SEIKOM ELECTRONIC


# User Manual
# RLSW®7

24 V AC/DC, 230 V AC

Version 1

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# 1. SAFETY INSTRUCTIONS

Read the product description before commissioning the device. Make sure that the product is suitable for your application without any restrictions.

Improper use or use not in accordance with the intended use can lead to malfunctions of the device or to undesirable effects on your application. For this reason, the installation, electrical connection, startup, operation and maintenance of the device may only be carried out by trained personnel.

The glycol content in cooling circuits must not exceed 30%. Above 30% glycol content, malfunctions and functional failure are possible.

# 2. GENERAL INFORMATION

The calorimetric flow monitors of the RLSW®7 series are an economical alternative to common pressure transmitters. The installation is simple and quick by means of a flange mount (for channel installation) or by means of a threaded connector. The switching point can be selected via the integrated potentiometer. In case a flow is present, the switching output is conductive (yellow LED on the unit is on).

## 2.1 Proper Use

The flow monitors of the RLSW®7 series operate on a thermodynamic basis without moving parts. Areas of application are the monitoring of chillers (water shortage), boiler and sprinkler systems, pumps, cooling and lubricant circuits. They serve as a replacement for mechanical paddle monitors and wind vane relays.

## 2.2 Function Principle

Flow monitors of the RLSW®7 series function according to the calorimetric principle. A unit's relay switches when flow speed reaches a pre-selected threshold value. The calorimetric measuring principle is based on a heated temperature-sensitive resistor. Flow in the medium dissipates heat from the precision resistor, the temperature of the resistor changes and thus its resistance value. This change is evaluated by the unit. However, not only the flow speed of the medium has an influence on the dissipated amount of heat, but also its temperature, therefore a relation between flow and temperature must be established. This is achieved by a second, temperature-dependent precision resistor next to the first one. The second precision resistor (temperature compensation) is not heated and serves to measure the temperature only.

| | | |
|---|---|---|
| **Flow ≥ threshold value** | Relay output energized | Yellow LED turns on |
| **Flow < threshold value** | Relay output not energized | Yellow LED shuts off |


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## 3. TECHNICAL DATA

| **Type** | **RLSW®7 G1/2-inch** | | | | **RLSW®7 G1/4-inch** | | | |
|---|---|---|---|---|---|---|---|---|
| Process connection | G1/2-inch | | | | G1/4-inch | | | |
| Operating voltage | 24 V AC/DC | | 230 V AC | | 24 V AC/DC | | 230 V AC | |
| Article-No. | 74398 | | 74399 | | 74396 | | 74397 | |
| Insertion depth | 46 mm | 150 mm | 46 mm | 150 mm | 48 mm | 150 mm | 48 mm | 150 mm |
| Voltage tolerance | ± 5% | | ± 6% | | ± 5% | | ± 6% | |
| Overvoltage category | II | | | | | | | |
| Signal lamp voltage | Green LED | | | | | | | |
| Power consumption | 3 VA | | 4,5 VA | | 3 VA | | 4,5 VA | |
| Ambient temperature | -20 ... 60°C | | | | | | | |
| Switching output | Relay, 1 change-over contact | | | | | | | |
| Switching function at flow | Relay engages | | | | | | | |
| Relay output | 250 V AC, 6 A, 1.5 kVA | | | | | | | |
| Minimum switching load | 10 mA, 5 V DC | | | | | | | |
| Signal lamp airflow | Yellow LED | | | | | | | |
| Media temperature range air | -25 ... 80°C | | | | | | | |
| Media temperature range water | -10 ... 80°C | | | | | | | |
| Temperature gradient | 15 K/min | | | | | | | |
| Switching point adjustment | With potentiometer | | | | | | | |
| Airflow range | 0.5 ... 20.0 m/s | | | | | | | |
| Water measuring range | 0.03 ... 10s/ max. 90 s | | | | | | | |
| Sensor | Integrated | | | | | | | |
| Sensor material | Stainless steel V2A | | | | | | | |
| Pressure resistance | 20 bar | | | | | | | |
| Electrical connection | 5 terminals, 2.5 $mm^2$ | | | | | | | |
| Protection category, housing | IP65 | | | | | | | |
| Protection category, terminals | IP67 | | | | | | | |
| Pollution class | 2 | | | | | | | |
| Housing dimensions (L x W x H) | 56 mm x 84 mm x 82 mm | | | | | | | |
| Type certification | Type examination TÜV Nord according to DIN EN 61010-1:2011-07 | | | | | | | |


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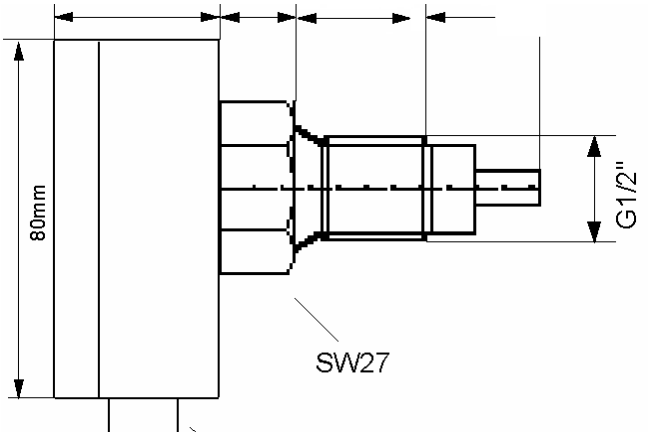
### 3.1 Dimensions (Housing depth approx. 80mm) Immersion depth alternatively available in 150mm.




*Drawings not to scale.*

## 4. INSTALLATION AND COMMISSIONING

**Installation and commissioning must be performed by authorized and qualified personnel.**

Connections to main supply (L, N) must be made by means of a protected isolating switch with usual fuses. As a matter of principle, the General VDE regulations must be complied with (VDE 0100, VDE 0113, VDE 0160). If the potential-free contact is connected to an extra-low safety voltage, sufficient insulation must be provided for the connecting cables up to the terminal, since otherwise the double insulation to the mains voltage side may be impaired. The current load capacity of the potential-free contact is limited to 6 A.

### 4.1 Installation Conditions

To avoid malfunctions, please refer to the following points:

- The tip of the sensor should be as close as possible to the center of the pipe.
- If there are deposits or air pockets in horizontal pipes, install the RLSW®7 sideways. Select a low-turbulence installation location.
- To avoid pitting, do not use the stainless steel sensor in solutions containing chlorine or in fittings/pipes made of copper, brass or gunmetal.
- Do not install the sensor directly behind valves, flaps, branches and bends.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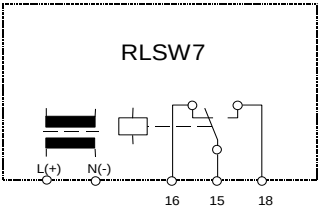
- If you measure air flows with the unit, the following applies:
  - In case of vertical pipes, the direction of flow should be upwards, especially for small air flows (up to 1 m/s), in order to avoid influences from thermally rising air.
  - The sensor needs at least 5xD (inside pipe diameter) of free inlet and 3xD (inside pipe diameter) of outlet path to avoid false measurement due to turbulence.

### 4.2 Electrical Connections




### 4.3 Setting the Switching Point

The unit has two potentiometers for setting the switching points, the upper one is for fine adjustment, the lower one is for coarse adjustment.

The interrelation between flow speed and resistance change of the precision resistors is not linear. In the lower range (low rates of flow) the relative change of resistance is large. In the upper range, the change of resistance at identical deviations in flow speed becomes increasingly smaller. When setting the switching point, it must first be determined what change is to be monitored, since some settings result in certain disadvantages. The following requirements must be taken into consideration:

**Low change in the rate of flow in the high flow speed range:** the switching point must be chosen very close to the measuring value of the normal flow, since the change of measuring values is very small when the rate of flow changes. Since the temperature compensation exhibits a certain amount of delay in comparison to the actual change of temperature, such a setting of the switching point is possible only with slow changes of temperature.

**Low change in the rate of flow in the low flow speed range:** the switching point may be selected at a greater distance from the measuring value of the normal rate of flow, since the changes of the measuring values are larger when the rate of flow changes. A change in temperature has no effect on the switching behaviour.

**Large change in the rate of flow:** in most cases like this a simple yes/no statement is desired (e. g. ventilator is running or ventilator stopped). Therefore, a larger safety margin may be selected, so that neither temperature changes nor turbulence have any influence on the switching behaviour.

The switching points are set on the evaluation unit of the Flow monitor.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### 4.4 Commissioning Instructions

When commissioning and adjusting the device, the following procedure is recommended:

- Install and connect the flow controller in accordance with installation instructions and conditions.
- Align the mark on the sensor end with the flow.
- If necessary. Set jumper for start-up bypass
- Set trimmer “Sensitivity” to minimum sensitivity (left limit stop).
- Connect main voltage. The green LED lights up. If the jumper has been set, the start-up bypass procedure will be executed (approx. 60 sec.).
- Set nominal rate of flow.
- Slowly turn trimmer “Sensitivity” clockwise until the yellow LED lights up and the signal output switches. In order to avoid erroneous switching at low changes of flow, turn the potentiometer slightly past the switching point.
- To check the function of the flow controller, reduce or stop the flow.
- The yellow LED will go off (output relay at RLSW®7 is released).
- Check glycol content (below 30%)

The device is now set to function.

## 5. MAINTENANCE INSTRUCTIONS

The flow sensor should be serviced at regular intervals, i.e., the flow sensor should be cleaned when used in heavily contaminated media. The following procedure is expedient:

- Dismantle flow monitor.
- Carefully soak the flow monitor in lukewarm soapy water for approx. 10 minutes (depending on the degree of soiling).
- Carefully rinse the flow monitor with lukewarm water.
- Install the flow monitor.
- Put the flow monitor into operation and, if necessary, carry out a new calibration with the evaluation electronics.

**Do not clean the sensor tip with a screwdriver, wire brush or similar. There is a high risk of damage.**


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## 6. ERROR MESSAGES

The following instructions are intended as first level support in case your flow monitor is not working properly.

| Problem | Potential Cause | Solution |
|---|---|---|
| Device does not work at all | Missing or wrong supply voltage | Check supply voltage and connection |
| Device does not detect an flow | Sensor is not installed properly<br><br>Flow is outside of the measurement range | Review if the sensor was installed with its marking positioned towards the airflow source and close to the duct's center<br><br>Adjust the tube's diameter to increase or decrease the flow |
| Device detects flow when no flow is present | Flow is present even at standstill e.g., due to ventilation flaps through which air enters from the outside | Adjust the sensor's switching point |
| Device shows delayed reaction behavior | Sensor tip is polluted | Carefully clean the sensor with water |
| Device switches in the event of a rapid media temperature increase | Temperature gradient is outside of technical specifications | Turn the "Sensitivity" potentiometer a little further clockwise.<br>Set switching point in hot media environment |


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# 7. EU DECLARATION OF CONFORMITY

SEIKOM Electronic GmbH & Co. KG
Fortunastraße 20
42489 Wülfrath
Telefon: +49 (0) 2058 2044
E-Mail: info@seikom-electronic.com

## EU-Declaration of Conformity

The EU declaration of conformity applies to the following unit:

**RLSW®7**

This declaration of conformity is issued under the sole responsibility of the manufacturer.
We confirm the conformity to the essential requirements of the European directives:

2014/30/EU (EMV-Richtlinie)
2014/35/EU (Niederspannungsrichtlinie)
2011/65/EU (Beschränkung gefährlicher Stoffe)
2015/863/EU (Ergänzung RoHS 3)

The following standards were applied:

DIN EN IEC 63000: 2019-05
DIN EN IEC 61000-6-2: 2019-11
DIN EN 61000-6-3: 2021-03

Wülfrath, 28th March 2023

Philipp Hein
Managing Director


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## Our Product Portfolio

| | | |
|---|---|---|
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+49 2058 916 900 0
info@seikom-electronic.com
www.seikom-electronic.com
SEIKOM-Electronic GmbH & Co. KG
Gold-Zack-Straße 7
40822 Mettmann


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