

Motor Control Solutions for the North American Market

Data Bulletin

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Introduction

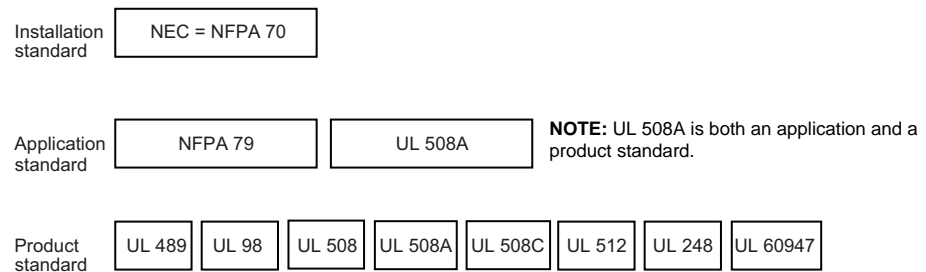
Schneider Electric offers a wide range of solutions to meet your motor control and protection needs. This data bulletin contains information regarding the application of those solutions in the United States and Canada.

Overview of U.S. Standards and Regulations

U.S. National Standards

Figure 1 outlines the national standards governing electrical installations in the U.S.:

Figure 1 – Standards



- National Electrical Code® (NEC), NFPA 70: Electrical Installation
- NFPA 79: Electrical Standard for Industrial Machinery
- UL 508A: Industrial Control Panels
- UL 489: Molded-Case Circuit Breaker, Molded-Case Switches
- UL 508: Industrial Control Equipment
- UL 508C: Power Conversion Equipment
- UL 98: Enclosed and Dead-Front Switches
- UL 512: Fuse Holders
- UL 248: Low Voltage Fuses
- UL 60947-4-1: Low Voltage Contactors and Starters
- UL 60947-5-1: Control Circuit Devices and Switching Elements

UL 508 Transition to UL 60947

The standard for Industrial Control Equipment, UL 508, has been harmonized with the relevant product standards of the IEC standard for low-voltage control and automation, IEC 60947.

This harmonization work was undertaken with the intent of creating standards that, while being based upon and adopting IEC requirements, would incorporate sufficient national differences to ease the transition from UL 508 to UL 60947-4-1. This goal has largely been accomplished in all cases. While the UL 508 and UL 60947 series standards do not look the same, when taking into account the national differences included in the harmonized standards, they are essentially technically identical.

Products originally listed to UL 508 will maintain their listing with no expiration. UL 508 and UL 60947 products can be used interchangeably.

The following industrial control categories are affected by this harmonization effort.

Table 1 – Industrial Control Categories

Standard	Product Description	Category Control Number
UL 60947-4-1	Magnetic Motor Controllers	NLDX
	Manual Motor Controllers	NLRV
	Combination Motor Controllers	NKJH
	Auxiliary Devices (Overload Relays only, Thermal & Electronic)	NKCR
	Industrial Control Switches	NRNT
UL 60947-5-1	Auxiliary Devices (Relays, Pilot Devices, Limit Switches)	NKCR

For more information on this transition, please refer to UL’s website for *Industrial Control Equipment Transition to IEC Standards*.

Product Standards: UL 489 Circuit Breakers vs. UL 1077 Supplementary Protectors

UL 489 circuit breakers are used to protect feeder and branch circuits. UL 1077 supplementary protectors are intended for use as overcurrent protection within a piece of equipment where branch circuit overcurrent protection is already provided. UL 489 circuit breakers are required for compliance with NFPA 70 and NFPA 79.

UL 1077 supplementary protectors are redundant, or additional, protection on branch circuits for equipment. They complement other branch circuit protection, provided by either UL 489 circuit breakers or UL 248 fuses. UL 489 circuit breakers can be used in place of UL 1077 supplementary protectors, but UL 1077 supplementary protectors can never be used in place of UL 489 circuit breakers.

Often times UL 1077 supplementary protectors are called circuit breakers, but this is incorrect. Circuit breakers are listed to the UL 489 standard while supplementary protectors are listed to the UL 1077 standard.

Certification Process

A nationally recognized testing laboratory (NRTL) can list or certify the equipment according to applications or product standards including the following: UL, CSA, ETL, TUV. Other approved agencies are listed at the following website: <http://www.osha.gov/dts/otpc/nrtl/index.html#nrtls>.

Acceptance of Electrical Equipment in the U.S.

The process for acceptance is as follows:

1. The equipment is listed or the manufacturer is certified:
 - a. For mass production equipment, the industrial control panel itself is listed by an NRTL.
 - b. For custom or low-volume equipment, the manufacturer or supplier of the industrial control panel is certified.
2. A local inspector under the authority having jurisdiction (AHJ) inspects and approves the electrical equipment and the installation prior to commissioning. The product listing or labeling may be used to assist in the inspection.

Structure of a Motor Starter in Accordance with UL 508A

Feeder Circuits and Branch Circuits

The feeder circuit includes all power conductors and components from the incoming feeder disconnect to the line side of the last branch short-circuit protection device (SCPD).

The branch circuit includes all power conductors and components from the load side of the branch circuit SCPD to the controller load-side connections.

Each branch circuit should be protected by its own disconnect and SCPD.

Figure 2 – Feeder Circuit and Branch Circuit

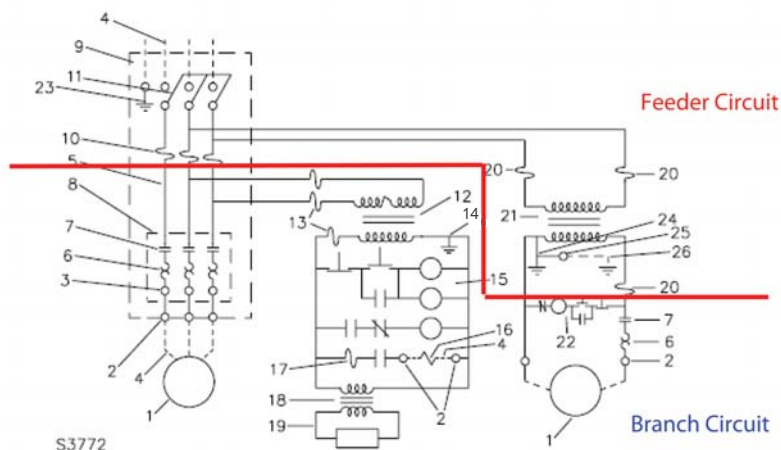


Table 2 contains a description of the numbered circuit components called out in Figure 2.

Table 2 – Circuit Components

1	Load—provided in the field	14	Control transformer ground (for 1000 VA max. control transformer)
2	Field wiring terminals	15	Control circuit devices and wiring—Class 1 circuit—isolated secondary circuit
3	Alternate field terminals	16	Solenoid or other control device—provided in the field
4	Field wiring	17	Supplementary protection
5	Internal wiring of the power circuit	18	Class 2 transformer
6	Overload relay and heater elements	19	Class 2 circuit
7	Contactors or controllers	20	Power transformer fuse—branch circuit protection
8	Starter	21	Power transformer—for motor load and control protector
9	Combination motor controller	22	Control circuit—Class 1 circuit—common control circuit
10	Branch circuit protection	23	Equipment ground and equipment ground terminal
11	Fused disconnect switch or circuit breaker	24	Bonding conductor—bonding jumper
12	Control transformer	25	Grounding electrode conductor terminal
13	Control transformer fuse or supplementary protection	26	Grounding electrode conductor—provided in the field

Group Motor Installations

In a group motor installation, a single disconnecting means and SCPD can be used for a group of motors. The specific rules are described in NEC Sections 430-112 and 430-53.

Group motor installations are used in the following applications:

- Fractional hp motors—NEC Section 430.53 (A):
For several motors, each rated 1 hp maximum on a branch circuit of 1000 V maximum, a single SCPD not exceeding 15 A is permitted under the following circumstances:
 - No single motor is rated greater than 6 A.
 - The branch-circuit short-circuit device rating marked on any controller is not exceeded.
 - Appropriate motor overload protection is used.
- Smallest rated motor protected—NEC Section 430.53 (B):
The SCPD is sized for the motor in the group with the lowest rating.
- Other group installations—NEC Section 430.53 (C):
Two or more motors of any rating, or one or more motors and other loads, where all the following conditions are met:
 - Each motor controller and overload protection device carries a Motor Group Installation listing.
 - Each circuit breaker (if used) is listed and is of the inverse time type.
 - The SCPD (fuse or circuit breaker) is sized for the largest motor plus the sum of all other motors and loads.
 - The sizing of the SCPD (fuse or circuit breaker) does not exceed the maximum allowed for overload protection of the smallest motor.
 - Appropriate overcurrent protection is provided for non-motor loads.

Tap Conductor Sizing Rules

The tap conductor sizing rules for group motor installations are governed by NEC Section 430.53 (D). Conductors from the load side of the SCPD for the motor group must comply with one of the following:

- The ampacity is not less than that of the branch circuit conductors.
- The ampacity is not less than 1/3 of the branch circuit conductors, and the length from the point of the tap to the motor overload device is not more than 7.5 m (25 ft).
- The ampacity is not less than 1/10 of the SCPD for the motor group, the length from the point of the tap to the controller(s) is not more than 3 m (10 ft), and the manual motor controller is marked “Suitable for Tap Conductor Protection in Group Installations.”

NOTE: Products certified for motor grouping must carry the markings on the product label or instruction sheet required by NEC and UL (such as “Suitable for Tap Conductor Protection in Group Installations”).

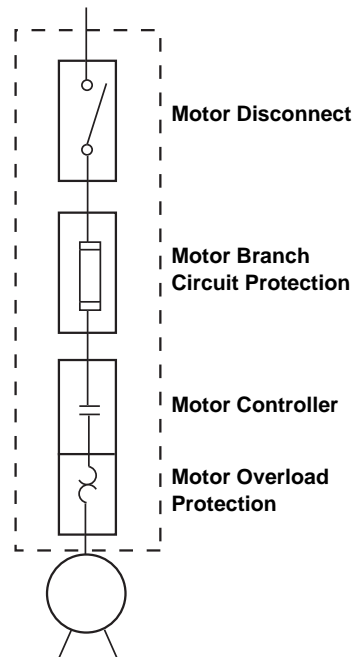
For more information, see data bulletin 8502DB0701 entitled “Group Motor Installations: Understanding NEC 430.53 Requirements.”

Required Functions of Combination Starters

Combination starters are the most common type of packaged motor controllers. They are called *combination* because of their construction and combined functions. NEC Article 430 defines the required functions of combination starters. Underwriters Laboratories, Inc.[®] (UL) specifies the tests and verifications that the components must pass before they can be listed as suitable for use for those functions.

See Figure 3 for the four component functions that compose a complete motor branch circuit as defined by the NEC.

Figure 3 – Required Functions of Combination Starters







Combination Starter Construction Types

UL 508 is the UL safety standard for industrial control equipment. Part IV defines the component functions, construction, testing, and performance requirements of six styles of combination starters. Each of these six styles meets the requirements of NEC Article 430 for the motor disconnecting means, the motor branch circuit short-circuit and ground-fault protection, the motor controller, and the motor overload (OL) protection. Each provides adequate protection against fire or personal injury under detected fault conditions.

The UL 508 type designations are differentiated by the actual components used to protect the motor branch circuit. See Table 3.

Table 3 – UL Combination Starter Type Designations

	UL Combination Starter Type	Device Used for Component Function				
		Disconnect	Branch Circuit Protection	Motor Controller	Motor Overload Relay	
Traditional Combination Starters from the 1980s and earlier	A	UL 98 Manual Disconnect	UL 248 Fuses	UL 508 Magnetic or Solid State Controller	UL 508 Motor Overload Relay	 <ul style="list-style-type: none"> UL 98 Disconnect Switch UL 248 Fuses UL 508 Controller UL 508 Overload Relay
	B		UL 508 Motor Short Circuit Protector			
	C	UL 489 Inverse Time Circuit Breaker				
	D	UL 489 Instantaneous Trip Circuit Breaker				
Recognized 1990	E	UL 508 Self-Protected Combination Controller				 <ul style="list-style-type: none"> UL 508 Type E Self-Protected Combination Starter: TeSys U
						 <ul style="list-style-type: none"> UL 508 Type E Manual Self-Protected Combination Starter: TeSys GV2P & GV3P
Recognized 2002	F	UL 508 Manual Self-Protected Combination Controller		UL 508 Magnetic or Solid State Controller	UL 508 Manual Self-Protected Combination Controller	 <ul style="list-style-type: none"> UL 508 Type F Combination Starter: TeSys GV2P/GV3P + TeSys D Contactor

UL Combination Starter Types A through D

UL 508 Types A through D combination starters are traditional style starters that use either a listed disconnect switch and fuses or a listed circuit breaker as the disconnect means and short circuit protection. Each type uses a separate UL 508 listed motor controller and overload relay. These starters are evaluated by UL under the same set of short circuit performance tests. Each type of combination starters clears detected faults without causing a fire or posing an electrical shock hazard to personnel. Each type is allowed to sustain damage that is contained within enclosures and may require the repair or replacement of devices after performing their protective function.

UL Combination Starter Type E

The concept of a self-protected combination starter was introduced from Europe during the 1980's. This concept unveiled an integrated device that performed all the required functions of a combination starter.

The first self-protected combination starters were manual, but by the mid-1980s, electromechanical self-protected combination starters were also on the market. These starters cleared detected faults within their rating without sustaining damage and could be put back into operation.

UL recognized this concept in 1990 and added the Type E self-protected category for both manual and electromechanical combination starters. UL added a separate set of short circuit and endurance performance tests to their 508 standard just for the Type E self-protected category.

UL Combination Starter Type F

Many manufacturers and users started combining a manual UL 508 Type E self-protected starter with a UL 508 contactor and called the combination "self-protected." This is not an accurate description since the combination was not tested in accordance with the requirements of the UL 508 Type E standard as a combination.

UL addressed this by recognizing a Type F category in 2002. This combination starter consisted of the manual self-protected starter and contactor combination. It is evaluated under the same short circuit tests as Types A through D, but it is not considered self-protected.

Self-Protected Designation and Implications

A combination starter must pass certain performance tests specified by UL 508 before it can be designated as self-protected. The required test sequence for the Type E self-protected combination starters is listed in UL 508, Table 77.4A. The test sequence includes both high fault and interrupting ability short circuit (low fault) detection tests, followed by an endurance test.

The tests required for Types A through D and Type F combination starters are listed in UL 508 Table 77.4. This test sequence does not include the detection of low fault short circuit tests followed by the endurance test. This is the difference between the testing and performance of a Type E self-protected combination starter and the starter types.

Construction Type Selection

Panel designers may choose any of the six construction types for their motor control panel with each construction type offering different advantages.

Construction Types A through D all utilize the same motor controllers and overload relays. However, they feature different methods to perform disconnect and branch circuit protection functions:

- Construction Type A is the only construction type that features fuses.
- Type B, which uses an UL 508 motor short circuit protector, is no longer commercially available.
- Type C utilizes UL 489 inverse time circuit breakers.
- Type D utilizes UL 489 instantaneous trip circuit breakers.

The key distinction between Type A and Type C or D can be simplified to the selection of a circuit breaker or a fuse for branch circuit protection. A fuse is an overcurrent protection with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it. A circuit breaker is a device designed to open and close a circuit by non-automatic means and to open the circuit automatically on a predetermined overcurrent without damage to itself when properly applied within its rating. The key difference between a fuse and a circuit breaker is that a fuse must be replaced once it experiences an overcurrent condition while a circuit breaker is resettable. Additionally, fuses operate independently on each phase while circuit breakers have three-phase common trip.

Construction Type E self-protected combination controllers and Type F combination controllers both offer the following advantages for panel designers:

- Higher coordinated short-circuit withstand ratings on UL 508A panels
- Easier component selection to meet the requirements of group motor applications
- Reduced panel space by reducing the number of components
- Required product markings to help designers quickly and accurately select components
- Increased productivity by reducing the number of wiring connections

UL 508 Type E self-protected combination starters also offer the advantage of reliability. UL 508's special endurance and short-circuit tests ensure a coordinated combination starter that will clear a detected fault and protect itself from damage. It is the only category of combination starter that a designer can easily identify as self-protected due to the required "Self-Protected Combination Motor Controller" product marking.

Disconnecting Means on a Feeder or Branch Circuit

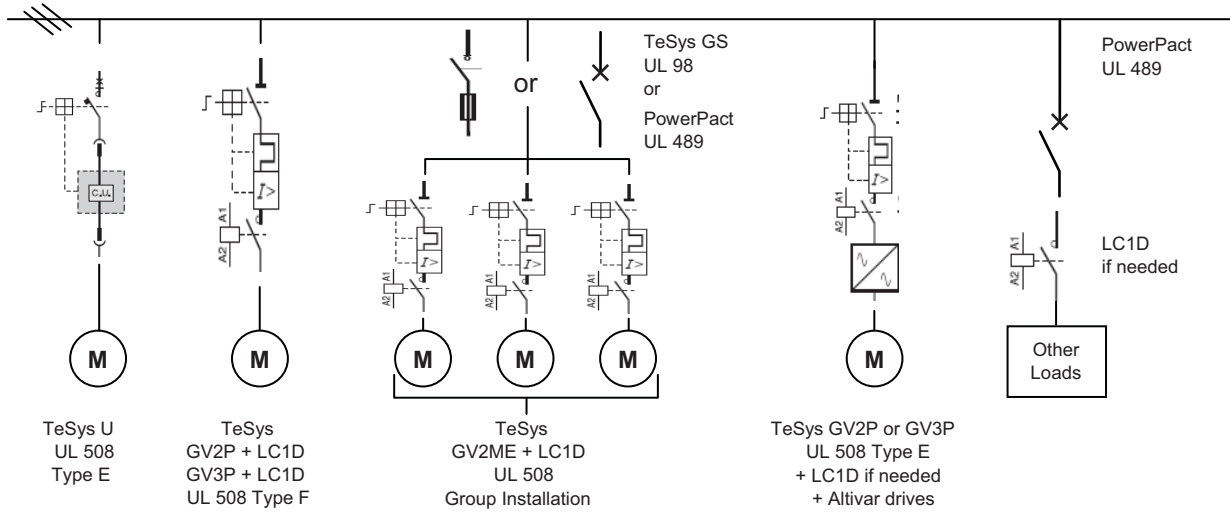
The disconnecting means on the feeder circuit, ahead of the last SCPD, must be a UL 98 disconnect switch or UL 489 circuit breaker. UL 508 switches or motor protectors are not acceptable.

On the branch circuit, the following are permitted as the disconnecting means when installed between the final motor branch circuit short circuit protection and the motor:

- Any UL 508 switch that is suitable as a motor disconnect (according to NEC Section 430.81), which is used to start and stop a motor
- A manual motor controller that is suitable as a motor disconnect (according to NEC Section 430.109)

Motor Starter Line Diagrams

Figure 4 – Power Supply Circuit



Disconnecting Means

A disconnecting means must be provided for each incoming supply (branch) circuit, and must open each ungrounded conductor of the supply circuit.

The disconnecting means may be one of the following:

- UL 489 inverse-time or instantaneous-trip circuit breaker
- UL 489 molded-case switch
- UL 98 switch unit, either open type or enclosed

For a motor starter, the disconnecting means could be a UL 508 Type E self-protected combination motor controller.

The sizing of the disconnecting means must meet UL 508A Section 30.2.

An UL 508 manual motor controller or switch (such as the TeSys™ Vario device) is certified for use on the load side of a motor's branch circuit protection. This is commonly called a *load break switch*.

Industrial Machinery Requirements (NFPA 79 Section 5.3.3.1 and UL 508A Section 65, 66)

These requirements cover industrial control panels for industrial machinery (NFPA 79-2002, Electrical Standard for Industrial Machinery). The following types of machines are identified as industrial machinery:

- Metalworking machine tools, including machines that cut or form metal
- Plastics machinery, including injection molding, extrusion, blow molding, specialized processing, thermoset molding, and size reduction machines
- Wood machinery, including woodworking, laminating, and sawmill machines
- Assembly machines
- Material handling machines, including industrial robots and transfer machines
- Inspection and testing machines, including coordinate measuring and in-process gauging machines

An operating mechanism for the disconnecting means must have the following characteristics:

- Readily accessible when the enclosure doors are in the open or closed position
- Installed so that its operation is not restricted by the enclosure door while in the open position
- Operable independent of the door position without the use of accessory tools or devices
- Lockable in the Off position independent of the door position; and, when the mechanism is locked, the disconnect cannot be closed

The UL 98 TeSys GS family of disconnect switches meet these characteristics:

- The TeSys GS1 30 A disconnect switch requires the use of operating mechanism kit GS1AD010.
- The TeSys GS2 family of disconnect switches provide these features from 60 to 400 A using operating mechanism kits GS2AD030N or GS2AD040N.

The UL 489 PowerPact™ Circuit breakers meet these characteristics when used in conjunction with a Class 9422 or 9421L operating mechanism and 9421LH79 handle.

SCCR Requirement in UL 508 A

NEC Article 409, NFPA 79, and UL 508A require that the SCCR be marked on all control panels.

The final builder or assembler of the equipment inside the panel is responsible for providing the SCCR for the overall panel, determined by one of the following three options:

- Testing each panel construction and recording the construction in the follow-up procedure. With the multitude of possible product combinations within a panel, this option may require much testing and maintenance. Third party testing and certification may also be required.
- Purchasing previously tested constructions (combinations) from a major supplier of equipment that can be tabulated in the control or machine panel builder's procedure. Once you have all the component ratings, either use an outside service or UL 508A, Supplement SB.
- Using a method described in UL 508A, Supplement SB.

NOTE: Using the interrupting rating of the main OCPD for the panel is not an acceptable practice.

▲ WARNING

INADEQUATE SHORT CIRCUIT INTERRUPTING RATING

Do not use the interrupting rating of the main OCPD as the SCCR rating for the controller.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Ratings: Tested Combination vs. Component

UL 508A, Supplement SB describes three steps to determine the SCCR of an industrial control panel. One of those steps is to determine the SCCR of all the individual power panel components using one of the following methods:

- Use the SCCR value marked on the component.
- Use assumed SCCR values in Table SB4.1 of Supplement SB.
- Use the tested SCCR from component combinations per UL 508.

Method 1 is often called component rating. Component rating involves looking at each individual component in the circuit and applying the lowest component rating to the overall system.

Method 2 uses Table SB4.1 (see Table 4) of Supplement SB, which applies a blanket maximum SCCR for all components. The SCCR for motor controllers is graduated based on its horsepower rating.

Table 4 – Extract of Table SB4.1

Component: Motor Controllers (rated in HP ¹)	Short Circuit Current Rating (kA)
a. 0–50	5
a. 51–200	10
b. 201–400	18
c. 401–600	30
d. 601–900	42
e. 901–1600	85

¹ Highest rated horsepower of motor controller.

Method 3 is often called tested combination rating. Individual motor branch circuit components are tested together in specific combinations to achieve a system rating. This system rating is not specifically limited by each individual component rating.

It is important to note that use of one method only is not required. It is very common to find systems that utilize two, if not all three, methods for determining SCCRs.

Component SCCR ratings offer the user of power control products a great deal of flexibility in the application of these products. A component SCCR rating for a contactor and overload relay typically calls for a maximum circuit breaker size which is not tied to a specific part number or combination of multiple specific part numbers. A similar scenario exists when using fuses for short circuit protection of a power control product. A fuse class and maximum size are what's called for, not a specific fuse or fuse holder; part numbers are not necessary. The component ratings for Schneider Electric contactors, overload relays, and motor starters are printed on the product labels and/or the product instruction sheets.

UL 508A Support Websites

Schneider Electric offers UL 508A support on our website at www.Schneider-Electric.us. A number of educational and product search tools are available, including overview information, a UL 508A SCCR determination flow chart, and information on our individual and combination product SCCRs. UL also publishes SCCR tested combination ratings on its website (refer to link below). Schneider Electric's updated tested combination ratings can be found on both websites and is free to download.

Schneider Electric's UL 508A Support Website:

<http://www.schneider-electric.us/sites/us/en/support/product-support-resources/ul-508a-support/ul-approved-tested-combination-spreadsheets-with-sccr-data.page>

UL's Short Circuit Current Ratings for Combination Motor Controller

Components Website: <http://industries.ul.com/industrial-systems-and-components/industrial-control-products-and-systems/short-circuit-current-ratings-for-combination-motor-controller-components>

Combination Starter Components

UL 98 Manual Disconnect Switches

TeSys™ GS Disconnect Switches



TeSys GS Disconnect Switch
GS2GU3N

Table 5 – TeSys™ GS Fusible Disconnect Switches

Catalog Number	Rating (A)	Poles	Maximum Rating (HP)				Short Circuit Current Rating, 600 Vac Max.	
			240 V	480 V	600 V	250 Vdc	Fuse Type	SCCR (kA)
GS1DDU3	30	3	7.5	15	20	5	CC	100
GS1DU3	30	3	7.5	15	20	5	J	100
GS2EEU3	30	3	7.5	15	20	5	CC	100
GS2EU3N	30	3	7.5	15	20	5	J	100
GS2GU3N	60	3	15	30	50	10	J	100
GS2JU3N	100	3	30	60	75	20	J	200
GS2MU3N	200	3	60	125	150	40	J	200
GS2QU3N	400	3	125	250	350	50	J	200
GS2SU3	600	3	200	400	500	—	J	200
GS2TU3	800	3	200	500	500	—	L	200

TeSys™ LK Disconnect Switches



TeSys LK Disconnect Switch
LK4SU3N

Table 6 – TeSys LK Non-Fusible Disconnect Switches

Catalog Number	Rating (A)	Poles	Maximum Rating (HP)				Short Circuit Current Rating, 600 Vac Max.	
			240 V	480 V	600 V	250 Vdc	Fuse Type	SCCR (kA)
LK4DU3CN	30	3	10	20	30	—	J	100
LK4GU3CN	60	3	20	40	50	—	J	100
LK4JU3CN	100	3	20	50	50	—	J	100
LK4JU3N	100	3	30	75	100	15	J	200
LK4MU3N	200	3	75	150	200	15	J	200
LK4QU3N	400	3	125	250	350	50	J	200
LK4SU3N	600	3	200	400	350	50	J	200
LK4TU3N	800	3	200	500	500	—	L	100
LK4UU3N	1000	3	200	500	500	—	L	100
LK4WU3N	1200	3	200	500	500	—	L	100

Class 9422 Disconnect Switches



**Flange Mounted, Variable Depth
Disconnect Switch
9422TF1**

Table 7 – Class 9422 Flange Mounted, Variable Depth Fusible and Non-Fusible Disconnect Switches

Disconnect Switch Size (A)	Variable Depth Min.–Max. (in.)	Max. Horsepower Ratings						Fuse Type	Fuse Clip Rating (A) Non-Interchangeable Type for Class H, J, K or R Fuses		Switch and Operating Mechanism Only, Does Not Include Handle Mechanism
		AC Systems Volts (Motor Volts)				Vdc			250 V	600 V	Catalog Number ¹
		208 (200)	240 (230)	480 (460)	600 (575)	250	600				
30	6.625–18	7.5	7.5	15	20	5	15	None	—	—	9422TCN30
								H, J, K, R	30 60	— 30	9422TCF30 9422TCF33
60	6.625–18	—	15	30	50	10	30	None	—	—	9422TDN60
								H, J, K, R	60 —	30 60	9422TDF60 9422TDF63
100	6.625–18	25	30	60	75	20	50	None	—	—	9422TEN10
								H, J, K, R	100	100	9422TEF10
200	9.12–19.25 ⁵	40	60	125	150	40	50	None	—	—	9422TF1
								H, J, K, R	200 —	200 400	9422TF2 9422TF3 ²
400 Fixed Depth ⁶	11.38 (A5 or A6 Handle)	75	125	250	350	50	50	None	—	—	9422TG1 ^{3, 4}
400 Variable Depth ⁶	15.87–19 (A7 or A8 Handle) ⁷							H, J, K, R	400	400	9422TG2 ^{3, 4}

¹ Switch and operating mechanism only — does not include handle mechanism

² Accommodates Class J fuses only

³ Commercially available enclosures may not accept 9422TG1 and 2 operating mechanisms. Contact enclosure manufacturer for availability of enclosures of use with these switches.

⁴ Right hand flange mounting only and requires a special enclosure

⁵ 9422 R2 will extend maximum mounting depth 7 inches

⁶ Switches are fixed-depth or adjustable, depending on handle selection.

⁷ Variable in increments of 0.63 inches.

UL 248 Fuses

TeSys™ DF Fuse Holders



TeSys DF Fuse Holders
DFCC3

Table 8 – TeSys DF Fuse Holders

Fuse Holder	Standards	Maximum Voltage	Current	Withstand
DFCC	IEC, UL (UL Listed)	600 Vac	30 A	200 kA
DF10	IEC, UL (UL Recognized)	690 Vac	33 A	200 kA
DF14	IEC, UL (UL Recognized)	690 Vac	50 A	200 kA
DF22	IEC, UL (UL Recognized)	690 Vac	125 A	200 kA

Type FB Fuse Holders



Type FB Fuse Holder
9080FB3611J

Table 9 – Type FB 600 V Fuse Holders

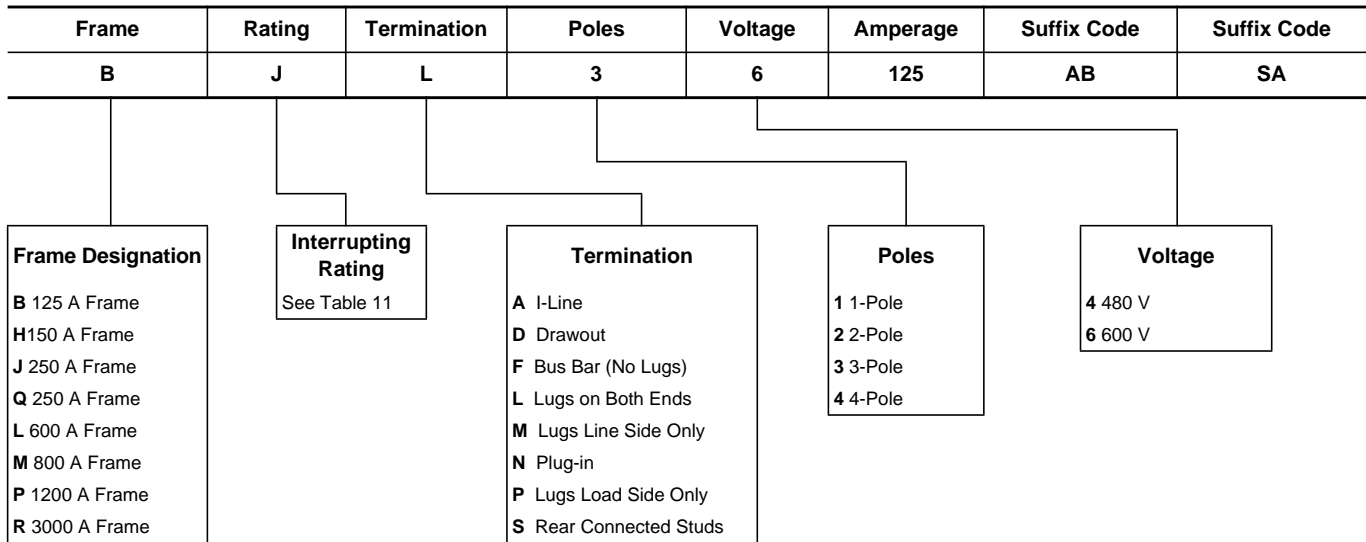
Rating (A)	No. of Poles	Catalog Number		Withstand
		Class J	Class R ¹	
30	2	9080FB2611J	9080FB2611R	200 kA
	3	9080FB3611J	9080FB3611R	
60	1	—	9080FB1621R	
	2	9080FB2621J	—	
	3	9080FB3621J	9080FB3621R	
100	3	—	9080FB3631R	

¹ Accepts current limiting fuses only

UL 489 Molded-Case Circuit Breakers

PowerPact™ Circuit Breakers and Motor Circuit Protectors

Table 10 – PowerPact™ Catalog Numbering System



**PowerPact B Circuit Breaker
BJL36125**

Table 11 – PowerPact Interrupting Ratings System

Voltage	Interrupting Rating						
	B	D	G	J	K	L	R
240 Vac	10 kA	25 kA	65 kA	100 kA	65 kA	125 kA	200 kA
480 Vac		18 kA	35 kA	65 kA	65 kA	100 kA	200 kA
600 Vac		14 kA	18 kA	25 kA	65 kA	50 kA	100 kA
Frame (X = available)							
B-Frame (15-125 A) ¹		X	X	X	X ²		
H-Frame (15-150 A)		X	X	X		X	X
J-Frame (150-250 A)		X	X	X		X	X
Q-Frame (70-250 A)	X	X	X	X			
L-Frame (200-600 A)		X	X	X		X	X
M-Frame (300-800 A)			X	X			
P-Frame (250-1200 A)			X	X	X ³	X ⁴	
R-Frame (600-3000 A)			X	X	X	X	

¹ B-Frame rating is rated up to 600Y/347 V and 480 V only. 600 V is not available.

² B-Frame K-interrupting rating is 100 kA at 240 Vac

³ P-Frame K-interrupting level is 50 kA at 480 Vac and 600 Vac

⁴ P-Frame L-interrupting level is 25 kA at 600 Vac

Table 12 – PowerPact H- and J-Frame Electronic Motor Circuit Protectors (MCP)

Frame	Sensor Rating	Full Load Ampere Range	Adjustable Instantaneous Trip Range	Suffix	Interrupting Rating		
					J Cat. No.	L Cat. No.	R Cat. No.
H-Frame	30 A	1.5–25 A	9–325 A	M71	HJL36030M71	HLL36030M71	HRL36030M71
	50 A	14–42 A	84–546 A	M72	HJL36050M72	HLL36050M72	HRL36050M72
	100 A	30–80 A	180–1040 A	M73	HJL36100M73	HLL36100M73	HRL36100M73
	150 A	58–130 A	348–1690 A	M74	HJL36150M74	HLL36150M74	HRL36150M74
J-Frame	250 A	114–217 A	684–2500 A	M75	JJL36250M75	JLL36250M75	JRL36250M75

UL 489 Miniature Circuit Breakers and UL 1077 Supplementary Protectors

Multi 9™ Circuit Breakers and Supplementary Protectors



Multi 9 UL 489 Circuit Breaker
M9F42110



Multi 9 UL 1077 Supplementary
Protector M9F22110

Table 13 – Multi 9™ Catalog Numbering System

Range	Function	Number	Poles	Amperage
M9	F	42	1	10

Range	Function	Number	Poles	Amperage
M9 Multi 9	F MCB P DPN R RCCB D RCBO V Vigi C60 Add-on Y Vigi N40 Add-on C CTRL	Internal code number depending on the standard and electrical characteristics.	1 1-Pole 2 2-Pole 3 3-Pole 4 4-Pole	From 0.5– 63 A

Table 14 – Multi 9 UL 489 Breaking Capacity

Number of Poles	Current Rating (A)	Voltage, AC				Voltage, DC	
		120 V	240 V	277 V	480/277 V	60 V	125 V
1 Pole	1–35	14	14	10	–	10	–
	40–63	10	10	–	–	10	–
2 Pole	1-35	14	14	10	10	10	10
	40-63	10	10	–	–	–	–
3 Pole	1-35	14	14	10	10	–	–
	40-63	10	10	–	–	–	–

Table 15 – Multi 9 UL 1077 Breaking Capacity

Number of Poles	Current Rating (A)	Voltage, AC				Voltage, DC	
		120 V	240 V	277 V	480/277 V	60 V	125 V
1 Pole	0.5–35	14	14	10	–	10	–
	40–63	10	10	5	–	10	–
2 Pole	1-35	14	14	10	10	10	10
	40-63	10	10	5	5	–	–
3 and 4 Pole	1-35	14	14	10	10	–	–
	40-63	10	10	5	5	–	–

UL 508 Contactors

TeSys™ K Contactors

Table 16 – TeSys K Contactors (Except for Spring Terminal Clamps)

Catalog Number	Standard Motor Ratings @ 50/60 Hz (HP)						Max. Inductive AC3 Current (A)	Max. Resistive AC1 Current (A)	Continuous Current Ratings	Max. Component SCCR (kA) ¹		
	Single-Phase		Three-Phase							Circuit Breakers @ 480 V ²	Circuit Breakers @ 600 V ²	Fuses @ 600 V ³
	120 V	240 V	208 V	240 V	480 V	600 V						
LC1K06	1/2	1	1.5	1.5	3	3	6	20	10	65	25	100
LC1K09	1/2	1.5	2	3	5	5	9	20	20	65	25	100
LC1K12	1	2	3	3	7.5	10	12	20	20	65	25	100

¹ Ratings apply to circuits with voltages no greater than those listed.
² When protected by any circuit breaker, including thermal-magnetic and magnetic, meeting the size limits in Table 18.
³ When protected by any Class J or CC time-delay fuse meeting the size limits in Table 18.
NOTE: This table lists the maximum SCCR of the component when protected by any circuit breaker or fuse. If the maximum component SCCR is 65 kA and a 25 kA rated circuit breaker is used, then the system will be 25 kA as the circuit breaker becomes the weakest link.

Table 17 – TeSys K Contactors with Spring Terminal Clamps

Catalog Number	Standard Motor Ratings @ 50/60 Hz (HP)						Max. Inductive AC3 Current (A)	Max. Resistive AC1 Current (A)	Continuous Current Ratings	Max. Component SCCR (kA) ¹		
	Single-Phase		Three-Phase							Circuit Breakers @ 480 V ²	Circuit Breakers @ 600 V ²	Fuses @ 600 V ³
	120 V	240 V	208 V	240 V	480 V	600 V						
LC1K06**3	1/4	1/2	1.5	1.5	3	3	6	20	10	65	25	100
LC1K09**3	1/3	1	2	2	5	5	9	20	10	65	25	100
LC1K12**3	1/3	1	2	2	5	5	12	20	10	65	25	100

¹ Ratings apply to circuits with voltages no greater than those listed.
² When protected by any circuit breaker, including thermal-magnetic and magnetic, meeting the size limits in Table 18.
³ When protected by any Class J or CC time-delay fuse meeting the size limits in Table 18.
NOTE: This table lists the maximum SCCR of the component when protected by any circuit breaker or fuse. If the maximum component SCCR is 65 kA and a 25 kA rated circuit breaker is used, then the system will be 25 kA as the circuit breaker becomes the weakest link.



**TeSys K Contactor
LC1K09**

Table 18 – TeSys K Contactor Maximum Component SCCR¹

Catalog Number	Circuit Breakers @ 480 V ²		Circuit Breakers @ 600 V ²		Fuses @ 600 V ³	
	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
LC1K06	20	65	20	25	25	100
LC1K09	20	65	20	25	30	100
LC1K12	20	65	20	25	30	100

¹ Ratings apply to circuits with voltages no greater than those listed.
² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.
³ When protected by any Class J or CC time-delay fuse.
NOTE: This table lists the maximum SCCR of the component when protected by any circuit breaker or fuse. If the maximum component SCCR is 65 kA and a 25 kA rated circuit breaker is used, then the system will be 25 kA as the circuit breaker becomes the weakest link.

TeSys™ D Contactors

Table 19 – TeSys D 3-Pole Contactors

Catalog Number	Standard Motor Ratings @ 50/60 Hz (HP)						Max. Inductive AC3 Current (A)	Max. Resistive AC1 Current (A)	No. of Poles		Continuous Current Rating	Max. Component SCCR (kA) ¹		
	Single-Phase		Three-Phase									Circuit Breakers @ 480 V ²	Circuit Breakers @ 600 V ²	Fuses @ 600 V ³
	120 V	240 V	208 V	240 V	480 V	600 V			N.O.	N.C.				
LC1D09	1/3	1	2	2	5	7.5	9	20	3	0	25	85	50	100
LC1D12	1/2	2	3	3	7.5	10	12	25	3	0	25	85	50	100
LC1D18	1	3	5	5	10	15	18	32	3	0	32	85	50	100
LC1D25	2	3	7.5	7.5	15	20	25	40	3	0	40	85	50	100
LC1D32	2	5	10	10	20	25	32	50	3	0	50	85	50	100
LC1D38	2	5	10	10	20	25	38	50	3	0	50	85	50	100
LC1D40A	3	5	10	10	30	30	40	60	3	0	60	100	50	100
LC1D50A	3	7.5	15	15	40	40	50	80	3	0	70	100	50	100
LC1D65A	5	10	20	20	40	50	65	80	3	0	80	100	50	100
LC1D80	7.5	15	25	30	60	60	80	125	3	0	110	100	50	100
LC1D95	7.5	15	25	30	60	60	95	125	3	0	110	—	—	—
LC1D115	—	—	30	40	75	100	115	200	3	0	160	100	50	100
LC1D150	—	—	40	50	100	125	150	200	3	0	160	100	50	100

¹ Ratings apply to circuits with voltages no greater than those listed.

² When protected by any circuit breaker, including thermal-magnetic and magnetic-only, meeting the size limits in Table 21 on page 23.

³ When protected by any Class J or CC time-delay fuse meeting the size limits in Table 21 on page 23.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Table 20 – TeSys D 4-Pole Contactors

Catalog Number	Max. Resistive AC1 Current (A)	No. of Poles		Continuous Current Rating	Max. Component SCCR (kA) ¹		
		N.O.	N.C.		Circuit Breakers @ 480 V ²	Circuit Breakers @ 600 V ²	Fuses @ 600 V ³
LC1DT20	20	4	0	25	85	50	100
LC1D098	20	2	2	25	85	50	100
LC1DT25	25	4	0	25	85	50	100
LC1D128	25	2	2	25	85	50	100
LC1DT32	32	4	0	32	85	50	100
LC1D188	32	2	2	32	85	50	100
LC1DT40	40	4	0	40	85	50	100
LC1D258	40	2	2	40	85	50	100
LC1DT60A	60	4	0	60	100	50	100
LC1DT80A	80	4	0	80	100	50	100
LC1D80004	125	4	0	110	100	50	100
LC1D80008	125	2	2	110	100	50	100
LC1D115004	200	4	0	160	100	50	100

¹ Ratings apply to circuits with voltages no greater than those listed.

² When protected by any circuit breaker, including thermal-magnetic and magnetic-only, meeting the size limits in Table 21 on page 23.

³ When protected by any Class J or CC time-delay fuse meeting the size limits in Table 21 on page 23.

NOTE: This table 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 as the circuit breaker becomes the weakest link.



TeSys D Contactor
LC1D12

Table 21 – TeSys D Contactor Maximum Component SCCR¹

Catalog Number	Circuit Breakers @ 480 V ²		Circuit Breakers @ 600 V ²		Fuses @ 600 V ³	
	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
LC1D09	35	85	35	50	25	100
LC1DT20						
LC1D12	36	85	36	50	30	100
LC1DT25						
LC1D18	60	85	60	50	40	100
LC1DT32						
LC1D25	60	85	60	50	60	100
LC1DT40						
LC1D32	60	85	60	50	80	100
LC1D38	60	85	60	50	80	100
LC1D40A	110	100	110	50	90	100
LC1DT60A						
LC1D50A	110	100	110	50	110	100
LC1D65A	110	100	110	50	125	100
LC1DT80A						
LC1D80	150	100	175	50	175	100
LC1D115	250	100	250	50	250	100
LC1D150	250	100	250	50	300	100

¹ Ratings apply to circuits with voltages no greater than those listed.

² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.

³ When protected by any Class J or CC time-delay fuse.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Additional TeSys™ D Contactor Ratings

Table 22 – UL/CSA Lighting Ratings

Catalog Number	Ballast	Tungsten		
	600 V	480Y/277 V	480 V	600 V
LC1D09 ¹ , LC1DT20 ¹	20	20	–	–
LC1D12 ¹ , LC1DT25 ¹	25	–	–	–
LC1D18 ¹ , LC1DT32 ¹	32	25	–	–
LC1D25 ¹ , LC1DT40 ¹	40	40	–	–
LC1D32 ¹	50	50	–	–
LC1D40A	60	–	–	60
LC1D50A	70	–	–	70
LC1D65A	80	–	–	70
LC1D80, LC1D80004	100	–	100	–
LC1D115, LC1D1150004	115	–	115	–
LC1D150, LC1D1500004	150	–	150	–

¹ AC coil only**Table 23 – Elevator Duty Ratings (HP)**

Catalog Number	Single-Phase	Three-Phase			
	240 V	208 V	240 V	480 V	600 V
LC1D12	1.5	2	3	7.5	7.5
LC1D18 ¹	3	5	5	—	—
LC1D25	3	5	7.5	15	20
LC1D32	5	10	7.5 ¹	—	—
LC1D40A ¹	5	10	10	—	—
LC1D50A ¹	7.5	15	15	—	—
LC1D50 ¹	7.5	10	15	25	30
LC1D65 ¹	10	15	20	40	50
LC1D80	15	20	25	50	50
LC1D150	15	25	30	60	75

¹ AC coil only**Table 24 – Definite Purpose Ratings, 3-Phase, Breaking All Lines
Hermetic Refrigeration Compressor**

Catalog Number	FLA	LRA			FLA Cycles
		240 V	480 V	600 V	
LC1D09	9	54	45	36	100,000
LC1D12	12	72	60	48	100,000
LC1D18	18	108	90	72	100,000
LC1D25	25	150	125	100	100,000
LC1D32	32	192	160	128	100,000
LC1D40A	40	240	200	160	100,000
LC1D50A	50	300	250	200	100,000
LC1D65A	65	390	325	260	100,000
LC1D80 (AC)	80	480	400	320	100,000
LC1D80 (DC)	75	450	375	300	100,000
LC1D115	115	690	575	460	100,000
LC1D150	150	900	750	600	100,000

TeSys™ F Contactors



TeSys F Contactor
LC1F400

Table 25 – TeSys F Contactors

Catalog Number	Standard Motor Ratings @ 50/60 Hz (hp)				Max. Inductive AC3 Current (A)	Max. Resistive AC1 Current (A)	Continuous Current Rating	Max. Component SCCR (kA) ¹	
	Three-Phase							Circuit Breakers @ 480 V ²	Fuses @ 600 V ³
	208 V	240 V	480 V	600 V					
LC1F115	30	40	75	100	115	200	175	65	100
LC1F150	40	50	100	125	150	250	200	65	100
LC1F185	50	60	125	150	185	275	200	65	100
LC1F225	60	75	150	150	225	315	250	—	—
LC1F265	60	75	150	200	265	350	285	—	100
LC1F330	75	100	200	250	330	400	370	—	100
LC1F400	100	125	250	300	400	500	420	—	—
LC1F500	150	200	400	500	500	700	700	—	—
LC1F630	250	300	600	800	630	1000	1000	—	—
LC1F800	350	400	800	900	800	1000	1000	—	—
LC1F780	—	450	900	900	780	1600	1350	—	—
LC1F1000	350	400	900	—	1000	—	1250	—	—
LC1F1400	—	—	—	—	—	1400	1400	—	—
LC1F1700	—	—	—	—	—	1700	1700	—	—
LC1F2100	—	—	—	—	—	2100	2100	—	—

¹ Ratings apply to circuits with voltages no greater than those listed.
² When protected by any circuit breaker, including thermal-magnetic and magnetic-only, meeting the size limits in Table 26.
³ When protected by any Class J time-delay fuse meeting the size limits in Table 26.

NOTE: This table lists the maximum SCCR of the component when protected by any circuit breaker or fuse. If the maximum component SCCR is 65 kA and a 25 kA rated circuit breaker is used, then the system will be 25 kA as the circuit breaker becomes the weakest link.

Table 26 – TeSys F Contactors Maximum Component SCCR¹

Catalog Number	Circuit Breakers @ 480 V ²		Fuses @ 600 V ³	
	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
LC1F115	200	65	200	100
LC1F150	250	65	200	100
LC1F185	250	65	400	100
LC1F265	—	—	600	100
LC1F330	—	—	600	100

¹ Ratings apply to circuits with voltages no greater than those listed.
² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.
³ When protected by any Class J time-delay fuse.
NOTE: This table 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 as the circuit breaker becomes the weakest link.

Additional TeSys™ F Contactor Ratings

Table 27 – UL/CSA Lighting Ratings

Catalog Number	Ballast		Tungsten
	480 V	600 V	480 V
LC1F115	115	—	115
LC1F150	150	—	150
LC1F185	—	200	200
LC1F265	—	265	265
LC1F330	300	—	300

Table 28 – Elevator Duty Ratings (HP)

Catalog Number	Single-Phase	Three-Phase			
	240 V	208 V	240 V	480 V	600 V
LC1F185	20	25	30	60	75
LC1F265	—	40	40	—	—
LC1F330	—	50	50	—	—
LC1F400	—	60	60	—	—
LC1F500	—	75	75	—	—

**Table 29 – Definite Purpose Ratings, 3-Phase, Breaking All Lines
Hermetic Refrigeration Compressor**

Contactor	FLA	LRA			FLA Cycles
		240 V	480 V	600 V	
LC1F115	135	800	800	520	100,000
LC1F150	150	900	750	700	100,000
LC1F185	220	1500	1500	1200	100,000
LC1F225	220	1500	1500	1200	100,000
LC1F265	270	1800	1900	1500	100,000
LC1F400	350	2000	2000	1800	100,000
LC1F500	700	4500	4500	4200	6,000
LC1F630	880	5000	5000	4850	6,000
LC1F780	1330	7500	7500	7290	6,000

TeSys™ N Contactors



TeSys N Contactor
T02CN13

Table 30 – TeSys N Contactors

Catalog Number	Standard Motor Ratings @ 50/60 Hz (HP)				Max. Resistive AC1 Current (A)	NEMA Size	Max. Component SCCR (kA) ¹		
	Three-Phase						Circuit Breakers @ 480 V ²	Circuit Breakers @ 600 V ²	Fuses @ 600 V ³
	200 V	230 V	460 V	575 V					
T02AN13	1.5	1.5	2	2	9	00	85	50	100
T02BN13	3	3	5	5	18	0	85	50	100
T02CN13	7.5	7.5	10	10	27	1	85	50	100
T02DN13	10	15	25	25	45	2	100	50	100
T02EN13	25	30	50	50	90	3	65	—	100
T02FN13	40	50	100	100	135	4	65	—	100
T02GN13	75	100	200	200	270	5	—	—	100
T02HN13	150	200	400	400	540	6	—	—	—
T02JN13	—	300	600	600	810	7	—	—	—

¹ Ratings apply to circuits with voltages no greater than those listed.

² When protected by any circuit breaker, including thermal-magnetic and magnetic-only, meeting the size limits in Table 31.

³ When protected by any Class J or CC time-delay fuse meeting the size limits in Table 31.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Table 31 – TeSys N Contactors Maximum Component SCCR¹

Catalog Number	Circuit Breakers @ 480 V ²		Circuit Breakers @ 600 V ²		Fuses @ 600 V ³	
	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
T02AN13	60	85	60	50	60	100
T02BN13	60	85	60	50	60	100
T02CN13	60	85	60	50	80	100
T02DN13	110	100	110	50	125	100
T02EN13	200	65	—	—	200	100
T02FN13	250	65	—	—	200	100
T02GN13	—	—	—	—	600	100

¹ Ratings apply to circuits with voltages no greater than those listed.

² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.

³ When protected by any Class J or CC time-delay fuse.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Type S Contactors



Type S Contactor
8502SAO11

Table 32 – Type S Contactors

Catalog Number	Standard Motor Ratings @ 50/60 Hz (HP)				Max. Resistive AC1 Current (A)	NEMA Size	Max. Component SCCR (kA) ¹	
	Three-Phase						Circuit Breakers @ 480 V ²	Fuses @ 600 V
	200 V	230 V	460 V	575 V				
8502SAO12	1.5	1.5	2	2	9	00	100	100 ³
8502SBO2	3	3	5	5	18	0	100	100 ³
8502SCO2	7.5	7.5	10	10	27	1	100	100 ³
8502SDO2	10	15	25	25	45	2	100	100 ³
8502SEO2	25	30	50	50	90	3	100	100 ³
8502SFO2	40	50	100	100	135	4	100	100 ⁴
8502SGO2	75	100	200	200	270	5	100	100 ⁴
8502SHO2	150	200	400	400	540	6	65	100 ⁴
8502SJO2	—	300	600	600	810	7	30	30

¹ Ratings apply to circuits with voltages no greater than those listed.

² When protected by any circuit breaker, including thermal-magnetic and magnetic-only, meeting the size limits in Table 33.

³ When protected by any Class RK5, RK1, T or J fuse, meeting the size limits in Table 33.

⁴ When protected by any Class T or J fuse, meeting the size limits in Table 33.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Table 33 – Type S Contactor Maximum Component SCCR¹

Catalog Number	Circuit Breakers @ 480 V ²		Fuses @ 600 V	
	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
8502SAO12	70	100	60 ³	100
8502SBO2	70	100	60 ³	100
8502SCO2	70	100	60 ³	100
8502SDO2	100	100	100 ³	100
8502SEO2	150	100	200 ³	100
8502SFO2	225	100	200 ⁴	100
8502SGO2	400	100	400 ⁴	100
8502SHO2	800	65	600 ⁴	100
8502SJO2	2000	30	1500	30

¹ Ratings apply to circuits with voltages no greater than those listed.

² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.

³ When protected by any Class RK5, RK1, T or J fuse.

⁴ When protected by any Class T or J fuse.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Definite Purpose Contactors

DP Compact Contactors



Definite Purpose Type DP Compact Contactor 8910DP22V09

Table 34 – Definite Purpose Type DP Compact Contactors

Catalog Number	Max. Inductive AC3 Current (A)	Locked Rotor Amperes			Max. Resistive AC1 Current (A)	Max. Component SCCR (kA) ¹	
		277 V	460 V	575 V		Circuit Breakers @ 480 V ²	Fuses @ 600 V ³
1-Pole Contactors							
8910DP11	20	120	100	80	30	100	100
8910DP21	25	150	125	100	35	100	100
8910DP31	30	150	125	100	40	100	100
8910DP41	40	240	200	160	50 ⁵	100	100
2-Pole Contactors⁴							
8910DP12	20	120	100	80	30	100	100
8910DP22	25	150	125	100	35	100	100
8910DP32	30	150	125	100	40	100	100
8910DP42	40	240	200	160	50	100	100

¹ Ratings apply to circuits with voltages no greater than those listed.
² When protected by any circuit breaker, including thermal-magnetic and magnetic-only, meeting the size limits in Table 35.
³ When protected by any Class J time-delay fuse, meeting the size limits in Table 35.
⁴ Above 240 V, all lines must be switched.
⁵ 50 A Resistive, maximum 277 V. All others rated 40 A Resistive (above 277 V).
NOTE: This table 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 as the circuit breaker becomes the weakest link.

Table 35 – Definite Purpose Type DP Compact Contactor Maximum Component SCCR¹

Catalog Number ²	Circuit Breaker @ 480 V ³		Fuse @ 600 V ⁴	
	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
8910DP1*	80	100	60	100
8910DP2*	80	100	60	100
8910DP3*	80	100	60	100
8910DP4*	100	100	100	100

¹ Ratings apply to circuits with voltages no greater than those listed.
² The “*” represents the number of poles. Replace the “*” with a 2 for a 2-pole contactor or a 3 for a 3-pole contactor.
³ When protected by any circuit breaker, including thermal-magnetic and magnetic-only.
⁴ When protected by any Class J time-delay fuse.
NOTE: This table 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 as the circuit breaker becomes the weakest link.

DPA Contactors



Definite Purpose Type DPA Contactor 8910DPA32

Table 36 – Definite Purpose Type DPA Contactors¹

Catalog Number	Max. Inductive AC3 Current (A)	Locked Rotor Amperes			Max. Resistive AC1 Current (A)	Horsepower Ratings					Poles	Max. Component SCCR (kA) ²	
		230 V	460 V	575 V		Single-Phase		Three-Phase				Circuit Breakers @ 480 V ³	Fuses @ 600 V ⁴
						115 V	230 V	230 V	460 V	575 V			
8910DPA12	20	120	100	80	30	1.5	3	7.5	7.5	7.5	2	100	100
8910DPA13											3		
8910DPA14											4		
8910DPA22	25	150	125	100	35	2	5	10	15	20	2	100	100
8910DPA23											3		
8910DPA24											4		
8910DPA32	30	180	150	120	40	2	5	10	15	20	2	100	100
8910DPA33											3		
8910DPA34											4		
8910DPA42	40	240	200	160	50	3	7.5	10	20	25	2	100	100
8910DPA43											3		
8910DPA44											4		
8910DPA52	50	300	250	200	65	3	10	15	30	30	2	100	100
8910DPA53											3		
8910DPA62	60	360	300	240	75	5	10	25	30	30	2	100	100
8910DPA63											3		
8910DPA72	75	450	375	300	94	5	15	25	40	40	2	100	100
8910DPA73											3		
8910DPA92	90	540	450	360	120	7.5	20	30	50	50	2	100	100
8910DPA93											3		

¹ Above 240 V, all lines must be switched.

² Ratings apply to circuits with voltages no greater than those listed.

³ When protected by any circuit breaker, including thermal-magnetic and magnetic-only, meeting the size limits in Table 37.

⁴ When protected by any Class RK5 or J time-delay fuse, meeting the size limits in Table 37.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Table 37 – Definite Purpose Type DPA Contactor Maximum Component SCCR¹

Catalog Number ²	Circuit Breaker @ 480 V ³		Fuse @ 600 V ⁴	
	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
8910DPA1*	80	100	60	100
8910DPA2*	80	100	60	100
8910DPA3*	80	100	60	100
8910DPA4*	100	100	100	100
8910DPA5*	150	100	200	100
8910DPA6*	150	100	200	100
8910DPA7*	225	100	200	100
8910DPA9*	225	100	200	100

¹ Ratings apply to circuits with voltages no greater than those listed.

² The "*" represents the number of poles. Replace the "*" with a 2 for a 2-pole contactor or a 3 for a 3-pole contactor or a 4 for a 4-pole contactor.

³ When protected by any circuit breaker, including thermal-magnetic and magnetic-only.

⁴ When protected by any Class RK5 or Class J time-delay fuse.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Type S Lighting Contactors



**Type S Lighting Contactor
8903SPO3V02**

Table 38 – Type S Lighting Contactors

Contact Ampere Ratings	No. of Poles	Catalog Number, Open Type		Max. Component SCCR (kA) ¹	
		Electrically Held	Mechanically Held	Circuit Breakers @ 480 V ²	Fuses @ 600 V ³
30	2	8903SMO1	8903SMO10	100	100 ³
	3	8903SMO2	8903SMO11		
	4	8903SMO3	8903SMO12		
	5	8903SMO4	8903SMO13		
60	2	8903SPO1	8903SPO10	100	100 ³
	3	8903SPO2	8903SPO11		
	4	8903SPO3	8903SPO12		
	5	8903SPO4	8903SPO13		
100	2	8903SQO1	8903SQO10	100	100 ³
	3	8903SQO2	8903SQO11		
	4	8903SQO3	8903SQO12		
	5	8903SQO4	8903SQO13		
200	2	8903SVO1	8903SVO10	100	100 ⁴
	3	8903SVO2	8903SVO11		
	4	8903SVO3	8903SVO12		
	5	8903SVO4	8903SVO13		
300	2	8903SXO1	8903SXO13	100	100 ⁴
	3	8903SXO2	8903SXO14		
400	2	8903SYO1	8903SYO16	65	100 ⁴
	3	8903SYO2	8903SYO17		
600	2	8903SZO1	8903SZO18	65	100 ⁴
	3	8903SZO2	8903SZO19		
800	2	8903SJO1	—	30	30
	3	8903SJO2	—		

¹ Ratings apply to circuits with voltages no greater than those listed.
² When protected by any circuit breaker, including thermal-magnetic and magnetic-only, meeting the size limits in Table 39.
³ When protected by any Class RK5, RK1, T or J fuse, meeting the size limits in Table 39.
⁴ When protected by any Class T or J fuse, meeting the size limits in Table 39.
 This table 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 as the circuit breaker becomes the weakest link.

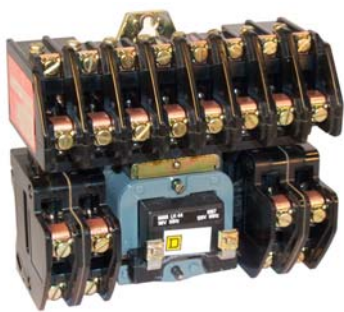
Table 39 – Type S Lighting Contactor Maximum Component SCCR¹

Catalog Number	Circuit Breaker @ 480 V ²		Fuse @ 600 V	
	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
8903SMO	70	100	60 ³	100
8903SPO	100	100	100 ³	100
8903SQO	150	100	200 ³	100
8903SVO	225	100	200 ⁴	100
8903SXO	400	100	400 ⁴	100
8903SYO	800	65	600 ⁴	100
8903SZO	800	65	600 ⁴	100
8903SJO	2000	30	1500	30

- ¹ Ratings apply to circuits with voltages no greater than those listed.
- ² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.
- ³ When protected by any Class RK5, RK1, T or J fuse.
- ⁴ When protected by any Class T or J fuse.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Type L/LX Lighting Contactors

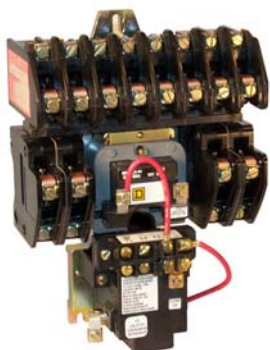


**Type L Lighting Contactor
8903LO1200**

Table 40 – Type L/LX Lighting Contactors

Contact Ampere Ratings	No. of Poles	Catalog Number, Open Type		Max. Component SCCR (kA) ¹	
		Electrically Held	Mechanically Held	Circuit Breakers @ 480 V ²	Fuses @ 600 V ³
30	2	8903LO20	8903LXO20	100	100 ⁴
	3	8903LO30	8903LXO30		
	4	8903LO40	8903LXO40		
	6	8903LO60	8903LXO60		
	8	8903LO80	8903LXO80		
	10	8903LO1000	8903LXO1000		
	12	8903LO1200	8903LXO1200		

- ¹ Ratings apply to circuits with voltages no greater than those listed.
- ² When protected by any circuit breaker, including thermal-magnetic and magnetic-only, meeting the size limits in Table 39.
- ³ When protected by any Class RK5, RK1, T or J fuse, meeting the size limits in Table 41.
- ⁴ When protected by any Class T or J fuse, meeting the size limits in Table 41.



**Type LX Lighting Contactor
8903LXO1200**

Table 41 – Type L/LX Lighting Contactor Maximum Component SCCR¹

Catalog Number	Circuit Breakers @ 480 V ²		Fuses @ 600 V ³	
	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
8903LO	Per NEC Table 430.52	100	Per NEC Table 430.52	100 ⁴
8903LXO				

- ¹ Ratings apply to circuits with voltages no greater than those listed.
- ² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.
- ³ When protected by any Class RK5, RK1, T or J fuse.
- ⁴ When protected by any Class T or J fuse.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

TeSys™ NEMA Lighting Contactors



TeSys NEMA Lighting Contactor
LC1D25MEQ4096

Table 42 – TeSys NEMA Lighting Contactors

Contact Ampere Ratings	No. of Poles	Catalog Number	Max. Component SCCR (kA) ¹		
		Electrically Held	Circuit Breakers @ 480 V ²	Circuit Breakers @ 600 V ²	Fuses @ 600 V ³
30	3	LC1D25MEQ4096	85	50	100
60	3	LC1D40AMEQ4096	100	50	100
100	3	LC1D80MEQ4096	100	50	100
150	3	LC1D150MEQ4096	100	50	100

- ¹ Ratings apply to circuits with voltages no greater than those listed.
- ² When protected by any circuit breaker, including thermal-magnetic and magnetic-only, meeting the size limits in Table 43.
- ³ When protected by any Class J or CC time-delay fuse meeting the size limits in Table 43.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Table 43 – TeSys NEMA Lighting Contactor Maximum Component SCCR¹

Catalog Number	Circuit Breakers @ 480 V ²		Circuit Breakers @ 600 V ²		Fuses @ 600 V ³	
	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
LC1D25MEQ4096	60	85	60	50	60	100
LC1D40AMEQ4096	110	100	110	50	90	100
LC1D80MEQ4096	150	100	150	50	175	100
LC1D150MEQ4096	250	100	250	50	300	100

- ¹ Ratings apply to circuits with voltages no greater than those listed.
- ² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.
- ³ When protected by any Class J or CC time-delay fuse.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

UL 508 Overload Relays

TeSys™ K Bimetal Overload Relays



TeSys K Overload Relay
LR2K0304

Table 44 – TeSys LR2K Bimetal Overload Relays

Current Setting Range (A)	Class 10 with Single Phase Sensitivity	Max. Component SCCR (kA) ¹					
		Circuit Breakers @ 480 V ²		Circuit Breakers @ 600 V ²		Fuses @ 600 V ³	
		Max. Breaker Size (A)	Max. SCCR (kA)	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
0.1–0.16	LR2K0301	15	65	15	25	10	100
0.16–0.23	LR2K0302	15	65	15	25	10	100
0.23–0.36	LR2K0303	15	65	15	25	10	100
0.35–0.54	LR2K0304	15	65	15	25	10	100
0.54–0.8	LR2K0305	15	65	15	25	10	100
0.8–1.2	LR2K0306	15	65	15	25	10	100
1.2–1.8	LR2K0307	15	65	15	25	10	100
1.8–2.6	LR2K0308	15	65	15	25	10	100
2.6–3.7	LR2K0310	15	65	15	25	10	100
3.8–5.5	LR2K0312	15	65	15	25	20	100
5.5–8	LR2K0314	25	65	25	25	30	100
8–11.5	LR2K0316	25	65	25	25	30	100

¹ Ratings apply to circuits with voltages no greater than those listed.

² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.

³ When protected by any Class J or CC time-delay fuse.

NOTE: This table lists the maximum SCCR of the component when protected by any circuit breaker or fuse. If the maximum component SCCR is 65 kA and a 25 kA rated circuit breaker is used, then the system will be 25 kA as the circuit breaker becomes the weakest link.

TeSys™ D Bimetal Overload Relays



TeSys D
Overload
Relay

Table 45 – TeSys LRD Bimetal Overload Relays

Current Setting Range (A)	For Direct Mounting to LC1...	Class 10 with Single Phase Sensitivity	Class 10 without Single Phase Sensitivity	Class 20 with Single Phase Sensitivity	Class 20 without Single Phase Sensitivity	Max. Component SCCR (kA) ¹						
						Circuit Breakers @ 480 V ²		Circuit Breakers @ 600 V ²		Fuses @ 600 V ³		
						Max. Breaker Size (A)	Max. SCCR (kA)	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)	
0.10–0.16	D09–D38	LRD01	LR3D01	—	—	15	65	15	50	10	100	
0.16–0.25		LRD02	LR3D02	—	—	15	65	15	50	10	100	
0.25–0.40		LRD03	LR3D03	—	—	15	65	15	50	10	100	
0.40–0.63		LRD04	LR3D04	LRD04L	LR3D04L	15	65	15	50	10	100	
0.63–1		LRD05	LR3D05	LRD05L	LR3D05L	15	65	15	50	10	100	
1–1.6		LRD06	LR3D06	LRD06L	LR3D06L	15	65	15	50	10	100	
1.6–2.5		LRD07	LR3D07	LRD07L	LR3D07L	15	65	15	50	10	100	
2.5–4		LRD08	LR3D08	LRD08L	LR3D08L	15	65	15	50	15	100	
4–6		LRD10	LR3D10	LRD10L	LR3D10L	15	65	15	50	20	100	
5.5–8		LRD12	LR3D12	LRD12L	LR3D12L	15	65	15	50	30	100	
7–10		LRD14	LR3D14	LRD14L	LR3D14L	20	65	20	50	40	100	
9–13		D12–D38	LRD16	LR3D16	LRD16L	LR3D16L	25	65	25	50	50	100
12–18		D18–D38	LRD21	LR3D21	LRD21L	LR3D21L	35	65	35	50	60	100
16–24		D25–D38	LRD22	LR3D22	—	—	45	65	45	50	60	100
17–24	—		—	LRD22L	LR3D22L	45	65	45	50	60	100	
23–32	LRD32		LR3D32	LRD32L	LR3D32L	60	65	60	50	80	100	
30–38	D32–D38	LRD35	LR3D35	—	—	70	65	70	50	100	100	
9–13	D40A–D65A ⁴	LRD313	LR3D313	LRD313L	—	25	100	25	50	30	100	
12–18		LRD318	LR3D318	LRD318L	—	35	100	35	50	45	100	
16–25		LRD325	LR3D325	LRD325L	—	45	100	45	50	60	100	
23–32		LRD332	LR3D332	LRD332L	—	60	100	60	50	80	100	
30–40		LRD340	LR3D340	LRD340L	—	70	100	70	50	100	100	
37–50		LRD350	LR3D350	LRD350L	—	90	100	90	50	125	100	
48–65	D50A–D65A ⁴	LRD365	LR3D365	LRD365L	—	125	100	125	50	200	100	
17–25	D40–D95 ⁵	LRD3322	LR3D3322	LR2D3522	LR3D3522	45	100	45	50	60	100	
23–32		LRD3353	LR3D3353	LR2D3553	LR3D3553	60	100	60	50	80	100	
30–40		LRD3355	LR3D3355	LR2D3555	LR3D3555	70	100	70	50	90	100	
37–50	D50–D95 ⁵	LRD3357	LR3D3357	LR2D3557	LR3D3557	90	100	90	50	125	100	
48–65		LRD3359	LR3D3359	LR2D3559	LR3D3559	125	100	125	50	150	100	
55–70	D65–D95 ⁵	LRD3361	LR3D3361	LR2D3561	LR3D3561	125	100	125	50	175	100	
63–80		LRD3363	LR3D3363	LR2D3563	LR3D3563	150	100	150	50	200	100	
80–104	D80–D95	LRD3365	—	—	—	200	100	200	50	250	100	
80–104	D115–D150	LRD4365	—	—	—	200	100	200	50	250	100	
95–120		LRD4367	—	—	—	—	250	100	250	50	400	100

¹ Ratings apply to circuits with voltages no greater than those listed.
² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.
³ When protected by any Class J or CC time-delay fuse.
⁴ Overload relays with Everlink termination - direct mount to D40A to D65A only.
⁵ Direct mount to old D2 style D40 to D65 (no Everlink terminations) and to D80–D95 only.
NOTE: This table 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 as the circuit breaker becomes the weakest link.

TeSys™ LR9D Electronic Overload Relays



TeSys LR9D Overload Relay
LR9D32



TeSys D Overload Relay
LR9D5369

Table 46 – TeSys LR9D Electronic Overload Relays

Current Setting Range (A)	For Direct Mounting to LC1...	Class 10	Class 20	Class 10 or 20 Selectable	Class 5/10/20/30 Selectable	Max. Component SCCR (kA) ¹							
						Circuit Breakers @ 480Y/277 V ²		Circuit Breakers @ 480 V ²		Circuit Breakers @ 600 V ²		Fuses @ 600 V ³	
						Max. Breaker Size (A)	Max. SCCR (kA)	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
0.1-0.5	D09-D38	—	—	—	LR9D01	2	10	—	—	—	—	1	100
0.4-2	D09-D38	—	—	—	LR9D02	8	10	—	—	—	—	6	100
1.6-8	D09-D38	—	—	—	LR9D08	20	10	—	—	—	—	30	100
6.4-32	D09-D38	—	—	—	LR9D32	—	—	70	65	—	—	125	100
22-110	N/A (Separate Mount Only)	—	—	—	LR9D100S	—	—	250	65	—	—	225	100
60-100	D115-D150	LR9D5367	LR9D5567	LR9D67	—	—	—	175	100	175	50	225	100

¹ Ratings apply to circuits with voltages no greater than those listed.

² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.

³ When protected by any Class J or CC time-delay fuse.

NOTE: This table lists the maximum SCCR of the component when protected by any circuit breaker or fuse. If the maximum component SCCR is 65 kA and a 25 kA rated circuit breaker is used, then the system will be 25 kA as the circuit breaker becomes the weakest link.

TeSys™ LR9F Electronic Overload Relays



TeSys F Overload Relay LR9F5

Table 47 – TeSys LR9F Electronic Overload Relays¹

Current Setting Range (A)	For Direct Mounting to LC1...	Class 10	Class 20	Max. Component SCCR (kA) ²					
				Circuit Breakers @ 480 V ³		Circuit Breakers @ 600 V ³		Fuses @ 600 V ⁴	
				Max. Breaker Size (A)	Max. SCCR (kA)	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
30–50	F115–F185	LR9F5357	LR9F5557	90	100	—	—	—	—
48–80		LR9F5363	LR9F5563	150	100	—	—	—	—
60–100		LR9F5367	LR9F5567	175	100	175	50	225	100
90–150		LR9F5369	LR9F5569	250	100	250	50	400	100
132–220	F185–F265 ⁵	LR9F5371	LR9F5571	250	65	—	—	—	—
200–330	F265–F500	LR9F7375	LR9F7575	—	—	—	—	—	—
300–500		LR9F7379	LR9F7579	—	—	—	—	—	—
380–630	F400–F630	LR9F7381	LR9F7581	—	—	—	—	—	—

¹ When mounting overload relays LR9F5*71 to LR9F5*71 directly beneath the contactor, supporting the relays with a mounting plate is recommended. With overload relays LR9F7*75 to LR9F7*81, use of a support mounting plate is mandatory.

² Ratings apply to circuits with voltages no greater than those listed.

³ When protected by any circuit breaker, including thermal-magnetic and magnetic-only.

⁴ When protected by any Class J time-delay fuse.

⁵ Interconnection kit LA7F407 is required to mount an LR9F5*71 to an LC1F185.

NOTE: This table lists the maximum SCCR of the component when protected by any circuit breaker or fuse. If the maximum component SCCR is 65 kA and a 25 kA rated circuit breaker is used, then the system will be 25 kA as the circuit breaker becomes the weakest link.

TeSys™ T Motor Management System



TeSys T Motor Management System LTMR08MFM

Table 48 – TeSys T Motor Management System

Current Range (A)	Catalog Number ¹		Max. Component SCCR (kA) ²	
	Control Voltage		Circuit Breakers (kA) ³	Fuses (kA)
	24 Vdc	100-240 Vac		
0.4–8	LTMR08*BD	LTMR08*FM	100	100
1.35–27	LTMR27*BD	LTMR27*FM	100	100
5–100	LTMR100*BD	LTMR100*FM	100	100

¹ The "*" represents the type of fieldbus. Replace the "*" with a M for Modbus, a P for Profibus DP, an E for Ethernet TCP/IP, a C for CANopen, and a D for DeviceNet.

² Ratings apply to circuits no greater than 600 V.

³ When protected by any circuit breaker, including thermal-magnetic and magnetic-only.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Motor Logic Solid State Overload Relays



Motor Logic Solid State Overload Relay 9065SFB20

Table 49 – Motor Logic Solid State Overload Relays

NEMA Size	Current Setting Range (A)	Class 10/20 Selectable Catalog Number	Max. Component SCCR (kA) ¹	
			Circuit Breakers ²	Fuses
00B	1.5-4.5	9065SFB20	100	100
00C	3-9	9065SFC20	100	100
0	6-18	9065SF020	100	100
1	9-27	9065SF120	100	100
2	15-45	9065SF220	100	100
3	30-90	9065SF320	100	100
4	45-135	9065SF420	100	100

¹ Ratings apply to circuits no greater than 600 V.

² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.

This table 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 as the circuit breaker becomes the weakest link.

UL 508 Starters

TeSys™ N Starters



TeSys N Starter with Motor Logic T36EN13BD

Table 50 – TeSys N Starters with Motor Logic Overload Relays

Catalog Number	Standard Motor Ratings @ 50/60 Hz (HP)				Continuous Current Rating (A)	NEMA Size	Max. Component SCCR (kA) ¹		
	Three-Phase						Circuit Breakers @ 480 V ²	Circuit Breakers @ 600 V ²	Fuses @ 600 V ³
	208 V	240 V	480 V	600 V					
T36AN13	1.5	1.5	2	2	9	00	85	50	100
T36BN13	3	3	5	5	18	0	85	50	100
T36CN13	7.5	7.5	10	10	27	1	85	50	100
T36DN13	10	15	25	25	45	2	100	50	100
T36EN13	25	30	50	50	90	3	65	10	100
T36FN13	40	50	100	100	135	4	65	10	100
T36GN13	75	100	200	200	270	5	18	18	100
T36HN13	150	200	400	400	540	6	30	30	30
T36JN13	—	300	600	600	810	7	42	42	42

¹ Ratings apply to circuits with voltages no greater than those listed.

² When protected by any circuit breaker, including thermal-magnetic and magnetic-only, meeting the size limits in Table 51.

³ When protected by any Class J or CC time-delay fuse, meeting the size limits in Table 51.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Table 51 – TeSys N Starter Maximum Component SCCR¹

Catalog Number	Circuit Breakers @ 480 V ²		Circuit Breakers @ 600 V ²		Fuses @ 600 V	
	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
T36AN13	60	85	60	50	60 ³	100
T36BN13	60	85	60	50	80 ³	100
T36CN13	60	85	60	50	80 ³	100
T36DN13	110	100	110	50	125 ³	100
T36EN13	200	65	*	10	200 ³	100
T36FN13	250	65	*	10	200 ³	100
T36GN13	*	18	*	18	600 ³	100
T36HN13	*	30	*	30	1000	30
T36JN13	*	42	*	42	1200	42

¹ Ratings apply to circuits with voltages no greater than those listed.
² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.
³ When protected by any Class J or CC time-delay fuse.
 * Per NEC Table 430.52

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Type S Starters



**Type S Starter with Motor Logic
8536SBO2**

Table 52 – Type S Starters with Motor Logic or TeSys T Overload Relays

Catalog Number	Standard Motor Ratings @ 50/60 Hz (HP)				Continuous Current Rating (A)	NEMA Size	Max. Component SCCR (kA) ¹	
	Three-Phase						Circuit Breakers @ 480 V ²	Fuses @ 600 V
	208 V	240 V	480 V	600 V				
8536SAO12	1.5	1.5	2	2	9	00	100	100 ³
8536SBO2	3	3	5	5	18	0	100	100 ³
8536SCO2	7.5	7.5	10	10	27	1	100	100 ³
8536SDO1	10	15	25	25	45	2	100	100 ³
8536SEO1	25	30	50	50	90	3	100	100 ³
8536SFO1	40	50	100	100	135	4	100	100 ⁴
8536SGO1	75	100	200	200	270	5	100	100 ⁴
8536SHO2	150	200	400	400	540	6	65	100 ⁴
8536SJO2	—	300	600	600	810	7	30	30

¹ Ratings apply to circuits with voltages no greater than those listed.
² When protected by any circuit breaker, including thermal-magnetic and magnetic-only, meeting the size limits in Table 53.
³ When protected by any Class RK5, RK1, T, or J fuse, meeting the size limits in Table 53.
⁴ When protected by any Class T or J fuse, meeting the size limits in Table 53.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Table 53 – Type S Starters with Motor Logic or TeSys T Overload Relays Max. Component SCCR¹

Catalog Number	Circuit Breakers @ 480 V ²		Fuses @ 600 V	
	Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
8536SAO12	70	100	60 ³	100
8536SBO2	70	100	60 ³	100
8536SCO2	70	100	60 ³	100
8536SDO1	100	100	100 ³	100
8536SEO1	150	100	200 ³	100
8536SFO1	225	100	200 ⁴	100
8536SGO1	400	100	400 ⁴	100
8536SHO2	800	65	600 ⁴	100
8536SJO2	2000	30	30	30

- ¹ Ratings apply to circuits with voltages no greater than those listed.
- ² When protected by any circuit breaker, including thermal-magnetic and magnetic-only.
- ³ When protected by any Class RK5, RK1, T or J fuse.
- ⁴ When protected by any Class T or J fuse.

NOTE: This table 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 as the circuit breaker becomes the weakest link.



**Type S Adapted Bimetal Starter
8536SAO12E4050**

Table 54 – Type S Starters with Adapted Bimetal Overload Relays

Catalog Number	Standard Motor Ratings @ 50/60 Hz (HP)				Continuous Current Rating (A)	NEMA Size	Max. Component SCCR (kA) ¹	
	Three-Phase						Circuit Breakers @ 480 V ²	Fuses @ 600 V ³
	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

- ¹ Ratings apply to circuits with voltages no greater than those listed.
- ² When protected by any circuit breaker, including thermal-magnetic and magnetic-only. Please refer to TeSys D overload relays (Table 45 on page 35) for ampacity restrictions.
- ³ When protected by any Class J or CC time-delay fuse. Please refer to TeSys D overload relays (Table 45 on page 35) for ampacity restrictions.

NOTE: This table 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 as the circuit breaker becomes the weakest link.

Definite Purpose Starters



**Definite Purpose Starter
8911DPSO33**

Table 55 – Definite Purpose Starters

Catalog Number	Max. Inductive AC3 Current (A)	Horsepower Ratings					No. of Thermal Units
		Single-Phase		Three-Phase			
		115 V	230 V	230 V	460 V	575 V	
2-Pole Single Phase							1
8911DPSO12	20	1.5	3	—	—	—	
8911DPSO22	25	2	5	—	—	—	
8911DPSO32	30	2	5	—	—	—	
8911DPSO42	40	3	7.5	—	—	—	
8911DPSO52	50	3	10	—	—	—	
3-Pole Poly-Phase							3
8911DPSO13	20	1.5	3	7.5	7.5	7.5	
8911DPSO23	25	2	5	10	15	20	
8911DPSO33	30	2	5	10	15	20	
8911DPSO43	40	3	7.5	10	20	25	
8911DPSO53	50	3	10	15	30	30	

UL 508 Self-Protected Combination Motor Controller (Type E)

TeSys™ U



TeSys U LU9SP0

Table 56 – TeSys U Self-Protected Combination Motor Starter (UL File E164871)

In combination with line spacer LU9SP0 for stand-alone starters or line spacer GV1G09 with GV2G busbars for multiple starters.

Standard Motor Ratings @ 50/60 Hz (HP)						Self-Protected Combination Starter	Overload Trip Range (A)	SCCR (kA)		
Single-Phase		Three-Phase						480Y/277 V	480 V with LUALB1 Limiter	600 V with LUALB1 Limiter
120 V	240 V	200 V	240 V	480 V	600 V					
1.5	2	3	3	7.5	10	LUB12	0.15–12	65	130	65
2	5	10	10	20	25	LUB32	0.15–32	65	130	65

NOTE: Type E ratings only valid at 480Y/277V and lower without using limiter block LUALB1. When limiter block LUALB1 is used, SCCR applies for stand alone starter or with GV1G09 and GV2G busbar for multiple starters.

UL 508 Manual Self-Protected Combination Motor Controller (Type E)

TeSys™ GV2P



GV2P10 with GV2GH7

Table 57 – TeSys GV2P Manual Self-Protected Combination Motor Starter (UL File E164871)

In combination with line spacer GV2GH7 or GV1G09 for stand-alone starters or line spacer GV1G09 with GV2G busbars for multiple starters.

Manual Self-Protected Starter	Overload Trip Range (A)	Maximum Horsepower Ratings						SCCR (kA)	
		Single-Phase		Three-Phase				480Y/277 V	600Y/347 V
		120 V	240 V	208 V	240 V	480 V	600 V		
GV2P01	0.10–0.16	—	—	—	—	—	—	100	50
GV2P02	0.16–0.25	—	—	—	—	—	—	100	50
GV2P03	0.25–0.40	—	—	—	—	—	—	100	50
GV2P04	0.40–0.63	—	—	—	—	—	—	100	50
GV2P05	0.63–1	—	—	—	—	—	0.5	100	50
GV2P06	1–1.6	—	1/10	—	—	0.75	0.75	100	50
GV2P07	1.6–2.5	—	1/6	0.5	0.5	1	1.5	100	50
GV2P08	2.5–4	1/8	1/3	0.75	0.75	2	3	100	50
GV2P10	4–6.3	0.25	0.5	1	1.5	3	5	100	50
GV2P14	6–10	0.5	1.5	2	3	5	7.5	100	22
GV2P16	9–14	0.75	2	3	3	10	10	10	—
GV2P20	13–18	1	3	5	5	10	15	10	—
GV2P21	17–23	1.5	3	5	7.5	15	20	10	—
GV2P22	20–25	2	—	7.5	7.5	15	20	10	—

NOTE: Type E ratings are only valid at 600Y/347 V and 480Y/277 V voltages and lower.

TeSys™ GV3P



GV3P40 with GV3G66 and GVAM11

Table 58 – TeSys GV3P Manual Self-Protected Combination Motor Starter (UL File E164871)

In combination with line spacer GV3G66 and short circuit signaling contact GVAM11 for stand-alone starters

Manual Self-Protected Starter	Overload Trip Range (A)	Maximum Horsepower Ratings						SCCR (kA)	
		1Ø		3Ø				480Y / 277 V	600Y / 347 V
		120V	240 V	208 V	240 V	480 V	600 V		
GV3P13	9–13	0.5	1.5	3	3	7.5	10	100	25
GV3P18	12–18	0.75	2	3	5	7.5	10	100	25
GV3P25	17–25	1.5	3	5	7.5	15	20	100	25
GV3P32	23–32	2	3	7.5	7.5	20	25	100	25
GV3P40	30–40	3	5	10	10	25	30	65	25
GV3P50	37–50	3	7.5	10	10	30	40	65	25
GV3P65	48–65	3	10	15	15	40	50	65	25

NOTE: Type E ratings are only valid at 600Y/347 V and 480Y/277 V voltages and lower.

Combination Starter Solutions

UL 508 Type A

Construction Type A utilizes four separate devices to achieve the four functions required for protection. The disconnecting means is achieved via a UL 98 manual disconnect switch. The motor branch circuit protection is achieved using UL 248 fuses. The motor controller and motor overload relay used are UL 508 contactors and UL 508 overload relays. Schneider Electric has various products that meet this construction type, as listed below.

Table 59 – Disconnecting Means using UL 248 Fuses, a UL 508 Contactor, and UL 508 Overload Relays

UL 98 Manual Disconnect	UL 248 Fuses	UL 508 Contactor	UL 508 Overload Relay
- TeSys LK non-fusible - Class 9422 non-fusible	- TeSys DF fuse holders - Type FB fuse holders	- TeSys K - TeSys D - TeSys F - TeSys N - Type S - Definite Purpose	- TeSys LR2K bimetal - TeSys LRD bimetal - TeSys LR9D electronic - TeSys LR9F electronic - TeSys T Motor Management System - Motor Logic solid state
- TeSys GS fusible switches ¹ - Class 9422 fusible switches ¹			

¹ TeSys GS and Class 9422 fusible switches accept UL 248 fuses directly into the switch, eliminating the need for a separate fuse holder.

A UL 508 starter is a combination of a UL 508 contactor and a UL 508 overload relay. As such, the use of UL 508 starters also meets construction Type A.

Table 60 – Disconnecting Means using UL 248 Fuses and a UL 508 Starter

UL 98 Manual Disconnect	UL 248 Fuses	UL 508 Starter
- TeSys LK non-fusible - Class 9422 non-fusible	- TeSys DF fuse holders - Type FB fuse holders	- TeSys N with Motor Logic - Type S with Motor Logic - Type S with TeSys T - Type S with Adapted Bimetal - Definite Purpose
- TeSys GS fusible switches ¹ - Class 9422 fusible switches ¹		

¹ TeSys GS and Class 9422 fusible switches accept UL 248 fuses directly into the switch, eliminating the need for a separate fuse holder.

UL 508 Type B

Construction Type B utilizes an UL 508 motor short circuit protector, which is no longer commercially available.

UL 508 Type C

Construction Type C utilizes three separate devices to achieve the four functions required for protection. The disconnecting means and motor branch circuit protection are achieved using a UL 489 inverse time circuit breaker. The motor controller and motor overload relay used are UL 508 contactors and UL 508 overload relays. Schneider Electric has various products that meet this construction type, as listed below.

Table 61 – Disconnecting Means and Motor Branch Circuit protection using a UL 98 Inverse Time Circuit Breaker, UL 508 Contactor, and a UL 508 Overload Relay

UL 489 Inverse Time Circuit Breaker	UL 508 Contactor	UL 508 Overload Relay
- PowerPact thermal-magnetic - Multi 9	- TeSys K - TeSys D - TeSys F - TeSys N - Type S - Definite Purpose	- TeSys LR2K bimetal - TeSys LRD bimetal - TeSys LR9D electronic - TeSys LR9F electronic - TeSys T Motor Management System - Motor Logic solid state

As previously mentioned, a UL 508 starter is a combination of a UL 508 contactor and a UL 508 overload relay. Therefore, the use of UL 508 starters also meets construction Type C.

Table 62 – Disconnecting Means and Motor Branch Circuit protection using a UL 489 Inverse Time Circuit Breaker and a UL 508 Starter

UL 489 Inverse Time Circuit Breaker	UL 508 Starter
<ul style="list-style-type: none"> - PowerPact thermal magnetic - Multi 9 	<ul style="list-style-type: none"> - TeSys N with Motor Logic - Type S with Motor Logic - Type S with TeSys T - Type S with Adapted Bimetal - Definite Purpose

UL 508 Type D

Construction Type D is very similar to Type C, except that the disconnecting means and motor branch circuit protection are achieved using a UL 489 instantaneous trip circuit breaker rather than an inverse time circuit breaker. Schneider Electric has various products that meet this construction type, as listed below.

Table 63 – Disconnecting Means and Motor Branch Circuit protection using a UL 489 Inverse Time Circuit Breaker, UL 508 Contactor, and a UL 508 Overload Relay

UL 489 Inverse Time Circuit Breaker	UL 508 Contactor	UL 508 Overload Relay
<ul style="list-style-type: none"> - PowerPact eMCP 	<ul style="list-style-type: none"> - TeSys K - TeSys D - TeSys F - TeSys N - Type S - Definite Purpose 	<ul style="list-style-type: none"> - TeSys LR2K bimetal - TeSys LRD bimetal - TeSys LR9D electronic - TeSys LR9F electronic - TeSys T Motor Management System - Motor Logic solid state

Just as for Type C, the use of UL 508 starters also meets construction Type D.

Table 64 – Disconnecting Means and Motor Branch Circuit Protection using a UL 489 Inverse Time Circuit Breaker and a UL 508 Starter

UL 489 Inverse Time Circuit Breaker	UL 508 Starter
<ul style="list-style-type: none"> - PowerPact eMCP 	<ul style="list-style-type: none"> - TeSys N with Motor Logic - Type S with Motor Logic - Type S with TeSys T - Type S with Adapted Bimetal - Definite Purpose

UL 508 Type E

Construction Type E is a unique situation in that all four functions are achieved using a single device. For this reason, Type E is known as a self-protected combination motor controller. Schneider Electric has two product families that meet this unique construction type, TeSys U and TeSys GV. TeSys U is a self-protected combination motor controller while TeSys GV is a manual self-protected combination motor controller.

Table 65 – UL 508 Self-protected Combination Motor Controller

UL 508 Self-Protected Combination Controller
<ul style="list-style-type: none"> -TeSys U

Table 66 – UL 508 Manual Self-protected Combination Motor Controller

UL 508 Manual Self-Protected Combination Controller
<ul style="list-style-type: none"> -TeSys GV2P -TeSys GV3P

UL 508 Type F

Construction Type F is similar to Type E, but uses two devices. The disconnecting means, motor branch circuit protection, and motor overload relay functions are all combined into one device, a UL 508 manual self-protected combination controller while the motor controller is kept separate in the form of a UL 508 contactor. Schneider Electric offers the following solution for this construction type:

Table 67 – Self-Protected Combination Motor Controller using a UL 508 Manual Self-Protected Combination Controller and a UL 508 Contactor

UL 508 Manual Self-Protected Combination Controller	UL 508 Contactor
-TeSys GV2P	-TeSys D
-TeSys GV3P	

TeSys™ GV2P + TeSys D Contactors

Manual Self-Protected Combination Starter Meeting UL 508 Type F
UL File E164871



TeSys GV2P with TeSys D
GV2GH7 + GV2P10 +
GV2AF3+ LC1D09

Table 68 – TeSys GV2P Type F Combination Motor Starter (UL File E164871)
In combination with line spacer GV2GH7 or GV1G09 for stand-alone starters or line spacer GV1G09 with GV2G busbars for multiple starters

Manual Self-Protected Starter	Overload Trip Range (A)	Maximum Horsepower Ratings						Type of Contactor Required	SCCR (kA)	
		Single-Phase		Three-Phase					480Y / 277 V	600Y / 347 V
		120 V	240 V	208 V	240 V	480 V	600 V			
GV2P01	0.10–0.16	—	—	—	—	—	—	LC1D09 or D12	100	—
GV2P02	0.16–0.25	—	—	—	—	—	—	LC1D09 or D12	100	—
								LC1D09	100	50
GV2P03	0.25–0.40	—	—	—	—	—	—	LC1D09 or D12	100	—
								LC1D09	100	50
GV2P04	0.40–0.63	—	—	—	—	—	—	LC1D09 or D12	100	—
								LC1D09	100	50
GV2P05	0.63–1	—	—	—	—	—	0.5	LC1D09 or D12	100	—
								LC1D09	100	50
GV2P06	1–1.6	—	1/10	—	—	0.75	0.75	LC1D09 or D12	100	—
								LC1D09	100	50
GV2P07	1.6–2.5	—	1/6	0.5	0.5	1	1.5	LC1D09 or D12	100	—
								LC1D09	100	50
GV2P08	2.5–4	1/8	1/3	0.75	0.75	2	3	LC1D09 or D12	100	—
								LC1D09	100	50
GV2P10	4–6.3	0.25	0.5	1	1.5	3	5	LC1D09 or D12	100	—
								LC1D09	100	50
GV2P14	6–10	0.5	1.5	2	3	5	7.5	LC1D09 or D12	100	—
								LC1D09	100	50
GV2P16	9–14	0.75	2	3	3	10	10	LC1D12 or D18	42	—
								LC1D18	50	50
GV2P20	13–18	1	3	5	5	10	15	LC1D12 or D18	42	—
								LC1D18	50	50
GV2P21	17–23	1.5	3	5	7.5	15	20	LC1D25 or D32	42	—
								LC1D25	50	50
GV2P22	20–25	2	—	7.5	7.5	15	20	LC1D25 or D32	42	—
								LC1D25	50	50

NOTE: Type F ratings only valid at 600Y/347V and 480Y/277V voltages and lower.

TeSys™ GV3P + TeSys D Contactors



TeSys GV3P with TeSys D
GV3G66 + GV3P40 +
GVAM11 + LC1D40A

Table 69 – TeSys GV3P Type F Combination Motor Starter (UL File E164871)
In combination with line spacer GV3G66 and short circuit signaling contact GVAM11 for stand-alone starters

Manual Self-Protected Starter	Overload Trip Range (A)	Maximum Horsepower Ratings						Type of Contactor Required	SCCR (kA)	
		Single-Phase		Three-Phase					480Y/277V	600Y/347V
		120 V	240 V	208 V	240 V	480 V	600 V			
GV3P13	9–13	0.5	1.5	3	3	7.5	10	LC1D18, D25, D32, D40A, D50A, or D65A	65	25
GV3P18	12–18	0.75	2	5	5	10	15	LC1D18, D25, D32, D40A, D50A, or D65A	65	25
GV3P25	17–25	1.5	3	5	7.5	15	20	LC1D25, D32, D40A, D50A, or D65A	65	25
GV3P32	23–32	2	5	7.5	10	20	25	LC1D32, D40A, D50A, or D65A	65	25
GV3P40	30–40	3	—	10	—	25	30	LC1D40A, 50A, or 65A	65	25
GV3P50	37–50	—	7.5	10	15	30	40	LC1D50A or 65A	65	25
GV3P65	48–65	5	10	15	20	40	50	LC1D65A or 80	65	25

NOTE: Type F ratings only valid at 600Y/347 V and 480Y/277 V voltages and lower.

Group Motor Installations

UL 508 Group Motor Installations

TeSys™ GV2ME + TeSys D Contactors



GV2ME07 with LC1D09

Table 70 – TeSys GV2ME and TeSys D Contactors for Group Motor Installations (UL File E164864)

In association with LC1D contactors, suitable for Group Installation when protected by fuses or a circuit breaker (including multi starter with GV1G09 or GV2G05 blocks plus GV2G busbars)

Manual Motor Starter	Overload Trip Range (A)	Maximum Horsepower Ratings						SCCR (kA) ¹			
		Single-Phase		Three-Phase				Type of Contactor Required	480 V	600Y / 347 V	480 V with GV1L3 Limiter
		120 V	240 V	208 V	240 V	480 V	600 V				
GV2ME01	0.10–0.16	—	—	—	—	—	—	LC1D09 or D12	65	42	65
GV2ME02	0.16–0.25	—	—	—	—	—	—	LC1D09 or D12	65	42	65
GV2ME03	0.25–0.40	—	—	—	—	—	—	LC1D09 or D12	65	42	65
GV2ME04	0.40–0.63	—	—	—	—	—	—	LC1D09 or D12	65	42	65
GV2ME05	0.63–1	—	—	—	—	—	0.5	LC1D09 or D12	65	42	65
GV2ME06	1–1.6	—	1/10	—	—	0.75	0.75	LC1D09 or D12	65	42	65
GV2ME07	1.6–2.5	—	1/6	0.5	0.5	1	1.5	LC1D09 or D12	65	42	65
GV2ME08	2.5–4	1/8	1/3	0.75	0.75	2	3	LC1D09 or D12	65	42	65
GV2ME10	4–6.3	0.25	0.5	1	1.5	3	5	LC1D09 or D12	65	42	65
GV2ME14	6–10	0.5	1.5	2	3	5	7.5	LC1D09 or D12	65	42	65
GV2ME16	9–14	0.75	2	3	3	10	10	LC1D12 or D18	22	10	65
GV2ME20	13–18	1	3	5	5	10	15	LC1D12 or D18	22	10	65
GV2ME21	17–23	1.5	3	5	7.5	15	20	LC1D25 or D32	10	10	65
GV2ME22	20–25	2	—	7.5	7.5	15	20	LC1D25 or D32	10	10	65
GV2ME32	24–32	2	5	7.5	10	20	25	LC1D25 or D32	5	5	65

¹ Ratings apply to circuit with voltages no greater than those listed.

TeSys™ GV2P + TeSys D Contactors



GV2P10 with LC1D09

Table 71 – TeSys GV2P and TeSys D Contactors for Group Motor Installations (UL File E164864)

In association with LC1D contactors, suitable for Group Installation when protected by fuses or a circuit breaker (including multi starter with GV1G09 or GV2G05 blocks plus GV2G busbars)

Manual Motor Starter	Overload Trip Range (A)	Maximum Horsepower Ratings						SCCR (kA) ¹			
		Single-Phase		Three-Phase				Type of Contactor Required	480 V	600Y / 347 V	480 V with GV1L3 Limiter
		120 V	240 V	208 V	240 V	480 V	600 V				
GV2P01	0.10-0.16	-	-	-	-	-	-	LC1D09 or D12	65	42	65
GV2P02	0.16-0.25	-	-	-	-	-	-	LC1D09 or D12	65	42	65
GV2P03	0.25-0.40	-	-	-	-	-	-	LC1D09 or D12	65	42	65
GV2P04	0.40-0.63	-	-	-	-	-	-	LC1D09 or D12	65	42	65
GV2P05	0.63-1	-	-	-	-	-	0.5	LC1D09 or D12	65	42	65
GV2P06	1-1.6	-	1/10	-	-	0.75	0.75	LC1D09 or D12	65	42	65
GV2P07	1.6-2.5	-	1/6	0.5	0.5	1	1.5	LC1D09 or D12	65	42	65
GV2P08	2.5-4	1/8	1/3	0.75	0.75	2	3	LC1D09 or D12	65	42	65
GV2P10	4-6.3	0.25	0.5	1	1.5	3	5	LC1D09 or D12	65	42	65
GV2P14	6-10	0.5	1.5	2	3	5	7.5	LC1D09 or D12	65	42	65
GV2P16	9-14	0.75	2	3	3	10	10	LC1D12 or D18	22	10	65
GV2P20	13-18	1	3	5	5	10	15	LC1D12 or D18	22	10	65
GV2P21	17-23	1.5	3	5	7.5	15	20	LC1D25 or D32	10	10	65
GV2P22	20-25	2	-	7.5	7.5	15	20	LC1D25 or D32	10	10	65
GV2P32	24-32	2	5	7.5	10	20	25	LC1D25 or D32	5	5	65

¹ Ratings apply to circuit with voltages no greater than those listed.

TeSys™ GV3P + TeSys D Contactors



GV3P40 with LC1D40A

Table 72 – TeSys GV3P and TeSys D Contactors for Group Motor Installations

In association with LC1D contactors, suitable for Group Installation when protected by fuses or a circuit breaker (including multi starter with GV3G busbars)

Manual Motor Starter	Overload Trip Range (A)	Maximum Horsepower Ratings						Type of Contactor Required	SCCR (kA)	
		Single-Phase		Three-Phase					480Y / 277 V	600Y / 347 V
		120 V	240 V	208 V	240 V	480 V	600 V			
GV3P13	9–13	0.5	1.5	3	3	7.5	10	LC1D18, D25, D32, D40A, D50A, or D65A	65	25
GV3P18	12–18	0.75	2	5	5	10	15	LC1D18, D25, D32, D40A, D50A, or D65A	65	25
GV3P25	17–25	1.5	3	5	7.5	15	20	LC1D25, D32, D40A, D50A, or D65A	65	25
GV3P32	23–32	2	5	7.5	10	20	25	LC1D32, D40A, D50A, or D65A	65	25
GV3P40	30–40	3	—	10	—	25	30	LC1D40A, 50A or 65A	65	25
GV3P50	37–50	—	7.5	10	15	30	40	LC1D50A or 65A	65	25
GV3P65	48–65	5	10	15	20	40	50	LC1D65A or 80	65	25

NOTE: These values are derived from the UL 508 Type F certification (E164871).

Specific Requirements for the Canadian Market

Installation and Product Standards

The installation standard in Canada is the *Canadian Electrical Code* (CEC). The CEC and the NEC are similar but not 100% equivalent.

The same is true for the CSA standards and corresponding UL standards (see Table 73). Some of the major differences are detailed below.

Certification Process

As in the U.S., nationally recognized testing laboratories (such as: CSA, ETL, TUV, and UL) are able to certify equipment according to these CSA standards. Refer to “Acceptance of Electrical Equipment in the U.S.” on page 5.

Technical Differences between Canadian and U.S. Standards

Some examples of differences between the Canadian and U.S. standards that currently apply to motor starters are listed below in Table 73. The TeSys™ product line is designed for compliance and compatibility with both the UL and the CSA requirements.

- Type E combination motors starters are recognized in Canada, however, the Type F combination starters are not currently accepted in Canada.
- Type E applications don't require the use of large spacing adapters when used in Canada.
- Group installation is recognized but the rules to define the common branch-circuit protection setting is quite different.
- Industrial control panels must meet CSA C22.2 No. 14
- Elevator equipment appliances must comply with the specific CSA Nr. B44.1 standard.
- Product marking requirements differ slightly.

Table 73 – Comparison of CSA and UL Standards

Standard Name	CSA Standard	UL Standard
Enclosed and Dead-Front Switches	CSA C22.2 No. 4	UL 98
Low-Voltage Fuses: Part 1: General Requirements	CSA C22.2 No. 248	UL 248
Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures	CSA C22.2 No. 5	UL 489
Industrial Control Equipment	CSA C22.2 No. 14	UL 508
Elevator Equipment	CSA No. B44.1	Partially UL 508

Full-Load Current, Three-Phase Alternating-Current Motors

The following full-load currents are based on the 2017 National Electrical Code, Table 430.250. These values are indicative; they vary according to the type of motor, the number of poles, and the manufacturer.

Table 74 – Induction-Type Squirrel Cage and Wound Rotor (A)

Horsepower (HP)	115 V	200 V	208 V	230 V	460 V	575 V
0.5	4.4	2.5	2.4	2.2	1.1	0.9
0.75	6.4	3.7	3.5	3.2	1.6	1.3
1	8.4	4.9	4.6	4.2	2.1	1.7
1.5	12.0	6.9	6.6	6.0	3.0	2.4
2	13.6	7.8	7.5	6.8	3.4	2.7
3	—	11.0	10.6	9.6	4.8	3.9
5	—	17.5	16.7	15.2	7.6	6.1
7.5	—	25.3	24.2	22	11	9
10	—	32.2	30.8	28	14	11
15	—	48.3	46.2	42	21	17
20	—	62.1	59.4	54	27	22
25	—	78.2	74.8	68	34	27
30	—	92	88	80	40	32
40	—	120	114	104	52	41
50	—	150	143	130	65	52
60	—	177	169	154	77	62
75	—	221	211	192	96	77
100	—	285	273	248	124	99
125	—	359	343	312	156	125
150	—	414	396	360	180	144
200	—	552	528	480	240	192
250	—	—	—	—	302	242
300	—	—	—	—	361	289
350	—	—	—	—	414	336
400	—	—	—	—	477	382
450	—	—	—	—	515	412
500	—	—	—	—	590	472

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