

FIMX8 | AIR FILTER MONITOR

Mounting and operating instructions



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SAFETY AND PRECAUTIONS



Read all the information, the datasheet, Modbus map, mounting and operating instructions and study the wiring and connection diagram before working with the product. For personal and equipment safety, and for optimum product performance, make sure you entirely understand the content before installing, using or maintaining this product.



For safety and licensing (CE) reasons, unauthorised conversion and / or modifications of the product are inadmissible.



The product should not be exposed to abnormal conditions, such as extreme temperatures, direct sunlight or vibrations. Long-term exposure to chemical vapours in high concentration can affect the product performance. Make sure the work environment is as dry as possible; avoid condensation.



All installations shall comply with local health and safety regulations and local electrical standards and approved codes. This product can only be installed by an engineer or a technician who has expert knowledge of the product and safety precautions.



Avoid contact with energised electrical parts. Always disconnect the power supply before connecting, servicing or repairing the product.



Always verify that you apply appropriate power supply to the product and use appropriate wire size and characteristics. Make sure that all the screws and nuts are well tightened and fuses (if any) are fitted well.



Recycling of equipment and packaging should be taken into consideration and these should be disposed of in accordance with local and national legislation / regulations.



In case there are any questions that are not answered, please contact your technical support or consult a professional.

PRODUCT DESCRIPTION

FIMX8 are filter monitors for observation of air filters in HVAC systems. Their purpose is to provide information on filter status and notify on the level of clogging. They can be equipped with one or two differential pressure sensors to measure the pressure drop on both sides of the filter. The pressure difference shows how clogged the filter is. The internet connection is based on the integrated Sentera Internet Gateway (SIG-M-2 or SIGWM). Via SenteraWeb measurements can be monitored and Modbus registers can be reset.

ARTICLE CODES

Article code	Monitoring of	Wi-Fi	Ethernet LAN connection
FIM18-1K0-WF	1 filter	yes	no
FIM28-1K0-WF	2 filters		no
FIM18-1K0-EW	1 filter		yes
FIM28-1K0-EW	2 filters		yes

INTENDED AREA OF USE

- Online monitoring of air filters in HVAC systems using SenteraWeb

TECHNICAL DATA

- Power supply: 85—264 VAC / 50—60 Hz
- Maximum current consumption: 25 mA
- 1 or 2 differential pressure channels with built-in digital high resolution differential pressure sensor
- Data transmission to and from the Internet via standard Ethernet or Wi-Fi
- Firmware updates via internet (SenteraWeb) or Wi-Fi
- LED indications
- Implemented MQTT protocol
- Configurable filter warning and filter alarm pressure
- Clogged filter notifications are sent by SenteraWeb via SMS or email
- Operating ambient conditions:
 - ▶ Temperature: -5—65 °C
 - ▶ Rel. humidity: < 95 % rH (non-condensing)
- Storage temperature: -20—70 °C

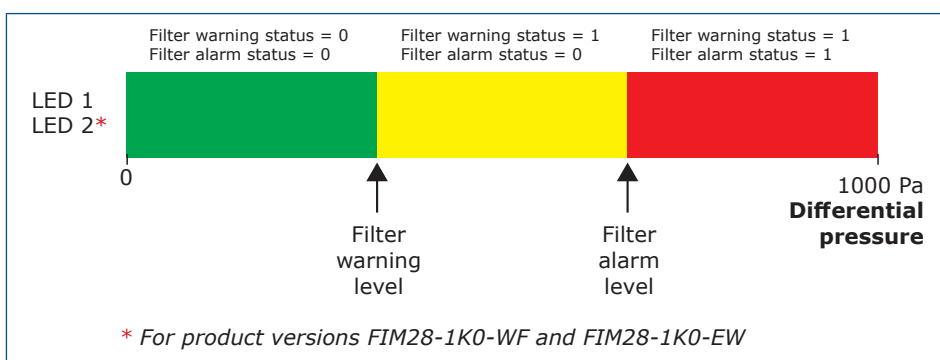
STANDARDS

- EMC Directive 2014/30/EC:
 - ▶ EN 61000-6-2:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments Amendment AC:2005 to EN 61000-6-2
 - ▶ EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments Amendments A1:2011 and AC:2012 to EN 61000-6-3
 - ▶ EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
 - ▶ EN 55011:2009 Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement Amendment A1:2010 to EN 55011
 - ▶ EN 55024:2010 Information technology equipment - Immunity characteristics - Limits and methods of measurement



- LVD directive 2014/35/EU:
 - ▶ EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - ▶ EN 62311:2008 Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)
 - ▶ EN 60950-1:2006 Information technology equipment - Safety - Part 1: General requirements Amendments AC:2011, A11:2009, A12:2011, A1:2010 and A2:2013 to EN 60950-1
- Radio equipment directive 2014/53/EU
 - ▶ EN 300 328 V2.1.1 Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
- ETSI EN 301 489-1 V2.1.1 (2017-02) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU
- ETSI EN 301 489-17 V3.1.1 (2017-02) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
- RoHS Directive 2011/65/EC
 - ▶ EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

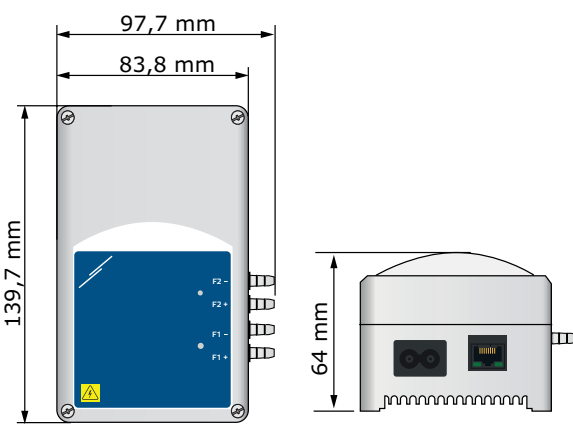
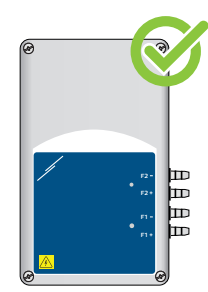
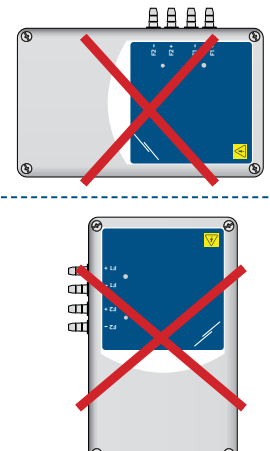
OPERATIONAL DIAGRAM



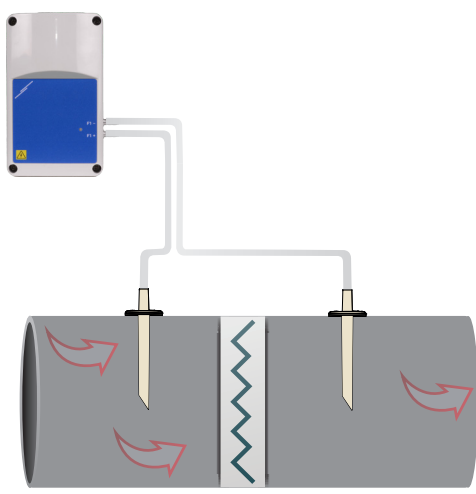
MOUNTING INSTRUCTIONS IN STEPS

Before you start mounting the unit, read carefully **"Safety and Precautions"**. Choose a smooth surface for installation (a wall, panel, etc.) and follow these steps:

1. Unscrew the front cover of the enclosure to remove it.
2. Attach the enclosure to the surface with suitable fasteners, taking into account the mounting dimensions in **Fig. 1** and the correct mounting position shown in **Fig. 2** below.

Fig. 1 Mounting dimensions	Fig. 2 Mounting position	
	Correct	Incorrect
		

3. Put back the front cover and secure it with the screws.
4. Connect the nozzles to the duct (see **Fig. 3**). Depending on the application, you must use a specific connection set such as Sentera's PSET-PVC-200 or PSET-QF-200 as indicated in **Fig. 3** below.

Fig. 3 Connecting with accessories
Application: Measuring differential pressure [Pa] or volume flow [m ³ /h] using PSET-PVC


5. Insert the power cord in the power socket.
6. Activate the power supply.

7. Connect the internet gateway to the internet via Wi-fi or via a LAN cable. If you want to connect the FIMX8 to your internet router via cable, you can do so via the Ethernet connection, using a standard network cable - **Fig. 4**.

Fig. 4 Connections



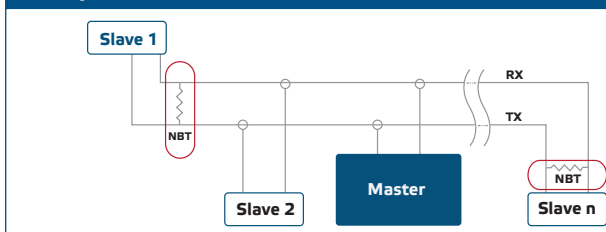
NOTE

For sensor calibration and Modbus registers reset procedures, see section "Operating instructions".

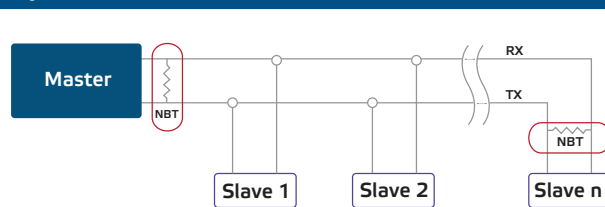
Optional settings

To assure correct communication, the NBT needs to be activated in only two devices on the Modbus RTU network. If necessary, enable the NBT resistor via 3SModbus or Sensistant (Holding register 9).

Example 1



Example 2



NOTE

On a Modbus RTU network, two bus terminators (NBTs) need to be activated.

NOTE

For the complete Modbus register data, refer to the product Modbus Register Map, which is a separate document attached to the article code on the website and contains the registers list. Products with earlier firmware versions may not be compatible with this list.

VERIFICATION OF INSTALLATION

Even if the LED brightness is set to "0" via holding register 31, the LED(s) on the enclosure should blink three times after the unit has been supplied and while it is measuring the filter status.

The green LED1 inside the enclosure lights up to indicate successful connection to the internet. The red LED3 on the printed circuit board lights up in case the connection to the internet is not successful. The SIG-M-2 or SIGWM gateway is integrated in the unit, so if you need further information, consult the SIG-M-2 or SIGWM documentation on our website. For further details on LED indications, please see **Fig. 5** and **Fig. 6** below.

 **NOTE**

For more information, refer to the product datasheet - Settings and indications.

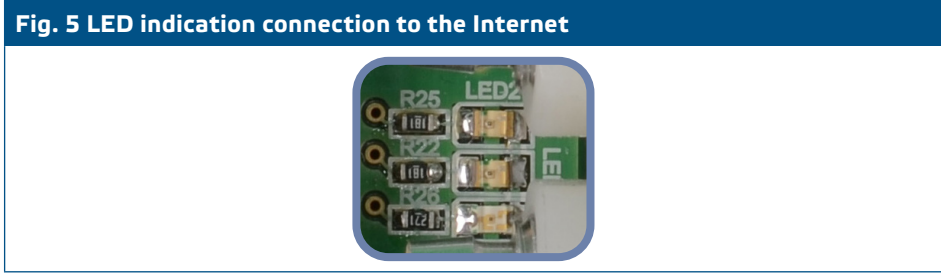
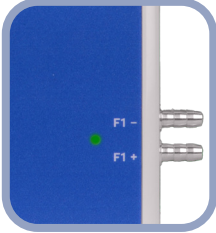
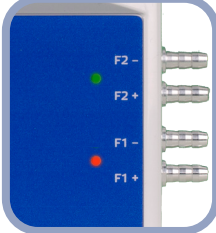


Fig. 6 LED indications on cover	
FIM18-1K0-XX	FIM28-1K0-XX
	
Green	Pressure level is lower than specified filter warning level.
Yellow	Pressure level is higher than specified filter warning level but lower than filter alarm level.
Red	Pressure level is higher than filter alarm level.
Pink	No communication with pressure sensor.
Bootloader mode: LED F1 is alternately blinking blue and green. It blinks red during programming.	

 **ATTENTION**

The status of the LEDs can be checked only when the unit is energised. Take the relevant safety measures!

 **ATTENTION**

LED intensity can be adjusted between 0 and 100 % with a step of 10 % according to the value set in Holding register 31.

OPERATING INSTRUCTIONS

- Calibration procedure:
1.

2.
- Disconnect the nozzles and make sure they are not clogged.
Enter "1" in holding register 20 to calibrate sensor 1. If your product version has two sensors, to calibrate the second one enter '1' in Holding register 30.

ATTENTION

Make sure the nozzles are disconnected and free.

Internet connection reset button

Both the EW and WF product versions feature Wi-Fi connection. The EW version also features LAN connection. Pressing the button in **Fig. 7** below resets the Ethernet LAN module in product versions FIM18-1K0-EW and FIM28-1K0-EW. The Wi-Fi module can be reset using the same button in the FIM18-1K0-WF and FIM28-1K0-WF product versions.

Fig. 7 Internet connection reset button



Reset tact switch for Wi-Fi (for both EW and WF versions)

In case of connection problems or to stop Wi-Fi connection: press and hold the reset tact switch shown in **Fig. 8** below until the blue LED on the Wi-Fi module lights up. If the LED goes out, the Wi-Fi connection is lost. If necessary, you can reconnect to any network via the SenteraWeb configuration page: <http://192.168.1.123>.

Fig. 8 Reset tact switch for Wi-Fi



TRANSPORT AND STORAGE

Avoid shocks and extreme conditions; stock in original packing.

WARRANTY AND RESTRICTIONS

The warranty against manufacturing flaws is valid for two years starting from the date of delivery. Any alterations or adjustments to the product absolve the manufacturer of all liability. The manufacturer disclaims all liability for typographical or other errors in this document.

MAINTENANCE

In normal conditions this product is maintenance-free. If soiled, clean with a dry or damp cloth. In case of heavy pollution, clean with a non-aggressive product. In these circumstances the unit should be disconnected from the supply. Pay attention that no fluids enter the unit. Only reconnect it to the supply when it is completely dry.