

CATALOG

Softstarters

PSR



Authorised Value Provider

Motors use almost one third of the world's generated electricity. So it is safe to say that reliable motor operation is crucial to our modern way of life.

ABB softstarters

How we are helping the industry

A softstarter from ABB offers you several values and benefits. Whether you are a consultant, OEM, panel builder or end-user, A softstarter will add to your business value by securing motor reliability, improving installation efficiency and increasing application productivity.



SECURE
MOTOR
Reliability

ABB softstarters help increase your motors lifetime by protecting it from electrical stress. Starting currents are easily optimized to your load, application and motor size. Over ten motor protection features are included to keep your motor safe from different load and network irregularities.



IMPROVE
INSTALLATION
Efficiency

Reduce your installation time and panel size by having all features you need built into your softstarter. Our softstarters are easy to install thanks to their compact design and many built-in features. The built-in bypass saves energy and space while reducing heat generation. A complete motor starting solution in one unit.



INCREASE
APPLICATION
Productivity

Reduce the number of stops in your production by allowing your softstarter to do more than just starting. Our softstarters reduce the mechanical stress on your motor application, which will increase your uptime. Torque control, pump cleaning, motor brake and many other features enable you to operate your process at its full potential.



Xylem - South Africa

ABB softstarters providing efficiency to the mining industry

One of Xylem's water solutions helps to prevent flooding in mines. Previous softstarters needed a lot of extra protection equipment. Xylem was looking for a simpler solution that would ensure reliability even at 3,500 meters depth. Reducing the number of components by 80 percent, shortened installation time by 60 percent. Costs cut to half has helped Xylem sell twice as many panels with softstarters as before.



Installation time reduced by **60%**



Total panel cost reduced by **50%**

For more examples of how ABB softstarters are helping the industry, visit: <https://new.abb.com/drives/softstarters-campaigns>

Common applications for softstarters

Pumps, fans, compressors and conveyors

A softstarter can do wonders with your operations. Packed with useful features, it reduces the wear of your equipment, improve the reliability of your processes and increase overall productivity.



01 Softstarters controlling pumps



02 Softstarters controlling fans

Pump

Eliminating water hammering with torque control

Water hammering is a common problem with pumps and typically results in wear in pipes and valves when starting and stopping the pump. The ABB softstarter feature torque control provides a soft pipe fill during start and eliminates water hammering during stop. The benefits are prolonged lifetime of the system and increased uptime.

Keep pipes and pumps clean

Many pumps risk getting clogged over time. This will cause reduced flow and increased risk of pump damage. Thanks to the feature to reverse the direction of the flow and start again with kick-start, ABB softstarters can help prevent and solve pump clogging and associated downtime.

Avoid running dry with underload protection

Damages due to pumps running dry can be avoided with the softstarter feature dry pump protection, called underload protection. It stops the motor which saves the pump from additional wear and contributes to prolonging its lifetime.

01



Fans

Soft starting adjusted to application

Fans normally have a high moment of inertia, which makes starting tough and current high. Using an ABB softstarter, the voltage is increased gradually during start, which reduces the current and removes the inrush peak. It is possible to adjust the settings to fit almost any starting condition, from unloaded to fully loaded.

Fast stops with motor braking

It can also take a long time to stop a fan. With the dynamic brake feature, also called flux braking, the stopping time can be reduced. This improves process safety when the load has a high moment of inertia and makes fan operation easier for the operator.

Avoid unwanted movements with stand still brake

An idle fan that is rotating backwards, due to wind or airflow from another fan, can be kept still using the stand still brake. It prevents unwanted airflow and improves the control of the system without the need for an external mechanical brake.

02





Softstarter

Like direct-on-line and star delta starters, softstarters are used to start and stop motors in full-speed applications. It eliminates common problems associated with motor starting and stopping, including electrical surges, spikes and high inrush currents. Because it offers soft starting and stopping, a softstarter is the optimal compromise between a direct-on-line or star-delta starter and a variable speed drive in many full-speed motor applications.



Variable speed drive

Like a softstarter, a variable speed drive (VSD) can perform soft motor starting and stopping. However, the VSD was designed primarily to control motor speed, resulting in energy efficient motor operation in variable speed applications. Using a VSD with the sole purpose of ensuring soft starting and stopping of full-speed motors can therefore be considered an unnecessarily advanced solution.

Comparison between different starting methods

The table below describes which problems are prevented, using the most common starting methods.

Comparison	Starting method type		Softstarter	Drive
	Direct on line DOL	Star-delta start Y/D		
Reduce high inrush current	No	Yes	Yes	Yes
Reduce heavy wear on bearings, shafts, gear boxes, etc	No	Reduced	Yes	Yes
Prevent slipping belts	No	Reduced	Yes	Yes
Remove torque/current peaks	No	No	Yes	Yes
Prevent water hammering in piping system	No	No	Yes	Yes
Need of variable speed control	No	No	No	Yes

The PSR softstarter is the most compact of all the softstarter ranges which allows for design of a compact starting equipment.

The PSR combined with a manual motor starter makes up a far more compact starting solution than the complex star-delta starter, and with the built-in bypass, the energy losses inside the softstarter are highly reduced.

PSR - The compact range

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 or 24 V AC/DC
- Two-phase controlled
- Soft start with voltage ramp
- Soft stop with voltage ramp
- Built-in bypass for energy saving and easy installation
- Easy set-up by three potentiometers
- 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)



SECURE
MOTOR

Reliability

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

The PSR 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 PSR, the bypass is built in and verified by ABB, saving you time during installation and space in your panel. Set-up is done through three potentiometers making it very fast and easy.

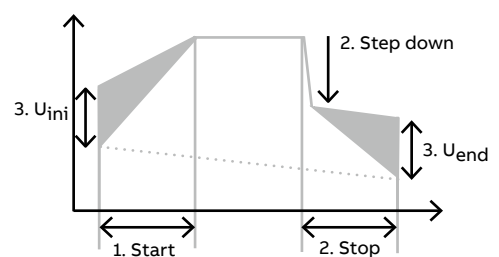
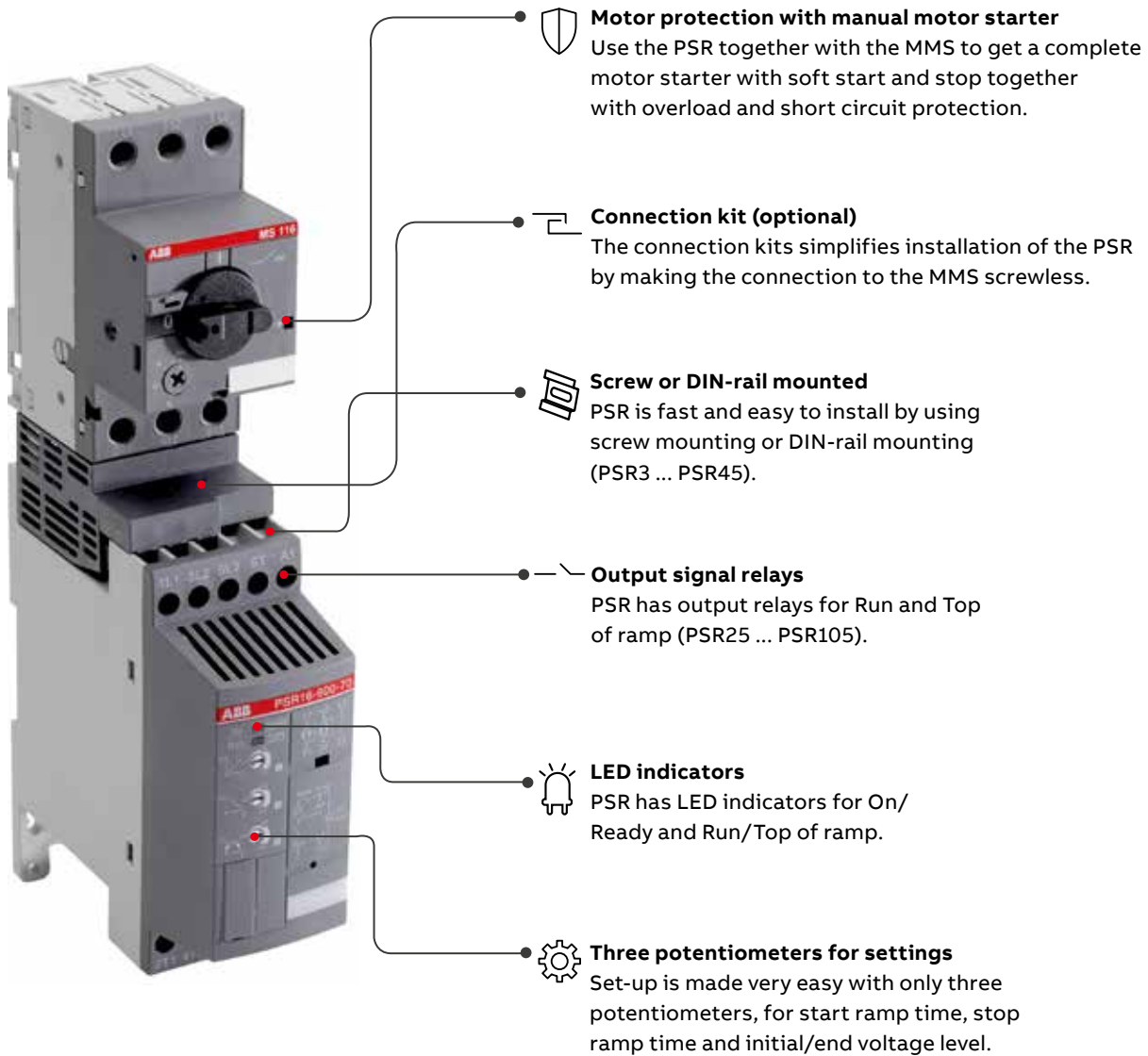


INCREASE
APPLICATION

Productivity

Reduce the mechanical stresses on your motor

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



PSR - The compact range

Coordination examples



PSR3 ... PSR16



PSR25 ... PSR30



PSR37 ... PSR45



PSR60 ... PSR105

Normal start In-line connected

Softstarter	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105 ²⁾
(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 ¹⁾	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 ¹⁾	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 ¹⁾	Switch fuse												
	OS32G							OS125G			OS250		
J-type fuses for UL coordination ¹⁾	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 ¹⁾	Thermal overload relay												
	TF42DU							TA75DU			TA110DU		
The line contactor is not required for the softstarter itself but often used to open if OL trips ¹⁾	Line contactor												
	AF9	AF9	AF9	AF12	AF16	AF26	AF30	AF38	AF52	AF65	AF80	AF96	AF116

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

²⁾ Can be used with MS495 up to 100 A

PSR - The compact range

Normal starts, class 10, in-line

Ordering details



PSR3 ... PSR16



PSR25 ... PSR30



PSR37 ... PSR45



PSR60 ... PSR105

Rated operational voltage U_e , 208...600 V AC, Rated control supply voltage, U_s , 100...240 V AC, 50/60 Hz

IEC Rated operational power				UL/CSA Rated operational power								
230 V	400 V	500 V	current	200/208 V	220/240 V	440/480 V	550/600 V	current				
P_e	P_e	P_e	I_e	P_e	P_e	P_e	P_e	FLA	Type	Order code	Weight	
kW	kW	kW	A	hp	hp	hp	hp	A			kg	lb
0.75	1.5	2.2	3.9	0.5	0.75	2	2	3.4	PSR3-600-70	1SFA896103R7000	0.45	0.99
1.5	3	4	6.8	1	1.5	3	5	6.1	PSR6-600-70	1SFA896104R7000	0.45	0.99
2.2	4	4	9	2	2	5	7.5	9	PSR9-600-70	1SFA896105R7000	0.45	0.99
3	5.5	5.5	12	3	3	7.5	10	11	PSR12-600-70	1SFA896106R7000	0.45	0.99
4	7.5	7.5	16	3	5	10	10	15.2	PSR16-600-70	1SFA896107R7000	0.45	0.99
5.5	11	15	25	7.5	7.5	15	20	24.2	PSR25-600-70	1SFA896108R7000	0.65	1.43
7.5	15	18.5	30	7.5	10	20	25	28	PSR30-600-70	1SFA896109R7000	0.65	1.43
7.5	18.5	22	37	10	10	25	30	34	PSR37-600-70	1SFA896110R7000	1.00	2.20
11	22	30	45	15	15	30	40	46.2	PSR45-600-70	1SFA896111R7000	1.00	2.20
15	30	37	60	20	20	40	50	59.4	PSR60-600-70	1SFA896112R7000	2.20	4.85
22	37	45	72	20	25	50	60	68	PSR72-600-70	1SFA896113R7000	2.27	5.00
22	45	55	85	25	30	60	75	80	PSR85-600-70	1SFA896114R7000	2.27	5.00
30	55	55	105	30	40	75	100	104	PSR105-600-70	1SFA896115R7000	2.27	5.00

Rated operational voltage U_e , 208...600 V AC, Rated control supply voltage, U_s , 24 V AC/DC, 50/60 Hz

IEC Rated operational power				UL/CSA Rated operational power								
230 V	400 V	500 V	current	200/208 V	220/240 V	440/480 V	550/600 V	current				
P_e	P_e	P_e	I_e	P_e	P_e	P_e	P_e	FLA	Type	Order code	Weight	
kW	kW	kW	A	hp	hp	hp	hp	A			kg	lb
0.75	1.5	2.2	3.9	0.5	0.75	2	2	3.4	PSR3-600-11	1SFA896103R1100	0.45	0.99
1.5	3	4	6.8	1	1.5	3	5	6.1	PSR6-600-11	1SFA896104R1100	0.45	0.99
2.2	4	4	9	2	2	5	7.5	9	PSR9-600-11	1SFA896105R1100	0.45	0.99
3	5.5	5.5	12	3	3	7.5	10	11	PSR12-600-11	1SFA896106R1100	0.45	0.99
4	7.5	7.5	16	3	5	10	10	15.2	PSR16-600-11	1SFA896107R1100	0.45	0.99
5.5	11	15	25	7.5	7.5	15	20	24.2	PSR25-600-11	1SFA896108R1100	0.65	1.43
7.5	15	18.5	30	7.5	10	20	25	28	PSR30-600-11	1SFA896109R1100	0.65	1.43
7.5	18.5	22	37	10	10	25	30	34	PSR37-600-11	1SFA896110R1100	1.00	2.20
11	22	30	45	15	15	30	40	46.2	PSR45-600-11	1SFA896111R1100	1.00	2.20
15	30	37	60	20	20	40	50	59.4	PSR60-600-11	1SFA896112R1100	2.20	4.85
22	37	45	72	20	25	50	60	68	PSR72-600-11	1SFA896113R1100	2.27	5.00
22	45	55	85	25	30	60	75	80	PSR85-600-11	1SFA896114R1100	2.27	5.00
30	55	55	105	30	40	75	100	104	PSR105-600-11	1SFA896115R1100	2.27	5.00

PSR - The compact range

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



07 Fieldbus plug
adapter

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 mm² 1 x 10...50 mm², 2 x 10...25 mm²

Fieldbus plug adapter with cable

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

PSR - The compact range

Technical data

Softstarter types	PSR3	PSR6	PSR9	PSR12	PSR16	PSR25	PSR30	PSR37	PSR45	PSR60	PSR72	PSR85	PSR105
Max. Power loss at rated I _e	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

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 AC/DC, +10%/-15%
Starting capacity at I _e	4 x I _e for 6 sec.
Maximum altitude	4000 m (13123 ft) ³⁾
Number of starts per hour	
standard	10 ¹⁾
with aux. fan	20 ¹⁾
Ambient temperature	
during operation	-25...+60 °C (-13...+140 F) ²⁾
during storage	-40...+70 °C (-40...+158 F)
Degree of protection	
main circuit	PSR3 - PSR30: IP20 PSR37 - PSR105: IP10
control circuit	PSR3 - PSR30: IP20
Power consumption:	
at 100...240 V AC	PSR3 - PSR30: 12 VA PSR37 - PSR105: 10 VA
at 24 V AC/DC	PSR3 - PSR30: 5 W PSR37 - PSR105: 10 VA
Signal relays for run signal: PSR3.. 105	
Resistive load	3 A
AC-15 (contactor)	0.5 A
Signal relays for top of ramp signal: PSR25... 105	
Resistive load	3 A
AC-15 (contactor)	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. 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 0.8% per °C (0.44% 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.

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

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

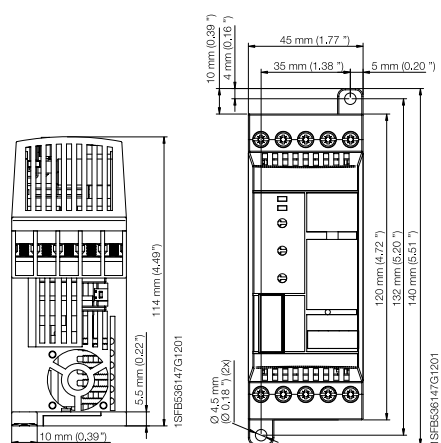
Number of starts per hour using PSR softstarters								
Motor current	Starts/hour with auxiliary fan							
I _e	10	20	30	40	50	60	80	100
3 A	PSR3	PSR3	PSR3	PSR3	PSR3	PSR3	PSR3	PSR3
6 A	PSR6	PSR6	PSR6	PSR6	PSR6	PSR6	PSR6	PSR9
9 A	PSR9	PSR9	PSR9	PSR9	PSR9	PSR12	PSR12	PSR12
12 A	PSR12	PSR12	PSR12	PSR12	PSR12	PSR16	PSR25	PSR25
16 A	PSR16	PSR16	PSR25	PSR25	PSR25	PSR25	PSR30	PSR30
25 A	PSR25	PSR2	PSR30	PSR37	PSR37	PSR37	PSR37	PSR45
30 A	PSR30	PSR30	PSR37	PSR37	PSR45	PSR45	PSR45	PSR45
37 A	PSR37	PSR37	PSR45	PSR45	PSR45	PSR45	PSR60	PSR60
45 A	PSR45	PSR45	PSR45	PSR60	PSR60	PSR60	PSR72	PSR72
60 A	PSR60	PSR60	PSR60	PSR72	PSR72	PSR85	PSR105	-
72 A	PSR72	PSR72	PSR72	PSR85	PSR105	PSR105	-	-
85 A	PSR85	PSR85	PSR105	PSR105	-	-	-	-
105 A	PSR105	PSR105	-	-	-	-	-	-

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

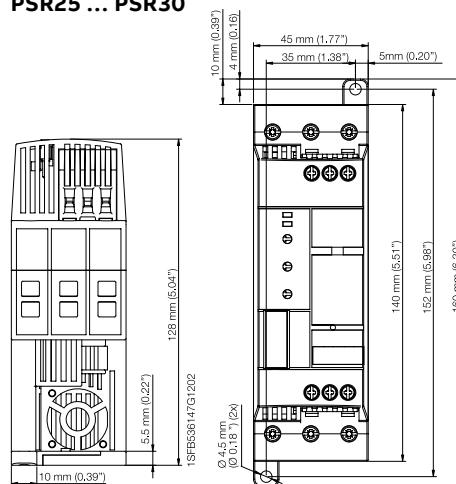
PSR - The compact range

Main dimensions

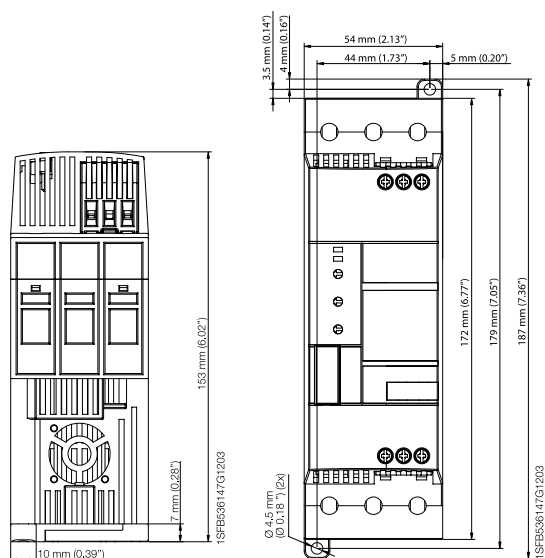
PSR3 ... PSR16



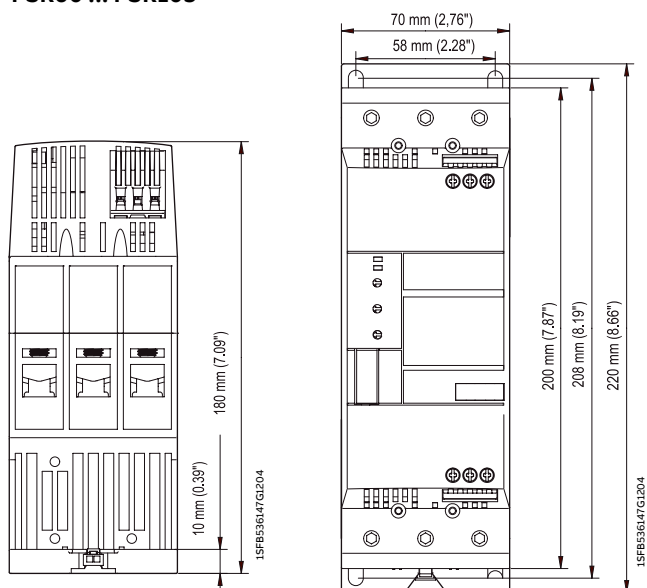
PSR25 ... PSR30



PSR37 ... PSR45



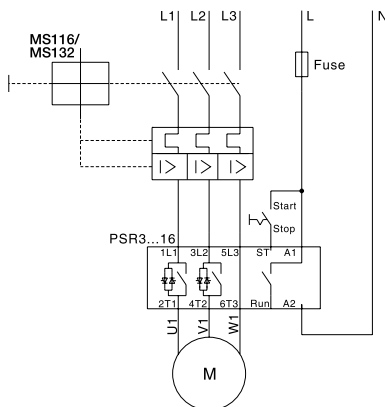
PSR60 ... PSR105



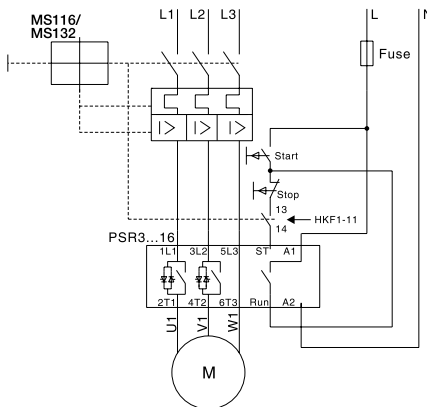
PSR - The compact range

Circuit diagrams

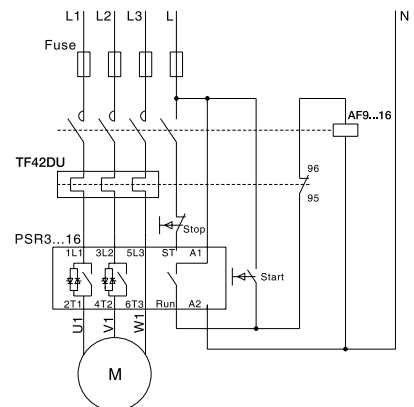
PSR3 ... PSR16 With MMS



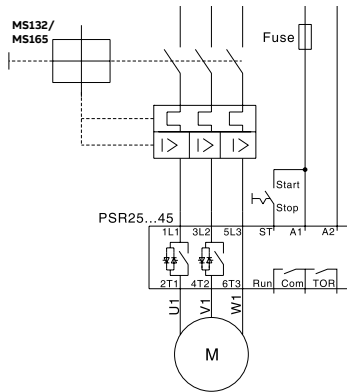
With MMS and auxiliary contact



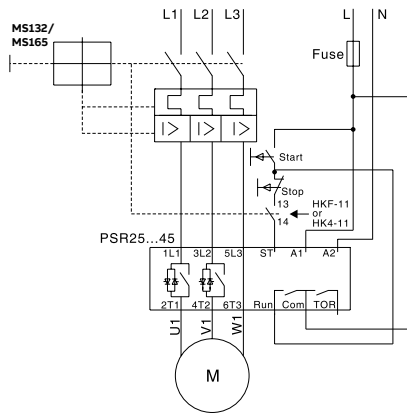
With fuses, contactor and O.L.



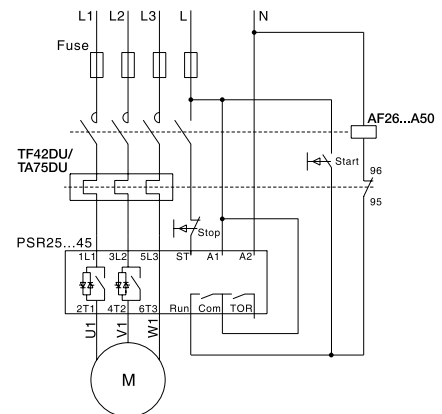
PSR25 ... PSR45 With MMS



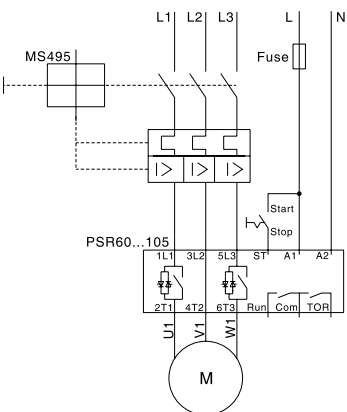
With MMS and auxiliary contact



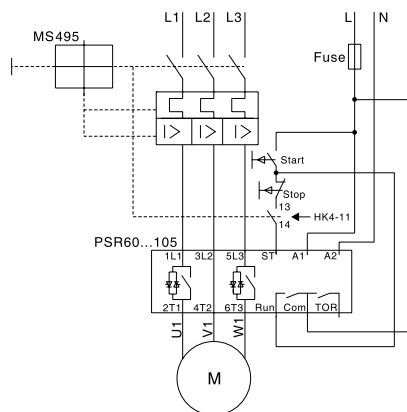
With fuses, contactor and O.L.



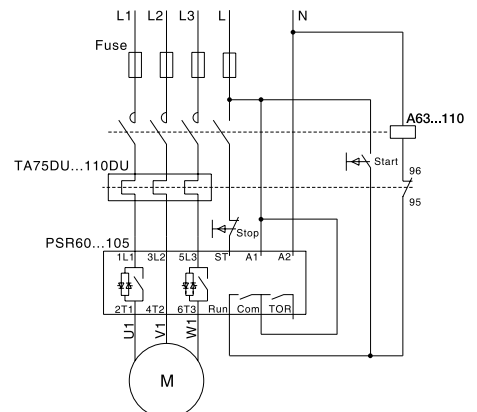
PSR60 ... PSR105 With MMS



With MMS and auxiliary contact



With fuses, contactor and O.L.



Marketing materials and tools

It is easy to access more information about ABB softstarters online. On our web page you will find tools for selection, coordination tables, CAD drawings and different types of documentation.



**Selection
tools**

Advanced selection tool: prosoft

Download here

[> LINK](#)

Online softstarter selection tool

Fast and easy selection of softstarter on any device

[> LINK](#)



**Webpages
External**

Softstarter main page

[> LINK](#)

PSR - The compact range

[> LINK](#)

PSE - The efficient range

[> LINK](#)

PSTX - The advanced range

[> LINK](#)



**Coordination &
SoftstarterCare**

Coordination tables

Online tool for coordination with short circuit protection, overload protection and line contactor.

[> LINK](#)



SoftstarterCare™

Service Engineer Tool

Software for easy set-up of PSE and PSTX, using a PC.

[> LINK](#)





Marketing materials

How to order printed materials
You can easily order marketing materials via Hansaprit.

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Drawing & Pictures

Download 2D and 3D drawings in any format

Use our Cadenas portal to download CAD drawings to all our Softstarters.

> [LINK](#)



Demo units

Demo units
Demonstration unit without power electronics, contains pushbuttons for demonstrations and short form manual



Type	Order code	Weight (1 pce) kg
PSR - softstarters and accessories	1SFA896599R1001	0.01
PSE105	1SFA897109R7008	2.40
PSTX105	1SFA898109R7008	2.95

Services to match your needs

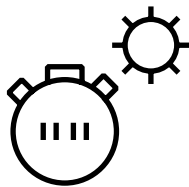
Your service needs depend on your operation, life cycle of your equipment and business priorities. We have identified our customers four most common needs and defined service options to satisfy them. What is your choice to keep your drives at peak performance?

Is uptime your priority?

Keep your drives and softstarters running with precisely planned and executed maintenance.

Example services include:

- Installation and Commissioning
- Spare Parts
- Preventive Maintenance
- ABB Drive and softstarter Care agreement
- Drive and softstarter Exchange



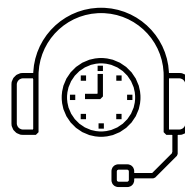
Operational efficiency

Is rapid response a key consideration?

If your drives and softstarters require immediate action, our global network is at your service.

Example services include:

- Technical Support
- On-site Repair
- Response time agreements
- Training



Rapid response

Drives and softstarters service

Your choice, your future

The future of your drives and softstarters depends on the service you choose.

Whatever you choose, it should be a well-informed decision. No guesswork. We have the expertise and experience to help you find and implement the right service for your drive equipment. You can start by asking yourself these two critical questions:

- Why should my drive and softstarter be serviced?
- What would my optimal service options be?

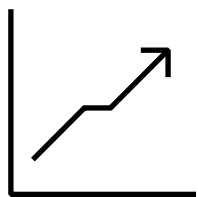
From here, you have our guidance and full support along the course you take, throughout the entire lifetime of your drives.

Need to extend your assets' lifetime?

Maximize your drive's lifetime with our services.

Example services include:

- Upgrades, Retrofits and Modernization
- Replacement, Disposal and Recycling



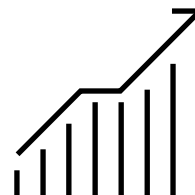
Life cycle management

Is performance most critical to your operation?

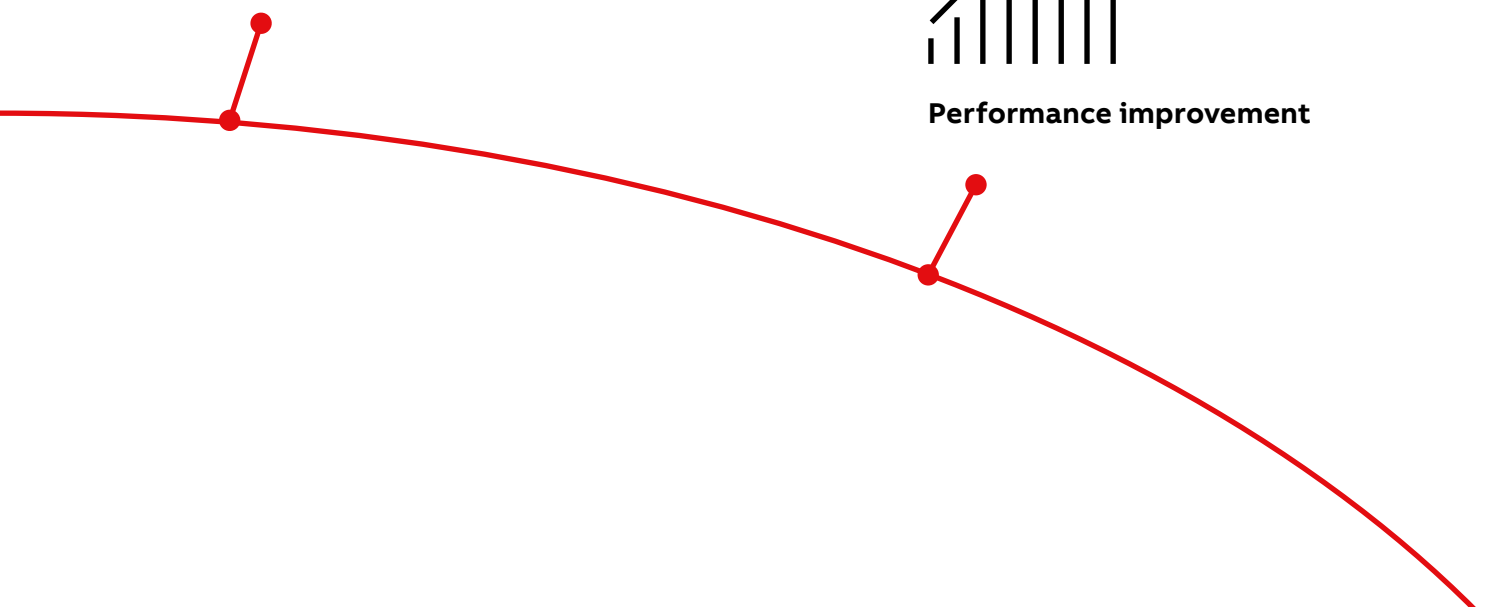
Get optimal performance out of your machinery and systems.

Example services include:

- Consulting
- Inspection and Diagnostics
- Upgrades, Retrofits and Modernization
- Workshop Repair
- Tailored services



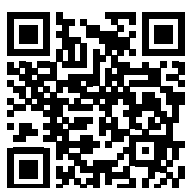
Performance improvement



Authorised Value Provider



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For more information, please contact
your local ABB representative or visit
<https://new.abb.com/drives/softstarters>



To get more information,
install QR code reader on
your mobile device, scan the
code and see more.