

## **Specification Single-Phase-Regulator SPR**

Regulator for speedcontrol of a single-phase motor capacitor

for  
Ventilation applications

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## **1. Safety and application instructions for the SPR**

### **1.1 Danger:**

As long as the SPR and any machinery is switched on, the operator may touch voltage leading and non-isolated conductors or rotating parts when he removes the covers and the prescribed protections, in handling the machine improperly, or during service work or improper use, and may well cause personal injuries and material damage.

All works with transport, installation and commissioning as well as maintenance have to be done by properly trained personnel.

Qualified personnel in terms of these basic security considerations are persons that are used to installation, assembly, commissioning and operation of the product and that have qualifications according to their work.

### **1.2. Intended Usage**

The SPR is used as a component for installation in machines that are used in commercial plants.

The commissioning of the SPR is prohibited until it is ascertained that the machine that includes the SPR follows the restrictions of the EU directive 89/ 392/ EC (machine directive).

The technical data and information to connection conditions are to be found at the rating plate or the documentation and have to be completely fulfilled.

### **1.3. Transport and Storage**

The considerations for transport, storage and the appropriate handling must be regarded.

Damages recognized after delivery must be immediately announced to the transport company. If applicable, notify the distributor before commissioning.

### **1.4. Installation**

Installation and cooling of the devices must be according to the specifications of the concerning documentation.

The SPR must be secured from improper operational demands. Take care to not bend electronic devices and/or change isolation distances. Avoid touching electronic elements and contacts.

The SPR contains electrostatic imperiled elements. Improper handling may easily destroy these elements. Inbuilt electrical components must not be destroyed (health risk in certain circumstances).

### 1.5. Electrical connection

At working at devices with supplied power regard the valid national accident prevention regulations (e.g. VGB 4).

The electrical installation has to be done according to the valid directives (e.g. cable diameters, fuse protection, ground wire connection). More detailed information is to be found in the documentation.

### 1.6. Operation

Plants that contain the SPR have to be provided, if applicable, with additional observation and security installations according to the concerning valid security directives, e.g. act on technical work equipment, accident prevention regulations etc. The documentation of the manufacturer has to be regarded.

After disconnection of the SPR from the supply voltage, voltage conducting device parts and cable conductors must not be immediately touched because of possibly charged condensers. Please regard the according notification signs at the SPR. During operation all covers must kept closed.

### 1.7. Maintenance and servicing

The documentation of the manufacturer has to be regarded.

### 1.8. Safety and Installation considerations

The SPR from MSF-Technik are operating resources for the deployment in industrial high-voltage plants and are operated with voltages that may cause heavy injuries or death when touching!

- Installations and works may only be executed by qualified electrical trained personnel and at voltage free device. The user manual has to be available at any time and has to be consequently regarded.
- The local directives for building electrical plants and accident prevention regulations must be fulfilled.
- The device is after disconnecting from the voltage conducted with dangerous voltage. Due to this, opening of the device or removing the cover is only permitted after disconnecting the device from voltage. Before turning the mains voltage on all covers must be mounted again.
- Also at motor standstill (e.g. due to electronics lock, short circuit at the out put clamps or blocked drive) the voltage circuit clamps and motor clamps may conduct dangerous voltage. A motor standstill is not identical with a galvanic disconnection from the mains voltage.
- **Attention:** The SPR may, depending on the settings, start automatically after powering the mains voltage.
- At rotating current SPR common FI circuit breakers as single protection are not applicable when the local directives do not allow a possible direct current component in the error current. The standard FI circuit breakers have to fulfill the new construction type acc. VDE 0664.

### Attention

- Children and the public must not have access to the device!
- The device may only be used for the purpose intended by the manufacturer. Unauthorized changes and the use of replacement parts and additional devices that are not sold or approved by the manufacturer may cause fire, electric shocks and injuries.
- Keep the manual in reach and make it available for every user!

### European EMC directive

If the SPR installed according to the recommendations of this manual it fulfills the requirements of the EMC directive according to the EMC product norm for motor driven systems EN 61800-3.

## 2. Assembly and Installation

### 2.1. Installation

The devices require adequate ventilation. Here are recommended values above and below the frequency inverter valid (above >100mm, below >120mm). Electrical parts (e.g. cable trench, contactor etc.) may be built within these limits. These objects recommend a minimum distance from the SPR depending on the height. This minimum distance is 2/3 of the object height. (Example: cable trench height 60mm →  $\frac{2}{3} * 60\text{mm} = 40\text{mm}$  distance). The build-in direction of the SPR is principally vertical.

The hot air has to be dissipated above the SPR!

### 2.2 Measures to secure the EMC

The following measures are to secure the EMC, which are of absolute necessity to the SPR technology. The device fulfills the demands of the high noise immunity and the slight-noise emissions for the usage in industry, under the guidelines of this manual's installation considerations.

### 2.3 Grounding, earthing, potential compensation

The correct professional grounding or earthing guarantees the protection of the staff against dangerous touch voltages (input, output and intermediate circuit voltage). Parasitic current inductance and low-impedance potential compensation are important measures to reduce electromagnetic influences.

## 3. Technical Features

The SPR is a control device for the speed control of single phase capacitor motors with modular construction. The max. output power of the control device is from 0,09KW to 1,5 KW.

Modular changes can be made according to the customer, so that the SPR satisfies every customer.

Optional the SPR is available with customised adjustments as well as pre-assembled mains- and motorcable

Furthermore, different controls (Emergency-Stop-Switch, Low-voltage-switch) can be integrated in the housing cover.

### **3.1 Special features**

**The practical design offers the following advantages:**

- Motor temperature control (PTC und Bimetall)
- Device temperature control
- Short-circuit-and overcurrent control
- Low voltage control
- Integrated potentiometer or stepp switch as well as mains switch
- Protection class IP 44 to IP 54
- Direct assembly machiney and plants

#### **3.1.1 Motor temperature control**

The SPR has an input at which the built in PTC-thermistor or Bi-Metall-switch can be connected.

After reaching the specific motor temperature the SPR switches the motor automatically off. After cooling the temperaturecontrol of the motor, the SPR does not start the motor automatically. The SPR contains an automatic restart inhibit after cooling down the thermostat. To start the motor, the user has to turn off the SPR at the power switch. The SPR can than be switched on after a short while.

#### **3.1.2 Device temperature control**

The SPR protects itself through a integrated temperature monitor control, against overtemperature. The temperature inside the device is measured. The SPR switches automatically off, if the temperature exceeds the fixed value from the manufacturer. After that the SPR should be turned off using the power switch. The user can re-activate the SPR with the power switch after the SPR has cooled down

#### **3.1.3 Short circuit and Overcurrent control**

The SPR is not destroyed in the case of a short circuit.

A short circuit in the motor output does not cause destruction of the motor output of the device. The SPR switches itself in case of a motor- cable- short- circuit automatically off. If there is an overcurrent due to blockage, the SPS also shuts the motor off after some time. This feature can u.U. be carried out parallel to the thermal motor control.

### **3.1.4 Integrated potentiometer or step switch as well as mains switch**

In the housing concept of the SPR can, thanks to it's flexibel designed aluminium housing etc. a linear potentiometer be integrated.

Depending on the application desired, a multi-stage switch as each fixed setpoint is integrable.

The SPR can be disconnectd using the integrated lit mainsswitch from the mains. Alternatively, and depending on the application request an inspection switch(red/yellow) can be integrated.

### **3.1.5 Protection class and direct mounting**

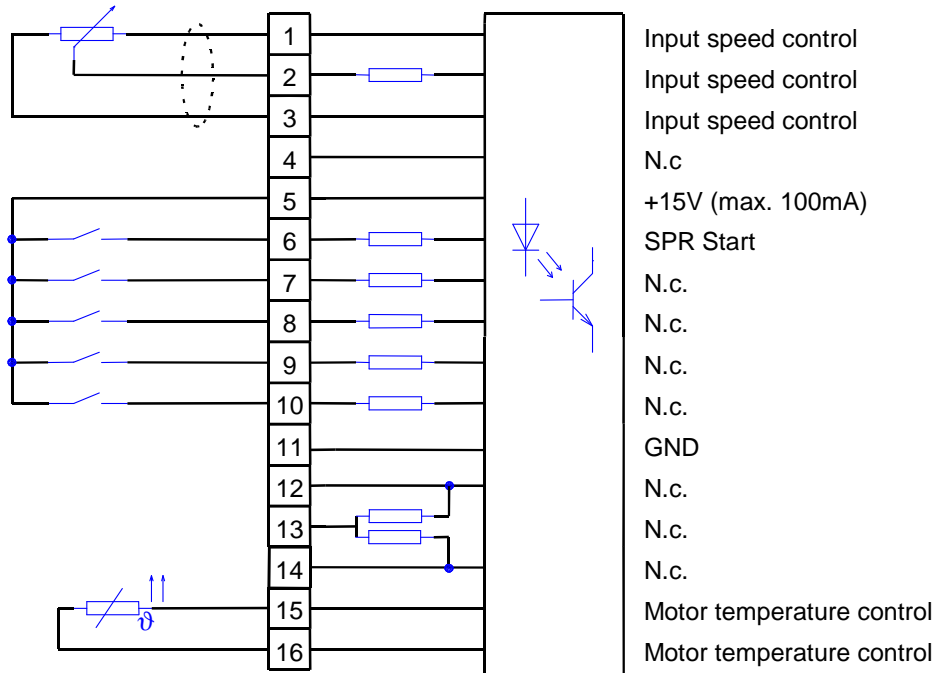
Thank's to the high protection class the SPR can be mounted directly in every plant and machine.

Without additional housing the SPR is designed for dircet mounting to the application. Its high protection class of IP44 to IP 54 (IP65 on request) protects the electronic from moisture and other debris.

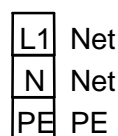
All seals are affixed one sided to the housing components. This helps prevent slipping or loss of the rubber seal when assembling.

## 4 Terminal connection

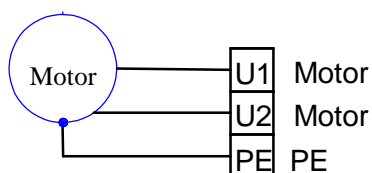
### 4.1 Controller



### 4.2 Mains connection



### 4.3 Motor connection





## 5. Technical Data

Type	SPR 090	SPR 120	SPR 180	SPR 250	SPR 370
Max. Motorpower	0,09 kW	0,12 kW	0,18 kW	0,25 kW	0,37 kW
Output current	1,1 A	1,3 A	1,48A	2,02 A	2,95 A
Max. Output-voltage	230V	230V	230V	230V	230V
Input voltage	230V ±10 %	230 V ±10 %	230 V ± 10 %	230 V ± 10 %	230 V ± 10 %
Mainsfilter	Internal	Internal	Internal	Internal	Internal
Mainsfrequency	50/60 Hz	50/60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Fusing (no Motorprotection)	6 A T	6 A T	6 A T	6 A T	6 A T
Protection class	IP 54	IP 54	IP 54	IP 54	IP 54
Ambient-temperature	0 – 40 °C	0 – 40 °C	0 – 40 °C	0 – 40 °C	0 – 40 °C
Ambient humidity	20 – 90 % rel. Not dewing	20 – 90 % rel. Not dewing	20 – 90 % rel. Not dewing	20 – 90 % rel. Not dewing	20 – 90 % rel. Not dewing

Type	SPR 550	SPR 750	SPR 1100	SPR 1500
Max. Motorpower	0,55 kW	0,75 kW	1,1 kW	1,5 kW
Output current	4,25 A	5,45 A	7,45 A	9,83 A
Max. Output-voltage	230V	230V	230V	230V
Input voltage	230 V ± 10 %	230 V ± 10 %	230V ±10 %	230 V ±10 %
Mainsfilter	Internal	Internal	Internal	Internal
Mainsfrequency	50 / 60 Hz	50 / 60 Hz	50/60 Hz	50/60 Hz
Fusing (no Motorprotection)	8 A T	8 A T	10 A T	12 A T
Protection class	IP 54	IP 54	IP 54	IP 54
Ambient-temperature	0 – 40 °C	0 – 40 °C	0 – 40 °C	0 – 40 °C
Ambient humidity	20 – 90 % rel. Not dewing	20 – 90 % rel. Not dewing	20 – 90 % rel. Not dewing	20 – 90 % rel. Not dewing