

Full Voltage Contactors and Starters Catalog

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Full Voltage NEMA Contactors and Starters

Catalog Numbering System

Class 8536

General Classification

8502	Contact
8536	Starter
8538	Combination Starter with Disconnect Switch
8539	Combination Starter with Circuit Breaker
8702	Reversing Contactor
8736	Reversing Starter
8738	Reversing Combination Starter with Disconnect Switch
8739	Reversing Combination Starter with Circuit Breaker
8810	Two Speed Starter ▲
8903	Type S Lighting Contactors ▲
8940	Pumping Plant Panel ▲
8941	Duplex Controller ▲

▲Consult the Table of Contents for page numbers.

Design

Type S NEMA Contactors and Starters

NEMA Size		Rating (8903 only)	
A	Size 00		
B	Size 0	M	30 A
C	Size 1	P	60 A
D	Size 2	Q	100 A
E	Size 3	V	200 A
F	Size 4	X	300 A
G	Size 5	Y	400 A
H	Size 6	Z	600 A
J	Size 7	J	800 A

Enclosure

A	NEMA 12 Industrial Use
F	NEMA 1 Flush Mounting General Purpose
G	NEMA 1 General Purpose Surface Mounting
H	NEMA 3R Rainproof
O	Open Style Device (no enclosure)
R	NEMA 7 & 9 Hazardous Environments, Spin Top™
T	NEMA 7 & 9 Hazardous Environments, Bolted
W	NEMA 4 Watertight, 4X Corrosion Resistant

Type S C G 3 V02

Form S

Numerals

Used to designate specific physical arrangements, such as the number of poles, fuse clip size, etc.; but the numbering varies with the Class of the equipment. Consult the Digest listings for the specific device numbers.

Voltage Code

AC operated devices without control transformer

Code	Voltage/Frequency
V01	24/60
V02	120/60 or 110/50
V06	480/60 or 440/50
V07	600/60 or 550/50
V08	208/60

V81: 480 V Primary, 120 V Secondary for units using a fused transformer control circuit (Form F4T)

This is only a partial listing. Consult the Digest page for each product for more options.

Common Forms (factory modifications)

A	Start-Stop pushbuttons in the enclosure cover
C	Hand-Off-Auto selector switch in the enclosure cover
E	Bimetallic overload relays
F4T	Fused transformer control circuit (primary fuses only)
FF4T	Fused transformer control circuit (primary & secondary fuses)
H	Solid-state overload relay (SSOLR)
P1	Red ON pilot light in the enclosure cover
P2	Green OFF pilot light in the enclosure cover
S	Separate control circuit
X01	One normally closed auxiliary contact N.C.
X10	One normally open auxiliary contact N.O.

Consult "Factory Modifications (Forms)" for additional Form designations. When more than one Form is applied to a single device, arrange the Forms in alphanumerical order.

See Motor Overload Protection—Factory Modifications (Forms), page 45 for additional Form designations and Solid-State Overload Relay Forms, page 49 for more information about Motor Logic SSOLRs.

Table 1 - Coil Voltage Codes

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

NOTE: These are the common voltages, more are available. Contact Schneider Electric at www.schneider-electric.com/us/ for information about other voltage codes.

Table 2 - How to Order

To Order Specify:	Catalog Number			
	Class	Type	Voltage Code	Form(s)
<ul style="list-style-type: none"> • Class Number • Type Number • Voltage Code • Form(s) 	8539	SCG44	V06	AH30P1X11

Description: NEMA Size 1 (10 hp) electronic motor circuit protector (MCP) combo starter in a NEMA 1 enclosure with a 480 V coil, start/stop push button (A), trip-class selectable SSOLR (H30), red pilot light (P1), and 1 N.O. and 1 N.C. auxiliary contact (X11).

Factory Modifications (Forms): Refer to Motor Overload Protection—Factory Modifications (Forms), page 45

Application Data: Refer to Application Data, page 32

Dimensions: Refer to Dimensions, page 55

Separate Enclosures (Class 9991): Refer to Catalog 9999CT9701

Replacement Parts (Class 9998): Refer to Catalog 9999CT9701

Type S Accessories (Class 9999): Refer to Catalog 9999CT9701

IMPORTANT: This information is intended for general interpretation of the catalog numbers. Do not use it to create catalog numbers for this product line.

For more ordering information, refer to the Product Selector at www.schneider-electric.com/us/.

NOTE: The terms *Class*, *Type*, and *Form* do not appear in the catalog number.

Devices are wired from the factory according to customer preference as follows:

- Common control
- Separate control (Form S)
- Control power transformer (CPT)

NOTE: TeSys™ T devices are unwired.

1. 24 V coils are not available on Sizes 4–7. On sizes 00–3, **Form S** (separate control) must be specified.

Class 8502 Type S AC Magnetic Contactors

General Information

Figure 1 - Type SCO2 Size 1, 3-Pole Contactor



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

Power Contact Ratings

All Type S contactors and starters are rated in accordance with NEMA standards. The ratings in the selection tables documented later in this documentation are for normal service. For complete data on power contact ratings, refer to Application Data per NEMA Standards ICS-1 and ICS-2, page 36.

Component Parts and Accessories

Holding Circuit Contact

A normally open holding circuit contact for three-wire control is provided on all contactors as standard.

- Sizes 00–2 contactors use a Class 9999 SX11 internal auxiliary contact as the holding circuit contact.
- Sizes 3–7 contactors use a Class 9999 SX6 external auxiliary contact as the holding circuit contact. See Class 9999 for the holding circuit contact electrical ratings.
- Size 00–1 single-phase contactors use a power pole as the holding circuit contact, and therefore has the same rating as the power contacts.

Enclosures

Class 8502 magnetic contactors and Class 8536 magnetic starters are available in the following enclosures:

- NEMA Type 1 General Purpose
- NEMA Type 4 & 4X Watertight and Dusttight Stainless Steel (stainless steel enclosures ship with hubs installed in the top and bottom of the enclosure)
- NEMA Type 4X Watertight, Dusttight, and Corrosion Resistant Glass—Polyester
- NEMA Type 12 Dusttight and Driptight for Industrial Use

The NEMA Type 4 & 4X stainless steel enclosure (Sizes 0-5) has a brushed finish.

Also, NEMA Type 12 devices can be modified for NEMA 3R applications by drilling a 1/8 in. diameter hole in the bottom of the enclosure and using the appropriate watertight conduit hubs.

Separate enclosures are available. See catalog 9999CT9701.

Coil Voltages

AC coils are available for application on 50–60 Hz.

- NEMA Sizes 00–5 contactors and starters are supplied with coils that are designed to operate satisfactorily on line voltages of 85–110% of rated voltage.
- NEMA Size 5–7 contactors and starters are supplied with a DC coil operated by a solid state rectifier circuit that is powered by an AC source and also operate on line voltages of 85%-110%.

Voltage Codes have not been added to the Type designations. You must include the Voltage Code when ordering contactors and starters. In addition, 24 Vac and 120 Vac control, polyphase contactors and starters will be wired for separate control (Form **S**).

Auxiliary Contacts

Additional auxiliary contacts can be added to Type S contactors and starters. See the table *Auxiliary Units—Class 8502 and 8536*, page 41 for maximum number of auxiliary units and table *Form Number of Additional Auxiliary Contacts*, page 42 for Form designations for factory installed auxiliary contacts.

Type S Accessories

Additional accessories such as power poles, pneumatic timer attachments, and cover mounted control stations are available as factory or field modifications.

Class 8502 Type S Contactor Selection Tables

3-Pole Polyphase—Open or NEMA 1, 4, and 4X

NOTE: In the table *3-Pole Polyphase—600 Vac Maximum—50–60 Hz*, page 8, replace ●●● with the voltage code shown in the table *Coil Voltage Codes*, page 6.

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

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Open Type	NEMA 1 General Purpose Enclosure	NEMA 4 & 4X Watertight, Dusttight Brushed Stainless Steel Enclosure ²
				Type	Type	Type
00	9	200	1.5	SAO12●●●	SAG12●●●	Use Size 0
		230	1.5			
		460	2			
		575	2			
0	18	200	3	SBO2●●●	SBG2●●●	SBW12●●●
		230	3			
		460	5			
		575	5			

2. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

Table 3 - 3-Pole Polyphase—600 Vac Maximum—50–60 Hz (Continued)

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Open Type	NEMA 1 General Purpose Enclosure	NEMA 4 & 4X Watertight, Dusttight Brushed Stainless Steel Enclosure ³
				Type	Type	Type
1	27	200	7.5	SCO2●●●	SCG2●●●	SCW12●●●
		230	7.5			
		460	10			
		575	10			
2	45	200	10	SDO2●●●	SDG2●●●	SDW12●●●
		230	15			
		460	25			
		575	25			
3	90	200	25	SEO2●●●	SEG2●●●	SEW12●●●
		230	30			
		460	50			
		575	50			
4	135	200	40	SFO2●●●	SFG2●●●	SFW12●●●
		230	50			
		460	100			
		575	100			
5	270	200	75	SGO2●●●	SGG2●●●	SGW12●●●
		230	100			
		460	200			
		575	200			
6	540	200	150	SHO2●●●	SHG2●●●	SHW2●●● ⁴
		230	200			
		460	400			
		575	400			
7	810	200	—	SJO2●●●	SJG2●●●	SJW2●●● ⁴
		230	300			
		460	600			
		575	600			



3-Pole Polyphase—NEMA 4X and 12/3R

NOTE: In the table 3-Pole Polyphase—600 Vac Maximum—50–60 Hz, page 10, replace ●●● with the voltage code shown in the table Coil Voltage Codes, page 6 .

3. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.
 4. Size 6 and 7 are NEMA 4 only, painted sheet steel enclosures.

Table 4 - 3-Pole Polyphase—600 Vac Maximum—50–60 Hz

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	NEMA 4X Watertight, Dusttight, Corrosion-Resistant Glass-Polyester Enclosure	NEMA 12/3R ⁵ Dusttight & Driptight Industrial Use Enclosure
				Type	Type
00	9	200	1-1/2	Use Size 0	Use Size 0
		230	1-1/2		
		460	2		
		575	2		
0	18	200	3	SBW22●●●	SBA2●●●
		230	3		
		460	5		
		575	5		
1	27	200	7-1/2	SCW22●●●	SCA2●●●
		230	7-1/2		
		460	10		
		575	10		
2	45	200	10	SDW22●●●	SDA2●●●
		230	15		
		460	25		
		575	25		
3	90	200	25	SEW22●●●	SEA2●●●
		230	30		
		460	50		
		575	50		
4	135	200	40	SFW22●●●	SFA2●●●
		230	50		
		460	100		
		575	100		
5	270	200	75	—	SGA2●●●
		230	100		
		460	200		
		575	200		
6	540	200	150	—	SHA2●●●
		230	200		
		460	400		
		575	400		
7	810	200	—	—	SJA2●●●
		230	300		
		460	600		
		575	600		

5. NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See Enclosures, page 7.

Explosion Proof Units



File E78503
CCN NPKR



File LR60905
Class 3218-03

Single-Phase 4- and 5-Pole Polyphase—Open or NEMA 1, 4 & 4X

NOTE: In the table 600 Vac Maximum—50–60 Hz, page 11, replace ●●● with the voltage code shown in the table Coil Voltage Codes, page 6 .

Table 5 - 600 Vac Maximum—50–60 Hz

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Open Type	NEMA 1 General Purpose Enclosure	NEMA 4 & 4X – Watertight, Dusttight, Brushed Stainless Steel Enclosure ⁶
				Type	Type	Type
1-Pole Single Phase						
0	18	115	1	SBO5●●●	SBG5●●●	SBW15●●●
		230	2			
1	27	115	2	SCO5●●●	SCG5●●●	SCW15●●●
		230	3			
2-Pole Single Phase						
00	9	115	1/3	SAO11●●●	SAG11●●●	Use Size 0
		230	1			
0	18	115	1	SBO1●●●	SBG1●●●	SBW11●●●
		230	2			
1	27	115	2	SCO1●●●	SCG1●●●	SCW11●●●
		230	3			
2	45	115	3	SDO1●●●	SDG1●●●	SDW11●●●
		230	7-1/2			
3	90	—	—	SEO1●●●	SEG1●●●	SEW11●●●
4	135	—	—	SFO1●●●	SFG1●●●	SFW11●●●
5	270	—	—	SGO1●●●	SGG1●●●	SGW11●●●
6	540	—	—	SHO1●●●	SHG1●●●	SHW1●●● ⁷
7	810	—	—	SJO1●●●	SJG1●●●	SJW1●●● ⁷
4-Pole Polyphase						
0	18	200	3	SBO3●●●	SBG3●●●	SBW13●●●
		230	3			
		460	5			
		575	5			
1	27	200	7-1/2	SCO3●●●	SCG3●●●	SCW13●●●
		230	7-1/2			
		460	10			
		575	10			

6. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.
7. Size 6 and 7 are NEMA 4 only, painted sheet steel enclosures.

Table 5 - 600 Vac Maximum—50–60 Hz (Continued)

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Open Type	NEMA 1 General Purpose Enclosure	NEMA 4 & 4X – Watertight, Dusttight, Brushed Stainless Steel Enclosure ⁸
				Type	Type	Type
2	45	200	10	SDO3●●●	SDG3●●●	SDW13●●●
		230	15			
		460	25			
		575	25			
3	90	200	25	SEO3●●●	SEG3●●●	SEW13●●●
		230	30			
		460	50			
		575	50			
4	135	200	40	SFO3●●●	SFG3●●●	SFW13●●●
		230	50			
		460	100			
		575	100			
5-Pole Polyphase						
0	18	200	3	SBO4●●●	SBG4●●●	SBW14●●●
		230	3			
		460	5			
		575	5			
1	27	200	7-1/2	SCO4●●●	SCG4●●●	SCW14●●●
		230	7-1/2			
		460	10			
		575	10			
2	45	200	10	SDO4●●●	SDG4●●●	SDW14●●●
		230	15			
		460	25			
		575	25			
3	90	200	25	SEO4●●●	SEG4●●●	SEW14●●●
		230	30			
		460	50			
		575	50			
4	135	200	40	SFO4●●●	SFG4●●●	SFW14●●●
		230	50			
		460	100			
		575	100			

Single-Phase 4- and 5-Pole Polyphase—NEMA 4X and 12/3R

NOTE: In the table 600 Vac Maximum—50–60 Hz, page 13, replace ●●● with the voltage code shown in the table Coil Voltage Codes, page 6 .

8. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

Table 6 - 600 Vac Maximum—50–60 Hz

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	NEMA 4X Watertight, Dusttight Corrosion-Resistant Glass-Polyester Enclosure	NEMA 12/3R ⁹ Dusttight and Driptight Industrial Use Enclosure
				Type	Type
1-Pole Single Phase					
0	18	115	1	—	SBA5●●●
		230	2	—	
1	27	115	2	—	SCA5●●●
		230	3	—	
2-Pole Single Phase					
00	9	115	1/3	Use Size 0	Use Size 0
		230	1		
0	18	115	1	SBW21●●●	SBA1●●●
		230	2		
1	27	115	2	SCW21●●●	SCA1●●●
		230	3		
2	45	115	3	SDW21●●●	SDA1●●●
		230	7-1/2		
3	90	—	—	—	SEA1●●●
4	135	—	—	—	SFA1●●●
5	270	—	—	—	SGA1●●●
6	540	—	—	—	SHA1●●●
7	810	—	—	—	SJA1●●●
4-Pole Polyphase					
0	18	200	3	SBW23●●●	SBA3●●●
		230	3		
		460	5		
		575	5		
1	27	200	7-1/2	SCW23●●●	SCA3●●●
		230	7-1/2		
		460	10		
		575	19		
2	45	200	10	SDW23●●●	SDA3●●●
		230	15		
		460	25		
		575	25		
3	90	200	25	—	SEA3●●●
		230	30		
		460	50		
		575	50		
4	135	200	40	—	SFA3●●●
		230	50		
		460	100		
		575	100		

9. NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See Enclosures, page 7 for more information.

Table 6 - 600 Vac Maximum—50–60 Hz (Continued)

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	NEMA 4X Watertight, Dusttight Corrosion-Resistant Glass-Polyester Enclosure	NEMA 12/3R ¹⁰ Dusttight and Driptight Industrial Use Enclosure
				Type	Type
5-Pole Polyphase					
0	18	200	3	—	SBA4●●●
		230	3		
		460	5		
		575	5		
1	27	200	7-1/2	—	SCA4●●●
		230	7-1/2		
		460	10		
		575	10		
2	45	200	10	—	SDA4●●●
		230	15		
		460	25		
		575	25		
3	90	200	25	—	SEA4●●●
		230	50		
		460	30		
		575	50		
4	135	200	40	—	SFA4●●●
		230	50		
		460	100		
		575	100		

10. NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See Enclosures, page 7 for more information.

Class 8536 Type S AC Magnetic Starters

General Information

Figure 2 - Type SCO2 Size 1, Three-Pole Starter with Motor Logic™ SSOLR



Type S magnetic starters are used for full-voltage starting and stopping of AC squirrel cage motors. Class 8536 Type S magnetic starters utilize a Class 8502 contactor design (see **General Information**, page 7 for more information) with direct mounted overload protection. Motor overload protection for three-phase starter applications can be provided through one of four options described in the follows sections.

Solid-State Overload Relay Protection (Motor Logic™ SSOLR)

These ambient-insensitive electronic 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 the overload relay section Solid-State Overload Relay Forms, page 49 or the *Digest*. (Catalog no. example: 8536SCO3V06H30).

Adapted Bimetallic or Solid-State Overload Relay (NEMA size 00-1)

The Adapted Bimetallic or Solid-State motor starter consists of a specially designed adapter that attaches with bus bars to the NEMA Type S contactor and holds the IEC Style overload relay: LRD/LR3D bimetallic or LR9D solid-state. This starter configuration is ordered by adding Form E (adapter only) to the standard catalog number. Based on the FLA of the motor, the LRD, LR3D, or LR9D overload relay can then be purchased separately and installed in the field to operate the starter. For more information, see *Adapted Bimetallic Overload Relay Forms*, page 49 or the *Digest*. (Catalog no. example: 8536SCO3V06E—without overload relay).

TeSys™ T Motor Management System (NEMA sizes 1-6)

TeSys T is a flexible system that integrates seamlessly into your automation system through five major communication protocols. TeSys T can predict what will happen in the process, as it accurately monitors current, voltage, and power over a wide range. For additional information about TeSys T Motor Management System, see the overload relay section TeSys™ T Factory Modifications (Forms), page 51 or the *Digest*.

Melting Alloy Type 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 to operate the starter. For a three-phase motor, three thermal units must be ordered using the Thermal Unit Selection tables in the *Digest*. The catalog number includes no Form number (for example, 8536SCO3V06).

Class 8536 Type S Starter Selection Tables

3-Pole Polyphase—Open or NEMA 1, 4, & 4X

Figure 3 - Type SCO3...S, Size 1, Three-Pole Starter with Motor Logic™ SSOLR



NOTE: In the table 3-Pole Polyphase—600 Vac Maximum—50–60 Hz, with Motor Logic™ SSOLR¹¹, page 17, replace ●●● with the voltage code shown in the table Coil Voltage Codes, page 6 .

For Form H30•, special lower-FLA factory-assembled starter combinations with Motor Logic SSOLR protection are available for certain sizes. See Solid-State Overload Relay Forms, page 49 for more information.

11. To order melting alloy overload relay, remove form "H30" from part number.

Table 7 - 3-Pole Polyphase—600 Vac Maximum—50–60 Hz, with Motor Logic™ SSOLR¹²

NEMA Siz	Continu-ous Current Ratings	Motor Voltage	Max. Hp	Open Type	NEMA 1 General Purpose Enclosure	NEMA 4 & 4X Watertight, Dusttight Brushed Stainless Steel Enclosure ¹³	NEMA 4X Watertight, Dusttight, Corrosion-Resistant Glass-Polyester Enclosure
				Type	Type	Type	Type
00	9	200	1.5	SAO12●●●H30	SAG12●●●H30	Use Size 0	Use Size 0
		230	1.5				
		460	2				
		575	2				
0	18	200	3	SBO2●●●H30	SBG2●●●H30	SBW12●●●H30	SBW22●●●H30
		230	3				
		460	5				
		575	5				
1	27	200	7.5	SCO3●●●H30	SCG3●●●H30	SCW13●●●H30	SCW23●●●H30
		230	7.5				
		460	10				
		575	10				
2	45	200	10	SDO1●●●H30	SDG1●●●H30	SDW11●●●H30	SDW21●●●H30
		230	15				
		460	25				
		575	25				
3	90	200	25	SEO1●●●H30	SEG1●●●H30	SEW11●●●H30	SEW21●●●H30
		230	30				
		460	50				
		575	50				
4	135	200	40	SFO1●●●H30	SFG1●●●H30	SFW11●●●H30	SFW21●●●H30
		230	50				
		460	100				
		575	100				
5	270	200	75	SGO1●●●H30	SGG1●●●H30	SGW11●●●H30	—
		230	100				
		460	200				
		575	200				
6	540	200	150	SHO2●●●H30	SHG2●●●H30	SHW2●●●H30 ¹⁴	—
		230	200				
		460	400				
		575	400				
7	810	200	—	SJO2●●●H30	SJG2●●●H30	SJW2●●●H30 ¹⁴	—
		230	300				
		460	600				
		575	600				

12. To order melting alloy overload relay, remove form "H30" from part number.

13. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

14. Size 6 and 7 are NEMA 4 only, painted sheet steel enclosures.

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3-Pole Polyphase—NEMA 12/3R

NOTE: In the table 3-Pole Polyphase—600 Vac Maximum—50–60 Hz¹⁵, page 18, replace ●●● with the voltage code shown in the table Coil Voltage Codes, page 6.

For Form H30*, special lower-FLA factory-assembled starter combinations with Motor Logic SSOLR protection are available for certain sizes. See Solid-State Overload Relay Forms, page 49 for more information.

Table 8 - 3-Pole Polyphase—600 Vac Maximum—50–60 Hz¹⁵

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	NEMA 12/3R ¹⁶ Dusttight and Driptight Industrial Use Enclosure
				Type
00	9	200	1.5	Use Size 0
		230	1.5	
		460	2	
		575	2	
0	18	200	3	SBA2●●●H30
		230	3	
		460	5	
		575	5	
1	27	200	7.5	SCA3●●●H30
		230	7.5	
		460	10	
		575	10	
2	45	200	10	SDA1●●●H30
		230	15	
		460	25	
		575	25	
3	90	200	25	SEA1●●●H30
		230	30	
		460	50	
		575	50	
4	135	200	40	SFA1●●●H30
		230	50	
		460	100	
		575	100	
5	270	200	75	SGA1●●●H30
		230	100	
		460	200	
		575	200	

15. To order melting alloy overload relay, remove form "H30" from part number.

16. NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See Enclosures, page 7 for more information.

Table 8 - 3-Pole Polyphase—600 Vac Maximum—50–60 Hz⁸ - (Continued)

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	NEMA 12/3R ¹⁷ Dusttight and Driptight Industrial Use Enclosure	
				Type	
6	540	200	150	SHA2●●●H30	
		230	200		
		460	400		
		575	400		
7	810	200	–	SJA2●●●H30	
		230	300		
		460	600		
		575	600		

2-Pole Single Phase—Open or NEMA 1, 4 & 4X

NOTE: In the table 2-Pole Single Phase—600 Vac Maximum—50–60 Hz (require one melting alloy thermal unit), page 19, replace ●●● with the voltage code shown in the table Coil Voltage Codes, page 6.

For thermal unit selection, refer to the *Digest*.

Table 9 - 2-Pole Single Phase—600 Vac Maximum—50–60 Hz (require one melting alloy thermal unit)

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Open Type	NEMA 1 General Purpose Enclosure	NEMA 4 and 4X Watertight, Dusttight Brushed Stainless Steel Enclosure ¹⁸	NEMA 4X Watertight, Dusttight, Corrosion-Resistant Glass-Polyester Enclosure
				Type	Type	Type	Type
00	9	115	1/3	SAO11●●●	SAG11●●●	Use Size 0	Use Size 0
		230	1				
0	18	115	1	SBO1●●●	SBG1●●●	SBW11●●●	SBW21●●●
		230	2				
1	27	115	2	SCO1●●●	SCG1●●●	SCW11●●●	SCW21●●●
		230	3				
1P	36	115	3	SCO2●●●	SCG2●●●	SCW12●●●	SCW22●●●
		230	5				
2	45	115	3	SDO6●●●	SDG6●●●	SDW16●●●	SDW26●●●
		230	7-1/2				

17. NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See Enclosures, page 7 for more information.

18. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

4-Pole, 2-Phase—Open or NEMA 1, 4 & 4X

NOTE: In the table 4-Pole, 2-Phase—600 Vac Maximum—50–60 Hz (require two melting alloy thermal units), page 20, replace ●●● with the voltage code shown in the table Coil Voltage Codes, page 6 .

For thermal unit selection, refer to the *Digest*.

Table 10 - 4-Pole, 2-Phase—600 Vac Maximum—50–60 Hz (require two melting alloy thermal units)

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Open Type	General Purpose Enclosure	NEMA 4 and 4X Watertight, Dusttight, Brushed Stainless Steel Enclosure ¹⁹	NEMA 4X Watertight, Dusttight, Corrosion-Resistant Glass-Polyester Enclosure
				Type	Type	Type	Type
0	18	200	3	SBO3●●●	SBG3●●●	SBW13●●●	SBW23●●●
		230	3				
		460	5				
		575	5				
1	27	200	7-1/2	SCO4●●●	SCG4●●●	SCW14●●●	SCW24●●●
		230	7-1/2				
		460	10				
		575	10				
2	45	200	10	SDO2●●●	SDG2●●●	SDW12●●●	SDW22●●●
		230	15				
		460	25				
		575	25				
3	90	200	25	SEO2●●●	SEG2●●●	SEW12●●●	—
		230	30				
		460	50				
		575	50				
4	135	200	40	SFO2●●●	SFG2●●●	SFW12●●●	—
		230	50				
		460	100				
		575	100				



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19. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

2-Pole Single Phase—NEMA 12/3R

NOTE: In the table 2-Pole Single Phase—600 Vac Maximum—50–60 Hz (require one melting alloy thermal unit), page 21, replace ●●● with the voltage code shown in the table Coil Voltage Codes, page 6.

For thermal unit selection, refer to the *Digest*.

Table 11 - 2-Pole Single Phase—600 Vac Maximum—50–60 Hz (require one melting alloy thermal unit)

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	NEMA 12/3R ²⁰ Dusttight and Driptight Industrial Use Enclosure
				Type
00	9	115	1/3	Use Size 0
		230	1	
0	18	115	1	SBA1●●●
		230	2	
1	27	115	2	SCA1●●●
		230	3	
1P	36	115	3	SCA2●●●
		230	5	
2	45	115	3	SDA6●●●
		230	7-1/2	

20. NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See Enclosures, page 7 for more information.

4-Pole, 2-Phase—NEMA 12/3R

NOTE: In the table 4-Pole 2-Phase—600 Vac Maximum—50–60 Hz (require two melting alloy thermal units), page 22, replace ●●● with the voltage code shown in the table Coil Voltage Codes, page 6.

For thermal unit selection, refer to the *Digest*.

Table 12 - 4-Pole 2-Phase—600 Vac Maximum—50–60 Hz (require two melting alloy thermal units)

NEMA Size	Continuous Current Ratings	Motor Voltage	Max. Hp	Coil Voltage	NEMA 12/3R ²¹ Dusttight & Driptight Industrial Use Enclosure
					Type
0	18	200	3	208	SBA3●●●
		230	3	240	
		460	5	480	
		575	5	600	
1	27	200	7-1/2	208	SCA4●●●
		230	7-1/2	240	
		460	10	480	
		575	10	600	
2	45	200	10	208	SDA2●●●
		230	15	240	
		460	25	480	
		575	25	600	
3	90	200	25	208	SEA2●●●
		230	30	240	
		460	50	480	
		575	50	600	
4	135	200	40	208	SFA2●●●
		230	50	240	
		460	100	480	
		575	100	600	



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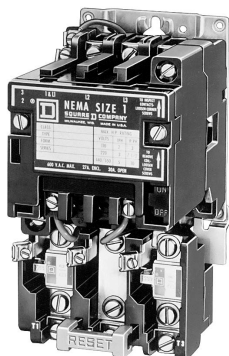


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21. NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See Enclosures, page 7 for more information.

Class 8536 Types SB–SD Starters with Auxiliary Load Terminals

Figure 4 - Type SB–SD Starters



Capacitors are sometimes used in motor branch circuits to improve power factor. The Size 0–2 Type SB–SD starters listed in the table 3-Pole Polyphase—600 Vac Maximum—50–60 Hz (devices require three melting alloy thermal units), page 23 include three auxiliary terminals to allow easy connection of power factor correction capacitors. When capacitors are connected using these terminals, no adjustment to the selection of thermal units is necessary. The auxiliary terminals accept 12–16 AWG solid or stranded wire. NEMA Size 3 and 4 starters have provisions for auxiliary connections as a standard. You must supply lugs as necessary.

The Type S starters with auxiliary load terminals can also be used to control two motors simultaneously from a single starter. However, this application is tightly restricted by Section 430-53 of the National Electrical Code. Refer to the NEC for restrictions regarding overload protection, size of controller, and motor branch circuit protection.

3-Pole, Polyphase Starters

NOTE: In the table 3-Pole Polyphase—600 Vac Maximum—50–60 Hz (devices require three melting alloy thermal units), page 23, replace ●●● with the voltage code shown in the table Coil Voltage Codes, page 6 .

For thermal unit selection, refer to the *Digest*.

Table 13 - 3-Pole Polyphase—600 Vac Maximum—50–60 Hz (devices require three melting alloy thermal units)

NEMA Size	Motor Voltage	Max. Hp	Open Style Type
0	200	3	SBTO2●●●
	230	3	
	460	5	
	575	5	
1	200	7-1/2	SCTO3●●●
	230	7-1/2	
	460	10	
	575	10	
2	200	10	SDTO1●●●
	230	15	
	460	25	
	575	25	

Extra Capacity Single-Phase Starters (Not NEMA Rated)

NOTE: In the table 2-Pole Single Phase—250 Vac Maximum—50–60 Hz (require one melting alloy thermal unit), page 24, replace ●●● with the voltage code shown in the table Coil Voltage Codes, page 6 .

For thermal unit selection, refer to the *Digest*.

Table 14 - 2-Pole Single Phase—250 Vac Maximum—50–60 Hz (require one melting alloy thermal unit)

Motor Voltage	Max. Hp	Open Style	NEMA 1 General Purpose Enclosure	NEMA 3R Rainproof, Sleet Resistant, Outdoor Use Enclosure	NEMA 4 and 4X Watertight, Dusttight, Brushed Stainless Steel Enclosure ²²	NEMA 4X Watertight Corrosion Resistant Glass-Polyester Enclosure	NEMA 12/3R ²³ Dusttight and Driptight Industrial Use Enclosure
		Type	Type	Type	Type	Type	Type
115	5	SDO8●●● ²⁴	—	SDH8●●● ²⁴	—	—	—
230	10		—	—	—	—	—
115	7-1/2	SEO6●●●	SEG6●●●	SEH6●●●	SEW16●●●	SEW26●●●	SEA6●●●
230	15		—	—	—	—	—

22. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

23. NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See Enclosures, page 7 for more information.

24. Uses a Size 3 overload relay.

Reversing Magnetic Contactors and Starters

Class 8702 Type S Reversing Contactors

General Information

Figure 5 - NEMA 00, 0, and 1 Reversing Contactor



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

Component Parts and Accessories—Reversing

Enclosures—Reversing

Class 8702 and 8736 reversing magnetic contactors and starters are available in the following enclosures:

- NEMA 1 General Purpose Enclosure
- NEMA 4 and 4X Watertight and Dusttight Stainless Steel (stainless steel enclosures ship with hubs installed in the top and bottom of the enclosure)
- NEMA 12 Dusttight and Driptight for Industrial Use

The NEMA 4 and 4X stainless steel enclosure (Sizes 0–5) has a brushed finish. Sizes 6 and 7 are painted sheet steel and are rated NEMA 4 only.

Also, NEMA 12 devices can be modified for NEMA 3R applications by drilling a 1/8 in. diameter hole in the bottom of the enclosure and using appropriate watertight conduit hubs.

Separate enclosures are available. See catalog 9999CT9701.



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Holding Circuit Contact—Reversing

Two normally open holding circuit contacts are provided on all reversing contactors and starters as standard. Sizes 00–2 contactors use a 9999SX11 auxiliary contact as the holding circuit contact. Sizes 3–7 contactors use a 9999SX6 auxiliary contact as the holding circuit contact.

Additionally, two normally closed auxiliary contacts are provided as standard and wired to prevent energization of both coils at the same time. Sizes 00–2 use a 9999SX12 auxiliary contact while Sizes 3–7 use a 9999SX7 auxiliary contact for this purpose.

See catalog 9999CT9701 for the holding circuit contact electrical ratings.

Coil Voltages—Reversing

AC coils are available for application on 50–60 Hz. NEMA Sizes 00–5 are supplied with coils that are designed to operate satisfactorily on line voltages of 85%-110% of rated voltage. NEMA Size 6 and 7 contactors are supplied with a DC coil operated by a solid state rectifier circuit that is powered by an AC source and also operates on line voltages of 85%-110%.

NOTE: The voltage code must be included when ordering contactors and starters. Also, 24 V and 120 V polyphase reversing contactors and starters are wired for separate control.

Mechanical Interlocks—Reversing

Mechanical interlocks are available for replacement or field assembly of Type S reversing contactors and starters (Sizes 00-4 **only**). See catalog 9999CT9701 for additional information.

Auxiliary Contacts—Reversing

Additional auxiliary contacts can be added to Type S reversing contactors and starters. See the table Auxiliary Units — Class 8702 and 8736 Reversing, page 44 for maximum number of auxiliary units and table Form Designations for Factory-Installed Auxiliary Contacts, page 44 for Form designations for factory installed auxiliary contacts. See catalog 9999CT9701 for auxiliary contact kits for field installation.

Type S Accessories—Reversing

Additional accessories such as power poles and cover mounted control stations are available as factory or field modifications.

Class 8702 Type S Reversing Contactor Selection Table

600 Vac Maximum—50–60 Hz

NOTE: In the table 600 Vac Maximum—50–60 Hz, page 27, replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes listed in the table Coil Voltage Codes, page 6.

Table 15 - 600 Vac Maximum—50–60 Hz

NEMA Size	Continu-ous Current Ratings	Motor Voltage	Max. Hp	Open Type		NEMA 1 General Purpose Enclosure	NEMA 4 & 4X Watertight, Dusttight Brushed Stainless Steel Enclosure (Sizes 0–5) ^{25,26}	NEMA 12/3R ²⁷ Dusttight & Driptight Industrial Use Enclosure
				Vertical Type	Horizontal Type	Type	Type	Type
00	9	200	1.5	—	SAO4●●●	SAG4●●●	Use Size 0	Use Size 0
		230	1.5					
		460	2					
		575	2					
0	18	200	3	SBO12●●●	SBO4●●●	SBG4●●●	SBW14●●●	SBA4●●●
		230	3					
		460	5					
		575	5					
1	27	200	7.5	SCO7●●●	SCO8●●●	SCG8●●●	SCW14●●●	SCA4●●●
		230	7.5					
		460	10					
		575	10					
2	45	200	10	SDO1●●●	SDO2●●●	SDG2●●●	SDW11●●●	SDA1●●●
		230	15					
		460	25					
		575	25					
3	90	200	25	SEO1●●●	SEO2●●●	SEG2●●●	SEW11●●●	SEA1●●●
		230	30					
		460	50					
		575	50					
4	135	200	40	SFO1●●●	SFO3●●●	SFG3●●●	SFW11●●●	SFA1●●●
		230	50					
		460	100					
		575	100					
5	270	200	75	SGO1●●●	SGO3●●●	SGG3●●●	SGW11●●●	SGA1●●●
		230	100					
		460	200					
		575	200					

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

26. NEMA 4 and 4X stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

27. NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See Enclosures—Reversing, page 25 for more information.

Table 15 - 600 Vac Maximum—50–60 Hz (Continued)

NEMA Size	Continu-ous Current Ratings	Motor Voltage	Max. Hp	Open Type		NEMA 1 General Purpose Enclosure	NEMA 4 & 4X Watertight, Dusttight Brushed Stainless Steel Enclosure (Sizes 0–5) ^{28,29}	NEMA 12/3R ³⁰ Dusttight & Driptight Industrial Use Enclosure
				Vertical Type	Horizontal Type	Type	Type	Type
6	540	200	150	—	SHO1●●●	SHG1●●●	SHW1●●●	SHA1●●●
		230	200					
		460	400					
		575	400					
7	810	200	—	—	SJO1●●●	SJG1●●●	SJW1●●●	SJA1●●●
		230	300					
		460	600					
		575	600					

Class 8736 Type S Reversing Starters

General Information

Figure 6 - NEMA Sizes 00, 0, and 1 Reversing Starter (Horizontal Type)

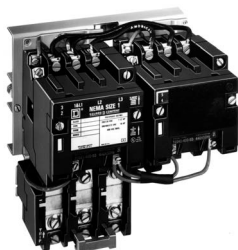


Figure 7 - NEMA Sizes 00, 0, and 1 Reversing Starter (Vertical Type)



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

28. NEMA 4 and 4X stainless steel enclosures (sizes 0–5) have a brushed finish. Sizes 6 and 7 are painted sheet steel and are rated NEMA 4 only.
 29. NEMA 4 and 4X stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.
 30. NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See Enclosures—Reversing, page 25 for more information.

Motor Overload Protection

Motor Logic™ Solid-State Overload Relay (SSOLR) Protection

These ambient-insensitive overload relays are available on three-phase devices, 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 solid-state overload relays (SSOLRs), see the overload relay section *Solid-State Overload Relay Forms*, page 49 or the *Digest*. (Catalog number example: 8736SCO8V06H30).

Adapted Bimetallic or Solid-State Overload Relay (NEMA Size 00–1)

The Adapted Bimetallic or Solid-State motor starter consists of a specially designed adapter that attaches with bus bars to the NEMA Type S contactor and holds the IEC Style overload relay: LRD/LR3D bimetallic or LR9D solid state. This starter configuration is ordered by adding Form E (adapter only) to the standard catalog number. Based on the FLA of the motor, the LRD, LR3D, or LR9D overload relay can then be purchased separately and installed in the field to operate the starter. For more information, see *Adapted Bimetallic Overload Relay Forms*, page 49 or the *Digest*. (Catalog number example: 8736SCO8V06E—without overload relay).

TeSys™ T Motor Management System (NEMA Sizes 1–6)

TeSys T is a flexible system that integrates seamlessly into your automation system through five major communication protocols. TeSys T can predict what will happen in the process, as it accurately monitors current, voltage, and power over a wide range. For additional information about the TeSys T Motor Management System, see the TeSys™ T Motor Management System section *TeSys™ T Factory Modifications (Forms)*, page 51 or the *Digest* (ordering example: 8736SCO8V06H616).

Melting Alloy 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 Thermal Unit Selection tables in the *Digest*. The catalog number includes no Form number (for example, 8736SCO8V06).

Class 8736 Type S Reversing Starters Selection Table

3-Pole Polyphase

NOTE: In the table 3-Pole Polyphase, 600 Vac Maximum, 50–60 Hz, with Motor Logic SSOLR³¹, page 30, replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes listed in the table Coil Voltage Codes, page 6.

For Form H30[•], special lower-FLA factory-assembled starter combinations with Motor Logic SSOLR protection are available for certain sizes. See Solid-State Overload Relay Forms, page 49 for more information.

Table 16 - 3-Pole Polyphase, 600 Vac Maximum, 50–60 Hz, with Motor Logic SSOLR³¹

NEMA Size	Continu-ous Current Ratings	Motor Voltage	Max. Hp	Open Style		NEMA 1 General Purpose Enclosure	NEMA 4 & 4X Watertight, Dusttight Brushed Stainless Steel Enclosure ³²	NEMA 12/3R ³³ Dusttight, Driptight Industrial Use Enclosure
				Vertical	Horizontal			
				Type	Type			
00	9	200	1.5	—	SAO16●●●H30	SAG16●●●H30	Use Size 0	Use Size 0
		230	1.5					
		460	2					
		575	2					
0	18	200	3	SBO10●●●H30	SBO4●●●H30	SBG4●●●H30	SBW14●●●H30	SBA4●●●H30
		230	3					
		460	5					
		575	5					
1	27	200	7.5	SCO7●●●H30	SCO8●●●H30	SCG8●●●H30	SCW14●●●H30	SCA4●●●H30
		230	7.5					
		460	10					
		575	10					
2	45	200	10	SDO1●●●H30	SDO2●●●H30	SDG2●●●H30	SDW11●●●H30	SDA1●●●H30
		230	15					
		460	25					
		575	25					
3	90	200	25	SEO1●●●H30	SEO2●●●H30	SEG2●●●H30	SEW11●●●H30	SEA1●●●H30
		230	30					
		460	50					
		575	50					
4	135	200	40	SFO1●●●H30	SFO3●●●H30	SFG3●●●H30	SFW11●●●H30	SFA1●●●H30
		230	50					
		460	100					
		575	100					
5	270	200	75	SGO1●●●H30	SGO3●●●H30	SGG3●●●H30	SGW11●●●H30	SGA1●●●H30
		230	100					
		460	200					
		575	200					

31. To order melting alloy overload relay, remove form "H30" from part number.

32. NEMA 4 & 4X stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

33. NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See Enclosures—Reversing, page 25 for more information.

Table 16 - 3-Pole Polyphase, 600 Vac Maximum, 50–60 Hz, with Motor Logic SSOLR¹⁶ - (Continued)

NEMA Size	Continu-ous Current Ratings	Motor Voltage	Max. Hp	Open Style		NEMA 1 General Purpose Enclosure	NEMA 4 & 4X Watertight, Dusttight Brushed Stainless Steel Enclosure ³⁴	NEMA 12/3R ³⁵ Dusttight, Driptight Industrial Use Enclosure
				Vertical	Horizontal			
				Type	Type			
6	540	200	150	—	SHO1●●●H30	SHG1●●●H30	SHW1●●●-H30 ³⁶	SHA1●●●H30
		230	200					
		460	400					
		575	400					
7	810	200	—	—	SJO1●●●H30	SJG1●●●H30	SJW1●●●H30 ³⁶	SJA1●●●H30
		230	300					
		460	600					
		575	600					

34. NEMA 4 & 4X stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

35. NEMA 12 enclosures can be field modified for outdoor non-corrosive and non-service entrance rated applications. See Enclosures—Reversing, page 25 for more information.

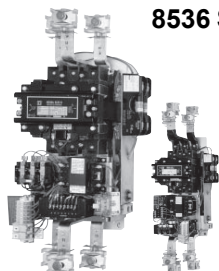
36. Sizes 6 and 7 are painted sheet steel and are rated NEMA 4 only.

Application Data

Class 8502/8536 Type S Application Data

Replacement Control Transformers Size 6, Type SH and Size 7, Type SJ

**Figure 8 -
Size 6
Starter
8536 SH**



**Figure 9 -
Size 7
Starter
8536 SJ**



Size 6 Type SH and 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 Size 6 and 7 are equipped as standard with a fused control circuit transformer (Form FF4T) rated 240/480-120 V 60 Hz, 220/440-110 V 50 Hz. The purpose of this transformer is to provide an isolated 120 V 60 Hz, 110 V 50 Hz supply for the control circuit. Size 6 and 7 devices can be ordered for other system voltages by specifying the voltage and frequency desired.

The tables Size 6, Type S Replacement Control Transformers, page 32 and Size 7, Type S Replacement Control Transformers, page 32 list the replacement transformers for Type S Sizes 6 and 7 contactors and starters. To change voltages on these devices, coils are not changed—instead transformers with the desired voltage are changed.

Table 17 - Size 6, Type S Replacement Control Transformers

Voltage		Class 9070 Type
60 Hz	50 Hz	
240/480-120	220/440-110	EO3S2A
208-120	—	EO3S2B
277-120	—	EO3S2C
—	380-110	EO3S2D
600-120	550-110	EO3S2E
120-120	110-110	EO3S2F
240-120	220-110	EO3S2G

Table 18 - Size 7, Type S Replacement Control Transformers

Voltage		Class 9070 Type
60 Hz	50 Hz	
240/480-120	220/440-110	EO19S2A
208-120	—	EO19S2B
277-120	—	EO19S2C
—	380-110	EO19S2D
600-120	550-110	EO19S2E
120-120	110-110	EO19S2F
240-120	220-110	EO19S2G

Field Conversion for Other System Voltages

Field conversion for other system voltages is accomplished by one of the following methods, **not by the usual practice of changing the coil**:

- If the factory wiring is indicated as being for 480 V 60 Hz, 440 V 50 Hz, conversion to 240 V 60 Hz, 220 V 50 Hz can be accomplished by reconnecting the control transformer as illustrated on the instruction sheet supplied with the controller. This is the same method used for Class 9070 control circuit transformers.

Conversion to any other voltage requires replacement of the control transformer. For other system voltages: i.e. 208, 277, 380, 600 V, a new transformer with single voltage primary must be selected from the tables Size

6, Type S Replacement Control Transformers, page 32 or Size 7, Type S Replacement Control Transformers, page 32. Control transformer connections are illustrated on the instruction sheet supplied with the controller.

- If the factory wiring is indicated as being for any voltage other than 480 V 60 Hz, 440 V 50 Hz, conversion to any other voltage requires replacement of the control transformer. Refer to Size 6, Type S Replacement Control Transformers, page 32 or Size 7, Type S Replacement Control Transformers, page 32.

NOTE:

- The standard transformer that was supplied can be used to power a maximum of five Class 9001 Type K illuminated operators powered with transformer type light modules. When extra capacity to power control relays or other inductive loads is required, a second transformer must be added. Extra capacity can be purchased as Form FF4T with additions in 100 VA increments.
- Standard controllers are wired for common control and can not be converted 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, that must not be bypassed. Form S controllers are not convertible for operation on common control.

Auxiliary Contacts—Type S Sizes 6 and 7

A normally open (N.O.) holding circuit contact and a normally closed (N.C.) auxiliary contact are provided as standard. The holding circuit contact may or may not be required for either 3-wire or 2-wire control. Size 6 and 7 devices have an additional N.C. auxiliary contact which is wired in the coil control circuit—**do not use this N.C. auxiliary contact.**

Maintenance of Equipment

Class 9998 Repair Parts Kits are available for all Class 8502 contactors and Class 8536 starters. Service bulletins with a complete list of replaceable parts are supplied with all enclosed devices. Separate bulletins can be ordered and are listed along with the appropriate contact parts kit.

Magnetic Contactor and Starter Contact Kits

Table 19 - Magnetic Contactor and Starter Contact Kits

Equipment To Be Serviced			No. of Poles in Kit	Class 9998 Parts Kit Type No.	
Class	Type	NEMA Size or Ampere Rating			
8502 8536 8538 8539 8547 8549 8606 8630 8640 8647 8702 8736 8738 8739 8810 8811 8812 8940	SA- (Series B)	00	3	SJ1	
	SB-		0	3	SL2
				4	SL12
	SB-, SC-(Power Pole Adder)	0 & 1	1	SL22	
	SC-		1 & 1P	3	SL3
			1	4	SL13
	SD-		2	3	SL4
				4	SL14
	SD-(Power Pole Adder)	2	1	SL24	
	SE-		3	2	SL6
				3	SL7
	SF-		4	2	SL8
				3	SL9
SG-		5	2	SL10	
			3	SL11	
SH-		6	2	SL25	
			3	SL26	
SJ-		7	2	SL30	
			3	SL31	

Table 19 - Magnetic Contactor and Starter Contact Kits (Continued)

Equipment To Be Serviced			No. of Poles in Kit	Class 9998 Parts Kit Type No.
Class	Type	NEMA Size or Ampere Rating		
8903	L (Series C) & LX (Series B)	30 A	4	RA5B
	SM-	30 A	3	SL3
			4	SL13
	SP-	60 A	3	SL4
			4	SL14
	SQ-	100 A	2	SL6
			3	SL7
	SV-	200 A	2	SL8
			3	SL9
	SX-	300 A	2	SL10
			3	SL11
	SY-	400 A	2	SL25
			3	SL26
	SZ-	600 A	2	SL32
			3	SL33
	SJ-	800 A	2	SL30
			3	SL31
PBM, PBP	30, 60 A	2	PB2	
PBN, PBQ	75, 100 A			
PBM, PBP	30, 60 A	3	PB3	
PBN, PBQ	75, 100 A			
PBR, PBV, PBW	150, 200, 225 A	2	PB14	
PBR, PBV, PBW	150, 200, 225 A	3	PB15	

Application Data for Selection

Table 20 - Application Data per NEMA Standards ICS-1 and ICS-2

NEMA Size	Load Voltage	Max. Hp Rating: Nonplugging and Nonjogging Duty		Max. Hp Rating: Plugging and Jogging Duty ³⁷		Continuous Current Rating (A) 600 V Max.	Service-Limit Current Rating (A) ³⁸	Tungsten and Infrared Lamp Load (A), 250 V Max. ³⁹	Resistance Heating Loads (KW) other than Infrared Lamp Loads ⁴⁰		KVA Rating for Switching Transformer Primaries at 50 or 60 Cycles				3 Ø Rating for Switching Capacitors ⁴¹
		Single Phase	Poly-phase	Single Phase	Poly-phase				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	KVAR	
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	—	1.5	18	21	10	—	—	1.2	2.1	0.6	1.0	—
	380	—	5	1	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

- 37. 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.
- 38. 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.
- 39. **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, and resistance heating 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.
- 40. Ratings apply to contactors which are employed to switch the load at the utilization voltage of the heat producing element with a duty which 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.
- 41. 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 rated continuous current. In many installations, the impedance of 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.

Table 20 - Application Data per NEMA Standards ICS-1 and ICS-2 (Continued)

NEMA Size	Load Voltage	Max. Hp Rating: Nonplugging and Nonjogging Duty		Max. Hp Rating: Plugging and Jogging Duty ⁴²		Continuous Current Rating (A) 600 V Max.	Service-Limit Current Rating (A) ⁴³	Tungsten and Infrared Lamp Load (A), 250 V Max. ⁴⁴	Resistance Heating Loads (KW) other than Infrared Lamp Loads ⁴⁵		KVA Rating for Switching Transformer Primaries at 50 or 60 Cycles				3 Ø Rating for Switching Capacitors ⁴⁶
		Single Phase	Poly-phase	Single Phase	Poly-phase				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	KVAR		
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 ⁴²	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 ⁴⁷	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 ⁴⁷	230	—	300	—	—	810	932	—	180	315	—	—	—	—	240
	460	—	600	—	—	810	932	—	360	625	—	—	—	—	480
	575	—	600	—	—	810	932	—	450	775	—	—	—	—	600

42. 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.
43. 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.
44. **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, and resistance heating 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.
45. Ratings apply to contactors which are employed to switch the load at the utilization voltage of the heat producing element with a duty which 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.
46. 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 rated continuous current. In many installations, the impedance of 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.
47. For NEMA Size 5 (series B), 6 and 7, the operation rate is as follows: Continuous operation rate is 3 operations per minute maximum; Jogging or Plugging Duty operation rate is 15 operations per minute for a maximum of three minutes.

Table 21 - Maximum Allowable Motor Code Letter

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

The motor ratings in Application Data, page 32 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 the table Maximum Allowable Motor Code Letter, page 38. Motors with code letters occurring later in the alphabet may require a larger controller. Consult the Customer Care Center at 1-888-778-2733.

The ratings for capacitor switching in Application Data, page 32 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.

NOTE: Tables and footnotes are taken from NEMA Standards.

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 provided 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 in the table Type S Contactor Maximum Component SCCR, page 38. Observe the size limits in the Circuit Breaker and Fuse columns.

NOTE: The table Type S Contactor Maximum Component SCCR, page 38 lists the maximum SCCR of the component when protected by any circuit-breaker or fuse. If the maximum component SCCR is 100 kA and a 25 kA rated circuit-breaker is used, then the system will be 25 kA, the SCCR rating of the circuit-breaker.

Table 22 - Type S Contactor Maximum Component SCCR

Catalog Number	Standard Motor Ratings, 3 Ø @ 50/60 Hz (hp)				Max. Resistive AC1 Current (A)	NEMA Size	Contactor Max. Component SCCR (kA) 48		Circuit Breakers @ 480 V 49		Fuses @ 600 V	
	200 V	230 V	460 V	575 V			Circuit Breakers @ 480 V 50	Fuses @ 600 V	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
8502SAO12	1.5	1.5	2	2	9	00	100	100 ⁵¹	70	100	60 ⁵²	100
8502SBO2	3	3	5	5	18	0	100	100 ⁵¹	70	100	60 ⁵²	100
8502SCO2	7.5	7.5	10	10	27	1	100	100 ⁵¹	70	100	60 ⁵²	100
8502SDO2	10	15	25	25	45	2	100	100 ⁵¹	100	100	100 ⁵²	100

48. Ratings apply to circuits with voltages no greater than those listed.

49. When protected by any circuit-breaker, including thermal-magnetic and magnetic-only.

50. When protected by any circuit-breaker, including thermal-magnetic and magnetic-only, meeting the limits in the circuit-breaker size column.

51. When protected by any Class RK5, RK1, T, or J fuse, meeting the limits in the fuse size column.

52. When protected by any Class RK5, RK1, T, or J fuse.

Table 22 - Type S Contactor Maximum Component SCCR (Continued)

Catalog Number	Standard Motor Ratings, 3 Ø @ 50/60 Hz (hp)				Max. Resistive AC1 Current (A)	NEMA Size	Contactor Max. Component SCCR (kA) ⁵³		Circuit Breakers @ 480 V ⁵⁴		Fuses @ 600 V	
	200 V	230 V	460 V	575 V			Circuit Breakers @ 480 V ⁵⁵	Fuses @ 600 V	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
8502SEO2	25	30	50	50	90	3	100	100 ⁵⁶	150	100	200 ⁵⁷	100
8502SFO2	40	50	100	100	135	4	100	100 ⁵⁸	225	100	200 ⁵⁹	100
8502SGO2	75	100	200	200	270	5	100	100 ⁵⁸	400	100	400 ⁵⁹	100
8502SHO2	150	200	400	400	540	6	65	100 ⁵⁸	800	65	600 ⁵⁹	100
8502SJO2	—	300	600	600	810	7	30	30	2000	30	1500	30

Table 23 - Type S Starters with Motor Logic™ or TeSys™ T Overload Relays⁶⁰

Catalog Number	Standard Motor Ratings, 3				Max. Resistive AC1 Current (A)	NEMA Size	Contactor Max. Component SCCR (kA) ⁵³		Circuit Breakers @ 480 V ⁶¹		Fuses @ 600 V	
	208 V	240 V	480 V	600 V			Circuit Breakers @ 480 V ⁶²	Fuses @ 600 V	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
8536SAO12	1.5	1.5	2	2	9	0	100	100 ⁵⁷	70	100	60 ⁵⁷	100
8536SBO2	3	3	5	5	18	0	100	100 ⁵⁷	70	100	60 ⁵⁷	100
8536SCO2	7.5	7.5	10	10	27	1	100	100 ⁵⁷	70	100	60 ⁵⁷	100
8536SDO1	10	15	25	25	45	2	100	100 ⁵⁷	100	100	100 ⁵⁷	100
8536SEO1	25	30	50	50	90	3	100	100 ⁵⁷	150	100	200 ⁵⁷	100
8536SFO1	40	50	100	100	135	4	100	100 ⁵⁸	225	100	200 ⁵⁸	100
8536SGO1	75	100	200	200	270	5	100	100 ⁵⁸	400	100	400 ⁵⁸	100
8536SHO2	150	200	400	400	540	6	65	100 ⁵⁸	800	65	600 ⁵⁸	100
8536SJO2	—	300	600	600	810	7	30	30	2000	30	1500	30

Table 24 - Type S Starters with Adapted Bimetallic Overload Relays

Catalog Number	Standard Motor Ratings @ 50/60 Hz (hp)				Continuous Current Rating (A)	NEMA Size	Max. Component SCCR (kA)	
	Three-Phase						Circuit Breakers @ 480 V ⁶³	Fuses @ 600 V ⁶⁴
	208 V	240 V	480 V	600 V				
8536SAO12	1.5	1.5	2	2	9	00	65	65
8536SBO2	3	3	5	5	18	0	65	65
8536SCO2	7.5	7.5	10	10	27	1	65	65

53. Ratings apply to circuits with voltages no greater than those listed.

54. When protected by any circuit-breaker, including thermal-magnetic and magnetic-only.

55. When protected by any circuit-breaker, including thermal-magnetic and magnetic-only, meeting the limits in the circuit-breaker size column.

56. When protected by any Class RK5, RK1, T, or J fuse, meeting the limits in the fuse size column.

57. When protected by any Class RK5, RK1, T, or J fuse.

58. When protected by any Class T or J fuse, meeting the limits in the fuse size column.

59. When protected by any Class T or J fuse.

60. Melting Alloy starters are rated short-circuit with no branch protection only, sizes 00–3 rated @ 5kA, size 4–5 rated @ 10kA, size 6 rated @ 18kA, and size 7 rated @ 30kA.

61. When protected by any circuit breaker, including thermal-magnetic and magnetic-only.

62. When protected by any circuit-breaker, including thermal-magnetic and magnetic-only, meeting the limits in the circuit breaker size column.

63. When protected by any circuit-breaker. Refer to TeSys™ D Overload Relays in the *Digest* for ampacity restrictions.

64. When protected by any Class J or CC time-delay fuse. Refer to TeSys D Overload Relays in the *Digest* for ampacity restrictions.

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 the table Application Data per NEMA Standards ICS-1 and ICS-2, page 36.

Table 25 - Coil Burden (Mean Values)

NEMA Size	Series	Number of Poles	Inrush VA		Sealed VA		Sealed Watts	
			50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
00	B	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		
3	—	2-3	676	700	47	46	15	14
		4-5	1260	1185	89	85	23.4	22
4	—	2-5	1260	1185	89	85	23.4	22
5	A	2-3	2970	2970	250	212	42	39
	B	—	—	—	—	—	—	—
6 ⁶⁵	—	2-3	1495	1780	56	48	27	32
7 ⁶⁵	—	2-3	—	1960	—	59	—	36

Table 26 - Wiring⁶⁶

NEMA Size	Type	Power Terminals		Control Terminals	
		Type of Lug	Wire Range ⁶⁷	Type of Lug	Wire Range ⁶⁷
00, 0, 1	SA, SB, SC	Pressure Wire	14-8 AWG Cu	Pressure Wire	16-12 AWG
2	SD	Box Lug	14-4 AWG Cu	Pressure Wire	16-12 AWG
3	SE	Box Lug	14-0 AWG Cu	Pressure Wire	16-12 AWG
4	SF	Box Lug	8 AWG - 250 MCM Cu	Pressure Wire	16-12 AWG
5	SG	Box Lug	4 AWG - 500 MCM Cu	Pressure Wire	16-12 AWG
6	SH	Parallel Groove	One or two 250-500 MCM per phase Cu	Pressure Wire	16-12 AWG
7	SJ	Parallel Groove	One to four 250-500 MCM per phase Cu	Pressure Wire	16-12 AWG

65. 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.

66. For wire smaller than 250 MCM order lug conversion kit 9999SCU7. The kit contains two lugs for number 2/0 AWG-300MCM (1 or 2 wires per lug).

67. Solid or stranded copper wire.

Auxiliary Units

Auxiliary contacts and power poles can be added by the factory or in the field on all Type S starters and contactors. The table *Auxiliary Units—Class 8502 and 8536*, page 41 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, 1, and 2 contactors and starters.

Table 27 - Auxiliary Units—Class 8502 and 8536

NEMA Size	Type	Number of Poles— Basic Contactor	Maximum Number of External Auxiliary Units (in addition to holding circuit contact)
00	SA	2–3	Four single-circuit auxiliary contacts (N.O. or N.C.) if second internal auxiliary contact is not used.
0–2	SB–SD	1–3	Four single-circuit auxiliary contacts (N.O. or N.C.) ⁶⁸ Two single-circuit auxiliary contacts (N.O. or N.C.) plus one power pole adder (1 or 2 poles, N.O. or N.C.)
		4–5	Two single-circuit auxiliary contacts (N.O. or N.C.)
3–4	SE–SF	2–5	Three single-circuit auxiliary contacts (N.O. or N.C.)
5	SG	2–3	Two 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	Three single-circuit auxiliary contacts (N.O. or N.C.)
			Two single-circuit auxiliary contacts (N.O. or N.C.) plus one NEMA Size 0–1 or Size 2 power pole adder (1 or 2 poles, N.O. or N.C.)

68. When adding four external auxiliary contacts to one Size 0 or 1 contactor, remove one of the return springs.

Factory Installed Auxiliary Contacts

Additional auxiliary contacts can be factory or field added to any Type S contactor or starter. See the table *Auxiliary Units—Class 8502 and 8536*, page 41 for the maximum number of auxiliary units. The table *Form Number of Additional Auxiliary Contacts*, page 42 lists the Form designations for factory installed electrical contacts.

See the *Digest* for field modification kits.

When ordering factory installed auxiliary contacts, use the Form designations listed in the table *Form Number of Additional Auxiliary Contacts*, page 42.

Table 28 - Form Number of Additional Auxiliary Contacts

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

Contact Arrangement

Class 9999 Type

1 N.O.

SX6

1 N.C.

SX7

1 N.O. or 1 N.C.

SX8

Power Poles

Single or double-circuit power pole adders can be factory or field installed on 2- and 3-pole Type S contactors and starters. The table *Power Pole Forms*, page 43 lists the Form designation for factory installed power pole adders. Only one power pole adder may be installed per contactor.

Table 29 - Power Pole Forms

Type	NEMA Size	Class 9999 Type	Form Designation
1 N.O.	0, 1	SB6	Y428
	2	SB11	Y436
1 N.C.	0, 1	SB7	Y429
	2	SB12	Y437
1 N.O., 1 N.C.	0, 1	SB8	Y435
	2	SB13	Y440
2 N.O.	0, 1	SB9	Y430
	2	SB14	Y438
2 N.C.	0, 1	SB10	Y434
	2	SB15	Y439

Control Circuit Transformers

Class 9070 Type TF machine tool control transformers are normally used when it is necessary to provide a lower voltage to the control circuit. This transformer with fused protection can be ordered from the factory by specifying Form FF4T. The addition of a transformer often requires the use of a larger enclosure. The table *Control Transformer Selection*, page 43 shows the transformer selection for starters and contactors with or without auxiliary units.

Table 30 - 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 ⁶⁹					
0, 1	SB & SC	TF100	TF150	TF200	TF300 ^{70 71}
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

69. Complete the contactor or starter Class and Type with the voltage code. See the transformer section of the *Digest* for information.

70. Requires oversized enclosure. (Size 2 reversing enclosure.)

71. Available in standard enclosure with Mag-Gard™ circuit-breaker and non-fusible disconnect switch. Requires oversized enclosure with thermal-magnetic circuit-breakers and fusible disconnect switches. (Size 2 reversing enclosure.)

Class 8702 /8736 Type S Application Data—Reversing

Auxiliary Units—Reversing

The table Auxiliary Units — Class 8702 and 8736 Reversing, page 44 shows the maximum number of auxiliary units (**in addition to the holding circuit and interlocking contacts**) that can be added to either the forward or reverse contactor or starter.

Table 31 - Auxiliary Units — Class 8702 and 8736 Reversing

NEMA Size (Type)	Number of Poles of Basic Contactor	Maximum number of auxiliary units on each contactor, forward or reverse, (in addition to internal holding circuit and interlocking contacts).
00 (SA)	2 or 3	Two single-circuit auxiliary contacts (N.O. or N.C.)
0, 1 & 2 (SB, SC & SD)	2 or 3	Four single-circuit auxiliary contacts (N.O. or N.C.) When adding four external auxiliary contacts to one Size 0 or 1 contactor, remove one of the return springs.
	4	Two single-circuit auxiliary contacts (N.O. or N.C.)
3, 4, 5, 6, & 7 (SE, SF, SG, SH, SJ)	Any	Two single-circuit auxiliary contacts (N.O. or N.C.)

Factory Installed Auxiliary Contacts—Reversing

Additional auxiliary contacts may be factory or field added to any Type S contactor or starter. See the table Auxiliary Units — Class 8702 and 8736 Reversing, page 44 for maximum number of auxiliary units. The table Form Designations for Factory-Installed Auxiliary Contacts, page 44 lists the Form designations for factory installed auxiliary contacts. See Class 9999 for field modification kits.

Table 32 - Form Designations for Factory-Installed Auxiliary Contacts

		Additional Auxiliary Contacts on R.H. Contactor (Reverse Contactor)					
		Standard (No Additional Auxiliary Contacts)	1 N.O.	1 N.C.	2 N.O.	1 N.O.-1 N.C.	2 N.C.
Additional Auxiliary Contacts on L.H. Contactor (Forward Contactor)	Standard (No Additional Auxiliary Contacts)	—	X0010	X0001	X0020	X0011	X0002
	1 N.O.	X1000	X1010	X1001	X1020	X1011	X1002
	1 N.C.	X0100	X0110	X0101	X0120	X0111	X0102
	2 N.O.	X2000	X2010	X2001	X2020	X2011	X2002
	1 N.O.-1 N.C.	X1100	X1110	X1101	X1120	X1111	X1102
	2 N.C.	X0200	X0210	X0201	X0220	X0211	X0202

Auxiliary Contact Units

Additional auxiliary contact units can be added to the Size 4 and 5 reversing contactors in the field. A maximum of two units can be added to the Size 4; a maximum of one unit can be added to the Size 5. No additional units can be added to the Size 6, however, 1 N.O. (normally open) circuit and 1 N.C. (normally closed) circuit are available on each forward and reverse contactor for customer use.

Motor Overload Protection—Factory Modifications (Forms)

Full Voltage Starters

Factory installed modifications are available for the classes of control equipment listed in the respective tables. Kits are also available for many field modifications and normal parts replacement on most control items. Refer to Classes 9998 and 9999 for complete listings.

NOTE:

- Standard equipment dimensions and enclosure construction may not apply when certain special features are added. Such cases should contact the factory, with complete description, when precise dimensions are required.
- If a UL label is required, consult the Customer Care Center at 1-888-778-2733. Some Forms are not UL Listed.

Full Voltage Starters Forms

Table 33 - Full Voltage Starters Forms

	Factory Modifications	Enclosure Type	Form
Pilot Devices in Cover Full Voltage Non-Reversing Controllers Only Classes 8502, 8536, 8538, 8539	Push-Buttons⁷²		
	Start-Stop	173, 3R, 4, 4X, 12	A
	Start-Stop (maintained contact) ^{74 75}	173, 3R, 4, 4X, 12	A16
	Start-Stop push-button and Hand-Off-Auto selector switch ⁷⁵	173, 3R, 4, 4X, 12	AC
	On-Off ⁷⁵	173, 3R, 4, 4X, 12	A3
	Single oiltight push-button (specify marking) ⁷⁵	1, 3R, 4, 4X, 12	A11
	Selector Switches		
	Hand-Off-Auto	173, 3R, 4, 4X, 12	C
	On-Off ⁷⁵	173, 3R, 4, 4X, 12	C6
	Non-standard markings for Pilot Devices ⁷⁵	1, 3R, 4, 12	G12 ⁷⁶
	Addition of padlock attachment to Class 9001 operators ⁷⁵	1, 3R, 4, 12	G122
	Pilot Lights (specify color/type) ⁷⁷ See Pilot Light Forms, page 46.	—	—
	With Operating Interlock: Add price of each interlock per light	1, 3R, 4, 4X, 12	X ⁷⁸
Pilot Devices in Cover Full Voltage Reversing and Multi-Speed Controllers Only Classes 8702, 8736, 8738	Push Buttons⁷²		
	Forward-Reverse-Stop ⁷⁵	1, 4, 4X, 12	A1
	High-Low-Stop ⁷⁵	1, 4, 12	A2
	Fast-Off-Slow ⁷⁵	1, 4, 12	A9
	High-Low push button and Hand-Off-Auto selector ⁷⁵	1, 4, 12	A10C
	Single oiltight push button (specify marking) ⁷⁵	1, 4, 4X, 12	A11
	Selector Switches		
Hand-Off-Auto	173, 4, 4X, 12	C	

72. All push-buttons are momentary contact unless specified otherwise.
 73. Selection of various Form combinations may force the use of a larger enclosure.
 74. Specify the appropriate Class 9001 Type K or SK operator required.
 75. Not available for Size 00.
 76. Specify the marking and/or the required Class 9001 Type KN or SKN operator required.
 77. Indicate the pilot light color as Form P1 (red), Form P2 (green) and so forth, as shown in the table Pilot Light Forms, page 46. 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. In addition, standard practice is to wire a green pilot light to indicate that the device is de-energized. An additional normally closed auxiliary contact is supplied. A wiring diagram must be provided for other pilot light colors or arrangements.
 78. 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 the table Auxiliary Units—Class 8502 and 8536, page 41 (for non-reversing single-speed devices) or the table Auxiliary Units — Class 8702 and 8736 Reversing, page 44 (for reversing or two-speed devices). For Class 8600 reduced voltage controllers, consult the Customer Care Center at 1-888-778-2733.

Table 33 - Full Voltage Starters Forms (Continued)

	Factory Modifications	Enclosure Type	Form
8739 8810 8811 8812	On-Off ⁷⁹	1 ⁸⁰ , 4, 4X	C6
	High-Off-Low	1, 4, 12	C7
	Forward-Off-Reverse ⁷⁹	1, 4, 4X, 12	C14
	High-Low and Hand-Off-Auto ⁷⁹	1, 4, 12	CC17
	Slow-Fas ^{79t}	1, 4, 4X, 12	C19
	Forward-Reverse ⁷⁹	1, 4, 4X, 12	C20
	High-Low-Off-Auto ⁷⁹	1, 4, 12	C25
	Non-Standard Markings for Pilot Devices ⁷⁹	Any	G12 ⁸¹
	Pilot Lights ⁸² Available with Operating Interlock	1, 4, 4X, 12	X ⁸³

Pilot Light Forms

Table 34 - Pilot Light Forms

	Standard	Push-to-Test	LED	LED-Push-to-Test
	Form	Form	Form	Form
Red ON	P1 ⁸⁴	P21	P51	P42
Red OFF	P71	P81	P91	P43
Red Unwired	P38	P28	P58	P44
Green ON	P72	P82	P92	P45
Green OFF	P2 ⁸⁴	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

79. Not available for Size 00.

80. Selection of various Form combinations may force the use of a larger enclosure.

81. Specify the marking and/or the required Class 9001 Type KN or SKN operator required.

82. Indicate the pilot light color as Form P1 (red), Form P2 (green) and so forth, as shown in the table Pilot Light Forms, page 46. 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. In addition, standard practice is to wire a green pilot light to indicate that the device is de-energized. An additional normally closed auxiliary contact is supplied. A wiring diagram must be provided for other pilot light colors or arrangements.

83. 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 the table Auxiliary Units—Class 8502 and 8536, page 41 (for non-reversing single-speed devices) or the table Auxiliary Units — Class 8702 and 8736 Reversing, page 44 (for reversing or two-speed devices). For Class 8600 reduced voltage controllers, consult the Customer Care Center at 1-888-778-2733.

84. Only for pilot light. Available for Size 00.

Full Voltage Contactors and Starters

Control Circuit Forms—Full Voltage and Multi-Speed Controllers Only

Table 35 - Control Circuit Forms, Full Voltage and Multi-Speed Controllers Only

Classes 8502, 8536, 8538, 8539, 8702, 8736, 8738, 8739, 8810, 8811 and 8812													
Classes	Factory Modifications	Enclosure Type	Form	NEMA SIZE									
				00	0	1	2	3	4	5	6	7	
	Separate Control Circuit —(specify voltage and frequency)	Any	S ⁸⁵	X	X	X	X	X	X	X	X	X	
	Fused Control Circuit (without control transformer)												
	One fuse ⁸⁶	1, 3R, 4, 4X, 12	F	X	X	X	X	X	X	X	X	—	
	Two fuses ⁸⁶	1, 3R, 4, 4X, 12	F4	X	X	X	X	X	X	X	X	—	
	Control Circuit Transformers⁸⁷—Standard capacity (50 or 60 Hz) Note: All orders requesting Form FT will be supplied as Form F4T.												
	Fuses												
	Primary	Secondary											
8502	2	1	1, 4, 4X, 12	FF4T	X	X	X	X	X	X	X ⁸⁸	X	X
8536	2	2	1, 4, 4X, 12 ⁸⁶	F4F10T	X	X	X	X	X	—	X ⁸⁸	—	—
8538	Additional Capacity (50 or 60 Hz)												
8539	<i>Two fuses in primary and one fuse in secondary</i>												
8702	100 VA additional capacity	1, 4, 4X, 12	FF4T11	X	X	X	X	X	X ⁸⁸	X ⁸⁸	X ⁸⁸	X	X
8736	200 VA additional capacity	1, 4, 4X, 12	FF4T12	X	X	X	X	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X	X
8738	300 VA additional capacity	1, 4, 4X, 12	FF4T13	X	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X	X
8739	400 VA additional capacity	1, 4, 4X, 12	FF4T14	X	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸
8810	500 VA additional capacity	1, 4, 4X, 12	FF4T15	X	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸	X ⁸⁸

Selection of Control Circuit Transformers

The standard primary/secondary voltages for control circuit transformers are indicated in the table *Control Circuit Transformer Codes*, page 48.

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.

For Example:

You have selected 8536SDG1V02S. V02S means that you need a coil voltage of 120-60/110-50 wired for separate control. You want to add **Form FF4T**, with transformer voltages of 480 V primary, 120 V secondary, and solid-state overload

85. All combination style devices—such as Class 8538, 8539, 8738, and 8739—that use **Form S** should also use **Form Y74** (auxiliary contact installed on the disconnect switch) in accordance with NEC Article 430-74.

86. Not available for Sizes 6 and 7.

87. See *Selection of Control Circuit Transformers*, page 47.

88. Single primary voltage must be specified.

relay protection with selectable Class 10/20 trip class—Form **H30**. (The Form designations needed are **FF4**, **H30**, and **T**.)

The new and complete Class, Type, voltage code, and Form number are shown in the following table:

Table 36 - Example of the Transformer Form Designation Results

Class	Type	Voltage Code	Form ⁸⁹
8536	SDG1	V81	FF4H30T

Marine Control Form

Table 37 - Marine Control Form

Class	Factory Modification	Enclosure Type	Form
8502 8536 8538 8539 8702 8736 8738 8739 8810 8941	Modification of standard device for use as marine control in accordance with UL508 ⁹⁰	12/3R 4/4X (stainless steel only)	M10

Control Circuit Transformer Codes

Table 38 - Control Circuit Transformer Codes

AC-Operated Devices With Control Transformers	
Voltage	Code
60 Hz (Primary–Secondary)	
120–12 ⁹¹	V88
120–24 ⁹¹	V89
208–120	V84
240–24 ⁹¹	V82
240–120	V80
277–120	V85
480–24 ⁹¹	V83
480–120	V81
480–240	V87
600–120	V86
Specify	V99

89. Specify Form numbers in alphabetical order. Each letter indicates the beginning of a new Form and may be followed by one or more numbers.

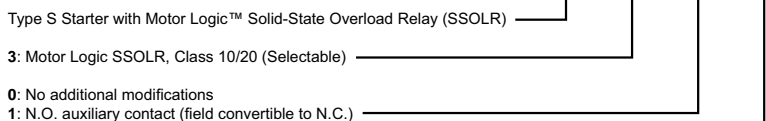
90. Not available for NEMA Sizes 0, 00, or 7. NEMA Sizes 00 and 0 cannot be used with marine controls.

91. 12 V coils are not available on Sizes 3–7. 24 V coils are not available on Sizes 4–7.

Solid-State Overload Relay Forms

The solid-state overload relay (SSOLR) is available on NEMA Size 00–7. For Class 8536, 8538, 8539, 8736, 8738, 8739 and 8810 devices.

Form Description



Special Factory-Assembled SSOLR/Contactor Size Combinations (When Applicable):

(must be specified on Size 00 starter orders)

Blank: Overload relay matched to the starter size (for example, Size 1 contactor and 9-27 A overload relay)

- 0: 6–18 A overload relay on the starter size indicated by the starter catalog number
- 1: 9–27 A overload relay on the starter size indicated by the starter catalog number
- 2: 15–45 A overload relay on the starter size indicated by the starter catalog number
- 3: 30–90 A overload relay on the starter size indicated by the starter catalog number
- 4: 45–135 A overload relay on the starter size indicated by the starter catalog number
- 8: 1.5–4.5 A overload relay on the starter size indicated by the starter catalog number (only offered on Feature Units)
- 9: 3–9 A overload relay on the starter size indicated by the starter catalog number

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.

Size 7 comes standard with the Motor Logic SSOLR, Class 10/20 (Selectable). No Form designation is required.

Table 39 - Special Factory-Assembled Starter Combinations with Motor Logic SSOLR Protection

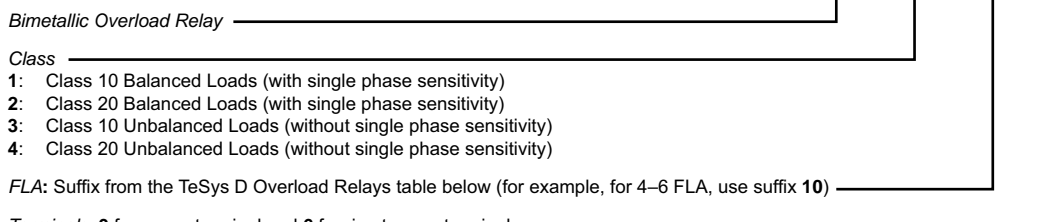
NEMA Contactor Size	SSOLR Size						
	00		0	1	2	3	4
	1.5–4.5 A	3–9 A	6–18 A	9–27 A	15–45 A	30–90 A	45–135 A
00	H308	H30	—	—	—	—	—
0	H308	H309	H30	—	—	—	—
1	H308	H309	H300	H30	—	—	—
2	—	H309	H300	H301	H30	—	—
3	—	—	—	—	—	H30	—
4	—	—	—	—	—	—	H30

Adapted Bimetallic Overload Relay Forms

Table 40 - Adapted Bimetallic Overload Relay for NEMA Type S Starter

This bimetallic overload relay is available on NEMA Sizes 00, 0, and 1 for Class 8536, 8538, 8539, 8736, 8738 and 8739 devices. To order a starter with the **adapter only**, add Form E to the catalog number (8536SBG2V02ES). When ordering with the adapter and bimetallic overload relay installed, use table TeSys D Overload Relays for Sizes 00–1 Type S Starters, page 50 as a guide.

Form Description



Sample catalog number: **8536SCO3V02E2160S**

NEMA Size 1 starter controlling a 7.5 hp motor (11 FLA)—Bimetallic overload relay is LRD16L (9–13 FLA)

Table 41 - TeSys D Overload Relays for Sizes 00–1 Type S Starters, Non-Reversing and Reversing, Classes 8536, 8538, 8539, 8736, 8738, and 8739

Current Setting Range Amperes	Class 20 with Single-Phase Sensitivity	Class 20 without Single-Phase Sensitivity	Class 20 with Single-Phase Sensitivity	Class 20 without Single-Phase Sensitivity	Factory Installed —Catalog Number Suffix (CP1 List)
	Screw Termination	Screw Termination	Ring Tongue Connector	Ring Tongue Connector	
0.40–0.63	LRD04L	LR3D04L	LRD04L6	LR3D04L6	04
0.63–1	LRD05L	LR3D05L	LRD05L6	LR3D05L6	05
1–1.6	LRD06L	LR3D06L	LRD06L6	LR3D06L6	06
1.6–2.5	LRD07L	LR3D07L	LRD07L6	LR3D07L6	07
2.5–4	LRD08L	LR3D08L	LRD08L6	LR3D08L6	08
4–6	LRD10L	LR3D10L	LRD10L6	LR3D10L6	10
5.5–8	LRD12L	LR3D12L	LRD12L6	LR3D12L6	12
7–10	LRD14L	LR3D14L	LRD14L6	LR3D14L6	14
9–13	LRD16L	LR3D16L	LRD16L6	LR3D16L6	16
12–18	LRD21L	LR3D21L	LRD21L6	LR3D21L6	21
17–24	LRD22L	LR3D22L	LRD22L6	LR3D22L6	22
23–32	LRD32L	LR3D32L	LRD32L6	LR3D32L6	32

NOTE: For tripping class 10:

- With screw termination, remove the **L** from the end of the above part number (for example, LRD32 is a class 10 bimetallic overload relay with a 23–32 A setting range).
- With a ring tongue connector, change the **L6** to **6** at the end of the above part number (for example, LRD326 is a class 10 bimetallic overload relay with a 23–32 A setting range).

Solid-State TeSys D Overload Relays for Type S Starters

Sizes 00–1, Non-Reversing (Classes 8536, 8538, 8539) and Reversing (Classes 8736, 8738 and 8739)

NOTE:

- **Field installed only:** The LR9D Overload Relay cannot be factory installed, it must be purchased separately and field installed.
- **Single-phase motor applications:** When using the LR9D with a single-phase motor, you must purchase the 3-pole starter to accommodate looping of the motor leads.

Current Setting	Overload Relay Catalog Number (sold separately)
Range Amperes	Trip Class 5/10/20/30 Dip Switch Selectable
0.1–0.5 A	LR9D01
0.4–2 A	LR9D02
1.6–8 A	LR9D08
6.4–32 A	LR9D32

Table 42 - TeSys D Overload Relays for Sizes 00–1 Type S Starters, Non-Reversing and Reversing, Classes 8536, 8538, 8539, 8736, 8738, and 8739

Current Setting Range Amperes	Class 20 <i>with</i> Single-Phase Sensitivity	Class 20 <i>without</i> Single-Phase Sensitivity	Class 20 <i>with</i> Single-Phase Sensitivity	Class 20 <i>without</i> Single-Phase Sensitivity	Factory Installed— Catalog Number Suffix (CP1 List)
	Screw Termination	Screw Termination	Ring Tongue Connector	Ring Tongue Connector	
0.40–0.63	LRD04L	LR3D04L	LRD04L6	LR3D04L6	04
0.63–1	LRD05L	LR3D05L	LRD05L6	LR3D05L6	05
1–1.6	LRD06L	LR3D06L	LRD06L6	LR3D06L6	06
1.6–2.5	LRD07L	LR3D07L	LRD07L6	LR3D07L6	07
2.5–4	LRD08L	LR3D08L	LRD08L6	LR3D08L6	08
4–6	LRD10L	LR3D10L	LRD10L6	LR3D10L6	10
5.5–8	LRD12L	LR3D12L	LRD12L6	LR3D12L6	12
7–10	LRD14L	LR3D14L	LRD14L6	LR3D14L6	14
9–13	LRD16L	LR3D16L	LRD16L6	LR3D16L6	16
12–18	LRD21L	LR3D21L	LRD21L6	LR3D21L6	21
17–24	LRD22L	LR3D22L	LRD22L6	LR3D22L6	22
23–32	LRD32L	LR3D32L	LRD32L6	LR3D32L6	32

NOTE: For tripping class 10:

- With screw termination, remove the **L** from the end of the above part number (for example, LRD32 is a class 10 bimetallic overload relay with a 23–32 A setting range).
- With a ring tongue connector, change the **L6** to **6** at the end of the above part number (for example, LRD326 is a class 10 bimetallic overload relay with a 23–32 A setting range).

TeSys™ T Factory Modifications (Forms)

Table 43 - 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 44 - TeSys T Motor Management System Modifications
H6xx or H7xx for use with Class 8536 and 8736 (Open Starters)**

Used on Size	Range	Form	
		Control Voltage	
		100–240 Vac	24 Vdc
1	0.4–8 A	H61X ⁹²	H71X ⁹²
1	1.35–27 A	H62X ⁹²	H72X ⁹²
2, 3	5.0–100 A	H63X ⁹²	H73X ⁹²
4	8–160 (CT 300:5 3 turns)	H65X ⁹²	H75X ⁹²
5	24–480 A (CT 300:5 1 turn)	H66X ⁹²	H76X ⁹²
6	48–960 A (CT 600:5 1 turn)	H67X ⁹²	H77X ⁹²

NOTES:

- The product configurator must be used to order TeSys T open starters.
- The auxiliary contact for the control of the starter coil has a maximum rating of 240 Vac.

Type S Contactor and Starter Forms

Table 45 - Full Voltage Controllers

Classes 8502, 8536, 8538, 8539, 8702, 8736, 8738, 8739, and 8810

Factory Modifications	En- clo- sure Type	Form	NEMA Size							
			0	1 1 PW 1 YD	2 2 PW 2 YD	3 3 PW 3 YD	4 4 PW 4 YD	5 5 PW 5 YD	6 6 PW 6 YD	7 7 PW 7 YD
Control relay (4 and 8 poles)	1, 12	R174	X	X	X	X	X	X	X	X
	4, 4X ⁹³	R174	X	X	X	X	X	X	X	X
	1, 12	R178	X	X	X	X	X	X	X	X
	4, 4X ⁹³	R178	X	X	X	X	X	X	X	X
Pneumatic Timing Relay – specify Class 9050 Type A or B										
0.1 seconds to 1.0 minute —On delay	1	K25	X	X	X	X	X	X	X	X
	4, 4X ⁹³ , 12, 3R	K25	X	X	X	X	X	X	X	X
0.1 seconds to 1.0 minute —Off delay	1	K26	X	X	X	X	X	X	X	X
	4, 4X ⁹³ , 12, 3R	K26	X	X	X	X	X	X	X	X
1.0 to 3.0 minute—On delay	1, 4, 12, 3R	K37	X	X	X	X	X	X	X	X
	4X ⁹³	K37	X	X	X	X	X	X	—	—
1.0 to 3.0 minute—Off delay	1, 4, 12, 3R	K38	X	X	X	X	X	X	X	X
	4X ⁹³	K38	X	X	X	X	X	X	X	X
Solid-state timing relay (specify timing range) and timer (120 V control required)	1, 4, 4X, 12	K1070	X	X	X	X	X	X	X	X

92. Where X is the communication option according to Communication Codes, page 51 (for example, H612).

93. This adder, used with a NEMA 4X enclosure, applies only to Classes 8538, 8539, 8738, 8739, and 8810 non-reversing.

Table 45 - Full Voltage Controllers (Continued)

Classes 8502, 8536, 8538, 8539, 8702, 8736, 8738, 8739, and 8810											
Factory Modifications		En-closure Type	Form	NEMA Size							
				0	1 1 PW 1 YD	2 2 PW 2 YD	3 3 PW 3 YD	4 4 PW 4 YD	5 5 PW 5 YD	6 6 PW 6 YD	7 7 PW 7 YD
Motor-driven timing relay ⁹⁴ ₉₅		1, 4, 12	K5	X	X	X	X	X	X	X	X
Phase failure and phase reversal relay with time delay option including under and over voltage protection.		1, 4, 4X, 12, 3R	R44	X	X	X	X	X	X	X	X
Addition of a protective relay with options of phase failure with time delay, phase reversal and under/over voltage protection (RM3TR1). Both motor voltage and control voltage (V8• voltage code) must be specified with device even if Form S is specified. Form replaces Forms Y444, Y445, Y447, Y448 and Y449.											
For multi-speed controllers: Compelling relay (requires motor to be started in low speed)		1, 4, 12	R1	X	X	X	X	X	X	X	X
Accelerating relay (provides timed acceleration to selected speed):											
For Class 8810		1, 4, 12	R2	X	X	X	X	X	X	X	X
For Class 8811		1, 4, 12	R2	X	X	X	X	X	X	X	X
For Class 8812		1, 4, 12	R2	X	X	X	X	X	X	X	X
Decelerating relay (imposes a timing delay during transfer from a higher to a lower speed):											
For Class 8810		1, 4, 12	R3	X	X	X	X	X	X	X	X
For Class 8811		1, 4, 12	R3	X	X	X	X	X	X	X	X
For Class 8812		1, 4, 12	R3	X	X	X	X	X	X	X	X
Anti-plugging timers and relays		1, 4, 12	R10	X	X	X	X	X	X	X	X
Meters and Metering ⁹⁶	Ammeter in cover (includes current transformer if required)		1	G91	X	X	X	X	X	X	X
	Ammeter and switch with two current transformers		1	G92	—	X	X	X	X	X	X
	Ammeter and switch with three current transformers		1	G93	—	X	X	X	X	X	X
	Voltmeter mounted		1	G94	—	X	X	X	X	X	X
	Voltmeter and switch mounted		1	G95	—	X	X	X	X	X	X
	Elapsed time meter		1, 12	G97	X	X	X	X	X	X	X
	Operation counter		1, 12	G99	X	X	X	X	X	X	X
Auxiliary Contacts	Additional starter (contactor) auxiliary contacts (Specify number of additional N.O. or N.C. contacts required per contactor.) Each will be X●● (for example, X01).		Any	X	X	X	X	X	X	X	X
	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 the tables in the Class 8536 section in <i>Auxiliary Units</i> , page 41 (for non-reversing single-speed devices). For Class 8600 Reduced Voltage controllers, consult Customer Care Center at 1-888-778-2733.										

94. If the controller has a control transformer, price that transformer with additional capacity for the relay provided.

95. Specify the control and line voltage.

96. The motor hp and voltage must be specified when placing an order. Meters are panel-mounted in NEMA 12 enclosures.

Table 45 - Full Voltage Controllers (Continued)

Classes 8502, 8536, 8538, 8539, 8702, 8736, 8738, 8739, and 8810												
Factory Modifications	En-closure Type	Form	NEMA Size									
			0	1 1 PW 1 YD	2 2 PW 2 YD	3 3 PW 3 YD	4 4 PW 4 YD	5 5 PW 5 YD	6 6 PW 6 YD	7 7 PW 7 YD		
Auxiliary contacts installed on disconnect switch or circuit breaker operating mechanism.												
SPDT	1, 4, 4X, 12	Y74	X	X	X	X	X	X	X	X	X	
DPDT	1, 4, 4X, 12	Y75	X	X	X	X	X	X	X	X	X	
NOTE: The above contacts do not switch with the automatic tripping of the circuit-breaker. If such operation is required, consult your nearest Schneider Electric sales office.)												
Enclosures	Space heater with N.C. auxiliary contact	1, 4, 4X, 12	G51	X	X	X	X	X	X	X	X	
	Function identification plate, with marking as specified	Any	G11	X	X	X	X	X	X	X	X	
	Cover gaskets added to NEMA 1 enclosures:											
	For Classes 8538 and 8539	1	Y47	X	X	Standard	Standard	Standard	Standard	—	—	
	For Classes 8738 and 8739	1	Y47	Standard	Standard	Standard	Standard	Standard	Standard	—	—	
	For other full voltage controllers	1	Y47	X	X	X	X	X	X	X	X	
	For reduced voltage controllers	1	Y47	X	X	X	X	X	X	X	X	
	Brushed stainless steel watertight device											
	Class 8606	—	Y56	—	—	X	X	X	X	X	X	
	Classes 8630 and 8640	—	Y56	—	Standard	Standard	Standard	Standard	Standard	X	X	

Dimensions

Class 8502/8536 Type S Approximate Dimensions, Shipping Weights

Open Style Dimensions

Table 46 - Open Style, Dimensions A–E

Class	NEMA Size	Type	Number of poles	Figure	Manufacturing screws	Dimensions, in./mm (For additional dimensions information, see Open Style Dimensional Diagrams, page 58.)										Weight (lb)
						A		B		C		D		E		
						in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	
8502	00	SAO	2–3	Class 8502 Contactor, page 58	(2) #10	3.22	82	4.34	110	4.22	107	1.63	41	1.63	41	4
	01	SBO	1–3	Class 8502 Contactor, page 58	(2) #10	3.22	82	4.34	110	4.22	107	1.63	41	1.63	41	4
		SCO	4–5			4.25	108	4.34	110	4.22	107	1.63	41	2.63	67	4.5
	2	SDO	2–3 4–5	Class 8502 Contactor, page 58	(3) #10	4.31	110	5.13	130	4.94	125	2.16	55	2.16	55	6.75
						5.63	143	5.13	130	4.94	125	2.16	55	3.47	88	8.25
	3	SEO	2–3 4–5	Class 8502 Contactor, page 58	(3) 1/4"	5.47	139	7.09	180	6.50	165	1.88	48	3.59	91	14
					(3) 5/16"	9.75	248	7.88	200	6.50	165	3.94	100	5.81	148	22
	4	SFO	2–3 4–5	Class 8502 Contactor, page 58	(3) 5/16"	6.00	152	8.19	208	6.50	165	2.06	52	3.94	100	18
					(3) 5/16"	9.75	248	8.19	208	6.50	165	3.94	100	5.81	148	22
5	SGO	2–3	Class 8502 Contactor, page 58	(3) 1/2"	8.66	220	12.31	313	8.75	222	3.25	83	5.81	148	45	
6	SHO	2–3	Class 8502 Contactor, page 58	(3) 1/2"	12.34	313	28.06	713	9.00	229	3.53	90	5.78	147	80	
7	SJO	2–3	Class 8502 Contactor, page 58	(3) 1/2"	12.34	313	37.25	946	10.8-8	276	3.53	90	5.78	147	135	

Table 46 - Open Style, Dimensions A–E (Continued)

Class	NEMA Size	Type	Number of poles	Figure	Manufacturing screws	Dimensions, in./mm (For additional dimensions information, see Open Style Dimensional Diagrams, page 58.)										Weight (lb)
						A		B		C		D		E		
						in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	
8536	00, 0, 1, 1P	SAO SCO	2–3	Class 8536 Starter, page 58	(3) #10	3.50	89	6.77	172	4.22	107	0.50	13	1.00	25	5
	0, 1	SBO SCO	4	Class 8536 Starter, page 58	(3) #10	4.53	115	6.77	172	4.22	107	0.50	13	1.00	25	5.5
	2	SDO	2–3	Class 8536 Starter, page 58	(3) #10	4.31	109	7.81	198	4.94	125	0.50	13	1.00	25	7.75
			4			5.63	143	7.81	198	4.94	125	0.50	13	1.00	25	9.25
	3	SEO	2–3	Class 8536 Starter, page 58	(3) 1/4"	5.47	139	11.09	282	6.50	165	0.88	22	1.75	44	17
			4			9.75	248	12.13	308	6.50	165	1.81	46	1.75	44	25
	4	SFO	3	Class 8536 Starter, page 58	(3) 5/16"	6.00	152	12.88	327	6.50	165	1.81	46	1.75	44	22
			4			9.75	248	12.88	327	6.50	165	1.81	46	1.75	44	25
5	SGO	3	Class 8536 Starter, page 58	(3) 1/2"	8.56	217	17.56	446	8.75	222	4.75	121	7.25	184	62	
6	SHO	3	Class 8536 Starter, page 58	(3) 1/2"	12.34	313	28.06	713	9.00	229	4.75	121	7.25	184	85	
7	SJO	3	Class 8536 Starter, page 58	(3) 1/2"	12.34	313	37.25	946	10.8-8	276	4.75	121	7.25	184	140	

Table 47 - Open Style, Dimensions F-I

Class	NEMA Size	Type	Number of poles	Figure	Manufacturing screws	Dimensions, in./mm (For additional dimensions information, see Open Style Dimensional Diagrams, page 58.)								Weight (lb)
						F		G		H		I		
						in.	mm	in.	mm	in.	mm	in.	mm	
8502	00	SAO	2-3	Class 8502 Contactor, page 58	(2) #10	0.22	6	3.94	100	—	—	—	—	4
	0 1	SBO	1-3	Class 8502 Contactor, page 58	(2) #10	0.22	6	3.94	100	—	—	—	—	4
		SCO	4-5			0.22	6	3.94	100	—	—	—	—	4.5
	2	SDO	2-3	Class 8502 Contactor, page 58	(3) #10	0.22	6	4.59	117	0.53	13	1.06	27	6.75
			4-5			0.22	6	4.59	117	0.53	13	1.06	27	8.25
	3	SEO	2-3	Class 8502 Contactor, page 58	(3) 1/4"	0.31	8	6.03	153	3.25	83	4.75	121	14
			4-5			(3) 5/16"	0.31	8	7.00	178	4.53	115	9.06	230
	4	SFO	2-3	Class 8502 Contactor, page 58	(3) 5/16"	0.31	8	7.00	178	3.59	91	5.31	135	18
			4-5			(3) 5/16"	0.31	8	7.00	178	4.53	115	9.06	230
5	SGO	2-3	Class 8502 Contactor, page 58	(3) 1/2"	0.63	16	11.13	283	4.75	121	7.25	184	45	
6	SHO	2-3	Class 8502 Contactor, page 58	(3) 1/2"	5.06	129	18.56	471	4.75	121	7.25	184	80	
7	SJO	2-3	Class 8502 Contactor, page 58	(3) 1/2"	7.22	183	22.38	568	4.75	121	7.25	184	135	

Table 47 - Open Style, Dimensions F-I (Continued)

Class	NEMA Size	Type	Number of poles	Figure	Manufacturing screws	Dimensions, in./mm (For additional dimensions information, see Open Style Dimensional Diagrams, page 58.)								Weight (lb)
						F		G		H		I		
						in.	mm	in.	mm	in.	mm	in.	mm	
8536	00, 0, 1, 1P	SAO-SCO	2-3	Class 8536 Starter, page 58	(3) #10	1.61	41	0.20	5	6.25	159	3.97	101	5
	0, 1	SBO-SCO	4	Class 8536 Starter, page 58	(3) #10	2.66	68	0.20	5	6.25	159	3.97	101	5.5
	2	SDO	2-3 4	Class 8536 Starter, page 58	(3) #10	2.16 3.47	55 88	0.20 0.20	5 5	7.34 7.34	186 186	4.06 4.06	103 103	7.75 9.25
	3	SEO	2-3 4	Class 8536 Starter, page 58	(3) 1/4" (3) 5/16"	3.59 5.81	91 148	0.31 0.31	8 8	10.19 11.19	259 284	5.75 5.75	146 146	17 25
	4	SFO	3 4	Class 8536 Starter, page 58	(3) 5/16" (3) 5/16"	3.94 5.91	100 150	0.31 0.31	8 8	11.19 11.19	284 284	5.75 5.75	146 146	22 25
	5	SGO	3	Class 8536 Starter, page 58	(3) 1/2"	5.38	137	0.63	16	16.38	416	6.00	152	62
	6	SHO	3	Class 8536 Starter, page 58	(3) 1/2"	5.78	147	5.06	129	18.56	471	8.69	221	85
	7	SJO	3	Class 8536 Starter, page 58	(3) 1/2"	5.78	147	7.22	183	22.38	568	9.00	229	140

Open Style Dimensional Diagrams

Figure 10 - Class 8502 Contactor

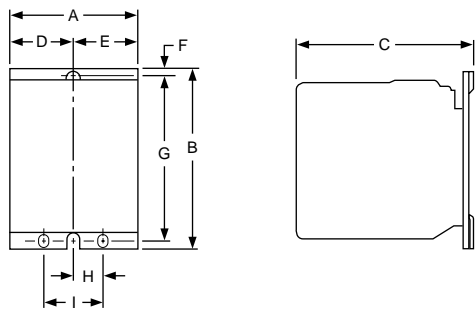
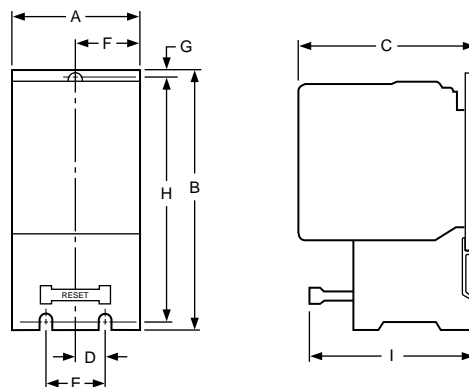


Figure 11 - Class 8536 Starter



NEMA 1 Dimensions

Table 48 - NEMA 1—General Purpose Enclosure Dimensions A–F

NEMA Size	Class	Type	Number of poles	Figure	Manufacturing screws	Dimensions, in./mm (For additional dimensions information, see NEMA 1 General Purpose Enclosure Dimensional Diagrams, page 61.)							Weight (lb)	
						A	B	C		D	E	F	Class	
								8502	8536				8502	8536
00, 0, 1	8502, 8536	SAG, SBG, SCG	All	Diagram G, page 61	(3) #10	6.00	10.00	5.28	5.56	3.00	0.88	8.13	7.5	8
						152	254	134	141	76	22	207		
2	8502, 8536	SDG	All	Diagram G, page 61	(4) 1/4"	7.81	12.69	6.03	6.31	—	1.09	10.50	14.5	15.5
						198	322	153	160	—	28	267		
3	8502, 8536	SEG	All	Diagram G, page 61	(4) 3/8"	11.44	21.81	8.00	8.38	—	1.53	18.75	34	37
						291	554	203	213	—	39	476		
4	8502, 8536	SFG	All	Diagram H, page 61	(4) 7/16"	11.25	25.16	9.00	9.00	8.59	1.25	1.25	52	56
						286	639	229	229	218	32	32		
5	8502, 8536	SGG	All	Diagram H, page 61	(4) 9/16"	17.22	44.22	12.81	12.94	13.00	2.13	2.13	143	160
						437	1123	325	329	330	54	54		
6	8502, 8536	SHG	All	Diagram I, page 61	(4) 11/16"	65.75	20.22	13.13	13.13	—	11.00	64.50	226	231
						1670	514	334	334	—	279	1638		
7	8502, 8536	SJG	All	Diagram I, page 61	—	93.00	34.50	23.50	23.50	Floor Mounting			—	—
						2362	876	597	597	Floor Mounting			—	—

Table 49 - NEMA 1—General Purpose Enclosure Dimensions G–L

NEMA Size	Class	Type	Number of poles	Figure	Manufacturing screws	Dimensions, in./mm (For additional dimensions information, see NEMA 1 General Purpose Enclosure Dimensional Diagrams, page 61.)						Weight (lb)	
						G	H	I	J	K	L	Class	
												8502	8536
00, 0, 1	8502, 8536	SAG, SBG, SCG	All	Diagram G, page 61	(3) #10	1.00	0.94	4.13	5.00	—	—	7.5	8
						25	24	105	127	—	—		
2	8502, 8536	SDG	All	Diagram G, page 61	(4) 1/4"	1.09	1.09	5.63	5.75	1.09	5.63	14.5	15.5
						28	28	143	146	28	143		
3	8502, 8536	SEG	All	Diagram G, page 61	(4) 3/8"	1.53	1.53	8.38	7.75	1.53	8.38	34	37
						39	39	213	197	39	213		
4	8502, 8536	SFG	All	Diagram H, page 61	(4) 7/16"	22.31	1.44	0.44	—	—	—	52	56
						567	37	11	—	—	—		
5	8502, 8536	SGG	All	Diagram H, page 61	(4) 9/16"	40.00	2.13	0.56	—	—	—	143	160
						1016	54	14	—	—	—		
6	8502, 8536	SHG	All	Diagram I, page 61	(4) 11/16"	2.31	5.50	—	—	—	—	226	231
						59	140	—	—	—	—		
7	8502, 8536	SJG	All	Diagram I, page 61	—	Floor Mounting						—	—
						Floor Mounting						—	—

Table 50 - NEMA 1—General Purpose Enclosure with Form FF4T Dimensions

NEMA Size	Classes	Type	Number of poles	Figure	Manufacturing screws	Dimensions, in./mm (For additional dimensions information, see NEMA 1 General Purpose Enclosure Dimensional Diagrams, page 61.)									
						A	B	C		D	E	F	G	H	I
								8502	8536						
0	8502, 8536	SBG	All	Diagram J, page 61	(4) 9/32	6.34	15.88	5.00	5.19	4.66	0.84	14.38	0.75	0.28	—
1	8502, 8536	SCG	All	Diagram J, page 61	(4) 9/32	161	403	127	132	118	21	365	19	7	—
2	8502, 8536	SDG	All	Diagram K, page 61	(4) 5/16	14.8-8 378	14.13 359	7.56 192	7.66 195	12.75 324	1.06 27	1.06 27	12.00 305	1.06 27	0.31 8
3	8502, 8536	SEG	2-3	Diagram G, page 61	(4) 3/8	Same as Standard NEMA 1 Dimensions, see above.									
4	8502, 8536	SFG	2-3	Diagram K, page 61	(4) 3/8	18.1-6 461	29.16 741	9.25 235	9.25 235	15.50 394	1.33 34	1.33 34	26.50 673	1.33 34	0.44 11
5	8502, 8536	SGG	All	Diagram K, page 61	(4) 9/16	Same as Standard NEMA 1 Dimensions, see above.									
6	8502, 8536	SHG	All	Diagram I, page 61	(4) 11/16	Form FF4T is supplied as standard. Refer to Replacement Control Transformers Size 6, Type SH and Size 7, Type SJ, page 32.									
7	8502, 8536	SJG	All	Diagram I, page 61	—										

NEMA 1 General Purpose Enclosure Dimensional Diagrams

Figure 12 - Diagram G

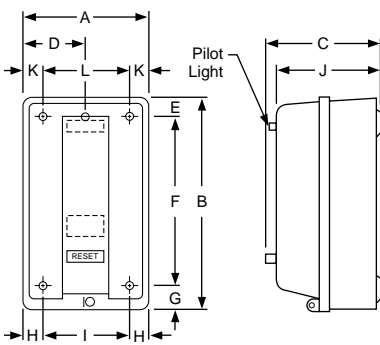


Figure 13 - Diagram H

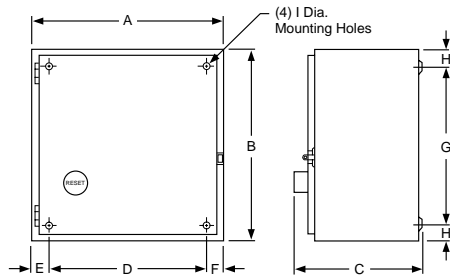


Figure 14 - Diagram I

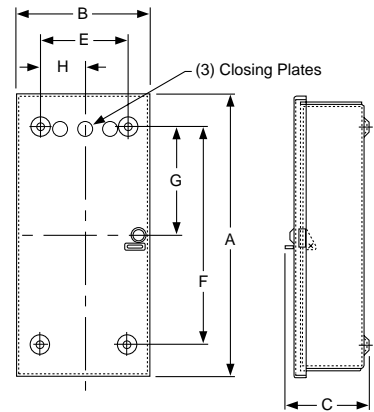


Figure 15 - Diagram J

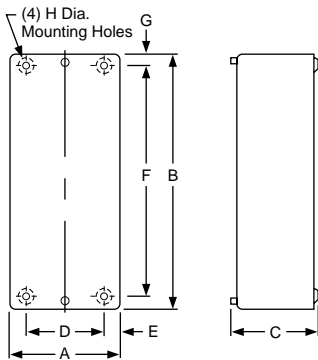
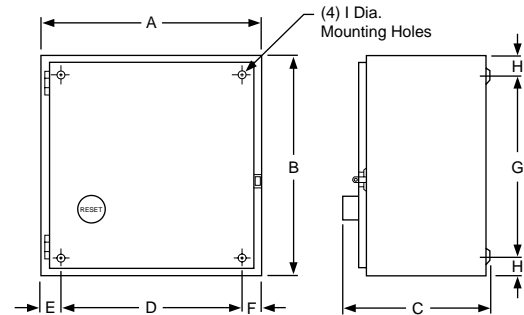


Figure 16 - Diagram K



NEMA 4 and 4X Dimensions

Table 51 - NEMA Type 4 & 4X—Stainless Steel Watertight Enclosures^{97, 98}, Dimensions A–F

NEMA Size	Class	Type	Number of poles	Dimensions, in./mm (For additional dimensions information, see NEMA 4 and 4X Stainless Steel Watertight Enclosure Dimensional Diagram, page 64.)						W Bot- tom Only	X Top and Bot- tom	Weight (lb)	
				A	B	C	D	E	F			Class 8502	Class 8536
				0, 1	8502	SBW SCW	All	6.38 162	7.13 181			13.19 335	1.56 40
	8536	SBW SCW	All	6.38 162	7.81 198	13.19 335	1.56 40	3.25 83	12.00 305	—	18		
2	8502	SDW	All	8.13 207	7.88 200	16.19 411	1.56 40	5.00 127	15.00 381	3/4" Dia. Hub	1.5" Dia. Hub	24	—
	8536			8.13 207	8.56 217	16.19 411	1.56 40	5.00 127	15.00 381			—	25
3, 4	8502	SEW	All	18.16 461	8.75 222	32.22 818	3.08 78	12.00 305	30.50 775	3/4" Dia. Hub	2.5" Dia. Hub	65	—
		SFW		69	—								

97. Size 6 and 7 are sheet steel enclosures and are rated NEMA 4 only.
 98. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

Table 51 - NEMA Type 4 & 4X—Stainless Steel Watertight Enclosures⁵¹ - ⁵¹ - , Dimensions A–F (Continued)

NEMA Size	Class	Type	Number of poles	Dimensions, in./mm (For additional dimensions information, see NEMA 4 and 4X Stainless Steel Watertight Enclosure Dimensional Diagram, page 64.)						W Bot-tom Only	X Top and Bot-tom	Weight (lb)	
				A	B	C	D	E	F			Class 8502	Class 8536
	8536	SEW	All	18.16	9.56	32.22	3.08	12.00	30.50	3/4" Dia. Hub	2.5" Dia. Hub	—	68
		SFW		461	243	818	78	305	775			—	73
5	8502, 8536	SGW	All	17.22	12.63	47.22	4.13	9.00	46.00	3/4" Dia. Hub	3.5" Dia. Hub	159	176
6 ⁹⁹	8502, 8536	SHW	All	20.22	12.13	65.22	4.13	12.00	64.00	3/4" Dia. Hub	(2) 3" Dia. Hub	227	232
7 ⁹⁹	8502, 8536	SJW	All	34.50	23.50	101.00	Floor Mounting				—	—	
				876	597	2565							

Table 52 - NEMA Type 4 & 4X—Stainless Steel Watertight Enclosures⁹⁹, ¹⁰⁰, Dimensions G–L

NEMA Size	Class	Type	Number of poles	Dimensions, in./mm (For additional dimensions information, see NEMA 4 and 4X Stainless Steel Watertight Enclosure Dimensional Diagram, page 64.)						W Bot-tom Only	X Top and Bot-tom	Weight (lb)	
				G	H	I	J	K	L			Class 8502	Class 8536
0, 1	8502	SBW	All	.59	1.19	11.78	1.63	2.31	.31	3/4" Dia. Hub	1" Dia. Hub	17	—
		SCW		15	30	299	41	59	8			—	18
	8536	SBW	All	.59	1.88	11.78	2.00	2.31	.31			—	18
		SCW		15	48	299	51	59	8			—	18
2	8502	SDW	All	1.09	1.94	14.75	2.00	2.63	.31	1.5" Dia. Hub	1.5" Dia. Hub	24	—
				28	49	375	51	67	8			—	25
	8536		All	1.09	2.88	14.75	2.56	3.19	.31			—	25
				28	73	375	65	81	8			—	25
3, 4	8502	SEW	All	.88	3.69	26.72	2.56	3.19	.44	3/4" Dia. Hub	2.5" Dia. Hub	65	—
		SFW		22	94	679	65	81	11			69	—
	8536	SEW		.88	4.50	26.72	2.56	3.19	.44			—	68
		SFW		22	114	679	65	81	11			—	73
5	8502, 8536	SGW	All	.63	4.59	28.31	3.13	5.75	.56	3/4" Dia. Hub	3.5" Dia. Hub	159	176
6 ⁹⁹	8502, 8536	SHW	All	.63	4.59	30.81	2.69	4.50	.56	3/4" Dia. Hub	(2) 3" Dia. Hub	227	232
7 ⁹⁹	8502, 8536	SJW	All	Floor Mounting						—	—		

99. Size 6 and 7 are sheet steel enclosures and are rated NEMA 4 only.

100. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

Table 53 - NEMA Type 4 & 4X—Stainless Steel Watertight Enclosures with Form FF4T ¹⁰¹, ¹⁰², Dimensions A–F

NEMA Size	Class	Type	Number of poles	Dimensions, in./mm (For additional dimensions information, see NEMA 4 and 4X Stainless Steel Watertight Enclosure Dimensional Diagram, page 64.)						W Bottom Only	X Top and Bottom
				A	B	C	D	E	F		
0, 1	8502	SBW	All	12.63	7.13	14.69	2.56	7.50	13.50	0.75	1
		SCW		321	181	373	65	191	343		
	8536	SBW	All	12.63	7.81	14.69	2.56	7.50	13.50	0.75	1
		SCW		321	198	373	65	191	343		
2	8502	SDW	All	14.88	7.56	16.31	2.56	9.75	15.00	0.75	1.5
				378	192	414	65	248	381		
	8536			14.88	8.25	16.31	2.56	9.75	15.00	0.75	1.5
				378	210	414	65	248	381		
3, 4	8502	SEW	2–3	Same as Standard NEMA 4 dimensions—see above.							
		SFW									
	8536	SEW	2–3	Same as Standard NEMA 4 dimensions—see above.							
		SFW									
5	8502, 8536	SGW	All	Same as Standard NEMA 4 dimensions—see above.							
6 ¹⁰¹	8502, 8536	SHW	All	Form FF4T is supplied as standard. Refer to Replacement Control Transformers Size 6, Type SH and Size 7, Type SJ, page 32.							
7 ¹⁰¹	8502, 8536	SJW	All								

Table 54 - NEMA Type 4 & 4X—Stainless Steel Watertight Enclosures with Form FF4T ¹⁰¹, ¹⁰², Dimensions G–L

NEMA Size	Class	Type	No. of Poles	Dimensions, in./mm (For additional dimensions information, see NEMA 4 and 4X Stainless Steel Watertight Enclosure Dimensional Diagram, page 64.)						W Bottom Only	X Top and Bottom
				G	H	I	J	K	L		
0, 1	8502	SBW	All	0.59	3.19	18.41	1.66	2.31	0.31	0.75	1
		SCW		15	81	468	42	59	8		
	8536	SBW	All	0.59	3.88	18.41	1.66	2.31	0.31	0.75	1
		SCW		15	99	468	42	59	8		
2	8502	SDW	All	0.66	3.19	20.88	2.00	2.63	0.31	0.75	1.5
				17	81	530	51	67	8		
	8536			0.66	3.88	20.88	2.00	2.63	0.31	0.75	1.5
				17	99	530	51	67	8		
3, 4	8502	SEW	2–3	Same as Standard NEMA 4 dimensions—see above.							
		SFW									
	8536	SEW	2–3	Same as Standard NEMA 4 dimensions—see above.							
		SFW									
5	8502, 8536	SGW	All	Same as Standard NEMA 4 dimensions—see above.							
6 ¹⁰¹	8502, 8536	SHW	All	Form FF4T is supplied as standard. Refer to Replacement Control Transformers Size 6, Type SH and Size 7, Type SJ, page 32.							

101. Size 6 and 7 are sheet steel enclosures and are rated NEMA 4 only.

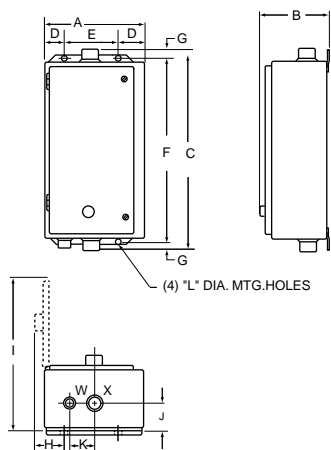
102. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

Table 54 - NEMA Type 4 & 4X—Stainless Steel Watertight Enclosures with Form FF4T⁵⁴ - ,⁵⁴ - , Dimensions G-L (Continued)

NEMA Size	Class	Type	No. of Poles	Dimensions, in./mm (For additional dimensions information, see NEMA 4 and 4X Stainless Steel Watertight Enclosure Dimensional Diagram, page 64.)						W Bottom Only	X Top and Bottom
				G	H	I	J	K	L		
7 ¹⁰³	8502, 8536	SJW	All								

NEMA 4 and 4X Stainless Steel Watertight Enclosure Dimensional Diagram

Figure 17 -



103. Size 6 and 7 are sheet steel enclosures and are rated NEMA 4 only.

NEMA 4X Dimensions

Table 55 - NEMA 4X—Watertight and Corrosion Resistant Glass Polyester Enclosures, Dimensions A–F

NEMA Size	Class	Type	Number of poles	Figure	Dimensions, in./mm (For additional dimensions information, see NEMA 4X Watertight and Corrosion Resistant Glass Polyester Enclosure Dimensional Diagrams, page 66.)						Hub		Weight (lb)
					A	B	C	D	E	F	W Bot- tom Only	X Top and Bot- tom	
0–1	8502, 8536	SBW SCW	All	Diagram L, page 66	6.50	6.44	12.13	0.75	5.00	8.75	0.75	1	17
					165	164	308	19	127	222			
2	8502, 8536	SDW	All	Diagram L, page 66	8.50	7.06	13.88	0.75	7.00	10.50	0.75	1.5	22
					216	179	353	19	179	267			

Table 56 - NEMA 4X—Watertight and Corrosion Resistant Glass Polyester Enclosures, Dimensions G–L

NEMA Size	Class	Type	Number of poles	Figure	Dimensions, in./mm (For additional dimensions information, see NEMA 4X Watertight and Corrosion Resistant Glass Polyester Enclosure Dimensional Diagrams, page 66.)						Hub		Weight (lb)
					G	H	I	J	K	L	W Bot- tom Only	X Top and Bot- tom	
0–1	8502, 8536	SBW SCW	All	Diagram L, page 66	1.69	3.34	10.06	1.31	2.13	0.31	0.75	1	17
					43	85	256	33	54	8			
2	8502, 8536	SDW	All	Diagram L, page 66	1.69	3.91	11.94	1.63	2.38	0.31	0.75	1.5	22
					43	99	303	41	60	8			

Table 57 - NEMA 4X—Watertight and Corrosion Resistant Glass Polyester Enclosures with Form FF4T, Dimensions A–F

NEMA Size	Class	Type	Number of poles	Figure	Dimensions, in./mm (For additional dimensions information, see NEMA 4X Watertight and Corrosion Resistant Glass Polyester Enclosure Dimensional Diagrams, page 66.)						Hub		Weight (lb)
					A	B	C	D	E	F	W Bot- tom Only	X Top and Bot- tom	
0–2	8502, 8536	SBW SCW SDW	All	Diagram M, page 66	16.88	9.78	22.75	—	10.13	21.50	—	—	—
					429	248	578	—	257	546			
3–4	8502, 8536	SEW SFW	All	Diagram M, page 66	25.81	11.94	33.50	—	18.50	32.25	—	—	—
					656	303	851	—	470	819			

Table 58 - NEMA 4X—Watertight and Corrosion Resistant Glass Polyester Enclosures with Form FF4T, Dimensions G–L

NEMA Size	Class	Type	Number of poles	Figure	Dimensions, in./mm (For additional dimensions information, see NEMA 4X Watertight and Corrosion Resistant Glass Polyester Enclosure Dimensional Diagrams, page 66.)						Hub		Weight (lb)
					G	H	I	J	K	L	W Bottom Only	X Top and Bottom	
3–4	8502, 8536	SEW SFW	All	Diagram M, page 66	—	—	—	—	—	—	—	—	

NEMA 4X Watertight and Corrosion Resistant Glass Polyester Enclosure Dimensional Diagrams

Figure 18 - Diagram L

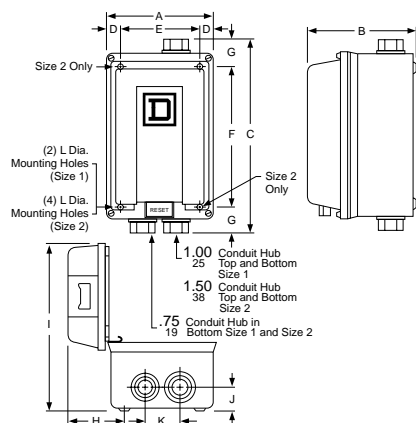
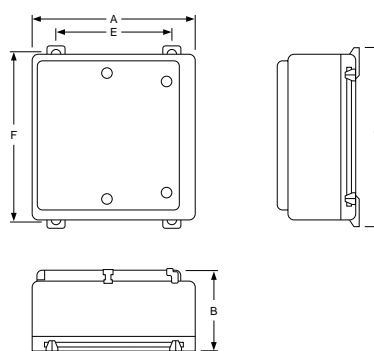


Figure 19 - Diagram M



NEMA 12/3R Dimensions

Table 59 - NEMA 12/3R—Dusttight Enclosure, Dimensions A–E

NEMA	Class	Type	Number of poles	Dimensions, in./mm (For additional dimensions information, see NEMA 12/3R Dimensional Diagrams, page 68.)					Weight (lb)	
				A	B	C	D	E	8502	8536
0	8502, 8536	SBA	All	6.38	8.53	12.75	1.56	3.25	15	16
1		SCA		162	217	324	40	83		
2	8502, 8536	SDA	All	8.13	9.28	16.00	1.56	5.00	22	23
3	8502, 8536	SEA	All	18.16	9.56	31.50	3.08	12.00	65	68
4		SFA		461	243	800	78	305		
5	8502, 8536	SGA	All	17.22	13.44	47.00	4.13	9.00	160	177
6	8502, 8536	SHA	All	20.22	13.00	65.00	4.13	12.00	228	233
7	8502, 8536	SJA	All	34.50	23.50	93.00	Floor Mounting		—	—

Table 60 - NEMA 12/3R—Dusttight Enclosure, Dimensions F–J

NEMA	Class	Type	Number of poles	Dimensions, in./mm (For additional dimensions information, see NEMA 12/3R Dimensional Diagrams, page 68.)					Weight (lb)	
				F	G	H	I	J	8502	8536
0	8502, 8536	SBA	All	12.00 305	0.38 10	3.56 90	12.25 311	0.31 8	15	16
1		SCA								
2	8502, 8536	SDA	All	15.00 381	0.50 13	3.56 90	15.38 391	0.31 8	22	23
3	8502, 8536	SEA	All	30.50 775	0.50 13	4.50 114	26.72 679	0.44 11	65	68
4		SFA							69	73
5	8502, 8536	SGA	All	46.00 1168	0.50 13	5.41 137	28.31 719	0.56 14	160	177
6	8502, 8536	SHA	All	64.00 1626	0.50 13	6.44 164	30.88 784	0.69 18	228	233
7	8502, 8536	SJA	All	Floor Mounting					—	—

Table 61 - NEMA 12/3R—Dusttight Enclosure with Form FF4T

NEMA	Class	Type	Number of poles	Dimensions, in./mm (For additional dimensions information, see NEMA 12/3R Dimensional Diagrams, page 68.)									
				A	B	C	D	E	F	G	H	I	J
0	8502, 8536	SBA	All	11.88 302	8.00 203	13.50 343	2.81 71	6.75 171	12.75 324	0.38 10	3.91 99	18.38 467	0.31 8
1		SCA											
2	8502, 8536	SDA	All	14.88 378	8.13 207	16.00 406	2.56 65	9.75 248	15.00 381	0.38 10	3.66 93	21.50 546	0.31 8
3	8502, 8536	SEA	2–3	Same as Standard NEMA Type 12 dimensions, see above.									
4		SFA											
5	8502, 8536	SGA	All	Form FF4T is supplied as standard. Refer to Replacement Control Transformers Size 6, Type SH and Size 7, Type SJ , page 32.									
6	8502, 8536	SHA	All										
7	8502, 8536	SJA	All										

Table 62 - NEMA 3R—Rainproof and Sleet Resistant Enclosures, Dimensions A–G

NEMA	Class	Type	Number of poles	Dimensions, in./mm (For additional dimensions information, see NEMA 12/3R Dimensional Diagrams, page 68.)										
				A	B	C	D1	D2	E	F	G1	G2	K.O. X	K.O. Y
0, 1	8502, 8536	SBH, SCH	All	8.84 225	12.28 312	7.13 181	1.38 35	1.44 37	6.00 152	7.50 191	2.59 66	2.19 56	1/2 3/4 1	1/2 3/4 1
2	8502, 8536	SDH	All	9.84 250	16.28 414	8.63 219	1.38 35	1.44 37	7.00 178	11.50 292	2.59 66	2.19 56	1 1-1/4 1-1/2	1/2 3/4
3	8502, 8536	SEH	All	12.84 326	25.28 642	8.63 219	1.38 35	1.44 37	10.00 254	20.50 521	2.59 66	2.19 56	1 1-1/4 2 2-1/2	1/2 3/4
4	8502, 8536	SFH	All	12.84 326	40.28 1023	9.13 232	1.38 35	1.44 37	10.00 254	35.50 902	2.59 66	2.19 56	1 1-1/4 2 2-1/2	1/2 3/4

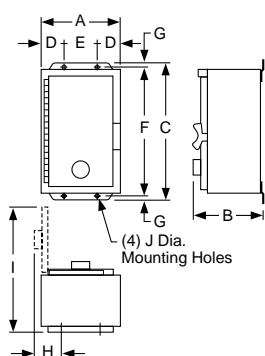
Table 63 - NEMA 3R—Rainproof and Sleet Resistant Enclosures, Dimensions H–P

NEMA	Class	Type	Number of poles	Dimensions, in./mm (For additional dimensions information, see NEMA 12/3R Dimensional Diagrams, page 68.)									
				H1	H1	J	K	L	M	N	P	K.O. X	K.O. Y
0, 1	8502, 8536	SBH, SCH	All	2.06 52	2.63 67	14.28 363	1.38 35	1.38 35	1.88 48	4.38 111	1.84 47	1/2 3/4 1	1/2 3/4 1
2	8502, 8536	SDH	All	2.06 52	2.63 67	16.78 426	1.31 33	1.75 44	2.13 54	4.88 124	1.84 47	1 1-1/4 1-1/2	1/2 3/4
3	8502, 8536	SEH	All	2.06 52	2.63 67	19.78 502	1.31 33	1.94 49	2.44 62	6.38 162	1.84 47	1 1-1/4 2 2-1/2	1/2 3/4
4	8502, 8536	SFH	All	2.06 52	2.63 67	20.28 515	1.31 33	2.31 59	2.69 68	6.38 162	1.84 47	1 1-1/4 2 2-1/2	1/2 3/4

NEMA 12/3R Dimensional Diagrams

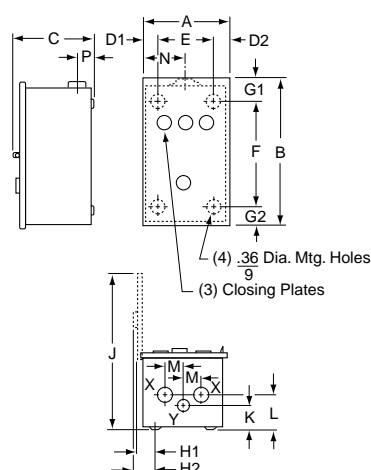
Industrial Use Enclosure

Figure 20 - NEMA 12/3R (with or without Form FF4T)



Outdoor Use Enclosure

Figure 21 - NEMA 3R



Class 8702/8736 Type S Approximate Dimensions, Shipping Weights

Reversing, Open Style Dimensions

Table 64 - Open Style—2 or 3-Pole Only, Dimensions A–G

Class	NEMA Size	Type	Mounting	Figure	Dimensions, in./mm (For additional dimensions information, see Open Style, Reversing, Dimensional Diagrams, page 72.)							Weight (lb)
					A	B	C	D	E	F	G	
8702	00	SAO	Horizontal	Diagram A, page 72	7.13 181	5.00 127	5.31 135	—	—	3.41 87	0.47 12	12
	0	SBO	Horizontal	Diagram A, page 72	7.13 181	5.00 127	5.31 135	—	—	3.41 87	.47 12	12
	1	SCO	Vertical	Diagram A, page 72 ¹⁰⁴	5.41 137	9.22 234	5.31 135	5.03 128	0.22 6	—	0.61 15	12
	2	SDO	Horizontal	Diagram A, page 72	9.00 229	6.88 175	6.03 153	—	—	4.50 114	0.38 10	16
			Vertical	Diagram A, page 72 ¹⁰⁴	6.75 171	11.38 289	6.03 153	6.25 159	0.25 6	—	0.50 13	16
	3	SEO	Horizontal	Diagram A, page 72	12.72 323	7.97 202	7.00 178	11.75 298	0.48 12	—	0.48 12	35
			Vertical	Diagram A, page 72 ¹⁰⁴	7.20 183	19.00 483	7.00 178	6.25 159	0.48 12	—	1.02 26	35
	4	SFO	Horizontal	Diagram A, page 72	14.25 362	11.69 297	7.00 178	13.25 337	.50 13	—	0.50 13	45
			Vertical	Diagram A, page 72 ¹⁰⁴	7.97 202	23.91 607	7.00 178	7.00 178	0.48 12	—	1.81 46	45
	5	SGO	Horizontal	Diagram A, page 72	19.31 490	16.19 411	9.38 238	18.00 457	0.66 17	—	1.03 26	98
Vertical			Diagram A, page 72 ¹⁰⁴	10.75 273	34.41 874	9.38 238	9.50 241	0.63 16	—	1.25 32	98	
6	SHO	Horizontal	Diagram A, page 72	22.38 568	28.05 712	9.52 242	18.00 457	0.77 20	—	3.83 97	195	
7	SJO	Horizontal	Diagram A, page 72	24.25 616	37.25 946	13.81 351	19.75 502	1.52 39	—	—	310	

104. The design of the vertical style differs from that of the corresponding horizontal style shown, but the dimensions apply.

Table 64 - Open Style—2 or 3-Pole Only, Dimensions A–G (Continued)

Class	NEMA Size	Type	Mounting	Figure	Dimensions, in./mm (For additional dimensions information, see Open Style, Reversing, Dimensional Diagrams, page 72.)							Weight (lb)
					A	B	C	D	E	F	G	
8736	00	SAO	Horizontal	Diagram B, page 72	7.13 181	6.91 176	5.31 135	—	—	3.41 87	0.47 12	13
	0	SBO	Horizontal	Diagram B, page 72	7.13 181	6.91 176	5.31 135	—	—	3.41 87	0.47 12	13
	1	SCO	Vertical	Diagram B, page 72 ¹⁰⁵	5.41 137	11.52 293	5.31 135	5.03 128	0.22 6	—	0.61 15	13
	2	SDO	Horizontal	Diagram B, page 72	9.00 229	8.50 216	6.03 153	—	—	4.50 114	0.38 10	18
			Vertical	Diagram B, page 72 ¹⁰⁵	6.75 171	13.48 342	6.03 153	6.25 159	0.25 6	—	0.78 20	18
	3	SEO	Horizontal	Diagram B, page 72	12.72 323	11.72 298	7.00 178	11.75 298	0.48 12	—	0.48 12	38
			Vertical	Diagram B, page 72 ¹⁰⁵	7.31 186	22.25 565	7.00 178	6.25 159	0.48 12	—	1.02 26	38
	4	SFO	Horizontal	Diagram B, page 72	14.25 362	14.59 371	7.00 178	13.25 337	0.50 13	—	1.84 47	48
			Vertical	Diagram B, page 72 ¹⁰⁵	7.97 202	26.81 681	7.00 178	7.00 178	0.48 12	—	1.84 47	48
	5	SGO	Horizontal	Diagram B, page 72	19.31 490	20.91 531	9.38 238	18.00 457	0.66 17	—	1.28 33	115
Vertical			Diagram B, page 72 ¹⁰⁵	10.75 273	39.16 995	9.38 238	9.50 241	0.66 17	—	1.28 33	115	
6	SHO	Horizontal	Diagram B, page 72	22.38 568	28.05 712	9.52 242	18.00 457	.77 20	—	3.83 97	200	
7	SJO	Horizontal	Diagram A, page 72	24.25 616	37.25 946	13.81 351	19.75 502	1.52 39	—	—	315	

105. The design of the vertical style differs from that of the corresponding horizontal style shown, but the dimensions apply.

Table 65 - Open Style—2 or 3-Pole Only, Dimensions H–M

Class	NEMA Size	Type	Mounting	Figure	Dimensions, in./mm (For additional dimensions information, see Open Style, Reversing, Dimensional Diagrams, page 72.)						Weight (lb)
					H	I	J	K	L	M	
8702	00	SAO	Horizontal	Diagram A, page 72	4.34 110	0.19 5	5.50 140	0.91 23	—	—	12
	0	SBO	Horizontal	Diagram A, page 72	4.34 110	.19 5	5.50 140	0.91 23	—	—	12
			Vertical	Diagram A, page 72 ¹⁰⁶	8.00 203	0.61 15	5.03 128	0.22 6	—	—	12
	2	SDO	Horizontal	Diagram A, page 72	5.63 143	0.25 6	6.00 152	1.50 38	—	—	16
			Vertical	Diagram A, page 72 ¹⁰⁶	10.38 264	0.50 13	6.25 159	0.25 6	—	—	16
	3	SEO	Horizontal	Diagram A, page 72	7.00 178	0.48 12	11.75 298	0.48 12	—	—	35
			Vertical	Diagram A, page 72 ¹⁰⁶	17.00 432	0.98 25	6.25 159	0.48 12	—	—	35
	4	SFO	Horizontal	Diagram A, page 72	8.00 203	1.84 47	13.25 337	0.50 13	—	—	45
			Vertical	Diagram A, page 72 ¹⁰⁶	20.25 514	1.19 30	7.00 178	0.48 12	—	—	45
	5	SGO	Horizontal	Diagram A, page 72	14.00 356	1.16 29	18.00 457	0.66 17	—	—	98
			Vertical	Diagram A, page 72 ¹⁰⁶	32.00 813	1.16 29	9.50 241	0.63 16	—	—	98
	6	SHO	Horizontal	Diagram A, page 72	21.19 538	3.03 77	18.00 457	0.77 20	—	—	195
	7	SJO	Horizontal	Diagram A, page 72	30.00 762	—	—	—	—	—	310

106. The design of the vertical style differs from that of the corresponding horizontal style shown, but the dimensions apply.

Table 65 - Open Style—2 or 3-Pole Only, Dimensions H–M (Continued)

Class	NEMA Size	Type	Mounting	Figure	Dimensions, in./mm (For additional dimensions information, see <i>Open Style, Reversing, Dimensional Diagrams</i> , page 72.)						Weight (lb)
					H	I	J	K	L	M	
8736	00	SAO	Horizontal	Diagram A, page 72	4.34 110	6.22 158	4.53 115	5.06 129	0.66 17	—	13
	0	SBO	Horizontal	Diagram A, page 72	4.34 110	6.22 158	4.53 115	5.06 129	0.66 17	—	13
	1	SCO	Vertical	Diagram B, page 72 ¹⁰⁷	8.00 203	10.70 272	2.52 64	5.06 129	0.22 6	5.03 128	13
	2	SDO	Horizontal	Diagram B, page 72	5.63 143	7.50 191	5.00 127	5.16 131	1.50 38	—	18
			Vertical	Diagram B, page 72 ¹⁰⁷	10.38 264	12.97 329	3.13 80	5.16 131	0.25 6	6.00 152	18
	3	SEO	Horizontal	Diagram B, page 72	10.75 273	10.75 273	11.75 298	6.25 159	0.48 12	11.75 298	38
			Vertical	Diagram B, page 72 ¹⁰⁷	20.75 527	—	6.25 159	6.25 159	0.48 12	6.25 159	38
	4	SFO	Horizontal	Diagram B, page 72	12.25 311	12.25 311	13.25 337	6.25 159	0.50 13	13.25 337	48
			Vertical	Diagram B, page 72 ¹⁰⁷	24.50 622	—	4.05 103	6.25 159	0.48 12	7.00 178	48
	5	SGO	Horizontal	Diagram B, page 72	19.00 483	19.00 483	18.00 457	6.63 168	0.63 16	18.00 457	115
Vertical			Diagram B, page 72 ¹⁰⁷	37.25 946	37.25 946	9.50 241	6.63 168	.63 16	9.50 241	115	
6	SHO	Horizontal	Diagram B, page 72	21.19 538	3.03 77	18.00 457	0.77 20	—	—	200	
7	SJO	Horizontal	Diagram A, page 72	30.00 762	—	—	—	—	—	315	

Open Style, Reversing, Dimensional Diagrams

Figure 22 - Diagram A

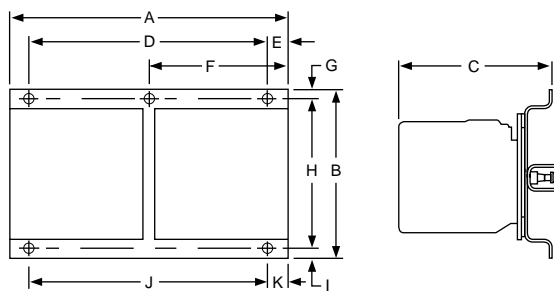
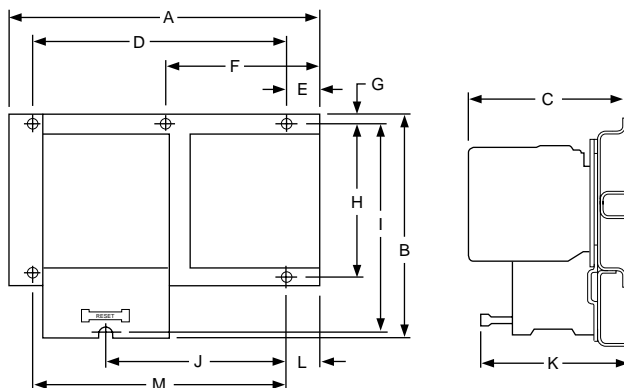


Figure 23 - Diagram B



107. The design of the vertical style differs from that of the corresponding horizontal style shown, but the dimensions apply.

Reversing, NEMA 1, 4, and 12 Dimensions

Table 66 - NEMA Type 1 Dimensions

NEMA Size	Class	Figure	Dimensions, in./mm (For additional dimensions information, see NEMA 1, 4, and 12, Reversing, Dimensional Diagrams, page 75.)										Weight (lb)	
			A	B	C		D	E	F	G	H	I	87-02	8736
					8702	8736								
00, 0 ¹⁰⁸ 1 ¹⁰⁸	8702, 8736	Diagram C, page 75	11.88 302	11.88 302	7.41 188	7.53 191	9.75 248	1.06 27	1.06 27	9.75 248	1.06 27	0.31 8	16	17
2 ¹⁰⁸	8702, 8736	Diagram C, page 75	14.88 378	14.13 359	7.56 192	7.66 195	12.7 5324	1.06 27	1.06 27	12.00 305	1.06 27	0.31 8	24	25
3 ¹⁰⁹ 4 ¹⁰⁹	8702, 8736	Diagram C, page 75	18.16 461	29.16 741	9.25 235	9.25 235	15.50 394	1.33 34	1.33 34	26.50 673	1.33 34	0.44 11	95	98
5	8702, 8736	Diagram C, page 75	35.22 895	46.22 1174	12.81 325	12.93 328	31.00 787	2.11 54	2.11 54	42.00 1067	2.11 54	0.56 14	298	315
6	8702, 8736	Diagram D, page 75	36.22 920	62.22 1580	19.47 495	19.47 495	Floor Mounting					400	405	
7	8702, 8736	Diagram D, page 75	34.50 876	93.00 2362	23.50 597	23.50 597						—	—	

Table 67 - NEMA Type 4 and 4X—Stainless Steel¹¹⁰ Dimensions A—F

NEMA Size	Class	Figure	Dimensions, in./mm (For additional dimensions information, see NEMA 1, 4, and 12, Reversing, Dimensional Diagrams, page 75.)						Hub Dia.		Weight (lb)	
			A	B	C	D	E	F	W Bottom Only	X Top and Bottom	8702	8736
0 ¹¹¹ 1 ¹¹¹	8702, 8736	Diagram E, page 75	12.63 321	7.81 198	14.69 373	2.56 65	7.50 191	13.50 343	3/4	1	25	26
2 ¹¹¹	8702, 8736	Diagram E, page 75	14.88 378	8.25 210	15.75 400	12.56 319	9.75 248	15.00 381	3/4	1-1/2	33	35
3 ¹¹¹ 4 ¹¹¹	8702	Diagram E, page 75	18.16 461	8.75 222	32.22 818	3.08 78	12.00 305	30.50 775	3/4	2-1/2	96	—
	8736	Diagram E, page 75	18.16 461	9.56 243	32.22 818	3.08 78	12.00 305	30.50 775	3/4	2-1/2	—	99
5	8702	Diagram E, page 75	35.22 895	12.13 308	49.22 1250	4.11 104	27.00 686	48.00 1219	3/4	3-1/2	300	—
	8736	Diagram E, page 75	35.22 895	12.94 329	49.22 1250	4.11 104	27.00 686	48.00 1219	3/4	3-1/2	—	317
6 ¹¹¹	8702, 8736	Diagram D, page 75	36.22 920	70.13 1781	19.47 495	Floor Mounting					500	505
7 ¹¹¹	8702, 8736	Diagram D, page 75	34.50 876	101.00 2565	23.50 597						—	—

108. Standard enclosure has space for a fused control transformer, Form FF4T, on Sizes 0-2, except for Size 0 & 1 4-Pole.

109. 3-Pole only.

110. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

111. Size 6 & 7 are sheet steel enclosures and are rated NEMA Type 4 only.

Table 68 - NEMA Type 4 and 4X—Stainless Steel¹¹² Dimensions G-L

NEMA Size	Class	Figure	Dimensions, in./mm (For additional dimensions information, see NEMA 1, 4, and 12, Reversing, Dimensional Diagrams, page 75.)						Hub Dia.		Weight (lb)	
			G	H	I	J	K	L	W Bottom Only	X Top and Bottom	8702	8736
0 ¹¹³ 1 ¹¹³	8702, 8736	Diagram E, page 75	0.59 15	3.88 99	18.41 468	1.66 42	2.31 59	0.31 8	3/4	1	8702	26
2 ¹¹³	8702, 8736	Diagram E, page 75	0.38 10	3.88 99	20.88 530	1.72 44	2.63 67	0.31 8	3/4	1-1/2	25	35
3 ¹¹³ 4 ¹¹³	8702 8736	Diagram E, page 75 Diagram E, page 75	0.88 22	3.69 94	26.72 679	2.56 65	3.19 81	0.44 11	3/4	2-1/2	33	—
5	8702 8736	Diagram E, page 75 Diagram E, page 75	0.63 16	4.59 117	45.81 1164	2.97 75	3.50 89	0.56 14	3/4	3-1/2	—	—
6 ¹¹³ 7 ¹¹³	8702, 8736	Diagram D, page 75 Diagram D, page 75	Floor Mounting						—	—	505	—

112. Stainless steel enclosures are shipped with hubs installed in the top and bottom of the enclosure.

113. Size 6 & 7 are sheet steel enclosures and are rated NEMA Type 4 only.

Table 69 - NEMA Type 12/ 3R Dimensions

NEMA Size	Class	Figure	Dimensions, in./mm (For additional dimensions information, see NEMA 1, 4, and 12, Reversing, Dimensional Diagrams, page 75.)										Weight (lb)	
			A	B	C	D	E	F	G	H	I	J	8702	8736
0 ¹¹⁴ 1 ¹¹⁴	8702, 8736	Diagram F, page 75	11.88 302	7.75 197	13.75 349	2.56 65	6.75 171	12.75 324	0.50 13	3.66 93	18.13 461	0.31 8	23	24
2 ¹¹⁴	8702, 8736	Diagram F, page 75	14.88 378	7.88 200	16.00 406	2.56 65	9.75 248	15.00 381	.50 13	3.66 93	21.25 540	0.31 8	31	32
3 ¹¹⁴ 4 ¹¹⁴	8702	Diagram F, page 75	18.16 461	9.25 235	31.50 800	3.08 78	12.00 305	30.50 775	0.50 13	3.69 93	26.72 679	0.44 11	96	—
	8736	Diagram F, page 75	18.16 461	9.56 243	31.50 800	3.08 78	12.00 305	30.50 775	0.50 13	4.50 114	26.72 679	0.44 11	—	99
5	8702	Diagram F, page 75	35.22 895	13.13 334	49.00 1245	4.13 105	27.00 686	48.00 1219	0.50 13	5.31 135	45.88 1165	0.56 14	302	—
	8736	Diagram F, page 75	35.22 895	13.94 354	49.00 1245	4.13 105	27.00 686	48.00 1219	0.50 13	6.13 156	45.88 1165	0.56 14	—	319
6	8702, 8736	Diagram D, page 75	36.22 920	62.22 1580	19.47 495	Floor Mounting						490	495	
7	8702, 8736	Diagram D, page 75	34.50 876	93.00 2362	23.50 597							—	—	

NEMA 1, 4, and 12, Reversing, Dimensional Diagrams

Figure 24 - Diagram C

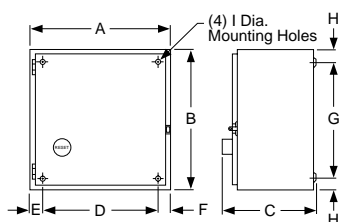


Figure 25 - Diagram D

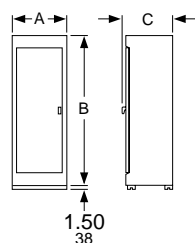


Figure 26 - Diagram E

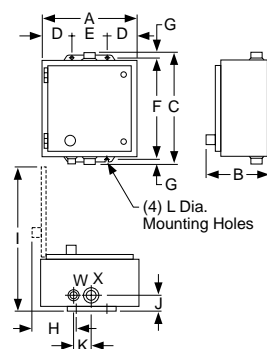
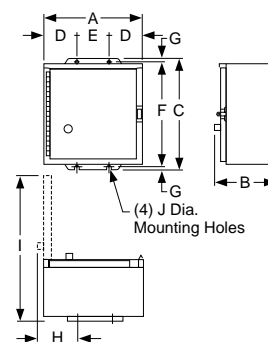


Figure 27 - Diagram F



114. Size 6 & 7 are sheet steel enclosures and are rated NEMA Type 4 only.

Full Voltage Vacuum Contactors and Starters

Class 8502 Type W Vacuum Contactors

Application Data

Figure 28 - Vacuum Contactor, Class 8502 Type WF



File E78351

CCN NLDX2



LR75167, 75168

Class 3211-04

Table 70 - Electrical Ratings

Characteristic	Size 4	Size 5	Size 6
Maximum Motor hp at:			
200 V	40	75	150
230 V	50	100	200
380 V	75	150	300
460 V	100	200	400
575 V	100	200	400
3-Phase Capacitor Switching—KVAR			
230 V	40	80	160
460 V	80	160	320
575 V	100	200	400
Transformer Switching—KVA 3 Phase, 3-Pole Coil Data			
240 V	23	47	94
480 V	47	94	188
600 V	59	117	234
Coil Data			
Inrush VA	300	600	1450
Sealed VA	30	20	32
Sealed Watts	6	20	30
Pick-up Volts	70% of rated coil voltage		
Drop-out Volts	50% of rated coil voltage		
Pick-up Time (ms)	18-22	24-32	24-32
Drop-out Time (ms)	90-120	96-100	96-100
Additional Electrical Characteristics			
Number of Poles	3	3	3
Max. Voltage Rating	600	600	600

Table 70 - Electrical Ratings (Continued)

Characteristic	Size 4	Size 5	Size 6
Enclosed Ampere Rating	135	270	540
Max. Closing Current Max.	1600	3000	6000
Interrupting Current	1600	3000	6000
Short Time Current (RMS):			
• 1 second	2400	4500	9000
• 2 seconds	1600	3000	6000
Dielectric Strength, Volts Max. Allowable Interrupting Impulse Voltage, VA (1 x 40 ms)	5375	5375	5375

Table 71 - Auxiliary Contact Units

Class 8502 Devices	Maximum Auxiliary Contact Units
Size 4	3
Size 5	4
Size 6	4

Table 72 - Terminals

Size	Power Terminals Wire Range ¹¹⁵	Control Terminals Wire Range ¹¹⁵
4	12 – 4/0	16–12 AWG
5 ¹¹⁶	One 0 AWG – 500 kcmil per phase	16–12 AWG
6 ¹¹⁶	Two 0 AWG – 500 kcmil per phase	16–12 AWG

General Information

Class 8502 Type W non-reversing vacuum contactors are used to switch capacitors, transformers and electric motors where overload protection is separately provided. Type W vacuum contactors are designed for operation at 600 V, 50/60 Hz.

By design, these contactors are well suited for heavy-duty applications in harsh environments. The power contacts are sealed in ceramic tubes, called vacuum interrupters or vacuum bottles, where the air has been evacuated. Arc quenchers are not required because any arc formed between opening contacts is not sustained due to the presence of the vacuum. The arc is extinguished when the current crosses zero after the contacts are opened, therefore the arc typically does not survive more than one half cycle. There is one vacuum interrupter or bottle per pole, therefore a three pole contactor has three vacuum interrupters or bottles. The power contacts are not affected by ambient conditions or contamination. This provides for long life and reliable operation in harsh applications.

Auxiliary Contacts - Vacuum Contactors

An auxiliary contact block, Class 9999 Type WX11, with one normally-open contact and normally-closed contact is used with the Size 4, 5, and 6 vacuum contactors.

115. Power terminal lugs are not supplied on Size 5 and 6 contactors. The values in the table reflect those for the Size 5 and 6 lug kits, Class 9999 Type LUW5 and LUW6 respectively.
 116. Solid or stranded copper wire.

Auxiliary Contact Units - Vacuum Contactors

Auxiliary contact units can be added in the field. Auxiliary Contact Units, page 77 shows the maximum number of units that may be added to a given size contactor (in addition to the coil auxiliary contact).

NOTE: In Class 8502—Full Voltage, 3–Pole Vacuum Contactors, page 78, replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes listed in Coil Voltage Codes, page 6.

Table 73 - Class 8502—Full Voltage, 3–Pole Vacuum Contactors

NEMA Size	Enclosed Ampere Rating	Locked Rotor Current (A)	Motor Voltage	Max. Hp	Open Style
					Type
4	135	1080	200	40	WFO3●●●
			230	50	
			460	100	
			575	100	
5	270	2160	200	75	WGO3●●●
			230	100	
			460	200	
			575	200	
6	540	4320	200	150	WHO3●●●
			230	200	
			460	400	
			575	400	

Table 74 - Class 9998—Replacement Coils for Class 8502 and 8702 Vacuum Contactors (Includes Rectifier)

Size	Type	Poles	Class and Type	Suffix Number (Complete Coil Number Consists of Class and Type Followed by Suffix Number)			
				120 V 110 V	240 V 220 V	480 V 440 V	600 V 550 V
4	WF	3	9998WF	120	240	480	600
5	WG	3	9998WG				
6	WH	3	9998WH				

Table 75 - Class 9999—Vacuum Contactor Kits

Kit Description		For Use With		Class 9999 Type
		Type	Size	
Auxiliary Contacts, Non-Convertible 1-N.O. & 1-N.C. Isolated Contacts	WF, WG	4, 5	WX11	
	WH	6		
Coil Circuit Auxiliary Contacts	1-N.O. & 1-N.C. Isolated Contacts, Delayed Break 1-N.C. Isolated Contact	WF	4	WCX11
		WG, WH	5, 6	WLX01
Lug Kits (include 6 lugs)		WG	5	LUW5
		WH	6	LUW6

Altitude

The vacuum contactor is designed to tolerate normal barometric pressure variances up to 6600 ft above sea level. If the contactor is to be used above 6600 ft above sea level, please consult the factory.

Termination Means

The Size 4 vacuum contactor is supplied with line and load side lugs. The Size 5 and 6 vacuum contactors are supplied without line and load side lugs. Class 9999 Type LUW5 and LUW6 lug kits are available for the Size 5 and 6 contactors. These kits include six lugs and the necessary mounting hardware.

Dimensional Diagrams—Class 8502 Type W Vacuum Contactors

Figure 29 - Class 8502 Type WF

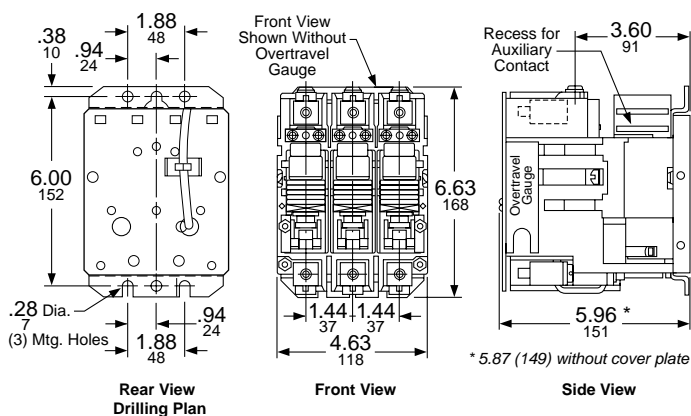


Figure 30 - Class 8502 Type WG

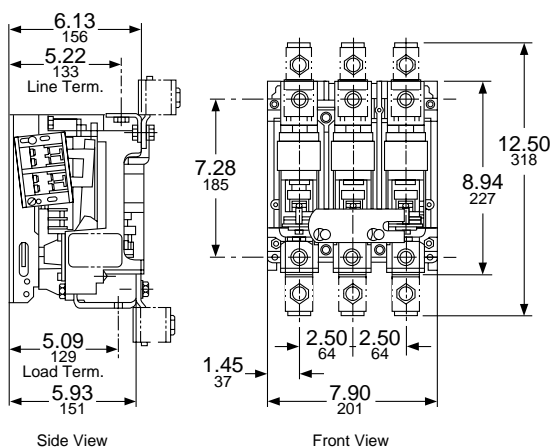
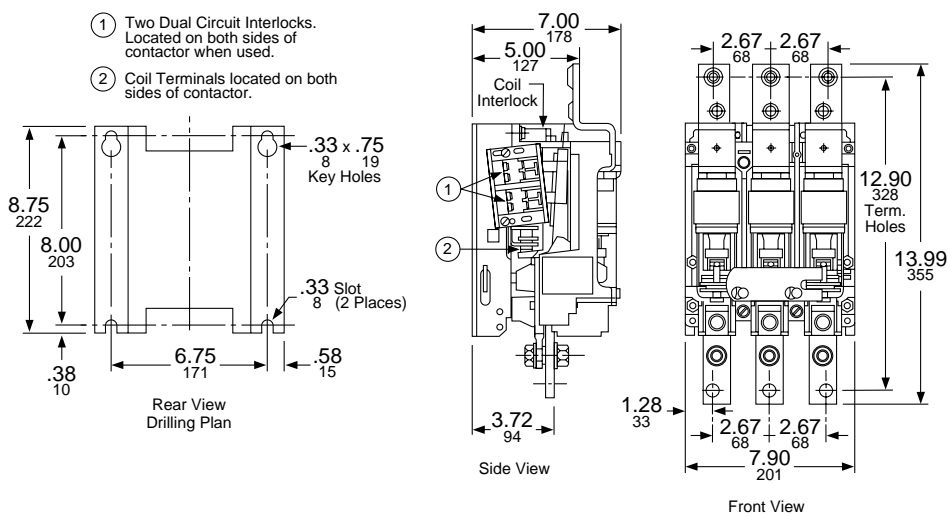


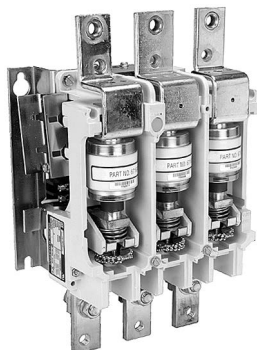
Figure 31 - Class 8502 Type WH



Class 8502 Type V Vacuum Contactors

General Information

Figure 32 - Class 8502 Type VF



The Class 8502 Type V vacuum contactor is a 3-pole device rated 1500 V that meets UL508 (1.5 kV) and CSA standards. Vacuum technology offers long life and low maintenance in a compact, lightweight design. The contactor is suitable for contaminated atmospheres because the main contacts are sealed in vacuum bottles. In addition, since gravity is not used to assist contactor operation, the Class 8502 contactor can be mounted in any plane without special modifications. Type V vacuum contactors are designed for the control of inductive or non-inductive loads at voltages from 200–1500 Vac.

For How to Order Information, see Catalog Interpretation, Type S Starters, page 5.

NOTE: In Class 8502—Full Voltage 3 Pole Vacuum Contactors, page 81, replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes listed in Coil Voltage Codes, page 6.

Table 76 - Class 8502—Full Voltage 3 Pole Vacuum Contactors

NEMA Size	Enclosed Ampere Rating	Locked Rotor Current (A)	Motor Voltage	Max. Hp	Open Style Type
4	160	1080	200	50	VFO3●●●
			230	60	
			460	125	
			575	150	
			800	200	
			1000	250	
5	320	2160	1500	400	VGO3●●●
			200	100	
			230	125	
			460	250	
			575	300	
			800	400	
			1000	—	
1500	800				

Table 76 - Class 8502—Full Voltage 3 Pole Vacuum Contactors (Continued)

NEMA Size	Enclosed Ampere Rating	Locked Rotor Current (A)	Motor Voltage	Max. Hp	Open Style Type
6	540	4320	200	150	VHO3●●●
			230	200	
			460	400	
			575	400	
			800	—	
			1000	—	
			1500	1300	

Table 77 - Class 9998—Replacement Coils for Class 8502/8702 (contains rectifier)

Size	Type	Pole-s	Class and Type	Suffix (the complete coil number consists of the Class, Type, and suffix)			
				110/120 V	220/240 V	440/480 V	550/600 V
4	VF	3	9998WF	120	240	480	600
5	VG	3	9998WG	120	240	480	600
6	VH	3	9998WH	120	240	480	600

Table 78 - Class 9999—Vacuum Starter Kits

For Use With		Kit Description	Class 9999 Type
Type	Size		
VF, VG	4, 5	Auxiliary Contacts, Non-Convertible 1 N.O. & 1 N.C. Isolated Contacts	WX11
VH	6		
VF	4	Coil Circuit Auxiliary Contacts 1 N.O. & 1 N.C. Isolated Contacts, Delayed Break 1 N.C. Isolated Contact	WCX11
VG, VH	5, 6		WLX01
VG	5	Lug Kits, 6 lugs included	LUW5
VH	6		LUW6

Dimensional Diagrams—Class 8502 Type V Vacuum Contactors

Class 8502 Type VF Size 4

Figure 33 -

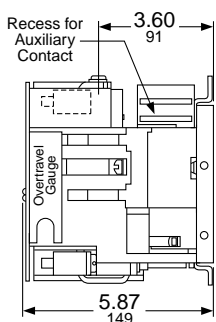
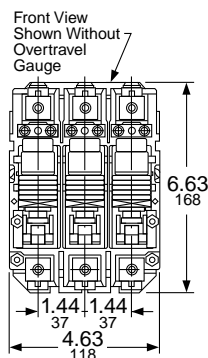
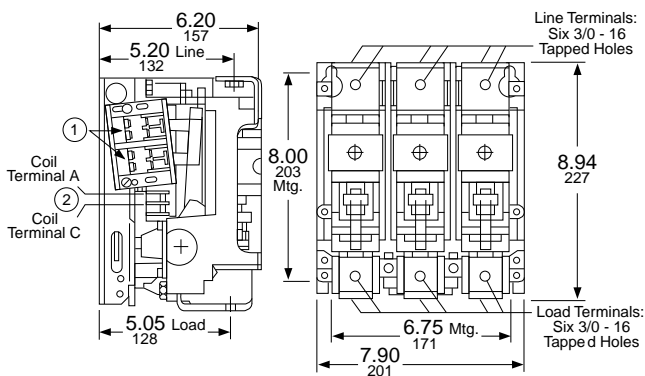


Figure 34 -



Class 8502 Type VG Size 5

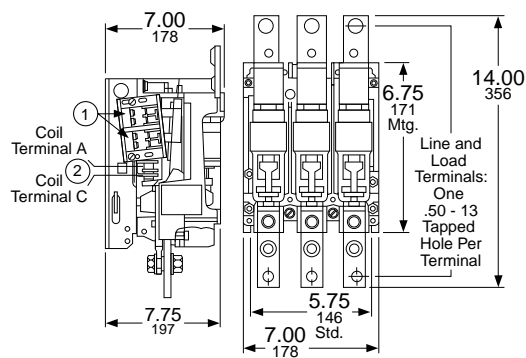
Figure 35 -



1. Two dual circuit auxiliary contacts can be located on both sides of contactor.
2. Coil Terminals B and D located on opposite side of contactor.

Class 8502 Type VH Size 6

Figure 36 -



1. Two dual circuit auxiliary contacts can be located on both sides of contactor.
2. Coil terminals B and D located on opposite side of contactor.

Class 8536 Type W Vacuum Starters

General Information

Class 8536 Type W non-reversing vacuum starters are used to switch electric motors where overload protection is not separately provided.

Type W vacuum starters are designed for operation at 600 V, 50/60 Hz. Starters are available exclusively with Motor Logic™ solid-state overload relay (SSOLR), Class 10/20 selectable.

For How to Order Information, see Catalog Interpretation, Type S Starters, page 5 and How to Order, page 6.

NOTE:

In Class 8536—Full Voltage Vacuum Starters, page 84, replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes listed in Coil Voltage Codes, page 6.

Table 79 - Class 8536—Full Voltage Vacuum Starters

NEMA Size	Enclosed Ampere Rating	Locked Rotor Current (A)	Motor Voltage	Max. Hp	Open Style
					Type
4	135	1080	200	40	WFO3●●●
			230	50	
			460	100	
			575	100	
5	270	2160	200	75	WGO3●●●
			230	100	
			460	200	
			575	200	
6	540	4320	200	150	WHO3●●●
			230	200	
			460	400	
			575	400	

Table 80 - Class 9998—Replacement Coils for Class 8536 Vacuum Starters

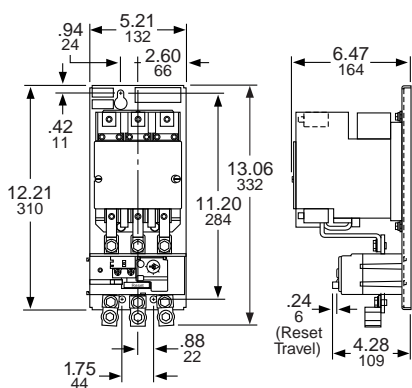
Size	Type	Poles	Class and Type	Suffix Number (Complete Coil Number Consists of Class and Type Followed by Suffix Number)			
				120 V 110 V	240 V 220 V	480 V 440 V	600 V 550 V
4	WF	All	9998WF	120	240	480	600
5	WG		9998WG	120	240	480	600
6	WH		9998WH	120	240	480	600

Table 81 - Class 9999—Vacuum Starter Kits

For Use With		Kit Description	Class 9999 Type
Type	Size		
WF, WG	4, 5	Auxiliary Contacts, Non-Convertible 1 N.O. & 1 N.C. Isolated Contacts	WX11
WH	6		
WF	4	Coil Circuit Auxiliary Contacts 1 N.O. & 1 N.C. Isolated Contacts, Delayed Break 1 N.C. Isolated Contact	WCX11
WG, WH	5, 6		WLX01
WG	5	Lug Kits (6) lugs included	LUW5

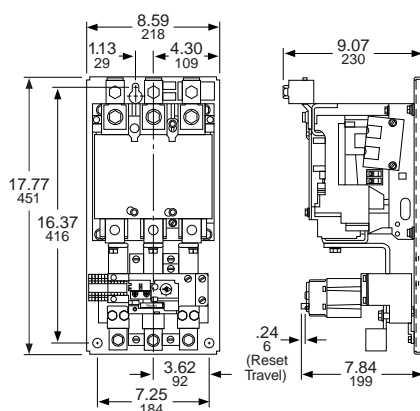
Dimensional Diagrams—Class 8536 Type W Vacuum Starters

Figure 37 -



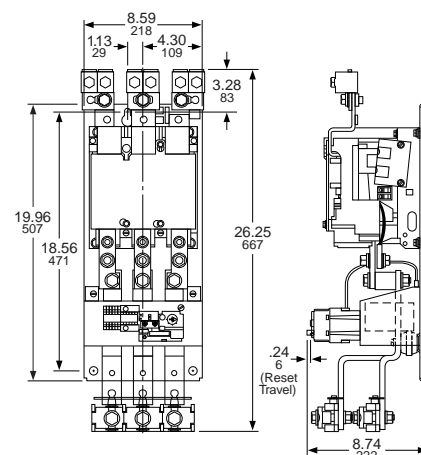
Dimensions for Class 8536 Type WF Size 4

Figure 38 -



Dimensions for Class 8536 Type WG Size 5

Figure 39 -



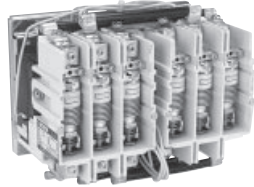
Dimensions for Class 8536 Type WH Size 6

Reversing Vacuum Contactors

Class 8702 Type W Vacuum Contactors

General Information

Figure 40 - Class 8702 Type W Reversing Vacuum Contactor



Class 8702 Type W reversing vacuum contactors are used to switch capacitors, transformers, and electric motors where overload protection is separately provided. Type W reversing vacuum contactors are designed for operation at 600 V, 50/60 Hz.

By design, these contactors are suited for heavy-duty applications in harsh environments. The power contacts are sealed in ceramic tubes, called vacuum interrupters or vacuum bottles, where the air has been evacuated. Arc quenchers are not required because any arc formed between opening contacts is not sustained due to the presence of the vacuum. The arc is extinguished when the current crosses zero after the contacts are opened. Therefore, the arc typically does not survive more than one half cycle. There is one vacuum interrupter or bottle per pole, so a 3-pole contactor has three vacuum interrupters or bottles. The power contacts are not affected by ambient conditions or contamination. This provides for long life and reliable operation in harsh applications.

Altitude—Reversing, Class 8702 Type W

The reversing vacuum contactor is designed to tolerate normal barometric pressure variances up to 6600 ft above sea level. If the contactor is to be used above 6600 ft above sea level, please consult the factory.

Termination Means—Reversing, Class 8702 Type W

The Size 4 reversing vacuum contactor is supplied with line and load side lugs. The Size 5 and 6 reversing vacuum contactors are supplied without line and load side lugs. Class 9999 Type LUW5 and LUW6 lug kits are available for the Size 5 and 6 contactors. These kits include six lugs and the necessary mounting hardware.

Auxiliary Contacts—Reversing, Class 8702 Type W

An auxiliary contact block, Class 9999 Type WX11 with one normally open contact and normally closed contact, is used with Size 4, 5, and 6 vacuum contactors.

Selection Tables—Full Voltage Reversing Vacuum Contactors

NOTE: In the table Class 8702 Full Voltage Reversing Vacuum Contactors (Horizontal Only) 3-Pole Polyphase—600 Vac Maximum—50–60 Hz, page 87, replace the three bullets (●●●) in the catalog number with the coil voltage code. Refer to the standard coil voltage codes listed in Coil Voltage Codes, page 6. Replacement coils are listed in Replacement Coils for Class 8702 Reversing Contactors, page 88.



File E78351
CCN NLDX



File LR60905
Class 3211-04

Auxiliary Contact Ratings—NEMA A600, R300

Table 82 - Auxiliary Contact Ratings—NEMA A600, R300

Description	Voltage	Make	Break
9999WX11, 9999WYO1	120–600 Vac	7200 VA	720 VA
	72–120 Vac	60 A	720 VA
	28–72 Vac	60 A	10 A
	28–300 Vac	28 A	28 VA

Class 8702 Full Voltage Reversing Vacuum Contactors (Horizontal Only) 3-Pole Polyphase—600 Vac Maximum—50–60 Hz

In the table Class 8702 Full Voltage Reversing Vacuum Contactors (Horizontal Only) 3-Pole Polyphase—600 Vac Maximum—50–60 Hz, page 87, replace the three bullets (●●●) in the catalog number with the coil voltage code.

Refer to the standard coil voltage codes listed in Coil Voltage Codes, page 6. Replacement coils are listed in the table Replacement Coils for Class 8702 Reversing Contactors, page 88.

Table 83 - Class 8702 Full Voltage Reversing Vacuum Contactors (Horizontal Only) 3-Pole Polyphase—600 Vac Maximum—50–60 Hz

NEMA Size	Enclosed Ampere Rating	Motor Voltage	Maximum Horsepower	Open Style
				Type
4	135	200	40	WFO3●●●
		230	50	
		380	75	
		460	100	
		575	100	
5	270	200	75	WGO3●●●
		230	100	
		380	150	
		460	200	
		575	200	
6	540	200	150	WHO3V●●●
		230	200	
		380	300	
		460	400	
		575	400	

Replacement Coils for Class 8702 Reversing Contactors

Table 84 - Class 9998—Replacement Coils for Class 8702 Reversing Contactors

Size	Type	Poles	Class and Type	Suffix Number (Complete Coil Number Consists of Class and Type Followed by Suffix Number)			
				120 V 110 V	240 V 220 V	480 V 440 V	600 V 550 V
4	WF	All	9998WF	120	240	480	600
5	WG		9998WG	120	240	480	600
6	WH		9998WH	120	240	480	600

Vacuum Contactor Kits

Table 85 - Class 9999—Vacuum Contactor Kits

Use With		Kit Description	Catalog Number
Type	Size		
WF-WH	4-6	Auxiliary Contacts, Non-Convertible 1-N.O. and 1-N.C. Isolated Contacts	9999WX11
WF	4	Coil Circuit Auxiliary Contacts 1-N.O. and 1-N.C. Isolated Contacts, Delayed Break 1-N.C. Isolated Contact	9999WCX11
WG-WH	5-6		9999WLX01
WG	5	Lug Kits (6) lugs included	9999LUW5
WH	6		9999LUW6

Dimensional Diagrams—Reversing Vacuum Contactors

Figure 41 - Size 4 Reversing Contactor with Lugs, Class 8702 WF

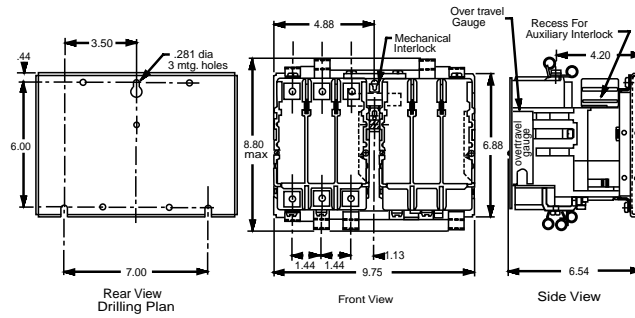


Figure 42 - Size 5 Reversing Contactor without Lugs, Class 8702 WG

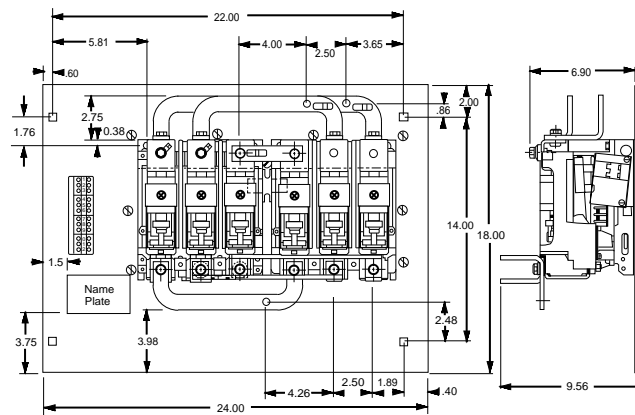
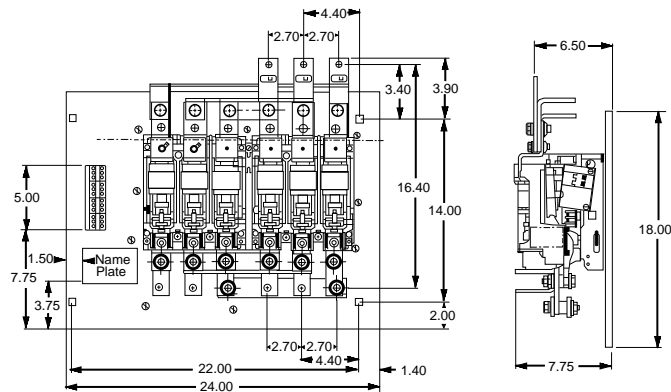


Figure 43 - Size 6 Reversing Contactor without Lugs, Class 8702 WH



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