Softstarters
PSR, PSRC, PSE and PSTX

For more information, please contact your local ABB representative or visit solutions.abb/softstarters
Motors use almost one third of the world’s generated electricity. So it is safe to say that reliable motor operation is crucial to our modern way of life.
ABB softstarters
How we are helping the industry

A softstarter from ABB offers you several values and benefits. Whether you are a consultant, OEM, panel builder or end-user, a softstarter will add to your business value by securing motor reliability, improving installation efficiency and increasing application productivity.

ABB softstarters help increase your motors lifetime by protecting it from electrical stress. Starting currents are easily optimized to your load, application and motor size. Over ten motor protection features are included to keep your motor safe from different load and network irregularities.

Reduce your installation time and panel size by having all features you need built into your softstarter. Our softstarters are easy to install thanks to their compact design and many built-in features. The built-in bypass saves energy and space while reducing heat generation. A complete motor starting solution in one unit.

Reduce the number of stops in your production by allowing your softstarter to do more than just starting. Our softstarters reduce the mechanical stress on your motor application, which will increase your uptime. Torque control, pump cleaning, motor brake and many other features enable you to operate your process at its full potential.

Xylem - South Africa
ABB softstarters providing efficiency to the mining industry

One of Xylem’s water solutions helps to prevent flooding in mines. Previous softstarters needed a lot of extra protection equipment. Xylem was looking for a simpler solution that would ensure reliability even at 3,500 meters depth. Reducing the number of components by 80 percent, shortened installation time by 60 percent. Costs cut to half has helped Xylem sell twice as many panels with softstarters as before.

installation time reduced by 60%

$ total panel cost reduced by 50%
Common applications for softstarters
Pumps, fans, compressors and conveyors

A softstarter can do wonders with your operations. Packed with useful features, it reduces the wear of your equipment, improve the reliability of your processes and increase overall productivity.

Pump
Eliminating water hammering with torque control
Water hammering is a common problem with pumps and typically results in wear in pipes and valves when starting and stopping the pump. The ABB softstarter feature torque control provides a soft pipe fill during start and eliminates water hammering during stop. The benefits are prolonged lifetime of the system and increased uptime.

Keep pipes and pumps clean
Many pumps risk getting clogged over time. This will cause reduced flow and increased risk of pump damage. Thanks to the feature to reverse the direction of the flow and start again with kick-start, ABB softstarters can help prevent and solve pump clogging and associated downtime.

Avoid running dry with underload protection
Damages due to pumps running dry can be avoided with the softstarter feature dry pump protection, called underload protection. It stops the motor which saves the pump from additional wear and contributes to prolonging its lifetime.

Fans
Soft starting adjusted to application
Fans normally have a high moment of inertia, which makes starting tough and current high. Using an ABB softstarter, the voltage is increased gradually during start, which reduces the current and removes the inrush peak. It is possible to adjust the settings to fit almost any starting condition, from unloaded to fully loaded.

Fast stops with motor braking
It can also take a long time to stop a fan. With the dynamic brake feature, also called flux braking, the stopping time can be reduced. This improves process safety when the load has a high moment of inertia and makes fan operation easier for the operator.

Avoid unwanted movements with stand still brake
An idle fan that is rotating backwards, due to wind or airflow from another fan, can be kept still using the stand still brake. It prevents unwanted airflow and improves the control of the system without the need for an external mechanical brake.

Compressors
Full control of current with current limit
Many applications are sensitive to high or variable starting currents. The feature current limit makes it possible to start the motor securely even in a weaker network, improving the availability of the equipment and system. Reducing the current means reducing the stress on cables, network and motor.

Full voltage start for scroll compressors
For scroll compressors it is often necessary to start the motor in a very short time while still maintaining a low starting current. Full voltage start is a start mode that gives you almost a direct start but without the current peak.

Phase reversal protection for problem-free commissioning
A motor rotating in the wrong direction, which may occur due to connecting the phases wrongly, may cause severe damage to a compressor. Using phase reversal protection, the motor won't start in the wrong direction, avoiding costly compressor downtime and repairs.

Conveyors
Avoid overheating with overload protection
Too much material on a conveyor belt may cause overload and overheating, reducing the reliability and longevity of the motor. ABB’s overload protection feature shuts down the motor in case of overload, avoiding overheating.

Increased flexibility with jog with slow speed
After stopping the belt, it may be necessary to run the motor at low speed to correctly position the belt before resuming operation. The jog with slow speed feature makes it possible to position the belt manually, in both forward and reverse direction, before re-starting the belt. This improves process efficiency and eliminates the need for a variable speed drive, a considerably more expensive solution for solving the problem.

Continuous operation with limp mode
Shorted thyristor is a possible problem for a softstarter, putting it out of operation until the component has been replaced. Using limp mode, the softstarter will continue to work with one thyristor shorted, avoiding costly unplanned stoppages.
Motor starting
Why motor starting and stopping matters

There are some common issues associated with starting and stopping electrical motors. Depending on requirement, different starting and stopping methods can be used.

Direct-on-line
Direct-on-line starting (DOL) is the easiest and most commonly used starting method. It is suitable for stable networks and mechanically stiff and well-dimensioned shaft systems due to the high current and torque generated during start. DOL starting is uncontrolled, which means that the motor will start with maximum current and torque regardless of load type.

Star-delta
A star-delta starter reduces current and torque during start. The starting current is about one third compared to direct-on-line starting, although it also reduces the starting torque to about 25 percent. Star-delta is not adjustable, so if the torque is reduced too much, the motor will not start. Current peaks will happen when switching from star to delta connection.

Softstarter
Like direct-on-line and star delta starters, softstarters are used to start and stop motors in full-speed applications. It eliminates common problems associated with motor starting and stopping, including electrical surges, spikes and high inrush currents. Because it offers soft starting and stopping, a softstarter is the optimal compromise between a direct-on-line or star-delta starter and a variable speed drive in many full-speed motor applications.

Variable speed drive
Like a softstarter, a variable speed drive (VSD) can perform soft motor starting and stopping. However, the VSD was designed primarily to control motor speed, resulting in energy efficient motor operation in variable speed applications. Using a VSD with the sole purpose of ensuring soft starting and stopping of full-speed motors can therefore be considered an unnecessarily advanced solution.

Comparison between different starting methods
The table below describes which problems are prevented, using the most common starting methods.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Direct on line</th>
<th>Star-delta start</th>
<th>Softstarter</th>
<th>Drive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce high inrush current</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Reduce heavy wear on bearings, shafts, etc</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Prevent slipping belts</td>
<td></td>
<td>○</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Remove torque/current peaks</td>
<td></td>
<td>○</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Prevent water hammering in piping system</td>
<td></td>
<td>○</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Need of variable speed control</td>
<td></td>
<td>○</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

● = standard, ○ = reduced, – = not available
ABB softstarters
A part of your motor starting solution

Motor starting requires several components to work perfectly together. ABB is a one-stop shop for motor starting, offering all the necessary components and complete motor starting solutions, proven together in numerous installations worldwide.

Can I use a softstarter on a ship?

ABB softstarters PSE and PSTX have marine approvals and are certified for marine environment.

Ships use IT-networks which means that there is a floating electrical ground. It is possible to use an ABB softstarter in such a network but it is recommended to not connect the functional ground on the softstarter to the ship to avoid disturbances from the network to effect the electronics inside the softstarter.

Can I use a softstarter for an ATEX motor?

ABB softstarter PSTX can be used to start ATEX classified motors in EX environments. However, always consult with your local ATEX certified expert for component selection and system design. Listed below are some points for consideration (but not limited to):

- Locate the softstarter outside the EX area, or in an ATEX approved panel
- The PSTX Softstarter has not a specific ATEX approved motor overload protection. The standard (global or local) may require this depending on the type of installation. If the standard requires it an external ATEX approved EOL/TOL should be considered
- Select softstarter according to normal or heavy-duty start depending on your application
- A line/fault contactor can be used in case of failure
- Determine the short circuit coordination rating and type that is needed for the application. Typically, there should be a coordination for a device, for example a fault contactor, that won’t get welded shut in case of short circuit.

Always consult with certified ATEX expert and follow local laws and regulations that applies.

Typical motor control cabinet
Overview

- Power supply CP-C.1
  - Power reserve and switching of high-peak currents help maximize system availability. Rated output voltage 24 VDC

- Short circuit breaker MCCB
  - Short circuit protection of motor
  - Possibility for electrical isolation

- Switch fuse
  - Short circuit protection of downstream devices
  - Type 2 coordination when using rapid fuses
  - Making and breaking of motor loads (AC-23A)
  - Safe isolation

- Liquid level monitoring relays CM-ENS
  - Monitoring and signalling the water level

- PLC ACS500
  - Automatic control
  - Remote communication

- Line contactor AF
  - Isolation at stop
  - Isolation at faults
  - Emergency trip
  - Back-up DOL starter

- Safety relay
  - The Sentry safety relay series are powerful and easy to use. They can monitor E-stops or other type of safety devices up to PLe/SIL3

- Switch fuse
  - Short circuit protection of downstream devices
  - Type 2 coordination when using rapid fuses
  - Making and breaking of motor loads (AC-23A)
  - Safe isolation

- Pilot devices
  - Remote control of motor
  - Indication of softstarter and motor status with light and sound
  - Emergency stop of motor

- Line contactor AF
  - Isolation at stop
  - Isolation at faults
  - Emergency trip
  - Back-up DOL starter

- Softstarter
  - Soft start and stop with reduced current
  - Features to improve process productivity
  - Detachable keypad for front door mounting on a panel
Softstarters portfolio
Overview

PSR - The compact range
PSR is our most compact softstarter with basic benefits and values. PSR can handle up to 100 starts per hour. Suitable for small motors.

Current: 3 A – 105 A
Main voltage: 208 V – 600 V

PSRC - For scroll compressor
PSRC is fast and easy to install with fixed settings. Designed for scroll compressors resulting in less stress on the compressor reducing the maintenance cost to a minimum.

Current: 3 A – 105 A
Main voltage: 208 V – 600 V

PSE - The efficient range
The new generation PSE is a true general purpose softstarter. It’s a perfect balance between high starting capacity and cost efficiency. Now featuring built-in fieldbus communication.

Current: 18 A – 370 A
Main voltage: 208 V – 600 V

PSTX - The advanced range
PSTX is the most complete alternative for any motor starting application. Featuring built-in modbus and anybus modules that support all major communication protocols.

Current: 30 A – 1250 A
Main voltage: 208 V – 690 V

Softstarters selection
ABB softstarters offering consists of four ranges, covering every need. The products help you secure motor reliability, improve installation efficiency and increase application productivity.

Altitude formula
De-rate for altitudes between 1000-4000 m or 3280-13123 ft with the following equations for all softstarters:

In meters: % of Ie = 100 – (x-1000)/150
In feet: % of FLA = 100 – (y-3280)/480
Where x/y is the actual altitude in m/ft

Temperature equations
PSTX and PSR in Celsius: 40...60 °C: Reduce Ie with 0.8%/°C
PSTX and PSR in Fahrenheit: 104...140 °F: Reduce FLA with 0.44%/°F
PSE in Celsius: 40...80 °C: Reduce Ie with 0.8%/°C
PSE in Fahrenheit: 104...140 °F: Reduce FLA with 0.33%/°F

Selection process
1. Determine softstarter series
First, determine the softstarter series that fulfill the needs of the application and motor. Use the guide on the left to explore the three series and the power range each one covers.

2. Match the softstarter size with the motor current
When the softstarter series is selected, the correct size should now be determined. The selection of a softstarter is based on the current. Find the softstarter that corresponds to the motor current.

3. Fine tune and select the correct size
The last step is to fine tune the selection, and there are three different factors to consider:
- Normal or a heavy load: If the load is characterized as a heavy load, select the next size softstarter in the series.
- High ambient temperature
- High altitude
Use the equations and the table on the right to find the correct de-rating equation.
Softstarters benefits and features

Increase your motors lifetime...
With ABB softstarters, starting currents are easily optimized to your load, application and motor size.

...by protecting it from electrical stresses.
Over ten motor protection features are included to keep your motor safe from overloads and network irregularities.

Reduce your installation time and panel size...
ABB softstarters are easy to install thanks to their compact design and many built-in features.

...by having everything that you need built in.
Built-in bypass saves energy and space while reducing heat generation: a complete motor starting solution in one unit designed and verified by ABB.

Reduce the number of production stops...
ABB softstarters reduce mechanical stress on your application which increases uptime.

...by letting the softstarter do more than just starting.
Torque control, pump cleaning, motor break and many more features enables you to use your process to its full potential.

Softstarter features

<table>
<thead>
<tr>
<th>Feature</th>
<th>PSR</th>
<th>PSE</th>
<th>PSTX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current limit</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>Current limit ramp and dual current limit</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>Electronic motor overload protection</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>Dual overload protection</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>Underload protection</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>Power factor underload protection</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>Locked rotor protection</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>Current/Voltage imbalance protection</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>Phase-reversal protection</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>Customer defined protection</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>Motor heating</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>PTC/PT100 input for motor protection</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>Overvoltage/undervoltage protection</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>Earth-fault protection</td>
<td>—</td>
<td>—</td>
<td>●</td>
</tr>
</tbody>
</table>

● = standard, O = option, – = not available

Case studies

Tasmanian salmon operation keeps its fish cool with ABB softstarters
Tassal upgrades the motor control center in Australia’s biggest land-based salmon hatchery with ABB Softstarters, ensuring the continuous operation of its water chillers.
For more information visit: Link

Lower the inrush current by 50%

Xylem - South Africa
ABB softstarters providing efficiency to the mining industry
Xylem reducing the number of components by 80%, shortened installation time by 60%. Costs cut to half has helped Xylem sell twice as many panels with softstarters as before. For more information visit: Link

Total panel costs reduced by 50%

Indian tourist town is pumped up over ABB Softstarters that help uninterrupted water supply
Shimla has cut pipeline damage 50% using Softstarters to help lift water thousands of feet from a dam to quench the thirst of millions. For more information visit: Link

Pipeline damage reduced by 50%
Wall mounting
Instructions

<table>
<thead>
<tr>
<th>Product</th>
<th>Minimum distance to wall mm (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSR3 … PSR16</td>
<td>A 0  B 0  C 25 (0.98)  D N/A</td>
</tr>
<tr>
<td>PSR25 … PSR30</td>
<td>A 0  B 0  C 25 (0.98)  D N/A</td>
</tr>
<tr>
<td>PSR37 … PSR45</td>
<td>A 0  B 0  C 25 (0.98)  D N/A</td>
</tr>
<tr>
<td>PSR60 … PSR105</td>
<td>A 0  B 0  C 25 (0.98)  D N/A</td>
</tr>
<tr>
<td>PSRc</td>
<td></td>
</tr>
<tr>
<td>PSR3 … PSR16</td>
<td>A 0  B 0  C 25 (0.98)  D N/A</td>
</tr>
<tr>
<td>PSR25 … PSR30</td>
<td>A 0  B 0  C 25 (0.98)  D N/A</td>
</tr>
<tr>
<td>PSR37 … PSR45</td>
<td>A 0  B 0  C 25 (0.98)  D N/A</td>
</tr>
<tr>
<td>PSR60 … PSR105</td>
<td>A 0  B 0  C 25 (0.98)  D N/A</td>
</tr>
<tr>
<td>PSE</td>
<td></td>
</tr>
<tr>
<td>PSE18 … PSE105</td>
<td>100 (3.94)  A 10 (0.39)  B 20 (0.79)  D N/A</td>
</tr>
<tr>
<td>PSE142 … PSE170</td>
<td>100 (3.94)  A 10 (0.39)  B 20 (0.79)  D N/A</td>
</tr>
<tr>
<td>PSE210 … PSE210</td>
<td>100 (3.94)  A 10 (0.39)  B 20 (0.79)  D N/A</td>
</tr>
<tr>
<td>PSTX</td>
<td></td>
</tr>
<tr>
<td>PSTX30 … PSTX105</td>
<td>100 (3.94)  A 10 (0.39)  B 20 (0.79)  D 35 (1.38)</td>
</tr>
<tr>
<td>PSTX142 … PSTX170</td>
<td>100 (3.94)  A 10 (0.39)  B 20 (0.79)  D 35 (1.38)</td>
</tr>
<tr>
<td>PSTX210 … PSTX210</td>
<td>100 (3.94)  A 10 (0.39)  B 20 (0.79)  D 35 (1.38)</td>
</tr>
<tr>
<td>PSTX410 … PSTX410</td>
<td>150 (5.91)  A 15 (0.59)  B 20 (0.79)  D 35 (1.38)</td>
</tr>
<tr>
<td>PSTX620 … PSTX840</td>
<td>150 (5.91)  A 15 (0.59)  B 20 (0.79)  D 35 (1.38)</td>
</tr>
<tr>
<td>PSTX1050 … PSTX1250</td>
<td>150 (5.91)  A 15 (0.59)  B 20 (0.79)  D 35 (1.38)</td>
</tr>
</tbody>
</table>

Certifications and approvals
The table below shows the certifications and approvals for ABB softstarters. For other certifications and/or approvals, please contact ABB.

<table>
<thead>
<tr>
<th>Certification</th>
<th>Approvals: ship classification societies</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE</td>
<td>ABS DNV Lloyd’s Register CCS PRS Class NK</td>
</tr>
<tr>
<td>EU</td>
<td>CCC EN 60947-1 CCS EN 60947-4-2 CE Lloyds Register</td>
</tr>
<tr>
<td>UL</td>
<td>C-tick CSA C22.2 No 14 KC</td>
</tr>
<tr>
<td>cULus</td>
<td>CCC EN 60947-1 EN 60947-4-2 NFCC</td>
</tr>
<tr>
<td>CCC</td>
<td>EAC CCC-22.2 No 14</td>
</tr>
<tr>
<td>China</td>
<td>EAC CCC EN 60947-4-2</td>
</tr>
<tr>
<td>USA</td>
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<td>EAC</td>
<td>EN 60947-4-2</td>
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<tr>
<td>Russia</td>
<td>EN 60947-4-2</td>
</tr>
<tr>
<td>ANCE</td>
<td>EN 60947-4-2</td>
</tr>
<tr>
<td>Mexico</td>
<td>EN 60947-4-2</td>
</tr>
<tr>
<td>Australia</td>
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<tr>
<td>Korea</td>
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<tr>
<td>ABS</td>
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</tr>
<tr>
<td>DNV</td>
<td>EN 60947-4-2</td>
</tr>
<tr>
<td>Lloyd’s</td>
<td>EN 60947-4-2</td>
</tr>
<tr>
<td>Register</td>
<td>EN 60947-4-2</td>
</tr>
<tr>
<td>CCS</td>
<td>EN 60947-4-2</td>
</tr>
<tr>
<td>PRS</td>
<td>EN 60947-4-2</td>
</tr>
<tr>
<td>Class NK</td>
<td>EN 60947-4-2</td>
</tr>
</tbody>
</table>

Note: • Standard design approved, the products wear the certification mark when it is required.

Minimum distance to front
Minimum distance to wall
Maximum mounting angle

<table>
<thead>
<tr>
<th>Product</th>
<th>Minimum distance to wall mm (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSR3 … PSR105</td>
<td>A 100 (3.94)  B 10 (0.39)  C 20 (0.79)  D 35 (1.38)</td>
</tr>
<tr>
<td>PSRc3 … PSRc105</td>
<td>A 100 (3.94)  B 10 (0.39)  C 20 (0.79)  D 35 (1.38)</td>
</tr>
<tr>
<td>PSE18 … PSE370</td>
<td>A 100 (3.94)  B 10 (0.39)  C 20 (0.79)  D 35 (1.38)</td>
</tr>
<tr>
<td>PSTX30 … PSTX1250</td>
<td>A 100 (3.94)  B 10 (0.39)  C 20 (0.79)  D 35 (1.38)</td>
</tr>
</tbody>
</table>

Note: • Standard design approved, the products wear the certification mark when it is required.

Directions and standards
No. 2006/95/EC Low voltage equipment
No. 2004/108/EC Electromagnetic compatibility
EN 60947-1 Low-voltage switchgear and controlgear - Part 1: General rules
EN 60947-4-2 AC semiconductor motor controllers and starters
UL 508 Industrial Control Equipment
CSA C22.2 No 14 Industrial Control Equipment

Items included in the box with the softstarter

<table>
<thead>
<tr>
<th>Softstarter</th>
<th>Multi-language manual</th>
<th>Terminal kit</th>
<th>Cable and mounting kit for detachable keypad</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSR1 … PSR105</td>
<td>•</td>
<td>O</td>
<td>–</td>
</tr>
<tr>
<td>PSRc1 … PSRc105</td>
<td>•</td>
<td>O</td>
<td>–</td>
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<tr>
<td>PSE18 … PSE105</td>
<td>•</td>
<td>O</td>
<td>–</td>
</tr>
<tr>
<td>PSE142 … PSE370</td>
<td>•</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PSTX30 … PSTX105</td>
<td>•</td>
<td>O</td>
<td>–</td>
</tr>
<tr>
<td>PSTX142 … PSTX1250</td>
<td>•</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

• = included, O = built-in, – = not included
The PSR softstarter is the most compact of all the softstarter ranges which allows for design of a compact starting equipment.

The PSR combined with a manual motor starter makes up a far more compact starting solution than the complex star-delta starter, and with the built-in bypass, the energy losses inside the softstarter are highly reduced.
PSR - The compact range

Introduction

Reduce the electrical stresses and keep the motor protected with the MMS
The PSR reduces the starting current for the motor. The possibility to connect it to the manual motor starter makes it possible to build a compact and complete starting solution with overload and short-circuit protection.

Saving time and money with built-in bypass and easy set-up
On the PSR, the bypass is built in and verified by ABB, saving you time during installation and space in your panel. Set-up is done through three potentiometers making it very fast and easy.

Reduce the mechanical stresses on your motor
Soft start and stop with PSR will reduce mechanical wear and tear on the application and increase the availability and uptime.

Technical specifications
- Rated operational current: 3...105 A
- Operational voltage: 208...600 V AC
- Wide rated control supply voltage: 100...240 V AC, 50/60 Hz or 24 V AC/DC

Features
- Two-phase controlled
- Soft start and stop with voltage ramp
- Built-in bypass for energy saving and easy installation
- Easy set-up by three potentiometers
- Run and Top of Ramp relays available for monitoring
- Connection kits available for connection to ABB’s manual motor starters (MMS)

Protection
- Motor protection with manual motor starter

Communication
- Fieldbus communication with fieldbus plug adapter and fieldbus plug

Motor protection with manual motor starter PSR together with the MMS to get a complete motor starter with soft start and stop together with overload and short circuit protection.

Connection kit (optional) simplifies installation of the PSR by making the connection to the MMS screwless.

Output signal relays for Run and Top of ramp (PSR25 ... PSR105).

Screw or DIN-rail mounted PSR is fast and easy to install by using screw mounting or DIN-rail mounting (PSR3 ... PSR45).

LED Indicators for On/Ready and Run/Top of ramp.

Three potentiometers for settings
Set-up is made very easy with only three potentiometers, for start ramp time, stop ramp time and initial/end voltage level.

Settings

Start and stops

1. Start = 1...20 sec
2. Stop = 0...20 sec - including the step down voltage Step down = 2% reduction for each second increased stop ramp
3. $U_{end} = 40...70\%$ results in end voltage = 30...80\%

Secure motor reliability
Improve installation efficiency
Increase application productivity
### Normal start-in-line connected

<table>
<thead>
<tr>
<th>Softstarter</th>
<th>Technical data</th>
<th>Using manual motor starters type 1 coordination will be achieved</th>
<th>Using gG fuses type 1 coordination will be achieved</th>
<th>Suitable switch fuse for the above gG fuses</th>
<th>J-type fuses for UL coordination</th>
<th>Overload protection is used to protect the motor from overheating</th>
<th>The line contactor is not required for the softstarter itself but often used to open if OL trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSR3 ... PSR16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSR25 ... PSR30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSR85 ... PSR95</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Max. fuses J-type fuse</td>
<td>Thermal overload relay</td>
<td>Line contactor</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Rating operational voltage $U_n$, 208...600 V AC, Rated control supply voltage, $U_c$, 20...240 V AC, 50/60 Hz

<table>
<thead>
<tr>
<th>IEC rated operational power</th>
<th>UL/CSA rated operational power</th>
<th>Type</th>
<th>Order code</th>
<th>Net Weight (kg)</th>
<th>Net Weight (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>230V $P_e$ $kW$</td>
<td>400V $P_e$ $kW$</td>
<td>FLA</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>200/208V $P_e$ $hp$</td>
<td>220/240V $P_e$ $hp$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>440/480V $P_e$ $hp$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Coordination tables (SOC)**

For more examples of coordination visit the online tool for coordination with short circuit protection, overload protection and line contactor.
**Connections**

<table>
<thead>
<tr>
<th>Article</th>
<th>breaker type</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSR3...16</td>
<td>MS16/132</td>
<td>PSR16-MS16</td>
<td>1SFAB99211R1001</td>
<td>1</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>PSR25...30</td>
<td>MS132</td>
<td>PSR30-MS132</td>
<td>1SFAB99212R1001</td>
<td>1</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>PSR37...45</td>
<td>MS165</td>
<td>PSR45-MS165</td>
<td>1SFAB99216R1001</td>
<td>1</td>
<td>0.05</td>
<td>0.11</td>
</tr>
<tr>
<td>PSR60...72</td>
<td>MS165</td>
<td>PSR60-MS165</td>
<td>1SFAB99215R1001</td>
<td>1</td>
<td>0.05</td>
<td>0.11</td>
</tr>
<tr>
<td>PSR80...105</td>
<td>MS495</td>
<td>PSR105-MS495</td>
<td>1AMHS01901R1001</td>
<td>1</td>
<td>0.03</td>
<td>0.08</td>
</tr>
</tbody>
</table>

**Net kg**

**Power consumption:**

- at 100...240 V AC: PSR3...45 12 VA
- at 24 V AC/DC: PSR3...105 10 VA

**Fuse for control supply voltage**

For 24 V version: 1.5 A slow acting fuse
For 100-240 V version: 6 A slow acting fuse

**Technical data**

- Rated insulation voltage: 600 V
- Rated operational voltage: 230...380 V ±10% or 50/60 Hz ±5%
- Rated control supply voltage: 10...24 V AC/DC, ±10%
- Motor rating at 415 V ±5%
- Current rating at 24 V AC/DC, ±10%
- Maximum ambient temperature: 400 m (1312 ft)
- Number of starts per hour: 10
- Power consumption: PSR3...45 60 A, PSR6...72 16 A, PSR85...105 12 A
- For On/Ready LED: Green
- For Run/Top of ramp: Green
- Ramp time during start: 1...20 sec.
- Ramp time during stop: 0...20 sec.
- Initial: 60 VA
- End: 30 VA

**Technical data**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSR...60</td>
<td>PSR105</td>
<td>P5LW-72</td>
<td>1SFAB99202R1072</td>
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<td>0.16</td>
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</table>

**Fieldbus plug adapter with cable**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS-FBPA</td>
<td>PS-FBPA</td>
<td>1SFAB99312R1002</td>
<td>1</td>
<td>0.05</td>
<td>0.11</td>
</tr>
</tbody>
</table>
PSR - The compact range

Main dimensions

---

PSR3 ... PSR16

---

PSR25 ... PSR30

---

PSR37 ... PSR45

---

PSR60 ... PSR105

---

PSR - The compact range

Circuit diagrams

---

PSR3 ... PSR16 With MMS

---

With MMS and auxiliary contact

---

With fuses, contactor and O.L.

---

PSR25 ... PSR45 With MMS

---

With MMS and auxiliary contact

---

With fuses, contactor and O.L.

---

PSR60 ... PSR105 With MMS

---

With MMS and auxiliary contact

---

With fuses, contactor and O.L.
The PSRC softstarter is fast and easy to install with fixed settings. Designed for scroll compressors results in less stress on the compressor reducing the maintenance cost to a minimum.
PSRC is optimized for scroll compressors
Less stress and reducing maintenance cost

General information for compressors
There are different types of compressors like piston compressor, scroll compressor, screw compressor etc. Smaller compressors are often of the piston type and the load torque increases linearly with the speed. Screw compressors are often used when there is a bigger need for air flow and this type has a load torque increasing with the square of the speed. Most compressors are started unloaded and are considered to be light starts.

By using an ABB’s softstarter it is possible to limit the starting torque to a level suitable for all different applications. The result is less stress on the compressor reducing the maintenance cost to a minimum. For scroll compressors, ABB has the special version PSRC that is optimized for that application.

Selection of a suitable softstarter
A compressor is usually a normal start and then the softstarter can be selected according to the motor kW size. If the compressor is a heavy duty start, the softstarter should be upsized one size. The same applies if more than 10 starts per hour are performed, upsize one size.

Features for scroll compressors
- Reduced starting current
- Short starting time (<1s) to guarantee lubrication of the compressor
- Recommended minimum starting voltage to secure a start in 400 V network
  - 200V for smaller compressors
  - 220V for bigger compressors

Features for the OEMs
- Easy and reliable
- 60 degree ambient temperature
- “Temper proof” No risk of parameters getting changed after installation

Recommended basic settings for scroll compressors:
- Start ramp: < 1 sec.
- Start mode: Voltage ramp
- Stop ramp: 0 sec
- Stop mode: No ramp
- Start ramp initial level: 50%

Rhoss - Italy
Keeps air flowing

The client
Rhoss is an Italian specialist in air conditioning and air handling products and systems. For over 40 years, it has been synonymous with quality, innovation and top level service. In a recent project, where high inrush currents caused problems to the scroll compressors used to compress air, Rhoss contacted ABB for a more sustainable motor starting solution.

The challenge
Many HVAC (Heating Ventilation and Air-Conditioning) projects use scroll compressors which require short starting times. In combination with customers requiring low starting currents, this proved a challenge for Rhoss. Other challenges are high temperatures and small spaces. Italian Rhoss had experienced all of the above in previous projects and sought a solution. They needed just one single product that could handle all these challenges. ABB had an answer.

The ABB solution
Rhoss implemented ABB's softstarters in its starting equipment and were soon aware of the concept’s many benefits. An integrated bypass meant the starting solution took up less space which also meant Rhoss could spend more of the space on controlling the high temperatures. The biggest benefit of all though is that the softstarter reduced the inrush currents of the scroll compressors by 60 percent while still maintaining the short starting time that this sort of application needs. The lowered starting currents mean less stress is put both on motor and compressor, reducing the need of maintenance and repairs.
PSRC

Introduction

Technical specifications
- Rated operational current: 3...105 A
- Operational voltage: 208...600 V AC
- Wide rated control supply voltage: 100...240 V AC, 50/60 Hz

Features
- Two-phase controlled
- Soft start with voltage ramp
- Built-in bypass for energy saving and easy installation
- Easy set-up
- Run and Top of Ramp relays available for monitoring
- Ambient temperature -25 to +60 degrees
- Connection kits available for connection to ABB’s manual motor starters (MMS)

Protection
- Motor protection with manual motor starter

Communication
- Fieldbus communication with fieldbus plug adapter and fieldbus plug

- Fixed settings “Temper proof”
  No risk of parameters getting changed after installation.

Connection kit (optional) simplifies installation of the PSRC by making the connection to the MMS screwless.

Screw or DIN-rail mounted
PSRC is fast and easy to install by using screw mounting or DIN-rail mounting (PSRC3 ... PSRC45).

Output signal relays for Run and Top of ramp (PSRC25 ... PSRC105).

LED Indicators for On/Ready and Run/Top of ramp.

Motor protection with manual motor starter the PSRC together with the MMS to get a complete motor starter with soft start together with overload and short circuit protection.

Reduce the electrical stresses and keep the motor protected with the MMS
The PSRC reduces the starting current for the motor. The possibility to connect it to the manual motor starter makes it possible to build a compact and complete starting solution with overload and short-circuit protection.

Saving time and money with built-in bypass and easy set-up
On the PSRC, the bypass is built in and verified by ABB, saving you time during installation and space in your panel.

Reduce the mechanical stresses on your motor
Soft start and stop with PSRC will reduce mechanical wear and tear on the application and increase the availability and uptime.

SECURE MOTOR RELIABILITY

IMPROVE INSTALLATION EFFICIENCY

INCREASE APPLICATION PRODUCTIVITY
Coordination examples

Normal start in-line connected

Technical data

Using manual motor starters type 1 coordination will be achieved

Using gG fuses type 1 coordination will be achieved

Suitable switch fuse for the above gG fuses

J-type fuses for UL coordination

Overload protection is used to protect the motor from overheating

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

Softstarter

PSRC1

PSRC2

PSRC3

PSRC4

PSRC5

PSRC105

Technical data

Using manual motor starters type 1 coordination will be achieved

Using gG fuses type 1 coordination will be achieved

Suitable switch fuse for the above gG fuses

J-type fuses for UL coordination

Overload protection is used to protect the motor from overheating

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

Softstarter

PSRC1

PSRC2

PSRC3

PSRC4

PSRC5

PSRC105

Coordination tables (SOC)

For more examples of coordination visit the online tool for coordination with short circuit protection, overload protection and line contactor.

Normal starts, class 10, in-line

Ordering details

Rated operational voltage Us, 208...600 V AC, Rated control supply voltage, Us, 100...240 V AC.
### PSRC Accessories

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSRC3...PSRC16</td>
<td>MS11/12</td>
<td>PSR16-MS116</td>
<td>1</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>PSRC25...PSRC30</td>
<td>MS132</td>
<td>PSR30-MS132</td>
<td>1</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>PSRC37...PSRC45</td>
<td>MS165</td>
<td>PSR45-MS165</td>
<td>1</td>
<td>0.05</td>
<td>0.11</td>
</tr>
<tr>
<td>PSRC60...PSRC105</td>
<td>MS495</td>
<td>PSR105-MS495</td>
<td>1</td>
<td>0.03</td>
<td>0.08</td>
</tr>
</tbody>
</table>

### PSRC Fan

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSRC3...PSRC45</td>
<td>PS-FAN-4SA</td>
<td>1SFA896931R1B001</td>
<td>1</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>PSRC60...PSRC105</td>
<td>PS-FAN-105SA</td>
<td>1SFA896933R1B001</td>
<td>1</td>
<td>0.01</td>
<td>0.02</td>
</tr>
</tbody>
</table>

### PSRC Terminal enlargements

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSRC60...PSRC105</td>
<td>PSLV-72</td>
<td>1SFA899000R1072</td>
<td>1</td>
<td>0.16</td>
<td>0.35</td>
</tr>
</tbody>
</table>

Note: Wire range: 1 x 10...50 mm², 2 x 10...26 mm²

### PSRC Fieldbus plug adapter with cable

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fieldbus plug adapter</td>
<td>PS-FBPA</td>
<td>1SFA896931R1B002</td>
<td>1</td>
<td>0.05</td>
<td>0.11</td>
</tr>
</tbody>
</table>

### PSRC Normal start

**In-line connected**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSRC3...PSRC6</td>
<td>PSRC6</td>
<td>1SFA896931R1B001</td>
<td>1</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>PSRC9...PSRC12</td>
<td>PSRC12</td>
<td>1SFA896931R1B001</td>
<td>1</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>PSRC16...PSRC25</td>
<td>PSRC25</td>
<td>1SFA896931R1B001</td>
<td>1</td>
<td>0.05</td>
<td>0.11</td>
</tr>
<tr>
<td>PSRC30...PSRC37</td>
<td>PSRC37</td>
<td>1SFA896931R1B001</td>
<td>1</td>
<td>0.03</td>
<td>0.08</td>
</tr>
</tbody>
</table>

**IP data**

- (400 V) hp: 2 x 5...10 mm²
- (250...300 V) hp: 2 x 2.5...5 mm²
- (1 x 14 AWG): 1 x 15...30 mm²
- (1 x 18 AWG): 1 x 10...20 AWG

**Connectable cable area**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSRC3...PSRC16</td>
<td>PSRC16</td>
<td>PSRC16-105</td>
<td>1</td>
<td>0.07</td>
<td>0.27</td>
</tr>
<tr>
<td>PSRC25...PSRC45</td>
<td>PSRC25...PSRC45</td>
<td>PSRC25...PSRC45</td>
<td>1</td>
<td>0.05</td>
<td>0.18</td>
</tr>
</tbody>
</table>

**Degree of protection**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
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<tbody>
<tr>
<td>PSRC3...PSRC16</td>
<td>PSRC16</td>
<td>PSRC16-105</td>
<td>1</td>
<td>0.07</td>
<td>0.27</td>
</tr>
<tr>
<td>PSRC25...PSRC45</td>
<td>PSRC25...PSRC45</td>
<td>PSRC25...PSRC45</td>
<td>1</td>
<td>0.05</td>
<td>0.18</td>
</tr>
</tbody>
</table>

**Ramp time**

- (1 x 16 - 95 mm²): 25 ± 10% of the maximum torque.
- (1 x 16 - 95 mm²): 25 ± 10% of the maximum torque.

**Temperature range**

- (-40 ºC to + 70 ºC (-40 to +158 ºF))

### PSRC Technical data

**Normal start**

- **In-line connected**
  - (400 V) hp: 2 x 5...10 mm²
  - (250...300 V) hp: 2 x 2.5...5 mm²
  - (1 x 14 AWG): 1 x 15...30 mm²
  - (1 x 18 AWG): 1 x 10...20 AWG

**Connectable cable area**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>PSRC3...PSRC16</td>
<td>PSRC16</td>
<td>PSRC16-105</td>
<td>1</td>
<td>0.07</td>
<td>0.27</td>
</tr>
<tr>
<td>PSRC25...PSRC45</td>
<td>PSRC25...PSRC45</td>
<td>PSRC25...PSRC45</td>
<td>1</td>
<td>0.05</td>
<td>0.18</td>
</tr>
</tbody>
</table>

**Degree of protection**

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<thead>
<tr>
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<th>Net kg</th>
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</tr>
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<tbody>
<tr>
<td>PSRC3...PSRC16</td>
<td>PSRC16</td>
<td>PSRC16-105</td>
<td>1</td>
<td>0.07</td>
<td>0.27</td>
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<tr>
<td>PSRC25...PSRC45</td>
<td>PSRC25...PSRC45</td>
<td>PSRC25...PSRC45</td>
<td>1</td>
<td>0.05</td>
<td>0.18</td>
</tr>
</tbody>
</table>

**Ramp time**

- (1 x 16 - 95 mm²): 25 ± 10% of the maximum torque.
- (1 x 16 - 95 mm²): 25 ± 10% of the maximum torque.

**Temperature range**

- (-40 ºC to + 70 ºC (-40 to +158 ºF))

**Number of starts per hour using PSRC softstarters**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSRC3...PSRC6</td>
<td>PSRC6</td>
<td>1SFA896931R1B001</td>
<td>1</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>PSRC9...PSRC12</td>
<td>PSRC12</td>
<td>1SFA896931R1B001</td>
<td>1</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>PSRC16...PSRC25</td>
<td>PSRC25</td>
<td>1SFA896931R1B001</td>
<td>1</td>
<td>0.05</td>
<td>0.11</td>
</tr>
<tr>
<td>PSRC30...PSRC37</td>
<td>PSRC37</td>
<td>1SFA896931R1B001</td>
<td>1</td>
<td>0.03</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Data obtained on an ambient temperature of 40ºC (104°F), starting current of 6 x full and ramp time 6 seconds. For more optimized selection or to use PSR for heavy-duty starts, please use the softstarter selection tool.
PSRC
Main dimensions mm, inches

PSRC3 ... PSRC16

PSRC25 ... PSRC30

PSRC37 ... PSRC45

PSRC60 ... PSRC105

PSRC
Circuit diagrams

PSRC3 ... PSRC16
A) With MMS
B) With MMS and auxiliary contact
C) With fuses, contactor and O.L.

PSRC25 ... PSRC45
D) With MMS
E) With MMS and auxiliary contact
F) With fuses, contactor and O.L.

PSRC60 ... PSRC105
G) With MMS
H) With MMS and auxiliary contact
I) With fuses, contactor and O.L.
The PSE has been designed to meet the most common requirements from the water segment and is specialized on pump operation. It combines the requested protections with a very compact design and built-in bypass. Remote operation with external keypad or over fieldbus is available as an option.
PSE - The efficient range

Introduction

Technical specifications
- Rated operational current: 18...370 A
- Operational voltage: 208...600 V AC
- Wide rated control supply voltage: 100...250 V AC, 50/60 Hz

Features
- Voltage ramp and torque control for both start and stop
- Two-phase controlled
- Current limit
- Kick-start
- Built-in bypass for energy saving and easy installation
- Illuminated display that uses symbols to become language neutral
- External keypad rated IP66 (Type 1, 4X,12) as an option
- Analog output for display of motor current

Protections
- Electronic overload protection
- Underload protection
- Locked rotor protection

Communication
- Built-In Modbus RTU
- Fieldbus communication with fieldbus plug adapter and fieldbus plug

Basic motor protection and current limit
The PSE includes the most important protections for handling different load situations that can happen to pumps e.g. overload and underload. The current limit gives you more control of the motor during start and allows you to start your motor in weaker networks.

Saving time and money with built-in bypass and compact design
On the PSE, the bypass is built in and verified by ABB, saving you time during installation and space in your panel. The keypad is language neutral and illuminated for easy set-up and operation in field. The compact design makes installation fast and easy.

Torque control for elimination of water hammering in pumps
Torque control is the most efficient way to stop a full speed pump. The PSE has a special torque stop ramp that is designed together with a pump manufacturer to eliminate water hammering in an optimal way.

PSE display

Illuminated and language-neutral display with icons
The display on PSE uses icons for fast and easy set-up of parameters. Each icon indicates a different parameter to set and makes navigation and setting of parameters easy.

LED Indicators
- Green ready LED
- Flashing - Control supply Steady - Main power available
- Green run LED
- Flashing - Ramping up/down Steady - TOR
- Yellow protection LED
- Red fault LED

Screw mounting
PSE is fast easy to install by using screw mounting.

Digital input for start, stop and reset
PSE is controlled through digital inputs using the internal 24 V DC source. This allows easy control with e.g. push buttons or relays.

Output signal relays for run, top of ramp and event
Three output signal relays for indicating that the motor is running, that the softstarter is in top of ramp and if any event has happened. The relays can be used e.g. with pilot lights or to control a line contactor.

Coated circuit boards
Protecting from dust, moist and corrosive atmosphere.

Torque control function
The absolutely best possible stop of pumps without water hammering and pressure surges.
### PSE - The efficient range

**Coordination examples**

<table>
<thead>
<tr>
<th>Softstarter</th>
<th>Technical data</th>
<th>Using MCCB only, type 1 coordination will be achieved</th>
<th>To achieve type 2 coordination, semi-conductor fuses must be used</th>
<th>Suitable switch fuse for recommended semi-conductor fuses</th>
<th>The line contactor is not required for the softstarter itself but often used to open if OL trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE18</td>
<td>IEC 1099-6</td>
<td>UL HP (440-480 V)</td>
<td>UL max FLA</td>
<td>MCCB (35 kA)</td>
<td>MCCS (50 kA)</td>
</tr>
<tr>
<td>PSE25</td>
<td>IEC 1129-1</td>
<td>XTY2N160 XTY2S160</td>
<td>XTY16016</td>
<td>10M15656</td>
<td>10M1564</td>
</tr>
<tr>
<td>PSE30</td>
<td>IEC 1129-1</td>
<td>XTY2N160 XTY2S160</td>
<td>XTY16016</td>
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<td>10M1564</td>
</tr>
<tr>
<td>PSE37</td>
<td>IEC 1129-1</td>
<td>XTY2N320 XTY3S320</td>
<td>XTY32032</td>
<td>10M15656</td>
<td>10M1564</td>
</tr>
<tr>
<td>PSE45</td>
<td>IEC 1129-1</td>
<td>XTY2N450 XTY4S450</td>
<td>XTY45045</td>
<td>10M15656</td>
<td>10M1564</td>
</tr>
<tr>
<td>PSE60</td>
<td>IEC 1129-1</td>
<td>XTY2N800 XTY8S800</td>
<td>XTY80080</td>
<td>10M15656</td>
<td>10M1564</td>
</tr>
<tr>
<td>PSE72</td>
<td>IEC 1129-1</td>
<td>XTY2N150 XTY1S150</td>
<td>XTY15015</td>
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<tr>
<td>PSE85</td>
<td>IEC 1129-1</td>
<td>XTY2N300 XTY3S300</td>
<td>XTY30030</td>
<td>10M15656</td>
<td>10M1564</td>
</tr>
<tr>
<td>PSE105</td>
<td>IEC 1129-1</td>
<td>XTY2N500 XTY5S500</td>
<td>XTY50050</td>
<td>10M15656</td>
<td>10M1564</td>
</tr>
</tbody>
</table>

**Ordering details**

**Normal start-in-line connected**

<table>
<thead>
<tr>
<th>IEC rated operational power</th>
<th>UL/CSA rated operational power</th>
<th>UL/CSA current</th>
<th>FLA</th>
</tr>
</thead>
<tbody>
<tr>
<td>230V Pe 5 kW</td>
<td>230/460V Pe 8 HP</td>
<td>230/460V Pe 8 HP</td>
<td>550/600V Pe 8 HP</td>
</tr>
</tbody>
</table>

**PSE - The efficient range**

| Normal start, class 10, in-line Rated operational voltage Ue, 208-600 V, Rated control supply voltage Uc, 100-250 V AC, 50/60 Hz |
|---|---|---|---|---|---|
| 1SFA897101R7000 | 1SFA897102R7000 | 1SFA897103R7000 | 1SFA897104R7000 | 1SFA897105R7000 | 1SFA897106R7000 |
| PSE18 ... PSE105 | PSE142 ... PSE170 | PSE210 ... PSE250 | PSE30-600-70 | PSE60-700-70 | PSE85-600-70 |

**Coordination tables (SOC) +**

For more examples of coordination visit the online tool for coordination with short circuit protection, overload protection and line contactor.

<table>
<thead>
<tr>
<th>230V Pe 5 kW</th>
<th>230/460V Pe 8 HP</th>
<th>230/460V Pe 8 HP</th>
<th>550/600V Pe 8 HP</th>
<th>FLA</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 5.5</td>
<td>7.5 12</td>
<td>13 10</td>
<td>11</td>
<td>PSE18-600-70</td>
</tr>
<tr>
<td>4 7.5</td>
<td>11 10</td>
<td>14 12</td>
<td>13</td>
<td>PSE25-600-70</td>
</tr>
<tr>
<td>5.5 11 15</td>
<td>25 5 10</td>
<td>15 20</td>
<td>25</td>
<td>PSE30-600-70</td>
</tr>
<tr>
<td>7.5 5 15</td>
<td>7.5 10</td>
<td>20 25</td>
<td>28</td>
<td>PSE37-600-70</td>
</tr>
<tr>
<td>9 18.5 25</td>
<td>20 30</td>
<td>30 30</td>
<td>34</td>
<td>PSE45-600-70</td>
</tr>
<tr>
<td>11.5 22.5 45</td>
<td>15 15 30</td>
<td>40 40</td>
<td>50</td>
<td>PSE50-600-70</td>
</tr>
<tr>
<td>15 30 45</td>
<td>20 20 40</td>
<td>50 50</td>
<td>60</td>
<td>PSE60-600-70</td>
</tr>
<tr>
<td>18.5 37.5 55</td>
<td>20 20 30</td>
<td>50 50</td>
<td>68</td>
<td>PSE72-600-70</td>
</tr>
<tr>
<td>22 55 65</td>
<td>25 25 50</td>
<td>50 50</td>
<td>78</td>
<td>PSE85-600-70</td>
</tr>
<tr>
<td>30 60 75</td>
<td>30 30 50</td>
<td>50 50</td>
<td>85</td>
<td>PSE105-600-70</td>
</tr>
<tr>
<td>40 75 90</td>
<td>40 40 50</td>
<td>50 50</td>
<td>100</td>
<td>PSE142-600-70</td>
</tr>
<tr>
<td>45 90 105</td>
<td>50 50 50</td>
<td>50 50</td>
<td>100</td>
<td>PSE170-600-70</td>
</tr>
<tr>
<td>55 110 125</td>
<td>60 60 60</td>
<td>60 60</td>
<td>100</td>
<td>PSE250-600-70</td>
</tr>
<tr>
<td>60 120 130</td>
<td>70 70 70</td>
<td>70 70</td>
<td>100</td>
<td>PSE370-600-70</td>
</tr>
</tbody>
</table>

**Heavy-duty starts, class 30, in-line Rated operational voltage Ue, 208...600 V, Rated control supply voltage Uc, 100...250 V AC, 50/60 Hz**

<table>
<thead>
<tr>
<th>IEC rated operational power</th>
<th>UL/CSA rated operational power</th>
<th>UL/CSA current</th>
<th>FLA</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 5.5</td>
<td>7.5 12</td>
<td>13 10</td>
<td>PSE18-600-70</td>
</tr>
<tr>
<td>4 7.5</td>
<td>11 10</td>
<td>14 12</td>
<td>PSE25-600-70</td>
</tr>
<tr>
<td>5.5 11 15</td>
<td>25 5 10</td>
<td>15 20</td>
<td>PSE30-600-70</td>
</tr>
<tr>
<td>7.5 5 15</td>
<td>7.5 10</td>
<td>20 25</td>
<td>PSE37-600-70</td>
</tr>
<tr>
<td>9 18.5 25</td>
<td>20 30</td>
<td>30 30</td>
<td>PSE45-600-70</td>
</tr>
<tr>
<td>11.5 22.5 45</td>
<td>15 15 30</td>
<td>40 40</td>
<td>PSE50-600-70</td>
</tr>
<tr>
<td>15 30 45</td>
<td>20 20 40</td>
<td>50 50</td>
<td>PSE60-600-70</td>
</tr>
<tr>
<td>18.5 37.5 55</td>
<td>20 20 30</td>
<td>50 50</td>
<td>PSE72-600-70</td>
</tr>
<tr>
<td>22 55 65</td>
<td>25 25 50</td>
<td>50 50</td>
<td>PSE85-600-70</td>
</tr>
<tr>
<td>30 60 75</td>
<td>30 30 50</td>
<td>50 50</td>
<td>PSE105-600-70</td>
</tr>
<tr>
<td>40 75 90</td>
<td>40 40 50</td>
<td>50 50</td>
<td>PSE142-600-70</td>
</tr>
<tr>
<td>45 90 105</td>
<td>50 50 50</td>
<td>50 50</td>
<td>PSE170-600-70</td>
</tr>
<tr>
<td>55 110 125</td>
<td>60 60 60</td>
<td>60 60</td>
<td>PSE250-600-70</td>
</tr>
<tr>
<td>60 120 130</td>
<td>70 70 70</td>
<td>70 70</td>
<td>PSE370-600-70</td>
</tr>
</tbody>
</table>

**NOTE**

PSE range updates (2018) • Built-in fault management communication protocol added • Increased firmware & hardware stability and reliability • Improved package and lay out

PSE frame C updates (2018) PSE210, PSE250 redesigned with more compact size and have new order codes replacing existing PSE Frame C that will be phased out. Terminal extension kit available as an accessory for new-fit.
**PSE - The efficient range**

**Accessories**

---

**Cable connectors for Cu cables**

<table>
<thead>
<tr>
<th>Article</th>
<th>Wire range mm²</th>
<th>Tightening torque max Nm</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE142</td>
<td>6...120</td>
<td>14</td>
<td>KIT FC Cu XT4 3pcs</td>
<td>1SDA068917R1</td>
<td>3</td>
<td>0.18</td>
<td>0.40</td>
</tr>
<tr>
<td>PSE142</td>
<td>2 x (50...120)</td>
<td>16</td>
<td>LZ185-2C/120 15FN074709R1000</td>
<td>2</td>
<td>0.10</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>PSE210</td>
<td>16...300</td>
<td>25</td>
<td>TS 400 3pcs</td>
<td>1SDA055016R1</td>
<td>3</td>
<td>0.39</td>
<td>0.89</td>
</tr>
</tbody>
</table>

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**Cable connectors for Al and Cu cables**

<table>
<thead>
<tr>
<th>Article</th>
<th>Wire range mm²</th>
<th>Tightening torque max Nm</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE142</td>
<td>95...185</td>
<td>31</td>
<td>KIT FC CuAl T4 3pcs</td>
<td>1SDA054988R1</td>
<td>3</td>
<td>0.14</td>
<td>0.31</td>
</tr>
<tr>
<td>PSE210</td>
<td>165...240</td>
<td>43</td>
<td>KIT FC CuAl/T5 400 3pcs</td>
<td>1SDA055020R1</td>
<td>3</td>
<td>0.24</td>
<td>0.54</td>
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</tbody>
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**Terminal enlargements**

<table>
<thead>
<tr>
<th>Article</th>
<th>Dimensions hole ø mm²</th>
<th>Bar ø mm²</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE18...PSE105</td>
<td>6.5</td>
<td>15 x 3</td>
<td>LW110</td>
<td>1SFN074307R1000</td>
<td>1</td>
<td>0.07</td>
<td>0.16</td>
</tr>
<tr>
<td>PSE142</td>
<td>10.5</td>
<td>17.5 x 5</td>
<td>LW185</td>
<td>1SFN074709R1000</td>
<td>1</td>
<td>0.29</td>
<td>0.64</td>
</tr>
<tr>
<td>PSE210</td>
<td>10.5</td>
<td>20 x 5</td>
<td>LW300</td>
<td>1SFN075010R1000</td>
<td>1</td>
<td>0.49</td>
<td>1.08</td>
</tr>
</tbody>
</table>

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**Terminal kit**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE142</td>
<td>PSE1</td>
<td>1SFAB97100R1001</td>
<td>1</td>
<td>0.13</td>
<td>0.29</td>
</tr>
</tbody>
</table>

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**Terminal extension**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE142</td>
<td>PSE1</td>
<td>1SFAB97201R1001</td>
<td>1</td>
<td>0.10</td>
<td>0.22</td>
</tr>
</tbody>
</table>

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**USB cable for Service Engineer Tool**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE18...PSE370</td>
<td>PSECA</td>
<td>1SFAB97301R1001</td>
<td>1</td>
<td>0.19</td>
<td>0.43</td>
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</tbody>
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**Fieldbus plug connection, cable included**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fieldbus plug</td>
<td>PS-FBPA</td>
<td>1SFAB986331R1002</td>
<td>1</td>
<td>0.10</td>
<td>0.22</td>
</tr>
</tbody>
</table>

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**Fieldbus plug adaptor**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal extensions retrofit kit</td>
<td>LXE60</td>
<td>1SFAB999603R1002</td>
<td>1</td>
<td>0.45</td>
<td>0.99</td>
</tr>
</tbody>
</table>

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**Modbus adapter**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
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<tbody>
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<td>0.99</td>
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</tbody>
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**Modbus adapter**

<table>
<thead>
<tr>
<th>Article</th>
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<td>1SFAB999603R1002</td>
<td>1</td>
<td>0.45</td>
<td>0.99</td>
</tr>
</tbody>
</table>

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**External keypad including a 3m cable**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>External keypad</td>
<td>PSE18...PSE370</td>
<td>PSEAC</td>
<td>1SFAB97201R1001</td>
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</tbody>
</table>

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**USB cable**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB cable</td>
<td>PS-CA</td>
<td>1SFAB97201R1001</td>
<td>1</td>
<td>0.10</td>
<td>0.22</td>
</tr>
</tbody>
</table>

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**Fieldbus plug adaptor**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
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<th>Pkg qty</th>
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<th>lb</th>
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</thead>
<tbody>
<tr>
<td>Fieldbus plug</td>
<td>PS-FBPA</td>
<td>1SFAB986331R1002</td>
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<td>0.19</td>
<td>0.43</td>
</tr>
</tbody>
</table>

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**Terminal shrouds**

<table>
<thead>
<tr>
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<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
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</thead>
<tbody>
<tr>
<td>Terminal shrouds</td>
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**External keypad**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB cable</td>
<td>PS-CA</td>
<td>1SFAB97201R1001</td>
<td>1</td>
<td>0.10</td>
<td>0.22</td>
</tr>
</tbody>
</table>

---

**Fieldbus plug connection, cable included**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fieldbus plug</td>
<td>PS-FBPA</td>
<td>1SFAB986331R1002</td>
<td>1</td>
<td>0.19</td>
<td>0.43</td>
</tr>
</tbody>
</table>

---

**Terminal extensions retrofit kit**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal extensions retrofit kit</td>
<td>LXE60</td>
<td>1SFAB999603R1002</td>
<td>1</td>
<td>0.45</td>
<td>0.99</td>
</tr>
</tbody>
</table>

---

**Modbus adapter**

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modbus adapter</td>
<td>PS-CA</td>
<td>1SFAB97201R1001</td>
<td>1</td>
<td>0.10</td>
<td>0.22</td>
</tr>
</tbody>
</table>
**Technical data**

- **Voltage**: Rated operational voltage $U_{e}$: 200...600 V $\pm$ 10%/$\pm$15%
- **Current**: Rated thermal current $I_{n}$: 3 A
- **Rated current**: Rated operational current $I_{e}$ at AC-15 ($U_{e}$ = 250 V)
- **Operation**: Vibration test according to IEC 60068-2-6:2007

**PSE - The efficient range**

**Main terminals**

- **Article**: PSE18...
- **Max. fuse rating - main circuit**: Bussmann fuses, DIN43 620 (Knife)
- **Power requirements supply circuit**: Holding (VA) / Pull-in (VA)

**Fuse ratings and power losses**

- **Softstarters**
  - **Type**: PSE18
  - **Current range**: 5.4...18.0 A
  - **Max. fuse rating at rated load**: 40 A
  - **Power requirement supply circuit**: 16/19.9 VA

**Table**

<table>
<thead>
<tr>
<th>Article</th>
<th>Max. power loss at rated load</th>
<th>Max. fuse rating - main circuit</th>
<th>Power requirements supply circuit</th>
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**Graphs**

- **Tripping curves for the integrated electronic overload protection**
- **IEEE 248 in lb**
- **IEEE 320 in lb**

---

*For the supply circuit 6 A delayed, for MCB use C characteristics.*
PSE - The efficient range

Dimensions

For more circuit diagrams see solutions.abb/softstarters
The PSTX combines many years of research and product development with extensive knowledge of application specific requirements and needs. It is our latest advancement in motor control & protection, and it adds new functionality and increased reliability.
PSTX - The advanced range

Introduction

Technical specifications
- Rated operational current: 30...1250 A (inside-delta: 2160 A)
- Operational voltage: 208...690 V AC
- Wide rated control supply voltage: 100...250 V, 50/60 Hz

Features
- Both in-line and inside-delta connection
- Detachable keypad rated IP66 (4X outdoor)
- Graphical display with 17 languages for easy setup and operation
- Built-in bypass for energy saving and easy installation
- Analog output for measurement of current, voltage, power factor etc.

Protections
- Complete motor protection

Communication
- Built-in Modbus RTU
- Support for all major communication protocols

Secure Motor Reliability

The PSTX offers complete motor protection in only one unit and is able to handle both load and network irregularities. PT-100, earth fault protection and over/under voltage protection along with many other functions keep your motor safer than ever. PSTX also offers three types of current limit: standard, dual and ramp. This gives you full control of your motor during start. It also allows you to use your motor in weaker networks.

Improve Installation Efficiency

Built-in bypass saves time and energy
When reaching full speed, the PSTX will activate its bypass. This saves energy while reducing the softstarters heat generation. On the PSTX, the bypass is built in and verified by ABB, saving you time during installation and space in your panel.

Increase Application Productivity

Complete control of pumps
Time to use your processes to their full potential. The PSTX features many application enhancing features, including torque control: the most efficient way to start and stop pumps. The pump cleaning feature can reverse pump flow and clean out pipes, securing uptime of your pump system.

Heavy duty design to handle heavy applications such as centrifugal fans, mill and mixers.

Jog with slow speed forward & reverse
The slow speed forward and backward jog feature will make you more flexible when operating e.g. conveyor belts and cranes.

Torque control function
The absolutely best possible stop of pumps without water hammering and pressure surges.

Customize your own specific home screens (up to seven different). The PSTX has 17 pre-installed languages. You can use your customized home screens to show status information important to your process and hide information that is not.

Easy to learn
The HMI is user-friendly and have a clear display that saves you time and resources during both setup and operation. The detachable keypad is standard on all PSTX softstarters with IP66 and 4x outdoor for tough environments.

Detachable keypad as standard. It can be placed on your panel door, meaning you do not have to interrupt your process in order to read status information or to change settings.

Coated PCB protecting from dust, moist and corrosive atmosphere.

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PSTX - The advanced range
Coordination examples

Normal start in-line connected

<table>
<thead>
<tr>
<th>Softstarter</th>
<th>Technical data</th>
<th>Using manual motor starter or MCCB, type 1 coordination will be achieved. 1</th>
<th>Using gG fuses, type 1 coordination will be achieved. To achieve type 2 coordination, semiconductor fuses must be used. 2</th>
<th>Suitable switch fuse for the recommended semiconductor fuses. 3</th>
<th>The line contactor is not required for the softstarter itself but often used to open if OL trips. 4</th>
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<tbody>
<tr>
<td>PSTX30</td>
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</table>

1 These are an example of coordination. For more examples see: https://applications.it.abb.com/SOC/Page/Selection.aspx
2 When using a softstarter in a network with high harmonic disturbances, we recommend to use a line-contactor. Please check the information in the Installation manual for more details.

Coordination tables (SOC) >
For more examples of coordination visit the online tool for coordination with short circuit protection, overload protection and line contactor.
### PSTX - The advanced range

**Normal starts, class 10, in-line Ordering details**

<table>
<thead>
<tr>
<th>IEC rated operational power</th>
<th>current</th>
<th>3UL/3SA rated operational power</th>
<th>440/460V</th>
<th>550/600V</th>
<th>FLA</th>
<th>Type</th>
<th>Order code</th>
<th>Net Weight (kg)</th>
<th>Net Weight (lb)</th>
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<tbody>
<tr>
<td>18.5 22 - 27.5 30 35 40 50 60 70 90</td>
<td>100 125 160 200 225 250 315 400</td>
<td>450 550 630 750 900 1000 1320 1600</td>
<td>110 150 180 200 240 250 315 370</td>
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</tbody>
</table>

**Rated operational voltage U_{in}, 100...250 V AC, 50/60 Hz**

<table>
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<tr>
<th>IEC rated operational power</th>
<th>current</th>
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### PSTX - The advanced range

**Heavy-duty starts, class 30, in-line Ordering details**

<table>
<thead>
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<th>IEC rated operational power</th>
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**Rated operational voltage U_{in}, 208...600 V, rated control supply voltage U_{dc}, 100...250 V AC, 50/60 Hz**

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<th>IEC rated operational power</th>
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<th>3UL/3SA rated operational power</th>
<th>440/460V</th>
<th>550/600V</th>
<th>FLA</th>
<th>Type</th>
<th>Order code</th>
<th>Net Weight (kg)</th>
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</table>
### PSTX - The advanced range

**Normal starts, class 10, inside delta**

**Ordering details**

**Rated operational voltage** $U_{n}$ 208...600 V, rated control supply voltage $U_{c}$ 100...250 V AC, 50/60 Hz

<table>
<thead>
<tr>
<th>IEC operational power</th>
<th>400V Pe</th>
<th>500V Pe</th>
<th>690V Pe</th>
<th>200V/208V Pe</th>
<th>440/480V Pe</th>
<th>600V Pe</th>
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<th>Net Weight (kg)</th>
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</table>

### PSTX - The advanced range

**Heavy-duty starts, class 30, inside delta**

**Ordering details**

**Rated operational voltage** $U_{n}$ 208...600 V, rated control supply voltage $U_{c}$ 100...250 V AC, 50/60 Hz

<table>
<thead>
<tr>
<th>IEC operational power</th>
<th>400V Pe</th>
<th>500V Pe</th>
<th>690V Pe</th>
<th>200V/208V Pe</th>
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<th>600V Pe</th>
<th>FLA</th>
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**Type**

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<td>PSTX300</td>
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---

**Order details**

- **PSTX105-600-70** 62.3 kg (137.2 lb)
- **PSTX300-600-70** 63.3 kg (140.1 lb)
### Cable connectors for Cu cables

<table>
<thead>
<tr>
<th>Article</th>
<th>Wire range mm²</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
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</thead>
<tbody>
<tr>
<td>PSTX142 ... PSTX170</td>
<td>6-120</td>
<td>KT FT CuX4 3pcs</td>
<td>1SDA066917R1</td>
<td>3</td>
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<td>PSTX142 ... PSTX170</td>
<td>2 x (50-95)</td>
<td>L2185-2C120</td>
<td>1SFA074091R1000</td>
<td>3</td>
<td>0.30</td>
<td>0.66</td>
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<tr>
<td>PSTX210 ... PSTX370</td>
<td>16-240</td>
<td>T5 400 3pcs</td>
<td>1SDA05501R1</td>
<td>3</td>
<td>0.36</td>
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<td>PSTX210 ... PSTX370</td>
<td>2 x (95-185)</td>
<td>OZXB4/1</td>
<td>1SAO2119188R1000</td>
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<td>PSTX470 ... PSTX570</td>
<td>2 x (120-240)</td>
<td>T6 630-50 6pcs</td>
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<td>PSTX570 ... PSTX1050</td>
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<td>T6 800-56 6pcs</td>
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### Cable connectors for Al cables

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<tr>
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<td>95-185</td>
<td>KT FT CuAlT4 3pcs</td>
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<td>PSTX210 ... PSTX370</td>
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<td>KT FT CuAl T5 400 3pcs</td>
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### Terminal extensions

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<th>Dimensions hole a mm²</th>
<th>bar mm</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
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<tbody>
<tr>
<td>PSTX142 ... PSTX170</td>
<td>8.5 x 17.5 x 5</td>
<td>LK205</td>
<td>1SFDN074810R1000</td>
<td>1</td>
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<tr>
<td>PSTX210 ... PSTX570</td>
<td>10.5 x 20.5 x 5</td>
<td>LK370</td>
<td>1SDA055410R1000</td>
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<tr>
<td>PSTX470 ... PSTX570</td>
<td>10.5 x 25.5 x 5</td>
<td>LK460</td>
<td>1SDA057510R1000</td>
<td>1</td>
<td>0.50</td>
<td>1.10</td>
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</tr>
<tr>
<td>PSTX720 ... PSTX840</td>
<td>13 x 40 x 6</td>
<td>LXT50</td>
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### Terminal enlargements

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<th>Pkg qty</th>
<th>Net kg</th>
<th>lb</th>
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<td>PSTX10 ... PSTX105</td>
<td>6.5 x 15.5</td>
<td>LK110</td>
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<td>PSTX142 ... PSTX170</td>
<td>10.5 x 17.5 x 5</td>
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### Terminal shrouds

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<th>lb</th>
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<tr>
<td>PSTX142 ... PSTX170</td>
<td>short for use with cable clamps</td>
<td>LT205-30C</td>
<td>1SAF124801R1000</td>
<td>2</td>
<td>0.05</td>
<td>0.11</td>
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<tr>
<td>PSTX142 ... PSTX170</td>
<td>long for use with compression lugs</td>
<td>LT205-50L</td>
<td>1SAF124803R1000</td>
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<td>PSTX210 ... PSTX370</td>
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<td>LT370-30C</td>
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<td>0.08</td>
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<td>LT370-30L</td>
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<td>long and deep for use with extending cable clamps, ATX200/2 and OXAB4</td>
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### Accessories

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<th>lb</th>
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### Fieldbus plug connection, cable included

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### I/O module, 24 V DC digital input

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<td>DX111-FBP1</td>
<td>1SA311000R0101</td>
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<td>DX122-FBP1</td>
<td>1SA362000R0101</td>
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### Anybus connection accessory for communication protocol suitable for PSTX30 ... PSTX1250

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<td>1AB-PROFIBUS-1</td>
<td>1SFA893000R1001</td>
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<td>1SFA893000R1003</td>
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<td>1AB-PROFINET-IO-2</td>
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<td>CANopen</td>
<td>1AB-CANopen-ID-3</td>
<td>1SFA893000R1013</td>
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### New!

- Profibus DP v1          - DeviceNet
- Modbus-RTU              - Profinet
- CANopen

### Only needed when Com 3-port is used with Extension I/O
### PSTX - The advanced range

#### Technical data

**Control circuit**
- Number of inputs: 2 (start, stop)
- Number of additional programmable inputs: 3 (each input can be programmed to: None, Reset, Enable, Slow speed forward (SSG), Slow speed reverse (SSR), Motor heating, Stand still brake, Start reverse, User defined protection, Emergency mode (active high), Emergency mode (active low), Fieldbus disable control. Start 1, Start 2, Start 3, Switch to remote control (Cancel brake)

**Signalling indication LED**
- Ready: Green
- Run: Green
- Fault: Red
- Protection: Yellow

**External keypad**
- Detachable keypad: Yes
- Display: LCD type, graphical
- Ambient temperature: -25...+60 °C (-13...+140 F)
- During operation: -25...+60 °C (-13...+140 F)
- During storage: -40...+60 °C (-40...+140 F)
- Degree of protection: IP66 (Type 1, 4, 12)

**Start and stop functions**
- Soft start with voltage ramp: Linear voltage ramp, suitable for most applications
- Soft start with torque control: Linear torque ramp, the best way to start pumps
- Soft stop with torque control: Commonly used to reduce water hammering in pumps
- Kick start: Used to start the soft starter in the case of need for high starting torque

**Fieldbus connection**
- Built-in Modbus RTU: Yes, with RS-485 interface on terminals 23 and 24
- Fieldbus failure protection: Indicates communication failure
- Over voltage warning: Yes
- Under voltage warning: Yes
- Fieldbus connection: Compatible with a special adapter, see catalog for details

**Warnings**
- Current overload warning: User defined on/off
- Current imbalance warning: User defined on/off
- Voltage imbalance warning: User defined on/off
- Thyristor overload warning (SCR): User defined on/off
- External faults detection: User defined on/off
- Emergency mode: Keep the soft starter running regardless of trip or failure. Activated via DI
- Automatic restart: In case of trip and stopped motor, the soft starter can restart itself
- Keypad password: Lock the keypad to inhibit unauthorized motor control
- Pump cleaning: Can reverse pump flow and clean out sludge
- Electronic overload Time-to-cool: The motor is ready to be reversed after an EOL trip
- Thyristor runtime measurement: Measures most electrical variables, e.g., voltage, current and power
- Auto phase sequence detection: Detection of the phase sequence
- Electricity metering: Measures most electrical variables, e.g., voltage, current and power
- Motor heating: DC injection in all windings to heat up the motor. Useful in cold or humid environment
- Stand still brake: Prevents the motor from moving, useful to keep fans from reversing
- Voltage sag detection: User defined
- Limp mode: Can keep process running until planned maintenance

---

*Valid for normal start (class 10) for 50% on time and 50% off time. If other data is required, contact your local ABB office.*

*See the catalog for details.*

---

### PSTX - The advanced range

#### Technical data

**Control circuit**
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**Signalling indication LED**
- Ready: Green
- Run: Green
- Fault: Red
- Protection: Yellow

**External keypad**
- Detachable keypad: Yes
- Display: LCD type, graphical
- Ambient temperature: -25...+60 °C (-13...+140 F)
- During operation: -25...+60 °C (-13...+140 F)
- During storage: -40...+60 °C (-40...+140 F)
- Degree of protection: IP66 (Type 1, 4, 12)

**Start and stop functions**
- Soft start with voltage ramp: Linear voltage ramp, suitable for most applications
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---

*Valid for normal start (class 10) for 50% on time and 50% off time. If other data is required, contact your local ABB office.*

*See the catalog for details.*

---
### Technical data

#### Fuse ratings and power losses

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<th>A</th>
<th>W</th>
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<td>45.0</td>
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<td>PSTX60</td>
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<td>170MS68</td>
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<tr>
<td>PSTX72</td>
<td>21.6</td>
<td>72.0</td>
<td>4.7</td>
<td>250</td>
<td>170MS71</td>
<td>600</td>
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<tr>
<td>PSTX85</td>
<td>22.5</td>
<td>85.0</td>
<td>6.5</td>
<td>315</td>
<td>170MS72</td>
<td>600</td>
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<tr>
<td>PSTX105</td>
<td>31.8</td>
<td>105.0</td>
<td>10</td>
<td>400</td>
<td>170MS81</td>
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<tr>
<td>PSTX125</td>
<td>42.9</td>
<td>125.0</td>
<td>18</td>
<td>500</td>
<td>170MS81</td>
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<tr>
<td>PSTX170</td>
<td>51.3</td>
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<td>26</td>
<td>630</td>
<td>170MS82</td>
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<tr>
<td>PSTX210</td>
<td>63.0</td>
<td>210.0</td>
<td>48</td>
<td>630</td>
<td>170MS82</td>
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</tr>
<tr>
<td>PSTX250</td>
<td>75.0</td>
<td>250.0</td>
<td>68</td>
<td>700</td>
<td>170MS82</td>
<td>2</td>
</tr>
<tr>
<td>PSTX300</td>
<td>90.0</td>
<td>300.0</td>
<td>97</td>
<td>800</td>
<td>170MS82</td>
<td>3</td>
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<tr>
<td>PSTX370</td>
<td>111.0</td>
<td>370.0</td>
<td>148</td>
<td>900</td>
<td>170MS83</td>
<td>3</td>
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<tr>
<td>PSTX470</td>
<td>140.0</td>
<td>470.0</td>
<td>222</td>
<td>900</td>
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<td>PSTX70</td>
<td>171.0</td>
<td>70.0</td>
<td>146</td>
<td>1100</td>
<td>170MS84</td>
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<tr>
<td>PSTX720</td>
<td>216.0</td>
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<td>78</td>
<td>1250</td>
<td>170MS85</td>
<td>3</td>
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<tr>
<td>PSTX840</td>
<td>252.0</td>
<td>840.0</td>
<td>108</td>
<td>1500</td>
<td>170MS88</td>
<td>3</td>
</tr>
<tr>
<td>PSTX1050</td>
<td>315.0</td>
<td>1050.0</td>
<td>165</td>
<td>1800</td>
<td>170MS89</td>
<td>3</td>
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<tr>
<td>PSTX1250 II*</td>
<td>375.0</td>
<td>1250.0</td>
<td>234</td>
<td>2000</td>
<td>170MS91</td>
<td>3</td>
</tr>
</tbody>
</table>

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

2) For short circuit overcurrent protection, the fuse links must be inserted inside the box.

3) For 400 V version, the maximum fuse are only available for motors with rated current up to 1150 A.

#### Tripping curves for electronic overload protection (cold) for PSE and PSTX

<table>
<thead>
<tr>
<th>Softstarter</th>
<th>Current (A)</th>
<th>Max fuse rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE</td>
<td>25...150</td>
<td>9.0...1600</td>
</tr>
<tr>
<td>PSTX470</td>
<td>25...120</td>
<td>9.0...1200</td>
</tr>
</tbody>
</table>

**Notes:**
- All units have an integrated electronic overload protection that can be set to four different tripping classes. Below you find a curve for each tripping class in cold state. These tripping curves are valid for PSTX.

![Tripping Curves Graph](image-url)

#### Main terminals

**Article**
- PSTX10...PSTX15
- PSTX120...PSTX170
- PSTX470...PSTX570
- PSTX720...PSTX1050
- PSTX1250

**Cu cable - flexible 1 mm²**
- 10...70 mm² 6...120 mm² 16...240 mm²

**Clamp type**
- Included

**Tightening torque**
- 8 Nm

**Acable - Stranded 1 mm²**
- 16...150 mm² 18...240 mm² 20...300 mm²

**Clamp type**
- Included

**Tightening torque**
- 8 Nm

**Cu cable - Stranded 2 mm²**
- 16...150 mm² 18...240 mm² 20...300 mm²

**Clamp type**
- Included

**Tightening torque**
- 8 Nm

**Acable - Stranded 2 mm²**
- 16...150 mm² 18...240 mm² 20...300 mm²

**Clamp type**
- Included

**Tightening torque**
- 8 Nm

**Supply and control circuit**

**Cu cable - Stranded 1 mm²**
- 0.75...2.5 mm² (19...14 AWG)

**Cu cable - Stranded 2 mm²**
- 0.75...1.5 mm² (16...18 AWG)

**Tightening torque**
- 0.5 Nm (4.4 in-lb)

**Note:**
- Bussmann fuses are only available for motors with rated current up to 1150 A.

**PSTX Integrated bypass ratings**

All ABB’s softstarters are equipped with a built-in bypass contactor. This bypass contactor is rated AC-1 since it only make and break the motor at full speed at the rated current of the softstarter. However, in the PSTK470-PSTX1050 products, the bypass contactors also has a "lower rated AC-3 rating" which is shown in the table below.

<table>
<thead>
<tr>
<th>Softstarter</th>
<th>PSTX470...PSTX570</th>
<th>PSTX720...PSTX1050</th>
<th>PSTX1250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated contactor</td>
<td>AF370</td>
<td>AF750</td>
<td>AF1250</td>
</tr>
</tbody>
</table>

**Note:**
- Terminals switch 156125483401050 must be used.
- Terminals switch 1561254834011050 can be used.
PSTX - The advanced range

Dimensions

PSTX detachable keypad

PSTX1250
PSTX - The advanced range

Circuit diagrams

PSTX30 ... PSTX1250 IEC circuit diagram

PSTX30 ... PSTX1250 UL circuit diagram

PSTX30 ... PSTX1250 in-line connected with line contactor and fuses

PSTX30 ... PSTX1250 inside-delta connected with contactor and fuses

CAUTION
Terminal 22 is a function earth, it is not a protective earth. It shall be connected to the mounting plate.

For more circuit diagrams see solutions.abb/softstarters
Fieldbus communication
For softstarters

Fieldbus communication interface offering
PSR, PSE and PSTX softstarters can be connected to a fieldbus network for monitoring and control. All major industrial fieldbus protocols are covered with different accessories making the installation very flexible.

Built-in Modbus-RTU for PSTX and PSE
- Built-in Modbus RTU communication interface
- Easy to install using the Modbus RTU adaptor which is included with the Softstarter
- Through this communication interface it is possible to get full control and status information of the Softstarter as well as reading- and writing parameters

Anybus connection for PSTX
- Anybus connection accessory for communication protocol suitable for PSTX30...PSTX1250

Anybus connection accessory for communication protocol suitable for PSTX30...PSTX1250

<table>
<thead>
<tr>
<th>Article</th>
<th>Connection ports</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profibus</td>
<td>1</td>
<td>AB-PROFIBUS-1</td>
<td>1SA899300R1001</td>
<td>1</td>
<td>0.05</td>
<td>0.07</td>
</tr>
<tr>
<td>DeviceNet</td>
<td>1</td>
<td>AB-DVNCN-1</td>
<td>1SA899300R1002</td>
<td>1</td>
<td>0.03</td>
<td>0.07</td>
</tr>
<tr>
<td>Modbus-RTU</td>
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<td>AB-MODBUS-RTU-1</td>
<td>1SA899300R1003</td>
<td>1</td>
<td>0.03</td>
<td>0.07</td>
</tr>
<tr>
<td>BACnet IP</td>
<td>2</td>
<td>AB-BACNET-IP-2</td>
<td>1SA899300R1004</td>
<td>1</td>
<td>0.03</td>
<td>0.07</td>
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<tr>
<td>EtherCAT IP</td>
<td>2</td>
<td>AB-ETHERCAT-IP-2</td>
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<td>0.03</td>
<td>0.07</td>
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<tr>
<td>Modbus/TCP</td>
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<td>0.07</td>
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<tr>
<td>Profinet</td>
<td>2</td>
<td>AB-PROFINET-IO-2</td>
<td>1SA899300R1010</td>
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<td>0.07</td>
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<tr>
<td>BACnet MS/TP</td>
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<td>AB-BACNET-MS/TP-1</td>
<td>1SA899300R1011</td>
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<td>0.03</td>
<td>0.07</td>
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<td>AB-ETHERCAT-IP-2</td>
<td>1SA899300R1012</td>
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<td>0.07</td>
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<tr>
<td>New CANopen</td>
<td>1</td>
<td>AB-CANOPEN-IO-1</td>
<td>1SA899300R1013</td>
<td>1</td>
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<td>0.07</td>
</tr>
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</table>

Only needed when Com 3-port is used with Extension I/O

ABB Fieldbus interface
For softstarters

Fieldbus communication interface offering
Available communication protocols for softstarters

<table>
<thead>
<tr>
<th>Communication</th>
<th>PSR</th>
<th>PSE</th>
<th>PSTX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profibus</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
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<tr>
<td>DeviceNet</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
</tr>
<tr>
<td>Modbus TCP</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
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<tr>
<td>Anybus</td>
<td>⬤</td>
<td>⬤</td>
<td>⬤</td>
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</tbody>
</table>

= Built-in
= Optional
= not available

Fieldbus plug kit for mounting fieldbus plug adapter together with fieldbus plugs
Includes: Holder, cable, cable holder and 2 terminal blocks

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>kg</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessory kit</td>
<td>PS-FBPK</td>
<td>1SA899320R1002</td>
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<td>0.15</td>
<td>0.33</td>
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</table>

Fieldbus plug adapter with cable

<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Order code</th>
<th>Pkg qty</th>
<th>kg</th>
<th>lb</th>
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</thead>
<tbody>
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For more information visit the Universal Motor Controller website: Link

Note: See separate catalog for fieldbus communication interfaces: Link

Fieldbus plug adapter

Fieldbus plug kit
Marketing materials and tools

It is easy to access more information about ABB softstarters online. On our web page you will find tools for selection, coordination tables, CAD drawings and different types of documentation. solutions.abb/softstarters

Marketing materials

Panorama >
Softstarter product overview.

Leaflets >
One- or two pages information for example case studies, fact sheet and more.

Manuals >
Do you need help with settings or communication and more check out or soft-starter manuals.

Certificates >
ISO certificates and approvals for softstarters.

Videos >
Softstarter YouTube playlist.

Demo units

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
<th>Order code</th>
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<tbody>
<tr>
<td>PSR16-600-70D</td>
<td>Demonstration unit without power electronics</td>
<td>1SFA98107R0009</td>
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<tr>
<td>PSR30-600-70D</td>
<td>Demonstration unit without power electronics</td>
<td>1SFA98109R0009</td>
</tr>
<tr>
<td>PSR45-600-70D</td>
<td>Demonstration unit without power electronics</td>
<td>1SFA98111R0009</td>
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<tr>
<td>PSR105-600-70D</td>
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<td>1SFA98115R0009</td>
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<td>PSTX105-600-70D</td>
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<tr>
<td>PSTX105-600-70D</td>
<td>Box with accessories</td>
<td>1SFA98109R0008</td>
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</tbody>
</table>

Extended warranty

Extended lifetime
Time to use your processes to their full potential. For Softstarters we have extended warranty options up to 3 years. Professional commissioning with warranty extension provides free of charge rapid response services, if the unexpected occurs.

Extended warranty tool >

PSTX simulator
Software application for testing and learning more about PSTX soft-starter. Simulate a motorstart in your computer an easy way to learn the menu and parameters.

ABB proSoft
Our popular software for the best softstarter/application match, which is free to download and use. All relevant ABB motors are preset in the tool, and all other motors can be set manually.

SoftstarterCare™
Service engineer tool makes softstarter commissioning easy by plug-in your PSTX softstarter using a PC. Access all parameters, event logs and troubleshooting information.

ABB e-configure
Product and application configuration tool for fast and easy online selection of softstarters.