Setting the switching point

The relationship between air velocity and impedance change is non linear. In the lower range of flow velocity, the change of impedance is very large. In the upper range of flow velocity, identical changes in flow velocity result in increasingly smaller impedance changes. If the switching point is set, it is important to note what change is to be monitored because different settings have certain disadvantages.

Note the following requirements

Small flow change in high flow velocity range: The switching point must be selected very close to the normal flow reading since flow changes only lead to a very small change in the measured value. Since temperature compensation takes place with certain delay after the actual temperature change has occurred, this switching point setting is only suitable for the applications which have slow temperature changes in the medium.

Small flow change in low flow velocity range: The switching point can be selected at a greater interval from the normal flow reading because a change in flow velocity causes a very large change in the measured value. A temperature change has no effect on switching behaviour.

Large change in flow rate:

A Yes/NO statement is usually required here (e.g. fan running or fan stationary). You can therefore select a safety clearance which is so large that neither temperature changes nor turbulence may have an affect on switching behaviour.

Assembly

The NLSW45-6 can be mounted on a top-hat rail to DIN EN 50022-35 using bolts or a quick-release clamp.
If the unit is exposed to major vibrations, it is advisable to mount it on a rubber-metal vibration damper.

Commissioning

Connection and commissioning has to be done by appropriate personnel! Please attend the following steps during assembling and connecting:

1. Connect the appropriate sensor to the appliance.
2. Set the “Sensitivity" potentiometer to minimum sensitivity.
3. Set the "start-up break“ potentiometer to the needed time (approx. 5-60s)
4. Connect the power supply; the appliance is operational within 2 seconds. The green LED lights up.
5. The yellow LED lights up briefly and turns off after the start-up break time.
6. Switch on the flow generator.
7. Slowly turn the "Sensitivity" potentiometer to maximum until the yellow LED has just lightened up. To attain stable switching behaviour, turn the potentiometer slightly past this switching point. Do not make this adjustment until the yellow LED has gone out!
8. To check the monitoring device, turn off the flow. The yellow LED turns off and the relay connects.

Attention: Pay attention to the connection diagram and be aware of using the correct voltage!

What to do if the monitoring device does not work properly

Problem	cause	sollution
device does not work in any way	no or wrong suplly voltage	check supply voltage and connection
device does not recognice flow	sensor is not installed properly	check the sensor's installation
	flow is out of range	change the tube's diameter
device reacts in a different way	sensor is highly polluted	maintain the sensor
device reacts in fast media tepmerature changes	temperature gradient is out of range	check the temp. Gradient of your installation

If you have any other questions, feel free to contact us.

Airflow monitoring

Installation and operating instruction NLSW45-6 and NLSW45-6.1

Our products correspond to the requirements of the European guidelines
WEEE 2012/19/EU - RoHS 2011/65/EU

UK CA

Mistakes and misprints are not to be excluded. All information „without guarantee“. 03/2022

General Information

The NLSW45-6 monitors gaseous media with tamperatures in the range of -20 to 250°C and up to 400°C with F8/400. The sensor is watched for short-circuit and loss of connection. The start-up delay and the switching point is settable step-less. The NLSW45-6 is used in combination with the sensor series F8. The compensation of different temperatures keeps the switching point constant.

Measuring principal

A temperature-sensitive resistor is heated according to the calorimetric measuring principle. The temperature-sensitive resistor is heated by a second resistor. A flow dissipates heat from the measuring resistor, causing the resistor's temperature to fall and thus a change of impedance. This temperature change is evaluated. Since both the velocity and the temperature of the flowing medium affect the dissipated heat, a relationship must be created between flow and temperature. For this purpose, a second temperature-sensitive resistor is located next to the first one. The second measuring resistor is not heated and is only used for the temperature measurement.

Airflow > / = switch point	Switching output is energised	Yellow LED "Airflow" switch on
Airflow < switch point	Switching output isn't energised	Yellow LED "Airflow" switch off

Technical Data

Type	**NLSW45-6 – NLSW45-6.1**	**NLSW45-6 – NLSW45-6.1**
Article-No.	**80502 – 80502/400°C**	**81504 – 81504/400°C**
Operating Voltage	24V AC/DC	230V AC 50/60Hz
Voltage tolerance	± 5%	± 6%
Over voltage category	II	II
Signal lamp, voltage	Green LED	Green LED
Power consumption	3VA/W	4,5VA
Ambient temperature	-20…+50°C	-20…+50°C
Switching output	Relay, 1 change-over contact	Relay, 1 change-over contact
Relay output Minimum switching load	250VAC, 8A, 2kVA 10mA / 5V DC	250VAC, 8A, 2kVA 10mA / 5V DC
Signal lamp, airflow	Yellow LED	Yellow LED
Atart up delay	selectable, 2s-60s	selectable, 2s-60s
Signal lamp, start up delay	-	-
Media temperature range NLSW45-6 Media temperature range NLSW45-6.1	-20…+250°C -20…+400°C	-20…+250°C -20…+400°C
Switching point adjustment	With potentiometer	With potentiometer
Airflow range NLSW45-6 Airflow range NLSW45-6.1	0.1-30m/s 0.1-20m/s	0.1-30m/s 0.1-20m/s
Measuring probes NLSW45-6 **Measuring probes NLSW45-6.1**	**F8, F8.1, F8.2, F8.3** **F8/400°C, F8.1/400°C,** **F8.2/400°C, F8.3/400°C**	**F8, F8.1, F8.2, F8.3** **F8/400°C, F8.1/400°C** **F8.2/400°C, F8.3/400°C**
Electrical connection	10 terminals, 2.5mm²	10 terminals, 2.5mm²
protection category, housing	IP40	IP40
protection category, terminals	IP20	IP20
contamiation class	2	2
Housing dimensions	L=120mm, W=45mm, H73mm	L=120mm, W=45mm, H73mm
Prüfzeichen	CE	

Installation Instruction

Before setting up the switching point, the device should have been active for at least 2 minutes in normal conditions. To set up the switching point please attend the following steps:

- The sensors tip should be placed in the duct's middle and has to be flowed around completely by the medium.
- The flow in vertical-ducts needs to be upwards.
- To assure maximum reliability the sensor needs a length of the inlet path of 5xD (inside pipe diameter) and 3xD (inside pipe diameter) of the outlet path.
- The sensor is to be mounted only with its own hex-head screw.
- The sensor must be connected to the evaluation unit as described in its manual. Incorrect connection leads to malfunctioning and can destroy both!
- If the sensor's cable is laid in a conduit with other live cables (motor-, solenoid valve-cables, …) we recommend shielding it.
- If the length of the cable needs to be changed it needed to be done with a.w.g. 16 (1.5mm²) and must not be longer than 20m!

Maintenance information

In order to avoid malfunction the sensor should be maintained in regular distances according to its pollution. Cleaning the sensor pay attention to following steps:

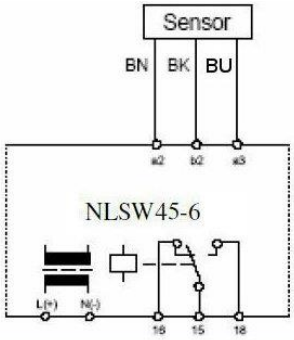
- Dismantle the sensor.
- Insert the sensor in slightly warm and soaped water carefully for about 10 minutes.
- Carefully rinse off the airflow sensor with lukewarm water.
- Assemble the airflow sensor.

Attention: Do not use screwdrivers or equal to clean the sensor!

Attention!!

Connection and commissioning must be performed by properly authorized and qualified personnel! Connection to mains supply (L, N) must be made by means of a protected isolating switch with the 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 10 A. Therefore, the electrical circuit of the potential-free contact must be protected by a 10.3 a fuse.

Electrical connection



Core colours: BN=brown BK=black BU=blue