



Operating and assembly instructions

UO-SGS-R Safety certified speed switches
UO-SRC-R Safety certified position switches

U-ONE[®]-SAFETY-LWL

Universal encoder system – Generation II

Read this operating and assembly manual before completing assembly, starting installation, or completing other work.
Store the manual for future use.

Manufacturer / Publisher

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Further current information on this product series can be found online in our Service Point.

Simply scan the QR Code and open the link in your browser.



These instructions and the enclosed declaration of conformity can also be accessed via our Service Point. For this purpose, the QR code on the type plate of the corresponding device must be scanned.

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Change reservation

The manual has been drawn up with the utmost care and attention. Nevertheless, we cannot exclude the possibility of errors in form and content.

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1 General information

1.1 Information on the Operating and assembly manual

This operating and assembly manual provides important information on handling the UO-SGS-R and UO-SRC-R electronic function modules. It must be read carefully before starting all work and complied with. The electronic function modules UO-SGS-R and UO-SRC-R are referred to as SRC-R/SGS/R in the following documentation.





Furthermore, the local accident prevention regulations and general safety regulations applicable for the area where the device will be used must be observed.

1.2 Scope of delivery

The scope of delivery for the function module includes the declaration of conformity and the operating and assembly manual and the software & support CD.

1.3 Explanation of symbols

Warning information is designated using symbols. Information is proceeded by signal words which express the extent of the danger involved. Always comply with these notices, and use caution to avoid accidents, personal injury and property damage.

	<p>WARNING! Indicates a potentially hazardous situation that could lead to death or severe injury if it is not avoided.</p>
	<p>CAUTION! Indicates a potentially hazardous situation that could lead to minor or slight injuries if it is not avoided.</p>
	<p>CAUTION! Indicates a potentially hazardous situation that could lead to property damage if it is not avoided.</p>
	<p>NOTE! Emphasises useful tips and recommendations, and provides information useful for efficient, smooth operation.</p>

1.4 Warranty and liability


Only the “General Terms and Conditions” of Johannes Hübner Fabrik elektrischer Maschinen GmbH apply. These will be provided to the operator at the latest when the order is confirmed or when the contract is concluded. All warranty and liability claims for personal injury and property damage are excluded, and the operator's operating permit will be null and void if one or more of the following apply:

- Failure to observe the operating and configuration manual.
- Improper use of the function module.
- Improper assembly, installation, commissioning and programming of the function module.
- Operating the function module despite technical defects.
- Independently carrying out mechanical or electrical modifications to function modules.
- Independently carrying out repairs.
- Catastrophes due to external interference or force majeure.
- Use of non-qualified personnel.
- Opening the function module.

1.5 Organisational measures

- The operating and assembly manual must always be stored easily within reach in the area where the function module is used.
- In addition to the operating and assembly manual, general statutory and other binding regulations on accident prevention and environmental protection must be observed. Operators must be trained on these regulations.
- Applicable national, local, and system-specific provisions and requirements must be observed.
- The operator is obligated to inform personnel of special operating considerations and requirements.
- The type plate and any prohibitions or notice signs adhered to the function modules must always be legible.
- Repairs may only be carried out by the manufacturer, or by an agency or individual authorised by the manufacturer.

1.6 Copyright protection

	<p>NOTE!</p> <p>Content information, texts, drawings, images, and other illustrations are copyright protected and subject to industrial property rights. Copying of any kind not associated with use of the function module is prohibited without a written declaration from the manufacturer. Violations will result in claims for damages.</p>
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1.7 Warranty provisions

Warranty provisions are outlined in the manufacturer's General Delivery Conditions.

1.8 Customer service

Contact persons are available by phone, fax, or e-mail for technical questions. See the manufacturer's address on page 2.

2 Basic safety information

	<p>CAUTION!</p> <p>This section provides an overview of all significant safety aspects necessary to protect personnel and ensure safe, fault-free operation of the function module. Failure to observe this information may result in significant danger.</p>
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2.1 Responsibility of the operator

The function modules are used in a commercial capacity. The operator of the function modules, therefore, is subject to statutory occupational safety requirements and the safety, accident prevention and environmental regulations applicable to the areas in which the function modules are used.

2.2 Selecting and qualifying personnel; basic obligations

- All work on function modules may be carried out only by qualified personnel. Qualified personnel are personnel with the training, experience, and instruction, as well as expertise on relevant standards, specifications, accident prevention regulations and operating circumstances necessary to carry out the required work, and who have been authorised to do so by the persons responsible for the safety of the system. They are able to identify and avoid potential hazards.
- In addition, please see standards VDE 0105-100 and IEC 60364 for the definition of “qualified personnel” (reference, e.g. Beuth Verlag GmbH, VDE-Verlag GmbH)
- Responsibilities for assembly, installation, commissioning and operation must be clearly defined. Personnel who are receiving instruction or training must be supervised.

2.3 Proper use

The SRC-R/SGS-R can be used in conjunction with an UO-SCU for


- safe, position-dependent switching of potential-free relay contacts (UO-SRC-R),
- safe, speed-dependent switching of potential-free relay contacts (UO-SGS-R),
- safe, error-dependent switching of potential-free relay contacts (UO-SRC-R / UO-SGS-R).

The system manufacturer must review whether the properties of the function module fulfil the safety requirements in its specific application. The system manufacturer is responsible for use of the function module and for deciding whether to use the module. Function modules are designed for unsupervised, continuous operation.



Proper use also includes:


- observing all information in this operating and assembly manual,
- observing type plates and any prohibition or information signs,
- observing the operating manual of the machine or system manufacturer,
- operating the function module within the limits stipulated in the technical data,
- not engaging in improper use.

2.4 Improper use

	<p>WARNING!</p> <p>Danger of death, physical injury and property damage due to improper use of the function module!</p> <p>In particular, the following uses are prohibited:</p> <ul style="list-style-type: none"> • Use in environments with an explosive atmosphere, • Use in environments with radioactive radiation, • Use for medical purposes.
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2.5 Safety information



 	<p>WARNING! CAUTION!</p> <p>Destruction, damage or impact to the function of the function module.</p> <ul style="list-style-type: none"> • Only complete wiring work and only connect or disconnect electrical connections when the module is powered down. • Review any potential hazards due to interactions with other systems and devices currently installed in the surrounding area, or which are to be installed. The user is responsible for taking relevant measures. • The power supply must be secured with a fuse appropriate for the diameter of the intake line. • Cables used must be suitable for the temperature range. • Defective function modules may not be operated. • Opening function modules is prohibited. • The type plates specify the technical properties of the function modules. If a type plate is no longer legible, or if a type plate is missing entirely, the function module may not be operated. Contact Hübner service (see page 2). • This module is not intended for use in residential areas and cannot provide adequate protection for radio reception in such areas. The device is classified in Group 1 and Class A according to EN 55011 and is intended for use in an industrial environment only.
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	<p>NOTE!</p> <p>Disposal:</p> <p>If the function module needs to be disposed after its service life, applicable national regulations must be observed.</p>
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3 Assembly

3.1 Safety instructions


	<p>WARNING!</p> <ul style="list-style-type: none"> • Installation and removal may only be carried out by qualified personnel. • In general, the requirements and acceptance conditions of the overall system must be taken into account for the installation. • Equipotential bonding measures must be provided for the entire processing chain of the system. Uninterrupted, low-resistance machine earthing must be ensured across all parts of the system. Ensure that connections have good electrical contact. • When laying the cables, ensure that there are no tripping hazards.
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 	<p>WARNING! CAUTION!</p> <p>Risk of death, serious injury and/or damage to property due to overriding of the safety functions caused by an unsafe shaft drive!</p> <p>In general, the requirements and acceptance conditions of the entire system must be taken into account for the attachment.</p>
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3.2 Basic rules

	<p>NOTE!</p> <ul style="list-style-type: none"> • The supply cable of the base unit must be laid at a sufficient distance from power and high-voltage cables. • Shield the power cables between the frequency inverter and motor in accordance with the manufacturer's specifications. • Generous mounting distances must be maintained to actuators/systems with high energy density or electromagnetic emissions (e.g. contactors, relays, inverters, motors, solenoid valves, brakes). • Inductors (e.g. relays, contactors, solenoid valves, brakes) must be wired with interference suppressors to minimize both conducted and airborne interference. • Further information on good installation practice can be found in the USL installation instructions electronics.
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3.3 Connection

	<p>NOTE!</p> <ul style="list-style-type: none"> • The DC power distribution for one or more USL systems should be designed in a star configuration for function modules, base units, and cabling. Ensure symmetrical wiring of the forward and return conductors as a twisted pair or cable. • Shielded cables must be used for all power and signal lines that are routed outside a cabinet. The cable shields must be connected to the machine ground at both ends. • Shield connection terminals must be used in the control cabinet to connect the cable shields over a large area.
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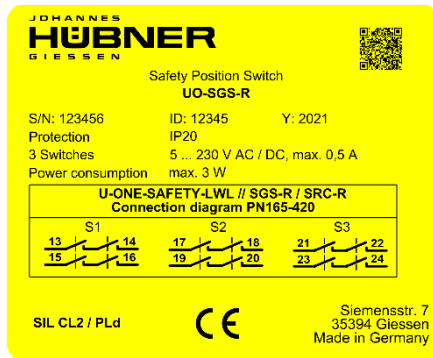
3.4 Replacing function modules

When replacing function modules, observe the following:

- The new function module must have the same item no. (ID) as the old one.
- The configuration of the function module to be replaced may be transferred to the new function module (see configuration instructions).
- When recommissioning the replaced function module, a secure test run must be completed first to ensure it functions correctly.

3.5 Type plate

The following image shows an example of a type plate.

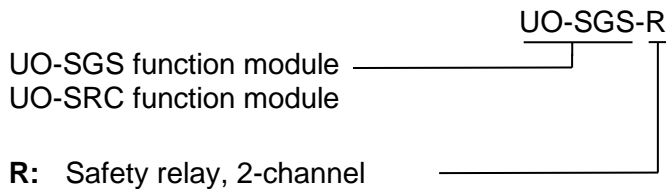


The type plate is located on the outside of the housing, and includes the following information:

- Manufacturer
- Type, year of construction
- CE mark
- Serial number (S/N)
- Protective class
- ID number
- Certification information

Fig. 3-1: Type plate (example)

3.6 Type designation



Label	Description
UO-SRC-R	3 safety certified position switches with forcibly guided relay Switching voltage max. 230V AC / DC
UO-SGS-R	3 safety certified speed switches with forcibly guided relay Switching voltage max. 230V AC / DC

4 Structure and function

The SRC-R/SGS-R is a switching module with 3 safety certified position switches or 3 safety certified speed switches. The SRC-R/SGS-R has forcibly-guided relays.

Each switch has a 2-channel (cat. 3) structure, as shown in the graphic. The switching statuses are illustrated in a powered-down state. A green LED on the front plate indicates that a switch is closed.

The switch states are configured using the US42Pro software.

A full description of the configuration is provided in the separate configuration manual.

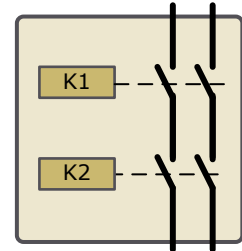


Fig. 4-1: Switch layout

!	<p>CAUTION! The module may only be configured while stopped. If a rotational movement is detected during configuration, the U-ONE®-SAFETY-LWL system is set into a safe state.</p>
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When using the switch as an error switch

!	<p>CAUTION! The error switch must be used such that the application enters a “safe state” when there is an error (relay contact opens).</p>
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4.1 Electrical data

Information	Value
Supply voltage	Delivered to the SCU module via the bus connector
Module power consumption	< 3 W
Switching voltage, current	5 VAC ... 250 VAC 5 mA ... 500 mA 5 VDC ... 30 VDC 5 mA ... 500 mA > 30 VDC ... 230 VDC 5 mA ... 180 mA
Mechanical relay service life	> 20,000,000 switching cycles
Time between 2 switching requests to a relay	≥ 135 ms
Switching time	≤ 10 ms
Protective class in accordance with DIN EN 60529	IP20 for cabinet installation Degree of protection of cabinet: ≥ IP54
Connection technology	Screw terminals 0.25 mm ² - 1.5 mm ²
Elevation above sea level	≤ 3000 m

The relay contacts must be protected against overcurrent via a back-up fuse (max. 2A).

	<p>WARNING! Overvoltage category III: If there is mixed installation between neighbouring relay outputs with SELV / PELV and mains voltage, then the applied voltage must be ≤ 150 V AC or ≤ 212 V DC (elevations up to 2000 m). For higher voltages or higher elevations, the operator must ensure that sufficient distance is maintained, for instance by leaving a relay output disconnected between them.</p>
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4.1.1 Operating statuses and displays

Operating status	Status LED	Switching status
Start	flashing yellow/green 2 Hz	open
normal	green	according to program
module not configured	yellow	open
configure the module	flashing yellow/green 1 Hz	according to program
switch test	flashing yellow/green 1 Hz	according to test
bootloader	flashing yellow/red 1 Hz	open
Warning	flashing yellow 1 Hz	according to program
Fault	red	open

Warning

A warning is generated if:

1. the number of switching cycles for at least one switching relay is $\geq 19,900,000$.
2. the SRC-R/SGS-R has reached the end of its service life (20 years).

5 Functional safety

The SRC-R/SGS-R can only be operated in conjunction with the UO-SCU function module. Please observe the information described in the relevant section of the UO-SCU operating manual.

5.1 Safety parameters

Parameters determined in accordance with DIN EN ISO 13849-1 for the SRC-R/SGS-R.


	Architecture	Category	PL	MTTF _D [a]	Service life
1 relay	1oo2 (2-channel)	3	d	298.6	20 years
3 relay				227.4	

Parameters set for the SRC-R/SGS-R according to IEC 61508 and DIN EN 62061.

	PFD _{AV}	PFH [FIT]	DC _{avg} [%]	SIL
1 relay	3.01E-05	0.34	96.4	2 (high demand)
3 relay	3.13E-05	0.36	97.1	

Calculations for the safety parameters of the overall system are provided in the configuration manual.

5.2 Information on functional safety


	<p>CAUTION!</p> <ul style="list-style-type: none"> • The relay contacts must be protected against overcurrent via a back-up fuse (2A). • Relays that do not change their switching status for more than 1 year during the application must be inspected once annually as part of maintenance work.
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6 Inspections

The SRC-R/SGS-R can only be operated in conjunction with the UO-SCU function module. Please observe the measures described in the relevant section of the UO-SCU operating manual.

7 Transportation, packaging and storage

7.1 Transportation safety information

	<p>CAUTION!</p> <p>Property damage due to improper transportation!</p> <p>These symbols and information on the packaging must be observed: Do not throw, risk of breakage, protect against wetness</p>
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7.2 Incoming goods controlling


The delivery must be checked promptly for transportation damage and to ensure it is complete upon receipt.

If there is transportation damage, the carrier must be informed directly upon delivery (take photos as evidence).

7.3 Packaging (disposal)

Packaging will not be taken back, and must be disposed of according to applicable statutory specifications and local regulations.

7.4 Storing packages (devices)

	<p>Protect against wetness!</p> <p>Protect packages against wetness, store in a dry and dust-free location.</p>
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In case of long storage times (> 6 months), we recommend packaging the devices in protective packaging (with desiccants).

7.5 Returning equipment (repair/goodwill/warranty)

Service requests (repair/goodwill/warranty) can be initiated directly via the following online form:

<https://www.huebner-giessen.com/en/service-support/after-sales-service/>

There you will also find contact details for our service, as well as questions and answers regarding the processing.

Devices that have come into contact with radioactive radiation or materials will not be taken back.

Devices that have come into contact with biological or chemical substances that could be hazardous to health must be decontaminated before they are returned.

A clearance certificate must be enclosed.

7.6 Disposal

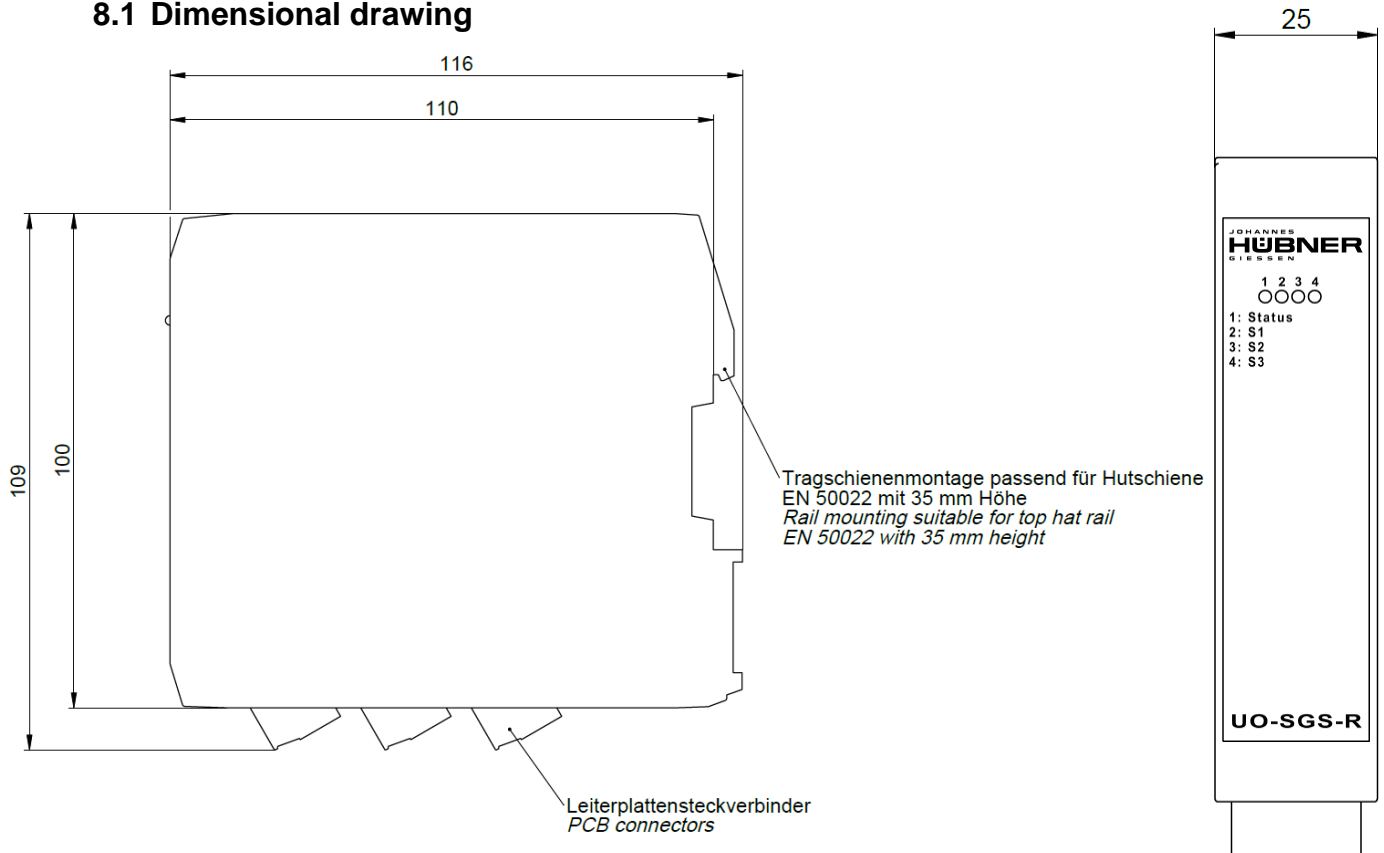
The manufacturer is not obligated to take back the devices.

The SRC-R/SGS-R must be treated as special electronic waste, and must be disposed of according to specific national law.

Local municipal authorities or speciality disposal companies can provide information on environmentally-appropriate disposal.

8 Documents

8.1 Dimensional drawing



8.2 Wiring diagram

