SWL series

Sensor for air ducts, evaluation unit for enclosed mounting

The combination of air flow sensor SLF 3 and evaluation unit ASL 453 is suitable for air flow monitoring in air-conditioning, ventilation and cooling installations and in any situation where flow processes must be detected in air or neutral gases. Sensitivity is adjustable over a wide range.

ASL 453

Technical data of sensor

General
Fast-reacting air flow sensor with movable flange for installation in air ducts. With temperature compensation, suitable for media with rapid temperature changes.

Medium temperature -20…+100°C

Compensation behavior
(Reaction speed on change in medium temperature) fast, approx. 0.3 s

Installation depth 35 mm

Sensor tube diameter 10 mm

Sensor tube material nickel-plated brass

Measuring element
Insensitive to moisture (can be cleaned in water). Sensitive to mechanical deformation (care must be taken when cleaning with hard objects).

Degree of protection IP 32

Electrical connection
Terminal strip accessible after removal of cover. 3-core connection to evaluation unit

Technical data of evaluation unit

Power supply
230 VAC or 24 VAC/DC
(see Product Summary)

Power consumption approx. 3 VA

Contact load
Relay, single pole 8 A, max. 250 VAC

Ambient temperature 0 – 60°C

Flow rate
Adjustable from 0.1 to 20 m/s for gaseous media

Response time approx. 1 s

Repetition accuracy
<2%, relative to the flow rate directly on the sensor.

Switching hysteresis approx. 2% of overall range

Max. cable length between sensor and evaluation unit
100 m, for shielded cable 1.5 mm².

Sensor protection
In case of breakage or interruption of the sensor wires, the unit switches off or an interruption of flow is signaled.

Type of construction Standard housing N 45

Weight approx. 0.35 kg

Function

The air flow monitors work according to the calorimetric principle. A thermistor is heated up. As heat is withdrawn by the flowing air, the thermistor resistance alters. The change in resistance is evaluated. As the resistance also depends on the temperature of the medium, the difference must be determined by a second thermistor. The difference is compensated and in this way the switching point is kept stable.
Suspended materials adhering to the sensor can have an insulating effect and so affect the measurement result and hence the defined switching point. Therefore it is advisable to remove any dirt during routine maintenance operations.

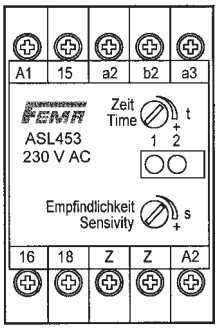
Switch-on bypass

While the plant is being started up (still no airflow present), the output contact is activated and the flow condition signaled. The time for the switch-on bypass is adjustable from 2-60 s. The start-up or switch-on bypass starts when the unit is switched on. If an external start button (normally closed contact) is connected (to the Z-Z terminals), the start-up bypass begins when the (locking) button is pressed.

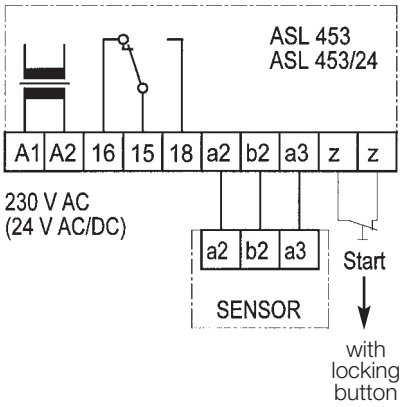
Product Summary

	Supply voltage	Type
Sensor	–	SLF 3
Evaluation unit	230 VAC	ASL 453
	24 V AC/DC	ASL 453/24

Operator interface



Wiring diagram



In case of malfunction, a sensor error can be ruled out by checking the resistances between the connecting wires. Sensor SLF 3 must be disconnected and checked with a suitable ohmmeter between the individual connecting wires:

Black-brown approx. 8.2 kOhm
Black-blue approx. 8.2 kOhm
Brown-blue approx. 18 kOhm

The terminal voltage of evaluation units ASW454 or ASW 454/24 can also be checked with a voltmeter between the “a2” and “a3” terminals after disconnecting the sensor.
31.4 VDC is the correct value.

Adjusting elements

s = sensitivity
t = time for switch-on bypass
(high sensitivity at low flow)

Signal lamps

1 = Flow present or switch-on bypass active
2 = supply voltage present

CE

Degree of protection:
IP 32 (sensor)
IP 65 (evaluation unit)