



Control unit SG-RS 204



EN | Operating instructions

Version 3.1

1001414

SG-RS 204

AC/DC 24 V

Original instructions

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Safety first!



- Read the manual carefully before use.
- Warning signs in the manual warn of unexpected dangers. Always observe warning signs.
- Retain the manual throughout the service life of the product.
- Pass the manual on to every subsequent owner or user of the product.
- Insert every supplement received from the manufacturer into the manual.
- **Observe chapter on Safety starting on page 5.**

Conformity



The design type of the product complies with the basic requirements of the following directives:

- 2006/42/EC (Safety of Machinery)
- 2011/65/EU (RoHS)
- 2014/30/EU (EMC)

The Declaration of Conformity is available in the download section of the website:
www.mayser.com/en/downloads

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About this manual

This manual is an integral part of the product.

Mayser will assume no liability and provide no guarantee whatsoever for damages and consequential damages resulting from failure to comply with the manual.

Validity

This manual is valid only for the product specified on the title page.

Target group

This manual is intended for the owner and electricians. The electrician must be familiar with the installation and commissioning.




Other applicable documents

- ➔ Also observe the following documents:
- Drawing of the sensor system (optional)
 - Wiring diagram (optional)
 - Installation instructions of the sensors used

Symbols used

Symbol	Meaning
➔ ...	Action with one or more steps whose order is not relevant.
1. ...	Action with several steps whose order is relevant.
• ... - ...	Bullets first level Bullets second level
(see Section <i>Installation</i>)	Cross-reference

Danger symbols and information

Symbol	Meaning
 DANGER	Immediate danger leading to death or serious injury.
 WARNING	Imminent danger which may lead to death or serious injury.
 CAUTION	Possible danger which may lead to minor or moderate injuries.
NOTE	Potential danger of property damage or environmental degradation. Information on easier and safer working practices.

Dimensions in drawings

Unless otherwise indicated, all dimensions are stated in millimetres (mm).

Safety

Intended use

The control unit is designed for signal processing of a pressure-sensitive protective device. It evaluates the output signals of sensors with monitoring resistor 1k Ω . The integrated output signal switching device (OSSD) transmits the evaluated safety signals directly to the downstream control.

The product complies with ISO 13849-1:2015 Category 1 PL c. So that the safety classification is retained, the downstream control must be of the same or a higher category.

Safety instructions

For your **own safety** the following safety instructions apply.

➔ Prevent electric shock

When working on electrical systems, always disconnect them from the power supply and secure them against being switched on again, to prevent injuries from electric shock.

➔ Ensure careful configuration of interface

The quality and reliability of the interface between the safety device and the machine affects the overall safety. Take special care when setting up this interface.

➔ Prevent restarting of the machine

As long as a hazard continues to exist, take measures to prevent the machine from restarting, for example by means of a startup lockout.

➔ Disable in case of error

Disable the safety device in case of malfunctions or visible damage.

➔ Do not use in ATEX zones

Do not use the Control Unit in potentially explosive environments (ATEX). The control unit is not authorised for use in these zones.

To prevent irreparable damage to the **product**, the following safety instructions apply.

➔ Do not open the control unit

Never open, tamper with or alter the control unit.

➔ Observe degree of protection

Only use the control unit in rooms with a minimum degree of protection of IP54 (e.g. switch cabinet).

→ Maintain distance

When installing in the switch cabinet, ensure sufficient distance from heat sources (at least 2 cm).

→ Check supply voltage

Check supply voltage. It must correspond with the connecting voltage U_s on the type plate.

→ Observe pin assignment

Observe pin assignment when connecting the supply voltage.

→ Do not exceed the maximum number of sensors

Do not connect more sensors on the control unit, than the number specified in the installation instructions of the sensors.

→ Protect relay contacts

Risk of welding: Protect the relay contacts externally.

→ Do not overload control unit

Ensure that the specified switching current is not exceeded.

→ Fit spark absorbers

When connecting inductive loads, fit spark absorbers (RC modules) to the consumer.

→ Do not cross link control unit

Do not cross link the control unit with other control units.
Terminals Y1 to Y4 are not potential-free.

Residual dangers

There are no known residual dangers associated with this product.

Parts supplied

1x Control unit

Enclosure with electronics module and plug-in connectors.

1x Operating instructions**1x Declaration of Conformity**

- Upon receipt of the parts supplied, check immediately for completeness and good condition.

Storage

- ➔ Store the control units in the original package, in a dry place.
- ➔ Comply with the storage temperature specified in the technical data.

Product overview

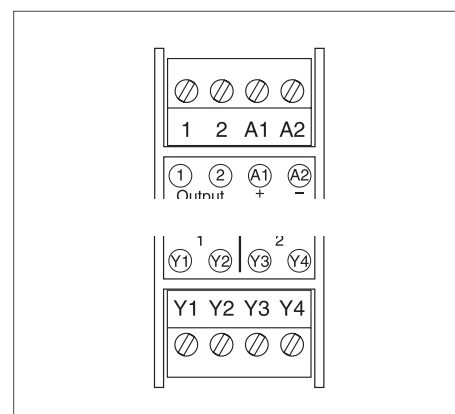
Connections

Connections:

Supply voltage
Switching channel
Sensor 1
Sensor 2

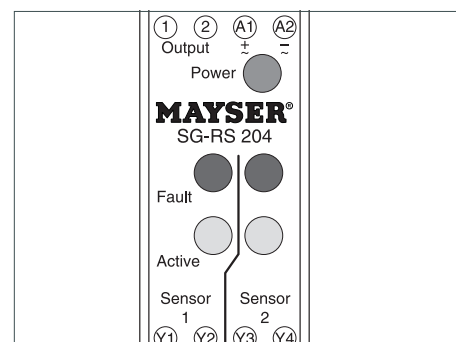
Terminals:

A1, A2
1, 2
Y1, Y2
Y3, Y4



LED indicators

- green LED „Power“:
Supply voltage connected
- red LED „Fault Sensor 1“:
Error sensor 1
- red LED „Fault Sensor 2“:
Error sensor 2
- yellow LED „Active Sensor 1“:
Sensor 1 activated
- yellow LED „Active Sensor 2“:
Sensor 2 activated



Operation

The electronic system monitors the electrical resistance of the two sensors with a defined zero signal current.

If supply voltage is applied, the green LED indicates "Power".

For sensors that are not actuated, relay K1 energizes. The yellow LEDs "Active Sensor 1" and "Active Sensor 2" as well as the red LEDs "Fault Sensor 1" and "Fault Sensor 2" do not light up; the switching channel is closed. If sensor 1 is actuated, relay K1 de-energizes. The yellow LED "Active Sensor 1" lights up; the switching channel is open. If sensor 2 is actuated, relay K1 de-energizes. The yellow LED "Active Sensor 2" lights up; the switching channel is open.

In the case of a cable break at sensor 1, relay K1 de-energizes. The red LED "Fault Sensor 1" lights up; the switching channel is open. In the case of a cable break on sensor 2, relay K1 de-energizes. The red LED "Fault Sensor 2" lights up; the switching channel is open.

Automatic reset

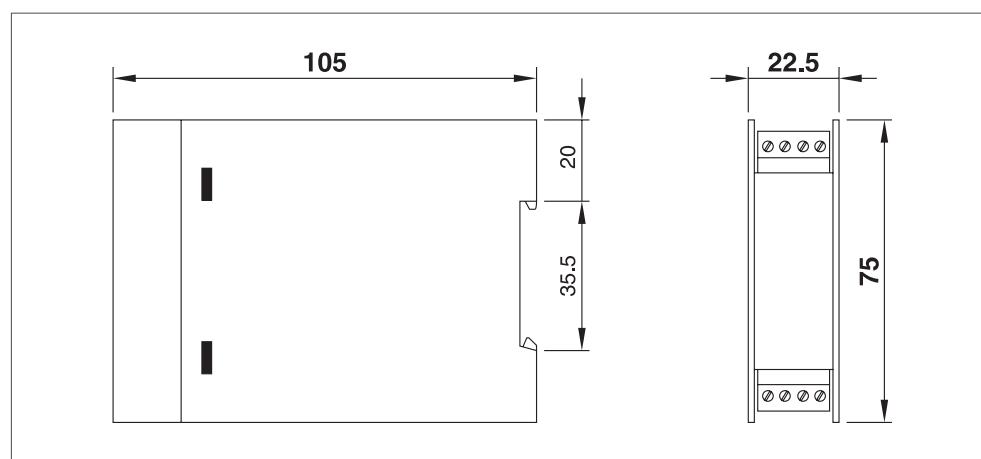
The control unit operates without a reset function. If the sensor is released after actuation, relay K1 energizes again with a delay of t_w . (see reactivation time t_w in chapter *Technical data*)

Installation

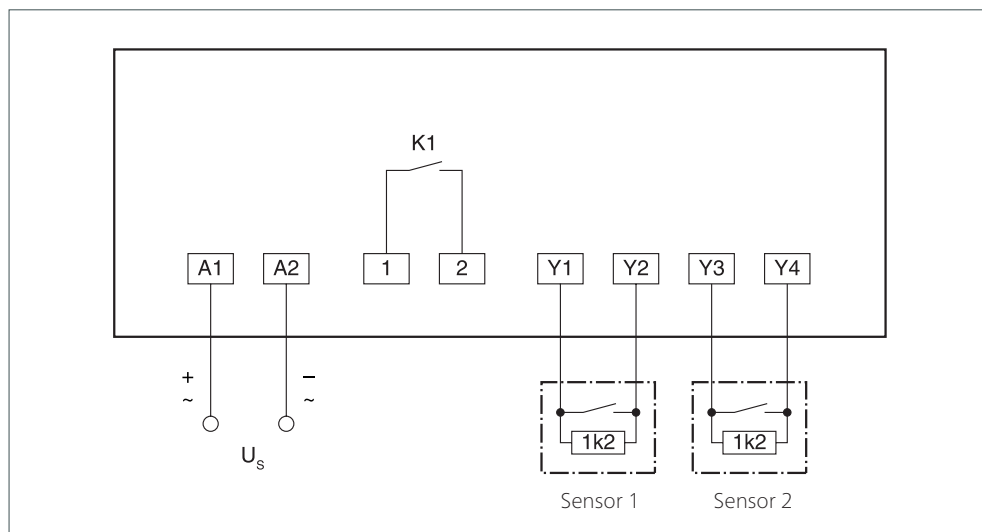
For your safety, the generally accepted safety rules also apply for assembly:

- Disconnect all devices and live parts in the immediate vicinity from the power supply.
- Ensure that all devices and live parts cannot be switched back on.
- Test to ensure that all devices and live parts are disconnected from the power supply.

1. Mount the control unit in any position on a 35 mm mounting rail type IEC 60715.



3. Wire the sensors, relay contacts and supply voltage to the cable terminals.

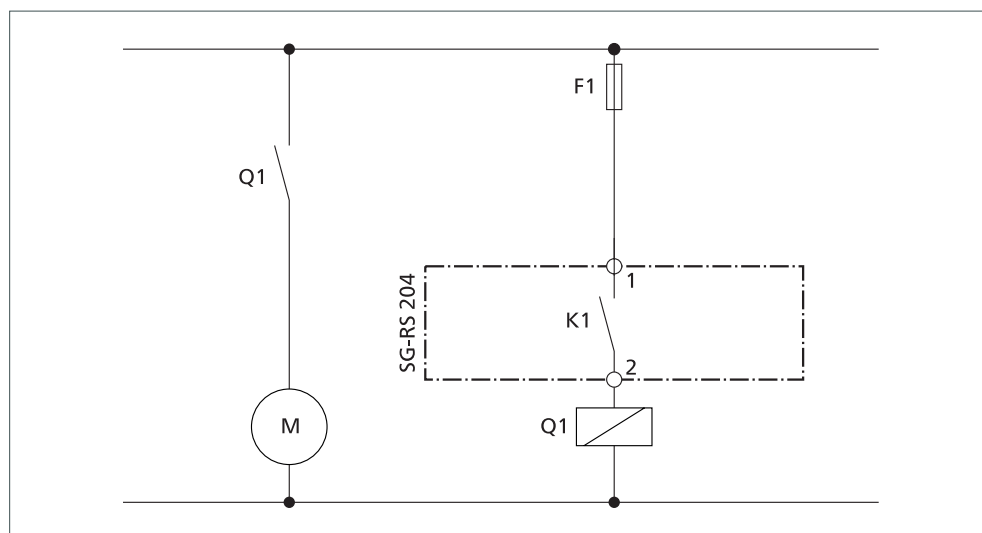


The SG-RS 204 control units can also be operated with only one monitoring circuit.

➔ In this case, bridge the monitoring circuit that is not needed with a 1k2 resistor.

Connection examples

Connection examples 1



Commissioning

1. Make sure the plug connections are firmly attached.
2. Connect the supply voltage.

⚠ WARNING: Danger of injury due to electrocution

➔ Never unplug plug connections with the power on.

Testing

1. Make sure no sensors are activated.
 - green LED „Power“ lights up
 - contact of switching channel is closed
2. Activate sensor 1.
 - yellow LED „Active Sensor 1“ lights up
 - contact of switching channel is open
3. Activate sensor 2.
 - yellow LED „Active Sensor 2“ lights up
 - contact of switching channel is open
4. Activate sensor 1 and 2.
 - yellow LEDs „Active Sensor 1“ and „Active Sensor 2“ are on
 - contact of switching channel is open
5. Disconnect sensor 1.
 - red LED „Fault Sensor 1“ lights up
 - contact of switching channel is open
6. Disconnect sensor 2.
 - red LED „Fault Sensor 2“ lights up
 - contact of switching channel is open

Pressure-sensitive protection device actuated

As long as the pressure-sensitive protection device remains actuated, the output signal switching devices of the control unit remain in the safe OFF state.

The control unit operates without a reset function. If the pressure-sensitive protection device is no longer actuated, the output signal switching device of the control unit automatically changes from the OFF state to the ON state. Without additional start interlock, the machine would start up again immediately.

Correlations

LEDs					Outputs	Meaning
Power green	Fault 1 red	Fault 2 red	Active 1 yellow	Active 2 yellow	1, 2	LED off: ○ LED on: ●
○	○	○	○	○	open	no supply voltage
●	○	○	○	○	closed	Control unit ready for operation
●	○	○	●	○	open	Sensor 1 activated
●	○	○	○	●	open	Sensor 2 activated
●	●	○	○	○	open	Fault at sensor 1 (cable break)
●	○	●	○	○	open	Fault at sensor 2 (cable break)

Decommissioning

- ➔ Switch off the pressure-sensitive protection device and safeguard it from being switched back on unintentionally.
- ➔ Affix a clear warning on the pressure-sensitive protection device warning that states it is temporarily or definitively decommissioned.

Recommissioning

- ➔ Recommission the pressure-sensitive protection device as specified in the chapter Commissioning (see chapter *Commissioning*).

Maintenance and cleaning

Maintenance

The control unit is maintenance-free.

- ➔ Repeat the operational test monthly.

Cleaning

- ➔ Clean the outside of the enclosure with a dry cloth.

Troubleshooting and remedies

Prerequisite: the control unit is connected to the supply voltage and sensor. No sensor is activated.

Fault display	Possible cause	Remedy
green LED „POWER“ does not light	No or incorrect supply voltage	1. Check supply voltage, compare with type plate 2. Check terminal connections
	If supply voltage is correctly connected: control unit is faulty.	➔ Replace control unit
yellow LED „Active Sensor 1“ lights continuously	Incorrect monitoring resistor on sensor 1	➔ Connect sensor with monitoring resistor 1k2
	If monitoring resistor is correct: sensor is faulty	➔ Replace sensor
yellow LED „Active Sensor 2“ lights continuously	Incorrect monitoring resistor on sensor 2	➔ Connect sensor with monitoring resistor 1k2
	If monitoring resistor is correct: sensor is faulty	➔ Replace sensor
red LED „Fault Sensor 1“ lights	No sensor 1 connected	➔ Connect sensor
	Incorrect monitoring resistor on sensor 1	➔ Connect sensor with monitoring resistor 1k2
	Cable break	➔ Replace sensor
red LED „Fault Sensor 2“ lights	No sensor 2 connected	➔ Connect sensor
	Incorrect monitoring resistor on sensor 2	➔ Connect sensor with monitoring resistor 1k2
	Cable break	➔ Replace sensor

The fault can still not be removed?

- ➔ Contact Mayser support: Phone +49 731 2061-0.
- ➔ In case of queries, have the information on the type plate at hand.

Type plate

A type plate for identification of the control unit is affixed on the side.

Replacement parts

⚠ CAUTION Overall safety endangered

If the sensor is not replaced with original Mayser parts, operation of the protective device may be impaired.

- ➔ Only use original parts from Mayser.

Disposal

Control unit

The devices produced by Mayser are professional electronic tools exclusively intended for commercial use (so-called B2B devices). Unlike devices mainly used in private households (B2C), they may not be disposed of at the collection centres of public sector disposal organisations (e.g. municipal recycling depots). At the end of their useful life, the devices may be returned to us for disposal.

WEEE reg. no. DE 39141253

Packaging

- Wood, cardboard, plastics

➔ Observe the following with respect to disposal:

- Comply with the relevant national disposal regulations and legal stipulations for these materials.
- If you enlist the services of a disposal company, the company will need the aforementioned list of materials.
- Materials should be recycled or disposed of in an eco-friendly manner.

Technical data

SG-RS 204		AC/DC 24 V	
Testing basis		EN 12978, ISO 13849-1, ISO 13856-1, ISO 13856-2, ISO 13856-3	
Supply voltage U _s			
Nominal voltage		AC/DC 24 V	
Voltage tolerance		21 to 26 V / 18 to 32 V	
Nominal current		156 mA / 46 mA	
Nominal frequency		50 Hz / –	
External protection		250 mA T	
Power consumption		< 4 VA / < 2 W	
Times			
Reaction time t _a		< 15 ms	
Re-start time t _w		< 20 ms	
Safety classifications			
ISO 13856: Reset function		without	
ISO 13849-1:2015		Category 1 PL c	
MTTF _D		155 a	
DC _{avg}		-	
B _{10D} (Load: DC 24 V / 2 A)		1× 10 ⁶	
n _{op} (Estimate)		52560/a	
CCF		-	
IEC 60664-1: Creep distance and air gap		soiling degree 2, overvoltage category III / 125 V, basic insulation	
Inputs			
Sensor		Y1, Y2 and Y3, Y4	
Short-circuit resistance		≤ 400 Ohm	
Line resistance		≤ 100 Ohm	
Line length (max.)		100 m	
Switching thresholds			
Sensor activated		< 460 Ohm	
Cable break		> 2k1 Ohm	
Outputs			
Switching channel (NO contact)		1, 2	
Switching voltage (max.)		AC 125 V	DC 24 V
Switching current (max.)		2 A	2 A
Switching current (min.)		10 mA	10 mA
Switching capacity (max.)		250 VA	48 W
Switching operations, mechanical		> 1× 10 ⁷	
Switching operations, electrical		> 1× 10 ⁵ (AC 125 V / 12 A)	
Contact fuse protection external		2 A quick-acting	
Mechanical operating conditions			
Cable terminals			
solid wire		1× 2.5 mm ² or 2× 1 mm ²	
strand without sheath		1× 2.5 mm ² or 2× 1.5 mm ²	
strand with sheath		1× 2.5 mm ²	
IEC 60529: Degree of protection		IP20	
max. humidity (23 °C)		95 %	
Operating temperature		-25 °C to +60 °C	
Storage temperature		-25 °C to +60 °C	
Impact resistance in operation		2.5 g	
Impact resistance transport		10 g	
Dimensions (W × H × D)		22.5 × 75 × 105 mm	
Weight		100 g	