



Catalogue

Softstarters Enclosed PSE

Power and productivity
for a better world™





Enclosed PSE

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Enclosed PSE

Softstarter description



Product description

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

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

Torque control



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

Built-in by-pass for energy saving

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

Coated circuit boards

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

Motor protection

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

Analog output

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

Display and keypad

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

External keypad

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

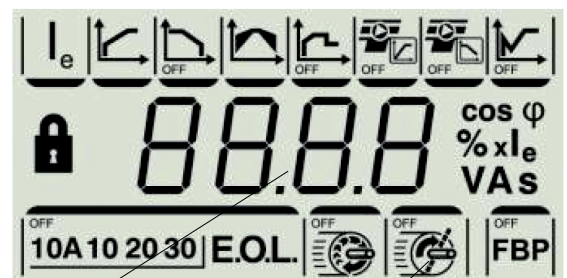
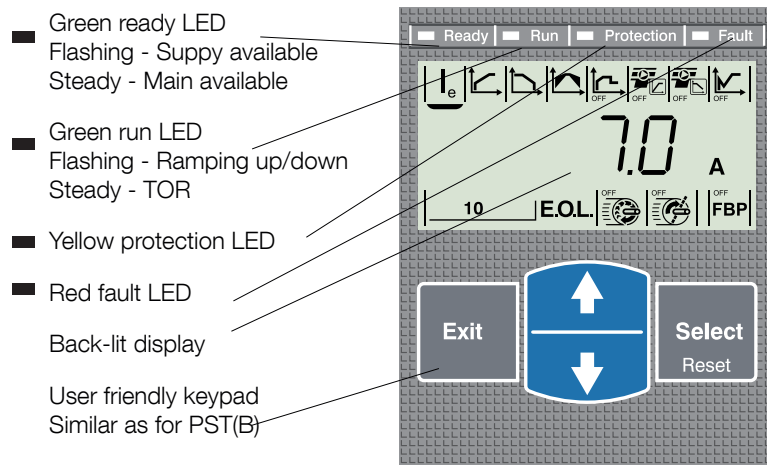
Enclosed PSE Softstarter description

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

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

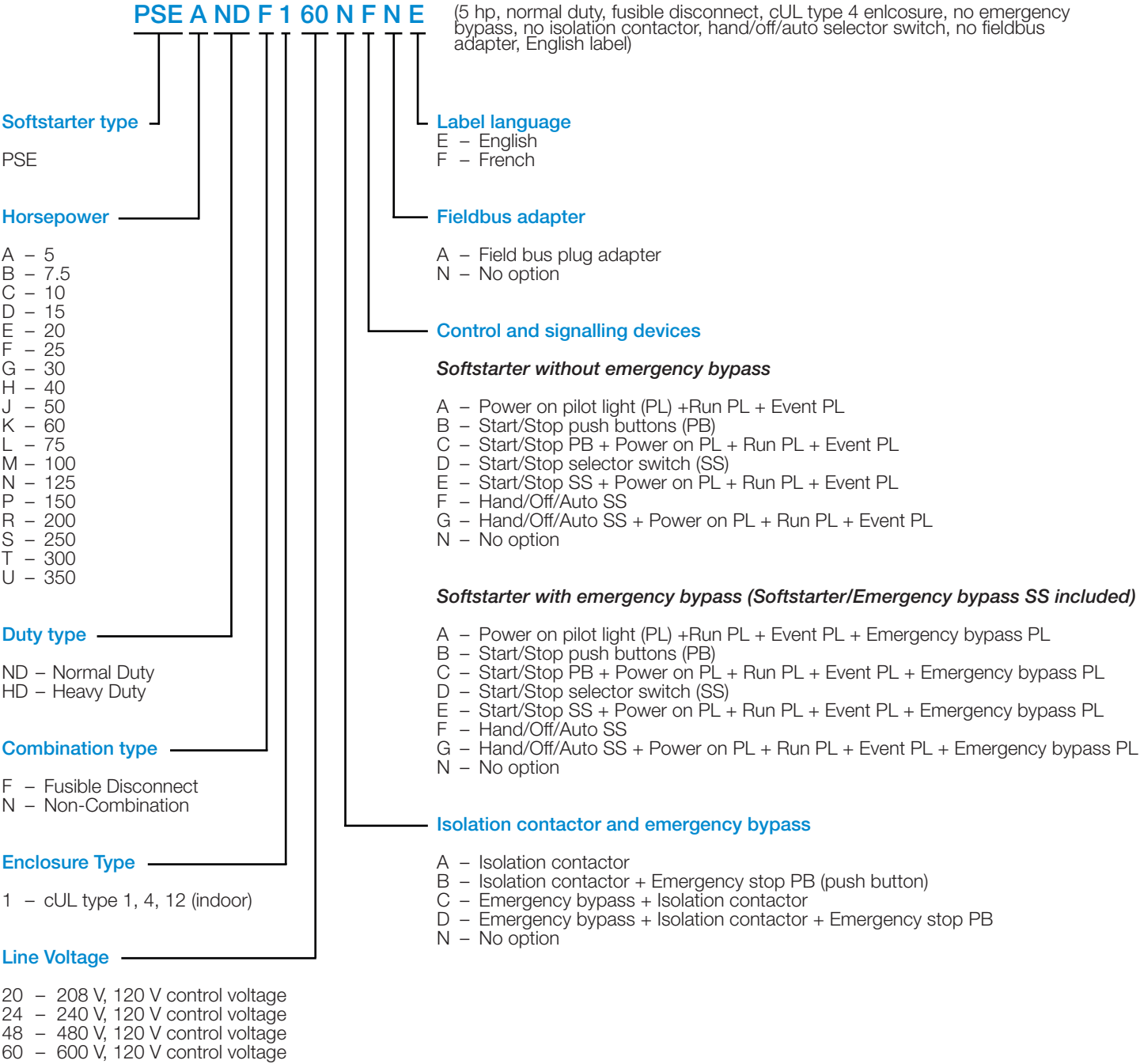


Settings



Enclosed PSE

Part number definition



Notes: The fuses need to be class J time delay for the disconnect.
Type 1 co-ordination will be achieved with the class J time delay fuses or breaker as the short circuit protection.
The front door keypad is always included.
The pilot light LED colors are: power on (white), Run (green), Fault (red), Emergency Bypass (green).

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PSE type and overload current range

Horsepower rating										PSE type	Overload current range	
Normal duty					Heavy duty						Integrated	Emergency bypass
208 V	240 V	480 V	600 V	Max FLA	208 V	240 V	480 V	600 V	Max FLA			
-	-	-	-	-	-	-	-	5	6.1	PSE18	5.4-18	5.7...18.9
-	-	-	-	-	-	-	5	7.5	9	PSE18	5.4-18	5.7...18.9
5	5	10	15	18	-	-	7.5	10	11	PSE18	5.4-18	5.7...18.9
7.5	7.5	15	20	25	5	5	10	15	18	PSE25	7.5-25	9.0...30.0
-	10	20	25	28	7.5	7.5	15	20	25	PSE30	9-30	9.0...30.0
10	-	25	30	34	-	-	20	25	28	PSE37	11.1-37	9.0...45.0
-	15	30	40	42	10	10	25	30	34	PSE45	13.5-45	27.0...80.0
15	20	40	50	60	-	15	30	40	42	PSE60	18-60	27.0...80.0
20	25	50	60	68	15	20	40	50	60	PSE72	21.6-72	27.0...80.0
25	30	60	75	80	20	25	50	60	68	PSE85	25.5-85	50.0...140.0
30	40	75	100	104	25	30	60	75	80	PSE105	31.8-106	50.0...140.0
40	50	100	125	130	30	40	75	100	104	PSE142	42.9-143	63.0...210.0
50	60	125	150	169	40	50	100	125	130	PSE170	51.3-171	63.0...210.0
60	75	150	200	192	50	60	125	150	169	PSE210	63-210	115.0...380.0
75	100	200	250	248	60	75	150	200	192	PSE250	75-250	115.0...380.0
100	125	250	300	302	75	100	200	250	248	PSE300	90.6-302	115.0...380.0
125	150	300	350	361	100	125	250	300	302	PSE370	111-370	150.0...500.0

How to select correct size

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

Quick guide for selection

Normal start Class 10

Heavy duty start class 30

Typical applications

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



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

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Enclosed unit technical data

Short circuit co-ordination type

Type 1 co-ordination will be achieved with the time delay class J fuses or breaker as the short circuit protection. Type 1 co-ordination requires that, under short-circuit conditions, the contactor or starter shall cause no danger to persons or installation and may not be suitable for further service without repair and replacement of parts.

Motor lug size

Softstarter type	Max FLA	Max AWG (Cu 75°C only)
PSE18	18	1
PSE25	25	1
PSE30	28	1
PSE37	34	1
PSE45	42	1/0
PSE60	60	1/0
PSE72	68	1/0
PSE85	80	1/0
PSE105	104	1/0
PSE142	130	4/0
PSE170	169	250 MCM
PSE210	192	300 MCM
PSE250	248	2 x 300 MCM
PSE300	302	2 x 300 MCM
PSE370	361	2 x 500 MCM

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Enclosed unit technical data

Enclosure dimensions for units with fusible disconnect

Horsepower rating								Dimensions (in)		
Normal duty				Heavy duty				H	W	D
208 V	240 V	480 V	600 V	208 V	240 V	480 V	600 V			
-	-	-	-	-	-	-	5	24	20	12
-	-	-	-	-	-	5	7.5	24	20	12
5	5	10	15	-	-	7.5	10	24	20	12
7.5	7.5	15	20	5	5	10	15	24	20	12
-	10	20	25	7.5	7.5	15	20	24	20	12
10	-	25	30	-	-	20	25	24	20	12
-	15	30	40	10	10	25	30	36	30	12
15	20	40	50	-	15	30	40	36	30	12
20	25	50	60	15	20	40	50	36	30	12
25	30	60	75	20	25	50	60	36	30	12
30	40	75	100	25	30	60	75	36	30	12
40	50	100	125	30	40	75	100	48	36	12
50	60	125	150	40	50	100	125	48	36	12
60	75	150	200	50	60	125	150	48	36	16
75	100	200	250	60	75	150	200	48	36	16
100	125	250	300	75	100	200	250	60	36	16
125	150	300	350	100	125	250	300	60	36	16

Enclosed PSE

Open unit technical data

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

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

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

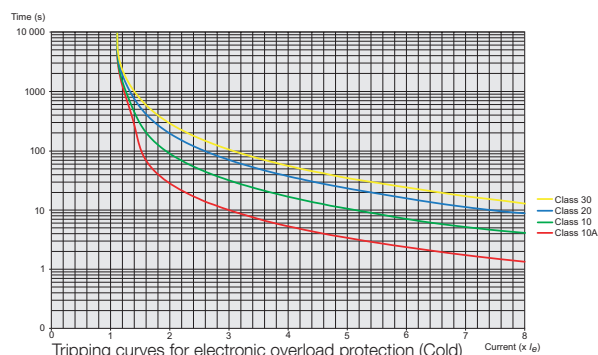
³⁾ When used at high altitudes above 1000 meters (3281 ft) up to 4000 meters (13123 ft) you need to derate the rated current using the following formula.

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

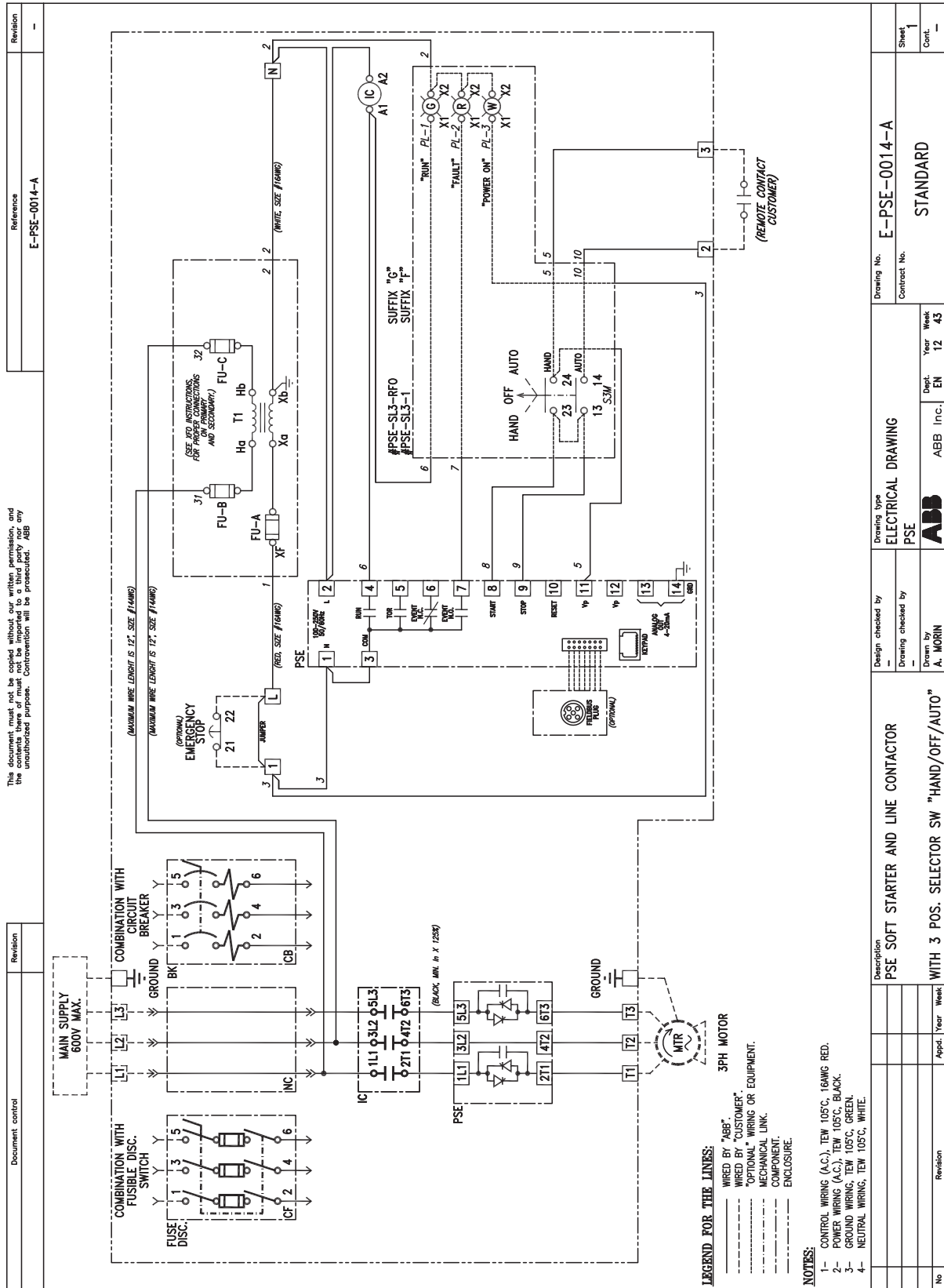
$$[\% \text{ of } I_e = 100 - \frac{x - 3280}{497}] \quad x = \text{actual altitude for the softstarter in feet}$$

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

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



Enclosed PSE
Electrical diagram example

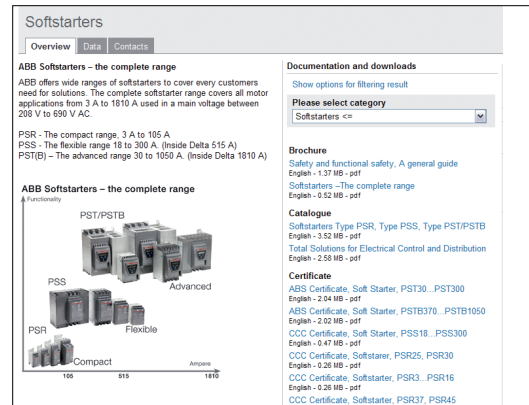


Marketing material and prosoft

Marketing material available on www.abb.com/lowvoltage

The following material is a selection of all softstarter related material that is available on www.abb.com/lowvoltage. Just click on “Control Products”, then “Softstarters”.

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

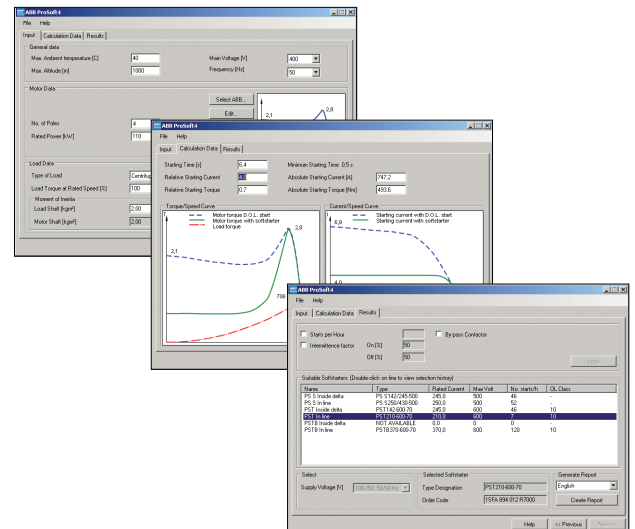


prosoft 5 - Softstarter selection tool

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

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








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



Certifications and approvals

The table below shows the approvals and certifications for the open type and enclosed PSE softstarter.
For approvals and/or certificates not listed below, please contact your local ABB sales office.

Certifications and approvals

Unit type	Certifications							Approvals: ship classification societies	
									
	CE EU		cULus Canada USA	CCC China	GOST Russia	ANCE Mexico	C-tick Australia	ABS American Bureau of Shipping	GL Germany
Open PSE18...PSE370	•	–	•	•	•	•	•	–	–
Enclosed PSE18...PSE370	–	•	–	–	–	–	–	–	–

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

Directives and standards

No. 2006/95/EC
No. 2004/108/EC
EN 60947-1
EN 60947-4-2
UL 508
CSA C22.2 No 14

Contact us

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