

PF Controllers

The Intelligent Controller with extensive starting and stopping configurations up to 400HP (3-wire), 700HP (6-wire) @460V



PF Control module with standard built in keypad and backlit 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...480A, 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.



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PF Softstarters

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 400HP @ 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 - 12 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

Voltage Range

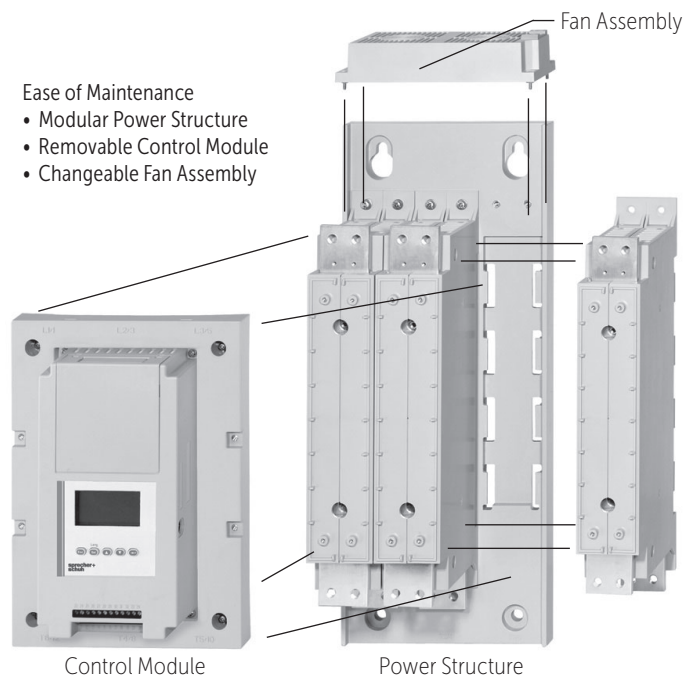
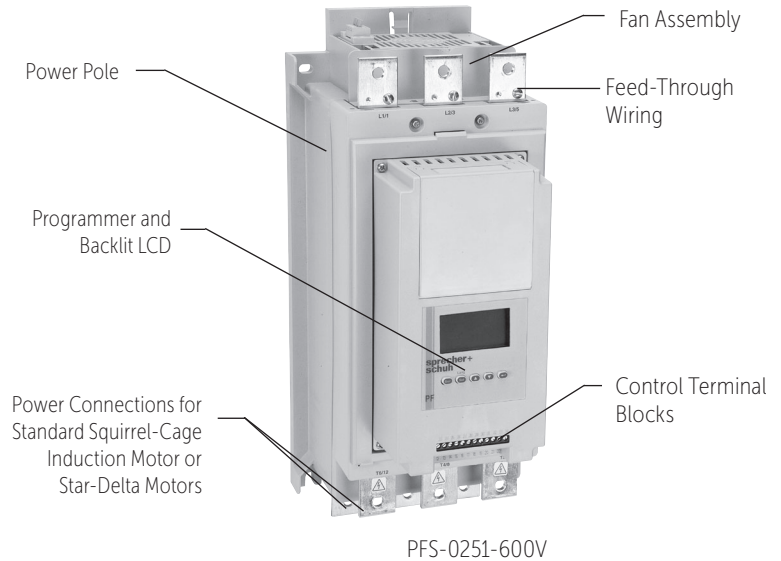
200...600V AC, 50/60 Hz

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



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

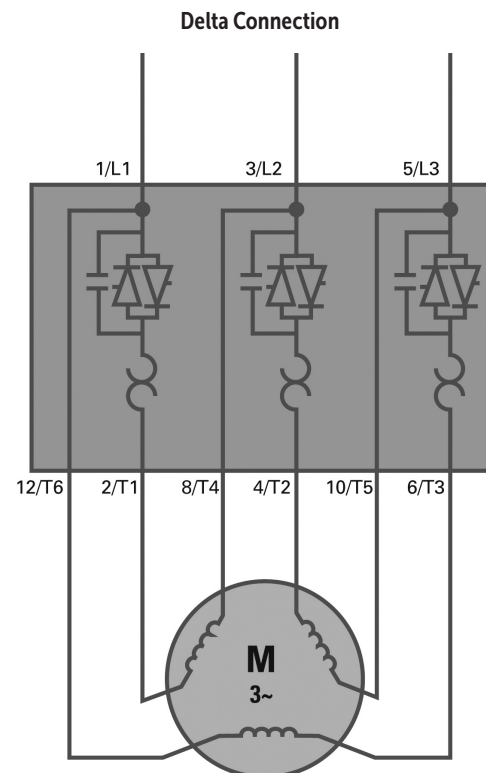
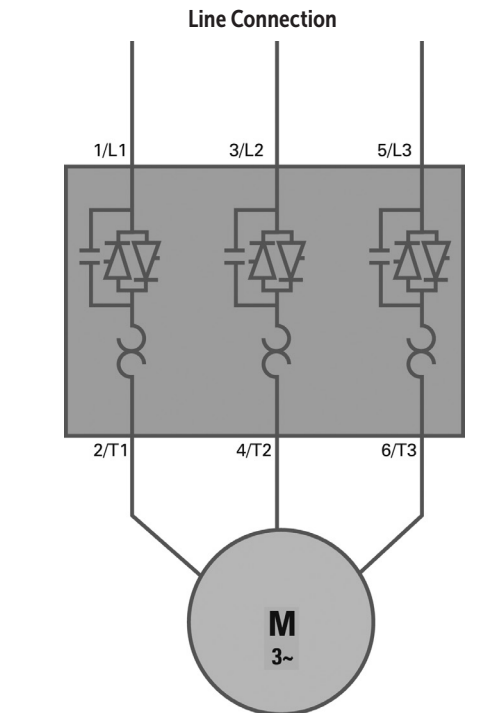
- Standard Squirrel-Cage Induction Motor
- Start-Delta Motor

Metering

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

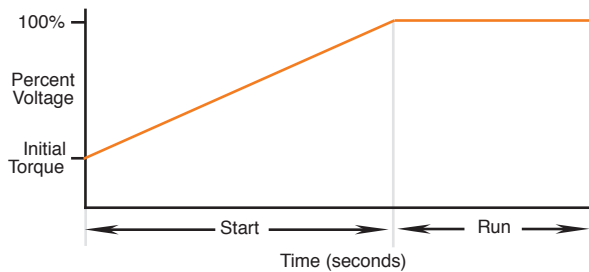
I/O

- 2 Inputs
- 4 Configurable Auxiliary Contacts


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PFS Softstarters

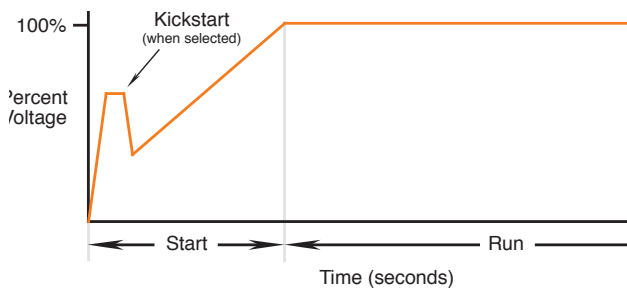
Modes of Operation (Standard PFS)

Soft Start



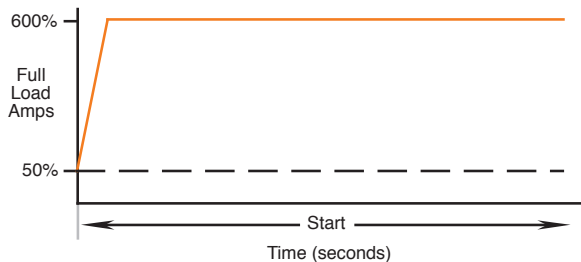
This method covers the most general applications. The motor is given an initial torque setting, which is user adjustable. From the initial torque level, the output voltage to the motor is steplessly increased during the acceleration ramp time, which is user adjustable.

Soft Start with Selectable Kickstart



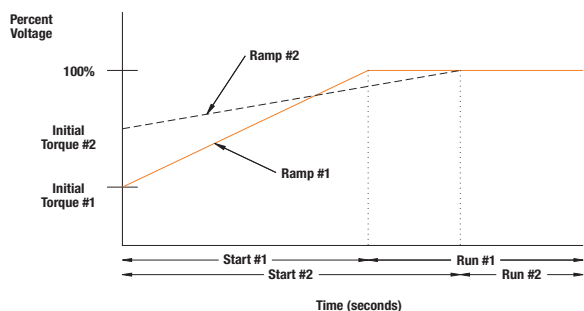
The kickstart feature provides a boost at startup to break away loads that may require a pulse of high torque to get started. It is intended to provide a current pulse, for a selected period of time.

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

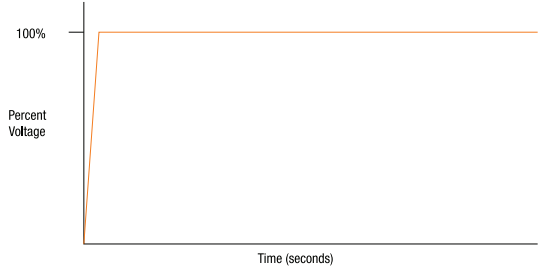
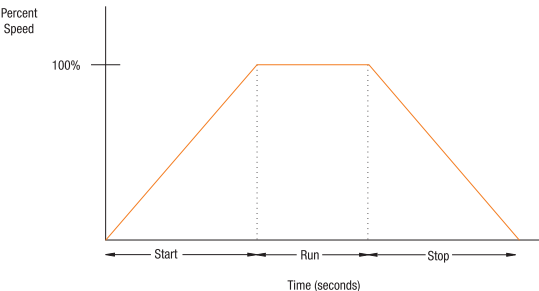
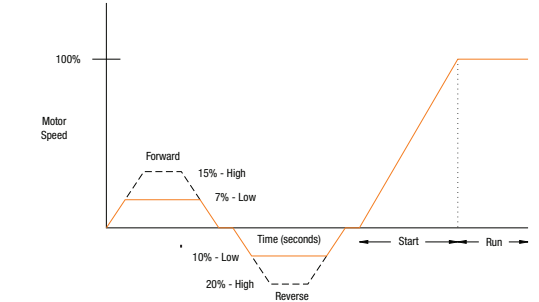
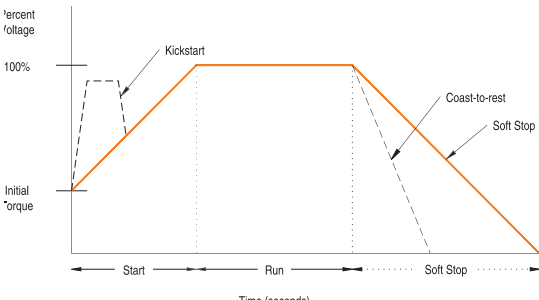


This starting method is useful on applications with varying loads, starting torque, and start time requirements. Dual Ramp Start offers the user the ability to select between two separate start profiles with separately adjustable ramp times and initial torque settings.

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PFS Softstarters

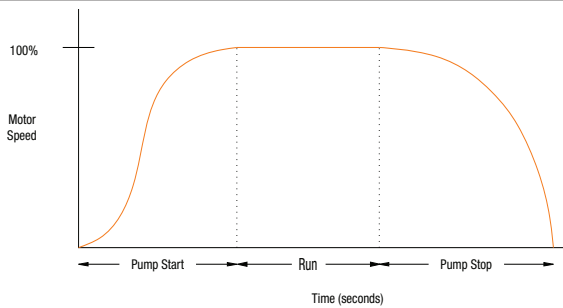
Modes of Operation (Standard PFS)

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 ①	
	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.

① Not intended to be used as an emergency stop. Refer to the applicable standards for emergency stop requirements.

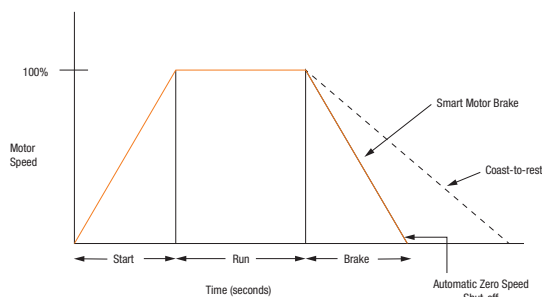
Optional Modes of Operation

Pump Control - Start and Stop (Option "PFB") ①



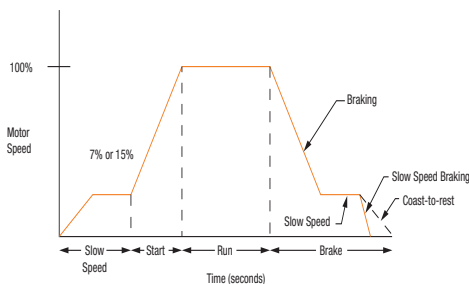
This option is used to reduce surges during the starting and stopping of a centrifugal pump by smoothly accelerating and decelerating the motor. The microprocessor analyzes the motor variables and generates commands which control the motor and reduce the possibility of surges occurring in the system.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

Smart Motor Brake (Option "PFD") ①



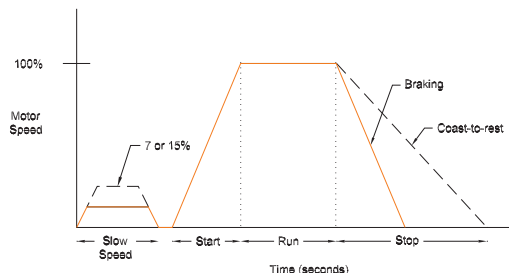
This option provides motor braking for applications that require the motor to stop faster than a coast to rest. Braking control, with automatic zero speed shut off, is fully integrated into the compact design of the PF controller. This design facilitates a clean, straight forward installation and eliminates 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") ①



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") ①



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%.

① 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 I²t 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

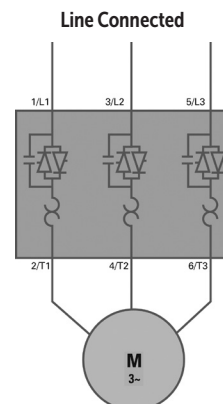
A motor tachometer is required for the Linear Speed Start mode. Please see the Specifications section page D49 for tachometer characteristics.

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 ①⑤

Rated Voltage [V AC]	Motor Current (Amps) ②	Max. kW 50 Hz	Max. Hp 60 Hz ③	100...240V AC 50/60Hz Control Voltage ④ Catalog Number	24V AC/DC Control Voltage ④ Catalog Number
200/208	1...5	~	1	PFS-0005-600V	PFS-0005-600V-024
	5...25	~	5	PFS-0025-600V	PFS-0025-600V-024
	8.6...43	~	10	PFS-0043-600V	PFS-0043-600V-024
	12...60	~	15	PFS-0060-600V	PFS-0060-600V-024
	17...85	~	25	PFS-0085-600V	PFS-0085-600V-024
	27...108	~	30	PFS-0108-600V	PFS-0108-600V-024
	34...135	~	40	PFS-0135-600V	PFS-0135-600V-024
	67...201	~	60	PFS-0201-600V	PFS-0201-600V-024
	84...251	~	75	PFS-0251-600V	PFS-0251-600V-024
	106...317	~	100	PFS-0317-600V	PFS-0317-600V-024
	120...361	~	125	PFS-0361-600V	PFS-0361-600V-024
230	1...5	1.1	1	PFS-0005-600V	PFS-0005-600V-024
	5...25	5.5	7.5	PFS-0025-600V	PFS-0025-600V-024
	8.6...43	11	15	PFS-0043-600V	PFS-0043-600V-024
	12...60	15	20	PFS-0060-600V	PFS-0060-600V-024
	17...85	22	30	PFS-0085-600V	PFS-0085-600V-024
	27...108	30	40	PFS-0108-600V	PFS-0108-600V-024
	34...135	37	50	PFS-0135-600V	PFS-0135-600V-024
	67...201	55	75	PFS-0201-600V	PFS-0201-600V-024
	84...251	75	100	PFS-0251-600V	PFS-0251-600V-024
	106...317	90	125	PFS-0317-600V	PFS-0317-600V-024
	120...361	110	150	PFS-0361-600V	PFS-0361-600V-024
	160...480	132	200	PFS-0480-600V	PFS-0480-600V-024



① Controllers rated 108 A and greater are not equipped with line and load terminal lugs. See page D2:19 for terminal lug kits.

② 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.

③ Hp ratings at motor terminal voltages for 200, 230, 460, and 575 line volts, respectively.

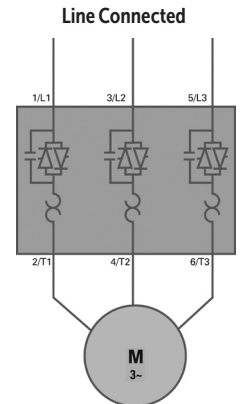
④ Separate 120V or 240V single phase is required for PF fan operation.

⑤ See page D2:18 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

⑥ 110/120V control power only. For 230V control power only, change catalog number suffix "-120" to "-230". Price remains the same.

Open Type Controller - Line Connected ①⑤

Rated Voltage [V AC]	Motor Current (Amps) ②	Max. kW 50 Hz	Max. Hp 60 Hz ③	100...240V AC 50/60Hz Control Voltage ④ Catalog Number	24V AC/DC Control Voltage ④ Catalog Number
400/415/460	1...5	2.2	3	PFS-0005-600V	PFS-0005-600V-024
	5...25	11	15	PFS-0025-600V	PFS-0025-600V-024
	8.6...43	22	30	PFS-0043-600V	PFS-0043-600V-024
	12...60	30	40	PFS-0060-600V	PFS-0060-600V-024
	17...85	45	60	PFS-0085-600V	PFS-0085-600V-024
	27...108	55	75	PFS-0108-600V	PFS-0108-600V-024
	34...135	75	100	PFS-0135-600V	PFS-0135-600V-024
	67...201	110	150	PFS-0201-600V	PFS-0201-600V-024
	84...251	132	200	PFS-0251-600V	PFS-0251-600V-024
	106...317	160	250	PFS-0317-600V	PFS-0317-600V-024
	120...361	200	300	PFS-0361-600V	PFS-0361-600V-024
500/575	1...5	2.2	3	PFS-0005-600V	PFS-0005-600V-024
	5...25	15	20	PFS-0025-600V	PFS-0025-600V-024
	8.6...43	22	40	PFS-0043-600V	PFS-0043-600V-024
	12...60	37	50	PFS-0060-600V	PFS-0060-600V-024
	17...85	55	75	PFS-0085-600V	PFS-0085-600V-024
	27...108	75	100	PFS-0108-600V	PFS-0108-600V-024
	34...135	90	125	PFS-0135-600V	PFS-0135-600V-024
	67...201	132	200	PFS-0201-600V	PFS-0201-600V-024
	84...251	160	250	PFS-0251-600V	PFS-0251-600V-024
	160...317	200	300	PFS-0317-600V	PFS-0317-600V-024
	120...361	250	350	PFS-0361-600V	PFS-0361-600V-024
	160...480	315	500	PFS-0480-600V	PFS-0480-600V-024

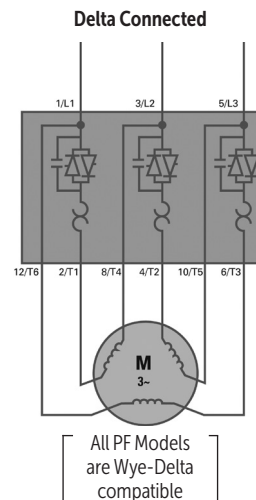

D2
PFS Softstarters

- ① Controllers rated 108 A and greater are not equipped with line and load terminal lugs. See page D2:19 for terminal lug kits.
- ② 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.

- ③ Hp ratings at motor terminal voltages for 200, 230, 460, and 575 line volts, respectively.
- ④ Separate 120V or 240V single phase is required for PF fan operation.
- ⑤ See page D2:18 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.
- ⑥ 110/120V control power only. For 230V control power only, change catalog number suffix "-120" to "-230". Price remains the same.

Open Type Controller - Delta Connected ①②⑦

Rated Voltage [V AC]	Motor Current (Amps) ④	Max. kW 50 Hz	Max. Hp 60 Hz ③	100...240V AC 50/60Hz Control Voltage ⑤ Catalog Number	24V AC/DC Control Voltage ⑤ Catalog Number
200/208	1.7...8.7	~	2	PFS-0005-600V	PFS-0005-600V-024
	8.7...43	~	10	PFS-0025-600V	PFS-0025-600V-024
	14.9...74	~	20	PFS-0043-600V	PFS-0043-600V-024
	20.8...104	~	30	PFS-0060-600V	PFS-0060-600V-024
	29.4...147	~	40	PFS-0085-600V	PFS-0085-600V-024
	47...187	~	60	PFS-0108-600V	PFS-0108-600V-024
	59...234	~	75	PFS-0135-600V	PFS-0135-600V-024
	116...348	~	100	PFS-0201-600V	PFS-0201-600V-024
	145...435	~	150	PFS-0251-600V	PFS-0251-600V-024
	183...549	~	200	PFS-0317-600V	PFS-0317-600V-024
	208...625	~	200	PFS-0361-600V	PFS-0361-600V-024
	277...831	~	300	PFS-0480-600V	PFS-0480-600V-024
230	1.7...8.7	2.2	2	PFS-0005-600V	PFS-0005-600V-024
	8.7...43	11	15	PFS-0025-600V	PFS-0025-600V-024
	14.9...74	22	25	PFS-0043-600V	PFS-0043-600V-024
	20.8...104	30	40	PFS-0060-600V	PFS-0060-600V-024
	29.4...147	45	50	PFS-0085-600V	PFS-0085-600V-024
	47...187	55	60	PFS-0108-600V	PFS-0108-600V-024
	59...234	75	75	PFS-0135-600V	PFS-0135-600V-024
	116...348	110	125	PFS-0201-600V	PFS-0201-600V-024
	145...435	132	150	PFS-0251-600V	PFS-0251-600V-024
	183...549	160	200	PFS-0317-600V	PFS-0317-600V-024
	208...625	200	250	PFS-0361-600V	PFS-0361-600V-024
	277...831	250	350	PFS-0480-600V	PFS-0480-600V-024



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② See page D2:18 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

③ Hp ratings at motor terminal voltages for 200, 230, 460, and 575 line volts, respectively.

④ 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.

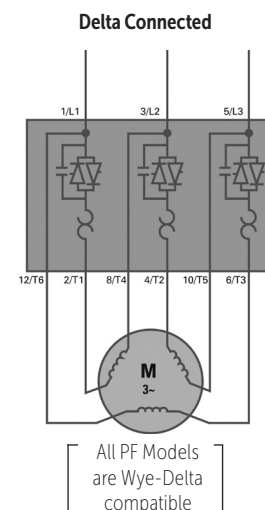
⑤ Separate 120V or 240V single phase is required for PF fan operation.

⑥ 110/120V control power only. For 230V control power only, change catalog number suffix "-120" to "-230". Price remains the same.

⑦ 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 ①②⑦

Rated Voltage [V AC]	Motor Current (Amps) ②	Max. kW 50 Hz	Max. Hp 60 Hz ③	100...240V AC 50/60Hz Control Voltage ⑤ Catalog Number	24V AC/DC Control Voltage ⑤ Catalog Number
460	1.7...8.7	4	5	PFS-0005-600V	PFS-0005-600V-024
	8.7...43	22	30	PFS-0025-600V	PFS-0025-600V-024
	14.9...74	37	50	PFS-0043-600V	PFS-0043-600V-024
	20.8...104	55	75	PFS-0060-600V	PFS-0060-600V-024
	29.4...147	75	100	PFS-0085-600V	PFS-0085-600V-024
	47...187	90	150	PFS-0108-600V	PFS-0108-600V-024
	59...234	132	150	PFS-0135-600V	PFS-0135-600V-024
	116...348	160	250	PFS-0201-600V	PFS-0201-600V-024
	145...435	250	350	PFS-0251-600V	PFS-0251-600V-024
	183...549	315	450	PFS-0317-600V	PFS-0317-600V-024
	208...625	355	500	PFS-0361-600V	PFS-0361-600V-024
500/575	277...831	450	700	PFS-0480-600V	PFS-0480-600V-024
	1.7...8.7	5.5	7.5	PFS-0005-600V	PFS-0005-600V-024
	8.7...43	15	40	PFS-0025-600V	PFS-0025-600V-024
	14.9...74	45	60	PFS-0043-600V	PFS-0043-600V-024
	20.8...104	55	100	PFS-0060-600V	PFS-0060-600V-024
	29.4...147	90	150	PFS-0085-600V	PFS-0085-600V-024
	47...187	132	150	PFS-0108-600V	PFS-0108-600V-024
	59...234	160	200	PFS-0135-600V	PFS-0135-600V-024
	116...348	250	350	PFS-0201-600V	PFS-0201-600V-024
	145...435	315	400	PFS-0251-600V	PFS-0251-600V-024
	183...549	400	500	PFS-0317-600V	PFS-0317-600V-024
	208...625	450	600	PFS-0361-600V	PFS-0361-600V-024
	277...831	560	900	PFS-0480-600V	PFS-0480-600V-024



D2
PFS Softstarters

① Controllers rated 108 A and greater are not equipped with line and load terminal lugs. See page D2:19 for terminal lug kits.

② See page D2:18 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

③ Hp ratings at motor terminal voltages for 200, 230, 460, and 575 line volts, respectively.

④ 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.

⑤ Separate 120V or 240V single phase is required for PF fan operation.

⑥ 110/120V control power only. For 230V control power only, change catalog number suffix "-120" to "-230". Price remains the same.

⑦ 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 ②③④

Rated Voltage [V AC]	Motor Current (Amps) ①	kW 50 Hz	Hp 60 Hz	Type 12 [Type 3R ⑤] Industrial Dusttight Catalog Number	Type 4 Watertight Catalog Number
200/208	1...5	—	1	PFS-0005-NHDD	PFS-0005-NHDW
	5...25	—	5	PFS-0025-NHDD	PFS-0025-NHDW
	8.6...43	—	10	PFS-0043-NHDD	PFS-0043-NHDW
	12...60	—	15	PFS-0060-NHDD	PFS-0060-NHDW
	17...85	—	25	PFS-0085-NHDD	PFS-0085-NHDW
	27...108	—	30	PFS-0108-NHDD	PFS-0108-NHDW
	34...135	—	40	PFS-0135-NHDD	PFS-0135-NHDW
	67...201	—	60	PFS-0201-NHDD	PFS-0201-NHDW
	84...251	—	75	PFS-0251-NHDD	PFS-0251-NHDW
	106...317	—	100	PFS-0317-NHDD	PFS-0317-NHDW
	120...361	—	125	PFS-0361-NHDD	PFS-0361-NHDW
	160...480	—	150	PFS-0480-NHDD	PFS-0480-NHDW
230	1...5	1.1	1	PFS-0005-NADD	PFS-0005-NADW
	5...25	5.5	7.5	PFS-0025-NADD	PFS-0025-NADW
	8.6...43	11	15	PFS-0043-NADD	PFS-0043-NADW
	12...60	15	20	PFS-0060-NADD	PFS-0060-NADW
	17...85	22	30	PFS-0085-NADD	PFS-0085-NADW
	27...108	30	40	PFS-0108-NADD	PFS-0108-NADW
	34...135	37	50	PFS-0135-NADD	PFS-0135-NADW
	67...201	55	75	PFS-0201-NADD	PFS-0201-NADW
	84...251	75	100	PFS-0251-NADD	PFS-0251-NADW
	106...317	90	125	PFS-0317-NADD	PFS-0317-NADW
	120...361	110	150	PFS-0361-NADD	PFS-0361-NADW
	160...480	132	200	PFS-0480-NADD	PFS-0480-NADW

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

① 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.

② Line and load termination are provided as standard.

③ See page D2:18 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

④ Other UL type enclosures available. Ask your Sprecher + Schuh representative.

⑤ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PFS-0085-NHDD becomes PFS-0085-NHDR. Price and dimensions remain the same.

Enclosed Non-Combination Starters - Line Connected ②③④

Rated Voltage [V AC]	Motor Current (Amps) ①	kW 50 Hz	Hp 60 Hz	Type 12 [Type 3R ⑤] Industrial Dusttight Catalog Number	Type 4 Watertight Catalog Number
460 ⑥	1...5	2.2	3	PFS-0005-NBDD	PFS-0005-NBDW
	5...25	11	15	PFS-0025-NBDD	PFS-0025-NBDW
	8.6...43	22	30	PFS-0043-NBDD	PFS-0043-NBDW
	12...60	30	40	PFS-0060-NBDD	PFS-0060-NBDW
	17...85	45	60	PFS-0085-NBDD	PFS-0085-NBDW
	27...108	55	75	PFS-0108-NBDD	PFS-0108-NBDW
	34...135	75	100	PFS-0135-NBDD	PFS-0135-NBDW
	67...201	110	150	PFS-0201-NBDD	PFS-0201-NBDW
	84...251	132	200	PFS-0251-NBDD	PFS-0251-NBDW
	106...317	160	250	PFS-0317-NBDD	PFS-0317-NBDW
	120...361	200	300	PFS-0361-NBDD	PFS-0361-NBDW
	160...480	250	400	PFS-0480-NBDD	PFS-0480-NBDW
500/575	1...5	2.2	3	PFS-0005-NCDD	PFS-0005-NCDW
	5...25	15	20	PFS-0025-NCDD	PFS-0025-NCDW
	8.6...43	22	40	PFS-0043-NCDD	PFS-0043-NCDW
	12...60	37	50	PFS-0060-NCDD	PFS-0060-NCDW
	17...85	55	75	PFS-0085-NCDD	PFS-0085-NCDW
	27...108	75	100	PFS-0108-NCDD	PFS-0108-NCDW
	34...135	90	125	PFS-0135-NCDD	PFS-0135-NCDW
	67...201	132	200	PFS-0201-NCDD	PFS-0201-NCDW
	84...251	160	250	PFS-0251-NCDD	PFS-0251-NCDW
	106...317	200	300	PFS-0317-NCDD	PFS-0317-NCDW
	120...361	250	350	PFS-0361-NCDD	PFS-0361-NCDW
	160...480	315	500	PFS-0480-NCDD	PFS-0480-NCDW

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

D2

PF Softstarters

① 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.

② Line and load termination are provided as standard.

③ See page D2:18 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

④ Other UL type enclosures available. Ask your Sprecher + Schuh representative.

⑤ For 380V applications choose softstarter based on FLA, then change the NB code in the catalog number to NG. For example PFS-0085-NBDD becomes PFS-0085-NGDD, which covers 25 HP @ 380V FLA 37. Price remains the same.

⑥ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PFS-0085-NBDD becomes PFS-0085-NBDR. Price and dimensions remain the same.

Enclosed Combination Circuit Breaker - Line Connected ①②④

Rated Voltage [V AC]	kW 50 Hz	Hp 60 Hz	Controller Current Rating ⑤	Type 12 [Type 3R ⑥] Industrial Dusttight Catalog Number	Type 4 Watertight Catalog Number
200	—	0.5	5 A	PFS-0005-BHD33D	PFS-0005-BHD33W
	—	0.75	5 A	PFS-0005-BHD34D	PFS-0005-BHD34W
	—	1	5 A	PFS-0005-BHD35D	PFS-0005-BHD35W
	—	1.5	25 A	PFS-0025-BHD36D	PFS-0025-BHD36W
	—	2	25 A	PFS-0025-BHD37D	PFS-0025-BHD37W
	—	3	25 A	PFS-0025-BHD38D	PFS-0025-BHD38W
	—	5	25 A	PFS-0025-BHD39D	PFS-0025-BHD39W
	—	5	25 A	PFS-0025-BHD40D	PFS-0025-BHD40W
	—	10	43 A	PFS-0043-BHD41D	PFS-0043-BHD41W
	—	15	60 A	PFS-0060-BHD42D	PFS-0060-BHD42W
	—	20	85 A	PFS-0085-BHD43D	PFS-0085-BHD43W
	—	25	85 A	PFS-0085-BHD44D	PFS-0085-BHD44W
	—	30	108 A	PFS-0108-BHD45D	PFS-0108-BHD45W
	—	40	135 A	PFS-0135-BHD46D	PFS-0135-BHD46W
	—	50	201 A	PFS-0201-BHD47D	PFS-0201-BHD47W
	—	60	201 A	PFS-0201-BHD48D	PFS-0201-BHD48W
	—	75	251 A	PFS-0251-BHD49D	PFS-0251-BHD49W
	—	100	317 A	PFS-0317-BHD50D	PFS-0317-BHD50W
230	—	125	361 A	PFS-0361-BHD51D	PFS-0361-BHD51W
	—	150	480 A	PFS-0480-BHD52D	PFS-0480-BHD52W
	0.37	0.5	5 A	PFS-0005-BAD33D	PFS-0005-BAD33W
	0.55	0.75	5 A	PFS-0005-BAD34D	PFS-0005-BAD34W
	0.75	1	5 A	PFS-0005-BAD35D	PFS-0005-BAD35W
	1.1	1.5	25 A	PFS-0025-BAD36D	PFS-0025-BAD36W
	1.5	2	25 A	PFS-0025-BAD37D	PFS-0025-BAD37W
	2.2	3	25 A	PFS-0025-BAD38D	PFS-0025-BAD38W
	3.7	5	25 A	PFS-0025-BAD39D	PFS-0025-BAD39W
	5.5	7.5	25 A	PFS-0025-BAD40D	PFS-0025-BAD40W
	7.5	10	43 A	PFS-0043-BAD41D	PFS-0043-BAD41W
	11	15	43 A	PFS-0043-BAD42D	PFS-0043-BAD42W
	15	20	60 A	PFS-0060-BAD43D	PFS-0060-BAD43W
	18.5	25	85 A	PFS-0085-BAD44D	PFS-0085-BAD44W
	22	30	85 A	PFS-0085-BAD45D	PFS-0085-BAD45W
	30	40	108 A	PFS-0108-BAD46D	PFS-0108-BAD46W
	37	50	135 A	PFS-0135-BAD47D	PFS-0135-BAD47W
	45	60	201 A	PFS-0201-BAD48D	PFS-0201-BAD48W
	55	75	201 A	PFS-0201-BAD49D	PFS-0201-BAD49W
	75	100	251 A	PFS-0251-BAD50D	PFS-0251-BAD50W
	90	125	317 A	PFS-0317-BAD51D	PFS-0317-BAD51W
	110	150	361 A	PFS-0361-BAD52D	PFS-0361-BAD52W
	132	200	480 A	PFS-0480-BAD54D	PFS-0480-BAD54W

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

① Other UL Type enclosures available. Contact your Sprecher + Schuh representative.

② See page D2:18 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

③ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.

④ See page D2:27 for circuit breaker ratings.

⑤ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PFS-0085-BHD43D becomes PFS-0085-BHD43R. Price and dimensions remain the same.

Enclosed Combination Circuit Breaker - Line Connected ①②④

Rated Voltage [V AC]	kW 50 Hz	Hp 60 Hz	Controller Current Rating ⑤	Type 12 [Type 3R ⑥] Industrial Dusttight Catalog Number	Type 4 Watertight Catalog Number
460 ⑤	0.37	0.5	5 A	PFS-0005-BBD33D	PFS-0005-BBD33W
	0.55	0.75	5 A	PFS-0005-BBD34D	PFS-0005-BBD34W
	0.75	1	5 A	PFS-0005-BBD35D	PFS-0005-BBD35W
	1.1	1.5	5 A	PFS-0005-BBD36D	PFS-0005-BBD36W
	1.5	2	5 A	PFS-0005-BBD37D	PFS-0005-BBD37W
	2.2	3	5 A	PFS-0005-BBD38D	PFS-0005-BBD38W
	3.7	5	25 A	PFS-0025-BBD39D	PFS-0025-BBD39W
	5.5	7.5	25 A	PFS-0025-BBD40D	PFS-0025-BBD40W
	7.5	10	25 A	PFS-0025-BBD41D	PFS-0025-BBD41W
	11	15	25 A	PFS-0025-BBD42D	PFS-0025-BBD42W
	15	20	43 A	PFS-0043-BBD43D	PFS-0043-BBD43W
	18.5	25	43 A	PFS-0043-BBD44D	PFS-0043-BBD44W
	22	30	43 A	PFS-0043-BBD45D	PFS-0043-BBD45W
	30	40	60 A	PFS-0060-BBD46D	PFS-0060-BBD46W
	37	50	85 A	PFS-0085-BBD47D	PFS-0085-BBD47W
	45	60	85 A	PFS-0085-BBD48D	PFS-0085-BBD48W
	55	75	108 A	PFS-0108-BBD49D	PFS-0108-BBD49W
	75	100	135 A	PFS-0135-BBD50D	PFS-0135-BBD50W
	90	125	201 A	PFS-0201-BBD51D	PFS-0201-BBD51W
	110	150	201 A	PFS-0201-BBD52D	PFS-0201-BBD52W
	132	200	251 A	PFS-0251-BBD54D	PFS-0251-BBD54W
	160	250	317 A	PFS-0317-BBD56D	PFS-0317-BBD56W
	200	300	361 A	PFS-0361-BBD57D	PFS-0361-BBD57W
	250	350	480 A	PFS-0480-BBD58D	PFS-0480-BBD58W
	250	400	480 A	PFS-0480-BBD59D	PFS-0480-BBD59W
575	0.37	0.75	5 A	PFS-0005-BCD34D	PFS-0005-BCD34W
	0.55	1	5 A	PFS-0005-BCD35D	PFS-0005-BCD35W
	0.75	1.5	5 A	PFS-0005-BCD36D	PFS-0005-BCD36W
	1.1	2	5 A	PFS-0005-BCD37D	PFS-0005-BCD37W
	2.2	3	5 A	PFS-0005-BCD38D	PFS-0005-BCD38W
	3.7	5	25 A	PFS-0025-BCD39D	PFS-0025-BCD39W
	5.5	7.5	25 A	PFS-0025-BCD40D	PFS-0025-BCD40W
	7.5	10	25 A	PFS-0025-BCD41D	PFS-0025-BCD41W
	11	15	25 A	PFS-0025-BCD42D	PFS-0025-BCD42W
	15	20	43 A	PFS-0043-BCD43D	PFS-0043-BCD43W
	18.5	25	43 A	PFS-0043-BCD44D	PFS-0043-BCD44W
	22	30	43 A	PFS-0043-BCD45D	PFS-0043-BCD45W
	22	40	43 A	PFS-0043-BCD46D	PFS-0043-BCD46W
	37	50	60 A	PFS-0060-BCD47D	PFS-0060-BCD47W
	45	60	85 A	PFS-0085-BCD48D	PFS-0085-BCD48W
	55	75	85 A	PFS-0085-BCD49D	PFS-0085-BCD49W
	75	100	108 A	PFS-0108-BCD50D	PFS-0108-BCD50W
	90	125	135 A	PFS-0135-BCD51D	PFS-0135-BCD51W
	110	150	201 A	PFS-0201-BCD52D	PFS-0201-BCD52W
	132	200	201 A	PFS-0201-BCD54D	PFS-0201-BCD54W
	160	250	251 A	PFS-0251-BCD56D	PFS-0251-BCD56W
	200	300	317 A	PFS-0317-BCD57D	PFS-0317-BCD57W
	250	350	361 A	PFS-0361-BCD58D	PFS-0361-BCD58W
	295	400	480 A	PFS-0480-BCD59D	PFS-0480-BCD59W
	315	450	480 A	PFS-0480-BCD60D	PFS-0480-BCD60W
	315	500	480 A	PFS-0480-BCD61D	PFS-0480-BCD61W

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

D2

PF Softstarters

- ① Other UL Type enclosures available. Contact your Sprecher + Schuh representative.
- ② See page D2:18 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.
- ③ The nominal current rating for the combination package may differ from the controller, based on the horse power. Consult your Sprecher + Schuh representative.
- ④ See page D2:27 for circuit breaker ratings.
- ⑤ 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-BGD47D, which covers 25 HP @ 380V FLA 37. Price remains the same.
- ⑥ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. For example catalog number PFS-0085-BBD47D becomes PFS-0085-BBD47R. Price and dimensions remain the same.

Enclosed Combination Fusible Starters - Line Connected ①②④

Rated Voltage [V AC]	kW 50 Hz	Hp 60 Hz	Controller Current Rating ③	Type 12 [Type 3R ⑤] Industrial Dusttight Catalog Number	Type 4 Watertight Catalog Number
200	—	0.5	5 A	PFS-0005-FHD33D	PFS-0005-FHD33W
	—	0.75	5 A	PFS-0005-FHD34D	PFS-0005-FHD34W
	—	1	5 A	PFS-0005-FHD35D	PFS-0005-FHD35W
	—	1.5	25 A	PFS-0025-FHD36D	PFS-0025-FHD36W
	—	2	25 A	PFS-0025-FHD37D	PFS-0025-FHD37W
	—	3	25 A	PFS-0025-FHD38D	PFS-0025-FHD38W
	—	5	25 A	PFS-0025-FHD39D	PFS-0025-FHD39W
	—	7.5	25 A	PFS-0025-FHD40D	PFS-0025-FHD40W
	—	10	43 A	PFS-0043-FHD41D	PFS-0043-FHD41W
	—	15	60 A	PFS-0060-FHD42D	PFS-0060-FHD42W
	—	20	85 A	PFS-0085-FHD43D	PFS-0085-FHD43W
	—	25	85 A	PFS-0085-FHD44D	PFS-0085-FHD44W
	—	30	108 A	PFS-0108-FHD45D	PFS-0108-FHD45W
	—	40	135 A	PFS-0135-FHD46D	PFS-0135-FHD46W
	—	50	201 A	PFS-0201-FHD47D	PFS-0201-FHD47W
	—	60	201 A	PFS-0201-FHD48D	PFS-0201-FHD48W
	—	75	251 A	PFS-0251-FHD49D	PFS-0251-FHD49W
	—	100	317 A	PFS-0317-FHD50D	PFS-0317-FHD50W
230	—	125	361 A	PFS-0361-FHD51D	PFS-0361-FHD51W
	—	150	480 A	PFS-0480-FHD52D	PFS-0480-FHD52W
	0.37	0.5	5 A	PFS-0005-FAD33D	PFS-0005-FAD33W
	0.55	0.75	5 A	PFS-0005-FAD34D	PFS-0005-FAD34W
	0.75	1	5 A	PFS-0005-FAD35D	PFS-0005-FAD35W
	1.1	1.5	25 A	PFS-0025-FAD36D	PFS-0025-FAD36W
	1.5	2	25 A	PFS-0025-FAD37D	PFS-0025-FAD37W
	2.2	3	25 A	PFS-0025-FAD38D	PFS-0025-FAD38W
	3.7	5	25 A	PFS-0025-FAD39D	PFS-0025-FAD39W
	5.5	7.5	25 A	PFS-0025-FAD40D	PFS-0025-FAD40W
	7.5	10	43 A	PFS-0043-FAD41D	PFS-0043-FAD41W
	11	15	43 A	PFS-0043-FAD42D	PFS-0043-FAD42W
	15	20	60 A	PFS-0060-FAD43D	PFS-0060-FAD43W
	18.5	25	85 A	PFS-0085-FAD44D	PFS-0085-FAD44W
	22	30	85 A	PFS-0085-FAD45D	PFS-0085-FAD45W
	30	40	108 A	PFS-0108-FAD46D	PFS-0108-FAD46W
	37	50	135 A	PFS-0135-FAD47D	PFS-0135-FAD47W
	45	60	201 A	PFS-0201-FAD48D	PFS-0201-FAD48W
	55	75	201 A	PFS-0201-FAD49D	PFS-0201-FAD49W
	75	100	251 A	PFS-0251-FAD50D	PFS-0251-FAD50W
	90	125	317 A	PFS-0317-FAD51D	PFS-0317-FAD51W
	110	150	361 A	PFS-0361-FAD52D	PFS-0361-FAD52W
	132	200	480 A	PFS-0480-FAD54D	PFS-0480-FAD54W

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

① Other UL Type enclosures available. Contact your Sprecher + Schuh representative.

② See page D2.18 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.

③ The nominal current rating for the combination package may differ from the controller, based on the horse power. Consult your Sprecher + Schuh representative.

④ Fuse clips accept J-type fuses. Power fuses are not supplied. See page D2.27 for Fusible Disconnect amp ratings.

⑤ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. For example: PFS-0085-FHD43D becomes PFS-0085-FHD43R. Price and dimensions remain the same.

Enclosed Combination Fusible Starters - Line Connected ①②④

Rated Voltage [V AC]	kW 50 Hz	Hp 60 Hz	Controller Current Rating ③	Type 12 [Type 3R ⑤] Industrial Dusttight Catalog Number	Type 4 Watertight Catalog Number
460 ⑥	0.37	0.5	5 A	PFS-0005-FBD33D	PFS-0005-FBD33W
	0.55	0.75	5 A	PFS-0005-FBD34D	PFS-0005-FBD34W
	0.75	1	5 A	PFS-0005-FBD35D	PFS-0005-FBD35W
	1.1	1.5	5 A	PFS-0005-FBD36D	PFS-0005-FBD36W
	1.5	2	5 A	PFS-0005-FBD37D	PFS-0005-FBD37W
	2.2	3	5 A	PFS-0005-FBD38D	PFS-0005-FBD38W
	3.7	5	25 A	PFS-0025-FBD39D	PFS-0025-FBD39W
	5.5	7.5	25 A	PFS-0025-FBD40D	PFS-0025-FBD40W
	7.5	10	25 A	PFS-0025-FBD41D	PFS-0025-FBD41W
	11	15	25 A	PFS-0025-FBD42D	PFS-0025-FBD42W
	15	20	43 A	PFS-0043-FBD43D	PFS-0043-FBD43W
	18.5	25	43 A	PFS-0043-FBD44D	PFS-0043-FBD44W
	22	30	43 A	PFS-0043-FBD45D	PFS-0043-FBD45W
	30	40	60 A	PFS-0060-FBD46D	PFS-0060-FBD46W
	37	50	85 A	PFS-0085-FBD47D	PFS-0085-FBD47W
	45	60	85 A	PFS-0085-FBD48D	PFS-0085-FBD48W
	55	75	108 A	PFS-0108-FBD49D	PFS-0108-FBD49W
	75	100	135 A	PFS-0135-FBD50D	PFS-0135-FBD50W
	90	125	201 A	PFS-0201-FBD51D	PFS-0201-FBD51W
	110	150	201 A	PFS-0201-FBD52D	PFS-0201-FBD52W
575	132	200	251 A	PFS-0251-FBD54D	PFS-0251-FBD54W
	160	250	317 A	PFS-0317-FBD56D	PFS-0317-FBD56W
	200	300	361 A	PFS-0361-FBD57D	PFS-0361-FBD57W
	250	350	480 A	PFS-0480-FBD58D	PFS-0480-FBD58W
	250	400	480 A	PFS-0480-FBD59D	PFS-0480-FBD59W
	0.37	0.75	5 A	PFS-0005-FCD34D	PFS-0005-FCD34W
	0.55	1	5 A	PFS-0005-FCD35D	PFS-0005-FCD35W
	0.75	1.5	5 A	PFS-0005-FCD36D	PFS-0005-FCD36W
	1.1	2	5 A	PFS-0005-FCD37D	PFS-0005-FCD37W
	2.2	3	5 A	PFS-0005-FCD38D	PFS-0005-FCD38W
	3.7	5	25 A	PFS-0025-FCD39D	PFS-0025-FCD39W
	5.5	7.5	25 A	PFS-0025-FCD40D	PFS-0025-FCD40W
	7.5	10	25 A	PFS-0025-FCD41D	PFS-0025-FCD41W
	11	15	25 A	PFS-0025-FCD42D	PFS-0025-FCD42W
	15	20	43 A	PFS-0043-FCD43D	PFS-0043-FCD43W
	18.5	25	43 A	PFS-0043-FCD44D	PFS-0043-FCD44W
	22	30	43 A	PFS-0043-FCD45D	PFS-0043-FCD45W
	22	40	43 A	PFS-0043-FCD46D	PFS-0043-FCD46W
	37	50	60 A	PFS-0060-FCD47D	PFS-0060-FCD47W
	45	60	85 A	PFS-0085-FCD48D	PFS-0085-FCD48W
	55	75	85 A	PFS-0085-FCD49D	PFS-0085-FCD49W
	75	100	108 A	PFS-0108-FCD50D	PFS-0108-FCD50W
	90	125	135 A	PFS-0135-FCD51D	PFS-0135-FCD51W
	110	150	201 A	PFS-0201-FCD52D	PFS-0201-FCD52W
	132	200	201 A	PFS-0201-FCD54D	PFS-0201-FCD54W
	160	250	251 A	PFS-0251-FCD56D	PFS-0251-FCD56W
	200	300	317 A	PFS-0317-FCD57D	PFS-0317-FCD57W
	250	350	361 A	PFS-0361-FCD58D	PFS-0361-FCD58W
	295	400	480 A	PFS-0480-FCD59D	PFS-0480-FCD59W
	315	450	480 A	PFS-0480-FCD60D	PFS-0480-FCD60W
	315	500	480 A	PFS-0480-FCD61D	PFS-0480-FCD61W

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

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PFS Softstarters

- ① Other UL Type enclosures available. Contact your Sprecher + Schuh representative for pricing.
- ② See page D2:18 if ordering factory installed PFB Pump Control or PFD Smart Motor Bake Control Modules, or other options.
- ③ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
- ④ Fuse clips accept J-type fuses (Class L fuses for some PF-480 applications; see page D2:27 for details). Power fuses are not supplied.
- ⑤ 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-FGD47D, which covers 25 HP @ 380V FLA 37. Price remains the same.
- ⑥ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PFS-0085-FBD47D becomes PFS-0085-FBD47R. Price and dimensions remain the same.

Options - Factory Modifications

Description	Catalog Number
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 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	Change "PFS" to "PFB"
Braking Control ❷❸ Provides Smart Motor Brake, Accu-Stop, and Slow Speed with Braking For 5A unit 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	Change "PFS" to "PFD"
Protective Module Protects power components from transient voltage spikes and transient voltage spikes and shunts noise energy 600V Line Side Protective Module 600V Load Side Protective Module 600V Both Line and Load Side Protective Modules	Add suffix - "8L" Add suffix - "8M" Add suffix - "8B"

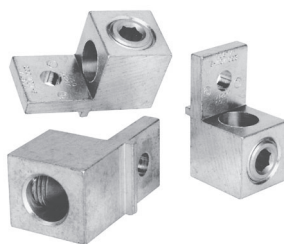
Description	Catalog Number
Pushbuttons (2) START and STOP pushbuttons for enclosed softstarters	Add suffix "-3"
Selector Switch Two or three position selector switch for enclosed softstarters "ON-OFF" "HAND-OFF-AUTO"	Add suffix "-6" Add suffix "-7"
Pilot Light ❸ Red pilot light with "RUN" inscription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

- ❶ Only one option may be added to the standard unit. See detailed descriptions of options starting on page D2:4.
- ❷ Not intended to be used as an emergency stop. Refer to applicable standards for emergency stop requirements.
- ❸ When adding Pilot Lights plus other cover controls, add the Pilot Light first. For example; to add a Start-Stop Pushbutton and a Pilot Light, add **-13** at the end of the part number, not -31.

Options - Field Modifications
Protective Modules ❶

 PFP-0085-600V	Current Rating	Description	Catalog Number
	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
	108...480		PFP-0480-600V

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
			Line Side	Load Side		
	108...135	#6...250 MCM AWG	3	3	3	PNX-1120
	201...251	16 mm2...120mm2	6	6		
	317...480	#4...500 MCM AWG 25 mm2...240MM2	6	6	PNX-1240	

IEC Terminal Covers ❸ ❹

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

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	Qty	24V AC/DC Catalog Number	Qty
Standard	All	PFS	1	PFS-024	1
Pump	All	PFB	1	PFB-024	1
Braking	5...85 A	PFD-0085	1	PFD-0085-024	1
	108...251 A	PFD-0251	1	PFD-0251-024	1
	317...480 A	PFD-0480	1	PFD-0480-024	1

Power Poles

PF Rating	Series	Line Voltage 200...600V Catalog Number ❶	Qty
5 A	B	PFL-0005-600V ❷	1
25 A	B	PFL-0025-600V ❷	1
43 A	B	PFL-0043-600V ❷	1
60 A	B	PFL-0060-600V ❷	1
85 A	B	PFL-0085-600V ❷	1
108 A	B	PFL-0108-600V ❷	1
135 A	B	PFL-0135-600V ❷	1
201 A	B	PFL-0201-600V ❸	1
251 A	B	PFL-0251-600V ❸	1
317 A	B	PFL-0317-600V ❸	1
361 A	B	PFL-0361-600V ❸	1
480 A	B	PFL-0480-600V ❸	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	Qty
5...85 A	B	PFV-0085	1
108...135 A	B		
201...251 A	B	PFV-0251	1
317...480 A	B	PFV-0480	1

- ❶ One piece provided per part number.
- ❷ Part number contains three power poles.
- ❸ Part number contains one power pole.

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, under-voltage, 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.

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PFS Softstarters

Technical Information

Electrical Ratings				
Power Circuit			UL/CSA/NEMA	IEC
	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	

Electrical Ratings

SCPD Performance 200...600V		Type 1 ^④					
SCPD List ^①	Device Rating	Max. Standard Available Fault	Max. Standard Fuse (A) ^②	Max. Standard Available Fault	Max. Circuit Breaker (A)	Max. High Fault	Max. Fuse (A) ^③
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 ^①	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			

^① Consult local codes for proper sizing of short circuit protection.

^② Non-time delay fuses (K5 – 5 ...480V (8.7...831 A) devices; Class L – 625...1250V (850...1600 A) devices).

^③ High capacity fault rating when used with time delay class CC, J, or L fuses.

^④ 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

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.

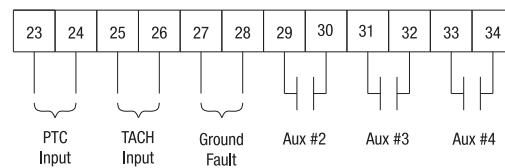
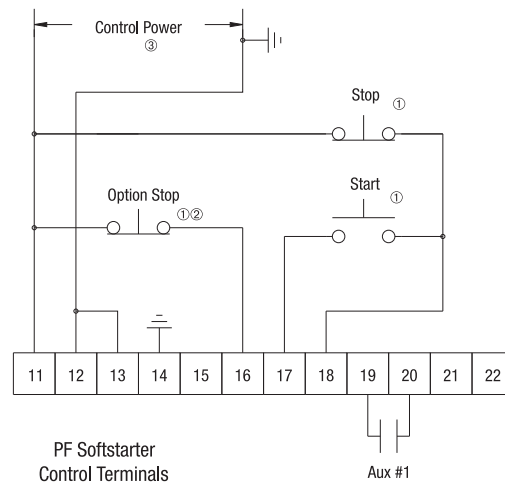
Mechanical

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 mm ² (14...3/0 AWG) Line Lower – 0.8...2.5 mm ² (18...14 AWG) Load Upper – 2.5...50 mm ² (14...1 AWG) Load Lower – 0.8...2.5 mm ² (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

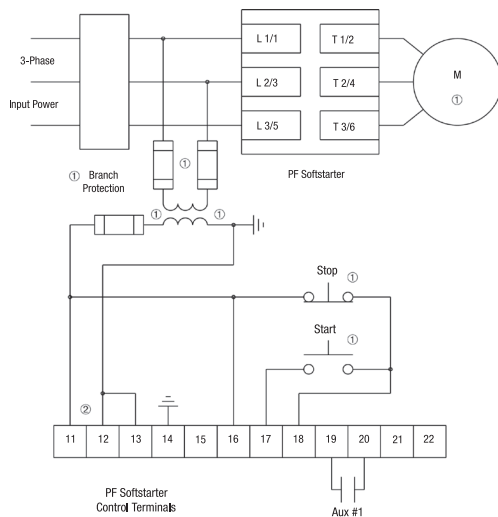
EMC Emission Levels	Conducted Radio Frequency Emissions	Class A	
	Radiated emissions	Class A	
EMC Immunity Levels	Electrostatic Discharge	B kV Air Discharge	
	Radio Frequency Electromagnetic Field	Per EN/IEC 60947-4-2	
	Fast Transient	Per EN/IEC 60947-4-2	
	Surge Transient	Per EN/IEC 60947-4-2	
Overload Characteristics	Current Range	Line	Delta
		5	1...5
		25	5...25
		43	8.6...43
		60	12...60
		85	17...85
		108	27...108
		135	34...135
		201	67...201
		251	84...251
		317	106...317
		361	120...361
		480	160...480
		625	208...625
		780	260...780
		970	323...970
		1250	416...1250
	Trip Classes	10, 15, 20, and 30	
	Trip Current Rating	117% of Motor FLC	
	Number of Poles	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



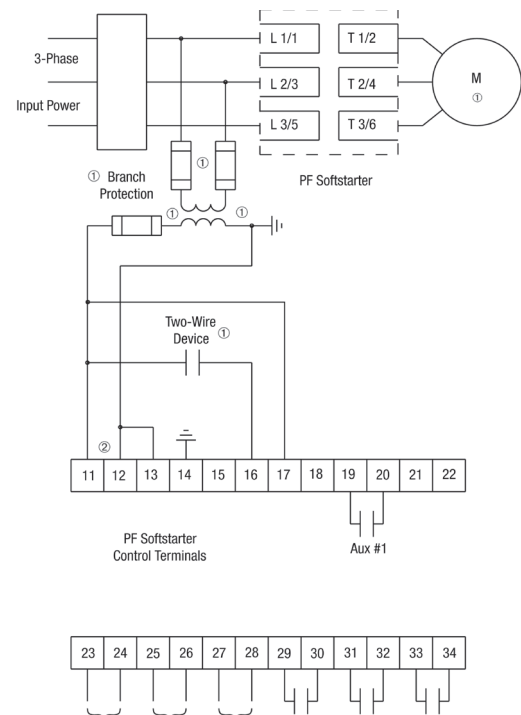
① Customer supplied.

3-Wire Control



① Customer supplied.

2-Wire Control



D2

PFS Softstarters

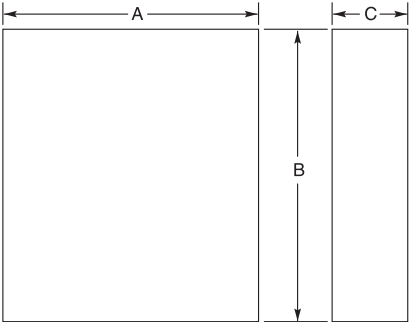
Approximate Dimensions and Shipping Weights
Open Type Controllers

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)	30.4 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 ①	—	2286 (90)	1829 (72)	508 (20)
1250 ①	—	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 ④

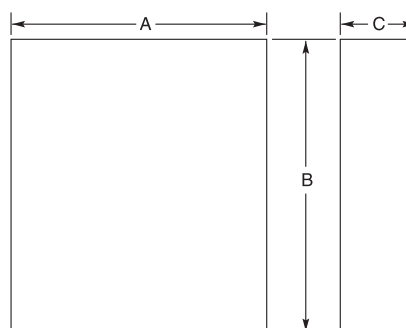
Enclosed Type Line-Connected Combination Controllers

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)
361❶	600 A/J	1524 (60)	914 (36)	406 (16)
480❷	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)
970❸	—	2286 (90)	1829 (72)	508 (20)
1250❹	—	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)
970❷	—	2286 (90)	1829 (72)	508 (20)
1250❹	—	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.

④ 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.