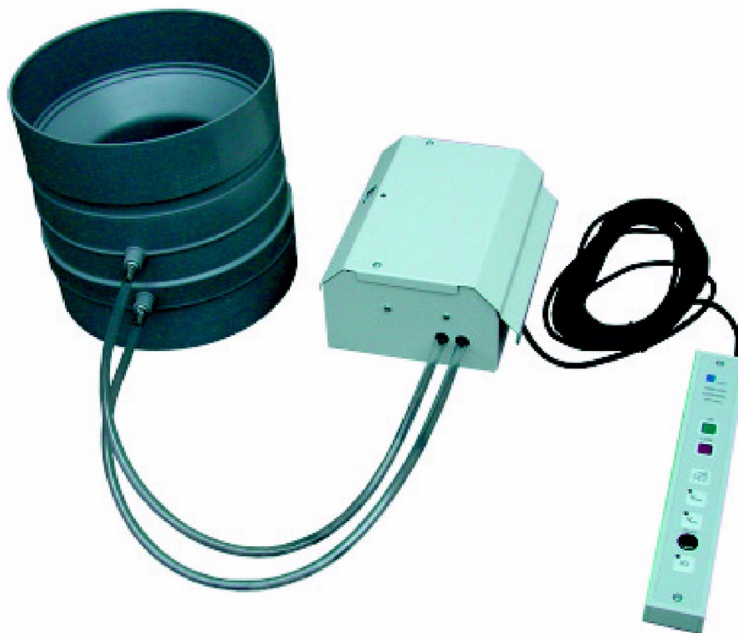




Laboratory Fume Hood Monitoring Device according to EN 14175 Model FM100



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Contents

Description	3
Functional description	3
Performance features	3
Order code	4
Terminal layout	6
Technical Data	7
Dimensions	8
Housing FM100	8
Venturi meter	8
Standard function indicator	8
Measuring rod MT	8
Specification text	8

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Description

Functional description

Use as monitoring and alarm system for return air volumetric flows in various applications, such as laboratory fume hoods, safety cabinets and other extractor systems.

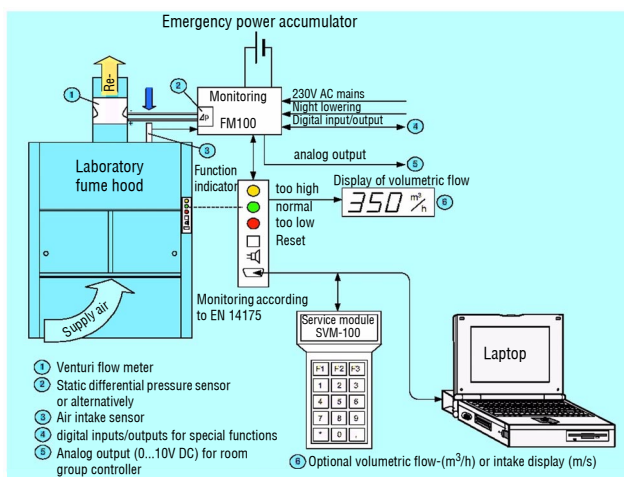
Microprocessor-controlled safety system for monitoring the toxic-release-proof operating state of laboratory fume hoods. An acoustic and optic alarm is activated as soon as the return air volumetric flow exceeds or drops below the parameterisable limit values.

FM100 meets the standard EN 14175. This means safety for the laboratory technician. FM100 is suitable for all types of laboratory fume hoods, and new installations and upgrades of existing laboratory fume hoods are easy to implement. In addition to customer-specific designs, a wide selection of different function indicators is available.

Precise and safe monitoring necessarily requires a suitable measuring system. To ensure a safe operation by means of the static differential pressure transmitter as well as reproducible and precise measurement results, we recommend using a Venturi flow meter or a measuring rod.



Block diagram: Laboratory fume hood monitoring device FM100



Function and control panel

The function and control panel is available in the surface-mounted housing or as mounting version in different types. Customer-specific designs will be carried out quickly and at optimised costs.

Operations

- Acoustic and optic alarm (red LED) for low return air/supply air
- Optic display (green LED) for sufficient return air/supply air
- RESET key for acknowledging the acoustic alarm
- Parameterisation socket via service module SVM100 or laptop

Options

- Light switch ON/OFF (laboratory fume hood interior)
- Optic display (yellow LED) for exceeding the maximum return air
- Yellow flashing LED as optic warning for the operating state "Front damper position" > 50 cm "

Performance features

- Microprocessor-controlled monitoring system
- Low-cost system
- Independent integrated power supply unit 230V AC
- All system data are saved power-failure-proof in the EEPROM
- Parameterisation and retrieval of all system values via service module SVM100 or laptop software PC2000
- Monitoring of supply air and return air systems
- Static differential pressure transmitter of long-term stability. Measuring range: 6...240 Pascal or 20...640 Pascal. Optionally with air flow sensor (face velocity)
- Monitoring of laboratory fume hood operation according to EN 14175 with acoustic and optic alarm.
- Optional monitoring as to whether a parameterisable volumetric flow was exceeded with optic warning.
- Optic and, optionally, acoustic warning for the operating state "Front damper position > 50 cm"
- Parameterisation of a second monitoring value (reduced volumetric flow in night operation)
- Emergency power accumulator (option) for power-failure-proof operation
- Suitable for all types of laboratory fume hoods

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Order code

Order code: Laboratory fume hood monitoring device

FM100 - A - 08 - 0010 - 3 - N - M - S	
Type	
model	
Standard	A
Explosion-proof model	Ex-
Supply and return air	C
customer-specific models	G ... Z
Fitted relays	
Fault	01
Fault + motor	03
Light	04
Fault + light	05
Light + motor	07
Fault + light + motor	08
	Sensor type
	S static differential pressure transmitter
	D dynamic air flow sensor
	Motor On / Off detection
	M = with 0 = without
	Emergency power accumulator 6V / 1.2 Ah
	N = with 0 = without
	Cable length of the function indicator
	1 = 1 m 3 = 3 m 5 = 5 m
	Function display and control panel type
0000	no function indicator
0010 ... 0999	various standard models
1000 ... 9999	customer-specific models

Order example: Laboratory fume hood monitoring device FM100

Housing model = standard, 3 relays, function indicator and control panel type = 0010 including a cable length of 3 m, with emergency power accumulator, with motor On / Off detection, static differential pressure transmitter.

Product: SCHAKO

type: FM100-A-08-0010-3-N-M-S

Explosion-proof model

Equipped with explosion-proof differential pressure transmitter and Ex barrier, suitable for zone 2 and zone 1. FM100 base unit must be mounted outside the Ex zone. Venturi flow meter and measuring rod are absolutely required and must be ordered in addition.

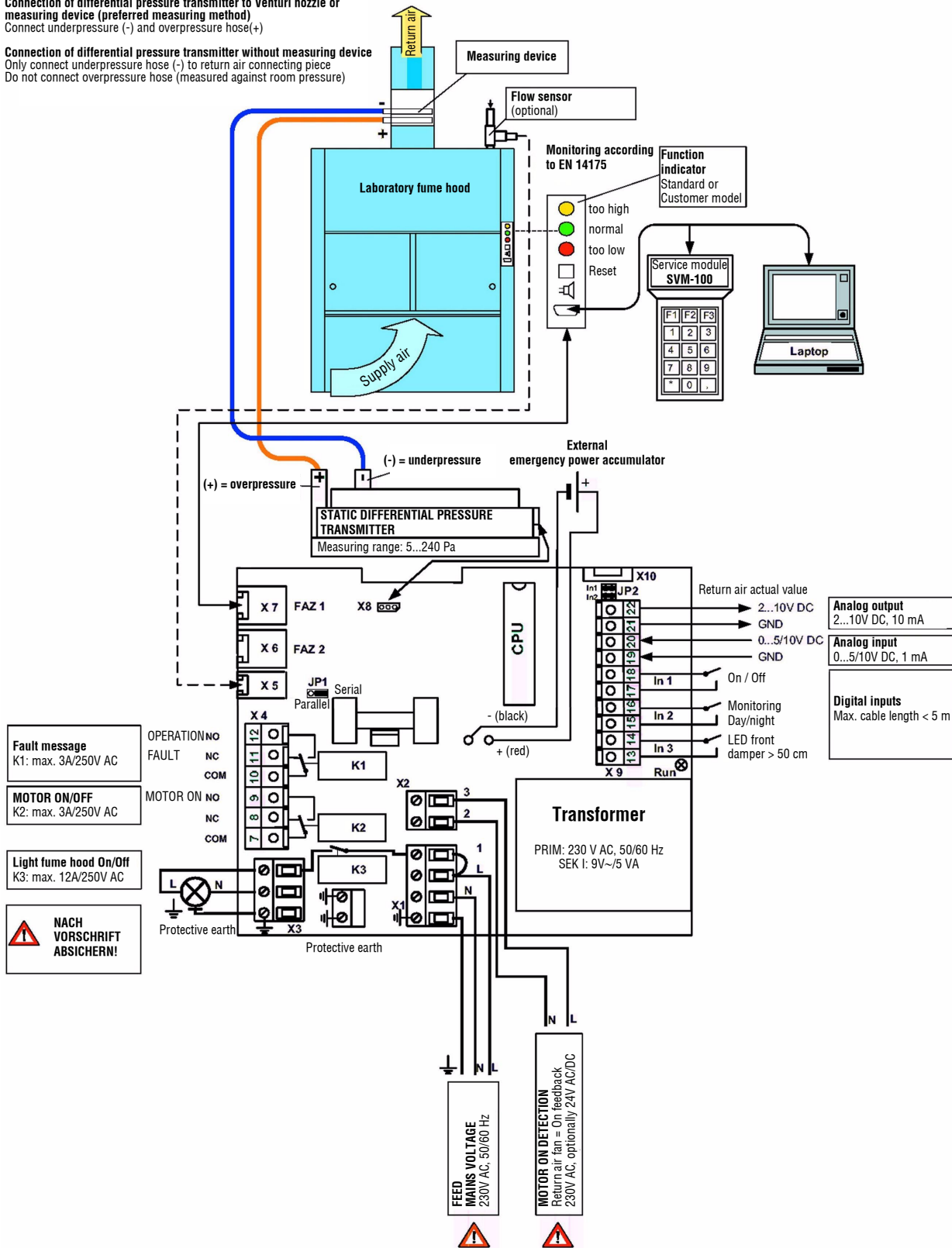
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Terminal layout

NOTE: Measuring device

Connection of differential pressure transmitter to Venturi nozzle or measuring device (preferred measuring method)
Connect underpressure (-) and overpressure hose(+)

Connection of differential pressure transmitter without measuring device
Only connect underpressure hose (-) to return air connecting piece
Do not connect overpressure hose (measured against room pressure)



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Technical Data

◆ General	
Rated voltage	230V AC/50/60Hz/+/-15%
Current consumption	max. 200 mA
Power consumption	max. 10 VA
Recovery time	600 ms
Operating temperature	0 °C to +55 °C
Humidity	max. 80% relative, non-condensing

◆ Housing	
Protection type	IP 20
Material	Sheet steel
Colour	white, RAL 9002
Dimensions (LxWxH)	(185 x 167 x 92) mm
Weight	approx. 1.4 kg
Device terminals	Screw terminal 1.5 mm ² Caged spring terminal 1.5 mm ²

◆ Relay inputs	
Number	1 relay (K3)
Contact type	Work contact
Switching voltage	max. 250V AC
Continuous current	max. 12A
Number	2 relays (K1, K2)
Contact type	Switchover/work contact
Switching voltage	max. 250V AC
Continuous current	max. 3A

◆ Digital inputs	
Number	3 inputs, 5V DC/2mA
Activation	potential-free contact Max. cable length < 5 m

◆ Analog output	
Return air actual value	2...10V DC, 10 mA

◆ Analog input	
Setpoint value:	0(2)...5/10V DC, 1 mA

◆ Differential pressure transmitter	
Measuring principle	static
Pressure range	6...240 Pascal 20...640 Pascal optional
Response time	< 10 ms
Sensor bursting pressure	500 mbar

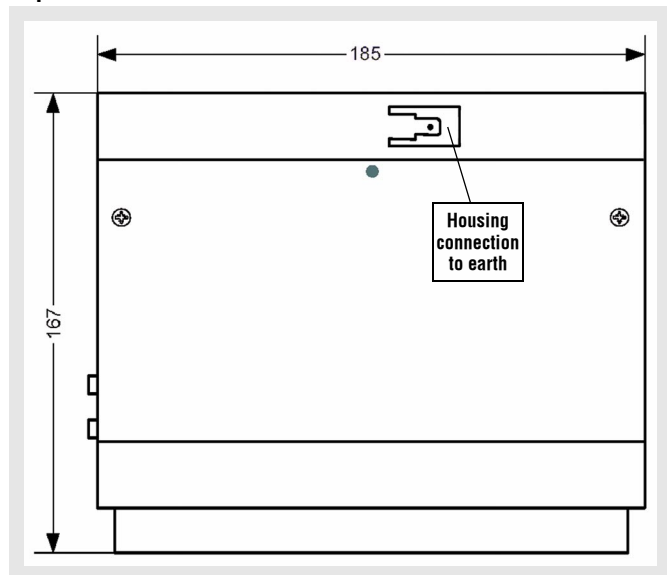
◆ Optional measuring system	
Material	Polypropylene (PPs)
Measuring system	Venturi flow meter or measuring rod

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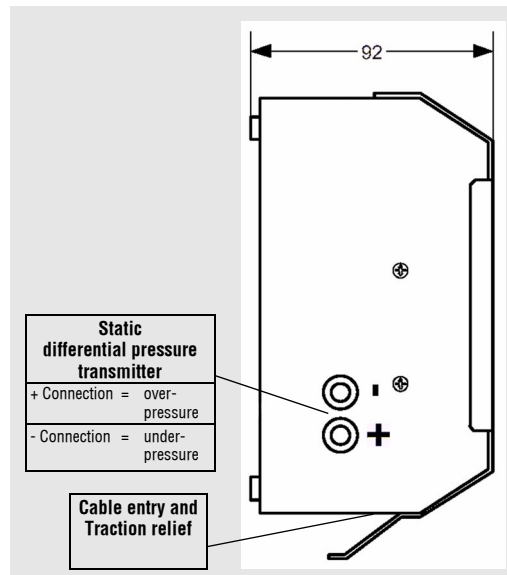
Dimensions

Housing FM100

Top view

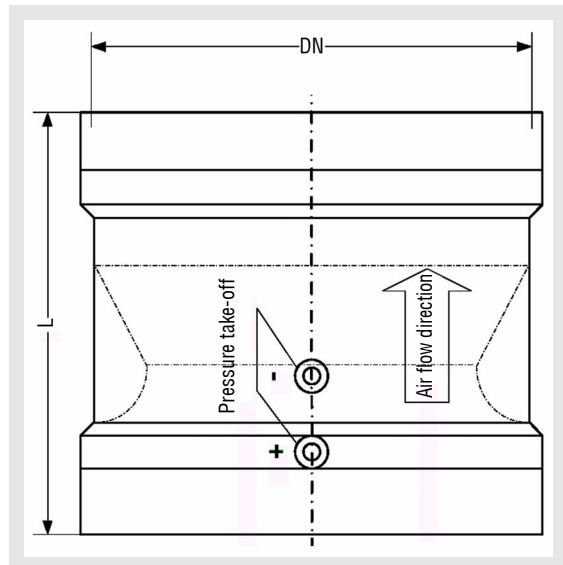


Side view



Venturi meter

Model: PPs, socket ends/socket ends



Nominal \varnothing [mm]	Length [mm]	Aperture factor B	V_{pin} [m ³ /h]	V_{max} [m ³ /h]
DN 160	190	40	80	509
DN 200	210	61	120	798
DN 250	230	92	170	1263
DN 315	600	148	280	2025

Aperture factor B at an air density of 1.2 kg/m³

Specification text

Laboratory fume hood monitoring device with integrated micro-processor, two independent watchdog circuits and static differential pressure transmitter. Monitoring of laboratory fume hood operation according to EN 14175 with acoustic and optic alarm. Optic and, optionally, acoustic warning for the operating state "Front damper" > 50 cm open". Integrated charging circuit for

Standard function indicator

Function indicator type: 0010



Measuring rod MT

suitable for installation in pipes or rectangular air ducts
Model: PP, lengths from 160 to 800 mm



For the measuring rod MT, the aperture factor B must be determined and depends on the mounting situation.

emergency power accumulator. Optional monitoring as to whether a parameterisable volumetric flow was exceeded with optic warning and parameterisation of a second monitoring values (reduced volumetric flow for night operation). Saving of system data in the power-failure-proof EEPROM. Suitable for all types of laboratory fume hoods.