Intelligent Softstarter Controllers

Intelligent Softstarter Controllers

Next Generation Softstarter Intelligent Controllers

From economical to elaborate… the right softstarter for any application up to 1000HP @480V

Sprecher + Schuh offers a full line of softstarter controllers that utilize reliable solid state electronics to soft start three phase induction motors. Various options such as "soft-stopping" and braking are also available.

The benefits of controlled starting

Solid state starting reduces the inrush currents and mechanical shock typical of conventional electromechanical motor starters, while providing silent and smooth acceleration without arcing, chattering or vibration. Wear on belts, chains, gearboxes and bearings is reduced, thus minimizing production losses and idle times.

Create the ideal start/stop profile for your application

Designed from fractional to 1000HP, Sprecher + Schuh softstarters can easily be configured to provide the desired starting and stopping characteristics. Starting modes range from basic Current Limit starting to "Soft Start with Selectable Kickstart," and other advanced starting modes offered for the PF controller. Standard stopping modes are Soft-stop and coast- to-rest, other optional advanced stopping modes are available in the PF controller such as Smart Motor Brake, Accu-Stop and slow-speed with braking. The PF Intelligent controller also features a Pump Control option designed specifically to reduce "waterhammer" in centrifugal pumping applications. Virtually every controller in the line provides a choice of starting and stopping combinations that allow you to create a custom motor controller suited for any application.

Modular and Compact Design

As standard, the Sprecher + Schuh Softstarter includes a built-in electronic overload, integral bypass and motor starting capabilities for both star-delta and standard squirrel-cage induction motors, advanced protection and diagnostics in a compact, maintainable, modular, cost-effective package.

No maintenance, easy installation

Because there are no moving parts, Softstarter Controllers require no regular maintenance to repair or replace worn out components. All units can be easily integrated into a new system or used to upgrade an existing electromechanical system (across-the-line, autotransformer, part-winding or wye-delta) using the same control circuitry.

Common Applications

Material Handling
Overhead Cranes
Rock Crushers
Extruders
Centrifugal Pumps
Conveying Systems
Lumber & Saw Mills
Ventilators & Blowers
Compressors
Stirrers & Mixers
Transport Systems
Mills & Kneaders

100HP 400HP 700HP 1000HP 1400HP

Line Connected

WYE DELTA COMPATIBLE

Delta Connected

PCS Softstarter Controller

- Microprocessor controller designed for 3-phase motors up to 480A (3...85A DIN-rail mountable)
- Provides three different starting modes and selectable soft stop mode
- Includes built-in electronic overload and bypass contactor
- All models wye-delta compatible (6 lead) up to 830A.

Line Connected

WYE DELTA COMPATIBLE

Delta Connected

PF Softstarter Controller

- Microprocessor controller designed for 3-phase motors or Wye-Delta (6-lead) motors (up to 1,250A; 1,600A Y-D).
- Provides four basic starting modes including soft start, current limit starting and softstart with selectable kickstart and other advanced starting modes.
- Includes electronic overload, integral bypass and advanced protection and diagnostics
- Numerous starting and stopping options available including unique Pump Control option for reducing "waterhammer" in pumping systems, and selectable auxiliary contacts.

Reduced Voltage Solid State Starters

S = Standard Features 0 = Optional Features	 **PCS Controller**	 **PF Controller**
Features	**200...600V 1...480 A**	**200...600V 1...1250 A**
Soft Start	S	S
Kickstart	S	S
Current Limit	S	S
Dual Ramp Start	~	S
Full Voltage	~	S
Soft Stop	S	S
Pump Control	~	0
Preset Slow Speed	~	S
Linear Speed	~	S
Smart Motor Braking	~	0
Accu-Stop	~	0
Slow Speed with Braking	~	0
Motor Protection	S	S
Metering	~	S
Keypad Programming/LCD Display	~	S
Inside Delta Connection	S	S
Product Selection	**Page D4**	**Page D29**

PCS Controllers

DIN-rail mounted softstarters up to 85A. Larger softstarter frame sizes up to 480A (400HP @480V)

Sprecher + Schuh DIN-rail mounted Controllers can be direct connected to CA7 contactors to provide isolation or to KT7 Motor Circuit Controllers for branch circuit protection (for models up to 37A)

The PCS Softstarter Controller is a Sprecher + Schuh's solid-state controllers with rich features at an economical price. This softstarter is specifically designed to start 3-phase motors (up to 400HP@460V / 500HP@575V), but is very compact, easy to use and DIN-rail mountable for models up to 85A. Four standard starting modes are available with the PCS Controller:

- Soft Start
- Soft Start with Selectable Kick-Start
- Current Limit Starting
- Soft Start with Soft Stop

All PCS Softstarters are designed to control either a standard 3-phase squirrel-cage induction motor or a wye-delta motor (700HP @ 460V/900HP @ 575V Y-D).

For use anywhere

PCS Softstarters come in three different frame sizes. The smallest frame is from 3A...37A, the middle size is from 43A...85A and the largest frame size is 108A...480A. These units are available from 200V...600V - 50/60 Hz. This assures the devices can be used anywhere in the world.

Many convenient features

Easy Set-up – Digital rotary switches are quickly and easily set to the exact value. LED indication of all faults is standard.

Built-in Overload Protection – PCS Softstarters are equipped with electronic overload protection, accomplished with the use of current transformers on each of the three phases. Protection is programmable, providing total flexibility. Overload trip class selection includes OFF, 10, 15 or 20 seconds. In addition, either manual or automatic trip reset may be selected. Trip rating is 120% of dial setting.

Bypass Contactor – PCS controllers are equipped with a bypass contactor on each phase. Once the motor is up to speed, the load is removed from the SCRs, increasing their life and reducing heat.

Over Temperature Protection – The Softstarter monitors SCR temperature by means of internal thermistors. When the power poles maximum rated temperature is reached, the microcomputer

switches off the PCS, a TEMP fault is indicated via LED, and the 97/98 fault contact closes.

Phase Reversal Protection – When enabled via a DIP-switch, 3-phase input power will be verified before starting. If input power phasing is detected to be incorrect, the start will be aborted and a fault indicated.

Phase Loss / Open Load – The PCS will not attempt to start if there is a single phase condition on the line. This protects from motor burnout during single phase starting.

Phase Imbalance – The unit monitors for imbalance between phase currents. To prevent motor damage, the unit will trip if the difference between the minimum phase current and the maximum phase current exceeds 65% for 3 seconds, and a fault will be indicated.

Shorted SCR – Prior to every start and during starting, the unit will check all SCRs for shorts and unit load connections to the motor. If there is a shorted SCR in the PCS and/or open load, the start will be aborted and a shorted SCR or open load fault will be indicated. This prevents damage from phase imbalance.

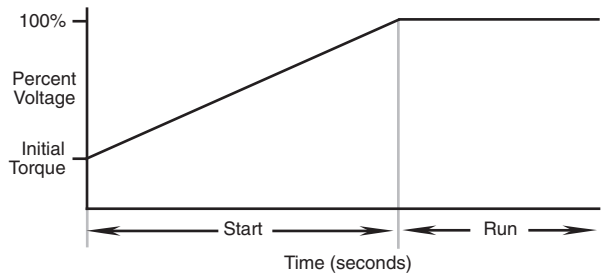
Push to Test – The unit with control wiring can be tested for fault conditions by using the Push to Test function. Hold down the Reset button for 7 seconds to activate the fault Aux (97, 98) and shut down the PCS. To clear, either push the Reset button or cycle control power to the device.

LED Description (Number of Flashes)

1. Overload
2. Overtemperature
3. Phase Reversal
4. Phase Loss/Open Load
5. Phase Imbalance
6. Shorted SCR
7. Test

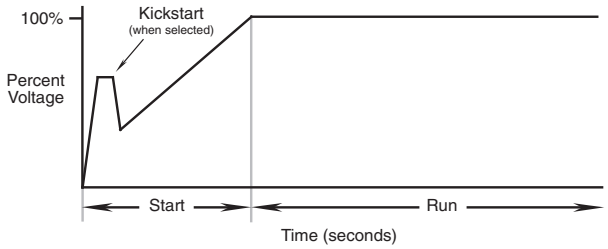
Modes of Operation (Standard)

Soft Start



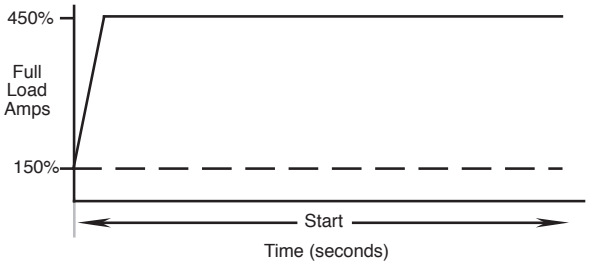
This method has the most general application. The motor is raised from an initial torque value to full voltage. Initial torque is adjustable to 15%, 25%, 35% or 65% locked rotor torque. The motor voltage is gradually increased during the acceleration ramp time, which can be adjusted from 2, 5, 10, 15, 20, 25 or 30 seconds.

Soft Start with Selectable Kickstart



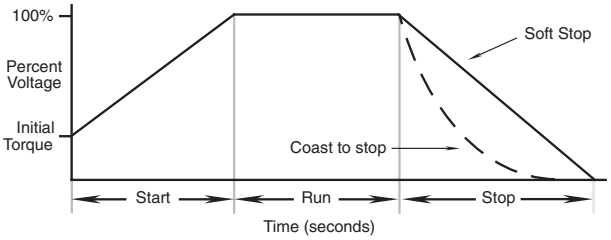
During the Soft Start phase, an initial kickstart or boost can be provided. This supplies a current pulse of 450% of full load current and is adjustable from 0.5 to 1.5 seconds. This allows the motor to develop additional torque for starting high inertia loads.

Current Limit Starting



This starting mode is used when it is desired to limit the maximum starting current (inrush). It can be adjusted for 150%, 250%, 350% or 450% of full load amps. Start times are selectable from 2, 5, 10, 15, 20, 25 or 30 seconds. If the motor is not up to speed after the selected time elapses, the controller transitions to full voltage.

Soft Stop

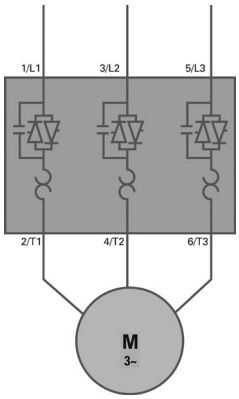


Soft Stop can be used for applications requiring an extended coast-to-rest, such as frictional type loads that tend to stop suddenly when voltage is removed from the motor. When enabled, the voltage ramp down time is equal to one, two or three times the start time selected. The load stops when the motor voltage drops to a point where the load torque is greater than the motor torque.

Open Type - Line Connected Controllers ❷❸❺

Rated Voltage (V AC)	Current Rating (Amps) ❶	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	With 100...240V AC Control Voltage Catalog Number	Price	With 24V AC/DC Control Voltage Catalog Number	Price
200/208	1...3	~	0.5	PCS-003-600V	656	PCS-003-600V-024	656
	3...9	~	0.75...2	PCS-009-600V	710	PCS-009-600V-024	710
	5.3...16	~	1.5...3	PCS-016-600V	872	PCS-016-600V-024	872
	6.3...19	~	1.5...5	PCS-019-600V	934	PCS-019-600V-024	934
	9.2...25	~	3...7.5	PCS-025-600V	965	PCS-025-600V-024	965
	10...30	~	3...7.5	PCS-030-600V	1175	PCS-030-600V-024	1175
	12.3...37	~	5...10	PCS-037-600V	1463	PCS-037-600V-024	1463
	14.3...43	~	5...10	PCS-043-600V	1956	PCS-043-600V-024	1956
	20...60	~	7.5...15	PCS-060-600V	2593	PCS-060-600V-024	2593
	28.3...85	~	10...25	PCS-085-600V	3376	PCS-085-600V-024	3376
	27...108	~	20...30	PCS-108-600V ❹	5346	PCS-108-600V-024 ❹	5346
	34...135	~	25...40	PCS-135-600V ❹	6476	PCS-135-600V-024 ❹	6476
	67...201	~	40...60	PCS-201-600V ❹	7736	PCS-201-600V-024 ❹	7736
	84...251	~	50...75	PCS-251-600V ❹	9011	PCS-251-600V-024 ❹	9011
	106...317	~	60...100	PCS-317-600V ❹	9344	PCS-317-600V-024 ❹	9344
	120...361	~	75...125	PCS-361-600V ❹	9909	PCS-361-600V-024 ❹	9909
	160...480	~	100...150	PCS-480-600V ❹	13937	PCS-480-600V-024 ❹	13937
230	1...3	0.55	0.5	PCS-003-600V	656	PCS-003-600V-024	656
	3...9	2.2	0.75...2	PCS-009-600V	710	PCS-009-600V-024	710
	5.3...16	4	1.5...5	PCS-016-600V	872	PCS-016-600V-024	872
	6.3...19	4	2...5	PCS-019-600V	934	PCS-019-600V-024	934
	9.2...25	5.5	3...7.5	PCS-025-600V	965	PCS-025-600V-024	965
	10...30	7.5	5...10	PCS-030-600V	1175	PCS-030-600V-024	1175
	12.3...37	7.5	5...10	PCS-037-600V	1463	PCS-037-600V-024	1463
	14.3...43	11	5...15	PCS-043-600V	1956	PCS-043-600V-024	1956
	20...60	15	7.5...20	PCS-060-600V	2593	PCS-060-600V-024	2593
	28.3...85	22	15...30	PCS-085-600V	3376	PCS-085-600V-024	3376
	27...108	30	20...40	PCS-108-600V ❹	5346	PCS-108-600V-024 ❹	5346
	34...135	37	25...50	PCS-135-600V ❹	6476	PCS-135-600V-024 ❹	6476
	67...201	55	40...75	PCS-201-600V ❹	7736	PCS-201-600V-024 ❹	7736
	84...251	75	50...100	PCS-251-600V ❹	9011	PCS-251-600V-024 ❹	9011
	106...317	90	60...125	PCS-317-600V ❹	9344	PCS-317-600V-024 ❹	9344
	120...361	110	75...150	PCS-361-600V ❹	9909	PCS-361-600V-024 ❹	9909
	160...480	132	100...200	PCS-480-600V ❹	13937	PCS-480-600V-024 ❹	13937

Line Connected



❶ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

❷ See page D23 for maximum starts per hour.

❸ Prior to the initial start of the motor at the final installation location:

– The bypass relays on the main circuit may be in an undefined switching state due to handling during shipping. Before connecting the main power source, apply the control voltage to set the bypass relays to a defined switching state. If this step is not performed, inadvertent operation of the motor may occur.

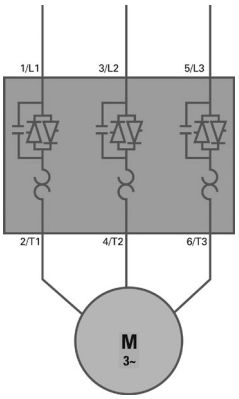
❹ Separate 120V or 240V single phase is required for PCS fan operation.

❺ Controllers rated 108A and greater are not equipped with the line and load terminal lugs. See page D18 for terminal lug kits.

Open Type - Line Connected Controllers cont. ❷❸❺

Rated Voltage (V AC)	Current Rating (Amps) ❶	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	With 100...240V AC Control Voltage Catalog Number	Price	With 24V AC/DC Control Voltage Catalog Number	Price
380/400/415/460	1...3	1.1	0.5...1.5	PCS-003-600V	656	PCS-003-600V-024	656
	3...9	4	1.5...5	PCS-009-600V	710	PCS-009-600V-024	710
	5.3...16	7.5	5...10	PCS-016-600V	872	PCS-016-600V-024	872
	6.3...19	7.5	5...10	PCS-019-600V	934	PCS-019-600V-024	934
	9.2...25	11	7.5...15	PCS-025-600V	965	PCS-025-600V-024	965
	10...30	15	7.5...20	PCS-030-600V	1175	PCS-030-600V-024	1175
	12.3...37	18.5	10...25	PCS-037-600V	1463	PCS-037-600V-024	1463
	14.3...43	22	10...30	PCS-043-600V	1956	PCS-043-600V-024	1956
	20...60	30	15...40	PCS-060-600V	2593	PCS-060-600V-024	2593
	28.3...85	45	25...60	PCS-085-600V	3376	PCS-085-600V-024	3376
	27...108	55	50...75	PCS-108-600V ❹	5346	PCS-108-600V-024 ❹	5346
	34...135	75	60...100	PCS-135-600V ❹	6476	PCS-135-600V-024 ❹	6476
	67...201	95...110	75...150	PCS-201-600V ❹	7736	PCS-201-600V-024 ❹	7736
	84...251	95...132	100...200	PCS-251-600V ❹	9011	PCS-251-600V-024 ❹	9011
	106...317	95...160	125...250	PCS-317-600V ❹	9344	PCS-317-600V-024 ❹	9344
	120...361	110...200	250...300	PCS-361-600V ❹	9909	PCS-361-600V-024 ❹	9909
	160...480	160...250	300...400	PCS-480-600V ❹	13937	PCS-480-600V-024 ❹	13937
500/575	1...3	1.5	0.75...2	PCS-003-600V	656	PCS-003-600V-024	656
	3...9	5.5	3...7.5	PCS-009-600V	710	PCS-009-600V-024	710
	5.3...16	7.5	5...10	PCS-016-600V	872	PCS-016-600V-024	872
	6.3...19	11	7.5...15	PCS-019-600V	934	PCS-019-600V-024	934
	9.2...25	15	7.5...20	PCS-025-600V	965	PCS-025-600V-024	965
	10...30	18.5	10...25	PCS-030-600V	1175	PCS-030-600V-024	1175
	12.3...37	22	15...30	PCS-037-600V	1463	PCS-037-600V-024	1463
	14.3...43	22	15...40	PCS-043-600V	1956	PCS-043-600V-024	1956
	20...60	37	20...50	PCS-060-600V	2593	PCS-060-600V-024	2593
	28.3...85	55	30...75	PCS-085-600V	3376	PCS-085-600V-024	3376
	27...108	75	60...100	PCS-108-600V ❹	5346	PCS-108-600V-024 ❹	5346
	34...135	90	75...125	PCS-135-600V ❹	6476	PCS-135-600V-024 ❹	6476
	67...201	75...132	100...200	PCS-201-600V ❹	7736	PCS-201-600V-024 ❹	7736
	84...251	90...160	125...250	PCS-251-600V ❹	9011	PCS-251-600V-024 ❹	9011
	106...317	100...200	200...300	PCS-317-600V ❹	9344	PCS-317-600V-024 ❹	9344
	120...361	132...250	200...350	PCS-361-600V ❹	9909	PCS-361-600V-024 ❹	9909
	160...480	200...315	250...500	PCS-480-600V ❹	13937	PCS-480-600V-024 ❹	13937

Line Connected



❶ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

❷ See page D23 for maximum starts per hour.

❸ Prior to the initial start of the motor at the final installation location:

– The bypass relays on the main circuit may be in an undefined switching state due to handling during shipping. Before connecting the main power source, apply the control voltage to set the bypass relays to a defined switching state. If this step is not performed, inadvertent operation of the motor may occur.

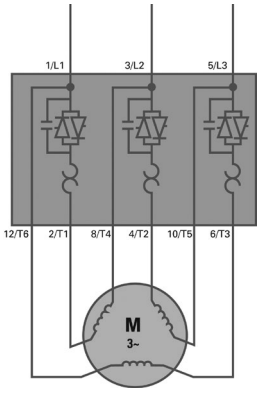
❹ Separate 120V or 240V single phase is required for PCS fan operation.

❺ Controllers rated 108A and greater are not equipped with the line and load terminal lugs. See page D18 for terminal lug kits.

Open Type - Delta Connected Controllers ❷❹❺

Rated Voltage (V AC)	Current Rating (Amps) ❶	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	With 100...240V AC Control Voltage Catalog Number	Price	With 24V AC/DC Control Voltage Catalog Number	Price
200/208	1.7...5.1	~	1	PCS-003-600V	656	PCS-003-600V-024	656
	5.1...16	~	1.5...3	PCS-009-600V	710	PCS-009-600V-024	710
	9.1...27.6	~	3...7.5	PCS-016-600V	872	PCS-016-600V-024	872
	10.9...32.8	~	3...10	PCS-019-600V	934	PCS-019-600V-024	934
	14.3...43	~	3...10	PCS-025-600V	965	PCS-025-600V-024	965
	17.3...52	~	5...10	PCS-030-600V	1175	PCS-030-600V-024	1175
	21...64	~	7.5...20	PCS-037-600V	1463	PCS-037-600V-024	1463
	25...74	~	7.5...20	PCS-043-600V	1956	PCS-043-600V-024	1956
	34.6...104	~	15...30	PCS-060-600V	2593	PCS-060-600V-024	2593
	50....147	~	15...40	PCS-085-600V	3376	PCS-085-600V-024	3376
	47...187	~	20...60	PCS-108-600V ❸	5346	PCS-108-600V-024 ❸	5346
	59...234	~	20...75	PCS-135-600V ❸	6476	PCS-135-600V-024 ❸	6476
	116...348	~	75...100	PCS-201-600V ❸	7736	PCS-201-600V-024 ❸	7736
	145...435	~	100...150	PCS-251-600V ❸	9011	PCS-251-600V-024 ❸	9011
	183...549	~	100...200	PCS-317-600V ❸	9344	PCS-317-600V-024 ❸	9344
	208...625	~	125...200	PCS-361-600V ❸	9909	PCS-361-600V-024 ❸	9909
	277...831	~	200...300	PCS-480-600V ❸	13937	PCS-480-600V-024 ❸	13937
230	1.7...5.1	0.25...1.1	1	PCS-003-600V	656	PCS-003-600V-024	656
	5.1...16	1.1...4	1...5	PCS-009-600V	710	PCS-009-600V-024	710
	9.1...27.6	2.2...7.5	3...10	PCS-016-600V	872	PCS-016-600V-024	872
	10.9...32.8	2.2...7.5	3...10	PCS-019-600V	934	PCS-019-600V-024	934
	14.3...43	4...11	3...15	PCS-025-600V	965	PCS-025-600V-024	965
	17.3...52	4...15	5...15	PCS-030-600V	1175	PCS-030-600V-024	1175
	21...64	5.5...18.5	7.5...20	PCS-037-600V	1463	PCS-037-600V-024	1463
	25...74	5.5...22	7.5...25	PCS-043-600V	1956	PCS-043-600V-024	1956
	34.6...104	7.5...30	15...40	PCS-060-600V	2593	PCS-060-600V-024	2593
	50...147	15...45	20...50	PCS-085-600V	3376	PCS-085-600V-024	3376
	47...187	55	20...60	PCS-108-600V ❸	5346	PCS-108-600V-024 ❸	5346
	59...234	75	25...75	PCS-135-600V ❸	6476	PCS-135-600V-024 ❸	6476
	116...348	110	75...125	PCS-201-600V ❸	7736	PCS-201-600V-024 ❸	7736
	145...435	132	100...150	PCS-251-600V ❸	9011	PCS-251-600V-024 ❸	9011
	183...549	160	125...200	PCS-317-600V ❸	9344	PCS-317-600V-024 ❸	9344
	208...625	200	150...250	PCS-361-600V ❸	9909	PCS-361-600V-024 ❸	9909
	277...831	250	200...300	PCS-480-600V ❸	13937	PCS-480-600V-024 ❸	13937

Delta Connected



All PCS Models are Wye-Delta compatible

❶ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

❷ Prior to the initial start of the motor at the final installation location:

– The bypass relays on the main circuit may be in an undefined switching state due to handling during shipping. Before connecting the main power source, apply the control voltage to set the bypass relays to a defined switching state. If this step is not performed, inadvertent operation of the motor may occur.

❸ Separate 120V or 240V single phase is required for PCS fan operation.

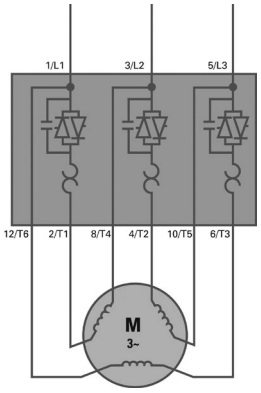
❹ Controllers rated 108A and greater are not equipped with the line and load terminal lugs. See page D18 for terminal lug kits.

❺ It is recommended that an isolation contactor be added to the circuit to provide galvanic isolation of the motor and final electromechanical removal of power.

Open Type - Delta Connected Controllers cont. ❷❹❺

Rated Voltage (V AC)	Current Rating (Amps) ❶	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	With 100...240V AC Control Voltage Catalog Number	Price	With 24V AC/DC Control Voltage Catalog Number	Price
380/400/415/460	1.7...5.1	0.55...2.2	0.5...2	PCS-003-600V	656	PCS-003-600V-024	656
	5.1...16	2.2...7.5	2...7.5	PCS-009-600V	710	PCS-009-600V-024	710
	9.1...27.6	4...11	5...15	PCS-016-600V	872	PCS-016-600V-024	872
	10.9...32.8	4...15	5...15	PCS-019-600V	934	PCS-019-600V-024	934
	14.3...43	5.5...22	7.5...20	PCS-025-600V	965	PCS-025-600V-024	965
	17.3...52	7.5...22	7.5...30	PCS-030-600V	1175	PCS-030-600V-024	1175
	21...64	7.5...30	10...30	PCS-037-600V	1463	PCS-037-600V-024	1463
	25...74	11...37	10...40	PCS-043-600V	1956	PCS-043-600V-024	1956
	34.6...104	15...55	20...60	PCS-060-600V	2593	PCS-060-600V-024	2593
	50...147	22...75	25...75	PCS-085-600V	3376	PCS-085-600V-024	3376
	47...187	90	40...150	PCS-108-600V ❸	5346	PCS-108-600V-024 ❸	5346
	59...234	132	50...150	PCS-135-600V ❸	6476	PCS-135-600V-024 ❸	6476
	116...348	160	150...250	PCS-201-600V ❸	7736	PCS-201-600V-024 ❸	7736
	145...435	250	200...350	PCS-251-600V ❸	9011	PCS-251-600V-024 ❸	9011
	183...549	315	250...450	PCS-317-600V ❸	9344	PCS-317-600V-024 ❸	9344
	208...625	355	300...500	PCS-361-600V ❸	9909	PCS-361-600V-024 ❸	9909
	277...831	450	350...700	PCS-480-600V ❸	13937	PCS-480-600V-024 ❸	13937
500/575	1.7...5.1	0.75...3	1...3	PCS-003-600V	656	PCS-003-600V-024	656
	5.1...16	3...7.5	3...10	PCS-009-600V	710	PCS-009-600V-024	710
	9.1...27.6	5.5...15	7.5...25	PCS-016-600V	872	PCS-016-600V-024	872
	10.9...32.8	5.5...22	7.5...30	PCS-019-600V	934	PCS-019-600V-024	934
	14.3...43	7.5...22	10...40	PCS-025-600V	965	PCS-025-600V-024	965
	17.3...52	11...30	15...50	PCS-030-600V	1175	PCS-030-600V-024	1175
	21...64	11...37	15...60	PCS-037-600V	1463	PCS-037-600V-024	1463
	25...74	15...45	20...60	PCS-043-600V	1956	PCS-043-600V-024	1956
	84.6...104	22...55	30...100	PCS-060-600V	2593	PCS-060-600V-024	2593
	50...147	30...90	40...150	PCS-085-600V	3376	PCS-085-600V-024	3376
	47...187	132	50...150	PCS-108-600V ❸	5346	PCS-108-600V-024 ❸	5346
	59...234	160	60...200	PCS-135-600V ❸	6476	PCS-135-600V-024 ❸	6476
	116...348	250	250...300	PCS-201-600V ❸	7736	PCS-201-600V-024 ❸	7736
	145...435	315	250...400	PCS-251-600V ❸	9011	PCS-251-600V-024 ❸	9011
	183...549	400	300...500	PCS-317-600V ❸	9344	PCS-317-600V-024 ❸	9344
	208...625	450	350...600	PCS-361-600V ❸	9909	PCS-361-600V-024 ❸	9909
	277...831	560	400...900	PCS-480-600V ❸	13937	PCS-480-600V-024 ❸	13937

Delta Connected



All PCS Models are Wye-Delta compatible

❶ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

❷ Prior to the initial start of the motor at the final installation location:

– The bypass relays on the main circuit may be in an undefined switching state due to handling during shipping. Before connecting the main power source, apply the control voltage to set the bypass relays to a defined switching state. If this step is not performed, inadvertent operation of the motor may occur.

❸ Separate 120V or 240V single phase is required for PCS fan operation.

❹ Controllers rated 108A and greater are not equipped with the line and load terminal lugs. See page D18 for terminal lug kits.

❺ It is recommended that an isolation contactor be added to the circuit to provide galvanic isolation of the motor and final electromechanical removal of power.

D

PCS Softstarters

Enclosed Non-Combination Starters - Line Connected ❶❷❹❻

Rated Voltage (V AC)	Current Rating (Amps) ❸	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	Type 12 [Type 3R ❺] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
200/208	1...3	~	0.5	PCS-003-NHDD	1666	PCS-003-NHDW	1733
	3...9	~	0.75...2	PCS-009-NHDD	1710	PCS-009-NHDW	1778
	5.3...16	~	1.5...3	PCS-016-NHDD	1796	PCS-016-NHDW	1868
	6.3...19	~	1.5...5	PCS-019-NHDD	1854	PCS-019-NHDW	1929
	9.2...25	~	3...7.5	PCS-025-NHDD	1854	PCS-025-NHDW	1929
	10...30	~	3...7.5	PCS-030-NHDD	1985	PCS-030-NHDW	2064
	12.3...37	~	5...10	PCS-037-NHDD	2159	PCS-037-NHDW	2245
	14.3...43	~	5...10	PCS-043-NHDD	2506	PCS-043-NHDW	2607
	20...60	~	7.5...15	PCS-060-NHDD	2898	PCS-060-NHDW	3013
	28.3...85	~	10...25	PCS-085-NHDD	3800	PCS-085-NHDW	3952
	27...108	~	20...30	PCS-108-NHDD	5900	PCS-108-NHDW	6136
	34...135	~	25...40	PCS-135-NHDD	7000	PCS-135-NHDW	7280
	67...201	~	40...60	PCS-201-NHDD	8300	PCS-201-NHDW	8632
	84...251	~	50...75	PCS-251-NHDD	9800	PCS-251-NHDW	10192
	106...317	~	60...100	PCS-317-NHDD	10532	PCS-317-NHDW	10954
	120...361	~	75...125	PCS-361-NHDD	11300	PCS-361-NHDW	11752
	160...480	~	100...150	PCS-480-NHDD	15502	PCS-480-NHDW	16122
230	1...3	0.55	0.5	PCS-003-NADD	1666	PCS-003-NADW	1733
	3...9	2.2	0.75...2	PCS-009-NADD	1710	PCS-009-NADW	1778
	5.3...16	4	1.5...5	PCS-016-NADD	1796	PCS-016-NADW	1868
	6.3...19	4	2...5	PCS-019-NADD	1854	PCS-019-NADW	1929
	9.2…25	5.5	3...7.5	PCS-025-NADD	1854	PCS-025-NADW	1929
	10...30	7.5	5...10	PCS-030-NADD	1985	PCS-030-NADW	2064
	12.3...37	7.5	5...10	PCS-037-NADD	2159	PCS-037-NADW	2245
	14.3...43	11	5...15	PCS-043-NADD	2506	PCS-043-NADW	2607
	20...60	15	7.5...20	PCS-060-NADD	2898	PCS-060-NADW	3013
	28.3...85	22	15...30	PCS-085-NADD	3800	PCS-085-NADW	3952
	27...108	30	20...40	PCS-108-NADD	5900	PCS-108-NADW	6136
	34...135	37	25...50	PCS-135-NADD	7000	PCS-135-NADW	7280
	67...201	55	40...75	PCS-201-NADD	8300	PCS-201-NADW	8632
	84...251	75	50...100	PCS-251-NADD	9800	PCS-251-NADW	10192
	106...317	90	60...125	PCS-317-NADD	10532	PCS-317-NADW	10954
	120...361	110	75...150	PCS-361-NADD	11300	PCS-361-NADW	11752
	160...480	132	100...200	PCS-480-NADD	15502	PCS-480-NADW	16122

Non-Combination PCS Softstarters include:

- A 120V control power transformer with fused primary and secondary
- PCS built-in electronic motor overload protection
- PCS built-in SCR bypass/ run contactor
- Available in UL Type 12 or 4 Enclosures
- Terminal blocks for remote control devices

❶ Other UL type enclosures available. Contact your Sprecher + Schuh representative for pricing.
❷ Include suffix and price adder from page D16 if ordering factory installed modifications.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ Line and load termination are provided as standard.
❺ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PCS-085-NHD**D** becomes PCS-085-NHD**R**. Price and dimensions remain the same.
❻ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

Enclosed Non-Combination Starters - Line Connected ❶❷❹❼

Rated Voltage (V AC)	Current Rating (Amps) ❸	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	Type 12 [Type 3R ❻] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
460 ❺	1...3	1.1	0.5...1.5	PCS-003-NBDD	1666	PCS-003-NBDW	1733
	3...9	4	1.5...5	PCS-009-NBDD	1710	PCS-009-NBDW	1778
	5.3...16	7.5	5...10	PCS-016-NBDD	1796	PCS-016-NBDW	1868
	6.3...19	7.5	5...10	PCS-019-NBDD	1854	PCS-019-NBDW	1929
	9.2...25	11	7.5...15	PCS-025-NBDD	1854	PCS-025-NBDW	1929
	10...30	15	7.5...20	PCS-030-NBDD	1985	PCS-030-NBDW	2064
	12.3...37	18.5	10...25	PCS-037-NBDD	2159	PCS-037-NBDW	2245
	14.3...43	22	10...30	PCS-043-NBDD	2506	PCS-043-NBDW	2607
	20...60	30	15...40	PCS-060-NBDD	2898	PCS-060-NBDW	3013
	28.3...85	45	25...60	PCS-085-NBDD	3800	PCS-085-NBDW	3952
	27...108	55	50...75	PCS-108-NBDD	5900	PCS-108-NBDW	6136
	34...135	75	60...100	PCS-135-NBDD	7000	PCS-135-NBDW	7280
	67...201	95...110	75...150	PCS-201-NBDD	8300	PCS-201-NBDW	8632
	84...251	95...132	100...200	PCS-251-NBDD	9800	PCS-251-NBDW	10192
	106...317	95...160	125...250	PCS-317-NBDD	10532	PCS-317-NBDW	10954
	120...361	110...200	250...300	PCS-361-NBDD	11300	PCS-361-NBDW	11752
	160...480	160...250	300...400	PCS-480-NBDD	15502	PCS-480-NBDW	16122
500/575	1...3	1.5	0.75...2	PCS-003-NCDD	1985	PCS-003-NCDW	2064
	3...9	5.5	3...7.5	PCS-009-NCDD	2028	PCS-009-NCDW	2109
	5.3...16	7.5	5...10	PCS-016-NCDD	2144	PCS-016-NCDW	2230
	6.3...19	11	7.5...15	PCS-019-NCDD	2115	PCS-019-NCDW	2200
	9.2…25	15	7.5...20	PCS-025-NCDD	2115	PCS-025-NCDW	2200
	10...30	18.5	10...25	PCS-030-NCDD	2376	PCS-030-NCDW	2471
	12.3...37	22	15...30	PCS-037-NCDD	2608	PCS-037-NCDW	2712
	14.3...43	22	15...40	PCS-043-NCDD	2984	PCS-043-NCDW	3104
	20...60	37	20...50	PCS-060-NCDD	3491	PCS-060-NCDW	3631
	28.3...85	55	30...75	PCS-085-NCDD	4143	PCS-085-NCDW	4309
	27...108	75	60..100	PCS-108-NCDD	6000	PCS-108-NCDW	6240
	34...135	90	75...125	PCS-135-NCDD	7200	PCS-135-NCDW	7488
	67...201	75...132	100...200	PCS-201-NCDD	8548	PCS-201-NCDW	8890
	84...251	90...160	125...250	PCS-251-NCDD	10141	PCS-251-NCDW	10547
	106...317	100...200	200...300	PCS-317-NCDD	11373	PCS-317-NCDW	11828
	120...361	132...250	200...350	PCS-361-NCDD	12546	PCS-361-NCDW	13048
	160...480	200...315	250...500	PCS-480-NCDD	17095	PCS-480-NCDW	17779

Non-Combination PCS Softstarters include:

- A 120V control power transformer with fused primary and secondary
- PCS built-in electronic motor overload protection
- PCS built-in SCR bypass/run contactor
- Available in UL Type 12 or 4 Enclosures
- Terminal blocks for remote control devices

❶ Other UL type enclosures available. Contact your Sprecher + Schuh representative for pricing.
❷ Include suffix and price adder from page D16 if ordering factory installed modifications.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ Line and load termination are provided as standard.
❺ For 380V applications choose softstarter based on FLA, then change the NB code in the catalog number to NG. Example PCS-043-N**B**DD becomes PCS-043-N**G**DD, which covers 25 HP @ 380V FLA 37. Price remains the same.
❻ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PCS-085-NBD**D** becomes PCS-085-NBD**R**. Price and dimensions remain the same.
❼ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

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PCS Softstarters

Enclosed Combination Circuit Breaker Starters - Line Connected ❶❷❹❻

Rated Voltage (V AC)	Current Rating (Amps) ❸	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	Type 12 [Type 3R ❺] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
200	3	—	0.5	PCS-003-BHD33D	2318	PCS-003-BHD33W	2411
	9	—	0.75	PCS-009-BHD34D	2390	PCS-009-BHD34W	2486
	9	—	1	PCS-009-BHD35D	2390	PCS-009-BHD35W	2486
	9	—	1.5	PCS-009-BHD36D	2390	PCS-009-BHD36W	2486
	16	—	2	PCS-016-BHD37D	2506	PCS-016-BHD37W	2607
	16	—	3	PCS-016-BHD38D	2506	PCS-016-BHD38W	2848
	25	—	5	PCS-025-BHD39D	2738	PCS-025-BHD39W	3059
	37	—	7.5	PCS-037-BHD40D	3144	PCS-037-BHD40W	3270
	43	—	10	PCS-043-BHD41D	3405	PCS-043-BHD41W	3541
	60	—	15	PCS-060-BHD42D	4114	PCS-060-BHD42W	4279
	85	—	20	PCS-085-BHD43D	4665	PCS-085-BHD43W	4852
	85	—	25	PCS-085-BHD44D	4665	PCS-085-BHD44W	4852
	108	—	30	PCS-108-BHD45D	7751	PCS-108-BHD45W	8061
	135	—	40	PCS-135-BHD46D	8953	PCS-135-BHD46W	9311
	201	—	60	PCS-201-BHD48D	10692	PCS-201-BHD48W	11119
	251	—	75	PCS-251-BHD49D	12546	PCS-251-BHD49W	13048
	317	—	100	PCS-317-BHD50D	13705	PCS-317-BHD50W	14253
	361	—	125	PCS-361-BHD51D	14444	PCS-361-BHD51W	15022
	480	—	150	PCS-480-BHD52D	18399	PCS-480-BHD52W	19135
230	3	0.37	0.5	PCS-003-BAD33D	2318	PCS-003-BAD33W	2411
	9	0.55	0.75	PCS-009-BAD34D	2390	PCS-009-BAD34W	2486
	9	0.75	1	PCS-009-BAD35D	2390	PCS-009-BAD35W	2486
	9	1.1	1.5	PCS-009-BAD36D	2390	PCS-009-BAD36W	2486
	9	1.5	2	PCS-009-BAD37D	2390	PCS-009-BAD37W	2486
	16	2.2	3	PCS-016-BAD38D	2506	PCS-016-BAD38W	2607
	25	3.7	5	PCS-025-BAD39D	2738	PCS-025-BAD39W	2848
	30	5.5	7.5	PCS-030-BAD40D	2941	PCS-030-BAD40W	3059
	37	7.5	10	PCS-037-BAD41D	3144	PCS-037-BAD41W	3270
	43	11	15	PCS-043-BAD42D	3405	PCS-043-BAD42W	3541
	60	15	20	PCS-060-BAD43D	4114	PCS-060-BAD43W	4279
	85	18.5	25	PCS-085-BAD44D	4665	PCS-085-BAD44W	4852
	85	22	30	PCS-085-BAD45D	4665	PCS-085-BAD45W	4852
	108	30	40	PCS-108-BAD46D	7751	PCS-108-BAD46W	8061
	135	37	50	PCS-135-BAD47D	8953	PCS-135-BAD47W	9311
	201	55	75	PCS-201-BAD49D	10692	PCS-201-BAD49W	11119
	251	75	100	PCS-251-BAD50D	12546	PCS-251-BAD50W	13048
	317	90	125	PCS-317-BAD51D	13705	PCS-317-BAD51W	14253
	361	110	150	PCS-361-BAD52D	14444	PCS-361-BAD52W	15022
	480	147	200	PCS-480-BAD54D	18399	PCS-480-BAD54W	19135

Combination Circuit Breaker PCS Softstarters include:

- A thermal magnetic circuit breaker with external operating handle
- A 120V control power transformer with fused primary and secondary
- PCS built-in electronic motor overload protection
- PCS built-in SCR bypass/run contactor
- Available in UL Type 12 or 4 Enclosures
- Terminal blocks for remote control devices

❶ Other UL type enclosures available. Contact your Sprecher + Schuh representative for pricing.
❷ Include suffix and price adder from page D16 if ordering factory installed modifications.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ See page D27 for circuit breaker ratings.
❺ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PCS-085-BHD43**D** becomes PCS-085-BHD43**R**. Price and dimensions remain the same.
❻ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

Enclosed Combination Circuit Breaker Starters - Line Connected ❶❷❹❼

Rated Voltage (V AC)	Current Rating (Amps) ❸	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	Type 12 [Type 3R ❻] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
460 ❺	3	0.37	0.5	PCS-003-BBD33D	2318	PCS-003-BBD33W	2411
	3	0.55	0.75	PCS-003-BBD34D	2318	PCS-003-BBD34W	2411
	3	0.75	1	PCS-003-BBD35D	2318	PCS-003-BBD35W	2411
	9	1.1	1.5	PCS-009-BBD36D	2390	PCS-009-BBD36W	2486
	9	1.5	2	PCS-009-BBD37D	2390	PCS-009-BBD37W	2486
	9	2.2	3	PCS-009-BBD38D	2390	PCS-009-BBD38W	2486
	16	3.7	5	PCS-016-BBD39D	2506	PCS-016-BBD39W	2607
	16	5.5	7.5	PCS-016-BBD40D	2506	PCS-016-BBD40W	2607
	25	7.5	10	PCS-025-BBD41D	2738	PCS-025-BBD41W	2848
	30	11	15	PCS-030-BBD42D	2941	PCS-030-BBD42W	3059
	37	15	20	PCS-037-BBD43D	3144	PCS-037-BBD43W	3270
	43	18.5	25	PCS-043-BBD44D	3405	PCS-043-BBD44W	3541
	43	22	30	PCS-043-BBD45D	3405	PCS-043-BBD45W	3541
	60	30	40	PCS-060-BBD46D	4114	PCS-060-BBD46W	4279
	85	37	50	PCS-085-BBD47D	4665	PCS-085-BBD47W	4852
	85	45	60	PCS-085-BBD48D	4665	PCS-085-BBD48W	4852
	108	55	75	PCS-108-BBD49D	7751	PCS-108-BBD49W	8061
	135	75	100	PCS-135-BBD50D	8953	PCS-135-BBD50W	9311
	201	110	150	PCS-201-BBD52D	10692	PCS-201-BBD52W	11119
	251	132	200	PCS-251-BBD54D	12546	PCS-251-BBD54W	13048
	317	160	250	PCS-317-BBD56D	13705	PCS-317-BBD56W	14253
	361	200	300	PCS-361-BBD57D	14444	PCS-361-BBD57W	15022
	480	250	400	PCS-480-BBD59D	18399	PCS-480-BBD59W	19135
575	3	0.55	0.75	PCS-003-BCD34D	2796	PCS-003-BCD34W	2908
	3	0.75	1	PCS-003-BCD35D	2796	PCS-003-BCD35W	2908
	9	1.1	1.5	PCS-009-BCD36D	2883	PCS-009-BCD36W	2998
	9	1.5	2	PCS-009-BCD37D	2883	PCS-009-BCD37W	2998
	9	2.2	3	PCS-009-BCD38D	2883	PCS-009-BCD38W	2998
	9	3.7	5	PCS-009-BCD39D	2883	PCS-009-BCD39W	2998
	16	5.5	7.5	PCS-016-BCD40D	2984	PCS-016-BCD40W	3104
	16	7.5	10	PCS-016-BCD41D	2984	PCS-016-BCD41W	3104
	25	11	15	PCS-025-BCD42D	3274	PCS-025-BCD42W	3405
	30	15	20	PCS-030-BCD43D	3535	PCS-030-BCD43W	3676
	37	18.5	25	PCS-037-BCD44D	3781	PCS-037-BCD44W	3932
	43	22	30	PCS-043-BCD45D	4085	PCS-043-BCD45W	4249
	43	30	40	PCS-043-BCD46D	4085	PCS-043-BCD46W	4249
	60	37	50	PCS-060-BCD47D	4955	PCS-060-BCD47W	5153
	85	45	60	PCS-085-BCD48D	5592	PCS-085-BCD48W	5816
	85	55	75	PCS-085-BCD49D	5592	PCS-085-BCD49W	5816
	108	75	100	PCS-108-BCD50D	8910	PCS-108-BCD50W	9266
	135	90	125	PCS-135-BCD51D	10301	PCS-135-BCD51W	10713
	201	132	200	PCS-201-BCD54D	11590	PCS-201-BCD54W	12054
	251	160	250	PCS-251-BCD56D	13517	PCS-251-BCD56W	14058
	317	200	300	PCS-317-BCD57D	14777	PCS-317-BCD57W	15368
	361	250	350	PCS-361-BCD58D	15502	PCS-361-BCD58W	16122
	480	315	500	PCS-480-BCD61D	19558	PCS-480-BCD61W	20340

Combination Circuit Breaker PCS Softstarters include:

- A thermal magnetic circuit breaker with external operating handle
- A 120V control power transformer with fused primary and secondary
- PCS built-in electronic motor overload protection
- PCS built-in SCR bypass/run contactor
- Available in UL Type 12 or 4 Enclosures
- Terminal blocks for remote control devices

❶ Other UL type enclosures available. Contact your Sprecher + Schuh representative for pricing.
❷ Include suffix and price adder from page D16 if ordering factory installed modifications.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ See page D27 for circuit breaker ratings.
❺ For 380V applications choose softstarter based on FLA, then change the BB code in the catalog number to BG. Example PCS-043-BBD44D becomes PCS-043-B**G**D44D, which covers 25 HP @ 380V FLA 37. Price remains the same.
❻ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PCS-085-BBD47**D** becomes PCS-085-BBD47**R**. Price and dimensions remain the same.
❼ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

D

PCS Softstarters

Enclosed Combination Fusible Starters - Line Connected ❶❷❹❻

Rated Voltage (V AC)	Current Rating (Amps) ❸	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	Type 12 [Type 3R ❺] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
200	3	—	0.5	PCS-003-FHD33D	2014	PCS-003-FHD33W	2094
	9	—	0.75	PCS-009-FHD34D	2043	PCS-009-FHD34W	2124
	9	—	1	PCS-009-FHD35D	2043	PCS-009-FHD35W	2124
	9	—	1.5	PCS-009-FHD36D	2043	PCS-009-FHD36W	2124
	16	—	2	PCS-016-FHD37D	2130	PCS-016-FHD37W	2215
	16	—	3	PCS-016-FHD38D	2130	PCS-016-FHD38W	2215
	25	—	5	PCS-025-FHD39D	2246	PCS-025-FHD39W	2335
	37	—	7.5	PCS-037-FHD40D	2564	PCS-037-FHD40W	2667
	43	—	10	PCS-043-FHD41D	2955	PCS-043-FHD41W	3074
	60	—	15	PCS-060-FHD42D	3694	PCS-060-FHD42W	3842
	85	—	20	PCS-085-FHD43D	4375	PCS-085-FHD43W	4550
	85	—	25	PCS-085-FHD44D	5372	PCS-085-FHD44W	5547
	108	—	30	PCS-108-FHD45D	7026	PCS-108-FHD45W	7307
	135	—	40	PCS-135-FHD46D	8214	PCS-135-FHD46W	8543
	201	—	60	PCS-201-FHD48D	9286	PCS-201-FHD48W	9658
	251	—	75	PCS-251-FHD49D	10243	PCS-251-FHD49W	10652
	317	—	100	PCS-317-FHD50D	11300	PCS-317-FHD50W	11752
	361	—	125	PCS-361-FHD51D	13343	PCS-361-FHD51W	13877
	480	—	150	PCS-480-FHD52D	16081	PCS-480-FHD52W	16724
230	3	0.37	0.5	PCS-003-FAD33D	2014	PCS-003-FAD33W	2094
	9	0.55	0.75	PCS-009-FAD34D	2043	PCS-009-FAD34W	2124
	9	0.75	1	PCS-009-FAD35D	2043	PCS-009-FAD35W	2124
	9	1.1	1.5	PCS-009-FAD36D	2043	PCS-009-FAD36W	2124
	9	1.5	2	PCS-009-FAD37D	2043	PCS-009-FAD37W	2124
	16	2.2	3	PCS-016-FAD38D	2130	PCS-016-FAD38W	2215
	25	3.7	5	PCS-025-FAD39D	2246	PCS-025-FAD39W	2335
	30	5.5	7.5	PCS-030-FAD40D	2361	PCS-030-FAD40W	2456
	37	7.5	10	PCS-037-FAD41D	2564	PCS-037-FAD41W	2667
	43	11	15	PCS-043-FAD42D	2955	PCS-043-FAD42W	3074
	60	15	20	PCS-060-FAD43D	3694	PCS-060-FAD43W	3842
	85	18.5	25	PCS-085-FAD44D	4375	PCS-085-FAD44W	4550
	85	22	30	PCS-085-FAD45D	5372	PCS-085-FAD45W	5547
	108	30	40	PCS-108-FAD46D	7026	PCS-108-FAD46W	7307
	135	37	50	PCS-135-FAD47D	8214	PCS-135-FAD47W	8543
	201	55	75	PCS-201-FAD49D	9286	PCS-201-FAD49W	9658
	251	75	100	PCS-251-FAD50D	10243	PCS-251-FAD50W	10652
	317	90	125	PCS-317-FAD51D	11300	PCS-317-FAD51W	11752
	361	110	150	PCS-361-FAD52D	13343	PCS-361-FAD52W	13877
	480	147	200	PCS-480-FAD54D	16081	PCS-480-FAD54W	16724

Combination Fusible PCS Softstarters include:

- A fused switch with external operating handle
- A 120V control power transformer with fused primary and secondary
- PCS built-in electronic motor overload protection
- PCS built-in SCR bypass/ run contactor
- Available in UL Type 12 or 4 Enclosures
- Terminal blocks for remote control devices

❶ Other UL type enclosures available. Contact your Sprecher + Schuh representative for pricing.
❷ Include suffix and price adder from page D16 if ordering factory installed modifications.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ Fuse clip accepts J-Type fuses. Power fuses are not supplied. See page D27 for Fusible Disconnect amp ratings.
❺ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PCS-085-FHD43**D** becomes PCS-085-FHD43**R**. Price and dimensions remain the same.
❻ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

Enclosed Combination Fusible Starters - Line Connected ❶❷❹❼

Rated Voltage (V AC)	Current Rating (Amps) ❸	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	Type 12 [Type 3R ❻] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
460 ❺	3	0.37	0.5	PCS-003-FBD33D	2014	PCS-003-FBD33W	2094
	3	0.55	0.75	PCS-003-FBD34D	2014	PCS-003-FBD34W	2094
	3	0.75	1	PCS-003-FBD35D	2014	PCS-003-FBD35W	2094
	9	1.1	1.5	PCS-009-FBD36D	2043	PCS-009-FBD36W	2124
	9	1.5	2	PCS-009-FBD37D	2043	PCS-009-FBD37W	2124
	9	2.2	3	PCS-009-FBD38D	2043	PCS-009-FBD38W	2124
	16	3.7	5	PCS-016-FBD39D	2130	PCS-016-FBD39W	2215
	16	5.5	7.5	PCS-016-FBD40D	2130	PCS-016-FBD40W	2215
	25	7.5	10	PCS-025-FBD41D	2246	PCS-025-FBD41W	2335
	30	11	15	PCS-030-FBD42D	2361	PCS-030-FBD42W	2456
	37	15	20	PCS-037-FBD43D	2564	PCS-037-FBD43W	2667
	43	18.5	25	PCS-043-FBD44D	2955	PCS-043-FBD44W	3074
	43	22	30	PCS-043-FBD45D	2955	PCS-043-FBD45W	3074
	60	30	40	PCS-060-FBD46D	3694	PCS-060-FBD46W	3842
	85	37	50	PCS-085-FBD47D	4375	PCS-085-FBD47W	4550
	85	45	60	PCS-085-FBD48D	5372	PCS-085-FBD48W	5547
	108	55	75	PCS-108-FBD49D	7026	PCS-108-FBD49W	7307
	135	75	100	PCS-135-FBD50D	8214	PCS-135-FBD50W	8543
	201	110	150	PCS-201-FBD52D	9286	PCS-201-FBD52W	9658
	251	132	200	PCS-251-FBD54D	10243	PCS-251-FBD54W	10652
	317	160	250	PCS-317-FBD56D	11300	PCS-317-FBD56W	11752
	361	200	300	PCS-361-FBD57D	13343	PCS-361-FBD57W	13877
	480	250	400	PCS-480-FBD59D	16081	PCS-480-FBD59W	16724
575	3	0.55	0.75	PCS-003-FCD34D	2405	PCS-003-FCD34W	2501
	3	0.75	1	PCS-003-FCD35D	2405	PCS-003-FCD35W	2501
	9	1.1	1.5	PCS-009-FCD36D	2434	PCS-009-FCD36W	2531
	9	1.5	2	PCS-009-FCD37D	2434	PCS-009-FCD37W	2531
	9	2.2	3	PCS-009-FCD38D	2434	PCS-009-FCD38W	2531
	9	3.7	5	PCS-009-FCD39D	2434	PCS-009-FCD39W	2531
	16	5.5	7.5	PCS-016-FCD40D	2579	PCS-016-FCD40W	2682
	16	7.5	10	PCS-016-FCD41D	2579	PCS-016-FCD41W	2682
	25	11	15	PCS-025-FCD42D	2637	PCS-025-FCD42W	2742
	30	15	20	PCS-030-FCD43D	2854	PCS-030-FCD43W	2968
	37	18.5	25	PCS-037-FCD44D	3071	PCS-037-FCD44W	3194
	43	22	30	PCS-043-FCD45D	3564	PCS-043-FCD45W	3706
	43	30	40	PCS-043-FCD46D	3564	PCS-043-FCD46W	3706
	60	37	50	PCS-060-FCD47D	4404	PCS-060-FCD47W	4580
	85	45	60	PCS-085-FCD48D	5259	PCS-085-FCD48W	5469
	85	55	75	PCS-085-FCD49D	6256	PCS-085-FCD49W	6466
	108	75	100	PCS-108-FCD50D	8070	PCS-108-FCD50W	8392
	135	90	125	PCS-135-FCD51D	9489	PCS-135-FCD51W	9869
	201	132	200	PCS-201-FCD54D	10214	PCS-201-FCD54W	10622
	251	160	250	PCS-251-FCD56D	12141	PCS-251-FCD56W	12626
	317	200	300	PCS-317-FCD57D	13966	PCS-317-FCD57W	14525
	361	250	350	PCS-361-FCD58D	15212	PCS-361-FCD58W	15820
	480	315	500	PCS-480-FCD61D	17240	PCS-480-FCD61W	17930

Combination Fusible PCS Softstarters include:

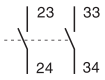
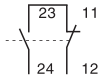
- A fused switch with external operating handle
- A 120V control power transformer with fused primary and secondary
- PCS built-in electronic motor overload protection
- PCS built-in SCR bypass/ run contactor
- Available in UL Type 12 or 4 Enclosures
- Terminal blocks for remote control devices

❶ Other UL type enclosures available. Contact your Sprecher + Schuh representative for pricing.
❷ Include suffix and price adder from page D16 if ordering factory installed modifications.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ Fuse clips accept J-Type fuses. Power fuses are not supplied. See page D27 for Fusible Disconnect amp ratings.
❺ For 380V applications choose softstarter based on FLA, then change the FB code in the catalog number to FG. Example PCS-043-FBD44D becomes PCS-043-F**G**D44D, which covers 25 HP @ 380V FLA 37. Price remains the same.
❻ For outdoor applications,replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PCS-085-FBD47**D** becomes PCS-085-FBD47**R**. Price and dimensions remain the same.
❼ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

Options - Factory Modifications

Description	Catalog Number	Price Adder
Pushbuttons (2) START and STOP pushbuttons for enclosed softstarters	Add suffix "**-3**"	**120**
Selector Switch Two or three position selector switch for enclosed softstarters "ON-OFF" "HAND-OFF-AUTO"	 Add suffix "**-6**" Add suffix "**-7**"	 **120** **120**
Pilot Light Red pilot light with "RUN" inscription for enclosed softstarters	Add suffix "**-1**"	**188**
Voltmeter (Panelboard) Measures all three phases. Includes switch.	Add suffix "**-VM3**"	**2729**
Ammeter (Panelboard) For monitoring all three phases. Includes switch.	Add suffix "**-AM3**"	**2729**
Elapsed Time Meter Measures elapsed motor running time	Add suffix "**-ETM**"	**1365**

Auxiliary Contact Blocks (1 & 2 Pole) ❶

Contact Block	Description	NO	NC	Contact Arrangement	For use with…	Catalog Number	Price
	• For side mounting with sequence terminal designations • Snap-on design – mounts without tools • One block per device only	1	0		All PCS & PCEC Controllers	**PCS-PA-10**	**30.75**
		2	0			**PCS-PA-20**	**40.50**
		0	1			**PCS-PA-01**	**30.75**
		1	1			**PCS-PA-11**	**40.50**

Accessories

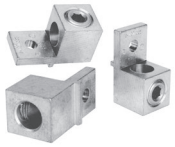
Accessory	Description	For use with…	Catalog Number	Price
 **PCV-064**	**Internal PCS Fan** • Attaches directly to PCS Controller • Recommended for enclosed PCS-003...37A Controllers • Fan is included as standard on PCS-043…480A devices • For PCS-108...480A units, separate 120V or 240V single phase is required for fan operation.	PCS-003…037	**PCV-064**	**53**
		PCS-043...085	**PCV-147**	**134**
		PCS-108...135	**PCV-234**	**365**
		PCS-201..251	**PFV-0251**	**444**
		PCS-317...480	**PFV-0480**	**488**
	**Connecting Module** • For direct connection of PCS Controller to KT7 Motor Circuit Controller • Motor Circuit Controller and PCS Controller must each be mounted • See Section F for KT7 Mounting Modules	KT7-25S to PCS-003…025	**PCS-25S-CC25**	**11**
		KT7-25H to PCS-003…025	**PCS-25H-CD25**	**11**
		KT7-45H to PCS-003…037	**PCS-45H-CF45**	**11**
	**Connecting Module** • For direct connection of PCS Controller to CA7 contactor • CA7 Contactor and PCS Controller must each be mounted • See Section F for KT7 Mounting Modules	CA7-9…23 to PCS-003…019	**PCS-23-CI23**	**11**
		CA7-30…37 to PCS-003…037	**PCS-37-CI37**	**11**
	**600V Protective Module** • Protects power components from transient voltage spikes and shunts noise energy away from the controller electronics • PCS (3 Lead) Line Connected Applications: Protective modules may be installed on the line and/or load side • PCS (6 Lead) Delta Connected Applications: Protective modules must be installed on the line side only • Clamping voltage range 705V…1750V, energy rating 290 joules	PCS-003...037-600V PCE-032...064-600V	**PCP-064-600V**	**80**
		PCS-043...085-600V PCE-074...147-600V	**PCP-147-600V**	**154**
		PCS-108...480 PCS-234-600V	**PFP-0480-600V**	**535**

❶ One Auxiliary Contact block (one or two pole) may be mounted on the right side of the controller.

IEC Terminal Covers ❶

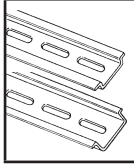
Description	Pkg. Qty.	Catalog Number	Price
IEC line or load terminal covers for 108...135A devices. Dead front protection	1	PFT-0135	69
IEC line or load terminal covers for 201...251A devices. Dead front protection		PFT-0251	80
IEC line or load terminal covers for 317...480A devices. Dead front protection		PFT-0480	88

Terminal Lug Kits (108...480 A) ❷

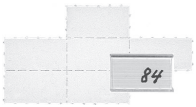


Current Rating (A)	Conductor Size	Total No. of Line Controller Terminal Lugs Possible Each Side: Line Side	Total No. of Line Controller Terminal Lugs Possible Each Side: Load Side	Pkg. Qty.	Catalog Number	Price
108...135	#6...250 MCM AWG 16 mm^2...120mm^2	3	3	3	PNX-1120	113
201...251		6	6			
317...480	#4...500 MCM AWG 25 mm^2...240MM^2	6	6		PNX-1240	167

Accessories

Accessory	Description	For Use With…	Catalog Number	Price
	**Remote Reset -** • For remote resetting of the PCS electronic overload • Attached directly to the PCS controller	All PCS Controllers	**CMR7-✱** *Replace ✱ with coil code below*	78
	**External Reset Button -** Used for manually resetting the PCS electronic overload	All PCS Controllers	**Use D7 Reset See Section H**	~
	**DIN-rail -** 2 meter lengths (6' 6") Top Hat, low profile (price per rail) Top Hat, high profile (price per rail)		**3F** **3AF**	See page A54

Marking Systems

Component	Description	Pkg. Qty.	Catalog Number	Price Each
	**Label Sheet –** 1 sheet with 105 self-adhesive paper labels each, 6 x 17mm	1	**CA7-FMS**	See page A54
	**Marking Tag Sheet -** 1 sheet with 160 perforated paper labels each, 6 x 17mm. To be used with transparent cover.	1	**CA7-FMP**	
	Transparent Cover - To be used with Marking Tag Sheets.	100 ❸	**CA7-FMC**	
	Tag Carrier - For marking with Series V7 Clip-on Tags.	100 ❸	**CA7-FMA2**	

CMR7 Remote Reset Coil Codes

AC Coil Code	Voltage Range: 50 Hz	60 Hz	50 / 60 Hz
24Z	~	~	24V
120	110V	120V	
240	220V	230V	

DC Coil Code	Voltage
24D	24VDC
48D	48VDC
115D	115VDC

❶ PCS-108...480A units include one terminal cover as standard.
❷ Line and Load terminals are provided as standard on enclosed PCS models. 5...85 A PCS units have box lugs standard. No additional lugs are required.
❸ Minimum order quantity is one package of 100. Price each x 100 = total price.

Control Modules

PCS Rating	For units rated 200...600V AC ❹					
	100...240V AC Catalog Number	Price	Qty	24V AC/DC Catalog Number	Price	Qty
108 A	**PCS-108**	**1825**	1	**PCS-108-024**	**1825**	1
135 A	**PCS-135**		1	**PCS-135-024**		1
201 A	**PCS-201**		1	**PCS-201-024**		1
251 A	**PCS-251**		1	**PCS-251-024**		1
317 A	**PCS-317**		1	**PCS-317-024**		1
361 A	**PCS-361**		1	**PCS-361-024**		1
480 A	**PCS-480**		1	**PCS-480-024**		1

Power Poles ❶

PCS Rating	For units rated 200…600V AC ❹		
	200…600V AC Catalog Number	Price	Qty
108 A	**PFL-0108-600V ❷**	**3535**	1
135 A	**PFL-0135-600V ❷**	**4998**	1
201 A	**PFL-0201-600V ❸**	**3028**	1
251 A	**PFL-0251-600V ❸**	**3709**	1
317 A	**PFL-0317-600V ❸**	**4042**	1
361 A	**PFL-0361-600V ❸**	**4375**	1
480 A	**PFL-0480-600V ❸**	**6722**	1

Each power pole contains two SCR's and one bypass contactor power pole. The PCS requires three power poles. For example: the replacement power pole for a PCS-0108-600V is PFL-0108-600V

❶ One piece provided per part number.
❷ Part number contains three power poles.
❸ Part number contains one power pole.
❹ Control Modules and Power Poles are not replaceable for PCS-003…85.

Standard Features	
Selectable Start Times	2, 5, 10, 15, 20, 25, or 30 s
Selectable Initial Torque	15%, 25%, 35%, and 65% of locked rotor torque
Selectable Current Limit	150%, 250%, 350%, and 450% of full load current
Selectable Kick Start - 450% FLA	0, 0.5, 1.0, or 1.5 s
Selectable Soft Stop	Off, 100%, 200%, or 300% of the start time setting when wired

Electrical Ratings

			UL/CSA/NEMA	IEC
Power Circuit	Rated Operation Voltage		200...600V AC (+10%, -15%)	500V~ — 500V~
	Rated Insulation Voltage		600V AC	500V~
	Dielectric Withstand		2200V AC	2500V~
	Repetitive Peak		200...600V AC: 1600V	500V~: 1600V
	Operating Frequency		50/60 Hz	50/60 Hz
	Utilization Category	1...37 A	—	AC-53b: 3.5-15:3585
		43...60 A	—	AC-53b: 4.5-30:1770
		85 A	—	AC-53b: 4.5-30:3570
		108 A	—	AC-53b: 4.5-30:1770
		135 A	—	AC-53b: 3.5-30: 1770
		201...251 A	—	AC-53b: 3.5-30: 1770
		317...480 A	—	AC-53b: 3.5-30: 1770
	Number of Poles		Equipment designed for 3-phase only	
	Rated Impulse Voltage		6 kV	
	DV/DT Protection		1000V/µs	
	Overvoltage Category		III	

			Type 1 ❷					
	SCPD Performance		Non-Time Delay Fuses (K5)		Thermal Magnetic Circuit Breaker		High Capacity Time Delay Class CC/J/L	
	SCPD List ❶		Max. Standard Available Fault	Max. Standard Fuse (A)	Max. Standard Available Fault	Max. Circuit Breaker (A)	Max. Standard Available Fault	Max. Circuit Fuse (A)
Short Circuit Protection	Line Device Operational Current Rating (A)	3	5 kA	12	5 kA	15	70 kA	6
		9	5 kA	30	5 kA	30	70 kA	15
		16	5 kA	60	5 kA	60	70 kA	30
		19	5 kA	70	5 kA	70	70 kA	40
		25	5 kA	100	5 kA	100	70 kA	50
		30	10 kA	110	10 kA	110	70 kA	60
		37	10 kA	125	10 kA	125	70 kA	60
		43	10 kA	150	10 kA	150	70 kA	90
		60	10 kA	225	10 kA	225	70 kA	125
		85	10 kA	300	10 kA	300	70 kA	175
		108	10 kA	400	10 kA	300	70 kA	200
		135	10 kA	500	10 kA	400	70 kA	225
		201	18 kA	600	18 kA	600	70 kA	350
		251	18 kA	700	18 kA	700	70 kA	400
		317	30 kA	800	30 kA	800	69 kA	500
		361	30 kA	1000	30 kA	1000	69 kA	600
		480	42 kA	1200	42 kA	1200	69 kA	800
	Delta Device Operational Current Rating (A)	5.1	5 kA	15	5 kA	15	70 kA	10
		16	5 kA	60	5 kA	60	70 kA	30
		27.6	5 kA	70	5 kA	70	70 kA	60
		32.8	5 kA	125	5 kA	125	70 kA	70
		43	5 kA	150	5 kA	150	70 kA	90
		52	10 kA	200	10 kA	200	70 kA	100
		64	10 kA	250	10 kA	250	70 kA	100
		74	10 kA	250	10 kA	250	70 kA	150
		104	10 kA	400	10 kA	300	70 kA	225
		147	10 kA	400	10 kA	400	70 kA	300
		187	10 kA	600	10 kA	500	70 kA	400
		234	10 kA	700	10 kA	700	70 kA	400
		348	18 kA	1000	18 kA	1000	70 kA	600
		435	18 kA	1200	18 kA	1200	69 kA	800
		549	30 kA	1600	30 kA	1600	69 kA	1000
		625	30 kA	1600	30 kA	1600	69 kA	1200
		831	42 kA	1600	30 kA	1600	69 kA	1600
		831	42 kA	1600	42 kA	1200	69 kA	1600

❶ Consult local codes for proper sizing of short circuit protection.

❷ Type 1 performance/protection indicates that, under a short-circuit condition, the fused or circuit breaker-protected starter shall cause no danger to persons or installation but may not be suitable for further service without repair or replacement.

Electrical Ratings				
			UL/CSA/NEMA	IEC
Control Circuit	Rated Operational Voltage (+10%, -15%)		100...240V AC, 24V AC/DC	100...240V AC, 24V AC/DC
	Rated Insulation Voltage		250V	250V-
	Rated Impulse Voltage		2.5 kV	4 kV
	Dielectric Withstand		1500V AC	2000V-
	Overvoltage Category		II	III ❶
	Operating Frequency		50/60 Hz	50/60 Hz
	Input on state voltage minimum, during start (IN1, IN2)		85V AC, 19.2V DC / 19.2V AC	
	Input on state current (IN1, IN2)		9.8 mA @120V AC/19.6 mA @ 240V AC, 7.3 mA @ 24V AC/DC	
	Input off state voltage maximum (IN1, IN2)		40V AC, 17V DC / 12V AC	
	Input off state current @ input off state voltage (IN1, IN2)		<10 mA, <12 mA	
	Control Power with Fan, during start	3...37 A	215 mA @ 120V AC / 180 mA @ 240V AC, 800 mA @ 24V DC / 660 mA @ 24V AC	
		43...85 A	200 mA @120V AC / 100 mA @240V AC, 700 mA @ 24V AC/DC	
			Fan Power	**Control Power**
		108...135 A	20 VA	200 mA @120V AC / 120 mA @ 240V AC, 600 mA @24V AC/DC
		201...251 A	40 VA	
		317...480 A	60 VA	
	Control Power without Fan, during start	3...37 A	205 mA @120V AC / 145 mA @240V AC, 705 mA @ 24V DC / 580 mA @24V AC	
Steady State Heat Dissipation and Overload Current Range		Controller Rating (A)	Steady State Heat Dissipation (W)	Overload Current Range (A)
		3	11	1..3
		9	12	3..9
		16	14	5.3...16
		19	15	6.3...19
		25	17	9.2...27.7
		30	19	10...30
		37	24	12.3...37
		43	34	14.3...43
		60	50	20...60
		85	82	28.3...85
		108	62	27...108
		135	75	34...135
		201	129	67...201
		251	147	84...251
		317	174	106...317
		361	194	120...361
		480	239	160...480

Auxiliary Contacts			
		UL/CSA/NEMA	IEC
Rated Operational Voltage		250V AC/30V DC	250V~/30V DC
Rated Insulation Voltage		250V	250V~
Rated Impulse Voltage		2.5 kV	4 kV
Dielectric Withstand		1500V AC	2000V~
Overvoltage Category		II	III ❶
Operating Frequency		50/60 Hz	50/60 Hz
Utilization Category		D300/D300	AC15
TB-97, -98 (OVLD/Fault)	Type of Control Circuit	Electromagnetic relay	
	Number of Contacts	1	
	Type of Contacts	Normally Open (N.O.)	
	Type of Current	AC/DC	
	Rated Operational Current (max.)	0.6 A @ 120V ~ and 0.3 A @ 240V-	
	Conventional Thermal Current I_{th}	1 A	
	Make/Break VA	432/72	
TB-13, -14 (Normal/Up-to-Speed)	Type of Control Circuit	Electromagnetic relay	
	Number of Contacts	1	
	Type of Contacts	Normally Open (N.O.)	
	Type of Current	AC/DC	
	Rated Operational Current (max.)	0.6 A @ 120V ~ and 0.3 A @ 240V-	
	Conventional Thermal Current I_{th}	1 A	
	Make/Break VA	432/72	

❶ Overvoltage category II, when either control or auxiliary circuit is wired to a SELV or PELV circuit.

Electrical Ratings			
Side-Mount Auxiliary Contacts			
		UL/CSA/NEMA	**IEC**
Rated Operational Voltage		250V AC/30V DC	250V/30V DC
Rated Insulation Voltage		250V	250V AC
Rated Impulse Voltage		2.5 kV	4 kV
Dielectric Withstand		1500V AC	2000V AC
Overvoltage Category		II	III❶
Operating Frequency		50/60 Hz	50/60 Hz
TB-23, -24 (Normal/Up-to-Speed) TB-33, -34 (Normal/Up-to-Speed)	Utilization Category	C300/R150	AC-15/DC-13
	Type of Control Circuit	Electromagnetic relay	
	Number of Contacts	1	
	Type of Contacts	Normally Open (N.O.)	
	Type of Current	AC/DC	
	Rated Operational Current (max.)	1.5 A @ 120V AC, 0.75A @ 240V AC, 1.17 A @ 24V DC	
	Conventional Thermal Current I_{th}	2.5 A	
	Make/Break VA	1800/180V AC, 28V DC (resistive)	
TB-11, 12 (Normal/Up-to-Speed)	Type of Control Circuit	B300/R300	AC-15/DC-13
	Type of Control Circuit	Electromagnetic relay	
	Number of Contacts	1	
	Type of Contacts	Normally Open (N.O.)	
	Type of Current	AC/DC	
	Rated Operational Current (max.)	3 A @ 120V AC, 1.5A @ 240V AC, 1.17 A @ 24V DC	
	Conventional Thermal Current I_{th}	5 A	
	Make/Break VA	3600/360 V AC, 28V DC (resistive)	

Environmental	
Operating Temperature Rating	-5...50 °C (23...122 °F) (open) -5...40 °C (23...104 °F) (enclosed)
Storage and Transportation Temperature Range	-25...85 °C (-13...185 °F)
Altitude	2000 m (6560 ft)
Humidity	5…95% (non-condensing)
Pollution Degree	2
Type of Protection	IP2X

Mechanical Ratings			
Resistance to Vibration	Operational		1.0 G Peak, 0.15 mm (0.006 in.) displacement
	Non-operational		2.5 G Peak, 0.38 mm (0.015 in.) displacement
Resistance to Shock	Operational		15 G
	Non-operational		30 G
Line Power Terminals	Cable Size Tightening Torque	3...37 A	2.5...25 mm2 (14...4 AWG) 2.3...2.8 N•m (20...25 in-lbs)
		43...85 A	2.5...95 mm2 (14...3/0 AWG) 11.3...12.4 N•m (100...110 in-lbs)
		108...135 A	16.9 N•m (150 in-lbs)
		201...251 A	Two M10 x 1.5 diameter holes per power pole
		317...480 A	Two M12 x 1.75 diameter holes per power pole
Load Power Terminals	Cable Size Tightening Torque	3...37 A	2.5...16 mm2 (14...6 AWG) 2.3...2.5 N•m (20...22.5 in-lbs)
		43...85 A	2.5...50 mm2 (14...1 AWG) 11.3...12.4 N•m (100...110 in-lbs)
		108...135 A	23 N•m (200 in-lbs)
		201...251 A	Two M10 x 1.5 diameter holes per power pole
		317...480 A	Two M12 x 1.75 diameter holes per power pole
Control Terminals	Cable Size Tightening Torque	All	0.2...2.5 mm2 (24...14 AWG) 0.5...0.9 N•m (4.4...8.0 in-lbs)

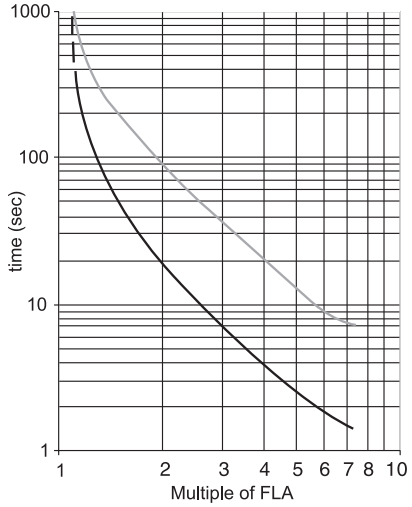
Other			
		UL/CSA/NEMA	**IEC**
EMC Emissions Levels	Conducted Radio Frequency Emissions	—	Class A
	Radiated Emissions	—	Class A
EMC Immunity Levels	Electrostatic Discharge	4 kV Contact and 8 kV Air Discharge	8 kV Air Discharge
	Radio Frequency Electromagnetic Field	—	Per EN/IEC 60947-4-2
	Fast Transient	—	Per EN/IEC 60947-4-2
	Surge Transient	—	Per EN/IEC 60947-4-2

❶ Overvoltage category II, when either control or auxiliary circuit is wired to a SELV or PELV circuit.

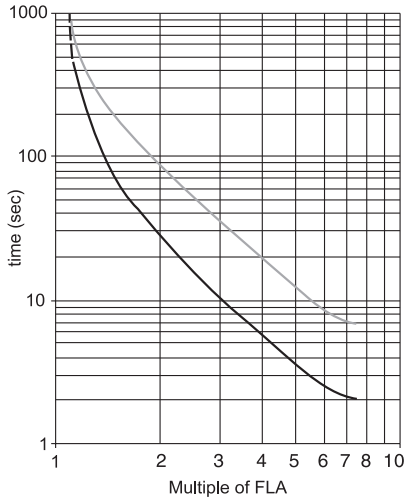
Overload Relay Trip Curves

Hot Cold

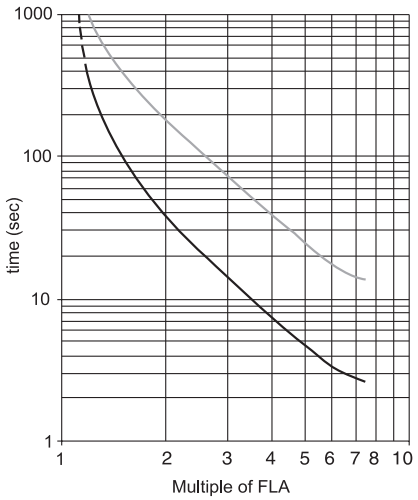
Trip Class 10



Trip Class 15

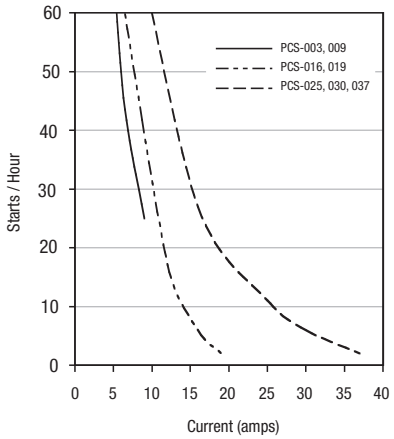


Trip Class 20

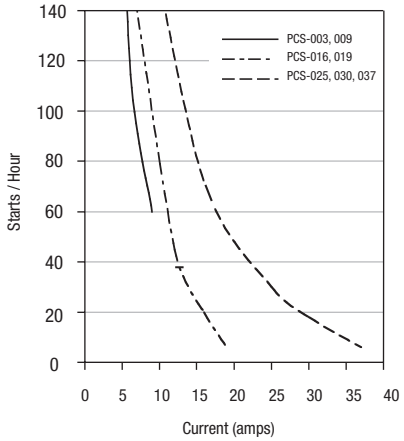


Starts per Hour Curves

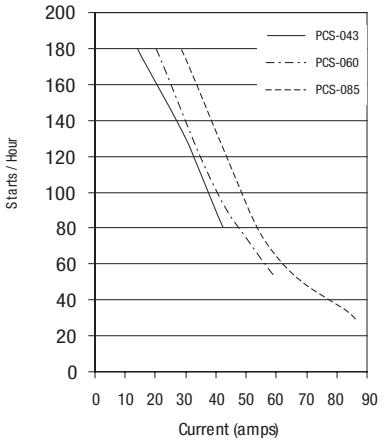
PCS Controller - Starts per hour
40C, 100% duty cycle, 10 sec., 350%, no fan



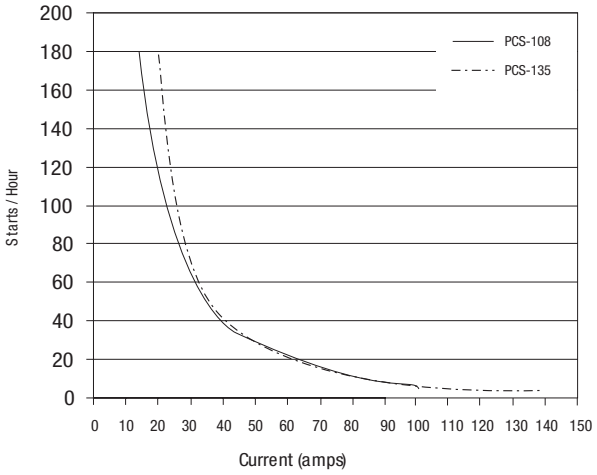
PCS Controller - Starts per hour
40C, 100% duty cycle, 10 sec., 350%, with fan



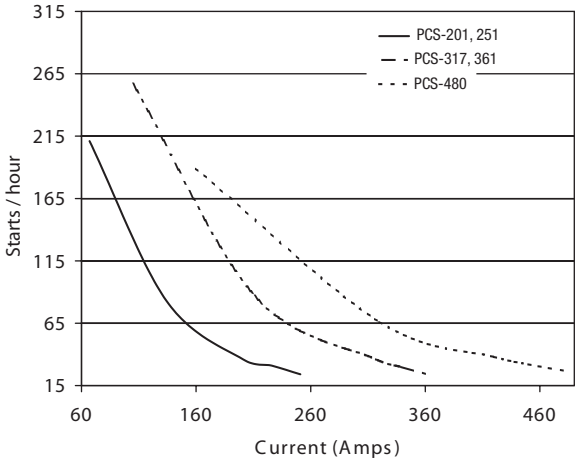
PCS Controller - Starts per hour
40C,100% Duty Cycle, 20sec, 350% (with standard fan)



PCS Controller Starts per hour (108-135A)
40C, 100% Duty Cycle, 20 sec, 350% (with standard fan)

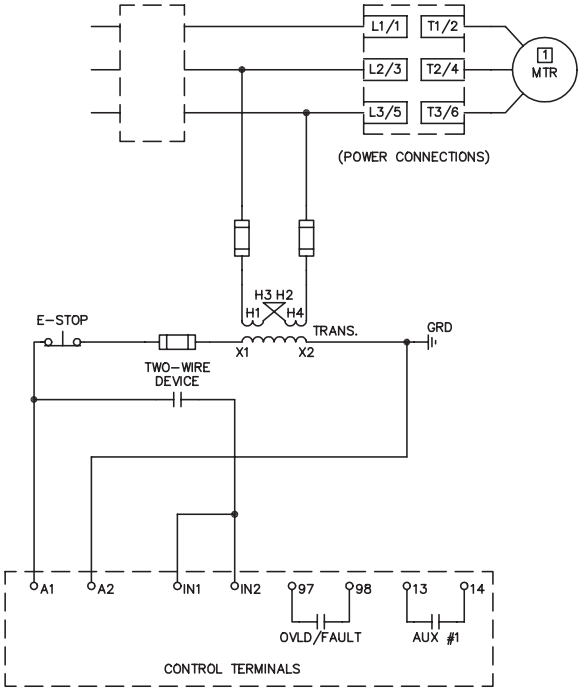


PCS Controller Starts per hour (201…480 A)
40C, 100% Duty Cycle, 20 sec, 350% (with standard fan)

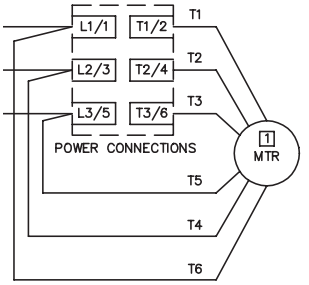


Two Wire Configuration

Line Connected ❶



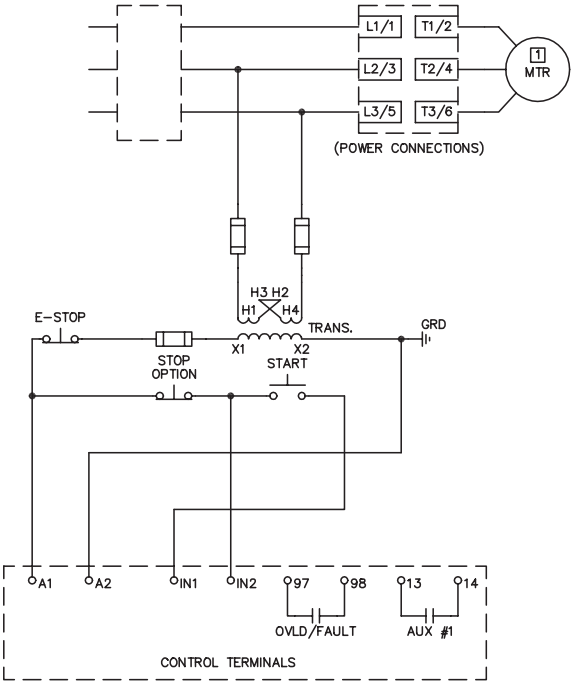
Delta Connected ❶



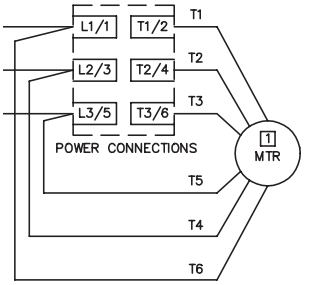
❶ Line or Delta Connected selection are determined by the customer.
- PCS DIP Switch #15 "**ON**": PCS set for Line Connected Motors
- PCS DIP Switch #15 "**OFF**": PCS set for Delta Connected Motors

Three Wire Configuration

Line Connected ❶



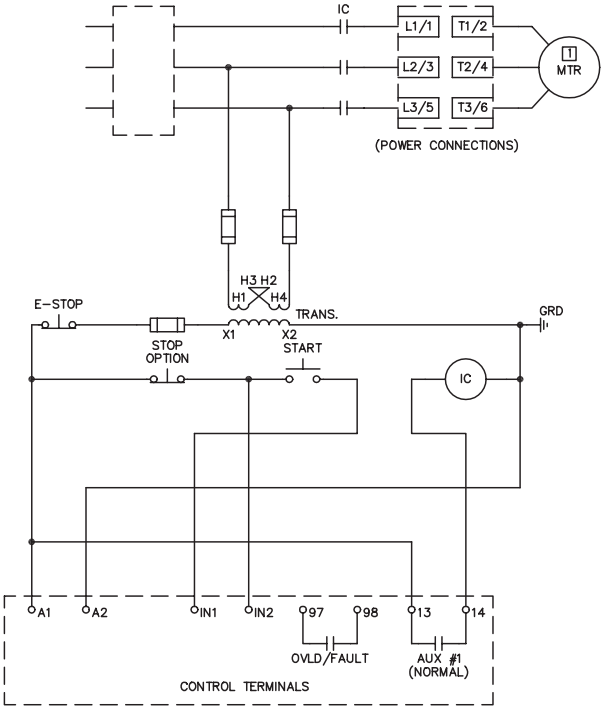
Delta Connected ❶



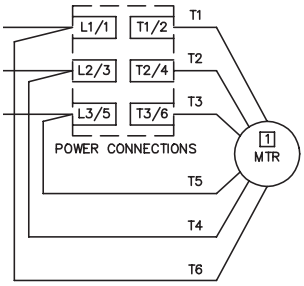
❶ Line or Delta Connected selection are determined by the customer.
- PCS DIP Switch #15 "**ON**": PCS set for Line Connected Motors
- PCS DIP Switch #15 "**OFF**": PCS set for Delta Connected Motors

Isolation Contactor Configuration

Line Connected ❶



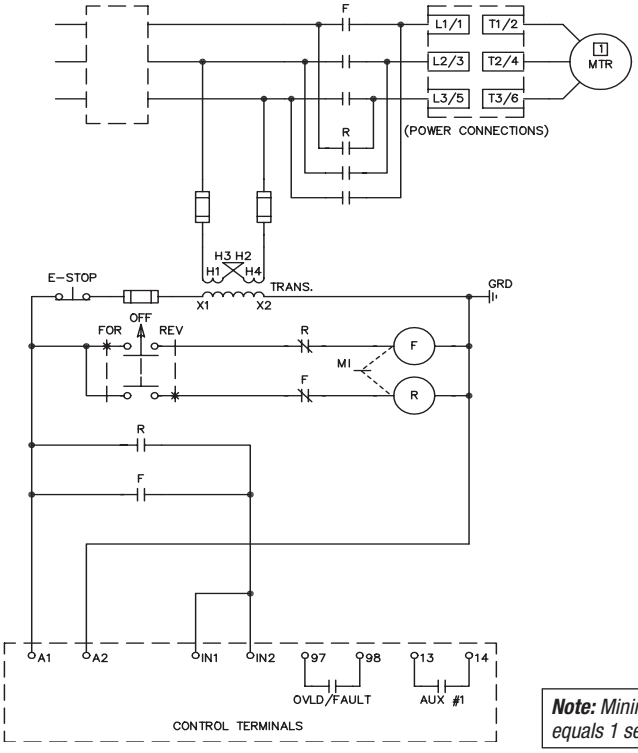
Delta Connected ❶



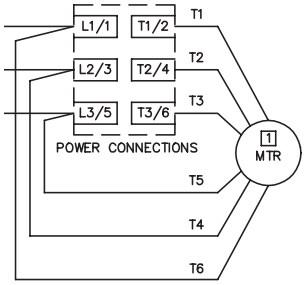
❶ Line or Delta Connected selection are determined by the customer.
- PCS DIP Switch #15 "**ON**": PCS set for Line Connected Motors
- PCS DIP Switch #15 "**OFF**": PCS set for Delta Connected Motors

Reversing Configuration

Line Connected ❶



Delta Connected ❶

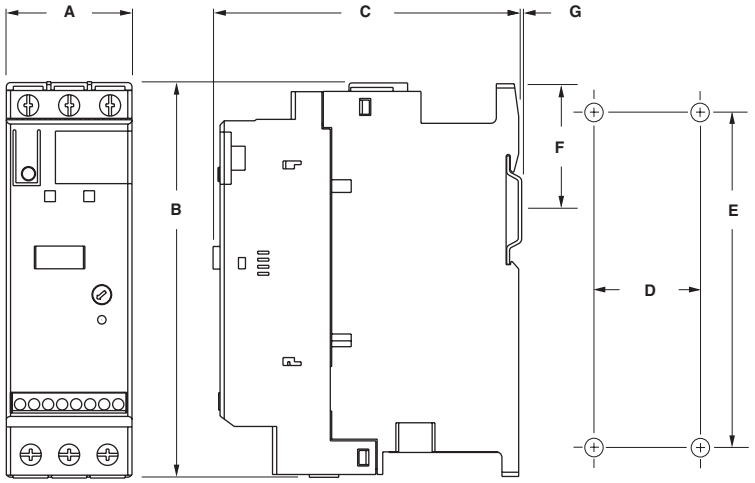


❶ Line or Delta Connected selection are determined by the customer.
- PCS DIP Switch #15 "**ON**": PCS set for Line Connected Motors
- PCS DIP Switch #15 "**OFF**": PCS set for Delta Connected Motors

***Note:** Minimum off time equals 1 second*

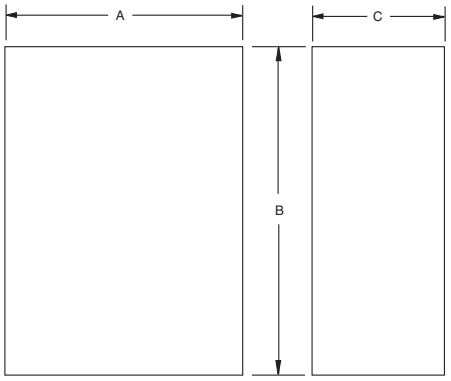
PCS Softstarter Controller

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



Controller	A	B	C	D	E	F	G	Mounting Hole Size	Weight (kg (lbs)
3…37A	44.8 (1-49/64)	139.7 (5-1/2)	100 (4-21/64)	35 (1-3/8)	132 (5-13/64)	46.4 (1-13/16)	2 (1/16)	4.6 (0.18)	0.86 (1.9)
43…85A	72 (2-26/32)	206 (8-1/8)	130 (5-1/8)	55 (2-5/32)	198 (7-25/32)	102 (4)	2 (1/16)	5.3 (0.21)	2.25 (5.0)
108...135A	196.4 (7.74)	443.7 (17.47)	205.2 (8.08)	166.6 (6.56)	367 (14.45)	~	~	7.5 (0.295)	15 (33)
201...251	225 (8.86)	560 (22.05)	265.3 (10.45)	150 (5.91)	504.1 (19.85)	~	~	11.5 (0.45)	30.4 (67)
317...480	290 (11.42)	600 (23.62)	298 (11.73)	200 (7.87)	539 (21.23)	~	~	11.5 (0.45)	45.8 (101)

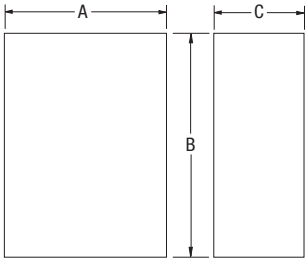
Minimum Enclosure Size



Controller	Height B	Width A	Depth C	Fan Requirements
3…37 A	305 (12)	224 (9)	152 (6)	none
43…85 A	406 (16)	305 (12)	203 (8)	none
108...135 A	762 (30)	610 (24)	305 (12)	none
201...251 A	965 (38)	762 (30)	356 (14)	none
317...480 A	1295 (51)	914 (36)	356 (14)	none

Enclosed Type Line-Connected Controllers

IMPORTANT NOTE:
Factory installed options may affect enclosure size requirements. Exact dimensions can be obtained after order entry. Consult your local Sprecher + Schuh representative.



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

Controller Rating (A)	Disconnect Rating	IP65 (Type 4/12)		
		B Height	A Width	C Depth
Non-Combination Controller				
3	—	356 (14)	305 (12)	152 (6)
9	—	356 (14)	305 (12)	152 (6)
16	—	356 (14)	305 (12)	152 (6)
25	—	356 (14)	305 (12)	152 (6)
30	—	356 (14)	305 (12)	152 (6)
37	—	356 (14)	305 (12)	152 (6)
43	—	406 (16)	356 (14)	203 (8)
60	—	406 (16)	356 (14)	203 (8)
85	—	406 (16)	356 (14)	203 (8)
108	—	762 (30)	610 (24)	305 (12)
135	—	762 (30)	610 (24)	305 (12)
201	—	914 (36)	762 (30)	406 (16)
251	—	914 (36)	762 (30)	406 (16)
317	—	1524 (60)	914 (36)	406 (16)
361	—	1524 (60)	914 (36)	406 (16)
480	—	1524 (60)	914 (36)	406 (16)
Combination Controllers with Fusible Disconnect				
3	30 A/J	508 (20)	406 (16)	203 (8)
9	30 A/J	508 (20)	406 (16)	203 (8)
16	30 A/J	508 (20)	406 (16)	203 (8)
25	30 A/J	508 (20)	406 (16)	203 (8)
30	60 A/J	508 (20)	406 (16)	203 (8)
37	60 A/J	508 (20)	406 (16)	203 (8)
43	60 A/J	610 (24)	508 (20)	203 (8)
60	100 A/J	610 (24)	508 (20)	254 (10)
85 ❶	100 A/J	610 (24)	508 (20)	254 (10)
85 ❷	200 A/J	762 (30)	610 (24)	305 (12)
108	200 A/J	914 (36)	762 (30)	406 (16)
135	200 A/J	914 (36)	762 (30)	406 (16)
201	400 A/J	1219 (48)	914 (36)	406 (16)
251	400 A/J	1219 (48)	914 (36)	406 (16)
317	600 A/J	1524 (60)	914 (36)	406 (16)
361	600 A/J	1524 (60)	914 (36)	406 (16)
480	600 A/J	1524 (60)	914 (36)	406 (16)
Combination Controllers with Circuit Breaker				
3	15 A	508 (20)	406 (16)	203 (8)
9	15 A	508 (20)	406 (16)	203 (8)
16	20 A	508 (20)	406 (16)	203 (8)
25	30 A	508 (20)	406 (16)	203 (8)
30	40 A	508 (20)	406 (16)	203 (8)
37	50 A	508 (20)	406 (16)	203 (8)
43	80 A	610 (24)	508 (20)	203 (8)
60	100 A	610 (24)	508 (20)	254 (10)
85	125 A	610 (24)	508 (20)	254 (10)
108	175 A/175 A Plug	914 (36)	762 (30)	406 (16)
135	225 A/225 A Plug	914 (36)	762 (30)	406 (16)
201	300 A/300 A Plug	1219 (48)	914 (36)	406 (16)
251	400 A/400 A Plug	1219 (48)	914 (36)	406 (16)
317	600 A/600 A Plug	1524 (60)	914 (36)	406 (16)
361	600 A/600 A Plug	1524 (60)	914 (36)	406 (16)
480	800 A/800 A Plug	1524 (60)	914 (36)	406 (16)

❶ Dimensions for FHD-43, FAD-44, FBD-47, and FCD-48.
❷ Dimensions for FHD-44, FAD-45, FBD-48, and FCD-49.

Notes

PF Controllers

The Intelligent Controller with extensive starting and stopping configurations up to 1000HP (3-wire), 1400HP (6-wire)

PF Control module with standard built in keypad and backlit in LCD display

The PF Softstarter Controller provides intelligence, unmatched performance, flexibility, and diagnostics in a modular compact design for controlling either a standard squirrel-cage induction motor or a star-delta motor. Seven standard, and two optional modes of operation are available within a single controller.

Standard Modes of Operation

- Soft Start with selectable kick start
- Current Limit Starting
- Dual ramp start
- Full voltage starting
- Linear speed acceleration
- Preset slow speed
- Soft stop

Optional Modes of Operation

- Pump Control
- Brake Control - Smart Motor Brake, Accu-stop and Slow Speed with Braking

Product Features

- Built-in SCR Bypass/Run Contactor
- Built in Electronic Motor Overload Protection
- CT on each phase
- LCD Display
- Keypad programming
- Four programming Auxiliary Contacts

The PF Softstarter is available for motors rated 1...1,250A, 200....600V AC, 50 and 60Hz. In addition to motors, the PF Softstarter can be used to control resistive loads.

Modular and Compact Softstarter

The PF Softstarter reduces both product size and the total cost to the customer. As standard, the PF Softstarter includes electronic overload, integral bypass and motor starting capabilities for both star-delta and standard squirrel-cage induction motors, advanced protection and diagnostics in a compact maintainable modular, cost-effective package.

Large or small HP and options for any application

The basic PF Controller combines large horsepower capacity with the most popular starting modules (up to 1,000HP @ 460V, 3-wire). Even in middle and low horsepower applications, PF Softstarters can be configured to provide exactly the right starting and stopping profile (see descriptions on following pages).

Precise programming set-up with built-in keypad & LCD display

The PF Controller comes equipped with a built-in keypad and LCD display for programming the controller parameter settings for the specific industrial application. The three-line 16-character backlit LCD display provides parameter identification using clear informative text. Parameters are arranged in an organized four-level menu structure for ease of programming and fast access to parameters which allows the PF Softstarters set-up to be performed quickly and easily.

Product Overview

Modular Design

The PF Softstarter provides intelligence, unmatched performance, flexibility and diagnostics in a modular compact design for controlling either a standard squirrel-cage induction motor or a star-delta motor.

Compact Size

The PF Softstarter integrates a bypass to minimize heat generation during run time. The bypass automatically closes when the motor reaches its nominal speed, resulting in a cooler-running component and reduction in enclosure size.

Current Range - 16 Models

Product Rating	Line Current	Delta Current
5	5	9
25	25	43
43	43	74
60	60	104
85	85	147
108	108	187
135	135	234
201	201	348
251	251	435
317	317	549
361	361	625
480	480	831
625	625	850
780	780	900
970	970	1200
1250	1250	1600

Voltage Range

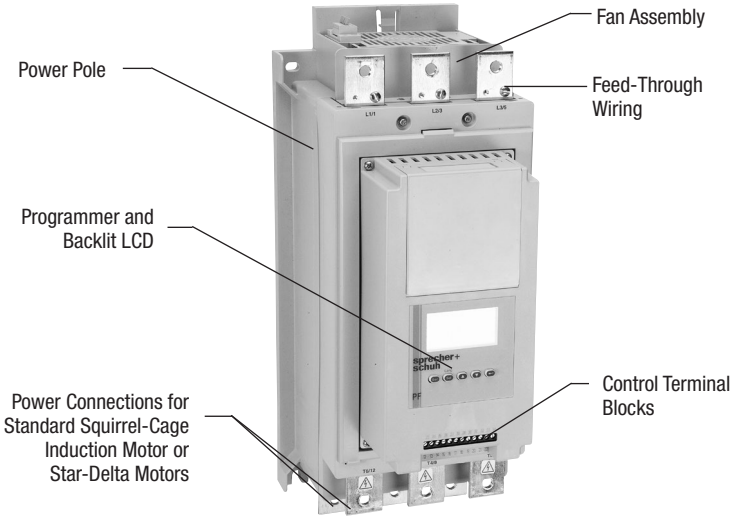
200...600V AC, 50/60 Hz

Control Range

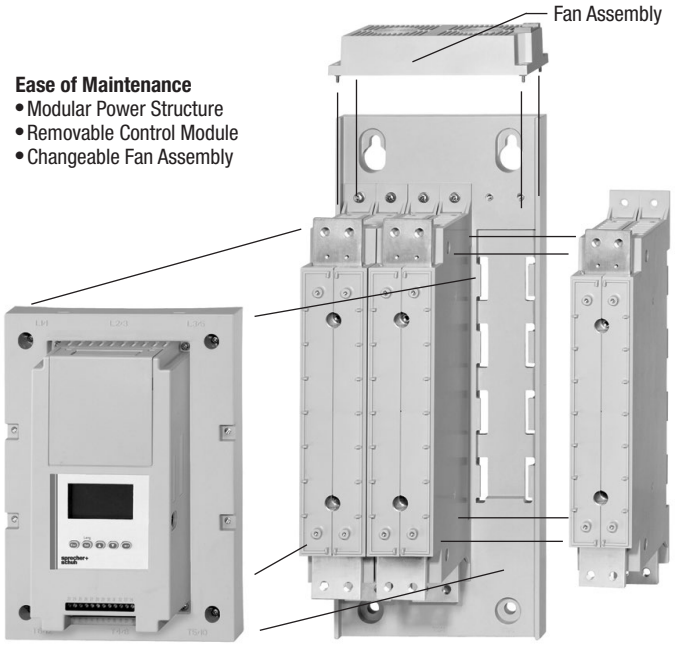
100...240V AC or 24V AC/DC

Starting Modes

	PFS Standard	PFB Pump Control	PFD Braking Control
Soft Start	X	X	X
Soft Stop	X		
Current Limit	X	X	X
Full Voltage	X	X	X
Kick Start	X	X	X
Preset Slow Speed	X		X
Linear Speed Start and Stop	X		
Dual Ramp	X		
Pump Start and Stop		X	
Smart Motor Brake			X
Accu-Stop			X
Slow Speed with Braking			X



PFS-0251-600V



Product Features

Overload
- Flexibility in Trip Class (10,15, 20, 30, Off)
- Reset Operation (Manual or Automatic)

Diagnostics
- PTC
- Line Fault
- Voltage Imbalance
- Undervoltage
- Overtemperature
- Overload
- Ground Fault
- Power Loss
- Phase Reversal
- Overvoltage
- Open Gate
- Excessive Starts per Hour

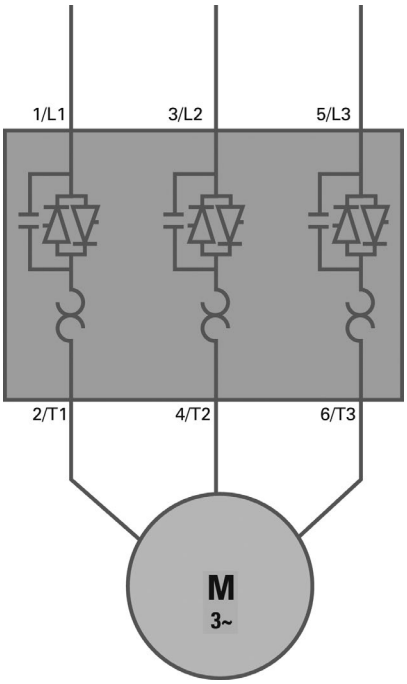
Configurable Auxiliary Contacts - 4
- Normal, Up-to-speed, External bypass, Fault, Alarm
- N.O. or N.C.

Motor Control
- Standard Squirrel-Cage Induction Motor
- Start-Delta Motor

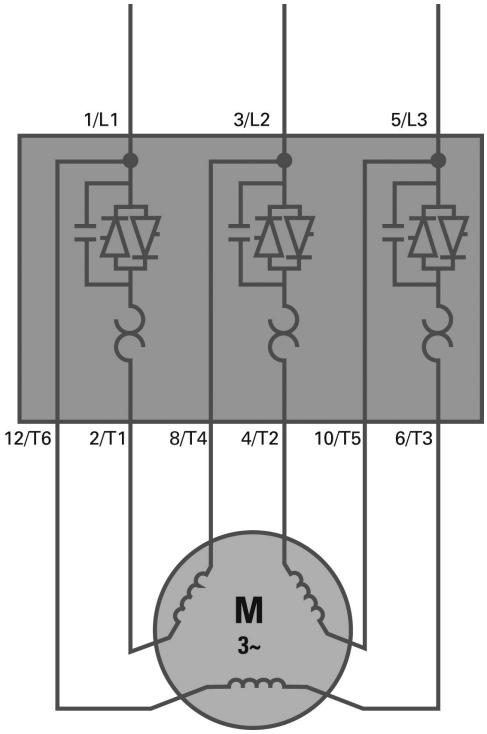
Metering
- Three-phase Currents
- Power in kW
- Motor Thermal
- Capacity Usage
- Elapsed Time of Motor Operation
- Three-phase voltages
- Power Usage in kWH
- Power Factor of the Running Motor

I/O
- 2 Inputs
- 4 Configurable Auxiliary Contacts

Line Connection

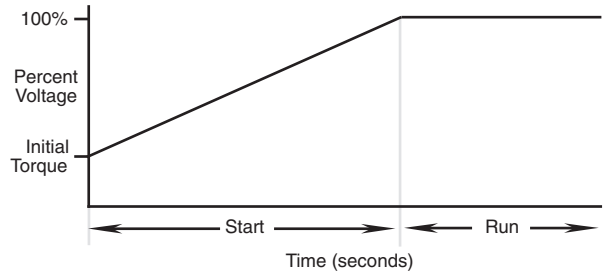


Delta Connection



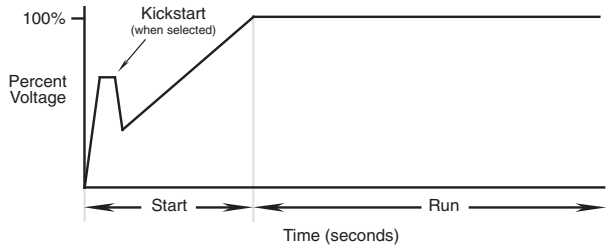
Modes of Operation *(Standard PFS)*

Soft Start



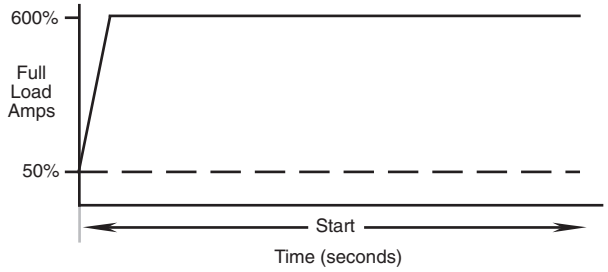
This method covers the most general applications. The motor is given an initial torque setting, which is user adjustable. From the initial torque level, the output voltage to the motor is steplessly increased during the acceleration ramp time, which is user adjustable.

Soft Start with Selectable Kickstart



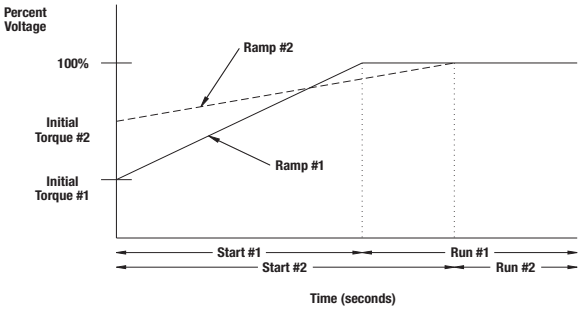
The kickstart feature provides a boost at startup to break away loads that may require a pulse of high torque to get started. It is intended to provide a current pulse, for a selected period of time.

Current Limit Starting



This method provides current limit start and is used when it is necessary to limit the maximum starting current. The starting current is user adjustable. The current limit starting time is user adjustable.

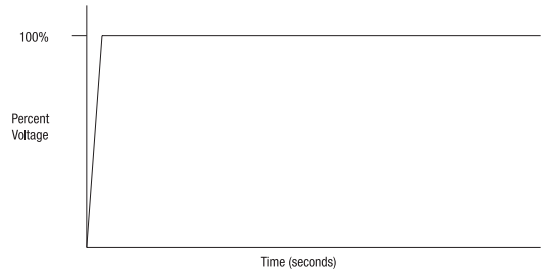
Dual Ramp Start



This starting method is useful on applications with varying loads, starting torque, and start time requirements. Dual Ramp Start offers the user the ability to select between two separate start profiles with separately adjustable ramp times and initial torque settings.

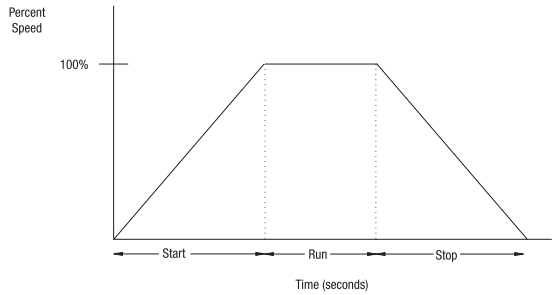
Modes of Operation *(Standard PFS)*

Full Voltage Start



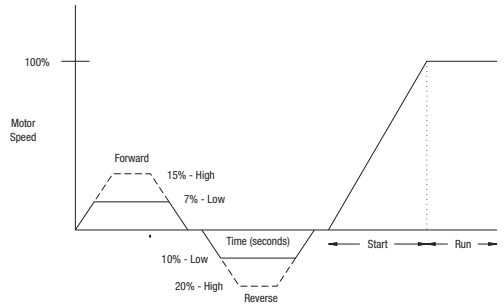
This method is used in applications requiring across-the-line starting. The PF controller performs like a solid-state contactor. Full inrush current and locked-rotor torque are realized. The PF may be programmed to provide full voltage start in which the output voltage to the motor reaches full voltage in 1/4 second.

Linear Speed Acceleration



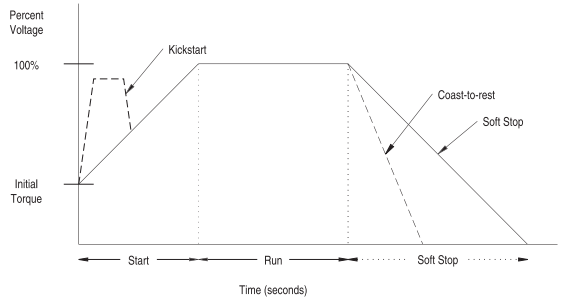
With this type of acceleration mode, a closed-loop feedback system maintains the motor acceleration at a constant rate. The required feedback signal is provided by a DC tachometer coupled to the motor (tachometer supplied by user 0-5V DC, 4.5V DC = 100% speed). Kickstart is available with this mode.

Preset Slow Speed



This method can be used on applications that require a slow speed for positioning material. The Preset Slow Speed can be set for either Low, 7% of base speed, or High, 15% of base speed. Reversing is also possible through programming. Speeds provided during reverse operation are Low, 10% of base speed, or High, 20% of base speed.

Soft Stop ❶

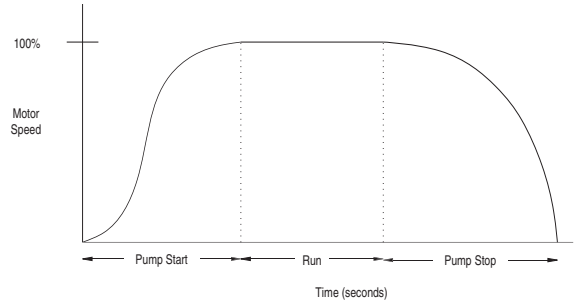


The Soft Stop option can be used in applications requiring an extended stop time. The voltage ramp down time is user adjustable from 0 to 120 seconds. The load will stop when the voltage drops to a point where the load torque is greater than the motor torque.

❶ Not intended to be used as an emergency stop. Refer to the applicable standards for emergency stop requirements.

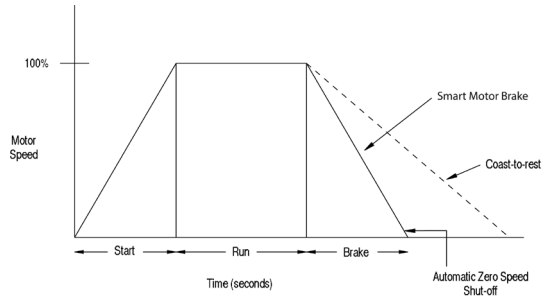
Optional Modes of Operation

Pump Control - Start and Stop (Option "PFB") ❶



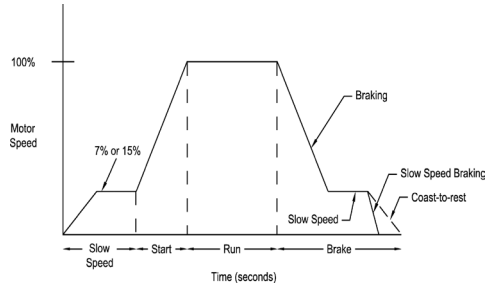
This option is used to reduce surges during the starting and stopping of a centrifugal pump by smoothly accelerating and decelerating the motor. The microprocessor analyzes the motor variables and generates commands which control the motor and reduce the possibility of surges occurring in the system. The pump control module also provides a built-in anti-backspin timer.

Smart Motor Brake (Option "PFD") ❶



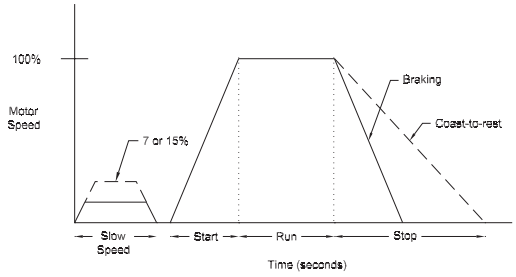
This option provides motor braking for applications that require the motor to stop faster than a coast to rest. Braking control, with automatic zero speed shut off, is fully integrated into the compact design of the PF controller. This design facilitates a clean, straight forward installation and eliminates the requirement for additional hardware such as braking contactors, resistors, timers, and speed sensors. The microprocessor based braking system applies braking current to a standard squirrel-cage induction motor. The strength of the braking current is programmable from 150...400% of full-load current.

Accu-Stop (Option "PFD") ❶



This option is used in applications requiring controlled position stopping. During stopping, braking torque is applied to the motor until it reaches preset slow speed (7% or 15% of rated speed) and holds the motor at this speed until a stop command is given. Braking torque is then applied until the motor reaches zero speed. Braking current is programmable from 0...400% of full-load current. Slow Speed Current is programmable from 0...450% of full-load current. Slow speed can be programmed for either 7% (low) or 15% (high).

Slow Speed with Braking (Option "PFD") ❶



Slow Speed with Braking is used on applications that require slow speed (in the forward direction) for positioning or alignment and also require braking control to stop. Slow speed adjustments are 7% (low) or 15% (high) of rated speed. Slow speed acceleration current is adjustable from 0...450%. Slow speed running current is adjustable from 0...450% of full-load current. Braking current is adjustable from 0...400%.

❶ Not intended to be used as an emergency stop. Refer to the applicable standards for emergency stop requirements.

Description of Features

Electronic Motor Overload Protection

The PF Softstarter controller incorporates, as standard, electronic motor overload protection. This overload protection is accomplished electronically with an I^2t algorithm. When coordinated with the proper short circuit protection, overload protection is intended to protect the motor, motor controller, and power wiring against overheating caused by excessive overcurrent. The PF Softstarter controller meets applicable requirements as a motor overload protective device. The controller's overload protection is programmable, providing the user with flexibility. The overload trip class consists of either OFF, 10, 15, 20 or 30 protection. The trip current is programmed by entering the motor full-load current rating, service factor, and selecting the trip class. Thermal memory is included to accurately model motor operating temperature. Ambient insensitivity is inherent in the electronic design of the overload.

Stall Protection and Jam Detection

Motors can experience locked-rotor currents and develop high torque levels in the event of a stall or a jam. These conditions can result in winding insulation breakdown or mechanical damage to the connected load. The PF Softstarter controller provides both stall protection and jam detection for enhanced motor and system protection. Stall protection allows the user to program a maximum stall protection delay time from 0...10 seconds. The stall protection delay time is in addition to the programmed start time and begins only after the start time has timed out. If the controller senses that the motor is stalled, it will shut down after the delay period has expired. Jam detection allows the user to determine the motor jam detection level as a percentage of the motor's full-load current rating. To prevent nuisance tripping, a jam detection delay time, from 0.0...99.0 seconds, can be programmed. This allows the user to select the time delay required before the PF Softstarter controller will trip on a motor jam condition. The motor current must remain above the jam detection level during the delay time. Jam detection is active only after the motor has reached full speed.

Underload Protection

Utilizing the underload protection of the PF Softstarter controller, motor operation can be halted if a drop in current is sensed. The PF Softstarter controller provides an adjustable underload trip setting from 0...99% of the programmed motor full-load current rating with an adjustable trip delay time of 0...99 seconds.

Undervoltage Protection

The PF Softstarter controller's undervoltage protection will halt motor operation if a drop in the incoming line voltage is detected. The undervoltage trip level is adjustable as a percentage of the programmed line voltage, from 0...99%. To eliminate nuisance trips, a programmable undervoltage trip delay time of 0...99 seconds can also be programmed. The line voltage must remain below the undervoltage trip level during the programmed delay time.

Overvoltage Protection

If a rise in the incoming line voltage is detected, the PF Softstarter controller's overvoltage protection will halt motor operation. The overvoltage trip level is adjustable as a percentage of the programmed line voltage, from 0...199%. To eliminate nuisance trips, a programmable overvoltage trip delay time of 0...99 seconds can also be programmed. The line voltage must remain above the overvoltage trip level during the programmed delay time.

Voltage Unbalance Protection

Voltage unbalance is detected by monitoring the 3-phase supply voltage magnitudes in conjunction with the rotational relationship of the three phases. The controller will halt motor operation when the calculated voltage unbalance reaches the user-programmed trip level. The voltage unbalance trip level is programmable from 0...25% unbalance.

Excessive Starts Per Hour

The PF Softstarter controller allows the user to program the allowed number of starts per hour (up to 99). This helps eliminate motor stress caused by repeated starting during a short time period.

Metering

Power monitoring parameters include:

- 3-phase current
- 3-phase voltage
- Power in kW
- Power usage in kWH
- Power factor
- Motor thermal capacity usage
- Elapsed time

Note: The motor thermal capacity usage allows the user to monitor the amount of overload thermal capacity usage before the PF Softstarter controller's built-in electronic overload trips.

LCD Display

The PF Softstarter controller's three-line 16-character backlit LCD display provides parameter identification using clear, informative text. Controller set up can be performed quickly and easily without the use of a reference manual. Parameters are arranged in an organized four-level menu structure for ease of programming and fast access to parameters.

Keypad Programming

Programming of parameters is accomplished through a five-button keypad on the front of the PF Softstarter controller. The five buttons include up and down arrows, an Enter button, a Select button, and an Escape button. The user needs only to enter the correct sequence of keystrokes for programming the PF Softstarter controller.

Auxiliary Contacts

Four fully programmable hard contacts are furnished as standard with the PF Softstarter controller:

Aux #1, Aux #2, Aux #3, Aux #4:
- N.O./N.C.
- Normal/Up-to-Speed/External Bypass/Fault/Alarm

Ground Fault Input

The PF Softstarter can monitor for ground fault conditions. An external core balance current transformer is required for this function.

Tach Input

A motor tachometer is required for the Linear Speed Start mode. Please see the Specifications section page D49 for tachometer characteristics.

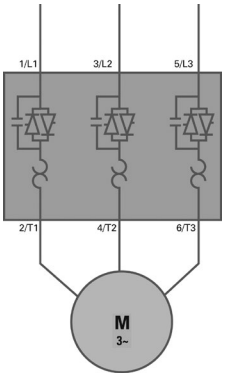
PTC Input

A motor PTC input can be monitored by the PF Softstarter. In the event of a fault, the PF Softstarter will shut down and indicate a motor PTC fault.

Open Type Controller - Line Connected ❶❺

Rated Voltage [V AC]	Motor Current (Amps) ❷	Max. kW 50 Hz	Max. Hp 60 Hz ❸	100...240V AC 50/60Hz Control Voltage ❹ Catalog Number	Price	24V AC/DC Control Voltage ❹ Catalog Number	Price
200/208	1...5	~	1	PFS-0005-600V	3999	PFS-0005-600V-024	3999
	5...25	~	5	PFS-0025-600V	4303	PFS-0025-600V-024	4303
	8.6...43	~	10	PFS-0043-600V	4520	PFS-0043-600V-024	4520
	12...60	~	15	PFS-0060-600V	5013	PFS-0060-600V-024	5013
	17...85	~	25	PFS-0085-600V	5433	PFS-0085-600V-024	5433
	27...108	~	30	PFS-0108-600V	6070	PFS-0108-600V-024	6070
	34...135	~	40	PFS-0135-600V	8171	PFS-0135-600V-024	8171
	67...201	~	60	PFS-0201-600V	9127	PFS-0201-600V-024	9127
	84...251	~	75	PFS-0251-600V	10127	PFS-0251-600V-024	10127
	106...317	~	100	PFS-0317-600V	10648	PFS-0317-600V-024	10648
	120...361	~	125	PFS-0361-600V	11402	PFS-0361-600V-024	11402
	160...480	~	150	PFS-0480-600V	16226	PFS-0480-600V-024	16226
	208...625	~	200	PFS-0625-600V-120 ❻	24339	~	~
	260...780	~	250	PFS-0780-600V-120 ❻	27700	~	~
	323...970	~	350	PFS-0970-600V-120 ❻	33959	~	~
	416...1250	~	400	PFS-1250-600V-120 ❻	43028	~	~
230	1...5	1.1	1	PFS-0005-600V	3999	PFS-0005-600V-024	3999
	5...25	5.5	7.5	PFS-0025-600V	4303	PFS-0025-600V-024	4303
	8.6...43	11	15	PFS-0043-600V	4520	PFS-0043-600V-024	4520
	12...60	15	20	PFS-0060-600V	5013	PFS-0060-600V-024	5013
	17...85	22	30	PFS-0085-600V	5433	PFS-0085-600V-024	5433
	27...108	30	40	PFS-0108-600V	6070	PFS-0108-600V-024	6070
	34...135	37	50	PFS-0135-600V	8171	PFS-0135-600V-024	8171
	67...201	55	75	PFS-0201-600V	9127	PFS-0201-600V-024	9127
	84...251	75	100	PFS-0251-600V	10127	PFS-0251-600V-024	10127
	106...317	90	125	PFS-0317-600V	10648	PFS-0317-600V-024	10648
	120...361	110	150	PFS-0361-600V	11402	PFS-0361-600V-024	11402
	160...480	132	200	PFS-0480-600V	16226	PFS-0480-600V-024	16226
	208...625	200	250	PFS-0625-600V-120 ❻	24339	~	~
	260...780	250	300	PFS-0780-600V-120 ❻	27700	~	~
	323...970	315	400	PFS-0970-600V-120 ❻	33959	~	~
	416...1250	400	500	PFS-1250-600V-120 ❻	43028	~	~

Line Connected



❶ Controllers rated 108 A and greater are not equipped with line and load terminal lugs. See page D47 for terminal lug kits.

❷ Motor FLA rating must fall within specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PF in the "Full Voltage" starting mode. Contact Sprecher+Schuh technical support for further guidance.

❸ Hp ratings at motor terminal voltages for 200, 230, 460, and 575 line volts, respectively.

❹ Separate 120V or 240V single phase is required for PF fan operation.

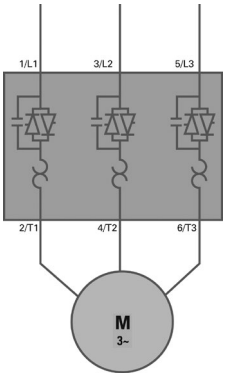
❺ Include suffix and price adder from page D46 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

❻ 110/120V control power only. For 230V control power only, change catalog number suffix "-120" to "-230". Price remains the same.

Open Type Controller - Line Connected ❶❺

Rated Voltage [V AC]	Motor Current (Amps) ❷	Max. kW 50 Hz	Max. Hp 60 Hz ❸	100...240V AC 50/60Hz Control Voltage ❹ Catalog Number	Price	24V AC/DC Control Voltage ❹ Catalog Number	Price
400/415/460	1...5	2.2	3	**PFS-0005-600V**	**3999**	**PFS-0005-600V-024**	**3999**
	5...25	11	15	**PFS-0025-600V**	**4303**	**PFS-0025-600V-024**	**4303**
	8.6...43	22	30	**PFS-0043-600V**	**4520**	**PFS-0043-600V-024**	**4520**
	12...60	30	40	**PFS-0060-600V**	**5013**	**PFS-0060-600V-024**	**5013**
	17...85	45	60	**PFS-0085-600V**	**5433**	**PFS-0085-600V-024**	**5433**
	27...108	55	75	**PFS-0108-600V**	**6070**	**PFS-0108-600V-024**	**6070**
	34...135	75	100	**PFS-0135-600V**	**8171**	**PFS-0135-600V-024**	**8171**
	67...201	110	150	**PFS-0201-600V**	**9127**	**PFS-0201-600V-024**	**9127**
	84...251	132	200	**PFS-0251-600V**	**10127**	**PFS-0251-600V-024**	**10127**
	106...317	160	250	**PFS-0317-600V**	**10648**	**PFS-0317-600V-024**	**10648**
	120...361	200	300	**PFS-0361-600V**	**11402**	**PFS-0361-600V-024**	**11402**
	160...480	250	400	**PFS-0480-600V**	**16226**	**PFS-0480-600V-024**	**16226**
	208...625	355	500	**PFS-0625-600V-120 ❻**	**24339**	~	~
	260...780	450	600	**PFS-0780-600V-120 ❻**	**27700**	~	~
	323...970	560	800	**PFS-0970-600V-120 ❻**	**33959**	~	~
	416...1250	710	1000	**PFS-1250-600V-120 ❻**	**43028**	~	~
500/575	1...5	2.2	3	**PFS-0005-600V**	**3999**	**PFS-0005-600V-024**	**3999**
	5...25	15	20	**PFS-0025-600V**	**4303**	**PFS-0025-600V-024**	**4303**
	8.6...43	22	40	**PFS-0043-600V**	**4520**	**PFS-0043-600V-024**	**4520**
	12...60	37	50	**PFS-0060-600V**	**5013**	**PFS-0060-600V-024**	**5013**
	17...85	55	75	**PFS-0085-600V**	**5433**	**PFS-0085-600V-024**	**5433**
	27...108	75	100	**PFS-0108-600V**	**6070**	**PFS-0108-600V-024**	**6070**
	34...135	90	125	**PFS-0135-600V**	**8171**	**PFS-0135-600V-024**	**8171**
	67...201	132	200	**PFS-0201-600V**	**9127**	**PFS-0201-600V-024**	**9127**
	84...251	160	250	**PFS-0251-600V**	**10127**	**PFS-0251-600V-024**	**10127**
	160...317	200	300	**PFS-0317-600V**	**10648**	**PFS-0317-600V-024**	**10648**
	120...361	250	350	**PFS-0361-600V**	**11402**	**PFS-0361-600V-024**	**11402**
	160...480	315	500	**PFS-0480-600V**	**16226**	**PFS-0480-600V-024**	**16226**
	208...625	450	600	**PFS-0625-600V-120 ❻**	**24339**	~	~
	260...480	560	800	**PFS-0780-600V-120 ❻**	**27700**	~	~
	323...970	710	1000	**PFS-0970-600V-120 ❻**	**33959**	~	~
	416...1250	900	1300	**PFS-1250-600V-120 ❻**	**43028**	~	~

Line Connected



❶ Controllers rated 108 A and greater are not equipped with line and load terminal lugs. See page D47 for terminal lug kits.

❷ Motor FLA rating must fall within specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PF in the "Full Voltage" starting mode. Contact Sprecher+Schuh technical support for further guidance.

❸ Hp ratings at motor terminal voltages for 200, 230, 460, and 575 line volts, respectively.

❹ Separate 120V or 240V single phase is required for PF fan operation.

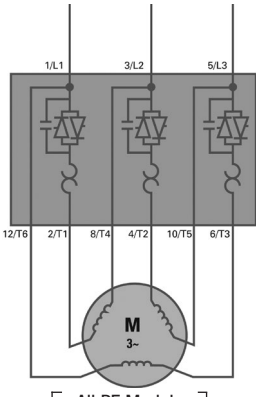
❺ Include suffix and price adder from page D46 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

❻ 110/120V control power only. For 230V control power only, change catalog number suffix "-120" to "-230". Price remains the same.

Open Type Controller - Delta Connected ❶❷❼

Rated Voltage [V AC]	Motor Current (Amps) ❹	Max. kW 50 Hz	Max. Hp 60 Hz ❸	100...240V AC 50/60Hz Control Voltage ❺ Catalog Number	Price	24V AC/DC Control Voltage ❺ Catalog Number	Price
200/208	1.7...8.7	~	2	PFS-0005-600V	3999	PFS-0005-600V-024	3999
	8.7...43	~	10	PFS-0025-600V	4303	PFS-0025-600V-024	4303
	14.9...74	~	20	PFS-0043-600V	4520	PFS-0043-600V-024	4520
	20.8...104	~	30	PFS-0060-600V	5013	PFS-0060-600V-024	5013
	29.4...147	~	40	PFS-0085-600V	5433	PFS-0085-600V-024	5433
	47...187	~	60	PFS-0108-600V	6070	PFS-0108-600V-024	6070
	59...234	~	75	PFS-0135-600V	8171	PFS-0135-600V-024	8171
	116...348	~	100	PFS-0201-600V	9127	PFS-0201-600V-024	9127
	145...435	~	150	PFS-0251-600V	10127	PFS-0251-600V-024	10127
	183...549	~	200	PFS-0317-600V	10648	PFS-0317-600V-024	10648
	208...625	~	200	PFS-0361-600V	11402	PFS-0361-600V-024	11402
	277...831	~	300	PFS-0480-600V	16226	PFS-0480-600V-024	16226
	283...850	~	300	PFS-0625-600V-120 ❻	24339	~	~
	300...900	~	300	PFS-0780-600V-120 ❻	27700	~	~
	400...1200	~	400	PFS-0970-600V-120 ❻	33959	~	~
	533...1600	~	500	PFS-1250-600V-120 ❻	43028	~	~
230	1.7...8.7	2.2	2	PFS-0005-600V	3999	PFS-0005-600V-024	3999
	8.7...43	11	15	PFS-0025-600V	4303	PFS-0025-600V-024	4303
	14.9...74	22	25	PFS-0043-600V	4520	PFS-0043-600V-024	4520
	20.8...104	30	40	PFS-0060-600V	5013	PFS-0060-600V-024	5013
	29.4...147	45	50	PFS-0085-600V	5433	PFS-0085-600V-024	5433
	47...187	55	60	PFS-0108-600V	6070	PFS-0108-600V-024	6070
	59...234	75	75	PFS-0135-600V	8171	PFS-0135-600V-024	8171
	116...348	110	125	PFS-0201-600V	9127	PFS-0201-600V-024	9127
	145...435	132	150	PFS-0251-600V	10127	PFS-0251-600V-024	10127
	183...549	160	200	PFS-0317-600V	10648	PFS-0317-600V-024	10648
	208...625	200	250	PFS-0361-600V	11402	PFS-0361-600V-024	11402
	277...831	250	350	PFS-0480-600V	16226	PFS-0480-600V-024	16226
	283...850	250	350	PFS-0625-600V-120 ❻	24339	~	~
	300...900	250	350	PFS-0780-600V-120 ❻	27700	~	~
	400...1200	400	400	PFS-0970-600V-120 ❻	33959	~	~
	533...1600	500	600	PFS-1250-600V-120 ❻	43028	~	~

Delta Connected



All PF Models are Wye-Delta compatible

❶ Controllers rated 108 A and greater are not equipped with line and load terminal lugs. See page D47 for terminal lug kits.

❷ Include suffix and price adder from page D46 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

❸ Hp ratings at motor terminal voltages for 200, 230, 460, and 575 line volts, respectively.

❹ Motor FLA rating must fall within specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PF in the "Full Voltage" starting mode. Contact Sprecher+Schuh technical support for further guidance.

❺ Separate 120V or 240V single phase is required for PF fan operation.

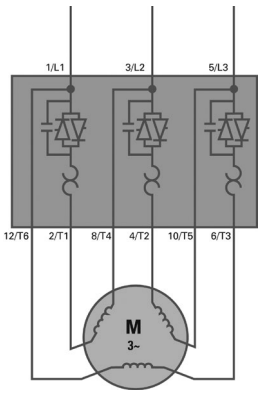
❻ 110/120V control power only. For 230V control power only, change catalog number suffix "-120" to "-230". Price remains the same.

❼ It is recommended that an isolation contactor be added to the circuit to provide galvanic isolation of the motor and final electromechanical removal of power.

Open Type Controller - Delta Connected ❶❷❼

Rated Voltage [V AC]	Motor Current (Amps) ❷	Max. kW 50 Hz	Max. Hp 60 Hz ❸	100...240V AC 50/60Hz Control Voltage ❺ Catalog Number	Price	24V AC/DC Control Voltage ❺ Catalog Number	Price
460	1.7...8.7	4	5	**PFS-0005-600V**	**3999**	**PFS-0005-600V-024**	**3999**
	8.7...43	22	30	**PFS-0025-600V**	**4303**	**PFS-0025-600V-024**	**4303**
	14.9...74	37	50	**PFS-0043-600V**	**4520**	**PFS-0043-600V-024**	**4520**
	20.8...104	55	75	**PFS-0060-600V**	**5013**	**PFS-0060-600V-024**	**5013**
	29.4...147	75	100	**PFS-0085-600V**	**5433**	**PFS-0085-600V-024**	**5433**
	47...187	90	150	**PFS-0108-600V**	**6070**	**PFS-0108-600V-024**	**6070**
	59...234	132	150	**PFS-0135-600V**	**8171**	**PFS-0135-600V-024**	**8171**
	116...348	160	250	**PFS-0201-600V**	**9127**	**PFS-0201-600V-024**	**9127**
	145...435	250	350	**PFS-0251-600V**	**10127**	**PFS-0251-600V-024**	**10127**
	183...549	315	450	**PFS-0317-600V**	**10648**	**PFS-0317-600V-024**	**10648**
	208...625	355	500	**PFS-0361-600V**	**11402**	**PFS-0361-600V-024**	**11402**
	277...831	450	700	**PFS-0480-600V**	**16226**	**PFS-0480-600V-024**	**16226**
	283...850	500	700	**PFS-0625-600V-120 ❻**	**24339**	~	~
	300...900	500	700	**PFS-0780-600V-120 ❻**	**27700**	~	~
	400...1200	710	1000	**PFS-0970-600V-120 ❻**	**33959**	~	~
	530...1600	900	1400	**PFS-1250-600V-120 ❻**	**43028**	~	~
500/575	1.7...8.7	5.5	7.5	**PFS-0005-600V**	**3999**	**PFS-0005-600V-024**	**3999**
	8.7...43	15	40	**PFS-0025-600V**	**4303**	**PFS-0025-600V-024**	**4303**
	14.9...74	45	60	**PFS-0043-600V**	**4520**	**PFS-0043-600V-024**	**4520**
	20.8...104	55	100	**PFS-0060-600V**	**5013**	**PFS-0060-600V-024**	**5013**
	29.4...147	90	150	**PFS-0085-600V**	**5433**	**PFS-0085-600V-024**	**5433**
	47...187	132	150	**PFS-0108-600V**	**6070**	**PFS-0108-600V-024**	**6070**
	59...234	160	200	**PFS-0135-600V**	**8171**	**PFS-0135-600V-024**	**8171**
	116...348	250	350	**PFS-0201-600V**	**9127**	**PFS-0201-600V-024**	**9127**
	145...435	315	400	**PFS-0251-600V**	**10127**	**PFS-0251-600V-024**	**10127**
	183...549	400	500	**PFS-0317-600V**	**10648**	**PFS-0317-600V-024**	**10648**
	208...625	450	600	**PFS-0361-600V**	**11402**	**PFS-0361-600V-024**	**11402**
	277...831	560	900	**PFS-0480-600V**	**16226**	**PFS-0480-600V-024**	**16226**
	283...850	560	900	**PFS-0625-600V-120 ❻**	**24339**	~	~
	300...900	630	900	**PFS-0780-600V-120 ❻**	**27700**	~	~
	400...1200	800	1300	**PFS-0970-600V-120 ❻**	**33959**	~	~
	533...1600	1100	1600	**PFS-1250-600V-120 ❻**	**43028**	~	~

Delta Connected



All PF Models are Wye-Delta compatible

❶ Controllers rated 108 A and greater are not equipped with line and load terminal lugs. See page D47 for terminal lug kits.

❷ Include suffix and price adder from page D46 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

❸ Hp ratings at motor terminal voltages for 200, 230, 460, and 575 line volts, respectively.

❹ Motor FLA rating must fall within specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PF in the "Full Voltage" starting mode. Contact Sprecher+Schuh technical support for further guidance.

❺ Separate 120V or 240V single phase is required for PF fan operation.

❻ 110/120V control power only. For 230V control power only, change catalog number suffix "-120" to "-230". Price remains the same.

❼ It is recommended that an isolation contactor be added to the circuit to provide galvanic isolation of the motor and final electromechanical removal of power.

Enclosed Non-Combination Starters - Line Connected ❷❸❹

Rated Voltage [V AC]	Motor Current (Amps) ❶	kW 50 Hz	Hp 60 Hz	Type 12 [Type 3R ❺] Industrial Dusttight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
200/208	1...5	—	1	PFS-0005-NHDD	4158	PFS-0005-NHDW	4324
	5...25	—	5	PFS-0025-NHDD	4448	PFS-0025-NHDW	4626
	8.6...43	—	10	PFS-0043-NHDD	4708	PFS-0043-NHDW	4897
	12...60	—	15	PFS-0060-NHDD	5216	PFS-0060-NHDW	5424
	17...85	—	25	PFS-0085-NHDD	5592	PFS-0085-NHDW	5816
	27...108	—	30	PFS-0108-NHDD	6288	PFS-0108-NHDW	6539
	34...135	—	40	PFS-0135-NHDD	9489	PFS-0135-NHDW	9869
	67...201	—	60	PFS-0201-NHDD	10909	PFS-0201-NHDW	11345
	84...251	—	75	PFS-0251-NHDD	11735	PFS-0251-NHDW	12204
	106...317	—	100	PFS-0317-NHDD	13010	PFS-0317-NHDW	13530
	120...361	—	125	PFS-0361-NHDD	14053	PFS-0361-NHDW	14615
	160...480	—	150	PFS-0480-NHDD	19268	PFS-0480-NHDW	20039
	208...625	—	200	PFS-0625-NHDD	27237	PFS-0625-NHDW	28326
	260...780	—	250	PFS-0780-NHDD	30424	PFS-0780-NHDW	31641
	323...970	—	350	PFS-0970-NHDD	R/F	PFS-0970-NHDW	R/F
	416...1250	—	400	PFS-1250-NHDD	R/F	PFS-1250-NHDW	R/F
230	1...5	1.1	1	PFS-0005-NADD	4158	PFS-0005-NADW	4324
	5...25	5.5	7.5	PFS-0025-NADD	4448	PFS-0025-NADW	4626
	8.6...43	11	15	PFS-0043-NADD	4708	PFS-0043-NADW	4897
	12...60	15	20	PFS-0060-NADD	5216	PFS-0060-NADW	5424
	17...85	22	30	PFS-0085-NADD	5592	PFS-0085-NADW	5816
	27...108	30	40	PFS-0108-NADD	6288	PFS-0108-NADW	6539
	34...135	37	50	PFS-0135-NADD	9489	PFS-0135-NADW	9869
	67...201	55	75	PFS-0201-NADD	10909	PFS-0201-NADW	11345
	84...251	75	100	PFS-0251-NADD	11735	PFS-0251-NADW	12204
	106...317	90	125	PFS-0317-NADD	13010	PFS-0317-NADW	13530
	120...361	110	150	PFS-0361-NADD	14053	PFS-0361-NADW	14615
	160...480	132	200	PFS-0480-NADD	19268	PFS-0480-NADW	20039
	208...625	200	250	PFS-0625-NADD	27237	PFS-0625-NADW	28326
	260...780	250	300	PFS-0780-NADD	30424	PFS-0780-NADW	31641
	323...970	315	400	PFS-0970-NADD	R/F	PFS-0970-NADW	R/F
	416...1250	400	500	PFS-1250-NADD	R/F	PFS-1250-NADW	R/F

Non-Combination PF Softstarters include:

- A 120V control power transformer with fused primary and secondary
- PF built-in electronic motor overload protection
- PF built-in SCR bypass/run contactor
- Available in UL Type 12 or 4 Enclosures
- Terminal blocks for remote control devices

❶ Motor FLA rating must fall within specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PF in the "Full Voltage" starting mode. Contact Sprecher+Schuh technical support for further guidance.

❷ Line and load termination are provided as standard.

❸ Include suffix and price adder from page D46 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

❹ Other UL type enclosures available. Ask your Sprecher + Schuh representative.

❺ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PFS-0085-NHD**D** becomes PFS-0085-NHD**R**. Price and dimensions remain the same.

Enclosed Non-Combination Starters - Line Connected ❷❸❹

Rated Voltage [V AC]	Motor Current (Amps) ❶	kW 50 Hz	Hp 60 Hz	Type 12 [Type 3R ❺] Industrial Dusttight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
460 ❺	1...5	2.2	3	PFS-0005-NBDD	4158	PFS-0005-NBDW	4324
	5...25	11	15	PFS-0025-NBDD	4448	PFS-0025-NBDW	4626
	8.6...43	22	30	PFS-0043-NBDD	4708	PFS-0043-NBDW	4897
	12...60	30	40	PFS-0060-NBDD	5216	PFS-0060-NBDW	5424
	17...85	45	60	PFS-0085-NBDD	5592	PFS-0085-NBDW	5816
	27...108	55	75	PFS-0108-NBDD	6288	PFS-0108-NBDW	6539
	34...135	75	100	PFS-0135-NBDD	9489	PFS-0135-NBDW	9869
	67...201	110	150	PFS-0201-NBDD	10909	PFS-0201-NBDW	11345
	84...251	132	200	PFS-0251-NBDD	11735	PFS-0251-NBDW	12204
	106...317	160	250	PFS-0317-NBDD	13010	PFS-0317-NBDW	13530
	120...361	200	300	PFS-0361-NBDD	14053	PFS-0361-NBDW	14615
	160...480	250	400	PFS-0480-NBDD	19268	PFS-0480-NBDW	20039
	208...625	355	500	PFS-0625-NBDD	27237	PFS-0625-NBDW	28326
	260...780	450	600	PFS-0780-NBDD	30424	PFS-0780-NBDW	31641
	323...970	560	800	PFS-0970-NBDD	R/F	PFS-0970-NBDW	R/F
	416...1250	710	1000	PFS-1250-NBDD	R/F	PFS-1250-NBDW	R/F
500/575	1...5	2.2	3	PFS-0005-NCDD	4158	PFS-0005-NCDW	4324
	5...25	15	20	PFS-0025-NCDD	4448	PFS-0025-NCDW	4626
	8.6...43	22	40	PFS-0043-NCDD	4708	PFS-0043-NCDW	4897
	12...60	37	50	PFS-0060-NCDD	5216	PFS-0060-NCDW	5424
	17...85	55	75	PFS-0085-NCDD	5592	PFS-0085-NCDW	5816
	27...108	75	100	PFS-0108-NCDD	6288	PFS-0108-NCDW	6539
	34...135	90	125	PFS-0135-NCDD	9489	PFS-0135-NCDW	9869
	67...201	132	200	PFS-0201-NCDD	10909	PFS-0201-NCDW	11345
	84...251	160	250	PFS-0251-NCDD	11735	PFS-0251-NCDW	12204
	106...317	200	300	PFS-0317-NCDD	13010	PFS-0317-NCDW	13530
	120...361	250	350	PFS-0361-NCDD	14053	PFS-0361-NCDW	14615
	160...480	315	500	PFS-0480-NCDD	19268	PFS-0480-NCDW	20039
	208...625	450	600	PFS-0625-NCDD	27237	PFS-0625-NCDW	28326
	260...780	560	800	PFS-0780-NCDD	30424	PFS-0780-NCDW	31641
	323...970	710	1000	PFS-0970-NCDD	R/F	PFS-0970-NCDW	R/F
	416...1250	900	1300	PFS-1250-NCDD	R/F	PFS-1250-NCDW	R/F

Non-Combination PF Softstarters include:

- A 120V control power transformer with fused primary and secondary
- PF built-in electronic motor overload protection
- PF built-in SCR bypass/run contactor
- Available in UL Type 12 or 4 Enclosures
- Terminal blocks for remote control devices

❶ Motor FLA rating must fall within specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PF in the "Full Voltage" starting mode. Contact Sprecher+Schuh technical support for further guidance.

❷ Line and load termination are provided as standard.

❸ Include suffix and price adder from page D46 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

❹ Other UL type enclosures available. Ask your Sprecher + Schuh representative.

❺ For 380V applications choose softstarter based on FLA, then change the NB code in the catalog number to NG.
Example PFS-0085-NBDD becomes PFS-0085-N**G**DD, which covers 25 HP @ 380V FLA 37. Price remains the same.

❻ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PFS-0085-NBD**D** becomes PFS-0085-NBD**R**. Price and dimensions remain the same.

D

PFS Softstarters

Enclosed Combination Circuit Breaker - Line Connected ❶❷❹

Rated Voltage [V AC]	kW 50 Hz	Hp 60 Hz	Controller Current Rating ❸	Type 12 [Type 3R ❺] Industrial Dusttight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
200	—	0.5	5 A	PFS-0005-BHD33D	6085	PFS-0005-BHD33W	6328
	—	0.75	5 A	PFS-0005-BHD34D	6085	PFS-0005-BHD34W	6328
	—	1	5 A	PFS-0005-BHD35D	6085	PFS-0005-BHD35W	6328
	—	1.5	25 A	PFS-0025-BHD36D	6259	PFS-0025-BHD36W	6509
	—	2	25 A	PFS-0025-BHD37D	6259	PFS-0025-BHD37W	6509
	—	3	25 A	PFS-0025-BHD38D	6259	PFS-0025-BHD38W	6509
	—	5	25 A	PFS-0025-BHD39D	6259	PFS-0025-BHD39W	6509
	—	7.5	25 A	PFS-0025-BHD40D	6259	PFS-0025-BHD40W	6509
	—	10	43 A	PFS-0043-BHD41D	6432	PFS-0043-BHD41W	6690
	—	15	60 A	PFS-0060-BHD42D	6968	PFS-0060-BHD42W	7247
	—	20	85 A	PFS-0085-BHD43D	7606	PFS-0085-BHD43W	7910
	—	25	85 A	PFS-0085-BHD44D	7606	PFS-0085-BHD44W	7910
	—	30	108 A	PFS-0108-BHD45D	10590	PFS-0108-BHD45W	11014
	—	40	135 A	PFS-0135-BHD46D	11981	PFS-0135-BHD46W	12460
	—	50	201 A	PFS-0201-BHD47D	15212	PFS-0201-BHD47W	15820
	—	60	201 A	PFS-0201-BHD48D	15212	PFS-0201-BHD48W	15820
	—	75	251 A	PFS-0251-BHD49D	16371	PFS-0251-BHD49W	17026
	—	100	317 A	PFS-0317-BHD50D	17965	PFS-0317-BHD50W	18683
	—	125	361 A	PFS-0361-BHD51D	19703	PFS-0361-BHD51W	20491
	—	150	480 A	PFS-0480-BHD52D	24339	PFS-0480-BHD52W	25313
	—	200	625 A	PFS-0625-BHD54D	31293	PFS-0625-BHD54W	32545
	—	250	780 A	PFS-0780-BHD56D	36653	PFS-0780-BHD56W	38120
230	0.37	0.5	5 A	PFS-0005-BAD33D	6085	PFS-0005-BAD33W	6328
	0.55	0.75	5 A	PFS-0005-BAD34D	6085	PFS-0005-BAD34W	6328
	0.75	1	5 A	PFS-0005-BAD35D	6085	PFS-0005-BAD35W	6328
	1.1	1.5	25 A	PFS-0025-BAD36D	6259	PFS-0025-BAD36W	6509
	1.5	2	25 A	PFS-0025-BAD37D	6259	PFS-0025-BAD37W	6509
	2.2	3	25 A	PFS-0025-BAD38D	6259	PFS-0025-BAD38W	6509
	3.7	5	25 A	PFS-0025-BAD39D	6259	PFS-0025-BAD39W	6509
	5.5	7.5	25 A	PFS-0025-BAD40D	6259	PFS-0025-BAD40W	6509
	7.5	10	43 A	PFS-0043-BAD41D	6432	PFS-0043-BAD41W	6690
	11	15	43 A	PFS-0043-BAD42D	6432	PFS-0043-BAD42W	6690
	15	20	60 A	PFS-0060-BAD43D	6968	PFS-0060-BAD43W	7247
	18.5	25	85 A	PFS-0085-BAD44D	7606	PFS-0085-BAD44W	7910
	22	30	85 A	PFS-0085-BAD45D	7606	PFS-0085-BAD45W	7910
	30	40	108 A	PFS-0108-BAD46D	10590	PFS-0108-BAD46W	11014
	37	50	135 A	PFS-0135-BAD47D	11981	PFS-0135-BAD47W	12460
	45	60	201 A	PFS-0201-BAD48D	15212	PFS-0201-BAD48W	15820
	55	75	201 A	PFS-0201-BAD49D	15212	PFS-0201-BAD49W	15820
	75	100	251 A	PFS-0251-BAD50D	16371	PFS-0251-BAD50W	17026
	90	125	317 A	PFS-0317-BAD51D	17965	PFS-0317-BAD51W	18683
	110	150	361 A	PFS-0361-BAD52D	19703	PFS-0361-BAD52W	20491
	132	200	480 A	PFS-0480-BAD54D	24339	PFS-0480-BAD54W	25313
	185	250	625 A	PFS-0625-BAD56D	31293	PFS-0625-BAD56W	32545
	220	300	780 A	PFS-0780-BAD57D	36653	PFS-0780-BAD57W	38120

Combination Circuit Breaker PF Softstarters include:

- A thermal magnetic circuit breaker with external operating handle
- A 120V control power transformer with fused primary and secondary
- PF built-in electronic motor overload protection
- PF built-in SCR bypass/run contactor
- Available in UL Type 12 or 4 Enclosures
- Terminal blocks for remote control devices

❶ Other UL Type enclosures available. Contact your Sprecher + Schuh representative for pricing.
❷ Include suffix and price adder from page D46 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ See page D55 for circuit breaker ratings.
❺ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PFS-0085-BHD43**D** becomes PFS-0085-BHD43**R**. Price and dimensions remain the same.

Enclosed Combination Circuit Breaker - Line Connected ❶❷❹

Rated Voltage [V AC]	kW 50 Hz	Hp 60 Hz	Controller Current Rating ❸	Type 12 [Type 3R ❻] Industrial Dusttight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
460 ❺	0.37	0.5	5 A	PFS-0005-BBD33D	6085	PFS-0005-BBD33W	6328
	0.55	0.75	5 A	PFS-0005-BBD34D	6085	PFS-0005-BBD34W	6328
	0.75	1	5 A	PFS-0005-BBD35D	6085	PFS-0005-BBD35W	6328
	1.1	1.5	5 A	PFS-0005-BBD36D	6085	PFS-0005-BBD36W	6328
	1.5	2	5 A	PFS-0005-BBD37D	6085	PFS-0005-BBD37W	6328
	2.2	3	5 A	PFS-0005-BBD38D	6085	PFS-0005-BBD38W	6328
	3.7	5	25 A	PFS-0025-BBD39D	6259	PFS-0025-BBD39W	6509
	5.5	7.5	25 A	PFS-0025-BBD40D	6259	PFS-0025-BBD40W	6509
	7.5	10	25 A	PFS-0025-BBD41D	6259	PFS-0025-BBD41W	6509
	11	15	25 A	PFS-0025-BBD42D	6259	PFS-0025-BBD42W	6509
	15	20	43 A	PFS-0043-BBD43D	6432	PFS-0043-BBD43W	6690
	18.5	25	43 A	PFS-0043-BBD44D	6432	PFS-0043-BBD44W	6690
	22	30	43 A	PFS-0043-BBD45D	6432	PFS-0043-BBD45W	6690
	30	40	60 A	PFS-0060-BBD46D	6968	PFS-0060-BBD46W	7247
	37	50	85 A	PFS-0085-BBD47D	7606	PFS-0085-BBD47W	7910
	45	60	85 A	PFS-0085-BBD48D	7606	PFS-0085-BBD48W	7910
	55	75	108 A	PFS-0108-BBD49D	10590	PFS-0108-BBD49W	11014
	75	100	135 A	PFS-0135-BBD50D	11981	PFS-0135-BBD50W	12460
	90	125	201 A	PFS-0201-BBD51D	15212	PFS-0201-BBD51W	15820
	110	150	201 A	PFS-0201-BBD52D	15212	PFS-0201-BBD52W	15820
	132	200	251 A	PFS-0251-BBD54D	16371	PFS-0251-BBD54W	17026
	160	250	317 A	PFS-0317-BBD56D	17965	PFS-0317-BBD56W	18683
	200	300	361 A	PFS-0361-BBD57D	19703	PFS-0361-BBD57W	20491
	250	350	480 A	PFS-0480-BBD58D	24339	PFS-0480-BBD58W	25313
	250	400	480 A	PFS-0480-BBD59D	24339	PFS-0480-BBD59W	25313
	355	500	625 A	PFS-0625-BBD61D	31293	PFS-0625-BBD61W	32545
	450	600	780 A	PFS-0780-BBD62D	36653	PFS-0780-BBD62W	38120
575	0.37	0.75	5 A	PFS-0005-BCD34D	6085	PFS-0005-BCD34W	6328
	0.55	1	5 A	PFS-0005-BCD35D	6085	PFS-0005-BCD35W	6328
	0.75	1.5	5 A	PFS-0005-BCD36D	6085	PFS-0005-BCD36W	6328
	1.1	2	5 A	PFS-0005-BCD37D	6085	PFS-0005-BCD37W	6328
	2.2	3	5 A	PFS-0005-BCD38D	6085	PFS-0005-BCD38W	6328
	3.7	5	25 A	PFS-0025-BCD39D	6259	PFS-0025-BCD39W	6509
	5.5	7.5	25 A	PFS-0025-BCD40D	6259	PFS-0025-BCD40W	6509
	7.5	10	25 A	PFS-0025-BCD41D	6259	PFS-0025-BCD41W	6509
	11	15	25 A	PFS-0025-BCD42D	6259	PFS-0025-BCD42W	6509
	15	20	43 A	PFS-0043-BCD43D	6432	PFS-0043-BCD43W	6690
	18.5	25	43 A	PFS-0043-BCD44D	6432	PFS-0043-BCD44W	6690
	22	30	43 A	PFS-0043-BCD45D	6432	PFS-0043-BCD45W	6690
	22	40	43 A	PFS-0043-BCD46D	6432	PFS-0043-BCD46W	6690
	37	50	60 A	PFS-0060-BCD47D	6968	PFS-0060-BCD47W	7247
	45	60	85 A	PFS-0085-BCD48D	7606	PFS-0085-BCD48W	7910
	55	75	85 A	PFS-0085-BCD49D	7606	PFS-0085-BCD49W	7910
	75	100	108 A	PFS-0108-BCD50D	10590	PFS-0108-BCD50W	11014
	90	125	135 A	PFS-0135-BCD51D	11981	PFS-0135-BCD51W	12460
	110	150	201 A	PFS-0201-BCD52D	15212	PFS-0201-BCD52W	15820
	132	200	201 A	PFS-0201-BCD54D	15212	PFS-0201-BCD54W	15820
	160	250	251 A	PFS-0251-BCD56D	16371	PFS-0251-BCD56W	17026
	200	300	317 A	PFS-0317-BCD57D	17965	PFS-0317-BCD57W	18683
	250	350	361 A	PFS-0361-BCD58D	19703	PFS-0361-BCD58W	20491
	295	400	480 A	PFS-0480-BCD59D	24339	PFS-0480-BCD59W	25313
	315	450	480 A	PFS-0480-BCD60D	24339	PFS-0480-BCD60W	25313
	315	500	480 A	PFS-0480-BCD61D	24339	PFS-0480-BCD61W	25313
	450	600	625 A	PFS-0625-BCD62D	31293	PFS-0625-BCD62W	32545
	560	800	780 A	PFS-0780-BCD65D	36653	PFS-0780-BCD65W	38120

Combination Circuit Breaker PF Softstarters include:

- A thermal magnetic circuit breaker with external operating handle
- A 120V control power transformer with fused primary and secondary
- PF built-in electronic motor overload protection
- PF built-in SCR bypass/run contactor
- Available in UL Type 12 or 4 Enclosures
- Terminal blocks for remote control devices

❶ Other UL Type enclosures available. Contact your Sprecher + Schuh representative.
❷ Include suffix and price adder from page D46 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.
❸ The nominal current rating for the combination package may differ from the controller, based on the horse power. Consult your Sprecher + Schuh representative.
❹ See page D55 for circuit breaker ratings.
❺ For 380V applications choose softstarter based on FLA, then change the BB code in the catalog number to BG. Example PFS-0085-BBD47D becomes PFS-0085-B**G**D47D, which covers 25 HP @ 380V FLA 37. Price remains the same.
❻ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PFS-0085-BBD47**D** becomes PFS-0085-BBD47**R**. Price and dimensions remain the same.

D

PFS Softstarters

Enclosed Combination Fusible Starters - Line Connected ❶❷❹

Rated Voltage [V AC]	kW 50 Hz	Hp 60 Hz	Controller Current Rating ❸	Type 12 [Type 3R ❺] Industrial Dusttight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
200	—	0.5	5 A	PFS-0005-FHD33D	5911	PFS-0005-FHD33W	6147
	—	0.75	5 A	PFS-0005-FHD34D	5911	PFS-0005-FHD34W	6147
	—	1	5 A	PFS-0005-FHD35D	5911	PFS-0005-FHD35W	6147
	—	1.5	25 A	PFS-0025-FHD36D	6085	PFS-0025-FHD36W	6328
	—	2	25 A	PFS-0025-FHD37D	6085	PFS-0025-FHD37W	6328
	—	3	25 A	PFS-0025-FHD38D	6085	PFS-0025-FHD38W	6328
	—	5	25 A	PFS-0025-FHD39D	6085	PFS-0025-FHD39W	6328
	—	7.5	25 A	PFS-0025-FHD40D	6085	PFS-0025-FHD40W	6328
	—	10	43 A	PFS-0043-FHD41D	6259	PFS-0043-FHD41W	6509
	—	15	60 A	PFS-0060-FHD42D	6795	PFS-0060-FHD42W	7066
	—	20	85 A	PFS-0085-FHD43D	7838	PFS-0085-FHD43W	8151
	—	25	85 A	PFS-0085-FHD44D	7838	PFS-0085-FHD44W	8151
	—	30	108 A	PFS-0108-FHD45D	10880	PFS-0108-FHD45W	11315
	—	40	135 A	PFS-0135-FHD46D	11532	PFS-0135-FHD46W	11993
	—	50	201 A	PFS-0201-FHD47D	14401	PFS-0201-FHD47W	14977
	—	60	201 A	PFS-0201-FHD48D	14401	PFS-0201-FHD48W	14977
	—	75	251 A	PFS-0251-FHD49D	15647	PFS-0251-FHD49W	16272
	—	100	317 A	PFS-0317-FHD50D	16806	PFS-0317-FHD50W	17478
	—	125	361 A	PFS-0361-FHD51D	18689	PFS-0361-FHD51W	19436
	—	150	480 A	PFS-0480-FHD52D	24194	PFS-0480-FHD52W	25162
	—	200	625 A	PFS-0625-FHD54D	30714	PFS-0625-FHD54W	31942
	—	250	780 A	PFS-0780-FHD56D	35494	PFS-0780-FHD56W	36914
230	0.37	0.5	5 A	PFS-0005-FAD33D	5911	PFS-0005-FAD33W	6147
	0.55	0.75	5 A	PFS-0005-FAD34D	5911	PFS-0005-FAD34W	6147
	0.75	1	5 A	PFS-0005-FAD35D	5911	PFS-0005-FAD35W	6147
	1.1	1.5	25 A	PFS-0025-FAD36D	6085	PFS-0025-FAD36W	6328
	1.5	2	25 A	PFS-0025-FAD37D	6085	PFS-0025-FAD37W	6328
	2.2	3	25 A	PFS-0025-FAD38D	6085	PFS-0025-FAD38W	6328
	3.7	5	25 A	PFS-0025-FAD39D	6085	PFS-0025-FAD39W	6328
	5.5	7.5	25 A	PFS-0025-FAD40D	6085	PFS-0025-FAD40W	6328
	7.5	10	43 A	PFS-0043-FAD41D	6259	PFS-0043-FAD41W	6509
	11	15	43 A	PFS-0043-FAD42D	6259	PFS-0043-FAD42W	6509
	15	20	60 A	PFS-0060-FAD43D	6795	PFS-0060-FAD43W	7066
	18.5	25	85 A	PFS-0085-FAD44D	7838	PFS-0085-FAD44W	8151
	22	30	85 A	PFS-0085-FAD45D	7838	PFS-0085-FAD45W	8151
	30	40	108 A	PFS-0108-FAD46D	10880	PFS-0108-FAD46W	11315
	37	50	135 A	PFS-0135-FAD47D	11532	PFS-0135-FAD47W	11993
	45	60	201 A	PFS-0201-FAD48D	14401	PFS-0201-FAD48W	14977
	55	75	201 A	PFS-0201-FAD49D	14401	PFS-0201-FAD49W	14977
	75	100	251 A	PFS-0251-FAD50D	15647	PFS-0251-FAD50W	16272
	90	125	317 A	PFS-0317-FAD51D	16806	PFS-0317-FAD51W	17478
	110	150	361 A	PFS-0361-FAD52D	18689	PFS-0361-FAD52W	19436
	132	200	480 A	PFS-0480-FAD54D	24194	PFS-0480-FAD54W	25162
	185	250	625 A	PFS-0625-FAD56D	30714	PFS-0625-FAD56W	31942
	220	300	780 A	PFS-0780-FAD57D	35494	PFS-0780-FAD57W	36914

Combination Fusible PF Softstarters include:

- A fused switch with external operating handle
- A 120V control power transformer with fused primary and secondary
- PF built-in electronic motor overload protection
- PF built-in SCR bypass/run contactor
- Available in UL Type 12 or 4 Enclosures
- Terminal blocks for remote control devices

❶ Other UL Type enclosures available. Contact your Sprecher + Schuh representative.
❷ Include suffix and price adder from page D46 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.
❸ The nominal current rating for the combination package may differ from the controller, based on the horse power. Consult your Sprecher + Schuh representative.
❹ Fuse clips accept J-type fuses. Power fuses are not supplied. See page D55 for Fusible Disconnect amp ratings.
❺ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PFS-0085-FHD43**D** becomes PFS-0085-FHD43**R**. Price and dimensions remain the same.

Enclosed Combination Fusible Starters - Line Connected ❶❷❹

Rated Voltage [V AC]	kW 50 Hz	Hp 60 Hz	Controller Current Rating ❸	Type 12 [Type 3R ❻] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
460 ❺	0.37	0.5	5 A	PFS-0005-FBD33D	5911	PFS-0005-FBD33W	6147
	0.55	0.75	5 A	PFS-0005-FBD34D	5911	PFS-0005-FBD34W	6147
	0.75	1	5 A	PFS-0005-FBD35D	5911	PFS-0005-FBD35W	6147
	1.1	1.5	5 A	PFS-0005-FBD36D	5911	PFS-0005-FBD36W	6147
	1.5	2	5 A	PFS-0005-FBD37D	5911	PFS-0005-FBD37W	6147
	2.2	3	5 A	PFS-0005-FBD38D	5911	PFS-0005-FBD38W	6147
	3.7	5	25 A	PFS-0025-FBD39D	6085	PFS-0025-FBD39W	6328
	5.5	7.5	25 A	PFS-0025-FBD40D	6085	PFS-0025-FBD40W	6328
	7.5	10	25 A	PFS-0025-FBD41D	6085	PFS-0025-FBD41W	6328
	11	15	25 A	PFS-0025-FBD42D	6085	PFS-0025-FBD42W	6328
	15	20	43 A	PFS-0043-FBD43D	6259	PFS-0043-FBD43W	6509
	18.5	25	43 A	PFS-0043-FBD44D	6259	PFS-0043-FBD44W	6509
	22	30	43 A	PFS-0043-FBD45D	6259	PFS-0043-FBD45W	6509
	30	40	60 A	PFS-0060-FBD46D	6795	PFS-0060-FBD46W	7066
	37	50	85 A	PFS-0085-FBD47D	7838	PFS-0085-FBD47W	8151
	45	60	85 A	PFS-0085-FBD48D	7838	PFS-0085-FBD48W	8151
	55	75	108 A	PFS-0108-FBD49D	10880	PFS-0108-FBD49W	11315
	75	100	135 A	PFS-0135-FBD50D	11532	PFS-0135-FBD50W	11993
	90	125	201 A	PFS-0201-FBD51D	14401	PFS-0201-FBD51W	14977
	110	150	201 A	PFS-0201-FBD52D	14401	PFS-0201-FBD52W	14977
	132	200	251 A	PFS-0251-FBD54D	15647	PFS-0251-FBD54W	16272
	160	250	317 A	PFS-0317-FBD56D	16806	PFS-0317-FBD56W	17478
	200	300	361 A	PFS-0361-FBD57D	18689	PFS-0361-FBD57W	19436
	250	350	480 A	PFS-0480-FBD58D	24194	PFS-0480-FBD58W	25162
	250	400	480 A	PFS-0480-FBD59D	24194	PFS-0480-FBD59W	25162
	355	500	625 A	PFS-0625-FBD61D	30714	PFS-0625-FBD61W	31942
	450	600	780 A	PFS-0780-FBD62D	35494	PFS-0780-FBD62W	36914
575	0.37	0.75	5 A	PFS-0005-FCD34D	5911	PFS-0005-FCD34W	6147
	0.55	1	5 A	PFS-0005-FCD35D	5911	PFS-0005-FCD35W	6147
	0.75	1.5	5 A	PFS-0005-FCD36D	5911	PFS-0005-FCD36W	6147
	1.1	2	5 A	PFS-0005-FCD37D	5911	PFS-0005-FCD37W	6147
	2.2	3	5 A	PFS-0005-FCD38D	5911	PFS-0005-FCD38W	6147
	3.7	5	25 A	PFS-0025-FCD39D	6085	PFS-0025-FCD39W	6328
	5.5	7.5	25 A	PFS-0025-FCD40D	6085	PFS-0025-FCD40W	6328
	7.5	10	25 A	PFS-0025-FCD41D	6085	PFS-0025-FCD41W	6328
	11	15	25 A	PFS-0025-FCD42D	6085	PFS-0025-FCD42W	6328
	15	20	43 A	PFS-0043-FCD43D	6259	PFS-0043-FCD43W	6509
	18.5	25	43 A	PFS-0043-FCD44D	6259	PFS-0043-FCD44W	6509
	22	30	43 A	PFS-0043-FCD45D	6259	PFS-0043-FCD45W	6509
	22	40	43 A	PFS-0043-FCD46D	6259	PFS-0043-FCD46W	6509
	37	50	60 A	PFS-0060-FCD47D	6795	PFS-0060-FCD47W	7066
	45	60	85 A	PFS-0085-FCD48D	7838	PFS-0085-FCD48W	8151
	55	75	85 A	PFS-0085-FCD49D	7838	PFS-0085-FCD49W	8151
	75	100	108 A	PFS-0108-FCD50D	10880	PFS-0108-FCD50W	11315
	90	125	135 A	PFS-0135-FCD51D	11532	PFS-0135-FCD51W	11993
	110	150	201 A	PFS-0201-FCD52D	14401	PFS-0201-FCD52W	14977
	132	200	201 A	PFS-0201-FCD54D	14401	PFS-0201-FCD54W	14977
	160	250	251 A	PFS-0251-FCD56D	15647	PFS-0251-FCD56W	16272
	200	300	317 A	PFS-0317-FCD57D	16806	PFS-0317-FCD57W	17478
	250	350	361 A	PFS-0361-FCD58D	18689	PFS-0361-FCD58W	19436
	295	400	480 A	PFS-0480-FCD59D	24194	PFS-0480-FCD59W	25162
	315	450	480 A	PFS-0480-FCD60D	24194	PFS-0480-FCD60W	25162
	315	500	480 A	PFS-0480-FCD61D	24194	PFS-0480-FCD61W	25162
	450	600	625 A	PFS-0625-FCD62D	30714	PFS-0625-FCD62W	31942
	560	800	780 A	PFS-0780-FCD65D	35494	PFS-0780-FCD65W	36914

Combination Fusible PF Softstarters include:

- A fused switch with external operating handle
- A 120V control power transformer with fused primary and secondary
- PF built-in electronic motor overload protection
- PF built-in SCR bypass/run contactor
- Available in UL Type 12 or 4 Enclosures
- Terminal blocks for remote control devices

❶ Other UL Type enclosures available. Contact your Sprecher + Schuh representative for pricing.
❷ Include suffix and price adder from page D46 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ Fuse clips accept J-type fuses (Class L fuses for some PF-480 applications; see page D55 for details). Power fuses are not supplied.
❺ For 380V applications choose softstarter based on FLA, then change the FB code in the catalog number to FG. Example PFS-0085-FBD47D becomes PFS-0085-F**G**D47D, which covers 25 HP @ 380V FLA 37. Price remains the same.
❻ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PFS-0085-FBD47**D** becomes PFS-0085-FBD47**R**. Price and dimensions remain the same.

D

PFS Softstarters

Options - Factory Modifications

Description	Catalog Number	Price Adder
Pump Control ❶ Provides smooth motor acceleration and deceleration, reducing surges caused by the starting and stopping of centrifugal pumps. Starting time is adjustable from 0...30 seconds and stopping time is adjustable from 0...120 seconds		
For 5A unit	Change "PFS" to "**PFB**"	**2150**
For 25A unit		
For 43A unit		
For 60A unit		
For 85A unit		
For 108A unit		
For 135A unit		
For 201A unit		
For 251A unit		
For 317A unit		
For 361A unit		
For 480A unit		
For 625A unit		
For 780A unit		
For 970A unit		
For 1250A unit		
Braking Control ❶❷ Provides Smart Motor Brake, Accu-Stop, and Slow Speed with Braking		
For 5A unit	Change "PFS" to "**PFD**"	**2556**
For 25A unit		**2556**
For 43A unit		**2556**
For 60A unit		**2556**
For 85A unit		**2556**
For 108A unit		**3195**
For 135A unit		**5533**
For 201A unit		**6405**
For 251A unit		**7246**
For 317A unit		**7480**
For 361A unit		**7917**
For 480A unit		**11549**
For 625A unit		**12624**
For 780A unit		**12624**
For 970A unit		**15273**
For 1250A unit		**15273**
Protective Module Protects power components from transient voltage spikes and transient voltage spikes and shunts noise energy		
600V Line Side Protective Module	Add suffix - "**-8L**"	**944**
600V Load Side Protective Module	Add suffix - "**-8M**"	**944**
600V Both Line and Load Side Protective Modules	Add suffix - "**-8B**"	**1890**

Description	Catalog Number	Price Adder
Pushbuttons (2) START and STOP pushbuttons for enclosed softstarters	Add suffix "**-3**"	**145**
Selector Switch Two or three position selector switch for enclosed softstarters		
"ON-OFF"	Add suffix "**-6**"	**145**
"HAND-OFF-AUTO"	Add suffix "**-7**"	**145**
Pilot Light Red pilot light with "RUN" inscription for enclosed softstarters	Add suffix "**-1**"	**228**
Voltmeter (Panelboard) Measures all three phases. Includes switch.	Add suffix "**-VM3**"	**3317**
Ammeter (Panelboard) For monitoring all three phases. Includes switch.	Add suffix "**-AM3**"	**3317**
Elapsed Time Meter Measures elapsed motor running time	Add suffix "**-ETM**"	**1660**

❶ Only one option may be added to the standard unit. See detailed descriptions of options starting on page D32.

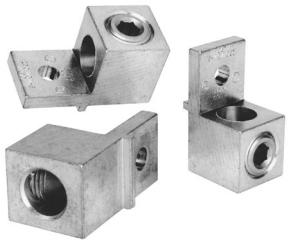
❷ Not intended to be used as an emergency stop. Refer to applicable standards for emergency stop requirements.

Options - Field Modifications

Protective Modules ❶

	Current Rating	Description	Catalog Number	Price
 PFP-0085-600V	5...85	600V Protective Module • PF (3 Lead) Line Connected Applications: Protective modules may be installed on the line and/or load side • PF (6 Lead) Delta Connected Applications: Protective modules must be installed on the line side only. • Clamping voltage range 705V…1750V, energy rating 290 joules	PFP-0085-600V	493
	108...480		PFP-0480-600V	535

Terminal Lug Kits (108...1250 A) ❷

	Current Rating (A)	Conductor Size	Total No. of Line Controller Terminal Lugs Possible Each Side: Line Side	Total No. of Line Controller Terminal Lugs Possible Each Side: Load Side	Pkg. Qty.	Catalog Number	Price
	108...135	#6...250 MCM AWG 16 mm^2...120mm^2	3	3	3	PNX-1120	113
	201...251		6	6			
	317...480	#4...500 MCM AWG 25 mm^2..240MM^2	6	6		PNX-1240	167
	625...780	2/0...500 MCM AWG	6	6		CA6-L630	See Section A
	970	4/0...500 MCM AWG	3	3		CA6-L860	
	1250	2/0...500 MCM AWG	3	3		CA6-L630	
		4/0...500 MCM AWG	3	3		CA6-L860	

IEC Terminal Covers ❸❹

	Description	Pkg. Qty.	Catalog Number	Price
	IEC line or load terminal covers for 108...135A devices. Dead front protection	1	PFT-0135	69
	IEC line or load terminal covers for 201...251A devices. Dead front protection		PFT-0251	80
	IEC line or load terminal covers for 317...480A devices. Dead front protection.		PFT-0480	88

❶ The same protective module mounts on the line or load side of the PF Softstarter. For applications requiring both line and load side protection, two protective modules must be ordered.
❷ Line and Load terminals are provided as standard on enclosed PF Softstarters.
❸ PF 5...85A units have box lugs as standard. No additional lugs are required. The 1250 A device requires (1) CA6-L630 and (1) CA6-L860 per connection. When a multi-conductor lug is required, refer to the PF User Manual for appropriate lug catalog number.
❹ PFx-108...480 units include one terminal guard as standard.

Control Modules

Description	PF Rating	For units rated 200...600V AC					
		100...240V AC Catalog Number	Price	Qty	24V AC/DC Catalog Number	Price	Qty
Standard	All	**PFS**	**2506**	1	**PFS-024**	**2593**	1
Pump	All	**PFB**	**4419**	1	**PFB-024**	**4564**	1
Braking	5...85 A	**PFD-0085**	**5013**	1	**PFD-0085-024**	**5056**	1
	108...251 A	**PFD-0251**	**5896**	1	**PFD-0251-024**	**6085**	1
	317...480 A	**PFD-0480**	**7591**	1	**PFD-0480-024**	**7591**	1
	625...780 A	**PFD-0780**	**7026**	1	~	~	~
	970...1250 A	**PFD-1250**	**8693**	1	~	~	~

Power Poles

PF Rating	Series	Line Voltage 200...600V Catalog Number ❶	Price	Qty
5 A	B	**PFL-0005-600V ❷**	**3042**	1
25 A	B	**PFL-0025-600V ❷**	**3216**	1
43 A	B	**PFL-0043-600V ❷**	**3390**	1
60 A	B	**PFL-0060-600V ❷**	**3549**	1
85 A	B	**PFL-0085-600V ❷**	**4057**	1
108 A	B	**PFL-0108-600V ❷**	**3535**	1
135 A	B	**PFL-0135-600V ❷**	**4998**	1
201 A	B	**PFL-0201-600V ❸**	**3028**	1
251 A	B	**PFL-0251-600V ❸**	**3709**	1
317 A	B	**PFL-0317-600V ❸**	**4042**	1
361 A	B	**PFL-0361-600V ❸**	**4375**	1
480 A	B	**PFL-0480-600V ❸**	**6722**	1
625 A	B	**PFL-0625-600V ❸**	**4288**	1
780 A	B	**PFL-0780-600V ❸**	**4752**	1
970 A	B	**PFL-0970-600V ❸**	**5752**	1
1250 A	B	**PFL-1250-600V ❸**	**6244**	1

Each power pole contains two SCR's and one bypass contactor power pole. The PF requires three power poles. For example: the replacement power pole for a PFS-0108-600V series B is PFL-0108-600V

Internal Heatsink Fans

PF Rating	Series	Catalog Number	Price	Qty
5...85 A	B	**PFV-0085**	**342**	1
108...135 A	B			
201..251 A	B	**PFV-0251**	**444**	1
317...480 A	B	**PFV-0480**	**488**	1
625...1250 A	B	**PFV-1250-120**	**448**	1
625...1250 A	B	**PFV-1250-230**	**448**	1

By-Pass Contactor ❹

PF Rating	Series	110/120V AC Catalog Number	Price	Qty	230/240V AC Catalog Number	Price	Qty
625...780 A	B	**CA6-180-EI-11-120**	**See page A92**	1	**CA6-180-EI-11-220W**	**See page A92**	1
970...1250 A	B	**CA6-420-EI-11-120**		1	**CA6-420-EI-11-220W**		1

❶ One piece provided per part number.
❷ Part number contains three power poles.
❸ Part number contains one power pole.
❹ See special installation instructions included in package.

Standard Features

Installation	Power Wiring	Standard squirrel-cage induction motor or a Wye-Delta, six-lead motor.
	Control Wiring	2- and 3-wire control for a wide variety of applications.
Setup	Keypad	Front keypad and backlit LCD display.
Starting and Stopping Modes		● Soft Start ● Current Limit Start ● Dual Ramp ● Full Voltage ● Linear Speed Acceleration ● Preset Slow Speed ● Soft Stop
Protection and Diagnostics		Power loss, line fault, voltage unbalance, excessive start/hour, phase reversal, undervoltage, overvoltage, controller temp, stall, jam, open gate, overload, underload.
Metering		Amps, Volts, kW, kWH, elapsed time, power factor, motor thermal capacity usage.
Alarm Contact		Overload, underload, undervoltage, overvoltage, unbalance, jam, stall, and ground fault
Status Indication		Stopped, starting, stopping, at speed, alarm, and fault.
Auxiliary Contacts		Four fully programmable contacts as normal/up-to-speed/external bypass/fault/alarm, (N.O./N.C.). On external bypass (N.O. only).

Optional Features

Pump Control		Helps reduce fluid surges in centrifugal pumping systems during starting and stopping period. Starting time is adjustable from 0...30 seconds. Stopping time is adjustable from 0...120 seconds.
Braking Control	Smart Motor Brake	Provides motor braking without additional equipment for applications that require the motor to stop quickly. Braking current is adjustable from 0...400% of the motor's full load current rating.
	Accu-Stop	Provides controlled position stopping. During stopping, braking torque is applied to the motor until it reaches preset slow speed (7% or 15% of rated speed) and holds the motor at this speed until a stop command is given. Braking torque is then applied until the motor reaches zero speed. Braking current is programmable from 0...450% of full load current.
	Slow Speed with Braking	Used on applications that require slow speed (in the forward direction) for positioning or alignment and also require braking control to stop.

Technical Information

Electrical Ratings				
			UL/CSA/NEMA	IEC
Power Circuit	Rated Operation Voltage		200…600V AC (–15%, +10%)	200…500V
	Rated Insulation Voltage		N/A	500V
	Rated Impulse Voltage		N/A	6000V
	Dielectric Withstand		2200V AC	2500V
	Repetitive Peak Inverse Voltage Rating		1600V	1600V
	Operating Frequency		50/60 Hz	
	Utilization Category	5…480 A	MG 1	AC-53B:3.0-50:1750
		625…1250 A	MG 1	AC-53B:3.0-50:3550
	Protection Against Electrical Shock	5…85 A	NA	IP20
		108…480 A		IP2X (with terminal covers)
		625…1250 A		IP00 (open device)
	DV/DT Protection		RC Snubber Network	
	Transient Protection		Metal Oxide Varistors: 220 Joules	
Control Circuit			UL/CSA/NEMA	IEC
	Rated Operational Voltage	5…480 A	100…240V AC or 24V AC/DC (–15%, +10%)	
		625…1250 A	110/120V AC and 230/240V AC	
	Rated Insulation Voltage		N/A	240V
	Rated Impulse Voltage		N/A	3000V
	Dielectric Withstand		1600V AC	2000V
	Operating Frequency		50/60 Hz	
	Input on state voltage minimum (terminals 15-18)		85V AC, 19.2V DC / 20.4V AC	
	Input on state current (terminals 15-18)		20 mA @ 120V AC/40 mA @ 240V AC, 7.6 mA @24V AC/DC	
	Input off state voltage maximum (terminals 15-18)		50V AC, 10V DC / 12V AC	
	Input off state current @ input off state voltage (terminals 15-18)		<10 mA AC, <3 mA DC	

Technical Information

Electrical Ratings

	SCPD Performance 200…600V		Type 1 ❹					
	SCPD List ❶	Device Rating	Max. Standard Available Fault	Max. Standard Fuse (A) ❷	Max. Standard Available Fault	Max. Circuit Breaker (A)	Max. High Fault	Max. Fuse (A) ❸
Short Circuit Protection	Line Device Operational Current Rating (A)	5	5 kA	20	5 kA	20	70 kA	10
		25	5 kA	100	5 kA	100	70 kA	50
		43	10 kA	150	10 kA	150	70 kA	90
		60	10 kA	225	10 kA	225	70 kA	125
		85	10 kA	300	10 kA	300	70 kA	175
		108	10 kA	400	10 kA	300	70 kA	200
		135	10 kA	500	10 kA	400	70 kA	225
		201	18 kA	600	18 kA	600	70 kA	350
		251	18 kA	700	18 kA	700	70 kA	400
		317	30 kA	800	30 kA	800	69 kA	500
		361	30 kA	1000	30 kA	1000	69 kA	600
		480	42 kA	1200	42 kA	1200	69 kA	800
		625	42 kA	1600	42 kA	1600	74 kA	1600
		780	42 kA	1600	42 kA	2000	74 kA	1600
		970	85 kA	2500	85 kA	2500	85 kA	2500
		1250	85 kA	3000	85 kA	3200	85 kA	3000
	Delta Device Operational Current Rating (A)	8.7	5 kA	35	5 kA	35	70 kA	17.5
		43	5 kA	150	5 kA	150	70 kA	90
		74	10 kA	300	10 kA	300	70 kA	150
		104	10 kA	400	10 kA	400	70 kA	200
		147	10 kA	400	10 kA	400	70 kA	200
		187	10 kA	600	10 kA	500	70 kA	300
		234	10 kA	700	10 kA	700	70 kA	400
		348	18 kA	1000	18 kA	1000	70 kA	600
		435	18 kA	1200	18 kA	1200	70 kA	800
		549	30 kA	1600	30 kA	1600	69 kA	1000
		625	30 kA	1600	30 kA	1600	69 kA	1200
		831	42 kA	1600	30 kA	1600	69 kA	1600
		850	42 kA	1600	42 kA	2000	74 kA	1600
		900	42 kA	1600	42 kA	2000	74 kA	1600
		1200	85 kA	3000	85 kA	3200	85 kA	3000
		1600	85 kA	3000	85 kA	3200	85 kA	3000

Semi-Conductor Fusing		Device Rating	Max. Standard Available Fault	Max. Ampere tested - North American Style	Max. Ampere Tested - European Style
SCCR ❹	Maximum FLC	108	70 kA	A070URD33xxx500	6.9 gRB 73xxx400 6.6URD33xxx500
		135	70 kA	A070URD33xxx500	6.9 gRB 73xxx400 6.6URD33xxx500
		201	70 kA	A070URD33xxx700	6.9 gRB 73xxx630 6.6URD33xxx700
		251	70 kA	A070URD33xxx700	6.9 gRB 73xxx630 6.6URD33xxx700
		317	70 kA	A070URD33xxx900	6.9 gRB 73xxx800 6.6URD33xxx900
		361	70 kA	A070URD33xxx900	6.9 gRB 73xxx800 6.6URD33xxx900
		480	70 kA	A070URD33xxx1250 A100URD73xxx1250	9 URD 73xxx1250 6.6URD33xxx1250
		625	70 kA	A070URD33xxx1400	6.6URD33xxx1400
		780	70 kA	A070URD33xxx1400	6.6URD33xxx1400
		970	85 kA	Two fuses in parallel A070URD33xxx1250	Two fuses in parallel 6.6URD33xxx1250
		1250	85 kA	Two fuses in parallel A070URD33xxx1250	Two fuses in parallel 6.6URD33xxx1250

❶ Consult local codes for proper sizing of short circuit protection.
❷ Non-time delay fuses (K5 – 5 ...480V (8.7...831 A) devices; Class L – 625...1250V (850...1600 A) devices).
❸ High capacity fault rating when used with time delay class CC, J. or L fuses.
❹ Type 1 performance/protection indicates that, under a short-circuit condition, the fused or circuit breaker-protected starter shall cause no danger to persons or installation but may not be suitable for further service without repair or replacement.

Technical Information

Electrical Ratings

Power Requirements	Control Module	1...480 A	120..240V AC	Transformer	75 VA
			24V AC	Transformer	130 VA
			24V DC	Inrush Current	5 A
				Inrush Time	250 ms
				Transient Watts	60 W
				Transient Time	500 ms
				Steady State Watts	24 W
				Minimum Power Supply	FLEX6024A
		625...1250 A	751 VA (recommended 800 VA)		
	Heatsink Fan(s) (A) ❶		5...135 A, 20 VA		
			201...251 A, 40 VA		
			317...480 A, 60 VA		
			625...1250 A, 150 VA		
Steady State Heat Dissipation with Control and Fan Power (Watts)	Controller Rating (A)	5	70		
		23	70		
		43	81		
		60	97		
		85	129		
		108	91		
		135	104		
		201	180		
		251	198		
		317	225		
		361	245		
		480	290		
		625	446		
		780	590		
		970	812		
		1250	1222		
Auxiliary Contacts 19/20 (Aux #1) 29/30 (Aux #2) 31/32 (Aux #3) 33/34 (Aux #4)	Type of Control Circuit		Electromagnetic relay		
	Number of Contacts		1		
	Type of Contacts		programmable N.O./N.C.		
	Type of Current		AC		
	Rated Optional Current		3 A @ 120V AC, 1.5 A @ 240V AC		
	Conventional Thermal Current I_{th}		5 A		
	Make/Break VA		3600/360		
	Utilization Category		AC-15		
PTC Input Ratings	Response Resistance		3400 Ω ± 150 Ω		
	Reset Resistance		1600 Ω ± 100 Ω		
	Short-Circuit Trip Resistance		25 Ω ± 10 Ω		
	Max. Voltage at PTC Terminals (R_{PTC} = 4k)		< 7.5V		
	Max. Voltage at PTC Terminals (R_{PTC} = open)		30V		
	Max. No. of Sensors		6		
	Max. Cold Resistance of PTC Sensor Chain		1500 Ω		
	Response Time		800 ms		
Tach input			0...5V DC, 4.5V DC = 100% Speed		

Environmental

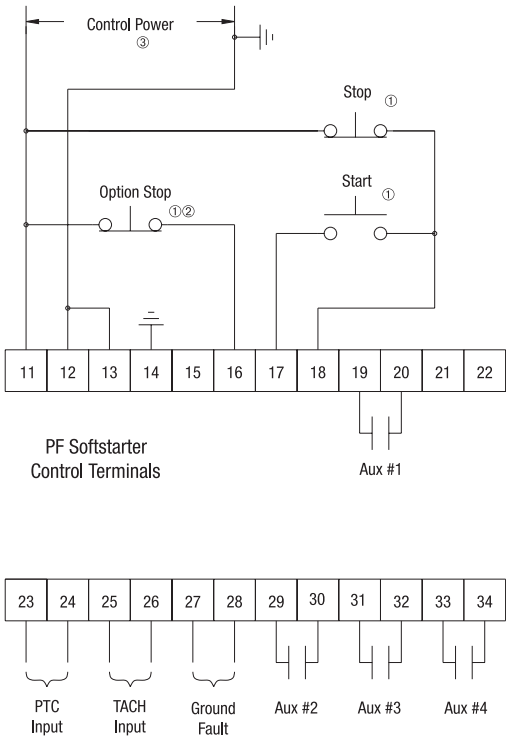
Operating Temperature Range	-5...50 °C (23...122 °F) (open) -5...40 °C (23...104 °F) (enclosed)
Storage and Transportation Temperature Range	-20...+75 °C (-4…167 °F)
Altitude	2000 m (6560 ft)
Humidity	5...95% (non-condensing)
Pollution Degree	2

❶ For devices rated 5...480 A, heatsink fans can be powered by either 110/120V AC or 220/240V AC.
For devices rated 625...1250 A, heatsink fans can only be powered by 110/120V AC.

Technical Information

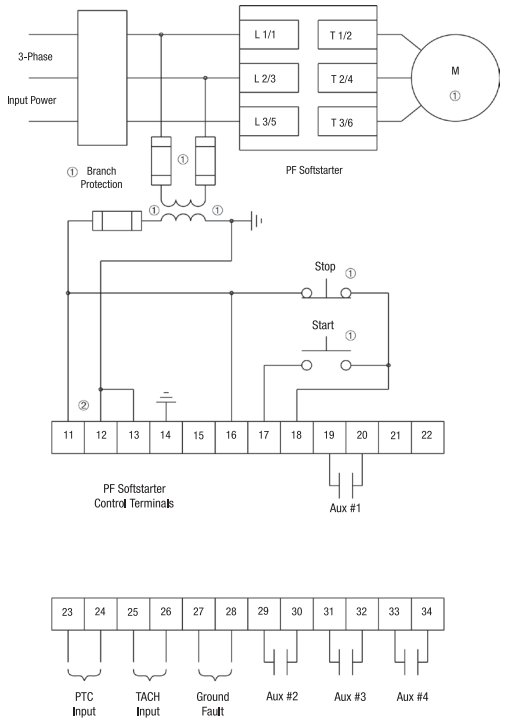
Mechanical				
Resistance to Vibration	Operational	All	1.0 G Peak, 0.15 mm (0.006 in.) displacement	
	Non-Operational	5...480 A	2.5 G Peak, 0.38 mm (0.015 in.) displacement	
		625...1250 A	1.0 G Peak, 0.15 mm (0.006 in.) displacement	
Resistance to Shock	Operational	5...85 A	15 G	
		108...480 A	5.5 G	
		625...1250 A	4 G	
	Non-Operational	5...85 A	30 G	
		108...480 A	25 G	
		625...1250 A	12 G	
Construction	Power Poles	5...85 A	Heatsink thyristor modular design	
	Power Poles	108...1250 A	Heatsink hockey puck thyristor modular design	
	Control Modules		Thermoset and Thermoplastic Moldings	
	Metal Parts		Plated Brass, Copper or Painted Steel	
Terminals	Power Terminals	5...85 A	Cable size – Line Upper – 2.5...95 mm² (14...3/0 AWG) Line Lower – 0.8...2.5 mm² (18...14 AWG) Load Upper – 2.5...50 mm² (14...1 AWG) Load Lower – 0.8...2.5 mm² (18...14 AWG) Tightening torque – 14.7 N•m (130 lb.-in.) Wire strip length – 18...20 mm (0.22...0.34 in.)	
		108...135 A	One M10 x 1.5 diameter hole per power pole	
		201...251 A	Two M10 x 1.5 diameter holes per power pole	
		317...480 A	Two M12 x 1.75 diameter holes per power pole	
		625...1250 A	Two 13.5 mm (0.53 in.) diameter holes per power pole	
	Power Terminal Markings		NEMA, CENELEC EN50 012	
	Control Terminals	M3 screw clamp	Clamping yoke connection	
Other				
EMC Emission Levels	Conducted Radio Frequency Emissions Radiated emissions		Class A Class A	
EMC Immunity Levels	Electrostatic Discharge Radio Frequency Electromagnetic Field Fast Transient Surge Transient		B kV Air Discharge Per EN/IEC 60947-4-2 Per EN/IEC 60947-4-2 Per EN/IEC 60947-4-2	
Overload Characteristics	Current Range		Line	Delta
		5	1...5	1.7...9
		25	5...25	8.6...43
		43	8.6...43	14.8...75
		60	12...60	20.8...104
		85	17...85	29.4...147
		108	27...108	47...187
		135	34...135	59...234
		201	67...201	116...348
		251	84...251	145...435
		317	106...317	183...549
		361	120...361	208...625
		480	160...480	277...831
		625	208...625	283...850
		780	260...780	300...900
		970	323...970	400...1200
		1250	416...1250	533...1600
	Trip Classes Trip Current Rating Number of Poles		10, 15, 20, and 30 117% of Motor FLC 3	
Certifications	Open Type Controllers		CE Marked Per Low Voltage Directive 73/23/EEC, 93/68/EEC UL Listed (File No. E195687)	

Soft Stop, Pump Control and Braking Wiring Diagram



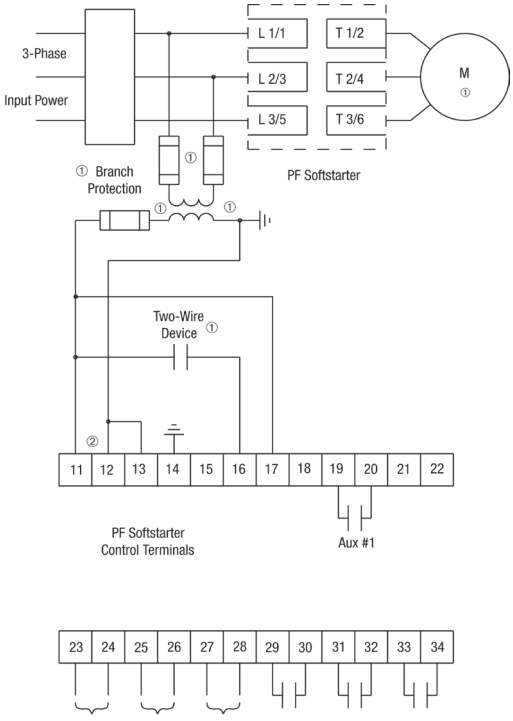
① Customer supplied.

3-Wire Control



① Customer supplied.

2-Wire Control



Approximate Dimensions and Shipping Weights

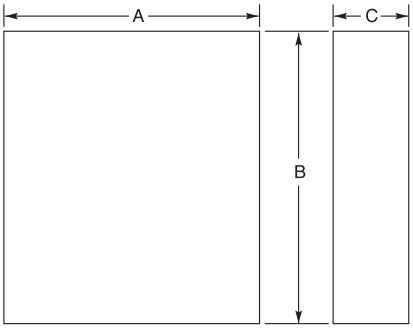
Open Type Controllers

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

Rating (A)	Height	Width	Depth	Weight
5...85	321 (12.6)	150 (5.9)	203 (8.0)	5.7 kg (12.6 lbs)
108...135	443.7 (17.47)	196.4 (7.74)	205.2 (8.08)	15.0 kg (33 lbs)
201...251	560 (22.05)	225 (8.86)	253.8 (9.99)	304 kg (67 lbs)
317...480	600 (23.62)	290 (11.42)	276.5 (10.89)	45.8 kg (101 lbs)
625...780	1041.1 (41.0)	596.9 (23.5)	346.2 (13.63)	179 kg (395 lbs)
970...1250	1041.1 (41.0)	596.9 (23.5)	346.2 (13.63)	224 kg (495 lbs)

Enclosed Type Line-Connected Controllers

IMPORTANT NOTE:
Factory-installed options may affect enclosure size requirements.
Exact dimensions can be obtained after order entry.
Please consult your local Sprecher + Schuh representative.



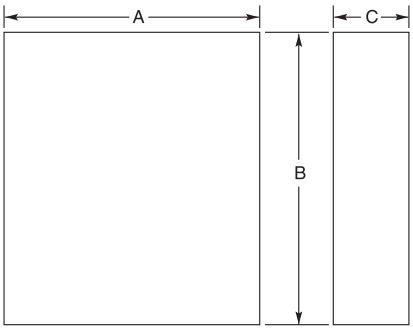
Controller Rating (A)	Disconnect Rating (A)	IP65 (Type 4/12) Height B	Width A	Depth C
		Non-Combination Controller		
5	—	610 (24)	508 (20)	254 (10)
25	—	610 (24)	508 (20)	254 (10)
43	—	610 (24)	508 (20)	254 (10)
60	—	610 (24)	508 (20)	254 (10)
85	—	610 (24)	508 (20)	254 (10)
108	—	762 (30)	610 (24)	305 (12)
135	—	762 (30)	610 (24)	305 (12)
201	—	914 (36)	762 (30)	406 (16)
251	—	914 (36)	762 (30)	406 (16)
317	—	1524 (60)	914 (36)	406 (16)
361	—	1524 (60)	914 (36)	406 (16)
480	—	1524 (60)	914 (36)	406 (16)
625	—	2286 (90)	1829 (72)	508 (20)
780	—	2286 (90)	1829 (72)	508 (20)
970 ❶	—	2286 (90)	1829 (72)	508 (20)
1250 ❶	—	2286 (90)	1829 (72)	508 (20)

❶ 970...1250 rated devices are only available as Type 1 and require a door-mounted fan, capable of delivering 204 cfm.

Approximate Dimensions ❹

Enclosed Type Line-Connected Combination Controllers

IMPORTANT NOTE:
Factory-installed options may affect enclosure size requirements.
Exact dimensions can be obtained after order entry.
Please consult your local Sprecher + Schuh representative.

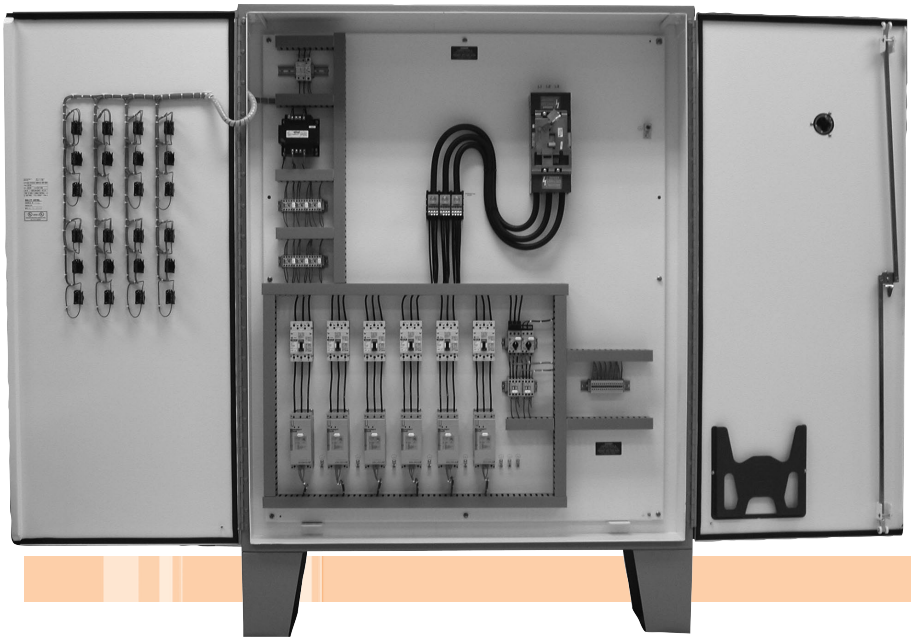


Controller Rating (A)	Disconnect Rating (A)	IP65 (Type 4/12) Height B	Width A	Depth C
Combination Controllers with Fusible Disconnect				
5	30 A/J	610 (24)	508 (20)	254 (10)
25	30 A/J	610 (24)	508 (20)	254 (10)
43	60 A/J	610 (24)	508 (20)	254 (10)
60	100 A/J	610 (24)	508 (20)	254 (10)
85	100 A/J	610 (24)	508 (20)	254 (10)
108	200 A/J	914 (36)	762 (30)	406 (16)
135	200 A/J	914 (36)	762 (30)	406 (16)
201	400 A/J	1219 (48)	914 (36)	406 (16)
251	400 A/J	1219 (48)	914 (36)	406 (16)
317	600 A/J	1524 (60)	914 (36)	406 (16)
361 ❶	600 A/J	1524 (60)	914 (36)	406 (16)
480 ❷	600 A/J	1524 (60)	914 (36)	406 (16)
	800 A/L	2286 (90)	508 (20)	508 (20)
625	—	2286 (90)	1829 (72)	508 (20)
780	—	2286 (90)	1829 (72)	508 (20)
970 ❸	—	2286 (90)	1829 (72)	508 (20)
1250 ❸	—	2286 (90)	1829 (72)	508 (20)
Combination Controllers with Circuit Breaker				
5	15 A	610 (24)	508 (20)	254 (10)
25	30 A	610 (24)	508 (20)	254 (10)
43	80 A	610 (24)	508 (20)	254 (10)
60	100 A	610 (24)	508 (20)	254 (10)
85	125 A	610 (24)	508 (20)	254 (10)
108	175 A/175 A Plug	914 (36)	762 (30)	406 (16)
135	225 A/225 A Plug	914 (36)	762 (30)	406 (16)
201	300 A/300 A Plug	1219 (48)	914 (36)	406 (16)
251	400 A/400 A Plug	1219 (48)	914 (36)	406 (16)
317	600 A/500 A Plug	1524 (60)	914 (36)	406 (16)
361	600 A/600 A Plug	1524 (60)	914 (36)	406 (16)
480	800 A/800 A Plug	1524 (60)	914 (36)	406 (16)
625	—	2286 (90)	1829 (72)	508 (20)
780	—	2286 (90)	1829 (72)	508 (20)
970 ❷	—	2286 (90)	1829 (72)	508 (20)
1250 ❸	—	2286 (90)	1829 (72)	508 (20)

❶ Use this row for 460V -58 and 575V -59.
❷ Use this row for 460V -59 and 575 -60 and -61.
❸ 970...1250 rated devices are only available as Type 1 and require a door-mounted fan, capable of delivering 240 cfm.
❹ These dimensions are to be considered the recommended minimal enclosure dimensions and do not represent actual Sprecher + Schuh assembled product dimensions. Consult your local Sprecher + Schuh representative for details.

Custom Softstarter Panels

Serving Many Industries



PCS Softstarter Custom Multi-Motor Panel 60HP@480V AC

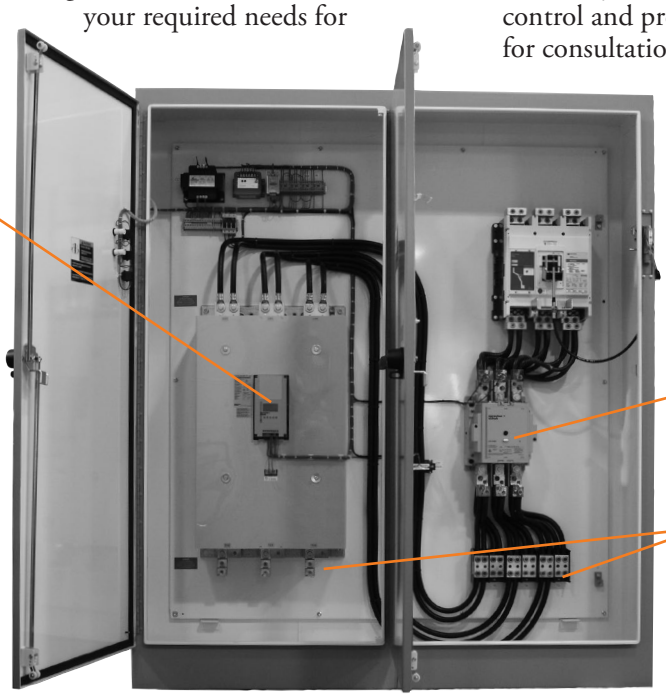
Sprecher+Schuh offers a broad range of Softstarter products for starting or stopping AC induction motors from ½ Hp to 1000 Hp. The entire range incorporates superior features, such as;

- Three Phase Control
- Built-in electronic overload and integral run bypass for both star-delta and standard squirrel-cage induction motors
- Advanced protection and diagnostics in a compact, maintainable, modular, cost-effective package

Whether you need a solid state controller for a single motor, special ramping or stopping maneuvers or a complex multi-motor solution, our range of Softstarter controllers meet your required needs for many applications. Here is a listing of industries the Sprecher+Schuh Custom Softstarter panels have played a successful role in.

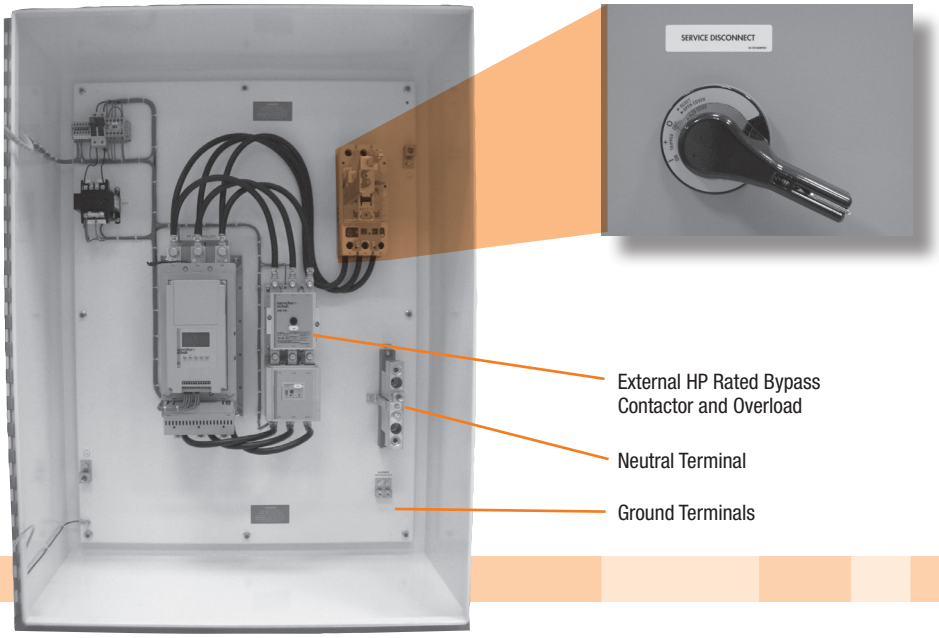
- Food Processing
- Irrigation
- Lumber and Wood Products
- Mining and Metals
- OEM Specialty Machine
- Petrochemical
- Pulp and Paper
- Textile
- Transportation and Machine Tool
- Water/Wastewater Treatment and Municipalities
- Cement/Rock crushers/Chippers

Contact your Sprecher+Schuh motor control and protection representative for consultation regarding custom quotations or help explaining which of the four families of Softstarter best meets your application needs.



PFS Softstarter 1000HP@480V AC for Wye-Delta 6-Lead Motor

PFS Softstarter UL508A Service Entrance Custom Panel 150HP@480V AC



Pumping and Braking Applications

Custom panels using the PCS and PFS Softstarters are an excellent choice for typical motor starting and soft stopping profiles.

For customers seeking a control panel solution to reduce water-hammering or rapid fluid surges, our PFB Pump Control Softstarter is the market leader in this technology. The PFB Softstarter algorithm is specially designed to reduce fluid surges in pumping systems. It provides closed loop acceleration and deceleration control of centrifugal pump motors without the need for feedback devices. When it comes to irrigation, pumping stations or any fluid applications, the PFB Pump Control is the leading choice.

Need to provide a motor control panel to align a tumbler for loading or unloading product? Need to reduce the stopping time of a Bandsaw by more than half of other mechanical braking systems? The PFD Smart Motor Braking is the ideal solution. The PFD Braking option provides motor braking for applications which require the motor to stop quickly. It is a microprocessor based braking system, which applies braking current to a motor. The strength of the braking current is adjustable from 0…400% of full load current.

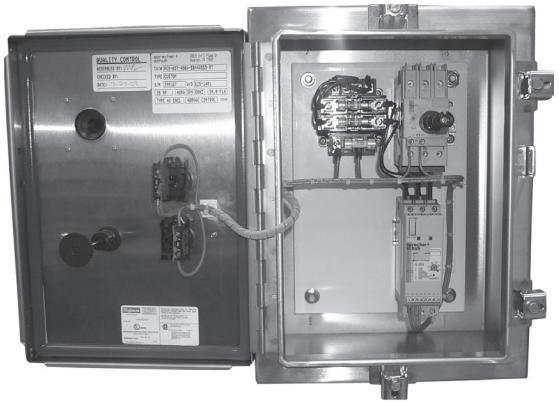
UL508A and Service Entrance Labeled

Upon request, custom Softstarter panels can be designed and labeled to meet UL508A requirements and /or Service Entrance requirements. Under UL508A, this ensures that all components in the panel are in compliance with UL and that wire bending spaces and wire sizes are properly selected for the given panel solution. The requirements for Service Entrance is to add special labeling near the main disconnecting handle and include a neutral bar and grounding lugs near the branch circuit protection device. The Sprecher+Schuh team is ready to meet your safety approval specifications.

PFS Softstarter Custom MCCB Combo 400HP@480V AC

Need Other Types of Enclosure Ratings?

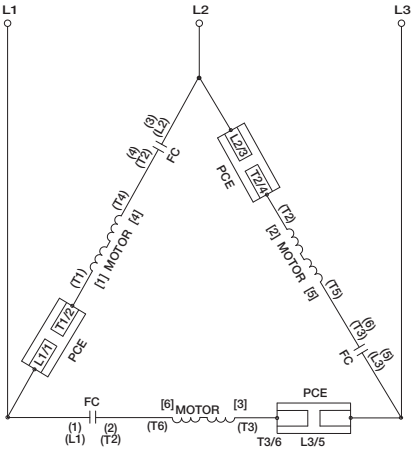
The PCS/PF Softstarters can be enclosed in a variety of enclosures away from our standard listing in this section. Whether it's an outdoor rated Type-12 with a drip shield, corrosive resistant Type-4X Non-Metallic or an ATEX Approved enclosure, our Sprecher+Schuh team has vast custom control experience in meeting your enclosure environmental specifications.



PCS Softstarter KTA7 Combo 25HP@480V Stainless Steel

PCEC Hydraulic Elevator Softstarters up to 150 HP @ 480 VAC

Unique advantages not found in electromechanical or other solid state starters



PCEC Hydraulic Elevator Softstarters are wired "inside the delta" for more efficient operation and retrofit

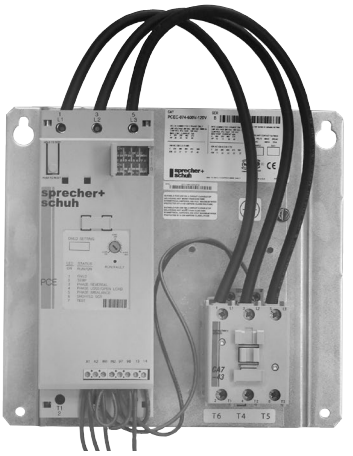
The PCE Hydraulic Elevator Softstarter and PCEC Panel Solution by Sprecher+Schuh are designed to simplify installation, set-up, and typical operation of motors that drive hydraulic elevators and escalators. This solid state starter solution is designed to operate 3 phase standard squirrel cage induction motors and can be connected to a 6 or 12 lead Wye-Delta (Star-Delta) or standard 3 or 9 lead motors. Through the use of LINE or INSIDE-THE-DELTA control, the solid state solution can provide ultimate control of the motor. The advantages of a solid state solution include the following:

Provides smooth motor starting

- Decreases current surges on weak electrical systems
- Reduced starting torque of the motor helps to reduce mechanical stress on system components
- Helps meet both local and regional electrical codes when reduced voltage starting is a requirement
- Eliminates voltage and current spikes associated with traditional Wye-Delta (Star-Delta) starters
- Maximizes motor life due to reduced electrical strain
- Lowers general system maintenance requirements for improved uptime

The PCEC panel solution provides a standard PCE controller and a factory coordinated fault contactor on a common mounting plate for ease of installation. The PCE controller utilizes software optimized for the elevator industry along with a built-in selectable Class 10, 15 and 20 overload relay and SCR bypass to control all three phases. The pre-wired control harness (3 ft / ~1m flying leads) is supplied to simplify wiring into current installations while the mounting plate holes are the same as many standard Wye-Delta electro-mechanical starter panels. To insure start up performance both the PCE controller and PCEC panel assembly are factory tested before shipping.

The result is a quick and easy starter solution for the elevator and escalator industries.



Microprocessor control provides precision operation

PCEC softstarters are under full microprocessor control, which limits starting current to the preset adjustable value. Current never exceeds the preset limit. Microprocessor control also provides finer increments of adjustment, facilitating smooth, repeatable, and accurate starting characteristics, independent of component aging and varying environmental conditions.

LED diagnostic display

An LED display indicates operating status and fault condition (overload, over temperature, phase reversal/phase loss, phase imbalance, shorted SCR, start fault). This enables speedy diagnosis and quick resolution of problems.

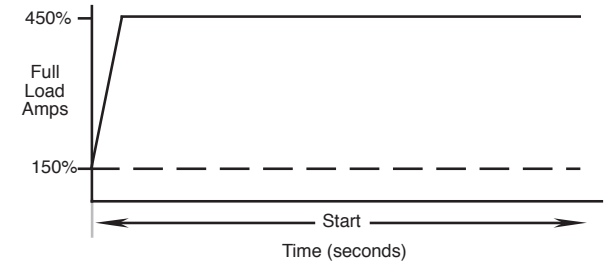
Standard fault contactor

The PCEC panel solution is equipped with a standard fault contactor which isolates one side of the motor windings from the line power in case of softstarter fault or motor overload. Current flow is prevented by this mechanical isolation in addition to the solid state SCRs.

UL/CSA Elevator Ratings

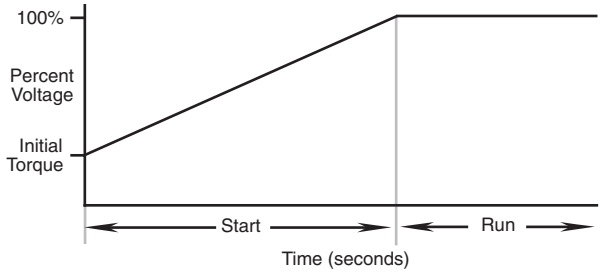
The PCEC Softstarters are UL Listed and cUL Listed (Canadian Standards per UL 508 and CS C22.2 No. 14-95) as solid state motor controllers in File E96956. They are also UL Listed and cUL Listed per UL 508 and CAN/CSA B44.1-96 as elevator controllers in File E3125.

Current Limit Starting



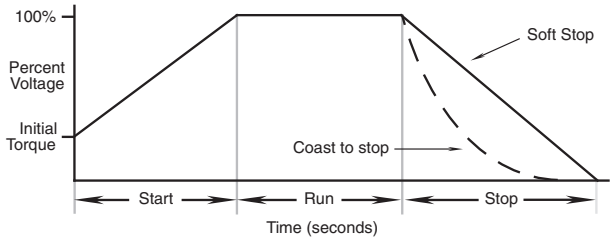
Through the use of internal current sensors, the PCEC will regulate the current level applied to the motor over the programmed period of time. This type of motor control produces a slow start and insures that the current does not exceed the programmed level. This is standard configuration of the device and aligns well with traditional applications.

Soft Start



During Soft start, the voltage is ramped from an initial set point to full voltage over the programmed period of time. This type of motor control produces a smooth start in less time than the current limit setting, however the current is not restricted.

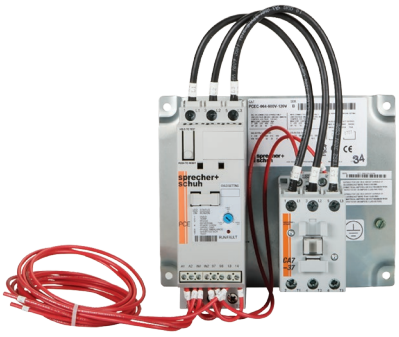
Soft Stop



Soft stop provides the ability to ramp down the voltage applied to the motor over a programmed period of time. The result is a smooth stop.

Diagnostics

Overload	The built in motor overload provides protection of the motor for over current conditions. This protection feature offers a user selectable setting called the trip class, which can be used to accommodate different applications and motor types. When the motor draws more than the nominal value of current for a period of time, the device will fault on a motor overload fault.
Over Temperature	The product includes a built in self monitoring method for detecting a SCR over-temperature condition. If the internal temperature exceeds a design threshold the device will fault on a SCR Overtemp fault.
Phase Reversal	The user can select the phase relationship of the incoming power. If this phase relationship changes, the device will fault indicating a problem.
Phase Loss/Open Load	When any one of the incoming 3 phases are lost, the controller will fault indicating a phase loss condition has occurred.
Phase Imbalance	When enabled, this motor protection feature will detect if a phase imbalance condition exists and fault the unit. A phase imbalance is defined as a 65% differential between the highest and lowest phase for more than 3 seconds.
Shorted SCR	Each time the PCEC initiates a start, it checks to see if the SCR's are operating correctly. If the controller is unable to properly turn on and off any one of the SCR's, the device will fault on a Shorted SCR fault.



Frame Size 1 - 32…64 Amp

Frame Size 2 - 74…147 Amp

Frame Size 3 - 234 Amp

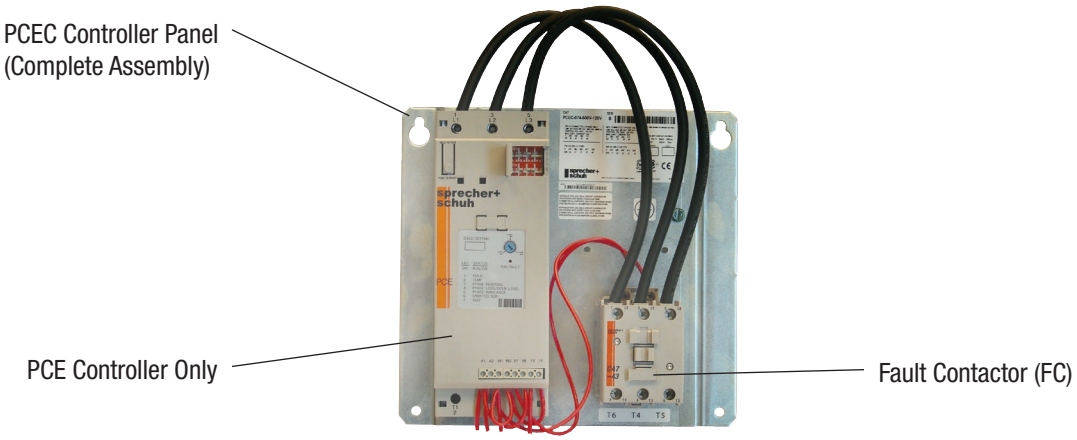
PCEC Controller Panel - 120V Control Voltage ❹❻

DELTA Connected - 6 Wire ❷					Line Connected - 3 Wire ❷					Frame Size	With 120VAC 50/60 Hz ❷❸ Control Voltage	
Maximum Horsepower				Overload Range ❶	Maximum Horsepower				Overload Range ❶			
200V	240V	480V	575V		200V	240V	480V	575V			Catalog Number	Price
10	10	20	30	10.9…32.9	5	5	10	15	6.3…19	1	PCEC-032-600V-120V	1078
15	15	30	40	17…51	7.5	10	20	25	10…30	1	PCEC-051-600V-120V	1299
20	20	40	60	21.3…64	10	10	25	30	12.3…37	1	PCEC-064-600V-120V	1564
20	25	50	60	24.7…74	10	15	30	40	14.3…43	2	PCEC-074-600V-120V	2213
30	40	75	100	34.7…104	15	20	40	50	20…60	2	PCEC-104-600V-120V	2877
40	50	100	150	49…147	25	30	60	75	28.3…85	2	PCEC-147-600V-120V	3807
75	75	150	200	59…234	40	50	100	125	34…135	3	PCEC-234-600V-120V ❺	7405

PCEC Controller Panel - 230V Control Voltage ❹❻

DELTA Connected - 6 Wire ❷					Line Connected - 3 Wire ❷					Frame Size	With 230VAC 50/60 Hz ❷❸ Control Voltage	
Maximum Horsepower				Overload Range ❶	Maximum Horsepower				Overload Range ❶			
200V	240V	480V	575V		200V	240V	480V	575V			Catalog Number	Price
10	10	20	30	10.9…32.9	5	5	10	15	6.3…19	1	PCEC-032-600V-230V	1078
15	15	30	40	17…51	7.5	10	20	25	10…30	1	PCEC-051-600V-230V	1299
20	20	40	60	21.3…64	10	10	25	30	12.3…37	1	PCEC-064-600V-230V	1564
20	25	50	60	24.7…74	10	15	30	40	14.3…43	2	PCEC-074-600V-230V	2213
30	40	75	100	34.7…104	15	20	40	50	20…60	2	PCEC-104-600V-230V	2877
40	50	100	150	49…147	25	30	60	75	28.3…85	2	PCEC-147-600V-230V	3807
75	75	150	200	59…234	40	50	100	125	34…135	3	PCEC-234-600V-230V ❺	7405

❶ Motor FLA must fall within the specified range to operate correctly.
❷ The PCEC Controller panel powerwire jumpers and parameter DIP switch settings are shipped in the DELTA connection mode by default. LINE connection requires the power wires to be reconfigured and DIP Switch #15 to be programmed for LINE connection mode by the customer.
❸ Internal fan is optional for PCEC-032…064. See page D61 to purchase separately. All other PCEC units have internal fan as standard.
❹ Purchase additional PCE Auxiliary Contact Blocks separately. See page D17. One Auxiliary Contact Block (one or two pole) may be mounted on the right side of the PCE controller.
❺ Separate 120V or 240V single phase is required for PCEC fan operation.
❻ The PCEC Hydraulic Elevator duty rating is 80 starts per hour at 50% duty cycle (160 calls per hour). Starts per hour are based on when the motor starts, the motor only runs on "up" calls. Installing an optional fan (PCV-64) is recommended for PCEC-032A…064A for maximum starts per hour performance. All other PCEC units have an internal fan as standard.



PCEC-074-600V-120V

Replacement Parts

Complete Assembly (For Reference Only)	PCE Controller Only		Price	PCE Fans	Price	Fault Contactor	Price	Fault Contactor Coil	Price
PCEC-032-600V-120V	**PCE-032-600V**		**892**	**PCV-064 (optional)**	**53**	**CA7-37-00-120**	**See Section A**	**TC473**	**See Section A**
PCEC-051-600V-120V	**PCE-051-600V**		**1120**			**CA7-37-00-120**			
PCEC-064-600V-120V	**PCE-064-600V**		**1392**			**CA7-37-00-120**			
PCEC-074-600V-120V	**PCE-074-600V**		**1844**	**PCV-147**	**134**	**CA7-43-00-120**		**TD473**	
PCEC-104-600V-120V	**PCE-104-600V**		**2449**			**CA7-60-00-120**		**TE473**	
PCEC-147-600V-120V	**PCE-147-600V**		**3275**			**CA7-85-00-120**		**TE473**	
PCEC-234-600V-120V	Complete Device	**PCE-234-600V**	**6698**	**PCV-234**	**365**	**CA6-180-EI-11-120**		**CA6-TGE865**	
	Control Module	**PCE-234**	**R/F**						
	Power Pole	**PFL-0135-600V ❶**	**See D19**						
	Terminal Cover	**PFT-0135**	**See D18**						

PCEC-032-600V-230V	**PCE-032-600V**		**892**	**PCV-064 (optional)**	**53**	**CA7-37-00-220W**	**See Section A**	**TC296**	**See Section A**
PCEC-051-600V-230V	**PCE-051-600V**		**1120**			**CA7-37-00-220W**			
PCEC-064-600V-230V	**PCE-064-600V**		**1392**			**CA7-37-00-220W**			
PCEC-074-600V-230V	**PCE-074-600V**		**1844**	**PCV-147**	**134**	**CA7-43-00-220W**		**TD296**	
PCEC-104-600V-230V	**PCE-104-600V**		**2449**			**CA7-60-00-220W**		**TE296**	
PCEC-147-600V-230V	**PCE-147-600V**		**3275**			**CA7-85-00-220W**		**TE296**	
PCEC-234-600V-230V	Complete Device	**PCE-234-600V**	**6698**	**PCV-234**	**365**	**CA6-180-EI-11-220W**		**CA6-TGE866**	
	Control Module	**PCE-234**	**R/F**						
	Power Pole	**PFL-0135-600V ❶**	**See D19**						
	Terminal Cover	**PFT-0135**	**See D18**						

Optional Accessories

See page D17 for PCE Controller Auxiliaries

See page A47 for Fault Contactor Front and Side Mount Auxiliaries

See page D17 for Protection Modules

❶ Part number contains three power poles.

Electrical

Power Circuit		UL/cUL/CSA	IEC
Rated Operational Voltage		200…600V AC	200…500V~
Rated Insulation Voltage		600V AC	500V~
Dielectric Withstand		2200V AC	2500V~
Repetitive Peak		200…600V AC: 1600	500V~: 1600
Rated Impulse Voltage		6 kV	
Over-voltage Category		III	
Number of Poles		Equipment designed for 3 phase only	
Operating Frequency		50/60 Hz	
Controller Utilization Category		32/51/64	AC-53b: 3.5-15:3585
		74/104/147	AC-53b: 4.5-30:1770
		234	AC-53b: 3.5-30:1770
Overload Current Range (Amps)		LINE	DELTA
	32	6.3...19	10.9...32.8
	51	10...30	17...51
	64	12.3...37	21.3...64
	74	14.3...43	24.7...74
	104	20...60	34.7...104
	147	28.3...85	49 ...147
	234	34...135	59...234

Control Circuit		UL/cUL/CSA	IEC
Rated Operational Voltage		100…120 V AC, 200…240V AC	120~, 240~
Rated Insulation Voltage		NA	300V~
Dielectric Withstand		NA	3000V
Rated Impulse Voltage		3kV	
Operating Frequency		50/60 Hz	
Control Power Requirements		32/51/64	215 mA @ 120 V AC , 180 mA @ 240 V AC
		74/104/147	200 mA @ 120 V AC , 100 mA @ 240 V AC
		234	200 mA @ 120 V AC , 120 mA @ 240 V AC
Fan Power Requirements		32/51/64	NA
		74/104/147	NA
		234	20 VA

Electrical (continued)

Short Circuit Performance	Type 1	
Device Current Rating	Max Fuse Size and Type	Max Available Fault Rating
32	70 A - RK5	5 kA
	125 A - K5	5 kA
51	125 A - RK5	5 kA
	200 A - K5	10 kA
64	125 A - RK5	5 kA
	200 A - K5	10 kA
74	150 A - RK5	5 kA
	250 A - J	10 kA
104	200 A - RK5	5 kA
	400 A - J	10 kA
147	250 A - RK5	10 kA
	400 A - J	10 kA
234	400 A - RK5	10 kA
	450 A - K5	10 kA

Auxiliary Contacts (Fault and Aux#1)	UL/cUL/CSA	IEC
Rated Operational Voltage	250V AC / 30V DC	250V~ / 30V DC
Rated Insulation Voltage	250V	250V~
Rated Impulse Voltage	NA	4kV
Dielectric Withstand	1500V AC	2000V~
Operating Frequency	50/60 Hz	
Utilization Category	D300	AC-15 / DC
Type of Control Circuit	Electromagnetic Relay	
Number of Contacts	1	
Type of contacts	Normally Open (N.O.)	
Type of current	AC/DC	
Rated Operational Current (Max.)	0.6 A @ 120 V~ and 0.3 A @ 240V~	
Conventional Thermal Current (Ith)	1 Amp	
Make/Break VA	432/72	

Mechanical

Resistance to Vibration	Operational	1.0 G Peak, 0.15 mm (0.006 in) displacement
	Non-operational	2.5 G Peak, 0.38 mm (0.015 in) displacement
Resistance to Shock	Operational	15 G
	Non-operational	5.5 G

Environmental

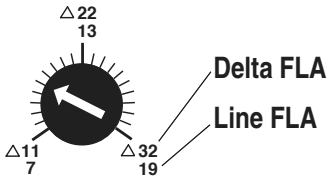
Operating Temperature	0…50°C (32…122°F) Open
	0…40°C (32…104°F) Enclosed
Altitude	2000 m (6560 ft)
Humidity	5…95% (non-condensing)
Pollution Degree	2

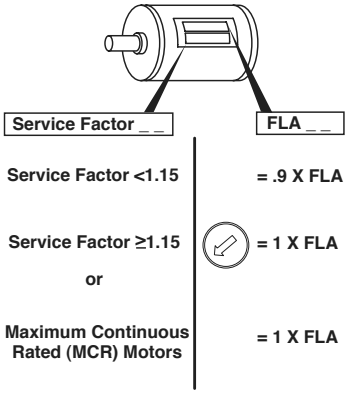
UL/CSA Elevator Ratings

The PCEC Softstarters are UL Listed and cUL Listed (Canadian Standards per UL 508 and CS C22.2 No. 14-95) as solid state motor controllers in File E96956. They are also UL Listed and cUL Listed per UL 508 and CAN/CSA B44.1-96 as elevator controllers in File E3125.

Motor FLA Adjustments

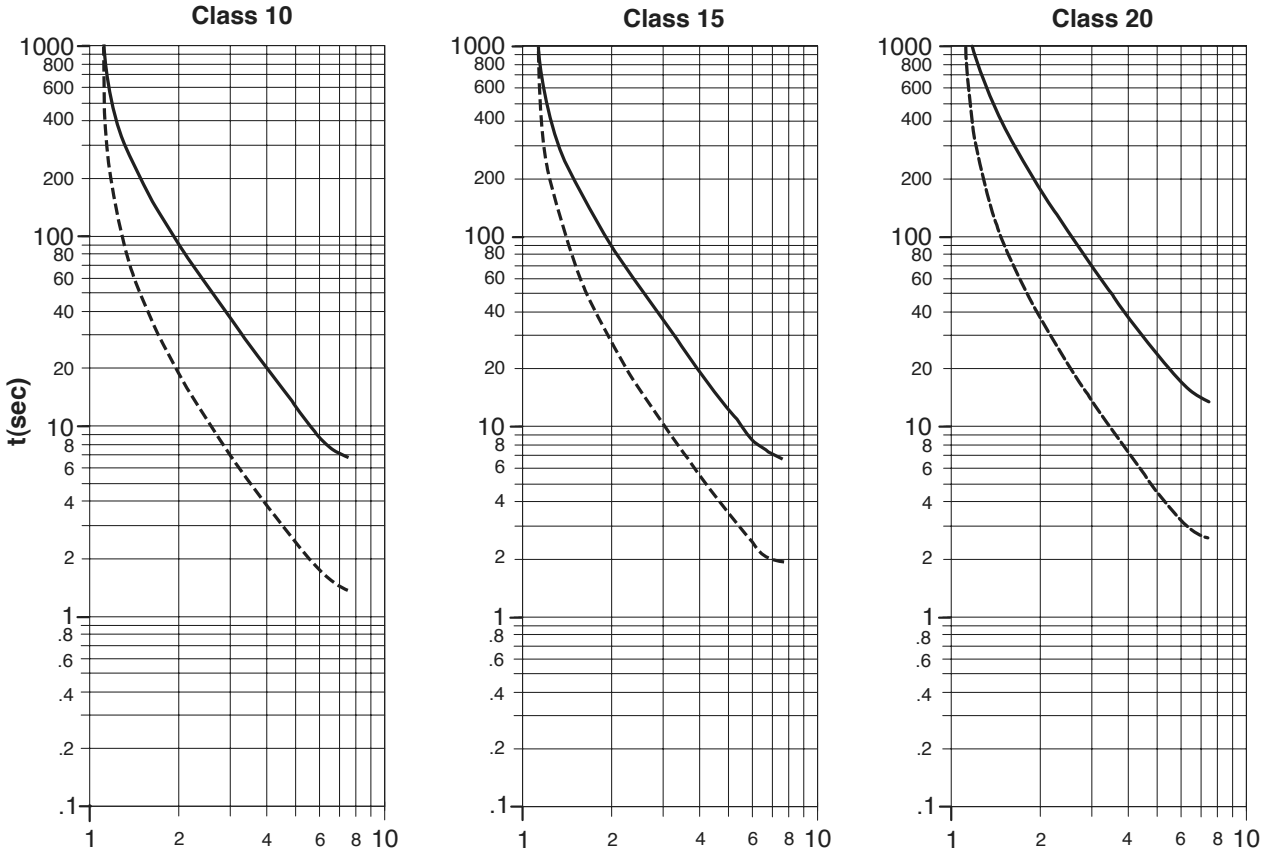
The front of the PCE controller contains a dial which is used for setting the actual FLA of the motor. The label is designed to accommodate motors connected in the LINE or DELTA mode. To determine the proper setting, look at the motors nameplate and set the dial accordingly. The dial setting can be modified depending on the service factor of the motor as shown:





Motor Overload Trip Curves

The trip class should be set according to the motors maximum permissible locked rotor time or the general thermal capabilities. Consult the motor manufacturer for recommendations on setting the trip class.



Terminal Torque Specifications

PCE Controller Information

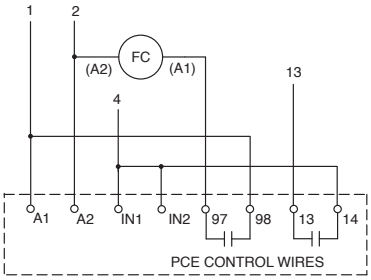
Controller Size	Units	Line Power Terminals	Load Power Terminals	Control Power Terminals
32/51/64	Wire Size	14 - 4 AWG (2.5 - 25 mm^2)	14 - 6 AWG (2.5 - 16 mm^2)	24 - 14 AWG (0.2 - 2.5 mm^2)
	Torque	20 - 25 lb-in. (2.3 - 2.8 Nm)	20 - 22.5 lb-in. (2.3 - 2.6 Nm)	4.4 - 8 lb-in. (0.5 - 0.9 Nm)
74/104/147	Wire Size	14 - 3/0 AWG (2.5 - 95 mm^2)	14 - 1 AWG (2.5 - 50 mm^2)	24 - 14 AWG (0.2 - 2.5 mm^2)
	Torque	100 - 110 lb-in. (11.3 - 12.4 Nm)	100 - 110 lb-in. (11.3 - 12.4 Nm)	4.4 - 8 lb-in. (0.5 - 0.9 Nm)
234	Wire Size	6 - 250 AWG (16 - 120 mm^2)	6 - 250 AWG (16 - 120 mm^2)	24 - 14 AWG (0.2 - 2.5 mm^2)
	Torque	275 lb-in. (31 Nm)	275 lb-in. (31 Nm)	4.4 - 8 lb-in. (0.5 - 0.9 Nm)

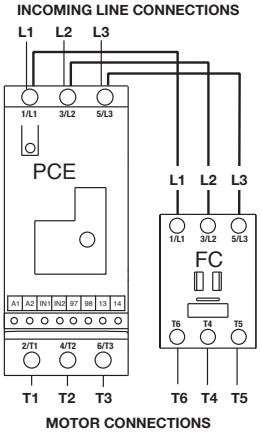
Fault Contactor Information

Controller Size	Units	Line Power Terminals	Load Power Terminals	Control Power Terminals
32/51/64/74	Wire Size	14 - 4 AWG (2.5 - 16 mm^2)	14 - 4 AWG (2.5 - 16 mm^2)	16 - 12 AWG (1.5 - 6 mm^2)
	Torque	22 - 35 lb. in. (2.5 - 4 Nm)	22 - 35 lb. in. (2.5 - 4 Nm)	9 - 13 lb. in. (1 - 2.5 Nm)
104/147	Wire Size	14 - 1 AWG (2.5 - 35 mm^2)	14 - 1 AWG (2.5 - 35 mm^2)	16 - 12 AWG (1.5 - 6 mm^2)
	Torque	31 - 53 lb. in. (3.5 - 6 Nm)	31 - 53 lb. in. (3.5 - 6 Nm)	9 - 13 lb. in. (1 - 2.5 Nm)
234	Wire Size	6 - 300 AWG (16 - 150 mm^2)	6 - 300 AWG (16 - 150 mm^2)	2x 16…12 AWG (2x 1…4 mm^2)
	Torque	250 lb-in. (28 Nm)	250 lb-in. (28 Nm)	12 - 20 lb-in. (1.4 - 2.3 Nm)

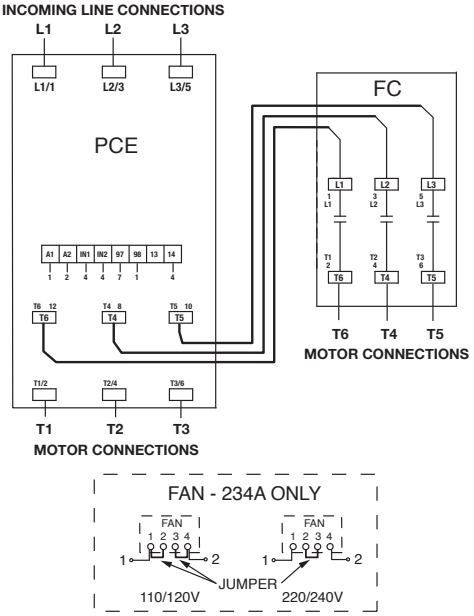
DELTA Connection Diagrams, Power, and Motor Wiring

1- CONTROL POWER (L)
2- CONTROL COMMON (N)
4- START ENABLE
13- UP TO SPEED INDICATION



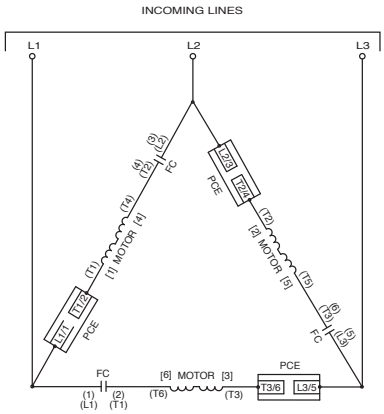


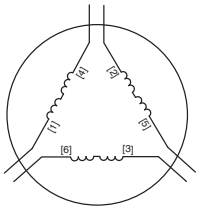
PCEC 32...147A

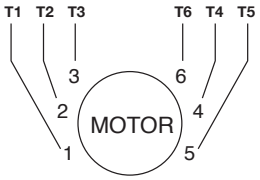


PCEC 234A

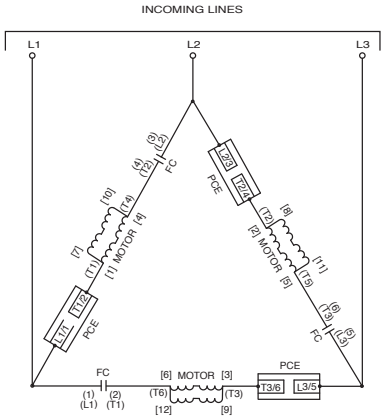
DELTA Connection Diagrams, Power, and Motor Wiring

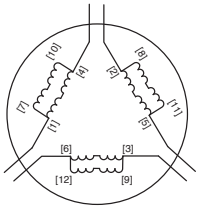


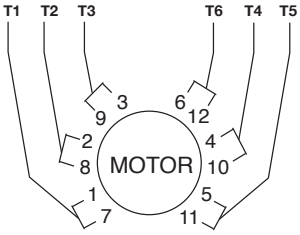




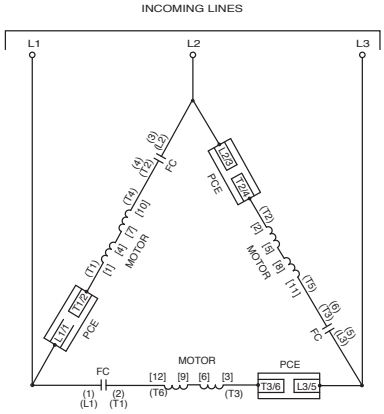
6 LEAD MOTOR CONNECTIONS							
STARTER TERMINALS	T1	T2	T3	T6	T4	T5	JUMPER
MOTOR TERMINALS	1	2	3	6	4	5	N/A

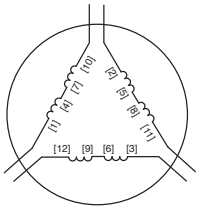


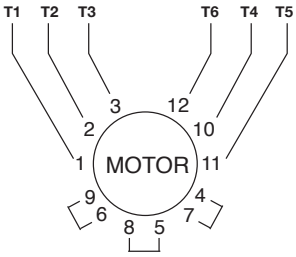




12 LEAD 230V LOW VOLTAGE MOTOR CONNECTIONS							
STARTER TERMINALS	T1	T2	T3	T6	T4	T5	JUMPER
MOTOR TERMINALS	1&7	2&8	3&9	6&12	4&10	5&11	N/A



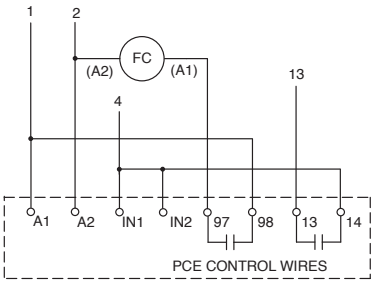


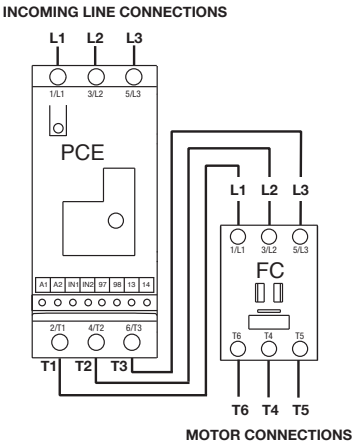


12 LEAD 460V HIGH VOLTAGE MOTOR CONNECTIONS							
STARTER TERMINALS	T1	T2	T3	T6	T4	T5	JUMPER
MOTOR TERMINALS	1	2	3	12	10	11	4&7 5&8 6&9

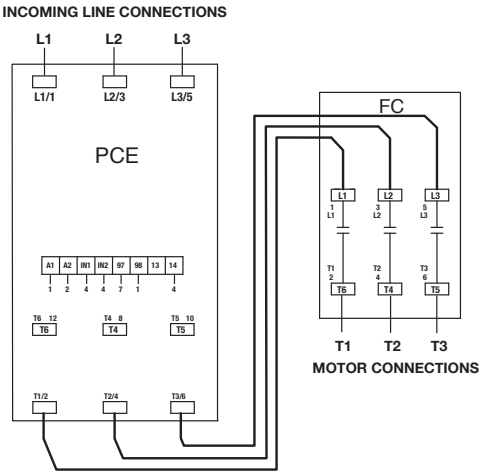
LINE Connection Diagrams, Power, and Motor Wiring

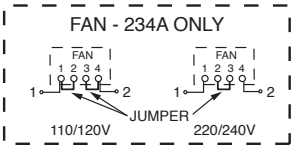
1- CONTROL POWER (L)
2- CONTROL COMMON (N)
4- START ENABLE
13- UP TO SPEED INDICATION





PCEC 32...147A

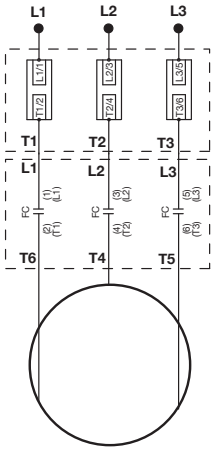




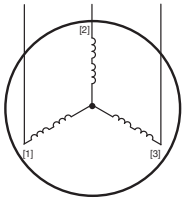
PCEC 234A

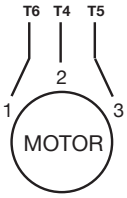
Note: The power wire configuration and DIP switch settings must be changed for the Line Connection method.

LINE Connection Diagrams, Power, and Motor Wiring

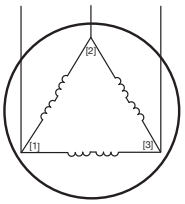


WYE

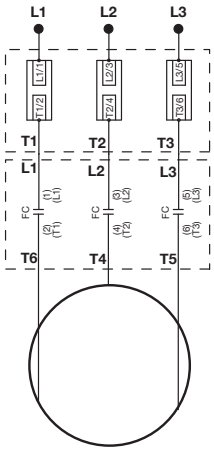




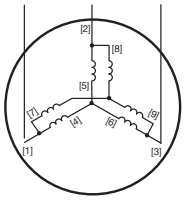
DELTA

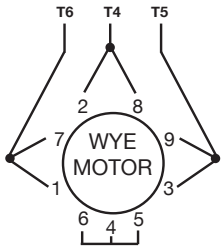


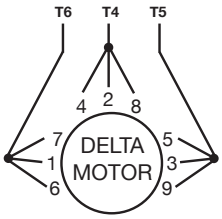
3 LEAD MOTOR CONNECTIONS				
STARTER TERMINALS	T6	T4	T5	JUMPER
WYE & DELTA MOTOR TERMINALS	1	2	3	N/A



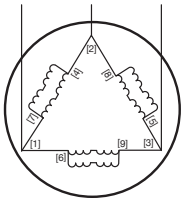
WYE



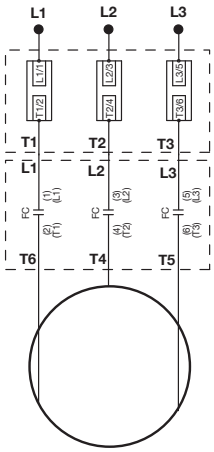




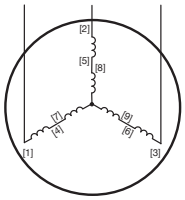
DELTA

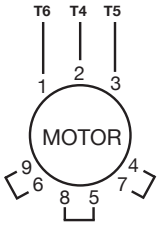


9 LEAD, 230V LOW VOLTAGE, MOTOR CONNECTIONS				
STARTER TERMINALS	T6	T4	T5	JUMPER
WYE MOTOR TERMINALS	1 & 7	2 & 8	3 & 9	4, 5, 6
DELTA MOTOR TERMINALS	1,6,7	2,4,8	3,5,9	N/A

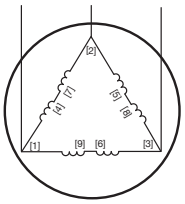


WYE



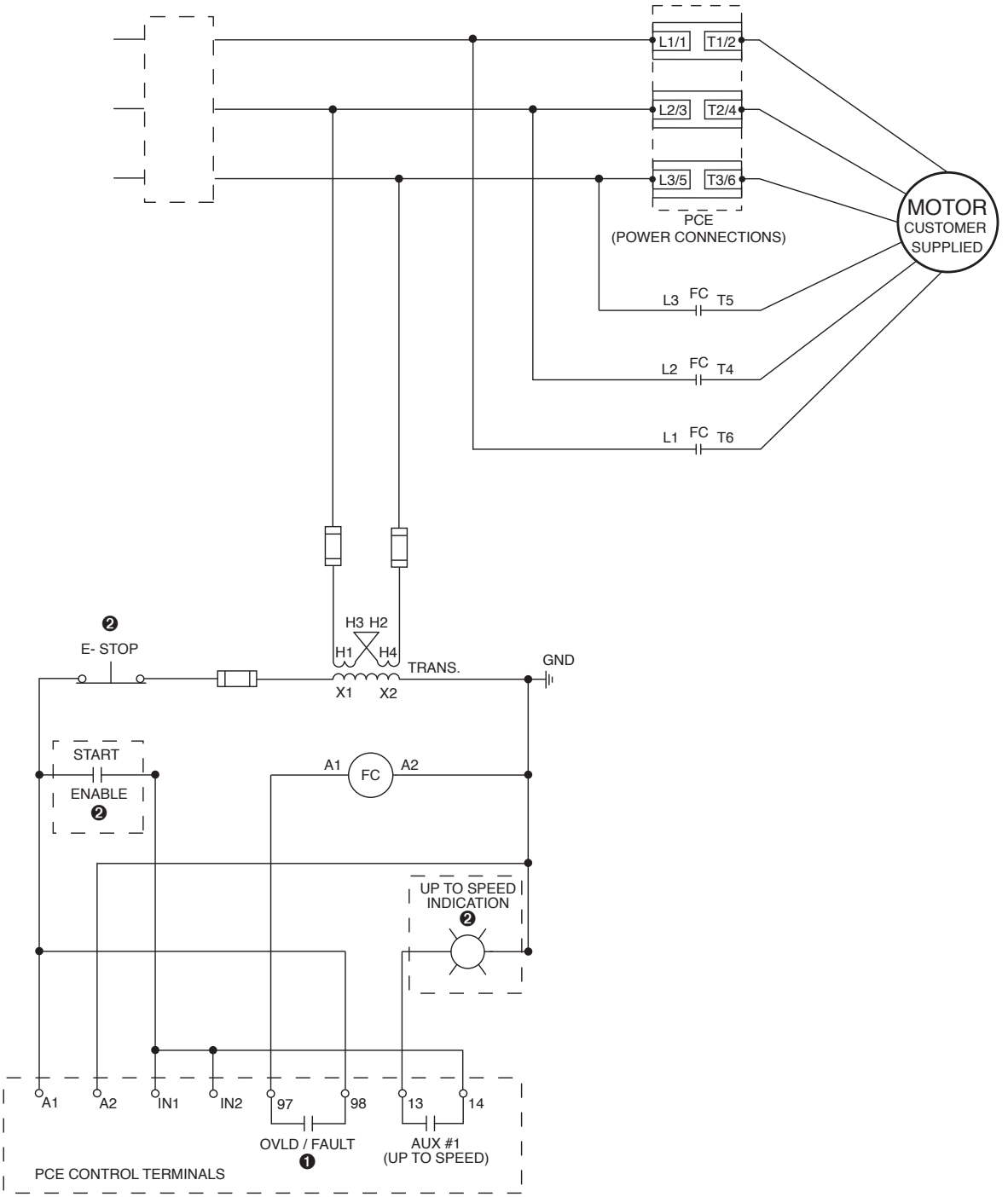


DELTA



9 LEAD, 460V HIGH VOLTAGE, MOTOR CONNECTIONS				
STARTER TERMINALS	T6	T4	T5	JUMPER
WYE & DELTA MOTOR TERMINALS	1	2	3	4 & 7 5 & 8 6 & 9

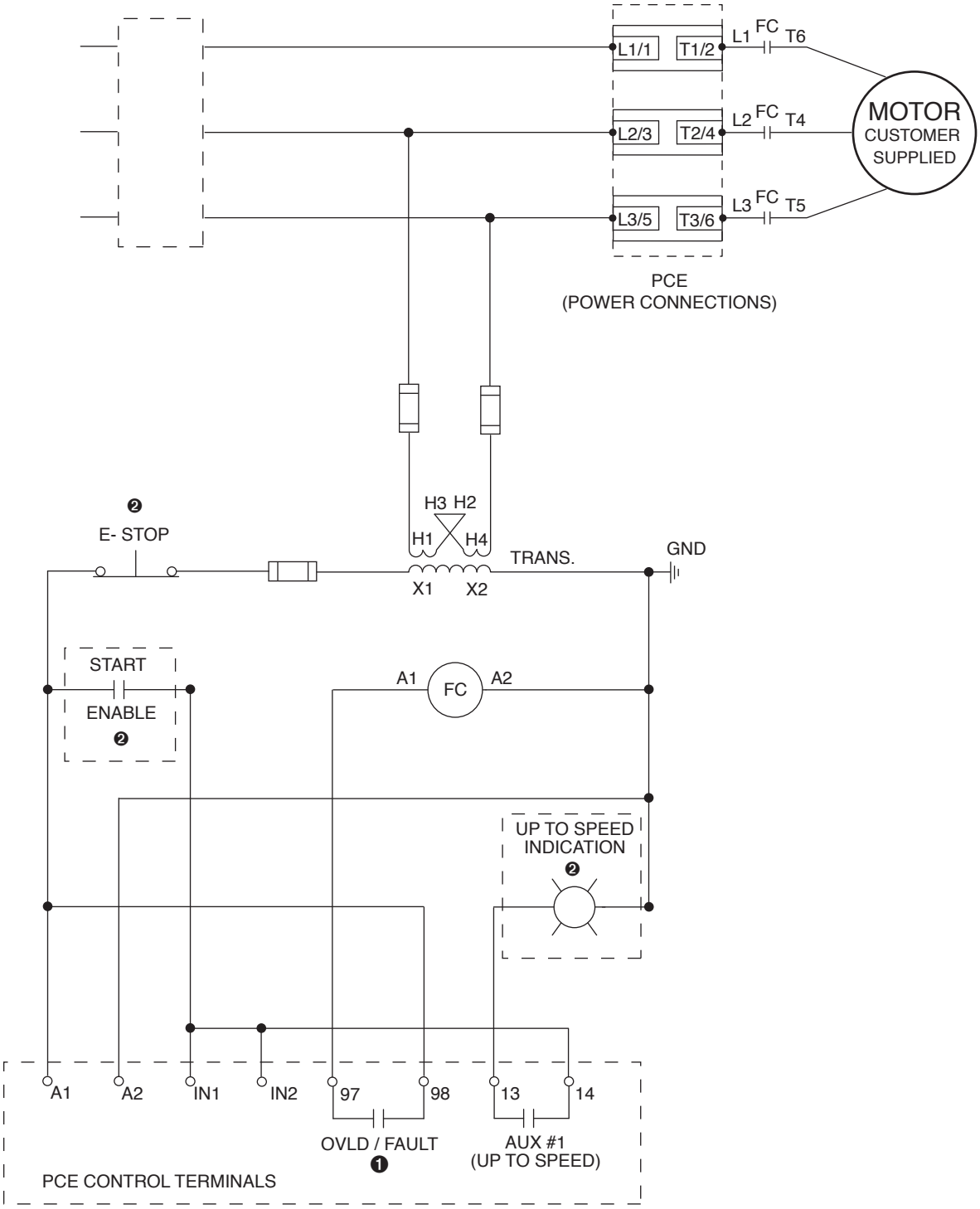
DELTA Connected Controller - Typical Control Wiring



❶ When (A1)(A2) control power is applied, (97)(98) contact closes instantaneously and opens when the PCE detects an overload or fault condition, or when control power is removed.

❷ Customer supplied.

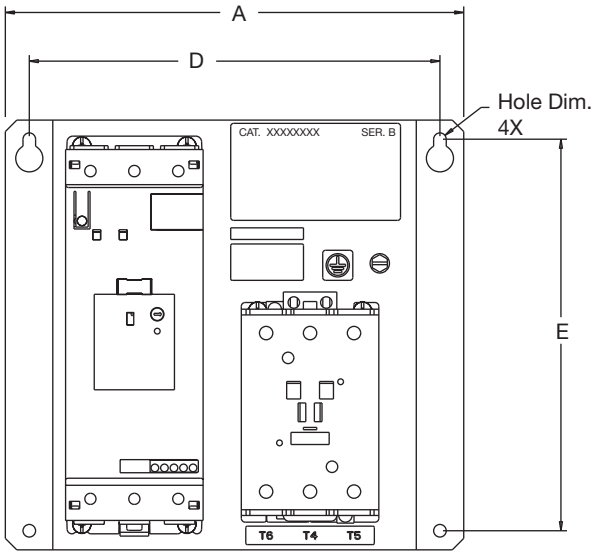
LINE Connected Controller - Typical Control Wiring

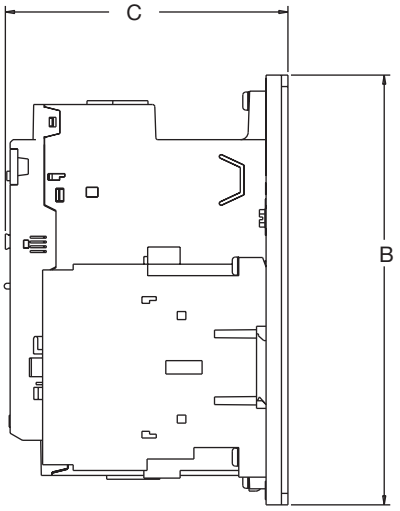


❶ When (A1)(A2) control power is applied, (97)(98) contact closes instantaneously and opens when the PCE detects an overload or fault condition, or when control power is removed.
❷ Customer supplied.

PCEC Hydraulic Elevator Softstarter

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





Controller Size	Units	A (Width)	B (Height)	C (Depth)	D	E	Hole Dim - 4x	Approx. Weight
32/51/64	mm	178	144	115.7	165.1	127.0	5.6	4 lbs (2 kg)
	in	7.01	5.67	4.56	6.50	5.00	0.22	
74/104/147	mm	240	225	147.9	215	205	6.6	14 lbs (6 kg)
	in	9.45	8.86	5.82	8.46	8.07	0.260	
234	mm	362	515	216.4	330.2	489.5	8.7	51 lbs (23 kg)
	in	14.25	20.28	8.52	13.00	19.27	0.343	