



AQS/TH PF

Indoor Sensor and Ventilation Control

Technical specifications and installation instructions

Item number 40115



Elsner Elektronik GmbH Control and Automation Engineering

Sohlengrund 16
75395 Ostelsheim
Germany

Phone +49 (0) 70 33 / 30 945-0 info@elsner-elektronik.de
Fax +49 (0) 70 33 / 30 945-20 www.elsner-elektronik.de

Technical support: +49 (0) 70 33 / 30 945-250

1. Description

The **Ventilation Control AQS/TH PF** combines sensor system and control technology for the ventilation system. Temperature, humidity and CO₂ level of the air are monitored. The device controls a window (open/close in one or two steps) or a ventilation device (one or two levels) via potential-free outputs.

Two inputs allow an interruption of the automatic system via external signals. A continuous movement command from a connected hand-held device, a timer or a blocking function (rain detector or similar) takes precedence.

The housing fits into standard 55 mm switching programmes and is available in two different colours. The **AQS/TH PF** is equipped with two buttons for manual control of the respective window/ventilator and for adjusting the device. The display shows current measured values and mode and guides through the set-up menus.

Functions:

- Measuring the **CO₂ level** in the air, the **temperature** and relative **air humidity**
- **Control of a window of ventilator** in one or two steps, threshold values to be adjusted individually
- **Display** of current measuring values and mode
- **2 buttons** for adjustment and manual control
- **2 inputs** for external actuation commands (button, timing, rain detector/ blocking function) with priority in case of continuous signal

1.0.1. Deliverables

- Housing with display
- CO₂ sensor unit
- Base plate
- 8-wire connecting cable

In addition you need (not included in the deliverables):

- Junction box Ø 60 mm, 42 mm depth
- Frame (for insert 55 x 55 mm), compatible to the switch scheme used in the building

1.1. Technical data

Housing	Plastic (partially painted)
Colours	<ul style="list-style-type: none"> • bright white (similar to RAL 9016 traffic white) • special colours on request
Mounting	Flush mounting (wall mounting in junction box Ø60 mm, 42 mm depth)
Protection category	IP 20

Dimensions	Housing approx. 55 x 55 (W x H, mm), Mounting depth approx. 15 mm, Base plate approx. 71 x 71 (W x H, mm)
Total weight	approx. 85 g
Ambient temperature	Operation 0...+50°C, storage -10...+60°C
Ambient humidity	max. 95% RH, avoid condensation
Operating voltage	24 V DC \pm 20%
Power consumption	max. 16 mA
CO ₂ measuring range	0...2000 ppm
CO ₂ resolution	1 ppm
CO ₂ accuracy*	\pm 50 ppm \pm 3% of the measuring value
Temperature measuring range	0...+50°C
Temperature resolution	0.1°C
Temperature accuracy*	\pm 0.5°C at 0...+50°C
Humidity measuring range	0% RH...95% RH
Humidity resolution	0.1%
Humidity accuracy	\pm 7,5% RH at 0...10% RH \pm 4,5% RH at 10...90% RH \pm 7,5% RH at 90...95% RH
Ventilation outputs	2 semi-conductor outputs, open collector max. 50 V AC/DC, 100 mA
Inputs	2 button inputs (with +24 V supply)

* Please note the information on *measuring accuracy* below.

The product conforms with the provisions of EU directives.

1.1.1. Measuring accuracy

Follow the instructions in chapter *Installation position* to avoid sources of interference and to ensure the specified accuracy of the sensor. To ensure a correct CO₂ measurement, the device must be installed in a windproof socket.

The indicated **accuracy of the CO₂ measurement** will be achieved after a run-in period of 24 hours (without interruption of the bus voltage) if the sensor has been in contact with fresh air (350...450 ppm) at least once in this period. During the warm-up phase the reading may not be displayed at all or wrongly, or remain frozen at 2001. After this, the CO₂ sensor will recalibrate every two weeks by defining the lowest measured value captured during that period (without interruption of the bus voltage) as a reference for fresh air.

The guarantee the accuracy on a sustained basis, the sensor should be provided with fresh air at least once in two weeks. This occurs normally during room ventilation.

When **measuring temperature**, the self-heating of the device is considered by the electronics. The heating is compensated by reducing the measured temperature by the self-heating of 0.7°C. The indicated indoor temperature measured value approaches the

actual room temperature during a 2 hours heating period. Additionally, the temperature can be adjusted in the basic settings menu.

2. Installation and start-up

2.1. Installation notes



Installation, testing, operational start-up and troubleshooting should only be performed by an electrician.



CAUTION! **Live voltage!**

There are unprotected live components inside the device.

- National legal regulations are to be followed.
 - Ensure that all lines to be assembled are free of voltage and take precautions against accidental switching on.
 - Do not use the device if it is damaged.
 - Take the device or system out of service and secure it against unintentional use, if it can be assumed, that risk-free operation is no longer guaranteed.
-

The device is only to be used for its intended purpose. Any improper modification or failure to follow the operating instructions voids any and all warranty and guarantee claims.

After unpacking the device, check it immediately for possible mechanical damage. If it has been damaged in transport, inform the supplier immediately.

The device may only be used as a fixed-site installation; that means only when assembled and after conclusion of all installation and operational start-up tasks and only in the surroundings designated for it.

Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

2.2. Installation location

The **Ventilation Control AQS/TH PF** are installed flush to the wall surface in a junction box (R 60 mm, 42 mm deep).



May be installed and operated in dry interior rooms only.
Avoid condensation.

When selecting an installation location, please ensure that the measurement results are affected as little as possible by external influences. Possible sources of interference include:

- Direct sunlight

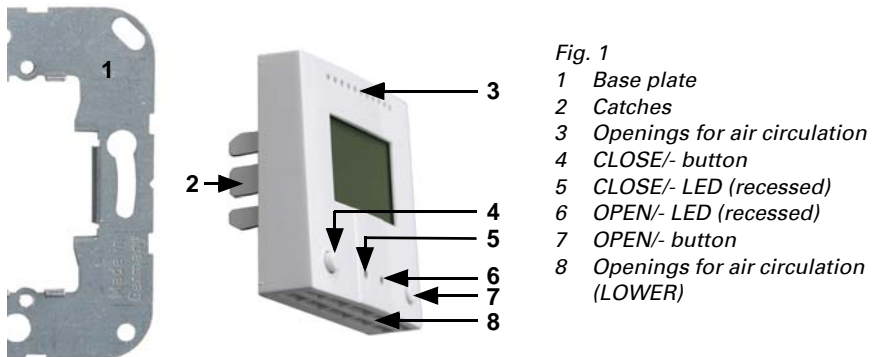
- Drafts from windows and doors
- Draft from ducts which lead from other rooms or from the outside to the junction box in which the sensor is mounted
- Warming or cooling of the building structure on which the sensor is mounted, e.g. due to sunlight, heating or cold water pipes
- Connection lines and ducts which lead from warmer or colder areas to the sensor

Measurement variations from such sources of interference must be corrected in the basic settings menu in order to ensure the specified accuracy of the sensor.

To ensure a correct CO₂ measurement, the device must be installed in a windproof socket.

2.3. Sensor connection and design

2.3.1. Housing



2.3.2. Connection board



Fig. 2

- 1 Slot CO₂ sensor unit
- 2 Socket for 8-wire connecting cable, see Fig. 4
- 3 Plug CO₂ sensor unit
- 4 CO₂ sensor unit

Cable length of CO₂ sensor approx. 110 mm.

- a Hole distance approx. 43 mm
- b Membrane diameter approx. 18 mm

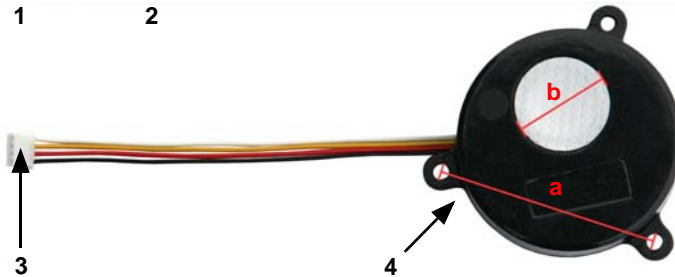


Fig. 3

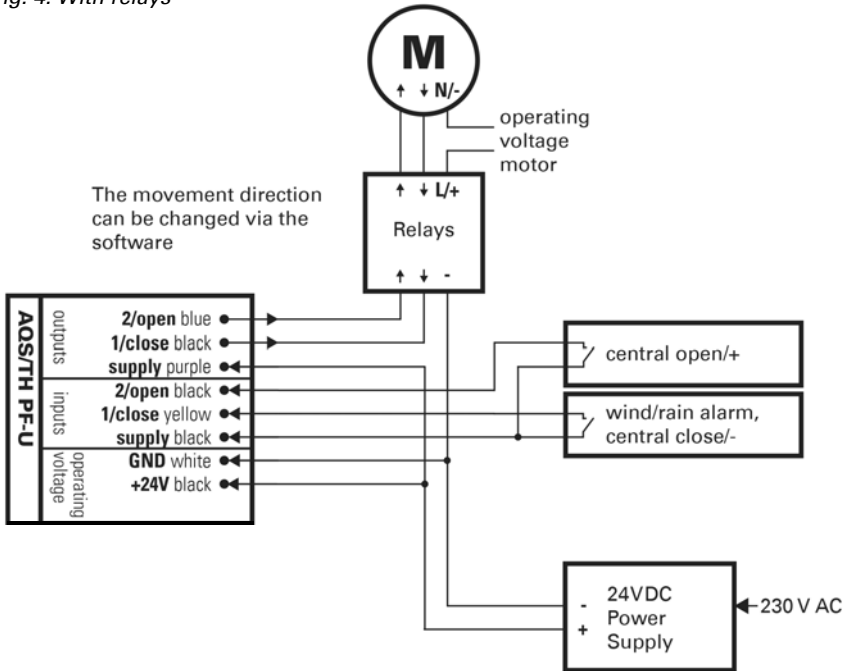
8-wire connecting cable for control outputs, inputs and operating voltage:



■	blue	Output 2 (OPEN window, Ventilator level 2)
■	black	Output 1 (CLOSE window, Ventilator level 1)
■	purple	Supply voltage for output 1+2
■	black	Input 2 (OPEN/+)
■	yellow	Input 1 (CLOSE/-)
■	black	Supply voltage for input 1+2
■	white	Operating voltage GND
■	black	Operating voltage +24 V

2.3.3. Wiring diagram Window

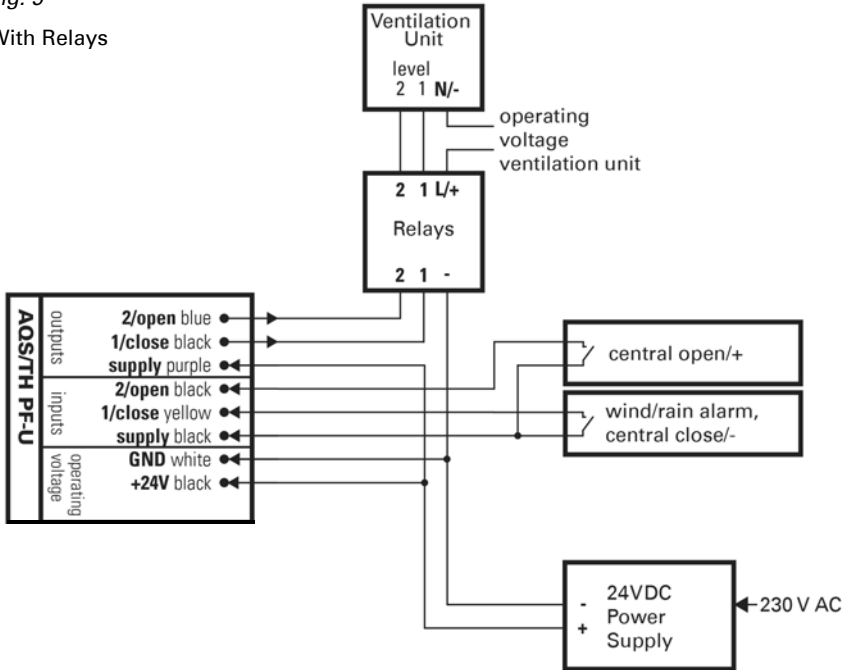
Fig. 4: With relays



2.3.4. Wiring diagram Ventilation Units

Fig. 5

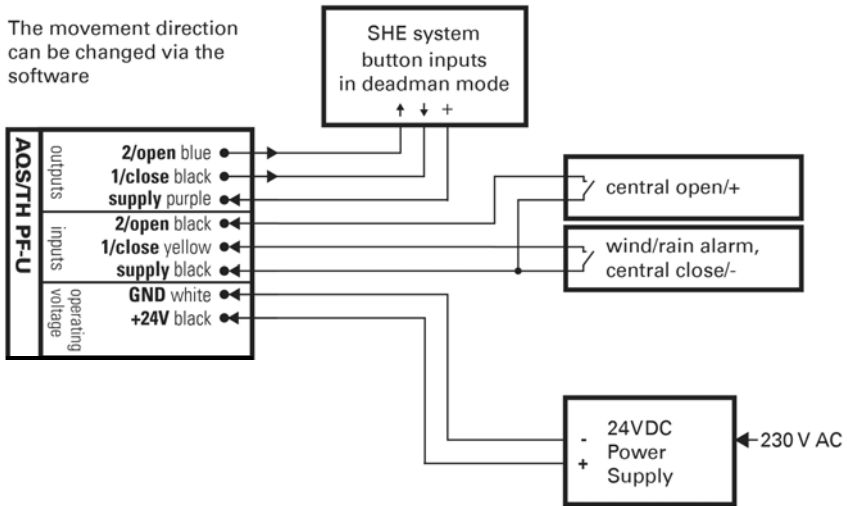
With Relays



2.3.5. Wiring diagram smoke and heat extraction system

Fig. 6

The movement direction can be changed via the software



2.4. Sensor assembly

First, place the windproof box with the supply connection. Seal the inlet tubes, too, in order to prevent drafts.



Place the CO₂ sensor unit into the box. The side with the sensor membrane must be facing the front.

Fig. 7

Then screw the base plate onto the junction box and position the frame of the switch range on top of this. Connect the CO₂ sensor unit, operating voltage and all other connections.

Insert the sensor housing firmly into the metal frame using the catches, so that the sensor and frame are fixed together.

2.5. Notes on mounting and commissioning

Never expose the device to water (e.g. rain) or dust. This can damage the electronics. You must not exceed a relative humidity of 95%. Avoid condensation.