



F191x Series

Dewpoint Meter Integrated with Display and Alarm

• 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

The F191x series can integrate a variety of the most advanced humidity sensors: FIXINST-P polymer film capacitive sensors, FIXINST-A ultra-fast response aluminum oxide sensors with innovative moisture sensitive materials and processes, and FIXINST-Q dual resonance QCM sensors with sensitivity at ultra-low dewpoint. These sensors provide F191x with the ability to accurately measure a wide range of dewpoint from -110 to +60 °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

- ✓ Compatible with various sensor technologies: polymer thin film, aluminum oxide, QCM crystal type sensors that can be used in different measurement ranges
- ✓ MEMS based pressure sensor for online pressure and atmospheric dewpoint (Abs. pressure 0 ... 1.7 MPa.a) monitoring
- ✓ Accurate to ± 2 °Ctd with up to 10+ dewpoint calibration and multi-point temperature compensation (Refer to **Technical Data**)
- ✓ Ultra-fast response time
- ✓ Outstanding long-term stability
- ✓ Anti-Condensation, resistant to particulate contamination, oil vapor and most chemicals
- ✓ High resistance to electrical disturbance
- ✓ 1.5" IPS wide viewing angle LCD with capacitive touch
- ✓ Relay alarm output
- ✓ IP66 metal housing provides good protection even in harsh industrial environments

2.3 Technical Data

Measuring Range	
Dewpoint	
F191A	-60 ... +60 °Ctd
F191B	-80 ... +20 °Ctd
F191C	-110 ... +20 °Ctd

Temperature	-40 ... +100 °C
Pressure	0 ... 1.7 MPa(a) (Option)
Accuracy	
Dewpoint (Air or Nitrogen)	
+20 ... -60 °Ctd	±2 °Ctd
-60 ... -100 °Ctd	±3 °Ctd
Temperature (Customizable)	
0 ... +50 °C	±0.3 °C (Standard)
-40 ... 0 °C & +50 ... +100 °C	±0.5 °C (Standard)
Pressure	
Accuracy @23 °C	±0.3% FS
Pressure drift with temperature	±0.001 MPa/10 °C
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]
Pressure	< 1 sec
Power	
Measuring State	16 ... 30 VDC Max 4.5 W @ 24 VDC
Output	
Analog Output (Customized)	4 ... 20 mA (4-wire)
Analog Resolution	0.002 mA
Analog Drift	0.01 % of span/°C
Analog Load	Max. 500 ohm
Digital Output	Modbus RTU (RS485)
Relay Output	Normal open 32 VDC/500 mA
Connector	2 × 5pin M12, Female
Operating Environment	

Operating Temperature	-30 … +70 °C
Storage Temperature	-40 … +80 °C
Relative Humidity	0 … 95 %RH
Sample Gas Flow Rate	> 1 L/min
Pressure	0 … 1.7 MPa(a)
(Integrated pressure sensor)	0 … 1.7 MPa(a)
(Without pressure sensor)	0 … 5 MPa(a) 0 … 25 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	IP66
Housing Material	Aluminum alloy
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)

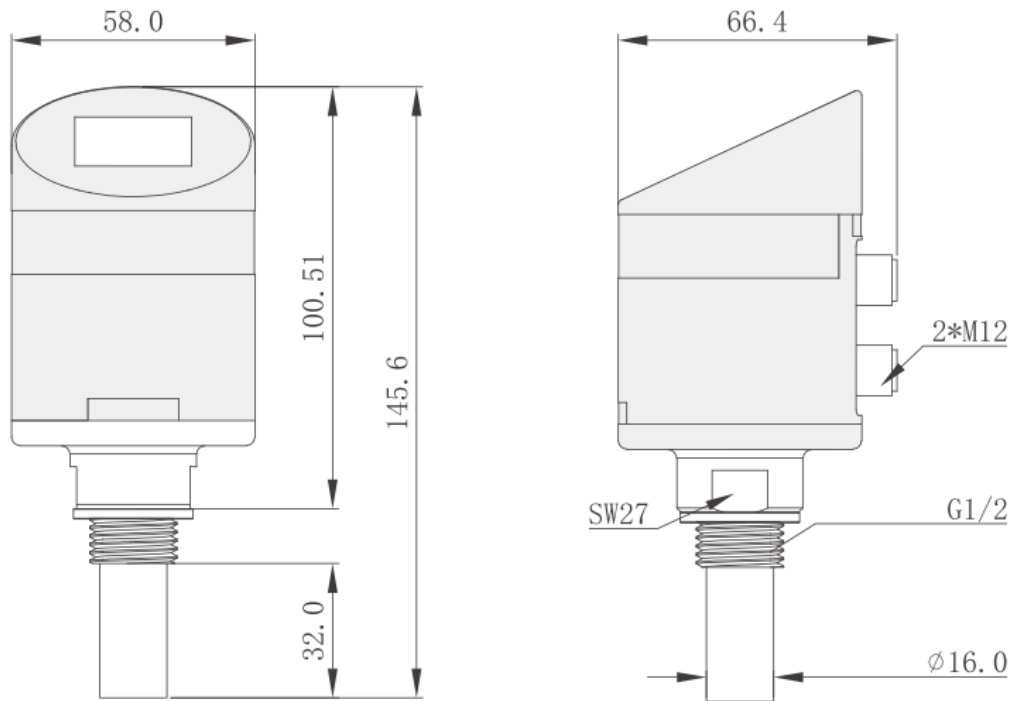


Figure 3-1 F191x Series Dimension Diagram

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**

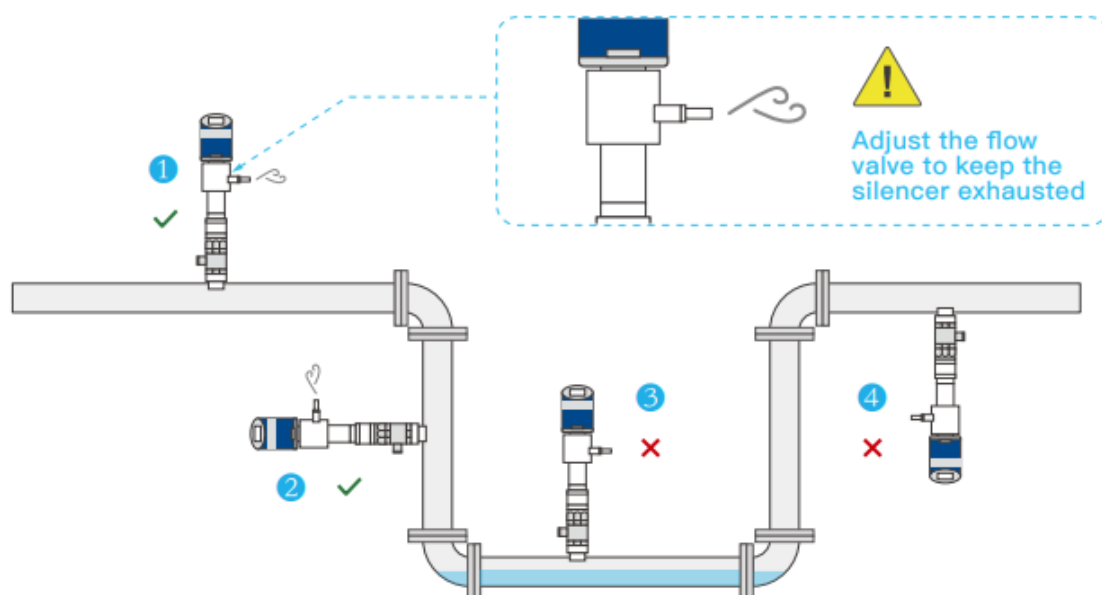


Figure 3-2 Installation with Measuring Chambers

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)

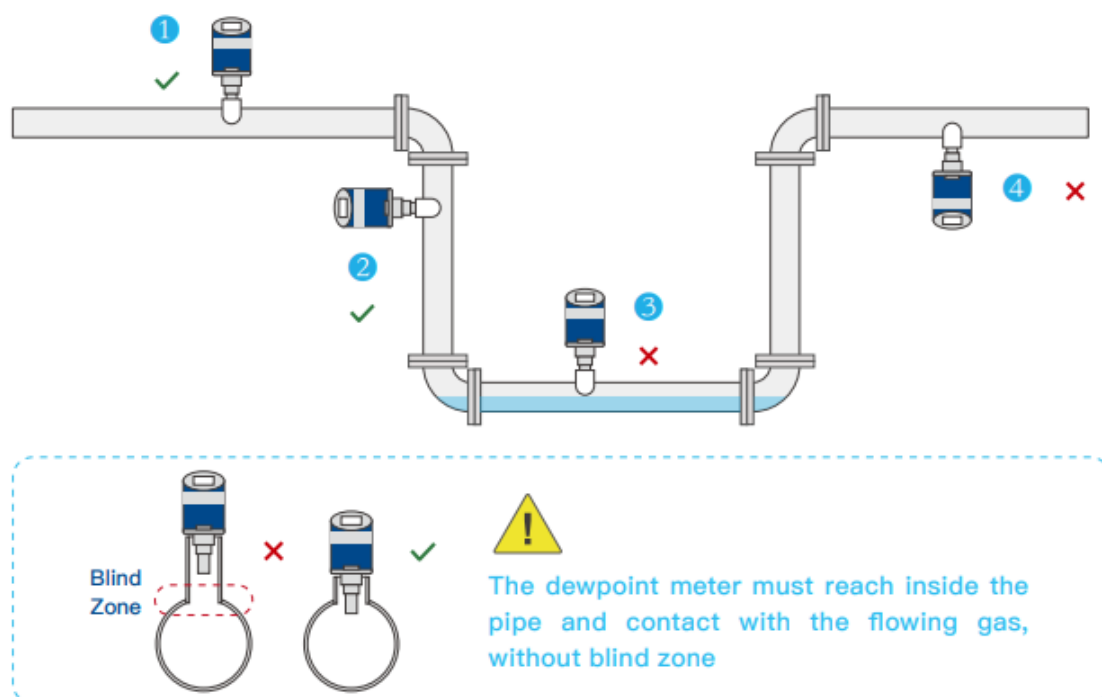


Figure 3-3 Installation Directly on the Pipe

3.3 Electrical Wiring

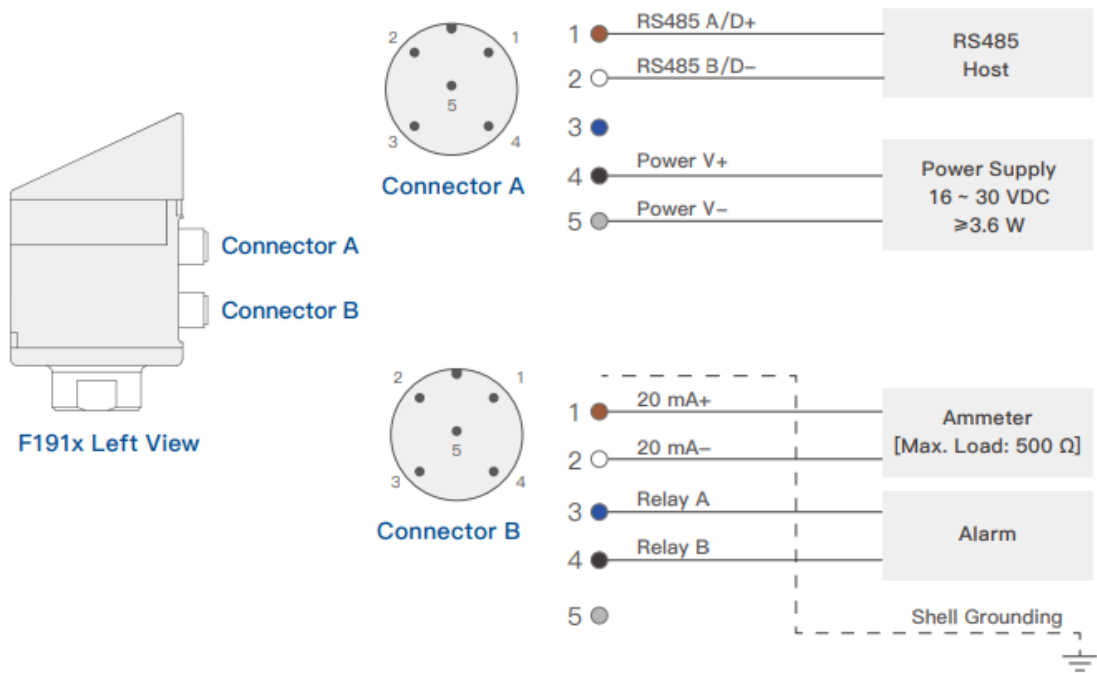


Figure 3-4 Electrical Connection Diagram

Table 3-1 M12 Pin Definition

Connector A		Connector B		FixInst Cable Color
Pin 1	RS485 A/D+	Pin 1	20 mA+	Brown
Pin 2	RS485 B/D-	Pin 2	20 mA-	White
Pin 3	N/A	Pin 3	Relay A	Blue
Pin 4	Power V+	Pin 4	Relay B	Black
Pin 5	Power V-	Pin 5	N/A	Grey



Do not tighten the M12 connection plug forcefully, the plug pins may break off!

4 Operation

4.1 Start-up

When meter is powered on, it starts to operate automatically according to the memorized settings.



Figure 4-1 F191x Series Power On Interface

4.2 User Interface Operation

The F191x series display the **Default** page after powered on. Configured with a screen lock function that can be unlocked by right slide touch.

The **Default** page of the display interface shows the dewpoint detection contents, which are dew point 1 and dew point 2. By left slide touch, switch to more data display page, you can view more parameters, including temperature, gauge pressure.

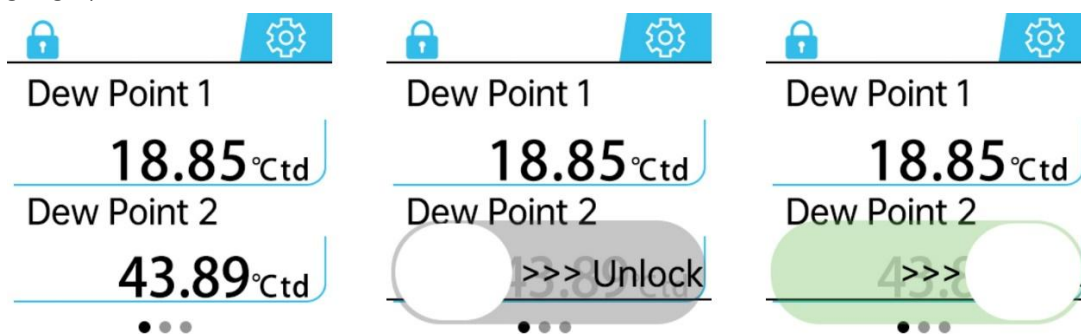
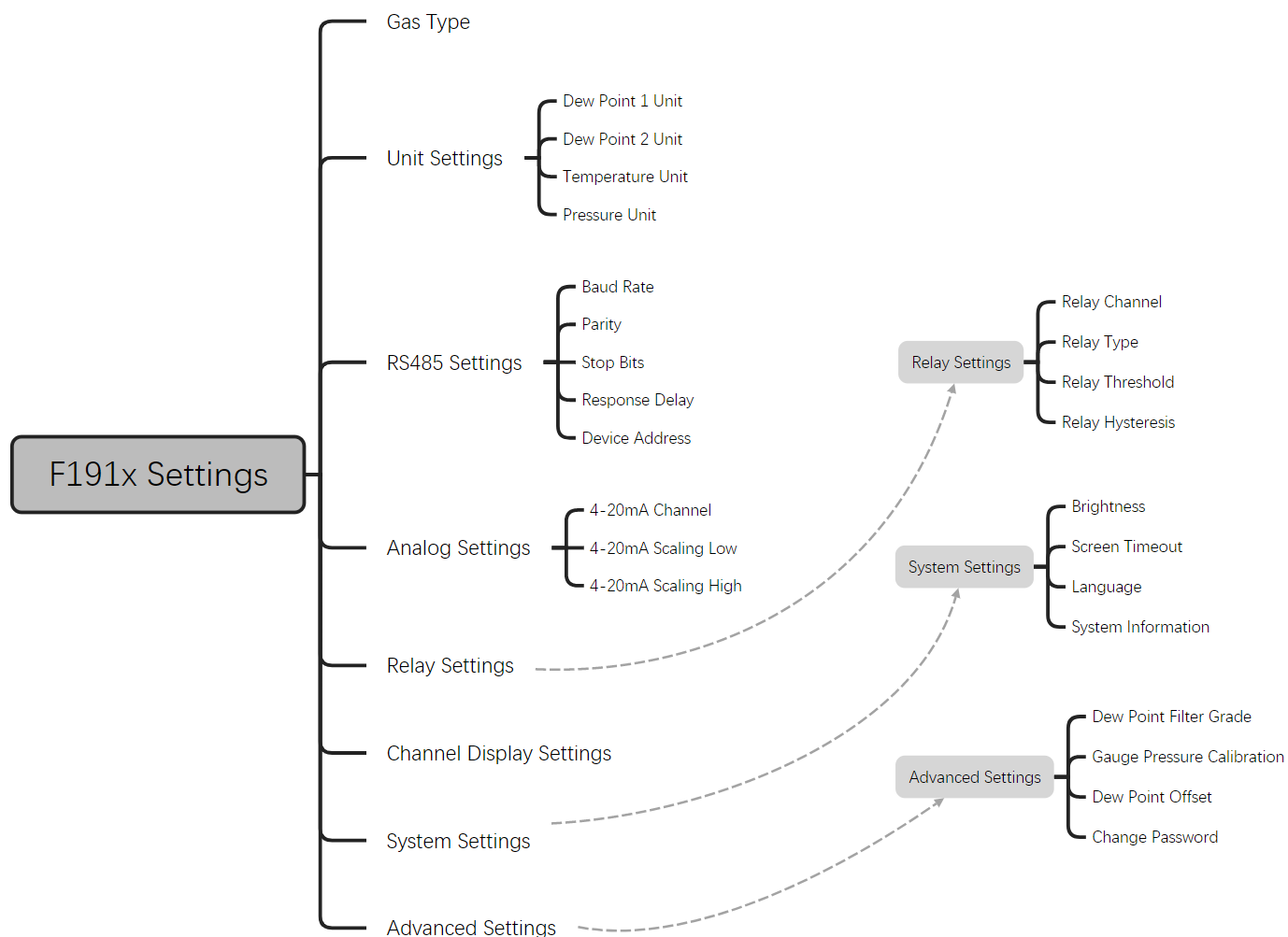


Figure 4-2 F191x Series Unlock Interface



Figure 4-3 F191x Series Temperature, Humidity, Dewpoint and Other Data Interface

4.3 Setting Menu



5 Other Optional Accessories

5.1 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.

5.2 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.

5.3 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.

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MEASUREMENT
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SPECIALIZES
IN COMPRESSED AIR & GAS

CALIBRATION CERTIFICATE

Instrument F133C
Series number 1138501030001
Manufacturer Fix Instruments
Calibration date 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 5-1 Dewpoint Calibration Certificate (for Reference Only)

5.4 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.

6 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.

6.1 Warranty Period

12 months from product shipment.

6.2 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.

6.3 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.

6.4 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/>

7 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

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