

Softstarters – overview

Type PSR - the compact range



Softstarter type 480V, 104°F	PSR3 ... PSR16					PSR25 ... PSR30		PSR37 ... PSR45		PSR60 ... PSR105			
	PSR	PSR	PSR	PSR	PSR	PSR	PSR	PSR	PSR	PSR	PSR	PSR	PSR
Normal start, Inline connected:	3	6	9	12	16	25	30	37	45	60	72	85	105
(480 V), hp	2	3	5	7.5	10	15	20	25	30	40	50	60	75
UL, Max. A	3.4	6.1	9	11	15.2	24.2	28	34	46.2	59.4	68	80	104
Manual motor starter [Ⓢ]	MS116 MS116 MS116 MS116 MS116 MS325 MS450 MS450 MS450 MS495 MS495 MS495 MS495												
Recommended size MMS	MS116 MS116 MS116 MS116 MS116 MS325 MS450 MS450 MS450 MS495 MS495 MS495 MS495												
Type J fuse minimum rating	Fuse protection 480 V, J Fuse based on UL, max A x 1.75 6 A 9 A 15 A 20 A 25 A 40 A 50 A 60 A 70 A 90 A 120 A 135 A 170 A												
Suitable fused disconnect for J fuses.	Fused disconnect [Ⓢ] OS30 OS30 OS30 OS30 OS30 OS60 OS60 OS60 OS100 OS125D OS160D OS160D OS160D 10 A 10 A 20 A 20 A 30 A 40 A 50 A 60 A 80 A 100 A 120 A 135 A 170 A												
Type J fuse	85 kA 85 kA 85 kA 85 kA 85 kA 85 kA 85 kA 85 kA 85 kA 85 kA 85 kA 85 kA 85 kA												
Short circuit current rating	AC-3 rated by-pass [Ⓢ] A9 A9 A9 A12 A16 A26 A30 A40 A40 A50 A63 A75 A110												
The line contactor is not required for the softstarter but is used to open if the OL trips.	Thermal overload relay [Ⓢ] TA25DU TA25DU TA25DU TA25DU TA25DU TA25DU TA25DU TA42DU TA75DU TA75DU TA75DU TA110DU TA110DU												
The overload relay is always required to protect the motor.	By-pass contact Built-in Built-in Built-in Built-in Built-in Built-in Built-in Built-in Built-in Built-in Built-in Built-in Built-in												
The by-pass contacts reduces the power loss of the softstarter	Control transformers Min. recommended transformer size. 50 VA 50 VA 50 VA 50 VA 50 VA 50 VA 50 VA 50 VA 50 VA 50 VA 50 VA 50 VA 50 VA Power consumption at 100-240V 12 VA 12 VA 12 VA 12 VA 12 VA 12 VA 12 VA 12 VA 12 VA 12 VA 12 VA 12 VA 12 VA Power consumption at 24V DC 5 W 5 W 5 W 5 W 5 W 5 W 5 W 5 W 5 W 5 W 5 W 5 W 5 W												

[Ⓢ] For complete catalog numbers, see the pertinent product section in the 1SXU000023C0202 Product Selector.

PSR

LED indications:

- On/Ready
- Run/Top of ramp

Three rotating switches setting:

- Start ramp (1-20 sec)
- Stop ramp (0-20 sec)
- Initial voltage (40-70 % of U_i)

Built-in signal relays for Run (PSR3 ... 45) and TOR (PSR25 ... 105)

Integrated By-Pass, No OL

PSS

LED indications:

- Power supply ON
- Completed start ramp TOP OF RAMP
- EXTERNAL FAULT
- GENERAL FAULT (motor side or unit)

Three rotating switches setting:

- Start ramp (1-30 sec)
- Stop ramp (0-30 sec)
- Initial voltage (30-70 % of U_i)
- Current limit $1.5-4 \times I_n$ (If used: Initial voltage fixed at 40% of U_i)

Dip-switch for Inline/Inside Delta connection

Built-in signal relays for fault and by-pass

Transparent lid to protect the settings

No By-Pass, No OL

Type PSS - the flexible range



Softstarter type 480V, 104°F	PSS18/30 ... 44/76				PSS50/85 ... 72/124			PSS85/147 ... 142/245			PSS175/300 ... 300/515		
	PSS	PSS	PSS	PSS	PSS	PSS	PSS	PSS	PSS	PSS	PSS	PSS	
Normal start, Inline connected:	18/30	30/52	37/64	44/76	50/85	60/105	72/124	85/147	105/181	142/245	175/300	250/430	300/515
(480 V), hp	10	20	25	30	30	40	50	60	75	100	125	150	200
UL, Max. A	18	28	34	40	47	56	67	85	105	125	156	225	248
Recommended size MCCB	MCCB Branch protection [Ⓢ] T2 T2 T2 T2 T2 T2 T2 T3 T3 T3 T4 T4 T5												
Semiconductor fuse Zyxol and respective fuse holders.	Fuse protection 65 kA (Max. fuse size), semiconductor fuses, Bussman with fuse holder 170M1364 170M1366 170M1368 170M1369 170M1369 170M1370 170M1371 170M1372 170M3019 170M3020 170M3021 170M5013 170M5015 170H1007 170H1007 170H1007 170H1007 170H1007 170H1007 170H1007 170H1007 170H3004 170H3004 170H3004 170H3004 170H3004												
Suitable fused disconnect for Type J fuses	Fused disconnect [Ⓢ] OS60 OS60 OS60 OS100 OS100 OS100 OS200 OS200 OS400 OS400 OS400 OS400 OS400 OES600 35 A 45 A 60 A 80 A 80 A 100 A 125 A 150 A 200 A 250 A 300 A 400 A 500 A												
480 V Fuse; Type J fuse minimum rating	5 kA 5 kA 5 kA 5 kA 5 kA 5 kA 5 kA 5 kA 5 kA 5 kA 5 kA 5 kA 5 kA												
Short circuit current rating	AC-3 rated by-pass [Ⓢ] A16 A26 A30 A40 A40 A50 A63 A95 A110 A145 A185 A210 A260												
The line contactor is not required for the softstarter itself but often used to open if OL trips.	Thermal overload relay [Ⓢ] TA25DU TA25DU TA42DU TA75DU TA75DU TA75DU TA75DU TA110DU TA110DU TA200DU TA200DU TA450DU TA450DU												
The overload relay is always required to protect the motor.	AC-1 rated by-pass [Ⓢ] A9 A16 A26 A26 A30 A40 A50 A50 A75 A110 A145 A145 A185												
The by-pass contactor can be used to reduce the power loss of the softstarter but also to increase the number of starts/h.	Current transformers The current transformer is required if the current limit function of the PSS is used. PSCT-30 1 turn PSCT-40 1 turn PSCT-50 1 turn PSCT-60 1 turn PSCT-75 1 turn PSCT-75 1 turn PSCT-100 1 turn PSCT-125 1 turn PSCT-150 1 turn PSCT-200 1 turn PSCT-250 1 turn PSCT-400 1 turn PSCT-400 1 turn												
Min. recommended transformer size.	Control transformers 50 VA 50 VA 50 VA 50 VA 50 VA 50 VA 50 VA 75 VA 75 VA 75 VA 75 VA 75 VA 75 VA Power consumption with by-pass 13.5 W 14.6 W 17.5 W 17.5 W 20.5 W 22 W 30.5 W 56.5 W 61 W 63 W 117 W 117 W 140 W Power consumption without by-pass 65 W 100 W 120 W 142 W 160 W 190 W 226 W 291 W 351 W 462 W 590 W 815 W 965 W												

[Ⓢ] For complete catalog numbers, see the pertinent product section in the 1SXU000023C0202 Product Selector.

PST/PSTB

Three separate terminals prepared for external by-pass (PST)

LED indications:

- Power on
- Fault
- Protection

Symbol for torque control

LCD-display with plain words in your language (14 different languages available)

Clear information

Advanced integrated EOL

Terminals for PTC input and analog output

Integrated By-Pass, 300-HP-900HP at 480V

Fieldbus communication

Programmable signal inputs

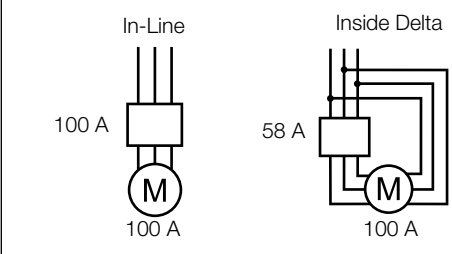
Programmable signal relays

Four button keypad

Integrated advanced motor protection

In-Line or Inside Delta for PSS and PST(B)

Softstarters type **PSS18/30...300/515** and **PST30 ... 300, PSTB370...1050** can be connected inside the motor delta (compare the connection for standard Wye-Delta starters). In this case the current through the softstarter is reduced by 42%. It will then be possible, for example, to run a 100 A motor using a 58 A PSS/PST Softstarter.



Type PST/PSTB - the advanced range



Softstarter type 480V, 104°F	PST30 ... 72					PST85 ... 142			PST175 ... 300				PSTB370 ... 470		PSTB570 ... 1050				
	PST	PST	PST	PST	PST	PST	PST	PST	PST	PST	PST	PST	PSTB	PSTB	PSTB	PSTB	PSTB	PSTB	
Normal start, Inline connected:	30	37	44	50	72	85	105	142	175	210	250	300	370	470	570	720	840	1050	
(480 V), hp	20	25	30	40	50	60	75	100	125	150	200	250	300	400	500	600	700	900	
UL, Max. A	28	34	42	54	68	80	104	130	156	192	248	302	361	480	590	720	840	1062	
Recommended size MCCB	MCCB Branch protection [Ⓢ] T2 T2 T2 T2 T2 T2 T3 T3 T3 T4 T4 T5 T5 T5 T5 T6 T6 T7 T7																		
Semiconductor fuse Zyxol and respective fuse holders	Fuse protection 65 kA (Max. fuse size), semiconductor fuses, Bussman with fuse holder 170M1366 170M1368 170M1369 170M1369 170M1371 170M1372 170M3019 170M3020 170M3021 170M5012 170M5013 170M5015 170M5015 170M5013 170M5015 170M5015 170M5018 170M6018 170M6020 170H1007 170H1007 170H1007 170H1007 170H1007 170H1007 170H3004 170H3004 170H3004 170H3004 170H3004 170H3004 170H3004 170H3004 170H3004 170H3004 170H3004 170H3004 170H3004 170H3004																		
Suitable fused disconnect for J fuse	Fused disconnect [Ⓢ] OS60 OS60 OS100 OS100 OS200 OS200 OS400 OS400 OS400 OS400 OES600 45 A 60 A 80 A 100 A 125 A 150 A 200 A 250 A 300 A 400 A 500 A 600 A 800 A L900 A L1200 A — — — —																		
480 V Fuse; Type J fuse minimum rating	10 kA 10 kA 10 kA 10 kA 10 kA 10 kA 10 kA 10 kA 10 kA 10 kA 10 kA 18 kA 18 kA 18 kA 18 kA 30 kA 30 kA 30 kA 42 kA 42 kA																		
Short circuit current rating	AC-3 rated by-pass [Ⓢ] A26 A30 A40 A50 A63 A75 A110 A145 A185 A210 A260 AF400 AF460 AF580 AF750 AF1350 AF1650																		
The line contactor is not required for the softstarter itself but often used to open if OL trips.	Electronic overload relay Built-in																		
Electronic overload	AC-1 rated by-pass [Ⓢ] A16 A26 A30 A40 A50 A50 A75 A110 A145 A145 A185 A185 A145 A185 A260 Built-in AF300 Built-in AF300 Built-in AF460 Built-in AF580 Built-in AF750 Built-in AF750																		
The by-pass contactor can be used to reduce the power loss of the softstarter but also to increase the number of starts/h.	Current transformers The current transformer is integrated. Integrated PSCT-30 Integrated PSCT-40 Integrated PSCT-50 Integrated PSCT-50 Integrated PSCT-75 Integrated PSCT-100 Integrated PSCT-125 Integrated PSCT-150 Integrated PSCT-200 Integrated PSCT-250 Integrated PSCT-400 Integrated PSCT-400																		
The current transformer is integrated	Control transformers Min. recommended transformer size. 50 VA 50 VA 50 VA 50 VA 50 VA 75 VA 75 VA 75 VA 250 VA 250 VA 250 VA 250 VA 750 VA 750VA 750 VA 750 VA 750 VA 750 VA Power consumption with by-pass 9.5 W 10.5 W 13.5 W 13.5 W 17 W 30.5 W 35 W 37 W 62 W 67 W 67 W 90 W 90 W 110 W 105 W 110 W 170 W 170 W Power consumption without by-pass 100 W 120 W 140 W 160 W 230 W 270 W 325 W 435 W 540 W 645 W 765 W 920 W — — — —																		

[Ⓢ] For complete catalog numbers, see the pertinent product section in the 1SXU000023C0202 Product Selector.

Integrated advanced motor protection

Inside the PST Softstarter, you will find useful features for advanced motor and softstarter protection, including: programmable overload protection, high current, underload, phase imbalance, phase reversal, thyristor overload protection, and bypass monitoring to ensure proper by-pass operation.

Programmable signal relays

All PST units have three programmable signal relays where each relay can signal Run, Top of Ramp or Event. The Event setting can be used to signal protections, faults and warnings. The supervisory functions monitor not only software and critical softstarter functionality but also phase loss and out of frequency range.

External keypad (option)

An external keypad is available as an option. The keypad can be mounted on a panel door, for example,

Integrated by-pass contactor

On the larger sizes (PSTB 370 ... PSTB1050), there is an ABB AF contactor integrated. This gives you advantages in terms of cost saving, space saving and last but not least energy saving. With a by-pass contactor you can reduce the power losses during normal run by 90 % or more.

The smaller units, PST30 up to PST300, which are not equipped with a built-in by-pass contactor, have an extra set of three terminals on the line side. The terminals are marked B1, B2 and B3 and shall be used when connecting an external by-pass contactor. This will enable the integrated protection functions also when the softstarter is by-passed.

Fieldbus communication

The PST Softstarter has a built-in interface on the front for connection of the ABB FieldBusPlug used for fieldbus communication. Through this interface it is possible to control the softstarter, achieve status information, up- and down load of parameters. The interface between the softstarter and the Field-BusPlug is always the same. Independently of PST Softstarter size or delivery date it is possible to connect to any fieldbus protocol later on since this is defined in the FieldBusPlug itself. Available protocols are CANopen, DeviceNet, Profibus DP and Modbus-RTU. To connect the PST Softstarter to a fieldbus system you need the appropriate accessories as well as

Torque control

The default setting is a normal voltage ramp but it is possible to select torque ramp. With the torque control function it is possible to start and stop motors with a more linear acceleration than when using the normal voltage ramps.

During start this can be used to reduce the wear on the equipment driven by the motor.

During stop, controlling the torque is especially useful for pump applications where voltage ramps can lead to a sudden torque drop which may result in water hammering and pressure surges. Torque control will keep these problems to an absolute minimum.

Torque limit

With the torque limit function enabled, the torque can never exceed a set value during start. This will minimize stress and wear on the equipment driven by the motor.

Analog output

With the PST(B) softstarter it is possible to have analog output signals to be used as input to a PLC or an analog meter. The output signals can be selected to be for instance the current of the motor, main voltage, active power or the temperature of the motor. The terminals used for analog output are also used for PTC protection, so only one of these functions can be used.



Contact us



The complete range

ABB offers three softstarter ranges

The compact range, PSR3...105 covers motor currents from 3 to 105 A.

- The compact design makes it possible to fit more products on a given mounting surface.
- Easy to install. Can either be snapped onto a DIN rail or screw mounted.
- Clear setting instructions are provided on the front.

The flexible range, PSS18...300 which is intended for motor currents from 18 A - 250 A "Inline" and up to 515 A "Inside Delta" configuration, offers a solution possible to adapt to almost any application:

- With two connection possibilities, either inline with the motor or inside the motor delta.
- Can be equipped with current limit. (possibility to limit the current during start)
- Easy to set up. With just three clearly labeled rotary switches on the front of the unit it is possible to adjust the softstarter for a wide range of applications.
- Solid state electrical circuit ensures the highest reliability and reduces the need for maintenance to a minimum, even in applications with frequent starts and stops.

The advanced range, PST(B)30...1050 Besides many functions this range also speaks your language. The range covers motor currents from 30 A to 1062 A "Inline" and up to 1839 A "Inside Delta" configuration.

- Advanced integrated protection
- Flexible bus communication system.
- LCD display. With 14 languages, a menu system similar to your mobile phone, preprogrammed application settings and automatic status and event logging, it couldn't be easier to set up and operate!
- Programmable signal relays.
- Integrated by-pass contactor on PSTB.
- Torque control.
- Analog output.

The compact range, PSR3 ... 45
The flexible range, PSS18/30 ... 300/515
The advanced range, PST30 ... PSTB1050

O	-	•	Field bus communication enabled
-	-	•	Real time clock
-	-	•	Programmable fault supervision functions
-	-	•	Programmable warning functions
-	-	•	PTC input for motor protection
-	-	•	High current protection
-	-	•	Phase imbalance /phase reversal protection
-	-	•	Locked rotor protection
-	•	•	Thyristor overtemperature protection
-	-	•	Motor overload protection
-	-	•	Four button keypad (external keypad available)
-	-	O	External keypad
-	O	•	Current limit control
-	•	•	Inline and Inside Delta connection
•	•	•	LED indications
•	-	•	Built-in by-pass contactor (On PSTB)
•	•	•	Ramp Start/Stop
-	-	•	Torque control
-	-	•	Analog output

- Standard
- O Optional
- Not available

Benefits with ABB's Softstarters

- + Soft start/Soft stop
- + Torque control
- + Current limit/Torque limit
- + No current peaks
- + No torque peaks
- + Less mechanical wear
- + Less maintenance
- + No production breaks

Result = **PROFIT**

ABB Inc.
 Low Voltage Products & Systems
 1206 Hatton Road
 Wichita Falls, TX 76302
 Phone: 888-385-1221
 940-397-7000
 Fax: 940-397-7085
 USA Technical help:
 888-385-1221, Option 4
 7:30AM to 5:30PM, CST,
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Softstarters The complete range

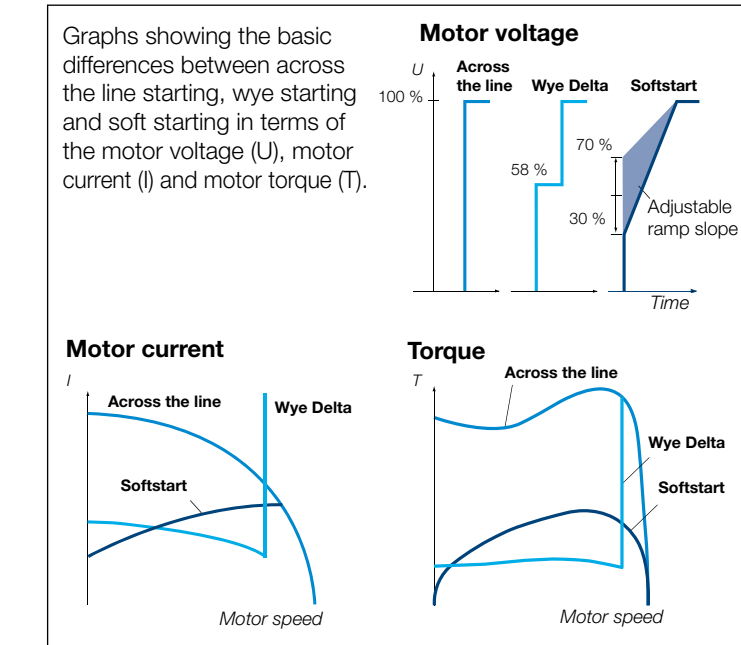
Softstarters for every customer need...

Why soft start?

Do you have rough and jerky motor starts? High starting currents and torques? Or high current and torque peaks?
 When it is important to have smooth start-up you can use a softstarter. Instead of switching directly to full voltage the softstarter ensures gradual voltage increase during start-up which naturally limits the current.

ABB offers the most complete range of softstarters on the market. You can find all product-related documentation such as brochures, catalogs, certificates and drawings at:
www.abb.com/lowvoltage

Differences between different starting methods



Take the stress out of starting... use a Softstarter from ABB

Quick guide for selection

Normal start Class 10

Select size according to the motor HP ratings

Typical applications

- Bow thruster
- Compressor
- Elevator
- Centrifugal pump
- Conveyor belt (short)
- Escalator

Heavy duty start Class 30

Select one size larger than the motor HP ratings



Typical applications

- Centrifugal fan
- Crusher
- Mixer
- Conveyor belt (long)
- Mill
- Stirrer

! If more than 10 starts /h Select **one** size larger than the standard selection.

Use "ProSoft" software to size your Softstarter!

