
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

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PSE - The efficient range

Introduction



- Rated operational current: 18...370 A
- Operational voltage: 208...600 V AC
- Wide rated control supply voltage: 100...250 V AC, 50/60 Hz
- 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
- 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
- **NEW** Built-in modbus-RTU communication for monitoring and control.
- Fieldbus communication with fieldbus plug adapter and the fieldbus plug
- 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

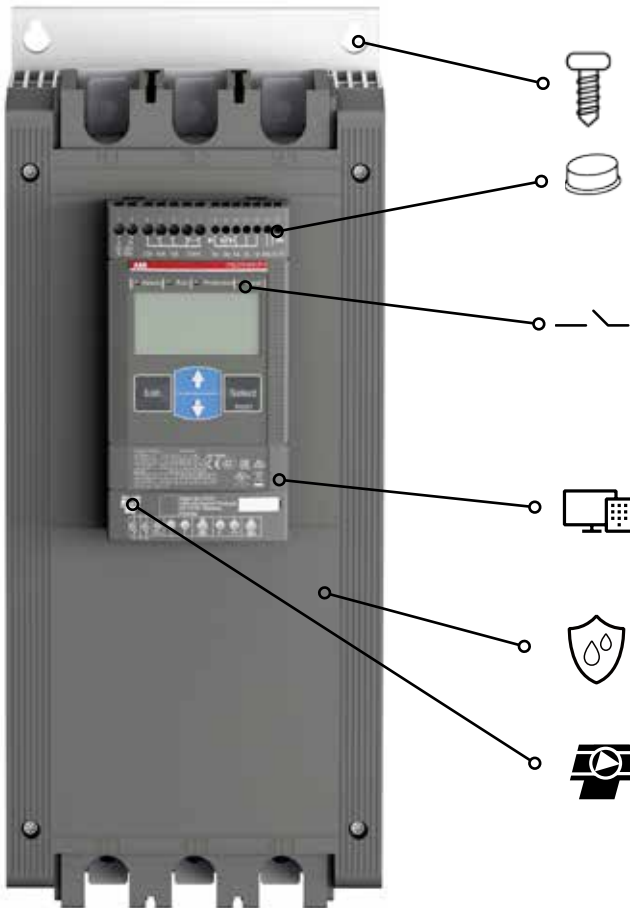
On the PSE, the bypass is built in and verified by ABB, saving you time during installation and space in your panel. The keypad is language neutral and illuminated for easy set-up and operation in field. The compact design makes installation fast and easy.



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.



NEW Modbus- RTU

Built-in Modbus- RTU fieldbus communication for monitoring and control. Support for all major communication protocols.



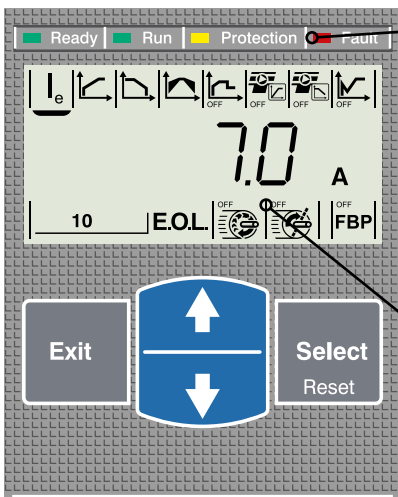
Coated PCB

Coated circuit boards protecting from dust, moist and corrosive atmosphere



Torque control

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



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



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.

PSE - The efficient range

Overview



PSE18 ... PSE105

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

¹⁾ These are an example of coordination. For more examples see: applications.it.abb.com/SOC

PSE - The efficient range

Overview



PSE142 ... PSE170



NEW 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
	400 V, 40 °C					
	MCCB (35 kA)					
Using MCCB only, type 1 coordination will be achieved ¹⁾	T3N250		T4N320	T5N400		T5N630
	MCCB (50 kA)					
	T3S250		T4S320	T5S400		T5S630
To achieve type 2 coordination, semi- conductor fuses must be used ¹⁾	Fuse protection (85kA), Semiconductor fuses, Bussmann					
	170M5809	170M5810	170M5812	170M5813	170M6812	170M6813
Suitable switch fuse for recommended semi- conductor fuses ¹⁾	Switch fuse					
	OS400D				OS630D	
The line contactor is not required for the softstarter itself but often used to open if OL trips ¹⁾	Line contactor					
	AF146	AF190	AF265	AF265	AF305	AF370

¹⁾ These are an example of coordination. For more examples see: 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



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		
Rated operational power			Rated operational current							pkg/1pce		
230 V	400 V	500 V	200/208 V	220/240 V	440/480 V	550/600 V	FLA			kg	(lb)	
P_e	P_e	P_e	I_e	P_e	P_e	P_e	P_e					
kW	kW	kW	A	hp	hp	hp	hp					
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	PSE210-600-70-1	1SFA897112R7001	9.50	(20.94)
75	132	160	250	75	100	200	250	248	PSE250-600-70-1	1SFA897113R7001	10.90	(24.03)
90	160	200	300	100	100	250	300	302	PSE300-600-70-1	1SFA897114R7001	10.90	(24.03)
110	200	250	370	125	150	300	350	361	PSE370-600-70-1	1SFA897115R7001	10.90	(24.03)

PSE - The efficient range

Heavy-duty starts, class 30, in-line

Ordering details

Typical applications

- Centrifugal fan
- Conveyor belt (long)
- Crusher
- Sawmill
- 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



PSE18 ... PSE105



PSE142 ... PSE170



NEW PSE210 ... PSE370





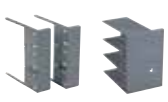





Rated operational voltage U_e , 208-600 V

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

IEC			UL/CSA					Type	Order code	Weight		
Rated operational power			Rated operational current	Rated operational power					FLA	pkg/1pce		
230 V	400 V	500 V		200/208 V	220/240 V	440/480 V	550/600 V					
P_e	P_e	P_e	I_e	P_e	P_e	P_e	P_e	FLA		kg	(lb)	
kW	kW	kW	A	hp	hp	hp	hp	A				
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	PSE210-600-70-1	1SFA897112R7001	9.50	(20.94)
59	110	132	210	60	75	150	200	192	PSE250-600-70-1	1SFA897113R7001	10.90	(24.03)
75	132	160	250	75	100	200	250	248	PSE300-600-70-1	1SFA897114R7001	10.90	(24.03)
90	160	200	300	100	100	250	300	302	PSE370-600-70-1	1SFA897115R7001	10.90	(24.03)

PSE - The efficient range

Accessories

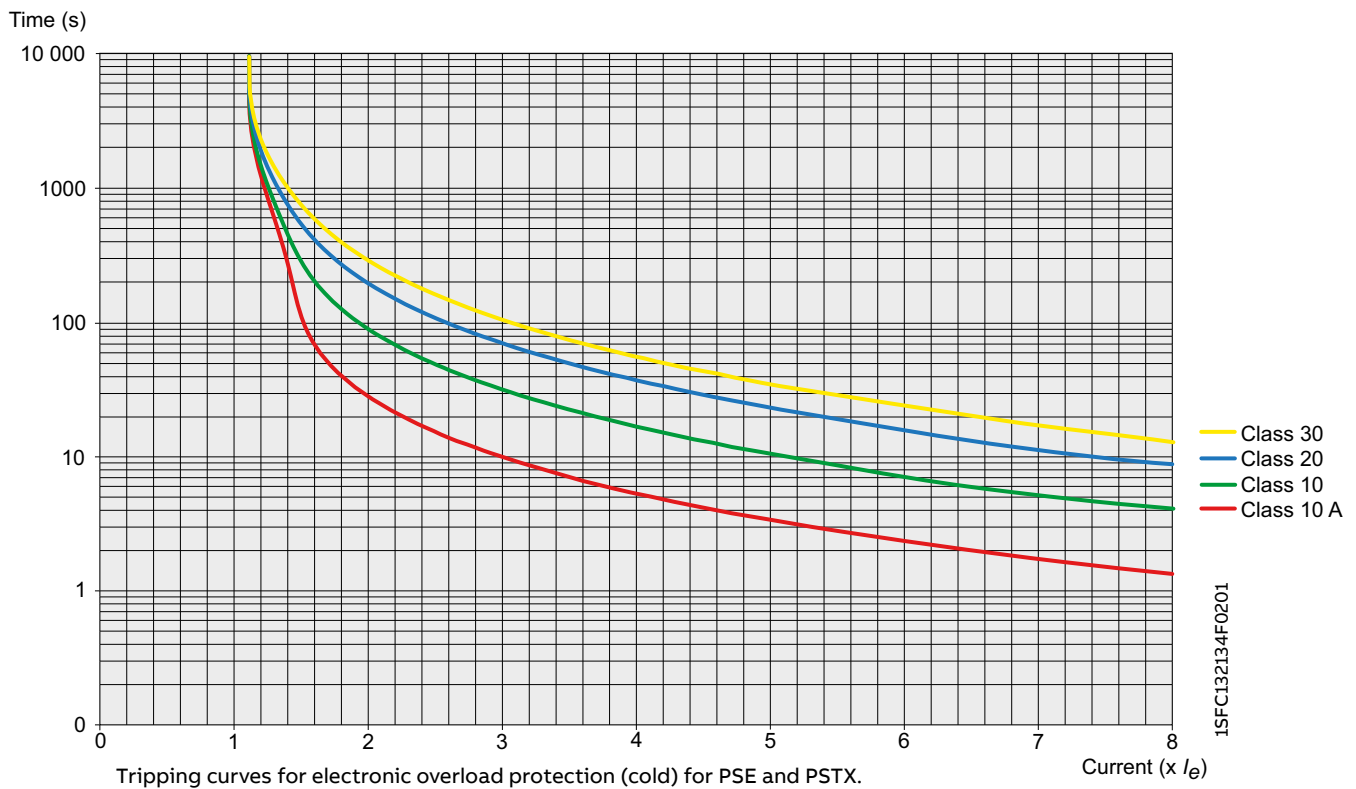
Description	Article	Type	Order code	Pkg qty	Weight pkg /1pce	kg	(lb)
Cable connectors for Cu cables							
		Wire range mm ²	Tightening torque max. Nm				
	PSE142 ... PSE170	6...120	14	-	1SDA066917R1	3	0.113 (0.249)
	PSE142 ... PSE170	2 x (50...120)	16	LZ185-2C/120	1SFN074709R1000	3	0.100 (0.220)
	PSE210 ... PSE370	16...300	25	-	1SDA055016R1	3	0.133 (0.293)
Cable connectors for Al and Cu cables							
		Wire range mm ²	Tightening torque max. Nm				
	PSE142 ... PSE170	95...185	31	-	1SDA054988R1	3	0.078 (0.172)
	PSE210 ... PSE370	185...240	43	-	1SDA055020R1	3	0.133 (0.293)
Terminal enlargements							
		Dimensions hole ø mm ²	bar mm ²				
	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)
Terminal kit							
	PSE142...PSE170			PSLE-185	1SFA899221R1002	1	0.200 (0.441)
	PSE210...370			PSLE-300	1SFA899221R1003	1	0.300 (0.661)
Terminal extension							
							
	PSE142 ... PSE170	8.5 17.5 x 5		LX205	1SFN074810R1000	1	0.250 (5.551)
	PSE210 ... PSE370	10.5 20 x 5		LX370	1SFN075410R1000	1	0.350 (0.772)
Terminal shrouds							
							
	PSE18... PSE105, Screw terminals			LT140-30L	1SFN124203R1000	2	0.070 (0.154)
	PSE142... PSE170, short for use with cable clamps			LT185-AC	1SFN124701R1000	2	0.050 (0.110)
	PSE142... PSE170, long for use with compression lugs			LT185-AL	1SFN124703R1000	2	0.220 (0.485)
	PSE210... PSE370, short for use with cable clamps			LT300-AC	1SFN125101R1000	2	0.070 (0.154)
	PSE210... PSE370, long for use with compression lugs			LT300-AL	1SFN125103R1000	2	0.280 (0.617)
External keypad including a 3m cable							
							
	PSE18 ... PSE370			PSEEK	1SFA897100R1001	1	0.198 (0.437)
USB cable for Service Engineer Tool							
							
	PSE18 ... PSE370			PSECA	1SFA897201R1001	1	0.130 (0.287)
Fieldbus plug connection, cable included							
							
	Fieldbus plug adaptor			PS-FBPA	1SFA896312R1002	1	0.060 (0.132)
Terminal Extensions retrofit kit							
							
	Terminal Extensions retrofit kit			LXR370	1SFA899222R1003	1	0.450 (0.992)
Modbus adapter							
							
	Modbus adapter			PS-MBIA	1SFA899300R1020	1	

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

Technical data		PSE18 ... PSE370	
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 \pm 10 %	
Rated control circuit voltage U_c		Internal 24 V DC	
Starting capacity at I_e		$4 \times I_e$ for 10 sec.	
Number of starts per hour		10 ¹⁾	
Overload capability	Overload class	10	
Ambient temperature	During operation	-25...+60 °C (-13...+140 F) ²⁾	
	During storage	-40...+70 °C (-40...+158 F)	
Maximum Altitude		4000 m (13123 ft) ³⁾	
Degree of protection	Main circuit	IP00	
	Supply and control circuit	IP20	
Main circuit	Built-in bypass	Yes	
	Cooling system - fan cooled (thermostat controlled)	Yes	
HMI for settings	Display	4 7-segments and icons. Illuminated	
	Keypad	2 selection keys and 2 navigation keys	
Main settings	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	
Signal relays	Kick start	Off, 30...100%	
	Number of signal relays		3
	K2	Run signal	
	K3	TOR (bypass) signal	
	K1	Event signal	
	Rated operational voltage U_e		100-250 V AC/24 V DC ⁴⁾
	Rated thermal current I_{th}		3 A
Rated operational current I_e at AC-15 ($U_e = 250$ V)		1.5 A	
Analog output	Output signal reference		4...20 mA
	Type of output signal		I Amp
	Scaling		Fixed at $1.2 \times I_e$
Control circuit	Number of inputs		3 (start, stop, reset of faults)
Signal indication LED	On / Ready		Green flashing / steady
	Run / TOR		Green flashing / steady
	Protection		Yellow
	Fault		Red
Protections	Electronic overload		Yes (Class 10A, 10, 20, 30)
	Locked rotor protection		Yes
	Underload protection		Yes
Fieldbus connection	Connection for ABB Fieldbus plug		Yes (option)
	NEW Built-in modbus		Yes
External keypad	Display		LCD type
	Ambient temperature		
	During operation		-25...+60 °C (-13...+140 F)
	During storage		-40...+70 °C (-40...+158 F)
Degree of protection		IP66	

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


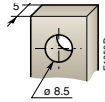
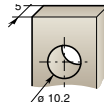






²⁾ Above 40 °C (104 F) up to max. 60 °C (140 F) reduce the rated current with 0.6% per °C (0.33% per F).

³⁾ When used at high altitudes, above 1000 meters (3281 ft) up to 4000 meters (13123 ft), de-rate the rated current using the following formula. [% of $I_e = 100 - \frac{x - 1000}{3000}$] x = actual altitude of the softstarter in meters.

⁴⁾ 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 ²	2.5...70 mm ²	6...120 mm ²	16...300 mm ²
	Clamp type		Included	1SDA066917R1	1SDA055016R1
	Tightening torque		8 Nm	14 Nm	25 Nm
	Cu cable - Flexible	2 x mm ²	2.5...70 mm ²	50...120 mm ²	-
	Clamp type		Included	1SFN074709R1000	-
	Tightening torque		8 Nm	16 Nm	-
	Cu cable - Stranded	1 x mm ²	2.5...70 mm ²	6...120 mm ²	16...300 mm ²
	Clamp type		Included	1SDA066917R1	1SDA055016R1
	Tightening torque		8 Nm	14 Nm	25 Nm
	Cu cable - Stranded	2 x mm ²	2.5...70 mm ²	50...120 mm ²	-
	Clamp type		Included	1SFN074709R1000	-
	Tightening torque		8 Nm	16 Nm	-
	Al cable - Stranded	1 x mm ²	-	95...185 mm ²	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 ²		0.75...2.5 mm ² (19...14 AWG)	
	Cu cable - Stranded	2 x mm ²		0.75...1.5 mm ² (19...16 AWG)	
	Tightening torque			0.5 Nm (4.4 in lb)	

Fuse ratings and power losses

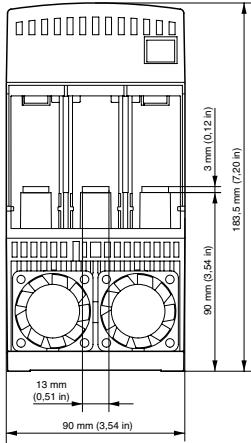
For softstarter	Current range	Max power loss at rated I _e	Max fuse rating - main circuit ¹⁾ Bussmann fuses, DIN43 620 (Knife)			Power requirements supply circuit Holding (VA) / Pull-in (VA)
			A	Type	Size	
PSE18	5.4...18.0	0.2	40	170M1563	000	16/19.9
PSE25	7.5...25.0	0.4	50	170M1564	000	16/19.9
PSE30	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	21/244
PSE250	75.0...250.0	12.5	700	170M5813	2	21/244
PSE300	90.6...302.0	18.0	800	170M6812	3	21/244
PSE370	111.0...370.0	27.4	900	170M6813	3	21/244

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

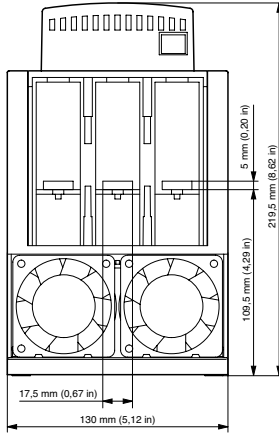
PSE - The efficient range

Dimensions

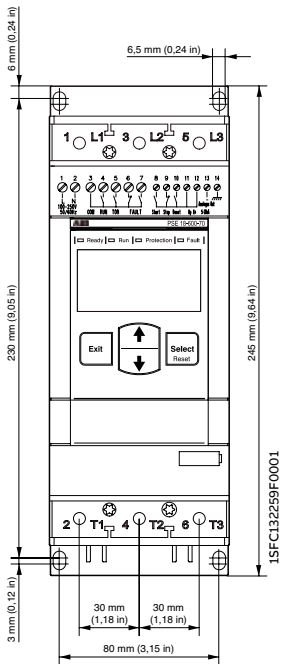
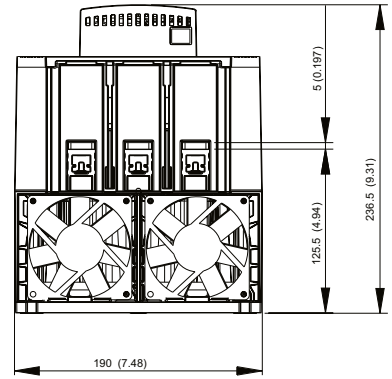
PSE18 ... PSE105



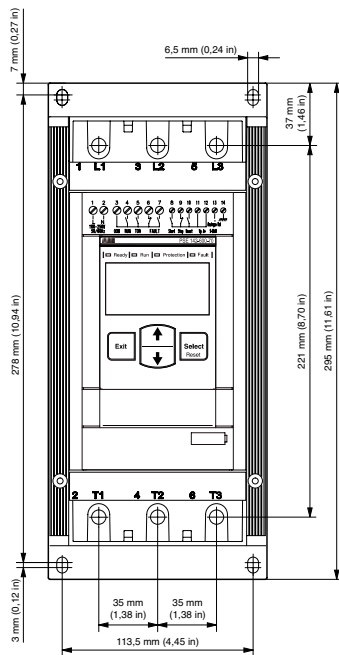
PSE142 ... PSE170



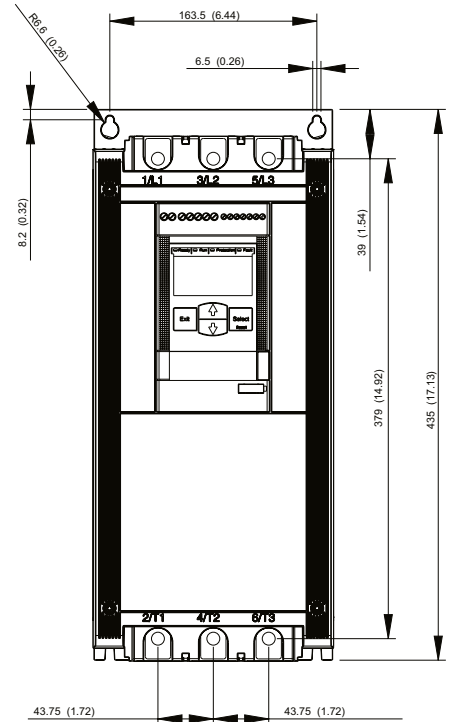
NEW
PSE210 ... PSE370



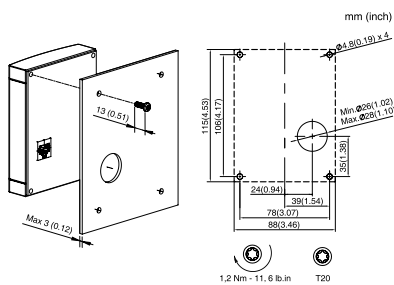
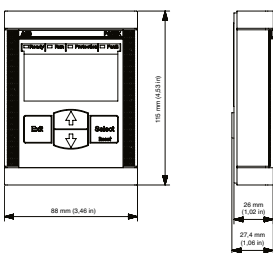
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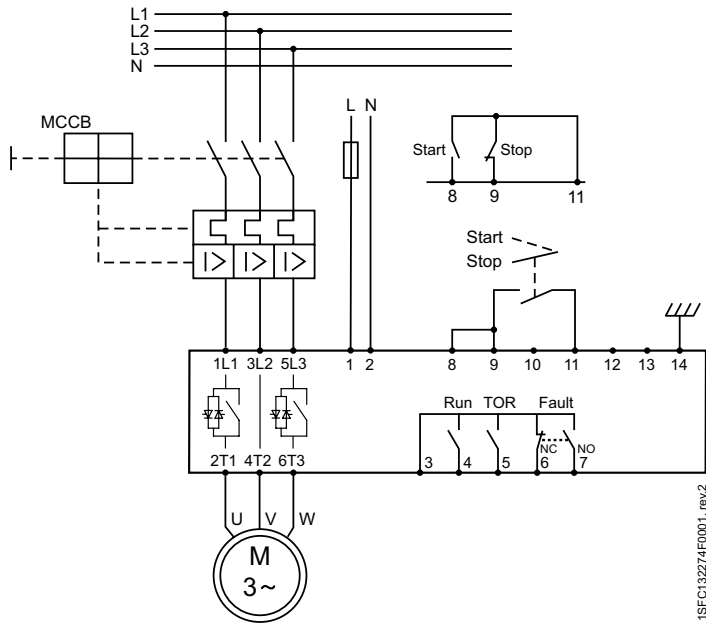


PSE external keypad (PSEEK)



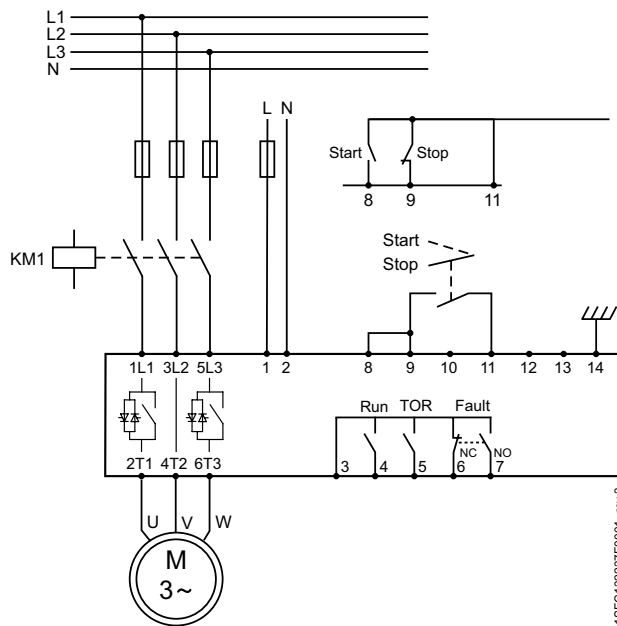
PSE - The efficient range
 Circuit diagrams

PSE18 ... PSE370
 With MCCB and line contactor



1SFC132274F0001, rev.2

With fuses and line contactor



1SFC132237F0001, rev.3