WISE AIR 4.0
MEASURE TO MANAGE

USER MANUAL · 2026 EDITION

WAPS-501

Compressed Air Pressure Sensor

Models covered: WAPS-501 and WAPS-502



±0.5 %
Accuracy

16 or 40 bar
Full-scale range

4–20 mA
or RS485 Modbus RTU

G ½"
Process connection

INSTALLATION · OPERATION · CONFIGURATION · MAINTENANCE

WISEAIR TECHNOLOGIES INDIA LLP

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ABOUT WISEAIR

WiseAir Technologies India LLP designs and supplies smart measurement instruments for compressed air and industrial gases — flow, dew point, pressure and power sensors, data loggers, smart drains and leak detection tools. Every WiseAir product is built to make compressed-air energy use **visible, measurable and manageable**.

WiseAir sensors work on their own or as part of the **WiseAir WASM-604 Smart Monitoring platform**, which collects data over Modbus / 4–20 mA, analyses it and reports energy, demand and leakage in real time.

DOCUMENT

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01 Safety and general information

Read this manual fully before you install, operate or maintain the WAPS-501 / WAPS-502 pressure sensor. Keep it with the sensor and make it available to everyone who works on the installation.

The sensor is designed only for measuring the pressure of compressed air and similar non-corrosive industrial gases, within the limits given in the technical specifications. WiseAir is not liable for damage caused by failure to follow this manual. Opening or modifying the sensor in any way not described here cancels the warranty.

! COMPRESSED AIR HAZARD

- Escaping air or bursting parts can cause serious injury or death.
- Never exceed the maximum pressure of the sensor or the pipework.
- Use only pressure-tight installation material.
- Depressurise the pipe section before you install or remove the sensor.

! ELECTRICAL HAZARD

- Follow all applicable regulations for electrical installations.
- Disconnect the power supply before any wiring or maintenance work.
- Only authorised, qualified personnel may carry out electrical work.

Using the sensor

- Do not use the sensor in explosive (hazardous) areas.
- Do not exceed the permitted operating, storage or transport temperatures and pressures. Operation outside these limits can damage the sensor or the system.
- Install the sensor correctly and have it calibrated regularly (at least once a year). An uncalibrated or badly installed sensor gives wrong readings.
- Do not dismantle the sensor.
- Always use a spanner on the hexagon of the process connection to tighten the sensor. Never turn the sensor by its housing or connector.
- Observe national regulations before and during installation and operation.

Storage and transport

Transport temperature	−10 °C to +60 °C
Storage temperature	−10 °C to +50 °C, humidity < 90 % RH, non-condensing
Protection	Keep out of direct sunlight and UV radiation during storage

02 Product overview

The WiseAir WAPS-501 / WAPS-502 is an industrial pressure transmitter for compressed-air systems. A ceramic measuring cell converts line pressure into a **4–20 mA** analogue signal or an **RS485 Modbus RTU** digital signal, which can be read by a PLC, a display unit, the WiseAir WADL-301 data logger or the WiseAir WASM-604 Smart Monitoring platform.

Why measure pressure?

Pressure is the primary measurement for a reliable compressed-air system. It is used to set compressor controls and to find pressure drops across dryers, filters and the distribution network. Provide tapped connection points (ideally with a valve) at the compressor discharge, after the treatment equipment, at the far ends of the network and at pressure-sensitive users.

A **pressure profile** — pressure measured at several points at the same time, from the compressor discharge to the point of use — is the best tool to find the real cause of a low-pressure complaint. It often shows that an inexpensive fix (for example a blocked filter or an undersized pipe) solves the problem without adding compressor capacity. Pressure sensors connected to a data logger make a pressure profile simple, because all points are recorded at the same time and against the same time base.

Accurate
±0.5 % accuracy — better than general-purpose gauges (typically 2.5 % of full scale).

Robust
Stainless steel housing and moisture-resistant ceramic measuring cell.

Connected
4–20 mA or RS485 Modbus RTU output for data loggers, PLCs and WASM-604 Smart Monitoring.

Typical applications

- Compressor discharge and header pressure
- Pressure drop across dryers and filters
- Pressure profile of the distribution network
- Pressure at critical points of use
- Compressor set-point optimisation and energy studies
- Permanent monitoring or temporary audits

03 What's in the box and optional accessories

1. WAPS-501 or WAPS-502 pressure sensor (as ordered)
2. User manual
3. Calibration certificate

NOTE
Check the model, measuring range and output on the sensor label against your order before installation. Contact WiseAir or your local dealer for accessory prices.

Optional accessories

- WiseAir WADL-301 data logger
- WiseAir WASM-604 Smart Monitoring software
- Panel-mounted analogue display unit
- Y-type connector for linking several Modbus sensors on one RS485 bus
- Ball valve and quick-release coupler for G ½ connection

04 Technical specifications

MEASUREMENT	
Measured value	Pressure (gauge)
Measuring range	0–16 bar(g) [0–1.6 MPa] or 0–40 bar(g) [0–4.0 MPa], as ordered
Accuracy	±0.5 %
Sensing element	Ceramic measuring cell, resistant to moisture

ELECTRICAL	
Supply voltage	9–30 VDC
Output	4–20 mA (2-wire) or RS485 Modbus RTU, as ordered
Electrical connection	4-pin plug connector (pin assignment in section 06)

MECHANICAL	
Process connection	G ½ (BSPP) male thread
Housing material	Stainless steel

ENVIRONMENT AND COMPLIANCE	
Ambient (operating) temperature	−20 °C to +80 °C
Storage temperature	−10 °C to +50 °C, < 90 % RH, non-condensing
EMC	According to IEC 61326-1
Calibration interval	12 months (recommended)

NOTE

1 bar = 0.1 MPa = 14.5 psi. The measuring range and output version of your sensor are printed on its label.

05 Mechanical installation

These instructions apply to both WAPS-501 and WAPS-502. Before you start, make sure the sensor range is suitable for the maximum pressure of your system.

WARNING

Incorrect installation can damage the sensor or give wrong readings. Depressurise the pipe section before you fit or remove the sensor.

1. **Select the location**

   Choose a point on a horizontal pipe in dry compressed air (relative humidity below 80 %), normally downstream of the dryer. The sensor must stand vertically on top of the pipe, at 90° to it. Leave enough room above the pipe to fit and remove the sensor. If the sensor is installed outdoors, protect it from sun and rain.

2. **Prepare the connection point**

   You need a connection point with a **G ½ female thread** — for example a welded socket, nipple or nozzle. A ball valve is optional but recommended: it lets you remove the sensor later (for example for calibration) without shutting down the line.

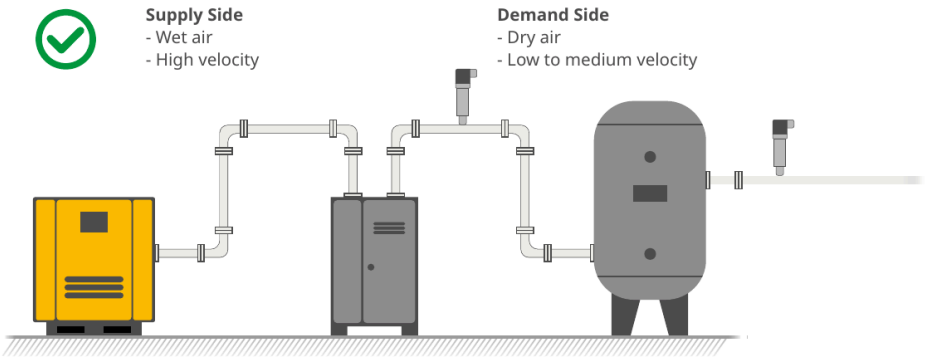
3 **Fit the sensor**

Seal the thread with a suitable sealing washer or thread sealant. Screw the sensor into the connection point (or into a quick-release coupler fitted on the valve) and tighten it with a spanner on the hexagon only.

4 **Pressurise and check**

Open the valve slowly. Check the connection for leaks with leak-detection spray or an ultrasonic leak detector.

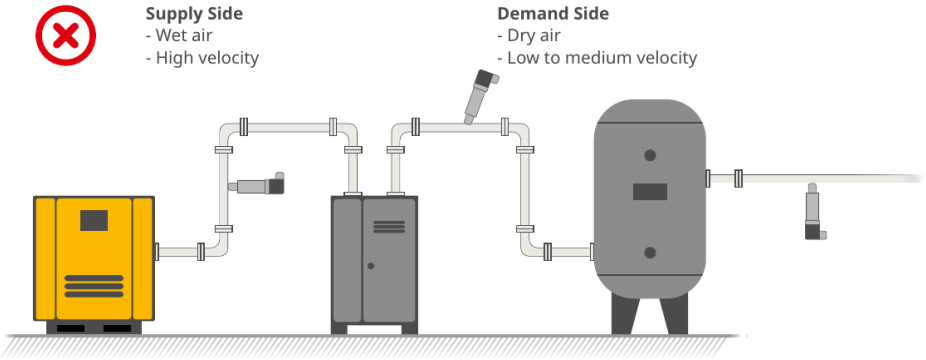
Correct installation



Sensor upright on top of the pipe, in dry air after the dryer and after the air receiver.

Incorrect installation

- Do **not** install the sensor before the dryer or in air with a relative humidity above 80 %.
- Do **not** install the sensor upside down, horizontally or at an angle.
- Do **not** let water or condensate enter the pressure port of the sensor.



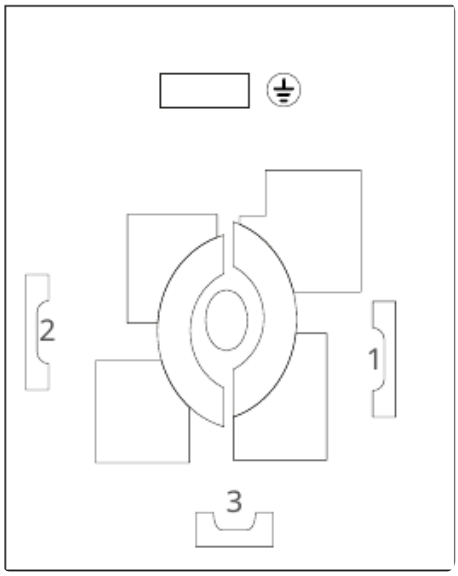
Wrong: sensor horizontal in wet air before the dryer, sensor at an angle, sensor hanging upside down.

06 Electrical connection

DANGER

Switch off the power supply before wiring. Use a 9–30 VDC SELV power supply. Earth the cable screen at one end only, according to site practice.

The sensor is connected through a 4-pin plug connector. On the square plug connector (shown on the cover photo), unscrew the centre screw to remove the cable socket, then open it to reach the terminals. Wire the sensor according to its output version (see the label).



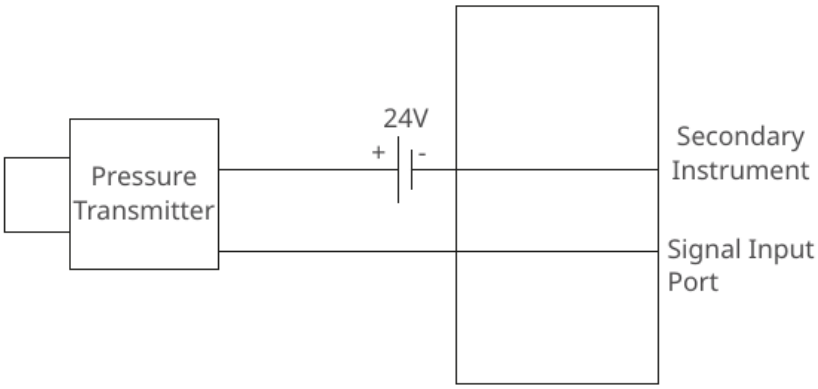
Connector socket — terminal numbering

Pin assignment

Pin	4–20 mA version	Modbus version
1	V+ (9–30 VDC)	V+ (9–30 VDC)
2	V− / 4–20 mA signal	V− (0 V)
3	Not connected	RS485 D+ (A)
4	Not connected	RS485 D− (B)

4–20 mA (2-wire loop)

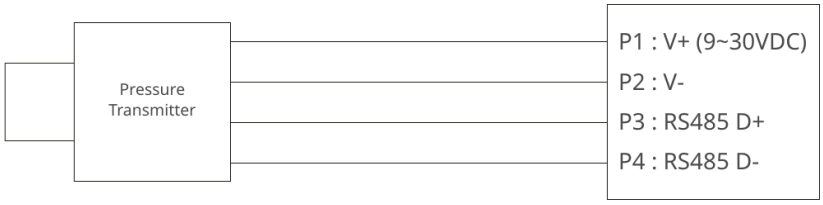
The sensor works as a 2-wire loop-powered transmitter. Connect the + of the 24 VDC supply to pin 1. Connect pin 2 to the signal input of the receiving instrument (PLC, display unit or data logger), and close the loop to the − of the supply. 4 mA corresponds to 0 bar(g) and 20 mA to the full-scale pressure of the sensor.



4–20 mA loop wiring

RS485 Modbus RTU

Connect power to pins 1 and 2 and the RS485 bus to pins 3 (D+) and 4 (D−). Use twisted-pair, screened cable. Several sensors can share one RS485 bus; give each one a unique Modbus address.



Modbus RTU wiring

MODBUS SETTINGS AND REGISTER MAP

The default communication settings (address, baud rate, parity) and the Modbus register map are given in the WiseAir Modbus guideline for WAPS-501 / WAPS-502. Contact WiseAir support (details on the back cover) for the current document.

07 Maintenance and calibration

The sensor has no user-serviceable parts. Keep the housing and connector clean and dry, and check the connector seal and cable gland at each service visit.

- Each sensor is calibrated before delivery. The calibration date is shown on the calibration certificate supplied with the sensor.
- Recalibrate the sensor **every 12 months**. Contaminated or wet air can make more frequent checks necessary.
- A ball valve at the measuring point lets you remove the sensor for calibration without shutting down the system.
- Calibration is not covered by the product warranty. Contact WiseAir support for calibration service.

08 Troubleshooting

Symptom	Possible cause	Action
No signal (0 mA) or no Modbus response	No supply voltage; connector loose; wrong pin wiring	Check 9–30 VDC at pins 1 and 2; refit the connector; check wiring against the pin table
Reading stays at 4 mA / 0 bar	Valve closed; port blocked	Open the isolation valve; depressurise, remove the sensor and check the port
Reading too high or too low	Wrong range scaled in the receiving instrument	Set the instrument scaling to the range on the sensor label (4 mA = 0, 20 mA = full scale)
Unstable or noisy reading	Long unscreened cable; screen not earthed; pulsating flow	Use screened twisted-pair cable and earth the screen at one end
Modbus communication errors	Wrong address, baud rate or parity; D+/D− swapped	Check the settings in the master; swap D+ and D−
Drift over time	Calibration overdue; moisture in the port	Check the installation is in dry air; send the sensor for calibration

09 Warranty and service

WiseAir Technologies provides a **12-month warranty** from the date of delivery on the WAPS-501 / WAPS-502 pressure sensor. The warranty covers defects in material and workmanship when the sensor is used within the stated operating conditions. Report any fault immediately and within the warranty period.

During the warranty period WiseAir will repair or replace a defective unit free of charge for parts and repair labour. Other services — such as removal and reinstallation, transport and site visits — are charged. Warranty repairs do not extend the warranty period.

Not covered by the warranty

- Damage from improper use or not following this manual
- Use of unsuitable accessories
- External influences such as vibration, transport damage, excess heat or moisture
- Cosmetic damage to the outside of the sensor (dents, marks)
- Calibration

The warranty is void if

- the sensor has been opened other than as described in this manual
- repairs or modifications have been made by third parties or unauthorised persons
- the serial number has been changed, damaged or removed

For service, contact WiseAir support (details on the back cover) and quote the model and serial number.

10 Commissioning report

SENSOR	
Model (WAPS-501 / WAPS-502)	
Serial number	
Measuring range / output version	
Calibration valid until	
Warranty valid until	
SITE	
Customer	
Measuring point / location	
Installed by	
Installation date	

Installation checks

#	Check	Yes	N/A	No	Comments
1	Sensor installed upright, in dry air, at the correct location				
2	Electrical wiring checked against the pin table				
3	4–20 mA scaling or Modbus settings checked in the receiving device				
4	Connection checked for leaks under pressure				
5	Reading compared with a reference gauge				

WiseAir representative _____ Customer representative _____ Date _____

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Need help with your WAPS-501?

Our product specialists support installation, commissioning, configuration and calibration — remotely or on site.

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> When you contact support, please keep the sensor serial number, firmware version and a photo of the installation ready.

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Specifications are subject to change without notice.