

PSR – The compact range

Description



Product description

- Wide rated operational voltage 208 – 600 V
- Rated control supply voltage 24 V DC or 100 – 240 V AC
- Rated operational current 3 – 105 A
- Wide ambient temperature range, -25 to +60 °C (-13 to 140 °F)
- Built-in by-pass on all sizes, saving energy and reducing installation time
- Potentiometer settings
- Run signal relay on all devices
- TOR signal relay on PSR25 ... PSR105
- Optional fieldbus communication using Profibus, Modbus, Devicenet or CANopen
- DIN rail mounting on PSR3 ... PSR45
- Screw mounting on all sizes
- Connection kits for easy connection with ABB manual motor starters
- Sophisticated algorithm eliminating the DC-component and thereby providing excellent starting performance.

Settings

- ① Start = 1 ... 20 sec
Stop = 0 ... 20 sec - including the step down voltage.
- ② Step down = 2% reduction for each second increased stop ramp
Stop ramp 10 sec -> Step down 80% (20% reduction)
- ③ U_{ini} = 40 ... 70% results in End voltage = 30 ... 60%

The PSR range is the most compact of all the ABB softstarter ranges, thereby making it possible to fit many devices into the same enclosure. The system concept with Manual Motor Starters provides a far more compact starting solution than for example a star delta starter.

Flexible mounting

PSR softstarters from 3 to 45 A are possible to mount on a din rail, ensuring quick and easy mounting. Naturally, all sizes can be screw mounted.

Few settings

The set-up of the PSR is easily done and confirmed using the three clearly marked potentiometers on the front.

Built-in by-pass for energy saving

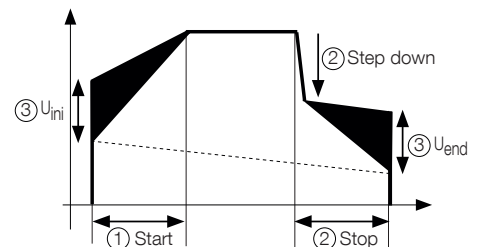
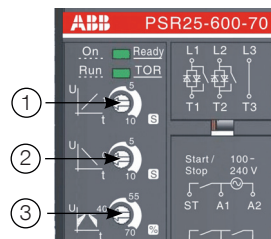
The built-in by-pass on all sizes does not only save energy; it will also ensure the most compact ABB softstarter design and reduce the installation time.

Suitable for stopping pumps

Even without using torque control, the PSR range is designed to reduce water hammering and will allow a superior stop compared to the direct stop resulting from a star delta starter or a DOL starter. See the special designed stop ramp with step down voltage below.

System concept with manual motor starters

All PSR softstarter sizes can easily be connected to the corresponding manual motor starters from ABB, using the special designed connection kits. This will both make the mounting and the connection easier and will provide a very compact starting solution containing short circuit and thermal protection, isolation function and softstarter - everything that you need.



PSR – The compact range

Overview



PSR3 ... PSR16

PSR25 ... PSR30

PSR37 ... PSR45

PSR60 ... PSR105

	Softstarter													
Normal start In-line connected	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105	
	(480 V) hp	2	3	5	7.5	10	15	20	25	30	40	50	60	75
	(600 V) hp	2	5	7.5	10	10	20	25	30	40	50	60	75	100
	UL/CSA, Max FLA	3.4	6.1	9	11	15.2	24.2	28	34	46.2	59.4	68	80	104
Using manual motor starter, type 1 coordination will be achieved	Manual motor starter (5 kA/600 V, 40 °C)													
	MS116			MS132			MS450			MS495			—	
Using J fuses, type 1 coordination will be achieved	J type fuse protection (85 kA)													
	175 % rating	5 A	10 A	15 A	15 A	25 A	40 A	45 A	50 A	80 A	100 A	110 A	125 A	175 A
	Max rating	35 A	35 A	35 A	35 A	35 A	60 A	60 A	90 A	90 A	110 A	125 A	150 A	200 A
	Minimum enclosure size ¹⁾	254 x 204 x 153 mm / 10 x 8 x 6 in					305 x 254 x 204 mm / 12 x 10 x 8 in				600 x 400 x 210 mm / 24 x 16 x 8 in			
Fusible disconnect switch for the above J fuses	Fusible disconnect switch													
	OS30			OS60			OS100			OS200				
Overload protection is used to protect the motor from over heating	Thermal overload relay													
	TF42DU					TA75DU				TA110DU				
The line contactor is not required for the softstarter itself but often used to open if OL trips	Line contactor													
	AF9		AF12	AF16	AF26	AF30	AF50	AF63	AF75	AF95	AF110			
Using by-pass will reduce the power loss and allow more starts per hour	By-pass													
	Built-in													

¹⁾ Enclosure that has two latching points minimum. For use in pollution degree 2 environment.

PSR – The compact range

Ordering details



PSR3 ... PSR105

Rated operational voltage U_e , 208-600 V AC

Rated control supply voltage, U_s , 100 - 240 V AC



PSR3 ... PSR16



PSR25 ... PSR30



PSR37 ... PSR45



PSR60 ... PSR105

230 V kW	400 V kW	500 V kW	208 V hp	230 V hp	480 V hp	600 V hp	UL/CSA Max rated operational current I_e A	Part number	Weight kg (lb)
0.75	1.5	2.2	0.5	0.75	2	2	3.4	PSR3-600-70	0.450 (0.99)
1.5	3	4	1	1.5	3	5	6.1	PSR6-600-70	0.450 (0.99)
2.2	4	4	2	2	5	7.5	9	PSR9-600-70	0.450 (0.99)
3	5.5	5.5	3	3	7.5	10	11	PSR12-600-70	0.450 (0.99)
4	7.5	7.5	3	5	10	10	15.2	PSR16-600-70	0.450 (0.99)
5.5	11	15	7.5	7.5	15	20	24.2	PSR25-600-70	0.650 (1.43)
7.5	15	18.5	7.5	10	20	25	28	PSR30-600-70	0.650 (1.43)
7.5	18.5	22	10	10	25	30	34	PSR37-600-70	1.000 (2.20)
11	22	30	15	15	30	40	46.2	PSR45-600-70	1.000 (2.20)
15	30	37	20	20	40	50	59.4	PSR60-600-70	2.200 (4.85)
22	37	45	20	25	50	60	68	PSR72-600-70	2.270 (5.00)
22	45	55	25	30	60	75	80	PSR85-600-70	2.270 (5.00)
30	55	55	30	40	75	100	104	PSR105-600-70	2.270 (5.00)

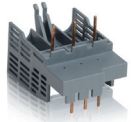
Rated operational voltage U_e , 208-600 V AC

Rated control supply voltage, U_s , 24 V DC

0.75	1.5	2.2	0.5	0.75	2	2	3.4	PSR3-600-81	0.450 (0.99)
1.5	3	4	1	1.5	3	5	6.1	PSR6-600-81	0.450 (0.99)
2.2	4	4	2	2	5	7.5	9	PSR9-600-81	0.450 (0.99)
3	5.5	5.5	3	3	7.5	10	11	PSR12-600-81	0.450 (0.99)
4	7.5	7.5	3	5	10	10	15.2	PSR16-600-81	0.450 (0.99)
5.5	11	15	7.5	7.5	15	20	24.2	PSR25-600-81	0.650 (1.43)
7.5	15	18.5	7.5	10	20	25	28	PSR30-600-81	0.650 (1.43)
7.5	18.5	22	10	10	25	30	34	PSR37-600-81	1.000 (2.20)
11	22	30	15	15	30	40	46.2	PSR45-600-81	1.000 (2.20)
15	30	37	20	20	40	50	59.4	PSR60-600-81	2.200 (4.85)
22	37	45	20	25	50	60	68	PSR72-600-81	2.270 (5.00)
22	45	55	25	30	60	75	80	PSR85-600-81	2.270 (5.00)
30	55	55	30	40	75	100	104	PSR105-600-81	2.270 (5.00)

PSR – The compact range

Accessories



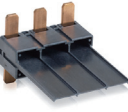
PSR16-MS116



PSR30-MS132



PSR45-MS450



PSR105-MS495



PSR-FAN



PSR-FAN 60-105 A



PS-FBPA



PSLW

Connection kit

For softstarter type

	Part number	Pack ^{ing} piece	Weight kg (lb) 1 piece
PSR3...PSR16 with MS116	PSR16-MS116	1	0.030 (0.07)
PSR25...PSR30 with MS132	PSR30-MS132	1	0.030 (0.07)
PSR37...PSR45 with MS450	PSR45-MS450	1	0.030 (0.07)
PSR60...PSR105 with MS495	PSR105-MS495	1	0.050 (0.11)

Fan

For softstarter type

	Part number	Pack ^{ing} piece	Weight kg (lb) 1 piece
PSR3...PSR45	PSR-FAN	1	0.010 (0.02)
PSR60...PSR105	PSR-FAN 60-105 A	1	0.013 (0.03)

Terminal enlargements

For softstarter type

	Part number	Pack ^{ing} piece	Weight kg (lb) 1 piece
PSR60...105 Wire range mm2 1x10...50, 2x10...25	PSLW-72	1	0.150 (0.33)

FieldBus plug connection accessory

For softstarter type

	Part number	Pack ^{ing} piece	Weight kg (lb) 1 piece
The same accessory for all sizes	PS-FBPA	1	0.060 (0.13)

ABB Field Bus Plug suitable for all sizes. See page 38-41

Connection kit

- Thermal motor overload protection
- Short circuit protection
- Connection device
- Isolating function
- Softstarter providing excellent start and stop



PSR – The compact range

Technical data

Rated insulation voltage U_i	600 V												
Rated operational voltage U_e	208...600 V +10 %/-15 %, 50/60 Hz ±5 %												
Rated control supply voltage U_s	100...240 V AC, 50/60Hz ±5 % or 24 V DC, +10 %/-15 %,												
Power consumption	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105
Supply circuit													
at 100-240 V AC	12 VA						10 VA						
at 24 V DC	5 W												
Max. Power loss at rated I_e	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105
	0.7 W	2.9 W	6.5 W	11.5 W	20.5 W	25 W	36 W	5.5 W	8.1 W	3.6 W	5.2 W	7.2 W	6.6 W
Starting capacity at I_e	4 x I _r for 6 sec.												
Number of starts per hour	See table on page 13.												
standard	10 ¹⁾												
with aux. fan	20 ¹⁾												
Service factor	100 %												
Ambient temperature													
during operation	-25 °C to + 60 °C (-13 to 140 °F) ²⁾												
during storage	-40 °C to + 70 °C (-40 to 158 °F)												
Maximum altitude	4000 m (13123 ft) ³⁾												
Degree of protection	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105
main circuit	IP20						IP10						
control circuit													
Connection	PSR3-PSR16			PSR25-PSR30			PSR37-PSR45			PSR60-PSR105			
main circuit													
cable area	1 x 2.5mm ² 1 x 14 AWG			1 x 2.5 - 10 mm ² 1 x 12 - 8 AWG			1 x 6 - 35 mm ² 1 x 8 - 4 AWG			1 x 10 - 95 mm ² 1 x 6 - 2/0 AWG			
tightening torque	1 Nm - 9 lb.in			2.3 Nm - 20 lb.in			4.0 Nm - 35 lb.in			8.0 Nm - 71 lb.in			
control circuit	PSR3-PSR16			PSR25-PSR105									
cable area	1 x 1.5 - 2.5 mm ² 2 x 1.5 mm ² 1 x 16 - 14 AWG 2 x 16 AWG			1 x 1.5 - 2.5 mm ² 2 x 1.5 mm ² 1 x 16 -14 AWG 2 x 16 AWG									
tightening torque	1 Nm - 9 lb.in			0.6 Nm - 5 lb.in									
Signal relays	PSR3-PSR16			PSR25-PSR105									
for Run signal													
Resistive load	240 V AC, 3 A / 24 V DC, 3 A			240 V AC, 3 A / 24 V DC, 3 A									
AC-15 (Contactor)	240 V AC, 0.5 A / 24 V DC, 0.5 A			240 V AC, 0.5 A / 24 V DC, 0.5 A									
for Top ramp signal													
Resistive load	-			240 V AC, 3 A / 24 V DC, 3 A									
AC-15 (Contactor)	-			240 V AC, 0.5 A / 24 V DC, 0.5 A									
LED													
for On/Ready	Green												
for Run/Top Of Ramp	Green												
Settings													
Ramp time during start	1-20 sec.												
Ramp time during stop	0-20 sec.												
Initial- and End Voltage	40-70%												

¹⁾ Valid for 50 % on time and 50 % off time. 4 x I_e for 6 sec., if other data is required, contact your sales office.

²⁾ Above 40 °C (104 °F) up to max. 60 °C (140 °F) reduce the rated current with 0.8 % per °C (0.44 % per °F).

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.

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

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

PSR – The compact range

Technical data

Number of starts per hour using PSR softstarters

Motor current I_e	Starts/hour without auxiliary fan							
	10	20	30	40	50	60	80	100
3 A	PSR3							
6 A	PSR6				PSR9			
9 A	PSR9		PSR12			PSR16		PSR25
12 A	PSR12		PSR16	PSR25		PSR30		
16 A	PSR16	PSR25		PSR30		PSR37		
25 A	PSR25	PSR30	PSR37		PSR45		PSR60	
30 A	PSR30	PSR37		PSR45		PSR60		PSR72
37 A	PSR37	PSR45		PSR60		PSR72	PSR85	PSR105
45 A	PSR45		PSR60		PSR72	PSR85	PSR105	-
60 A	PSR60		PSR72	PSR85	PSR105		-	-
72 A	PSR72	PSR85	PSR105		-	-	-	-
85 A	PSR85	PSR105		-	-	-	-	-
105 A	PSR105	-	-	-	-	-	-	-

Starts/hour with auxiliary fan

10	20	30	40	50	60	80	100
PSR3							
PSR6							PSR9
PSR9			PSR12			PSR16	
PSR12		PSR16	PSR25		PSR30		
PSR16	PSR25		PSR30		PSR37		
PSR25	PSR30	PSR37		PSR45		PSR60	
PSR30	PSR37		PSR45			PSR60	
PSR37	PSR45		PSR60		PSR72	PSR85	PSR105
PSR45		PSR60		PSR72	PSR85	PSR105	-
PSR60		PSR72	PSR85	PSR105		-	-
PSR72	PSR85	PSR105		-	-	-	-
PSR85	PSR105		-	-	-	-	-
PSR105	-	-	-	-	-	-	-

Data based on an ambient temperature of 40 °C (104 °F), starting current of $4 \times I_e$ and ramp time 6 seconds.
For more optimized selections, or to use PSR for heavy duty starts, please use the softstarter selection program, ProSoft.