

# PSTX softstarter

## The advanced range

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- 11** Built-in protections
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PSTX is our most advanced softstarter with full control and motor protection built-in. PSTX is the most complete alternative for any motor starting application.

Featuring built-in modbus and any-bus modules that support all major communication protocols.

01 PSTX advanced range softstarter

### Complete motor protection

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.

### 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.

### 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.

### HMI

A user-friendly and clear display 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.

### 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.

### Coated PCB

Coated circuit boards protecting from dust, moist and corrosive atmosphere. PSTX coating type DOW CORNING 1-2620 LOW VOC.

### Heavy duty

Designed to handle heavy applications such as centrifugal fan, mill and mixers.

### Torque control

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

Technical data	PSTX30... 1250
Rated insulation voltage $U_i$	690V
Rated operational voltage $U_e$	208...600 V, 208...690V +10% / -15%, 50/60Hz $\pm$ 10%
Rated control supply voltage $U_s$	100...250 V +10%/-15%, 50/60Hz $\pm$ 10%
Rated control circuit voltage $U_c$	Internal or external 24 V DC
Starting capacity at $I_e$	4 x $I_e$ for 10 sec
Number of starts per hour	10 for PSTX30 ... PSTX370 <sup>1)</sup> 6 for PSTX470 ... PSTX1250 <sup>1)</sup>
Overload capability	Overload class 10
Maximum altitude	4000 m (13123 ft) <sup>3)</sup>

Ambient temperature	
During operation	-25...+60 °C, (-13...+140 F) <sup>2)</sup>
During storage	-40...+70 °C, (-40...+158 F)

Degree of protection	
Main circuit	-
Supply and control circuit	IP20

Main circuit	
Built-in bypass contactor	Yes
Cooling system - Fan cooled	Yes (thermostat controlled)

HMI for settings (Human Machine Interface)	
Display	LCD type, graphical
Languages	Arabic, Chinese, Czech, Dutch, English, Finnish, French, German, Greek, Indonesian, Italian, Polish, Portuguese, Russian, Spanish, Swedish and Turkish
Keypad	2 selection keys, 4 navigation keys, start key, stop key, info key and remote/local key

Signal relays	
Number of programmable signal relays	3 (each relay can be programmed to None, Run, Top of ramp, Event group 0-6, Sequence 1-3 Run, Sequence 1-3 Top of ramp or Run reverse)
K4	Default as Run signal
K5	Default as Top of Ramp (Bypass) signal
K6	Default as Event group 0 (Faults)
Rated operational voltage, $U_e$	250 V AC/24 V DC
Rated thermal current $I_{th}$	5 A
Rated operational current $I_e$ at AC-15 ( $U_e=250$ V)	1.5 A

Analog output	
Output signal reference	0...10 V, 0...10 mA, 0...20 mA, 4...20 mA
Type of output signal	Motor current (A), Main voltage (V), Active power (kW), Active power (HP), Reactive power (kVAr), Apparent power (kVArh), Active energy (kWh), Reactive energy (kVArh), cos phi, Motor temperature (%), Thyristor temperature (%), Motor voltage (%), Main frequency (Hz), PT100 temperature (centigrade), PTC resistance (Ohm)

Directives 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

<sup>1)</sup> Valid for normal start (class 10) for 50% on time and 50% off time. If other data is required, contact your local ABB 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), de-rate the rated current using the following formula. [% of  $I_e = 100 - \frac{x-1000}{150}$ ] x = actual

altitude of the softstarter in meter, [% of  $I_e = 100 - \frac{x-3280}{497}$ ] x = actual altitude of the softstarter in feet. For de-rating of voltage, contact your local ABB office.

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 (Jog), Slow speed reverse (Jog), 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 or Cancel brake)

Signalling indication LED	
Ready	Green
Run	Green
Fault	Red
Protection	Yellow

External keypad	
Detachable keypad	Yes
Display	LCD type, graphical
Ambient temperature	
During operation	-25...+60 °C, (-13...+140 F)
During storage	-40...+70 °C, (-40...+158 F)

Degree of protection	IP66 (Type 1, 4X, 12)
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Start and stop functions	
Soft start with voltage ramp	Linear voltage ramp, suitable for most applications
Soft stop with voltage ramp	Used to prolong the stop sequence
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	More power in the start for heavy duty applications.
Full voltage start	0.5 second start ramp for applications with need of high starting torque
Sequence start	Start multiple motors with one softstarter
Current limit	Limits the current below a specified value
Dual current limit	Consist of a low level, a high level and a time between them
Current limit ramp	A linear increase of the current from the low to the high level
Torque limit	Limit the torque to between 20-200%
Pre-start function	Use Motor heating, Stand still brake or Jog automatically prior to start ramp
Jog with slow speed, forward and reverse	Run the motor in three different speeds, both forward and reverse
Start reverse (external contactors)	Internal logic that allows control of external contactors for reverse start
Dynamic brake	Provides a braking force to decrease stop time

Product compliance	
CE, cULus, CCC, EAC, ANCE, C-tick, KC, ABS, DNV GL, Lloyd's Register, CCS, PRS, Class NK	



PSTX Dimensions and weight						
Frame size	H (mm)	W (mm)	D <sup>1)</sup> (mm)	(kg)	(lb)	
PSTX30...105	314	150	197.5	6.10	13.45	
PSTX142...170	377	199	283.3	9.60	21.16	
PSTX210...370	470	258	279.1	12.70	27.99	
PSTX470...570	493	361	282.15	25.00	55.12	
PSTX720...840	493	435	366.5	46.20	101.85	
PSTX1050	515	435	366.5	64.20	141.64	
PSTX1250	565	435	366.5	64.70	142.64	

<sup>1)</sup> Note: Include HMI

<b>Fieldbus connection</b>	
Built-in Modbus RTU	Yes, with RS485 interface on terminals 23 and 24
Connection for Anybus	Yes, including most common protocols, see catalog for details
Connection for ABB Fieldbus plug	Yes, compatible with a special adapter, see catalog for details
<b>Protections</b>	
Electronic overload protection, EOL	User defined, class 10A, 10, 20, 30
Dual overload (separate overload for start and run)	Possible to set separate overloads for start and full speed
PTC connection	User defined temperature control with external PTC sensor
PT-100 connection	User defined temperature control with external PT-100 sensor
Locked rotor protection	Prevents start if motor is stuck, e.g. stuck pumps and conveyors
Current underload protection	Stops the process if the load is too light, e.g. a pump running dry
Current imbalance protection	User defined, checks current imbalance between the phases
Power factor underload protection	User defined, trip if power factor is out of range
Under voltage protection	User defined, prevents the motor from stalling in weak networks
Over voltage protection	User defined, prevents the motor from damage at high voltage levels
Voltage imbalance protection	User defined, checks voltage imbalance between the phases
Earth fault protection / ground fault protection	User defined, 0.1-1.0 sec, stops the process if earth fault is detected
Phase reversal protection	Prevents start if phases are connected in the wrong order
Bypass open protection	Trips if the bypass is open when it should be closed
User defined protection	Programmable input, can be used with external protection device
Too long current limit protection	User defined, trips when the current has been at the current limit for too long time
HMI failure protection	Indicates communication failure between softstarter and HMI
Fieldbus failure protection	Indicates communication failure between softstarter and PLC
Extension IO failure protection	Indicates communication failure between softstarter and IO module
Max number of starts/hour	Prevents start if the thyristors gets too warm (thus used over specification)
Too long start time protection	User defined, trips when the starting time exceeds a set value
<b>External faults detection</b>	
Phase loss	Yes
High current	Yes
Low control supply voltage	Yes
Faulty usage	Yes, e.g. using limp mode inside-delta
Faulty connection	Yes
Bad network quality	Yes

For all functions and features see installation and commissioning manual, 1SFC132081M0201 available on [new.abb.com/drives/softstarter](https://new.abb.com/drives/softstarter)

For more information, please contact your local ABB representative or visit <https://new.abb.com/drives/softstarters>

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<b>Warnings</b>	
Current underload 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
Electronic overload Time-to-trip	User defined on/off
Short circuit warning (for Limp mode)	User defined on/off, for Limp mode
Over voltage warning	User defined on/off
Under voltage warning	User defined on/off
Power factor underload warning	User defined on/off
Locked rotor warning	User defined on/off
Faulty fan warning	User defined on/off
THD(U) - Total Harmonic Distortion warning	User defined on/off
Motor runtime limit warning	User defined on/off
Phase loss warning (for stand by)	User defined on/off, for stand by
EOL warning	User defined on/off
<b>Internal faults detection</b>	
Thyristor overload	Yes
Short circuit	Yes
Open circuit thyristor or gate	Yes
Heat sink over temperature	Yes
Shunt fault	Yes
<b>PTC input</b>	
Switch off resistance	2825 ohm ± 20%
Switch on resistance	1200 ohm ± 20%
<b>Other functions</b>	
Real time clock	Can maintain time when the softstarter isn't powered up, 48 h back-up
Event log	Log of events such as trips, parameters changed and operation
Emergency mode	To keep the softstarter running regardless of trip or failure. Activated via DI
Automatic restart	In case of trip and stopped motor, the softstarter can restart itself
Keypad password	Lock the keypad to inhibit unauthorized motor control
Pump cleaning	Can reverse pump flow and clean out pipes
Electronic overload Time-to-cool	Time until the motor is ready to be restarted 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 sags detection	User defined
Limp mode with two-phase motor control if one set of thyristors is shorted	Can keep process running until planned maintenance

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