Motor Control Solutions
for the North American Market

Data Bulletin

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Retain for future use.

Schneider Electric

Table of Contents

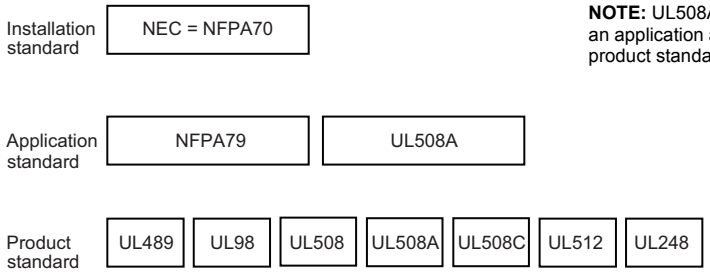
Introduction

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

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

Figure 1: Standards



- National Electrical Code® (NEC), NFPA70: Electrical Installation
- NFPA79: Electrical Standard for Industrial Machinery
- UL508A: Industrial Control Panel
- UL489: Molded-Case Circuit Breaker, Molded-Case Switches
- UL508: Industrial Control Equipment
- UL508C: Power Conversion Equipment
- UL98: Enclosed and Dead-Front Switches
- UL512: Fuse Holders
- UL248: Low Voltage Fuses

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 products are listed at the following website: http://www.osha.gov/dts/otpca/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 UL508A

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

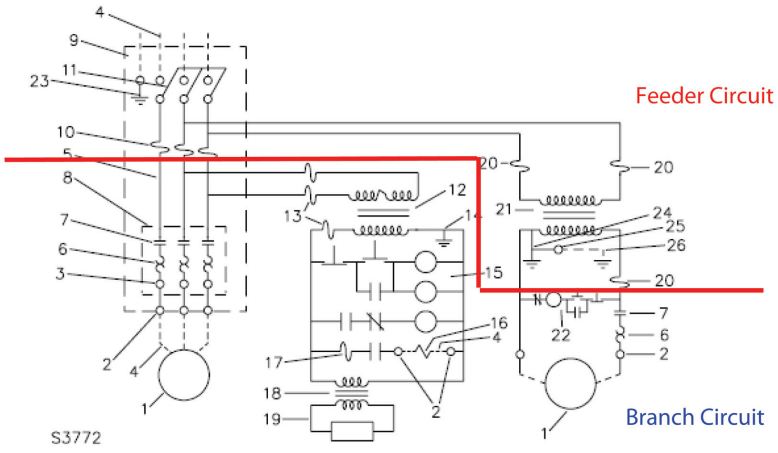


Table 1 contains a description of the numbered circuit components called out in Figure 2.

Table 1: 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	Contactor or controller	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 600 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 short-circuit device rating marked on any controller (UL508 circuit breaker, switch or contactor) 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 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 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”).

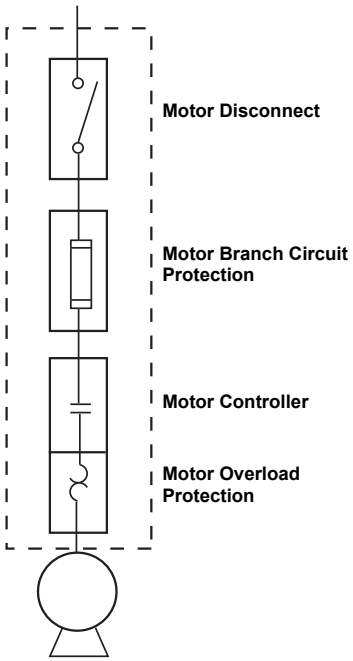
For more information, see data bulletin #8502DB0701 entitled “Group Motor Installations: Understanding NEC 430.53 Requirements.”

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 2.

Table 2: UL Combination Starter Type Designations

<table>
<tr><th rowspan="2"></th><th rowspan="2">UL Combination Starter Type</th><th colspan="4">Device Used for Component Function</th><th rowspan="2"></th></tr>
<tr><th>Disconnect</th><th>Branch Circuit Protection</th><th>Motor Controller</th><th>Motor OL Relay</th></tr>
<tr><td rowspan="4">Traditional Combination Starters from the 1980s and earlier</td><td>A</td><td rowspan="2">UL 98 Manual Disconnect</td><td>UL 248 Fuses</td><td rowspan="4">UL 508 Magnetic or Solid State Controller</td><td rowspan="4">UL 508 Motor Overload Relay</td><td rowspan="2"> 
UL 98 Disconnect Switch
UL 248 Fuses
UL 508 Controller
UL 508 Overload Relay</td></tr>
<tr><td>B</td><td>UL 508 Motor Short Circuit Protector</td></tr>
<tr><td>C</td><td colspan="2">UL 489 Inverse Time Circuit Breaker</td><td rowspan="2"> 
UL 489 Circuit Breaker
UL 508 Controller
UL 508 Overload Relay</td></tr>
<tr><td>D</td><td colspan="2">UL 489 Instantaneous Trip Circuit Breaker</td></tr>
<tr><td>Recognized 1990</td><td>E</td><td colspan="4">UL 508 Self-Protected Combination Controller</td><td> 
UL 508 Type E Self-Protected Combination Starter: TeSys U
 
UL 508 Type E Manual Self-Protected Combination Starter: TeSys GV2P & GV3P</td></tr>
<tr><td>Recognized 2002</td><td>F</td><td colspan="2">UL 508 Manual Self-Protected Combination Controller</td><td>UL 508 Magnetic or Solid State Controller</td><td>UL 508 Manual Self-Protected Combination Controller</td><td> 
UL 508 Type F Combination Starter: TeSys GV2P/GV3P + TeSys D Contactor</td></tr>
</table>

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

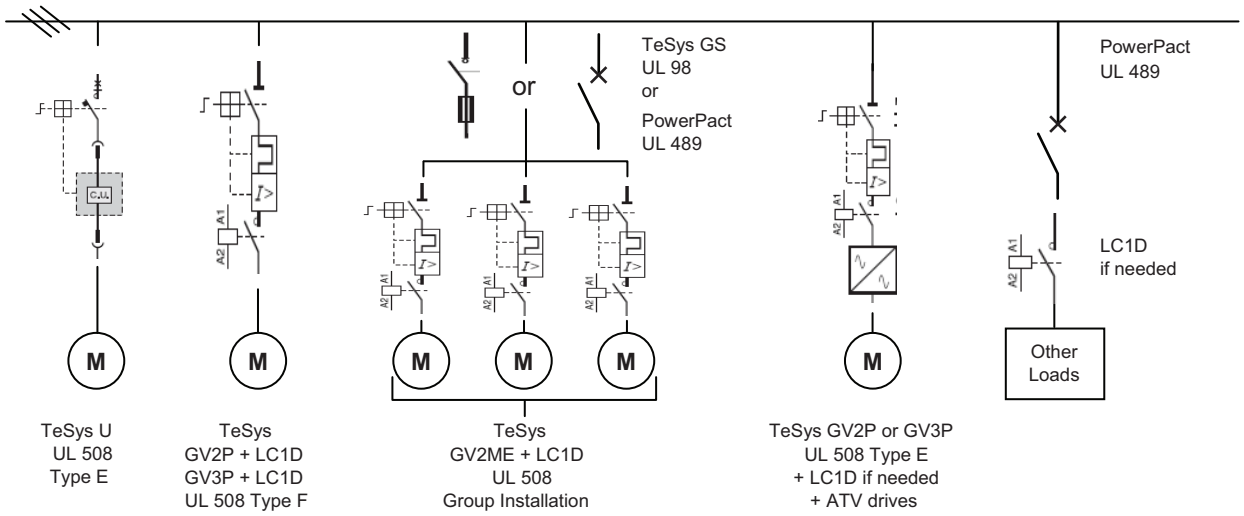
The disconnecting means on the feeder circuit, ahead of the last SCPD, must be a UL98 disconnect switch or UL489 circuit breaker. UL508 switches or motor protectors are not acceptable.

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 UL508 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:

- UL489 inverse-time or instantaneous-trip circuit breaker
- UL489 molded-case switch
- UL98 switch unit, either open type or enclosed

For a motor starter, the disconnecting means could be a UL508 Type E self-protected combination motor controller.

The sizing of the disconnecting means must meet UL508A Section 30.2.

An UL508 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 (NFPA79 Section 5.3.3.1 and UL508A 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 UL98 TeSys GS disconnect switches meet these characteristics:

- The TeSys GS1 disconnect switch requires the use of operating mechanism GS1AD010 and GS1AD020.
- The TeSys GS2 disconnect switch provides these features (coming soon).

The UL489 PowerPact Circuit breakers meet these characteristics when used in conjunction with a Class 9422 or 9421L operating mechanism and 9421LH79 handle.

SCCR requirement in UL508A

NEC Article 409, NFPA 79, and UL508A 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

UL508A, 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 SCCRs in Table SB4.1 of Supplement SB.
- Use the tested SCCR from component combinations per UL508.

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 3) 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 3: Extract of Table SB4.1

Component	Short Circuit Current Rating
Motor controllers (rated in hp)	
a. 0–50	5 kA
a. 51–200	10 kA
b. 201–400	18 kA
c. 401–600	30 kA
d. 601–900	42 kA
e. 901–1500	85 kA

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 determinging 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.

UL508A Support Websites

Schneider Electric offers UL508A support on our website at www.Schneider-Electric.us. A number of educational and product search tools are available on the website, including overview information, a UL 508A SCCR determination flow chart, or information on our individual or combination product SCCRs. The UL also publishes SCCR tested combination ratings on its website. Schneider Electric's updated tested combination ratings can be found on both websites and is free to download.

Schneider Electric's UL508A Support Website:
http://www.schneider-electric.us/sites/us/en/support/product-support-resources/ul-508a-support/ul-508a-support.page

(In the "What's New" area, select "Fully UL508A Tested and Approved Combination Spreadsheets Now Available.")

UL's UL508A Combination Motor Controller Website:
http://www.ul.com/global/eng/pages/offerings/industries/powerandcontrols/industrialcontrolequipment/

Combination Starter Components

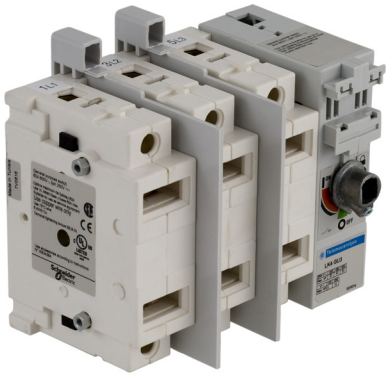
UL 98 Manual Disconnect Switches

TeSys™ GS Disconnect Switches

TeSys GS Disconnect Switch
GS1DU3

Table 4: TeSys GS Fusible Disconnect Switches

Catalog Number	Ampere Rating (A)	Horsepower Rating (hp)				SCCR@ 600 Vac (kA)	Fuse Type	UL Type
		3Ø Vac			Vdc			
		240	480	600	250			
GS1DDU3	30	7.5	15	20	5	100	CC	489
GS1DU3	30	7.5	15	20	5	100	J	98
GS2GU3N	60	15	30	50	10	200	J	98
GS2JU3N	100	30	60	75	20	200	J	98
GS2MU3N	200	60	125	150	40	200	J	98
GS2QU3N	400	125	250	350	50	200	J	98
GS2SU3	600	200	400	500	—	200	J	98
GS2TU3	800	250	500	500	—	200	L	98

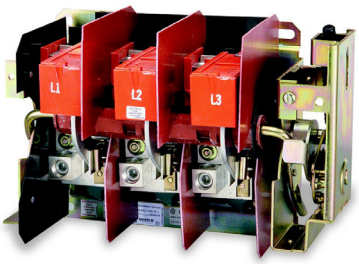


TeSys LK
Disconnect Switch
LK4GU3

Table 5: TeSys LK Non-Fusible Disconnect Switches

Catalog Number	Ampere Rating (A)	Horsepower Rating (hp)				SCCR @ 600 Vac (kA)	Fuse Type
		3Ø Vac			Vdc		
		240	480	600	250		
LK4DU3CN	30	10	20	30	—	100	J
LK4GU3CN	60	20	40	50	—	100	J
LK4JU3N	100	30	75	100	15	200	J
LK4MU3N	200	75	150	200	15	200	J
LK4QU3N	400	125	250	350	50	200	J
LK4SU3N	600	200	400	350	50	200	J
LK4TU3N	800	200	500	500	—	100	L
LK4UU3N	1000	200	500	500	—	100	L
LK4WU3N	1200	200	500	500	—	100	L

Class 9422 Disconnect Switches



Flange Mountd, Variable Depth Disconnect Switch 9422TF1

Table 6: Class 9422 Flange Mounted, Variable Depth Disconnect Switches

Disconnect Switch Size (A)	Horsepower Ratings						Fuse Type	Fuse Clip Rating (A) Non-Interchangeable Type for Class H, J, K or R Fuses		Catalog Number [1]
	3Ø Vac				Vdc					
	208	240	480	600	250	600		250 V	600 V	
30	7.5	7.5	15	20	5	15	None	—	—	9422TCN30
							H, J, K, R	30 60	— 30	9422TCF30 9422TCF33
60	—	15	30	50	10	30	None	—	—	9422TDN60
							H, J, K, R	60 —	30 60	9422TDF60 9422TDF63
100	25	30	60	75	20	50	None	—	—	9422TEN10
							H, J, K, R	100	100	9422TEF10
200	40	60	125	150	40	50	None	—	—	9422TF1
							H, J, K, R	200 —	200 400	9422TF2 9422TF3 [2]
400	75	125	250	350	50	50	None	—	—	9422TG1 [3, 4]
							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

UL 248 Fuses

TeSys™ DF Fuse Holder

Table 7: 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 Holder

Table 8: Type FB 600 V Fuse Holders

Rating (A)	No. of Poles	Fuse	Catalog Number
30	1	Class R	9080FB1611R
	2	Class R	9080FB2611R
		Class J	9080FB2611J
	3	Class R	9080FB3611R
		Class J	9080FB3611J
60	1	Class R	9080FB1621R
	2	Class J	9080FB2621J
	3	Class R	9080FB3621R
		Class J	9080FB3621J
100	3	Class R	9080FB3631R

UL 489 Molded-Case Circuit Breakers

PowerPact Circuit Breakers and Motor Circuit Protectors

Table 9: PowerPact Catalog Numbering System

Frame	Rating	Termination	Poles	Voltage	Amperage	Suffix Code	Suffix Code
H	G	L	3	6	150	AB	SA

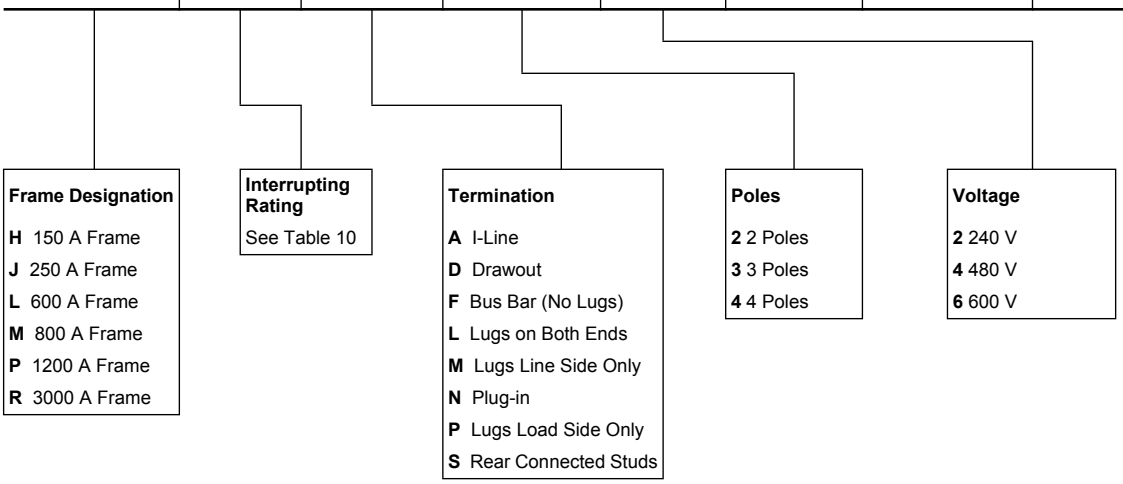


Table 10: PowerPact Interrupting Ratings System

Voltage	Interrupting Rataing					
	D	G	J	K	L	R
240 Vac	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	13 kA	25 kA	65 kA	50 kA	100 kA
Frame (X = available)						
H-Frame (15-150 A)	X	X	X		X	X
J-Frame (150-250 A)	X	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 [1]	X [2]	
R-Frame (600-3000 A)		X	X	X	X	

[1] P-Frame K-interrupting level is 50kA at 480 Vac and 600 Vac
[2] P-Frame L-interrupting level is 25kA at 600 Vac

Table 11: PowerPact H- and J-Frame Electronic Motor Circuit Protectors (MCP)

Frame	Current	Full Load (A)	Adjustable Instantaneous	Suffix	J Interrupting	L Interrupting
					Cat. No.	Cat. No.
H-Frame	30 A	1.5–25 A	9–325 A	M71	HJL36030M71	HLL36030M71
	50 A	14–42 A	84–546 A	M72	HJL36050M72	HLL36050M72
	100 A	30–80 A	180–1040 A	M73	HJL36100M73	HLL36100M73
	150 A	58–130 A	348–1690 A	M74	HJL36150M74	HLL36150M74
J-Frame	250 A	114–217 A	684–2500 A	M75	JJL36250M75	JLL36250M75

UL508 Contactors

TeSys™ K Contactors

Table 12: TeSys K Contactors

Catalog Number	Standard Motor Ratings @ 50/60 Hz (hp)						Max. Inductive AC3 Current (A)	Max. Resistive AC1 Current (A)	Max. Component SCCR (kA) [1]	
	1 Ø		3 Ø						Circuit Breakers @ 480 V [2]	Fuses @ 600 V [3]
	120 V	240 V	208 V	240 V	480 V	600 V				
LC1K06	0.5	1.5	1.5	1.5	3	3	6	15	65	100
LC1K09	0.5	1.5	2	3	5	5	9	20	65	100
LC1K12	0.5	1.5	3	3	7.5	10	12	20	65	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.
[3] When protected by any Class J or CC time-delay fuse meeting the size limites in Table 13.
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 13: TeSys K Contactor Maximum Component SCCR [1]

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)
LC1K06	20	65	25	100
LC1K09	20	65	30	100
LC1K12	20	65	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 14: TeSys D Contactors

Catalog Number	Standard Motor Ratings @ 50/60 Hz (hp)						Max. Inductive AC3 Current (A)	Max. Resistive AC1 Current (A)	Max. Component SCCR (kA) [1]	
	1 Ø		3 Ø						Circuit Breakers @ 480 V [2]	Fuses @ 600 V [3]
	120 V	240 V	208 V	240 V	480 V	600 V				
LC1D09	0.5	1	2	2	5	7.5	9	20	85	100
LC1D12	1	2	3	3	7.5	10	12	25	85	100
LC1D18	1	3	5	5	10	15	18	32	85	100
LC1D25	2	3	7.5	7.5	15	20	25	40	85	100
LC1D32	2	5	10	10	20	30	32	50	85	100
LC1D40A	3	5	10	10	30	30	40	60	100	100
LC1D50A	3	7.5	15	15	40	40	50	80	100	100
LC1D65A	5	10	20	20	40	50	65	80	100	100
LC1D80	7.5	15	25	30	60	60	80	125	100	100
LC1D115	—	—	30	40	75	100	115	200	100	100
LC1D150	—	—	40	50	100	125	150	200	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 15.
[3] When protected by any Class J or CC time-delay fuse meeting the size limites in Table 15.
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 15: TeSys D Contactor Maximum Component SCCR [1]

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)
LC1D09	35	85	25	100
LC1D12	35	85	30	100
LC1D18	60	85	40	100
LC1D25	60	85	60	100
LC1D32	60	85	80	100
LC1D40A	110	100	90	100
LC1D50A	110	100	110	100
LC1D65A	110	100	125	100
LC1D80	150	100	175	100
LC1D115	250	100	250	100
LC1D150	250	100	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 (Class CC applicable up to 30A 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.

Additional TeSys™ D Contactor Ratings

Table 16: UL/CSA Lighting Ratings @ 575 / 600V

Device	Ballast	Tungsten
LC1D09 (AC coil only)	20 A	20 A
LC1D12 (AC coil only)	25 A	20 A
LC1D18 (AC coil only)	32 A	25 A
LC1D25 (AC coil only)	40 A	40 A
LC1D32 (AC coil only)	50 A	50 A
LC1DT20 (AC coil only)	20 A	20 A
LC1DT25 (AC coil only)	25 A	25 A
LC1DT32 (AC coil only)	32 A	32 A
LC1DT40 (AC coil only)	40 A	40 A
LC1D40A	60 A	60 A
LC1D50A	70 A	70 A
LC1D65A	80 A	70 A
LC1D80, LC1D80004	100 A	100 A[1]
LC1D115, LC1D1150004	115 A	115 A[1]
LC1D150, LC1D1500004	150 A	150 A[1]

[1] 480 V max.

Table 17: Elevator Duty Ratings (hp)

Catalog Number	1 Ø	3 Ø			
	240 V	208 V	240 V	480 V	600 V
LC1D12 (AC)	1.5	2	3	7.5	7.5
LC1D25 (AC)	3	5	7.5	15	20
LC1D32 (AC)	5	10	—	—	—
LC1D40A (AC)	—	—	—	—	—
LC1D50A (AC)	7.5	10	15	25	30
LC1D65A (AC)	10	15	20	25	30
LC1D80	15	20	25	50	50
LC1D115	—	—	—	—	—
LC1D150	15	25	30	60	75

Additional TeSys™ D Contactor Ratings Continued

Table 18: Definite Purpose Ratings, 3-Phase, Breaking All Lines
Hermetic Refrigeration Compressor

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

TeSys F Contactors

TeSys F Contactor LC1F400

Table 19: TeSys F Contactors

Catalog Number	Standard Motor Ratings @ 50/60 Hz (hp)				Max. Inductive AC3 Current (A)	Max. Resistive AC1 Current (A)
	3 Ø					
	208 V	240 V	480 V	600 V		
LC1F115	30	40	75	100	115	200
LC1F150	40	50	100	125	150	250
LC1F185	50	60	125	150	185	275
LC1F225	—	—	—	—	225	315
LC1F265	60	75	150	175	265	350
LC1F330	75	100	200	250	330	400
LC1F400	100	125	250	300	400	500
LC1F500	150	200	400	500	500	700
LC1F630	250	300	600	800	630	1000
LC1F780	—	—	—	—	780	1600
LC1F800	—	450	800	900	800	1000
LC1F1400	—	—	—	—	—	1400
LC1F1700	—	—	—	—	—	1700
LC1F2100	—	—	—	—	—	2100

Additional TeSys™ F Contactor Ratings

Table 20: UL/CSA Lighting ratings @ 480 V

3-Pole or 4-Pole Contactor	Tungsten Rating	Ballast Rating
LC1F115	115 A	115 A
LC1F150	150 A	150 A
LC1F185	200 A	200 A
LC1F265	265 A	265 A
LC1F330	300 A	300 A

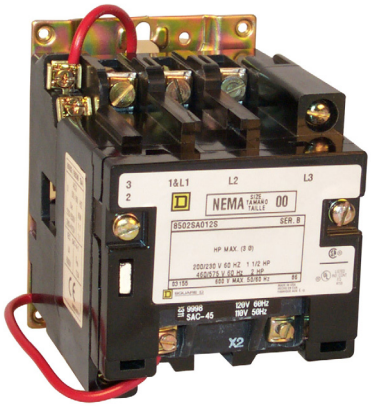
Table 21: Elevator Duty Ratings (hp)

Contactor	1Ø	3Ø			
	240 V	208 V	240 V	480 V	600 V
LC1F185	20	25	30	75	75
LC1F265	—	40	40	—	—
LC1F330	—	50	50	—	—
LC1F400	—	60	60	—	—
LC1F500	—	75	75	—	—
LC1F630	—	100	100	—	—

Table 22: Definite Purpose Ratings, 3-Phase, Breaking All Lines
Hermetic Refrigeration Compressor

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

Type S Contactors



Type S Contactor
8502SAO12

Table 23: Type S Contactors

Catalog Number	Standard Motor Ratings @ 50/60 Hz (hp)				Max. Resistive AC1 Current (A)	NEMA Size	Max. Component SCCR (kA) [1]	
	3 Ø						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 24.
[3] When protected by any Class RK5, RK1, T or J fuse, meeting the size limits in Table 24.
[4] When protected by any Class T or J fuse, meeting the size limits in Table 24.
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 24: Type S Contactor Maximum Component SCCR[1]

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.

Additional Type S Contactor Ratings

Table 25: Type S Lighting Ratings @ 250 V Maximum

Catalog Number	Tungsten & Infrared (A)
8502SAO12	5
8502SBO2	10
8502SCO2	15
8502SDO2	30
8502SEO2	60
8502SFO2	120
8502SGO2	240
8502SHO2	480
8502SJO2	—

Definite Purpose Contactors

Definite Purpose Type DP Compact Contactor 8910DP22V09

Table 26: Definite Purpose Type DP Compact Contactors

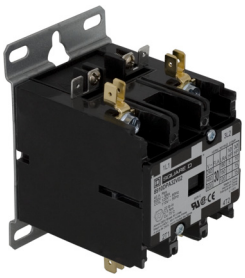
Catalog Number	Max. Inductive AC3 Current (A)	Locked Rotor Amperes			Max. Resistive AC1 Current (A)	Max. Component SCCR (kA) [1]	
		277 V	460 V	575 V		Circuit Breakers @ 480 V [2]	Fuses @ 600 V [3]
1-Pole Contactors							
8910DP11	20	120	100	80	25	100	100
8910DP21	25	150	125	100	30	100	100
8910DP31	30	150	125	100	40	100	100
8910DP41	40	240	200	160	50 [5]	100	100
2-Pole Contactors [4]							
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 27.
[3] When protected by any Class J time-delay fuse, meeting the size limits in Table 24.
[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 27: Definite Purpose Type DP Compact Contactor Maximum Component SCCR[1]

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.



Definite Purpose Type DPA Contactor 8910DPA32

Table 28: Definite Purpose Type DPA Contactors [1]

Catalog Number	Max. Inductive AC3 Current (A)	Locked Rotor Amperes			Max. Resistive AC1 Current (A)	Horsepower Ratings					Poles	Max. Component SCCR (kA) [2]	
						1Ø		3Ø				Circuit Breakers @ 480 V [3]	Fuses @ 600 V [4]
		230 V	460 V	575 V		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 29.
[4] When protected by any Class RK5 or J time-delay fuse, meeting the size limits in Table 29.
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 29: Definite Purpose Type DPA Contactor Maximum Component SCCR[1]

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.

UL 508 Overload Relays

TeSys™ K Overload Relays

TeSys K Overload Relay LR2K0304

Table 30: TeSys K Overload Relays

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

TeSys D Overload Relay

Table 31: TeSys D 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 [1]			
						Circuit Breakers @ 480 V [2]		Fuses @ 600 V [3]	
						Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
0.10–0.16	D09–D32	LRD01	LR3D01	—	—	15	65	10	100
0.16–0.25		LRD02	LR3D02	—	—	15	65	10	100
0.25–0.40		LRD03	LR3D03	—	—	15	65	10	100
0.40–0.63		LRD04	LR3D04	—	—	15	65	10	100
0.63–1		LRD05	LR3D05	—	—	15	65	10	100
1–1.6		LRD06	LR3D06	—	—	15	65	10	100
1.6–2.5		LRD07	LR3D07	—	—	15	65	10	100
2.5–4		LRD08	LR3D08	LRD1508	LR3D1508A1	15	65	15	100
4–6		LRD10	LR3D10	LRD1510	LR3D1510A1	15	65	20	100
5.5–8		LRD12	LR3D12	LRD1512	LR3D1512A1	15	65	30	100
7–10		LRD14	LR3D14	LRD1514	LR3D1514A1	20	65	40	100
9–13	D12–D32	LRD16	LR3D16	LRD1516	LR3D1516A1	25	65	50	100
12–18	D18–D32	LRD21	LR3D21	LRD1521	LR3D1521A1	35	65	60	100
16–24	D25–D32	LRD22	LR3D22	—	—	45	65	60	100
17–25		—	—	LRD1522	LR3D1522A1	45	65	100	100
23–32		LRD32	LR3D32	—	—	60	65	80	100
23–28		—	—	LRD1530	LR3D1530A1	60	65	100	100
25–32		—	—	LRD1532	LR3D1532A1	60	65	100	100
30–38	D32	LRD35	LR3D35	—	—	70	65	100	100
9–13	D40A–D65A [4]	LRD313	LR3D313	LRD313L	—	25	100	30	100
12–18		LRD318	LR3D318	LRD318L	—	35	100	45	100
16–25		LRD325	LR3D325	LRD325L	—	45	100	60	100
23–32		LRD332	LR3D332	LRD332L	—	60	100	80	100
30–40		LRD340	LR3D340	LRD340L	—	70	100	100	100
37–50		LRD350	LR3D350	LRD350L	—	90	100	125	100
48–65	D50A–D65A [4]	LRD365	LR3D365	LRD365L	—	125	100	200	100
17–25	D40–D80 [5]	LRD3322	LR3D3322	LR2D3522	LR3D3522	45	100	60	100
23–32		LRD3353	LR3D3353	LR2D3553	LR3D3553	60	100	80	100
30–40		LRD3355	LR3D3355	LR2D3555	LR3D3555	70	100	90	100
37–50	D50–D80 [5]	LRD3357	LR3D3357	LR2D3557	LR3D3557	90	100	125	100
48–65		LRD3359	LR3D3359	LR2D3559	LR3D3559	125	100	150	100
55–70	D65–D80 [5]	LRD3361	LR3D3361	LR2D3561	LR3D3561	125	100	175	100
63–80		LRD3363	LR3D3363	LR2D3563	LR3D3563	150	100	200	100
80–104	D80	LRD3365	—	—	—	200	100	250	100
80–104	D115–D150	LRD4365	—	—	—	200	100	250	100
95–120		LRD4367	—	—	—	250	100	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 (Class CC applicable up to 30A only).
[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 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 D Overload Relay
LR9D5369

Table 32: TeSys™ D Overload Relays — Solid State

Current Setting Range (A)	For Direct Mounting to LC1…	Class 10	Class 20	Class 10 or 20 Selectable	Max. Component SCCR [1]			
					Circuit Breakers @ 480 V [2]		Fuses @ 600 V [3]	
					Max. Breaker Size (A)	Max. SCCR (kA)	Max. Fuse Size (A)	Max. SCCR (kA)
60–100	D115–D150	LR9D5367	LR9D5567	LR9D67	175	100	225	100
90–150	D115–D150	LR9D5369	LR9D5569	LR9D69	250	100	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 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.

TeSys F Overload Relays

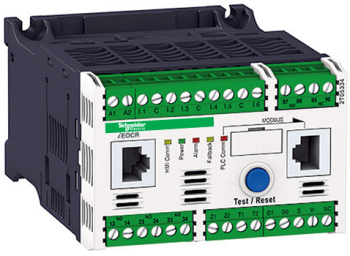
TeSys F Overload Relay
LR9F5

Table 33: TeSys F Overload Relays [1]

Current Setting Range (A)	For Direct Mounting to LC1…	Class 10	Class 20
30–50	F115–F185	LR9F5357	LR9F5557
48–80		LR9F5363	LR9F5563
60–100		LR9F5367	LR9F5567
90–150		LR9F5369	LR9F5569
132–220	F185–F265 [2]	LR9F5371	LR9F5571
200–330	F265–F500	LR9F7375	LR9F7575
300–500		LR9F7379	LR9F7579
380–630	F400–F630	LR9F7381	LR9F7581

[1] When mounting overload relays LR9F5*57 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] Interconnection kit LA7F407 is required to mount an LR9F*71 to an LC1F185.

TeSys T Motor Management System



TeSys T Motor Management System
LTMR08MFM

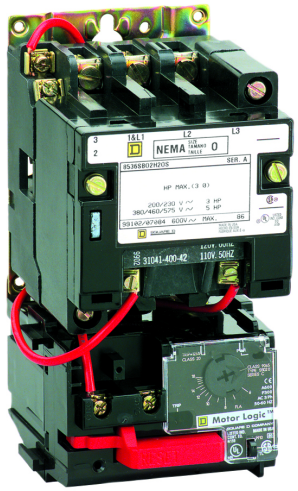
Table 34: TeSys T Motor Management System

Current Range (A)	Catalog Number [1]		Max. Component SCCR [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 Modbus TCP, a C for CANopen and a D for DeviceNet.
[2] Ratings apply to circuits no greater than 600 V.
[3] When protected by any Class J or CC time-delay fuse (Class CC applicable up to 30 A 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.

UL508 Starters

Type S Starters



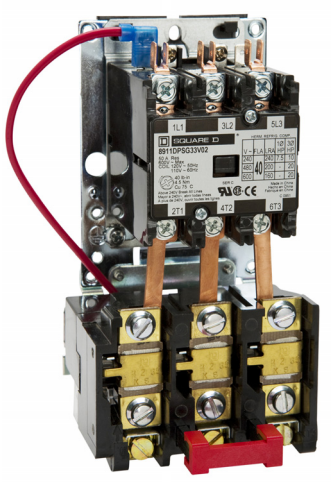
MotorStarter with Motorlogic
8536SBO2

Table 35: Type S Starters [1]

Catalog Number	Standard Motor Ratings @ 50/60 Hz (hp)				Continuous Current Rating (A)	NEMA Size
	3 Ø					
	200 V	230 V	460 V	575 V		
8536SAO12	1.5	1.5	2	2	9	00
8536SBO2	3	3	5	5	18	0
8536SCO2	7.5	7.5	10	10	27	1
8536SDO1	10	15	25	25	45	2
8536SEO1	25	30	50	50	90	3
8536SFO1	40	50	100	100	135	4
8536SGO1	75	100	200	200	270	5
8536SHO2	150	200	400	400	540	6
8536SJO2	—	300	600	600	810	7

[1] Type S starters with TeSys T overload relays have the same component short-circuit current ratings as the Type S contactor, shown in Table 23.

Definite Purpose Starters



Definite Purpose Starter
8911DPSO33

Table 36: Definite Purpose Starters

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

TeSys™ U

TeSys U
LUB12

Meeting UL508 Type E
UL File E164871

Table 37: TeSys U Horsepower and SCCR Ratings
In combination with line spacer LU9SP0 (stand-alone starters) or GV1G09 and GV2G busbars (multiple starters)

Standard Motor Ratings @ 50/60 Hz (hp)						Self-Protected Combination Starter	Overload Trip Range (A)	SCCR (kA)		
1Ø		3Ø						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 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

TeSys GV2P

GV2P10

Meeting UL 508 Type E
UL File E164871

Table 38: TeSys GV2P Horsepower and SCCR Ratings
In combination with line spacer GV2GH7 (stand-alone starters) or GV1G09 and GV2G busbars (multiple starters)

Manual Self-Protected Starter	Overload Trip Range (A)	Maximum Horsepower Ratings						SCCR (kA) 480Y/277V
		1Ø		3Ø				
		120 V	240 V	208 V	240 V	480 V	600 V	
GV2P01	0.10–0.16	—	—	—	—	—	—	100
GV2P02	0.16–0.25	—	—	—	—	—	—	100
GV2P03	0.25–0.40	—	—	—	—	—	—	100
GV2P04	0.40–0.63	—	—	—	—	—	—	100
GV2P05	0.63–1	—	—	—	—	—	0.5	100
GV2P06	1–1.6	—	1/10	—	—	0.75	0.75	100
GV2P07	1.6–2.5	—	1/6	0.5	0.5	1	1.5	100
GV2P08	2.5–4	1/8	1/3	0.75	0.75	2	3	100
GV2P10	4–6.3	0.25	0.5	1	1.5	3	5	100
GV2P14	6–10	0.5	1.5	2	3	5	7.5	100
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 480Y voltages and lower.

TeSys GV3P

GV3P25

Table 39: TeSys GV3P Horsepower and SCCR Ratings
In combination with line spacer GV3G66 and GVAM11 (magnetic trip unit) 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	5	5	10	15	100	25
GV3P25	17–25	1.5	3	5	7.5	15	20	100	25
GV3P32	23–32	2	5	7.5	10	20	25	100	25
GV3P40	30–40	3	—	10	—	25	30	65	25
GV3P50	37–50	—	7.5	10	15	30	40	65	25
GV3P65	48–65	5	10	15	20	40	50	65	25

Type E ratings are only valid at 600Y and 480Y voltages and lower.

Combination Starter Solutions

UL508 Type A

Construction Type A utilizes four separate devices to achieve the four functions required for protection. The disconnecting means is achieved via a UL98 manual disconnect switch. The motor branch circuit protection is achieved using UL248 fuses. The motor controller and motor overload relay used are UL508 contactors and UL508 overload relays. Schneider Electric has various products that meet this construction type, as listed below.

Table 40: Disconnecting Means using UL248 Fuses, a UL508 Contactor, and UL508 Overload Relays

UL98 Manual Disconnect	UL248 Fuses	UL508 Contactor	UL508 Overload Relay
TeSys™ GS Disconnects	TeSys DF Fuse Holder	TeSys K contactor	TeSys K overload relay
Class 9422 Disconnects	Type FB Fuse Holder	TeSys D contactor	TeSys D overload relay
		TeSys F contactor	TeSys F overload relay
		Type S contactor	TeSys T motor management system
		Definite Purpose contactor	

A UL508 starter is a combination of a UL508 contactor and a UL508 overload relay. As such, the use of UL508 starters also meets construction Type A.

Table 41: Disconnecting Means using UL248 Fuses and a UL508 Starter

UL98 Manual Disconnect	UL248 Fuses	UL508 Starter
TeSys GS Disconnects	TeSys DF Fuse Holder	Type S starter
Class 9422 Disconnects	Type FB Fuse Holder	Definite Purpose starter

UL508 Type B

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

UL508 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 UL489 inverse time circuit breaker. The motor controller and motor overload relay used are UL508 contactors and UL508 overload relays. Schneider Electric has various products that meet this construction type, as listed below.

Table 42: Disconnecting Means and Motor Branch Circuit protection using a UL98 Inverse Time Circuit Breaker, UL508 Contactor, and a UL508 Overload Relay

UL98 Inverse Time Circuit Breaker	UL508 Contactor	UL508 Overload Relay
PowerPact circuit breaker	TeSys K contactor	TeSys K overload relay
	TeSys D contactor	TeSys D overload relay
	TeSys F contactor	TeSys F overload relay
	Type S contactor	TeSys T motor management system
	Definite Purpose contactor	

As previously mentioned, a UL508 starter is a combination of a UL508 contactor and a UL508 overload relay. Therefore, the use of UL508 starters also meets construction Type C.

Table 43: Disconnecting Means and Motor Branch Circuit protection using a UL489 Inverse Time Circuit Breaker and a UL508 Starter

UL489 Inverse Time Circuit Breaker	UL508 Starter
PowerPact circuit breaker	Type S starter
	Definite Purpose starter

UL508 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 UL489 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 44: Disconnecting Means and Motor Branch Circuit protection using a UL489 Inverse Time Circuit Breaker, UL508 Contactor, and a UL508 Overload Relay

UL489 Inverse Time Circuit Breaker	UL508 Contactor	UL508 Overload Relay
PowerPact circuit breaker	TeSys™ K contactor	TeSys K overload relay
	TeSys D contactor	TeSys D overload relay
	TeSys F contactor	TeSys F overload relay
	Type S contactor	TeSys T motor management system
	Definite Purpose contactor	

Just as for Type C, the use of UL508 starters also meets construction Type D.

Table 45: Disconnecting Means and Motor Branch Circuit protection using a UL489 Inverse Time Circuit Breaker and a UL508 Starter

UL489 Inverse Time Circuit Breaker	UL508 Starter
PowerPact circuit breaker	Type S starter
	Definite Purpose starter

UL508 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 46: UL508 Self-protected Combination Motor Controller

UL508 Self-Protected Combination Controller
TeSys U

Table 47: UL508 Manual Self-protected Combination Motor Controller

UL508 Manual Self-Protected Combination Controller
TeSys GV2P and GV3P

UL508 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 UL508 manual self-protected combination controller while the motor controller is kept separate in the form of a UL508 contactor. Schneider Electric offers the following solution for this construction type:

Table 48: Self-protected Combination Motor Controller using a UL508 Manual Self-protected Combination Controller and a UL508 Contactor

UL508 Manual Self-Protected Combination Controller	UL508 Contactor
TeSys GV2P and GV3P	TeSys D contactor

TeSys™ GV2P + TeSys D Contactors

GV2P10

Manual Self-Protected Combination Starter Meeting UL508 Type F
UL File E164871

Table 49: TeSys GV2P Horsepower and SCCR Ratings
In combination with line spacer GV2GH7 (stand-alone starters) or GV1G09 and GV2G busbars (multiple starters)

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

Type F ratings only valid at 480Y and lower.

TeSys GV3P + TeSys D Contactors

GV3P40 with LC1D40A

Table 50: TeSys GV3P Horsepower and SCCR Ratings
In combination with line spacer GV3G66 and GVAM11 (magnetic trip unit) for stand-alone starters

Manual Self-Protected Starter	Overload Trip Range (A)	Maximum Horsepower Ratings						Type of Contactor Required	SCCR (kA)	
		1Ø		3Ø					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	65	25
GV3P18	12–18	0.75	2	5	5	10	15	LC1D18	65	25
GV3P25	17–25	1.5	3	5	7.5	15	20	LC1D25	65	25
GV3P32	23–32	2	5	7.5	10	20	25	LC1D32	65	25
GV3P40	30–40	3	—	10	—	25	30	LC1D40A, 50A, 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

Type F ratings only valid at 600Y and 480Y voltages and lower.

Group Motor Installations

UL508 Group Motor Installations

TeSys™ GV2ME

GV2ME07

GV2ME: UL File E164864

Table 51: TeSys GV2ME Horsepower and SCCR Ratings
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]					
		1Ø		3Ø				Type of Contactor Required	480 V	600Y / 347 V	480 V with GV1L3 Limiter	Contactor for 600 V with LA9LB920	600 V with LA9LB920
		120 V	240 V	208 V	240 V	480 V	600 V						
GV2ME01	0.10–0.16	—	—	—	—	—	—	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2ME02	0.16–0.25	—	—	—	—	—	—	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2ME03	0.25–0.40	—	—	—	—	—	—	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2ME04	0.40–0.63	—	—	—	—	—	—	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2ME05	0.63–1	—	—	—	—	—	0.5	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2ME06	1–1.6	—	1/10	—	—	0.75	0.75	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2ME07	1.6–2.5	—	1/6	0.5	0.5	1	1.5	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2ME08	2.5–4	1/8	1/3	0.75	0.75	2	3	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2ME10	4–6.3	0.25	0.5	1	1.5	3	5	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2ME14	6–10	0.5	1.5	2	3	5	7.5	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2ME16	9–14	0.75	2	3	3	10	10	LC1D12 or D18	22	10	65	LC1D32 or D38	42
GV2ME20	13–18	1	3	5	5	10	15	LC1D12 or D18	22	10	65	LC1D32 or D38	42
GV2ME21	17–23	1.5	3	5	7.5	15	20	LC1D25 or D32	10	10	65	LC1D32 or D38	42
GV2ME22	20–25	2	—	7.5	7.5	15	20	LC1D25 or D32	10	10	65	LC1D32 or D38	42
GV2ME32	24–32	2	5	7.5	10	20	25	LC1D25 or D32	5	5	65	LC1D32 or D38	42

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

TeSys™ GV2P

GV2P10

Table 52: TeSys GV2P Horsepower and SCCR Ratings
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]					
		1Ø		3Ø				Type of Contactor Required	480 V	600Y / 347 V	480 V with GV1L3	Contactor for 600 V with LA9LB920	600 V with LA9LB920
		120 V	240 V	208 V	240 V	480 V	600 V						
GV2P01	0.10–0.16	—	—	—	—	—	—	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2P02	0.16–0.25	—	—	—	—	—	—	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2P03	0.25–0.40	—	—	—	—	—	—	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2P04	0.40–0.63	—	—	—	—	—	—	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2P05	0.63–1	—	—	—	—	—	0.5	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2P06	1–1.6	—	1/10	—	—	0.75	0.75	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2P07	1.6–2.5	—	1/6	0.5	0.5	1	1.5	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2P08	2.5–4	1/8	1/3	0.75	0.75	2	3	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2P10	4–6.3	0.25	0.5	1	1.5	3	5	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2P14	6–10	0.5	1.5	2	3	5	7.5	LC1D09 or D12	65	42	65	LC1D09 or D12	42
GV2P16	9–14	0.75	2	3	3	10	10	LC1D12 or D18	22	10	65	LC1D32 or D38	42
GV2P20	13–18	1	3	5	5	10	15	LC1D12 or D18	22	10	65	LC1D32 or D38	42
GV2P21	17–23	1.5	3	5	7.5	15	20	LC1D25 or D32	10	10	65	LC1D32 or D38	42
GV2P22	20–25	2	—	7.5	7.5	15	20	LC1D25 or D32	10	10	65	LC1D32 or D38	42
GV2P32	24–32	2	5	7.5	10	20	25	LC1D25 or D32	5	5	65	LC1D32 or D38	42

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

TeSys GV3P

GV3P25

Table 53: TeSys GV3P Horsepower and SCCR Ratings
In association with LC1D contactors, suitable for Group Installation, when protected by fuses or a circuit breaker

Manual Motor Starter	Overload Trip Range (A)	Maximum Horsepower Ratings						Type of Contactor Required	SCCR (kA)	
		1Ø		3Ø					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	65	25
GV3P18	12–18	0.75	2	5	5	10	15	LC1D18	65	25
GV3P25	17–25	1.5	3	5	7.5	15	20	LC1D25	65	25
GV3P32	23–32	2	5	7.5	10	20	25	LC1D32	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

These values are derived from the UL508 Type F certification (E164871).

Short Circuit Protection for Drives

Drives are not rated for group motor applications.

When a variable-speed drive is connected to a single-motor circuit, the branch-circuit protection provided must be of the type and size specified in the manufacturer's instructions that come with the drive. When the instructions do not specify the type and size, a branch-circuit fuse or inverse-time circuit breaker must be used and must be sized based on the input current rating of the drive multiplied by the percentage from UL508A Table 31.1.

Schneider Electric tested drives in combination with the following:

- Fuses
- UL489 circuit breakers
- GV2P and GV3P UL508 Type E self-protected, manual combination starters

The Combinations in the Table below have been tested per UL508C (Reference UL file E116875).

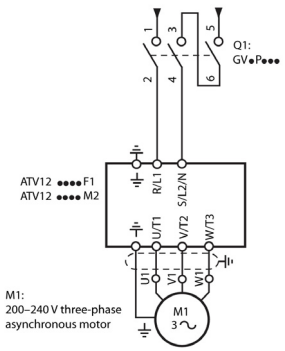
Altivar™ 12 AC Drives

Table 54: The Combinations in the Table Below Have Been Tested per UL508C (Reference UL file E116875)

ATV12 Drive					Short Circuit Current Ratings [1]									
					With QO Circuit Breaker					With GV2P/3P		With Fuses		
Input Voltage +10%/-15% 60 Hz Y	kW	hp	Input withstand Rating (kA) [6]	Reference	QO	QOB	QOU	A	SCCR (kA) [7] X	GV2P/3P Type E [2, 3]	SCCR (kA)	Fuses (A) [5] Z1, Z2	SCCR (kA)	Line Reactor [4]
120 V, 1-phase	0.18	0.25	1	ATV12H018F1	yes	yes	yes	10	1	GV2P10	1	Ferraz HSJ (15)	1	—
	0.37	0.5	1	ATV12•037F1	yes	yes	yes	20	1	GV2P14	1	Ferraz HSJ (25)	1	—
	0.75	1	1	ATV12H075F1	yes	yes	yes	25	1	GV2P20	1	Ferraz HSJ (40)	1	—
240 V, 1-phase	0.18	0.25	1	ATV12H018M2	yes	yes	yes	10	1	GV2P08	1	Fast Acting Class CC Ferraz ASTDR(7)	1	—
	0.37	0.5	1	ATV12•037M2	yes	yes	yes	10	1	GV2P10	1	Ferraz HSJ (15)	1	—
	0.55	0.75	1	ATV12•055M2	yes	yes	yes	15	1	GV2P14	1	Ferraz HSJ (25)	1	—
	0.75	1	1	ATV12•075M2	yes	yes	yes	20	1	GV2P14	1	Ferraz HSJ (25)	1	—
	1.5	2	1	ATV12HU15M2	no	no	yes	25	1	GV2P20	1	Ferraz HSJ (40)	1	—
	2.2	3	1	ATV12HU22M2	no	no	yes	35	1	GV2P22	1	Ferraz HSJ (45)	1	—
240 V, 3-phase	0.18	0.25	5	ATV12H018M3	yes	yes	yes	10	5	GV2P07	5	Fast Acting Class CC Ferraz ATDR(7)	5	—
	0.37	0.5	5	ATV12•037M3	yes	yes	yes	10	5	GV2P08	5	Fast Acting Class CC Ferraz ATDR(7)	5	—
	0.75	1	5	ATV12•075M3	yes	yes	yes	15	5	GV2P14	5	Ferraz HSJ (15)	5	—
	1.5	2	5	ATV12•U15M3	yes	yes	yes	15	5	GV2P16	5	Ferraz HSJ (25)	5	—
	2.2	3	5	ATV12•U22M3	yes	yes	yes	25	5	GV2P20	5	Ferraz HSJ (25)	5	—
	3	3	5	ATV12•U30M3	no	no	yes	30	5	GV2P21	5	Ferraz HSJ (40)	5	—
	4	5	5	ATV12•U40M3	no	no	yes	40	5	GV2P22		Ferraz HSJ (45)	5	—
240 V, 3-phase	0.18	0.25	5	ATV2H018M3	yes	yes	yes	10	10	GV2P07	50	3	65	3%
	0.37	0.5	5	ATV12•037M3	yes	yes	yes	10	10	GV2P08	50	8	65	3%
	0.75	1	5	ATV12•075M3	yes	yes	yes	15	10	GV2P14	50	15	65	3%
	1.5	2	5	ATV12•U15M3	yes	yes	yes	15	10	GV2P13	50	25	65	3%
	2.2	3	5	ATV12•U22M3	yes	yes	yes	25	10	GV2P18	50	30	65	3%
	3	3	5	ATV12•U30M3	no	no	yes	30	10	GV2P25	50	40	65	3%
	4	5	5	ATV12•U40M3	no	no	yes	40	10	GV2P32	50	50	65	3%

[1] Types of enclosures that can be used: 1, 12, 3, 3R, 4, and 4X-all non-ventilated.
[2] The GV2P•• self-protected manual combination starter must be used with the GV2GH7 insulating barrier to meet the UL 508 Type E rating.
[3] The GV3P•• self-protected manual combination starter must be used with the GV3G66 insulating barrier and the GVAM11 auxiliary contact block to meet the UL 508 Type E rating.
[4] The line reactor is required when the ATV12 drive is used in a system with a current availability higher than the drive's SCCR design.
[5] When fuse type is not specified any Class J or CC can be used. If fuse manufacturer is not specified any fuse manufacturer can be used.
[6] Input withstand rating is that for which the product has been designed thermally. Installation on a supply greater than this level will require additional inductance to satisfy this level.
[7] Output interrupt rating relies on integral solid state short circuit protection. This does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any additional local codes. This is dependant on the type of installation.
Suitable for use on a circuit capable of delivering not more than ___x___rms symmetrical kiloAmperes___Y___Volts maximum, when protected by___Z1___with a maximum rating of ___Z2___.

Wiring



With Single-Phase Power Supply, when using GV2P and GV3P manual self-protected combination starters for single-phase input applications, wire the starter as illustrated.

Altivar™ 32 AC Drives

ATV32 with TeSys GV2P

Components for use together in accordance with standard UL508C (UL file E116875, CSA file 224330).

Table 55: The Combinations in the Table Below Have Been Tested per UL508C (Reference UL file E116875)

ATV32 Drive							Containment Short Circuit Current Ratings [2]					
							With Circuit Breaker		With GV*P		With Fuses	
Input Voltage 60 Hz	hp	Reference	Input AIC Rating (kA) [1]	Minimum Inductance (mH)	Line Reactor Reference	Output Interrupt Rating (kA)	PowerPact [3]	SCCR (kA)	GV2P/3P Type E [4]	SCCR (kA)	Fuses 600 V Class J [6] (A)	SCCR (kA)
208-230V, 1-phase	1/4	ATV32H018M2	1	2.5	RL00402	100	H*L36015	65	GV2P08	65	7	100
	1/2	ATV32H037M2	1	2.5	RL00802	100	H*L36015	65	GV2P10	65	15	100
	3/4	ATV32H055M2	1	2.5	RL00802	100	H*L36015	65	GV2P14	65	25	100
	1	ATV32H075M2	1	2.5	RL01202	100	H*L36015	65	GV3P13 [5]	65	25	100
	1 1/2	ATV32HU11M2	1	0.8	RL01201	100	H*L36020	65	GV3P18 [5]	65	25	100
	2	ATV32HU15M2	1	0.8	RL01201	100	H*L36030	65	GV3P25 [5]	65	40	100
	3	ATV32HU22M2	1	0.8	RL01801	100	H*L36035	65	GV3P25 [5]	65	45	100
480V, 3 phase	1/2	ATV32H037N4	5	12	RL00201	100	H*L36015	65	GV2P07	65	6	100
	3/4	ATV32H055N4	5	12	RL00201	100	H*L36015	65	GV2P07	65	6	100
	1	ATV32H075N4	5	12	RL00201	100	H*L36015	65	GV2P08	65	6	100
	1 1/2	ATV32HU11N4	5	6.5	RL00402	100	H*L36015	65	GV2P08	65	12	100
	2	ATV32HU15N4	5	6.5	RL00402	100	H*L36015	65	GV2P10	65	12	100
	3	ATV32HU22N4	5	5	RL00803	100	H*L36015	65	GV2P14	65	15	100
	4	ATV32HU30N4	5	3	RL00802	100	H*L36015	65	GV2P14	65	17.5	100
	5	ATV32HU40N4	5	3	RL00802	100	H*L36015	65	GV3P13 [5]	65	25	100
	7 1/2	ATV32HU55N4	22	2.5	RL01202	100	H*L36020	65	GV3P18	65	40	100
	10	ATV32HU75N4	22	1.5	RL01802	100	H*L36030	65	GV3P25	65	40	100
	15	ATV32HD11N4	22	1.2	RL02502	100	H*L36040	65	GV3P32	65	60	100
	20	ATV32HD15N4	22	0.8	RL03502	100	H*L36050	65	GV3P40	65	70	100

[1] This column shows the maximum input available interrupt current (AIC) rating the Altivar 32 drive can be installed on without adding impedance to the drive. Electrical distribution systems with a higher AIC capability will cause higher input currents in the front end of the drive. Install at least the minimum inductance shown when using an Altivar 32 drive on a system with a higher AIC value shown in this column. Without any additional impedance the column with the Input AIC ratings are the Short Circuit Current Ratings (SCCR) with the listed circuit breakers, GV*P products, and fuses.

[2] The Altivar 32 drive has a 100kA interrupt rating on the output of the drive. In addition to providing a rating based on shorting the output of the drive, these short circuit current ratings have been obtained by shorting components internal to the Altivar 32. These ratings allow proper coordination of short circuit protection. The amp rating of the short circuit protection devices in the table are maximum values. Smaller ampere sizes may be used. Integral solid state short circuit protection in the drive does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any local codes. Ratings apply to an Altivar 32 drive mounted in a non-ventilated Type 1, 3R, 4(X) or 12 rated enclosure. Minimum enclosure volume is 3.375 times the drive volume. The listed line reactor minimum inductance is required to get these higher ratings.

[3] Circuit Breaker part number designations: * = short circuit current rating. For 208 / 230 V range, use: * = D for 25kA, G for 65kA, J for 65kA, L for 65kA. For 480 V range, use: * = D for 18kA, G for 35kA, J for 65kA, L for 65kA.

[4] 480 V ratings are for Wye connected electrical distribution systems. GV2Ppp self protected manual combination starter must be used with GV2GH7 insulating barrier to meet UL 508 Type E rating. GV3Ppp self protected manual combination starter must be used with GV3G66 + GVAM11 insulating barrier to meet UL 508 Type E rating.

[5] The following GV2P products can be used in place of the GV3P products for obtaining the ratings listed in the Input AIC ratings column: GV2P16 for GV3P13, GV2P20 for GV3P18, GV2P22 for GV3P25.

[6] Fuse type can be fast acting or time delay Class J, or Class CC.

Altivar™ 212

Components for use together in accordance with standard UL508C (UL file E116875, CSA file 224330).

ATV212 Drive ATV212HU55M3X

Table 56: ATV212 Combination Ratings

ATV212 AC Drive				Containment Short Circuit Current Rating [1]						
				With Circuit Breaker			With GV*P		With Fuses	
Input Voltage 60 Hz	hp	Reference	Output Interrupt Rating (kAIC)	PowerPact	SCCR (kA) [2]	SCCR (kA) [3]	GV2P/3P Type E [4]	SCCR (kA) [2, 3]	Fuses (A) 600 V [5]	SCCR (kA) [2, 3]
208V, 3 phase	1	ATV212H075M3X	100	HDL36015	22	22	GV2P10	22	10	100
	2	ATV212HU15M3X	100	HDL36015	22	22	GV2P14	22	15	100
	3	ATV212HU22M3X	100	HDL36020	22	22	GV2P16	22	30	100
	4	ATV212HU30M3X	100	HDL36030	22	22	GV2P20	22	35	100
	5	ATV212HU40M3X	100	HDL36040	22	22	GV2P20	22	35	100
	7.5	ATV212HU55M3X	100	HDL36050	22	22	GV2P22	22	50	100
	10	ATV212HU75M3X	100	HDL36070	22	22	GV2P32	22	60	100
	15	ATV212HD11M3X	100	HDL36100	22	22	GV3P50	22	100	100
	20	ATV212HD15M3X	100	HDL36125	22	22	GV3P65	22	125	100
	25	ATV212HD18M3X	100	JDL36175	22	22	—	—	150	100
	30	ATV212HD22M3X	100	JDL36200	22	22	—	—	175	100
	40	ATV212HD30M3X	100	JDL36250	22	22	—	—	200	100
230V, 3 phase	1	ATV212H075M3X	100	HDL36015	22	22	GV2P10	22	10	100
	2	ATV212HU15M3X	100	HDL36015	22	22	GV2P10	22	15	100
	3	ATV212HU22M3X	100	HDL36020	22	22	GV2P14	22	30	100
	4	ATV212HU30M3X	100	HDL36030	22	22	GV2P20	22	35	100
	5	ATV212HU40M3X	100	HDL36035	22	22	GV2P20	22	35	100
	7.5	ATV212HU55M3X	100	HDL36045	22	22	GV2P21	22	45	100
	10	ATV212HU75M3X	100	HDL36060	22	22	GV2P32	22	60	100
	15	ATV212HD11M3X	100	HDL36090	22	22	GV3P40	22	90	100
	20	ATV212HD15M3X	100	HDL36125	22	22	GV3P50	22	110	100
	25	ATV212HD18M3X	100	HDL36150	22	22	—	—	150	100
	30	ATV212HD22M3X	100	JDL36175	22	22	—	—	175	100
	40	ATV212HD30M3X	100	JDL36225	22	22	—	—	200	100

Table 56: ATV212 Combination Ratings *(continued)*

ATV212 AC Drive				Containment Short Circuit Current Rating [1]						
Input Voltage 60 Hz	hp	Reference	Output Interrupt Rating (kAIC)	With Circuit Breaker			With GV*P		With Fuses	
				PowerPact	SCCR (kA) [2]	SCCR (kA) [3]	GV2P/3P Type E [4]	SCCR (kA) [2, 3]	Fuses (A) 600 V [5]	SCCR (kA) [2, 3]
480V, 3 phase	1	ATV212H075N4	100	HDL36015	—	22	GV2P07	22	5	100
	2	ATV212HU15N4	100	HDL36015	—	22	GV2P08	22	7.5	100
	3	ATV212HU22N4	100	HDL36015	—	22	GV2P10	22	10	100
	4	ATV212HU30N4	100	HDL36020	—	22	GV2P14	22	15	100
	5	ATV212HU40N4	100	HDL36020	—	22	GV2P14	22	15	100
	7.5	ATV212HU55N4	100	HDL36025	—	22	GV2P16	22	20	100
	10	ATV212HU75N4	100	HDL36030	—	22	GV2P20	22	30	100
	15	ATV212HD11N4	100	HDL36045	—	22	GV2P21	22	45	100
	20	ATV212HD15N4	100	HDL36060	10	22	GV2P22	22	60	100
	25	ATV212HD18N4	100	HDL36070	10	22	GV2P32	22	80	100
	30	ATV212HD22N4S	100	HDL36090	10	22	GV3P40	22	90	100
	30	ATV212HD22N4	100	HDL36090	—	22	—	—	90	100
	40	ATV212HD30N4	100	HDL36125	—	22	—	—	110	100
	50	ATV212HD37N4	100	HDL36125	10	10	—	—	125	100
	60	ATV212HD45N4	100	HDL36150	10	10	—	—	150	100
	75	ATV212HD55N4	100	JDL36175	10	10	—	—	200	100
	100	ATV212HD75N4	100	JDL36225	10	10	—	—	250	100

[1] The Altivar™ 212 has a 100k SCC rating on the output of the drive as many other drives are rated. In addition to providing a rating based on shorting the output of the drive, these short circuit rating have been obtained by testing the weakest point internal to the ATV212 per UL508C. These ratings allow proper coordination of short circuit protection. The amp rating of the short circuit protection devices in the table are maximum values. Smaller amp sizes may be used.
[2] Ratings also apply to ATV212 Type 1 product, ie: an ATV212 fitted with a conduit box.
[3] Ratings apply to an ATV212 mounted in a non-ventilated Type 1, 3R, 4(X) or 12 rated enclosure. Minimum enclosure volume is 3.375 times the drive volume.
[4] 480 V ratings are for Wye connected electrical distribution systems. GV2P** self protected manual combination starter must be used with GV2GH7 insulating barrier to meet UL 508 Type E rating.
[5] Fuse type can be Class J, fast acting or time delay, or Class CC.

Altivar™ 312 AC Drives

Components for use together in accordance with standard UL508C.

ATV312

Table 57: ATV312 Combination Ratings

ATV312 Drive								Short Circuit Current Ratings					
Input Voltage +10%/-15% 60 Hz		hp	Reference	Input AIC Rating (kA)	Minimun Inductance (mH)	Line Reactor Reference	Output Interrupt rating: (kA) [1]	With Circuit Breaker		With GV*P		With Fuses	
								PowerPact	SCCR (kA) [3]	GV2P/3P Type E [3, 4]	SCCR (kA)	Fuse (A) [5]	SCCR (kA) [2, 3]
Three-phase with or without line reactor													
208/230V Three-phase	Without line reactor	0.25	ATV312H018M3	5	—	—	100	HxL36015	22	—	—	3	22
		0.5	ATV312H037M3	5	—	—	100	HxL36015	22	—	—	6	22
		0.75	ATV312H055M3	5	—	—	100	HxL36015	22	—	—	10	22
		1	ATV312H075M3	5	—	—	100	HxL36015	22	—	—	10	22
		1.5	ATV312HU11M3	5	—	—	100	HxL36015	22	—	—	15	22
		2	ATV312HU15M3	5	—	—	100	HxL36015	22	—	—	15	22
		3	ATV312HU22M3	5	—	—	100	HxL36020	22	—	—	20	22
		—	ATV312HU30M3	5	—	—	100	HxL36020	22	—	—	25	22
		5	ATV312HU40M3	5	—	—	100	HxL36030	22	—	—	35	22
		7.5	ATV312HU55M3	22	—	—	100	HxL36040	22	—	—	50	22
		10	ATV312HU75M3	22	—	—	100	HxL36060	22	—	—	60	22
		15	ATV312HD11M3	22	—	—	100	HxL36070	22	—	—	80	22
		20	ATV312HD15M3	22	—	—	100	HxL36090	22	—	—	110	22
	With line reactor	0.25	ATV312H018M3	5	3	RL-00401	100	HxL36015	65	GV2P07	65	3	22
		0.5	ATV312H037M3	5	3	RL-00401	100	HxL36015	65	GV2P08	65	6	22
		0.75	ATV312H055M3	5	3	RL-00401	100	HxL36015	65	GV2P10	65	10	22
		1	ATV312H075M3	5	3	RL-00401	100	HxL36015	65	GV2P10	65	10	22
		1.5	ATV312HU11M3	5	1.5	RL-00801	100	HxL36015	65	GV2P14	65	15	22
		2	ATV312HU15M3	5	1.5	RL-00801	100	HxL36015	65	GV2P14	65	15	22
		3	ATV312HU22M3	5	1.25	RL-01201	100	HxL36020	65	GV3P13 or GV3P18	65	20	22
		—	ATV312HU30M3	5	1.25	RL-01801	100	HxL36020	65	GV3P18	65	25	22
		5	ATV312HU40M3	5	1.25	RL-01801	100	HxL36030	65	GV3P25	65	35	22
		7.5	ATV312HU55M3	22	0.5	RL-02501	100	HxL36040	65	GV3P32 or GV3P40	65	50	22
		10	ATV312HU75M3	22	0.4	RL-03501	100	HxL36060	65	GV3P50	65	60	22
		15	ATV312HD11M3	22	0.3	RL-04501	100	HxL36070	65	GV3P65	65	80	22
		20	ATV312HD15M3	22	0.2	RL-08001	100	HxL36090	65	—	—	110	22

Table 57: ATV312 Combination Ratings *(continued)*

ATV312 Drive								Short Circuit Current Ratings					
Input Voltage +10%/-15% 60 Hz		hp	Reference	Input AIC Rating (kA)	Minimun Inductance (mH)	Line Reactor Reference	Output Interrupt rating: (kA) [1]	With Circuit Breaker		With GV*P		With Fuses	
								PowerPact	SCCR (kA) [3]	GV2P/3P Type E [3, 4]	SCCR (kA)	Fuse (A) [5]	SCCR (kA) [2, 3]
Three-phase with or without line reactor													
400/480 V Three-phase	Without line reactor	0.5	ATV312H037N4	5	—	—	100	HxL36015	22	—	—	3	22
		0.75	ATV312H055N4	5	—	—	100	HxL36015	22	—	—	6	22
		1	ATV312H075N4	5	—	—	100	HxL36015	22	—	—	6	22
		1.5	ATV312HU11N4	5	—	—	100	HxL36015	22	—	—	10	22
		2	ATV312HU15N4	5	—	—	100	HxL36015	22	—	—	10	22
		3	ATV312HU22N4	5	—	—	100	HxL36015	22	—	—	15	22
		—	ATV312HU30N4	5	—	—	100	HxL36015	22	—	—	15	22
		5	ATV312HU40N4	5	—	—	100	HxL36015	22	—	—	20	22
		7.5	ATV312HU55N4	22	—	—	100	HxL36020	22	—	—	30	22
		10	ATV312HU75N4	22	—	—	100	HxL36030	22	—	—	35	22
		15	ATV312HD11N4	22	—	—	100	HxL36035	22	—	—	50	22
		20	ATV312HD15N4	22	—	—	100	HxL36050	22	—	—	70	22
	With line reactor	0.5	ATV312H037N4	5	12	RL00201	100	HxL36015	65	GV2P07	65	3	100
		0.75	ATV312H055N4	5	12	RL00201	100	HxL36015	65	GV2P07	65	6	100
		1	ATV312H075N4	5	12	RL00201	100	HxL36015	65	GV2P08	65	6	100
		1.5	ATV312HU11N4	5	6.5	RL00402	100	HxL36015	65	GV2P08	65	10	100
		2	ATV312HU15N4	5	6.5	RL00402	100	HxL36015	65	GV2P10	65	10	100
		3	ATV312HU22N4	5	5	RL00803	100	HxL36015	65	GV2P14	65	15	100
		—	ATV312HU30N4	5	3	RL00802	100	HxL36015	65	GV2P14	65	15	100
		5	ATV312HU40N4	5	3	RL00802	100	HxL36015	65	GV3P13	65	20	100
		7.5	ATV312HU55N4	22	2.5	RL01202	100	HxL36020	65	GV3P18	65	30	100
		10	ATV312HU75N4	22	1.5	RL01802	100	HxL36030	65	GV3P25	65	35	100
		15	ATV312HD11N4	22	1.2	RL02502	100	HxL36035	65	GV3P32	65	50	100
		20	ATV312HD15N4	22	0.8	RL03502	100	HxL36050	65	GV3P40	65	70	100
575/600 V Three-phase	With line reactor	1	ATV312H075S6	5	20	RL-00202	100	FAL36015	22	—	—	6	22
		2	ATV312HU15S6	5	9	RL-00403	100	FAL36015	22	—	—	6	22
		3	ATV312HU22S6	5	6.5	RL-00402	100	FAL36015	22	—	—	10	22
		5	ATV312HU40S6	5	5	RL-00803	100	FAL36025	22	—	—	15	22
		7.5	ATV312HU55S6	22	2.5	RL-01202	100	FAL36040	22	—	—	20	22
		10	ATV312HU75S6	22	2.5	RL-01202	100	FAL36050	22	—	—	25	22
		15	ATV312HD11S6	22	1.5	RL-01802	100	FAL36070	22	—	—	35	22
		20	ATV312HD15S6	22	1.2	RL-02502	100	FAL36080	22	—	—	45	22

Table 57: ATV312 Combination Ratings *(continued)*

ATV312 Drive								Short Circuit Current Ratings					
Input Voltage +10%/-15% 60 Hz		hp	Reference	Input AIC Rating (kA)	Minimun Inductance (mH)	Line Reactor Reference	Output Interrupt rating: (kA) [1]	With Circuit Breaker		With GV*P		With Fuses	
								PowerPact	SCCR (kA) [3]	GV2P/3P Type E [3, 4]	SCCR (kA)	Fuse (A) [5]	SCCR (kA) [2, 3]
Single-phase with or without line reactor													
208/230 V Single-phase	Without line reactor	0.25	ATV312H018M2	1	—	—	100	—	—	—	—	6	22
		0.5	ATV312H037M2	1	—	—	100	—	—	—	—	10	22
		0.75	ATV312H055M2	1	—	—	100	—	—	—	—	10	22
		1	ATV312H075M2	1	—	—	100	—	—	—	—	15	22
		1.5	ATV312HU11M2	1	—	—	100	—	—	—	—	20	22
		2	ATV312HU15M2	1	—	—	100	—	—	—	—	20	22
		3	ATV312HU22M2	1	—	—	100	—	—	—	—	30	22
		5	ATV312HU75M3	2	—	—	100	HxL36060	22	—	—	60	22
		7.5	ATV312HD11M3	2	—	—	100	HxL36070	22	—	—	80	22
		10	ATV312HD15M3	2	—	—	100	HxL36090	22	—	—	110	22
	With line reactor	5	ATV312HU75M3	22	0.75	RL-03502	100	HxL36060	65	GV3P50	65	60	22
		7.5	ATV312HD11M3	22	0.375	RL-05502	100	HxL36070	65	GV3P65	65	80	22
		10	ATV312HD15M3	22	0.278	RL-08002	100	HxL36090	65	—	—	110	22
400/480 V Single-phase	Without line reactor	0.5	ATV312H075N4	5	—	—	100	HxL36015	22	—	—	6	22
		0.75	ATV312HU11N4	5	—	—	100	HxL36015	22	—	—	10	22
		1	ATV312HU15N4	5	—	—	100	HxL36015	22	—	—	10	22
		1.5	ATV312HU22N4	5	—	—	100	HxL36015	22	—	—	15	22
		2	ATV312HU30N4	5	—	—	100	HxL36015	22	—	—	15	22
		3	ATV312HU40N4	5	—	—	100	HxL36015	22	—	—	20	22
		3	ATV312HU55N4	22	—	—	100	HxL36020	22	—	—	30	22
		5	ATV312HU75N4	22	—	—	100	HxL36030	22	—	—	35	22
		7.5	ATV312HD11N4	22	—	—	100	HxL36035	22	—	—	50	22
		10	ATV312HD15N4	22	—	—	100	HxL36050	22	—	—	70	22
	With line reactor	0.5	ATV312H075N4	5	5.79	RL-00402	100	HxL36015	65	GV2P08	65	6	22
		0.75	ATV312HU11N4	5	4.27	RL-00402	100	HxL36015	65	GV2P08	65	10	22
		1	ATV312HU15N4	5	4.27	RL-00803	100	HxL36015	65	GV2P10	65	10	22
		1.5	ATV312HU22N4	5	2.77	RL-00802	100	HxL36015	65	GV2P14	65	15	22
		2	ATV312HU30N4	5	2.77	RL-00802	100	HxL36015	65	GV2P14	65	15	22
		3	ATV312HU40N4	5	1.68	RL-01202	100	HxL36015	65	GV3P13	65	20	22
		3	ATV312HU55N4	22	1.29	RL-01802	100	HxL36020	65	GV3P18	65	30	22
		5	ATV312HU75N4	22	0.912	RL-02502	100	HxL36030	65	GV3P25	65	35	22
		7.5	ATV312HD11N4	22	0.694	RL-03502	100	HxL36035	65	GV3P32	65	50	22
		10	ATV312HD15N4	22	0.569	RL-04502	100	HxL36050	65	GV3P40	65	70	22

[1] The Altivar™ 312 has a 100k SCC rating on the output of the drive as many other drives are rated. In addition to providing a rating based on shorting the output of the drive, these short circuit rating have been obtained by testing the weakest point internal to the ATV312 per UL508C. These ratings allow proper coordination of short circuit protection. The amp rating of the short circuit protection devices in the table are maximum values. Smaller amp sizes may be used.
[2] Ratings also apply to ATV312 Type 1 product, ie: an ATV312 fitted with a conduit box.
[3] Ratings apply to an ATV312 mounted in a non-ventilated Type 1, 3R, 4(X) or 12 rated enclosure. Minimum enclosure volume is 3.375 times the drive volume .
[4] 480 V ratings are for Wye connected electrical distribution systems. GV2P* self protected manual combination starter must be used with GV2GH7 insulating barrier to meet UL 508 Type E rating. GV3P** must be used with GV3G66 and GVAM11 in order to meet UL508 rating.
[5] Fuse type can be Class J, fast acting or time delay, or Class CC.

Altivar™ 61 AC Drives

Table 58: ATV61 Combination Ratings

Altivar 61								Containment Short Circuit Current Rating [2]								
								with Circuit Breaker [3]			with GVxP [3]			with Fuses [3]		
Input Voltage 50/60 Hz	(hp)	(A)	Reference:	Input Rating: (kA) [1]	Mimimum inductance (mH)	Line Reactor Reference	Output Interrupt rating: kAIC	PowerPact [4]	SCCR (kA)	Mimimum Enclosure Volume (in [3])	GV2P/3P Type E [5]	SCCR (kA)	Mimimum Enclosure Volume (in [3])	Fuse (A) 600 V Class J [6]	SCCR (kA)	Mimimum Enclosure Volume (in [3])
Three-phase Input, with line reactor																
200/240 V Three-phase	1	4.8	ATV61H075M3	5	3	RL00401	100	HJL36015	100	4017	GV2P10	65	1600	15	100	4017
	2	8	ATV61HU15M3	5	1.5	RL00801	100	HJL36025	100	4017	GV2P14	65	1600	25	100	4017
	3	11	ATV61HU22M3	5	1.25	RL01201	100	HJL36040	100	4017	GV3P18	65	1920	40	100	4017
	—	13.7	ATV61HU30M3	5	0.8	RL01801	100	HJL36040	100	4017	GV3P18	65	1920	40	100	4017
	5	17.5	ATV61HU40M3	5	0.8	RL01801	100	HJL36060	100	6528	GV3P25	65	1920	60	100	6528
	7.5	27.5	ATV61HU55M3	22	0.5	RL02501	100	HJL36070	100	6528	GV3P40	65	2880	70	100	6528
	10	33	ATV61HU75M3	22	0.4	RL03501	100	HJL36110	100	6528	GV3P50	65	4032	110	100	6528
	15	54	ATV61HD11M3X	22	0.3	RL04501	100	HJL36125	100	6528	GV3P50	65	5760	125	100	6528
	20	66	ATV61HD15M3X	22	0.25	RL05501	100	JJL36175	100	6528	GV3P65	65	5760	175	100	6528
	25	75	ATV61HD18M3X	22	0.2	RL08001	100	JJL36200	100	13215	—	—	—	200	100	13215
	30	88	ATV61HD22M3X	22	0.15	RL10001	100	JJL36250	100	13215	—	—	—	250	100	13215
	40	120	ATV61HD30M3X	22	0.1	RL13001	100	JJL36250	100	13215	—	—	—	250	100	13215
	50	144	ATV61HD37M3X	22	0.075	RL16001	100	JJL36250	100	13215	—	—	—	250	100	13215
	60	176	ATV61HD45M3X	10	0.055	RL20001	100	LAL36400	22	8640	—	—	—	400	22	8640
380/480 V Three-phase	1	2.3	ATV61H075N4	5	12	RL00201	100	HLL36015	100	4017	GV2P08	65	1600	15	100	4017
	2	4.1	ATV61HU15N4	5	6.5	RL00402	100	HLL36015	100	4017	GV2P10	65	1600	15	100	4017
	3	5.8	ATV61HU22N4	5	6.5	RL00402	100	HLL36015	100	4017	GV2P14	65	1600	15	100	4017
	—	7.8	ATV61HU30N4	5	3	RL00802	100	HLL36015	100	4017	GV2P14	65	1920	15	100	4017
	5	10.5	ATV61HU40N4	5	3	RL00802	100	HLL36025	100	4017	GV3P13	65	1920	25	100	4017
	7.5	14.3	ATV61HU55N4	22	2.5	RL01202	100	HLL36035	100	6528	GV3P25	65	2880	35	100	6528
	10	17.6	ATV61HU75N4	22	1.5	RL01802	100	HLL36050	100	6528	GV3P25	65	2880	50	100	6528
	15	27.7	ATV61HD11N4	22	1.2	RL02502	100	HLL36060	100	6528	GV3P40	65	4032	60	100	6528
	20	33	ATV61HD15N4	22	0.8	RL03502	100	HLL36080	100	6528	GV3P50	65	5760	80	100	6528
	25	41	ATV61HD18N4	22	0.8	RL03502	100	HLL36100	100	6528	GV3P50	65	8640	100	100	6528
	30	48	ATV61HD22N4	22	0.7	RL04502	100	HLL36125	100	6528	GV3P50	65	8640	125	100	6528
	40	66	ATV61HD30N4	22	0.5	RL05502	100	HLL36150	100	6528	GV3P65	65	10368	150	100	6528
	50	79	ATV61HD37N4	22	0.4	RL08002	100	JLL36175	100	13215	—	—	—	175	100	13215
	60	94	ATV61HD45N4	22	0.4	RL08002	100	JLL36225	100	13215	—	—	—	225	100	13215
	75	116	ATV61HD55N4	22	0.3	RL10002	100	JLL36250	100	13215	—	—	—	250	100	13215
	100	160	ATV61HD75N4	22	0.2	RL13002	100	JLL36250	100	38250	—	—	—	250	100	38250
	100	160	ATV61HD75N4	22	0.2	RL13002	100	KCL34250	100	38250	—	—	—	250	100	38250
575 V Three-phase	3	3.9	ATV61HU22S6X	22	9	RL00403	100	HLL36015	50	3898	—	—	—	6	100	3898
	—	5.8	ATV61HU30S6X	22	9	RL00403	100	HLL36015	50	3898	—	—	—	6	100	3898
	5	6.1	ATV61HU40S6X	22	5	RL00803	100	HLL36015	50	3898	—	—	—	10	100	3898
	7.5	9	ATV61HU55S6X	22	3	RL01203	100	HLL36020	50	3898	—	—	—	15	100	3898
	10	11	ATV61HU75S6X	22	2.5	RL01203	100	HLL36025	50	3898	—	—	—	20	100	3898

Table 58: ATV61 Combination Ratings *(continued)*

Altivar 61								Containment Short Circuit Current Rating [2]								
								with Circuit Breaker [3]			with GVxP [3]			with Fuses [3]		
Input Voltage 50/60 Hz	(hp)	(A)	Reference:	Input Rating: (kA) [1]	Mimimum inductance (mH)	Line Reactor Reference	Output Interrupt rating: kAIC	PowerPact [4]	SCCR (kA)	Mimimum Enclosure Volume (in [3])	GV2P/3P Type E [5]	SCCR (kA)	Mimimum Enclosure Volume (in [3])	Fuse (A) 600 V Class J [6]	SCCR (kA)	Mimimum Enclosure Volume (in [3])
500/690 V Three-phase	3	3.9	ATV61HU30Y	22	9	RL00403	100	—	—	—	—	—	—	10	100	8640
	—	5.8	ATV61HU40Y	22	5	RL00803	100	—	—	—	—	—	—	10	100	8640
	5	6.1	ATV61HU55Y	22	5	RL00803	100	—	—	—	—	—	—	15	100	8640
	7.5	9	ATV61HU75Y	22	3	RL00802	100	—	—	—	—	—	—	20	100	8640
	10	11	ATV61HD11Y	22	2.5	RL01202	100	—	—	—	—	—	—	25	100	8640
	15	17	ATV61HD15Y	22	1.5	RL01802	100	—	—	—	—	—	—	35	100	8640
	20	22	ATV61HD18Y	22	1.2	RL02502	100	—	—	—	—	—	—	45	100	8640
	25	27	ATV61HD22Y	22	1.2	RL02502	100	—	—	—	—	—	—	60	100	8640
	30	32	ATV61HD30Y	22	0.8	RL03502	100	—	—	—	—	—	—	60	100	8640
	40	41	ATV61HD37Y	22	0.7	RL04502	100	—	—	—	—	—	—	90	100	9792
	50	52	ATV61HD45Y	22	0.5	RL05502	100	—	—	—	—	—	—	100	100	9792
	60	62	ATV61HD55Y	22	0.4	RL08002	100	—	—	—	—	—	—	125	100	9792
	75	77	ATV61HD75Y	22	0.4	RL08002	100	—	—	—	—	—	—	150	100	9792
	100	99	ATV61HD90Y	22	0.3	RL10002	100	—	—	—	—	—	—	175	100	9792
Single-phase Input, without line reactor																
200/240 V Single-phase	0.5	3	ATV61H075M3	5	—	—	100	HJL36015	5	4017	GV2P104	5	1600	15	5	1078
	1	4.8	ATV61HU15M3	5	—	—	100	HJL36025	5	4017	GV2P14	5	1600	25	5	1078
	2	8	ATV61HU22M3	5	—	—	100	HJL36040	5	4017	GV3P18	5	4017	40	5	1550
	3	11	ATV61HU30M3	5	—	—	100	HJL36040	5	4017	GV3P18	5	1920	40	5	1550
	5	17.5	ATV61HU75M3	5	—	—	100	HJL36110	5	6528	GV3P50	5	4032	110	5	2719
	7.5	27.5	ATV61HD15M3X	5	—	—	100	JJL36175	5	6528	GV3P65	5	5760	175	5	4036
	10	33	ATV61HD18M3X	5	—	—	100	JJL36200	5	13215	—	—	—	200	5	4900
	15	54	ATV61HD30M3X	5	—	—	100	JJL36250	5	13215	—	—	—	250	5	9640
	20	66	ATV61HD37M3X	5	—	—	100	JJL36250	5	13215	—	—	—	250	5	9640
	25	75	ATV61HD45M3X	10	—	—	100	—	—	—	—	—	—	300	10	9640
Single-phase Input, line reactor																
200/240 V Single-phase	—	13.7	ATV61HU40M3	5	1	RL02502	100	HJL36060	5	6528	GV3P25	65	1920	60	5	1550
	5	17.5	ATV61HU55M3	5	0.8	RL03502	100	HJL36070	5	6528	GV3P40	65	2880	70	5	1987
	7.5	27.5	ATV61HU75M3	22	0.5	RL05502	100	HJL36110	22	6528	GV3P50	65	4032	110	22	2719
	10	33	ATV61HD15M3X	22	0.4	RL08002	100	JJL36175	22	6528	GV3P65	65	5760	175	22	4036
	15	54	ATV61HD22M3X	22	0.3	RL10002	100	JJL36250	22	13215	—	—	—	250	22	4900
	20	66	ATV61HD30M3X	22	0.2	RL13002	100	JJL36250	22	13215	—	—	—	250	22	9640
	25	75	ATV61HD37M3X	22	0.15	RL16002	100	JJL36250	100	13215	—	—	—	250	22	9640
	30	88	ATV61HD45M3X	22	0.185	RL20003B14	100	—	—	8640	—	—	—	300	22	9640

[1] This column shows the maximum prospective short circuit current value the Altivar™ 61 can be installed on without adding impedance to the drive. Electrical distribution systems with a higher prospective short circuit current will cause higher input currents in the front end of the drive. Add the inductance referred to in the table at the input of the drive if installing the drive on a system with higher available fault current.

[2] The Altivar 61 has a 100k SCC rating on the output of the drive. In addition to providing a rating based on shorting the output of the drive, these short circuit rating have been obtained by shorting components internal to the Altivar 61 These ratings allow proper coordination of short circuit protection. The integral solid state short circuit protection in the drive does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any local codes. The listed line reactor or minimum impedance is required to obtain ratings above the Input Rating.

[3] Ratings apply to an Altivar 61 mounted in a non-ventilated Type 1, 3R, 4(X) or 12 rated enclosure.

[4] Circuit breakers with lower interrupt ratings can be used, such as:
- For 200 / 240 Vac, replace with HGL or JGL for 65kA interrupt rating.
- For 380 / 480, replace with HGL or JGL for 35kA or HJL or JJL for 65kA interrupt rating.
- For 575 / 600, replace with HJL for 25kA or HGL for 18kA, or HDL for 14kA interrupt rating.

[5] 480 V ratings are for Wye connected electrical distribution systems. GV2P* self protected manual combination starter must be used with GV2GH7 insulating barrier to meet UL 508 Type E rating GV3Ppp self protected manual combination starter must be used with GV3G66 + GVAM11 insulating barrier to meet UL 508 Type E rating. GV3P* self protected manual combination starter must be used with GV3G66 + GVAM11 insulating barrier to meet UL 508 Type E rating.

[6] Use Bussmann fuses. Fuse type can be fast acting or time delay Class J, or Class CC unless otherwise noted. For 575 - 690 Vac rated drives, use Ferraz Shawmut Class J fast acting fuse.

Table 59: ATV61 Combination Ratings

Altivar™ 61								Containment Short Circuit Current Rating [2]					
								with Circuit Breaker [3]			with Fuses [3]		
Input Voltage 50/60 Hz	(hp)	(A)	Reference:	Input Rating: (kA) [1]	Mimimum inductance (mH)	Line Reactor Reference	Output Interrupt rating: kAIC	PowerPact [4]	SCCR (kA)	Mimimum Enclosure Volume (in 3)	Fuse (A) 600 V Class J [6]	SCCR (kA)	Mimimum Enclosure Volume (in 3)
Three-phase Input, with line reactor													
200/240 V Three-phase	75	221	ATV61HD55M3X	35	0.045	RL25001	100	—	—	—	350	10	22749
	100	285	ATV61HD75M3X	35	0.04	RL32001	100	—	—	—	350	10	22749
	125	359	ATV61HD90M3X	35	0.03	RL40001	100	—	—	—	450	10	22749
380/480 V Three-phase	125	179	ATV61HD90N4	35	0.15	RL16002	100	LIL36300	100	45900	300	100	45900
	150	215	ATV61HC11N4	35	0.11	RL20002	100	LIL36400	100	45900	400	100	45900
	200	259	ATV61HC13N4	35	0.09	RL25002	100	LIL36400	100	45900	400	100	45900
	250	314	ATV61HC16N4	50	0.075	RL32002	100	MHL36600	100	45900	600	100	45900
	350	427	ATV61HC22N4	50	0.05	RL50002	100	—	—	—	600	100	53550
	400	481	ATV61HC25N4	50	0.05	RL50002	100	—	—	—	600	100	53550
	500	616	ATV61HC31N4	50	0.04	RL60002	100	—	—	—	600 [5]	100	53550
	600	759	ATV61HC40N4	30	0.029	RL75002	100	—	—	—	900 [7]	30	95579
	700	941	ATV61HC50N4	30	0.027	RL85002B14	100	—	—	—	2 x 600 [6]	42	95579
	900	1188	ATV61HC63N4	30	0.019	RL120002B14	100	—	—	—	2 x 800 [5]	42	120265
500/690 V Three-phase	125	125	ATV61HC11Y	28	0.2	RL13002	100	—	—	—	160 [6]	28	31117
	150	150	ATV61HC13Y	28	0.15	RL16002	100	—	—	—	200 [6]	28	31117
	—	180	ATV61HC16Y	35	0.11	RL20002	100	—	—	—	250 [6]	35	31117
	200	220	ATV61HC20Y	35	0.11	RL20002	100	—	—	—	300 [6]	35	31117
	250	290	ATV61HC25Y	35	0.09	RL25002	100	—	—	—	400 [6]	35	54450
	350	355	ATV61HC31Y	35	0.06	RL40002	100	—	—	—	500 [6]	35	54450
	450	420	ATV61HC40Y	42	0.05	RL50002	100	—	—	—	600 [6]	42	54450
	550	543	ATV61HC50Y	42	0.04	RL60002	100	—	—	—	2 x 400 [6]	42	120265
	700	675	ATV61HC63Y	42	0.029	RL75002	100	—	—	—	2 x 500 [6]	42	120265
	800	840	ATV61HC80Y	42	0.022	RL100002B14	100	—	—	—	2 x 600 [6]	42	120265

[1] Electrical distribution systems with a higher prospective short circuit current will cause higher input currents in the front end of the drive. Add the inductance referred to in the table at the input of the drive if installing the drive on a system with higher prospective short circuit current. This column shows the maximum prospective short circuit current value the 200/240V and 380/480V Altivar 61 can be installed on without adding impedance to the drive. A 3% (minimum) input line reactor or equivalent inductance is required for these 575/690 Vac Altivar 61s and provides the listed value with the listed fuse protection. Add the inductance refered to in the table. Line reactor references are rated for 600Vac.

[2] The Altivar 61 has a 100k SCC rating on the output of the drive. In addition to providing a rating based on shorting the output of the drive, these short circuit rating have been obtained by shorting components internal to the Altivar 61. These ratings allow proper coordination of short circuit protection. Note: The integral solid state short circuit protection in the drive does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any local codes. The listed line reactor or minimum impedance is required to obtain ratings above the Input Rating.

[3] Ratings apply to an Altivar 61 mounted in a non-ventilated Type 1, 3R, 4(X) or 12 rated enclosure. Minimum enclosure volume allows for the specified SCCR. Your application specific thermal requirements may require a larger enclosure

[4] Use Bussmann fuses. Fuse type can be fast acting or time delay Class J, unless otherwise noted.

[5] Fuse type must be Class T fast acting fuses.

[6] Fuse type must be fast acting Class J fuses unless otherwise noted.

[7] Fuse type must be semi-conductor fuses.

Altivar™ 71 AC Drives

Table 60: ATV71 Combination Ratings

Altivar 71								Containment Short Circuit Current Ratings [2]								
								with Circuit Breaker [3]			with GVxP [3]			with Fuses [3]		
Input Voltage 50/60 Hz	(hp)	(A)	Reference:	Input Rating: (kA) [1]	Mimimum inductance (mH)	Line Reactor Reference	Output Interrupt rating: kAIC	PowerPact [4]	SCCR (kA)	Mimimum Enclosure Volume (in [3])	GV2P/3P Type E [5]	SCCR (kA)	Mimimum Enclosure Volume (in [3])	Fuse (A) 600 V Class J [6]	SCCR (kA)	Mimimum Enclosure Volume (in [3])
Three-phase Input, with line reactor																
200/240 V Three-phase	0.5	3	ATV71H037M3	5	3	RL00401	100	HJL36015	100	4017	GV2P08	65	1600	15	100	4017
	1	4.8	ATV71H075M3	5	1.5	RL00401	100	HJL36015	100	4017	GV2P10	65	1600	15	100	4017
	2	8	ATV71HU15M3	5	1.25	RL00801	100	HJL36025	100	4017	GV2P14	65	1600	25	100	4017
	3	11	ATV71HU22M3	5	0.8	RL01201	100	HJL36035	100	4017	GV3P18	65	1920	35	100	4017
	—	13.7	ATV71HU30M3	5	0.8	RL01801	100	HJL36035	100	4017	GV3P18	65	1920	35	100	4017
	5	17.5	ATV71HU40M3	5	0.5	RL01801	100	HJL36060	100	4017	GV3P25	65	1920	60	100	4017
	7.5	27.5	ATV71HU55M3	22	0.4	RL02501	100	HJL36080	100	6528	GV3P40	65	2880	80	100	6528
	10	33	ATV71HU75M3	22	0.3	RL03501	100	HJL36110	100	6528	GV3P50	65	4032	110	100	6528
	15	54	ATV71HD11M3X	22	0.25	RL04501	100	HJL36110	100	6528	GV3P50	65	5760	110	100	6528
	20	66	ATV71HD15M3X	22	0.2	RL05501	100	HJL36150	100	6528	GV3P65	65	5760	150	100	6528
	25	75	ATV71HD18M3X	22	0.15	RL08001	100	JJL36175	100	13215	—	—	—	175	100	13215
	30	88	ATV71HD22M3X	22	0.1	RL10001	100	JJL36200	100	13215	—	—	—	200	100	13215
	40	120	ATV71HD30M3X	22	0.075	RL13001	100	JJL36250	100	13215	—	—	—	250	100	13215
	50	144	ATV71HD37M3X	22	0.055	RL16001	100	JJL36250	100	13215	—	—	—	250	100	13215
	60	176	ATV71HD45M3X	10	0.055	RL20001	100	LAL36400	22	8640	—	—	—	400	22	8640
308/480 V Three-phase	1	2.3	ATV71H075N4	5	12	RL00201	100	HLL36015	100	4017	GV2P08	65	1600	15	100	4017
	2	4.1	ATV71HU15N4	5	6.5	RL00402	100	HLL36015	100	4017	GV2P10	65	1600	15	100	4017
	3	5.8	ATV71HU22N4	5	6.5	RL00402	100	HLL36015	100	4017	GV2P14	65	1600	15	100	4017
	—	7.8	ATV71HU30N4	5	3	RL00802	100	HLL36015	100	4017	GV2P14	65	1920	15	100	4017
	5	10.5	ATV71HU40N4	5	3	RL00802	100	HLL36025	100	4017	GV3P13	65	1920	25	100	4017
	7.5	14.3	ATV71HU55N4	22	2.5	RL01202	100	HLL36040	100	6528	GV3P25	65	2880	40	100	6528
	10	17.6	ATV71HU75N4	22	1.5	RL01802	100	HLL36050	100	6528	GV3P25	65	2880	50	100	6528
	15	27.7	ATV71HD11N4	22	1.2	RL02502	100	HLL36070	100	6528	GV3P40	65	4032	70	100	6528
	20	33	ATV71HD15N4	22	0.8	RL03502	100	HLL36100	100	6528	GV3P50	65	5760	100	100	6528
	25	41	ATV71HD18N4	22	0.8	RL03502	100	HLL36090	100	6528	GV3P50	65	8640	90	100	6528
	30	48	ATV71HD22N4	22	0.7	RL04502	100	HLL36100	100	6528	GV3P50	65	8640	100	100	6528
	40	66	ATV71HD30N4	22	0.5	RL05502	100	HLL36125	100	6528	GV3P65	65	10368	125	100	6528
	50	79	ATV71HD37N4	22	0.4	RL08002	100	HLL36150	100	13215	—	—	—	150	100	13215
	60	94	ATV71HD45N4	22	0.4	RL08002	100	JLL36200	100	13215	—	—	—	200	100	13215
	75	116	ATV71HD55N4	22	0.3	RL10002	100	JLL36225	100	13215	—	—	—	225	100	13215
	100	160	ATV71HD75N4	22	0.2	RL13002	100	JLL36250	100	38250	—	—	—	250	100	38250
	100	160	ATV71HD75N4	22	0.2	RL13002	100	KCL34250	100	38250	—	—	—	250	100	38250
575 V Three-phase	2	2.7	ATV71HU15S6X	22	9	RL00403	100	HLL36015	50	3898	—	—		6	100	3898
	3	3.9	ATV71HU22S6X	22	9	RL00403	100	HLL36015	50	3898	—	—		6	100	3898
	—	5.8	ATV71HU30S6X	22	9	RL00403	100	HLL36015	50	3898	—	—		6	100	3898
	5	6.1	ATV71HU40S6X	22	5	RL00803	100	HLL36015	50	3898	—	—		10	100	3898
	7.5	9	ATV71HU55S6X	22	3	RL01203	100	HLL36020	50	3898	—	—		15	100	3898
	10	11	ATV71HU75S6X	22	2.5	RL01203	100	HLL36025	50	3898	—	—		20	100	3898

Altivar™ 71 AC Drives

Table 60: ATV71 Combination Ratings *(continued)*

Altivar 71								Containment Short Circuit Current Ratings [2]								
								with Circuit Breaker [3]			with GVxP [3]			with Fuses [3]		
Input Voltage 50/60 Hz	(hp)	(A)	Reference:	Input Rating: (kA) [1]	Mimimum inductance (mH)	Line Reactor Reference	Output Interrupt rating: kAIC	PowerPact [4]	SCCR (kA)	Mimimum Enclosure Volume (in [3])	GV2P/3P Type E [5]	SCCR (kA)	Mimimum Enclosure Volume (in [3])	Fuse (A) 600 V Class J [6]	SCCR (kA)	Mimimum Enclosure Volume (in [3])
500/690 V Three-phase	2	2.7	ATV71HU22Y	22	9	RL00403	100	—	—	—	—	—	—	6	100	8640
	3	3.9	ATV71HU30Y	22	9	RL00403	100	—	—	—	—	—	—	10	100	8640
	—	5.8	ATV71HU40Y	22	5	RL00803	100	—	—	—	—	—	—	10	100	8640
	5	6.1	ATV71HU55Y	22	5	RL00803	100	—	—	—	—	—	—	15	100	8640
	7.5	9	ATV71HU75Y	22	3	RL00802	100	—	—	—	—	—	—	20	100	8640
	10	11	ATV71HD11Y	22	2.5	RL01202	100	—	—	—	—	—	—	25	100	8640
	15	17	ATV71HD15Y	22	1.5	RL01802	100	—	—	—	—	—	—	35	100	8640
	20	22	ATV71HD18Y	22	1.2	RL02502	100	—	—	—	—	—	—	45	100	8640
	25	27	ATV71HD22Y	22	1.2	RL02502	100	—	—	—	—	—	—	60	100	8640
	30	32	ATV71HD30Y	22	0.8	RL03502	100	—	—	—	—	—	—	60	100	8640
	40	41	ATV71HD37Y	22	0.7	RL04502	100	—	—	—	—	—	—	90	100	9792
	50	52	ATV71HD45Y	22	0.5	RL05502	100	—	—	—	—	—	—	100	100	9792
	60	62	ATV71HD55Y	22	0.4	RL08002	100	—	—	—	—	—	—	125	100	9792
	75	77	ATV71HD75Y	22	0.4	RL08002	100	—	—	—	—	—	—	150	100	9792
	100	99	ATV71HD90Y	22	0.3	RL10002	100	—	—	—	—	—	—	175	100	9792
Single-phase Input, without line reactor																
200/240 V Single-phase	0.5	3	ATV71H075M3	5	—	—	100	HJL36015	5	4017	GV2P10	5	1600	15	5	1078
	1	4.8	ATV71HU15M3	5	—	—	100	HJL36025	5	4017	GV2P14	5	1600	25	5	1078
	2	8	ATV71HU22M3	5	—	—	100	HJL36035	5	4017	GV3P18	5	4017	35	5	1550
	3	11	ATV71HU30M3	5	—	—	100	HJL36035	5	4017	GV3P18	5	1920	35	5	1550
	5	17.5	ATV71HU75M3	5	—	—	100	HJL36110	5	6528	GV3P50	5	4032	110	5	2719
	7.5	27.5	ATV71HD15M3X	5	—	—	100	HJL36150	5	6528	GV3P65	5	5760	150	5	4036
	10	33	ATV71HD18M3X	5	—	—	100	JJL36175	5	13215	—	—	—	175	5	4900
	15	54	ATV71HD30M3X	5	—	—	100	JJL36250	5	13215	—	—	—	250	5	9640
	20	66	ATV71HD37M3X	5	—	—	100	JJL36250	5	13215	—	—	—	250	5	9640
	25	75	ATV71HD45M3X	10	—	—	100	—	—	—	—	—	—	300	10	9640
Single-phase Input, with line reactor																
200/240 V Single-phase	—	13.7	ATV71HU40M3	5	1	RL02502	100	HJL36060	5	6528	GV3P25	65	1920	60	5	1550
	5	17.5	ATV71HU55M3	5	0.8	RL03502	100	HJL36080	5	6528	GV3P40	65	2880	80	5	1987
	7.5	27.5	ATV71HU75M3	22	0.5	RL05502	100	HJL36110	22	6528	GV3P50	65	4032	110	22	2719
	10	33	ATV71HD15M3X	22	0.4	RL08002	100	HJL36150	22	6528	GV3P65	65	5760	150	22	4036
	15	54	ATV71HD22M3X	22	0.3	RL10002	100	JJL36200	22	13215	—	—	—	200	22	4900
	20	66	ATV71HD30M3X	22	0.2	RL13002	100	JJL36250	22	6528	—	—	—	250	22	9640
	25	75	ATV71HD37M3X	22	0.15	RL16002	100	JJL36250	22	6528	—	—	—	250	22	9640
	30	88	ATV71HD45M3X	22	0.185	RL20003B14	100	LAL36400	22	8640	—	—	—	300	22	9640

[1] This column shows the maximum prospective short circuit current value the Altivar™ 71 can be installed on without adding impedance to the drive. Electrical distribution systems with a higher prospective short circuit current will cause higher input currents in the front end of the drive. Add the inductance referred to in the table at the input of the drive if installing the drive on a system with higher prospective short circuit current.

[2] The Altivar 71 has a 100k SCC rating on the output of the drive. In addition to providing a rating based on shorting the output of the drive, these short circuit rating have been obtained by shorting components internal to the Altivar 71. These ratings allow proper coordination of short circuit protection. The integral solid state short circuit protection in the drive does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any local codes. The listed line reactor or minimum impedance is required to obtain ratings above the Input Rating.

[3] Ratings apply to an Altivar 71 mounted in a non-ventilated Type 1, 3R, 4(X) or 12 rated enclosure. Minimum enclosure volume allows for the specified SCCR. Your application specific thermal requirements may require a larger enclosure.

[4] Circuit breakers with lower interrupt ratings can be used, such as:
- For 200/240 Vac, replace with HGL or JGL for 65kA interrupt rating.
- For 380/480, replace with HGL or JGL for 35kA or HJL or JJL for 65kA interrupt rating.
- For 575/600, replace with HJL for 25kA or HGL for 18kA, or HDL for 14kA interrupt rating

[5] 480 V ratings are for Wye connected electrical distribution systems. GV2P* self protected manual combination starter must be used with GV2GH7 insulating barrier to meet UL 508 Type E rating. GV3P* self protected manual combination starter must be used with GV3G66 + GVAM11 insulating barrier to mett UL 509 Type E rating.

[6] Use Bussmann fuses. Fuse type can be fast acting or time delay Class J, or Class CC unless otherwise noted. For 575–690 Vac rated drives, use Ferraz Shawmut Class J fast acting fuse.

Table 61: ATV71 High Horsepower Combination Ratings

Altivar™ 71								Containment Short Circuit Current Rating [2]					
								with Circuit Breaker [3]			with Fuses[3]		
Input Voltage 50/60 Hz	(hp)	(A)	Reference:	Input Rating: (kA) [1]	Mimimum inductance (mH)	Line Reactor Reference	Output Interrupt rating: kAIC	PowerPact [4]	SCCR (kA)	Mimimum Enclosure Volume (in 3)	Fuse (A) 600 V Class J [4]	SCCR (kA)	Mimimum Enclosure Volume (in 3)
Three-phase Input, with line reactor													
200/240 V Three-phase	75	221	ATV71HD55M3X	35	0.045	RL25001	100	—	—	—	350	10	22749
	100	285	ATV71HD75M3X	35	0.04	RL32001	100	—	—	—	450	10	28416
380/480 V Three-phase	125	179	ATV71HD90N4	35	0.15	RL16002	100	LIL36300	100	45900	300	100	45900
	150	215	ATV71HC11N4	35	0.11	RL20002	100	LIL36300	100	45900	300	100	45900
	200	259	ATV71HC13N4	35	0.09	RL25002	100	LIL36400	100	45900	400	100	45900
	250	314	ATV71HC16N4	50	0.075	RL32002	100	—	—	—	400	100	45900
	300	387	ATV71HC20N4	50	0.06	RL40002	100	—	—	—	500	100	53550
	400	481	ATV71HC25N4	50	0.05	RL50002	100	—	—	—	600	100	53550
	450	550	ATV71HC28N4	50	0.04	RL60002	100	—	—	—	700 [5]	18	53550
	500	616	ATV71HC31N4	30	0.04	RL60002	100	—	—	—	800 [5]	30	95579
	600	759	ATV71HC40N4	30	0.029	RL75002	100	—	—	—	2 x 500 [6]	30	95579
	700	941	ATV71HC50N4	30	0.027	RL85002B14	100	—	—	—	2 x 600 [6]	30	120265
500/690 V Three-phase	125	125	ATV71HC11Y	28	0.2	RL13002	100	—	—	—	200 [6]	28	31117
	150	150	ATV71HC13Y	28	0.15	RL16002	100	—	—	—	200 [6]	28	31117
	—	180	ATV71HC16Y	35	0.11	RL20002	100	—	—	—	250 [6]	35	31117
	200	220 / 200	ATV71HC20Y	35	0.11	RL20002	100	—	—	—	300 [6]	35	54450
	250	290	ATV71HC25Y	35	0.09	RL25002	100	—	—	—	400 [6]	35	54450
	350	355	ATV71HC31Y	35	0.06	RL40002	100	—	—	—	500 [6]	35	54450
	450	420	ATV71HC40Y	42	0.05	RL50002	100	—	—	—	2 x 300 [6]	42	120265
	550	543	ATV71HC50Y	42	0.04	RL60002	100	—	—	—	2 x 400 [6]	42	120265
	700	675	ATV71HC63Y	42	0.029	RL75002	100	—	—	—	2 x 500 [6]	42	120265

[1] Electrical distribution systems with a higher prospective short circuit current will cause higher input currents in the front end of the drive. Add the inductance referred to in the table at the input of the drive if installing the drive on a system with higher prospective short circuit current. This column shows the maximum prospective short circuit current value the 200/240V and 380/480V Altivar 71 can be installed on without adding impedance to the drive. A 3% (minimum) input line reactor or equivalent inductance is required for these 575/690 Vac Altivar 71s and provides the listed value with the listed fuse protection. Add the inductance refered to in the table. Line reactor references are rated for 600Vac.

[2] The Altivar 71 has a 100k SCC rating on the output of the drive. In addition to providing a rating based on shorting the output of the drive, these short circuit rating have been obtained by shorting components internal to the Altivar 71. These ratings allow proper coordination of short circuit protection. Note: The integral solid state short circuit protection in the drive does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any local codes. The listed line reactor or minimum impedance is required to obtain ratings above the Input Rating.

[3] Ratings apply to an Altivar 71 mounted in a non-ventilated Type 1, 3R, 4(X) or 12 rated enclosure. Minimum enclosure volume allows for the specified SCCR. Your application specific thermal requirements may require a larger enclosure

[4] Use Bussmann fuses. Fuse type can be fast acting or time delay Class J, unless otherwise noted.

[5] Fuse type must be Class T fast acting fuses.

[6] Fuse type must be fast acting Class J fuses unless otherwise noted.

[7] Fuse type must be semi-conductor fuses.

Short Circuit Protection for Soft Starters

Altistart™ 22 Soft Starters

Table 62: Altistart 22 Combination Short Circuit Current Ratings (SCCR)
Recommended combination ratings with fuse or circuit breaker protective device for ATS22•••S6U.

Altistart 22			SCCR Ratings [5]							Minimum Enclosure Volume	
			With Circuit Breaker			With Fuses [6]					
Power indicated on rating plate (HP)	Reference	NEC Full Load Current (A)	PowerPact [1, 2] (Innverse Time) C1, C2 [4]	PowerPact [1, 2] (Instantaneous-Trip) C1, C2 [4]	SCCR (kA) B [4]	Molded Case Switches	Fuse (A) C1, C2 [4]	SCCR (kA) B [4]	TeSys™ Contactor [8]	No TeSys Contactor [4] (in [3])	With TeSys Contactor [4] (in [3])
208 V[A]											
3	ATS22D17S6U	10.6	HLL36040	HLL36030M71	100	HLL36000S15	15	100	LC•D18	2310	4158
7.5	ATS22D32S6U	24.2	HLL36070	HLL36050M72	100	HLL36000S15	40	100	LC•D32	2310	4158
10	ATS22D47S6U	30.8	HLL36100	HLL36100M73	100	HLL36000S15	50	100	LC•D40A	2310	4158
15	ATS22D62S6U	46.2	HLL36125	HLL36100M73	100	HLL36000S15	80	100	LC•D50A	2772	4620
20	ATS22D75S6U	59.4	HLL36150	HLL36150M74	100	HLL36000S15	100	100	LC•D80	2772	4620
25	ATS22D88S6U	74.8	HLL36150	HLL36150M74	100	HLL36000S15	125	100	LC•D80	2772	4620
30	ATS22C11S6U	88	JLL36250	HLL36150M74	100	HLL36000S15	150	100	LC•D115	3696	6468
40	ATS22C14S6U	114	JLL36250	JLL36250M75	100	HLL36000S15	200	100	LC•D150	3696	6468
50	ATS22C17S6U	143	JLL36250	JLL36250M75	100	JLL36000S25	250	100	LC•F185	3696	6468
60	ATS22C21S6U	169	DLL36400	JLL36250M75	100	JLL36000S25 DLL36600S60	250	100	LC•F265	11267	45000
				DLL36400M36							
			LHL36350	LHL3640031M	42						
75	ATS22C25S6U	211	LHL36400	LHL3640032M	42	DLL36600S60	350	100	LC•F330	11267	45000
			DLL36400	DLL36400M36	100						
100	ATS22C32S6U	273	DLL36600	DLL36600M42	100	DLL36600S60	450	100	LC•F400	11267	45000
125	ATS22C41S6U	343	DLL36600	DLL36600M42	100	DLL36600S60	600	100	LC•F500	11267	45000
150	ATS22C48S6U	396	MJL36800	PLL34080M68	100	PLL34000S60	700	100	LC•F500	10584	34272
			PLL34080								
230 V[A]											
5	ATS22D17S6U	15.2	HLL36040	HLL36030M71	100	HLL36000S15	30	100	LC•D25	2310	4158
10	ATS22D32S6U	28	HLL36070	HLL36050M72	100	HLL36000S15	45	100	LC•D32	2310	4158
15	ATS22D47S6U	42	HLL36100	HLL36100M73	100	HLL36000S15	70	100	LC•D50A	2310	4158
20	ATS22D62S6U	54	HLL36125	HLL36100M73	100	HLL36000S15	90	100	LC•D65A	2772	4620
25	ATS22D75S6U	68	HLL36150	HLL36150M74	100	HLL36000S15	110	100	LC•D80	2772	4620
30	ATS22D88S6U	80	HLL36150	HLL36150M74	100	HLL36000S15	125	100	LC•D115	2772	4620
40	ATS22C11S6U	104	JLL36250	HLL36150M74	100	HLL36000S15	175	100	LC•D150	3696	6468
50	ATS22C14S6U	130	JLL36250	JLL36250M75	100	JLL36000S17	225	100	LC•D150	3696	6468
60	ATS22C17S6U	154	JLL36250	JLL36250M75	100	JLL36000S25	250	100	LC•F185	3696	6468
75	ATS22C21S6U	192	DLL36400	JLL36250M75	100	JLL36000S25 DLL36600S60	300	100	LC•F330	11267	45000
				DLL36400M36							
			LHL36350	LHL3640031M	42						
100	ATS22C25S6U	248	LHL36400	LHL3640032M	42	DLL36600S60	400	100	LC•F330	11267	45000
			DLL36400	DLL36400M36	100						
125	ATS22C32S6U	312	DLL36600	DLL36600M42	100	DLL36600S60	500	100	LC•F400	11267	45000
150	ATS22C41S6U	360	DLL36600	DLL36600M42	100	DLL36600S60	600	100	LC•F500	11267	45000
200	ATS22C59S6U	480	MJL36800	PLL34080M68	100	PLL34000S80	800	100	LC•F630	10584	34272
			PLL34080								

Table 62: Altistart 22 Combination Short Circuit Current Ratings (SCCR) *(continued)*
Recommended combination ratings with fuse or circuit breaker protective device for ATS22•••S6U.

Altistart 22			SCCR Ratings [5]							Minimum Enclosure Volume	
			With Circuit Breaker			With Fuses [6]					
Power indicated on rating plate (HP)	Reference	NEC Full Load Current (A)	PowerPact [1, 2] (Innverse Time) C1, C2 [4]	PowerPact [1, 2] (Instantaneous-Trip) C1, C2 [4]	SCCR (kA) B [4]	Molded Case Switches	Fuse (A) C1, C2 [4]	SCCR (kA) B [4]	TeSys™ Contactor [8]	No TeSys Contactor [4] (in [3])	With TeSys Contactor [4] (in [3])
460 V[A]											
10	ATS22D17S6U	14	HLL36040	HLL36030M71	100	HLL36000S15	20	100	LC•D18	2310	4158
20	ATS22D32S6U	27	HLL36070	HLL36050M72	100	HLL36000S15	35	100	LC•D32	2310	4158
30	ATS22D47S6U	40	HLL36100	HLL36100M73	100	HLL36000S15	70	100	LC•D50A	2310	4158
40	ATS22D62S6U	52	HLL36125	HLL36100M73	100	HLL36000S15	90	100	LC•D65A	2772	4620
50	ATS22D75S6U	65	HLL36150	HLL36150M74	100	HLL36000S15	110	100	LC•D80	2772	4620
60	ATS22D88S6U	77	HLL36150	HLL36150M74	100	HLL36000S15	125	100	LC•D115	2772	4620
75	ATS22C11S6U	96	JLL36250	HLL36150M74	100	HLL36000S15	150	100	LC•D115	3696	6468
100	ATS22C14S6U	124	JLL36250	JLL36250M75	100	JLL36000S17	200	100	LC•D150	3696	6468
125	ATS22C17S6U	156	JLL36250	JLL36250M75	100	JLL36000S25	250	100	LC•F185	3696	6468
150	ATS22C21S6U	180	DLL36400	JLL36250M75	100	JLL36000S25 DLL36600S60	300	100	LC•F265	11267	45000
			LIL36350	DLL36400M36							
			LHL36350	LHL3640031M	42						
200	ATS22C25S6U	240	LHL36400	LHL3640032M	42	DLL36600S60	400	100	LC•F330	11267	45000
			DLL36400	DLL36400M36	100						
			LIL36400								
250	ATS22C32S6U	302	DLL36600	DLL36600M42	100	DLL36600S60	500	100	LC•F400	11267	45000
			LIL36500								
300	ATS22C41S6U	361	DLL36600	DLL36600M42	100	DLL36600S60	600	100	LC•F500	11267	45000
			LIL36600								
350	ATS22C48S6U	414	MJL36800	—	65	PLL34000S60	700	100	LC•F500	10584	34272
			PLL34080	PLL34080M68	100						
400	ATS22C59S6U	477	MJL36800	—	65	PLL34000S60	800	100	LC•F360	10584	34272
			PLL34080	PLL34080M68	100						
575 V[A]											
15	ATS22D17S6U	17	HLL36040	HLL36030M71	50	HLL36000S15	25	100	LC•D40A	2310	4158
25	ATS22D32S6U	27	HLL36070	HLL36050M72	50	HLL36000S15	45	100	LC•D40A	2310	4158
40	ATS22D47S6U	41	HLL36100	HLL36100M73	50	HLL36000S15	70	100	LC•D50A	2310	4158
50	ATS22D62S6U	52	HLL36125	HLL36100M73	50	HLL36000S15	90	100	LC•D80	2772	4620
60	ATS22D75S6U	62	HLL36150	HLL36150M74	50	HLL36000S15	100	100	LC•D80	2772	4620
75	ATS22D88S6U	77	HLL36150	HLL36150M74	50	HLL36000S15	125	100	LC•D115	2772	4620
100	ATS22C11S6U	99	JLL36250	HLL36150M74	50	HLL36000S15	150	100	LC•D115	3696	6468
125	ATS22C14S6U	125	JLL36250	JLL36250M75	50	JLL36000S17	200	100	LC•D150	3696	6468
150	ATS22C17S6U	144	JLL36250	JLL36250M75	50	JLL36000S25	250	100	LC•F185	3696	6468
200	ATS22C21S6U	192	DLL36400[3]	JLL36250M75	50	JLL36000S25 DLL36600S60	300	100	LC•F330	11267	45000
			LIL36350	DLL36400M36[3]							
			LHL36350	LHL3640031M	18						
250	ATS22C25S6U	242	DLL36400[3]	DLL36400M36[3]	50	DLL36600S60	400	100	LC•F330	11267	45000
			LIL36400								
			LHL36400	LHL3640032M	18						
300	ATS22C32S6U	289	DLL36600[3]	DLL36600M42[3]	50	DLL36600S60	500	100	LC•F400	11267	45000
			LIL36500								

Table 62: Altistart 22 Combination Short Circuit Current Ratings (SCCR) *(continued)*
Recommended combination ratings with fuse or circuit breaker protective device for ATS22•••S6U.

Altistart 22			SCCR Ratings [5]						TeSys™ Contactor [8]	Minimum Enclosure Volume	
			With Circuit Breaker			With Fuses [6]					
Power indicated on rating plate (HP)	Reference	NEC Full Load Current (A)	PowerPact [1, 2] (Innverse Time) C1, C2 [4]	PowerPact [1, 2] (Instantaneous-Trip) C1, C2 [4]	SCCR (kA) B [4]	Molded Case Switches	Fuse (A) C1, C2 [4]	SCCR (kA) B [4]		No TeSys Contactor [4] (in [3])	With TeSys Contactor [4] (in [3])
350	ATS22C41S6U	336	DLL36600[3]	DLL36600M42[3]	50	DLL36600S60	500	100	LC•F500	11267	45000
			LIL36600								
400	ATS22C48S6U	382	MJL36800	—	25	PKL36000S60	600	100	LC•F500	10584	34272
			PKL36080	PKL36080M68	50						
500	ATS22C59S6U	472	MJL36800	—	25	PKL36000S80	800	100	LC•F630	10584	34272
			PKL36080	PKL36080M68	50						

[1] Square D PowerPact circuit breakers. Maximum breaker size for SCCR is shown. The third character of the breaker catalog number may be an “L”, an “F”, an “M” or a “P”. The following types of Square D breakers with lower interrupting ratings may be substituted for the breakers shown: HD, HG, HJ, JD, JG, JJ, DG, DJ, MG, PG, PJ, PK.
[2] A smaller ampacity breaker within the same product family may be substituted for the one described.
[3] Short circuit rating of the combination exceeds the rating of the circuit breaker. Combinations including F500 contactor are rated 35 kA at 600 V.
[4] Suitable for use on a circuit capable of delivering not more than ___B___rms symmetrical kiloAmperes, ___A___Volts maximum, when protected by ___C1___ with a maximum rating of ___C2___.
[5] For all models, rating indicates standard use conditions. For heavy duty condition, the user manual must be referred to.
[6] Molded case switches provide the disconnecting means, and fuses provide the short circuit protection. The molded case switch part numbers are only suggestions. Customer may choose to use similar approved disconnecting means.
[7] JLL36000S17 may be replaced by JLL36000S25.
[8] Contactor may be LC1 or LC2 type. The next larger contactor may be substituted for the one shown. Contactors may be used in conjuction with circuit breaker protection and ATS22 soft starter for line and load isolation applications.

Altistart™ 48 Soft Starters

Altistart 48

Tested combination short-circuit ratings for Altistart 48 soft starters are posted on UL's Combination Motor Controller website under the Square D Soft-Starts link: http://www.ul.com/global/eng/pages/offerings/industries/powerandcontrols/industrialcontrolequipment/shortcircuit/

Table 63: Altistart 48 Soft Starters [1]

Standard Duty Motor (Low Inertia Loads) [2] Maximum Horsepower					Altistart Soft Starts	
208 V	230 V	400 V	460 V	575 V	Rated A	Catalog Number
3	5	5.5	10	15	17	ATS48D17Y
5	7.5	7.5	15	20	22	ATS48D22Y
7.5	10	11	20	25	32	ATS48D32Y
10	—	15	25	30	38	ATS48D38Y
—	15	18.5	30	40	47	ATS48D47Y
15	20	22	40	50	62	ATS48D62Y
20	25	30	50	60	75	ATS48D75Y
25	30	37	60	75	88	ATS48D88Y
30	40	45	75	100	110	ATS48C11Y
40	50	55	100	125	140	ATS48C14Y
50	60	75	125	150	170	ATS48C17Y
60	75	90	150	200	210	ATS48C21Y
75	100	110	200	250	250	ATS48C25Y
100	125	132	250	300	320	ATS48C32Y
125	150	160	300	350	410	ATS48C41Y
150	—	220	350	400	480	ATS48C48Y
—	200	250	400	500	590	ATS48C59Y
200	250	315	500	600	660	ATS48C66Y
250	300	355	600	800	790	ATS48C79Y
350	350	400	800	1000	1000	ATS48M10Y
400	450	500	1000	1200	1200	ATS48M12Y

[1] Motor full load amperage (FLA) must not exceed the ampere rating of the soft start.
[2] Low Inertia—Connected motor load inertia equal or less than 10 times motor rotor inertia.
High Inertia—Connected motor load inertia greater than 10 times motor rotor inertia.

Select the Altistart 48 softstart using the nameplate full-load ampere rating of the motor and above. The horsepower ratings are for reference only.

NOTE: For severe duty or high inertia loads, derate by 1 hp size.

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 64 below). 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 4.

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 53. The TeSys™ product line is designed for compliance and capatibility 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 64: Comparison of CSA and UL Standards

Standard Name	CSA Standard	UL Standard
Enclosed and Dead-Front Switches	CSA C22.2 No. 4	UL98
Low-Voltage Fuses: Part 1: General Requirements	CSA C22.2 No. 248	UL248
Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures	CSA C22.2 No. 5	UL489
Industrial Control Equipment	CSA C22.2 No. 14	UL508
Elevator Equipment	CSA No. B44.1	Partially UL508

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

The following full-load current values conform to NEC requirements. These value are indicative; they vary according to the type of motor, the number of poles, and the manufacturer.

Table 65: 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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