



F103x Series

Polymer Capacitor Standard Dewpoint Transmitter

• Instruction Manual •

Version: 1.05

Experts in Compressed Air & Fluid Measurement

Fast · Accurate · Management

Preface

- Dear customer, thank you for choosing our products.
- This manual is a description of the use range, functions, installation and operation methods, troubleshooting, and maintenance of the product.
- The user must read this operation manual completely before using the device to properly use the product.
- After you read it, keep it in an accessible place for the next operational reference.

Notice

- Fix Instruments is not responsible for damage caused by unauthorized changes to the equipment without reviewing the operation manual or violating the provisions of this operation manual, and the instrument guarantee will be automatically voided.
- Fix Instruments is not responsible for incidental damage caused by transportation, equipment performance, or mishandling.
- Fix Instruments do not promise the suitability of this equipment for any application not described herein.
- Fix Instruments have tried to make the information in this manual correct. If you find any problems, you are welcome to contact us.
- The contents of this manual are forbidden to be reproduced, copied, or modified without permission.
- Due to ongoing product improvements, specifications and designs are subject to change without prior notice. Please refer to the actual product for final confirmation.

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1 Safety Instructions

1.1 General Safety Instructions

**Danger!****Compressed air!**

Any contact with rapid air leaks or pressurized parts of the compressed air system can lead to significant injury or even death.

- Never exceed the recommended pressure range.
- Make sure air tools & hoses are in good condition.
- Ensure the system is not under pressure when performing repair & maintenance.

**Danger!****Power voltage!**

Any contact with the electrical parts of the product can lead to significant injury or even death.

- Consider all electrical installation-related regulations.
- Any power connections must be disconnected when performing repair & maintenance.
- Any electrical work on the system is to be performed by authorized personnel only.

**Attention!****Operating conditions!**

Please check the permissible operating conditions. Any operation beyond these limits could potentially cause measurement failure or even damage the instrument or the entire system.

- Please review national standards and regulations during the preparation and installation process.
- The product is prohibited for use in explosive areas.
- Ensure the product operates within the allowed working conditions.

**Caution!****Product malfunction!**

Incorrect handling and improper transport could cause product malfunction.

- Unauthorized disassembly of the product is prohibited.
- Use correct and appropriate tools to operate to product.
- In case the product malfunctions, please stop using it and contact customer support.

1.2 Storage and Transport Safety

- Ensure the product is transported at a temperature of -20 ... +60 °C.
- It is recommended to use the product's original packaging for storage and transport.
- Make sure the product is stored at a temperature of -40 ... +80 °C.
- Avoid exposure to sunlight and UV rays.
- The storage humidity must be < 90% and free of condensation.

2 Product Overview

2.1 Application

F103x Series is a sensor for detecting the dewpoint in industrial applications within the allowable range of technical data.

These technical data can be found in the **Technical Data**.

Compared with other types of sensors, polymer capacitive sensors are the best in terms of accuracy, response times, long-term stability, and price performance when the dewpoint of the measurement medium is above -40 °Ctd.

Revolutionary auto-calibration circuit design automatically compensates for measuring drift caused by temperature, contamination, and aging, providing long-term stability and high accuracy measurements.

Innovative temperature compensation algorithm and multi-point temperature-compensated calibration, greatly reduces temperature-dependent dewpoint drift and ensuring high-precision dewpoint measurement over a wide temperature range.

2.2 Features

- ✓ Based on polymer thin film capacitive sensor technology
- ✓ Application in dewpoint > -60 °Ctd:
Refrigerant dryers, desiccant dryers, industrial gases
- ✓ 10+ points of dew point calibration and multi-point temperature compensation provide accurate measurements up to ± 2 °Ctd (Refer to **Technical Data**)
- ✓ Ultra-fast response time and outstanding long-term stability
- ✓ Anti-condensation, resistant to particulate contamination, oil vapor and most chemicals
- ✓ Excellent immunity to interference
- ✓ IP65 protection class, providing good protection even in harsh environments
- ✓ Provides comprehensive sensor setup, data transfer, software upgrades, and maintenance via Modbus RTU (RS485) interface and powerful service APP
- ✓ Calibration is valid for two years, reducing maintenance

2.3 Technical Data

Measurement Range	
Dewpoint	
F103A	-60 ... +20 °Ctd
F103B	-60 ... +60 °Ctd
Temperature	-40 ... +100 °C

Accuracy	
Dewpoint (Air or Nitrogen)	
+60 ... -20 °Ctd	±2 °Ctd (Standard) ±0.5 °Ctd (Customized)
-20 ... -60 °Ctd	±2 °Ctd
Temperature (Customizable)	
0 ... +50 °C	± 0.3 °C (Standard)
-40 ... 0 °C & +50 ... +100 °C	± 0.5 °C (Standard)
Response Time	
Dewpoint: 63% [90%], Reference: 20 °C, 1 bar(a), 4 L/min	
-50 → +20 °Ctd	20 sec [40 sec]
+20 → -50 °Ctd	1 min [3 min]
Power	
Measuring State	10 ... 30 VDC Max 1.5 W @ 24 VDC
Output	
Analog Output (Customized)	4 ... 20 mA (3-wire)
Analog Resolution	0.002 mA
Analog Drift	0.01 % of span/°C
Analog Load	Max. 500 ohm
Digital Output	Modbus RTU (RS485)
Connector	5pin M12, Female
Operating Environment	
Environment Temperature	-30 ... +70 °C
Storage Temperature	-40 ... +80 °C
Relative Humidity	0 ... 95 %RH
Sample Gas Flow Rate	>1 L/min
Pressure	0 ... 5 MPa(a) 0 ... 35 MPa(a) (Option)
Other	
Process Connection	ISO G1/2" thread (Standard) 3/4" - 16 UNF thread (Customized)

	5/8" - 18 UNF thread (Customized)
Protection Code	IP65
Casing Material	SUS304
Sensor Filter	Stainless steel sinter filter (Filtration class 30~45 μm)
EMC	Compliant with IEC 61326-1

3 Dimension & Installation

3.1 Dimension (in mm)

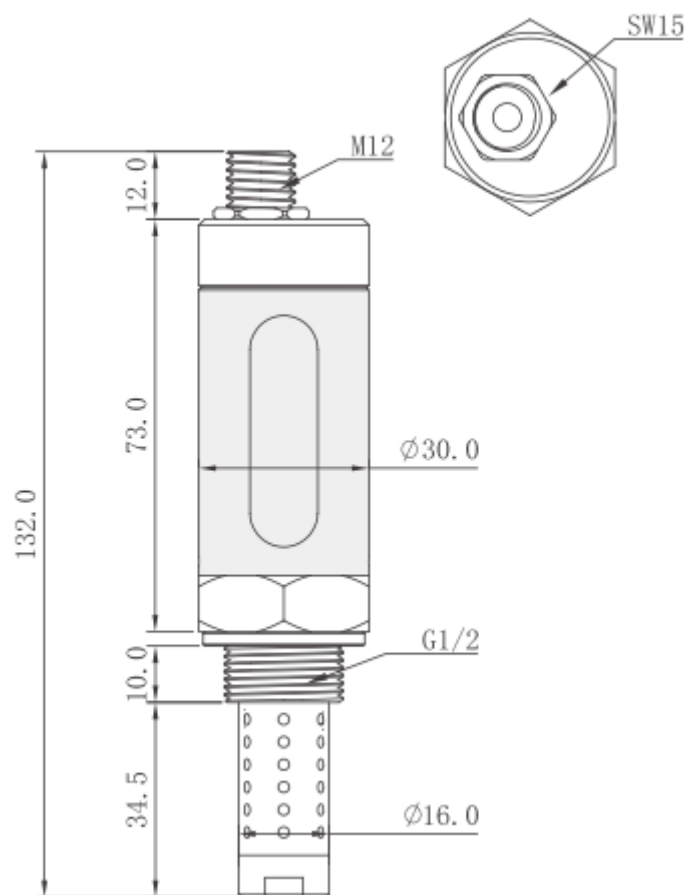


Figure 3-1 F103x Series Dimension Diagram

3.2 Installation Procedure

The following situations are recommended for installation with measuring chambers:

A: Risk of water splashing on the sensor

B: High process temperature

C: Required to install or remove measurement devices in operating, pressurized condition

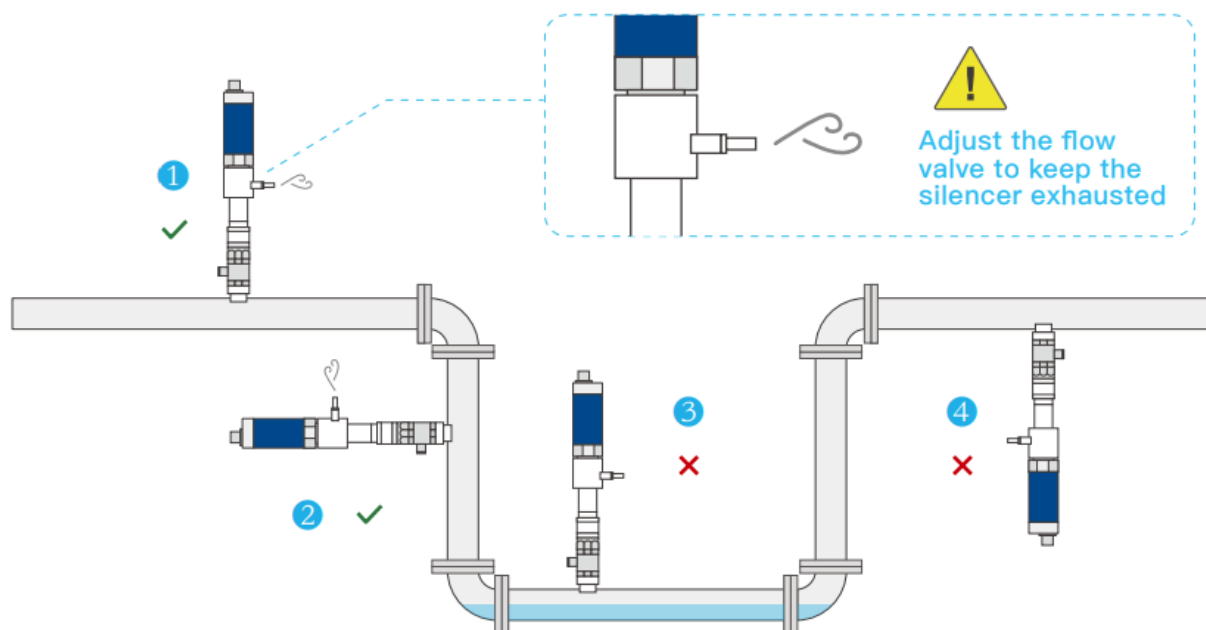


Figure 3-2 Installation with Measuring Chambers

The following situations are recommended for installation directly on the pipe:

A: The gas in the pipeline cannot be exhausted directly (for example: dangerous gases or expensive process gases)

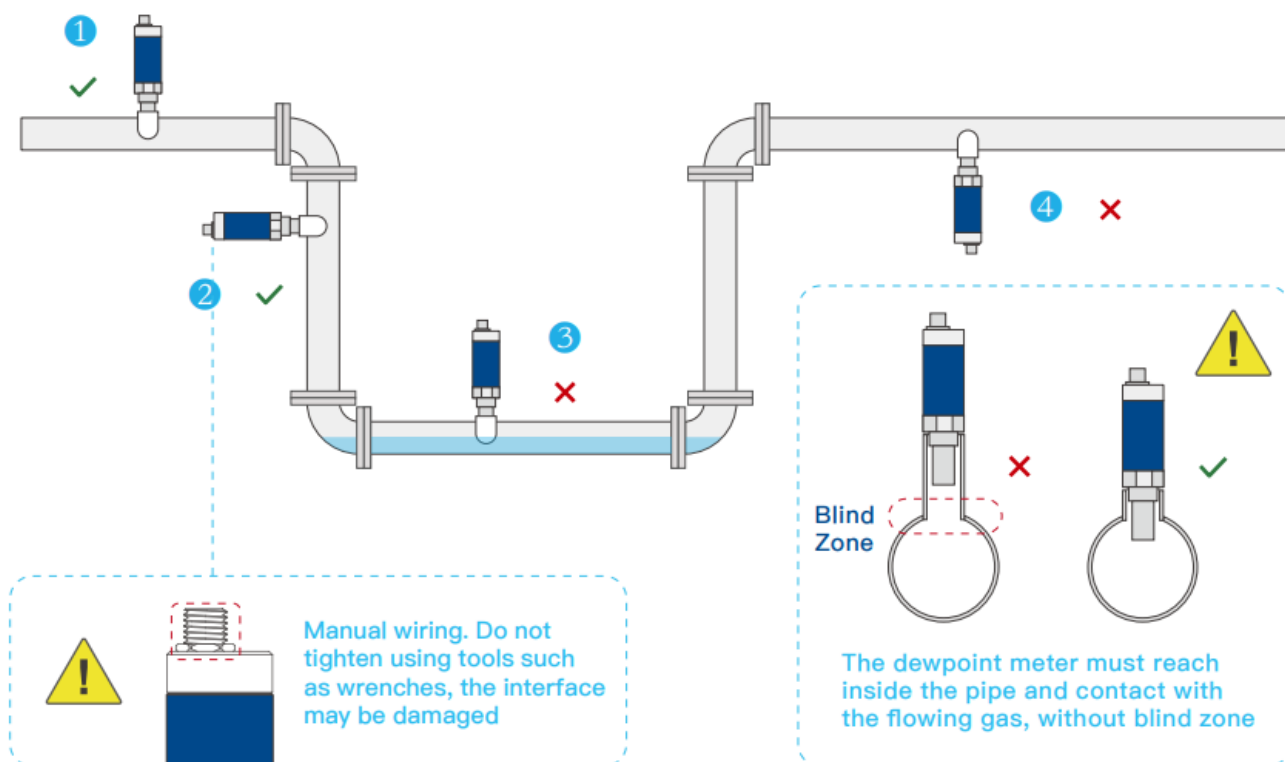


Figure 3-3 Installation Directly on the Pipe

3.3 Electrical Wiring

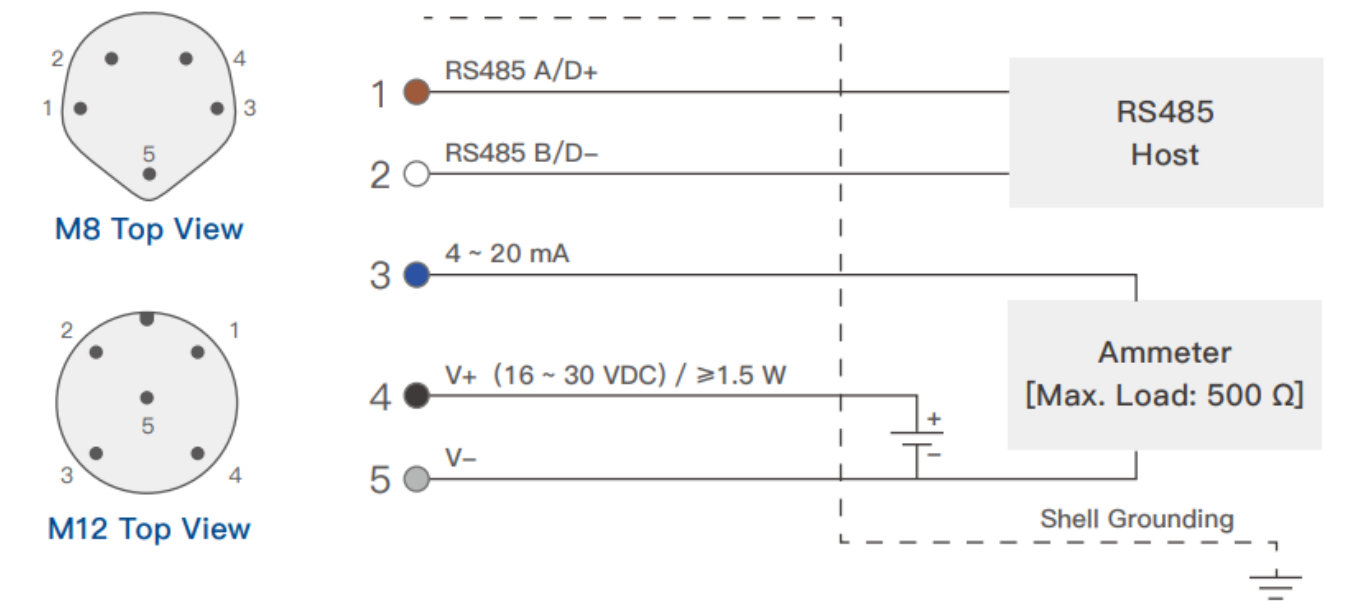


Figure 3-4 Electrical Connection Diagram

Connector	Pin1	Pin2	Pin3	Pin4	Pin5
Signal	RS485 A/D+	RS485 B/D-	4~20mA	V+	V-
FixInst Cable Color	Brown	White	Blue	Black	Grey

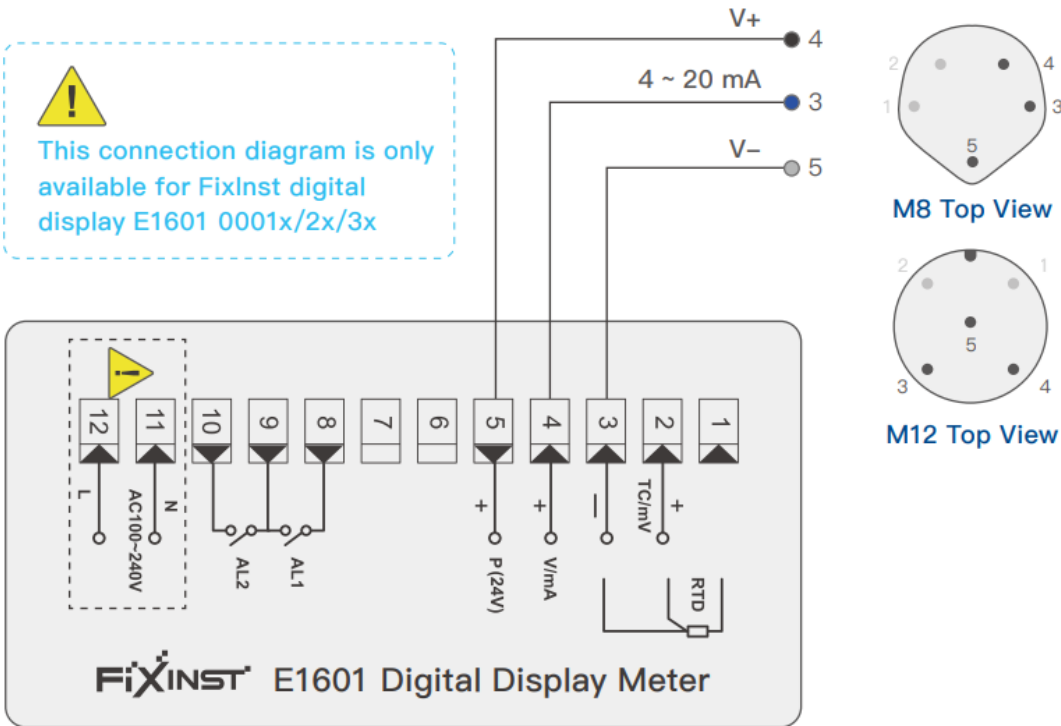


Figure 3-5 Electrical Connection Diagram of Digital Display Meter

4 Other Optional Accessories

4.1 Measuring Chamber

Many different types of measuring chambers such as quick connector type, by-pass type, dryer-specific type and high pressure type. For more information, please contact local distributor or manufacturer.

4.2 Service Kit

The service kit is used to connect the sensor to a personal computer. Parameters of the sensor, such as analog output range, alarm threshold, units and etc. can be modified via the service kit.

4.3 Calibration

The product is factory calibrated and the calibration certificate is attached to the product. Since the measurement accuracy of the product is affected by the on-site environment (oil, high humidity, or other impurities can affect the accuracy), we recommend the user perform calibration once a year. Calibration service is not covered by the product guarantee. Please contact the manufacturer in case calibration is required.

FAST
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MEASUREMENT
EXPERT
SPECIALIZES
IN COMPRESSED AIR & GAS

CALIBRATION CERTIFICATE

Instrument
Series number
Manufacturer
Calibration date

F133C
 1138501030001
 Fix Instruments
 30 Aug 2018

CALIBRATION RESULTS:

Description	Units	Reference value	Measured value	Evaluation
Dew point	°Ctd	19.82	19.32	Passed
		9.74	8.94	Passed
		-0.42	-0.72	Passed
		-10.60	-10.90	Passed
		-20.12	-20.42	Passed
		-30.58	-31.18	Passed
		-40.10	-40.40	Passed
		-50.38	-50.48	Passed
		-60.08	-61.08	Passed
		-70.04	-70.74	Passed
Temperature	°C	5.00	5.00	Passed
		25.00	25.00	Passed
		35.00	35.00	Passed
Pressure	bar(a)	0	0	Passed
		3.00	3.00	Passed
		9.00	9.00	Passed

EQUIPMENT USED IN CALIBRATION:

Type	Serial number	Uncertainty
MBW 373LX	16-0431	±0.1 °C
PT100	JD170504170	±0.1 °C
P3000	18083000790	±0.012 bar

Ambient condition: Humidity 30...60 %RH / Temperature 20...26 °C / Pressure 1015±20 hPa / Flow 2...4 L/min

Modbus RTU setting: Address: 1 / Baudrate: 9600 / Framing,Parity,Stop bit: 8, None, 1

The above instruments was calibrated by comparing the dewpoint output to MBW 373 LX dewpoint mirror in the Fix Instruments Humidity Calibration Laboratory. The calibration is according to FixInst working standard and traceability chain for dew point, temperature and pressure calibrations.

Checked By 

This report is the test result of FixInst laboratory, it is real and effective

Figure 4-1 Dewpoint Calibration Certificate (for Reference Only)

4.4 Maintenance

Please check the sinter filter regularly. If contamination of the sinter filter is found, it is recommended to replace it promptly. Contact the manufacturer for details.



Caution!

Wet or contaminated sinter filter or sensor will result in longer response time or even incorrect measurement result.

5 Warranty Terms

Dear Customer:

Thank you for choosing FixInst products. We have always been committed to providing our customers with high-quality, high-performance instrumentation products to meet your needs in a variety of application scenarios.

In order to ensure your satisfaction after purchasing the product, please read the following after-sales terms and conditions carefully, so that you can correctly and efficiently apply for the warranty service when needed.

5.1 Warranty Period

12 months from product shipment.

5.2 Warranty Coverage

1、Warranty period due to the product's own problems caused by performance failures, confirmed by the seller's test, will provide free maintenance services; human misuse or due to the site of the product working conditions and the product type does not match the damage caused by the exceptions.

The following are not covered by warranty:

- ① Product damage caused by force majeure factors (such as natural disasters, etc.).
- ② Products due to natural wear and tear, rough handling caused by the appearance of damage, scratches or wear (such as impact caused by the loss of paint, surface bumps, etc.).
- ③ Damage caused by disassembling the product without the Company's consent or unauthorized changes in the use of the product.
- ④ Damage to the product caused by repair or modification not authorized by the company.
- ⑤ Damage caused by improper use of the product by the user or operation in violation of the instructions.
- ⑥ Products purchased from unauthorized sources.

2、For non-warranty or non-warranty product failure, we will provide paid repair services, the specific cost depends on the actual situation.

5.3 Warranty Certificate

Users are required to provide valid proof of purchase (e.g., invoice, receipt, etc.) and product serial number when applying for warranty service.

5.4 Warranty Channels

Users can apply for after-sales warranty service by filling out our after-sales treasure system or contacting customer service personnel.

<https://www.fixinstruments.com/about-us/contact-us/>

6 Disposal of Waste



Notice!

Electronic devices are recyclable material and do not belong in the household waste. The device, the accessories and packaging must be disposed according to your local statutory requirements.

The dispose can also be carried by the manufacturer of the product. Please contact the manufacturer for details.

Experts in Compressed Air &
Fluid Measurement

FIX Instruments Europe AB

Diabasgatan 12, 25468 Helsingborg, Sweden
service@fixinstruments.com