PF Controllers

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

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.

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

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

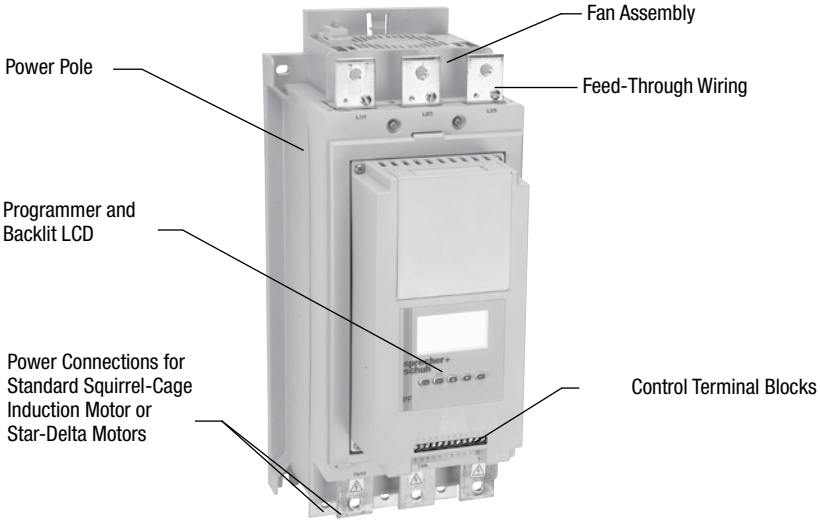
200...600V AC, 50/60 Hz

Control Range

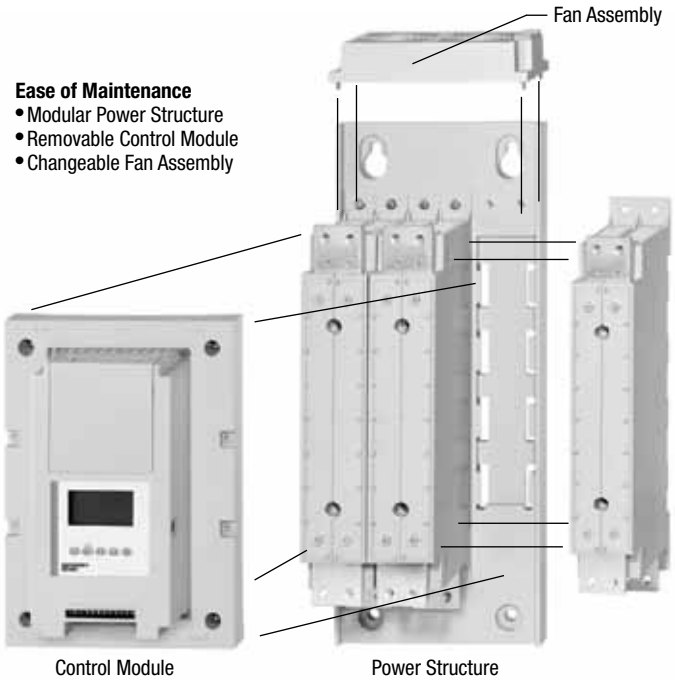
100...240V AC or 24V AC/DC

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

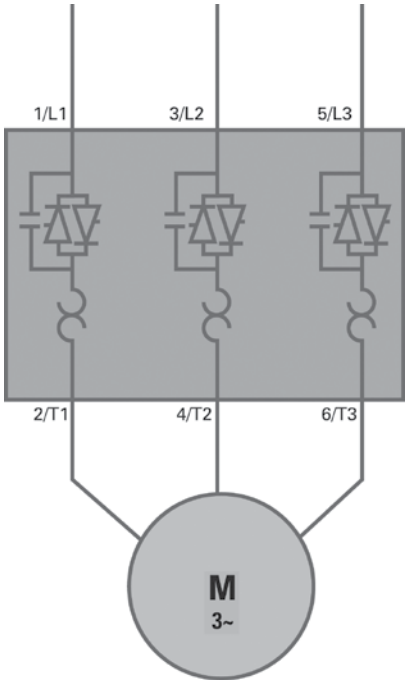
Configurable Auxiliary Contacts - 4
- Normal, Up-to-speed, External bypass, Fault, Alarm
- N.O. or N.C.

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

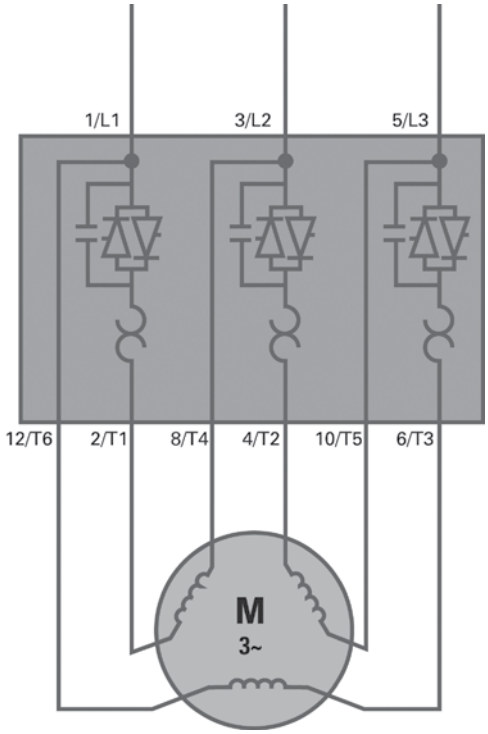
Metering
- Three-phase Currents
- Power in kW
- Motor Thermal
- Capacity Usage
- Elapsed Time of Motor Operation
- Three-phase voltages
- Power Usage in kWH
- Power Factor of the Running Motor

I/O
- 2 Inputs
- 4 Configurable Auxiliary Contacts

Line Connection

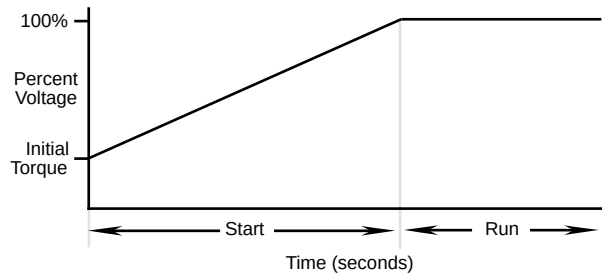


Delta Connection



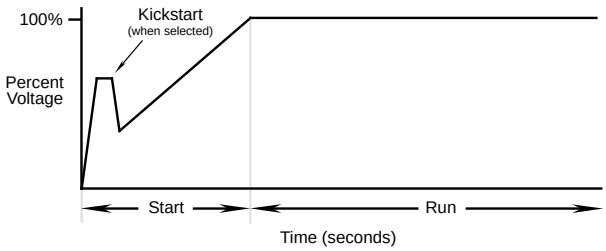
Modes of Operation *(Standard)*

Soft Start



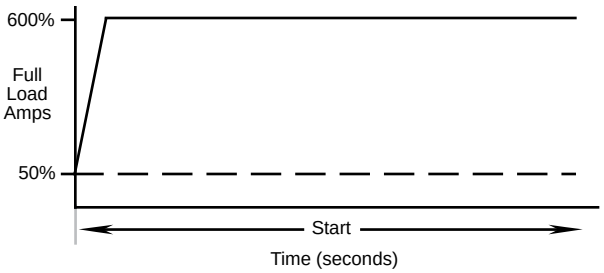
This method covers the most general applications. The motor is given an initial torque setting, which is user adjustable. From the initial torque level, the output voltage to the motor is steplessly increased during the acceleration ramp time, which is user adjustable.

Soft Start with Selectable Kickstart



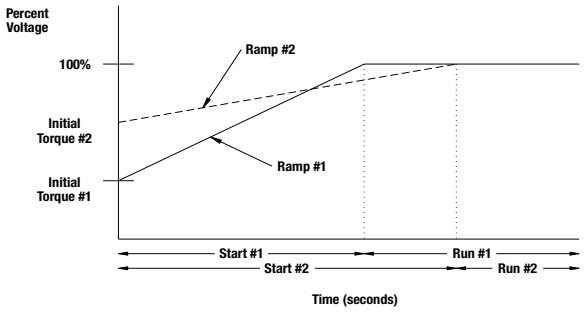
The kickstart feature provides a boost at startup to break away loads that may require a pulse of high torque to get started. It is intended to provide a current pulse, for a selected period of time.

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.

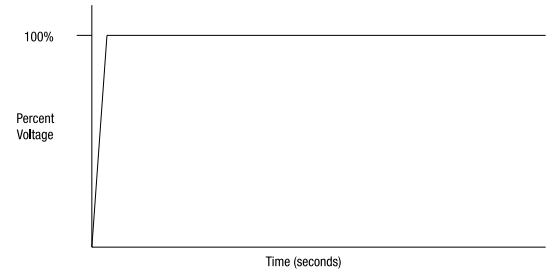
Dual Ramp Start



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.

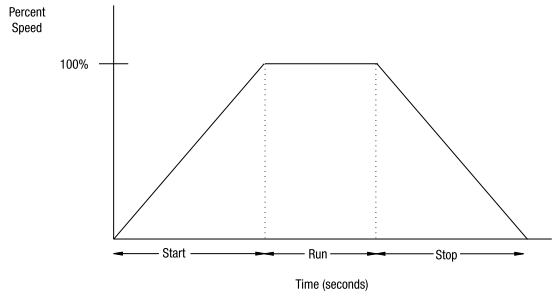
Modes of Operation *(Standard)*

Full Voltage Start



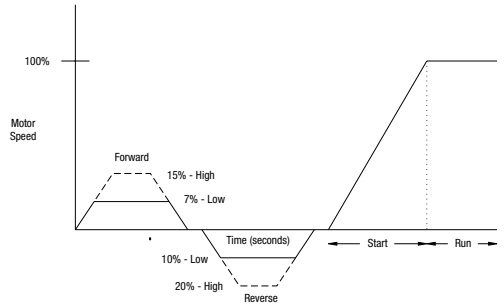
This method is used in applications requiring across-the-line starting. The PF controller performs like a solid-state contactor. Full inrush current and locked-rotor torque are realized. The PF may be programmed to provide full voltage start in which the output voltage to the motor reaches full voltage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

Linear Speed Acceleration



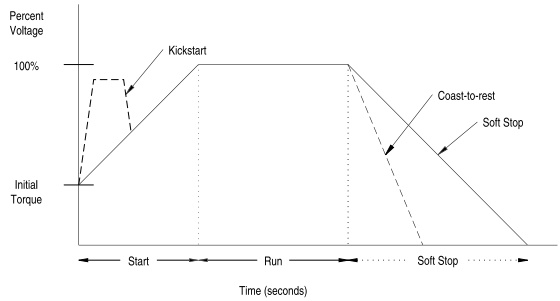
With this type of acceleration mode, a closed-loop feedback system maintains the motor acceleration at a constant rate. The required feedback signal is provided by a DC tachometer coupled to the motor (tachometer supplied by user 0-5V DC, 4.5V DC = 100% speed). Kickstart is available with this mode.

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

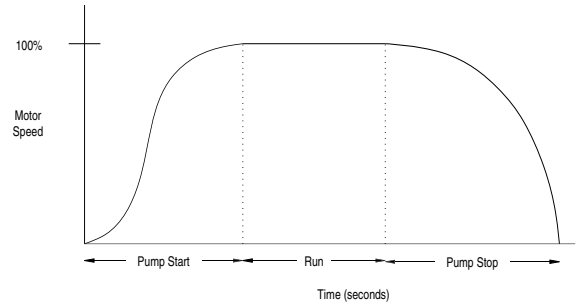


The Soft Stop option can be used in applications requiring an extended stop time. The voltage ramp down time is user adjustable from 0 to 120 seconds. The load will stop when the voltage drops to a point where the load torque is greater than the motor torque.

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

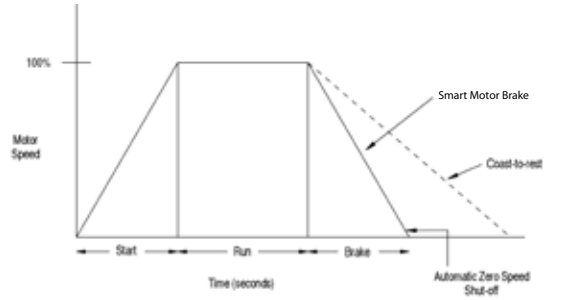
Optional Modes of Operation

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



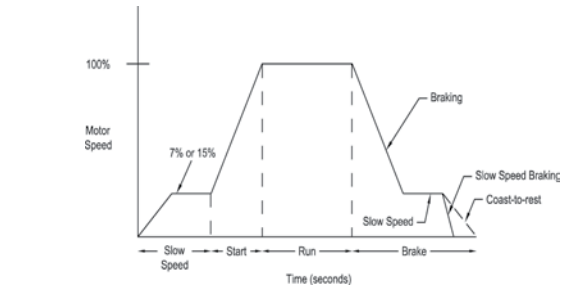
This option is used to reduce surges during the starting and stopping of a centrifugal pump by smoothly accelerating and decelerating the motor. The microprocessor analyzes the motor variables and generates commands which control the motor and reduce the possibility of surges occurring in the system.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

Smart Motor Brake (Option "PFD") ❶



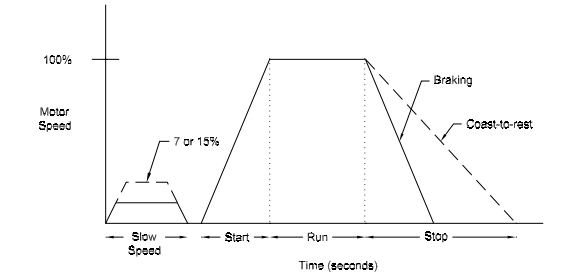
This option provides motor braking for applications that require the motor to stop faster than a coast to rest. Braking control, with automatic zero speed shut off, is fully integrated into the compact design of the PF controller. This design facilitates a clean, straight forward installation and eliminates 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.

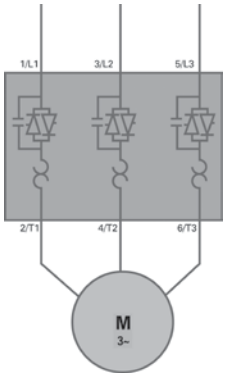
Tach Input
A motor tachometer is required for the Linear Speed Start mode. Please see the Specifications section page D49 for tachometer characteristics.

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 Catalog Number	Price	24V AC/DC ❹ Control Voltage 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.

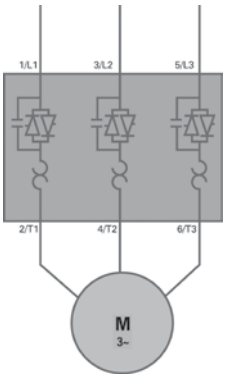
❺ Include suffix and price adder from page D46 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

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 Catalog Number	Price	24V AC/DC ❹ Control Voltage 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.

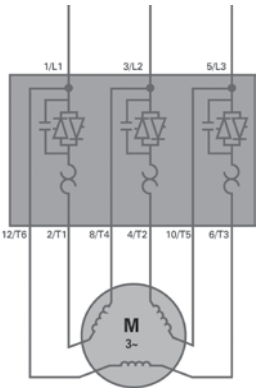
❺ Include suffix and price adder from page D46 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

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 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



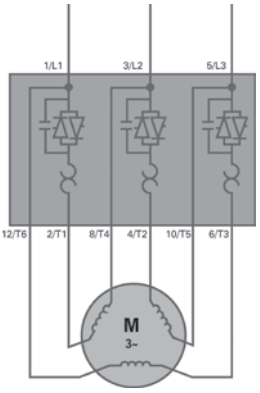
All PF Models are Wye-Delta compatible

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 Catalog Number	Price	24V AC/DC ❺ Control Voltage 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 ❻] 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.

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 D56 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 D56 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.

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 D56 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 D56 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.

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		**2150**
For 43A unit		**2150**
For 60A unit		**2150**
For 85A unit		**2150**
For 108A unit		**2150**
For 135A unit		**2150**
For 201A unit		**2150**
For 251A unit		**2150**
For 317A unit		**2150**
For 361A unit		**2150**
For 480A unit		**2150**
For 625A unit		**2150**
For 780A unit		**2150**
For 970A unit		**2150**
For 1250A unit		**2150**
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.

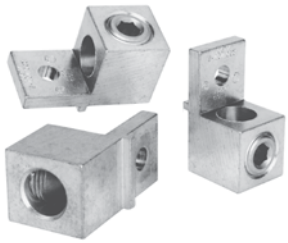
❷ Not intended to be used as an emergency stop. Refer to applicable standards for emergency stop requirements.

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.	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		Pkg. Qty.	Catalog Number	Price
			Line Side	Load Side			
	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.

Specifications

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	
			UL/CSA/NEMA	IEC
Control Circuit	Rated Operational Voltage	5…480 A	100…240V AC or 24V AC/DC	
		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

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

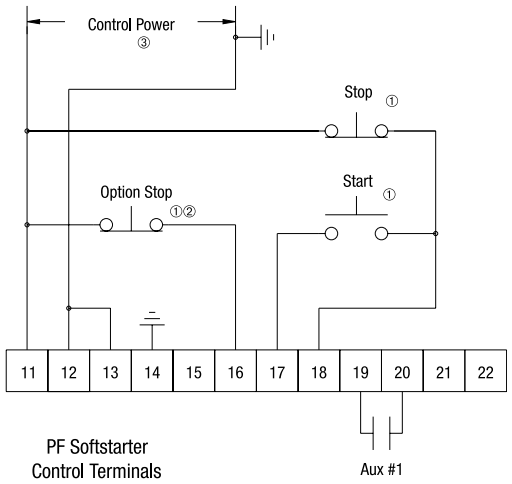
Operating Temperature Range	-5...50 °C (23...122 °F) (open) -5...40 °C (23...104 °F) (enclosed)
Storage and Transportation Temperature Range	-20...+75 °C (-4…167 °F)
Altitude	2000 m (6560 ft)
Humidity	5...95% (non-condensing)
Pollution Degree	2

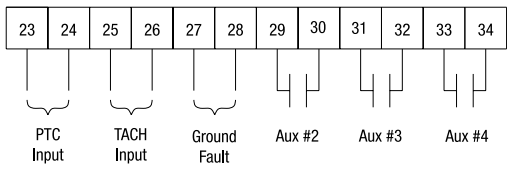
❶ For devices rated 5...480 A, heatsink fans can be powered by either 110/120V AC or 220/240V AC.
For devices rated 625...1250 A, heatsink fans can only be powered by 110/120V AC.

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)

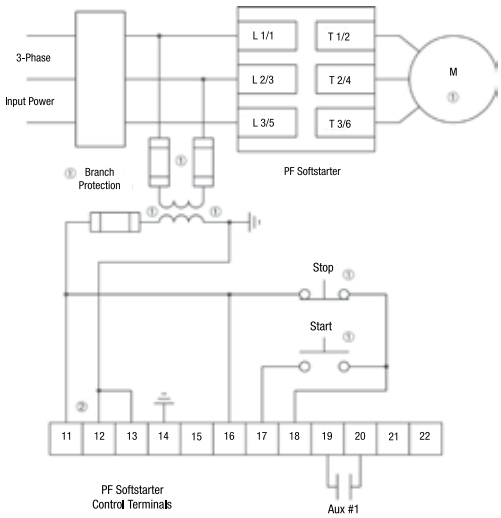
Soft Stop, Pump Control and Braking Wiring Diagram

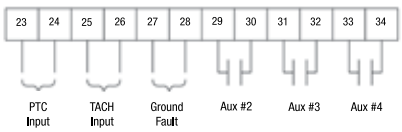




① Customer supplied.

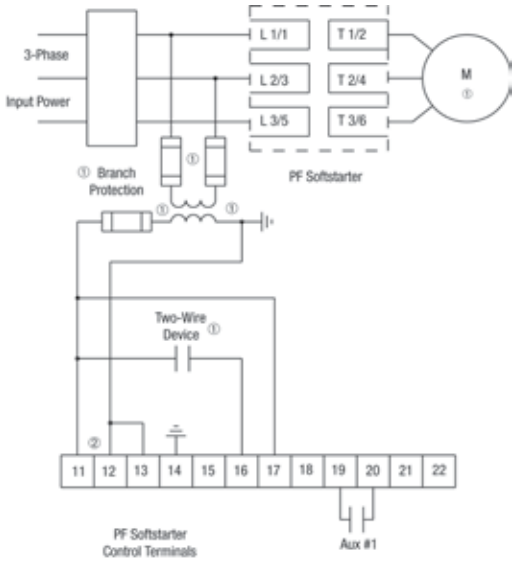
3-Wire Control

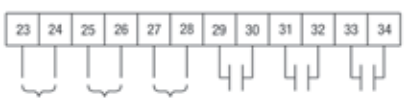




① Customer supplied.

2-Wire Control





Approximate Dimensions and Shipping Weights

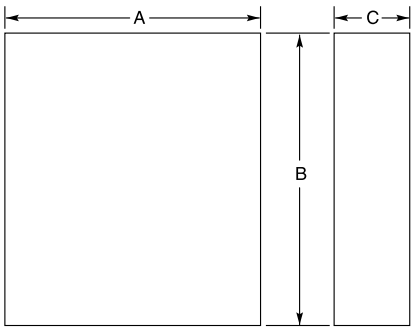
Open Type Controllers

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.

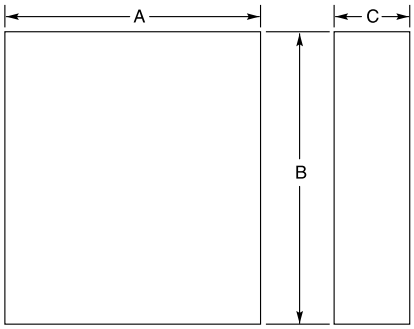


Controller Rating (A)	Disconnect Rating (A)	IP65 (Type 4/12)		
		Height B	Width A	Depth C
Non-Combination Controller				
5	—	610 (24)	508 (20)	254 (10)
25	—	610 (24)	508 (20)	254 (10)
43	—	610 (24)	508 (20)	254 (10)
60	—	610 (24)	508 (20)	254 (10)
85	—	610 (24)	508 (20)	254 (10)
108	—	762 (30)	610 (24)	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

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	600 A/J	1524 (60)	914 (36)	406 (16)
480 ❶	600 A/J	1524 (60)	914 (36)	406 (16)
480 ❷	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.

Notes