	2.31	14.28	0.75	1	40
	8539	SCW	9.5	9.84	24.06	3.25	2.5	4.5	23.5	0.59	3.03	1.31	2.31	14.28	0.75	1	40
2	8538, 8539	SDW	10.5	9.59	27.75	3.25	2.5	5.5	27	0.59	3	2	2.63	16.53	0.75	1.5	55
3 [2]	8538, 8539	SEW	15.25	10.59	42	5	3.19	10.25	40.5	0.59	3	2.56	3.19	22.19	0.75	2.5	111
4	8538	SFW	16	10.53	52.5	5	3.56	11	51	0.59	3	2.56	3.19	22.47	0.75	2.5	158
	8539	SFW	16	10.53	52.5	3.25	2.5	11	51	0.59	3	2.56	3.19	22.47	0.75	2.5	120
5	8538	SGW	20	13.72	78	9.25	4	12	77	0.56	4.5	3	3.5	29.41	0.75	3.5	—
	8539	SGW	20	13.72	66	5	4	12	65	0.56	4.5	3	3.5	29.41	0.75	3.5	440
6 [3]	8538, 8539	SHW	36	17	90	—	—	—	—	—	—	—	—	47.88	—	—	—

[1] Dimensions include space for Form **FF4T** (standard control transformer). An oversize enclosure may be required for Form **FF4T11** (100 VA additional capacity) and Form **FF4T12** (200 VA additional capacity).

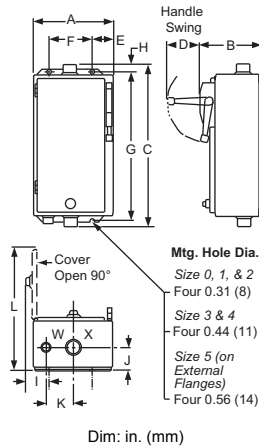
[2] For Class 8538 Size 3 devices with 200 A fuse clips, use the dimensions for Class 8538 Size 4 devices.

[3] Size 6 enclosures are floor mounting.

Table 28: Conduit Sizes, Locations A, B, C, and D

NEMA Size	Standard
0-1	1.25
2	1.5
3-4	2.5
5	4

Figure 6:
NEMA 4 & 4X
Stainless Steel Enclosure



Dim: in. (mm)

Combination Starters Class 8538, 8539—Panel Layout

Panel Layout Drawings

Table 29: Standard Enclosures—NEMA 1, 4 & 4X Stainless, and 12/3R

This table identifies open panel space on standard NEMA 1, 4 & 4X stainless steel, and 12/3R combination starters. Space and mounting holes are provided in all combination starters for the field addition of a control transformer—see Table 71 on page 44 for control transformer selection.

Class	NEMA Size	Dimensions, in.								
		A	B	C	D	E	F	G	H	I
8538	0, 1	6.9	18.5	6.9	6.5	0	3.5	3.4	6.9	4.0
8539				6.5	7.9					—
8538	2	7.9	22.0	7.5	7.0	3.1	4.8	0	7.7	6.0
8539				6.5	8.4					—
8538	3	12.0	29.5	9.0	7.7	0	5.6	6.4	12.9	5.3
8539				6.5	8.5					—
8538	4	13.0	39.0	11.0	11.5	0	7.0	6.0	13.0	9.0
8539				6.8	12.5					—
8538	5 ^[1]	17.3	59.0	13.5	25.0	0	10.8	6.5	20.5	—
8539				JLL: 6.8 LLL: 9.0	JLL: 23.0 LLL: 24.5					—
8538	6	32.0	82.0	32.0	40.0	0	13.0	19.0	35.0	—
8539				LLL: 9.0 MJL: 12.5	LLL: 25.5 MJL: 40.5					—

^[1] Size 5 combination starter does not contain a full-size panel. No usable panel space is available.

Figure 7: Class 8538—Standard

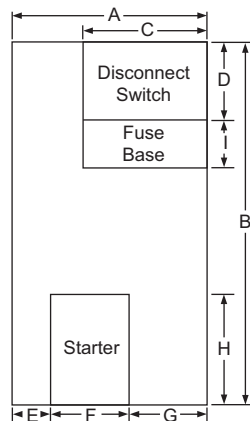
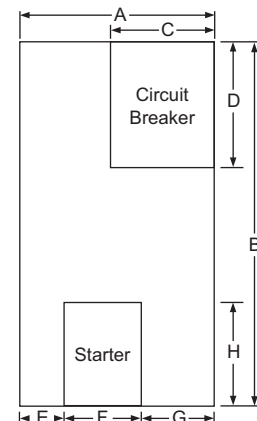


Figure 8: Class 8539—Standard



Oversize Enclosures—NEMA 1, 4 & 4X Stainless, and 12

Combination starters in oversize enclosures provide additional panel space for field addition of control relays, timing relays, terminal blocks, or other auxiliary equipment. Disconnect switch devices offer more than 130 in² of available panel space, and circuit breaker devices more than 180 in².

Figure 9: Class 8538—Oversize

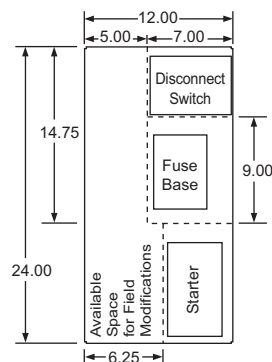
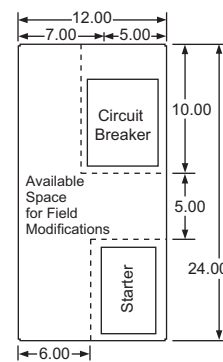


Figure 10: Class 8539—Oversize



Reversing Combination Starters, NEMA Style

General Information—Reversing Combination Starters

Class 8738 and 8739 Type S reversing combination starters combine the requirements of motor overload and short-circuit protection into one convenient package. Type S reversing combination starters are manufactured in accordance with NEMA standards, are UL Listed, and are CSA certified. Class 8738 and 8739 reversing combination starters are designed to operate at 600 Vac, 50–60 Hz. Type S reversing combination starters come standard with melting alloy overload relays. Bimetallic and solid-state overload relays are available as options (see pages 45–46).

Enclosures—Class 8738 and 8739 reversing combination starters are available in the following enclosures:

- NEMA 1 General Purpose
- NEMA 4 & 4X Watertight and Dusttight
- NEMA 4X Watertight, Dusttight, and Corrosion Resistant Glass-Polyester
- NEMA 12/3R Dusttight and Driptight for Industrial Use

The NEMA 4 & 4X stainless steel enclosures (Sizes 0–5) have a brushed finish. Sizes 6–7 are sheet-steel enclosures and are rated NEMA 4 only.

The NEMA 4X glass-polyester enclosed devices are UL Listed. Hubs are furnished as standard on NEMA 4X enclosures.

NEMA 12/3R enclosures can be field modified for outdoor applications. Specify **Form G26** for NEMA 3R (no additional charge). See page 19 for details.

Coil Voltages—AC coils are available for application at 50/60 Hz. NEMA Sizes 00–5 are furnished with coils designed to operate satisfactorily on line voltages of 85–110% of rated voltage.

NEMA Size 6–7 contactors are furnished with a DC coil operated by a solid-state rectifier circuit, which is powered by an AC source.

NOTE: A voltage code is required when ordering combination starters. Polyphase combination starters with 24 Vac or 120 Vac coil voltages come wired for **separate control**.

Auxiliary Contacts—Additional auxiliary contacts may be added to Type S starters. See page 37 for the maximum number of auxiliary units and the Form designations for factory installed auxiliary contacts. See catalog 9999CT9701 for auxiliary contact kits for field installation.

Type S Accessories—Additional accessories such as fuse blocks, fuse clip kits, disconnect switch and circuit breaker interlocks, and cover-mounted control units are available for field modifications. For factory modifications (Forms), see page 42. For field modification kits, see catalog 9999CT9701.

Overload Protection

Type S magnetic starters are used for full-voltage starting and stopping of AC squirrel cage motors. Motor overload protection for three-phase starter applications can be provided through one of four options, as follows:

Solid-State Overload Relay Protection (Motor Logic™ SSOLR)—These ambient insensitive overload relays are available on Sizes 00–6 and standard on Size 7. They provide phase loss and phase unbalance protection. To order, add Form **H30** (for selectable trip class 10 or 20 protection). For more information about Motor Logic SSOLRs, see page 45 and catalog 9065CT9701. (Product catalog number example: 8536SCO3V06**H30**)

Adapted Bimetallic Overload Relay (NEMA Sizes 00–1)—The adapted bimetallic motor starter includes a specially designed adapter. It attaches with bus bars to the Type S NEMA contactor and holds the IEC-style bimetallic overload relay (type LRD or LR3D). This starter configuration can be ordered by adding Form **E** (adapter only) to the standard catalog number. The LRD or LR3D bimetallic overload relay must be purchased separately, based on the motor FLA, and installed in the field in order to operate the starter. For more information—including how to order the adapted bimetallic overload relay as a factory installed option—see page 45 and catalog 9065CT9701. (Product catalog number example: 8536SCO3V06**E**)

TeSys T Motor Management System (NEMA Sizes 1–6)—The flexible TeSys T system integrates seamlessly into your automation system through five major communication protocols. The TeSys T system can predict what will happen in the process, as it accurately monitors current, voltage, and power over a wide range. This option is available for control voltages of 24 Vac or 100–240 Vac. For additional information about the TeSys T Motor Management System, see page 46 and catalog 9065CT9701. NOTE: The full catalog number contains a four-character Form number (for example, 8536SCO3V06**H616**).

Melting Alloy Thermal Overload Relays—Melting alloy style thermal overload blocks are installed as part of the starter, and thermal elements must be selected and installed separately in order to operate the starter. For a three-phase motor, three thermal units must be ordered using the tables in catalog 9065CT9701. The catalog number includes no Form number (for example, 8536SCO3V06).

Combination Starters

Class 8738—Reversing, Fusible Disconnect Switch Type

Fusible, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 30: Class 8738 Reversing Full-Voltage Type, Fusible (with Class H and K Fuse Clips), with Motor Logic SSOLR (replace ●●● with the voltage code)

Motor Voltage (Starter Voltage)	Ratings			Enclosure				
	Max. Hp Polyphase	NEMA Size	Fuse Clip Size (A)	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304)	NEMA 4X Watertight, Dusttight, and Corrosion Resistant Polyester	NEMA 12/3R Industrial Use Dusttight and Driptight ^[1]	
				Type ^[2]	Type ^[2]	Type ^[2]	With External Reset	Without External Reset
200 (208)	3	0	30	SBG12●●●H30 ^[3]	SBW12●●●H30 ^[3]	SBW22●●●H30 ^[3]	SBA22●●●H30 ^[3]	SBA12●●●H30 ^[3]
	5	1	30	SCG12●●●H30 ^[3]	SCW12●●●H30 ^[3]	SCW22●●●H30 ^[3]	SCA22●●●H30 ^[3]	SCA12●●●H30 ^[3]
	7.5		60	SCG13●●●H30 ^[3]	SCW13●●●H30 ^[3]	SCW23●●●H30 ^[3]	SCA23●●●H30 ^[3]	SCA13●●●H30 ^[3]
	10	2	60	SDG12●●●H30	SDW12●●●H30	SDW22●●●H30	SDA22●●●H30	SDA12●●●H30
	20	3	100	SEG15●●●H30	SEW15●●●H30	—	SEA25●●●H30	SEA15●●●H30
	40	4	200	SFG15●●●H30	SFW15●●●H30	—	SFA25●●●H30	SFA15●●●H30
	75	5	400	SGG15●●●H30	SGW15●●●H30	—	SGA25●●●H30	SGA15●●●H30
230 (240)	3	0	30	SBG12●●●H30 ^[3]	SBW12●●●H30 ^[3]	SBW22●●●H30 ^[3]	SBA22●●●H30 ^[3]	SBA12●●●H30 ^[3]
	5	1	30	SCG12●●●H30 ^[3]	SCW12●●●H30 ^[3]	SCW22●●●H30 ^[3]	SCA22●●●H30 ^[3]	SCA12●●●H30 ^[3]
	7.5		60	SCG13●●●H30 ^[3]	SCW13●●●H30 ^[3]	SCW23●●●H30 ^[3]	SCA23●●●H30 ^[3]	SCA13●●●H30 ^[3]
	15	2	60	SDG12●●●H30	SDW12●●●H30	SDW22●●●H30	SDA22●●●H30	SDA12●●●H30
	25	3	100	SEG15●●●H30	SEW15●●●H30	—	SEA25●●●H30	SEA15●●●H30
	50	4	200	SFG15●●●H30	SFW15●●●H30	—	SFA25●●●H30	SFA15●●●H30
	100	5	400	SGG15●●●H30	SGW15●●●H30	—	SGA25●●●H30	SGA15●●●H30
460 (480)	5	0	30	SBG13●●●H30 ^[3]	SBW13●●●H30 ^[3]	SBW23●●●H30 ^[3]	SBA23●●●H30 ^[3]	SBA13●●●H30 ^[3]
	10	1	30	SCG14●●●H30 ^[3]	SCW14●●●H30 ^[3]	SCW24●●●H30 ^[3]	SCA24●●●H30 ^[3]	SCA14●●●H30 ^[3]
	15	2	30	SDG16●●●H30 ^[3]	SDW16●●●H30 ^[3]	SDW26●●●H30 ^[3]	SDA26●●●H30 ^[3]	SDA16●●●H30 ^[3]
	25		60	SDG14●●●H30	SDW14●●●H30	SDW24●●●H30	SDA24●●●H30	SDA14●●●H30
	50	3	100	SEG13●●●H30	SEW13●●●H30	—	SEA23●●●H30	SEA13●●●H30
	100	4	200	SFG13●●●H30	SFW13●●●H30	—	SFA23●●●H30	SFA13●●●H30
	200	5	400	SGG13●●●H30	SGW13●●●H30	—	SGA23●●●H30	SGA13●●●H30
575 (600)	5	0	30	SBG13●●●H30 ^[3]	SBW13●●●H30 ^[3]	SBW23●●●H30 ^[3]	SBA23●●●H30 ^[3]	SBA13●●●H30 ^[3]
	10	1	30	SCG14●●●H30 ^[3]	SCW14●●●H30 ^[3]	SCW24●●●H30 ^[3]	SCA24●●●H30 ^[3]	SCA14●●●H30 ^[3]
	15	2	30	SDG16●●●H30 ^[3]	SDW16●●●H30 ^[3]	SDW26●●●H30 ^[3]	SDA26●●●H30 ^[3]	SDA16●●●H30 ^[3]
	25		60	SDG14●●●H30	SDW14●●●H30	SDW24●●●H30	SDA24●●●H30	SDA14●●●H30
	50	3	100	SEG13●●●H30	SEW13●●●H30	—	SEA23●●●H30	SEA13●●●H30
	100	4	200	SFG13●●●H30	SFW13●●●H30	—	SFA23●●●H30	SFA13●●●H30
	200	5	400	SGG13●●●H30	SGW13●●●H30	—	SGA23●●●H30	SGA13●●●H30

^[1] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

^[2] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 31.

^[3] Form H30, with the possibility of a fourth character to select a lower FLA range (for example, H308). See page 45.

Table 31: Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24 ^[1]	—	V01
120 ^[1]	110	V02
208	—	V08
240	220	V03
277 ^[1]	—	V04
480	440	V06
600	550	V07
Specify	Specify	V99

Standard unit



File E152395
CCN, NKJH, KNKJH7



File LR584
Class 3211 04

Note that some units are not CSA certified. Consult the factory.

^[1] These voltage codes must include **Form S** (no charge) for separate control (for example, order as 8738SCG13V02S). Note that **24 V** coils are **not** available on Sizes 4–7.

NOTE: For voltage codes used with control transformers, see Table 71 on page 44.

Combination Starters

Class 8738—Reversing, Non-Fusible Disconnect Switch Type

Non-Fusible, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 32: Class 8738 Non-Fusible Disconnect Switch Type—Full-Voltage, Reversing, with Motor Logic SSOLR

Motor Voltage (Starter Voltage)	Ratings			Enclosure				
	Max. Hp Polyphase	NEMA Size	Fuse Clip Size (A)	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304)	NEMA 4X Watertight, Dusttight and Corrosion Resistant Polyester	NEMA 12/3R ^[1] Industrial Use Dusttight and Driptight	
				Type ^[2]	Type ^[2]	Type ^[2]	With External Reset	Without External Reset
200 (208)	3	0	None	SBG11●●●H30 ^[3]	SBW11●●●H30 ^[3]	SBW21●●●H30 ^[3]	SBA21●●●H30 ^[3]	SBA11●●●H30 ^[3]
	7.5	1	None	SCG11●●●H30 ^[3]	SCW11●●●H30 ^[3]	SCW21●●●H30 ^[3]	SCA21●●●H30 ^[3]	SCA11●●●H30 ^[3]
	10	2	None	SDG11●●●H30	SDW11●●●H30	SDW21●●●H30	SDA21●●●H30	SDA11●●●H30
	25	3	None	SEG11●●●H30	SEW11●●●H30	—	SEA21●●●H30	SEA11●●●H30
	40	4	None	SFG11●●●H30	SFW11●●●H30	—	SFA21●●●H30	SFA11●●●H30
	75	5	None	SGG11●●●H30	SGW11●●●H30	—	SGA21●●●H30	SGA11●●●H30
230 (240)	3	0	None	SBG11●●●H30 ^[3]	SBW11●●●H30 ^[3]	SBW21●●●H30 ^[3]	SBA21●●●H30 ^[3]	SBA11●●●H30 ^[3]
	7.5	1	None	SCG11●●●H30 ^[3]	SCW11●●●H30 ^[3]	SCW21●●●H30 ^[3]	SCA21●●●H30 ^[3]	SCA11●●●H30 ^[3]
	15	2	None	SDG11●●●H30	SDW11●●●H30	SDW21●●●H30	SDA21●●●H30	SDA11●●●H30
	30	3	None	SEG11●●●H30	SEW11●●●H30	—	SEA21●●●H30	SEA11●●●H30
	50	4	None	SFG11●●●H30	SFW11●●●H30	—	SFA21●●●H30	SFA11●●●H30
	100	5	None	SGG11●●●H30	SGW11●●●H30	—	SGA21●●●H30	SGA11●●●H30
460 (480)	5	0	None	SBG11●●●H30 ^[3]	SBW11●●●H30 ^[3]	SBW21●●●H30 ^[3]	SBA21●●●H30 ^[3]	SBA11●●●H3 ^[3]
	10	1	None	SCG11●●●H30 ^[3]	SCW11●●●H30 ^[3]	SCW21●●●H30 ^[3]	SCA21●●●H30 ^[3]	SCA11●●●H30 ^[3]
	25	2	None	SDG11●●●H30	SDW11●●●H30	SDW21●●●H30	SDA21●●●H30	SDA11●●●H30
	50	3	None	SEG11●●●H30	SEW11●●●H30	—	SEA21●●●H30	SEA11●●●H30
	100	4	None	SFG11●●●H30	SFW11●●●H30	—	SFA21●●●H30	SFA11●●●H30
	200	5	None	SGG11●●●H30	SGW11●●●H30	—	SGA21●●●H30	SGA11●●●H30
575 (600)	5	0	None	SBG11●●●H30 ^[3]	SBW11●●●H30 ^[3]	SBW21●●●H30 ^[3]	SBA21●●●H30 ^[3]	SBA11●●●H30 ^[3]
	10	1	None	SCG11●●●H30 ^[3]	SCW11●●●H30 ^[3]	SCW21●●●H30 ^[3]	SCA21●●●H30 ^[3]	SCA11●●●H30 ^[3]
	25	2	None	SDG11●●●H30	SDW11●●●H30	SDW21●●●H30	SDA21●●●H30	SDA11●●●H30
	50	3	None	SEG11●●●H30	SEW11●●●H30	—	SEA21●●●H30	SEA11●●●H30
	100	4	None	SFG11●●●H30	SFW11●●●H30	—	SFA21●●●H30	SFA11●●●H30
	200	5	None	SGG11●●●H30	SGW11●●●H30	—	SGA21●●●H30	SGA11●●●H30

^[1] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

^[2] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 35 on page 28.

^[3] Form H30, with the possibility of a fourth character to select a lower FLA range (for example, H308). See page 45.

Combination Starters

Class 8738—Reversing, Disconnect Switch Type, Fusible, with Class R Fuse Clips

Class R Fuse Clips, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 33: Class 8738 Disconnect Switch Type, Fusible, with Class R Fuse Clips—100,000 AIC Rating (replace ●●● with the voltage code)

Motor Voltage (Starter Voltage)	Ratings			Enclosure				
	Max. Hp Polyphase	NEMA Size	Fuse Clip Size (A)	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304)	NEMA 4X Watertight, Dusttight, and Corrosion Resistant Polyester	NEMA 12/3R ^[1] Industrial Use Dusttight and Driptight	
				Type ^[2]	Type ^[2]	Type ^[2]	With External Reset	Without External Reset
200 (208)	3	0	30	SBG32●●●H30 ^[3]	SBW32●●●H30 ^[3]	SBW42●●●H30 ^[3]	SBA42●●●H30 ^[3]	SBA32●●●H30 ^[3]
	5	1	30	SCG32●●●H30 ^[3]	SCW32●●●H30 ^[3]	SCW42●●●H30 ^[3]	SCA42●●●H30 ^[3]	SCA32●●●H30 ^[3]
	7.5		60	SCG33●●●H30 ^[3]	SCW33●●●H30 ^[3]	SCW43●●●H30 ^[3]	SCA43●●●H30 ^[3]	SCA33●●●H30 ^[3]
	10	2	60	SDG32●●●H30	SDW32●●●H30	SDW42●●●H30	SDA42●●●H30	SDA32●●●H30
	20	3	100	SEG35●●●H30	SEW35●●●H30	—	SEA45●●●H30	SEA35●●●H30
	40	4	200	SFG35●●●H30	SFW35●●●H30	—	SFA45●●●H30	SFA35●●●H30
	75	5	400	SGG35●●●H30	SGW35●●●H30	—	SGA45●●●H30	SGA35●●●H30
230 (240)	3	0	30	SBG32●●●H30 ^[3]	SBW32●●●H30 ^[3]	SBW42●●●H30 ^[3]	SBA42●●●H30 ^[3]	SBA32●●●H30 ^[3]
	5	1	30	SCG32●●●H30 ^[3]	SCW32●●●H30 ^[3]	SCW42●●●H30 ^[3]	SCA42●●●H30 ^[3]	SCA32●●●H30 ^[3]
	7.5		60	SCG33●●●H30 ^[3]	SCW33●●●H30 ^[3]	SCW43●●●H30 ^[3]	SCA43●●●H30 ^[3]	SCA33●●●H30 ^[3]
	15	2	60	SDG32●●●H30	SDW32●●●H30	SDW42●●●H30	SDA42●●●H30	SDA32●●●H30
	25	3	100	SEG35●●●H30	SEW35●●●H30	—	SEA45●●●H30	SEA35●●●H30
	50	4	200	SFG35●●●H30	SFW35●●●H30	—	SFA45●●●H30	SFA35●●●H30
	100	5	400	SGG35●●●H30	SGW35●●●H30	—	SGA45●●●H30	SGA35●●●H30
460 (480)	5	0	30	SBG33●●●H30 ^[3]	SBW33●●●H30 ^[3]	SBW43●●●H30 ^[3]	SBA43●●●H30 ^[3]	SBA33●●●H30 ^[3]
	10	1	30	SCG34●●●H30 ^[3]	SCW34●●●H30 ^[3]	SCW44●●●H30 ^[3]	SCA44●●●H30 ^[3]	SCA34●●●H30 ^[3]
	15	2	30	SDG36●●●H30 ^[3]	SDW36●●●H30 ^[3]	SDW46●●●H30 ^[3]	SDA46●●●H30 ^[3]	SDA36●●●H30 ^[3]
	25		60	SDG34●●●H30	SDW34●●●H30	SDW44●●●H30	SDA44●●●H30	SDA34●●●H30
	50	3	100	SEG33●●●H30	SEW33●●●H30	—	SEA43●●●H30	SEA33●●●H30
	100	4	200	SFG33●●●H30	SFW33●●●H30	—	SFA43●●●H30	SFA33●●●H30
	200	5	400	SGG33●●●H30	SGW33●●●H30	—	SGA43●●●H30	SGA33●●●H30
575 (600)	5	0	30	SBG33●●●H30 ^[3]	SBW33●●●H30 ^[3]	SBW43●●●H30 ^[3]	SBA43●●●H30 ^[3]	SBA33●●●H30 ^[3]
	10	1	30	SCG34●●●H30 ^[3]	SCW34●●●H30 ^[3]	SCW44●●●H30 ^[3]	SCA44●●●H30 ^[3]	SCA34●●●H30 ^[3]
	15	2	30	SDG36●●●H30 ^[3]	SDW36●●●H30 ^[3]	SDW46●●●H30 ^[3]	SDA46●●●H30 ^[3]	SDA36●●●H30 ^[3]
	25		60	SDG34●●●H30	SDW34●●●H30	SDW44●●●H30	SDA44●●●H30	SDA34●●●H30
	50	3	100	SEG33●●●H30	SEW33●●●H30	—	SEA43●●●H30	SEA33●●●H30
	100	4	200	SFG33●●●H30	SFW33●●●H30	—	SFA43●●●H30	SFA33●●●H30
	200	5	400	SGG33●●●H30	SGW33●●●H30	—	SGA43●●●H30	SGA33●●●H30

^[1] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

^[2] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 35 on page 28.

^[3] Form H30, with the possibility of a fourth character to select a lower FLA range (for example, H308). See page 45.

Combination Starters

Class 8739—Reversing, Electronic Motor Circuit Protector (MCP) Circuit Breaker

Electronic MCP, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 34: Class 8739 Electronic MCP, Full-Voltage Type, Reversing with Motor Logic SSOLR (replace ●●● with the voltage code)

Motor Voltage (Starter Voltage)	Ratings			Enclosure				
	NEMA Size	Hp Range Polyphase	Circuit Breaker (See Digest Section 7 for Adjustment Range)	NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304) (Sizes 0-5) ^[1]	NEMA 4X Watertight, Dusttight and Corrosion Resistant Polyester	NEMA 12/3R ^[2] Industrial Use Dusttight and Driptight	
				Type ^[3]	Type ^[3]	Type ^[3]	With External Reset	Without External Reset
200 (208)	0	0.25–3	HLL36030M71	SBG43●●●H30 ^[4]	SBW43●●●H30 ^[4]	SBW53●●●H30 ^[4]	SBA53●●●H30 ^[4]	SBA43●●●H30 ^[4]
	1	0.25–5	HLL36030M71	SCG44●●●H30 ^[4]	SCW44●●●H30 ^[4]	SCW54●●●H30 ^[4]	SCA54●●●H30 ^[4]	SCA44●●●H30 ^[4]
		7.5	HLL36050M72	SCG45●●●H30 ^[4]	SCW45●●●H30 ^[4]	SCW55●●●H30 ^[4]	SCA55●●●H30 ^[4]	SCA45●●●H30 ^[4]
	2	1.5–5	HLL36030M71	SDG42●●●H30 ^[4]	SDW42●●●H30 ^[4]	SDW52●●●H30 ^[4]	SDA52●●●H30 ^[4]	SDA42●●●H30 ^[4]
		7.5–10	HLL36050M72	SDG43●●●H30	SDW43●●●H30	SDW53●●●H30	SDA53●●●H30	SDA43●●●H30
	3	15–25	HLL36100M73	SEG42●●●H30	SEW42●●●H30	SEW52●●●H30	SEA52●●●H30	SEA42●●●H30
	4	30–40	JLL36250M75	SFG44●●●H30	SFW44●●●H30	SFW54●●●H30	SFA54●●●H30	SFA44●●●H30
	5	50–60	JLL36250M75	SGG44●●●H30	SGW44●●●H30	—	SGA54●●●H30	SGA44●●●H30
		75	LJL36400M36	SGG45●●●H30	SGW45●●●H30	—	SGA55●●●H30	SGA45●●●H30
	6	100	LJL36400M36	SHG43●●●H30	SHW43●●●H30	—	SHA53●●●H30	SHA43●●●H30
		125–150	LJL36600M42	SHG45●●●H30	SHW45●●●H30	—	SHA55●●●H30	SHA45●●●H30
230 (240)	0	0.25–3	HLL36030M71	SBG43●●●H30 ^[4]	SBW43●●●H30 ^[4]	SBW53●●●H30 ^[4]	SBA53●●●H30 ^[4]	SBA43●●●H30 ^[4]
	1	0.25–7.5	HLL36030M71	SCG44●●●H30 ^[4]	SCW44●●●H30 ^[4]	SCW54●●●H30 ^[4]	SCA54●●●H30 ^[4]	SCA44●●●H30 ^[4]
	2	1.5–7.5	HLL36030M71	SDG42●●●H30 ^[4]	SDW42●●●H30 ^[4]	SDW52●●●H30 ^[4]	SDA52●●●H30 ^[4]	SDA42●●●H30 ^[4]
		10	HLL36050M72	SDG43●●●H30	SDW43●●●H30	SDW53●●●H30	SDA53●●●H30	SDA43●●●H30
	3	15	HLL36100M73	SDG44●●●H30	SDW44●●●H30	SDW54●●●H30	SDA54●●●H30	SDA44●●●H30
		15–30	HLL36100M73	SEG42●●●H30	SEW42●●●H30	SEW52●●●H30	SEA52●●●H30	SEA42●●●H30
	4	40–50	JLL36250M75	SFG44●●●H30	SFW44●●●H30	SFW54●●●H30	SFA54●●●H30	SFA44●●●H30
	5	60	JLL36250M75	SGG44●●●H30	SGW44●●●H30	—	SGA54●●●H30	SGA44●●●H30
		75–100	LJL36400M36	SGG45●●●H30	SGW45●●●H30	—	SGA55●●●H30	SGA45●●●H30
	6	125–150	LJL36600M42	SHG45●●●H30	SHW45●●●H30	—	SHA55●●●H30	SHA45●●●H30
		200	PLL34080M68	SHG46●●●H30	SHW46●●●H30	—	SHA56●●●H30	SHA46●●●H30
460 (480)	0	0.25–5	HLL36030M71	SBG43●●●H30 ^[4]	SBW43●●●H30 ^[4]	SBW53●●●H30 ^[4]	SBA53●●●H30 ^[4]	SBA43●●●H30 ^[4]
	1	0.25–10	HLL36030M71	SCG44●●●H30 ^[4]	SCW44●●●H30 ^[4]	SCW54●●●H30 ^[4]	SCA54●●●H30 ^[4]	SCA44●●●H30 ^[4]
	2	5–15	HLL36030M71	SDG42●●●H30 ^[4]	SDW42●●●H30 ^[4]	SDW52●●●H30 ^[4]	SDA52●●●H30 ^[4]	SDA42●●●H30 ^[4]
		20–25	HLL36050M72	SDG43●●●H30	SDW43●●●H30	SDW53●●●H30	SDA53●●●H30	SDA43●●●H30
	3	20–25	HLL36050M72	SEG41●●●H30	SEW41●●●H30	SEW51●●●H30	SEA51●●●H30	SEA41●●●H30
		30–50	HLL36100M73	SEG42●●●H30	SEW42●●●H30	SEW52●●●H30	SEA52●●●H30	SEA42●●●H30
	4	60–100	JLL36250M75	SFG44●●●H30	SFW44●●●H30	SFW54●●●H30	SFA54●●●H30	SFA44●●●H30
	5	125	JLL36250M75	SGG44●●●H30	SGW44●●●H30	—	SGA54●●●H30	SGA44●●●H30
		150–200	LJL36400M36	SGG45●●●H30	SGW45●●●H30	—	SGA55●●●H30	SGA45●●●H30
	6	250–350	LJL36600M42	SHG45●●●H30	SHW45●●●H30	—	SHA55●●●H30	SHA45●●●H30
		400	PLL34080M68	SHG46●●●H30	SHW46●●●H30	—	SHA56●●●H30	SHA46●●●H30
575 (600)	0	0.25–5	HLL36030M71	SBG43●●●H30 ^[4]	SBW43●●●H30 ^[4]	SBW53●●●H30 ^[4]	SBA53●●●H30 ^[4]	SBA43●●●H30 ^[4]
	1	0.25–10	HLL36030M71	SCG44●●●H30 ^[4]	SCW44●●●H30 ^[4]	SCW54●●●H30 ^[4]	SCA54●●●H30 ^[4]	SCA44●●●H30 ^[4]
	2	5–20	HLL36030M71	SDG42●●●H30 ^[4]	SDW42●●●H30 ^[4]	SDW52●●●H30 ^[4]	SDA52●●●H30 ^[4]	SDA42●●●H30 ^[4]
		25	HLL36050M72	SDG43●●●H30	SDW43●●●H30	SDW53●●●H30	SDA53●●●H30	SDA43●●●H30
	3	25–30	HLL36050M72	SEG41●●●H30	SEW41●●●H30	SEW51●●●H30	SEA51●●●H30	SEA41●●●H30
		40–50	HLL36100M73	SEG42●●●H30	SEW42●●●H30	SEW52●●●H30	SEA52●●●H30	SEA42●●●H30
	4	60–100	JLL36250M75	SFG44●●●H30	SFW44●●●H30	SFW54●●●H30	SFA54●●●H30	SFA44●●●H30
	5	125–150	JLL36250M75	SGG44●●●H30	SGW44●●●H30	—	SGA54●●●H30	SGA44●●●H30
		200	LJL36400M36	SGG45●●●H30	SGW45●●●H30	—	SGA55●●●H30	SGA45●●●H30
	6	250	LJL36400M36	SHG43●●●H30	SHW43●●●H30	—	SHA53●●●H30	SHA43●●●H30
		300–400	LJL36600M42	SHG45●●●H30	SHW45●●●H30	—	SHA55●●●H30	SHA45●●●H30

^[1] Size 6 starter enclosures are NEMA 4 painted sheet steel.

^[2] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

^[3] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 35 on page 28.

^[4] Form H30, with the possibility of a fourth character to select a lower FLA range (for example, H308). See page 45.

Combination Starters

Class 8739—Reversing, Electronic Motor Circuit Protector (MCP) Circuit Breaker

Table 35: Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24 ^[1]	—	V01
120 ^[1]	110	V02
208	—	V08
240	220	V03
277 ^[1]	—	V04
480	440	V06
600	550	V07
Specify	Specify	V99

^[1] **Form S** (no charge) must be included with these voltage codes where a separate source of voltage is used for the control coil (for example, order as 8739SCG41V02**S**).
 Note that **24 V** coils are **not** available on Sizes 4–7.

NOTE: For voltage codes used with control transformers, see Table 71 on page 44.

Dimensions	Page 18
Factory Modifications (Forms)	Page 42
Type S Accessories (Class 9999)	Catalog 9999CT9701R10/07

Combination Starters

Class 8739—Reversing, Thermal-Magnetic Circuit Breaker

Thermal-Magnetic, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 36: Class 8739 Thermal-Magnetic, Full-Voltage Type, Reversing, 200–240 V, with Motor Logic SSOLR (replace ●●● with the voltage code)

Motor Voltage (Starter Voltage)	Ratings				Enclosure				
	Max. Hp Polyphase	NEMA Size	Circuit Breaker		NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304) (Sizes 0-5) ^[1]	NEMA 4X Watertight, Dusttight and Corrosion Resistant Polyester	NEMA 12/3R ^[2] Industrial Use Dusttight and Driptight	
			Type	Rating (A)	Type ^[3]	Type ^[3]	Type ^[3]	With External Reset	Without External Reset
200 (208)	2	0	HLL36015	15	SBG1●●●H30 ^[4]	SBW1●●●H30 ^[4]	SBW11●●●H30 ^[4]	SBA11●●●H30 ^[4]	SBA1●●●H30 ^[4]
	3		HLL36020	20	SBG3●●●H30 ^[4]	SBW3●●●H30 ^[4]	SBW13●●●H30 ^[4]	SBA13●●●H30 ^[4]	SBA3●●●H30 ^[4]
	5	1	HLL36035	35	SCG5●●●H30 ^[4]	SCW5●●●H30 ^[4]	SCW15●●●H30 ^[4]	SCA15●●●H30 ^[4]	SCA5●●●H30 ^[4]
	7.5		HLL36050	50	SCG2●●●H30 ^[4]	SCW2●●●H30 ^[4]	SCW12●●●H30 ^[4]	SCA12●●●H30 ^[4]	SCA2●●●H30 ^[4]
	10	2	HLL36060	60	SDG1●●●H30	SDW1●●●H30	SDW11●●●H30	SDA11●●●H30	SDA1●●●H30
	15	3	HLL36100	100	SEG3●●●H30	SEW3●●●H30	SEW13●●●H30	SEA13●●●H30	SEA3●●●H30
	20		HLL36125	125	SEG1●●●H30	SEW1●●●H30	SEW11●●●H30	SEA11●●●H30	SEA1●●●H30
	25		HLL36150	150	SEG5●●●H30	SEW5●●●H30	SEW15●●●H30	SEA15●●●H30	SEA5●●●H30
	30	4	JLL36200	200	SFG3●●●H30	SFW3●●●H30	SFW13●●●H30	SFA13●●●H30	SFA3●●●H30
	40		JLL36250	250	SFG4●●●H30	SFW4●●●H30	SFW14●●●H30	SFA14●●●H30	SFA4●●●H30
230 (240)	50	5	JLL36250	250	SGG6●●●H30	SGW6●●●H30	—	SGA16●●●H30	SGA6●●●H30
	60–75		LLL36400U33X	400	SGG4●●●H30	SGW4●●●H30	—	SGA14●●●H30	SGA4●●●H30
	100–125	6	LLL36600U33X	600	SHG4●●●H30	SHW4●●●H30	—	SHA14●●●H30	SHA4●●●H30
	150		MJL36800	800	SHG5●●●H30	SHW5●●●H30	—	SHA15●●●H30	SHA5●●●H30
	2	0	HLL36015	15	SBG1●●●H30 ^[4]	SBW1●●●H30 ^[4]	SBW11●●●H30 ^[4]	SBA11●●●H30 ^[4]	SBA1●●●H30 ^[4]
	3		HLL36020	20	SBG3●●●H30 ^[4]	SBW3●●●H30 ^[4]	SBW13●●●H30 ^[4]	SBA13●●●H30 ^[4]	SBA3●●●H30 ^[4]
	5	1	HLL36035	35	SCG5●●●H30 ^[4]	SCW5●●●H30 ^[4]	SCW15●●●H30 ^[4]	SCA15●●●H30 ^[4]	SCA5●●●H30 ^[4]
	7.5		HLL36045	45	SCG6●●●H30 ^[4]	SCW6●●●H30 ^[4]	SCW16●●●H30 ^[4]	SCA16●●●H30 ^[4]	SCA6●●●H30 ^[4]
	10	2	HLL36060	60	SDG1●●●H30	SDW1●●●H30	SDW11●●●H30	SDA11●●●H30	SDA1●●●H30
	15		HLL36090	90	SDG7●●●H30	SDW7●●●H30	SDW17●●●H30	SDA17●●●H30	SDA7●●●H30
230 (240)	20	3	HLL36100	100	SEG3●●●H30	SEW3●●●H30	SEW13●●●H30	SEA13●●●H30	SEA3●●●H30
	25–30		HLL36150	150	SEG5●●●H30	SEW5●●●H30	SEW15●●●H30	SEA15●●●H30	SEA5●●●H30
	40	4	JLL36225	225	SFG1●●●H30	SFW1●●●H30	SFW11●●●H30	SFA11●●●H30	SFA1●●●H30
	50		JLL36250	250	SFG4●●●H30	SFW4●●●H30	SFW14●●●H30	SFA14●●●H30	SFA4●●●H30
	60	5	JLL36250	250	SGG6●●●H30	SGW6●●●H30	—	SGA16●●●H30	SGA6●●●H30
	75		LLL36400U33X	400	SGG4●●●H30	SGW4●●●H30	—	SGA14●●●H30	SGA4●●●H30
	100		LLL36600U33X	600	SGG2●●●H30	SGW2●●●H30	—	SGA12●●●H30	SGA2●●●H30
	125	6	LLL36600U33X	600	SHG4●●●H30	SHW4●●●H30	—	SHA14●●●H30	SHA4●●●H30
	150–200		MJL36800	800	SHG5●●●H30	SHW5●●●H30	—	SHA15●●●H30	SHA5●●●H30

^[1] Size 6 starter enclosures are NEMA 4 painted sheet steel.

^[2] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

^[3] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 37.

^[4] **Form H30**, with the possibility of a fourth character to select a lower FLA range (for example, **H308**). See page 45.

Table 37: Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24 ^[1]	—	V01
120 ^[1]	110	V02
208	—	V08
240	220	V03
277 ^[1]	—	V04
480	440	V06
600	550	V07
Specify	Specify	V99

^[1] **Form S** (no charge) must be included with these voltage codes where a separate source of voltage is used for the control coil (for example, order as 8739SCG5V02S).

Note that **24 V** coils are **not** available on Sizes 4–7.

NOTE: For voltage codes used with control transformers, see Table 71 on page 44.

Dimensions	Page 18
Factory Modifications (Forms)	Page 42
Type S Accessories (Class 9999)	Catalog 9999CT9701R10/07

Combination Starters

Class 8739—Reversing, Thermal-Magnetic Circuit Breaker

Thermal-Magnetic, 3-Pole Polyphase—600 Vac Maximum, 50–60 Hz

Table 38: Class 8739 Thermal-Magnetic, Full-Voltage Type, Reversing, 460–600 V, with Motor Logic SSOLR (replace ●●● with the voltage code)

Motor Voltage (Starter Voltage)	Ratings				Enclosure				
	Max. Hp Polyphase	NEMA Size	Circuit Breaker		NEMA 1 General Purpose	NEMA 4 & 4X Watertight and Dusttight Stainless Steel (304) (Sizes 0–5) [1]	NEMA 4X Watertight, Dusttight and Corrosion Resistant Polyester	NEMA 12/3R [2] Industrial Use Dusttight and Driptight With External Reset	Without External Reset
			Type	Rating (A)	Type [3]	Type [3]	Type [3]	Type [3]	Type [3]
460 (480)	5	0	HLL36015	15	SBG1●●●H30 [4]	SBW1●●●H30 [4]	SBW11●●●H30 [4]	SBA11●●●H30 [4]	SBA1●●●H30 [4]
	7.5	1	HLL36025	25	SCG3●●●H30 [4]	SCW3●●●H30 [4]	SCW13●●●H30 [4]	SCA13●●●H30 [4]	SCA3●●●H30 [4]
	10		HLL36030	30	SCG7●●●H30 [4]	SCW7●●●H30 [4]	SCW17●●●H30 [4]	SCA17●●●H30 [4]	SCA7●●●H30 [4]
	15	2	HLL36045	45	SDG3●●●H30	SDW3●●●H30	SDW13●●●H30	SDA13●●●H30	SDA3●●●H30
	20		HLL36060	60	SDG1●●●H30	SDW1●●●H30	SDW11●●●H30	SDA11●●●H30	SDA1●●●H30
	25		HLL36070	70	SDG5●●●H30	SDW5●●●H30	SDW15●●●H30	SDA15●●●H30	SDA5●●●H30
	30	3	HLL36080	80	SEG6●●●H30	SEW6●●●H30	SEW16●●●H30	SEA16●●●H30	SEA6●●●H30
	40		HLL36100	100	SEG3●●●H30	SEW3●●●H30	SEW13●●●H30	SEA13●●●H30	SEA3●●●H30
	50		HLL36150	150	SEG5●●●H30	SEW5●●●H30	SEW15●●●H30	SEA15●●●H30	SEA5●●●H30
	60	4	JLL36105	150	SFG5●●●H30	SFW5●●●H30	SFW15●●●H30	SFA15●●●H30	SFA5●●●H30
	75		JLL36200	200	SFG3●●●H30	SFW3●●●H30	SFW13●●●H30	SFA13●●●H30	SFA3●●●H30
	100		JLL36250	250	SFG4●●●H30	SFW4●●●H30	SFW14●●●H30	SFA14●●●H30	SFA4●●●H30
575 (600)	125–150	5	LLL36400U33X	400	SGG4●●●H30	SGW4●●●H30	—	SGA14●●●H30	SGA4●●●H30
	200		LLL36600U33X	600	SGG2●●●H30	SGW2●●●H30	—	SGA12●●●H30	SGA2●●●H30
	250	6	LLL36600U33X	600	SHG4●●●H30	SHW4●●●H30	—	SHA14●●●H30	SHA4●●●H30
	300–400		MJL36800	800	SHG5●●●H30	SHW5●●●H30	—	SHA15●●●H30	SHA5●●●H30
	5	0	HLL36015	15	SBG1●●●H30 [4]	SBW1●●●H30 [4]	SBW11●●●H30 [4]	SBA11●●●H30 [4]	SBA1●●●H30 [4]
	7.5	1	HLL36020	20	SCG8●●●H30 [4]	SCW8●●●H30 [4]	SCW18●●●H30 [4]	SCA18●●●H30 [4]	SCA8●●●H30 [4]
	10		HLL36025	25	SCG3●●●H30 [4]	SCW3●●●H30 [4]	SCW13●●●H30 [4]	SCA13●●●H30 [4]	SCA3●●●H30 [4]
	15	2	HLL36035	35	SDG8●●●H30	SDW8●●●H30	SDW18●●●H30	SDA18●●●H30	SDA8●●●H30
	20		HLL36045	45	SDG3●●●H30	SDW3●●●H30	SDW13●●●H30	SDA13●●●H30	SDA3●●●H30
	25		HLL36060	60	SDG1●●●H30	SDW1●●●H30	SDW11●●●H30	SDA12●●●H30	SDA1●●●H30
	30	3	HLL36070	70	SEG4●●●H30	SEW4●●●H30	SEW14●●●H30	SEA14●●●H30	SEA4●●●H30
	40		HLL36090	90	SEG6●●●H30	SEW6●●●H30	SEW16●●●H30	SEA16●●●H30	SEA6●●●H30
	50		HLL36100	100	SEG3●●●H30	SEW3●●●H30	SEW13●●●H30	SEA13●●●H30	SEA3●●●H30
575 (600)	60–75	4	JLL36150	150	SFG5●●●H30	SFW5●●●H30	SFW15●●●H30	SFA15●●●H30	SFA5●●●H30
	100		JLL36250	250	SFG4●●●H30	SFW4●●●H30	SFW14●●●H30	SFA14●●●H30	SFA4●●●H30
	125–150	5	JLL36250	250	SGG6●●●H30	SGW6●●●H30	—	SGA16●●●H30	SGA6●●●H30
	200		LLL36400U33X	400	SGG4●●●H30	SGW4●●●H30	—	SGA14●●●H30	SGA4●●●H30
	250–350	6	LLL36600U33X	600	SHG4●●●H30	SHW4●●●H30	—	SHA14●●●H30	SHA4●●●H30
	400		MJL36800	800	SHG5●●●H30	SHW5●●●H30	—	SHA15●●●H30	SHA5●●●H30

[1] Size 6 starter enclosures are NEMA 4 painted sheet steel.

[2] NEMA 12/3R enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See page 19 for more information.

[3] Replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes shown in Table 39.

[4] Form H30, with the possibility of a fourth character to select a lower FLA range (for example, H308). See page 45.

Table 39: Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24 [1]	—	V01
120 [1]	110	V02
208	—	V08
240	220	V03
480	440	V06
600	550	V07
Specify	Specify	V99

[1] Form S (no charge) must be included with these voltage codes where a separate source of voltage is used for the control coil (for example, order as 8739SDG3V02S). Note that 24 V coils are not available on Sizes 4–7.

NOTE: For voltage codes used with control transformers, see Table 71 on page 44.

Combination Starters Class 8738, 8739—Reversing—Approximate Dimensions

Dimensions for Reversing Combination Starters—NEMA 1, 12, and 3R

Table 40: NEMA 1 Enclosure, Sizes 0–2 (see Figure 11)

NEMA Size	Class	Type	Dimensions (in.) [1]																Top & Bottom		Sides Y	Wt. (lb)
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	W	X		
0–1	8738, 8739	SBG SCG	13.75	23	8.34	10.63	21	18.91	1.88	1.88	3.75	2.31	1.06	3.25	2.19	1.25	0.88	—	0.25 / 0.75 / 1	0.25 / 0.75 / 1	0.25	49
2	8738, 8739	SDG	15	28.75	9.59	11.63	26.25	21.47	2.19	2	4	2.56	1.25	3.25	2.19	1.25	0.91	—	1 / 1.25	1 / 1.25	0.25	80

[1] These dimensions are also for **Form FF4T** (standard control transformer), **Form FF4T11** (100 VA additional capacity), and **Form FF4T12** (200 VA additional capacity).

Table 41: NEMA 1 Enclosure, Sizes 3–6 (see Figure 12)

NEMA Size	Class	Type	Dimensions (in.) [1]																Top & Bottom		Sides Y	Wt. (lb)
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	W	X		
3	8738, 8739	SEG	18.5	44	10.59	12.5	3	25.97	43.5	0.25	—	2.81	3.5	5	2.69	5.38	1.22	0.91	1 / 1.25 2 / 2.25	0.25 / 0.75	0.25	245
4	8738	SFG	21	51.5	10.53	15	3	30.72	51	0.25	—	2.81	3.5	5	2.69	5.38	1.22	0.91	2.5	0.25 / 0.75	0.25	—
	8739	SFG	18.5	44	10.59	12.5	3	25.97	43.5	0.25	—	2.81	3.5	5	2.69	5.38	1.22	0.91	1 / 1.25 2 / 2.25	0.25 / 0.75	0.25	—
5	8738	SGG	30	77	15.5	22	4	39.41	76	0.25	—	3.5	6.28	9.25	3.19	—	—	—	0.25 / 0.75	3	—	—
	8739	SGG	30	65	13.72	22	4	39.41	64	0.25	—	3.5	6.28	5	3.19	—	—	—	0.25 / 0.75	3	—	—
6	8738, 8739	SHG	36	90	17.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

[1] These dimensions are also for **Form FF4T** (standard control transformer), **Form FF4T11** (100 VA additional capacity), and **Form FF4T12** (200 VA additional capacity).

Table 42: NEMA 12/3R Enclosure (see Figure 13)

NEMA Size	Class	Type	Dimensions (in.) ^[1]										Wt. (lb)
			A	B	C	D	E	F	G	H	I	J	
0–1	8738, 8739	SBA SCA	13.75	10.09	24.75	3.25	2.5	8.75	24	0.38	3.75	20.31	52
2	8738, 8739	SDA	15	10.97	31	3.25	3	9	30.25	0.38	3.75	23.44	95
3	8738, 8739	SEA	18.5	10.59	45	5	3	12.5	44	0.25	3.75	25.59	255
4	8738	SFA	21	10.59	52.5	5	3	15	51.5	0.25	3.75	30.34	—
	8739	SFA	18.5	10.59	45	3.25	3	12.5	44	0.25	3.75	25.59	—
5	8738	SGA	30	15.5	78	9.25	4	22	77	0.25	7.5	39.41	—
	8739	SGA	30	15.5	66	—	4	22	65	0.25	7.5	37.88	—
6 ^[2]	8739	SHA	36	17.03	90	—	—	—	—	—	—	—	—

[1] These dimensions are also for **Form FF4T** (standard control transformer), **Form FF4T11** (100 VA additional capacity), and **Form FF4T12** (200 VA additional capacity).

[2] Size 6 enclosures are floor mounting.

Figure 11: NEMA 1 Enclosure (Sizes 0–2)

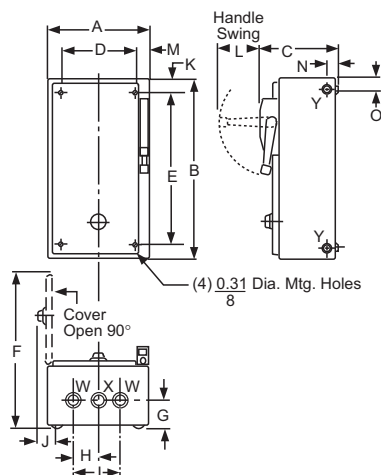


Figure 12: NEMA 1 Enclosure (Sizes 3–6)

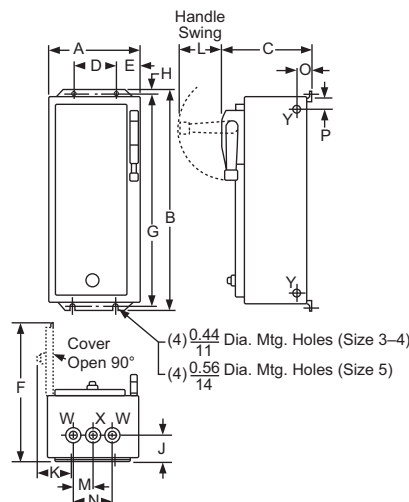
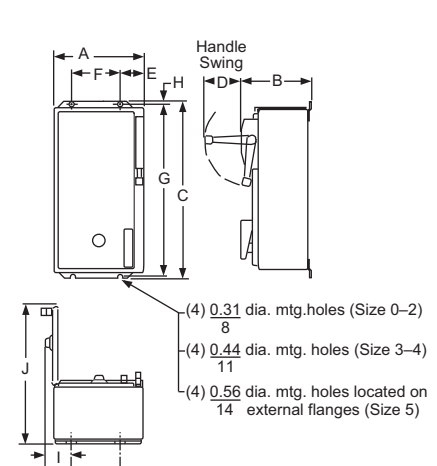


Figure 13: NEMA 12/3R Enclosure



Combination Starters

Class 8738, 8739—Reversing—Approximate Dimensions

Dimensions for Reversing Combination Starters—NEMA 4 and 4X

Table 43: NEMA 4X Polyester Enclosure (see Figure 14)

NEMA Size	Class	Type	Dimensions (in.) [1]				
			A	B	C	E	F
0-2	8738 & 8739	SBW SCW SDW	25.25	11.4	27.00	17.88	25.75
3-4	8739	SEW SFW	26.31	11.4	33.50	18.50	32.25

[1] These dimensions are also for **Form FF4T** (standard control transformer), **Form FF4T11** (100 VA additional capacity), and **Form FF4T12** (200 VA additional capacity).

Table 44: Information on Hubs

Hubs are furnished with each NEMA 4X combination starter as shown in this table. Note that hubs are installed only in stainless steel enclosures; they are not installed in polyester enclosures.

NEMA Size	Hub Size, Quantity = 1	Hub Size, Quantity = 2
0 & 1	0.75 in.	1.00 in.
2	0.75 in.	1.50 in.
3 & 4	0.75 in.	2.50 in.

Table 45: NEMA 4 & 4X Stainless Steel Enclosure (see Figure 15)

NEMA Size	Class	Type	Dimensions (in.)												Bottom W (Hub)	Top & Bot. X (Hub)	Wt. (lb)
			A	B	C	D	E	F	G	H	I	J	K	L			
0-1	8738, 8739	SBW SCW	13.75	8.34	25.19	3.25	2.5	8.75	24	0.59	3	1.63	2.31	18.53	0.75	1	52
2	8738, 8739	SDW	15	9.59	30.03	3.25	2.5	10	29.75	0.63	3	2	2.63	21.03	0.75	1.5	95
3	8738, 8739	SEW	18.5	10.56	45.19	5	3	12.5	44	0.59	3.5	2.63	3.19	25.5	0.75	2.5	255
4	8738	SFW	21	10.53	52.69	5	3	15	51.5	0.59	3.5	2.63	3.19	30.25	0.75	2.5	—
	8739	SFW	18.5	10.56	45.19	5	3	12.5	44	0.59	3.5	2.63	3.19	25.5	0.75	2.5	—
5	8738	SGW	30	15.5	78.09	9.25	4	22	77	0.56	6.09	3	3.5	39.41	0.75	3.5	—
	8739	SGW	30	13.89	66.09	5	4	22	65	0.56	6.09	3	3.5	37.88	0.75	3.5	—
6	8739	SHW	36	17.03	98	—	—	—	—	—	—	—	—	—	—	—	—

Figure 14: NEMA 4X Polyester Enclosure

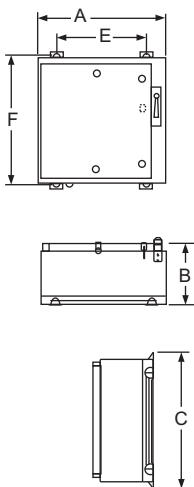
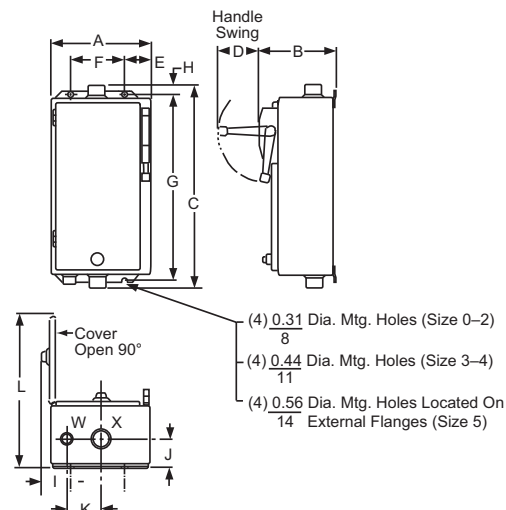


Figure 15: NEMA 4 & 4X Stainless Enclosure



NOTE: Illustrations are for dimensional information only, and may not represent the actual enclosure.

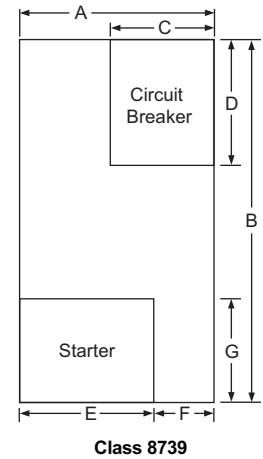
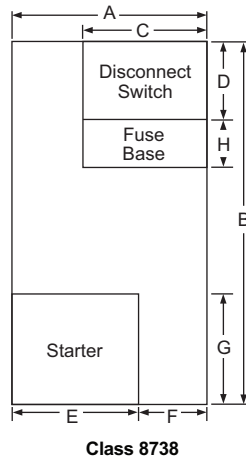
Combination Starters Class 8738, 8739—Reversing—Panel Layout

Panel Layout Drawings

Table 46: Panel Layout Drawings—NEMA 1, 4 & 4X Stainless, 12/3R

Class	NEMA	Dimensions, in.							
		A	B	C	D	E	F	G	H
8738	0, 1	10.75	19	6.9	6.5	7.25	3.5	9	4
8739				6.5	7.9				—
8738	2	12	24	7.5	7.0	7.75	4.25	11	6
8739				7	8.8				—
8738	3	15.5	32.5	9	7.7	15.5	0	14	5
8739				8.25	8.5				—
8738	4	18	39	11.5	20.5	18	0	17	—
8739		15.5	32.5	9.25	10.5	15	0	15	
8738	5 [1]	27	59	26	25.0	21	6	21	—
8739		27	58	JLL: 6.8; LLL: 9	JLL: 23; LLL: 24.5	21	6	21	—
8739	6	32	82	LLL: 9; MJL: 12.5	LLL: 26; MJL: 27.5	22.5	9.5	36	—

[1] Size 5 combination starter does not contain a full-size panel. No usable panel space is available.



Combination Starters

Class 8538, 8539, 8738, 8739—Application Data

Application Data

Table 47: Ratings and Application Data

NEMA Size	Load Voltage	Max. Hp Rating				Continuous Current Rating (A) 600 V Max.	Service- Limit Current Rating (A) ^[1]	Tungsten and Infrared Lamp Load (A), 250 V Max. ^[2]	Resistance Heating Loads (KW) other than Infrared Lamp Loads ^[3]		KVA Rating for Switching Transformer Primaries at 50 or 60 Cycles				3 Ø Rating for Switching Capacitors ^[4]		
		Nonplugging and Nonjogging Duty									Plugging and Jogging Duty ^[5]					Inrush Currents (Worst Case Peak)	
									≤20 Times Peak of Continuous Current Rating							>20 to 40 Times Peak of Continuous Current Rating	
		Single Phase	Poly- phase	Single Phase	Poly- phase				Single Phase	Poly- phase	Single Phase	Poly- phase	Single Phase	Poly- phase		Single Phase	Poly- phase
00	115	0.5	—	—	—	9	11	5	—	—	—	—	—	—			
	200	—	1.5	—	—	9	11	5	—	—	—	—	—	—			
	230	1	1.5	—	—	9	11	5	—	—	—	—	—	—			
	380	—	1.5	—	—	9	11	—	—	—	—	—	—	—			
	460	—	2	—	—	9	11	—	—	—	—	—	—	—			
575	—	2	—	—	9	11	—	—	—	—	—	—	—	—			
0	115	1	—	0.5	—	18	21	10	—	—	0.6	—	0.3	—	—		
	200	—	3	—	1.5	18	21	10	—	—	—	1.8	—	0.9	—		
	230	2	3	1	1.5	18	21	10	—	—	1.2	2.1	0.6	1.0	—		
	380	—	5	—	1.5	18	21	—	—	—	—	—	—	—	—		
	460	—	5	—	2	18	21	—	—	—	2.4	4.2	1.2	2.1	—		
575	—	5	—	2	18	21	—	—	—	3.0	5.2	1.5	2.6	—			
1	115	2	—	1	—	27	32	15	3	5	1.2	—	0.6	—	—		
	200	—	7.5	—	3	27	32	15	—	9.1	—	3.6	—	1.8	—		
	230	3	7.5	2	3	27	32	15	6	10	2.4	4.3	1.2	2.1	—		
	380	—	10	—	5	27	32	—	—	16.5	—	—	—	—	—		
	460	—	10	—	5	27	32	—	12	20	4.9	8.5	2.5	4.3	—		
575	—	10	—	5	27	32	—	15	25	6.2	11.0	3.1	5.3	—			
1P	115	3	—	1.5	—	36	42	24	—	—	—	—	—	—	—		
230	5	—	3	—	36	42	24	—	—	—	—	—	—	—	—		
2	115	3	—	2	—	45	52	30	5	8.5	2.1	—	1.0	—	—		
	200	—	10	—	7.5	45	52	30	—	15.4	—	6.3	—	3.1	—		
	230	7.5	15	5	10	45	52	30	10	17	4.1	7.2	2.1	3.6	8		
	380	—	25	—	15	45	52	—	—	28	—	—	—	—	—		
	460	—	25	—	15	45	52	—	20	34	8.3	14	4.2	7.2	16		
575	—	25	—	15	45	52	—	25	43	10.0	18	5.2	8.9	20			
3	115	—	—	—	—	90	104	60	10	17	4.1	—	2.0	—	—		
	200	—	25	—	15	90	104	60	—	31	12	—	—	6.1	—		
	230	—	30	—	20	90	104	60	20	34	8.1	14	4.1	7.0	27		
	380	—	50	—	30	90	104	—	—	56	—	—	—	—	—		
	460	—	50	—	30	90	104	—	40	68	16	28	8.1	14	53		
575	—	50	—	30	90	104	—	50	86	20	35	10	18	67			
4	200	—	40	—	25	135	156	120	—	45	—	20	—	10	—		
	230	—	50	—	30	135	156	120	30	52	14	23	6.8	12	40		
	380	—	75	—	50	135	156	—	—	86.7	—	—	—	—	—		
	460	—	100	—	60	135	156	—	60	105	27	47	14	23	80		
	575	—	100	—	60	135	156	—	75	130	34	59	17	29	100		
5 ^[6]	200	—	75	—	60	270	311	240	—	91	—	41	—	20	—		
	230	—	100	—	75	270	311	240	60	105	27	47	14	24	80		
	380	—	150	—	125	270	311	—	—	173	—	—	—	—	—		
	460	—	200	—	150	270	311	—	120	210	54	94	27	47	160		
	575	—	200	—	150	270	311	—	150	260	68	117	34	59	200		
6 ^[6]	200	—	150	—	125	540	621	480	—	182	—	81	—	41	—		
	230	—	200	—	150	540	621	480	120	210	54	94	27	47	160		
	380	—	300	—	250	540	621	—	—	342	—	—	—	—	—		
	460	—	400	—	300	540	621	—	240	415	108	188	54	94	320		
	575	—	400	—	300	540	621	—	300	515	135	234	68	117	400		
7 ^[6]	230	—	300	—	—	810	932	—	180	315	—	—	—	—	240		
	460	—	600	—	—	810	932	—	360	625	—	—	—	—	480		
	575	—	600	—	—	810	932	—	450	775	—	—	—	—	600		

[1] Per NEMA Standards paragraph ICS 2-321.20, the service-limit current represents the maximum rms current, in Amperes, which the controller may be expected to carry for protracted periods in normal service. At service-limit current ratings, temperature rises may exceed those obtained by testing the controller at its continuous current rating. The ultimate trip current of over-current (overload) relays or other motor protective devices shall not exceed the service-limit current ratings of the controller.

[2] **Fluorescent Lamp Loads—300 V and Less**—The characteristics of fluorescent lamps are such that it is not necessary to derate Class 8502 contactors below their normal continuous current rating. Class 8903 contactors may also be used with fluorescent lamp loads. For controlling tungsten and infrared lamp loads, Class 8903 AC lighting contactors are recommended. These contactors are specifically designed for such loads and are applied at their full rating as listed in the Class 8903 Lighting Contactors section of the *Digest*.

[3] Ratings apply to contactors which are used to switch the load at the utilization voltage of the heat-producing element with a duty that requires continuous operation of not more than five openings per minute. Class 8903 Types L and S lighting contactors are rated for resistance heating loads.

[4] When discharged, a capacitor has essentially zero impedance. For repetitive switching by a contactor, sufficient impedance should be connected in series to limit inrush current to not more than 6 times the contactor's rated continuous current. In many installations, the impedance of the connecting conductors may be sufficient for this purpose. When switching to connect additional banks, the banks already on the line may be charged and can supply additional available short-circuit current which should be considered when selecting the impedance to limit the current.

[5] Ratings shown are for applications requiring repeated interruptions of stalled motor current or repeated closing of high transient currents encountered in rapid motor reversal, involving more than five openings or closings per minute and more than ten in a ten-minute period, such as plug-stop, plug-reverse or jogging duty. Ratings apply to single-speed and multi-speed controllers.

[6] For NEMA Size 6 and 7, the operation rate is as follows: Continuous operation, 3 operations/minute maximum; Jogging or Plugging Duty, 15 operations/minute—3 minutes maximum.

Table 48: Code Letter—Maximum Allowable Motor

Motor Hp Rating	Max. Allowable Motor Code Letter
1.5–2	L
3–5	K
7.5 and above	H

The motor ratings in Table 47 are NEMA standard ratings and apply only when the code letter of the motor is the same as or occurs earlier in the alphabet than what is shown in Table 48. Motors with code letters occurring later in the alphabet may require a larger controller. Consult the Customer Care Center at 1-888-778-2733.

NOTE: Tables and footnotes are taken from NEMA Standards.

Combination Starters

Class 8538, 8539—Non-Reversing—Application Data

The ratings for capacitor switching in Table 47 on page 34 assume the following maximum available fault currents (rms symmetrical amperes):

- NEMA Size 00–3: 5,000 A
- NEMA Size 4–5: 10,000 A
- NEMA Size 6: 18,000 A
- NEMA Size 7: 30,000 A

If the available fault current is greater than these values, connect sufficient impedance in series.

Refer to the instruction material for the actual tested SCCR values.

Power Contact Ratings: All contactors and starters are rated in accordance with NEMA standards. The ratings shown in the selection tables are for normal service. For complete data on power contact ratings, refer to Table 47 on page 34.

Table 49: Short-Circuit Protection

According to the National Electrical Code, branch circuit overcurrent protection must be provided for each contactor or starter. For starters, refer to the instructions furnished with the thermal unit selection table. For contactors (Class 8502 or 8702), provide branch circuit overcurrent protection in accordance with the National Electrical Code, except do not exceed the maximum protective device ratings shown below.

NEMA Size	Maximum Voltage	Class K5, RK5 or RK1 Fuse (Amperes)	Class J or T Fuse (Amperes)	Inverse-Time Circuit Breaker (Amperes)
00	600	10	15	15
	250	12	15	15
0	600	20	30	20
	250	25	30	35
1	600	30	60	40
	250	40	60	60
2	600	60	100	80
	250	60	100	90
3	600	100	200	125
	250	125	200	150
4	600	200	400	225
5	600	400	600	400
6	600	600	1200 ^[1]	800
7	600	600	1600 ^[1]	1200

^[1] Class L Fuse only.

Capacitor Switching: The kilovar ratings of enclosed, three-phase contactors used as switches for capacitor loads, when only one load appears on the secondary of a distribution system, are shown in Table 47 on page 34.

Table 50: Coil Burden (Mean Values)

NEMA Size	No. of Poles	Inrush VA		Sealed VA		Sealed W	
		50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
00	2–3	—	165	—	33	—	6
0–1	1–5	232	245	26	27	7.7	7.8
2	2–3	296	311	36	37	12	14
	4–5	429	438	37	38	12	14
3	2–3	676	700	47	46	15	14
	4–5	1260	1185	89	85	23.4	22
4	2–5						
5	2–3	2970	2970	250	212	42	39
6 ^[1]	2–3	1495	1780	56	48	27	32
7 ^[1]	2–3	—	1960	—	59	—	36

^[1] Size 6 and 7 have a DC coil. The values shown are for the AC input to the DC power supply that provides power to the coil. Ambient temperature (operating temperature): 0 to 40 °C (32 to 104 °F).

Combination Starters

Class 8538, 8539—Non-Reversing—Application Data

Table 51: Maintenance of Equipment

Class 9998 repair parts kits are available for all Class 8502 contactors and Class 8536 starters. Instruction bulletins with a complete list of replaceable parts are furnished with all enclosed devices. Bulletins are available online and are listed below along with the appropriate contact parts kit.

NEMA Size	Type	Device		Instruction Bulletin	Supersedes Service Bulletin	Replacement Contacts, Class 9998 Type
		Series	No. of Poles			
00	SA	A	2-3	—	362AS	SL2
		B	2-3	30072-013-08	556AS	SJ1
0	SB	A&B	1-3	30072-013-09	277AS	SL2
			4		277AS & 250AS	SL12
			5		277AS & 250AS	One SL12 & one SL22; or one SL2 & two SL22
1	SC	A&B	1-3	30072-013-10	278AS	SL3
			4		278AS & 250AS	SL13
			5		278AS & 250AS	One SL13 & one SL22; or one SL3 & two SL22
1P	SC	A	2	30072-013-10	278AS	SL3
2	SD	A	2-3	30072-013-11	279AS	SL4
			4		279AS & 293AS	SL14
			5		279AS & 293AS	One SL14 & one SL24; or one SL4 & two SL24
3	SE	A	2	30072-013-01	305AS	SL6
			3	30072-013-01	305AS	SL7
			4	30072-013-03	326AS	Two SL6
			5	30072-013-03	326AS	One SL6 & one SL7
4	SF	A	2	30072-013-02	306AS	SL8
			3	30072-013-02	306AS	SL9
			4	30072-013-03	326AS	Two SL8
			5	30072-013-03	326AS	One SL8 & one SL9
5	SG	A	2	30072-013-18	328AS	SL10
			3	30072-013-18	328AS	SL11
	SGO	B	2	30072-013-103	—	SL10
			3	30072-013-103	—	SL11
6	SH	A	2	—	342AS	SL25
			3	—	342AS	SL26
		B	2	30072-013-12	370AS	SL25
			3	30072-013-12	370AS	SL26
7	SJ	A (Class 8536)	2	—	397AS, 30072-013-13	SL30
			3	—		SL31
		A (Class 8502) C (Class 8536)	2 3	30072-013-59 30072-013-59	—	SL30 SL31

Table 52: Terminals

NEMA Size	Type	Line Terminals on Disconnect Means (the numbers in parentheses are quantities)		Power Terminals on Magnetic Starter			Control Terminals on Magnetic Starter		
		Type of Lug	Wire Range, AWG	Type of Lug	Wire Range	Wires Per Terminal	Type of Lug	Wire Range	Wires Per Terminal
0, 1	SB, SC	Box Lug	14–1/0 Cu/Al	Pressure Wire	14–8 Cu	1 or 2	Pressure Wire	16–12 Cu	2
2	SD	Box Lug	14–1/0 Cu/Al	Box Lug	14–4 Cu	1	Pressure Wire	16–12 Cu	2
3	SE	Box Lug	14–1/0 Cu/Al	Box Lug	14–0 Cu	1	Pressure Wire	16–12 Cu	2
4	SF	Box Lug	6–300 MCM Cu/Al	Box Lug	8–250 MCM Cu	1	Pressure Wire	16–12 Cu	2
5	SG	Box Lug	(1) 4–500 MCM Cu	Box Lug	4–500 MCM Cu	1	Pressure Wire	16–12 Cu	2
6	SH	Box Lug	—	Parallel Groove	250–500 MCM Cu	1 or 2	Pressure Wire	16–12 Cu	2
7	SJ	Box Lug	—	Parallel Groove	250–500 MCM Cu	1–4	Pressure Wire	16–12 Cu	2

Combination Starters

Class 8538, 8539—Non-Reversing—Application Data

Table 53: Auxiliary Units

Auxiliary contacts, power poles, and timer attachments can be added by the factory or in the field on all Type S starters and contactors. This table shows the maximum number of auxiliary units (*in addition to the holding circuit contact*) that can be added to a given size starter or contactor. In addition, it is possible to add a second internal contact on NEMA Size 0–2 contactors and starters.

NEMA Size	Type	No. of Poles—Basic Contactor	Maximum Number of External Auxiliary Units (in addition to the holding circuit contact)
00	SA	2–3	4 single-circuit auxiliary contacts (N.O. or N.C.) if second internal auxiliary contact is not used.
0–2	SB–SD	1–3	4 single-circuit auxiliary contacts (N.O. or N.C.) ^[1] 2 single-circuit auxiliary contacts (N.O. or N.C.) plus 1 power pole adder (1 or 2 poles, N.O. or N.C.)
		4–5	2 single-circuit auxiliary contacts (N.O. or N.C.)
3–4	SE–SF	2–5	3 single-circuit auxiliary contacts (N.O. or N.C.)
5	SG	2–3	2 single-circuit auxiliary contacts (N.O. or N.C.) plus 1 NEMA Size 0–1 or Size 2 power pole adder (1 or 2 poles, N.O. or N.C.)
6–7	SH–SJ	2–3	3 single-circuit auxiliary contacts (N.O. or N.C.)
			2 single-circuit auxiliary contacts (N.O. or N.C.) plus 1 NEMA Size 0–1 or Size 2 power pole adder (1 or 2 poles, N.O. or N.C.)

^[1] When adding 4 external auxiliary contacts to one Size 0 or 1 contactor, remove one of the return springs.

Table 54: Factory Installed Additional Auxiliary Contacts—Form Numbers

This table lists the Form designations for use when ordering **factory-installed** electrical contacts. For field modification kits, see Class 9999 Accessories.

Number of N.O. Contacts	Number of N.C. Contacts	Form Number
0	1	X01
0	2	X02
0	3	X03
0	4	X04
1	0	X10
1	1	X11
1	2	X12
1	3	X13
2	0	X20
2	1	X21
2	2	X22
3	0	X30
3	1	X31
4	0	X40

Table 55: Disconnect Switch and Circuit Breaker Interlocks

Class	Type	Series	SPDT (Form Y74) Class 9999 Type	DPDT (Form Y75) Class 9999 Type
Disconnect Switch				
8538 ^[1]	SB, SC, SD	Series B	R6	R7
8538	SBA, SCA, SBG, SCG	Series D & above	TC11	TC21
	SBAS8, SCAS8, SBGS8, SCGS8	Series D & above	TC10	TC20
	SDA, SDA ^[1] , SDG, SDG ^[1]	Series D & above	TC10	TC20
8538, 8738	SD	Series C	R43	R44
	SB, SC	Series C	R45	R46
	SE, SF	Series A	R8	R9
	SE	Series B & C	R41	R42
	SEA, SEG	Series D & above	TC10	TC20
	SF	Series B & C	R39	R40
	SG	—	R35	R36
8738	SBA, SCA, SBG, SCG	Series E & above	TC11	TC21
	SBAS8, SCAS8, SBGS8, SCGS8	Series E & above	TC10	TC20
	SDA, SDG	Series E & above	TC10	TC20
Circuit Breaker				
8539, 8739	SB, SC, SD, SE, SF, SG	Series K	R26	R27

^[1] Class 8538 type numbers ending in suffix **S8**.

Combination Starters

Class 8538, 8539—Non-Reversing—Application Data

Table 56: Disconnect Switch and Circuit Breaker Interlock Electrical Ratings

Class 9999 Type R6, 8, 26, 35, 39, 41, 43, 45, TC10, & TC11				Class 9999 Type R7, 9, 27, 36, 40, 42, 44, 46 & TC 20, 21					
Vac 50 or 60 Hz	Maximum Current			Vac 50 or 60 Hz	Maximum Current				
	Make (A)	Break (A)	Continuous Carrying Current (A)		Make (A)	VA	Break (A)	VA	Continuous Carrying Current (A)
120	40	15	15	120	30	3450	3	345	10
240	20	10	15	240	15	3450	1.5	345	10
480	10	6	15	480	7.5	3450	0.75	345	10
600	8	5	15	600	6	3450	0.6	345	10

Control Circuit Transformers

Class 9070 Type TF control transformers are normally used in order to provide a lower voltage to the control circuit. (To order a factory-installed transformer with fused protection, specify Form FF4T). The addition of a transformer often requires the use of a larger enclosure (refer to the dimensions on page 19). Table 57 shows the transformer selection for the given sized starters and contactors, with or without auxiliary units.

Table 57: Control Transformer Selection

NEMA Size	Starter Type	Standard Capacity (Form FF4T)	Additional Capacity		
		Class 9070, Type [1]	50 VA (Form FF4T10)	100 VA (Form FF4T11)	200 VA (Form FF4T12)
0, 1	SB, SC	TF100	TF150	TF200	TF300
2	SD	TF100	TF150	TF200	TF300
3	SE	TF150	TF200	TF300	TF500
4	SF	TF300	TF300	TF500	T500
5	SG	TF100 and 8501XO20	TF100 and 8501XO20	TF150 and 8501XO20	TF300 and 8501XO20
6	SH	EO3S2 is standard	N/A	EO3FS2 and T100	EO3S2 and TF200
7	SJ	EO19S2 is standard	N/A	EO19S2 and TF100	EO3S2 and TF200

[1] Complete the control transformer Class and Type with the voltage code. See Table 71 on page 44.

NOTE: 9070TF transformers are now standard in Series K combination starters when factory installed.

Table 58: Electronic Motor Circuit Protector (MCP) Selection by Hp Ratings of Induction-type Squirrel-Cage Motors

This table indicates the MCP adjustable trip range that corresponds to the suffix of the circuit breaker catalog number. The MCP motor circuit protector should be adjusted to a level just above locked-rotor current of the motor. This setting provides optimum overcurrent protection for the motor. For more information on MCP instantaneous-trip circuit breakers, refer to the MCP circuit breaker section of this catalog.

3Ø, 60 Hz Voltages				Full-Load Amperes	Suffix
200 Vac	230 Vac	460 Vac	575 Vac		
0.5–5	0.5–7.5	0.75–15	1–20	1.5–25	M71
5–10	5–15	10–30	15–40	14–42	M72
10–25	15–30	25–60	30–75	30–80	M73
20–40	25–50	50–100	60–125	58–130	M74
40–60	50–75	100–150	125–200	114–217	M75

 File E78360
CCN NITW2
Transformers

 File E61239
CCN XPTQ

 File LR37055
Class 5411 06

Combination Starters Class 8538, 8539—Non-Reversing—Application Data

Table 59: UL Listed Short-Circuit Ratings—Class 8539 Electronic MCP Style

Enclosure	NEMA Size	AIC at 480 Vac (RMS)	AIC at 600 Vac (RMS)
Standard (NEMA 1, 4 and 4X stainless, and 12/3R)	0, 1	100,000	35,000
	2–5	100,000	50,000
	6	65,000	18,000
	7	65,000	30,000

Table 60: UL Listed Short-Circuit Ratings—Class 8539 Thermal-Magnetic Circuit Breaker Style

Enclosure	NEMA Size	AIC at 480 Vac (RMS)	AIC at 600 Vac (RMS)
Standard (NEMA 1, 4 and 4X stainless, and 12/3R)	0, 1	100,000	35,000
	2–5	100,000	50,000
	6	65,000	18,000
	7	65,000	30,000

Table 61: UL Listed Short-Circuit Ratings—Class 8538 Disconnect Switch Style

Enclosure	NEMA Size	NEMA Fuse Class	Available Amperes, RMS Symmetrical
Oversize	0–2	Class H or K	5,000
Standard (non-oversize NEMA 1, 4 and 4X stainless, and 12)	0–2	Class R/J	100,000
	0–3	Class H or K	5,000
	0–3	Class R/J	100,000
	4–5	Class H or K	10,000
	4–5	Class R/J	100,000
	6	Class H or K	18,000
	6	Class R/J	100,000

Table 62: Motor Code Letters

Horsepower	Motor Code Letters
0.5 or less	A-L
0.75–1.5	A-K
2–3	A-J
5–25	A-H
30–125	A-G
150 or more	A-F

NOTE: The combination starter selection tables on pages 15–14 are suitable for motors with locked-rotor current letters according to NEC Table 430-7(b) as listed in Table 62. For other motors, a special thermal-magnetic circuit breaker with adjustable magnetic trip settings for the specific motor is required. When ordering for these special applications, specify the motor horsepower, voltage, frequency, full-load current, and code letter (or locked rotor current) to help ensure proper protection.

Combination Starters

Class 8738, 8739—Reversing—Application Data

Control Circuit Transformers

Space and drilling are provided in all combination starters—in NEMA 1, 4 & 4X stainless, and 12/3R enclosures—for the field addition (or factory installation) of a Class 9070 transformer. For standard control transformer selection in reversing combination starters, see Table 63. For primary fusing of the control circuit, the Class 9999 Type SF4 fuseholder kit is suggested. This kit can be either panel mounted or side mounted on the Type S starter.

Table 63: Control Transformer Selection

NEMA Size	Starter Type	Standard Capacity (Form FF4T)	Additional Capacity		
		50 VA (Form FF4T10)	100 VA (Form FF4T11)	200 VA (Form FF4T12)	
		Class 9070, Type [1]			
0 & 1	SB & SC	TF100	TF150	TF200	TF300
2	SD	TF100	TF150	TF200	TF300
3	SE	TF150	TF200	TF300	TF500
4	SF	TF300	TF300	TF500	T500
5	SG	TF100 and 8501XO20	TF100 and 8501XO20	TF150 and 8501XO20	TF300 and 8501XO20
6	SH	EO3S2 is standard	N/A	EO3FS2 and T100	EO3S2 and TF200
7	SJ	EO19S2 is standard	N/A	EO19S2 and TF100	EO3S2 and TF200

[1] Complete the contactor or starter Class and Type with the voltage code. See Table 71 on page 44.

NOTE: 9070TF transformers are now standard in Series K combination starters.

Table 64: Class 8738 UL Short-Circuit Ratings

NEMA Size	Fuse Clip Type	Enclosure [1]	Ampere Interrupting Capability Rating (AIC)
0–3	Standard	Standard	5,000
0–3	Class R	Standard	100,000
4–5	Standard	Standard	10,000
4–5	Class R	Standard	100,000

[1] Standard enclosures include NEMA 1, 4 & 4X stainless, and 12/3R.

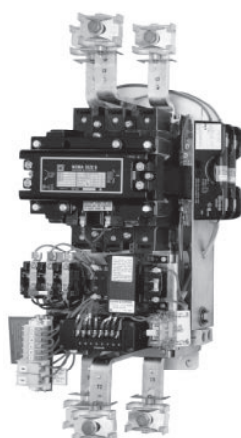
Table 65: Class 8739—UL Listed Short-Circuit Ratings

Motor Circuit Protector and Thermal-Magnetic Styles			
NEMA Size	Enclosure [1]	AIC at 480 Vac (RMS)	AIC at 600 Vac (RMS)
0, 1	Standard	100,000	35,000
2–5	Standard	100,000	50,000
6	Standard	65,000	18,000
7	Standard	65,000	30,000

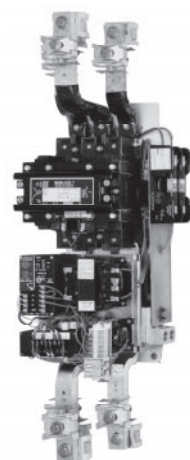
[1] Standard enclosures include NEMA 1, 4 and 4X stainless, and 12/3R.

Combination Starters

Class 8738, 8739—Reversing—Application Data



NEMA Size 6 Starter
8536 SH



NEMA Size 7 Starter
8536 SJ

NEMA Size 6 Type SH and NEMA Size 7 Type SJ contactors and starters have a DC coil operated by a solid-state rectifier circuit mounted on the device and powered from an AC source. The NEMA Size 6 and 7 devices come standard with a fused control-circuit transformer rated 240/480-120 V 60 Hz, 220/440-110 V 50 Hz. The purpose of this transformer is to provide an isolated supply, 120 V 60 Hz / 110 V 50 Hz, for the control circuit. NEMA Size 6 and 7 devices can be ordered for other system voltages by specifying the voltage and frequency desired.

Operation Rates—Continuous Operation: 3 operations/minute maximum. Jogging or Plugging Duty: 15 operations/minute—3 minutes maximum.

Field Conversion—Devices can be field converted to other system voltages by one of the following methods, *not by the usual practice of changing the coil*:

1. If the factory wiring is 480 V 60 Hz / 440 V 50 Hz, the device can be converted to 240 V 60 Hz / 220 V 50 Hz by reconnecting the control transformer as illustrated on the instruction sheet furnished with the controller. This is the same method that would be used on Class 9070 control circuit transformers.
Conversion to any other voltage requires replacement of the control transformer. For other system voltages—for example, 208, 277, 380, 600 V—a new transformer with single-voltage primary must be selected from Table 66 or 67. Control transformer connections are illustrated on the instruction sheet furnished with the controller.
2. If the factory wiring is any voltage *other than* 480 V 60 Hz / 440 V 50 Hz, conversion to another voltage requires replacement of the control transformer. Refer to Table 66 or 67.
3. In Square D combination starters, the standard transformer provided can be used to power a maximum of five Class 9001 Type K illuminated operators powered with transformer-type light modules. When additional capacity to power control relays or other inductive loads is required, a second transformer must be added. Additional capacity can be purchased as Form FF4T with additions in 100 VA increments.
4. Standard controllers are wired for common control and are not convertible for operation of the control circuit from a separate source of supply voltage. Controllers designated Form S have special wiring designed for separate control. They are furnished with an isolating transformer, usually having a 120 V primary and 120 V secondary, which must not be bypassed. Form S controllers are not convertible for operation on common control.

Tables 66 and 67 list the replacement transformers for NEMA Size 6 and 7 Type S contactors and starters. To change voltages on these devices, coils are not changed—instead, transformers are changed to those with the desired voltage.

Table 66: NEMA Size 6 Replacement Control Transformers (150 VA) for Type S Devices

Voltage		Class 9070
60 Hz	50 Hz	Type
240/480-120	220/440-110	31104-512-50
208-120	—	31104-512-52
277-120	—	31104-512-53
—	380-110	31104-512-54
600-120	550-110	31104-512-51
120-120	110-110	31104-512-55
240-120	220-110	31104-512-56

Table 67: NEMA Size 7 Replacement Control Transformers (200 VA) for Type S Devices

Voltage		Class 9070
60 Hz	50 Hz	Type
240/480-120	220/440-110	31123-501-50
208-120	—	31123-501-52
277-120	—	31123-501-53
—	380-110	31123-501-54
600-120	550-110	31123-501-51
120-120	110-110	31123-501-55
240-120	220-110	31123-501-56

Auxiliary Contacts: An N.O. holding circuit contact and an N.C. auxiliary contact come standard. The holding circuit contact may or may not be required for either 3-wire or 2-wire control. NEMA Size 6 and 7 devices have an additional N.C. auxiliary contact wired in the coil control circuit. **Do not use this N.C. contact for any other purpose.**

Combination Starters

Class 8538, 8539, 8738, and 8739—Factory Modifications (Forms)

Factory Modifications (Forms)

Factory-installed modifications are available for the Classes of control equipment listed in the tables below. Kits are also available for many field modifications and normal parts replacement on most control items. Refer to Class 9998 and 9999 products in *Digest* Section 16 for complete listings.

Standard equipment dimensions and enclosure construction may not apply when certain special features are added. Such cases should be referred to the factory with complete description when accurate dimensions are required.

NOTE: If a UL label is required, consult the local Square D field office. Some Forms **are not** UL Listed.

Table 68: Full Voltage Starters—Cover-Mounted Control Units

Controller	Pilot Device	Factory Modifications	Enclosure Type	Form
Pilot Devices in the Cover Full Voltage Non-Reversing Controllers Only Classes 8538 8539	Push Buttons ^[1]	Start-Stop	1 ^[2] , 3R, 4, 4X, 12/3R	A
		Start-Stop (maintained contact) ^[3] , ^[4]	1 ^[2] , 3R, 4, 4X, 12/3R	A16
		Start-Stop push button and Hand-Off-Auto selector switch ^[4]	1 ^[2] , 3R, 4, 4X ^[5] , 12/3R	AC
		On-Off ^[4]	1 ^[2] , 3R, 4, 4X ^[5] , 12/3R	A3
		Single oiltight push button (specify marking) ^[4]	1, 3R, 4, 4X ^[5] , 12/3R	A11
	Selector Switches	Hand-Off-Auto	1 ^[2] , 3R, 4, 4X, 12/3R	C
		On-Off ^[4]	1 ^[2] , 3R, 4, 4X ^[5] , 12/3R	C6
		Non-standard markings for pilot devices ^[4]	1, 3R, 4, 12/3R	G12 ^[6]
		Addition of a padlock attachment to Class 9001 operators ^[4]	1, 3R, 4, 12/3R	G122
	Pilot Lights (specify color and type) ^[7]	Without operating interlock	See Table 69 on page 43. ^[7]	
		With operating interlock (add price of each interlock per light)	1, 3R, 4, 4X ^[5] , 12/3R	X
Pilot Devices in Cover Full Voltage Reversing and Multi-Speed Controllers Only Classes 8738 8739	Push Buttons ^[1]	Forward-Reverse-Stop ^[4]	1, 4, 4X ^[5] , 12/3R	A1
		High-Low-Stop ^[4]	1, 4, 12/3R	A2
		Fast-Off-Slow ^[4]	1, 4, 12/3R	A9
		High-Low push button and Hand-Off-Auto selector ^[4]	1, 4, 12/3R	A10C
		Single oiltight push button (specify marking) ^[4]	1, 4, 4X ^[5] , 12/3R	A11
	Selector Switches	Hand-Off-Auto	1, 4, 4X ^[5] , 12/3R	C
		On-Off ^[4]	1, 4, 4X ^[5]	C6
		High-Off-Low	1, 4, 12/3R	C7
		Forward-Off-Reverse ^[4]	1, 4, 4X ^[5] , 12/3R	C14
		High-Low and Hand-Off-Auto ^[4]	1, 4, 12/3R	CC17
		Slow-Fast ^[4]	1, 4, 4X ^[5] , 12/3R	C19
		Forward-Reverse ^[4]	1, 4, 4X ^[5] , 12/3R	C20
		High-Low-Off-Auto ^[4]	1, 4, 12/3R	C25
		Non-standard markings for pilot devices ^[4]	Any	G12 ^[6]
	Pilot Lights (specify color and type) ^[7]	Without operating interlock	See Table 69 on page 43. ^[7]	
		With operating interlock	1, 4, 4X ^[5] , 12/3R	X ^[8]

^[1] All push buttons are momentary contact unless specified otherwise.

^[2] Selection of various Form combinations may force the use of a larger enclosure.

^[3] Specify the appropriate Class 9001 Type K or SK operator.

^[4] Not available for Size 00.

^[5] This Form is available with a NEMA 4X enclosure only with Class 8538, 8539, 8738, and 8739 devices.

^[6] Specify the marking and/or the required Class 9001 Type KN or SKN legend plate.

^[7] Indicate the pilot light color as Form P1 (red), Form P2 (green), and so forth, as shown in Table 69 on page 43. Unless otherwise requested, standard practice is to wire a red pilot light to indicate that the device is energized. No additional auxiliary contact is required. Also, standard practice is to wire a green pilot light to indicate that the device is de-energized. An additional normally closed auxiliary contact is provided. A wiring diagram must be provided for other pilot light colors or arrangements.

^[8] To determine the maximum number of auxiliary contacts that can be added to each Type S device, and for the appropriate X Form, refer to Table 53 on page 37.

Combination Starters

Class 8538, 8539, 8738, and 8739—Factory Modifications (Forms)

Table 69: Pilot Light Forms

Description	Form			
	Standard	Push-to-Test	LED	LED-Push-to-Test
Red On	P1	P21	P51	P42
Red Off	P71	P81	P91	P43
Red Unwired	P38	P28	P58	P44
Green On	P72	P82	P92	P45
Green Off	P2	P22	P52	P46
Green Unwired	P39	P29	P59	P47
Amber	P3	P23	P53	P63
Clear	P4	P24	P54	P64
Yellow	P35	P25	P55	P48
Blue	P36	P26	P56	P66
White	P37	P27	P57	P67
Red Low—Green Hi	P73	P83	P93	P77
Green Low—Red Hi	P74	P84	P94	P78
Red Off—Green Fwd/Rev	P75	P85	P95	P79
Green Off—Red Fwd/Rev	P76	P86	P96	P80

Table 70: Control Circuit, Full Voltage Controllers Only

Classes	Factory Modifications	Enclosure Type	Form	NEMA Size									
				00	0	1	2	3	4	5	6	7	
8538 8539 8738 8739	Separate control circuit—specify voltage and frequency	Any	S	X	X	X	X	X	X	X	X	X	
	Fused control circuit (without control transformer)												
	One fuse [1]	1, 3R, 4, 4X, 12/3R	F	X	X	X	X	X	X	X	—	—	
	Two fuses [1]	1, 3R, 4, 4X, 7, 9, 12/3R	F4	X	X	X	X	X	X	X	—	—	
	Control Circuit Transformers [2]—Standard capacity (50 or 60 Hz) Note: All orders requesting Form FT will be supplied as Form FF4T.												
	FUSES												
	Primary	Secondary											
	2	1	1, 4, 4X, 12/3R	FF4T	X	X	X	X	X	X	X	X	X
	2	2	1, 4, 4X, 12/3R	F4F10T	X	X	X	X	X	X	X	—	—
	Additional Capacity (50 or 60 Hz)												
	Two fuses in primary and one fuse in secondary												
	100 VA additional capacity	1, 4, 4X, 12/3R		FF4T11	X	X	X	X	X	X	X	X	X
	200 VA additional capacity	1, 4, 4X, 12/3R		FF4T12	X	X	X	X	X	X	X	X	X
	300 VA additional capacity	1, 4, 4X, 12/3R		FF4T13	X	X	X	X	X	X	X	X	X
	400 VA additional capacity	1, 4, 4X, 12/3R		FF4T14	X	X	X	X	X	X	X	X	X
	500 VA additional capacity	1, 4, 4X, 12/3R		FF4T15	X	X	X	X	X	X	X	X	X

^[1] Not available for Sizes 6 and 7.

^[2] See Table 71 on page 44.

Combination Starters

Class 8538, 8539, 8738, and 8739—Factory Modifications (Forms)

Control Circuit Transformer Selection

The standard primary/secondary voltages for control circuit transformers are shown in Table 71.

Table 71: Selection of Control Circuit Transformers—AC-Operated Devices

Voltage, 60 Hz (Primary—Secondary)	Code
120—24 ^[1]	V89
208—120	V84
240—24 ^[1]	V82
240—120	V80
277—120	V85
480—24 ^[1]	V83
480—120	V81
480—240	V87
600—120	V86
Specify	V99

^[1] 24 V coils are **not** available on Sizes 4–7.

To order, select the desired device with the appropriate transformer Form designation. Then convert the previously selected voltage code (V●●) to reflect the desired primary/secondary voltage for the transformer. The secondary voltage should equal the previously selected coil voltage of the device.

Table 72: Example: Control Circuit Transformer Selection

You have selected 8538SDG16V02S. V02S indicates a coil voltage of 120-60/110-50 wired for separate control. You would like to add **Form FF4T**, with transformer voltages of 480 V primary, 120 V secondary, and solid-state overload relay protection with selectable Class 10/20 trip class (**Form H30**).

The new and complete Class, Type, voltage code, and Form number will be:

Class	Type	Voltage Code	Form (list the Form numbers in alphabetical order)
8538	SDG16	V81	FF4H30T

Table 73: Marine Control

Class	Enclosure Type	Description	Form
8538, 8539, 8738, 8739	12/3R or 4/4X (stainless steel only)	Factory modification of the standard device for use as marine control in accordance with UL508	M10

Table 74: Power Poles, Coil Transient Suppressors, and Terminal Blocks—Full Voltage Controllers Only
Classes 8538, 8539, 8738, 8739

Factory Modifications				Enclosure Type	Class 9999, Type	Form	NEMA Size								
							00	0	1	2	3	4	5	6	7
Power Poles (addition of one) ^[1]	NEMA Size 1, 30 A	Single pole	N.O.	Any	SB6	Y428	—	X	X	X ^[2]	X	X	X	X	X
			N.C.	Any	SB7	Y429	—	X	X	X ^[1]	X	X	X	X	X
		Double pole	N.O./N.O.	Any	SB9	Y430	—	X	X	X ^[1]	X	X	X	X	X
			N.C./N.C.	Any	SB10	Y434	—	X	X	X ^[1]	X	X	X	X	X
	NEMA Size 2	Single pole	N.O.	Any	SB11	Y436	—	—	—	X ^[1]	X	X	X	X	X
			N.C.	Any	SB12	Y437	—	—	—	X ^[1]	X	X	X	X	X
		Double pole	N.O./N.O.	Any	SB14	Y438	—	—	—	X ^[1]	X	X	X	X	X
			N.C./N.C.	Any	SB15	Y439	—	—	—	X ^[1]	X	X	X	X	X
			N.O./N.C.	Any	SB13	Y440	—	—	—	X ^[1]	X	X	X	X	X
Miscellaneous	Coil transient suppressor (120 V only), per coil.			Any	Any	Y145	X	X	X	X	X	X	X	X	X
	Addition of terminal blocks (specify wired or unwired).			1, 4, 12 1, 4, 12	Any	G56● ^[3] G50● ^[3]	—	X	X	X	X	X	X	X	X
	Wired, per terminal, each Unwired, per terminal, each						—	X	X	X	X	X	X	X	X

^[1] Single- or double-circuit power pole adders may be factory or field installed on 2- and 3-pole Type S contactors and starters. This table lists the Form designation for factory-installed power pole adders. Only one power pole adder can be installed per contactor. For field modification kits, see Class 9999 Accessories in the Digest.

^[2] When adding a power pole to a Size 2 device, also specify Form **Y118** (stronger coil, Size 2 only).

^[3] Addition of terminal block 9080CA or 9080GR6 only. Replace the bullet (●) in the Form number with the number of circuits (example: **G505** is a five-circuit, unwired terminal block). Available in groups of five only.

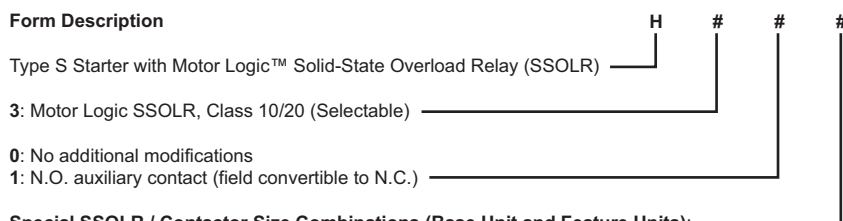
Combination Starters

Class 8538, 8539, 8738, and 8739—Factory Modifications (Forms)

Solid-State Overload Relay Factory Modifications (Forms)

The solid-state overload relay (SSOLR) is available on NEMA Size 00–7.
For Class 8538, 8539, 8738, and 8739 devices.

Form Description



Special note for Class 8810 devices:

You **must** specify two separate Form numbers to get Motor Logic overload relays on two-speed starters.

The catalog number will be alphanumeric. Example:

- Open style, Size 4 two speed starter with Motor Logic SSOLRs
- Single winding, 460 V, constant or variable torque
- High speed FLA = 96 A
- Low speed FLA = 27 A (use Size 2 overload relay)

Catalog number to order: **8810SF01V02H30H302S**
Where:

- Form H30 is a Size 4 contactor with a 45–135 A Motor Logic SSOLR for high speed
- Form H302 is a 15–45 A Motor Logic SSOLR on the low speed contactor.

Table 75: Forms, Motor Logic SSOLR
Classes 8536, 8538, 8539, 8736, 8738, 8739, 8810, and 8940

Factory Modification: Motor Logic SSOLR Class 10/20 (Selectable)	NEMA Size and Overload Current Range								
	00	0	1	2	3	4	5	6	7
	3–9 A	6–18 A	9–27 A	15–45 A	30–90 A	45–135 A	90–270 A	180–540 A	270–810 A
SSOLR—No Additional Modifications	H30	H30	H30	H30	H30	H30	H30	H30	Standard
SSOLR—With Auxiliary Contact	H31	H31	H31	H31	H31	H31	H31	H31	H31

Table 76: Special Starter Combinations with Motor Logic Overload Relay Protection

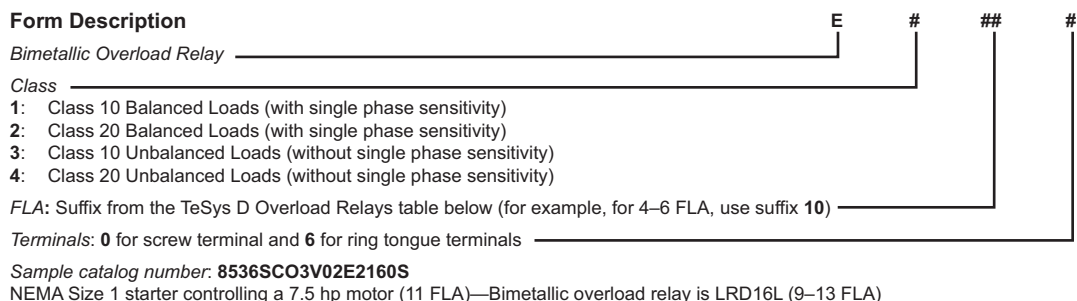
NEMA Contactor Size	SSOLR Size						
	00 _B	00 _C	0	1	2	3	4
00	[1]	Standard	—	—	—	—	—
0	[1]	[1]	Standard	—	—	—	—
1	[1]	[1]	[1]	Standard	—	—	—
2	[1]	[1]	[1]	[1]	Standard	—	—
3	—	—	—	—	—	Standard	—
4	—	—	—	—	—	—	Standard

[1] Available factory starter combination.

Adapted Bimetallic Overload Relay for Type S NEMA Starter (Forms)

This bimetallic overload relay is available on NEMA Sizes 00, 0, and 1 for Class 8538, 8539, 8738 and 8739 devices. To order a starter with the adapter only, add **Form E** to the catalog number (for example, 8536SBG2V02ES). When ordering with the adapter and the bimetallic overload relay installed, refer to Table 77 on page 46.

Form Description



Combination Starters

Class 8538, 8539, 8738, and 8739—Factory Modifications (Forms)

Table 77: TeSys D Overload Relays for Size 00–1 Type S Starters, Non-Reversing and Reversing, Classes 8538, 8539, 8736, 8738, and 8739

Current Setting Range, Amperes	Class 20 with Single-Phase Sensitivity		Class 20 without Single-Phase Sensitivity		Factory Installed—Catalog Number Suffix
	Screw Termination	Ring Tongue Connector	Screw Termination	Ring Tongue Connector	
0.40–0.63	LRD04L	LRD04L6	LR3D04L	LR3D04L6	04
0.63–1	LRD05L	LRD05L6	LR3D05L	LR3D05L6	05
1–1.6	LRD06L	LRD06L6	LR3D06L	LR3D06L6	06
1.6–2.5	LRD07L	LRD07L6	LR3D07L	LR3D07L6	07
2.5–4	LRD08L	LRD08L6	LR3D08L	LR3D08L6	08
4–6	LRD10L	LRD10L6	LR3D10L	LR3D10L6	10
5.5–8	LRD12L	LRD12L6	LR3D12L	LR3D12L6	12
7–10	LRD14L	LRD14L6	LR3D14L	LR3D14L6	14
9–13	LRD16L	LRD16L6	LR3D16L	LR3D16L6	16
12–18	LRD21L	LRD21L6	LR3D21L	LR3D21L6	21
17 to 24	LRD22L	LRD22L6	LR3D22L	LR3D22L6	22
23 to 32	LRD32L	LRD32L6	LR3D32L	LR3D32L6	32

TeSys T Factory Modifications (Forms)

Table 78: Communication Codes

Communication Network	Code
Modbus™	2
Profibus®	3
CANopen	4
DeviceNet®	5
Ethernet TCP/IP (communication protocols: Ethernet/IP and Modbus/TCP)	6

Table 79: TeSys T Motor Management System Modifications H6xx or H7xx for use with 8538, 8539, 8738 & 8739 (Enclosed Combination Starters)

Used on Size	Range	Form [1]	
		Control Voltage	
		100–240 Vac	24 Vdc
1	0.4–8 A	H61●	H71●
	1.35–27 A	H62●	H72●
2, 3	5.0–100 A	H63●	H73●
4	8–160 (CT 300:5, 3 turns)	H65●	H75●
5	24–480 A (CT 300:5, 1 turn)	H66●	H76●
6	48–960 A (CT 600:5, 1 turn)	H67●	H77●

[1] Replace the bullet (●) with the code for the the communication option according to Table 78 (for example, H612).

NOTES:

- To order TeSys T starters, use the product configurator.
- The auxiliary contact controlling the starter coil has a maximum rating of 240 Vac.

Interlocks and Control Transformers



An electrical interlock can be factory installed in a combination starter, or installed in the field. For factory modification, specify **Form Y74** for single-pole, or **Form Y75** for double-pole interlocks. For field installation, see Table 80.

A one- or two-pole electrical interlock can be added to the disconnect switch or circuit breaker. In this way, if a separate control circuit is used, the magnetic starter can be de-energized when the disconnect means is switched to the Off position. See Table 80 for proper interlock selection. For electrical ratings of disconnect switch and circuit breaker interlocks, see Table 81.

Table 80: Electrical Interlocks for Disconnect Switches and Circuit Breakers—Field Installation

Class	Type	SPDT ^[1]	DPDT
		Class 9999 Type	Class 9999 Type
Disconnect Switch Interlocks			
8538 ^[2]	SB, SC, SD (Series B)	R6	R7
8538	SBA, SCA, SBG, SCG (Series D and above)	TC11	TC21
	SBAS8, SCAS8, SBGS8, SCGS8 (Series D and above)	TC10	TC20
	SDA, SDA ^[2] SDG, SDG ^[2] (Series D and above)	TC10	TC20
8538, 8738	SB, SC (Series C)	R45	R46
	SD (Series C)	R43	R44
	SE, SF (Series A)	R8	R9
	SE (Series B & C)	R41	R42
	SF (Series B & C)	R39	R40
	SG	R35	R36
	SEA, SEG (Series D and above)	TC10	TC20
8738	SBAS8, SCAS8, SBGS8, SCGS8 (Series E and above)	TC10	TC20
	SBA, SCA, SBG, SCG (Series E and above)	TC11	TC21
	SDA, SDG (Series E and above)	TC10	TC20
Circuit Breaker Interlocks			
8539, 8739	SB, SC, SD, SE, SF, SG (Series K)	R26	R27

[1] For factory modification, specify **Form Y74** for single-pole, or **Form Y75** for double-pole interlocks.

[2] Class 8538 type numbers ending in suffix **S8**.

Table 81: Electrical Ratings for Disconnect Switch and Circuit Breaker Interlocks

Class 9999 Type R6, 8, 26, 35, 39, 41, 43, 45, TC10, & TC11				Class 9999 Type R7, 9, 27, 36, 40, 42, 44, 46 & TC 20, 21					
Vac 50 or 60 Hz	Maximum Current			Vac 50 or 60 Hz	Maximum Current				
	Make	Break	Continuous Carrying Current (A)		Make		Break		Continuous Carrying Current (A)
	(A)	(A)			A	VA	A	VA	
120	40	15	15	120	30	3450	3	345	10
240	20	10	15	240	15	3450	1.5	345	10
480	10	6	15	480	7.5	3450	0.75	345	10
600	8	5	15	600	6	3450	0.6	345	10

Control Transformers

9070TF transformers are now standard in Series K combination starters when factory installed.

Table 82: Control Transformer Selection

NEMA Size	Starter Type	Standard Capacity	Additional Capacity		
			50 VA	100 VA	200 VA
		Form FF4T	Form FF4T10	Form FF4T11	Form FF4T12
		Class 9070 Type [1]			
0 & 1	SB & SC	TF100	TF150	TF200	TF300
2	SD	TF100	TF150	TF200	TF300
3	SE	TF150	TF200	TF300	TF500
4	SF	TF300	TF300	TF500	T500
5	SG	TF100 and 8501XO20	TF100 and 8501XO20	TF150 and 8501XO20	TF300 and 8501XO20
6	SH	EO3S2 is standard	N/A	EO3FS2 and T100	EO3S2 and TF200
7	SJ	EO19S2 is standard	N/A	EO19S2 and TF100	EO3S2 and TF200

[1] Complete the contactor or starter Class and Type with the voltage code. See Table 71 on page 44.

Combination Starters

Class 8538, 8539, 8738, and 8739—Accessories

Internal Auxiliary Switch—Circuit breakers can be furnished with a factory installed auxiliary switch for remote indication of an open/tripped or closed circuit breaker. One auxiliary switch (**Form Y741**) or two auxiliary switches (**Form Y751**) can be furnished. The switches come with normally open and normally closed circuits with a common connection. Contacts must be used on the same polarity and are rated 15 A at 240 Vac. The auxiliary switches are located internally and come with 19–20 in. leads.

Alarm Switch—The alarm switch is used to actuate bell alarms and warning lights. It operates only when the circuit breaker is tripped. The alarm switch is factory installed only (**Form Y742**) and consists of a single-pole, single-throw switch, which is normally open except when the circuit breaker is tripped. The contacts are rated 4 A at 240 Vac. This switch is located in the circuit breaker and comes with 19–20 in. leads.

Transformer Selection—In all disconnect switch and circuit breaker combination starters in enclosures (NEMA 1, 4 & 4X stainless and polyester, and 12/3R), space and drilling are available for the field addition or factory installation of a Class 9070 control circuit transformer and Class 9999 Type SFR4 fuse holder. This kit can be either panel mounted or side mounted on the Type S starter. For standard control transformer selection in combination starters, see Table 82 on page 47. For secondary fuse holder, order 9080PF1.

Fuse Block Mounting Brackets—The standard capacity transformer, Class 9070 Type TF100, for the Size 0 and 1 starters mounts to the right of the magnetic starter.

Codes and Standards—Most combination starters and Forms are UL Listed in file E152395, Category NKJH, and CSA approved in File CR 584.

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8538CT9701R08/17 Replaces 8538CT9701 01/1998
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