

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



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

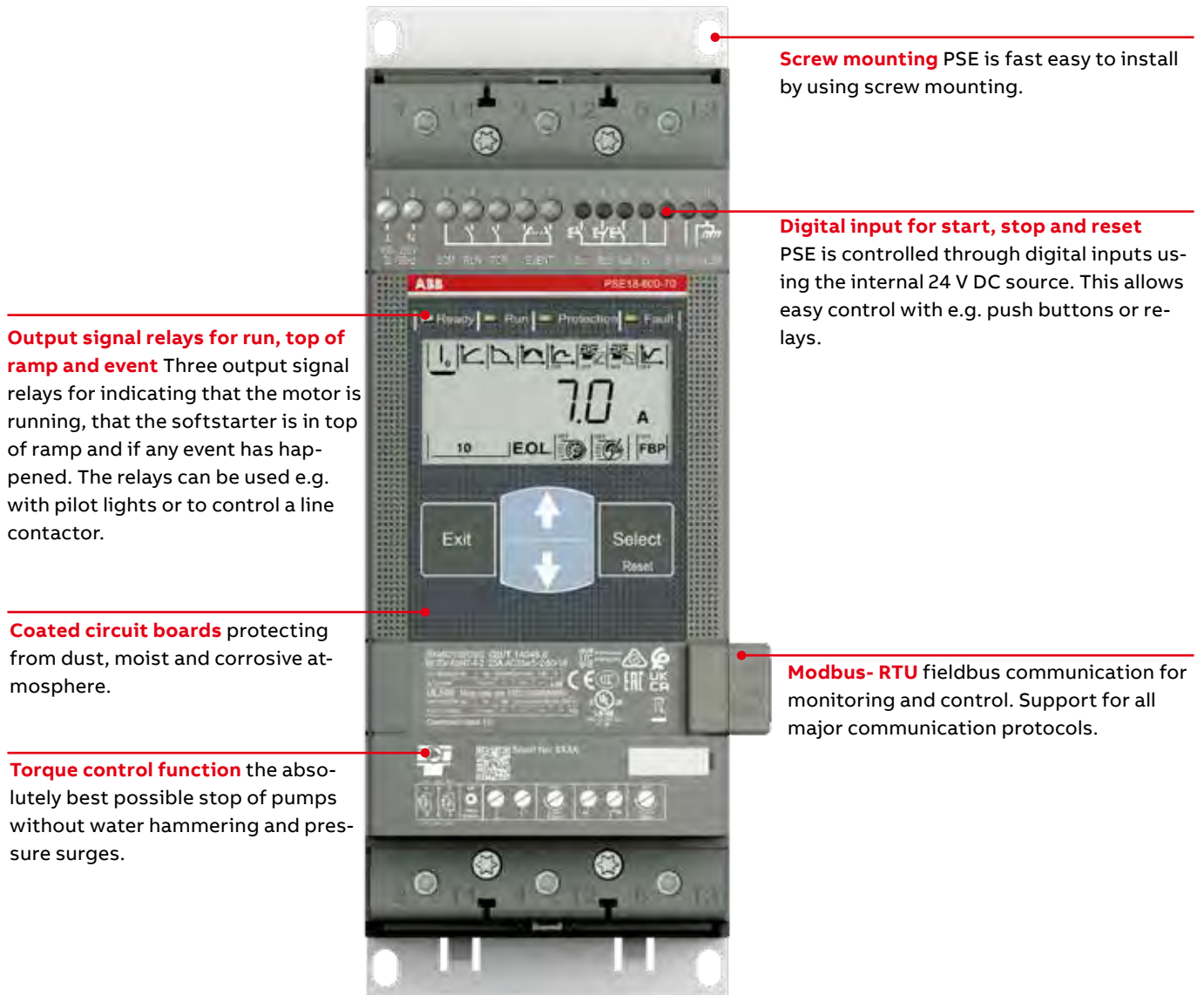
On the PSE, the bypass is built in and verified by ABB, saving you time during installation and space in your panel. The keypad is language neutral and illuminated for easy set-up and operation in field. The compact design makes installation fast and easy.



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.

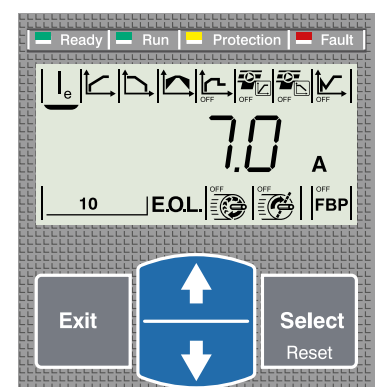


PSE display

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



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Coordination examples



PSE18 ... PSE105

PSE142 ... PSE170

PSE210 ... PSE370

Normal start In-line connected

Softstarter	Technical data				Using MCCB only, type 1 coordination will be achieved ¹⁾ MCCB (400 V, 40 °C)		To achieve type 2 coordination, semi- conductor fuses must be used ¹⁾	Suitable switch fuse for recommended semi-conductor fuses ¹⁾	The line contactor is not required for the softstarter itself but often used to open if OL trips ¹⁾
	IEC kW (400V)	IEC max A	UL HP (440-480 V)	UL max FLA	MCCB (35 kA)	MCCB (50 kA)	Fuse protection (85 kA), Semiconductor fuses, Bussmann	Switch fuse	Line contactor
PSE18	7.5	18	10	18	XT2N160	XT2S160	170M1563	OS32GD	AF26
PSE25	11	25	15	25	XT2N160	XT2S160	170M1564	OS32GD	AF26
PSE30	15	30	20	28	XT2N160	XT2S160	170M1566	OS32GD	AF30
PSE37	18.5	37	25	34	XT2N160	XT2S160	170M1567	OS63GD	AF38
PSE45	22	45	30	42	XT2N160	XT2S160	170M1568	OS63GD	AF52
PSE60	30	60	40	60	XT2N160	XT2S160	170M1569	OS63GD	AF65
PSE72	37	72	50	68	XT2N160	XT2S160	170M1571	OS125GD	AF80
PSE85	45	85	60	80	XT2N160	XT2S160	170M1572	OS125GD	AF96
PSE105	55	106	75	104	XT3N250	XT3S250	170M3819	OS250D	AF116
PSE142	75	143	100	130	XT3N250	XT3S250	170M5809	OS400D	AF146
PSE170	90	171	125	169	XT3N250	XT3S250	170M5810	OS400D	AF190
PSE210	110	210	150	192	XT4N320	XT4S320	170M5812	OS400D	AF265
PSE250	132	250	200	248	XT5N400	XT5S400	170M5813	OS400D	AF265
PSE300	160	300	250	302	XT5N400	XT5S400	170M6812	OS630D	AF305
PSE370	200	370	300	361	XT5N630	XT5S630	170M6813	OS630D	AF370

¹⁾ These are an example of coordination. For more examples see: <https://applications.it.abb.com/SOC/Page/Selection.aspx>



Coordination tables (SOC) >

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

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Ordering details



NOTE

PSE range updates (2018)

- Built in Modbus-RTU communication protocol added
- Increased firmware & hardware stability and reliability
- Improved package and inlay

PSE frame C updates (2018)

PSE210..PSE370 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 accessory for retro-fit.

Normal starts, class 10, in-line Rated operational voltage U_e , 208-600 V, Rated control supply voltage U_s , 100-250 V AC, 50/60 Hz

IEC rated operational power			current I_e A	UL/CSA rated operational power				FLA	Type	Order code	Net Weight (kg)	Net Weight (lb)
230V P_e kW	400V P_e kW	500V P_e kW		200/208V P_e hp	220/240V P_e hp	440/480V P_e hp	550/600V P_e hp					
4	7.5	11	18	5	5	10	15	18	PSE18-600-70	1SFA897101R7000	2.5	5.5
5.5	11	15	25	7.5	7.5	15	20	25	PSE25-600-70	1SFA897102R7000	2.5	5.5
7.5	15	18.5	30	7.5	10	20	25	28	PSE30-600-70	1SFA897103R7000	2.5	5.5
9	18.5	22	37	10	10	25	30	34	PSE37-600-70	1SFA897104R7000	2.5	5.5
11	22	30	45	10	15	30	40	42	PSE45-600-70	1SFA897105R7000	2.5	5.5
15	30	37	60	20	20	40	50	60	PSE60-600-70	1SFA897106R7000	2.5	5.5
18.5	37	45	72	20	25	50	60	68	PSE72-600-70	1SFA897107R7000	2.5	5.5
22	45	55	85	25	30	60	75	80	PSE85-600-70	1SFA897108R7000	2.6	5.7
30	55	75	106	30	40	75	100	104	PSE105-600-70	1SFA897109R7000	2.9	6.3
40	75	90	143	40	50	100	125	130	PSE142-600-70	1SFA897110R7000	4.4	9.7
45	90	110	171	60	60	125	150	169	PSE170-600-70	1SFA897111R7000	4.4	9.7
59	110	132	210	60	75	150	200	192	PSE210-600-70-1	1SFA897112R7001	8.5	18.7
75	132	160	250	75	100	200	250	248	PSE250-600-70-1	1SFA897113R7001	10.6	23.3
90	160	200	300	100	100	250	300	302	PSE300-600-70-1	1SFA897114R7001	10.6	23.3
110	200	250	370	125	150	300	350	361	PSE370-600-70-1	1SFA897115R7001	10.6	23.3

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

IEC rated operational power			current I_e A	UL/CSA rated operational power				FLA	Type	Order code	Net Weight (kg)	Net Weight (lb)
230V P_e kW	400V P_e kW	500V P_e kW		200/208V P_e hp	220/240V P_e hp	440/480V P_e hp	550/600V P_e hp					
3	5.5	7.5	12	3	3	7.5	10	11	PSE18-600-70	1SFA897101R7000	2.5	5.5
4	7.5	11	18	5	5	10	15	18	PSE25-600-70	1SFA897102R7000	2.5	5.5
5.5	11	15	25	7.5	7.5	15	20	25	PSE30-600-70	1SFA897103R7000	2.5	5.5
7.5	15	18.5	30	7.5	10	20	25	28	PSE37-600-70	1SFA897104R7000	2.5	5.5
9	18.5	22	37	10	10	25	30	34	PSE45-600-70	1SFA897105R7000	2.5	5.5
11	22	30	45	10	15	30	40	42	PSE60-600-70	1SFA897106R7000	2.5	5.5
15	30	37	60	20	20	40	50	60	PSE72-600-70	1SFA897107R7000	2.5	5.5
18.5	37	45	72	20	25	50	60	68	PSE85-600-70	1SFA897108R7000	2.6	5.7
22	45	55	85	25	30	60	75	80	PSE105-600-70	1SFA897109R7000	2.9	6.3
30	55	75	106	30	40	75	100	104	PSE142-600-70	1SFA897110R7000	4.4	9.7
40	75	90	143	40	50	100	125	130	PSE170-600-70	1SFA897111R7000	4.4	9.7
45	90	110	171	60	60	125	150	169	PSE210-600-70-1	1SFA897112R7001	8.5	18.7
59	110	132	210	60	75	150	200	192	PSE250-600-70-1	1SFA897113R7001	10.6	23.3
75	132	160	250	75	100	200	250	248	PSE300-600-70-1	1SFA897114R7001	10.6	23.3
90	160	200	300	100	100	250	300	302	PSE370-600-70-1	1SFA897115R7001	10.6	23.3

PSE - The efficient range

Accessories



Cable connectors for
CU cables

Cable connectors for Cu cables

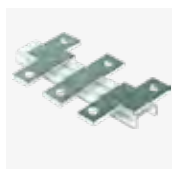
Article	Wire range mm ²	Tightening torque max Nm	Type	Order code	Pkg qty	Net kg	lb
PSE142 ... PSE170	6...120	14	KIT FC Cu XT4 3pcs	1SDA066917R1	3	0.18	0.40
PSE142 ... PSE170	2 x (50...120)	16	LZ185-2C/120 1SFN074709R1000		3	0.10	0.22
PSE210 ... PSE370	16...300	25	T5 400 3pcs	1SDA055016R1	3	0.39	0.45



Cable connectors for
CU & AL cables

Cable connectors for Al and Cu cables

Article	Wire range mm ²	Tightening torque max Nm	Type	Order code	Pkg qty	Net kg	lb
PSE142 ... PSE170	95...185	31	KIT FC CuAl T4 3pcs	1SDA054988R1	3	0.14	0.31
PSE210 ... PSE370	185...240	43	KIT FC CuAl T5 400 3pcs	1SDA055020R1	3	0.24	0.54



Terminal enlargements

Terminal enlargements

Article	Dimensions hole ø mm ²	bar mm ²	Type	Order code	Pkg qty	Net kg	lb
PSE18 ... PSE105	6.5	15 x 3	LW110	1SFN074307R1000	1	0.07	0.14
PSE142 ... PSE170	10.5	17.5 x 5	LW185	1SFN074707R1000	1	0.29	0.64
PSE210 ... PSE370	10.5	20 x 5	LW300	1SFN075107R1000	1	0.49	1.08



Terminal kit

Terminal kit

Article	Type	Order code	Pkg qty	Net kg	lb
PSE142...PSE170	PSLE-185	1SFA899221R1002	1	0.34	0.75
PSE210...370	PSLE-300	1SFA899221R1003	1	0.30	0.66



Terminal extension

Terminal extension

Article	Type	Order code	Pkg qty	Net kg	lb
PSE142 ... PSE170 8.5 17.5 x 5	LX205	1SFN074810R1000	1	0.25	0.55
PSE210 ... PSE370 10.5 20 x 5	LX370	1SFN075410R1000	1	0.35	0.77

PSE - The efficient range

Accessories



Terminal shrouds

Terminal shrouds

Article	Type	Order code	Pkg qty	Net kg	lb
PSE18... PSE105, Screw terminals	LT140-30L	1SFN124203R1000	2	0.07	0.15
PSE142... PSE170, short for use with cable clamps	LT185-AC	1SFN124701R1000	2	0.05	0.11
PSE142... PSE170, long for use with compression lugs	LT185-AL	1SFN124703R1000	2	0.22	0.49
PSE210... PSE370, short for use with cable clamps	LT300-AC	1SFN125101R1000	2	0.09	0.19
PSE210... PSE370, long for use with compression lugs	LT300-AL	1SFN125103R1000	2	0.28	0.62



External keypad

External keypad including a 3m cable

Article	Type	Order code	Pkg qty	Net kg	lb
PSE18 ... PSE370	PSEEK	1SFA897100R1001	1	0.13	0.29



USB cable

USB cable for Service Engineer Tool

Article	Type	Order code	Pkg qty	Net kg	lb
PSE18 ... PSE370	PSECA	1SFA897201R1001	1	0.10	0.22



Fieldbus plug adaptor

Fieldbus plug connection, cable included

Article	Type	Order code	Pkg qty	Net kg	lb
Fieldbus plug adaptor	PS-FBPA	1SFA896312R1002	1	0.15	0.33



Terminal extensions retrofit kit

Terminal extensions retrofit kit

Article	Type	Order code	Pkg qty	Net kg	lb
Terminal extensions retrofit kit	LXR370	1SFA899222R1003	1	0.45	0.99



Modbus adapter

Modbus adapter

Article	Type	Order code	Pkg qty	Net kg	lb
Modbus adapter	PS-MBIA	1SFA899300R1020	1	0.01	0.02

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⁾
Maximum Altitude	4000 m (13123 ft) ³⁾
Overload capability	
Overload class	10
Ambient temperature	
During operation	-25...+60 °C (-13...+140 F) ²⁾
During storage	-40...+70 °C (-40...+158 F)
Degree of protection	
Main circuit	IP00
Supply and control circuit	IP20
Main circuit	
Built-in bypass	Yes
Cooling system	fan cooled (thermostat controlled)
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	$1.5...7 \times I_e$
Torque control for start	Yes / No
Torque control for stop	Yes / No
Kick start	Off, 30...100%
Signal relays	
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
Vibration test	
According to IEC 60068-2-6:2007	

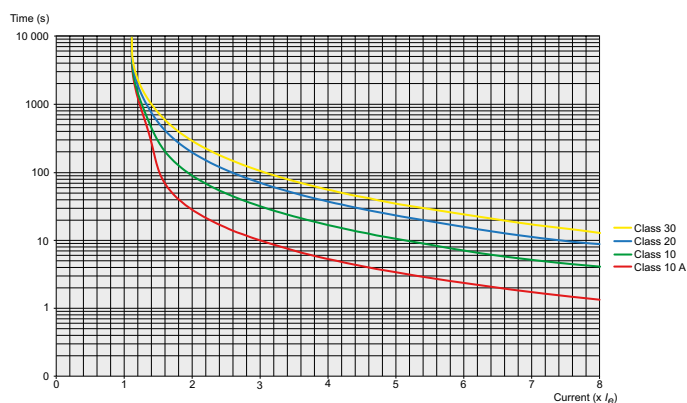
Technical data	PSE18 ... PSE370
Analog output	
Output signal reference	4...20 mA
Type of output signal	I Amp
Scaling	Fixed at $1.2 \times I_e$
Control circuit	
Number of inputs	3 (start, stop, reset of faults)
Signal indication LED	
On / Ready	Green flashing / steady
Run / TOR	Green flashing / steady
Protection	Yellow
Fault	Red
Protections	
Electronic overload	Yes (Class 10A, 10, 20, 30)
Locked rotor protection	Yes
Underload protection	Yes
Fieldbus connection	
ABB Fieldbus plug	Yes (option)
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. $[\% \text{ of } I_e = 100 - \frac{x - 1000}{150}] \times \text{actual altitude of the softstarter in meters.}$

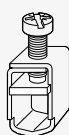
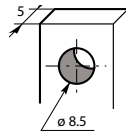
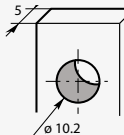
⁴⁾ A common voltage needs to be used for all 3 signal relays.



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. See page 66 for bigger picture.

PSE - The efficient range

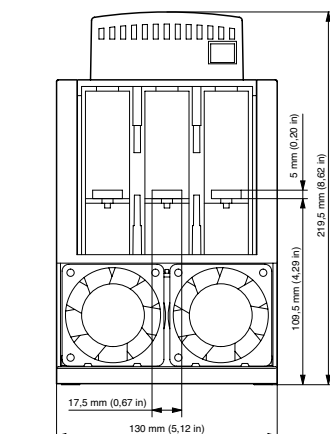
Technical data

						
Main terminals						
Article	PSE18... 105	PSE142... 170	PSE210... 370			
Cu cable - Flexible 1 x mm²	2.5...70 mm²	6...120 mm²	16...300 mm²			
 Clamp type	Included	1SDA066917R1	1SDA055016R1			
 Tightening torque	8 Nm	14 Nm	25 Nm			
Cu cable - Flexible 2 x mm²	2.5...70 mm²	50...120 mm²	-			
 Clamp type	Included	1SFN074709R1000	-			
 Tightening torque	8 Nm	16 NM	-			
Cu cable - Stranded 1 x mm²	2.5...70 mm²	6...120 mm²	16...300 mm²			
 Clamp type	Included	1SDA066917R1	1SDA055016R1			
 Tightening torque	8 Nm	14 Nm	25 Nm			
Cu cable - Stranded 2 x mm²	2.5...70 mm²	50...120 mm²	-			
 Clamp type	Included	1SFN074709R1000	-			
 Tightening torque	8 Nm	16 NM	-			
Al cable - Stranded 1 x mm²	-	95...185 mm²	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 mm²	0.75...2.5 mm² (19...14 AWG)					
Cu cable - Stranded 2 x mm²	0.75...1.5 mm² (19...16 AWG)					
Tightening torque	0.5 Nm (4.4 in lb)					
Fuse ratings and power losses						
	Current range	Max power loss at rated I_n	Max fuse rating - main circuit ¹⁾ Bussmann fuses, DIN43 620 (Knife)		Power requirements supply circuit Holding (VA) / Pull-in (VA)	
Softstarter	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	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

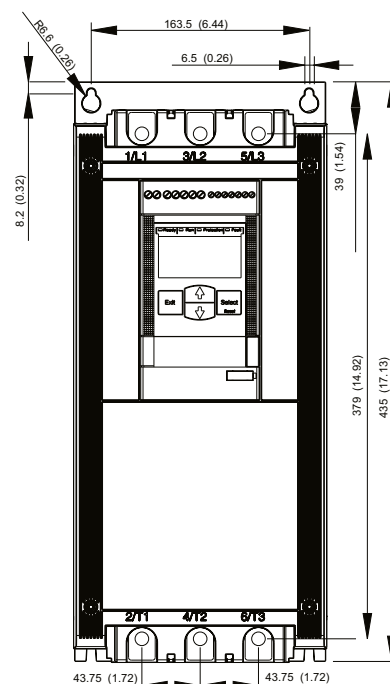
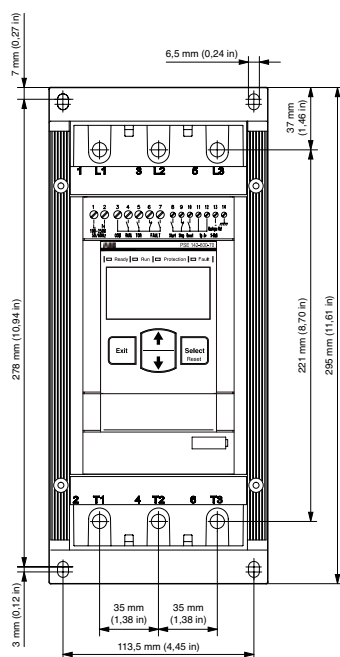
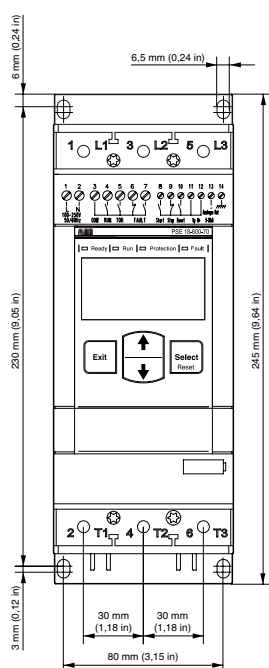
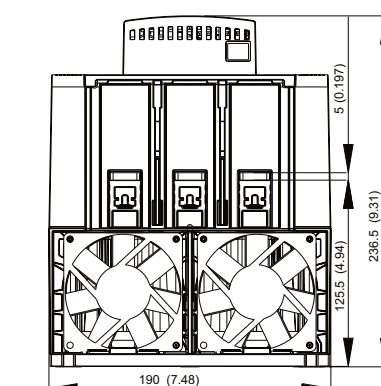
¹⁾ For the supply circuit 6 A delayed, for MCB use C characteristics.

Dimensions

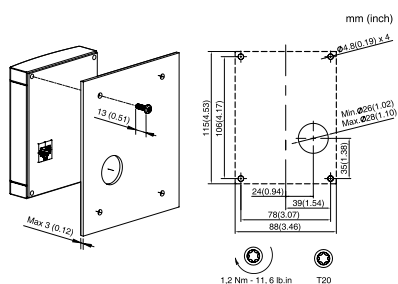
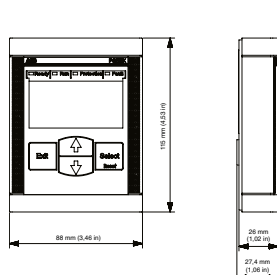
PSE142... 170



PSE210... 370



External keypad (PSEEEK)

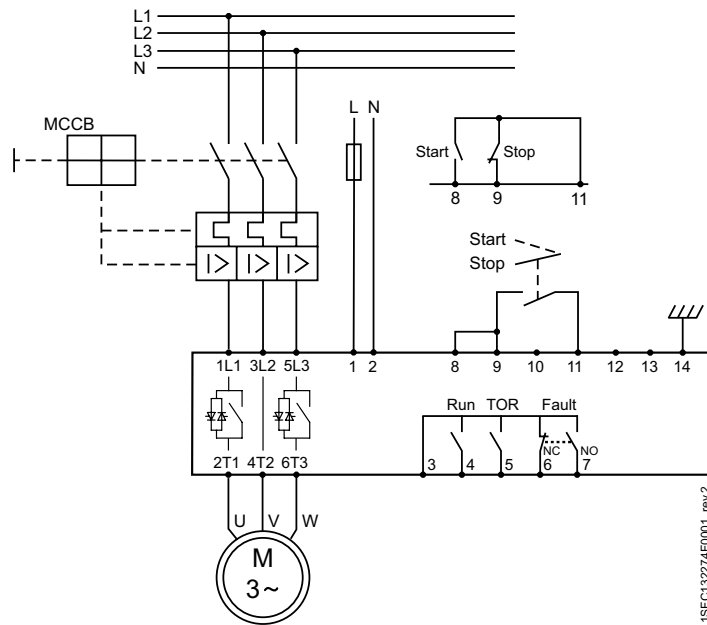


PSE - The efficient range

Circuit diagrams

PSE18... 370

With MCCB and line contactor



With fuses and line contactor

