PCS Controllers

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

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

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

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

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

For use anywhere

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

Many convenient features

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

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

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

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

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

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

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

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

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

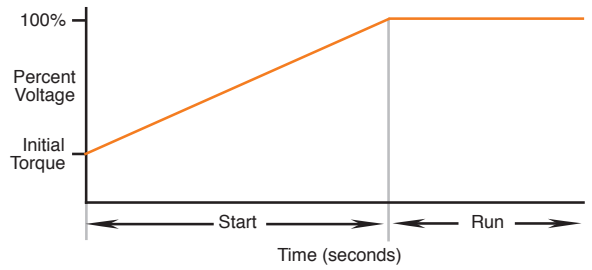
Push to Test – The unit with control wiring can be tested for fault conditions by using the Push to Test function. Hold down the Reset button for 7 seconds to activate the fault Aux (97, 98) and shut down the PCS. To clear, either push the Reset button or cycle control power to the device.

LED Description (Number of Flashes)

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

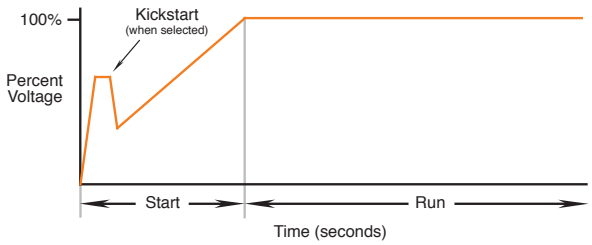
Modes of Operation (Standard)

Soft Start



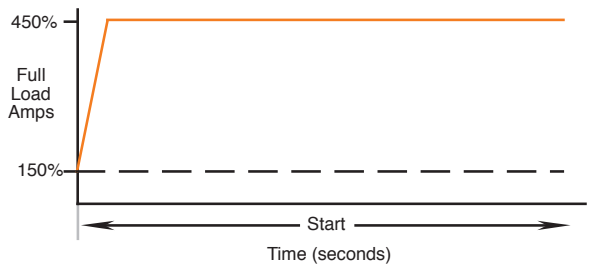
This method has the most general application. The motor is raised from an initial torque value to full voltage. Initial torque is adjustable to 15%, 25%, 35% or 65% locked rotor torque. The motor voltage is gradually increased during the acceleration ramp time, which can be adjusted from 2, 5, 10, 15,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

Soft Start with Selectable Kickstart



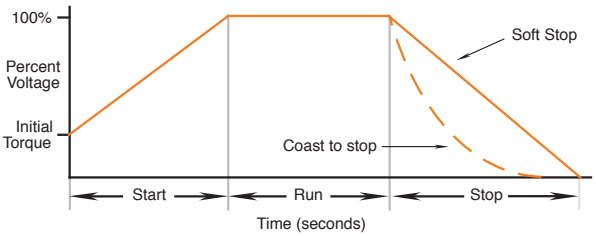
During the Soft Start phase, an initial kickstart or boost can be provided. This supplies a current pulse of 450% of full load current and is adjustable from 0.5 to 1.5 seconds. This allows the motor to develop additional torque for starting high inertia loads.

Current Limit Starting



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

Soft Stop

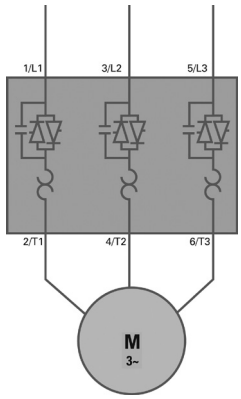


Soft Stop can be used for applications requiring an extended coast-to-rest, such as frictional type loads that tend to stop suddenly when voltage is removed from the motor. When enabled, the voltage ramp down time is equal to one, two or three times the start time selected. The load stops when the motor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

Open Type - Line Connected Controllers ❷❸❺

Rated Voltage (V AC)	Current Rating (Amps) ❶	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	With 100...240V AC Control Voltage Catalog Number	Price	With 24V AC/DC Control Voltage Catalog Number	Price
200/208	1...3	~	0.5	PCS-003-600V	451.17	PCS-003-600V-024	451.17
	3...9	~	0.75...2	PCS-009-600V	486.20	PCS-009-600V-024	486.20
	5.3...16	~	1.5...3	PCS-016-600V	594.61	PCS-016-600V-024	594.61
	6.3...19	~	1.5...3	PCS-019-600V	642.77	PCS-019-600V-024	642.77
	9.2...25	~	3...7.5	PCS-025-600V	661.33	PCS-025-600V-024	661.33
	10...30	~	3...7.5	PCS-030-600V	806.95	PCS-030-600V-024	806.95
	12.3...37	~	5...10	PCS-037-600V	998.66	PCS-037-600V-024	998.66
	14.3...43	~	5...10	PCS-043-600V	1,346.83	PCS-043-600V-024	1,346.83
	20...60	~	7.5...15	PCS-060-600V	1,762.87	PCS-060-600V-024	1,762.87
	28.3...85	~	10...25	PCS-085-600V	2,299.42	PCS-085-600V-024	2,299.42
	27...108	~	20...30	PCS-108-600V ❹	3,679.09	PCS-108-600V-024 ❹	3,679.09
	34...135	~	25...40	PCS-135-600V ❹	4,467.48	PCS-135-600V-024 ❹	4,467.48
	67...201	~	40...60	PCS-201-600V ❹	5,299.66	PCS-201-600V-024 ❹	5,299.66
	84...251	~	50...75	PCS-251-600V ❹	6,186.68	PCS-251-600V-024 ❹	6,186.68
	106...317	~	60...100	PCS-317-600V ❹	6,405.59	PCS-317-600V-024 ❹	6,405.59
	120...361	~	75...125	PCS-361-600V ❹	6,909.29	PCS-361-600V-024 ❹	6,909.29
	160...480	~	100...150	PCS-480-600V ❹	9,548.23	PCS-480-600V-024 ❹	9,548.23
230	1...3	0.55	0.5	PCS-003-600V	451.17	PCS-003-600V-024	451.17
	3...9	2.2	0.75...2	PCS-009-600V	486.20	PCS-009-600V-024	486.20
	5.3...16	4	1.5...5	PCS-016-600V	594.61	PCS-016-600V-024	594.61
	6.3...19	4	2...5	PCS-019-600V	642.77	PCS-019-600V-024	642.77
	9.2...25	5.5	3...7.5	PCS-025-600V	661.33	PCS-025-600V-024	661.33
	10...30	7.5	5...10	PCS-030-600V	806.95	PCS-030-600V-024	806.95
	12.3...37	7.5	5...10	PCS-037-600V	998.66	PCS-037-600V-024	998.66
	14.3...43	11	5...15	PCS-043-600V	1,346.83	PCS-043-600V-024	1,346.83
	20...60	15	7.5...20	PCS-060-600V	1,762.87	PCS-060-600V-024	1,762.87
	28.3...85	22	15...30	PCS-085-600V	2,299.42	PCS-085-600V-024	2,299.42
	27...108	30	20...40	PCS-108-600V ❹	3,679.09	PCS-108-600V-024 ❹	3,679.09
	34...135	37	25...50	PCS-135-600V ❹	4,467.48	PCS-135-600V-024 ❹	4,467.48
	67...201	55	40...75	PCS-201-600V ❹	5,299.66	PCS-201-600V-024 ❹	5,299.66
	84...251	75	50...100	PCS-251-600V ❹	6,186.68	PCS-251-600V-024 ❹	6,186.68
	106...317	90	60...125	PCS-317-600V ❹	6,405.59	PCS-317-600V-024 ❹	6,405.59
	120...361	110	75...150	PCS-361-600V ❹	6,909.29	PCS-361-600V-024 ❹	6,909.29
	160...480	132	100...200	PCS-480-600V ❹	9,548.23	PCS-480-600V-024 ❹	9,548.23

Line Connected



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

❷ See page D25 for maximum starts per hour.

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

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

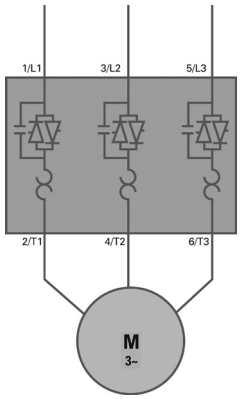
❺ Controllers rated 108A and greater are not equipped with the line and load terminal lugs. See page D20 for terminal lug kits.

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

Open Type - Line Connected Controllers cont. ❷❸❺

Rated Voltage (V AC)	Current Rating (Amps) ❶	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	With 100...240V AC Control Voltage Catalog Number	Price	With 24V AC/DC Control Voltage Catalog Number	Price
380/400/415/460	1...3	1.1	0.5...1.5	PCS-003-600V	451.17	PCS-003-600V-024	451.17
	3...9	4	1.5...5	PCS-009-600V	486.20	PCS-009-600V-024	486.20
	5.3...16	7.5	5...10	PCS-016-600V	594.61	PCS-016-600V-024	594.61
	6.3...19	7.5	5...10	PCS-019-600V	642.77	PCS-019-600V-024	642.77
	9.2...25	11	7.5...15	PCS-025-600V	661.33	PCS-025-600V-024	661.33
	10...30	15	7.5...20	PCS-030-600V	806.95	PCS-030-600V-024	806.95
	12.3...37	18.5	10...25	PCS-037-600V	998.66	PCS-037-600V-024	998.66
	14.3...43	22	10...30	PCS-043-600V	1,346.83	PCS-043-600V-024	1,346.83
	20...60	30	15...40	PCS-060-600V	1,762.87	PCS-060-600V-024	1,762.87
	28.3...85	45	25...60	PCS-085-600V	2,299.42	PCS-085-600V-024	2,299.42
	27...108	55	50...75	PCS-108-600V ❹	3,679.09	PCS-108-600V-024 ❹	3,679.09
	34...135	75	60...100	PCS-135-600V ❹	4,467.48	PCS-135-600V-024 ❹	4,467.48
	67...201	95...110	75...150	PCS-201-600V ❹	5,299.66	PCS-201-600V-024 ❹	5,299.66
	84...251	95...132	100...200	PCS-251-600V ❹	6,186.68	PCS-251-600V-024 ❹	6,186.68
	106...317	95...160	125...250	PCS-317-600V ❹	6,405.59	PCS-317-600V-024 ❹	6,405.59
	120...361	110...200	250...300	PCS-361-600V ❹	6,909.29	PCS-361-600V-024 ❹	6,909.29
	160...480	160...250	300...400	PCS-480-600V ❹	9,548.23	PCS-480-600V-024 ❹	9,548.23
500/575	1...3	1.5	0.75...2	PCS-003-600V	451.17	PCS-003-600V-024	451.17
	3...9	5.5	3...7.5	PCS-009-600V	486.20	PCS-009-600V-024	486.20
	5.3...16	7.5	5...10	PCS-016-600V	594.61	PCS-016-600V-024	594.61
	6.3...19	11	7.5...15	PCS-019-600V	642.77	PCS-019-600V-024	642.77
	9.2...25	15	7.5...20	PCS-025-600V	661.33	PCS-025-600V-024	661.33
	10...30	18.5	10...25	PCS-030-600V	806.95	PCS-030-600V-024	806.95
	12.3...37	22	15...30	PCS-037-600V	998.66	PCS-037-600V-024	998.66
	14.3...43	22	15...40	PCS-043-600V	1,346.83	PCS-043-600V-024	1,346.83
	20...60	37	20...50	PCS-060-600V	1,762.87	PCS-060-600V-024	1,762.87
	28.3...85	55	30...75	PCS-085-600V	2,299.42	PCS-085-600V-024	2,299.42
	27...108	75	60...100	PCS-108-600V ❹	3,679.09	PCS-108-600V-024 ❹	3,679.09
	34...135	90	75...125	PCS-135-600V ❹	4,467.48	PCS-135-600V-024 ❹	4,467.48
	67...201	75...132	100...200	PCS-201-600V ❹	5,299.66	PCS-201-600V-024 ❹	5,299.66
	84...251	90...160	125...250	PCS-251-600V ❹	6,186.68	PCS-251-600V-024 ❹	6,186.68
	106...317	100...200	200...300	PCS-317-600V ❹	6,405.59	PCS-317-600V-024 ❹	6,405.59
	120...361	132...250	200...350	PCS-361-600V ❹	6,909.29	PCS-361-600V-024 ❹	6,909.29
	160...480	200...315	250...500	PCS-480-600V ❹	9,548.23	PCS-480-600V-024 ❹	9,548.23

Line Connected



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

❷ See page D25 for maximum starts per hour.

❸ Prior to the initial start of the motor at the final installation location:
- The bypass relays on the main circuit may be in an undefined switching state due to handling during shipping. Before connecting the main power source, apply the control voltage to set the bypass relays to a defined switching state. If this step is not performed, inadvertent operation of the motor may occur.

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

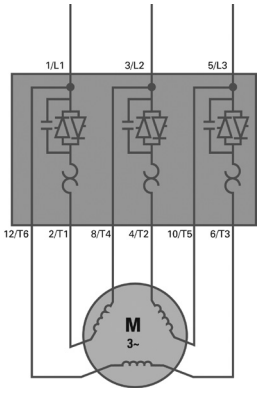
❺ Controllers rated 108A and greater are not equipped with the line and load terminal lugs. See page D20 for terminal lug kits.

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

Open Type - Delta Connected Controllers ❷❹❺

Rated Voltage (V AC)	Current Rating (Amps) ❶	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	With 100...240V AC Control Voltage Catalog Number	Price	With 24V AC/DC Control Voltage Catalog Number	Price
200/208	1.7...5.1	~	1	PCS-003-600V	451.17	PCS-003-600V-024	451.17
	5.1...16	~	1.5...3	PCS-009-600V	486.20	PCS-009-600V-024	486.20
	9.1...27.6	~	3...7.5	PCS-016-600V	594.61	PCS-016-600V-024	594.61
	10.9...32.8	~	3...10	PCS-019-600V	642.77	PCS-019-600V-024	642.77
	14.3...43	~	3...10	PCS-025-600V	661.33	PCS-025-600V-024	661.33
	17.3...52	~	5...10	PCS-030-600V	806.95	PCS-030-600V-024	806.95
	21...64	~	7.5...20	PCS-037-600V	998.66	PCS-037-600V-024	998.66
	25...74	~	7.5...20	PCS-043-600V	1,346.83	PCS-043-600V-024	1,346.83
	34.6...104	~	15...30	PCS-060-600V	1,762.87	PCS-060-600V-024	1,762.87
	50....147	~	15...40	PCS-085-600V	2,299.42	PCS-085-600V-024	2,299.42
	47...187	~	20...60	PCS-108-600V ❸	3,679.09	PCS-108-600V-024 ❸	3,679.09
	59...234	~	20...75	PCS-135-600V ❸	4,467.48	PCS-135-600V-024 ❸	4,467.48
	116...348	~	75...100	PCS-201-600V ❸	5,299.66	PCS-201-600V-024 ❸	5,299.66
	145...435	~	100...150	PCS-251-600V ❸	6,186.68	PCS-251-600V-024 ❸	6,186.68
	183...549	~	100...200	PCS-317-600V ❸	6,405.59	PCS-317-600V-024 ❸	6,405.59
	208...625	~	125...200	PCS-361-600V ❸	6,909.29	PCS-361-600V-024 ❸	6,909.29
	277...831	~	200...300	PCS-480-600V ❸	9,548.23	PCS-480-600V-024 ❸	9,548.23
230	1.7...5.1	0.25...1.1	1	PCS-003-600V	451.17	PCS-003-600V-024	451.17
	5.1...16	1.1...4	1...5	PCS-009-600V	486.20	PCS-009-600V-024	486.20
	9.1...27.6	2.2...7.5	3...7.5	PCS-016-600V	594.61	PCS-016-600V-024	594.61
	10.9...32.8	2.2...7.5	3...10	PCS-019-600V	642.77	PCS-019-600V-024	642.77
	14.3...43	4...11	3...15	PCS-025-600V	661.33	PCS-025-600V-024	661.33
	17.3...52	4...15	5...15	PCS-030-600V	806.95	PCS-030-600V-024	806.95
	21...64	5.5...18.5	7.5...20	PCS-037-600V	998.66	PCS-037-600V-024	998.66
	25...74	5.5...22	7.5...25	PCS-043-600V	1,346.83	PCS-043-600V-024	1,346.83
	34.6...104	7.5...30	15...40	PCS-060-600V	1,762.87	PCS-060-600V-024	1,762.87
	50...147	15...45	20...50	PCS-085-600V	2,299.42	PCS-085-600V-024	2,299.42
	47...187	55	20...60	PCS-108-600V ❸	3,679.09	PCS-108-600V-024 ❸	3,679.09
	59...234	75	25...75	PCS-135-600V ❸	4,467.48	PCS-135-600V-024 ❸	4,467.48
	116...348	110	75...125	PCS-201-600V ❸	5,299.66	PCS-201-600V-024 ❸	5,299.66
	145...435	132	100...150	PCS-251-600V ❸	6,186.68	PCS-251-600V-024 ❸	6,186.68
	183...549	160	125...200	PCS-317-600V ❸	6,405.59	PCS-317-600V-024 ❸	6,405.59
	208...625	200	150...250	PCS-361-600V ❸	6,909.29	PCS-361-600V-024 ❸	6,909.29
	277...831	250	200...300	PCS-480-600V ❸	9,548.23	PCS-480-600V-024 ❸	9,548.23

Delta Connected



All PCS Models are Wye-Delta compatible

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

❷ Prior to the initial start of the motor at the final installation location:
- The bypass relays on the main circuit may be in an undefined switching state due to handling during shipping. Before connecting the main power source, apply the control voltage to set the bypass relays to a defined switching state. If this step is not performed, inadvertent operation of the motor may occur.

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

❹ Controllers rated 108A and greater are not equipped with the line and load terminal lugs. See page D20 for terminal lug kits.

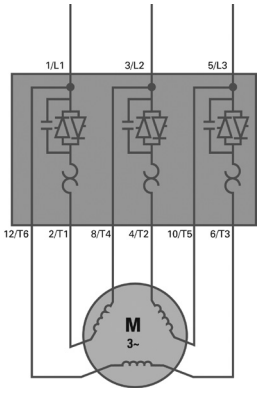
❺ It is recommended that an isolation contactor be added to the circuit to provide galvanic isolation of the motor and final electromechanical removal of power.

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

Open Type - Delta Connected Controllers cont. ❷❹❺

Rated Voltage (V AC)	Current Rating (Amps) ❶	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	With 100...240V AC Control Voltage Catalog Number	Price	With 24V AC/DC Control Voltage Catalog Number	Price
380/400/415/460	1.7...5.1	0.55...2.2	0.5...2	PCS-003-600V	451.17	PCS-003-600V-024	451.17
	5.1...16	2.2...7.5	2...7.5	PCS-009-600V	486.20	PCS-009-600V-024	486.20
	9.1...27.6	4...11	5...15	PCS-016-600V	594.61	PCS-016-600V-024	594.61
	10.9...32.8	4...15	5...15	PCS-019-600V	642.77	PCS-019-600V-024	642.77
	14.3...43	5.5...22	7.5...20	PCS-025-600V	661.33	PCS-025-600V-024	661.33
	17.3...52	7.5...22	7.5...30	PCS-030-600V	806.95	PCS-030-600V-024	806.95
	21...64	7.5...30	10...40	PCS-037-600V	998.66	PCS-037-600V-024	998.66
	25...74	11...37	10...50	PCS-043-600V	1,346.83	PCS-043-600V-024	1,346.83
	34.6...104	15...55	20...75	PCS-060-600V	1,762.87	PCS-060-600V-024	1,762.87
	50...147	22...75	25...100	PCS-085-600V	2,299.42	PCS-085-600V-024	2,299.42
	47...187	90	40...150	PCS-108-600V ❸	3,679.09	PCS-108-600V-024 ❸	3,679.09
	59...234	132	50...150	PCS-135-600V ❸	4,467.48	PCS-135-600V-024 ❸	4,467.48
	116...348	160	150...250	PCS-201-600V ❸	5,299.66	PCS-201-600V-024 ❸	5,299.66
	145...435	250	200...350	PCS-251-600V ❸	6,186.68	PCS-251-600V-024 ❸	6,186.68
	183...549	315	250...450	PCS-317-600V ❸	6,405.59	PCS-317-600V-024 ❸	6,405.59
	208...625	355	300...500	PCS-361-600V ❸	6,909.29	PCS-361-600V-024 ❸	6,909.29
	277...831	450	350...700	PCS-480-600V ❸	9,548.23	PCS-480-600V-024 ❸	9,548.23
500/575	1.7...5.1	0.75...3	1...3	PCS-003-600V	451.17	PCS-003-600V-024	451.17
	5.1...16	3...7.5	3...10	PCS-009-600V	486.20	PCS-009-600V-024	486.20
	9.1...27.6	5.5...15	7.5...20	PCS-016-600V	594.61	PCS-016-600V-024	594.61
	10.9...32.8	5.5...22	7.5...30	PCS-019-600V	642.77	PCS-019-600V-024	642.77
	14.3...43	7.5...22	10...40	PCS-025-600V	661.33	PCS-025-600V-024	661.33
	17.3...52	11...30	15...50	PCS-030-600V	806.95	PCS-030-600V-024	806.95
	21...64	11...37	15...60	PCS-037-600V	998.66	PCS-037-600V-024	998.66
	25...74	15...45	20...60	PCS-043-600V	1,346.83	PCS-043-600V-024	1,346.83
	84.6...104	22...55	30...100	PCS-060-600V	1,762.87	PCS-060-600V-024	1,762.87
	50...147	30...90	40...150	PCS-085-600V	2,299.42	PCS-085-600V-024	2,299.42
	47...187	132	50...150	PCS-108-600V ❸	3,679.09	PCS-108-600V-024 ❸	3,679.09
	59...234	160	60...200	PCS-135-600V ❸	4,467.48	PCS-135-600V-024 ❸	4,467.48
	116...348	250	250...300	PCS-201-600V ❸	5,299.66	PCS-201-600V-024 ❸	5,299.66
	145...435	315	250...400	PCS-251-600V ❸	6,186.68	PCS-251-600V-024 ❸	6,186.68
	183...549	400	300...500	PCS-317-600V ❸	6,405.59	PCS-317-600V-024 ❸	6,405.59
	208...625	450	350...600	PCS-361-600V ❸	6,909.29	PCS-361-600V-024 ❸	6,909.29
	277...831	560	400...900	PCS-480-600V ❸	9,548.23	PCS-480-600V-024 ❸	9,548.23

Delta Connected



All PCS Models are Wye-Delta compatible

D

PCS Softstarters

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

❷ Prior to the initial start of the motor at the final installation location:
- The bypass relays on the main circuit may be in an undefined switching state due to handling during shipping. Before connecting the main power source, apply the control voltage to set the bypass relays to a defined switching state. If this step is not performed, inadvertent operation of the motor may occur.

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

❹ Controllers rated 108A and greater are not equipped with the line and load terminal lugs. See page D20 for terminal lug kits.

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

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

Enclosed Non-Combination Starters - Line Connected ❶❷❹❻

Rated Voltage (V AC)	Current Rating (Amps) ❸	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	Type 12 [Type 3R ❺] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
200/208	1...3	~	0.5	PCS-003-NHDD	1,283.63	PCS-003-NHDW	1,332.69
	3...9	~	0.75...2	PCS-009-NHDD	1,318.38	PCS-009-NHDW	1,370.50
	5.3...16	~	1.5...3	PCS-016-NHDD	1,383.79	PCS-016-NHDW	1,440.00
	6.3...19	~	1.5...3	PCS-019-NHDD	1,428.76	PCS-019-NHDW	1,487.01
	9.2...25	~	3...7.5	PCS-025-NHDD	1,428.76	PCS-025-NHDW	1,487.01
	10...30	~	3...7.5	PCS-030-NHDD	1,529.93	PCS-030-NHDW	1,590.23
	12.3...37	~	5...10	PCS-037-NHDD	1,663.82	PCS-037-NHDW	1,730.25
	14.3...43	~	5...10	PCS-043-NHDD	1,931.58	PCS-043-NHDW	2,009.25
	20...60	~	7.5...15	PCS-060-NHDD	2,233.07	PCS-060-NHDW	2,321.98
	28.3...85	~	10...25	PCS-085-NHDD	2,929.05	PCS-085-NHDW	3,045.56
	27...108	~	20...30	PCS-108-NHDD	4,546.88	PCS-108-NHDW	4,728.79
	34...135	~	25...40	PCS-135-NHDD	5,395.14	PCS-135-NHDW	5,610.78
	67...201	~	40...60	PCS-201-NHDD	6,396.70	PCS-201-NHDW	6,652.20
	84...251	~	50...75	PCS-251-NHDD	7,552.58	PCS-251-NHDW	7,855.09
	106...317	~	60...100	PCS-317-NHDD	8,116.72	PCS-317-NHDW	8,441.72
	120...361	~	75...125	PCS-361-NHDD	8,708.46	PCS-361-NHDW	9,056.96
	160...480	~	100...150	PCS-480-NHDD	11,947.18	PCS-480-NHDW	12,425.48
230	1...3	0.55	0.5	PCS-003-NADD	1,283.63	PCS-003-NADW	1,332.69
	3...9	2.2	0.75...2	PCS-009-NADD	1,317.88	PCS-009-NADW	1,370.50
	5.3...16	4	1.5...5	PCS-016-NADD	1,383.79	PCS-016-NADW	1,440.00
	6.3...19	4	2...5	PCS-019-NADD	1,428.76	PCS-019-NADW	1,487.01
	9.2…25	5.5	3...7.5	PCS-025-NADD	1,428.76	PCS-025-NADW	1,487.01
	10...30	7.5	5...10	PCS-030-NADD	1,529.93	PCS-030-NADW	1,590.23
	12.3...37	7.5	5...10	PCS-037-NADD	1,663.82	PCS-037-NADW	1,730.25
	14.3...43	11	5...15	PCS-043-NADD	1,931.58	PCS-043-NADW	2,009.25
	20...60	15	7.5...20	PCS-060-NADD	2,233.07	PCS-060-NADW	2,321.98
	28.3...85	22	15...30	PCS-085-NADD	2,929.05	PCS-085-NADW	3,045.56
	27...108	30	20...40	PCS-108-NADD	4,546.88	PCS-108-NADW	4,728.79
	34...135	37	25...50	PCS-135-NADD	5,395.14	PCS-135-NADW	5,610.78
	67...201	55	40...75	PCS-201-NADD	6,396.70	PCS-201-NADW	6,652.20
	84...251	75	50...100	PCS-251-NADD	7,552.58	PCS-251-NADW	7,855.09
	106...317	90	60...125	PCS-317-NADD	8,116.72	PCS-317-NADW	8,441.72
	120...361	110	75...150	PCS-361-NADD	8,708.46	PCS-361-NADW	9,056.96
	160...480	132	100...200	PCS-480-NADD	11,947.18	PCS-480-NADW	12,425.48

Non-Combination PCS Softstarters include:

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

❶ Other UL type enclosures available. Contact your Sprecher + Schuh representative for pricing.
❷ See page D18 if ordering factory installed modifications.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ Line and load termination are provided as standard.
❺ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PCS-085-NHD**D** becomes PCS-085-NHD**R**. Price and dimensions remain the same.
❻ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

Enclosed Non-Combination Starters - Line Connected ❶❷❹❼

Rated Voltage (V AC)	Current Rating (Amps) ❸	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	Type 12 [Type 3R ❻] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
460 ❺	1...3	1.1	0.5...1.5	PCS-003-NBDD	1,283.63	PCS-003-NBDW	1,332.69
	3...9	4	1.5...5	PCS-009-NBDD	1,318.38	PCS-009-NBDW	1,370.50
	5.3...16	7.5	5...10	PCS-016-NBDD	1,383.79	PCS-016-NBDW	1,440.00
	6.3...19	7.5	5...10	PCS-019-NBDD	1,428.76	PCS-019-NBDW	1,487.01
	9.2...25	11	7.5...15	PCS-025-NBDD	1,428.76	PCS-025-NBDW	1,487.01
	10...30	15	7.5...20	PCS-030-NBDD	1,529.93	PCS-030-NBDW	1,590.23
	12.3...37	18.5	10...25	PCS-037-NBDD	1,663.82	PCS-037-NBDW	1,730.25
	14.3...43	22	10...30	PCS-043-NBDD	1,931.58	PCS-043-NBDW	2,009.25
	20...60	30	15...40	PCS-060-NBDD	2,233.07	PCS-060-NBDW	2,321.98
	28.3...85	45	25...60	PCS-085-NBDD	2,929.05	PCS-085-NBDW	3,045.56
	27...108	55	50...75	PCS-108-NBDD	4,546.88	PCS-108-NBDW	4,728.79
	34...135	75	60...100	PCS-135-NBDD	5,395.14	PCS-135-NBDW	5,610.78
	67...201	95...110	75...150	PCS-201-NBDD	6,396.70	PCS-201-NBDW	6,652.20
	84...251	95...132	100...200	PCS-251-NBDD	7,552.58	PCS-251-NBDW	7,855.09
	106...317	95...160	125...250	PCS-317-NBDD	8,116.72	PCS-317-NBDW	8,441.72
	120...361	110...200	250...300	PCS-361-NBDD	8,708.46	PCS-361-NBDW	9,056.96
	160...480	160...250	300...400	PCS-480-NBDD	11,947.18	PCS-480-NBDW	12,425.48
500/575	1...3	1.5	0.75...2	PCS-003-NCDD	1,529.93	PCS-003-NCDW	1,590.23
	3...9	5.5	3...7.5	PCS-009-NCDD	1,562.64	PCS-009-NCDW	1,624.98
	5.3...16	7.5	5...10	PCS-016-NCDD	1,599.43	PCS-016-NCDW	1,659.73
	6.3...19	11	7.5...15	PCS-019-NCDD	1,630.09	PCS-019-NCDW	1,695.50
	9.2…25	15	7.5...20	PCS-025-NCDD	1,630.09	PCS-025-NCDW	1,695.50
	10...30	18.5	10...25	PCS-030-NCDD	1,831.42	PCS-030-NCDW	1,903.99
	12.3...37	22	15...30	PCS-037-NCDD	2,010.27	PCS-037-NCDW	2,089.99
	14.3...43	22	15...40	PCS-043-NCDD	2,299.50	PCS-043-NCDW	2,392.50
	20...60	37	20...50	PCS-060-NCDD	2,690.93	PCS-060-NCDW	2,798.24
	28.3...85	55	30...75	PCS-085-NCDD	3,192.73	PCS-085-NCDW	3,320.48
	27...108	75	60..100	PCS-108-NCDD	4,624.55	PCS-108-NCDW	4,809.53
	34...135	90	75...125	PCS-135-NCDD	5,549.46	PCS-135-NCDW	5,771.23
	67...201	75...132	100...200	PCS-201-NCDD	6,587.81	PCS-201-NCDW	6,851.49
	84...251	90...160	125...250	PCS-251-NCDD	7,815.23	PCS-251-NCDW	8,127.97
	106...317	100...200	200...300	PCS-317-NCDD	8,764.67	PCS-317-NCDW	9,115.22
	120...361	132...250	200...350	PCS-361-NCDD	9,669.14	PCS-361-NCDW	10,055.46
	160...480	200...315	250...500	PCS-480-NCDD	13,174.60	PCS-480-NCDW	13,701.95

Non-Combination PCS Softstarters include:

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

❶ Other UL type enclosures available. Contact your Sprecher + Schuh representative for pricing.
❷ See page D18 if ordering factory installed modifications.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ Line and load termination are provided as standard.
❺ For 380V applications choose softstarter based on FLA, then change the NB code in the catalog number to NG. For example PCS-043-N**B**DD becomes PCS-043-N**G**DD, which covers 25 HP @ 380V FLA 37. Price remains the same.
❻ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PCS-085-NBD**D** becomes PCS-085-NBD**R**. Price and dimensions remain the same.
❼ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

Enclosed Combination Circuit Breaker Starters - Line Connected ❶❷❹❻

Rated Voltage (V AC)	Current Rating (Amps) ❸	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	Type 12 [Type 3R ❺] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
200	3	—	0.5	PCS-003-BHD33D	1,786.46	PCS-003-BHD33W	1,858.00
	9	—	0.75	PCS-009-BHD34D	1,841.64	PCS-009-BHD34W	1,916.25
	9	—	1	PCS-009-BHD35D	1,841.64	PCS-009-BHD35W	1,916.25
	9	—	1.5	PCS-009-BHD36D	1,841.64	PCS-009-BHD36W	1,916.25
	16	—	2	PCS-016-BHD37D	1,931.58	PCS-016-BHD37W	2,009.25
	16	—	3	PCS-016-BHD38D	1,931.58	PCS-016-BHD38W	2,195.26
	25	—	5	PCS-025-BHD39D	2,110.43	PCS-025-BHD39W	2,357.75
	37	—	7.5	PCS-037-BHD40D	2,423.16	PCS-037-BHD40W	2,520.25
	43	—	10	PCS-043-BHD41D	2,624.50	PCS-043-BHD41W	2,728.74
	60	—	15	PCS-060-BHD42D	3,170.24	PCS-060-BHD42W	3,297.99
	85	—	20	PCS-085-BHD43D	3,595.40	PCS-085-BHD43W	3,739.50
	85	—	25	PCS-085-BHD44D	3,595.40	PCS-085-BHD44W	3,739.50
	108	—	30	PCS-108-BHD45D	5,973.59	PCS-108-BHD45W	6,212.74
	135	—	40	PCS-135-BHD46D	6,899.52	PCS-135-BHD46W	7,175.46
	201	—	60	PCS-201-BHD48D	8,240.39	PCS-201-BHD48W	8,569.47
	251	—	75	PCS-251-BHD49D	9,669.14	PCS-251-BHD49W	10,055.46
	317	—	100	PCS-317-BHD50D	10,562.37	PCS-317-BHD50W	10,984.46
	361	—	125	PCS-361-BHD51D	11,131.62	PCS-361-BHD51W	11,577.22
	480	—	150	PCS-480-BHD52D	14,180.25	PCS-480-BHD52W	14,747.46
230	3	0.37	0.5	PCS-003-BAD33D	1,786.46	PCS-003-BAD33W	1,858.00
	9	0.55	0.75	PCS-009-BAD34D	1,841.64	PCS-009-BAD34W	1,916.25
	9	0.75	1	PCS-009-BAD35D	1,841.64	PCS-009-BAD35W	1,916.25
	9	1.1	1.5	PCS-009-BAD36D	1,841.64	PCS-009-BAD36W	1,916.25
	9	1.5	2	PCS-009-BAD37D	1,841.64	PCS-009-BAD37W	1,916.25
	16	2.2	3	PCS-016-BAD38D	1,931.58	PCS-016-BAD38W	2,009.25
	25	3.7	5	PCS-025-BAD39D	2,110.43	PCS-025-BAD39W	2,195.26
	30	5.5	7.5	PCS-030-BAD40D	2,266.80	PCS-030-BAD40W	2,357.75
	37	7.5	10	PCS-037-BAD41D	2,423.16	PCS-037-BAD41W	2,520.25
	43	11	15	PCS-043-BAD42D	2,624.50	PCS-043-BAD42W	2,728.74
	60	15	20	PCS-060-BAD43D	3,170.24	PCS-060-BAD43W	3,297.99
	85	18.5	25	PCS-085-BAD44D	3,595.40	PCS-085-BAD44W	3,739.50
	85	22	30	PCS-085-BAD45D	3,595.40	PCS-085-BAD45W	3,739.50
	108	30	40	PCS-108-BAD46D	5,973.59	PCS-108-BAD46W	6,212.74
	135	37	50	PCS-135-BAD47D	6,899.52	PCS-135-BAD47W	7,175.46
	201	55	75	PCS-201-BAD49D	8,240.39	PCS-201-BAD49W	8,569.47
	251	75	100	PCS-251-BAD50D	9,669.14	PCS-251-BAD50W	10,055.46
	317	90	125	PCS-317-BAD51D	10,562.37	PCS-317-BAD51W	10,984.46
	361	110	150	PCS-361-BAD52D	11,131.62	PCS-361-BAD52W	11,577.22
	480	147	200	PCS-480-BAD54D	14,180.25	PCS-480-BAD54W	14,747.46

Combination Circuit Breaker PCS Softstarters include:

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

❶ Other UL type enclosures available. Contact your Sprecher + Schuh representative for pricing.
❷ See page D18 if ordering factory installed modifications.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ See page D29 for circuit breaker ratings.
❺ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PCS-085-BHD43D becomes PCS-085-BHD43R. Price and dimensions remain the same.
❻ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

Enclosed Combination Circuit Breaker Starters - Line Connected ❶❷❹❼

Rated Voltage (V AC)	Current Rating (Amps) ❸	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	Type 12 [Type 3R ❻] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
460 ❺	3	0.37	0.5	PCS-003-BBD33D	1,786.46	PCS-003-BBD33W	1,858.00
	3	0.55	0.75	PCS-003-BBD34D	1,786.46	PCS-003-BBD34W	1,858.00
	3	0.75	1	PCS-003-BBD35D	1,786.46	PCS-003-BBD35W	1,858.00
	9	1.1	1.5	PCS-009-BBD36D	1,841.64	PCS-009-BBD36W	1,916.25
	9	1.5	2	PCS-009-BBD37D	1,841.64	PCS-009-BBD37W	1,916.25
	9	2.2	3	PCS-009-BBD38D	1,841.64	PCS-009-BBD38W	1,916.25
	16	3.7	5	PCS-016-BBD39D	1,931.58	PCS-016-BBD39W	2,009.25
	16	5.5	7.5	PCS-016-BBD40D	1,931.58	PCS-016-BBD40W	2,009.25
	25	7.5	10	PCS-025-BBD41D	2,110.43	PCS-025-BBD41W	2,192.19
	30	11	15	PCS-030-BBD42D	2,266.80	PCS-030-BBD42W	2,357.75
	37	15	20	PCS-037-BBD43D	2,423.16	PCS-037-BBD43W	2,520.25
	43	18.5	25	PCS-043-BBD44D	2,624.50	PCS-043-BBD44W	2,728.74
	43	22	30	PCS-043-BBD45D	2,624.50	PCS-043-BBD45W	2,728.74
	60	30	40	PCS-060-BBD46D	3,170.24	PCS-060-BBD46W	3,297.99
	85	37	50	PCS-085-BBD47D	3,595.40	PCS-085-BBD47W	3,739.50
	85	45	60	PCS-085-BBD48D	3,595.40	PCS-085-BBD48W	3,739.50
	108	55	75	PCS-108-BBD49D	5,973.59	PCS-108-BBD49W	6,212.74
	135	75	100	PCS-135-BBD50D	6,899.52	PCS-135-BBD50W	7,175.46
	201	110	150	PCS-201-BBD52D	8,240.39	PCS-201-BBD52W	8,569.47
	251	132	200	PCS-251-BBD54D	9,669.14	PCS-251-BBD54W	10,055.46
	317	160	250	PCS-317-BBD56D	10,562.37	PCS-317-BBD56W	10,984.46
	361	200	300	PCS-361-BBD57D	11,131.62	PCS-361-BBD57W	11,577.22
	480	250	400	PCS-480-BBD59D	14,180.25	PCS-480-BBD59W	14,747.46
575	3	0.55	0.75	PCS-003-BCD34D	2,154.38	PCS-003-BCD34W	2,241.25
	3	0.75	1	PCS-003-BCD35D	2,154.38	PCS-003-BCD35W	2,241.25
	9	1.1	1.5	PCS-009-BCD36D	2,221.83	PCS-009-BCD36W	2,310.74
	9	1.5	2	PCS-009-BCD37D	2,221.83	PCS-009-BCD37W	2,310.74
	9	2.2	3	PCS-009-BCD38D	2,221.83	PCS-009-BCD38W	2,310.74
	9	3.7	5	PCS-009-BCD39D	2,221.83	PCS-009-BCD39W	2,310.74
	16	5.5	7.5	PCS-016-BCD40D	2,299.50	PCS-016-BCD40W	2,392.50
	16	7.5	10	PCS-016-BCD41D	2,299.50	PCS-016-BCD41W	2,392.50
	25	11	15	PCS-025-BCD42D	2,523.32	PCS-025-BCD42W	2,624.50
	30	15	20	PCS-030-BCD43D	2,724.65	PCS-030-BCD43W	2,832.98
	37	18.5	25	PCS-037-BCD44D	2,913.72	PCS-037-BCD44W	3,030.23
	43	22	30	PCS-043-BCD45D	3,147.76	PCS-043-BCD45W	3,274.49
	43	30	40	PCS-043-BCD46D	3,147.76	PCS-043-BCD46W	3,274.49
	60	37	50	PCS-060-BCD47D	3,819.21	PCS-060-BCD47W	3,971.49
	85	45	60	PCS-085-BCD48D	4,309.77	PCS-085-BCD48W	4,482.49
	85	55	75	PCS-085-BCD49D	4,309.77	PCS-085-BCD49W	4,482.49
	108	75	100	PCS-108-BCD50D	6,866.82	PCS-108-BCD50W	7,140.71
	135	90	125	PCS-135-BCD51D	7,938.90	PCS-135-BCD51W	8,256.74
	201	132	200	PCS-201-BCD54D	8,932.28	PCS-201-BCD54W	9,289.98
	251	160	250	PCS-251-BCD56D	10,417.25	PCS-251-BCD56W	10,834.22
	317	200	300	PCS-317-BCD57D	11,388.15	PCS-317-BCD57W	11,843.96
	361	250	350	PCS-361-BCD58D	11,947.18	PCS-361-BCD58W	12,425.48
	480	315	500	PCS-480-BCD61D	15,073.48	PCS-480-BCD61W	15,675.44

Combination Circuit Breaker PCS Softstarters include:

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

❶ Other UL type enclosures available. Contact your Sprecher + Schuh representative for pricing.
❷ See from page D18 if ordering factory installed modifications.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ See page D29 for circuit breaker ratings.
❺ For 380V applications choose softstarter based on FLA, then change the BB code in the catalog number to BG. Example PCS-043-BBD44D becomes PCS-043-B**G**D44D, which covers 25 HP @ 380V FLA 37. Price remains the same.
❻ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. For example number PCS-085-BBD47**D** becomes PCS-085-BBD47**R**. Price and dimensions remain the same.
❼ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

Enclosed Combination Fusible Starters - Line Connected ❶❷❹❻

Rated Voltage (V AC)	Current Rating (Amps) ❸	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	Type 12 [Type 3R ❺] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
200	3	—	0.5	PCS-003-FHD33D	1,552.42	PCS-003-FHD33W	1,613.74
	9	—	0.75	PCS-009-FHD34D	1,574.90	PCS-009-FHD34W	1,637.24
	9	—	1	PCS-009-FHD35D	1,574.90	PCS-009-FHD35W	1,637.24
	9	—	1.5	PCS-009-FHD36D	1,574.90	PCS-009-FHD36W	1,637.24
	16	—	2	PCS-016-FHD37D	1,641.33	PCS-016-FHD37W	1,706.74
	16	—	3	PCS-016-FHD38D	1,641.33	PCS-016-FHD38W	1,706.74
	25	—	5	PCS-025-FHD39D	1,731.27	PCS-025-FHD39W	1,799.74
	37	—	7.5	PCS-037-FHD40D	1,976.55	PCS-037-FHD40W	2,055.24
	43	—	10	PCS-043-FHD41D	2,277.02	PCS-043-FHD41W	2,369.00
	60	—	15	PCS-060-FHD42D	2,847.29	PCS-060-FHD42W	2,960.73
	85	—	20	PCS-085-FHD43D	3,371.58	PCS-085-FHD43W	3,506.48
	85	—	25	PCS-085-FHD44D	4,140.12	PCS-085-FHD44W	4,275.03
	108	—	30	PCS-108-FHD45D	5,414.56	PCS-108-FHD45W	5,631.22
	135	—	40	PCS-135-FHD46D	6,330.27	PCS-135-FHD46W	6,583.72
	201	—	60	PCS-201-FHD48D	7,157.07	PCS-201-FHD48W	7,443.23
	251	—	75	PCS-251-FHD49D	7,893.93	PCS-251-FHD49W	8,209.73
	317	—	100	PCS-317-FHD50D	8,708.46	PCS-317-FHD50W	9,056.96
	361	—	125	PCS-361-FHD51D	10,283.36	PCS-361-FHD51W	10,695.23
	480	—	150	PCS-480-FHD52D	12,393.79	PCS-480-FHD52W	12,889.46
230	3	0.37	0.5	PCS-003-FAD33D	1,552.42	PCS-003-FAD33W	1,613.74
	9	0.55	0.75	PCS-009-FAD34D	1,574.90	PCS-009-FAD34W	1,637.24
	9	0.75	1	PCS-009-FAD35D	1,574.90	PCS-009-FAD35W	1,637.24
	9	1.1	1.5	PCS-009-FAD36D	1,574.90	PCS-009-FAD36W	1,637.24
	9	1.5	2	PCS-009-FAD37D	1,574.90	PCS-009-FAD37W	1,637.24
	16	2.2	3	PCS-016-FAD38D	1,641.33	PCS-016-FAD38W	1,706.74
	25	3.7	5	PCS-025-FAD39D	1,731.27	PCS-025-FAD39W	1,799.74
	30	5.5	7.5	PCS-030-FAD40D	1,819.16	PCS-030-FAD40W	1,892.74
	37	7.5	10	PCS-037-FAD41D	1,976.55	PCS-037-FAD41W	2,055.24
	43	11	15	PCS-043-FAD42D	2,277.02	PCS-043-FAD42W	2,369.00
	60	15	20	PCS-060-FAD43D	2,847.29	PCS-060-FAD43W	2,960.73
	85	18.5	25	PCS-085-FAD44D	3,371.58	PCS-085-FAD44W	3,506.48
	85	22	30	PCS-085-FAD45D	4,140.12	PCS-085-FAD45W	4,275.03
	108	30	40	PCS-108-FAD46D	5,414.56	PCS-108-FAD46W	5,631.22
	135	37	50	PCS-135-FAD47D	6,330.27	PCS-135-FAD47W	6,583.72
	201	55	75	PCS-201-FAD49D	7,157.07	PCS-201-FAD49W	7,443.23
	251	75	100	PCS-251-FAD50D	7,893.93	PCS-251-FAD50W	8,209.73
	317	90	125	PCS-317-FAD51D	8,708.46	PCS-317-FAD51W	9,056.96
	361	110	150	PCS-361-FAD52D	10,283.36	PCS-361-FAD52W	10,695.23
	480	147	200	PCS-480-FAD54D	12,393.79	PCS-480-FAD54W	12,889.46

Combination Fusible PCS Softstarters include:

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

❶ Other UL type enclosures available. Contact your Sprecher + Schuh representative for pricing.

❷ See page D18 if ordering factory installed modifications.

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

❹ Fuse clip accepts J-Type fuses. Power fuses are not supplied. See page D29 for Fusible Disconnect amp ratings.

❺ For outdoor applications, replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. Example: PCS-085-FHD43**D** becomes PCS-085-FHD43**R**. Price and dimensions remain the same.

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

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

Enclosed Combination Fusible Starters - Line Connected ❶❷❹❼

Rated Voltage (V AC)	Current Rating (Amps) ❸	Starting Duty kW 50 Hz	Starting Duty Hp 60Hz	Type 12 [Type 3R ❻] Industrial Dustight Catalog Number	Price	Type 4 Watertight Catalog Number	Price
460 ❺	3	0.37	0.5	PCS-003-FBD33D	1,552.42	PCS-003-FBD33W	1,613.74
	3	0.55	0.75	PCS-003-FBD34D	1,552.42	PCS-003-FBD34W	1,613.74
	3	0.75	1	PCS-003-FBD35D	1,552.42	PCS-003-FBD35W	1,613.74
	9	1.1	1.5	PCS-009-FBD36D	1,574.90	PCS-009-FBD36W	1,637.24
	9	1.5	2	PCS-009-FBD37D	1,574.90	PCS-009-FBD37W	1,637.24
	9	2.2	3	PCS-009-FBD38D	1,574.90	PCS-009-FBD38W	1,637.24
	16	3.7	5	PCS-016-FBD39D	1,641.33	PCS-016-FBD39W	1,706.74
	16	5.5	7.5	PCS-016-FBD40D	1,641.33	PCS-016-FBD40W	1,706.74
	25	7.5	10	PCS-025-FBD41D	1,731.27	PCS-025-FBD41W	1,799.74
	30	11	15	PCS-030-FBD42D	1,819.16	PCS-030-FBD42W	1,892.74
	37	15	20	PCS-037-FBD43D	1,976.55	PCS-037-FBD43W	2,055.24
	43	18.5	25	PCS-043-FBD44D	2,277.02	PCS-043-FBD44W	2,369.00
	43	22	30	PCS-043-FBD45D	2,277.02	PCS-043-FBD45W	2,369.00
	60	30	40	PCS-060-FBD46D	2,847.29	PCS-060-FBD46W	2,960.73
	85	37	50	PCS-085-FBD47D	3,371.58	PCS-085-FBD47W	3,506.48
	85	45	60	PCS-085-FBD48D	4,140.12	PCS-085-FBD48W	4,275.03
	108	55	75	PCS-108-FBD49D	5,414.56	PCS-108-FBD49W	5,631.22
	135	75	100	PCS-135-FBD50D	6,330.27	PCS-135-FBD50W	6,583.72
	201	110	150	PCS-201-FBD52D	7,157.07	PCS-201-FBD52W	7,443.23
	251	132	200	PCS-251-FBD54D	7,893.93	PCS-251-FBD54W	8,209.73
	317	160	250	PCS-317-FBD56D	8,708.46	PCS-317-FBD56W	9,056.96
	361	200	300	PCS-361-FBD57D	10,283.36	PCS-361-FBD57W	10,695.23
	480	250	400	PCS-480-FBD59D	12,393.79	PCS-480-FBD59W	12,889.46
575	3	0.55	0.75	PCS-003-FCD34D	1,853.91	PCS-003-FCD34W	1,927.49
	3	0.75	1	PCS-003-FCD35D	1,853.91	PCS-003-FCD35W	1,927.49
	9	1.1	1.5	PCS-009-FCD36D	1,875.37	PCS-009-FCD36W	1,951.00
	9	1.5	2	PCS-009-FCD37D	1,875.37	PCS-009-FCD37W	1,951.00
	9	2.2	3	PCS-009-FCD38D	1,875.37	PCS-009-FCD38W	1,951.00
	9	3.7	5	PCS-009-FCD39D	1,875.37	PCS-009-FCD39W	1,951.00
	16	5.5	7.5	PCS-016-FCD40D	1,987.79	PCS-016-FCD40W	2,066.48
	16	7.5	10	PCS-016-FCD41D	1,987.79	PCS-016-FCD41W	2,066.48
	25	11	15	PCS-025-FCD42D	1,930.56	PCS-025-FCD42W	2,113.50
	30	15	20	PCS-030-FCD43D	2,199.34	PCS-030-FCD43W	2,287.24
	37	18.5	25	PCS-037-FCD44D	2,366.95	PCS-037-FCD44W	2,462.00
	43	22	30	PCS-043-FCD45D	2,747.14	PCS-043-FCD45W	2,856.49
	43	30	40	PCS-043-FCD46D	2,747.14	PCS-043-FCD46W	2,856.49
	60	37	50	PCS-060-FCD47D	3,394.06	PCS-060-FCD47W	3,529.99
	85	45	60	PCS-085-FCD48D	4,053.25	PCS-085-FCD48W	4,214.73
	85	55	75	PCS-085-FCD49D	4,821.80	PCS-085-FCD49W	4,983.27
	108	75	100	PCS-108-FCD50D	6,219.89	PCS-108-FCD50W	6,467.22
	135	90	125	PCS-135-FCD51D	7,313.43	PCS-135-FCD51W	7,605.72
	201	132	200	PCS-201-FCD54D	7,871.44	PCS-201-FCD54W	8,186.22
	251	160	250	PCS-251-FCD56D	9,357.43	PCS-251-FCD56W	9,730.46
	317	200	300	PCS-317-FCD57D	10,763.70	PCS-317-FCD57W	11,193.97
	361	250	350	PCS-361-FCD58D	11,723.36	PCS-361-FCD58W	12,192.46
	480	315	500	PCS-480-FCD61D	13,287.02	PCS-480-FCD61W	13,818.46

Combination Fusible PCS Softstarters include:

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

❶ Other UL type enclosures available. Contact your Sprecher + Schuh representative.
❷ See page D18 if ordering factory installed modifications.
❸ The nominal current rating for the combination package may differ from the controller, based on the horsepower. Consult your Sprecher + Schuh representative.
❹ Fuse clips accept J-Type fuses. Power fuses are not supplied. See page D29 for Fusible Disconnect amp ratings.
❺ For 380V applications choose softstarter based on FLA, then change the FB code in the catalog number to FG. Example PCS-043-FBD44D becomes PCS-043-F**G**D44D, which covers 25 HP @ 380V FLA 37. Price remains the same.
❻ For outdoor applications,replace "D" in catalog number with an "R". All enclosures are Type-12 with a Drip Shield. For example number PCS-085-FBD47**D** becomes PCS-085-FBD47**R**. Price and dimensions remain the same.
❼ Motor FLA rating must fall within the specified current range for unit to operate properly. Special consideration should be given when using a motor with a potentially high starting current (greater than ten times motor FLA) with the PCS in the "Full Voltage" starting mode. The overload setting must be set to the motor FLA regardless if the Overload Function is "OFF" (disabled). Contact Sprecher+Schuh technical support for further guidance.

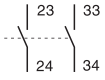
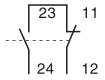
www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

Options - Factory Modifications

Description	Catalog Number	Price Adder
Pushbuttons (2) START and STOP pushbuttons for enclosed softstarters	Add suffix "**-3**"	**219.73**
Selector Switch Two or three position selector switch for enclosed softstarters "ON-OFF" "HAND-OFF-AUTO"	 Add suffix "**-6**" Add suffix "**-7**"	 **219.73** **219.73**
Pilot Light ❶ Red pilot light with "RUN" inscription for enclosed softstarters	Add suffix "**-1**"	**152.28**
Voltmeter (Panelboard) Measures all three phases. Includes switch.	Add suffix "**-VM3**"	**2103.28**
Ammeter (Panelboard) For monitoring all three phases. Includes switch.	Add suffix "**-AM3**"	**2103.28**
Elapsed Time Meter Measures elapsed motor running time	Add suffix "**-ETM**"	**1051.64**

❶ 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.

Auxiliary Contact Blocks (1 & 2 Pole) ❶

Contact Block	Description	NO	NC	Contact Arrangement	For use with…	Catalog Number	Price
	• For side mounting with sequence terminal designations • Snap-on design – mounts without tools • One block per device only	1	0		All PCS & PCEC Controllers	PCS-PA-10	26.47
		2	0			PCS-PA-20	35.57
		0	1			PCS-PA-01	26.47
		1	1			PCS-PA-11	35.57

Accessories

Accessory	Description	For use with…	Catalog Number	Price
 PCV-064	**Internal PCS Fan** • Attaches directly to PCS Controller • Recommended for enclosed PCS-003...37A Controllers • Fan is included as standard on PCS-043…480A devices • For PCS-108...480A units, separate 120V or 240V single phase is required for fan operation.	PCS-003…037 PCE-032...064-600V	PCV-064	46.50
		PCS-043...085 PCE-074...147-600V	PCV-147	71.23
		PCS-108...135 PCE-234-600V	PCV-234	268.79
		PCS-201..251	PFV-0251	358.72
		PCS-317...480	PFV-0480	393.47
	**Connecting Module** • For direct connection of PCS Controller to KT7 Motor Circuit Controller • Motor Circuit Controller and PCS Controller must each be mounted • See Section F for KT7 Mounting Modules	KT7-25S to PCS-003…025	PCS-25S-CC25	9.68
		KT7-25H to PCS-003…025	PCS-25H-CD25	9.68
		KT7-45H to PCS-003…037	PCS-45H-CF45	9.68
	**Connecting Module** • For direct connection of PCS Controller to CA7 contactor • CA7 Contactor and PCS Controller must each be mounted • See Section F for KT7 Mounting Modules	CA7-9…23 to PCS-003…019	PCS-23-CI23	9.68
		CA7-30…37 to PCS-003…037	PCS-37-CI37	9.68
	**600V Protective Module** • Protects power components from transient voltage spikes and shunts noise energy away from the controller electronics • PCS (3 Lead) Line Connected Applications: Protective modules may be installed on the line and/or load side • PCS (6 Lead) Delta Connected Applications: Protective modules must be installed on the line side only • Clamping voltage range 705V…1750V, energy rating 290 joules	PCS-003...037-600V PCE-032...064-600V	PCP-064-600V	69.50
		PCS-043...085-600V PCE-074...147-600V	PCP-147-600V	134.9
		PCS-108...480 PCE-234-600V	PFP-0480-600V	522.24

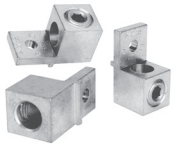
❶ One Auxiliary Contact block (one or two pole) may be mounted on the right side of the controller.

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

IEC Terminal Covers ❶

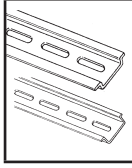
Description	Pkg. Qty.	Catalog Number	Price
IEC line or load terminal covers for 108...135A devices. Dead front protection	1	PFT-0135	61.63
IEC line or load terminal covers for 201...251A devices. Dead front protection		PFT-0251	73.69
IEC line or load terminal covers for 317...480A devices. Dead front protection		PFT-0480	81.66

Terminal Lug Kits (108...480 A) ❷

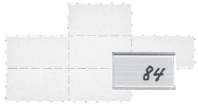


Current Rating (A)	Conductor Size	Total No. of Line Controller Terminal Lugs Possible Each Side		Pkg. Qty.	Catalog Number	Price
		Line Side	Load Side			
108...135	#6...250 MCM AWG 16 mm^2...120mm^2	3	3	3	PNX-1120	97.70
201...251		6	6			
317...480	#4...500 MCM AWG 25 mm^2...240MM^2	6	6		PNX-1240	148.19

Accessories

Accessory	Description	For Use With...	Catalog Number	Price
	**Remote Reset -** • For remote resetting of the PCS electronic overload • Attached directly to the PCS controller	All PCS Controllers	**CMR7-✱** *Replace ✱ with coil code below*	73.38
	**External Reset Button -** Used for manually resetting the PCS electronic overload	All PCS Controllers	**Use D7 Reset See Section H**	~
	**DIN-rail -** 2 meter lengths (6' 6") Top Hat, low profile (price per rail) Top Hat, high profile (price per rail)		**3F** **3AF**	See page N30

Marking Systems

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

CMR7 Remote Reset Coil Codes

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

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

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

Control Modules

PCS Rating	For units rated 200...600V AC ❹					
	100...240V AC Catalog Number	Price	Qty	24V AC/DC Catalog Number	Price	Qty
108 A	**PCS-108**	**1,277.50**	1	**PCS-108-024**	**1,277.50**	1
135 A	**PCS-135**	**1,308.16**	1	**PCS-135-024**	**1,308.16**	1
201 A	**PCS-201**	**1,308.16**	1	**PCS-201-024**	**1,308.16**	1
251 A	**PCS-251**	**1,308.16**	1	**PCS-251-024**	**1,308.16**	1
317 A	**PCS-317**	**1,308.16**	1	**PCS-317-024**	**1,308.16**	1
361 A	**PCS-361**	**1,308.16**	1	**PCS-361-024**	**1,308.16**	1
480 A	**PCS-480**	**1,308.16**	1	**PCS-480-024**	**1,308.16**	1

Power Poles ❶

PCS Rating	For units rated 200…600V AC ❹		
	200…600V AC Catalog Number	Price	Qty
108 A	**PFL-0108-600V ❷**	**3,117.10**	1
135 A	**PFL-0135-600V ❷**	**3,975.58**	1
201 A	**PFL-0201-600V ❸**	**2,115.54**	1
251 A	**PFL-0251-600V ❸**	**2,299.50**	1
317 A	**PFL-0317-600V ❸**	**2657.20**	1
361 A	**PFL-0361-600V ❸**	**2,892.26**	1
480 A	**PFL-0480-600V ❸**	**3,934.70**	1

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

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

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

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

Electrical Ratings

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

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

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

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

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

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

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

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

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

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

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

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

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

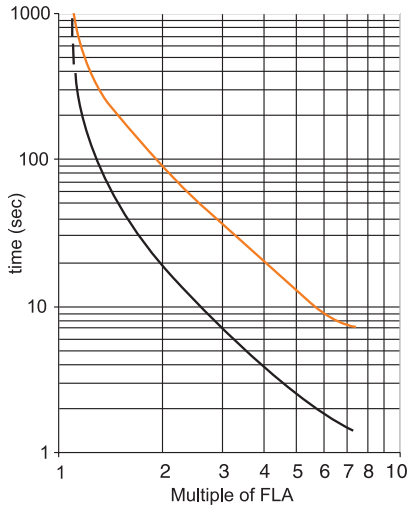
❶ Overvoltage category II, when either control or auxiliary circuit is wired to a SELV or PELV circuit.

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

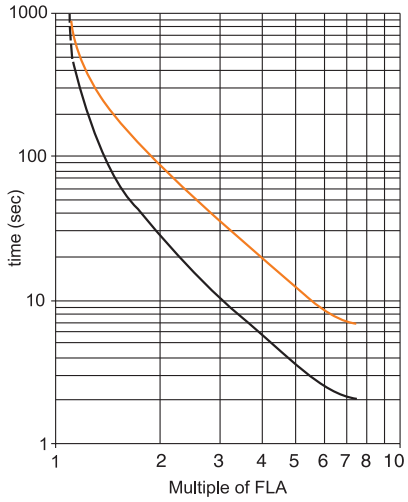
Overload Relay Trip Curves

Hot — Cold

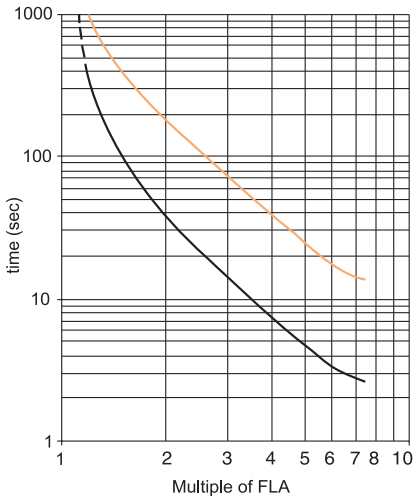
Trip Class 10



Trip Class 15

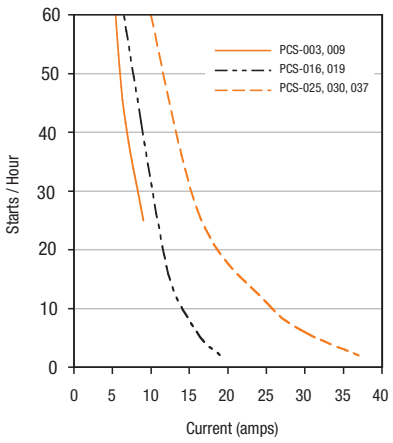


Trip Class 20

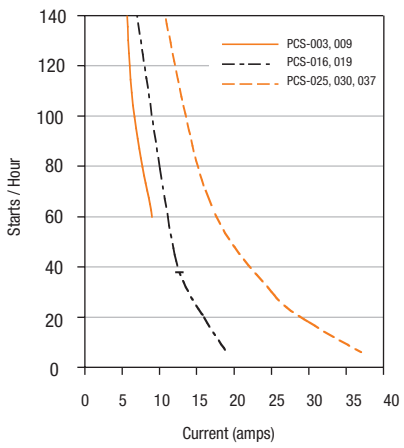


Starts per Hour Curves

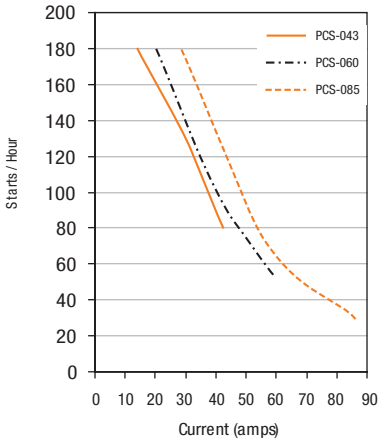
PCS Controller - Starts per hour
40C, 100% duty cycle, 10 sec., 350%, no fan



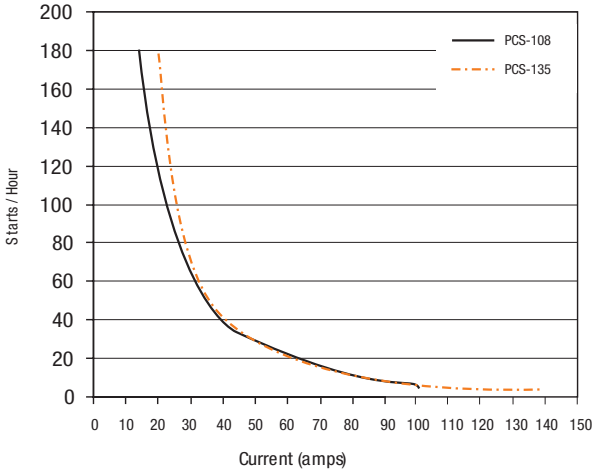
PCS Controller - Starts per hour
40C, 100% duty cycle, 10 sec., 350%, with fan



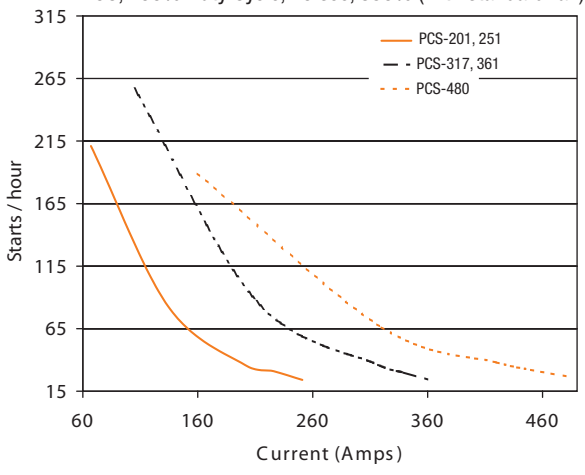
PCS Controller - Starts per hour
40C,100% Duty Cycle, 20sec, 350% (with standard fan)



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

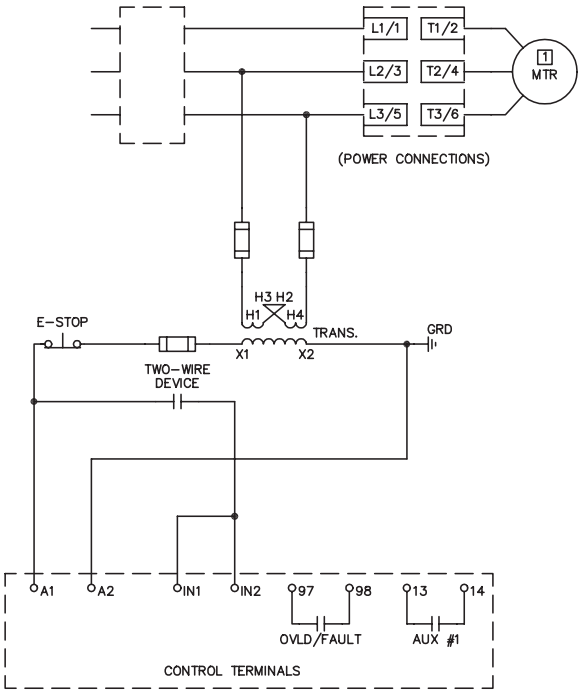


PCS Controller Starts per hour (201…480 A)
40C, 100% Duty Cycle, 20 sec, 350% (with standard fan)

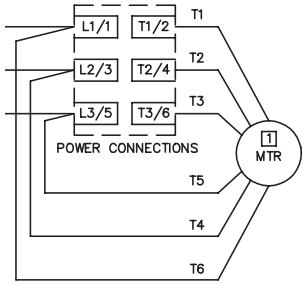


Two Wire Configuration

Line Connected ❶



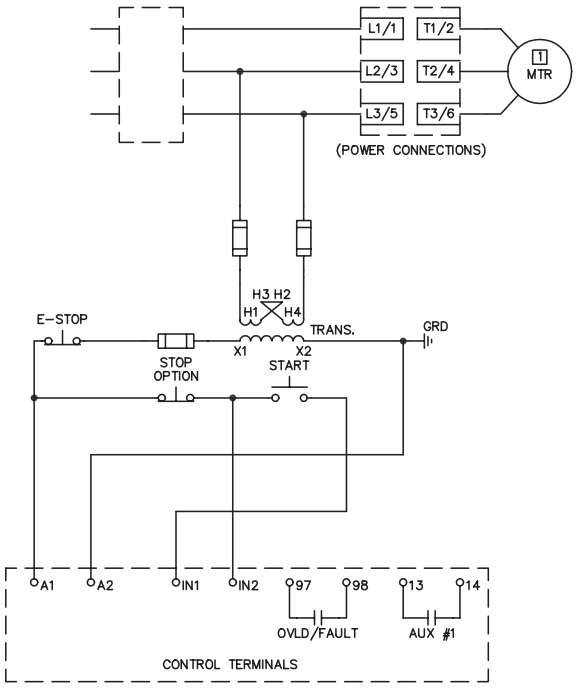
Delta Connected ❶



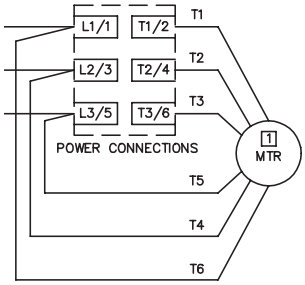
❶ Line or Delta Connected selection are determined by the customer.
- PCS DIP Switch #15 "**ON**": PCS set for Line Connected Motors
- PCS DIP Switch #15 "**OFF**": PCS set for Delta Connected Motors

Three Wire Configuration

Line Connected ❶



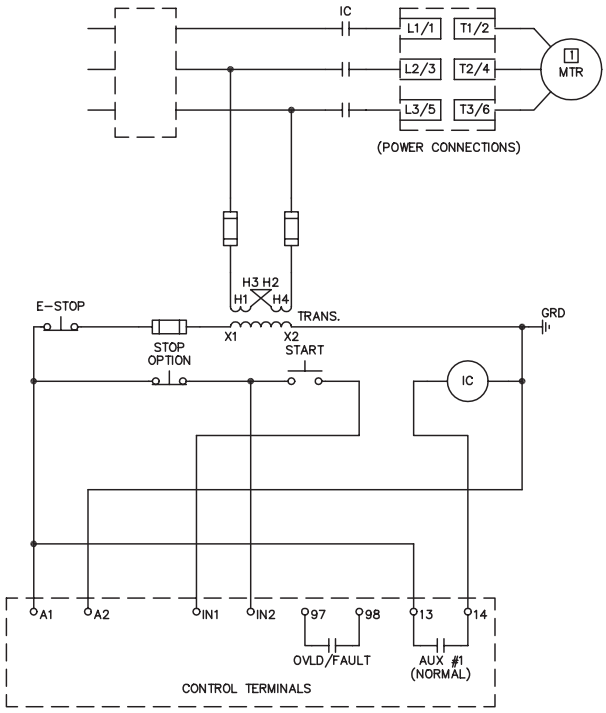
Delta Connected ❶



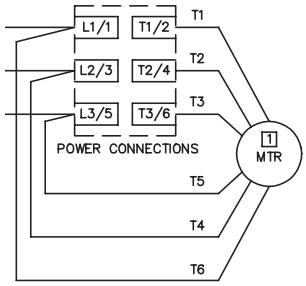
❶ Line or Delta Connected selection are determined by the customer.
- PCS DIP Switch #15 "**ON**": PCS set for Line Connected Motors
- PCS DIP Switch #15 "**OFF**": PCS set for Delta Connected Motors

Isolation Contactor Configuration

Line Connected ❶



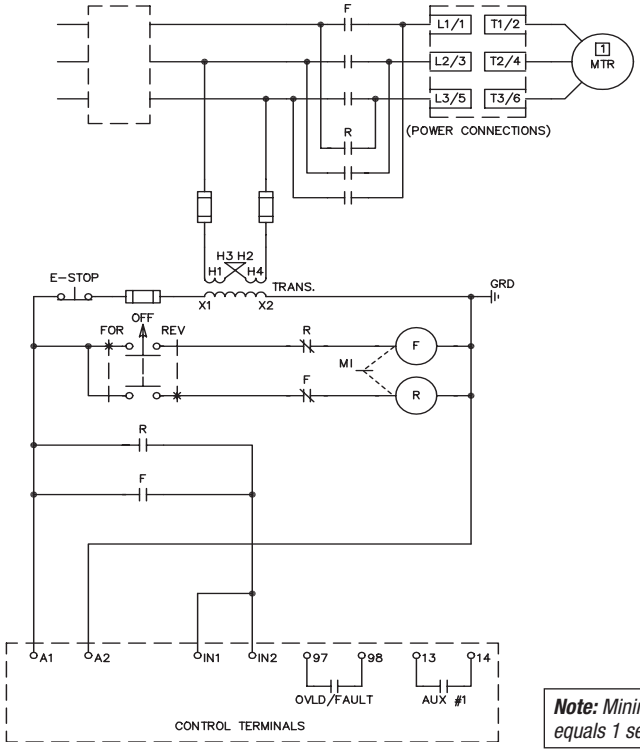
Delta Connected ❶



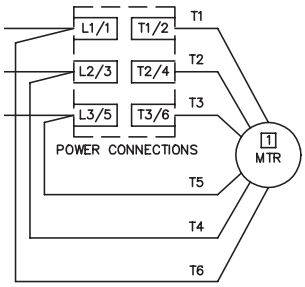
❶ Line or Delta Connected selection are determined by the customer.
- PCS DIP Switch #15 "**ON**": PCS set for Line Connected Motors
- PCS DIP Switch #15 "**OFF**": PCS set for Delta Connected Motors

Reversing Configuration

Line Connected ❶



Delta Connected ❶

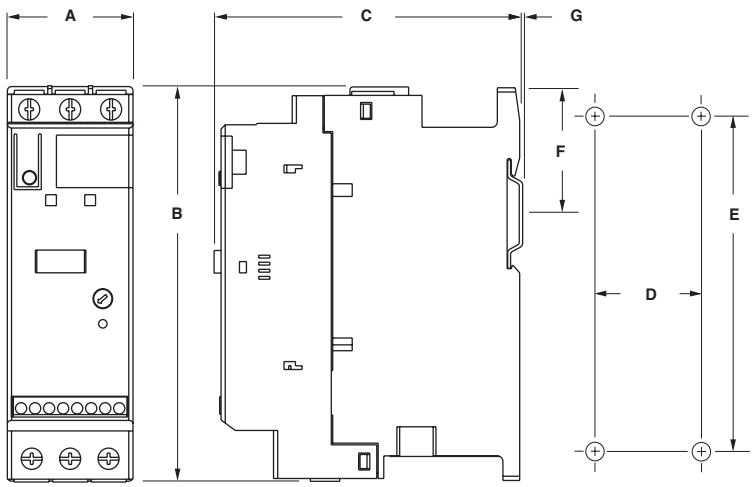


❶ Line or Delta Connected selection are determined by the customer.
- PCS DIP Switch #15 "**ON**": PCS set for Line Connected Motors
- PCS DIP Switch #15 "**OFF**": PCS set for Delta Connected Motors

Note: *Minimum off time equals 1 second*

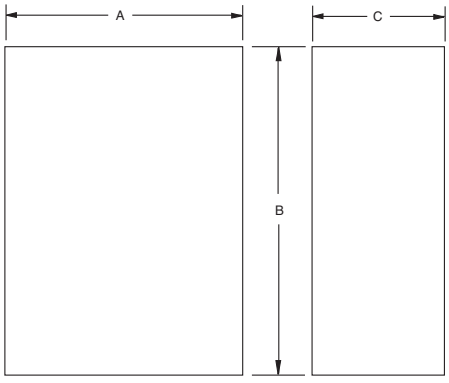
PCS Softstarter Controller

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



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

Minimum Enclosure Size

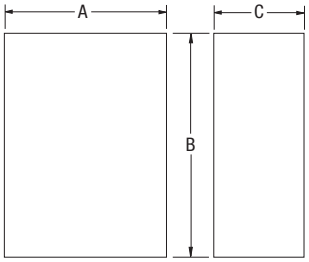


Controller	Height B	Width A	Depth C	Fan Requirements
3…37 A	305 (12)	224 (9)	152 (6)	none
43…85 A	406 (16)	305 (12)	203 (8)	none
108...135 A	762 (30)	610 (24)	305 (12)	none
201...251 A	965 (38)	762 (30)	356 (14)	none
317...480 A	1295 (51)	914 (36)	356 (14)	none

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

Enclosed Type Line-Connected Controllers

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



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

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

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

www.sprecherschuh.com/ecatalog - All pricing shown in US dollars - FY19

Notes