

CATALOG

# Softstarter Type PSE



# ABB softstarter

## 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.

### SECURE MOTOR

#### Reliability



ABB softstarters help increase your motor's 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.

### IMPROVE INSTALLATION

#### Efficiency



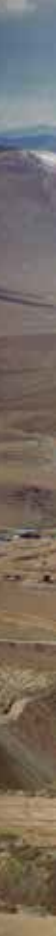
Reduce your installation time and panel size by having all features you need built into your softstarter. Our softstarters are easy to install thanks to their compact design and many built-in features. The built-in bypass saves energy and space while reducing heat generation. A complete motor starting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

### INCREASE APPLICATION

#### Productivity



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.





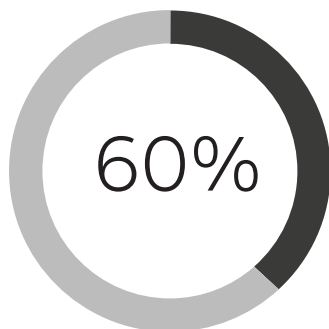
## Xylem - South Africa

ABB's softstarters providing efficiency to the mining industry

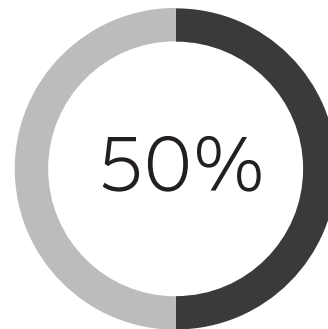
One of Xylem's water solutions helps to prevent flooding in mines. Previous softstarters needed a lot of extra protection equipment. Xylem was looking for a simpler solution that would ensure reliability even at 3,500 meters depth. Reducing the number of components by 80 percent, shortened installation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

Why softstarting matters to Xylem

Installation time reduced by



Total panel cost reduced by



For more examples of how ABB's softstarters are helping the industry, visit [www.abb.com/lowvoltage/launches/pstx](http://www.abb.com/lowvoltage/launches/pstx)

# ABB softstarter

## How we are helping the industry

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.

### Controlling pumps

#### ELIMINATING WATER HAMMERING WITH TORQUE CONTROL

Water hammering is a common problem with pumps. It typically results in a lot on wear of pipes and valves when stopping the pump. The ABB softstarter feature torque control stop eliminates water hammering and prolongs the lifetime of the system, while reducing pump downtime.

#### 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 underload protection. It stops the motor which saves the pump from additional wear and contributes to prolonging its lifetime.

### Controlling fans

#### SOFT STARTING ADJUSTED TO APPLICATION

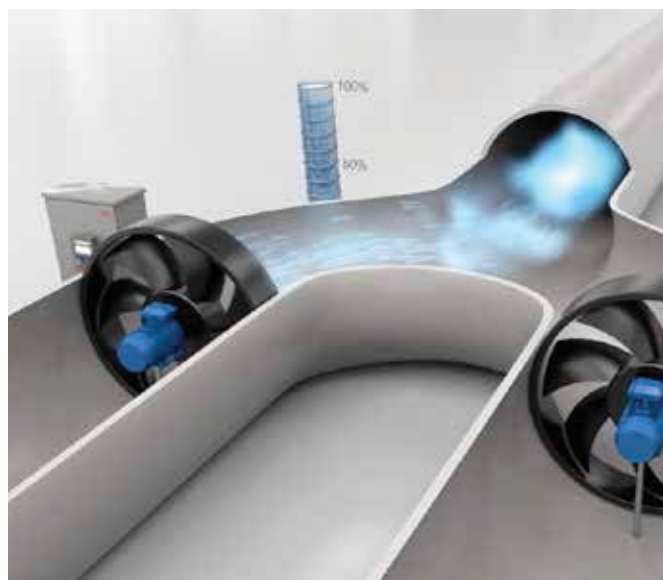
Fans normally have a high moment of inertia, which makes starting tough and current high. Using an ABB softstarter, the voltage is increased gradually during start, which reduces the current and removes the inrush peak. It is possible to adjust the settings to fit almost any starting condition, from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

#### FAST STOPS WITH MOTOR BRAKING

It can also take a long time to stop the fan. Active braking using the dynamic brake feature reduces stopping times. 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.



## Controlling conveyor belts

### 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.



## Controlling 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.





# ABB softstarters

## 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.

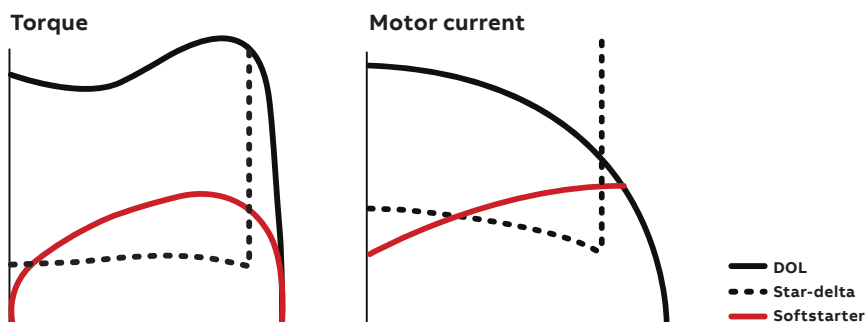
Star-delta is not adjustable, so if the torque is reduced too much, the motor will not start. Current peaks will happen when switching from star to delta connection.



### 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.



Typical torque and current curves from starting a motor using DOL, star-delta and softstarter.

### 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.

ABB's softstarter offering consists of three ranges, covering every need. The products help you secure motor reliability, improve installation efficiency and increase application productivity.



PSR – The compact range		PSE – The efficient range		PSTX – The advanced range	
Technical data:					
Rated motor current	3...105 A	Rated motor current	30...370 A	Rated motor current	30...1250 A (inside delta: 2160 A)
Main motor voltage	208...600 V	Main motor voltage	208...600 V	Main motor voltage	208...690 V
Control supply voltage	100...240 V AC or 24 V AC/DC	Control supply voltage	100...250 V AC	Control supply voltage	100...250 V AC

	Current limit	Current limit ramp and dual current limit	Electronic motor overload protection	Dual overload protection	Underload protection	Power factor protection	Locked rotor underload protection	Current / Voltage protection	Phase reversal protection	Customer defined protection	Motor heating	PTC / PT100 input for motor protection	Earth-fault protection	Built-in bypass	Inside-delta connection possible	Detachable display and keypad	Motor runtime and start count	Programmable warning functions	Overload time-to-trip	Analog output	Fieldbus output	Event log	Multiple languages	Electricity metering	Torque control	Torque limit	Coated PCBs	Limp mode	Jog with slow speed forward / reverse	Dynamic brake	Stand still brake	Sequence start	Full voltage start	Kick start	Automatic pump cleaning			
PSR	—	—	—	—	—	—	—	—	—	—	—	—	•	—	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
PSE	•	—	•	—	•	—	•	—	—	—	—	—	•	—	•	—	—	—	—	•	○	○	—	—	•	—	•	—	—	—	—	—	—	—	•	—		
PSTX	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	17	•	•	•	•	•	•	•	•	•	•	•	•	•		
Secure motor reliability													Improve installation efficiency										Increase application productivity															
• Standard   ○ Optional   — 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 for an ATEX motor?

ABB's softstarters PSR, PSE and PSTX can be used to start ATEX classified motors in Ex environments if the following considerations are taken into account:

- The softstarter has to be placed outside the Ex area. Either in another location or inside an ATEX approved panel.
- A separate ATEX approved overload relay from ABB has to be used together with a line contactor. This overload relay will replace the built-in EOL in the softstarter and has an ATEX approved tripping curve.
- Select softstarter according to normal or heavy-duty start depending on application and line contactor and overload relay with type 2 coordination.

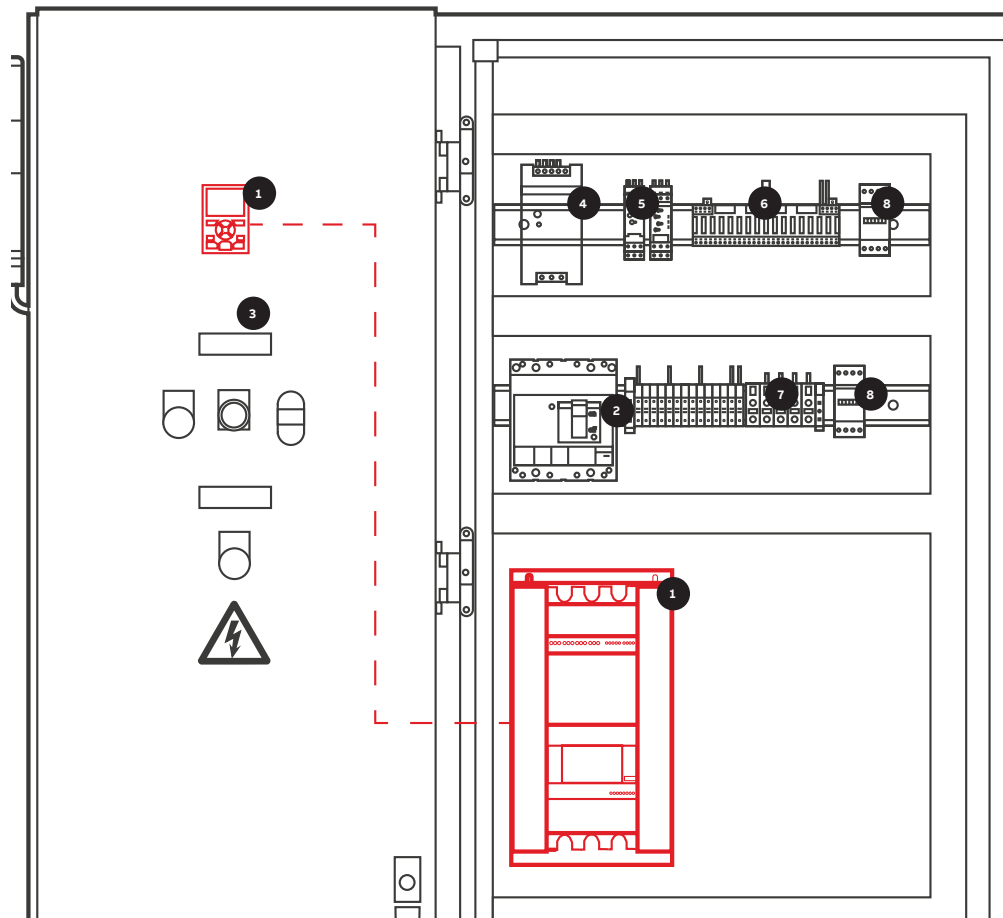


### Can I use a softstarter on a ship?

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

Ships uses 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.





- 1** SOFTSTARTER
- Soft start and stop with reduced current
  - Features to improve process productivity
  - Detachable keypad for front door mounting on a panel



- 2** SHORT CIRCUIT BREAKER MCCB
- Short circuit protection of motor
  - Possibility for electrical isolation



- 3** PILOT DEVICES
- Remote control of motor
  - Indication of softstarter and motor status with light and sound
  - Emergency stop of motor



- 4** POWER SUPPLY CP-E
- Possible to use 24V AC/DC equipments in the panel, e.g. PLC



- 5** LIQUID LEVEL MONITORING RELAYS CM-ENS
- Monitoring and signalling the water level



- 6** PLC 800M
- Automatic control
  - Remote communication



- 7** TERMINAL BLOCKS SNK RANGE
- Easy installation of control wires



- 8** LINE CONTACTOR AF
- Isolation at stop
  - Isolation at faults
  - Emergency stop
  - Back-up DOL starter

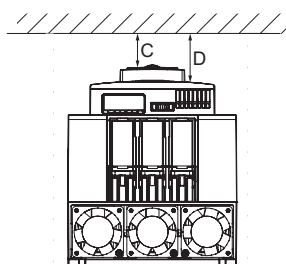
# ABB softstarters

## Wall mounting instructions

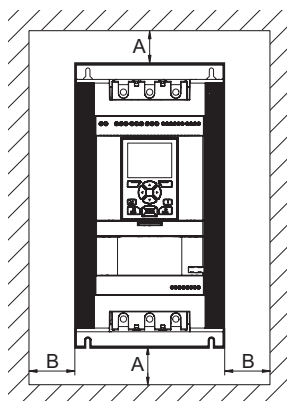
Minimum distance to wall mm (in)				
Softstarter, type	A <sup>1)</sup>	B <sup>1)</sup>	C	D
<b>PSR</b>				
PSR3 ... PSR16	0	0	25 (0.98)	N/A
PSR25 ... PSR30	0	0	25 (0.98)	N/A
PSR37 ... PSR45	0	0	25 (0.98)	N/A
PSR60 ... PSR105	0	0	25 (0.98)	N/A
<b>PSE</b>				
PSE18 ... PSE105	100 (3.94)	10 (0.39)	20 (0.79)	N/A
PSE142 ... PSE170	100 (3.94)	10 (0.39)	20 (0.79)	N/A
PSE210 ... PSE370	100 (3.94)	10 (0.39)	20 (0.79)	N/A
<b>PSTX</b>				
PSTX30 ... PSTX105	100 (3.94)	10 (0.39)	20 (0.79)	35 (1.38)
PSTX142 ... PSTX170	100 (3.94)	10 (0.39)	20 (0.79)	35 (1.38)
PSTX210 ... PSTX370	100 (3.94)	10 (0.39)	20 (0.79)	35 (1.38)
PSTX470 ... PSTX570	150 (5.91)	15 (0.59)	20 (0.79)	35 (1.38)
PSTX720 ... PSTX840	150 (5.91)	15 (0.59)	20 (0.79)	35 (1.38)
PSTX1050 ... PSTX1250	150 (5.91)	15 (0.59)	20 (0.79)	35 (1.38)

<sup>1)</sup> PSR, Only for wall mounted Softstarters

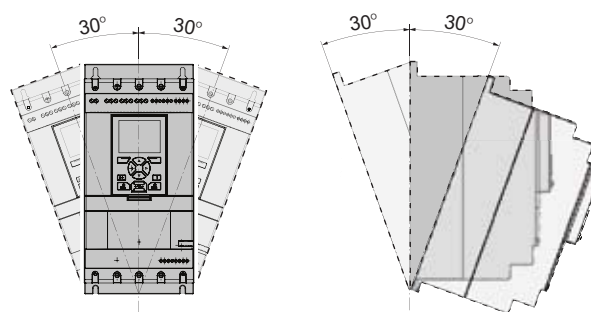
Minimum distance to front



Minimum distance to wall



Maximum mounting angle



Items included in the box with the softstarter







	Multi-language manual	Terminal kit	Cable and mounting kit for detachable keypad
PSR3 ... PSR105	•	—	—
PSE18 ... PSE370	•	•	—
PSTX30 ... PSTX1250	•	•	•

# ABB softstarters

## Certifications and approvals

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

### Certifications and approvals

Abbreviation approved in	Certifications						Approvals: ship classification societies					
							ABS	DNV GL	Lloyd's Register	CCS	PRS	Class NK
PSR3 ... PSR105	•	•	•	•	•	•	—	—	—	—	•	—
PSE18 ... PSE370	•	•	•	•	•	•	•	•	•	•	•	•
PSTX30 ... PSTX1250	•	•	•	•	•	•	•	•	•	•	•	•

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

### Directives and standards

No. 2006/95/EC	Low voltage equipment
No. 2004/108/EC	Electromagnetic compability
EN 60947-1	Low-voltageswitchgear 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



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.

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# PSE - The efficient range

<b>26–27</b>	<b>Introduction</b>
<b>28–29</b>	<b>Overview</b>
<b>30–31</b>	<b>ordering details</b>
<b>32</b>	<b>Accessories</b>
<b>33–35</b>	<b>Technical data</b>
<b>36</b>	<b>Dimensions</b>
<b>37</b>	<b>Circuit diagrams</b>

# PSE - The efficient range

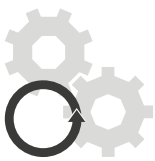
## Introduction



- Two-phase controlled
- Operational voltage: 208...600 V AC
- Wide rated control supply voltage: 100...250 V AC, 50/60 Hz
- Rated operational current: 18...370 A
- Voltage ramp and torque control for both start and stop
- Current limit
- Kick-start
- Built-in bypass for energy saving and easy installation
- Coated PCBA protecting from dust, moist and corrosive atmosphere
- Illuminated display that uses symbols to become language neutral
- External keypad rated IP66 (Type 1, 4X,12) as an option
- Fieldbus communication with FieldBusPlug adapter and the FieldBusPlug
- Analog output for display of motor current
- Electronic overload protection
- Underload protection
- Locked rotor protection

### SECURE MOTOR

## Reliability



#### 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.

### IMPROVE INSTALLATION

## Efficiency



#### 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.

### INCREASE APPLICATION

## Productivity



#### 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.





## 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.



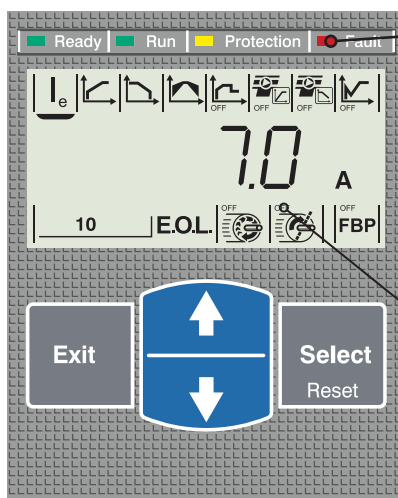
## OUTPUT SIGNAL RELAYS FOR RUN, TOP OF RAMP AND EVENT

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.



## CLEAR MARKINGS ON THE FRONT FOR EASY INSTALLATION

All markings are on the front making it very easy to read after installation.



## LED INDICATORS

## Green ready LED

Flashing - Supply available  
Steady - Main available

## Green run LED

Flashing - Ramping up/down  
Steady - TOR

## Yellow protection LED

## Red fault LED



## 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. Set-up is done by using the four buttons on the keypad.

## PSE - The efficient range

### Overview



PSE18 ... PSE105

Normal start In-line connected (400 V) kW IEC, max. A (440-480 V) hp UL, max. FLA	PSE18	PSE25	PSE30	PSE37	PSE45	PSE60	PSE72	PSE85	PSE105
	7.5	11	15	18.5	22	30	37	45	55
	18	25	30	37	45	60	72	85	106
	10	15	20	25	30	40	50	60	75
	18	25	28	34	42	60	68	80	104
Using MCCB only, type 1 coordination will be achieved <sup>1)</sup>	400 V, 40 °C								
	MCCB (35 kA)								
	T2N160								T3N250
	MCCB (50 kA)								
	T2S160								T3S250
To achieve type 2 coordination, semi- conductor fuses must be used <sup>1)</sup>	Fuse protection (85 kA), Semiconductor fuses, Bussmann								
	170M1563	170M1564	170M1566	170M1567	170M1568	170M1569	170M1571	170M1572	170M3819
Suitable switch fuse for recommended semi- conductor fuses <sup>1)</sup>	Switch fuse								
	OS32GD			OS63GD			OS125GD		OS250D
The line contactor is not required for the softstarter itself but often used to open if OL trips <sup>1)</sup>	Line contactor								
	AF26		AF30	AF38	AF52	AF65	AF80	AF96	AF116

<sup>1)</sup> This is an example of coordination. For more examples see: [applications.it.abb.com/SOC](http://applications.it.abb.com/SOC)

## PSE - The efficient range

### Overview



PSE142 ... PSE170



PSE210 ... PSE370

Normal start In-line connected (400 V) kW IEC, max. A (440-480 V) hp UL, max. FLA	PSE142	PSE170	PSE210	PSE250	PSE300	PSE370
	75	90	110	132	160	200
	143	171	210	250	300	370
	100	125	150	200	250	300
	130	169	192	248	302	361
Using MCCB only, type 1 coordination will be achieved <sup>1)</sup>	400 V, 40 °C					
	MCCB (35 kA)					
	T3N250		T4N320	T5N400		T5N630
	MCCB (50 kA)					
	T3S250		T4S320	T5S400		T5S630
To achieve type 2 coordination, semi- conductor fuses must be used <sup>1)</sup>	Fuse protection (85kA), Semiconductor fuses, Bussmann					
	170M5809	170M5810	170M5812	170M5813	170M6812	170M6813
Suitable switch fuse for recommended semi- conductor fuses <sup>1)</sup>	Switch fuse					
	OS400D				OS630D	
The line contactor is not required for the softstarter itself but often used to open if OL trips <sup>1)</sup>	Line contactor					
	AF140	AF190	AF205	AF265	AF305	AF370

<sup>1)</sup> This is an example of coordination. For more examples see: [applications.it.abb.com/SOC](http://applications.it.abb.com/SOC)



## PSE - The efficient range

Normal starts, class 10, in-line,  
ordering details

### Typical applications:

- Bow thruster
- Centrifugal pump
- Compressor
- Conveyorbelt (short)
- Elevator
- Escalator



If more than 10 starts/h, select one size larger than the standard selection.  
For a more precise selection, use the online softstarter selection tool available by scanning the shown QR code or using the selection tool available on: [new.abb.com/low-voltage/products/softstarters](http://new.abb.com/low-voltage/products/softstarters)



Rated operational voltage  $U_e$ , 208...600 V

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

IEC			UL/CSA				Type		Order code		Weight (1 pce)	
Rated operational power			Rated operational power				current					
230 V	400 V	500 V										
$P_e$	$P_e$	$P_e$	$I_e$	200 / 208 V	220 / 240 V	440 / 480 V	550 / 600 V	FLA			kg	(lb)
kW	kW	kW	A	hp	hp	hp	hp	A				
4	7.5	11	18	5	5	10	15	18	PSE18-600-70	1SFA897101R7000	2.40	(5.29)
5.5	11	15	25	7.5	7.5	15	20	25	PSE25-600-70	1SFA897102R7000	2.40	(5.29)
7.5	15	18.5	30	7.5	10	20	25	28	PSE30-600-70	1SFA897103R7000	2.40	(5.29)
9	18.5	22	37	10	10	25	30	34	PSE37-600-70	1SFA897104R7000	2.40	(5.29)
11	22	30	45	10	15	30	40	42	PSE45-600-70	1SFA897105R7000	2.40	(5.29)
15	30	37	60	20	20	40	50	60	PSE60-600-70	1SFA897106R7000	2.40	(5.29)
18.5	37	45	72	20	25	50	60	68	PSE72-600-70	1SFA897107R7000	2.50	(5.51)
22	45	55	85	25	30	60	75	80	PSE85-600-70	1SFA897108R7000	2.50	(5.51)
30	55	75	106	30	40	75	100	104	PSE105-600-70	1SFA897109R7000	2.50	(5.51)
40	75	90	143	40	50	100	125	130	PSE142-600-70	1SFA897110R7000	4.20	(9.26)
45	90	110	171	60	60	125	150	169	PSE170-600-70	1SFA897111R7000	4.20	(9.26)
59	110	132	210	60	75	150	200	192	PSE210-600-70	1SFA897112R7000	12.40	(27.34)
75	132	160	250	75	100	200	250	248	PSE250-600-70	1SFA897113R7000	13.90	(30.64)
90	160	200	300	100	100	250	300	302	PSE300-600-70	1SFA897114R7000	13.90	(30.64)
110	200	250	370	125	150	300	350	361	PSE370-600-70	1SFA897115R7000	13.90	(30.64)

## PSE - The efficient range

Heavy-duty start, class 30, in-line,  
ordering details



### Typical applications

- Centrifugal fan
- Conveyor belt (long)
- Crusher
- Mill
- Mixer
- Stirrer



If more than 10 starts/h, select one size larger than the standard selection. For a more precise selection, use the online softstarter selection tool available by scanning the shown QR code or using the selection tool available on: [new.abb.com/low-voltage/products/softstarters](http://new.abb.com/low-voltage/products/softstarters)











Rated operational voltage  $U_e$ , 208-600 V

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

IEC				UL/CSA				Type	Order code	Weight (1 pce)		
Rated operational power			current	Rated operational power			current					
230 V	400 V	500 V		200 / 208 V	220 / 240 V	440 / 480 V						550 / 600 V
P <sub>e</sub> kW	P <sub>e</sub> kW	P <sub>e</sub> kW	I <sub>e</sub> A	P <sub>e</sub> hp	P <sub>e</sub> hp	P <sub>e</sub> hp	P <sub>e</sub> hp	FLA A			kg	(lb)
3	5.5	7.5	12	3	3	7.5	10	11	PSE18-600-70	1SFA897101R7000	2.40	(5.29)
4	7.5	11	18	5	5	10	15	18	PSE25-600-70	1SFA897102R7000	2.40	(5.29)
5.5	11	15	25	7.5	7.5	15	20	25	PSE30-600-70	1SFA897103R7000	2.40	(5.29)
7.5	15	18.5	30	7.5	10	20	25	28	PSE37-600-70	1SFA897104R7000	2.40	(5.29)
9	18.5	22	37	10	10	25	30	34	PSE45-600-70	1SFA897105R7000	2.40	(5.29)
11	22	30	45	10	15	30	40	42	PSE60-600-70	1SFA897106R7000	2.40	(5.29)
15	30	37	60	20	20	40	50	60	PSE72-600-70	1SFA897107R7000	2.50	(5.51)
18.5	37	45	72	20	25	50	60	68	PSE85-600-70	1SFA897108R7000	2.50	(5.51)
22	45	55	85	25	30	60	75	80	PSE105-600-70	1SFA897109R7000	2.50	(5.51)
30	55	75	106	30	40	75	100	104	PSE142-600-70	1SFA897110R7000	4.20	(9.26)
40	75	90	143	40	50	100	125	130	PSE170-600-70	1SFA897111R7000	4.20	(9.26)
45	90	110	171	60	60	125	150	169	PSE210-600-70	1SFA897112R7000	12.40	(27.34)
59	110	132	210	60	75	150	200	192	PSE250-600-70	1SFA897113R7000	13.90	(30.64)
75	132	160	250	75	100	200	250	248	PSE300-600-70	1SFA897114R7000	13.90	(30.64)
90	160	200	300	100	100	250	300	302	PSE370-600-70	1SFA897115R7000	13.90	(30.64)

## PSE - The efficient range

### Accessories

 1SFT98099_095C2 5B8054C2	For softstarter type	Wire range	Tightening torque max.	Type	Order code	Pkg qty	Weight (1 pce)
		mm <sup>2</sup>	Nm				kg (lb)
	Cable connectors for Cu cables						
	PSE142 ... PSE170	6...120	14	–	1SDA066917R1	3	0.113 (0.249)
	PSE142 ... PSE170	2 x (50...120)	16	LZ185-2C/120	1SFN074709R1000	3	0.100 (0.220)
	PSE210 ... PSE370	16...300	25	–	1SDA055016R1	3	0.133 (0.293)
 1SFT98099_01C1	For softstarter type	Wire range	Tightening torque max.	Type	Order code	Pkg qty	Weight (1 pce)
		mm <sup>2</sup>	Nm				kg (lb)
	Cable connectors for Al and Cu cables						
	PSE142 ... PSE170	95...185	31	–	1SDA054988R1	3	0.078 (0.172)
	PSE210 ... PSE370	185...240	43	–	1SDA055020R1	3	0.133 (0.293)
 LW... 1SFT98000_011C3	For softstarter type	Dimensions hole ø	bar mm <sup>2</sup>	Type	Order code	Pkg qty	Weight (1 pce)
		mm <sup>2</sup>					kg (lb)
	Terminal enlargements						
	PSE18 ... PSE105	6.5	15 x 3	LW110	1SFN074307R1000	1	0.100 (0.220)
	PSE142 ... PSE170	10.5	17.5 x 5	LW185	1SFN074707R1000	1	0.450 (0.992)
	PSE210 ... PSE370	10.5	20 x 5	LW300	1SFN075107R1000	1	1.230 (2.712)
 LT ... -AC 1SFT98099_019C3  LT ... -AL 1SFT98099_125	For softstarter type		Req. qty	Type	Order code	Pkg qty	Weight (1 pce)
							kg (lb)
	Terminal shrouds						
	PSE142 ... PSE170, short for use with cable clamps		2	LT185-AC	1SFN124701R1000	2	0.050 (0.110)
	PSE142 ... PSE170, long for use with compression lugs		2	LT185-AL	1SFN124703R1000	2	0.220 (0.485)
	PSE210 ... PSE370, short for use with cable clamps		2	LT300-AC	1SFN125101R1000	2	0.070 (0.154)
PSE210 ... PSE370, long for use with compression lugs		2	LT300-AL	1SFN125103R1000	2	0.280 (0.617)	
 PSEEK 1SFC132328F0002	For softstarter type			Type	Order code	Pkg qty	Weight (1 pce)
							kg (lb)
	External keypad including a 3m cable						
	PSE18 ... PSE370			PSEEK	1SFA897100R1001	1	0.198 (0.437)
 PSECA 1SFC132355F0002	For softstarter type			Type	Order code	Pkg qty	Weight (1 pce)
							kg (lb)
	USB cable for Service Engineer Tool						
	PSE18 ... PSE370			PSECA	1SFA897201R1001	1	0.130 (0.287)
 PS-FBPA 1SFC132368F0001	For softstarter type			Type	Order code	Pkg qty	Weight (1 pce)
							kg (lb)
	FieldBusPlug connection accessory						
	PSE18 ... PSE370			PS-FBPA	1SFA896312R1002	1	0.060 (0.132)

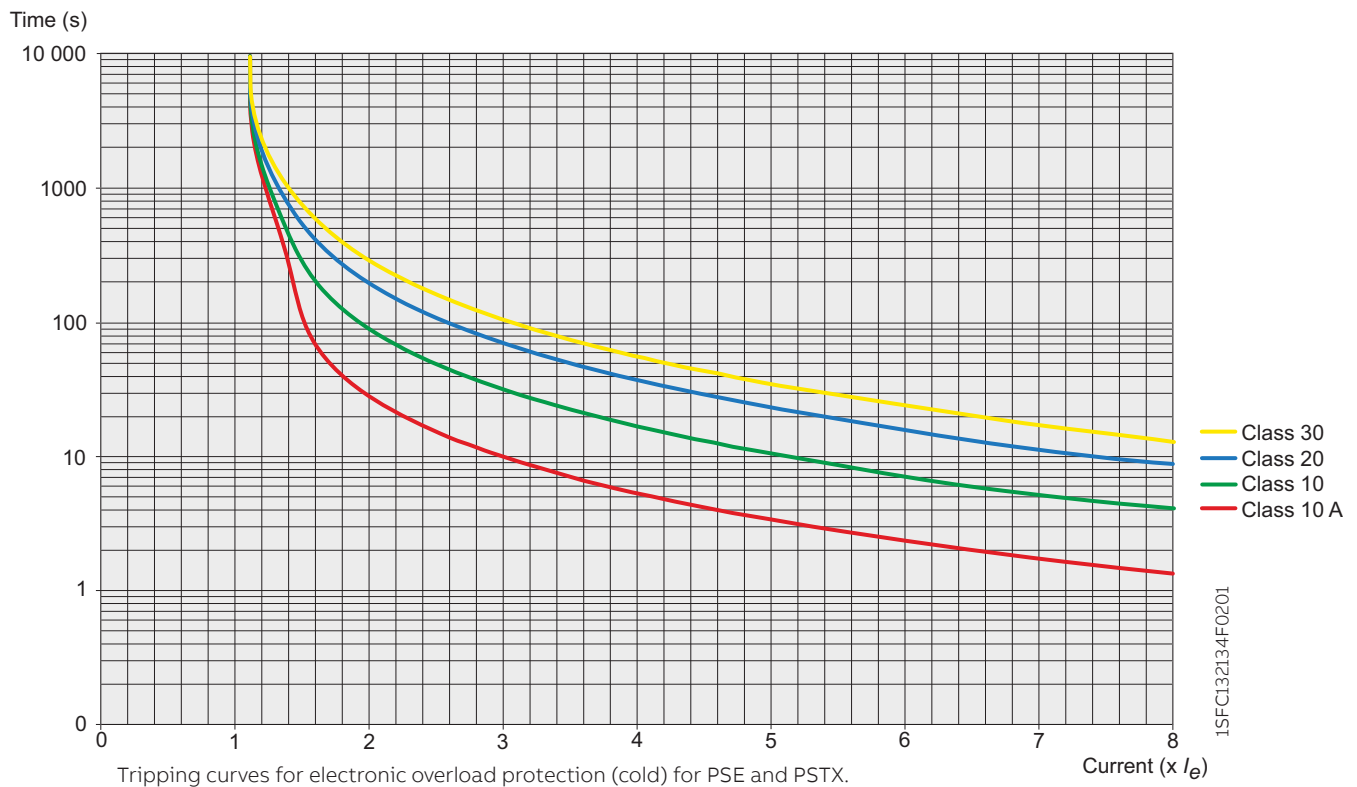


## PSE - The efficient range

### Technical data

Tripping curves for the integrated electronic overload protection

PSE has 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.



## PSE - The efficient range

### Technical data

<b>Softstarter type</b>		<b>PSE18 ... PSE370</b>
<b>Rated insulation voltage <math>U_i</math></b>		600 V
<b>Rated operational voltage <math>U_e</math></b>		208...600 V +10%/-15%
<b>Rated control supply voltage <math>U_s</math></b>		100...250 V +10%/-15%, 50/60 Hz $\pm 10\%$
<b>Rated control circuit voltage <math>U_c</math></b>		Internal 24 V DC
<b>Starting capacity at <math>I_e</math></b>		4 x $I_e$ for 10 sec.
<b>Number of starts per hour</b>		10 <sup>1)</sup>
<b>Overload capability</b>	Overload class	10
<b>Ambient temperature</b>	During operation	-25...+60 °C (-13...+140 F) <sup>2)</sup>
	During storage	-40...+70 °C (-40...+158 F)
<b>Maximum Altitude</b>		4000 m (13123 ft) <sup>3)</sup>
<b>Degree of protection</b>	Main circuit	IP00
	Supply and control circuit	IP20
<b>Main circuit</b>	Built-in bypass	Yes
	Cooling system - fan cooled (thermostat controlled)	Yes
<b>HMI for settings</b>	Display	4 7-segments and icons. Illuminated
	Keypad	2 selection keys and 2 navigation keys
<b>Main settings</b>	Setting current	Size dependent
	Ramp time during start	1...30 sec
	Ramp time during stop	0...30 sec
	Initial/end voltage	30...70%
	Current limit	1.5...7 x $I_e$
	Torque control for start	Yes / No
	Torque control for stop	Yes / No
	Kick start	Off, 30...100%
<b>Signal relays</b>	Number of signal relays	3
	K2	Run signal
	K3	TOR (bypass) signal
	K1	Event signal
	Rated operational voltage $U_e$	250 V AC/24 V DC <sup>4)</sup>
	Rated thermal current $I_{th}$	3 A
<b>Analog output</b>	Rated operational current $I_e$ at AC-15 ( $U_e = 250$ V)	1.5 A
	Output signal reference	4...20 mA
	Type of output signal	1 Amp
	Scaling	Fixed at 1.2 x $I_e$
<b>Control circuit</b>	Number of inputs	3 (start, stop, reset of faults)
<b>Signal indication LED</b>	On / Ready	Green flashing / steady
	Run / TOR	Green flashing / steady
	Protection	Yellow
	Fault	Red
<b>Protections</b>	Electronic overload	Yes (Class 10A, 10, 20, 30)
	Locked rotor protection	Yes
	Underload protection	Yes
<b>Fieldbus connection</b>	Connection for ABB FieldBusPlug	Yes (option)
<b>External keypad</b>	Display	LCD type
	Ambient temperature	
	During operation	-25...+60 °C (-13...+140 F)
	During storage	-40...+70 °C (-40...+158 F)
<b>Degree of protection</b>		IP66

<sup>1)</sup> Valid for 50% on time and 50% off time. If other data is required, contact your local ABB office.

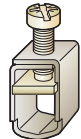
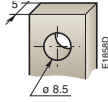
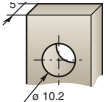






<sup>2)</sup> Above 40 °C (104 F) up to max. 60 °C (140 F) reduce the rated current with 0.6% per °C (0.33% per F).

<sup>3)</sup> When used at high altitudes, above 1000 meters (3281 ft) up to 4000 meters (13123 ft), de-rate the rated current using the following formula. [ % of  $I_e = 100 - \frac{x - 1000}{1000} ] \times x$  = actual altitude of the softstarter in meters.

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

## PSE - The efficient range

### Technical data

Main terminals		PSE18 ... PSE105	PSE142 ... PSE170	PSE210 ... PSE370
				
	Cu cable - Flexible 1 x mm <sup>2</sup>	2.5...70 mm <sup>2</sup>	6...120 mm <sup>2</sup>	16...300 mm <sup>2</sup>
	Clamp type	Included	1SDA066917R1	1SDA055016R1
	Tightening torque	8 Nm	14 Nm	25 Nm
	Cu cable - Flexible 2 x mm <sup>2</sup>	2.5...70 mm <sup>2</sup>	50...120 mm <sup>2</sup>	-
	Clamp type	Included	1SFN074709R1000	-
	Tightening torque	8 Nm	16 Nm	-
	Cu cable - Stranded 1 x mm <sup>2</sup>	2.5...70 mm <sup>2</sup>	6...120 mm <sup>2</sup>	16...300 mm <sup>2</sup>
	Clamp type	Included	1SDA066917R1	1SDA055016R1
	Tightening torque	8 Nm	14 Nm	25 Nm
	Cu cable - Stranded 2 x mm <sup>2</sup>	2.5...70 mm <sup>2</sup>	50...120 mm <sup>2</sup>	-
	Clamp type	Included	1SFN074709R1000	-
	Tightening torque	8 Nm	16 Nm	-
	Al cable - Stranded 1 x mm <sup>2</sup>	-	95...185 mm <sup>2</sup>	185...240
	Clamp type	-	1SDA054988R1	1SDA055020R1
	Tightening torque	-	31 Nm	43 Nm
	Lugs			
	Width	22 mm (0.866 in)	24 mm (0.945 in)	30 mm (1.181 in)
	Diameter >=	6.5 mm (0.256 in)	8.5 mm (0.335 in)	10.2 mm (0.402 in)
	Tightening torque	9 Nm (80 in lb)	18 Nm (159 in lb)	28 Nm (248 in lb)
Connection capacity acc to UL / CSA 1 x AWG / kcmil		6...2/0	6...300 kcmil	4...400 kcmil
	Clamp type	Included	ATK185	ATK300
	Tightening torque	71 in lb	300 in lb	375 in lb
Connection capacity acc to UL / CSA 2 x AWG / kcmil		-	-	4...500 kcmil
	Clamp type	-	-	ATK300/2
	Tightening torque	-	-	375 in lb
Supply and control circuit				
	Cu cable - Stranded 1 x mm <sup>2</sup>	0.75...2.5 mm <sup>2</sup> (19...14 AWG)		
	Cu cable - Stranded 2 x mm <sup>2</sup>	0.75...1.5 mm <sup>2</sup> (19...16 AWG)		
	Tightening torque	0.5 Nm (4.4 in lb)		

### Fuse ratings and power losses

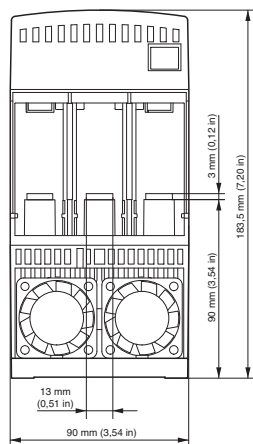
For softstarter	Current range	Max power loss at rated I <sub>e</sub>	Max fuse rating - main circuit <sup>1)</sup> Bussmann fuses, DIN43 620 (Knife)			Power requirements supply circuit Holding (VA) / Pull-in (VA)
Type	A	W	A	Type	Size	
PSE18	5.4...18.0	0.2	40	170M1563	000	16/19.9
PSE25	7.5...25.0	0.4	50	170M1564	000	16/19.9
PSE30	9.0...30.0	0.5	80	170M1566	000	16/19.9
PSE37	11.1...37.0	0.8	100	170M1567	000	16/19.9
PSE45	13.5...45.0	1.2	125	170M1568	000	16/19.9
PSE60	18.0...60.0	2.2	160	170M1569	000	16/19.9
PSE72	21.6...72.0	3.1	250	170M1571	000	16/19.9
PSE85	25.5...85.0	4.3	315	170M1572	000	16/19.9
PSE105	31.8...106.0	6.6	400	170M3819	1*	16/19.9
PSE142	42.9...143.0	12.1	450	170M5809	2	16/31
PSE170	51.3...171.0	17.6	500	170M5810	2	16/31
PSE210	63.0...210.0	8.8	630	170M5812	2	30/716
PSE250	75.0...250.0	12.5	700	170M5813	2	30/716
PSE300	90.6...302.0	18.0	800	170M6812	3	30/716
PSE370	111.0...370.0	27.4	900	170M6813	3	30/716

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

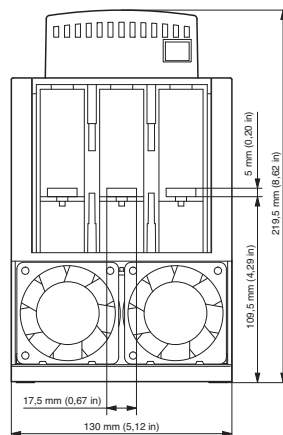
## PSE - The efficient range

### Dimensions

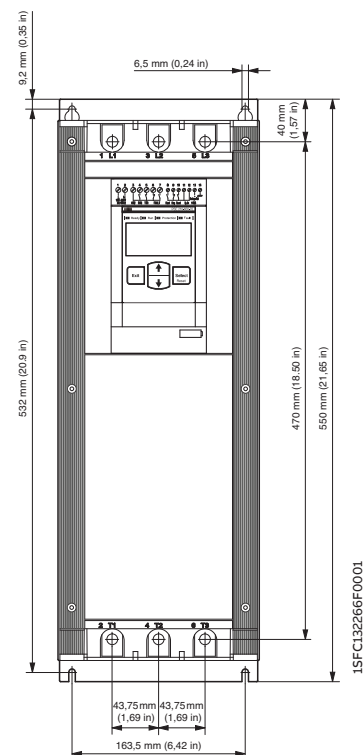
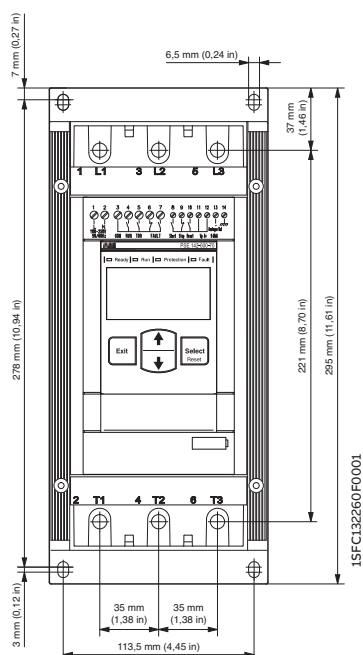
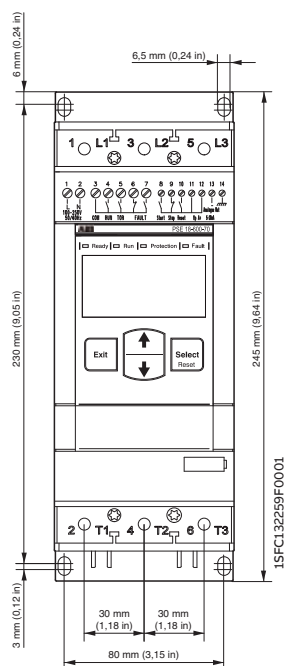
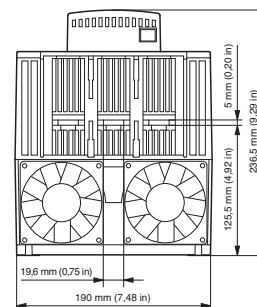
PSE18 ... PSE105



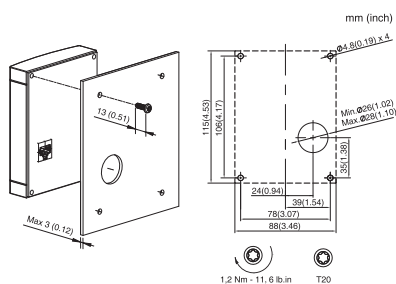
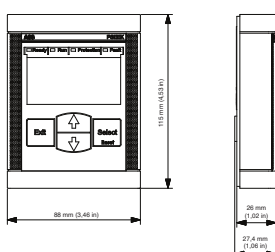
PSE142 ... PSE170



PSE210 ... PSE370



### PSE external keypad (PSEEK)

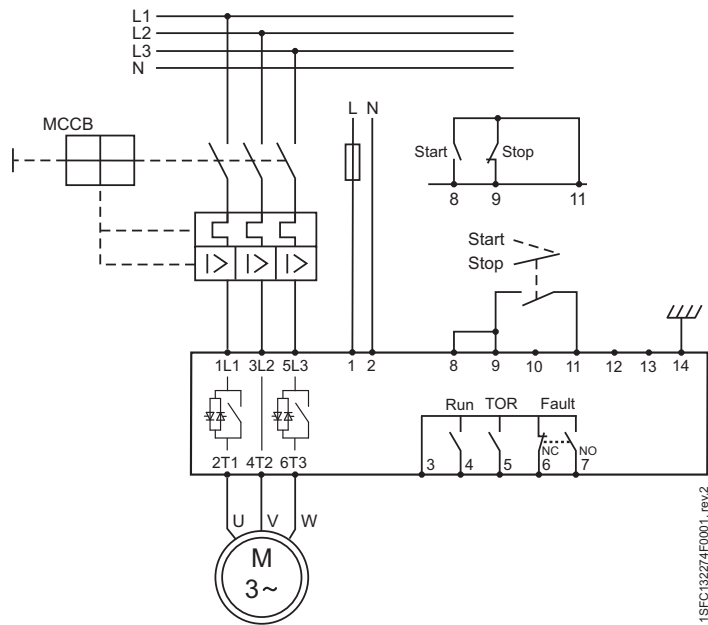


## PSE - The efficient range

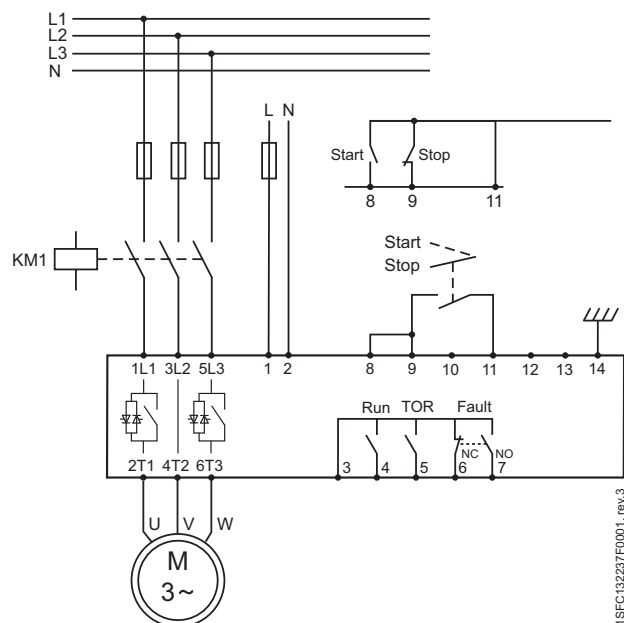
### Circuit diagrams

#### PSE18 ... PSE370

##### With MCCB and line contactor



##### With fuses and line contactor



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**ABB AB**

Control Products

Low Voltage Products

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