User Manual

Pressure Sensor - 4-20mA Output

Model: PRE10000x and PRE20000x

Table of Contents

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.

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 Pressure Sensors

Virtually every compressed air or gas system has some sort of low pressure warning on the machine. When the warning is triggered it's usually too late to react and the machine shuts down. If this happens often enough, system pressure is generally reset to a higher value to alleviate the problem. This increases the overall running cost of the system and the artificial demand.

There are a number of potential problems within compressed air or gas systems that can cause low pressure warnings to trigger, from compressor reaction time, high peak demands or simply restrictions in the filters and pipework. Continuously monitoring pressure can highlight the exact cause, helping you to resolve issues.

How many pressure sensors do I need?

You will need at least two pressure sensors:

- one (1) pressure sensor on the wet side of the system to monitor compressor output and
- one (1) pressure sensor on the dry side of the system to measure the system supply pressure.

You could use differential pressure sensors across filters, dryers and other pressure loss systems or you can mount additional pressure sensors to calculate the difference. The choice is yours but either way, you will have a much clearer picture of what is going on in your system.

Where else should pressure sensors be located?

It usually pays to have pressure sensors near any high compressed air or gas consumers and at the far ends of the system. This will assist you in identifying issues occurring downstream of your compressed air generation.

Easy to connect

Pressure sensors are simple 4-20mA output units that easily connect to any system monitoring.

Benefits of monitoring pressure

- Monitor system pressure and fluctuations
- Improve system performance
- Avoid financial losses from down time
- Improve reliability and scheduled maintenance
- Protect key assets and critical equipment such as Compressors, Pumps, Conveyors, Motors, Fans, Cooling towers and other key production machinery
- Plan maintenance in advance and prevent expensive failures

Accuracy

The accuracy of pressure sensors can be affected by the on-site conditions. Contaminants such as oil, high humidity or other impurities can affect the calibration and accuracy of the sensor.

Calibration requirements

Pressure sensors should be calibrated every 2 years. Compressed Air Alliance can arrange calibration for you.

Permanent and temporary solutions

Pressure sensors are available for temporary or permanent installations.

Pressure Sensor Pack

Each pressure sensor comes with:

- ✓ Pressure sensor (0-16 bar **or** 0-50 bar)
- ✓ 5 meter cable with M12 connector **or** M12 connector only (no cable).

Pressure Sensor (0-16 bar **or** 0-50 bar)	**PLUS**	5 meter cable with M12 connector	**OR**	M12 connector only (no cable)
	**PLUS**		**OR**	

Specifications

	Pressure Sensor	
Technology	Ceramic core, resistant to moisture	
Accuracy[1]	±1%	
	Measurement Ranges	
Pressure Range	0-16 bar **or** 0-50 bar	0 – 232 psi **or** 0 – 725 psi
	Outputs	
Output	Analogue: 4 to 20mA (2 wire)	
Output Signals	Pressure	
	Power	
Power Supply	≤10mA, 24V DC	
Electrical Connection	4 pin M12, female	
	Other Information	
Process Connection	ISO G1/4" thread	
Ambient Temperature	-30°C to +80°C	-22°F to +176°F
Dimensions	68 mm L x 22 mm W	2.7" L x 0.9" W
Casing	Stainless Steel	
IP Rating	IP65	
Installation Type	Permanent, or Temporary installation	
Calibration Frequency[2]	Every 2 years	
Warranty Period	12 Months	

1 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.

2 Pressure sensors require calibration every 2 years. Compressed Air Alliance can arrange calibration for you.

Installation Overview

Step 1 – Find a suitable location for sensor

- Check if you are measuring Dynamic or Static pressure

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

Step 3 – Attach Pressure Sensor to connection point

Step 4 – Wire the sensor (see '*Installation – Electrical*')

Step 5 (optional) – Connect the sensor to your SCADA or energy management system

Step 6 – Fill out the Commissioning Report (last page of this manual)

Tools and Equipment needed for installation

(not included with Pressure Sensor Pack)

Wrench / Spanner

Screw Driver

Ball Valve (optional)

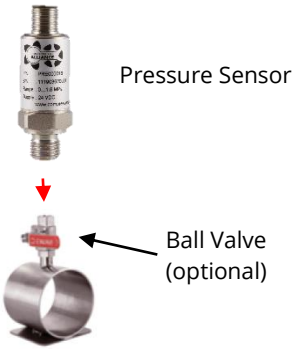
Thread Tape / Sealant

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

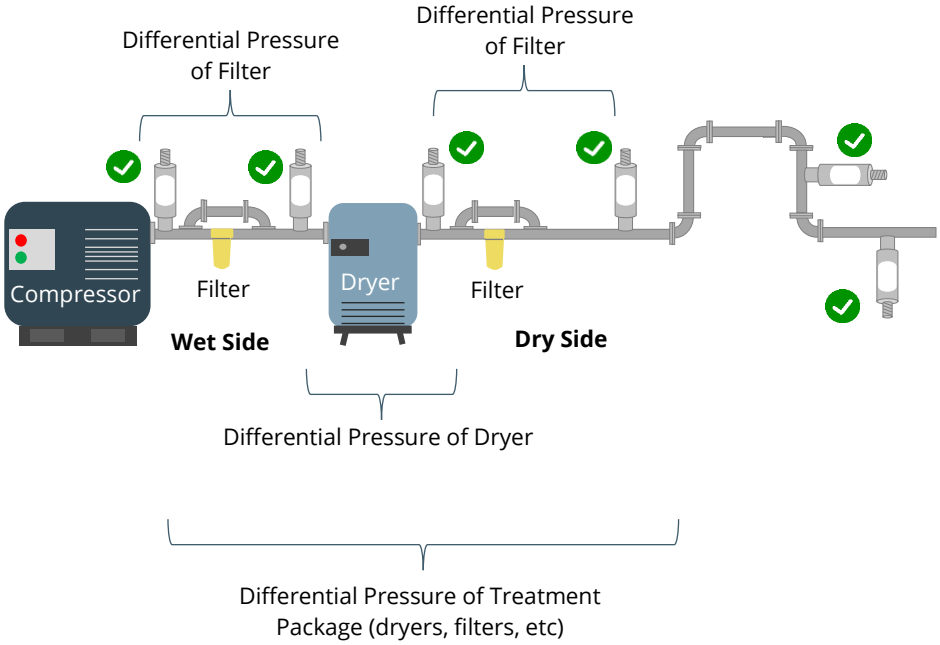
The sensor can be installed on pipes, wet and dry receivers, compressor outlet or anywhere you want to record pressure.

The sensor **can be installed in any direction** (vertical, horizontal, upside down, at an angle) **in wet or dry gas.**

Make sure there is enough room around the installation point to fit the sensor.

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

Correct Installation



Compressed Air Alliance reccommends at least two pressure sensors are installed on the system:

- one (1) pressure sensor on the wet side of the system to monitor compressor output and
- one (1) on the dry side of the system to measure the system supply pressure.

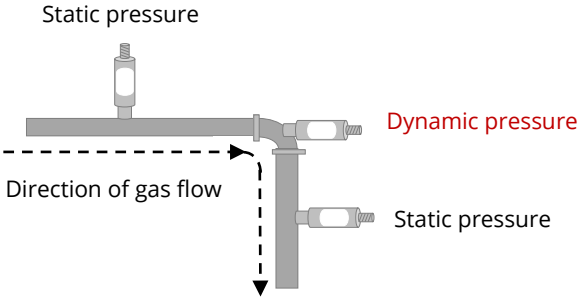
However more pressure sensors will give you a much clearer picture of what is going on in your system, eg near any high compressed air or gas consumers and at the far ends of the system. This will assist you in identifying issues occurring downstream of your compressed air or gas generation.

Dynamic v Static Pressure

Static and dynamic pressure will give different readings. It is important to know which pressure you want to measure as this will affect where you install the sensor. For most applications, you will measure static pressure.

To measure **Static** pressure – install the sensor adjacent / perpendicular to the gas flow

To measure **Dynamic** pressure - install the sensor inline with the direction of gas flow.



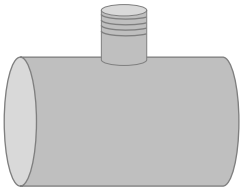
Step 2 – Install connection point in pipe

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 1/4".

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 pressurised or unpressurised pipes. See the Compressed Air Alliance website for information on hot tap drills and clamps.

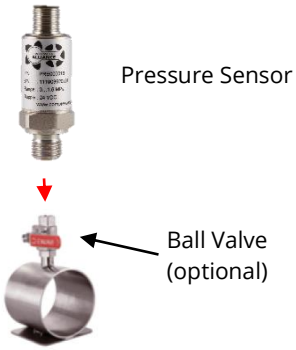
Ball Valve **OR** Welded nipple on pipe



If you need to remove the sensor, use a spanner. Do not pull the sensor out by the cable as this may snap the cable.

Step 3 – Attach pressure sensor to connection point

- Screw the sensor into the connection point and tighten with a spanner
  - Fix sensor firmly to prevent loosing or shaking
  - A reducing bush may be needed if connecting the sensor to a large ball valve or nipple
  - Use thread tape or sealant, where required
- If using a ball valve, open the valve



Installation – Electrical

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

Notes:

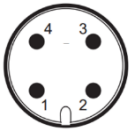
- Do **not** screw the M12 connector using force, otherwise it may damage the connection pins.
- Always check the M12 connectors to make sure they are wired correctly.
- Consider all local and national safety requirements and regulations for electrical installations.
- The system must be disconnected from any power supply during installation and maintenance work.
- Any electrical work on the system is only allowed by authorised and qualified personal.

Wiring – 4-20mA Output

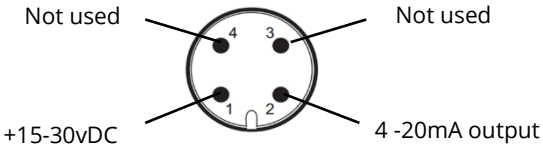
The Pressure Sensor has one 4 pin, M12 connector on top of the sensor.

Pin connections for 4-20mA output

Connector	
Pin 1	+15-30 vDC
Pin 2	4-20mA Output
Pin 3	Not used
Pin 4	Not used



4-20mA Wiring (2 wire)



4-20mA Scaling

Model Number	Pressure Range	4 mA	20mA
PRE10000x	0-16 bar (232 psi)	0	16 *if measuring in bar* 232 *if measuring in PSI*
PRE20000x	0-50 bar (725 psi)	0	50 *if measuring in bar* 725 *if measuring in PSI*

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.

Pressure 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. Calibration is excluded from the product warranty. For more information, contact Compressed Air Alliance.

Trouble Shooting

My sensor isn't reading correctly

If your sensor is not reading the correct values, follow these steps.

1. Make sure the sensor is suitable for your system. Refer to the "*Specifications*" section for details.
2. Make sure the sensor is calibrated. Sensors should be calibrated every 2 years. Contact your local dealer or Compressed Air Alliance for calibration.
3. Check the location of the sensor – are you measuring static pressure or dynamic pressure? Refer to "*Dynamic v Static Pressure*" section for more information.
4. Make sure the sensor is installed correctly. Refer to "*Installation - Mechanical*" section for more information.
5. Make sure the sensor is wired correctly. Refer to "*Installation – Electrical* " section for more information.
    - Is the 4-20mA scaling correct?
6. Is your associated equipment compatible with the pressure sensor output?

If you are still having problems, contact your local dealer or Compressed Air Alliance.

Need help?

Contact your local dealer.

Alternatively, contact Compressed Air Alliance via:

- Phone (Australia): 1300 558 526
- E-mail: sales@compressedairalliance.com
- Website: www.compressedairalliance.com

Commissioning Report

About the Sensor

Part Number (eg PRE100001)			
Serial Number			
Installed by		**Installed Date**	

Installation

Step	Task	Yes	NA	No	Comments	Sign
1	Pressure sensor installed in correct location? (refer to "*Installation - Mechanical*")					
2	Are you measuring static or dynamic pressure (refer to "*Installation - Mechanical*")					
3	Electrical wiring checked (refer to "*Installation - Electrical*")					
4	4-20mA settings checked?					

This page is left blank intentionally

Compressed Air Alliance Pty Ltd

Address: 1 Arthur St, Dee Why NSW 2099, Australia

E-mail: sales@compressedairalliance.com

Website: www.compressedairalliance.com