

PSR – The compact range

Overview



	PSR3 ... PSR16				PSR25 ... PSR30		PSR37... PSR45		PSR60 ... PSR105				
	Softstarter. Type												
Normal start In-line connected	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105
(400 V) kW	1.5	3	4	5.5	7.5	11	15	18.5	22	30	37	45	55
IEC, Max. A	3.9	6.8	9	12	16	25	30	37	45	60	72	85	105
(440-480 V) hp	2	3	5	7.5	10	15	20	25	30	40	50	60	75
UL, Max FLA	3.4	6.1	9	11	15.2	24.2	28	34	46.2	59.4	68	80	104
	400 V, 40 °C												
Using manual motor starters type 1 coordination will be achieved	Manual motor starter (50 kA) type												
	MS116			MS132			MS450		MS495		—		
Using gG fuses type 1 coordination will be achieved	Fuse protection (50 kA) gG Fuse												
	10 A	16 A	25 A	32 A		50 A	63 A	100 A	125 A	200 A		250 A	
Suitable switch fuse for the above gG fuses	Switch fuse, type												
	OS32GD				OS125GD				OS250GD				
Overload protection is used to protect the motor from over heating	Thermal overload relay												
	TF42DU				TA75DU				TA110DU				
The line contactor is not required for the softstarter itself but often used to open if OL trips	Line contactor, type												
	AF9		AF12	AF16	AF26	AF30	AF38	A50	A63	A75	A95	A110	
Using by-pass will reduce the power loss and allow more starts per hour	By-pass contacts												
	Built-in												

PSR – The compact range

Technical data

Rated insulation voltage U_i	600 V												
Rated operational voltage U_o	208...600 V +10 %/-15 %, 50/60 Hz ± 5 %												
Rated control supply voltage U_c	100...240 V AC, 50/60Hz ± 5 % or 24 V DC, +10 %/-15 %,												
Power consumption	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105
Supply circuit	12 VA						10 VA						
at 100-240 V AC	12 VA						10 VA						
at 24 V DC	5 W												
Max. Power loss at rated I_o	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105
	0.7 W	2.9 W	6.5 W	11.5 W	20.5 W	25 W	36 W	5.5 W	8.1 W	3.6 W	5.2 W	7.2 W	6.6 W
Starting capacity at I_o	4 x I_e for 6 sec.												
Number of starts per hour	See table below for details												
standard	10 ¹⁾												
with aux. fan	20 ¹⁾												
Service factor	100 %												
Ambient temperature													
during operation	-25 °C to + 60 °C ²⁾												
during storage	-40 °C to + 70 °C												
Maximum altitude	4000 m ³⁾												
Degree of protection	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105
main circuit	IP20						IP10						
control circuit	IP20						IP10						
Connectable cable area,	PSR3-PSR16			PSR25-PSR30			PSR37-PSR45			PSR60-PSR105			
main circuit	1 x 0.75 - 2.5mm ²			1 x 2.5 - 10mm ²			1 x 6 - 35mm ²			1 x 10 - 95mm ²			
	2 x 0.75 - 2.5mm ²			2 x 2.5 - 10mm ²			2 x 6 - 16mm ²			2 x 6 - 35mm ²			
control circuit	PSR3-PSR16			PSR25-PSR105			PSR25-PSR105			PSR25-PSR105			
	1 x 0.75 - 2.5mm ²			1 x 0.75 - 2.5mm ²			1 x 0.75 - 2.5mm ²			2 x 0.75 - 1.5mm ²			
	2 x 0.75 - 2.5mm ²			2 x 0.75 - 2.5mm ²			2 x 0.75 - 2.5mm ²			2 x 0.75 - 1.5mm ²			
Signal relays	PSR3-PSR16						PSR25-PSR105						
for Run signal													
Resistive load	240 V AC, 3 A / 24 V DC, 3 A						240 V AC, 3 A / 24 V DC, 3 A						
AC-15 (Contactor)	240 V AC, 0.5 A / 24 V DC, 0.5 A						240 V AC, 0.5 A / 24 V DC, 0.5 A						
for Top ramp signal													
Resistive load	-						240 V AC, 3 A / 24 V DC, 3 A						
AC-15 (Contactor)	-						240 V AC, 0.5 A / 24 V DC, 0.5 A						
LED													
for On/Ready	Green												
for Run/Top Of Ramp	Green												
Settings													
Ramp time during start	1-20 sec.												
Ramp time during stop	0-20 sec.												
Initial- and End Voltage	40-70%												

¹⁾ Valid for 50 % on time and 50 % off time. 4 x I_o for 6 sec., if other data is required, contact your sales office.

²⁾ Above 40 °C up to max. 60 °C reduce the rated current with 0.8 % per °C.

³⁾ When used at high altitudes above 1000 meters up to 4000 meters you need to derate the rated current using the following formula.

$$\left[\% \text{ of } I_o = 100 - \frac{x - 1000}{150} \right] \quad x = \text{actual altitude for the softstarter}$$

Number of starts per hour using PSR softstarters

Motor current I_o	Starts/hour without auxiliary fan							Starts/hour with auxiliary fan							
	10	20	30	40	50	60	80	100	10	20	30	40	50	60	80
3 A	PSR3							PSR6							
6 A	PSR6							PSR9							
9 A	PSR9			PSR12			PSR16				PSR25				
12 A	PSR12			PSR16			PSR25			PSR30					
16 A	PSR16		PSR25			PSR30			PSR37						
25 A	PSR25		PSR30		PSR37			PSR45			PSR60				
30 A	PSR30		PSR37		PSR45			PSR60			PSR72				
37 A	PSR37		PSR45		PSR60			PSR72		PSR85			PSR105		
45 A	PSR45		PSR60		PSR72			PSR85		PSR105			-		
60 A	PSR60		PSR72		PSR85			PSR105			-			-	
72 A	PSR72		PSR85		PSR105			-			-			-	
85 A	PSR85		PSR105		-			-			-			-	
105 A	PSR105		-		-			-			-			-	

Data based on an ambient temperature of 40°, starting current of 4 x I_o and ramp time 6 seconds.

For more optimized selections, or to use PSR for heavy duty starts, please use the softstarter selection program, ProSoft.

PSS – The flexible range

Overview



PSS18/30...PSS44/76

PSS50/85...PSS72/124

	PSS18/30...PSS44/76				PSS50/85...PSS72/124		
Normal start In-line connected (400 V) kW IEC, Max. A (440-480 V) hp UL, Max FLA	Softstarter, Type						
	PSS18/30	PSS30/52	PSS37/64	PSS44/76	PSS50/85	PSS60/105	PSS72/124
	7.5	15	18.5	22	25	30	37
	18	30	37	44	50	60	72
	10	20	25	30	30	40	50
	18	28	34	40	47	56	67
	400 V, 40° C						
Using MCCB type 1 coordination will be achieved	MCCB (50kA), type						
	T2S160						
To achieve type 2 coordination semi-conductor fuses must be used	Fuse protection (65kA), Semi-conductor fuses, Bussmann, type						
	170M1564	170M1566	170M1568		170M1569	170M1570	170M1571
Suitable switch fuse for the recommended semi-conductor fuses	Switch fuse, type						
	OS32GD03P		OS63GD03P			OS125GD03P	
Overload protection is used to protect the motor from over heating	Thermal overload relay, type						
	TF42DU			TA75DU			
The line contactor is not required for the softstarter itself but often used to open if OL trips	Line contactor, type						
	AF16	AF30	AF38		A50	A63	A75
The by-pass contactor will reduce the power loss of the softstarter. All softstarters can be operated without by-pass	By-pass contactor, type						
	AF9	AF16	AF26		AF30	A40	A50
Must be used if current limit function is required	Current transformers, type						
	PSCT-30 1 turn	PSCT-40 1 turn	PSCT-50 1 turn	PSCT-60 1 turn		PSCT-75 1 turn	PSCT-100 1 turn

A50 ... A300 might be replaced by AF50 ... AF300

The table above is an overview of possible combinations of devices.

Complete coordination tables are available at www.abb.com/lowvoltage

PSS – The flexible range

Overview



	PSS85/147...PSS142/245			PSS175/300...PSS300/515		
	Softstarter. Type					
Normal start In-line connected	PSS85/147	PSS105/181	PSS142/245	PSS175/300	PSS250/430	PSS300/515
	45	55	75	90	132	160
	85	105	142	175	250	300
	60	75	100	125	150	200
(400 V) kW IEC, Max. A (440-480 V) hp UL, Max FLA	85	105	125	156	225	248
	400 V, 40 °C					
Using MCCB type 1 coordination will be achieved	MCCB (50kA), type					
	T2S160	T3S250			T4S320	T5S400
To achieve type 2 coordination semi-conductor fuses must be used	Fuse protection (65kA), Semiconductor fuses, Bussmann, type					
	170M1572	170M3819	170M5809	170M5810	170M5813	170M6813
Suitable switch fuse for the recommended semi-conductor fuses	Switch fuse, type					
	OS125GD03P	OS250D03P	OS400D03P		OS630D03P	
Overload protection is used to protect the motor from over heating	Thermal overload relay, type					
	TA110DU		TA200DU		TA450DU	
The line contactor is not required for the softstarter itself but often used to open if OL trips	Line contactor, type					
	A95	A110	A145	A185	A260	A300
The by-pass contactor will reduce the power loss of the softstarter. All softstarters can be operated without by-pass	By-pass contactor, type					
	A50	A63	A95	A145	A210	
Must be used if current limit function is required	Current transformers, type					
	PSCT-125 1 turn	PSCT-150 1 turn	PSCT200 1 turn	PSCT-250 1 turn	PSCT-400 1 turn	

How to select correct size

By using the guide here, you can quickly select a suitable softstarter for the most common applications.

If a more precise selection is required, you can use Prosoft, a selection software available at www.abb.com/lowvoltage

Quick guide for selection

Normal start Class 10

Ordering - see page 18 - 19

Heavy duty start class 30

Ordering - see page 20 - 21



Typical applications

- Bow thruster
- Compressor
- Elevator
- Centrifugal pump
- Conveyor belt (short)
- Escalator
- Centrifugal fan
- Crusher
- Mixer
- Conveyor belt (long)
- Mill
- Stirrer

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

PSS – The flexible range

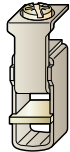
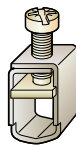
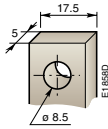
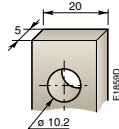
Technical data

Rated insulation voltage U_i	690 V		
Rated operational voltage U_e	208 ... 500 V AC, 400 ... 690 V AC + 10 % / -15 %, 50/60 Hz \pm 5 %		
Rated control supply voltage U_s	110 ... 120 V or 220 ... 240 V +10 % / -15 %, 50/60 Hz \pm 5 %		
Rated control circuit voltage U_c	Internal 24 V DC		
Starting capacity at I_e	at max. rated current, I_e 4 x I_e for 10 sec.		
Number of starts per hour	30 ¹⁾		
Overload capability			
Overload class	10		
Service factor	PSS18/30 ... 250/430	PSS300/515	
	115 %	110 %	
Ambient temperature			
during operation	-25 °C to + 60 °C ²⁾		
during storage	-40 °C to + 70 °C		
Maximum altitude	4000 m ³⁾		
Degree of protection	PSS18/30-500 ... 44/76-500	PSS50/85-500 ... 72/124-500	PSS85/147-500 ... 300/515-500
Main circuit	IP20	IP10	IP00
	PSS18/30-690 ... 72/124-690		PSS85/147-690 ... 300/515-690
	IP10		IP00
Supply and control circuit	PSS18/30 ... PSS300/515		
	IP20		
Signal relays			
By-pass signal	Yes		
Fault signal	Yes (NO or NC)		
Rated operational voltage, U_a	250 V AC / 24 V DC		
Rated thermal current I_e	5A		
Rated operational current I_e at AC-15 ($U_e=250$ V)	1.5 A		
Signaling indication LED			
Ready to start / ON	Green		
Completed start ramp / T.O.R	Green		
General fault	Red		
External fault	Red		
Settings			
Ramp time during start	1 – 30 sec		
Ramp time during stop	0 – 30 sec		
Initial voltage during start	30 – 70 %		
Current limit function x CT-ratio	1.5 ... 4 ⁴⁾		
Switch for In-line / Inside Delta	Yes		
¹⁾ Valid for 50 % on time and 50 % off time. 3.5 x I_e for 7 sec., if other data is required, contact your sales office.			
²⁾ Above 40 °C up to max. 60 °C reduce the rated current with 0.8 % per °C.			
³⁾ When used at high altitudes above 1000 meters up to 4000 meters you need to derate the rated current using the following formula. [% of I_e = 100 - $\frac{x - 1000}{150}$] x = actual altitude for the softstarter			
⁴⁾ Only if current transformer is connected (accessory).			

PSS – The flexible range

Technical data

Cross section of connection cables

		Type of softstarter PSS18/30-500 ... PSS44/76-500		PSS50/85-500 ... PSS72/124-500, PSS18/30-690 ... PSS72/124-690		PSS85/147 ... PSS142/245		PSS175/300 ... PSS300/515	
Main circuit									
Connection clamp									
									
Solid/stranded	1 x mm ²	2.5 – 16		6 – 50					See accessories
Solid/stranded	2 x mm ²	2.5 – 16		6 – 25					See accessories
Tightening torque (recommended)	Nm	2.6		4.5					See accessories
Connection bar									
Width and thickness	mm	–		–					
Hole diameter	mm	–		–		8.5		10.2	
Tightening torque (recommended)	Nm	–		–		18		28	
Supply and control circuit									
Connection clamp									
Solid/stranded	1 x mm ²	2.5		2.5		2.5		2.5	
Solid/stranded	2 x mm ²	–		–		–		–	
Tightening torque (recommended)	Nm	0.5		0.5		0.5		0.5	

Fuse ratings and power losses

For Softstarter	Recommended ABB Overload protection			Max power loss at rated I _e		Max fuse rating - main circuit ^{1) 3)} Busman Fuses, DIN43 620			Power requirements of supply VA
	Type	Type	Current range A	without by-pass ²⁾ W	with external by-pass W	A	Type	size	
PSS18/30	TF42DU		7.6 - 18	65	13.5	50	170M1564	000	9
PSS30/52	TF42DU		7.6 - 30	100	14.6	80	170M1566	000	9
PSS37/64	TF42DU		7.6 - 37	120	17.5	125	170M1568	000	9
PSS44/76	TA75DU		18 - 44	142	17.5	160	170M1569	000	9
PSS50/85	TA75DU		18 - 50	160	20.5	160	170M1569	000	10
PSS60/105	TA75DU		18 - 60	190	22	200	170M1570	000	10
PSS72/124	TA75DU		18 - 72	226	30.5	250	170M1571	000	10
PSS85/147	TA110DU		65 - 85	291	56.5	315	170M1572	000	36
PSS105/181	TA110DU		65 - 105	351	61	400	170M3819	1*	36
PSS142/245	TA200DU		66 - 142	462	63	450	170M5809	2	36
PSS175/300	TA200DU		66 - 175	590	117	500	170M5810	2	65
PSS250/430	TA450DU		130 - 250	815	117	700	170M5813	2	65
PSS300/515	TA450DU		130 - 300	965	140	900	170M6813	3	65

¹⁾ For the supply circuit 6 A delayed, for MCB use C characteristics.
²⁾ Calculated power loss at operational current (I_{op}) without by-pass.
P_{tot} = 3 x I_{op} + VA value
Example: PSS 60/105 running at 52A
P_{tot} = 3 x 52 + 10 = 166W
³⁾ Max fuse rating independent if In-Line or Inside Delta connection. In Inside Delta connections of PSS, the fuses can be placed outside of the delta.

PSE – The efficient range

Overview



PSE18 ... PSE105

Normal start
In-line connected

(400 V) kW

IEC, Max. A

(440-480 V) hp

UL, Max FLA

Softstarter, Type

PSE18	PSE25	PSE30	PSE37	PSE45	PSE60	PSE72	PSE85	PSE105
7.5	11	15	18.5	22	30	37	45	55
18	25	30	37	45	60	72	85	106
10	15	20	25	30	40	50	60	75
18	25	28	34	42	60	68	80	104

400 V, 40 °C

Using MCCB only, type 1
coordination will be achieved

MCCB (35 kA), type

T2N160

T3N250

MCCB (50 kA), type

T2S160

T3S250

To achieve type 2 coordina-
tion, semi-conductor fuses
must be used

Fuse protection (85 kA), Semiconductor fuses, Bussmann, type

170M1563	170M1564	170M1566	170M1567	170M1568	170M1569	170M1571	170M1572	170M3819
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Suitable switch fuse for re-
commended semi-conductor
fuses

Switch fuse, type

OS32GD03P

OS63GD03P

OS125GD03P

OS250D03P

The line contactor is not
required for the softstarter
itself but often used to open
if OL trips

Line contactor, type

AF26

AF30

AF38

A50

A63

A75

A95

A110

Overload protection is used
to protect the motor from
over heating

Electronic overload relay, type

Built-in

The by-pass will reduce the
power loss of the softstarter.

By-pass, type

Built-in

A50 ... A300 might be replaced by AF50 ... AF300

The table above is an overview of possible combinations of devices.

Complete coordination tables are available at www.abb.com/lowvoltage

PSE – The efficient range

Overview



PSE142 ... PSE170

PSE210 ... PSE370

Normal start
In-line connected

(400 V) kW
IEC, Max. A
(440-480 V) hp
UL, Max FLA

Softstarter. Type

PSE142	PSE170	PSE210	PSE250	PSE300	PSE370
75	90	110	132	160	200
143	171	210	250	300	370
100	125	150	200	250	300
130	169	192	248	302	361

400 V, 40 °C

Using MCCB only, type 1 coordination will be achieved

MCCB (35 kA), type

T3N250	T4N320	T5N400	T5N630
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MCCB (50 kA), type

T3S250	T4S320	T5S400	T5S630
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To achieve type 2 coordination, semi-conductor fuses must be used

Fuse protection (85kA), Semiconductor fuses, Bussmann, type

170M5809	170M5810	170M5812	170M5813	170M6812	170M6813
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Suitable switch fuse for recommended semi-conductor fuses

Switch fuse, type

OS400D03P	OS630D03P
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The line contactor is not required for the softstarter itself but often used to open if OL trips

Line contactor, type

A145	A185	A210	A260	A300	AF400
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Overload protection is used to protect the motor from over heating

Electronic overload relay, type

Built-in

The by-pass will reduce the power loss of the softstarter.

By-pass, type

Built-in

How to select correct size

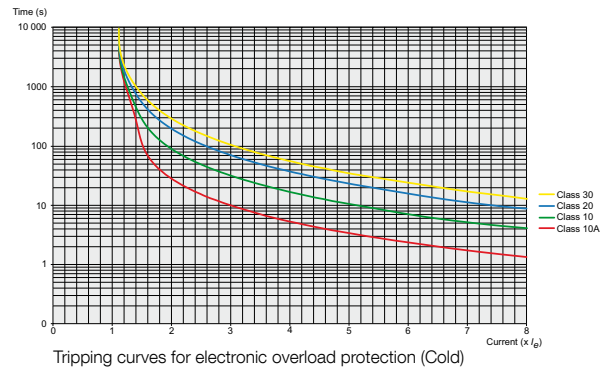
By using the guide here, you can quickly select a suitable softstarter for the most common applications.
If a more precise selection is required, you can use Prosoft, a selection software available at www.abb.com/lowvoltage

Quick guide for selection	
Normal start Class 10	Heavy duty start class 30
Ordering - see page 30	Ordering - see page 31
Typical applications	
<ul style="list-style-type: none"> • Bow thruster • Compressor • Elevator 	<ul style="list-style-type: none"> • Centrifugal pump • Conveyor belt (short) • Escalator • Centrifugal fan • Crusher • Mixer • Conveyor belt (long) • Mill • Stirrer
<p>! If more than 10 starts/h Select one size larger than the standard selection</p>	

PSE – The efficient range

Technical data

Rated insulation voltage U_i	600 V	Analog output	
Rated operational voltage U_e	208 ... 600 V +10 %/-15 %	Output signal reference	4 ... 20 mA
Rated control supply voltage U_s	100 ... 250 V +10 %/-15 %, 50/60 Hz \pm 5 %	Type of output signal	1 Amp
Rated control circuit voltage U_c	Internal 24 V DC	Scaling	Fixed at $1.2 \times I_e$
Starting capacity at I_e	$4 \times I_e$ for 10 sec.	Control circuit	
Number of starts per hour	10 ¹⁾	Number of inputs	3 (start, stop, reset of faults)
Overload capability,		Signal indication LED's	
Overload Class	10	On / Ready	Green flashing / steady
Ambient temperature		Run / TOR	Green flashing / steady
During operation	-25 ... +60 °C ²⁾	Protection	Yellow
During storage	-40 ... +70 °C	Fault	Red
Maximum Altitude	4000 m ³⁾	Protections	
Degree of protection		Electronic overload	Yes (Class 10A, 10, 20, 30)
Main circuit	IP00	Locked rotor protection	Yes
Supply and Control circuit	IP20	Underload protection	Yes
Main circuit		Field bus connection	
Built-in By-pass	Yes	Connection for ABB FieldBusPlug	Yes (option)
Cooling system - Fan cooled (thermostat controlled)	Yes	External keypad	
HMI for settings		Display LCD type	
Display	4 7-segments and icons. Illuminated	Ambient temperature	
Keypad	2 selection keys and 2 navigation keys	during operation	-25 ... +60 °C
Main settings		during storage	-40 ... +70 °C
Setting current	Size dependent	Degree of protection	IP66
Ramp time during start	1-30 sec		
Ramp time during stop	0-30 sec		
Initial / end voltage	30-70%		
Current limit	$1.5-7 \times I_e$		
Torque control for start	Yes / No		
Torque control for stop	Yes / No		
Kick start	Off, 30-100%		
Signal relays			
Number of signal relays	3		
K2	Run signal		
K3	TOR (By-pass) signal		
K1	Event signal		
Rated operational voltage U_e	250 V AC / 24 V DC ⁴⁾		
Rated thermal current I_{th}	3 A		
Rated operational current I_e			
at AC-15 ($U_e = 250$ V)	1.5 A		



¹⁾ Valid for 50 % on time and 50 % off time, with $3.5 \times I_e$ for 7 seconds. If other data is required, please contact your sales office

²⁾ Above 40 °C up to max. 60 °C reduce the rated current with 0.6 % per °C.

³⁾ When used at high altitudes above 1000 meters up to 4000 meters you need to derate the rated current using the following formula.

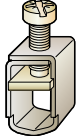
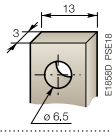
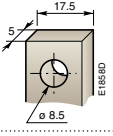
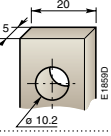
$[\% \text{ of } I_e = 100 - \frac{x - 1000}{150}]$ x = actual altitude for the softstarter

⁴⁾ A common voltage needs to be used for all 3 signal relays

PSE – The efficient range

Technical data

Cross section of connection cables

		Type of softstarter PSE18 ... PSE105		PSE142 ... PSE170	PSE210 ... PSE370
Main circuit					
Connection clamp					
					
Solid/stranded	1 x mm ²	2.5 – 70			See accessories
Solid/stranded	2 x mm ²	2.5 – 70			See accessories
Tightening torque (recommended)	Nm	9			See accessories
Connection bar					
					
Width and thickness	mm				
Hole diameter	mm				
Tightening torque (recommended)	Nm	9		18	28
Supply and control circuit					
Connection clamp					
Solid/stranded	1 x mm ²	2.5		2.5	2.5
Solid/stranded	2 x mm ²	1.5		1.5	1.5
Tightening torque (recommended)	Nm	0.5		0.5	0.5

Fuse ratings and power losses

For Softstarter	Recommended ABB Overload protection		Max power loss at rated I _e (Internal by-pass)	Max fuse rating - main circuit ¹⁾			Power requirements supply circuit
	Type	Current range		Bussman Fuses, DIN43 620		VA/VA pull in	
Type	Type	A	W	A	Type	Size	VA/VA pull in
PSE							
PSE18	Integrated	5.4-18	0.2	40	170M1563	000	16
PSE25	Integrated	7.5-25	0.4	50	170M1564	000	16
PSE30	Integrated	9-30	0.5	80	170M1566	000	16
PSE37	Integrated	11.1-37	0.8	100	170M1567	000	16
PSE45	Integrated	13.5-45	1.2	125	170M1568	000	16
PSE60	Integrated	18-60	2.2	160	170M1569	000	16
PSE72	Integrated	21.6-72	3.1	250	170M1571	000	16
PSE85	Integrated	25.5-85	4.3	315	170M1572	000	16
PSE105	Integrated	31.8-106	6.6	400	170M3819	1*	16
PSE142	Integrated	42.9-143	12.1	450	170M5809	2	16
PSE170	Integrated	51.3-171	17.6	500	170M5810	2	16
PSE210	Integrated	63-210	8.8	630	170M5812	2	23/350
PSE250	Integrated	75-250	12.5	700	170M5813	2	23/350
PSE300	Integrated	90.6-302	18	800	170M6812	3	23/350
PSE370	Integrated	111-370	27.4	900	170M6813	3	23/350

¹⁾For the supply circuit 6 A delayed, for MCB use C characteristics.

PST(B) – The advanced range

Overview



PST30 ... PST72

PST85 ... PST142

Normal start
In-Line connected

(400 V) kW

IEC, Max. A

(440-480 V) hp

UL, Max FLA

Softstarter, Type

	PST30	PST37	PST44	PST50	PST60	PST72	PST85	PST105	PST142
(400 V) kW	15	18.5	22	25	30	37	45	55	75
IEC, Max. A	30	37	44	50	60	72	85	105	142
(440-480 V) hp	20	25	30	40	40	50	60	75	100
UL, Max FLA	28	34	42	54	60	68	80	104	130

400 V, 40 °C

Using MCCB only, type 1 coordination will be achieved.

MCCB (50kA), type

	T2S160						T3S250		
--	--------	--	--	--	--	--	--------	--	--

To achieve a type 2 coordination, semi-conductor fuses must be used.

Fuse protection (65kA), Semiconductor fuses, Bussmann, type

	170M1566	170M1568	170M1569	170M1570	170M1571	170M1572	170M3819	170M5809
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Suitable switch fuse for recommended semi-conductor fuses.

Switch fuse, type

	OS32GD03P	OS63GD03P			OS125GD03P		OS250D03P	OS400D03P
--	-----------	-----------	--	--	------------	--	-----------	-----------

The line contactor is not required for the softstarter itself but often used to open if OL trips

Line contactor, type

	AF30	AF38	A50	A63	A75	A95	A110	A145
--	------	------	-----	-----	-----	-----	------	------

Overload protection is used to protect the motor from over heating

Electronic overload relay

	Built-in							
--	----------	--	--	--	--	--	--	--

The by-pass contactor will reduce the power loss of the softstarter. All softstarters can be operated without by-pass

By-pass contactor, type

	AF16	AF26	AF30	A40	A50	A63	A95
--	------	------	------	-----	-----	-----	-----

A50 ... A300 might be replaced by AF50 ... AF300.

The table above is an overview of possible combinations of devices.

Complete coordination tables are available at www.abb.com/lowvoltage

PST(B) – The advanced range

Overview



PST175 ... PST300

PSTB370 ... PSTB470

PSTB570 ... PSTB1050

Normal start
In-Line connected

(400 V) kW
IEC, Max. A
(440-480 V) hp
UL, Max FLA

Softstarter, Type

PST175	PST210	PST250	PST300	PSTB370	PSTB470	PSTB570	PSTB720	PSTB840	PSTB1050
90	110	132	160	200	250	315	400	450	560
175	210	250	300	370	470	570	720	840	1050
125	150	200	250	300	400	500	600	700	900
156	192	248	302	361	480	590	720	840	1062

400 V, 40 °C

Using MCCB only, type 1 coordination will be achieved.

MCCB (50kA), type

T4S250	T5S400	T5S630	T6S630	T6S800	T7S1250	T7S1600

To achieve a type 2 coordination, semi-conductor fuses must be used.

Fuse protection (65kA), Semiconductor fuses, Bussmann, type

170M5810	170M5812	170M5813	170M6813	170M5813	170M6813	170M8554	170M6018	170M6020 ²⁾

Suitable switch fuse for recommended semi-conductor fuses.

Switch fuse, type

OS400D03P	OS630D03P	OS400D03P	OS630D03P	OS800D03P	1)

The line contactor is not required for the softstarter itself but often used to open if OL trips

Line contactor, type

A185	A210	A260	A300	AF400	AF580	AF750	AF1350	AF1650

Overload protection is used to protect the motor from over heating

Electronic overload relay, type

Built-in

The by-pass contactor will reduce the power loss of the softstarter. All softstarters can be operated without by-pass

By-pass contactor, type

A145	A210	Built-in

1) Switch fuse not available. Use Bussman fuse base 170H3004
2) PSTB1050-690-70 has 170M6019

How to select correct size

By using the guide here, you can quickly select a suitable softstarter for the most common applications.

If a more precise selection is required, you can use Prosoft, a selection software available at www.abb.com/lowvoltage

Quick guide for selection

Normal start Class 10

Ordering - see page 40 - 41

Heavy duty start class 30

Ordering - see page 42 - 43

Typical applications

- Bow thruster
- Compressor
- Elevator
- Centrifugal pump
- Conveyor belt (short)
- Escalator
- Centrifugal fan
- Crusher
- Mixer
- Conveyor belt (long)
- Mill
- Stirrer

If more than 10 starts/h

! Select one size larger than the standard selection

PST(B) – The advanced range

Technical data

Rated insulation voltage U_i	690 V		Control circuit	
Rated operational voltage U_e	208...600 V, 400...690 V + 10 % / -15 % 50/60 Hz $\pm 5\%$		Number of inputs	2 (start, stop)
Rated control supply voltage U_s	100...250 V +10% / -15% 50/60 Hz $\pm 5\%$		Number of additional programmable inputs	2 (Each input can be programmed to be either: Non, Reset, Enable, Jog, DOL- On, Start motor 2, Start motor 3 or FB-Dis)
Rated control circuit voltage U_c	Internal or external 24 V DC			
Starting capacity at I_e	3 x I_e for 15 sec.			
Number of starts per hour	PST30...300	PSTB370...1050		
	30 ¹⁾	10 ¹⁾		
Overload capability			Signalling indication LED	
Overload class	10		Power on	Green
Service factor	PST(B)30...840	PSTB1050	Fault	Red
	115 %	100 %	Protection	Yellow
Ambient temperature				
during operation	$\pm 0 \dots +50 \text{ }^\circ\text{C}$ ²⁾		Protections	
during storage	$-25 \dots +70 \text{ }^\circ\text{C}$		Electronic overload	Yes (Class 10A, 10, 20, 30)
Maximum altitude	4000 m ³⁾		Dual overload	Yes (separate overload function for start and run)
Degree of protection	PST30...72	PST85...PSTB1050	PTC connection	Yes
main circuit	IP10	IP00	Locked rotor protection	Yes (Level and delay adjustable)
Supply and control circuit	IP20		Underload protection	Yes (Level and delay adjustable)
Main circuit	PST30...300	PSTB370...1050	Phase imbalance	Yes (Level and delay adjustable)
Built-in By-pass contactor	No	Yes	High current (8 x I_e)	Yes
Cooling system - Fan cooled	Yes (thermostat controlled)		Phase reversal protection	Yes
HMI for settings (Human Machine Interface)			Warnings (pre-warning)	
Display	Full text		High current	Yes (Level and delay adjustable)
Languages	English, German, Italian, Dutch, Chinese, Finnish, Swedish, French, Spanish, Russian, Portuguese, Turkish, Polish and Czech		Low current (underload)	Yes (Level and delay adjustable)
Keypad	2 selection keys and 2 navigating keys		Overload trip	Yes (Level and delay adjustable)
			Overtemp, thyristor (SCR)	Yes
Signal relays			Start of several motors	
Number of programmable signal relays	3 (each relay can be programmed to be Run, By-pass or Event signal)		Possible to set-up and start three different motors	Yes (Different parameter sets)
K4	Default as Run signal		Field bus connection	
K5	Default as TOR (By-pass) signal		Connection for ABB FiledBus Plug	Yes
K6	Default as Event signal		PTC input	
Rated operational voltage, U_e	250 V AC / 24 V DC		Switch off resistance	2825 ohm $\pm 20\%$
Rated thermal current I_{th}	5 A		Switch on resistance	1200 ohm $\pm 20\%$
Rated operational current I_e at AC-15 ($U_e=250$ V)	1.5 A		External keypad	
Analog output			Display	LCD type
Output signal reference	0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA		Ambient temperature	
Type of output signal	I Amp, U Volt, P kW, P hp, Q kVAR, S kVA, TmpMot, TmpSCR, cosPhi		During operation	$\pm 0 \dots +50 \text{ }^\circ\text{C}$
			During storage	$-25 \dots +70 \text{ }^\circ\text{C}$
			Degree of protection	IP66

¹⁾ Valid for 50 % on time and 50 % off time. $3.5 \times I_e$ for 7 sec., if other data is required, contact your sales office.

²⁾ Above 40 °C up to max. 50 °C reduce the rated current with 0.8 % per °C.

³⁾ When used at high altitudes above 1000 meters up to 4000 meters you need to derate the rated current using the following formula.

$$\left[\% \text{ of } I_e = 100 - \frac{x - 1000}{150} \right] \quad x = \text{actual altitude for the softstarter}$$

PSTB Integrated by-pass ratings

Softstarter	PSTB370	PSTB470	PSTB570	PSTB720	PSTB840	PSTB1050
Integrated contactor	AF300		AF460	AF580		AF750
AC-3 rating (A)	305		460	580		750

PST(B) – The advanced range

Technical data

Major possible settings and the displayed text and the set default values

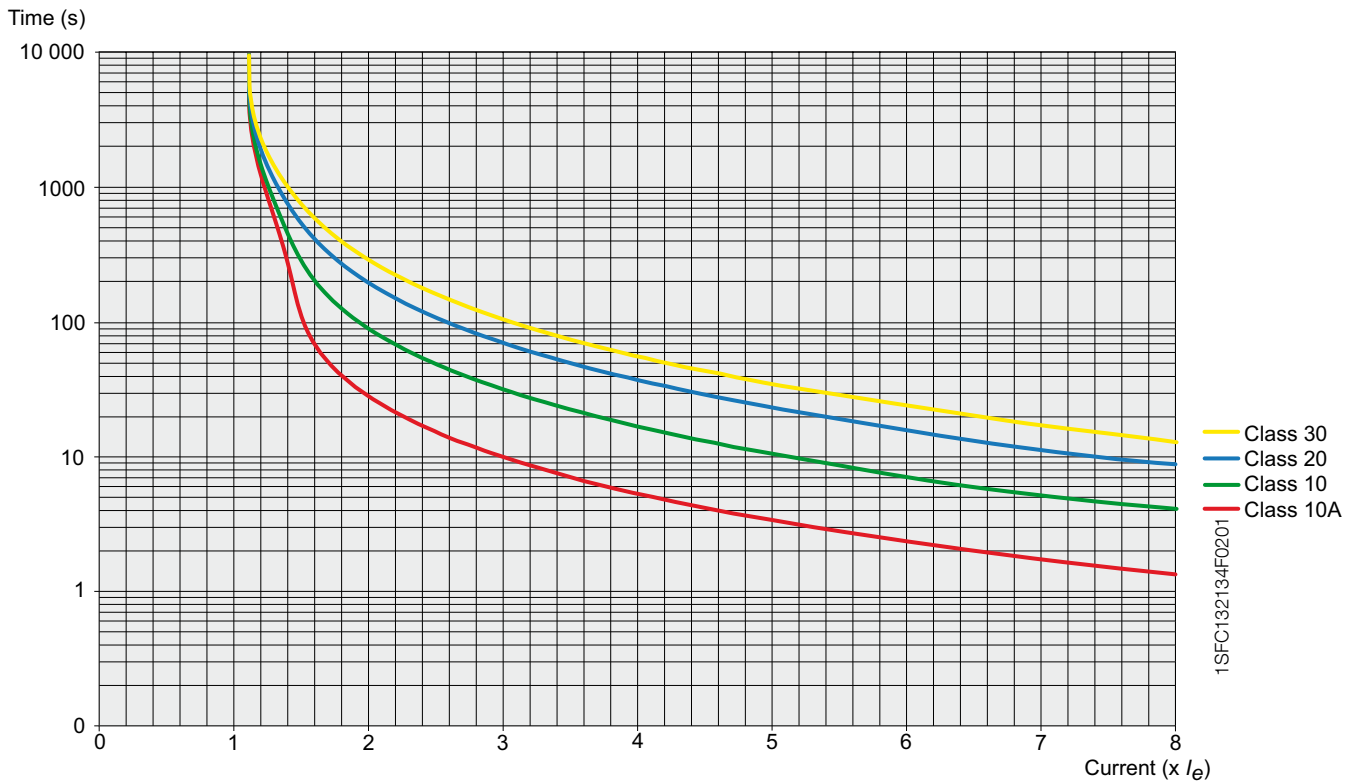
Description	Text on display Eng)	Values on display	Default value
Setting current for overload, locked rotor etc.	Setting I _a	9.0 ... 1207 A divided into 19 overlapping ranges.	See table, page 48
Time for start ramp	Start Ramp	1 ... 30 s, 1 ... 120 s (Range depends on Start Range)	10 s
Time for stop ramp	Stop Ramp	0 ... 30 s, 0 ... 120 s (Range depends on Stop Range)	0 s
Initial voltage for start ramp	Init Volt	30 ... 70 %	30 %
End voltage for stop ramp	End Volt	30 ... 70 %	30 %
Step down voltage	Step Down	30 ... 100 %	100 %
Level of the current limit.	Current Lim	1.5 ... 7.0 x I _a	4.0 x I _a
Selection of Kick start	Kick Start	Yes, No	No
Level of Kick start if selected	Kick Level	50 ... 100 %	50 %
Time for Kick start if selected	Kick Time	0.1 ... 1.5 s	0.2
Selectable range for start ramp	Start Range	1 ... 30 s, 1 ... 120 s	1 ... 30 s
Selectable range for stop ramp	Stop Range	0 ... 30 s, 0 ... 120 s	0 ... 30 s
Overload protection	Overload	No, Normal, Dual	Normal
Overload Class	OL Class	10 A, 10, 20, 30	10
Overload Class, Dual type, Start Class	OL Class S	10A, 10, 20, 30	10
Overload Class, Dual type, Run Class	OL Class R	10A, 10, 20, 30	10
Type of operation for overload protection	OL Op	Stop-M, Stop-A, Ind	Stop-M
Locked rotor protection	Locked Rotor	Yes, No	No
Trip level for locked rotor protection	Lock R Lev	0.5 ... 8.0 x I _a	4.0 x I _a
Trip time for locked rotor protection	Lock R Time	0.2 ... 10 s	1.0 s
Type of operation for locked rotor protection	Lock R Op	Stop-M, Stop-A, Ind	Stop-M
Underload protection	Underload	Yes, No	No
Trip level for Underload protection	Underl Lev	0.4 ... 0.8 x I _a	0.5 x I _a
Trip time for Underload protection	Underl Time	1 ... 30 s	10 s
Type of operation for Underload protection	Underl Op	Stop-M, Stop-A, Ind	Stop-M
Phase imbalance protection	Phase Imb	Yes, No	No
Trip level for phase imbalance protection	Ph Imb Lev	10 ... 80 %	80 %
Type of operation for phase imbalance protection	Ph Imb Op	Stop-M, Stop-A, Ind	Stop-M
High current protection	High I	Yes, No	No
Type of operation for high current protection	High I Op	Stop-M, Stop-A, Ind	Stop-M
Phase reversal protection	Phase Rev	Yes, No	No
Type of operation for phase reversal protection	Ph Rev Op	Stop-M, Stop-A, Ind	Stop-M
PTC protection	PTC	Yes, No	No
Type of operation for PTC protection	PTC Op	Stop-M, Stop-A	Stop-M
An external Bypass contactor is used	Ext ByPass	Yes, No	No
High current warning	Warn I=High	Yes, No	No
Trip level for high current warning	Wa I=H Lev	0.5 ... 5.0 x I _a	1.2 x I _a
Low current warning	Warn I=Low	Yes, No	No
Trip level for low current warning	Wa I=L Lev	0.4 ... 1.0 x I _a	0.8 x I _a
Overload warning	Warn OL	Yes, No	No
Trip level for overload warning	Wa OL Lev	40 ... 99 %	90 %
Thyristor overload warning	Warn SCR OL	Yes, No	No
Type of operation for phase loss fault	Ph Loss Op	Stop-M, Stop-A	Stop-M
Type of operation for by-pass doesn't close	BP open Op	Stop-M, Stop-A	Stop-M
Type of operation for by-pass doesn't open	BP closed Op	Stop-M, Stop-A	Stop-M
Type of operation for fieldbus fault	FB Fault Op	Stop-M, Stop-A	Stop-M
Type of operation for frequency fault	Freq F Op	Stop-M, Stop-A	Stop-M
Type of operation for heat sink over temperature fault	HS Temp Op	Stop-M, Stop-A	Stop-M
Type of operation for thyristor short circuit fault	SCR SC Op	Stop-M, Stop-A	Stop-M
Function of programmable input In_0	In0	None, Reset, Enable, Jog, DOL, Start 2, FB-Dis	Reset
Function of programmable input In_1	In1	None, Reset, Enable, Jog, DOL, Start 3, FB-Dis	Reset
Function of programmable relay output K4	Relay K4	Run, TOR, Event	Run
Function of programmable relay output K5	Relay K5	Run, TOR, Event	TOR
Function of programmable relay output K6	Relay K6	Run, TOR, Event	Event
Control of the softstarter with fieldbus	Fieldb Ctrl	Yes, No	No
Number of sequences for sequence start.	No of Seq	No, 2, 3	No
Language to use on display	Language	US/UK, FI, SE, PT, NL, IT, FR, ES, DE, CN, RU, TR, PL, CZ	US/UK
Password for display	Password	No, 1 ... 255	No
Start mode	Start Mode	Volt, Torque	Volt
Stop mode	Stop Mode	Volt, Torque	Volt
Torque limit	Torque limit	20 ... 200 %	150 %
Analog output	Analogue Out	Yes, No	No
Analog output, reference	Anl Ref	0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	4 ... 20 mA
Analog output, type of value	Anl Type	I Amp, U Volt, P kW, P hp, Q kVA, S kVA, TmpMot, TmpSCR, cosPhi	I Amp

PST(B) – The advanced range

Technical data

Tripping curves for the integrated electronic overload protection

All units have an integrated electronic overload protection possible to set on four different tripping classes. Below you find a curve for each tripping class in cold state. These tripping curves are valid for PSE, PST and PSTB




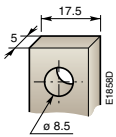
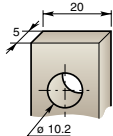
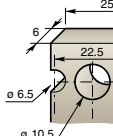
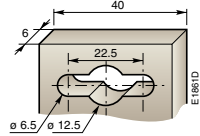
Tripping curves for electronic overload protection (Cold) for PSE, PST and PSTB.



PST(B) – The advanced range

Technical data

Cross section of connection cables

		Type of softstarter				
		PST30 ... 72	PST85 ... 142	PST175 ... 300	PSTB370 ... 470	PSTB570 ... 1050
Main circuit						
Available terminals:	L1, L2, L3	Yes	Yes	Yes	Yes	Yes
	T1, T2, T3	Yes	Yes	Yes	Yes	Yes
(For external by-pass)	B1, B2, B3	Yes	Yes	Yes	No	No
Connection clamp						
						
Solid/stranded	1 x mm ²	10 ... 95	See accessories			
Solid/stranded	2 x mm ²	6 ... 35	See accessories			
Tightening torque (recommended)	Nm	6.0	See accessories			
Connection bar						
		No				
Width and thickness	mm	–				
Hole diameter	mm	–				
Tightening torque (recommended)	Nm	–	18	28	35	45
Supply and control circuit						
Connection clamp				Yes		
Solid/stranded	1 x mm ²			2.5		
Solid/stranded	2 x mm ²			1.5		
Tightening torque (recommended)	Nm			0.5		

Fuse ratings and power losses

For Softstarter	Recommended ABB Overload protection		Max power loss at rated I _n		Max fuse rating - main circuit ¹⁾³⁾			Power requirements supply circuit VA/VA pull in
	Type	Current range A	without by-pass ²⁾	with by-pass W	Busman Fuses, DIN43 620			
			W	W	Type	Size		
PST								
PST30	Integrated	9...35	100	9.5	80	170M1566	000	5
PST37	Integrated	11...43	120	10.5	125	170M1568	000	5
PST44	Integrated	13...51	140	13.5	160	170M1569	000	5
PST50	Integrated	15...58	160	13.5	160	170M1569	000	5
PST60	Integrated	18...69	190	15.5	200	170M1570	000	5
PST72	Integrated	22...83	230	17	250	170M1571	000	5
PST85	Integrated	25...98	270	30.5	315	170M1572	000	10
PST105	Integrated	32...120	325	35	400	170M3819	1*	10
PST142	Integrated	43...163	435	37	450	170M5809	2	10
PST175	Integrated	53...201	540	62	500	170M5810	2	15
PST210	Integrated	63...241	645	67	630	170M5812	2	15
PST250	Integrated	75...288	765	67	700	170M5813	2	15
PST300	Integrated	90...345	920	90	900	170M6813	3	15
PSTB 600 V								
PSTB370	Integrated	111...425	N/A	90	700	170M5813	2	20/480
PSTB470	Integrated	141...540	N/A	110	900	170M6813	3	20/480
PSTB570	Integrated	171...655	N/A	105	900	170M6813	3	25/900
PSTB720	Integrated	216...828	N/A	110	1250	170M8554	3	25/860
PSTB840	Integrated	252...966	N/A	170	1500	170M6018 ⁴⁾	3	25/860
PSTB1050	Integrated	315...1207	N/A	170	1800	170M6020 ⁴⁾	3	25/860
PSTB 690 V								
PSTB370	Integrated	111...425	N/A	90	700	170M5813	2	20/480
PSTB470	Integrated	141...540	N/A	110	900	170M6813	3	20/480
PSTB570	Integrated	171...655	N/A	105	900	170M6813	3	25/900
PSTB720	Integrated	216...828	N/A	110	1250	170M8554	3	25/860
PSTB840	Integrated	252...966	N/A	170	1500	170M6018 ⁴⁾	3	25/860
PSTB1050	Integrated	315...1207	N/A	170	1600	170M6019 ⁴⁾	3	25/860

¹⁾ For the supply circuit 6 A delayed, for MCB use C characteristics.

²⁾ See PSS page 24

³⁾ Max fuse rating independent if In-Line or Inside Delta connection. In Inside Delta connections of PST, the fuses can be placed outside of the delta. For PSTB the fuses shall be placed inside the delta. Contact ABB for more information.

⁴⁾ DIN43 653