SEIKOM ELECTRONIC

User Manual
RLSW®5A

24 V AC/DC, 230 V AC

Version 1

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CONTENTS

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.

2. GENERAL INFORMATION

The calorimetric flow monitors RLSW®5A 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 PG7 threaded connector. The switching point can be selected via the integrated potentiometer. The sensor and control unit are compactly connected, with the sensor tube also serving for mounting. To adapt the range of the analog output to the existing flow conditions, the flow maximum can be set in the desired output voltage (max. 10 V) or in the desired output current (max. 20 mA).

2.1 Proper Use

Flow controllers of the RLSW®5A series are intended to be used to monitor flow of gaseous media within the specified technical data. Main areas of application are heating, ventilating and air conditioning in the field of automated building systems.

2.2 Function Principle

Flow monitors of the RLSW®5 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 "Airflow" turns on
Flow < threshold value	Relay output not energized	Yellow LED "Airflow" shuts off

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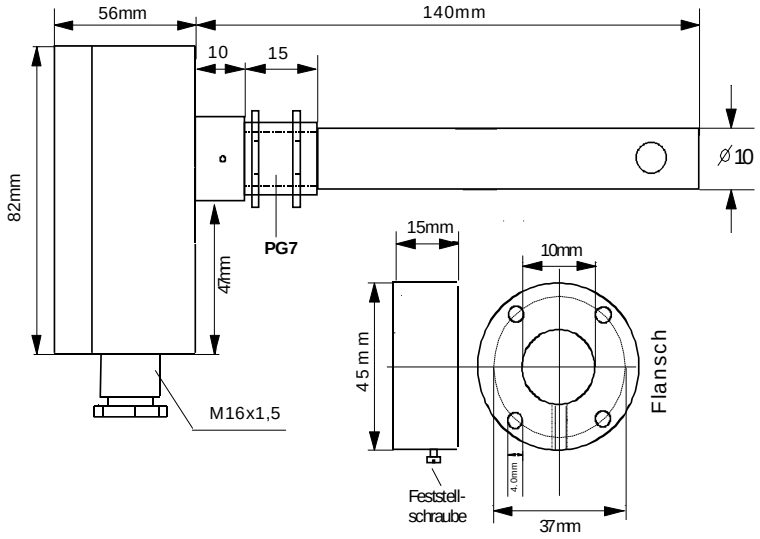
3. TECHNICAL DATA

Type	**RLSW®5A**	
Article-No.	81448/10	80448/10
Operating voltage	24 V AC/DC	230 V AC 50/60 Hz
Voltage tolerance	± 5%	± 6%
Overvoltage category	II	
Signal lamp voltage	Green LED	
Power consumption	4 VA	
Ambient temperature	-20 ... 60°C	
Signal output flow	0 ...10 V (Ra = 10k Ohm) relative	
Signal output for flow	0 ... 20 mA (Ra = 0,2kOhm) relative	
Accuracy of the output signal	± 10% of the measured value	
Reproducibility of the output signal	± 1% of full scale	
Media temperature range	0 ... 70°C	
Temperature gradient	15 K/min	
Measuring range	0.1 ... 30.0 m/s	
Sensor	Integrated	
Immersion depth	50 mm, 130 mm, 165 mm, 300 mm, 400 mm, 500 mm	
Process connection	PG7, mounting flange	
Sensor material	MS, nickel-plated,	
Pressure resistance	10 bar	
Electrical connection	6 terminals, 2.5 mm^2	
Protection category, housing	IP65	
Protection category, terminals	IP67	
Pollution class	II	
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	

3.1 Dimensions

(Housing depth approx. 80mm)



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. The through hole in the shaft of the sensor must be completely inside the channel.
- The marking is intended as an assembly aid and should be placed in the direction from which the flow originates.

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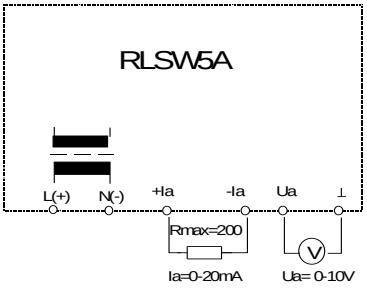
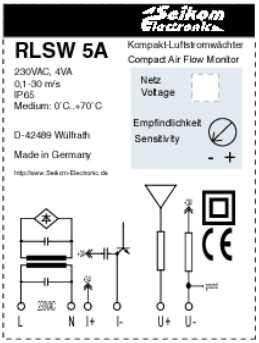
- In case of vertical pipes, the direction of flow should be upwards.
- The sensor needs at least 5xD (inside pipe diameter) of free inlet and 3xD (inside pipe diameter) of outlet path to avoid false measurement due to turbulence.
- Screw in the flow monitor sensor only via the hexagon of the sensor housing.
- The device is independent of the installation position.
- Optimum measurement results can only be achieved with optimum installation order while observing the inlet and outlet distances.

4.2 Electrical Connections

Attention: 4-wire device N (-) from Ub and U- /-Ia from signal output must not be bridged, otherwise the device may be damaged.





4.3 Setting the Switching Point

The interrelation between air 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 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 air flow monitor.

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 end of the sensor with the air stream.
- Connect main voltage. The green LED lights up.
- Set nominal rate of flow.
- Use the "Gain" potentiometer to adjust the desired output signal to the nominal flow, e.g., nominal flow 5 m/s = signal output U to 5 V.
- The current setting of the RLSW®5A is automatically determined by the voltage setting.

The device is now set to function.

5. MAINTENANCE INSTRUCTIONS

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

- Dismantle air flow monitor
- Carefully soak the airflow monitor in lukewarm soapy water for approx. 10 minutes (depending on the degree of soiling).
- Carefully rinse the airflow monitor with lukewarm water.
- Install the airflow monitor
- Put the airflow 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.

6. ERROR MESSAGES

The following instructions are intended as first level support in case your airflow 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 air flow	Sensor is not installed properly.	Review if the sensor was installed with its marking positioned towards the airflow source and close to the duct's center.
	Flow is outside of the measurement range	Adjust the tube's diameter to increase or decrease the flow

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Device detects air flow when no air flow is present	Air 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

7. EU DECLARATION OF CONFORMITY

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EU-Declaration of Conformity

The EU declaration of conformity applies to the following unit:

RLSW®5A

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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