



Catalog

# Softstarters

## Type PSR, PSE, PST and PSTB

## Efficient PSE Range – World's first compact softstarter with Torque control

The latest addition to the ABB softstarter family is the efficient PSE range. This softstarter has been equipped with all the most important features making it a very efficient choice. During the development process, great focus has been put into making sure that both the softstarter and the process are even more reliable. Further more, the softstarter has been equipped with built-in by-pass to reduce the wiring and a back-lit display to provide easy set-up and monitoring.

## The complete range of Softstarters

The ABB softstarter portfolio now consists of 3 different ranges making it possible to find a suitable softstarter for almost all possible applications and motor sizes all the way up to 1800A. The softstarter family consists of the Compact PSR, the Efficient PSE and the Advanced PST(B) range.



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# Softstarters

From the moment the first electrical motors were developed, engineers have been searching for a way to avoid electrical and mechanical problems that usually occur when starting the motor. These problems include high inrush current and current spikes as well as excessive mechanical wear. One traditional way to avoid this is to use a star delta starter. This starting method in many applications is insufficient, as problems with current spikes and torque peaks will remain. In addition, it does not provide any way to perform a soft stop. A softstarter on the other hand will provide far better performance during the start and also the possibility to soft stop the motor.

ABB has been producing softstarters since the beginning of the 1980's. The valuable experience gained since the early 80's has been incorporated into the design of today's product ranges. Matching modern power electronics with smart circuitry and software, the ABB softstarters offer superior control of the current and voltage during motor start-up and stop, in addition to several state of the art design features.

## The solution to both mechanical and electrical problems

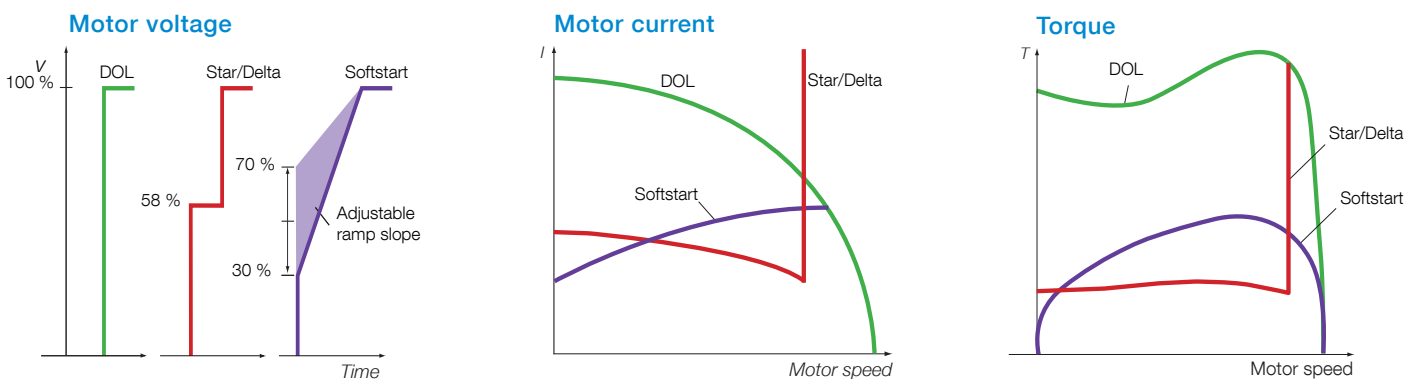
AC motors, "the workhorse of the industry", are used to drive fans, crushers, agitators, pumps, conveyors, etc. Depending on how it is installed, too often unnecessary and unwanted torque

and current peaks are an everyday reality in production plants all over the world, causing damage in several ways. Among them are:

- Electrical problems due to voltage and current transients arising from Direct-On-Line or Star-Delta starts. Such transients may overload the local supply network and cause unacceptable voltage variations that interfere with other electrical equipment connected to the network.
- Mechanical problems that address the entire drive chain, from motor to driven equipment, causing a big need for service and repair as well as unwanted down time.
- Operational problems, such as damage to products on conveyor belts.
- Water hammering and pressure surges in pipe systems when starting and stopping pumps.

The financial consequences are considerable; every technical problem and every breakdown costs money in terms of repairs as well as lost production.

The easy solution to all of these problems is to install an ABB Softstarter type PSR, PSE or PST(B). With ABB Softstarters, it is possible to start and stop smoothly while keeping mechanical and electrical stresses to a minimum.



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



# Softstarters

## ABB softstarters – The complete range

ABB offers three different ranges of softstarters to cover every customer need for solutions for motor sizes up to 1800 A. This page describes the main characteristics of the different softstarter ranges

### PSR – The compact range

The PSR softstarter is the most compact of all the softstarter ranges, thereby making it possible to design compact starting equipment. The system concept with Manual Motor Starters and the PSR provides a far more compact starting solution than for instance a star delta starter.

The built-in by-pass reduces the energy loss and makes the connection easier. With only three potentiometers, the set-up couldn't be any easier. Still, the optimized ramping characteristics will ensure a very smooth start and stop for all applications.

### PSE – The efficient range

The PSE softstarter is the world's first compact softstarter with both built-in electronic overload for motor protection and torque control for an excellent control of pumps. The compact design with the most important functionality integrated provides a very efficient starting solution.

The illuminated language neutral display and the four button keypad make it easy to take advantage of all the advanced functionality in the softstarter. The display will also provide all the necessary information both during ramping and continuous operation.

### PST(B) – The advanced range

The PST(B) softstarter is the most advanced softstarter in the range with almost all imaginable functionality included. All the advanced protections for the motor, the softstarter and the load ensure a trouble free operation. Pre-warnings even allow problems to be detected before the motor needs to be stopped and thereby avoiding unnecessary downtime.

The torque control function has been developed and tested together with well known pump manufacturers to ensure the best possible start/stop of pumps without water hammering and pressure surges.

With the full text LCD display in your own language, pre-programmed application settings and event logging, it couldn't be easier to set-up and operate.

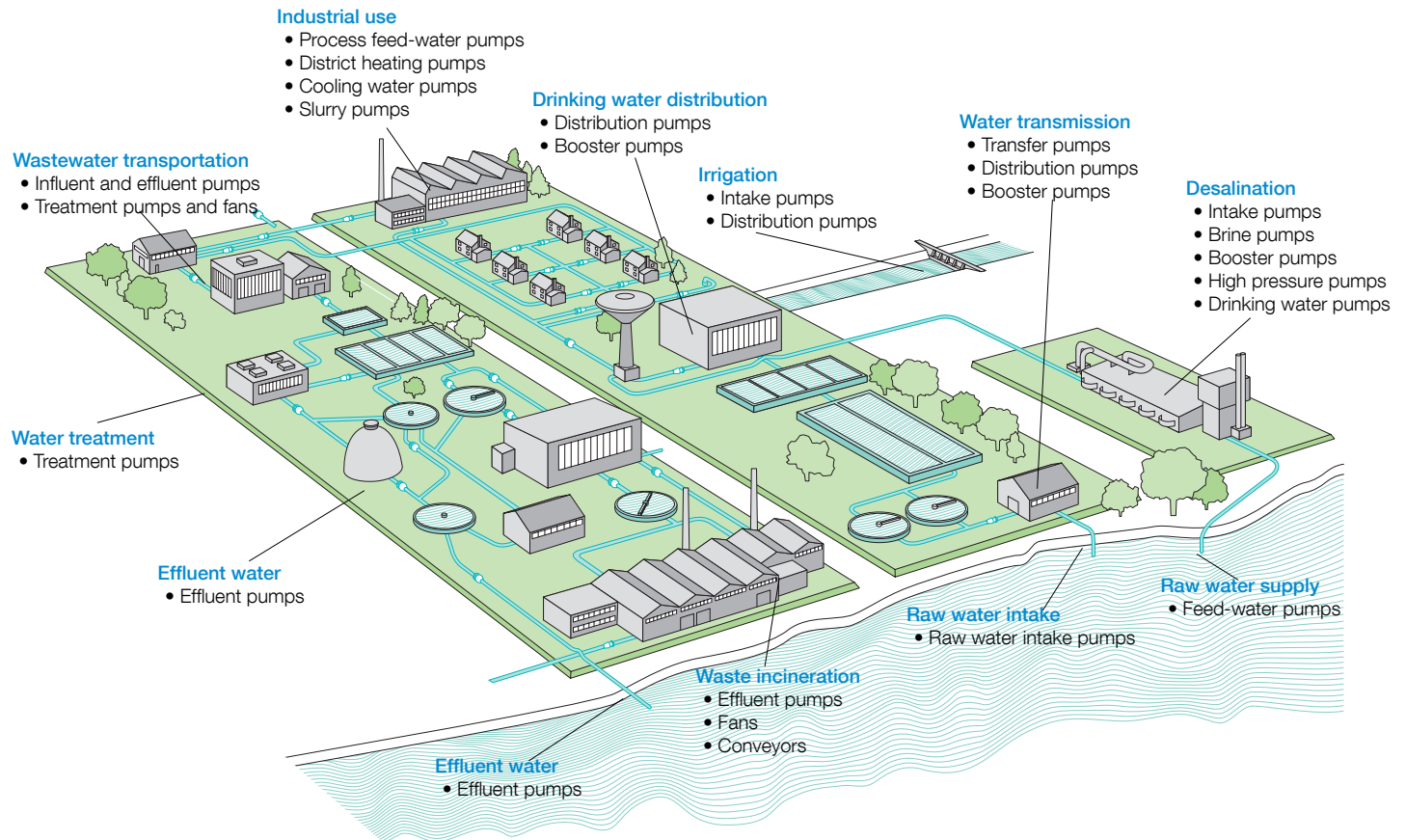
By using the ABB FieldBusPlug, you can decide at any time which bus protocol to use. The fieldbus system will allow you to set-up, control and monitor the softstarter.

PSR	PSE	PST(B)	• Standard	O Optional	– Not available
•	•	• 1)	Built-in by-pass	1) on PSTB	
–	–	•	Inside delta connection		
–	•	O	Coated PCBs		
–	•	•	Display and keypad		
–	•	•	Torque control		
–	•	•	Settable current limit function		
–	•	•	Electronic motor overload protection		
–	–	•	PTC input for motor protection		
–	–	•	Phase imbalance protection		
–	–	•	Phase reversal protection		
–	•	•	Locked rotor protection		
–	•	•	Thyristor overtemperature protection		
–	•	•	Underload protection		
–	–	•	Programmable warning functions		
–	•	•	Analog output		
O	O	•	FieldBus communication		
–	O	•	Event log		
–	O	O	External keypad		

# Applications

## Pumps

Water is the world's most important resource and water facilities can be found all over the world. Examples of water applications are freshwater and wastewater systems, circulating water for heating or cooling and irrigation.



### Common questions:

- How to avoid voltage drops on the network when starting?
- ABB softstarter will reduce the starting current and thereby avoid the voltage drops.
- How to avoid water hammering when stopping?
- Use our softstarters equipped with an optimized stop ramp or even better with torque control.
- How to ensure high reliability in harsh environments?
- Use our softstarters equipped with coated circuit boards to better withstand those environments.
- How to protect my pumping equipment in the best possible way?
- Use ABB softstarters equipped with our special designed protections such as overload, underload, and locked rotor protection.

# Applications

## Fans



### Common questions:

- How to avoid extended voltage drops due to long starting time?
- Use an ABB softstarter equipped with current limit to keep control of the starting current.
- How to extend the life of the driving belts?
- Our softstarters will reduce the mechanical stress during start, thus avoiding slipping belts.
- How to ensure the operation of the fan?
- A softstarter with underload protection will detect broken belts, making the operator immediately aware of the problem.

## Compressors



### Common questions:

- How to ensure a long life of the compressor?
- Using a softstarter for starting will reduce the accelerating torque, thereby minimizing the mechanical stress.
- How to build a compact compressor unit?
- Using a compact softstarter like PSR or PSE will allow a much more compact starting equipment than for instance a star delta starter.

## Conveyor belts



### Common questions:

- How to reduce the need for service and repair of the conveyor belt?
- A softstarter from ABB will cause minimal mechanical stress on the conveyor belt.
- How to avoid that the conveyor belt is running in the wrong direction?
- Use a softstarter with phase reversal protection.
- How to improve the efficiency of the conveyor belt?
- Using softstarters with high and low current warnings allows you to load on and off the conveyor belt.
- How to ensure a successful start in high inertia loads?
- A softstarter with kick start function will provide sufficient torque to be able to overcome the initial high friction from a temporarily jammed belt.



# PSR – The compact range

## Description



### Product description

- Wide rated operational voltage 208 – 600 V
- Rated control supply voltage 24 V DC or 100 – 240 V AC
- Rated operational current 3 – 105 A
- Wide ambient temperature range, -25 to +60 °C (-13 to 140 °F)
- Built-in by-pass on all sizes, saving energy and reducing installation time
- Potentiometer settings
- Run signal relay on all devices
- TOR signal relay on PSR25 ... PSR105
- Optional fieldbus communication using Profibus, Modbus, Devicenet or CANopen
- DIN rail mounting on PSR3 ... PSR45
- Screw mounting on all sizes
- Connection kits for easy connection with ABB manual motor starters
- Sophisticated algorithm eliminating the DC-component and thereby providing excellent starting performance.

### Settings

- ① Start = 1 ... 20 sec  
Stop = 0 ... 20 sec - including the step down voltage.
- ② Step down = 2% reduction for each second increased stop ramp  
Stop ramp 10 sec -> Step down 80% (20% reduction)
- ③  $U_{ini}$  = 40 ... 70% results in End voltage = 30 ... 60%

The PSR range is the most compact of all the ABB softstarter ranges, thereby making it possible to fit many devices into the same enclosure. The system concept with Manual Motor Starters provides a far more compact starting solution than for example a star delta starter.

### Flexible mounting

PSR softstarters from 3 to 45 A are possible to mount on a din rail, ensuring quick and easy mounting. Naturally, all sizes can be screw mounted.

### Few settings

The set-up of the PSR is easily done and confirmed using the three clearly marked potentiometers on the front.

### Built-in by-pass for energy saving

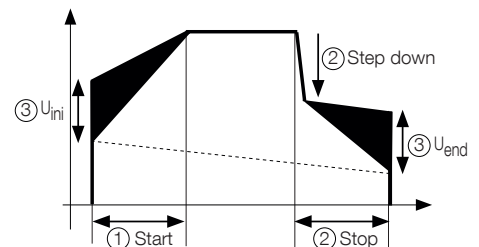
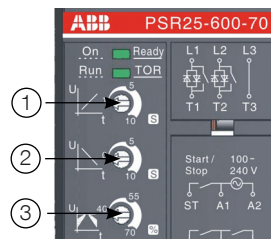
The built-in by-pass on all sizes does not only save energy; it will also ensure the most compact ABB softstarter design and reduce the installation time.

### Suitable for stopping pumps

Even without using torque control, the PSR range is designed to reduce water hammering and will allow a superior stop compared to the direct stop resulting from a star delta starter or a DOL starter. See the special designed stop ramp with step down voltage below.

### System concept with manual motor starters

All PSR softstarter sizes can easily be connected to the corresponding manual motor starters from ABB, using the special designed connection kits. This will both make the mounting and the connection easier and will provide a very compact starting solution containing short circuit and thermal protection, isolation function and softstarter - everything that you need.



# PSR – The compact range

## Overview



PSR3 ... PSR16

PSR25 ... PSR30

PSR37 ... PSR45

PSR60 ... PSR105

		Softstarter												
Normal start In-line connected		PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105
	(480 V) hp	2	3	5	7.5	10	15	20	25	30	40	50	60	75
	(600 V) hp	2	5	7.5	10	10	20	25	30	40	50	60	75	100
	UL/CSA, Max FLA	3.4	6.1	9	11	15.2	24.2	28	34	46.2	59.4	68	80	104
Using manual motor starter, type 1 coordination <sup>1)</sup> will be achieved		5 kA/600 V, 40 °C manual motor starter					MS132			MS450		MS495		—
Using J fuses, type 1 coordination will be achieved		85 kA J type fuse protection												
	175 % rating	5 A	10 A	15 A	15 A	25 A	40 A	45 A	50 A	80 A	100 A	110 A	125 A	175 A
	Max rating	35 A	35 A	35 A	35 A	35 A	60 A	60 A	90 A	90 A	110 A	125 A	150 A	200 A
	Minimum enclosure size <sup>2)</sup>	254 x 204 x 153 mm / 10 x 8 x 6 in					305 x 254 x 204 mm / 12 x 10 x 8 in				610 x 407 x 204 mm / 24 x 16 x 8 in			
Fusible disconnect switch for the above J fuses		Fusible disconnect switch												
		OS30					OS60			OS100		OS200		
Overload protection is used to protect the motor from over heating		Thermal overload relay												
		TF42					TF65				TF96		TF140	
The line contactor is not required for the softstarter itself but often used to open if OL trips		Line contactor												
		AF09		AF12	AF16	AF26	AF30	AF40	AF52	AF65	AF80	AF96	AF116	
Using by-pass will reduce the power loss and allow more starts per hour		By-pass												
		Built-in												

<sup>1)</sup> According to CSA-C22.2 No. 60947-4-1-07, type 1 coordination requires that, under short-circuit conditions, the contactor or starter shall cause no danger to persons or installation and may not be suitable for further service without repair and replacement of parts.

<sup>2)</sup> Minimum enclosure size used for short circuit current rating test. Enclosure that has two latching points minimum. For use in pollution degree 2 environment.

# PSR – The compact range

## Ordering details



### PSR3 ... PSR105

Rated operational voltage  $U_e$ , 208-600 V AC

Rated control supply voltage,  $U_s$ , 100 - 240 V AC



PSR3 ... PSR16



PSR25 ... PSR30



PSR37 ... PSR45



PSR60 ... PSR105

230 V kW	400 V kW	500 V kW	208 V hp	230 V hp	480 V hp	600 V hp	UL/CSA Max rated operational current $I_e$ A	Part number	Weight kg (lb)
0.75	1.5	2.2	0.5	0.75	2	2	3.4	PSR3-600-70	0.450 (0.99)
1.5	3	4	1	1.5	3	5	6.1	PSR6-600-70	0.450 (0.99)
2.2	4	4	2	2	5	7.5	9	PSR9-600-70	0.450 (0.99)
3	5.5	5.5	3	3	7.5	10	11	PSR12-600-70	0.450 (0.99)
4	7.5	7.5	3	5	10	10	15.2	PSR16-600-70	0.450 (0.99)
5.5	11	15	7.5	7.5	15	20	24.2	PSR25-600-70	0.650 (1.43)
7.5	15	18.5	7.5	10	20	25	28	PSR30-600-70	0.650 (1.43)
7.5	18.5	22	10	10	25	30	34	PSR37-600-70	1.000 (2.20)
11	22	30	15	15	30	40	46.2	PSR45-600-70	1.000 (2.20)
15	30	37	20	20	40	50	59.4	PSR60-600-70	2.200 (4.85)
22	37	45	20	25	50	60	68	PSR72-600-70	2.270 (5.00)
22	45	55	25	30	60	75	80	PSR85-600-70	2.270 (5.00)
30	55	55	30	40	75	100	104	PSR105-600-70	2.270 (5.00)

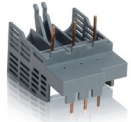
Rated operational voltage  $U_e$ , 208-600 V AC

Rated control supply voltage,  $U_s$ , 24 V AC/DC

230 V kW	400 V kW	500 V kW	208 V hp	230 V hp	480 V hp	600 V hp	UL/CSA Max rated operational current $I_e$ A	Part number	Weight kg (lb)
0.75	1.5	2.2	0.5	0.75	2	2	3.4	PSR3-600-11	0.450 (0.99)
1.5	3	4	1	1.5	3	5	6.1	PSR6-600-11	0.450 (0.99)
2.2	4	4	2	2	5	7.5	9	PSR9-600-11	0.450 (0.99)
3	5.5	5.5	3	3	7.5	10	11	PSR12-600-11	0.450 (0.99)
4	7.5	7.5	3	5	10	10	15.2	PSR16-600-11	0.450 (0.99)
5.5	11	15	7.5	7.5	15	20	24.2	PSR25-600-11	0.650 (1.43)
7.5	15	18.5	7.5	10	20	25	28	PSR30-600-11	0.650 (1.43)
7.5	18.5	22	10	10	25	30	34	PSR37-600-11	1.000 (2.20)
11	22	30	15	15	30	40	46.2	PSR45-600-11	1.000 (2.20)
15	30	37	20	20	40	50	59.4	PSR60-600-11	2.200 (4.85)
22	37	45	20	25	50	60	68	PSR72-600-11	2.270 (5.00)
22	45	55	25	30	60	75	80	PSR85-600-11	2.270 (5.00)
30	55	55	30	40	75	100	104	PSR105-600-11	2.270 (5.00)

# PSR – The compact range

## Accessories



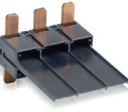
PSR16-MS116



PSR30-MS132



PSR45-MS450



PSR105-MS495



PSR-FAN



PSR-FAN 60-105 A



PS-FBPA



PSLW

### Connection kit

#### For softstarter type

	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PSR3...PSR16 with MS116	<b>PSR16-MS116</b>	1	0.030 (0.07)
PSR25...PSR30 with MS132	<b>PSR30-MS132</b>	1	0.030 (0.07)
PSR37...PSR45 with MS450	<b>PSR45-MS450</b>	1	0.030 (0.07)
PSR60...PSR105 with MS495	<b>PSR105-MS495</b>	1	0.050 (0.11)

### Fan

#### For softstarter type

	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PSR3...PSR45	<b>PSR-FAN</b>	1	0.010 (0.02)
PSR60...PSR105	<b>PSR-FAN 60-105 A</b>	1	0.013 (0.03)

### Terminal enlargements

#### For softstarter type

	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PSR60...105 Wire range mm2 1x10...50, 2x10...25	<b>PSLW-72</b>	1	0.150 (0.33)

### FieldBus plug connection accessory

#### For softstarter type

	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
The same accessory for all sizes	<b>PS-FBPA</b>	1	0.060 (0.13)

ABB Field Bus Plug suitable for all sizes. See page 38-41

### Connection kit

Thermal motor  
overload protection

Short circuit  
protection

Connection  
device



Isolating function

Softstarter providing  
excellent start and stop



# PSR – The compact range

## Technical data

<b>Rated insulation voltage U<sub>i</sub></b>	600 V												
<b>Rated operational voltage U<sub>e</sub></b>	208...600 V +10 %/-15 %, 50/60 Hz ±5 %												
<b>Rated control supply voltage U<sub>s</sub></b>	100...240 V AC, 50/60Hz ±5 % or 24 V AC/DC, +10 %/-15 %,												
<b>Power consumption</b>	<b>PSR3</b>	<b>PSR6</b>	<b>PSR9</b>	<b>PSR12</b>	<b>PSR16</b>	<b>PSR25</b>	<b>PSR30</b>	<b>PSR37</b>	<b>PSR45</b>	<b>PSR60</b>	<b>PSR72</b>	<b>PSR85</b>	<b>PSR105</b>
<b>Supply circuit</b>													
at 100-240 V AC	12 VA						10 VA						
at 24 V AC/DC	5 W												
<b>Max. Power loss at rated I<sub>e</sub></b>	<b>PSR3</b>	<b>PSR6</b>	<b>PSR9</b>	<b>PSR12</b>	<b>PSR16</b>	<b>PSR25</b>	<b>PSR30</b>	<b>PSR37</b>	<b>PSR45</b>	<b>PSR60</b>	<b>PSR72</b>	<b>PSR85</b>	<b>PSR105</b>
	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
<b>Starting capacity at I<sub>e</sub></b>	4 x I <sub>r</sub> for 6 sec.												
<b>Number of starts per hour</b>	See table on page 13.												
standard	10 <sup>1)</sup>												
with aux. fan	20 <sup>1)</sup>												
<b>Service factor</b>	100 %												
<b>Ambient temperature</b>													
during operation	-25 °C to + 60 °C (-13 to 140 °F) <sup>2)</sup>												
during storage	-40 °C to + 70 °C (-40 to 158 °F)												
<b>Maximum altitude</b>	4000 m (13123 ft) <sup>3)</sup>												
<b>Degree of protection</b>	<b>PSR3</b>	<b>PSR6</b>	<b>PSR9</b>	<b>PSR12</b>	<b>PSR16</b>	<b>PSR25</b>	<b>PSR30</b>	<b>PSR37</b>	<b>PSR45</b>	<b>PSR60</b>	<b>PSR72</b>	<b>PSR85</b>	<b>PSR105</b>
main circuit	IP20						IP10						
control circuit	IP20												
<b>Connection</b>	<b>PSR3-PSR16</b>				<b>PSR25-PSR30</b>			<b>PSR37-PSR45</b>		<b>PSR60-PSR105</b>			
<b>main circuit</b>													
cable area	1 x 0.75...2.5 mm <sup>2</sup>				1 x 2.5...10 mm <sup>2</sup>			1 x 6...35 mm <sup>2</sup>		1 x 10...95 mm <sup>2</sup>			
	1 x 18...14 AWG				1 x 12...8 AWG			1 x 8...4 AWG		1 x 6...2/0 AWG			
tightening torque	1 Nm - 9 lb.in				2.3 Nm - 20 lb.in			4.0 Nm - 35 lb.in		8.0 Nm - 71 lb.in			
<b>control circuit</b>	<b>PSR3-PSR16</b>				<b>PSR25-PSR105</b>								
cable area	1 x 0.75...2.5 mm <sup>2</sup>				1 x 0.75...2.5 mm <sup>2</sup>								
	2 x 0.75...1.5 mm <sup>2</sup>				2 x 0.75...1.5 mm <sup>2</sup>								
	1 x 18...14 AWG				1 x 18...14 AWG								
	2 x 16 AWG				2 x 16 AWG								
tightening torque	0.6 Nm - 5 lb.in				0.6 Nm - 5 lb.in								
<b>Signal relays</b>	<b>PSR3-PSR16</b>				<b>PSR25-PSR105</b>								
<b>for Run signal</b>													
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								
<b>for Top ramp signal</b>													
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								
<b>LED</b>													
for On/Ready	Green												
for Run/Top Of Ramp	Green												
<b>Settings</b>													
Ramp time during start	1-20 sec.												
Ramp time during stop	0-20 sec.												
Initial- and End Voltage	40-70%												

<sup>1)</sup> Valid for 50 % on time and 50 % off time. 4 x I<sub>e</sub> for 6 sec., if other data is required, contact your sales office.

<sup>2)</sup> Above 40 °C (104 °F) up to max. 60 °C (140 °F) reduce the rated current with 0.8 % per °C (0.44 % per °F).

<sup>3)</sup> When used at high altitudes above 1000 meters (3281 ft) up to 4000 meters (13123 ft) you need to derate the rated current using the following formula.

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

$$[\% \text{ of } I_e = 100 - \frac{X - 3280}{497}] \quad X = \text{actual altitude for the softstarter in feet}$$

# PSR – The compact range

## Technical data

### Number of starts per hour using PSR softstarters

Motor current $I_e$	Starts/hour without auxiliary fan							
	10	20	30	40	50	60	80	100
3 A	PSR3							
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	-		-		-		-

### Starts/hour with auxiliary fan

10	20	30	40	50	60	80	100
PSR3							
PSR6							PSR9
PSR9			PSR12			PSR16	
PSR12		PSR16		PSR25		PSR30	
PSR16	PSR25		PSR30		PSR37		
PSR25	PSR30	PSR37		PSR45		PSR60	
PSR30	PSR37		PSR45			PSR60	
PSR45		PSR60		PSR72	PSR85	PSR105	
PSR60		PSR72	PSR85	PSR105		-	
PSR72	PSR85	PSR105		-		-	
PSR85	PSR105		-		-		-
PSR105	-		-		-		-

Data based on an ambient temperature of 40 °C (104 °F), starting current of  $4 \times I_e$  and ramp time 6 seconds.  
For more optimized selections, or to use PSR for heavy duty starts, please use the softstarter selection program, prosoft.

# PSE – The efficient range

## Description



### Product description

- Wide rated operational voltage 208 – 600 V AC
- Wide rated control supply voltage 100 – 250 V, 50/60 Hz
- Rated operational current 18 to 370 A
- Wide ambient temperature range, -25 to +60 °C (-13 to 140 °F)
- Coated circuit boards for reliable operation in harsh environment
- Built-in by-pass on all sizes, saving energy and reducing installation time
- User friendly HMI with illuminated language neutral display and four button keypad
- Optional external keypad, IP66
- Torque control for excellent control of pumps
- Current limit, adjustable between  $1.5 - 7 \times I_e$
- Motor overload protection with classes 10A, 10, 20 and 30
- Motor underload protection to detect pumps running dry
- Locked rotor protection, detecting jammed pumps
- Kick start to start jammed pumps or conveyor belts
- Analog output showing operational current, 4 – 20 mA
- Optional fieldbus communication using Profibus, Modbus, Devicenet or CANopen
- Sophisticated algorithm eliminating the DC-component and thereby providing excellent starting performance.

The PSE softstarter range is the world's first compact softstarters with Torque Control. This makes the PSE range an excellent choice for pumping application where water hammering normally is a big problem. With its compact design and advanced functionality, the PSE is also a very efficient solution for other common applications such as compressors and fans.

### Torque control



The most important function when stopping pumps is torque control. Since the PSE softstarter is optimized for controlling pumps, this feature is a must.

### Built-in by-pass for energy saving

Using the built-in by-pass after reaching full voltage will greatly reduce the power loss and thereby save energy. In the PSE softstarter range, the by-pass is built-in on all sizes, which will give the most compact starting solution and reduce the need for wiring during installation.

### Coated circuit boards

All circuit boards in the new PSE softstarter have a protective coating to ensure a reliable operation even in tough environments like wastewater plants, where corrosive gases and acids may exist.

### Motor protection

The PSE softstarter is equipped with built-in electronic overload protection, protecting the motor from overheating. Since no additional overload device is needed, our efficient design saves both space, installation time, and ultimately money.

### Analog output

The analog output terminals can be connected to an analog current meter to show the current during operation and thereby eliminating the need for an additional current transformer. The analog output signal can also be used as an analog input to a PLC.

### Display and keypad

The set-up of the PSE softstarter is done by using the four button keypad and the illuminated display, providing a quick and easy set-up. While operating, the display will also provide important status information such as current and voltage.

### External keypad

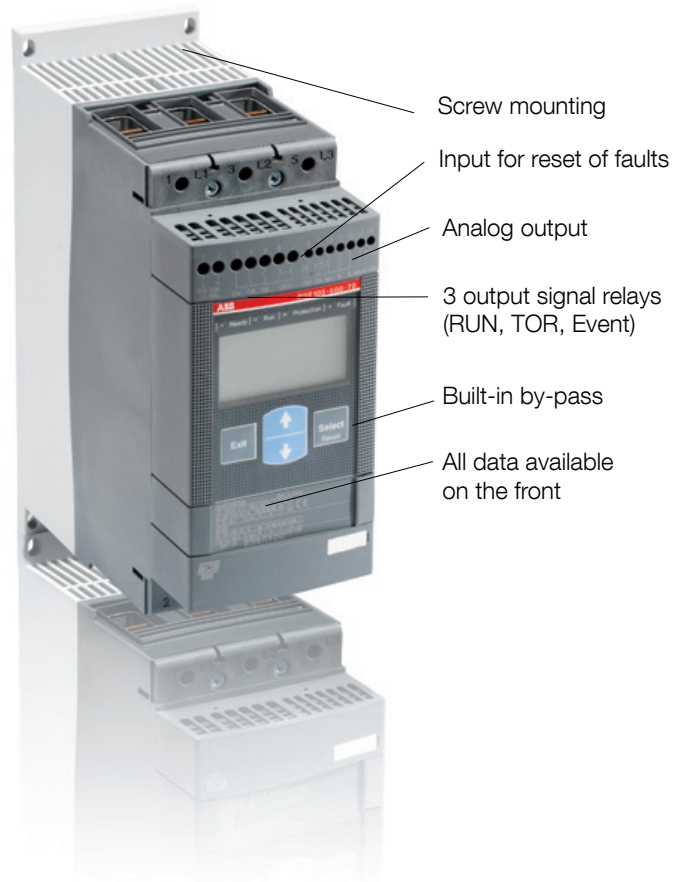
As an option the PSE softstarter can be equipped with an external keypad for easy set-up and monitoring of the unit without opening the enclosure door. The keypad can also be used to copy parameters between different softstarters.

# PSE – The efficient range

## Description

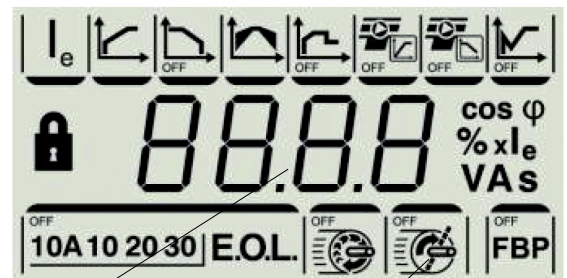
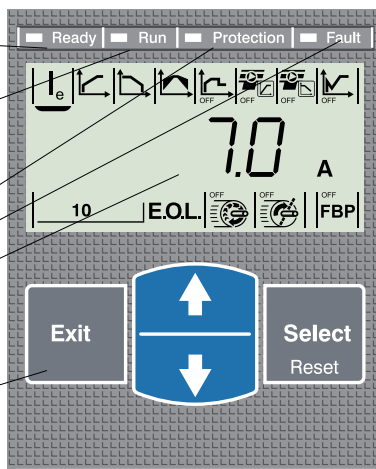
The PSE Softstarter can be selected according to the rated motor power in normal duty applications like pumps, compressors, elevators, escalators, short conveyor belts and bow thrusters. See page 18.

For heavy duty applications like centrifugal fans, crushers, mixers, mills, stirrers and long conveyor belts, select a softstarter from page 19. The softstarter selection tool prosoft can also be used for a more optimized selection.



### Settings

- Green ready LED  
Flashing - Supply available  
Steady - Main available
- Green run LED  
Flashing - Ramping up/down  
Steady - TOR
- Yellow protection LED
- Red fault LED
- Back-lit display
- User friendly keypad  
Similar as for PST(B)



Four digits showing values and messages

Icon's for showing functions. Language neutral

# PSE – The efficient range

## Overview



PSE18 ... PSE105

Normal start In-line connected  (480 V) hp (600 V) hp UL/CSA, Max FLA	Softstarter								
	PSE18	PSE25	PSE30	PSE37	PSE45	PSE60	PSE72	PSE85	PSE105
	10	15	20	25	30	40	50	60	75
	15	20	25	30	40	50	60	75	100
18	25	28	34	42	60	68	80	104	
Using MCCB only, type 1 coordination <sup>1)</sup> will be achieved	25 kA/600 V, 35 kA/480 V, 40 °C MCCB								
Max MCCB rating	Ts3L070TW	Ts3L100TW	Ts3L125TW	Ts3L150TW	Ts3L150TW	T4S250TW	T5S300TW	T5S300BW	
Using J fuses, type 1 coordination will be achieved	85 kA J type fuse protection								
175% rating	30 A	40 A	45 A	50 A	70 A	100 A	110 A	125 A	175 A
Max rating	40 A	50 A	60 A	80 A	100 A	125 A	150 A	175 A	225 A
Minimum enclosure size <sup>2)</sup>	610 x 508 x 305 mm / 24 x 20 x 12 in								
Fusible disconnect switch for the above J fuses	Fusible disconnect switch								
	OS30	OS60		OS100			OS200		
The line contactor is not required for the softstarter itself but often used to open if OL trips	Line contactor								
	AF26	AF30	AF40	AF52	AF65	AF80	AF96	AF116	
Overload protection is used to protect the motor from over heating	Electronic overload relay								
	Built-in								
The by-pass will reduce the power loss of the softstarter	By-pass								
	Built-in								

<sup>1)</sup> According to CSA-C22.2 No. 60947-4-1-07, type 1 coordination requires that, under short-circuit conditions, the contactor or starter shall cause no danger to persons or installation and may not be suitable for further service without repair and replacement of parts.

<sup>2)</sup> Minimum enclosure size used for short circuit current rating test. Enclosure that has two latching points minimum. For use in pollution degree 2 environment.

# PSE – The efficient range

## Overview



PSE142 ... PSE170



PSE210 ... PSE370

Normal start  
In-line connected

(480 V) hp  
(600 V) hp  
UL/CSA, Max FLA

Softstarter						
PSE142	PSE170	PSE210	PSE250	PSE300	PSE370	
100	125	150	200	250	300	
125	150	200	250	300	350	
130	169	192	248	302	361	

Using MCCB only, type 1 coordination <sup>1)</sup> will be achieved

Max MCCB rating

65 kA/600 V, 40 °C MCCB

T5L400BW

T5L600BW

Using J fuses, type 1 coordination will be achieved

175% rating  
Max rating

85 kA J type fuse protection

225 A	250 A	300 A	400 A	500 A	600 A
300 A	350 A	450 A	500 A	600 A	600 A

Minimum enclosure size <sup>2)</sup>

915 x 762 x 305 mm /  
36 x 30 x 12 in

1220 x 915 x 407 mm / 48 x 36 x 16 in

Fusible disconnect switch for the above J fuses

Fusible disconnect switch

OS400

OS600

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

Line contactor

AF140	AF190	AF205	AF265	AF305	AF370
-------	-------	-------	-------	-------	-------

Overload protection is used to protect the motor from over heating

Electronic overload relay

Built-in

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

By-pass

Built-in

<sup>1)</sup> According to CSA-C22.2 No. 60947-4-1-07, type 1 coordination requires that, under short-circuit conditions, the contactor or starter shall cause no danger to persons or installation and may not be suitable for further service without repair and replacement of parts.

<sup>2)</sup> Minimum enclosure size used for short circuit current rating test. Enclosure that has two latching points minimum. For use in pollution degree 2 environment.

### 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](http://www.abb.com/lowvoltage)

### Quick guide for selection

Normal start Class 10	Heavy duty start class 30
Ordering - see page 18	Ordering - see page 19
<b>Typical applications</b>	
<ul style="list-style-type: none"> <li>• Bow thruster</li> <li>• Compressor</li> <li>• Elevator</li> </ul>	<ul style="list-style-type: none"> <li>• Centrifugal pump</li> <li>• Conveyor belt (short)</li> <li>• Escalator</li> </ul>
	<ul style="list-style-type: none"> <li>• Centrifugal fan</li> <li>• Crusher</li> <li>• Mixer</li> </ul>
	<ul style="list-style-type: none"> <li>• Conveyor belt (long)</li> <li>• Mill</li> <li>• Stirrer</li> </ul>
<p><b>!</b> If more than 10 starts/h Select <u>one</u> size larger than the standard selection</p>	

# PSE – The efficient range

## Normal starts, class 10, In-Line, ordering details



### PSE18 ... PSE370

Rated operational voltage,  $U_o$ , 208 - 600 V AC

Rated control supply voltage,  $U_c$ , 100 - 250 V AC, 50/60 Hz



PSE18 ... PSE105



PSE142 ... PSE170



PSE210 ... PSE370

230 V kW	400 V kW	500 V kW	208 V hp	230 V hp	480 V hp	600 V hp	UL/CSA Max rated operational current $I_e$ A	Part number	Weight kg (lb)
4	7.5	11	5	5	10	15	18	PSE18-600-70	2.4 (5.29)
5.5	11	15	7.5	7.5	15	20	25	PSE25-600-70	2.4 (5.29)
7.5	15	18.5	7.5	10	20	25	28	PSE30-600-70	2.4 (5.29)
9	18.5	22	10	10	25	30	34	PSE37-600-70	2.4 (5.29)
11	22	30	10	15	30	40	42	PSE45-600-70	2.4 (5.29)
15	30	37	20	20	40	50	60	PSE60-600-70	2.4 (5.29)
18.5	37	45	20	25	50	60	68	PSE72-600-70	2.5 (5.51)
22	45	55	25	30	60	75	80	PSE85-600-70	2.5 (5.51)
30	55	75	30	40	75	100	104	PSE105-600-70	2.5 (5.51)
40	75	90	40	50	100	125	130	PSE142-600-70	4.2 (9.26)
45	90	110	60	60	125	150	169	PSE170-600-70	4.2 (9.26)
59	110	132	60	75	150	200	192	PSE210-600-70	12.4 (27.34)
75	132	160	75	100	200	250	248	PSE250-600-70	13.9 (30.64)
90	160	200	100	100	250	300	302	PSE300-600-70	13.9 (30.64)
110	200	250	125	150	300	350	361	PSE370-600-70	13.9 (30.64)



# PSE – The efficient range

## Heavy duty starts, class 30, In-Line, ordering details



### PSE18 ... PSE370

Rated operational voltage,  $U_e$ , 208 - 600 V AC

Rated control supply voltage,  $U_c$ , 100 - 250 V AC, 50/60 Hz



230 V kW	400 V kW	500 V kW	208 V hp	230 V hp	480 V hp	600 V hp	UL/CSA Max rated operational current $I_e$ A	Part number	Weight kg (lb)
3	5.5	7.5	3	3	7.5	10	11	PSE18-600-70	2.4 (5.29)
4	7.5	11	5	5	10	15	18	PSE25-600-70	2.4 (5.29)
5.5	11	15	7.5	7.5	15	20	25	PSE30-600-70	2.4 (5.29)
7.5	15	18.5	7.5	7.5	20	25	28	PSE37-600-70	2.4 (5.29)
9	18.5	22	10	10	25	30	34	PSE45-600-70	2.4 (5.29)
11	22	30	15	15	30	40	42	PSE60-600-70	2.4 (5.29)
15	30	37	20	20	40	50	60	PSE72-600-70	2.5 (5.51)
18.5	37	45	25	25	50	60	68	PSE85-600-70	2.5 (5.51)
22	45	55	30	30	60	75	80	PSE105-600-70	2.5 (5.51)
30	55	75	40	40	75	100	104	PSE142-600-70	4.2 (9.26)
40	75	90	50	50	100	125	130	PSE170-600-70	4.2 (9.26)
45	90	110	60	60	125	150	169	PSE210-600-70	12.4 (27.34)
59	110	132	75	75	150	200	192	PSE250-600-70	13.9 (30.64)
75	132	160	75	75	200	250	248	PSE300-600-70	13.9 (30.64)
90	160	200	125	125	250	300	302	PSE370-600-70	13.9 (30.64)

# PSE – The efficient range

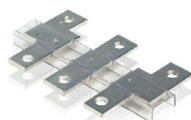
## Accessories



ATK...

### Cable connectors for Al and Cu cables

For softstarter type	Wire range mm <sup>2</sup> (AWG)	Tightening torque max. Nm (lb-in)	Part number <sup>1) 2)</sup>	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PSE142 ... 170	25-150 (4 AWG - 300 MCM)	13.5 (275 lb-in)	ATK185	3	0.100 (0.220)
PSE210 ... 370	25-185 (4 AWG - 400 MCM)	43 (375 lb-in)	ATK300	3	0.168 (0.370)
PSE210 ... 370	2 x 25-240 (2 x 4 AWG - 500 MCM)	43 (375 lb-in)	ATK300/2	3	0.434 (0.957)



LW...

### Terminal enlargements

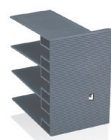
For softstarter type	Dimensions hole ø mm (in)	bar mm (in)	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PSE142... 170	10.5 (0.413)	20 x 5 (0.787 x 0.197)	LW185	1	0.450 (0.992)
PSE210...370	13 (0.512)	40 x 6 (1.575 x 0.236)	LW300	1	1.230 (2.712)



LE185

### Terminal nut washer kits <sup>1)</sup>

For softstarter type	Req. qty	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PSE142... 170	2	LE185	2	0.200 (0.441)
PSE210...370	2	LE300	2	0.300 (0.661)



LT ... -AL

### Terminal shrouds

For softstarter type	Suitable for	Req. qty	Part number <sup>3)</sup>	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PSE142... 170	Compression lugs	2	LT185-AL	2	0.220 (0.485)
PSE210...370	Compression lugs	2	LT300-AL	2	0.280 (0.617)



PSEK

### External keypad including a 3m cable

For softstarter type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PSE18...370	PSEK	1	-



PSECA

### Service Engineer Tool USB cable

For softstarter type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PSE18...370	PSECA	1	-



PS-FBPA

### Fieldbus plug connection accessory

For softstarter type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
The same accessory for all sizes	PS-FBPA	1	0.060 (0.132)
ABB Field Bus Plug suitable for all sizes. See page 38-42			

<sup>1)</sup> The terminal nut washer kits come standard with the PSE unit.

<sup>2)</sup> Two lug sets are needed per PSE.

<sup>3)</sup> The LT300-AL is not compatible with ATK300/2 cable connector.

# PSE – The efficient range

## Technical data

<b>Rated insulation voltage <math>U_i</math></b>	600 V
<b>Rated operational voltage <math>U_e</math></b>	208 ... 600 V +10 %/-15 %
<b>Rated control supply voltage <math>U_s</math></b>	100 ... 250 V +10 %/-15 %, 50/60 Hz $\pm$ 5 %
<b>Rated control circuit voltage <math>U_c</math></b>	Internal 24 V DC
<b>Starting capacity</b>	$4xI_e$ for 10 sec.
<b>Number of starts per hour</b>	10 <sup>1)</sup>
<b>Overload capability,</b> Overload Class	10
<b>Ambient temperature</b>	
During operation	-25 ... +60 °C (-13 to 140 °F) <sup>2)</sup>
During storage	-40 ... +70 °C (-40 to 158 °F)
<b>Maximum Altitude</b>	4000 m (13123 ft) <sup>3)</sup>
<b>Degree of protection</b>	
Main circuit	IP00
Supply and Control circuit	IP20
<b>Main circuit</b>	
Built-in By-pass	Yes
Cooling system - Fan cooled (thermostat controlled)	Yes
<b>HMI for settings</b>	
Display	4 7-segments and icons. Illuminated
Keypad	2 selection keys and 2 navigation keys
<b>Main settings</b>	
Setting current	Size dependent
Ramp time during start	1-30 sec
Ramp time during stop	0-30 sec
Initial / end voltage	30-70%
Current limit	1,5-7xI <sub>e</sub>
Torque control for start	Yes / No
Torque control for stop	Yes / No
Kick start	Off, 30-100%
<b>Signal relays</b>	
Number of signal relays	3
K2	Run signal
K3	TOR (By-pass) signal
K1	Event signal
<b>Rated operational voltage <math>U_e</math></b>	250 V AC / 24 V DC <sup>4)</sup>
<b>Rated thermal current <math>I_{th}</math></b>	3 A
<b>Rated operational current <math>I_e</math></b> at AC-15 ( $U_e = 250$ V)	1.5 A

<sup>1)</sup> 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

<sup>2)</sup> Above 40 °C (104 °F) up to max. 60 °C (140 °F) reduce the rated current with 0.6 % per °C (0.33 % per °F).

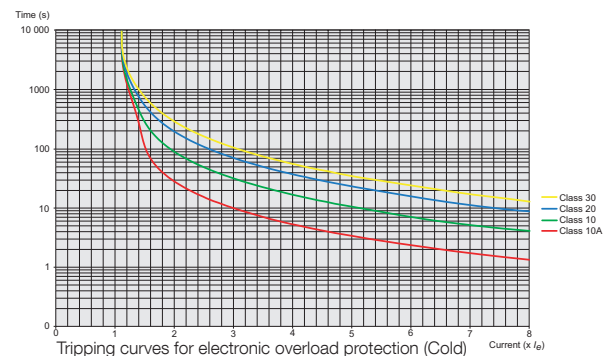
<sup>3)</sup> When used at high altitudes above 1000 meters (3281 ft) up to 4000 meters (13123 ft) you need to derate the rated current using the following formula.

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

$$\left[ \% \text{ of } I_e = 100 - \frac{x - 3280}{497} \right] \quad x = \text{actual altitude for the softstarter in feet}$$

<sup>4)</sup> A common voltage needs to be used for all 3 signal relays.

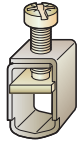
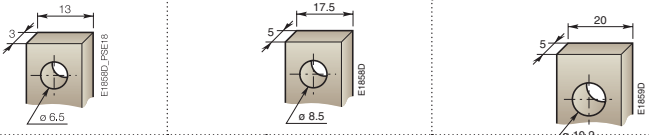
<b>Analog output</b>	
Output signal reference	4 ... 20 mA
Type of output signal	I Amp
Scaling	Fixed at $1.2 \times I_e$
<b>Control circuit</b>	
Number of inputs	3 (start, stop, reset of faults)
<b>Signal indication LED's</b>	
On / Ready	Green flashing / steady
Run / TOR	Green flashing / steady
Protection	Yellow
Fault	Red
<b>Protections</b>	
Electronic overload	Yes (Class 10A, 10, 20, 30)
Locked rotor protection	Yes
Underload protection	Yes
<b>Field bus connection</b>	
Connection for ABB FieldBusPlug	Yes (option)
<b>External keypad</b>	
Display LCD type	
Ambient temperature	
during operation	-25 ... +60 °C (-13 to 140 °F)
during storage	-40 ... +70 °C (-40 to 158 °F)
Degree of protection	IP66 (cULus type 4X indoor)



# PSE – The efficient range

## Technical data

### Cross section of connection cables

		Softstarter PSE18 ... PSE105		PSE142 ... PSE170	PSE210 ... PSE370
<b>Main circuit</b>					
Connection clamp					
					
Solid/stranded	1 x mm <sup>2</sup> (AWG)	2.5...70 (12...2/0)		See accessories	
Solid/stranded	2 x mm <sup>2</sup> (AWG)	2.5...70 (12...2/0)		See accessories	
Tightening torque (recommended)	Nm (lb-in)	9 (79.66)		See accessories	
<b>Connection bar</b>					
					
Width and thickness	mm (in)	13 (0.512) x 3 (0.118)	17.5 (0.689) x 5 (0.197)	20 (0.787) x 5 (0.197)	
Hole diameter	mm (in)	6.5 (0.256)	8.5 (0.335)	10.2 (0.402)	
Tightening torque (recommended)	Nm (lb-in)	9 (79.66)	18 (159.31)	28 (247.82)	
<b>Supply and control circuit</b>					
Connection clamp					
Solid/stranded	1 x mm <sup>2</sup> (AWG)	0.2...2.5 (24...14)	0.2...2.5 (24...14)	0.2...2.5 (24...14)	
Solid/stranded	2 x mm <sup>2</sup> (AWG)	0.2...1.5 (24...16)	0.2...1.5 (24...16)	0.2...1.5 (24...16)	
Tightening torque (recommended)	Nm (lb-in)	0.5 (4.43)	0.5 (4.43)	0.5 (4.43)	

### Semi-conductor fuse ratings and power losses

For Softstarter	Overload protection			Max semi-conductor fuse rating - main circuit Coordination type 2 (85 kA) Bussman Fuses, DIN43 620			Supply circuit power requirements <sup>1)</sup>
	Type	Current range A	Max power loss at rated I <sub>e</sub> (Internal by-pass) W	A	Type	Size	
<b>PSE</b>							
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

<sup>1)</sup> For the supply circuit use a maximum 6 A time-delay fuse or an MCB with type C characteristics.



# PST(B) – The advanced range

## Description



### Description

- Wide rated operational voltage 208 – 690 V AC
- Wide rated control supply voltage 100 – 250 V, 50/60 Hz
- Rated operational current 30 to 1050 A (Up to 1810 A inside delta)
- Wide ambient temperature range, -25 to +50 °C (-13 to 122 °F)
- Both in line and inside delta connection
- Coated circuit boards available, for reliable operation even in harsh environments
- Full text display in 14 languages and 4 button keypad for easy set-up and operation
- Optional external keypad, IP66
- Built-in by-pass contactor on PSTB (from 370 A) for energy saving and easy installation
- Prepared for external by-pass on PST (30 – 300 A)
- Torque Control for excellent control of pumps
- Current limit, adjustable between  $1.5 - 7 \times I_n$
- Fieldbus communication using Profibus, Modbus, Devicenet or CANopen
- Dual motor overload protection with classes 10A, 10, 20 and 30
- Adaptable motor underload protection to detect pumps running dry
- Adaptable locked rotor protection to detect jammed pumps
- PTC protection to protect the motor from overheating
- Adjustable kick start to start jammed pumps
- Programmable output signal relays
- Programmable pre-warning functions
- Event log with time stamp
- Analog output showing current, voltage, power factor etc.  
0 – 10 V, 0 – 20 mA, 4 – 20 mA

The PST(B) softstarter is the most advanced softstarter in the ABB product portfolio and is equipped with almost all imaginable features. This makes the PST(B) ideal for almost every application.



### Torque Control

The ABB torque control function is developed together with pump manufacturers to ensure the best possible pump stop, eliminating problems with water hammering and pressure surges.

### By-pass for energy saving

By-passing the softstarter after reaching full voltage, will save energy and reduce the heat generation. The PST softstarters are equipped with extra terminals making the connection of an external by-pass contactor easier and allowing all protections to be active during by-pass. On the PSTB softstarters, an ABB AF-contactor is already built-in, ensuring a compact starting solution with minimal wiring during installation.

### Advanced protections

The PST(B) softstarters are equipped with almost all protections imaginable for protecting the motor, the softstarter and the application. To offer more flexibility, all protections can be tailored to your specific needs.

### Flexible analog output

The analog output terminals can be connected to an analog current meter to show the current during operation and thereby eliminating the need for an additional current transformer. The analog output signal can also be used as an analog input to a PLC.

### Fieldbus communication

Using the ABB FieldBusPlug, all the most common fieldbus protocols are supported. Using the PLC system it is possible to set-up the softstarter, read status information and also to control the softstarter.

### Display and keypad

The PST(B) softstarter is equipped with a full text display showing all information in clear text in your own language. To make it even easier to set-up, there are standard settings for many common applications, such as centrifugal pump. Selecting this will automatically provide all required settings including torque control when stopping.

### External keypad

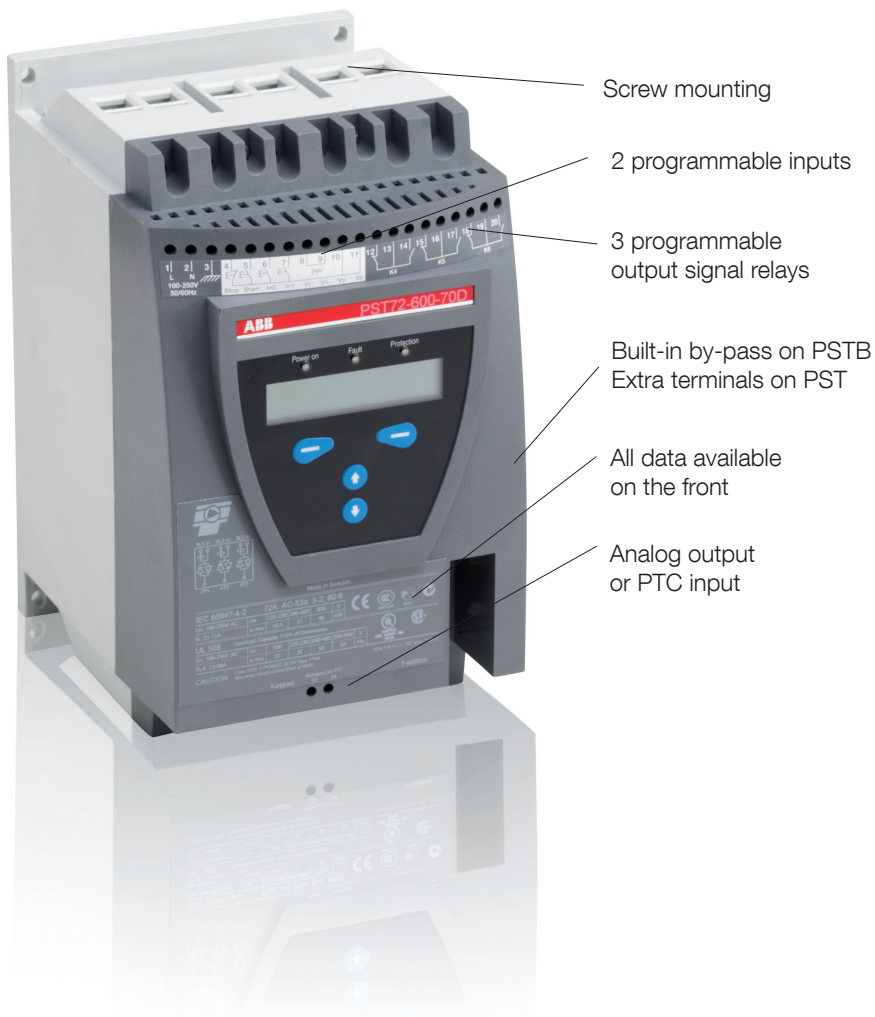
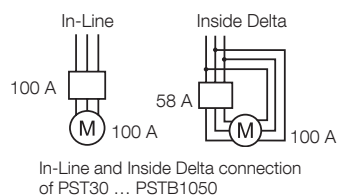
As an option, the PST(B) softstarter can be equipped with an external keypad for easy set-up and monitoring of the unit without opening the enclosure door. The keypad can also be used to copy parameters between different softstarters.



# PST(B) – The advanced range

## Description

The PST Softstarter can be selected according to the rated motor power in normal duty applications like pumps, compressors, elevators, escalators, short conveyor belts and bow thrusters. See page 28-29, For heavy duty applications like centrifugal fans, crushers, mixers, mills, stirrers and long conveyor belts, select a softstarter from page 30-31. The softstarter selection tool prosoft can also be used for a more optimized selection.



- Green on LED
  - Yellow protection LED
  - Red fault LED
- Full text display in 14 languages
- User friendly keypad
- Pre set application settings



External keypad with same design as the fixed one



# PST(B) – The advanced range

## Overview



PST30 ... PST72



PST85 ... PST142

Normal start  
In-Line connected

(480 V) hp  
(600 V) hp  
UL/CSA, Max FLA

Softstarter									
PST30	PST37	PST44	PST50	PST60	PST72	PST85	PST105	PST142	
20	25	30	40	40	50	60	75	100	
25	30	40	50	50	60	75	100	125	
28	34	42	54	60	68	80	104	130	

Using MCCB only, type 1 coordination <sup>1)</sup> will be achieved

10 kA/480-600 V, 40 °C MCCB									
Ts3								T4	

Using J fuses, type 1 coordination will be achieved

175 % rating  
Max rating  
Min enclosure size (in) <sup>2)</sup>

85 kA J type fuse protection									
45 A	50 A	70 A	90 A	100 A	110 A	125 A	175 A	225 A	
90 A	110 A	150 A	175 A	225 A		250 A	350 A	400 A	
20 x 20 x 12						24 x 20 x 12			

Fusible disconnect switch for the above J fuses

Fusible disconnect switch									
OS60		OS100			OS200			OS400	

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

Line contactor									
AF30	AF40		AF52	AF65	AF80	AF96	AF116	AF140	

Overload protection is used to protect the motor from over heating

Electronic overload relay									
Built-in									

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

By-pass contactor (AC-1)									
AF16	AF26	AF30	AF40		AF52		AF80	AF116	

<sup>1)</sup> According to CSA-C22.2 No. 60947-4-1-07, type 1 coordination requires that, under short-circuit conditions, the contactor or starter shall cause no danger to persons or installation and may not be suitable for further service without repair and replacement of parts.

<sup>2)</sup> Minimum enclosure size used for short circuit current rating test. Enclosure that has two latching points minimum. For use in pollution degree 2 environment.

# PST(B) – The advanced range

## Overview



PST175 ... PST300



PSTB370 ... PSTB470



PSTB570 ... PSTB1050

Normal start  
In-Line connected

(480 V) hp

(600 V) hp

UL/CSA, Max FLA

Softstarter									
PST175	PST210	PST250	PST300	PSTB370	PSTB470	PSTB570	PSTB720	PSTB840	PSTB1050
125	150	200	250	300	400	500	600	700	900
150	200	250	300	350	500	600	700	800	1000
156	192	248	302	361	480	590	720	840	1062

Using MCCB only, type 1 coordination <sup>1)</sup> will be achieved

18 kA/480-600 V, 40 °C MCCB	65 kA/600 V, 40 °C	30kA/480-600 V, 40 °C	42 kA/480-600 V, 40 °C
T4	T5	T5L600BW	T6H
			T7H
			T8

Using J or L fuses, type 1 coordination will be achieved

175 % rating

Max rating

Min enclosure size (in) <sup>2)</sup>

85 kA J or L type fuse protection									
250 A	300 A	400 A	500 A	600 A	800 A	1000 A	1200 A	1400 A	1800 A
400 A		450 A		600 A		700 A		1200 A	
30 x 30 x 12		20 x 24 x 12		24 x 24 x 16		48 x 36 x 16			

Fusible disconnect switch for the above J fuses

Fusible disconnect switch										
OS400			OS600		OS800		OS1200		-	-

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

Line contactor									
AF190	AF205	AF265	AF305	AF370	AF460	AF580	AF750	AF1350	AF1650

Overload protection is used to protect the motor from over heating

Electronic overload relay									
Built-in									

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

By-pass contactor (AC-1)									
AF140		AF190		AF205		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](http://www.abb.com/lowvoltage)

### Quick guide for selection

Normal start Class 10

Heavy duty start class 30

Ordering - see page 28 - 29

Ordering - see page 30 - 31

#### Typical applications

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

If more than 10 starts/h

! Select one size larger than the standard selection

# PST(B) – The advanced range

## Normal starts, class 10, In-Line, ordering details



### PST30 ... PSTB1050

Rated operational voltage  $U_e$ , 208 - 600 V

Rated control supply voltage,  $U_s$ , 100 - 250 V AC, 50/60 Hz



PST30 ... PST72



PST85 ... PST142



PST175 ... PST300



PSTB370 ... PSTB470



PSTB570 ... PSTB1050

400 V kW	500 V kW	690 V kW	208 V hp	230 V hp	480 V hp	600 V hp	UL/CSA Max rated operational current $I_e$ A	Part number *)	Weight kg (lb)
15	18.5	-	7.5	10	20	25	28	PST30-600-70□	4.80 (10.58)
18.5	22	-	10	10	25	30	34	PST37-600-70□	4.80 (10.58)
22	25	-	10	15	30	40	42	PST44-600-70□	4.80 (10.58)
25	30	-	15	20	40	50	54	PST50-600-70□	4.80 (10.58)
30	37	-	20	20	40	50	60	PST60-600-70□	5.00 (11.02)
37	45	-	20	25	50	60	68	PST72-600-70□	5.00 (11.02)
45	55	-	25	30	60	75	80	PST85-600-70□	11.20 (24.69)
55	75	-	30	40	75	100	104	PST105-600-70□	13.00 (28.66)
75	90	-	40	50	100	125	130	PST142-600-70□	13.00 (28.66)
90	110	-	50	60	125	150	156	PST175-600-70□	21.50 (47.40)
110	132	-	60	75	150	200	192	PST210-600-70□	21.50 (47.40)
132	160	-	75	100	200	250	248	PST250-600-70□	23.00 (50.71)
160	200	-	100	100	250	300	302	PST300-600-70□	23.00 (50.71)
200	257	-	125	150	300	350	361	PSTB370-600-70□	31.00 (68.34)
250	315	-	150	200	400	500	480	PSTB470-600-70□	31.00 (68.34)
315	400	-	200	250	500	600	590	PSTB570-600-70□	52.00 (114.64)
400	500	-	250	300	600	700	720	PSTB720-600-70□	55.00 (121.25)
450	600	-	300	350	700	800	840	PSTB840-600-70□	60.00 (133.28)
560	730	-	400	450	900	1000	1062	PSTB1050-600-70□	60.00 (133.28)

### PST30 ... PSTB1050

Rated operational voltage  $U_e$ , 400 - 690 V

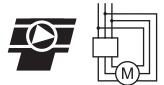
Rated control supply voltage,  $U_s$ , 100 - 250 V AC, 50/60 Hz

15	18.5	25			20	25	28	PST30-690-70□	4.80 (10.58)
18.5	22	30			25	30	34	PST37-690-70□	4.80 (10.58)
22	25	37			30	40	42	PST44-690-70□	4.80 (10.58)
25	30	45			40	50	54	PST50-690-70□	4.80 (10.58)
30	37	55			40	50	60	PST60-690-70□	5.00 (11.02)
37	45	59			50	60	68	PST72-690-70□	5.00 (11.02)
45	55	75			60	75	80	PST85-690-70□	11.20 (24.69)
55	75	90			75	100	104	PST105-690-70□	13.00 (28.66)
75	90	132			100	125	130	PST142-690-70□	13.00 (28.66)
90	110	160			125	150	156	PST175-690-70□	21.50 (47.40)
110	132	184			150	200	192	PST210-690-70□	21.50 (47.40)
132	160	220			200	250	248	PST250-690-70□	23.00 (50.71)
160	200	257			250	300	302	PST300-690-70□	23.00 (50.71)
200	257	355			300	350	361	PSTB370-690-70□	31.00 (68.34)
250	315	450			400	500	480	PSTB470-690-70□	31.00 (68.34)
315	400	560			500	600	590	PSTB570-690-70□	52.00 (114.64)
400	500	710			600	700	720	PSTB720-690-70□	55.00 (121.25)
450	600	800			700	800	840	PSTB840-690-70□	60.00 (133.28)
560	730	1000			900	1000	1062	PSTB1050-690-70□	60.00 (133.28)

\*) Add code letter in Type acc. to below:  
 No code letter = Normal  
 T = Coated PCBs

# PST(B) – The advanced range

## Normal starts, class 10, Inside Delta, ordering details



### PST30...PSTB1050

Rated operational voltage  $U_e$ , 208 - 600 V

Rated control supply voltage,  $U_c$ , 100 - 250 V AC, 50/60 Hz



PST30 ... PST72



PST85 ... PST142



PST175 ... PST300



PSTB370 ... PSTB470



PSTB570 ... PSTB1050

	400 V kW	500 V kW	690 V kW	208 V hp	230 V hp	480 V hp	600 V hp	UL/CSA Max rated operational current $I_e$ A	Part number *)	Weight kg (lb)
25	30	-	-	10	15	30	40	42	PST30-600-70□	4.80 (10.58)
30	37	-	-	15	20	40	50	54	PST37-600-70□	4.80 (10.58)
37	45	-	-	20	25	50	60	72	PST44-600-70□	4.80 (10.58)
45	55	-	-	25	30	60	75	80	PST50-600-70□	4.80 (10.58)
55	75	-	-	30	40	75	100	104	PST60-600-70□	5.00 (11.02)
59	80	-	-	30	40	75	100	104	PST72-600-70□	5.00 (11.02)
75	90	-	-	40	50	100	125	130	PST85-600-70□	11.20 (24.69)
90	110	-	-	50	60	125	150	156	PST105-600-70□	13.00 (28.66)
132	160	-	-	60	75	150	200	192	PST142-600-70□	13.00 (28.66)
160	200	-	-	75	100	200	250	248	PST175-600-70□	21.50 (47.40)
184	250	-	-	100	100	250	300	302	PST210-600-70□	21.50 (47.40)
220	295	-	-	125	150	300	350	361	PST250-600-70□	23.00 (50.71)
257	355	-	-	150	200	400	500	480	PST300-600-70□	23.00 (50.71)
355	450	-	-	200	250	500	600	590	PSTB370-600-70□	31.00 (68.34)
450	600	-	-	250	300	600	700	720	PSTB470-600-70□	31.00 (68.34)
540	700	-	-	300	350	700	800	840	PSTB570-600-70□	52.00 (114.64)
710	880	-	-	400	500	1000	1200	1247	PSTB720-600-70□	55.00 (121.25)
800	1000	-	-	500	600	1200	1500	1454	PSTB840-600-70□	60.00 (133.28)
1000	1250	-	-	600	700	1500	1800	1839	PSTB1050-600-70□	60.00 (133.28)

### PST30 ... PSTB1050

Rated operational voltage  $U_e$ , 400 - 690 V

Rated control supply voltage,  $U_c$ , 100 - 250 V AC, 50/60 Hz

25	30	45				30	40	42	PST30-690-70□	4.80 (10.58)
30	37	55				40	50	54	PST37-690-70□	4.80 (10.58)
37	45	59				50	60	72	PST44-690-70□	4.80 (10.58)
45	55	75				60	75	80	PST50-690-70□	4.80 (10.58)
55	75	90				75	100	104	PST60-690-70□	5.00 (11.02)
59	80	110				75	100	104	PST72-690-70□	5.00 (11.02)
75	90	132				100	125	130	PST85-690-70□	11.20 (24.69)
90	110	160				125	150	156	PST105-690-70□	13.00 (28.66)
132	160	220				150	200	192	PST142-690-70□	13.00 (28.66)
160	200	257				200	250	248	PST175-690-70□	21.50 (47.40)
184	250	315				250	300	302	PST210-690-70□	21.50 (47.40)
220	295	400				300	350	361	PST250-690-70□	23.00 (50.71)
257	355	500				400	500	480	PST300-690-70□	23.00 (50.71)
355	450	600				500	600	590	PSTB370-690-70□	31.00 (68.34)
450	600	800				600	700	720	PSTB470-690-70□	31.00 (68.34)
540	700	960				700	800	840	PSTB570-690-70□	52.00 (114.64)
710	880	1200				1000	1200	1247	PSTB720-690-70□	55.00 (121.25)
800	1000	1400				1200	1500	1454	PSTB840-690-70□	60.00 (133.28)
1000	1250	1700				1500	1800	1839	PSTB1050-690-70□	60.00 (133.28)

\*) Add code letter in Type acc. to below:  
 No code letter = Normal  
 T = Coated PCBs



# PST(B) – The advanced range

## Heavy Duty, class 30, In-Line, ordering details



### PST30...PSTB1050

Rated operational voltage  $U_e$ , 208 - 600 V

Rated control supply voltage,  $U_s$ , 100 - 250 V AC, 50/60 Hz



PST30 ... PST72



PST85 ... PST142



PST175 ... PST300



PSTB370 ... PSTB470



PSTB570 ... PSTB1050

400 V kW	500 V kW	690 V kW	208 V hp	230 V hp	480 V hp	600 V hp	UL/CSA Max rated operational current $I_e$ A	Part number *)	Weight kg (lb)
11	15	-	5	7.5	15	20	25	PST30-600-70□	4.80 (10.58)
15	18.5	-	7.5	10	20	25	28	PST37-600-70□	4.80 (10.58)
18.5	22	-	10	10	25	30	34	PST44-600-70□	4.80 (10.58)
22	25	-	10	15	30	40	42	PST50-600-70□	4.80 (10.58)
25	30	-	15	20	40	50	54	PST60-600-70□	5.00 (11.02)
30	37	-	20	20	40	50	60	PST72-600-70□	5.00 (11.02)
37	45	-	20	25	50	60	68	PST85-600-70□	11.20 (24.69)
45	55	-	25	30	60	75	80	PST105-600-70□	13.00 (28.66)
55	75	-	30	40	75	100	104	PST142-600-70□	13.00 (28.66)
75	90	-	40	50	100	125	130	PST175-600-70□	21.50 (47.40)
90	110	-	50	60	125	150	156	PST210-600-70□	21.50 (47.40)
110	132	-	60	75	150	200	192	PST250-600-70□	23.00 (50.71)
132	160	-	75	100	200	250	248	PST300-600-70□	23.00 (50.71)
160	200	-	100	100	250	300	302	PSTB370-600-70□	31.00 (68.34)
200	257	-	125	150	300	350	361	PSTB470-600-70□	31.00 (68.34)
250	315	-	150	200	400	500	480	PSTB570-600-70□	52.00 (114.64)
315	400	-	200	250	500	600	590	PSTB720-600-70□	55.00 (121.25)
400	500	-	250	300	600	700	720	PSTB840-600-70□	60.00 (133.28)
450	600	-	300	350	700	800	840	PSTB1050-600-70□	60.00 (133.28)

### PST30...PSTB1050

Rated operational voltage  $U_e$ , 400 - 690 V

Rated control supply voltage,  $U_s$ , 100 - 250 V AC, 50/60 Hz

11	15	18.5			15	20	25	PST30-600-70□	4.80 (10.58)
15	18.5	25			20	25	28	PST37-600-70□	4.80 (10.58)
18.5	22	30			25	30	34	PST44-600-70□	4.80 (10.58)
22	25	37			30	40	42	PST50-600-70□	4.80 (10.58)
25	30	45			40	50	54	PST60-600-70□	5.00 (11.02)
30	37	55			40	50	60	PST72-600-70□	5.00 (11.02)
37	45	59			50	60	68	PST85-600-70□	11.20 (24.69)
45	55	75			60	75	80	PST105-600-70□	13.00 (28.66)
55	75	90			75	100	104	PST142-600-70□	13.00 (28.66)
75	90	132			100	125	130	PST175-600-70□	21.50 (47.40)
90	110	160			125	150	156	PST210-600-70□	21.50 (47.40)
110	132	184			150	200	192	PST250-600-70□	23.00 (50.71)
132	160	220			200	250	248	PST300-600-70□	23.00 (50.71)
160	200	257			250	300	302	PSTB370-600-70□	31.00 (68.34)
200	257	355			300	350	361	PSTB470-600-70□	31.00 (68.34)
250	315	450			400	500	480	PSTB570-600-70□	52.00 (114.64)
315	400	560			500	600	590	PSTB720-600-70□	55.00 (121.25)
400	500	710			600	700	720	PSTB840-600-70□	60.00 (133.28)
450	600	800			700	800	840	PSTB1050-600-70□	60.00 (133.28)

\*) Add code letter in Type acc. to below:  
 □ No code letter = Normal  
 T = Coated PCBs

# PST(B) – The advanced range

## Heavy Duty, class 30, Inside Delta, ordering details



### PST30...PSTB1050

Rated operational voltage  $U_e$ , 208 - 600 V

Rated control supply voltage,  $U_c$ , 100 - 250 V AC, 50/60 Hz



PST30 ... PST72



PST85 ... PST142



PST175 ... PST300



PSTB370 ... PSTB470



PSTB570 ... PSTB1050

	400 V kW	500 V kW	690 V kW	208 V hp	230 V hp	480 V hp	600 V hp	UL/CSA Max rated operational current $I_e$ A	Part number *)	Weight kg (lb)
18.5	25	-	-	7.5	10	25	30	34	PST30-600-70□	4.80 (10.58)
25	30	-	-	10	15	30	40	42	PST37-600-70□	4.80 (10.58)
30	37	-	-	15	20	40	50	54	PST44-600-70□	4.80 (10.58)
37	45	-	-	20	25	50	60	72	PST50-600-70□	4.80 (10.58)
45	55	-	-	25	30	60	75	80	PST60-600-70□	5.00 (11.02)
55	75	-	-	30	40	75	100	104	PST72-600-70□	5.00 (11.02)
59	80	-	-	40	40	75	100	104	PST85-600-70□	11.20 (24.69)
75	90	-	-	40	50	100	125	130	PST105-600-70□	13.00 (28.66)
90	110	-	-	50	60	125	150	156	PST142-600-70□	13.00 (28.66)
132	160	-	-	60	75	150	200	192	PST175-600-70□	21.50 (47.40)
160	200	-	-	75	100	200	250	248	PST210-600-70□	21.50 (47.40)
184	250	-	-	100	100	250	300	302	PST250-600-70□	23.00 (50.71)
220	295	-	-	125	150	300	350	361	PST300-600-70□	23.00 (50.71)
257	355	-	-	150	200	400	500	480	PSTB370-600-70□	31.00 (68.34)
355	450	-	-	200	250	500	600	590	PSTB470-600-70□	31.00 (68.34)
450	600	-	-	250	300	600	700	720	PSTB570-600-70□	52.00 (114.64)
540	700	-	-	300	350	700	800	840	PSTB720-600-70□	55.00 (121.25)
710	880	-	-	400	500	1000	1200	1247	PSTB840-600-70□	60.00 (133.28)
800	1000	-	-	500	600	1200	1500	1454	PSTB1050-600-70□	60.00 (133.28)

### PST30...PSTB1050

Rated operational voltage  $U_e$ , 400 - 690 V

Rated control supply voltage,  $U_c$ , 100 - 250 V AC, 50/60 Hz

	400 V kW	500 V kW	690 V kW	208 V hp	230 V hp	480 V hp	600 V hp	UL/CSA Max rated operational current $I_e$ A	Part number *)	Weight kg (lb)
18.5	25	37	-	-	-	25	30	34	PST30-690-70□	4.80 (10.58)
25	30	45	-	-	-	30	40	42	PST37-690-70□	4.80 (10.58)
30	37	55	-	-	-	40	50	54	PST44-690-70□	4.80 (10.58)
37	45	59	-	-	-	50	60	72	PST50-690-70□	4.80 (10.58)
45	55	75	-	-	-	60	75	80	PST60-690-70□	5.00 (11.02)
55	75	90	-	-	-	75	100	104	PST72-690-70□	5.00 (11.02)
59	80	110	-	-	-	75	100	104	PST85-690-70□	11.20 (24.69)
75	90	132	-	-	-	100	125	130	PST105-690-70□	13.00 (28.66)
90	110	160	-	-	-	125	150	156	PST142-690-70□	13.00 (28.66)
132	160	220	-	-	-	150	200	192	PST175-690-70□	21.50 (47.40)
160	200	257	-	-	-	200	250	248	PST210-690-70□	21.50 (47.40)
184	250	315	-	-	-	250	300	302	PST250-690-70□	23.00 (50.71)
220	295	400	-	-	-	300	350	361	PST300-690-70□	23.00 (50.71)
257	355	500	-	-	-	400	500	480	PSTB370-690-70□	31.00 (68.34)
355	450	600	-	-	-	500	600	590	PSTB470-690-70□	31.00 (68.34)
450	600	800	-	-	-	600	700	720	PSTB570-690-70□	52.00 (114.64)
540	700	960	-	-	-	700	800	840	PSTB720-690-70□	55.00 (121.25)
710	880	1200	-	-	-	1000	1200	1247	PSTB840-690-70□	60.00 (133.28)
800	1000	1400	-	-	-	1200	1500	1454	PSTB1050-690-70□	60.00 (133.28)

\*) Add code letter in Type acc. to below:  
 No code letter = Normal  
 T = Coated PCBs

# PST(B) – The advanced range

## Accessories

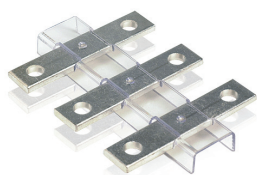
### Terminal lug kits for Al and Cu cables

For PST(B)85...1050 without external bypass (line/load lugs and terminal nut washer)

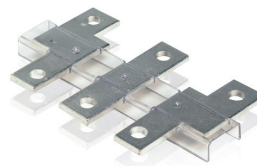
For softstarter type	Wire range AWG	Tightening torque max. Nm (lb-in)	Part number	Pack <sup>ing</sup> piece
PST85 ...142	#4 - 300 MCM (1 per phase)	13.5 (275 lb-in)	PSLK-185	6
PST175 ...300	#4 - 400 MCM (1 per phase)	43 (375 lb-in)	PSLK-300	6
PST175...300	#4 - 500 MCM (2 per phase)	43 (375 lb-in)	PSLK-300/2	6
PSTB370...470	2/0 - 500 MCM (2 per phase)	43 (375 lb-in)	PSLK-580/2	6
PSTB570 ...1050	2/0 - 500 MCM (3 per phase)	43 (375 lb-in)	PSLK-750/3	6

For PST85...300 with external bypass (line/load lugs and terminal nut washer)

PST85 ...142	#4 - 300 MCM (1 per phase)	13.5 (275 lb-in)	PSLK-185-B	9
PST175 ...300	#4 - 400 MCM (1 per phase)	43 (375 lb-in)	PSLK-300-B	9
PST175 ...300	#4 - 500 MCM (2 per phase)	43 (375 lb-in)	PSLK-300/2-B	9



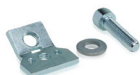
LX...



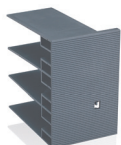
LW...



LE185



LE460



LT ... -AL



PSTEK



PSTM-2

### Terminal extensions

For softstarter type	Dimensions hole $\phi$ mm <sup>2</sup> (in <sup>2</sup> )	bar mm (in)	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PST85 ...142	8.5 (0.0132)	17.5 x 5 (0.689 x 0.197)	LX185 <sup>1)</sup>	1	0.250 (0.551)
PST175 ...300	10.5 (0.0163)	20 x 5 (0.787 x 0.197)	LX300 <sup>2)</sup>	1	0.350 (0.772)
PSTB370...470	10.5 (0.0163)	25 x 5 (0.984 x 0.197)	LX460	1	0.500 (1.102)
PSTB570...1050	13 (0.0202)	40 x 6 (1.575 x 0.236)	LX750	1	0.850 (1.874)

### Terminal enlargements

For softstarter type	Dimensions hole $\phi$ mm <sup>2</sup> (in <sup>2</sup> )	bar mm (in)	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PST30...72	6.5 (0.0101)	15 x 3 (0.591 x 0.118)	LW110 <sup>1)</sup>	1	0.100 (0.220)
PST85...142	10.5 (0.0163)	17.5 x 5 (0.689 x 0.197)	LW185 <sup>1)</sup>	1	0.250 (0.551)
PST175...300	10.5 (0.0163)	20 x 5 (0.787 x 0.197)	LW300 <sup>1)</sup>	1	0.450 (0.992)
PSTB370...470	10.5 (0.0163)	25 x 5 (0.984 x 0.197)	LW460	1	0.730 (1.609)
PSTB570...1050	13 (0.0202)	40 x 6 (1.575 x 0.236)	LW750	1	1.230 (2.712)

### Terminal nut washer

For softstarter type	Req. qty	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PST85...142	1	LE185 <sup>1)</sup>	2	0.200 (0.441)
PST175...300	3	LE300 <sup>2)</sup>	2	0.300 (0.661)
PSTB370...470	6	LE460	6	0.600 (1.323)
PSTB570...1050	6	LE750	6	0.750 (1.653)

### Terminal shrouds

For softstarter type	Suitable for	Req. qty	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PST85...142	Compression lugs and cable connectors	1 pc and	LT185-AL	2	0.220 (0.485)
		1 pc	LT460-AL	2	0.800 (1.764)
PST175...300	Compression lugs and cable connectors	3 pcs	LT300-AL <sup>2) 3)</sup>	2	0.280 (0.617)
PSTB370...470	Compression lugs and cable connectors	2 pcs	LT460-AL	2	0.800 (1.764)
PSTB570...1050	Compression lugs and cable connectors	2 pcs	LT750-AL	2	0.825 (1.819)

### External keypad including a 3m cable

For softstarter type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PST30...300	PSTEK	1	0.400 (0.882)
PSTB370...1050			

### Marine Kit

For softstarter type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
PST85...142	PSTM-2	1	0.240 (0.529)

**Fieldbus plug - ABB Fieldbus Plug** suitable for all sizes. See page 38-41

<sup>1)</sup> Only fits on the motor side.

<sup>2)</sup> Use two sets of the accessories on the line side and one set on the motor side.

<sup>3)</sup> The LT300-AL is not compatible with PSLK-300/2 cable connector.



# PST(B) – The advanced range

## Technical data

<b>Rated insulation voltage U<sub>i</sub></b>	690 V	
<b>Rated operational voltage U<sub>e</sub></b>	208...600 V, 400...690 V + 10 % / - 15 % 50/60 Hz ±5%	
<b>Rated control supply voltage U<sub>s</sub></b>	100...250 V +10% / -15% 50/60 Hz ±5%	
<b>Rated control circuit voltage U<sub>c</sub></b>	Internal or external 24 V DC	
<b>Starting capacity at I<sub>r</sub></b>	3 x I <sub>e</sub> for 15 sec.	
<b>Number of starts per hour</b>	<b>PST30...300</b> 30 <sup>1)</sup>	<b>PSTB370...1050</b> 10 <sup>1)</sup>
<b>Overload capability</b>		
Overload class	10	
<b>Service factor</b>	<b>PST(B)30...840</b> 115 %	<b>PSTB1050</b> 100 %
<b>Ambient temperature</b>		
during operation	±0 ... +50 °C (32 to 122 °F) <sup>2)</sup>	
during storage	-25 ... +70 °C (-13 to 158 °F)	
<b>Maximum altitude</b>	4000 m <sup>3)</sup>	
<b>Degree of protection</b>	<b>PST30...72</b>	<b>PST85...PSTB1050</b>
main circuit	IP10	IP00
Supply and control circuit	IP20	
<b>Main circuit</b>	<b>PST30...300</b>	<b>PSTB370...1050</b>
Built-in By-pass contactor	No	Yes
Cooling system - Fan cooled	Yes (thermostat controlled)	
<b>HMI for settings</b> (Human Machine Interface)		
Display	Full text	
Languages	English, German, Italian, Dutch, Chinese, Finnish, Swedish, French, Spanish, Russian, Portugese, Turkish, Polish and Czech	
Keypad	2 selection keys and 2 navigating keys	
<b>Signal relays</b>		
Number of programmable signal relays	3 (each relay can be programmed to be Run, By-pass or Event signal)	
K4	Default as Run signal	
K5	Default as TOR (By-pass) signal	
K6	Default as Event signal	
Rated operational voltage, U <sub>e</sub>	250 V AC / 24 V DC	
Rated thermal current I <sub>th</sub>	5 A	
Rated operational current I <sub>e</sub> at AC-15 (U <sub>e</sub> =250 V)	1.5 A	
<b>Analog output</b>		
Output signal reference	0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA	
Type of output signal	I Amp, U Volt, P kW, P hp, Q kVAR, S kVA, TmpMot, TmpSCR, cosPhi	

<sup>1)</sup> Valid for 50 % on time and 50 % off time, 3.5 x I<sub>e</sub> for 7 sec., if other data is required, contact your sales office.

<sup>2)</sup> Above 40 °C (104 °F) up to max. 50 °C (122 °F) reduce the rated current with 0.8 % per °C (0.44 % per °F).

<sup>3)</sup> When used at high altitudes above 1000 meters (3281 ft) up to 4000 meters (13123 ft) you need to derate the rated current using the following formula.

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

$$\left[ \% \text{ of } I_e = 100 - \frac{x - 3280}{497} \right] \quad x = \text{actual altitude for the softstarter in feet}$$

<b>Control circuit</b>	
Number of inputs	2 (start, stop)
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)

<b>Signalling indication LED</b>	
Power on	Green
Fault	Red
Protection	Yellow

<b>Protections</b>	
Electronic overload	Yes (Class 10A, 10, 20, 30)
Dual overload	Yes (separate overload function for start and run)
PTC connection	Yes
Locked rotor protection	Yes (Level and delay adjustable)
Underload protection	Yes (Level and delay adjustable)
Phase imbalance	Yes (Level and delay adjustable)
High current (8 x I <sub>e</sub> )	Yes
Phase reversal protection	Yes

<b>Warnings (pre-warning)</b>	
High current	Yes (Level and delay adjustable)
Low current (underload)	Yes (Level and delay adjustable)
Overload trip	Yes (Level and delay adjustable)
Overtemp, thyristor (SCR)	Yes

<b>Start of several motors</b>	
Possible to set-up and start three different motors	Yes (Different parameter sets)

<b>Field bus connection</b>	
Connection for ABB FieldBusPlug	Yes

<b>PTC input</b>	
Switch off resistance	2825 ohm ± 20%
Switch on resistance	1200 ohm ± 20%

<b>External keypad</b>	
Display	LCD type
Ambient temperature	
During operation	±0 ... +50 °C (32 to 122 °F)
During storage	-25 ... +70 °C (-13 to 158 °F)
Degree of protection	IP66 (cULus type 4X indoor)

### 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	Values on display	Default value
Setting current for overload, locked rotor etc.	Setting I <sub>s</sub>	9.0 ... 1207 A divided into 19 overlapping ranges.	See table, page 37
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 <sub>s</sub>	4.0 x I <sub>s</sub>
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
<b>Overload protection</b>	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
<b>Locked rotor protection</b>	Locked Rotor	Yes, No	No
Trip level for locked rotor protection	Lock R Lev	0.5 ... 8.0 x I <sub>s</sub>	4.0 x I <sub>s</sub>
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
<b>Underload protection</b>	Underload	Yes, No	No
Trip level for Underload protection	Underl Lev	0.4 ... 0.8 x I <sub>s</sub>	0.5 x I <sub>s</sub>
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
<b>Phase imbalance protection</b>	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
<b>High current protection</b>	High I	Yes, No	No
Type of operation for high current protection	High I Op	Stop-M, Stop-A, Ind	Stop-M
<b>Phase reversal protection</b>	Phase Rev	Yes, No	No
Type of operation for phase reversal protection	Ph Rev Op	Stop-M, Stop-A, Ind	Stop-M
<b>PTC protection</b>	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
<b>High current warning</b>	Warn I=High	Yes, No	No
Trip level for high current warning	Wa I=H Lev	0.5 ... 5.0 x I <sub>s</sub>	1.2 x I <sub>s</sub>
<b>Low current warning</b>	Warn I=Low	Yes, No	No
Trip level for low current warning	Wa I=L Lev	0.4 ... 1.0 x I <sub>s</sub>	0.8 x I <sub>s</sub>
<b>Overload warning</b>	Warn OL	Yes, No	No
Trip level for overload warning	Wa OL Lev	40 ... 99 %	90 %
<b>Thyristor overload warning</b>	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

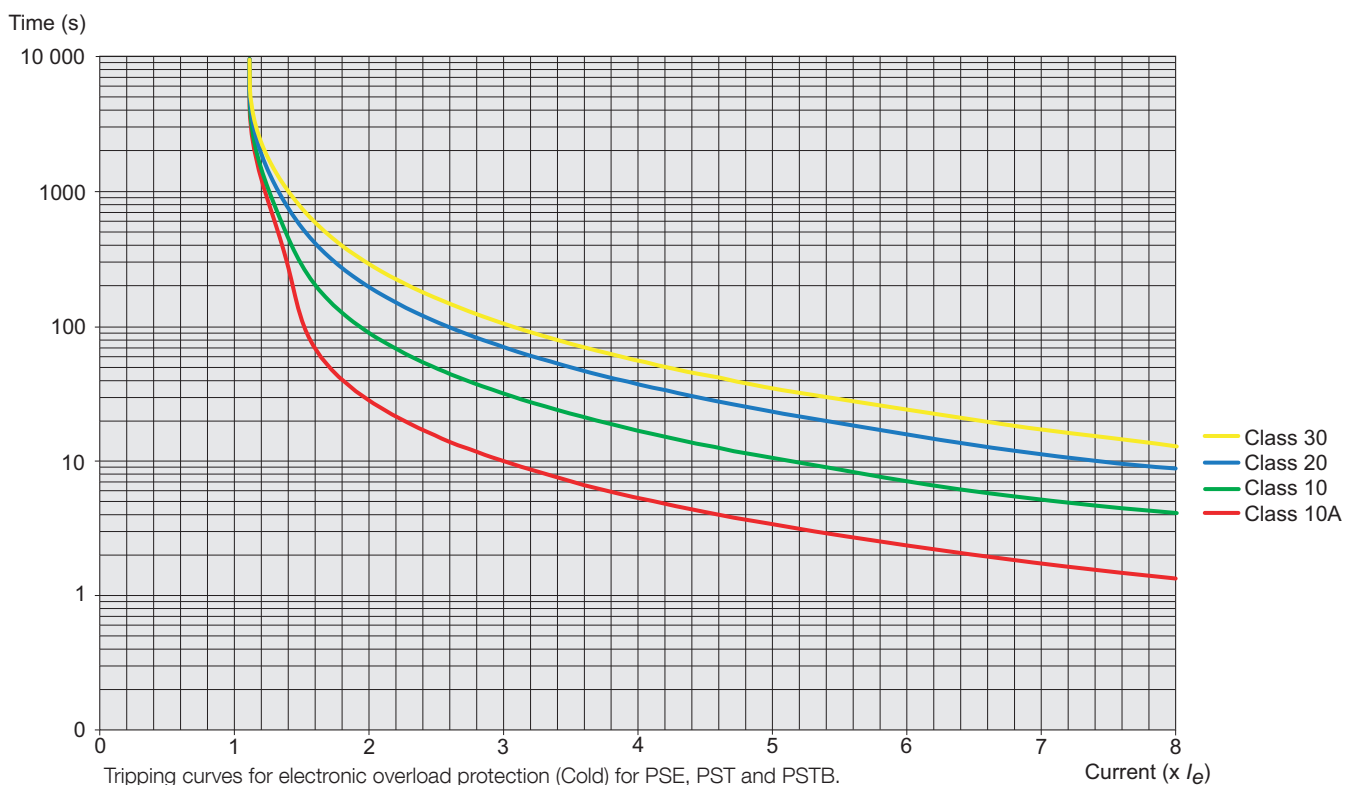
# PST(B) – The advanced range

## Technical data

Description	Text on display	Values on display	Default value
Password for display	Password	No, 1 ... 255	
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

### Tripping curves for the integrated electronic overload protection

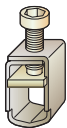
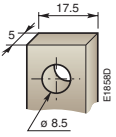
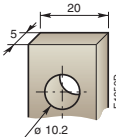
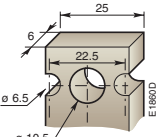
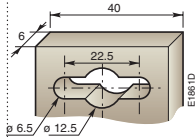
All units have an integrated electronic overload protection possible to set on four different tripping classes. Below you find a curve for each tripping class in cold state. These tripping curves are valid for PSE, PST and PSTB.



# PST(B) – The advanced range

## Technical data

### Cross section of connection cables

		Softstarter							
		PST30 ... 72	PST85 ... 142	PST175 ... 300	PSTB370 ... 470	PSTB570 ... 1050			
<b>Main circuit</b>									
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 <sup>2</sup> (AWG)	10 ... 95 (8...3/0)		See accessories					
Solid/stranded	2 x mm <sup>2</sup> (AWG)	6 ... 35 (10...2)		See accessories					
Tightening torque (recommended)	Nm (lb-in)	6.0 (53.10)		See accessories					
<b>Connection bar</b>									
									
Width and thickness	mm (in)	–	17.5 x 5 (0.689 x 0.197)	20 x 5 (0.787 x 0.197)	25 x 6 (0.984 x 0.236)	40 x 6 (1.575 x 0.236)			
Hole diameter	mm (in)	–	8.5 (0.335)	10.2 (0.402)	10.5 (0.413)	6.5, 12.5 (0.256, 0.492)			
Tightening torque (recommended)	Nm (lb-in)	–	18 (159.3)	28 (247.8)	35 (309.8)	45 (398.3)			
<b>Supply and control circuit</b>									
Connection clamp				Yes					
Solid/stranded	1 x mm <sup>2</sup> (AWG)				2.5 (14)				
Solid/stranded	2 x mm <sup>2</sup> (AWG)				1.5 (16)				
Tightening torque (recommended)	Nm (lb-in)				0.5 (4.43)				

# PST(B) – The advanced range

## Technical data

### Fuse ratings and power losses

For Softstarter Type	Recommended ABB Overload protection		Max power loss at rated $I_e$		Max semi-conductor fuse rating - main circuit Coordination type 2 (65 kA) <sup>3)</sup> Bussman Fuses, DIN43 620			Supply circuit power requirements <sup>1)</sup> VA/VA pull in
	Type	Current range A	without by-pass <sup>2)</sup> W	with by-pass W	A	Type	Size	
<b>PST</b>								
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
<b>PSTB 600 V</b>								
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	170M8556	3	25/860
PSTB1050	Integrated	315...1207	N/A	170	1800	170M8558	3	25/860
<b>PSTB 690 V</b>								
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	170M8556	3	25/860
PSTB1050	Integrated	315...1207	N/A	170	1600	170M8557	3	25/860

<sup>1)</sup> For the supply circuit use a maximum 6 A time-delay fuse or an MCB with type C characteristics.

<sup>2)</sup> Calculated power loss at operational current (I<sub>op</sub>) without by-pass.

P<sub>tot</sub> = 3 x I<sub>op</sub> + VA value  
 Example: PST 60 running at 52 A  
 P<sub>tot</sub> = 3 x 52 + 5 = 161 W

<sup>3)</sup> Max fuse rating independent of 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.

# Field Bus Communication

## MODBUS TCP interface MTQ22-FBP



MTQ22

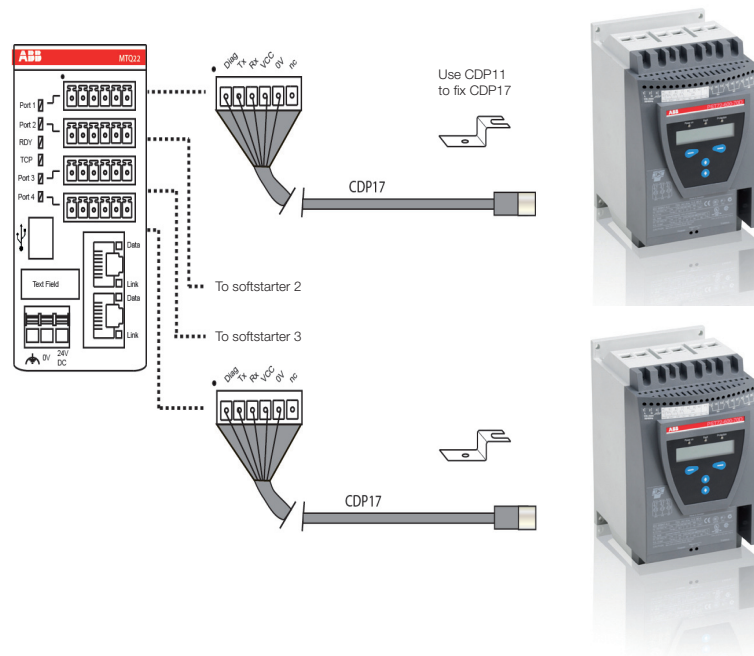
### Modbus TCP interface

- Ethernet connectivity for up to four UMC100
- Modbus TCP protocol
- Supports all network topologies
  - Star
  - Bus
  - Ring with redundancy (MRP protocol)
- No special Ethernet connectors required in MCCs
- Easy to use in withdrawable applications

### Ordering details

Designation	Cable length	Type	Order code	Price	Pkg	Weight
				Pkg pieces	qty	(1 pce)
						kg (lb)
Ethernet Modbus TCP Interface	-	MTQ22-FBP.0	1SAJ260000R0100	1		0.200
Terminal bloc for MTQ22 X1...X4	-	ETHTB-FBP.4	1SAJ929200R0001	4		0.001
Terminal bloc for MTQ22 X1...X4	-	ETHTB-FBP.50	1SAJ929200R0002	50		0.001
Cable MTQ22 – UMC100	1.5 m	CDP17-FBP.150	1SAJ929170R0015	1		0.001
Cable MTQ22 – drawer outside	1.5 m	CDP18-FBP.150	1SAJ929180R0015	1		0.001
Cable UMC100 – drawer inside	1.0 m	CDP19-FBP.100	1SAJ929190R0010	1		0.001
Passive cable fixing bracket	-	CDP11-FBP.0	1SAJ929100R0001	50		0.010 (0.220)
Passive cable fixing bracket	-	CDP11-FBP.4	1SAJ929100R0004	4		0.010 (0.220)

### Softstarters with MTQ22-FBP Modbus TCP interface





# Field Bus Communication

## DeviceNet, MODBUS-RTU and CANopen, ordering details



### DeviceNet FieldBusPlug

Ready-made DeviceNet fieldbus interface with various cable lengths.

- Applicable on all FBP motor starters and other devices
- Degree of protection IP65, diagnostic LED

Designation	Cable length	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
DeviceNet-FBP	0.25 m (0.82 ft)	DNP21-FBP.025	1SAJ 230 000 R1003	1	0.09 (0.198)
DeviceNet-FBP	0.50 m (1.64 ft)	DNP21-FBP.050	1SAJ 230 000 R1005	1	0.10 (0.220)
DeviceNet-FBP	1.00 m (3.28 ft)	DNP21-FBP.100	1SAJ 230 000 R1010	1	0.13 (0.287)
DeviceNet-FBP	5.00 m (16.40 ft)	DNP21-FBP.500	1SAJ 230 000 R1050	1	0.36 (0.794)



DNP21-FBP  
MRP21-FBP  
COP21-FBP

### MODBUS-RTU FieldBusPlug

Ready-made MODBUS-RTU fieldbus interface with various cable lengths.

- Applicable on all FBP motor starters and other devices
- Degree of protection IP65, diagnostic LED

Designation	Cable length	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
MODBUS-RTU-FBP	0.25 m (0.82 ft)	MRP21-FBP.025	1SAJ 250 000 R0003	1	0.09 (0.198)
MODBUS-RTU-FBP	0.50 m (1.64 ft)	MRP21-FBP.050	1SAJ 250 000 R0005	1	0.10 (0.220)
MODBUS-RTU-FBP	1.00 m (3.28 ft)	MRP21-FBP.100	1SAJ 250 000 R0010	1	0.13 (0.287)
MODBUS-RTU-FBP	5.00 m (16.40 ft)	MRP21-FBP.500	1SAJ 250 000 R0050	1	0.36 (0.794)

### CANopen FieldBusPlug

Ready-made CANopen fieldbus interface with various cable lengths.

- Applicable on all FBP motor starters and other devices
- Degree of protection IP65, diagnostic LED

Designation	Cable length	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
CANopen-FBP	0.25 m (0.82 ft)	COP21-FBP.025	1SAJ 230 100 R1003	1	0.09 (0.198)
CANopen-FBP	0.50 m (1.64 ft)	COP21-FBP.050	1SAJ 230 100 R1005	1	0.10 (0.220)
CANopen-FBP	1.00 m (3.28 ft)	COP21-FBP.100	1SAJ 230 100 R1010	1	0.13 (0.287)

### To connect the PST Softstarter to a DeviceNet or CANopen fieldbus system...

you need specific software for PLC set-up, (EDS file) which is available at [www.abb.com/lowvoltage](http://www.abb.com/lowvoltage) on the Softstarter pages. Look under the documentation-link named Software. If you need help or advice, please contact your local ABB office.

# Field Bus Communication

## DeviceNet, MODBUS-RTU and CANopen accessories, ordering details

### Accessories for the DeviceNet, MODBUS-RTU and CANopen bus connector



DNF11-FBP.050



DNM11-FBP.050

#### DeviceNet, MODBUS-RTU and CANopen round cable for bus junctions

Ready-made bus cable with an M12 connector and an open cable end.

Designation	Cable length	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
Round cable with female connector	0.50 m (1.64 ft)	DNF11-FBP.050	1SAJ 923 002 R0005	1	0.04 (0.088)
Round cable with male connector	0.50 m (1.64 ft)	DNM11-FBP.050	1SAJ 923 003 R0005	1	0.04 (0.088)

#### DeviceNet, MODBUS-RTU and CANopen round cable for bus extension

Ready-made bus cable with M12 male and female connectors



DNX11-FDP

Designation	Cable length	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
Extension cable	1.00 m (3.28 ft)	DNX11-FBP.100	1SAJ 923 001 R0010	1	0.08 (0.176)
Extension cable	3.00 m (9.84 ft)	DNX11-FBP.300	1SAJ 923 001 R0030	1	0.20 (0.441)
Extension cable	5.00 m (16.40 ft)	DNX11-FBP.500	1SAJ 923 001 R0050	1	0.31 (0.683)
Round cable	100.00 m (328 ft)	DNC11-FBP.999	1SAJ 923 004 R1000	1	5.60 (12.346)



DNM11-FBP.0

DNF11-FBP.0



DNR11-FBP.120

#### DeviceNet, MODBUS-RTU and CANopen round cable connectors

Bus cable and coupling accessories

Designation	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
Male connector for round cable	DNM11-FBP.0	1SAJ 923 005 R0001	5	0.15 (0.331)
Female connector for round cable	DNF11-FBP.0	1SAJ 923 006 R0001	5	0.15 (0.331)

#### DeviceNet, MODBUS-RTU and CANopen termination resistor

Designation	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
Termination Resistor, 120 Ohm	DNR11-FBP.120	1SAJ 923 007 R0001	1	0.02 (0.044)

# Field Bus Communication

## Profibus DP, ordering details



PDP22-FBP

### Profibus DP FieldBusPlug

Ready-made Profibus DP fieldbus interface with various cable lengths.

- Supports PROFIBUS DP V0 and V1
- Applicable on all FBP motor starters and other devices
- Degree of protection IP65, diagnostic LED



Designation	Cable length	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
Profibus DP FBP	0.25 m (0.82 ft)	PDP22-FBP.025	1SAJ 240 100 R1003	1	0.09 (0.198)
Profibus DP FBP	0.50 m (1.64 ft)	PDP22-FBP.050	1SAJ 240 100 R1005	1	0.10 (0.220)
Profibus DP FBP	1.00 m (3.28 ft)	PDP22-FBP.100	1SAJ 240 100 R1010	1	0.13 (0.287)
Profibus DP FBP	2.00 m (6.56 ft)	PDP22-FBP.200	1SAJ 240 100 R1020	1	0.20 (0.441)
Profibus DP FBP	5.00 m (16.40 ft)	PDP22-FBP.500	1SAJ 240 100 R1050	1	0.36 (0.794)



PDQ22-FBP

### Profibus DP FieldBusPlug for 4 devices

PDQ22 is a member of the ABB FieldBusPlug family of bus connectors. It allows the connection of up to four devices to Profibus DP by just using one Profibus node access. This allows a cost efficient device integration for devices that are located physically nearby. PDQ22 supports DP-V0 and DP-V1. The degree of protection is IP66. There are separate diagnosis LEDs for bus and device status.

Note that the accessory PDQ22-FBP only works with the PSR and PSE and not with the PST(B) softstarter.

Designation	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
Quadruple bus connector	PDQ22-FBP	1SAJ 240 200 R0050	1	0.20 (0.441)
DINrail adapter for PDQ22-FBP	CDA11-FBP.0	1SAJ 929 300 R0001	1	0.11 (0.243)
Fixing bracket for passive plug of connection cable	CDP11-FBP.0	1SAJ 929 100 R0001	1	0.50 (1.102)



### Configuration software

This cable and software can be used for set-up and commissioning of the softstarter as well as to keep back-up of the parameter settings.

Designation	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
USB to FBP interface cable	UTF21-FBP	1SAJ 929 400 R0002	1	
PDP22/PDQ22 Device Type Manager (DTM) incl. FDT/DTM frame application	PBDTM-FBP	1SAJ 924 012 R0003	1	

### To connect the PST Softstarter to a Profibus DP fieldbus system...

you need specific software for PLC set-up, (GSD file) which is available at [www.abb.com/lowvoltage](http://www.abb.com/lowvoltage) on the Softstarter pages. Look under the documentation-link named Software. If you need help or advice, please contact your local ABB office.

PDP21 is replaced by PDP22.

Use PDP22 with the GSD-file Abb\_082d.gsd regardless if the PLC is a DP/V0 or DP/V1.

# Field Bus Communication

## Profibus DP accessories, ordering details



### Accessories for the Profibus DP Bus Connector

#### Profibus DP Round Cable for Bus Junctions

Ready-made bus cable with an M12 connector and an open cable end.

- Application on bus junctions such as e.g. Profibus DB couplers or devices with an integrated Profibus DB interface



PDF11-FBP.050



PDM11-FBP.050

Designation	Cable length	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
Round Cable with female connector	0.50 m (1.64 ft)	PDF11-FBP.050	1SAJ 924 002 R0005	1	0.04 (0.088)
Round Cable with male connector	0.50 m (1.64 ft)	PDM11-FBP.050	1SAJ 924 003 R0005	1	0.04 (0.088)

#### Profibus DP Round Cable for Bus Extension

Ready-made bus cable with M12 male and female connectors

Round cable on coil



PDX11-FBP



PDM11-FBP



PDF11-FBP



PDR11-FBP.150



PDV11-FBP,  
PDV12-FBP



PDA11-FBP.050



PDA12-FBP.050

Designation	Cable length	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
Extension Cable	0.50 m (1.64 ft)	PDX11-FBP.050	1SAJ 924 001 R0005	1	0.04 (0.088)
Extension Cable	1.00 m (3.28 ft)	PDX11-FBP.100	1SAJ 924 001 R0010	1	0.08 (0.176)
Extension Cable	3.00 m (9.84 ft)	PDX11-FBP.300	1SAJ 924 001 R0030	1	0.20 (0.441)
Extension Cable	5.00 m (16.40 ft)	PDX11-FBP.500	1SAJ 924 001 R0050	1	0.31 (0.683)
Round Cable	100.00 m (328 ft)	PDC11-FBP.999	1SAJ 924 004 R1000	1	5.60 (12.346)

#### Profibus DP Accessories for Bus Extension

Designation	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
Male Connector for round cable	PDM11-FBP.0	1SAJ 924 005 R0001	5	0.03 (0.066)
Female Connector for round cable	PDF11-FBP.0	1SAJ 924 006 R0001	5	0.03 (0.066)

#### Profibus DP Termination Resistor, Miscellaneous Accessories

Designation	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
Termination Resistor, 150 Ohm	PDR11-FBP.150	1SAJ 924 007 R0001	1	0.03 (0.066)
Feeding connector 24V DC, Code B-A	PDV11-FBP.0	1SAJ 924 008 R0001	1	0.04 (0.088)
Feeding connector 24V DC, Code A-A	PDV12-FBP.0	1SAJ 924 011 R0001	1	0.04 (0.088)
Adaptor M12-Dsub9-M12 Cable length 0.50m	PDA11-FBP.050	1SAJ 924 009 R0005	1	0.04 (0.088)
Adaptor M12-Dsub9-M12 Cable length 2 x 0.50m	PDA12-FBP.050	1SAJ 924 010 R0005	1	0.04 (0.088)

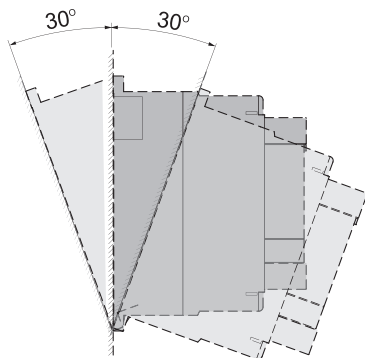
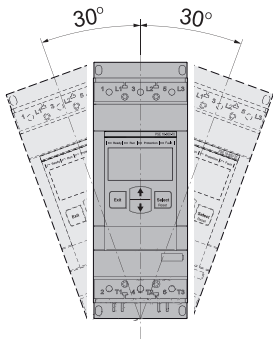
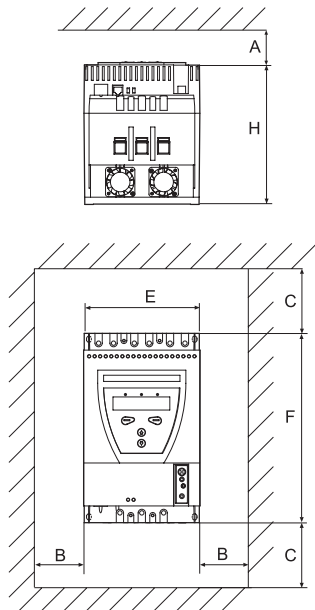
#### Extension cable

Designation	Cable length	Type	Part number	Pack <sup>ing</sup> piece	Weight kg (lb) 1 piece
Extension cable (female/male), shielded	0.3 m (0.98 ft)	CDP15-FBP.030	1SAJ 929 140 R0003	1	
Extension cable (female/male), shielded	0.6 m (1.97 ft)	CDP15-FBP.060	1SAJ 929 140 R0006	1	
Extension cable (female/male), shielded	1.5 m (4.92 ft)	CDP15-FBP.150	1SAJ 929 140 R0015	1	0.20 (0.441)
Extension cable (male/open), shielded	1.5 m (4.92 ft)	CDP16-FBP.150	1SAJ 929 150 R0015	1	0.20 (0.441)

# Wall mounting instructions

## Softstarters

### Minimum distance to wall/front

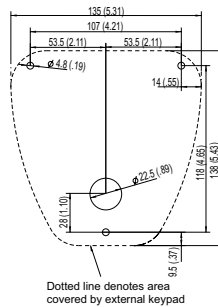
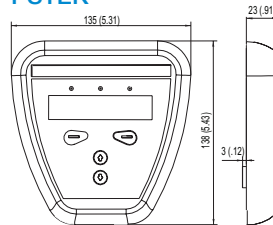


### Dimensions (mm/in)

Softstarter	A	B	C	E	F	H
<b>PSR</b>						
PSR3 ... 16	25/0.984	0 <sup>1)</sup>	0	45/1.77	140/5.51	114/4.49
PSR25 ... 30	25/0.984	0 <sup>1)</sup>	0	45/1.77	160/6.30	128/5.04
PSR37 ... 45	25/0.984	0 <sup>1)</sup>	0	54/2.13	187/7.36	153/6.02
PSR60 ... 105	25/0.984	0 <sup>1)</sup>	0	70/2.76	220/8.66	180/7.09
<b>PSE</b>						
PSE18 ... 105	20/0.787	10/0.394	100/3.94	90/3.54	245/9.65	185.5/7.30
PSE142 ... 170	20/0.787	10/0.394	100/3.94	130/5.12	295/11.61	219.5/8.64
PSE210 ... 370	20/0.787	10/0.394	100/3.94	190/7.48	550/21.65	236.5/9.31
<b>PST</b>						
PST30 ... 72	20/0.787	10/0.394	100/3.94	160/6.30	260/10.24	196/7.72
PST85 ... 142	20/0.787	10/0.394	100/3.94	186/7.32	390/15.35	270/10.63
PST175 ... 300	20/0.787	10/0.394	100/3.94	360/14.17	420/16.54	270/10.63
<b>PSTB</b>						
PSTB370 ... 470	20/0.787	15/0.394	150/5.91	365/14.37	460/18.11	361/14.21
PSTB570 ... 1050	20/0.787	15/0.394	150/5.91	435/17.13	515/20.28	381/14.21

<sup>1)</sup> 5 mm/0.197 inch for the 24 V AC/DC version

### Dimensions PSTEK



Dotted line denotes area covered by external keypad

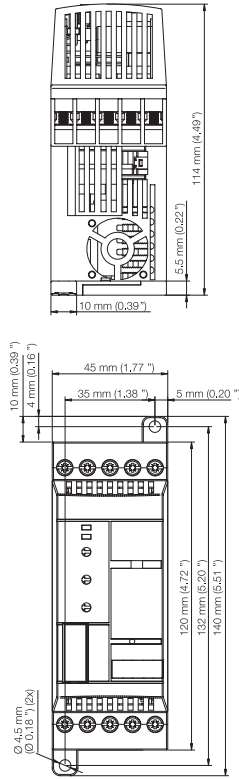
Dimensions in mm (and inches)

Dimensions in mm (and inches)

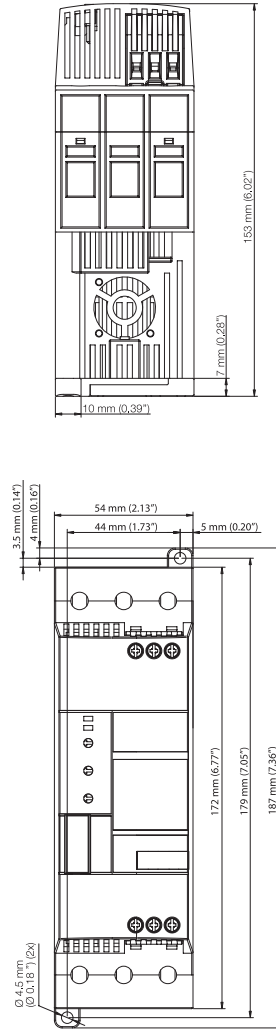


# Dimensions PSR softstarters

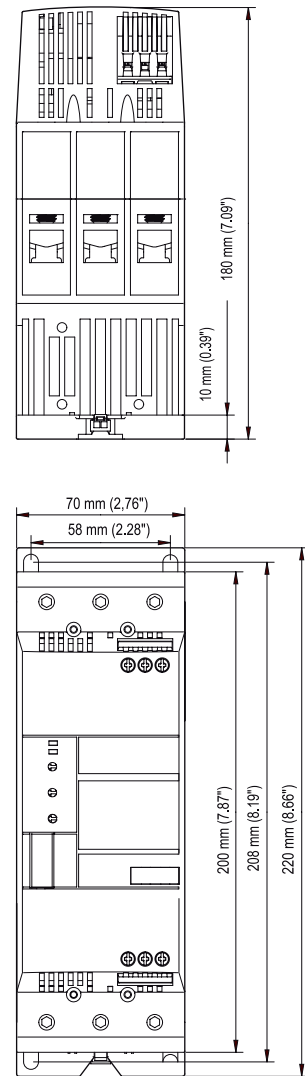
## PSR3 ... 16



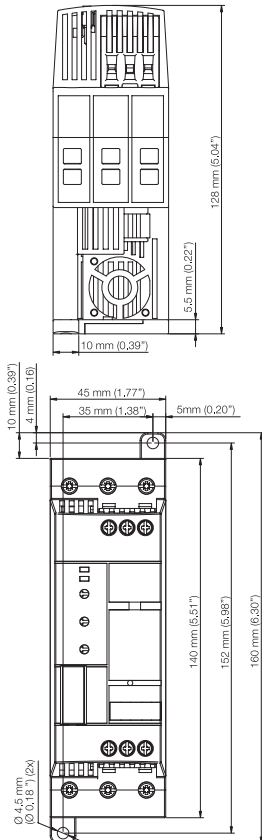
## PSR37 ... 45



## PSR60 ... 105



## PSR25 ... 30

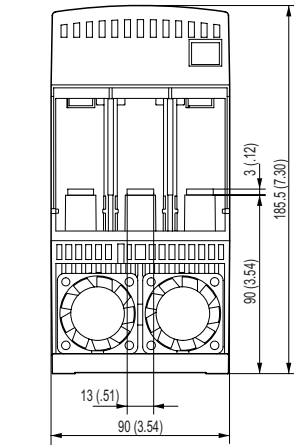


Dimensions in mm (and inches)

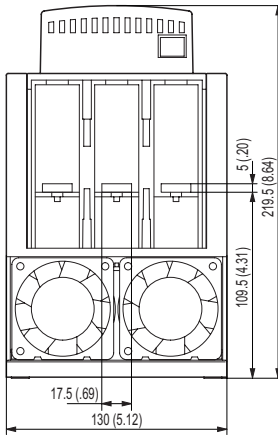
# Dimensions

## PSE softstarters

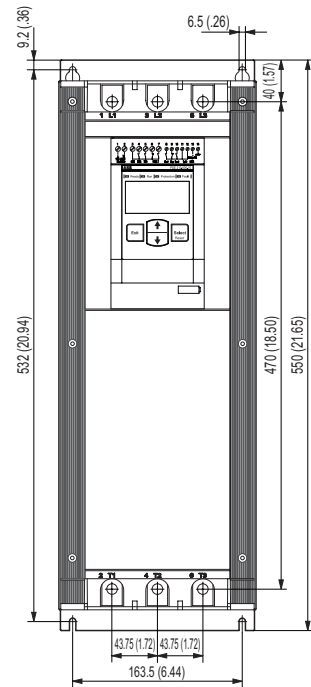
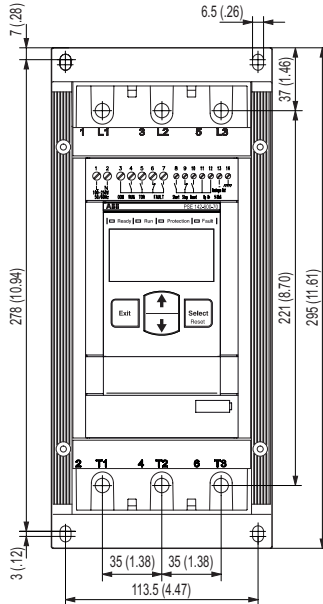
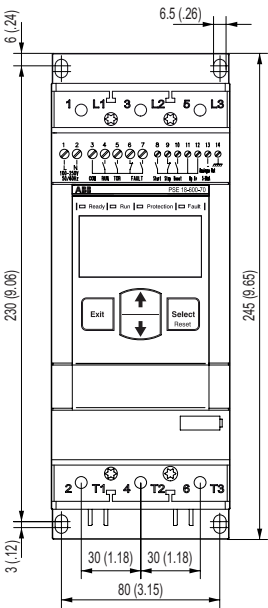
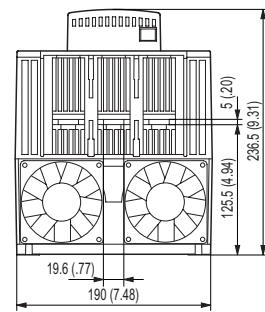
PSE18 ... 105



PSE142 ... 170



PSE210 ... 370

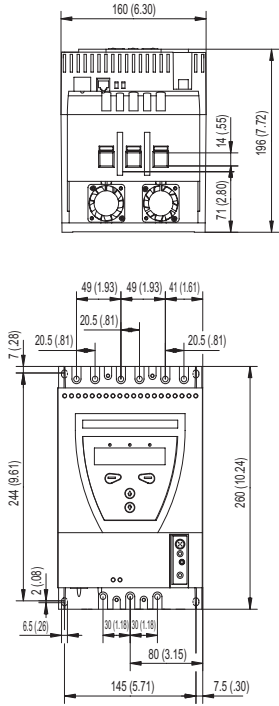


Dimensions in mm (and inches)

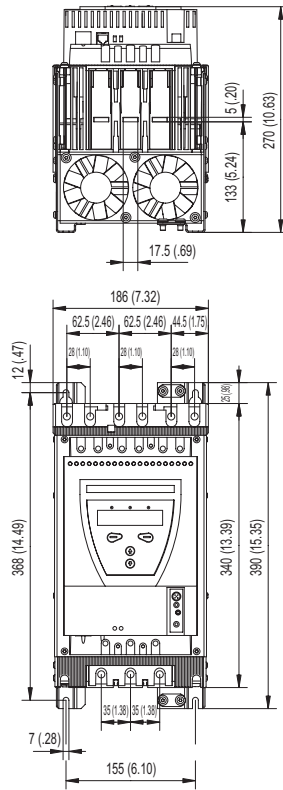
# Dimensions

## PST and PSTB softstarters

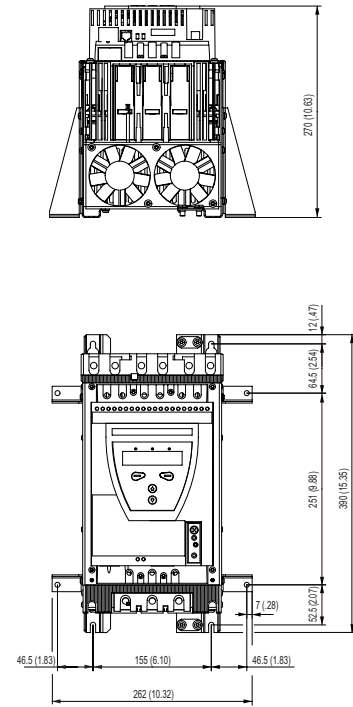
**PST30 ... 72**



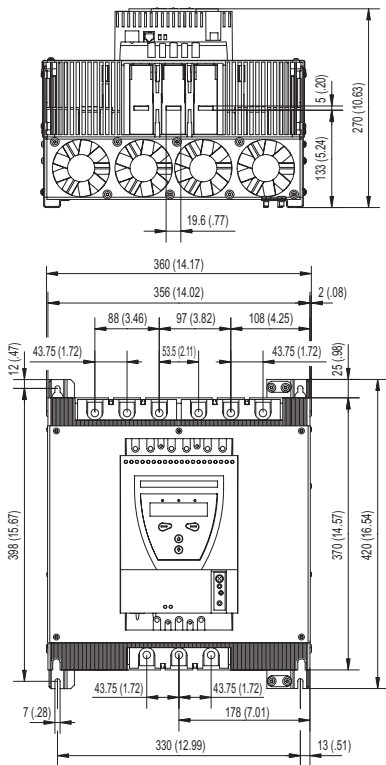
**PST85 ...142**



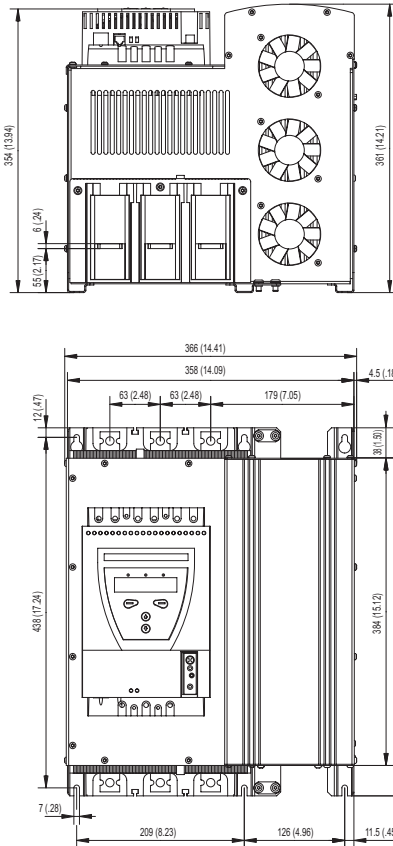
**PST85 ...142 with marine kit**



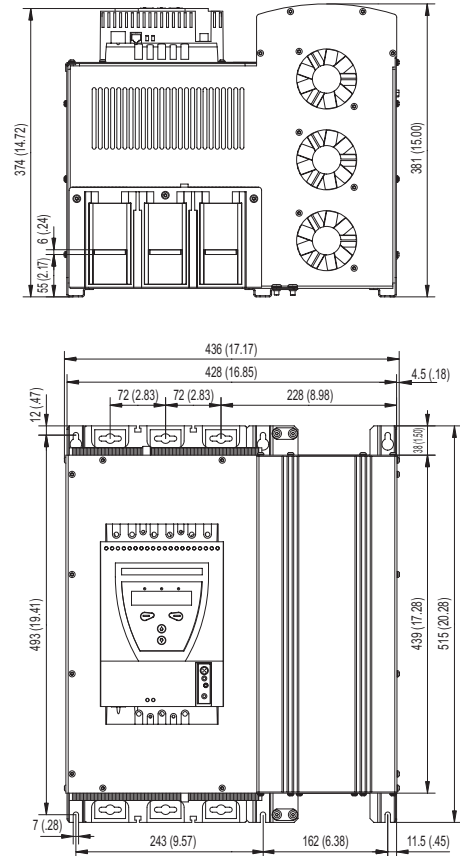
**PST175 ... 300**



**PSTB370 ... 470**



**PSTB570 ... 1050**



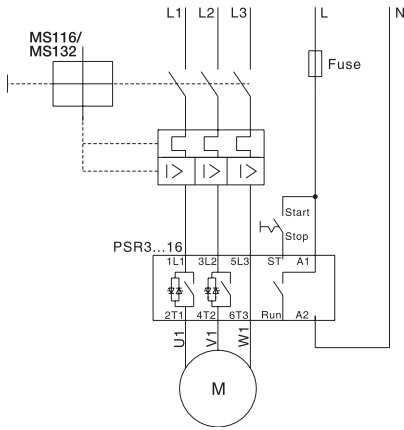
Dimensions in mm (and inches)

# Circuit diagrams

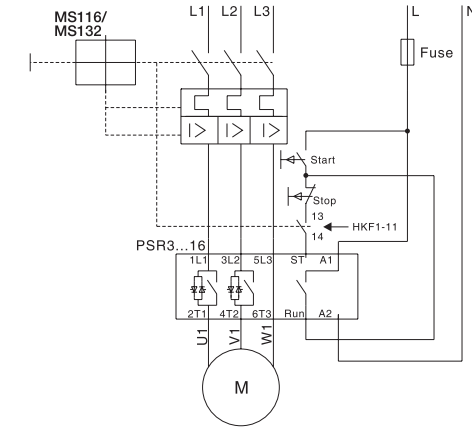
## PSR softstarters

### PSR3 ...16

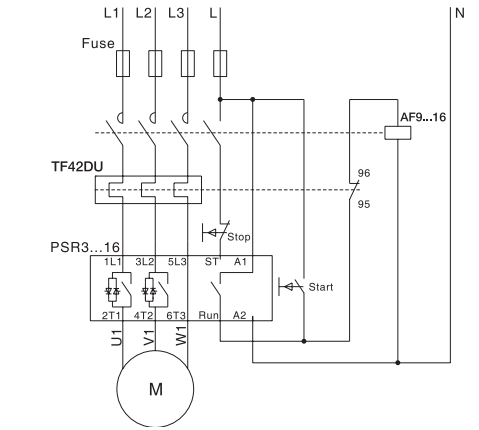
#### A) With MMS



#### B) With MMS and auxiliary contact

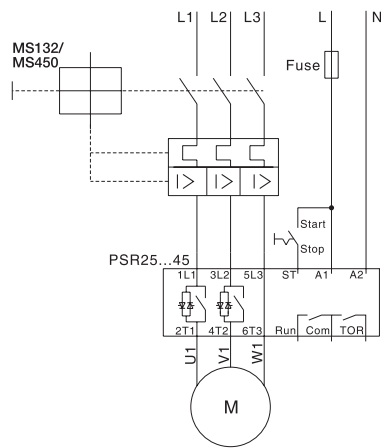


#### C) With fuses, contactor and O.L.

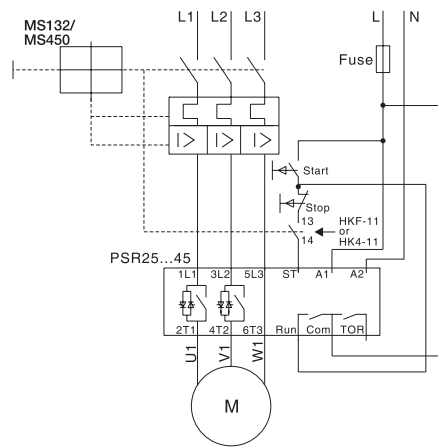


### PSR25 ... 45

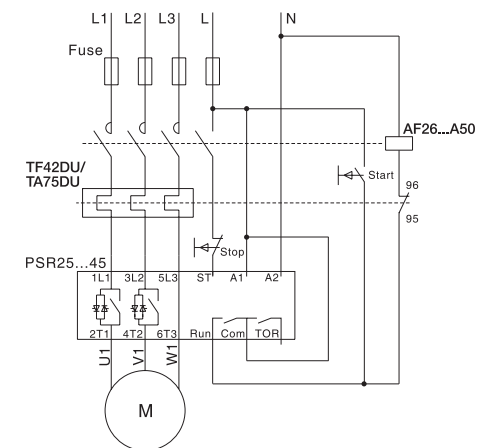
#### D) With MMS



#### E) With MMS and auxiliary contact

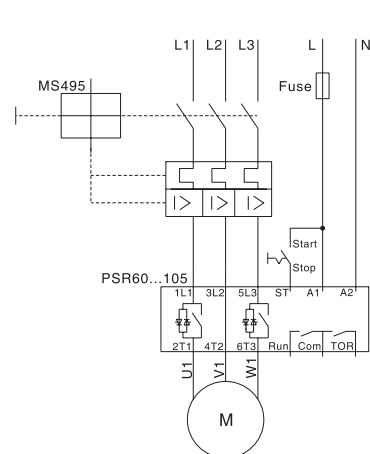


#### F) With fuses, contactor and O.L.

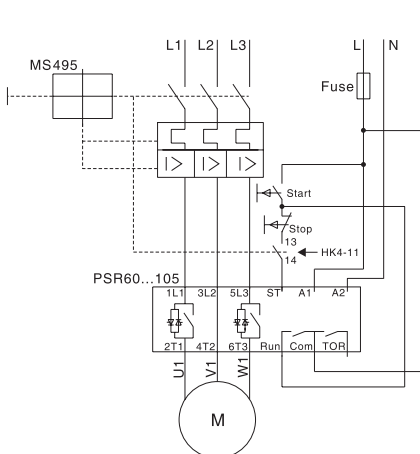


### PSR60 ... 105

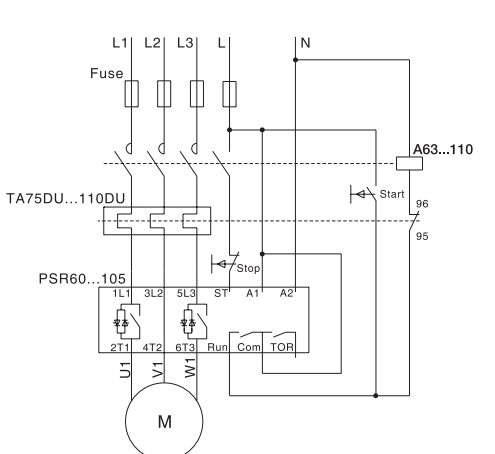
#### G) With MMS



#### H) With MMS and auxiliary contact



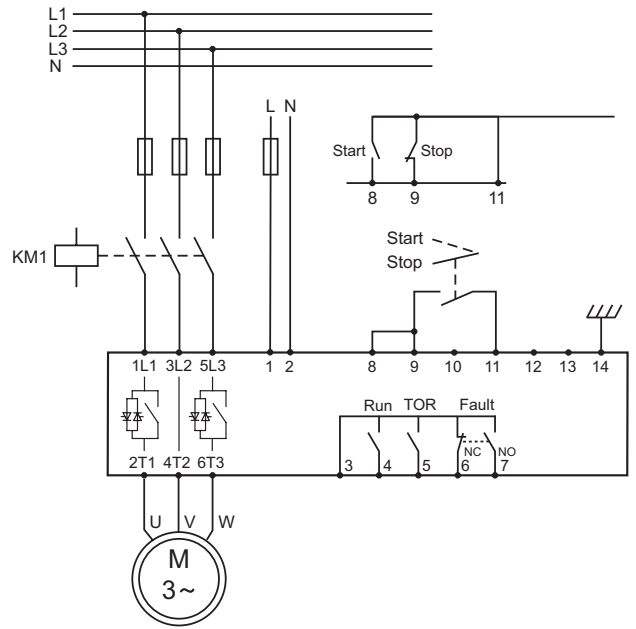
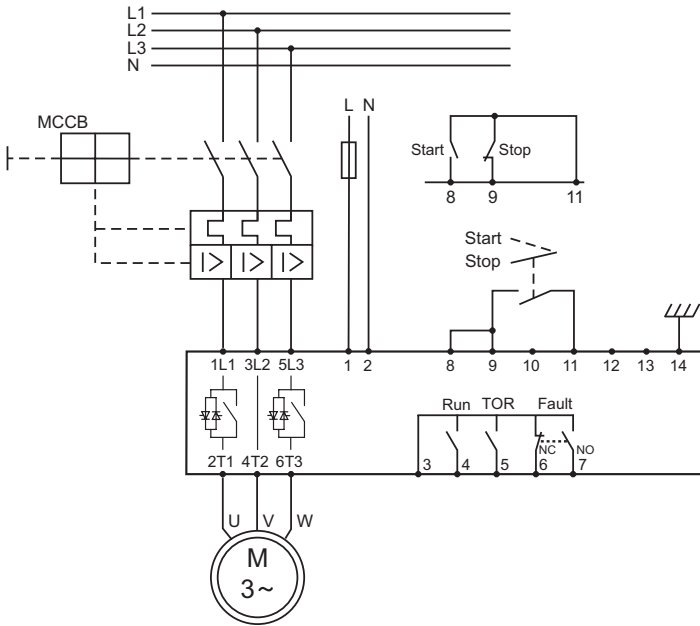
#### I) With fuses, contactor and O.L.



# Circuit diagrams

## PSE softstarters

### PSE18 ... 370

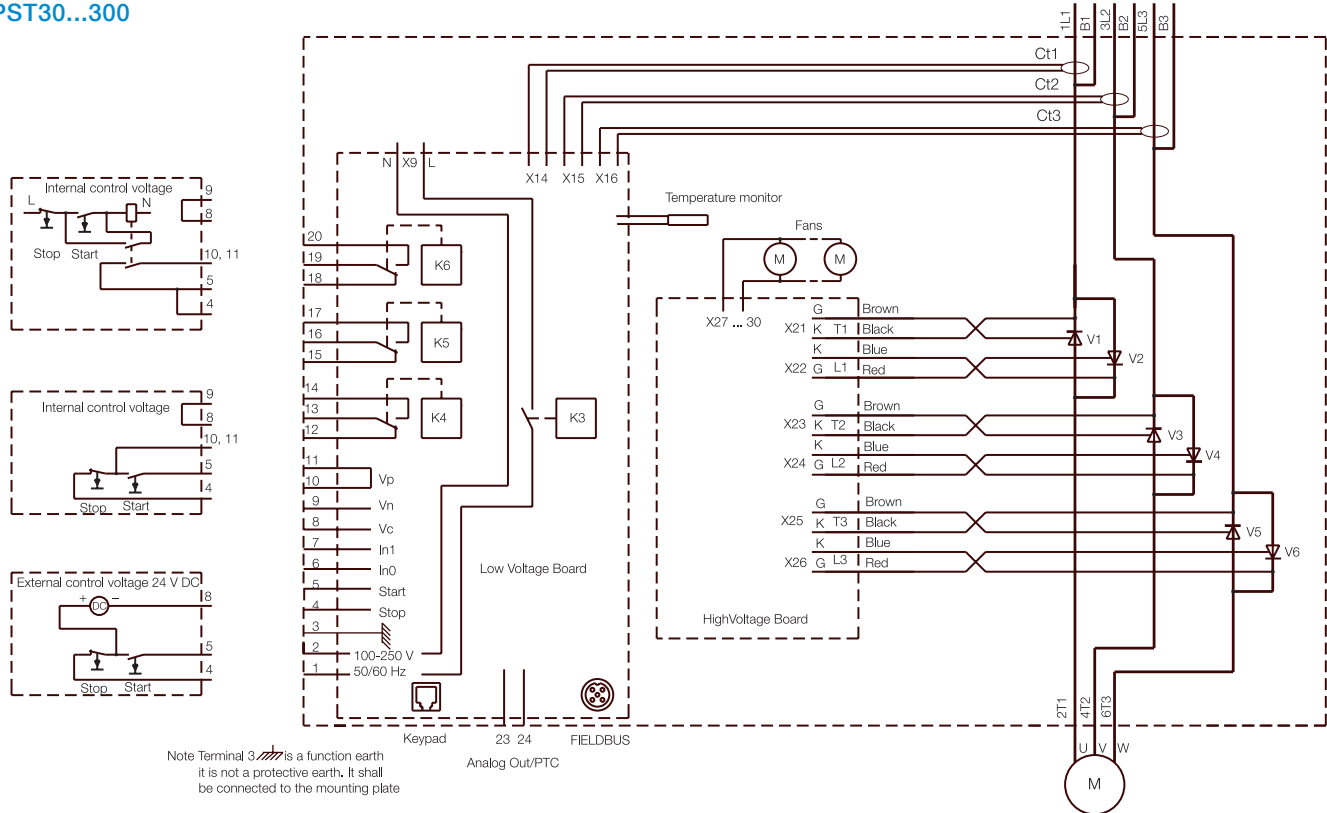




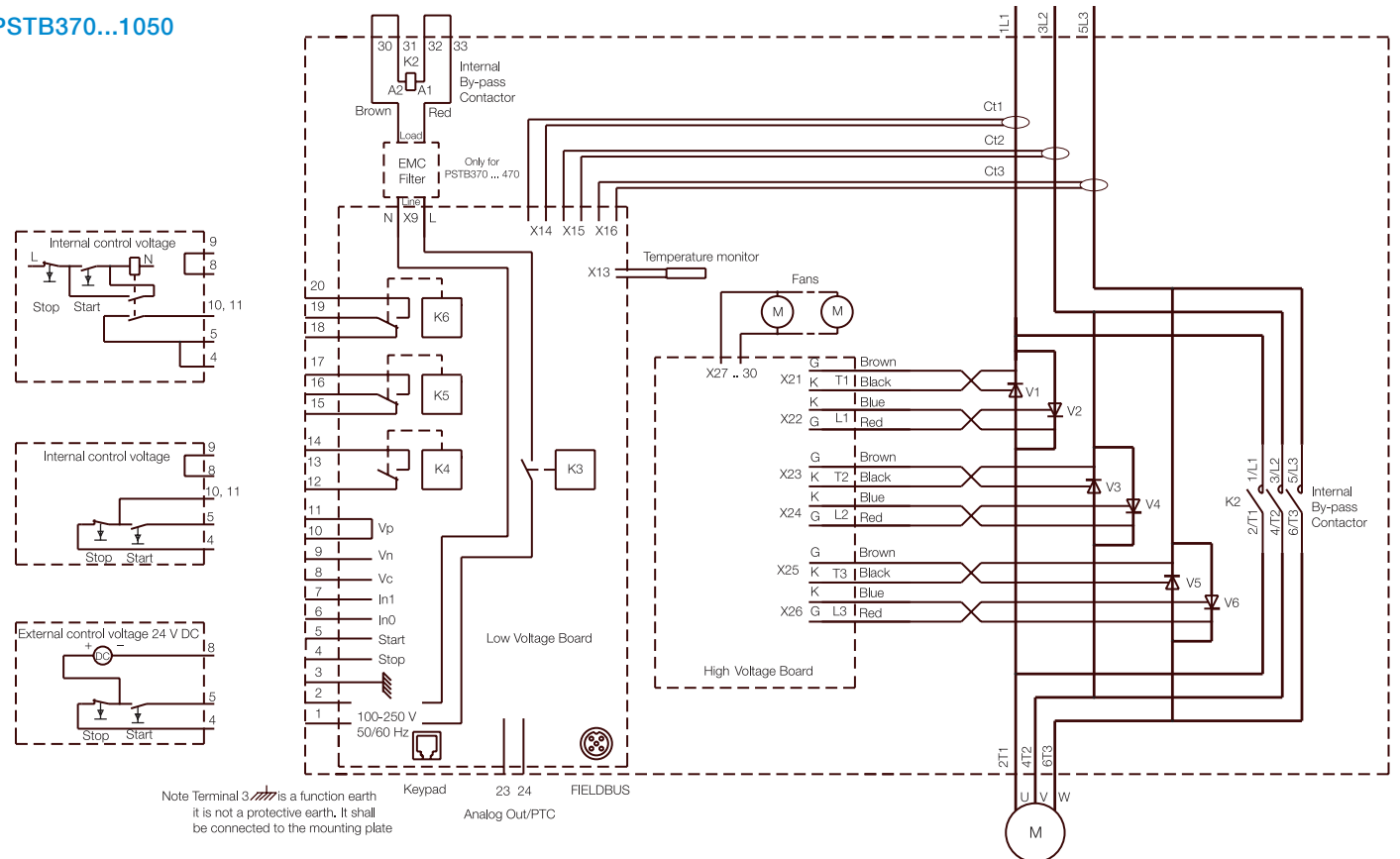
# Circuit diagrams

## PST and PSTB softstarters

### PST30...300



### PSTB370...1050



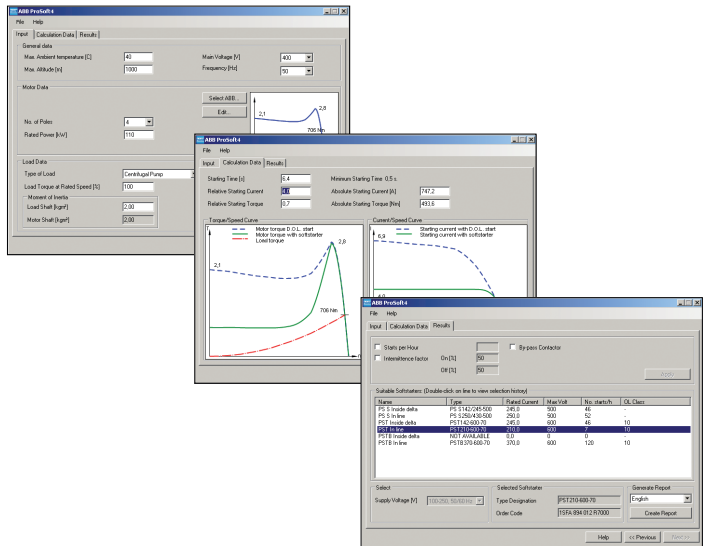
# prosoft and marketing material

## prosoft 5 - Softstarter selection tool

The selection of a softstarter can be done according to this catalog. This will work fine in the majority of cases but by using the softstarter selection tool prosoft, a more optimized selection will be achieved. Especially in extremely heavy duty applications with several minutes starting time, the use of prosoft is recommended.

When using prosoft, the selection is done in 3 steps, which can be seen as 3 different tabs in the program:

1. Input tab – Type in the general data and information about the motor and about the load. Try to use as accurate data as possible to get the most accurate results.
2. Calculation tab – Here it is possible to see how long the start will be depending on how high the current is. This tab will indicate which settings should be used and it might affect the selection.
3. The selection tab – Select which of the suggested softstarters to use. Here it is also possible to generate a report about the selection.



## SoftstarterCare™ Service Engineer Tool for PSE

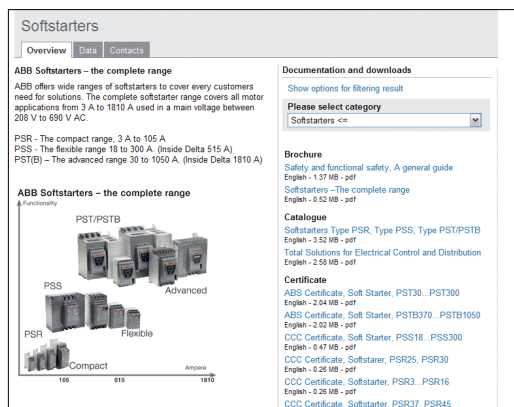
- Access all parameters on the HMI from a PC
- Access to additional parameters that can't be reached from the HMI
- Access to the PSE event log
- Access to PSE Softstarter status information
- Upgrade the Softstarter firmware



## Marketing material available on [www.abb.com/lowvoltage](http://www.abb.com/lowvoltage)

The following material is a selection of all softstarter related material that is available on [www.abb.com/lowvoltage](http://www.abb.com/lowvoltage). Just click on "Control Products", then "Softstarters".

- Product catalogs and brochures
- Certificates and approvals
- Circuit diagrams and application diagrams
- Dimension drawings (2D and 3D)
- Manuals
- eds- and gsd-files for fieldbus connection
- prosoft selection tool











# Certifications and approvals

The table below shows the approvals and certifications for different softstarters.

For approvals and/or certificates not listed below, please contact your local ABB sales office.

## Certifications and approvals

Abbreviation Approved in	Certifications					Approvals: ship classification societies		
								
	CE EU	cULus Canada USA	CCC China	GOST Russia	ANCE Mexico	C-tick Australia	ABS American Bureau of Shipping	GL Germany
PSR3 ... PSR105	•	•	•	•	–	•	–	–
PSE18 ... PSE370	•	•	•	•	•	•	–	–
PST30 ... PSTB1050	•	•	•	•	•	•	•	•

• **Standard design approved**, the company labels bear the certification mark when this is required.

## Directives and standards

No. 2006/95/EC

No. 2004/108/EC

EN 60947-1

EN 60947-4-2

UL 508

CSA C22.2 No 14

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