Softstarters – overview

Type PSR- the compact range

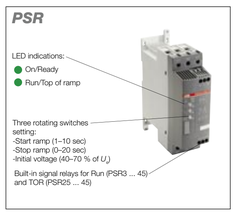
Type PSS- the flexible range

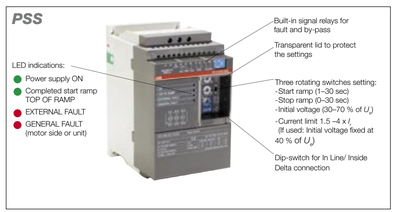
Type PST/PSTB- the advanced range

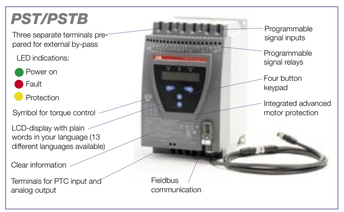
Softstarter, Type	PSR3 ... PSR16					PSR25 ... PSR30		PSR37 ... PSR45		PSS18/30 ... 44/76				PSS50/85 ... 72/124			PSS85/147 ... 142/245			PSS175/300 ... 300/515		
	PSR 3	PSR 6	PSR 9	PSR 12	PSR 16	PSR 25	PSR 30	PSR 37	PSR 45	PSS 18/30	PSS 30/52	PSS 37/64	PSS 44/76	PSS 50/85	PSS 60/105	PSS 72/124	PSS 85/147	PSS 105/181	PSS 142/245	PSS 175/300	PSS 250/430	PSS 300/515
Normal start, In Line connected :																						
(400 V), **kW**	1.5	3	4	5.5	7.5	11	15	18.5	22	7.5	15	18.5	22	25	30	37	45	55	75	90	132	160
IEC, Max. A	3.9	6.8	9	12	16	25	30	37	45	18	30	37	44	50	60	72	85	105	142	175	250	300
(440-480 V), **hp**	2	3	5	7.5	10	15	20	25	30	10	20	25	30	30	40	50	60	75	100	125	150	200
UL, Max. A	3.4	6.1	9	11	15.2	24.2	28	34	46.2	18	28	34	40	47	56	67	85	105	125	156	225	248
400V, 40 °C										**400V, 40 °C**												
Manual Motor Starter, Type										**MCCB (50 kA)**, Type												
If using manual motor starter or an MCCB type 1 coordination will be achieved.	MS116	MS116	MS116	MS116	MS116	MS325	MS450	MS450	MS450	T2S160	T2S160	T2S160	T2S160	T2S160	T2S160	T2S160	T2S160	T3S250	T3S250	T3S250	T4S320	T5S400
Fuse protection 400 V, 65 kA, gG Fuse										**Fuse protection 400 V, 65 kA, Semiconductor fuses, Bussman**, Type												
Using gG fuses, type 1 coordination will be achieved. To achieve type 2 coordination for the PSS or PST(B) softstarters semi-conductor fuses must be used.	10 A	16 A	25 A	32 A	32 A	50 A	63 A	100 A	125 A	170M... 1364	170M... 1366	170M... 1368	170M... 1369	170M... 1369	170M... 1370	170M... 1371	170M... 1372	170M... 3019	170M... 3020	170M... 3021	170M... 5013	170M... 5015
Switch fuse, Type										**Switch fuse**, Type												
Suitable switch fuse for the recommended gG fuses or semi-conductor fuses.	OS32D	OS32D	OS32D	OS32D	OS32D	OS32D	OS32D	OS63D	OS125D	OS160... RD0380	OS160... RD0380	OS160... RD0380	OS160... RD0380	OS160... RD0380	OS160... RD0380	OS160... RD0380	OS160... RD0380	OESA250... R03D80	OESA250... R03D80	OESA250... R03D80	OESA400... R03D80	OESA400... R03D80
Line contactor, Type										**Line contactor**, Type												
The line contactor is not required for the softstarter itself but often used to open if OL trips.	A9	A9	A9	A12	A16	A26	A30	A40	A50	A26	A30	A40	A50	A50	A63	A75	A95	A110	A145	A185	A260	A300
Thermal overload relay, Type										**Thermal overload relay**, Type												
The overload relay is always required to protect the motor.	TA25DU	TA25DU	TA25DU	TA25DU	TA25DU	TA25DU	TA25DU	TA42DU	TA75DU	TA25DU	TA25DU	TA42DU	TA75DU	TA75DU	TA75DU	TA75DU	TA110DU	TA110DU	TA200DU	TA200DU	TA450DU	TA450DU
By-pass contactor, Type										**By-pass contactor**, Type												
The by-pass contactor can be used to reduce the power loss of the softstarter but also to increase the number of starts/h.	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in	A9	A16	A26	A26	A30	A40	A50	A50	A63	A95	A145	A145	A210
Current transformers										**Current transformers**, Type												
The current transformer is required if the current limit function of the PSS is used.	-	-	-	-	-	-	-	-	-	PSCT-60 2 turns	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

Softstarter, Type	PST30 ... 72						PST85 ... 142			PST175 ... 300				PSTB370 ... 470		PSTB570 ... 1050			
	PST 30	PST 37	PST 44	PST 50	PST 60	PST 72	PST 85	PST 105	PST 142	PST 175	PST 210	PST 250	PST 300	PSTB 370	PSTB 470	PSTB 570	PSTB 720	PSTB 840	PSTB 1050
	15	18.5	22	25	30	37	45	55	75	90	110	132	160	200	250	315	400	450	560
	30	37	44	50	60	72	85	105	142	175	210	250	300	370	470	570	720	840	1050
	20	25	30	40	40	50	60	75	100	125	150	200	250	300	400	500	600	700	900
	28	34	42	54	60	68	80	104	130	156	192	248	302	361	480	590	720	840	1062
400V, 40 °C																			
MCCB (50 kA), Type																			
	T2S160	T2S160	T2S160	T2S160	T2S160	T2S160	T2S160	T3S250	T3S250	T4S250	T4S250	T5S400	T5S400	T5S630	T5S630	S6S630	S6S800	S7S1250	S7S1600
Fuse protection 400 V, 65 kA, Semiconductor fuses, Bussman, Type																			
	170M1366	170M1368	170M1369	170M1369	170M1370	170M1371	170M1372	170M3019	170M3020	170M3021	170M5012	170M5013	170M5015	170M5013	170M5015	170M5015	170M5018	170M6018	170M6020 2)
Switch fuse, Type																			
	OS160... RD0380	OS160... RD0380	OS160... RD0380	OS160... RD0380	OS160... RD0380	OS160... RD0380	OS160... RD0380	OESA250... R03D80	OESA250... R03D80	OESA250... R03D80	OESA400... R03D80	OESA400... R03D80	OESA400... R03D80	OESA400... R03D80	OESA630... R03D80	OESA630... R03D80	OESA800... R03D80	1)	1)
Line contactor, Type																			
	A30	A40	A50	A50	A63	A75	A95	A110	A145	A185	A210	A260	A300	AF400	AF580	AF580	AF750	AF1350	AF1650
Electronic overload relay																			
	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	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
By-pass contactor, Type																			
	A16	A26	A26	A30	A40	A50	A50	A63	A95	A145	A145	A145	A210	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
Current transformers																			
	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated

1) PSTB840 and PSTB1050: Switch fuse not available, use fuse holder, Bussman type, 170H3004.
2) PSTB1050-690-70 has 170M6019

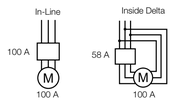






In-Line or Inside Delta for PSS and PST(B)

Softstarters type **PSS18/30...300/515** and **PST30 ... 300, PSTB370...1050** can be connected inside the motor delta (compare the connection for standard Star-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.



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.

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.

External keypad (option)

An external keypad is available as option. The keypad can be mounted on a panel door for example to view/control the softstarter without opening the door. The keypad can also be used to copy parameters between different softstarters.

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 FieldBusPlug 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 AS-Interface, DeviceNet, Profibus DP and Modbus-RTU. To connect the PST Softstarter to a fieldbus system you need the accessories described In our Catalogue 1SFC132004C0201 as well as specific software for PLC set-up, which is available at **www.abb.com/lowvoltage** on the Softstarter pages.

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 analoge output are also used for PTC protection, so only one of these functions can be used.

The complete range

ABB offers three different softstarter ranges

The compact range, PSR3...45 covers motor currents from ***3 to 45 A***.

- The compact design **makes its 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 instructions about the settings are provided on the front.

The flexible range, PSS18...300 which is intended for motor currents from ***18 to 515 A*** offers a solution possible to adapt to almost any application:

- With two connection possibilities, either **in line 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 functionalities this range also speak your language. The range covers motor currents from ***30 to 1810 A***.

- **Advanced integrated protections**
- **Flexible bus communication system**.
- **LCD display**. With 13 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
–	•	•	In Line and Inside Delta connection
•	•	•	LED indications
•	–	• [1]	Built-in by-pass contactor ([1] 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**

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Panorama

Softstarters

The Complete Range

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ABB Automation Technologies AB
Division Automation Products/Cewe-Control
SE-721 61 Västerås, Sweden
Telephone +46 21 32 07 00
Telefax +46 121 12 60 01

http://www.abb.com/lowvoltage

Softstarters for every customer need...

Why soft start?

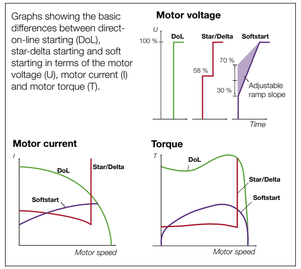
Do You have rough and jerky motor starts? High starting currents and torques? Or high current and torque peaks?

When it is important to have smooth start-up you can use a softstarter. Instead of switching directly to full voltage the softstarter ensure 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, catalogues, certificates and drawings, at: www.abb.com/lowvoltage

Differences between different starting methods

Graphs showing the basic differences between direct-on-line starting (DoL), star-delta starting and soft starting in terms of the motor voltage (U), motor current (I) and motor torque (T).



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 kW 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 kW ratings

Heavy duty

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.

If a more precise selection is required, you can use the softstarter selection programme Prosoft, available at: **www.abb.com/lowvoltage/Tools & Software**