

# PSR – The compact range

## Description



### Product description

- Wide rated operational voltage 208–600 V
- Rated control supply voltage 24 V AC/DC or 100–240 V AC
- Rated operational current 3–105 A
- Wide ambient temperature range, -25 to +60 °C
- 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's manual motor starters
- Sophisticated algorithm eliminating the DC-component and thereby providing excellent starting performance

The PSR range is the most compact of all ABB's softstarter ranges. The compact PSR range makes it possible to fit many devices into the same enclosure. A PSR together with a MMS (manual motor starter) makes up a far more compact starting solution than a Star-Delta starter, for instance.

### 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 setup 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's softstarter design and reduce the installation time. Thanks to the reduced heat generation, the softstarter can be mounted inside high IP class enclosures.

### Suitable for stopping pumps

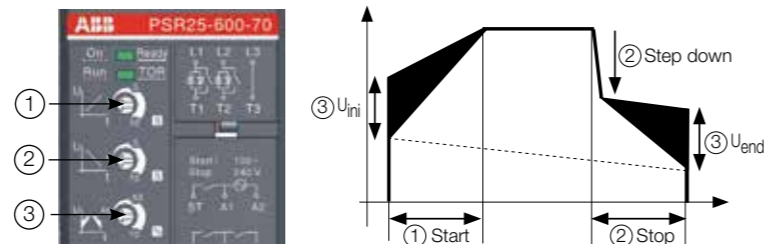
Even without using torque control, the PSR range is designed to reduce water hammering. Compared to the direct stops of a Star-Delta starter or a DOL starter the PSR is superior. See the stop ramp with step-down voltage below.

### System concept with manual motor starters

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

## Settings

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



# PSR – The compact range

## Overview



	PSR3 ... PSR16				PSR25 ... PSR30				PSR37... PSR45		PSR60 ... PSR105											
	<b>Softstarter, type</b>																					
Normal start In-line connected	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105									
	(400 V) kW	1.5	3	4	5.5	7.5	11	15	18.5	22	30	37	45	55								
	IEC, max. A	3.9	6.8	9	12	16	25	30	37	45	60	72	85	105								
(440-480 V) hp	2	3	5	7.5	10	15	20	25	30	40	50	60	75									
UL, max FLA	3.4	6.1	9	11	15.2	24.2	28	34	46.2	59.4	68	80	104									
	<b>400 V, 40 °C</b>																					
	<b>Manual motor starter (50 kA) type</b>																					
Using manual motor starters type 1 coordination will be achieved	MS116				MS132				MS450		MS495		—									
	<b>Fuse protection (50 kA) gG Fuse</b>																					
Using gG fuses type 1 coordination will be achieved	10 A	16 A	25 A	32 A	50 A	63 A	100 A	125 A	200 A	250 A												
	<b>Switch fuse, type</b>																					
Suitable switch fuse for the above gG fuses	OS32GD						OS125GD			OS250D												
	<b>Thermal overload relay</b>																					
Overload protection is used to protect the motor from over heating	TF42								TF65		TF96		TF140DU									
	<b>Line contactor, type</b>																					
The line contactor is not required for the softstarter itself but often used to open if OL trips	AF9		AF12		AF16		AF26		AF30		AF38		AF52		AF65		AF80		AF96		AF116	
	<b>By-pass contacts</b>																					
Using by-pass will reduce the power loss and allow more starts per hour	Built-in																					

# PSR – The compact range

## Ordering details



# PSR – The compact range

## Accessories

### PSR3 ... PSR105

Rated operational voltage  $U_o$ , 208-600 V AC

Rated control supply voltage,  $U_c$ , 100-240 V AC

Motor power

230 V P kW	400 V P kW	500 V P kW	IEC Max rated operational current $I_e$ A	Type	Order code	Weight kg 1 piece
0.75	1.5	2.2	3.9	PSR3-600-70	1SFA896103R7000	0.450
1.5	3	4	6.8	PSR6-600-70	1SFA896104R7000	0.450
2.2	4	4	9	PSR9-600-70	1SFA896105R7000	0.450
3	5.5	5.5	12	PSR12-600-70	1SFA896106R7000	0.450
4	7.5	7.5	16	PSR16-600-70	1SFA896107R7000	0.450
5.5	11	15	25	PSR25-600-70	1SFA896108R7000	0.650
7.5	15	18.5	30	PSR30-600-70	1SFA896109R7000	0.650
7.5	18.5	22	37	PSR37-600-70	1SFA896110R7000	1.000
11	22	30	45	PSR45-600-70	1SFA896111R7000	1.000
15	30	37	60	PSR60-600-70	1SFA896112R7000	2.200
22	37	45	72	PSR72-600-70	1SFA896113R7000	2.270
22	45	55	85	PSR85-600-70	1SFA896114R7000	2.270
30	55	55	105	PSR105-600-70	1SFA896115R7000	2.270

Rated operational voltage  $U_o$ , 208-600 V AC

Rated control supply voltage,  $U_c$ , 24 V AC/DC

0.75	1.5	2.2	3.9	Type	Order code	Weight kg 1 piece
0.75	1.5	2.2	3.9	PSR3-600-11	1SFA896103R1100	0.450
1.5	3	4	6.8	PSR6-600-11	1SFA896104R1100	0.450
2.2	4	4	9	PSR9-600-11	1SFA896105R1100	0.450
3	5.5	5.5	12	PSR12-600-11	1SFA896106R1100	0.450
4	7.5	7.5	16	PSR16-600-11	1SFA896107R1100	0.450
5.5	11	15	25	PSR25-600-11	1SFA896108R1100	0.650
7.5	15	18.5	30	PSR30-600-11	1SFA896109R1100	0.650
7.5	18.5	22	37	PSR37-600-11	1SFA896110R1100	1.000
11	22	30	45	PSR45-600-11	1SFA896111R1100	1.000
15	30	37	60	PSR60-600-11	1SFA896112R1100	2.200
22	37	45	72	PSR72-600-11	1SFA896113R1100	2.270
22	45	55	85	PSR85-600-11	1SFA896114R1100	2.270
30	55	55	105	PSR105-600-11	1SFA896115R1100	2.270



PSR3 ... PSR16



PSR25 ... PSR30



PSR37 ... PSR45



PSR60 ... PSR105



PSR16-MS116



PSR30-MS132



PSR45-MS450



PSR105-MS495



PSR-FAN3-45A



PSR-FAN60-105A



PS-FBPA



PSLW

### Connection kit

For softstarter type	Type	Order code	Pack <sup>ing</sup> piece	Weight kg 1 piece
PSR3...PSR16 with MS116 or MS132	PSR16-MS116	1SFA896211R1001	1	0.022
PSR25...PSR30 with MS132-12...MS132-32	PSR30-MS132	1SFA896212R1001	1	0.040
PSR37...PSR45 with MS450	PSR45-MS450	1SFA896213R1001	1	0.034
PSR60...PSR105 with MS495	PSR105-MS495	1SAM501903R1001	1	0.050

### Fan

For softstarter type	Type	Order code	Pack <sup>ing</sup> piece	Weight kg 1 piece
PSR3...PSR45	PSR-FAN3-45A	1SFA896311R1001	1	0.010
PSR60...PSR105	PSR-FAN60-105A	1SFA896313R1001	1	0.013

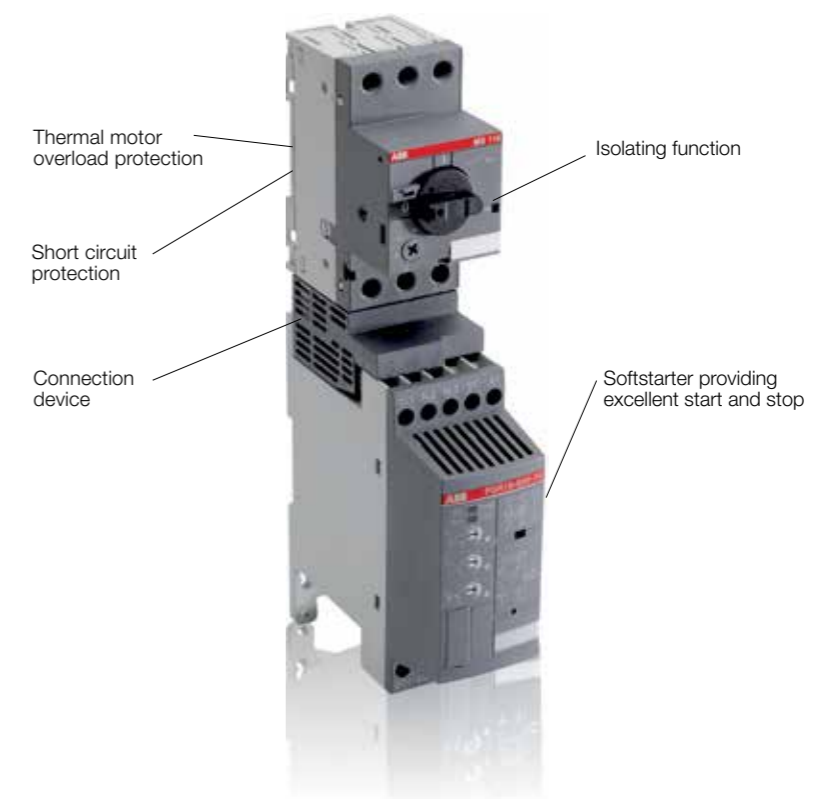
### Terminal enlargements

For softstarter type	Type	Order code	Pack <sup>ing</sup> piece	Weight kg 1 piece
PSR60...105	PSLW-72	1SFA899002R1072	1	0.150
Wire range mm2	1x10...50, 2x10...25			

### FieldBusPlug connection accessory

For softstarter type	Type	Order code	Pack <sup>ing</sup> piece	Weight kg 1 piece
The same accessory for all sizes	PS-FBPA	1SFA896312R1002	1	0.060
ABB's FieldBusPlug suitable for all sizes. See page 50-53				

### Connection kit



# PSR – The compact range

## Technical data

Rated insulation voltage $U_i$	600 V												
Rated operational voltage $U_o$	208...600 V +10%/-15%, 50/60 Hz ±5%												
Rated control supply voltage $U_c$	100...240 V AC, 50/60Hz ±5% or 24 V AC/DC, +10%/-15%												
Power consumption	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105
Supply circuit	12 VA												
at 100-240 V AC	10 VA												
at 24 V AC/DC	5 W												
Max. Power loss at rated $I_o$	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 $I_o$	4 x $I_o$ for 6 sec.												
Number of starts per hour	See table below for details												
standard	10 <sup>1)</sup>												
with aux. fan	20 <sup>1)</sup>												
Service factor	100%												
Ambient temperature													
during operation	-25 °C to +60 °C <sup>2)</sup>												
during storage	-40 °C to +70 °C												
Maximum altitude	4000 m <sup>3)</sup>												
Degree of protection	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105
main circuit	IP20												
control circuit	IP10												
Connectable cable area													
main circuit	PSR3-PSR16				PSR25-PSR30				PSR37-PSR45				PSR60-PSR105
	1 x 0.75-2.5mm <sup>2</sup>				1 x 2.5-10mm <sup>2</sup>				1 x 6-35mm <sup>2</sup>				1 x 10-95mm <sup>2</sup>
	2 x 0.75-2.5mm <sup>2</sup>				2 x 2.5-10mm <sup>2</sup>				2 x 6-16mm <sup>2</sup>				2 x 6-35mm <sup>2</sup>
control circuit	PSR3-PSR16				PSR25-PSR105								
	1 x 0.75-2.5mm <sup>2</sup>				1 x 0.75-2.5mm <sup>2</sup>								
	2 x 0.75-2.5mm <sup>2</sup>				2 x 0.75-1.5mm <sup>2</sup>								
Signal relays	PSR3-PSR16												
for run signal	PSR25-PSR105												
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%												

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

<sup>2)</sup> Above 40 °C up to max. 60 °C reduce the rated current with 0.8% per °C.

<sup>3)</sup> When used at high altitudes above 1000 meters up to 4000 meters you need to derate the rated current using the following formula.

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

## Number of starts per hour using PSR softstarters

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

Data based on an ambient temperature of 40°, starting current of 4 x  $I_o$  and ramp time 6 seconds.

For more optimized selections, or to use PSR for heavy-duty starts, please use the softstarter selection tool.

# PSR – The compact range

## UL ratings

### UL ratings

Softstarter Type	Motor power P (hp) and full load current FLA (A)					Max. fuse A, Type
	Max FLA A	$U_o$ 200 V/208 V hp	$U_o$ 220 V/240 V hp	$U_o$ 440 V/480 V hp	$U_o$ 550 V/600 V hp	
PSR3	3.4	0.5	0.75	2	2	35 A J-Type
PSR6	6.1	1	1.5	3	5	35 A J-Type
PSR9	9	2	2	5	7.5	35 A J-Type
PSR12	11	3	3	7.5	10	35 A J-Type
PSR16	15.2	3	5	10	10	35 A J-Type
PSR25	24.2	7.5	7.5	15	20	60 A J-Type
PSR30	28	7.5	10	20	25	60 A J-Type
PSR37	34	10	10	25	30	90 A J-Type
PSR45	46.2	15	15	30	40	90 A J-Type
PSR60	59.4	20	20	40	50	110 A J-Type
PSR72	68	20	25	50	60	125 A J-Type
PSR85	80	25	30	60	75	150 A J-Type
PSR105	104	30	40	75	100	200 A J-Type

