

CATALOG

# PSRC softstarters

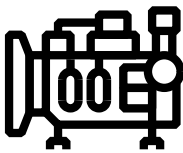
## For scroll compressors



- PSRC is optimized for scroll compressors  
less stress and reducing maintenance cost

# PSRC is optimized for scroll compressors

## Less stress and reducing maintenance cost



### General information for compressors

There are different types of compressors like piston compressor, scroll compressor, screw compressor etc. Smaller compressors are often of the piston type and the load torque increases linearly with the speed. Screw compressors are often used when there is a bigger need for air flow and this type has a load torque increasing with the square of the speed. Most compressors are started unloaded and are considered to be light starts.

By using an ABB's softstarter it is possible to limit the starting torque to a level suitable for all different applications. The result is less stress on the compressor reducing the maintenance cost to a minimum. For scroll compressors, ABB has the special version PSRC that is optimized for that application.

### Selection of a suitable softstarter

A compressor is usually a normal start and then the softstarter can be selected according to the motor kW size. If the compressor is a heavy duty start, the softstarter should be upsized one size. The same applies if more than 10 starts per hour are performed, upsize one size.

### Features for scroll compressors

- Reduced starting current
- Short starting time (<1s) to guarantee lubrication of the compressor
- Recommended minimum starting voltage to secure a start in 400 V network
  - 200V for smaller compressors
  - 220V for bigger compressors

### Features for the OEMs

- Easy and reliable
- 60 degree ambient temperature
- "Temper proof" No risk of parameters getting changed after installation

### Recommended basic settings for scroll compressors:

Start ramp: < 1 sec.  
Start mode: Voltage ramp  
Stop ramp: 0 sec  
Stop mode: No ramp  
Start ramp initial level: 50%



## Rhoss - Italy

### Keeps air flowing

#### The client

Rhoss is an Italian specialist in air conditioning and air handling products and systems. For over 40 years, it has been synonymous with quality, innovation and top level service. In a recent project, where high inrush currents caused problems to the scroll compressors used to compress air, Rhoss contacted ABB for a more sustainable motor starting solution.

#### The challenge

Many HVAC (Heating Ventilation and Air-Conditioning) projects use scroll compressors which require short starting times. In combination with customers requiring low starting currents, this proved a challenge for Rhoss. Other challenges are high temperatures and small spaces. Italian Rhoss had experienced all of the above in previous projects and sought a solution. They needed just one single product that could handle all these challenges. ABB had an answer.

#### The ABB solution

Rhoss implemented ABB's softstarters in its starting equipment and were soon aware of the concept's many benefits. An integrated bypass meant the starting solution took up less space which also meant Rhoss could spend more of the space on controlling the high temperatures. The biggest benefit of all though is that the softstarter reduced the inrush currents of the scroll compressors by 60 percent while still maintaining the short starting time that this sort of application needs. The lowered starting currents mean less stress is put both on motor and compressor, reducing the need of maintenance and repairs.



**Starting currents  
reduced by 60%**

# PSRC

## Introduction



### Feature list

- Rated operational current: 3...105 A
- Operational voltage: 208...600 V AC
- Wide rated control supply voltage: 100...240 V AC, 50/60 Hz
- Two-phase controlled
- Soft start with voltage ramp
- Built-in bypass for energy saving and easy installation
- Easy set-up
- Fieldbus communication with fieldbus plug adapter and the fieldbus plug
- Run and Top of Ramp relays available for monitoring
- Connection kits available for connection to ABB's manual motor starters (MMS)
- Ambient temperature -25 to +60 degrees



SECURE  
MOTOR  
**Reliability**

### Reduce the electrical stresses and keep the motor protected with the MMS

The PSRC reduces the starting current for the motor. The possibility to connect it to the manual motor starter makes it possible to build a compact and complete starting solution with overload and short-circuit protection.



IMPROVE  
INSTALLATION  
**Efficiency**

### Saving time and money with built-in bypass and easy set-up

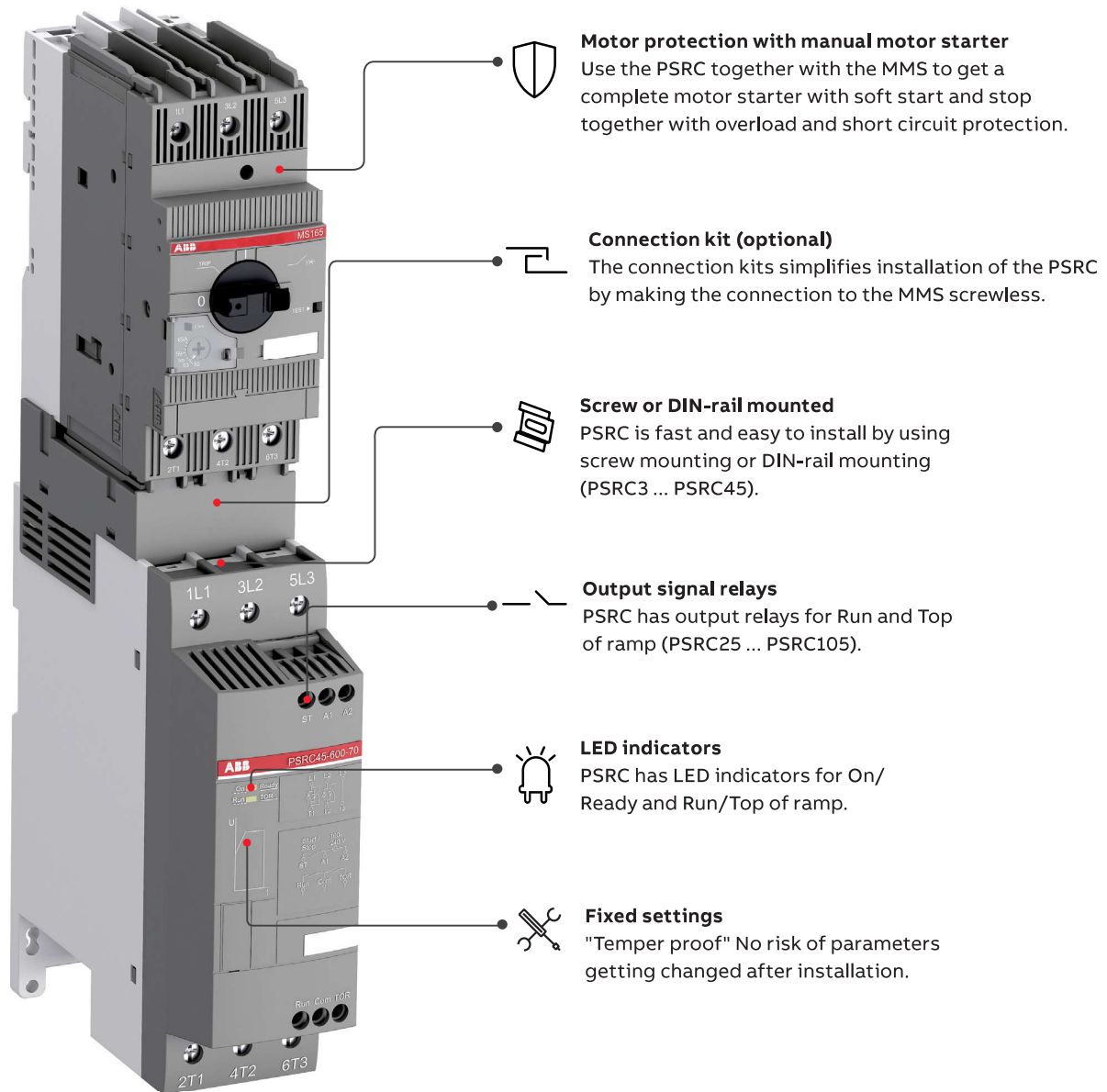
On the PSRC, the bypass is built in and verified by ABB, saving you time during installation and space in your panel.



INCREASE  
APPLICATION  
**Productivity**

### Reduce the mechanical stresses on your motor

Soft start and stop with PSRC will reduce mechanical wear and tear on the application and increase the availability and uptime.



# PSRC coordination

## Overview



PSRC3... PSRC16



PSRC25... PSRC30



PSRC37... PSRC45



PSRC60... PSRC105

### Normal start In-line connected

Softstarter	PSRC3	PSRC6	PSRC9	PSRC12	PSRC16	PSRC25	PSRC30	PSRC37	PSRC45	PSRC60	PSRC72	PSRC85	PSRC105 <sup>2)</sup>
(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
Using manual motor starters type 1 coordination will be achieved <sup>1)</sup>	Manual motor starter (50 kA) 400 V, 40 °C												
	MS116	MS116	MS116	MS132	MS132	MS132	MS132	MS165	MS165	MS165	MS495	MS495	MS495
Using gG fuses type 1 coordination will be achieved <sup>1)</sup>	Fuse protection (50 kA) gG Fuse												
	10 A	16 A	25 A	32 A	32 A	50 A	63 A	100 A	125 A	125 A	200 A	200 A	250 A
Suitable switch fuse for the above gG fuses <sup>1)</sup>	Switch fuse												
	OS32G							OS125G			OS250		
J-type fuses for UL coordination <sup>1)</sup>	Max. fuse, J-type												
	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
Overload protection is used to protect the motor from over heating <sup>1)</sup>	Thermal overload relay												
	TF42DU							TA75DU			TA110DU		
The line contactor is not required for the softstarter itself but often used to open if OL trips <sup>1)</sup>	Line contactor												
	AF9	AF9	AF9	AF12	AF16	AF26	AF30	AF38	AF52	AF65	AF80	AF96	AF116

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

<sup>2)</sup> Can be used with MS495 up to 100 A

# Ordering details

## Normal starts, class 10, in-line



Rated operational voltage  $U_e$ , 208...600 V AC, Rated control supply voltage,  $U_s$ , 100...240 V AC.

Motor power							
IEC data		UL/CSA data				Type	Order code
kW at 400 V	I <sub>e</sub> rated current	hp at 208 V	hp at 480 V	hp at 600 V	FLA		
1.5	3.9	0.5	2	2	3.4	PSRC3-600-70	1SFA896203R7000
3	6.8	1	3	5	6.1	PSRC6-600-70	1SFA896204R7000
4	9	2	5	7.5	9	PSRC9-600-70	1SFA896205R7000
5.5	12	3	7.5	10	11	PSRC12-600-70	1SFA896206R7000
7.5	16	3	10	10	15	PSRC16-600-70	1SFA896207R7000
11	25	7.5	15	20	14	PSRC25-600-70	1SFA896208R7000
15	30	7.5	20	25	28	PSRC30-600-70	1SFA896209R7000
18.5	37	10	25	30	34	PSRC37-600-70	1SFA896210R7000
22	45	15	30	40	46.2	PSRC45-600-70	1SFA896211R7000
30	60	20	40	50	59.4	PSRC60-600-70	1SFA896212R7000
37	72	20	50	60	68	PSRC72-600-70	1SFA896213R7000
45	85	25	60	75	80	PSRC85-600-70	1SFA896214R7000
55	105	30	75	100	104	PSRC105-600-70	1SFA896215R7000

PSRC Dimensions and weight					
Frame size	H (mm)	W (mm)	D (mm)	(kg)	(lb)
PSRC3...16	140	45	113.5	0.45	0.99
PSRC25...30	160	45	128	0.60	1.43
PRSC37...45	187	54	153	1.0	2.20
PSRC60...105	220	70	180	2.27	5.0





# Ordering details

## PSRC accessories



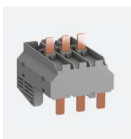
01 Connection kit  
for PSRC3...16



02 Connection kit  
for PSRC25...30



03 Connection kit  
for PSRC37...45



04 Connection kit  
for PSRC60...72



05 Fan



06 Terminal  
enlargements

### Connection kit

Article	breaker type	Type	Order code	Pkg qty	kg	lb
PSRC3...16	MS116/132	PSR16-MS116	1SFA896211R1001	1	0.022	0.049
PSRC25...30	MS132	PSR30-MS132	1SFA896212R1001	1	0.040	0.088
PSRC37...45	MS165	PSR45-MS165	1SFA896216R1001	1	0.050	0.110
PSRC60...72	MS165	PSR60-MS165	1SFA896215R1001	1	0.050	0.110
PSRC60...105	MS495	PSR105-MS495	1SAM501903R1001	1	0.034	0.075

### Fan

Article	Type	Order code	Pkg qty	kg	lb
PSRC3...16	PSR-FAN3-45A	1SFA896311R1001	1	0.010	0.022
PSRC25...30	PSR-FAN60-105A	1SFA896313R1001	1	0.013	0.029

### Terminal enlargements

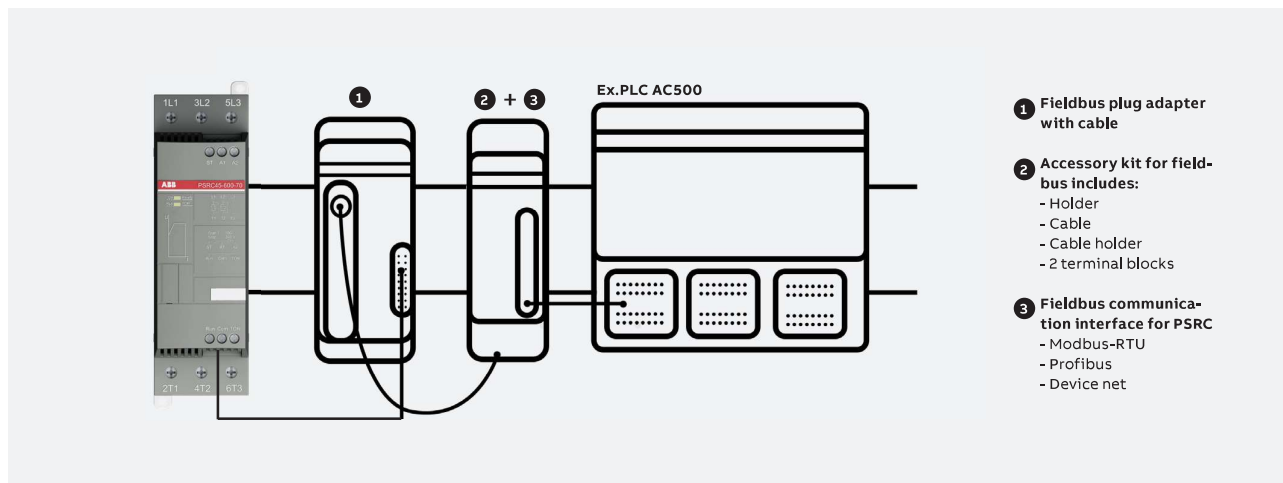
Article	Type	Order code	Pkg qty	kg	lb
PSRC60... PSRC105	PSLW-72	1SFA899002R1072	1	0.150	0.033

Note: Wire range mm<sup>2</sup> 1 x 10...50 mm<sup>2</sup>, 2 x 10...25 mm<sup>2</sup>



# Fieldbus communication

## PSRC



01 Fieldbus plug adapter

### 1 Fieldbus plug adapter with cable

Article	Type	Order code	Pkg qty	kg	lb
Fieldbus plug adapter	PS-FBPA	1SFA896312R1002	1	0.060	0.132



02 Fieldbus plug kit

### 2 Fieldbus plug kit for mounting fieldbus plug adapter together with fieldbus plugs

Includes: Holder, cable, cable holder and 2 terminal blocks

Article	Type	Order code	Pkg qty	kg	lb
Accessory kit	PS-FBPK	1SFA899320R1002	1	0.150	0.331



03 Modbus RTU

### 3 Fieldbus communication interface, **Order from EP**

Article	Type	Order code	Pkg qty	kg	lb
<b>Modbus-RTU</b>					
Modbus RTU communication interface; terminal block for fieldbus connection included	MRP31.0	1SAJ251000R0001	1	0.039	0.086
Cable from MRP31.0 to drawer outside, length 1.5 m	CDP24.150	1SAJ929240R0015	1	0.060	0.132
<b>Profibus</b>					
Profibus DP communication interface	PDP32.0	1SAJ242000R0001	1	0.050	0.110
Cable from PDP32.0 to drawer outside, length 1.5 m	CDP24.150	1SAJ929240R0015	1	0.060	0.132
<b>Device net</b>					
DeviceNet communication interface; terminal block for fieldbus connection included	DNP31.0	1SAJ231000R0001	1	0.039	0.086
Cable from DNP31.0 to drawer outside, length 1.5 m	CDP24.150	1SAJ929240R0015	1	0.060	0.132

Note: See separate catalog for fieldbus communication interfaces: [Link](#)  
For more information visit the Universal Motor Controller website: [Link](#)



04 Profibus





05 Device net

# Certifications and distance

## PSRC

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

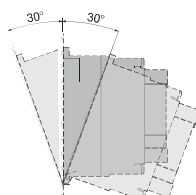
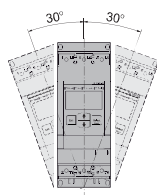
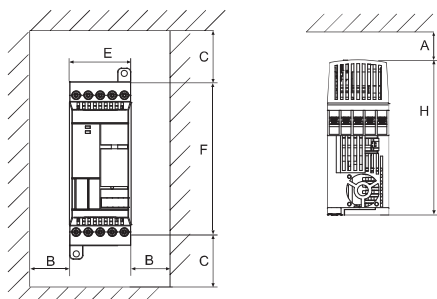
### Certifications and approvals FOR PSRC3... 105

								
Abbreviation approved in	CE EU	cULus Canada USA	CCC China	EAC Russia	KC Korea	ANCE Mexico	C-tick Australia	PRS

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

### Minimum distance to wall (front) (mm)

Softstarter type	A	B	C	E	F	H
PSRC3 ... 16	25	0*	0	45	140	114
PSRC25 ... 30	25	0*	0	45	160	128
PSRC37 ... 45	25	0*	0	54	187	153
PSRC60 ... 105	25	0*	0	70	220	180



### Directives and standards

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

# Technical data

## PSRC

<b>Normal start</b>													
<b>In-line connected</b>	PSRC3	PSRC6	PSRC9	PSRC12	PSRC16	PSRC25	PSRC30	PSRC37	PSRC45	PSRC60	PSRC72	PSRC85	PSRC105
<b>IEC data</b>													
(400 V) kW	1.5	3	4	5.5	7.5	11	15	18.5	22	30	37	45	55
I <sub>e</sub> rated current	3.9	6.8	9	12	16	25	30	37	45	60	72	85	105
<b>UL/CSA data</b>													
(208 V) hp	0.5	1	2	3	3	7.5	7.5	10	15	20	20	25	30
(440-480 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
FLA	3.4	6.1	9	11	15.2	24.2	28	34	46.2	59.4	68	80	104

<b>Connectable cable area</b>	<b>PSRC3...16</b>	<b>PSRC25... 30</b>	<b>PSRC37... 45</b>	<b>PSRC60...105</b>
Main circuit	1 x 0.75 - 2.5 mm <sup>2</sup> 2 x 0.75 - 2.5 mm <sup>2</sup> 1 x 14 AWG	1 x 2.5 - 10 mm <sup>2</sup> 2 x 2.5 - 10 mm <sup>2</sup> 1 x 12 - 8 AWG	1 x 6 - 35 mm <sup>2</sup> 2 x 6 - 16 mm <sup>2</sup> 1 x 8 - 4 AWG	1 x 10 - 95 mm <sup>2</sup> 2 x 6 - 35 mm <sup>2</sup> 1 x 6 - 2/0 AWG
Control circuit	<b>PSRC3...16</b> 1 x 0.75 - 2.5 mm <sup>2</sup> 1 x 0.75 - 2.5 mm <sup>2</sup> 1 x 16 - 14 AWG / 2 x 16 AWG	<b>PSRC25... 105</b> 1 x 0.75 - 2.5 mm <sup>2</sup> 2 x 0.75 - 1.5 mm <sup>2</sup> 1 x 16 - 14 AWG / 2 x 16 AWG		

<b>Degree of protection</b>	
main circuit	PSRC3... 30: IP20 PSRC37... 105: IP10
control circuit	PSRC3... 30: IP20
<b>Signal relays</b>	
For Run signal	<b>PSRC3... 16</b> 240 V AC, 3 A / 24 V DC, 3 A
Resistive load	<b>PSRC25... 105</b> 240 V AC, 3 A / 24 V DC, 3 A
AC-15 (Contactor)	<b>PSRC3... 16</b> 240 V AC, 0.5 A / 24 V DC 0.5 A <b>PSRC25... 105</b> 240 V AC, 0.5 A / 24 V DC, 0.5 A
For Top ramp signal	<b>PSRC25... 105</b>
Resistive load	240 V AC, 3 A / 24 V DC, 3 A
AC-15 (Contactor)	<b>PSRC25... 105</b> 240 V AC, 0.5 A / 24 V DC, 0.5 A
Rated insulation voltage U <sub>i</sub>	600 V
Rated operational voltage U <sub>e</sub>	208...600 V AC +10 %/-15 %, 50/60 Hz ±5 %
Rated control supply voltage U <sub>s</sub>	100...240 V AC, 50/60Hz ±5 %
<b>Ambient temperature</b>	
during operation	-25 °C to + 60 °C (-13 to + 140 °F)1)
during storage	-40 °C to + 70 °C (-40 to +158 °F)
Maximum altitude	4000 m (13123 ft)2)

1) 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).

2) When used at high altitudes above 1000 meters (3281 ft) up to 4000 meters (13123 ft) you need to derate the rated current using one of the following formulas.

[% of I<sub>e</sub> = 100 - (x-1000)/150] x = actual altitude for the softstarter in meters. [% of I<sub>e</sub> = 100 - (x-3280)/497] x = actual altitude for the softstarter in feet.

<b>Number of starts per hour using PSRC softstarters</b>								
Starts/hour without auxiliary fan								
I <sub>e</sub>	10	20	30	40	50	60	80	100
3 A	PSRC3	PSRC3	PSRC3	PSRC3	PSRC3	PSRC3	PSRC3	PSRC6
6 A	PSRC6	PSRC6	PSRC6	PSRC6	PSRC6	PSRC9	PSRC9	PSRC9
9 A	PSRC9	PSRC9	PSRC9	PSRC12	PSRC12	PSRC12	PSRC16	PSRC25
12 A	PSRC12	PSRC12	PSRC12	PSRC16	PSRC25	PSRC25	PSRC30	PSRC30
16 A	PSRC16	PSRC25	PSRC25	PSRC25	PSRC30	PSRC30	PSRC37	PSRC37
25 A	PSRC25	PSRC30	PSRC37	PSRC37	PSRC37	PSRC45	PSRC45	PSRC60
30 A	PSRC30	PSRC37	PSRC37	PSRC45	PSRC45	PSRC60	PSRC60	PSRC72
37 A	PSRC37	PSRC45	PSRC45	PSRC60	PSRC60	PSRC72	PSRC85	PSRC105
45 A	PSRC45	PSRC45	PSRC60	PSRC60	PSRC72	PSRC85	PSRC105	-
60 A	PSRC60	PSRC60	PSRC72	PSRC85	PSRC105	PSRC105	-	-
72 A	PSRC72	PSRC85	PSRC105	PSRC105	-	-	-	-
85 A	PSRC85	PSRC105	PSRC105	-	-	-	-	-
105 A	PSRC105	-	-	-	-	-	-	-

<b>Number of starts per hour using PSRC softstarters</b>								
Starts/hour with auxiliary fan								
I <sub>e</sub>	10	20	30	40	50	60	80	100
3 A	PSRC3	PSRC3	PSRC3	PSRC3	PSRC3	PSRC3	PSRC3	PSRC3
6 A	PSRC6	PSRC6	PSRC6	PSRC6	PSRC6	PSRC6	PSRC6	PSRC9
9 A	PSRC9	PSRC9	PSRC9	PSRC9	PSRC9	PSRC12	PSRC12	PSRC12
12 A	PSRC12	PSRC12	PSRC12	PSRC12	PSRC12	PSRC16	PSRC25	PSRC25
16 A	PSRC16	PSRC16	PSRC25	PSRC25	PSRC25	PSRC25	PSRC30	PSR30
25 A	PSRC25	PSRC2	PSRC30	PSRC37	PSRC37	PSRC37	PSRC37	PSRC45
30 A	PSRC30	PSRC30	PSRC37	PSRC37	PSRC45	PSRC45	PSRC45	PSRC45
37 A	PSRC37	PSRC37	PSRC45	PSRC45	PSRC45	PSRC45	PSRC60	PSRC60
45 A	PSRC45	PSRC45	PSRC45	PSRC60	PSRC60	PSRC60	PSRC72	PSRC72
60 A	PSRC60	PSRC60	PSRC60	PSRC72	PSRC72	PSRC85	PSRC105	-
72 A	PSRC72	PSRC72	PSRC72	PSRC85	PSRC105	PSRC105	-	-
85 A	PSRC85	PSRC85	PSRC105	PSRC105	-	-	-	-
105 A	PSRC105	PSRC105	-	-	-	-	-	-

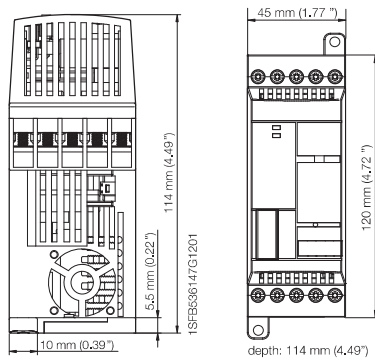
Data based on an ambient temperature of 40° (104 F), starting current of 4 x I<sub>e</sub> and ramp time 6 seconds. For more optimized selection or to use PSR for heavy-duty starts, please use the softstarter selection tool.

# Dimensions

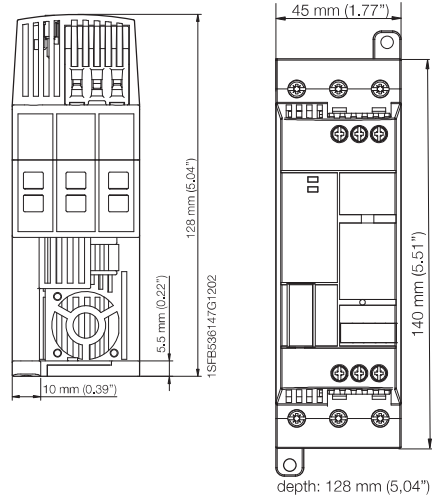
## PSRC

Main dimensions mm, inches

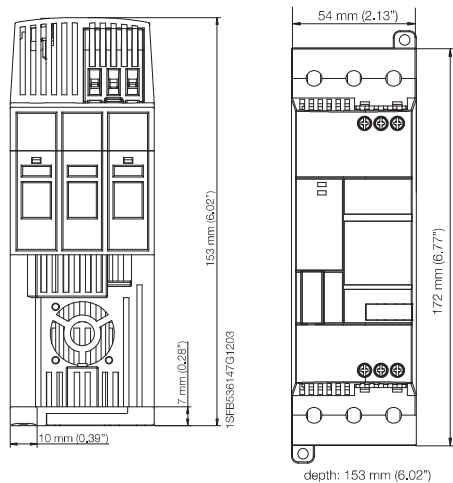
### PSRC3 ... PSRC16



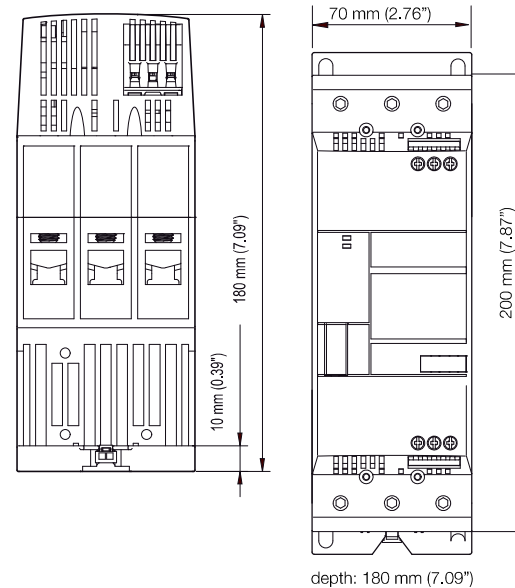
### PSR25C ... PSRC30



### PSRC37 ... PSRC45



### PSRC60 ... PSRC105

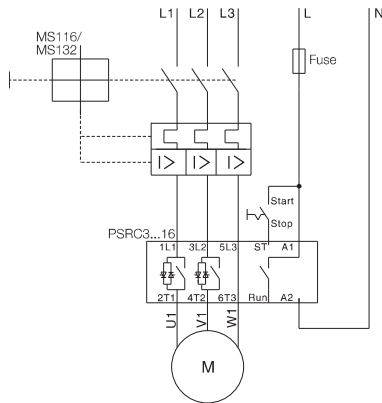


# Circuit diagrams

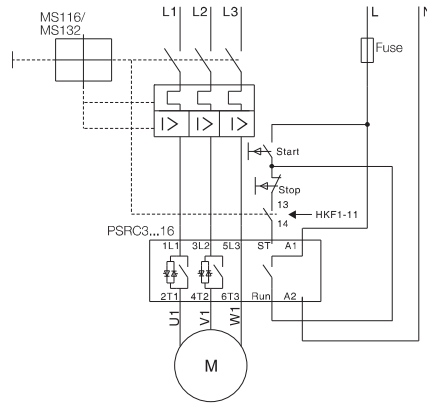
## PSRC

### PSRC3 ... PSRC16

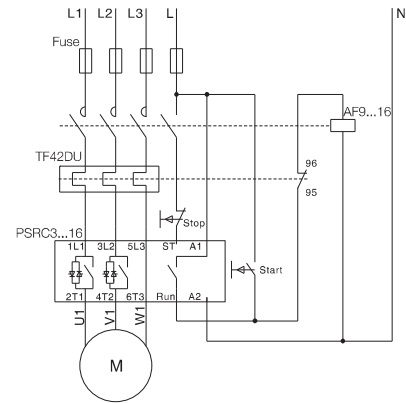
#### A) With MMS



#### B) With MMS and auxiliary contact

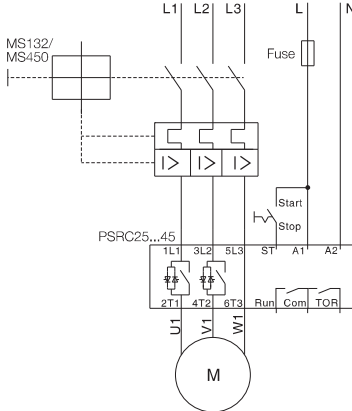


#### C) With fuses, contactor and O.L.

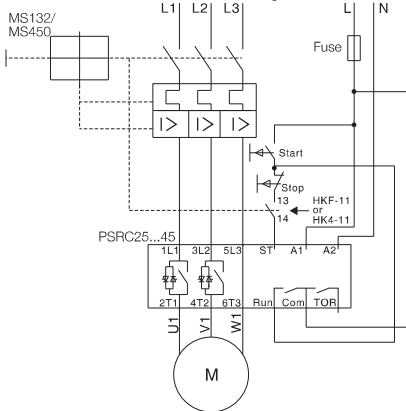


### PSRC25 ... PSRC45

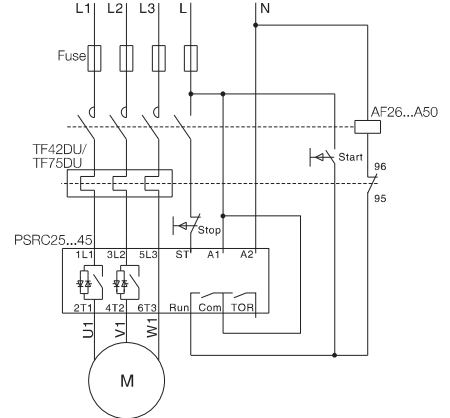
#### D) With MMS



#### E) With MMS and auxiliary contact

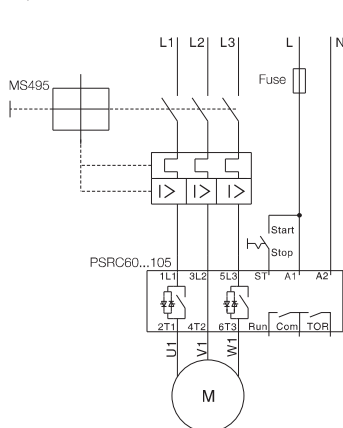


#### F) With fuses, contactor and O.L.

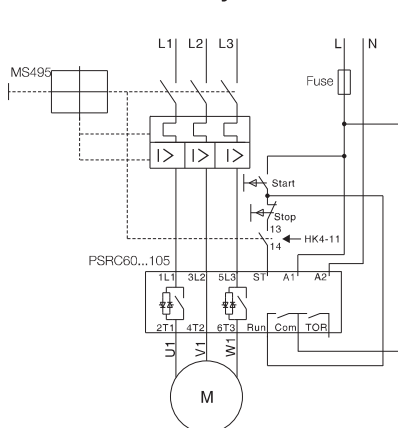


### PSRC60 ... PSRC105

#### G) With MMS



#### H) With MMS and auxiliary contact



#### I) With fuses, contactor and O.L.

