SEIKOM ELECTRONIC

Operating instructions

NLSW®45-3 SIL1

24 V AC/DC, 230 V AC

Version 1

+49 2058 916 900 0• info@seikom-electronic.com• www.seikom-electronic.com

Contents

Contents **3**

1. SAFETY INSTRUCTIONS **4**

2. GENERAL INFORMATION **4**

2.1 Proper use 4

2.2 Operating principle 4

3. TECHNICAL DATA **5**

4. INSTALLATION AND COMMISSIONING **6**

4.1 Installation conditions 6

4.2 Electrical connections 6

4.3 Setting the switching point 6

4.4 Instructions for commissioning 7

5. MAINTENANCE INSTRUCTIONS **8**

6. TROUBLESHOOTING **8**

7. EU DECLARATION OF CONFORMITY **9**

1. SAFETY INSTRUCTIONS

Read the product description before using the device. Make sure that the product is fully suitable for your application.

Incorrect or improper use can lead to malfunctions of the device or to undesirable effects on your application.

For this reason, installation, electrical connection, commissioning, operation and maintenance of the appliance may only be carried out by trained personnel.

2. GENERAL INFORMATION

The calorimetric flow monitors in the NLSW®45-3 SIL1 series are an economical alternative to conventional pressure transmitters. Typical applications include the monitoring of engine cooling systems, paint shops or the flow monitoring of test stands. Installation is quick and easy via a flange mounting (for duct installation) or via a threaded connection. The switching point can be freely selected via the integrated potentiometer. The switching output is activated when there is a flow (yellow LED on the device lights up).

2.1 Proper use

The flow monitors of the NLSW®45-3 SIL1 series are intended for monitoring gaseous media within the specified technical data. The main areas of application are heating, ventilation and air conditioning in the field of building automation as well as system monitoring, especially for safety-critical areas.

2.2 Functional principle

Flow monitors of the NLSW®45-3 SIL1 series operate according to the calorimetric principle. The relay of a device switches when the flow velocity reaches a preselected threshold value. The calorimetric measuring principle is based on a heated, temperature-sensitive resistor. Heat is extracted from the precision resistor by the flow in the medium, the temperature of the resistor changes and thus its resistance value. This change is evaluated by the device. However, since not only the flow velocity of the medium has an influence on the amount of heat dissipated, but also its temperature, a correlation between flow and temperature must be established. This is achieved by a second, temperature-dependent precision resistor in addition to the first. The second precision resistor (temperature compensation) is not heated and is only used to measure the temperature.

Flow rate ≥ threshold value	Relay output activated	Yellow "Air flow" LED lights up
Flow rate < threshold value	Relay output not activated	Yellow "Airflow" LED goes out

+49 2058 916 900 0• info@seikom-electronic.com• www.seikom-electronic.com

3. TECHNICAL DATA

Type	**NLSW®45-3 SIL1**	
Operating voltage	24 V AC/DC	230 V AC 50/60 Hz
Article no.	77029SIL1	63377SIL1
Voltage tolerance	± 5%	± 6%
Overvoltage category	II	
Signal display voltage	Green LED	
Power consumption max.	3 VA	4.5 VA
Ambient temperature Device	-20 ... 50°C	
Signal output flow	Relay, 1 changeover contact	
Switching function with flow	Relay picks up	
Relay output	250 V AC, 8 A, 2 kVA	
Minimum switching capacity	10 mA, 5 V DC	
Signal display with flow	Yellow LED	
Start-up delay	5 ... 60 s (jumper can be activated)	
Start-up delay display	Yellow LED	
Media temperature range	-25 ... 120°C	
Switching point adjustment	Adjustable via potentiometer	
Air flow range	0.1 ... 30.0 m/s	
Measuring sensor	F3 SIL1 (available separately)	
Immersion depth approx.	50 mm, 130 mm, 165 mm, 300 mm, 400 mm, 500 mm	
Electrical connection	10 terminals, 2.5 mm^2	
Enclosure protection class	IP40	
Protection class Terminals	IP20	
Housing dimensions (L x W x H)	120 mm x 45 mm x 73 mm	
SIL certification	SIL1	
Test mark	Type tested TÜV Nord according to DIN EN 61010-1:2011-07	

4. INSTALLATION AND COMMISSIONING

Installation and commissioning must be carried out by authorized and qualified personnel.

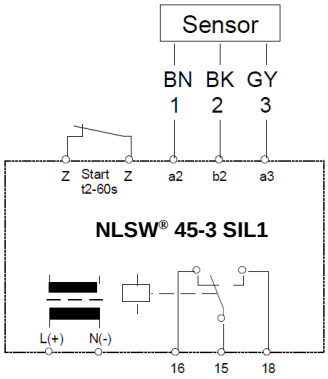
The connection to the main supply (L, N) must be made via a protected circuit breaker with standard fuses. The general VDE regulations must always be observed (VDE 0100, VDE 0113, VDE 0160). If the potential-free contact is connected to a safety extra-low voltage, the connecting cables must be sufficiently insulated up to the terminal, as otherwise the double insulation to the mains voltage side may be impaired. The current carrying capacity of the potential-free contact is limited to 8 A. Therefore, the circuit of the potential-free contact must be protected with a 10.3 A fuse.

4.1 Installation conditions

To avoid malfunctions, please observe 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 duct.
- There is a small notch in the metal at the end of the sensor. This marking is intended as a mounting aid and should be placed in the direction from which the current is coming.
- With vertical ducts, 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.
- For optimum measurement, the sensor requires at least 5 x D (internal pipe diameter) of the free inlet and 3 x D of the outlet in order to avoid incorrect measurements due to turbulence.
- The built-in device to IP20 (corresponds to VBG4) must be installed in an enclosure or in a switch cabinet.
- The NLSW®45-3 SIL1 evaluation unit is intended for mounting on a profile rail (DIN EN 50022-35). If the device is exposed to major vibrations, it is advisable to mount it on vibrating metal.

4.2 Electrical connections



BN: Brown

BK: Black

GY: Gray

4.3 Setting the swit

The relationship between air velocity and change in resistance is not linear. In the lower range (small flows), the change in resistance is very large. In the upper range, the change in resistance is always smaller for the same flow changes. When setting the switching point, it should therefore be noted

+49 2058 916 900 0• info@seikom-electronic.com• www.seikom-electronic.com

which change is to be monitored, as different settings have certain disadvantages. The following requirements should be observed:

Small flow change in the high flow velocity range: The switching point must be selected very close to the measured value of the normal flow, as the measured value change is very small when the flow changes. As the temperature compensation has a certain delay compared to the actual temperature change, such a switching point setting is only possible for applications with slow temperature changes.

Small flow change in the low flow velocity range: The switching point can be selected at a greater distance from the measured value of the normal flow, as the measured value change is large when the flow changes. A change in temperature has no effect on the switching behavior.

Large flow change: A 'yes/no' statement is usually required here (e.g. fan running or fan stopped). Therefore, such a large safety distance can be selected that neither temperature changes nor turbulence have an influence on the switching behavior.

The switching points are set on the evaluation unit of the airflow monitor.

4.4 Instructions for commissioning

The following procedure is recommended for commissioning and setting the device:

- Connect a suitable sensor to the device and install the flow controller and sensor in accordance with the installation instructions.
- Align the mark on the end of the sensor with the air flow.
- If necessary. Set jumper for start-up bypass
- Set the "Sensitivity" potentiometer to minimum sensitivity (left stop).
- Connect the mains voltage. The green LED lights up. If the jumper is set, the start-up bypass runs (approx. 60 seconds).
- Set the nominal flow rate.
- Slowly turn the "Sensitivity" potentiometer clockwise until the yellow LED lights up and the signal output switches. Turn the potentiometer slightly beyond the switching point to avoid incorrect switching when the flow rate changes slightly.
- To check the function of the flow regulator, reduce or stop the flow.
- The yellow LED goes out (output relay on the device has dropped out)

The device is now ready for operation.

5. MAINTENANCE INSTRUCTIONS

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

- Dismantling the air flow sensor
- Carefully immerse the airflow sensor in lukewarm soapy water for approx. 10 minutes (depending on the degree of soiling)
- Carefully rinse the air flow sensor with lukewarm water
- Fitting the air flow sensor
- Commission the air flow monitor and, if necessary, carry out a new adjustment with the evaluation electronics)

Please do not clean the sensor tip with a screwdriver, wire brush or similar. There is a risk of damage.

6. TROUBLESHOOTING

The following instructions are intended as first aid if your airflow monitor is not working properly.

Problem	Possible cause	Solution
The device does not work.	Missing or incorrect power supply.	Check supply voltage and connection.
The device does not detect air flow.	The sensor is not installed correctly. Flow rate is outside the measuring range	Check that the sensor has been installed so that its mark is in the direction of the air flow source and close to the center of the duct. Adjust the diameter of the pipe to increase or decrease the flow rate.
The device detects an air flow, even if there is no air flow.	Air flow is also present at standstill, e.g. through ventilation flaps, through air flowing in from outside.	Set the switching point of the sensor.
The device reacts with a delay.	The sensor tip is dirty.	Clean the sensor carefully with water.
Device switches when the media temperature rises rapidly.	The temperature gradient is outside the technical specifications.	Turn the "Sensitivity" potentiometer slightly further clockwise. Set the switching point in a hot media environment.

+49 2058 916 900 0• info@seikom-electronic.com• www.seikom-electronic.com

7. EU DECLARATION OF CONFORMITY

SEIKOM Electronic GmbH & Co. KG
Gold-Zack-Straße 7
40822 Mettmann
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:

NLSW®45-3 SIL1

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

Mettmann, 28th March 2023

Philipp Hein
Managing Director

Notz

+49 2058 916 900 0• info@seikom-electronic.com• www.seikom-electronic.com

Growing network of local distributors available online
www.seikom-electronic.com

Our product portfolio

Flow rate	Temperature	Print
Air quality and CO_2	Zener barriers	Universal Transmitter

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

SEIKOM ELECTRONIC