



User Manual

Dew Point Sensor - Mini Series

Model: DEM



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Notices

Please read this manual in full and carefully observe the notes and instructions before and during installation, operation and maintenance. The manufacturer cannot be held liable for any damage which occurs as a result of noncompliance with this manual.

Do not tamper with device. Should the device be tampered with in any manner other than a procedure which is described and specified in this manual, the warranty is cancelled and the manufacturer is exempt from liability.

The product is designed exclusively for the described application. Use of this product in conditions not specified in this manual or, contrary to the instructions provided by the manufacturer, is considered improper handling of the product and will void your warranty. The manufacturer will not be held liable for any damages resulting from improper use of the product.

This manual should be read carefully by relevant personnel and the end user. This manual should be kept with the product and be made available as needed. **Once you install or use the product, you accept that you have read, understood and complied with this manual.**

Compressed Air Alliance endeavours to make the content of this manual correct, but is not responsible for omissions or errors and the consequences caused. In case of any doubts or questions regarding this manual or the product, please contact Compressed Air Alliance.



Warnings

Ignoring the warnings can lead to serious injury and/or cause damage!

When handling, operating or carrying out maintenance on this product, personnel must employ safe working practices and observe all local health & safety requirements and regulations.

Improper operation or maintenance of this product could be dangerous and result in an accident causing damage to machinery or injury or death.

The manufacturer cannot anticipate every possible circumstance which may represent a potential hazard. The warnings in this manual cover the most common potential hazards and are therefore not all-inclusive. If the user employs an operating procedure, an item of equipment or a method of working which is not specifically recommended by the manufacturer they must ensure that the product will not be damaged or made unsafe and that there is no risk to persons or property.

NEVER CHANGE ORIGINAL COMPONENTS WITH ALTERNATIVES.



Compressed Air Safety

Any contact with quickly escaping air or bursting parts of the compressed air system can lead to serious injuries or even death.

- Do not exceed the maximum permitted pressure.
- Only use pressure rated installation materials and parts.
- Avoid getting hit by escaping air or bursting parts.
- The system must be pressure-less during maintenance work.



Electrical Safety

Any contact with energised parts of the product, may lead to an electrical shock which can lead to serious injuries or even death. The user shall take all measures necessary to protect against electrical shock.

Consider all regulations for electrical installations.

The system must be disconnected from any power supply during maintenance work.

Any electrical work on the system is only allowed by authorised qualified personal.

Storage and transportation

- Make sure that the transportation temperature of the sensor is between -10°C to 60°C (14°F to 140°F).
- Please make sure that the storage temperature of the sensor is between -10°C to 50°C (14°F to 122°F) and the humidity is $<90\%$, no condensation. Avoid direct UV and solar radiation during storage.

Cleaning

If you need to clean the sensor it is recommended to use a clean, dry cloth. For stubborn marks, use distilled water or isopropyl alcohol only.

Please note: contamination on the sensor tip will affect calibration and accuracy of the sensor. Removal of the contamination may not fix the issue.

Disposal

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

About Dew Point Sensors

Dew Point Sensors are the simplest way to monitor dryer performance and detect moisture issues before they can cause a problem.

Moisture in the gas systems can clog pipes, break machinery, cause contamination (eg rust, mildew, bacteria) or cause freezing.

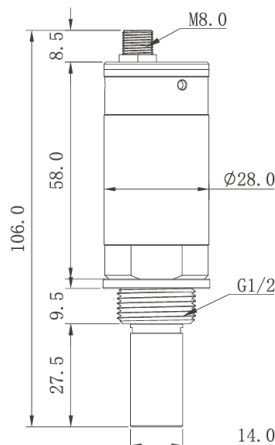
Compressed Air Alliance's dew point sensors are designed for measuring pressure dew point, gas temperature, relative humidity and pressure (optional) in manufacturing, industrial and base building environments.

Dew point sensors are cheap, easy to install and have low maintenance requirements.

Benefits of monitoring dew point

- Improve system reliability
- Reduce product contamination risks
- Reduce system maintenance
- Reduce operating and energy costs
- Reduce the risk of rust and corrosion build up
- Improve dryer reliability
- Improve filter life and performance
- Reduce the risk of bacteria, fungus and yeast build up
- Alerts you to changes in dryer performance before moisture appears in your plant
- Easy to install and low maintenance
- Suitable for temporary or permanent installations.

Dew Point Sensor Dimensions (mm)



Specifications – Mini Series

Mini Series	
Technology	Polymer
System	Compressed air and gas systems up to 4 Mpa (600psi)
Dryer Type	Refrigerant, Desiccant, Drum or Membrane dryers
Gases	Air, Argon, Carbon Dioxide, Carbon Monoxide, Helium, Hydrogen, Nitrogen, Oxygen
Accuracy	<p>Dew Point: $\pm 2^{\circ}\text{C}$ Temperature: $\pm 0.5^{\circ}\text{C}$</p> <p><i>The accuracy of the sensor is affected by on-site conditions. Contaminants such as oil, high humidity or other impurities can affect the calibration and accuracy of the sensor.</i></p>
Minimum gas flow	> 1 L/min
Measurement Ranges	
Dew Point Measurement	-60°C to +60°C -76°F to 140°F
Gas Temperature Measurement	-40°C to +100°C -40°F to +212°F
Outputs	
Output	Analogue: 4 to 20mA (3 wire) Digital: RS485 Modbus / RTU
Modbus Output Signals	Pressure Dew Point (PDP), Relative Humidity (RH), Temperature (°C or °F)
Analogue Output Signals	Pressure Dew Point (PDP) only
Power	
Power Supply	10 to 30V / 50 mA + 4-20mA Current output
4-20 mA Current Output	<ul style="list-style-type: none"> Resolution Temperature Drift Load
	<ul style="list-style-type: none"> 0.002 mA 0.01% of span/°C Max 500 ohm

Mini Series	
Electrical Connection	1 x 5 pin M8, female
EMC	According to IEC 61326-1
Working Environment	
Operating Temperature	-30 to +70°C -22 to +158°F
Working Pressure	0 to 50 bar
Gas Relative Humidity	0 to 95% RH
Storage Temperature	-30°C to +70°C -22°F to +158°F
Other Information	
Inbuilt Display	No
Process Connection	G1/2" thread (Contact us for UNF process connection)
Measurement Chamber	1/2" Quick coupling (Nitto type) with Adjustable Bleed Screw
Dimensions	107 mm L x 28 mm W 4.2" L x 1.1" W
Casing	Stainless Steel or Aluminium
IP Rating	IP65
Installation Type	Permanent or temporary installation
Calibration Frequency	Every 2 years <i>provided the sensor is not exposed to relative humidity above 85%</i>

Dew Point Sensor Pack

Each dew point sensor comes with:

- ✓ Dew Point sensor – in either Aluminium **or** Stainless Steel Casing
- ✓ Measurement Chamber with mounting bracket
 - Standard option = 1/2" Quick coupling (Nitto type) with Adjustable Silencer
 - Talk to you local dealer about other options
- ✓ Connector – 5 meter cable with M8 connector



Installation Overview

Compressed Air Alliance recommends that our dew point sensors are installed via a measurement chamber.

Step 1 – Find a suitable section of pipe

- The sensor must be installed vertically, on dry side of system
- Do **NOT** install the sensor before a dryer or in gases with a relative humidity above 80%
- Do **NOT** install the sensor upside down, horizontally, at an angle or in wet gas

Step 2 – Install connection point in pipe, eg a ball valve, nozzle or nipple

Step 3 – Attach Dew Point Sensor to connection point

Step 4 – Set the gas bleed

Step 5 – Wire the sensor (see '*Installation – Electrical*')

Step 6 – Check the sensor settings

Step 7 (optional) – Connect the sensor to your SCADA or energy management system

Step 8 – Fill out the Commissioning Report (last page of this manual)

Tools and Equipment needed for installation

(not included with Dew Point Sensor Pack)



Wrench /
Spanner



Thread Tape /
Sealant



Ball Valve
(optional)



Hot Tap Kit
(optional)

Installation – Mechanical

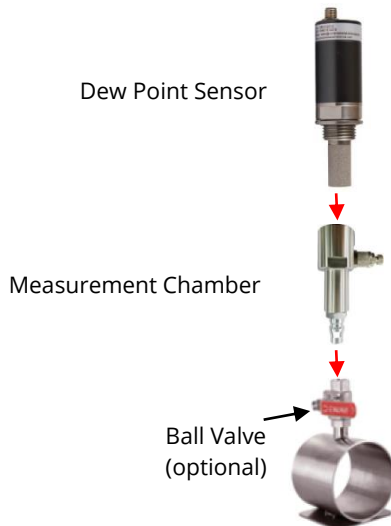


WARNING! Incorrect installation can damage the sensor or cause it to work incorrectly.



Notes

- **Before installing the sensor, make sure it is rated for your system** (refer to the “Specifications” section).
 - Use of the product outside specified ranges or operating parameters can lead to malfunctions and may damage the product or system.
- Do not use this product in explosive areas.
- Always use a spanner / wrench to install the product.
- Only use pressure rated materials and parts when installing and maintaining the product.
- Do not disassemble the product.
- Please observe local and national regulations before/during installation and operation.
- The product must be installed properly and calibrated regularly, otherwise it may lead to inaccurate measurement values.

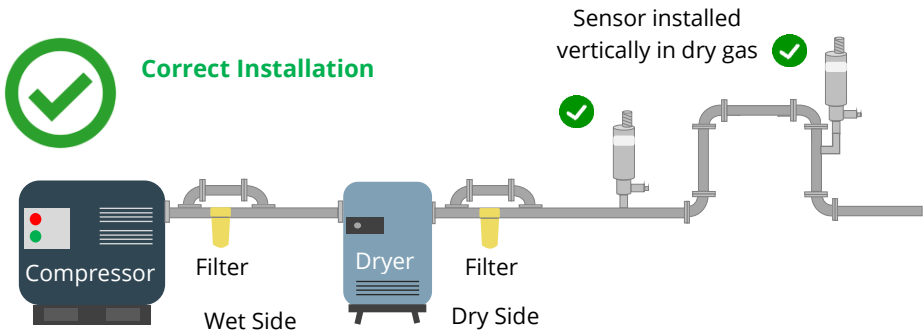


Step 1 – Find a suitable section of pipe

The sensor **must be installed vertically in dry gas** (gas humidity should be less than 80% relative humidity (RH)).

Make sure the sensor location has enough room above the pipe to install the sensor.

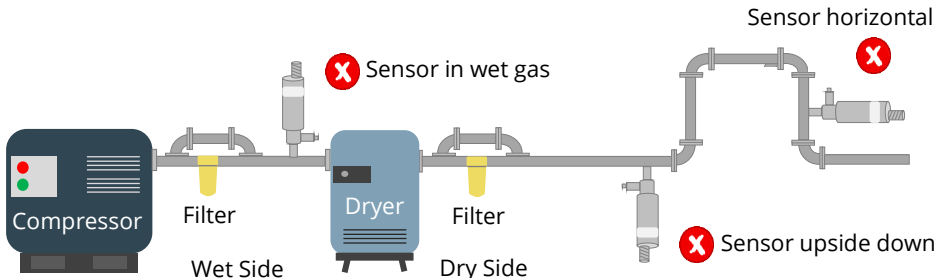
If installing the sensor outdoors, protection from sun and rain is necessary.



Do **NOT** install the sensor before a dryer or in gases with a relative humidity above 80%.

Do **NOT** install the sensor upside down, horizontally or at an angle, as shown below.

Do **NOT** let condensate reach the tip of the sensor

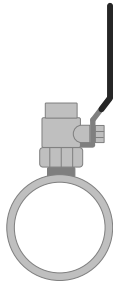


Step 2 – Install connection point in pipe

To install the sensor, you need a connection point to the pipe, eg a ball valve or a nozzle or nipple. The thread must be G 1/2".

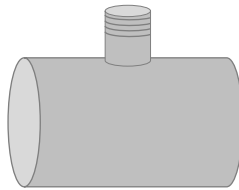
Use of a ball valve is optional - You do not need to use a valve to install the sensor. However, using a valve will make removing the sensor easier (eg when you need to remove the sensor for calibration).

If installing a ball valve, you can use a hot tap drill and clamp to create a connection point on pressurized or unpressurized pipes. See the Compressed Air Alliance website for information on hot tap drills and clamps.



Ball Valve

OR



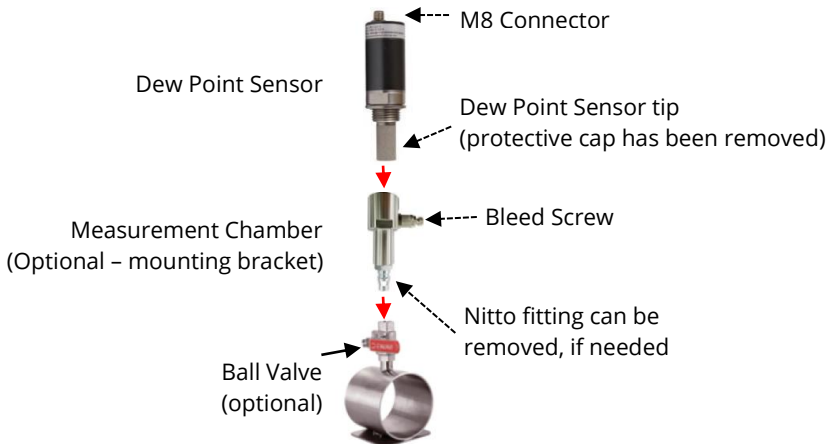
Welded nipple on pipe

Step 3 – Attach dew point sensor to connection point

The dew point sensor's measurement chamber comes with a nitto fitting. This can be removed and the chamber connected directly to a valve with a male BSP fitting, if required.



- Remove (unscrew) the protective cap from the dew point sensor
- Screw the sensor into the measurement chamber
- Screw the measurement chamber into the connection point (eg valve, nipple or nozzle) and tighten with a spanner
 - Compressed Air Alliance recommends that our dew point sensors are installed via a measurement chamber
 - A reducing bush may be needed if connecting the measurement chamber to a large ball valve or nipple
 - Fix measurement chamber firmly to prevent loosening or shaking
 - Use thread tap or sealant to prevent gas escaping
 - If needed, you can use the mounting bracket to secure the measurement chamber to a wall or block
- Open the valve



Optional - use the mounting bracket to secure the measurement chamber to a wall or block

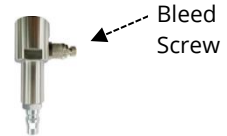
Step 4 – Set the Gas Bleed

To ensure a flow of gas past the sensor tip, either allow a small amount of gas to escape to atmosphere (option 1 below) or connect a zero loss chamber (option 2 below).

Option 1 – Bleed gas to air

On the measurement chamber:

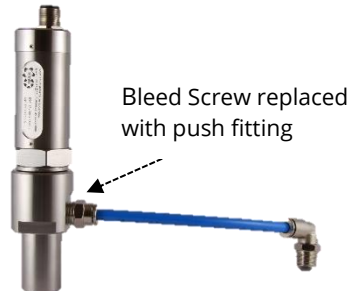
- Close the bleed screw completely.
- Then slowly open the bleed screw to allow a small flow of gas to escape to the atmosphere.



Option 2 – Zero Loss Chamber

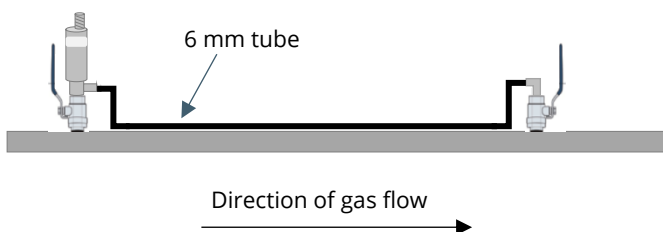
The zero loss chamber will prevent gas escaping to atmosphere and can improve system efficiency.

- Remove the bleed screw and fitting from measurement chamber
- Install a 1/4" to 6mm push fit into measurement chamber
- Connect a 6 mm tube between the measurement chamber and a second connection point downstream of the sensor.



Tip - use cable ties to secure the 6 mm tube to the pipe.

Zero Loss Chamber set up



Installation – Electrical



WARNING! Incorrect wiring can damage the sensor or cause it to work incorrectly.

Notes:

- Do **not** screw the M8 connector using force, otherwise it may damage the connection pins.
- Always check the M8 connectors to make sure they are wired correctly.
- Consider all local and national safety requirements and regulations for electrical installations.
- **The system must be disconnected from any power supply during installation and maintenance work.**
- Any electrical work on the system is only allowed by authorised and qualified personal.

4-20mA Scaling

The sensor has an analog output range of 4 to 20 mA, which is a 3-wire active analog output. The analog output scaling is:

- 4 mA = -60°C (-76°F)
- 20 mA = +60°C (140°F)

The analog output can be set to correspond to temperature, dew point, or humidity.

Wiring - Mini Dew Point Sensor

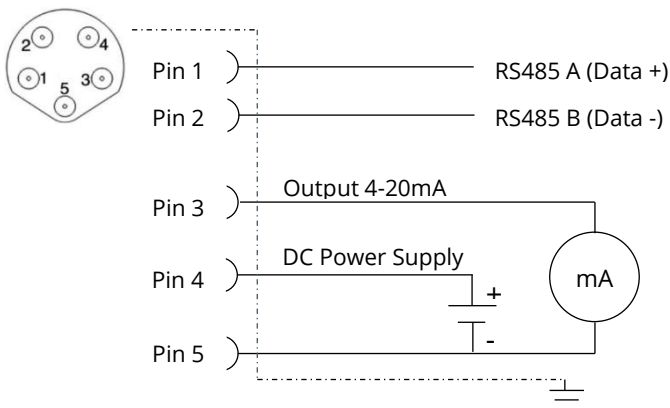
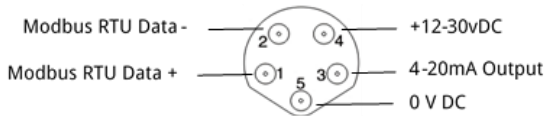
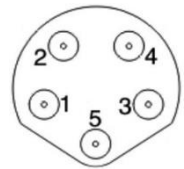
The Mini series Dew Point Sensor has an M8 connector.

Do **not** screw the M8 connector using force. Otherwise, it may damage the connection pins.

The data cable will be coloured coded as shown in the table below. Its good practice to check the cable colours and make sure they match the chart below.



Connector		Cable Colour
Pin 1	RS845, Data + (A)	Brown
Pin 2	RS845, Data - (B)	White
Pin 3	4-20mA Output	Blue
Pin 4	+12-30 vDC	Black
Pin 5	0 vDC (Ground for Modbus)	Grey



Communication Settings

Default Modbus Settings

All dew point sensors use the following default Modbus settings. Settings can be changed to suit system requirements using our Service Software (contact Compressed Air Alliance for more information).

Default Modbus RTU (RS485) Settings					
Address	Baud Rate	Frame / Parity / Stop Bit	Response Time	Response Delay	Frame Spacing
1	9600	8 / N / 1	1 Sec	0 Milliseconds	7 Characters

Modbus Registers						
Holding Register	Address	Data Type	Byte Length	Description	Unit	Read / Write
1	0	FLOAT	4	Temperature	°C or °F	Read
3	2	FLOAT	4	Relative Humidity	%RH	Read
5	4	FLOAT	4	Pressure Dew Point	°Ctd or °Ftd	Read

Optional integrated pressure sensor						
21	20	FLOAT	4	Absolute Pressure	KPa, Mpa, Bar, PSI	Read
42	41	FLOAT	4	Gauge Pressure	KPa, Mpa, Bar, PSI	Read

Warranty

Compressed Air Alliance provides a 12-month warranty for all sensors. The warranty covers materials and workmanship under the stated operating conditions from the date of delivery. Please report any findings immediately and within the warranty time.

If faults occur during the warranty period Compressed Air Alliance will repair or replace the defective unit, without charge for repair labour and material costs but there is a charge for other services such as labour to remove or reinstall the instrument, transport and packing. Warranty repairs do not extend the period of warranty.

The following damage is excluded from this warranty:

- Improper use and non-adherence to the user manual.
- Use of unsuitable accessories.
- External influences (e.g. damage caused by vibration, damage during transportation, excess heat or moisture).

The warranty is cancelled when one of the following situations occurs:

- The user opens the measurement instrument

without a direct request written in this manual.

- Repairs or modifications are undertaken by third parties or unauthorised persons.
- The serial number has been changed, damaged or removed.

Other claims, especially damage occurring on the outside of the instrument (eg dents, marks), are not included unless responsibility is legally binding.

Calibration

The sensor is calibrated before delivery. The calibration date is printed on the certificate which is shipped with the sensor.

Dew Point Sensors require calibration to remain accurate. The frequency of calibration depends greatly on the level of contamination within your system.

We recommend you calibrate the sensor every 2 years (provided the sensor is not exposed to relative humidity above 85%). Calibration is excluded from the product warranty. For more information, contact Compressed Air Alliance.

Commissioning Report

About the Sensor

Part Number (eg DEM100001)			
Serial Number			
Installed by		Installed Date	

About the Compressed Air System

Dryer Type (select one)	Refrigerant	Desiccant	Membrane	Other
Dew Point Sensor Reading				

Installation

Step	Task	Yes	NA	No	Comments	Sign
1	Is the Dew Point Sensor installed correctly? (refer to " <i>Installation - Mechanical</i> ")					
2	Is the Dew Point Sensor wired correctly? (refer to " <i>Installation - Electrical</i> ")					
3	Dew Point sensor attached to pipe?					
4	Modbus and 4-20mA settings checked?					
5	Are the dryer and condensate drains working correctly?					



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