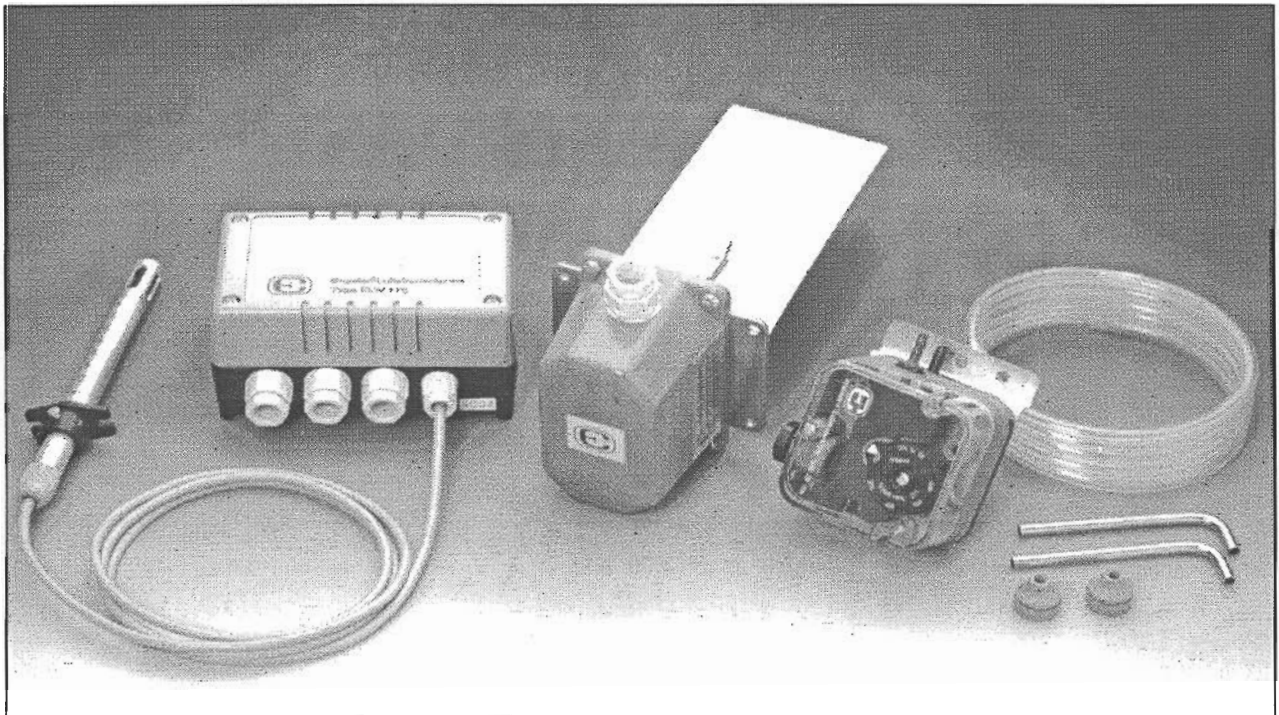


ENGELAIR®
Air Flow Monitoring

Regulation and Safe Air Flow Monitoring

for **ENGELS ELECTRIC AIR HEATERS** in heating,
air conditioning and ventilating systems

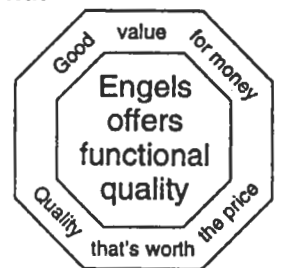


ENGELAIR® air flow monitor, a complete range for safety and control in monitoring
air flows in units and systems.*

Type ELW 170 and ELW 180, the completely new safety system solution. Complies with
the requirements of DIN 57100, part 420.

- reliable
- safe
- manual
- electronic

Safety with intelligent technology



ENGELAIR® air flow monitors serve as monitoring systems for air and non-aggressive
gasses in heating, air conditioning and ventilating systems, e.g. for heat exchangers and
filters, for registering and electrically signalling absent or deficient nominal air quantity.
Especially in conjunction with electric air heaters, air flow monitoring provides important,
additional safety. We offer all current unit systems, deliverable at short notice.

Regulation acc. to VOB 3.2.3.4./DIN 18379 / IEC Standard 364 - 4 - 42
* Regulation acc. to VDE 0100/DIN 57100, part 420

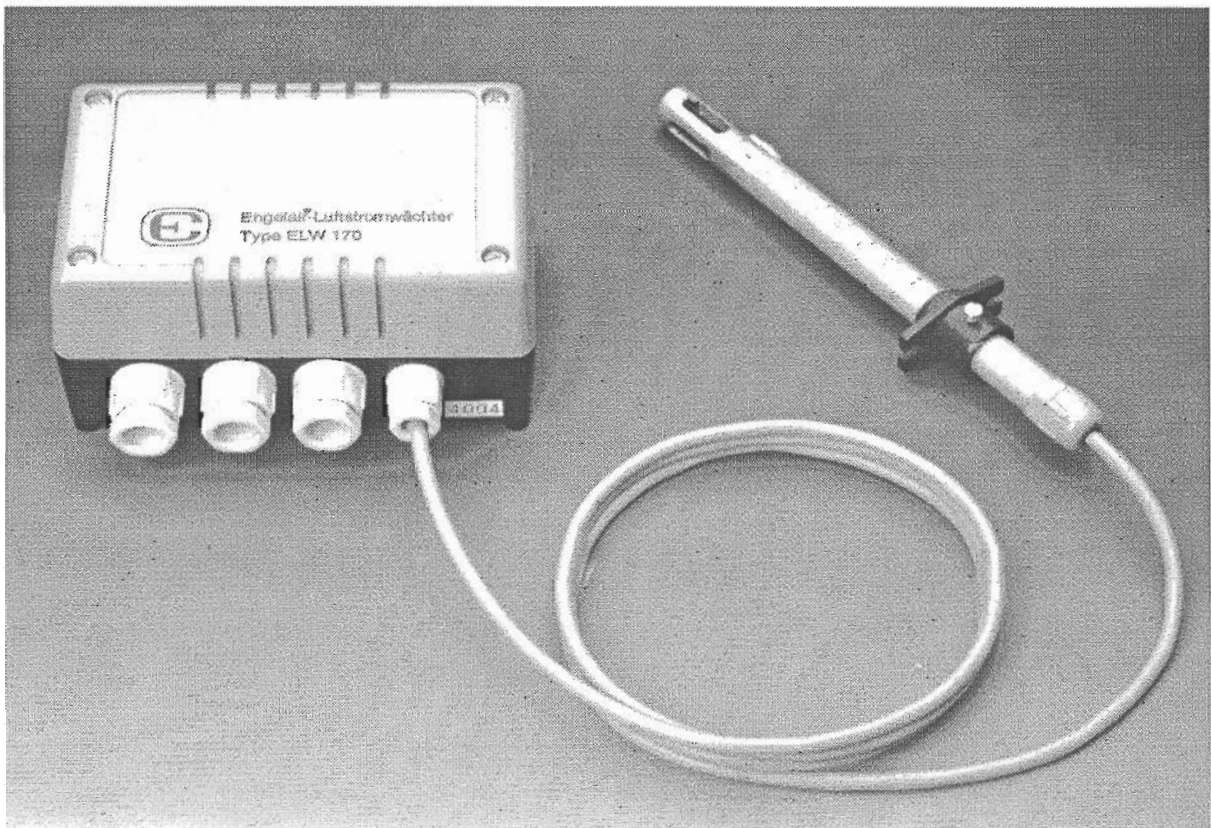


ENGELAIR® - the better solution

ENGELAIR®

AIR FLOW MONITORING

for electric air heaters,* air conditioning and ventilating systems



Electronic air flow monitors of the new generation

A completely new and comprehensive safety system solution

Air flow monitors serve as monitoring systems for air and non-aggressive gasses in heating, air conditioning and ventilating systems, e.g. for heat exchangers, units and components, filters, etc., for registering and electrically signalling absent or deficient nominal air quantity. Especially in conjunction with electric air heaters, air flow monitoring provides important, additional safety.

Engelair® air flow monitor type ELW 170

Electronic wind vane relay for installing (surface) in the measurement point area. Continuous switchpoint adjustment from 0.2 to 10 m/s. Use without an additional time lag relay.

* Regulation acc. to VOB 3.2.3.4./DIN 18379

* Regulation acc. to VDE 0100/DIN 57100, part 420

* Regulation according to IEC Standard 364-4-42



This appliance meets the requirements of EN 50081-1 and EN 50082-2 for unconditional use in industrial and residential areas.

ENGELS

Safety with intelligent technology

**Engelair®
Electronic Air Flow Monitors**

Type ELW 170

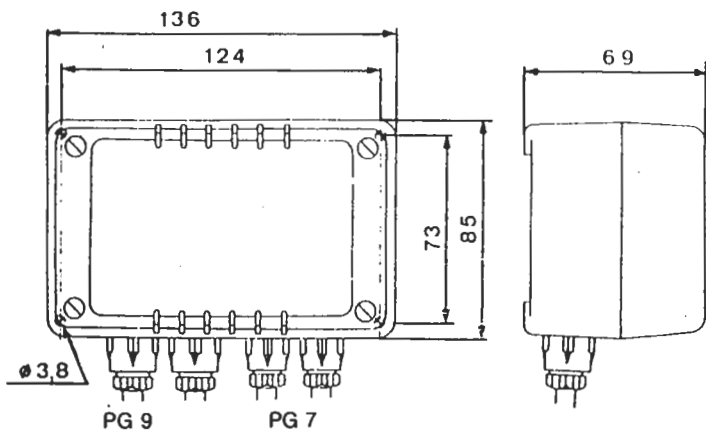
Technical Data

Dimensions: acc. as diagrammed
 Voltage: 230 V/AC, ± 15%, 50 Hz/60 Hz
 Breaking capacity: 10 A relay
 Time constants: sensor approx. 1 s
 Adjustment: internally, via potentiometer
 Time delay cut-in: pre-set to 15 s
 (poti. painted over)
 Time delay cut-out: pre-set to 2 s
 (poti. painted over)
 Thermal element: terminals 11 + 12, 42 ohms at +20°C.
 Hysteresis: 1 - 10% adjustable (from set value)
 Switch element: relay change-over switch, potential-free
 Connection: see circuit diagram
 Protective system: switch unit acc. to DIN 40050 IP 65
 Ambient temperature for the switch housing:
 253 - 353 K (-20 °C to +80 °C)
 Operating temperature for the sensor:
 253 - 373 K (-20 °C to +100 °C)
 Installation position: universal, for vertical or horizontal
 air flow.
 Manufactured acc. to EN 60730
 Voltage at sensor: 10 V, terminals 9+10
 Duty cycle: 100 %
 Connecting terminal : 2,50 mm², sensor 1,00 mm²
 Weight: 0.5 kg
 Other voltages, e.g. 24 V/110 V, on request

Installation

For installation and wiring, remove the cover of the switch unit.
 Unit is suitable for surface or duct mounting.
 When starting operation, adjust switch point. Slide duct sensor as far as possible into the duct. At lower air speed (up to approx. 1.5 m/s) the sensor opening is perpendicular to the air flow (air flows in front of sensor), at higher air speed, the sensor is horizontal with the air flow (air flows over the sensor).
 No foreign voltage may be applied to the sensor. Use sensor and switch unit only together from the same packaging unit; note identical ref. no.

Dimensional sketch of switch unit (mm)



Safety with intelligent technology

Design

Plastic switch unit housing with four PG screw connections: PG 9/PG 7.
 Material: ABS
 Duct sensor made of aluminium pipe with Kapton sensor and plastic fastening flange. The duct submersion depth is adjustable by the lock screw.
 Probe cable: 1.5 m long, shielded, 4-stranded.
 Extension up to max. 50 m, with shielded cable, min. 0.50 mm².

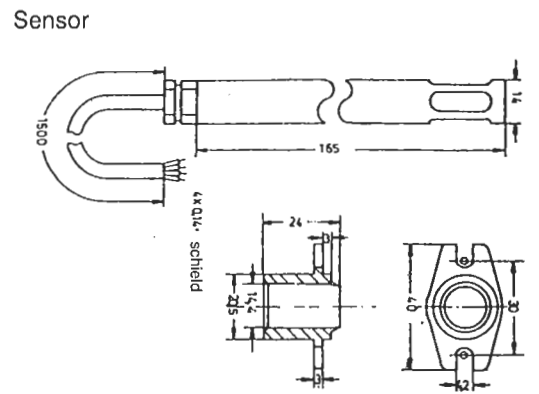
Functioning

Engelair electronic air flow monitors operate with a flow sensor, consisting of a copper constantan thermopile whose hot soldering joint is brought by an integrated heating element to an excess temperature of approx. 323 - 343 K.
 The air flow to be measured or monitored absorbs more or less heat from this hot soldering joint depending on speed, so that the outlet voltage of the thermopile, which is proportional to the resulting temperature difference, constitutes a measure of the flow rate of the air. It has a maximum with the medium at rest and then drops monotonically with increasing flow rate

The sensor responds very fast, thanks to its special design.
 The medium is monitored without the use of moving parts.
 In case of cable parting or interruption the unit automatically goes over to malfunction.
 Severe soiling affects the time constants of the sensor; clean only in a voltage-free state.
 LED signals flow present.

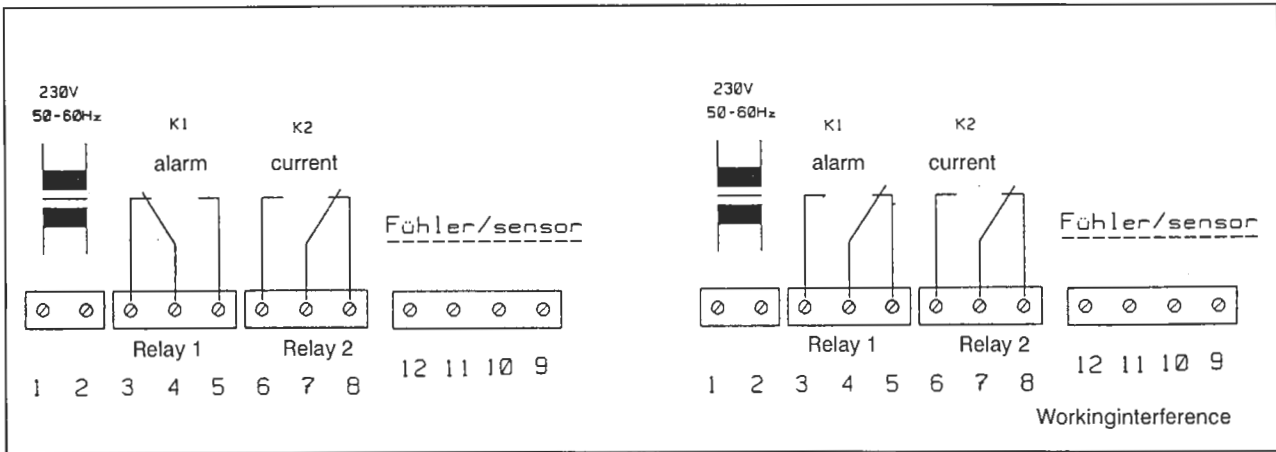
Adjustment

The „minimum flow rate“ is set ex works for delivery (approx. 1.5 m/s).
 When starting operation, the internal LED signals flow present.
 Turn up the adjusting potentiometer until the LED goes out (adjusting value is then higher than the actual speed), then turn back the adjustment slightly (LED indicator on).
 The power supply must be interrupted before renewed operation of the appliance.
 Hysteresis adaptable to any requirements.
 Adjust hysteresis as desired.



Drill scheme for fastening flange

Connection wiring diagram



Procedure

Use only relay 2, contact 7-6 as safety switch contact for the control circuit.

This ensures that the electric air heater will only be switched on if the adjusted desired/nominal flow rate is obtained.

With the previously used units, the release for switch-on usually occurred immediately and was only interrupted again on the absence of air flow.

With synchronized switching on of ventilator and heat exchanger as well, no additional time lag relay must be used.

After the time delay cut-in and in the presence of the adjusted air flow, relay 2, contact 7-6 engages. If sufficient air flow has not formed, relay 1, contact 4-5 engages. The unit goes over to malfunction status, which can be signalled via this contact. Relay 2 does not engage.

For systems with variable air flow, adjust the time delay cut-out slightly higher, if necessary.

In case of a malfunction during operation and a fall in flow rate below the set value, relay 2, contact 7-8 and relay 1, contact 4-5 switch after the time delay cut-out, so that both relays signal a malfunction and the electric air heater is immediately switched off.

The air flow monitor must be electrically locked and can only be put back in operation after unlocking.

Installation Note

To avoid functional problems, select the sensor cable extension as short as possible. The control unit can be directly fastened either to the duct or to the wall.

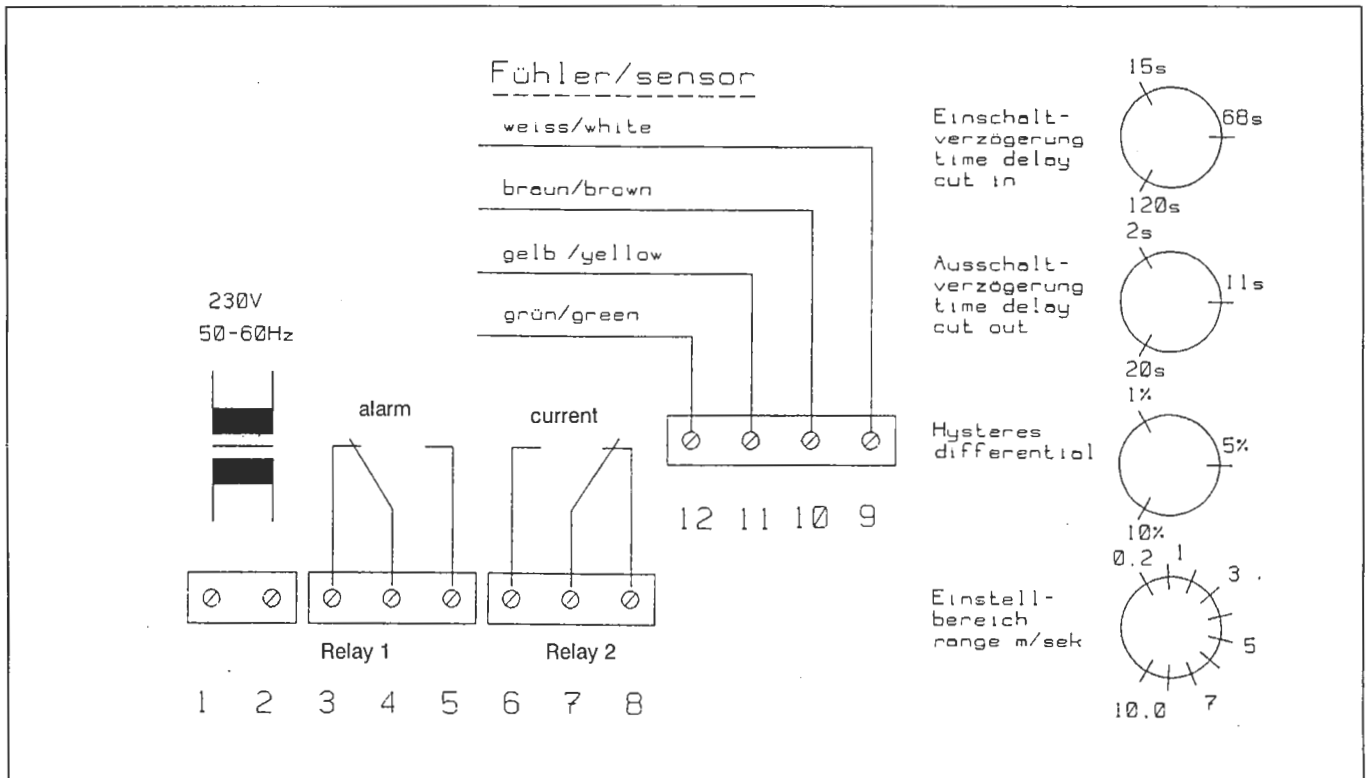
Electrical cable extension sensor with screened cable. Screen must be earthed.

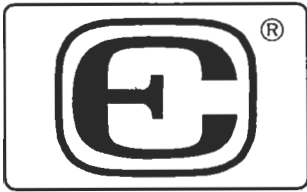
The sensor must be situated in the direct path of unobstructed air flow.

Locations in which air cushions or swirls may occur are to be avoided.

Do not place filters, multi-leaf dampers or inspection apertures between the air flow pilot switch and electric air heater.

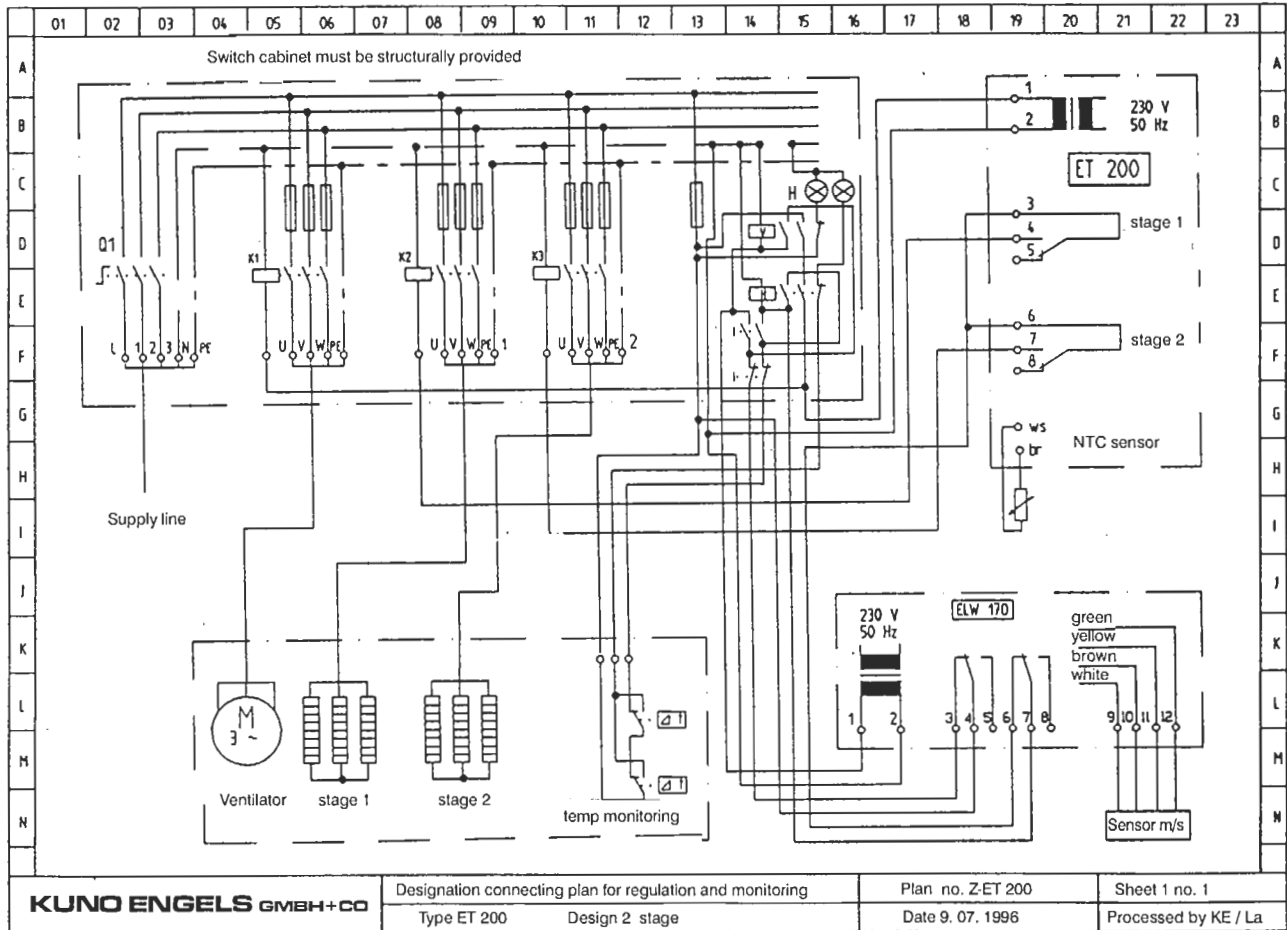
Internal unit diagram





KUNO ENGELS Vertriebs-GmbH
 Electro-technical Manufactures
 Hauptstraße 42 - D-42799 Leichlingen
 Telephone: 0049 / 2174 / 790 00 - Telefax 0049 / 2174 / 790 010

Connection plan, control and monitoring, for connection at customer location

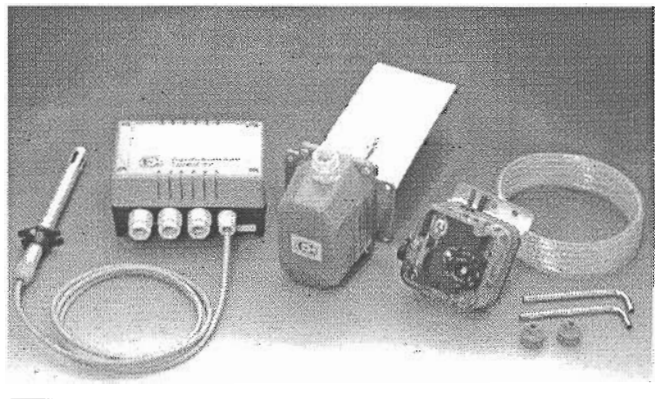


ENGELS
ELECTRIC AIR HEATERS



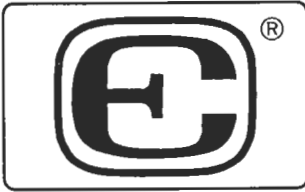
ENGELNORM® - ENGELCANAL®
ENGELCOMPACT® - ENGELVARI-O®

ENGELCONTROL® - temperature limiting
ENGELTHERM® - temperature control
ENGELAIR® - air flow monitoring
ENGELTHYROTEMP® - control system
ENGELS - heating grids®



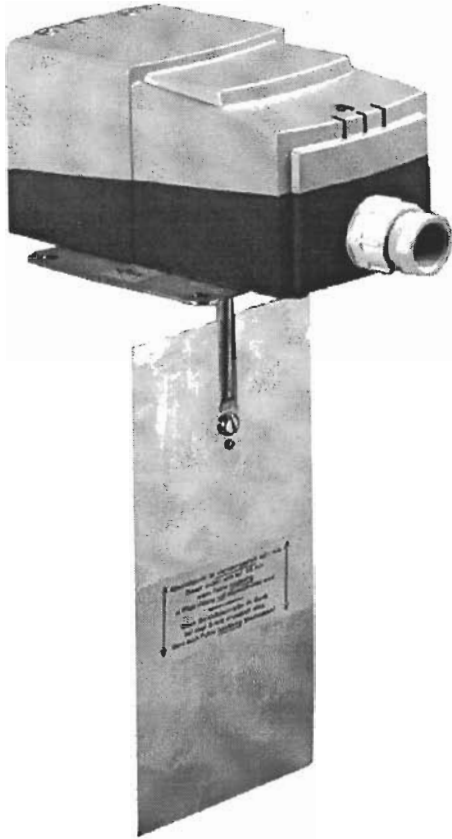
ENGELAIR® - the better solution

All data correspond to present knowledge and are subject to revision - re-printing not permitted



ENGELAIR®

Air Flow Monitor



ENGELAIR®
Air Flow Monitor Type ZB 141



Technical data

Dimensions: as in illus.
Voltage: 220/230 V - 50/60 Hz
Breaking capacity: 15A

Adj. range: from 2 m/s flow rate
(adjusted ex works to 1 m/s cut-off).
max. cut-off 8 m/s,
min cut-in 2 m/s

Adjustment: continuous by turning the range screw; with
flow rates above 5 m/s please
detach the paddle at the marking.
The basic adjustment is then 2.5 m/s.

Switch element: encapsulated micro-switch as single-
pole-change over switch, acc. to VDE 0631

Connection: red and white break contact with pressure
drop to the adjusted nominal value. Red and
blue make contact with pressure drop used
as signal contact.

Protective system: acc. to DIN 40050 IP 65

Ambient

temperature: housing max. 328K (+ 55 °C)
sensor max. 353K (+ 80 °C)

Design

Plastic housing with cable routing PG 11. Wind vane made of
0.15 mm stainless spring steel. Special axle bearings prevent
the otherwise usual wobbling.

For sealing during installation, an Abil seal is supplied.

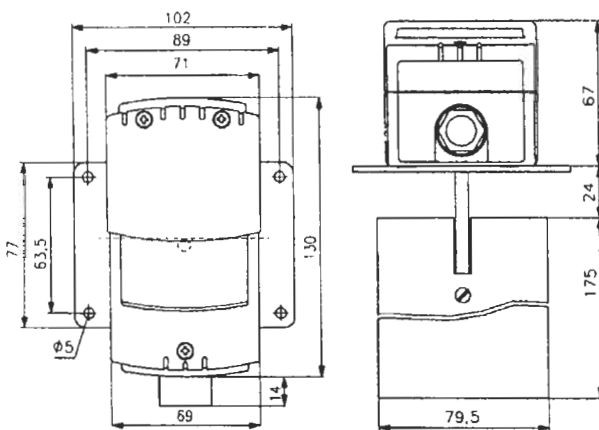
Testsign SEV.

Functioning/Note

Installation is position-independent. The unit operates when the
arrow points in the direction of air flow. For use in vertical ducts,
the desired value must be re-set at the range screw, to
compensate for the weight of the vane.

With air flow monitoring for electric heat exchangers, a starting
bridge must be provided by means of a time function element.

Do not place filters, multi-leaf dampers or inspection
apertures between the air flow pilot switch and
electric air heater.



PG 11 / M16x1,5 oder M20x1,5

Connection plan

