

Selection Guide

and Technical Specifications



Electronic Motor Starters

Series CET7, CEUT7

Topic	Page
<i>Introduction</i>	2
<i>Selection and Accessories</i>	3
<i>Technical Specifications</i>	4
<i>Trip Curves</i>	7
<i>Wiring Diagrams</i>	9
<i>Dimensions</i>	11

CET7 Electronic Motor Starters

The CET7 product is an advanced electro-mechanical motor starter that combines the functionality of a contactor and an overload relay into a smaller footprint. This starter series offers direct-on-line (DOL) and reversing electronic motor starters.

CET7 starters can control single- and three-phase motors up to 480V AC and are available with maximum current ratings of 9 A and 23 A. The CET7 starter has integrated electronic overload protection, which eliminates the need for a separate overload relay.

The CET7 series of starters includes non-reversing and reversing, and standard options, both of which have the same slim form-factor. All CET7 starter options can be installed side-by-side without derating. This configuration is referred to as 'zero stacked.' Zero-stacking provides a significant reduction in the required panel space.

The CET7 starter requires a 24V DC control power source and uses 24V DC control signals. For control inputs, the CET7 starter is equipped with start, stop, remote reset, and reversing (when applicable). Two separate, integrated 24V DC (100 mA max load) outputs signal the CET7 starter and fault status.

The CET7 starter features a user interface on the front of the unit for configuration and diagnostics. Light-emitting diodes (LEDs) indicate module and motor status and reversing status. With the CET7 starter DIP switches, you can switch between single and three-phase control, and select auto or manual overload reset. A full load ampere (FLA) selector dial is also installed on the front of the unit, which can be used to configure the CET7 starter protection features.

Protection Features

The CET7 starter offers multiple protection functions with the following options:

- Electronic overload protection with Class 10 overload trip
- Auto and manual overload reset
- Phase loss protection
- Phase imbalance protection
- Contact weld protection
- Single-phase miswiring protection
- Remote reset control input

Point-on-Wave technology

Precise timing is essential in motor control applications. Point-on-Wave switching triggers electrical loads at an exact point on the voltage waveform, reducing component stress, arc energy, and electromagnetic interference. With this technology, the CET7 improves device longevity and enhances energy efficiency.

With Point-on-Wave technology, the CET7 allows you to maintain:

Energy efficiency: By reducing switching losses and improving power quality, POW technology contributes to overall energy efficiency in industrial applications.



Reliability and durability: Controlled switching helps in minimizing stress on components, extending their operational lifespan, and reducing maintenance requirements.

Flexibility: It allows for flexibility in design and operation, accommodating various loaded conditions and adapting to dynamic industrial environments.

Thermal performance

The CET7 supports zero-stacking of motor starters without derating up to 55°C, enabling compact panel layouts while maintaining full performance. This allows efficient use of space in tight installations without compromising reliability or continuous operation.

Zero-Stacking allows Enhanced Features

Continuous monitoring: Provides constant oversight of critical production points to prevent missed issues and maintain quality and safety.

Flexibility and scalability: Zero-stacking enables quick system adjustments or expansions without major redesigns, supporting changing production needs.

Cost efficiency: Despite using multiple components, zero-stacking is often more economical than other redundancy or reliability methods.

The CET7 characteristics

- Fewer components
- Simplified Wiring
- More panel space
- Less complexity



Series CET7 Electronic Motor Starters

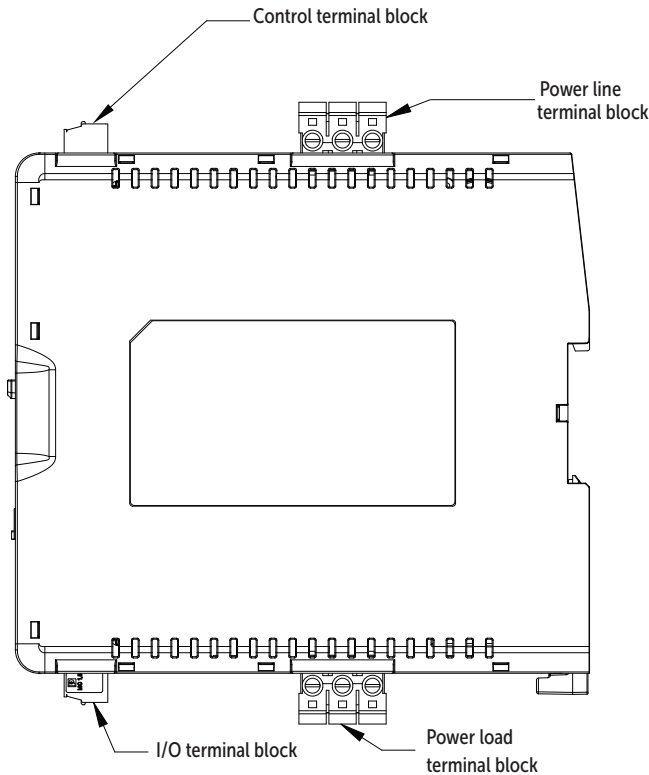
	Description	Current Range [A]	Operation	Terminal Type	Catalog Number
	Non-reversing	0.75...9 A	Standard	screw terminals	CET7-9-S
	Non-reversing	4.6...23 A	Standard	screw terminals	CET7-23-S
	Reversing	0.75...9 A	Standard	screw terminals	CEUT7-9-S
	Reversing	4.6...23 A	Standard	screw terminals	CEUT7-23-S

Replacement Terminal Block Kits

The CET7 starter ships with terminal block kits. The following accessory kits are intended to be used as spare or replacement terminal blocks.

Description	Safety	Terminals	Current Range	Reversing / Non-Reversing	Catalog Number
Spare or replacement terminal blocks	No functional safety	screw terminals	0.75...9A	Non-Reversing	CET7-9-S-TB
				Reversing	CEUT7-9-S-TB
			4.6...23A	Non-Reversing	CET7-23-S-TB
				Reversing	CEUT7-23-S-TB

CET7 starter has the following connectors



The CET7 starter-terminal main line and load connections support the following:

- Flexible stranded wire
- Flexible stranded wire with ferrule
- Coarse-stranded wire
- Solid wire

Only one single conductor can be used on the power terminals. The control/aux terminal can use two conductors per terminal.

The CET7 starter is configured to reset the overload trips manually by default.

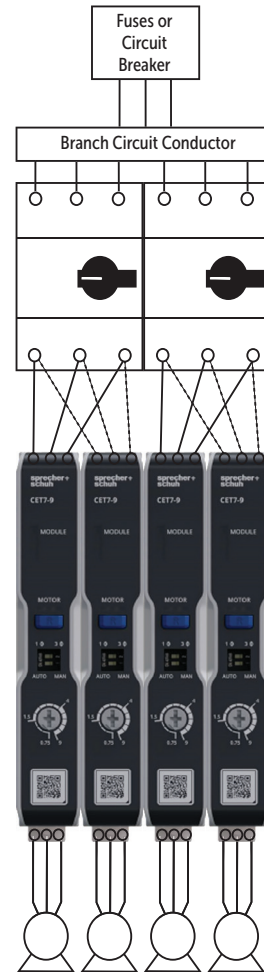
WARNING: If the device is set to Automatic Reset, it will restart automatically. Take precautions to help prevent hazards.

Group Installation with MPCBs

Devices rated for 9 A (CET7-9-S, CEUT7-9-S) are Suitable for motor group applications when used on the load side of a cat. no. KTA9-40H-20A circuit breaker with an SCCR rating of 65 kA @ 480Y/277V.

There is only one BCPD for the "Group".

Group installation with MPCBs
Branch Circuit Protection Device



Overview

Group installation has been successfully used for many years in the U.S. and Canada. It allows "two or more motors or one or more motors and other loads to be connected to the same branch-circuit...". The most restrictive part of the conditions that are specified for Group Installation is the requirement for the protection of the conductors for each motor circuit. In the U.S. NEC for 2002, a new rule for the conductor sizing was added for devices that are listed and marked "Suitable for use as Tap Conductor Protection".

Series KT9 MPCBs are UL/CSA Listed for Group Installation: conductors from the BCPD to each motor must be a minimum of 1/3 the ampacity of the Branch Circuit conductors.

Series KT9 MPCBs are UL/CSA Listed for Tap conductor Protection in Group Installations: conductors from the BCPD to manual motor controller listed as "...Tap Conductor Protection..." must be minimum of 1/10 the rating or setting of the BCPD. Conductors from the controller to the motor must be 125% of the motor FLA.

General Ratings



Attribute		Value
Standards compliance		<ul style="list-style-type: none"> • UL 60947-4-1 • CSA C22.2, No. 60947-4-1 • EN 60947-4-1 • NM EN 60947-4-1
Certifications		cULus, CE, UKCA, Morocco, RCM
Rated operating current	9 A configuration	0.75...9 A
	23 A configuration	4.6...23 A
Control voltage power source requirements ❶	9 A devices	24V DC (-15% / +10%) control power source on the A1+/A2-terminals
	23 A devices	
Rated operating voltage U _e		480V AC
Maximum operating voltage		480V AC
Rated insulation voltage U _i		500V
Rated impulse withstand voltage U _{imp}		6 kV
Rated frequency		50/60 Hz
Trip class		10
Utilization category		AC-3
Number of operations		1 million operation (AC-3)
Temperature	Storage temperature range	-40...+85 °C (-40...+185 °F)
	Ambient temperature range	-20...+55 °C (-4...+131 °F)
	Surrounding air temperature range	-20...+65 °C (-4...+149 °F)
Humidity	Operating	5...95% noncondensing 92% relative humidity
	Damp Heat - Steady State Per IEC 60068-2-78	93% relative humidity 40 °C (104 °F) 56 days
	Damp Heat - Cyclic Per IEC 60068-2-30	93% relative humidity 25 °C/40 °C (77 °F/104 °F) 21 Cycles
Cooling Method		Natural convection
Resistance to Vibration Per IEC 60068-2-6	9 A configuration	Operating 3 G
	23 A configuration	15 G Operating 30 G Nonoperating
Resistance to Shock Per IEC 60068-2-27	9 A configuration	15 G Operating 25 G Nonoperating
	23 A configuration	15 G Operating 25 G Nonoperating
Maximum altitude		2000 m (6561 ft)
Pollution environment		Pollution Degree 3
Mounting		Vertical mounting Recommended
Minimum distance to other units, same type		Zero-stack capability
Degree of protection		IP20 with terminal blocks installed
Minimum enclosure size	9 A configuration	406 x 305 x 203 mm (16 x 12 x 8 in.)
	23 A configuration	

❶ The CET7 starter is designed with internal overcurrent protection to limit the maximum energy into the control circuit.

Fault Ratings

Rating	Protection Type	Attribute	9 A Starters	23 A Starters
UL Standard Fault	Fuse or circuit breaker	Max Fuse [A]	35 (Class RK5)	90 (Class J)
		Max Circuit Breaker [A]	30 (KTU9)	
		Standard Fault Current [kA]	1	3
UL High Fault	Fuse	Max Class J Fuse [A]	35	60
		Max Class CC Fuse [A]	30	~
		High Fault Current [kA]	100	
	Circuit breaker	Max Circuit Breaker [A]	30	
		High Fault Current [kA]	65	
		Recommended Circuit Breaker (480Y/277V)	Cat. No. KTU9-40H-3D-30	

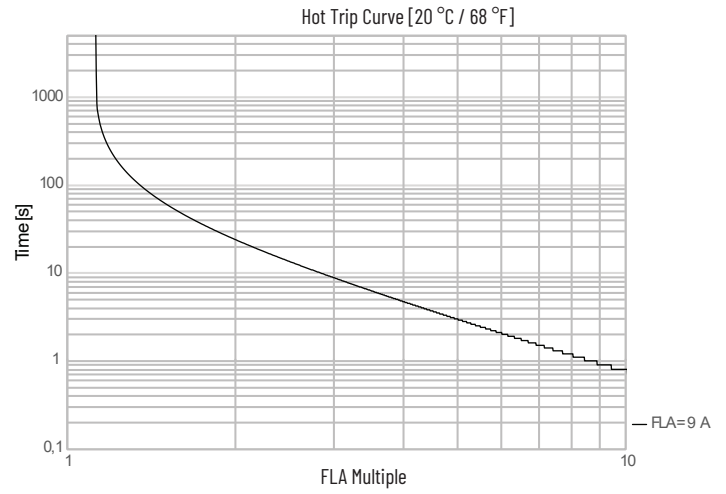
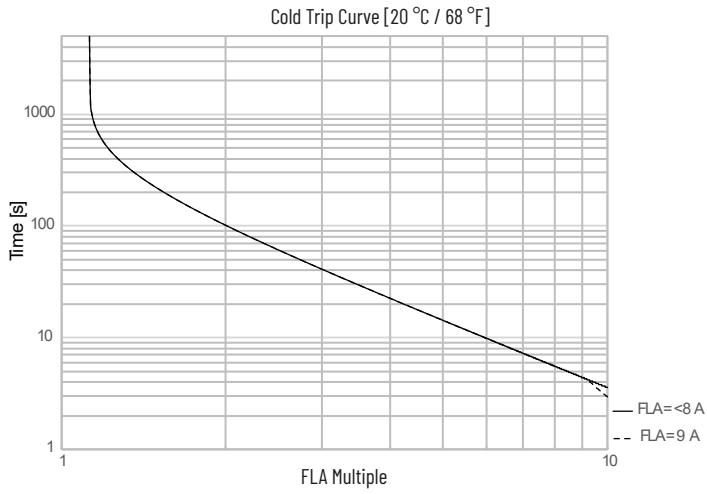
Wiring and Torque Specifications

Connection					Screw Terminals			
					Power Terminals ❶		Control / Auxiliary Terminals	
					9 A	23 A	9 A	23 A
Wiring	Solid		1 conductor	mm2	2.5...4	2.5...6	1...2.5	
				AWG	14...12	14...10	18...14	
		2 conductors		mm2	~	~	1...1.5	
				AWG	~	~	18...16	
	Stranded ❷		1 conductor	mm2	2.5...4	2.5...6	1...2.5	
				AWG	14...12	14...10	18...14	
	2 conductors	mm2	~	~	1...1.5			
		AWG	~	~	18...16			
Stripping length					9 mm (0.35 in.)		9 mm (0.35 in.)	
Recommended screwdriver					3 mm (1/8 in.)		3 mm (1/8 in.)	
Tightening torque			N•m		0.4...0.5	0.5...0.6	0.22...0.25	
			lb•in		3.5...4.4	4.4...5.3	1.95...2.21	

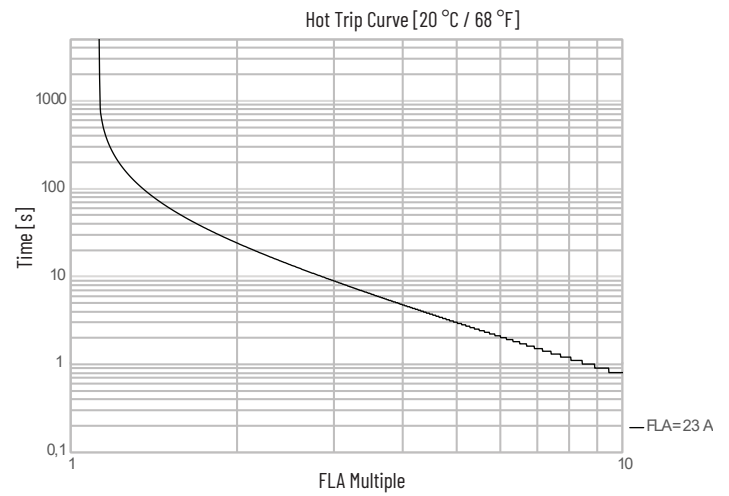
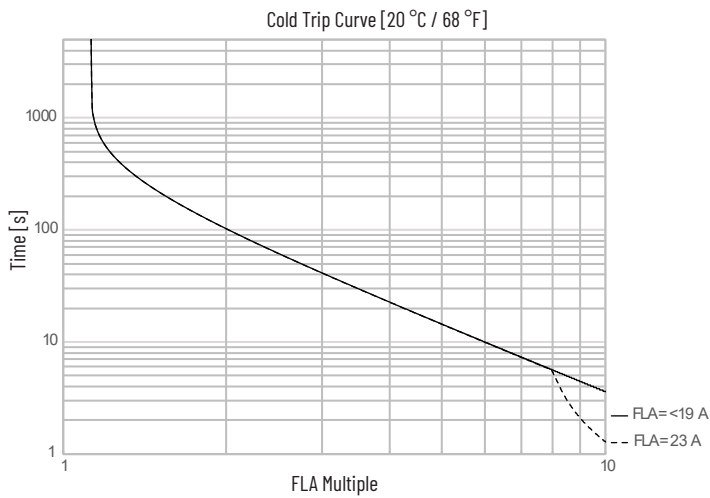
❶ The CET7 starter is designed with internal overcurrent protection to limit the maximum energy into the control circuit.

❷ Main line and load connections support flexible stranded wire, flexible stranded wire with ferrule, or coarse-stranded wire.

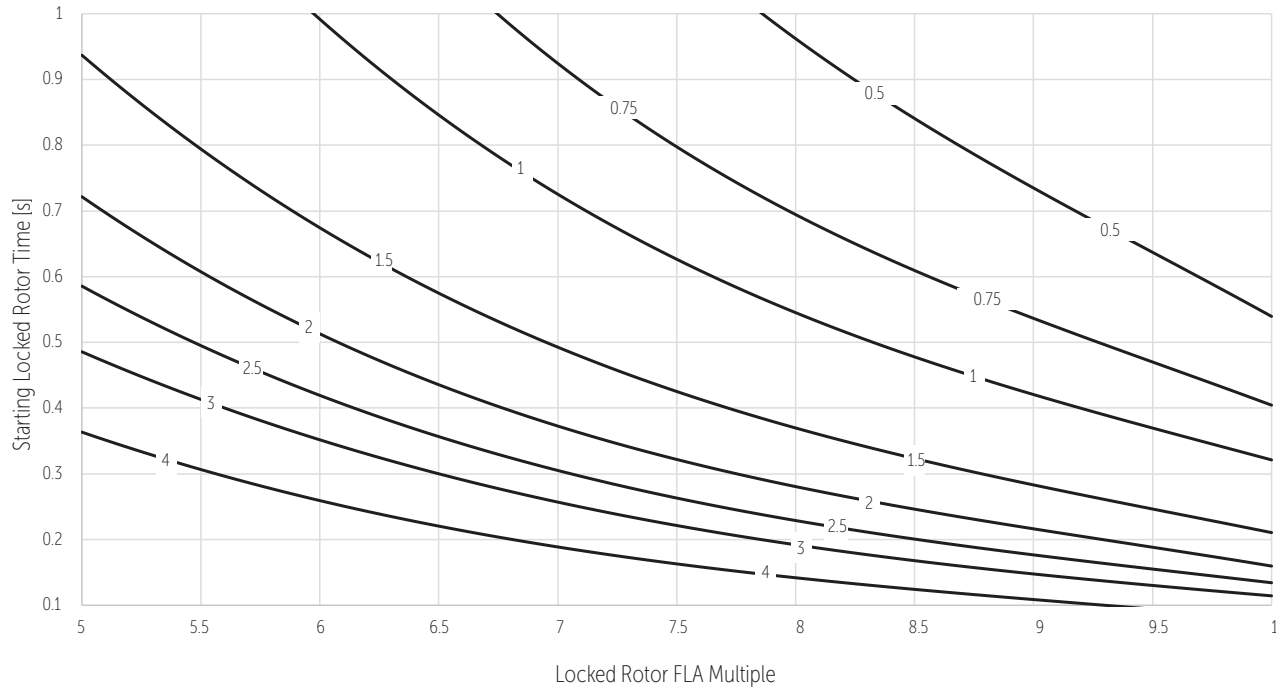
Trip Curves – 9 A



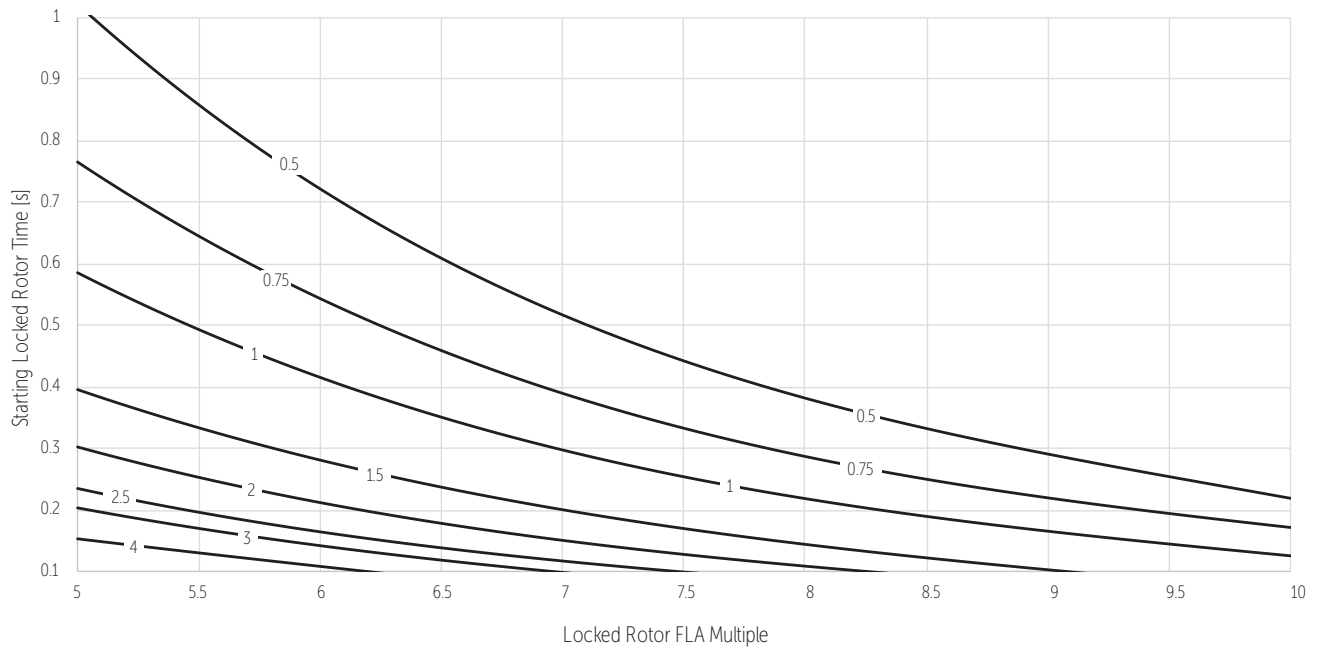
Trip Curves – 23 A



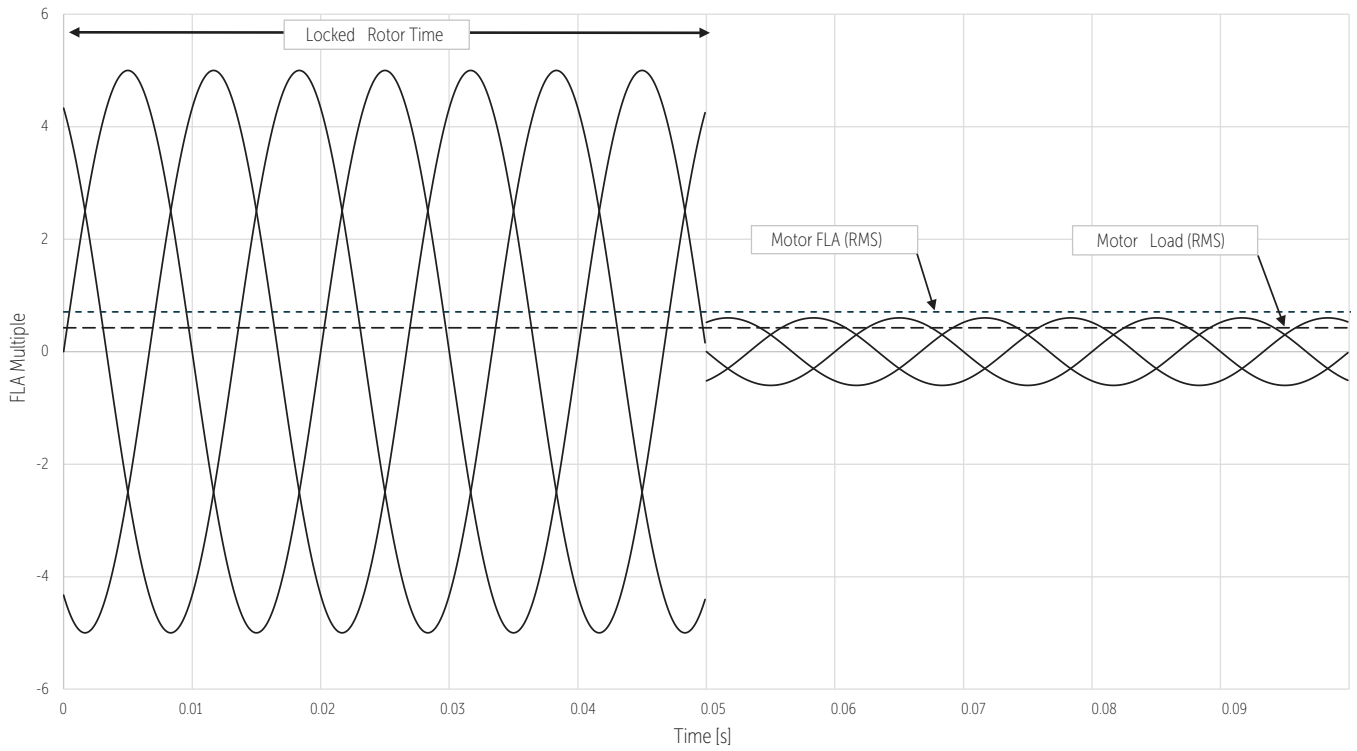
Maximum Starts per Minute @ 68°F (20°C) - 9A and 23A Devices, 80% FLA



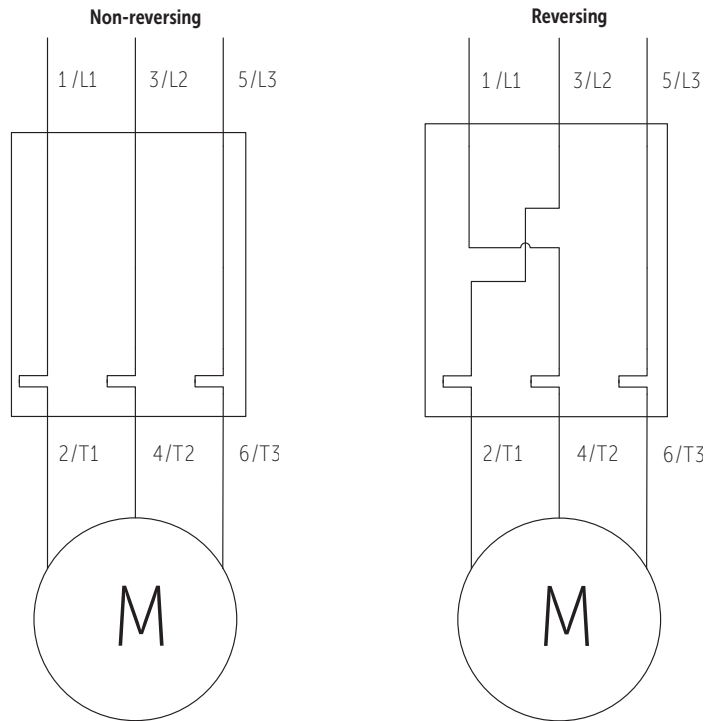
Maximum Starts per Minute @ 68°F (20°C) - 9A and 23A Devices, 100% FLA



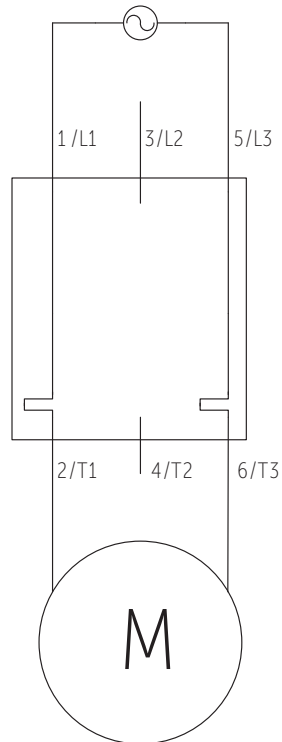
Simplified Motor Start



Three-phase Wiring Diagram

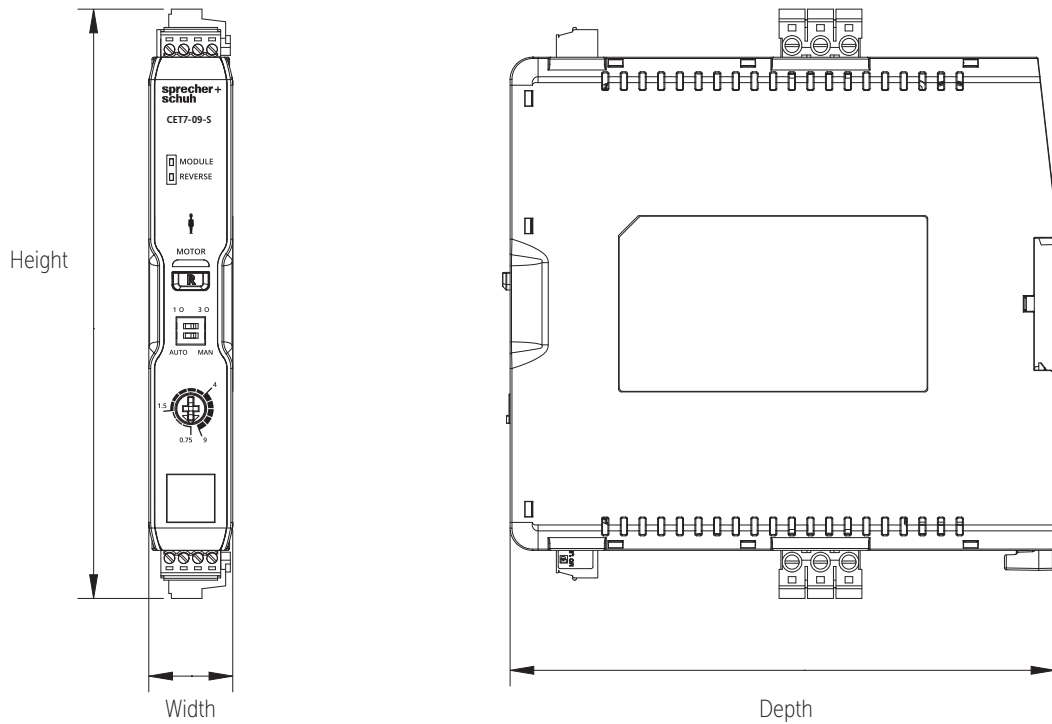


Single-phase Wiring Diagram



Approximate Dimensions

Dimensions are in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



Starter Size	Height [mm (in.)]	Width [mm (in.)]	Depth [mm (in.)]
9 A	158.1 (6.22)	22.5 (0.89)	148 (5.83)
23 A	180.6 (7.11)	45 (1.77)	168.7 (6.64)

