# QM42-DPSx-2Q Differential Pressure Sensor

## Features

The differential pressure sensor offers accurate low-differential pressure measurement of air and non-condensing, non-corrosive gases in applications such as air filter monitoring, isolation and clean rooms, building pressurization and dust collectors.



- Silicon piezoresistive differential pressure core
- Aluminum alloy housing
- Senses up to ±1 inches of water column using the **QM42-DPS1-2Q** model
- Senses up to ±5 inches of water column using the **QM42-DPS5-2Q** model
- Senses up to ± 20 inches of water column using the **QM42-DPS20-2Q** model
- RS-485 Modbus serial communication

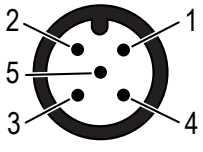
## Models

| Model | Description | Interface | Connection |
|---|---|---|---|
| **QM42-DPS1-2Q** | Differential Pressure Sensor ±1 in w.c. and 10 ft of tubing | RS-485 Modbus | 2.09 m (6.9 ft) cable with a 5-pin M12 quick disconnect (QD) connector |
| **QM42-DPS5-2Q** | Differential Pressure Sensor ±5 in w.c. and 10 ft of tubing | | |
| **QM42-DPS20-2Q** | Differential Pressure Sensor ±20 in w.c. and 10 ft of tubing | | |

## Wiring

This sensor is designed for use as a Modbus server. This sensor can be plugged into any Modbus RS-485 network, compatible MultiHop Data Radio, or DXMR90 Series Controller. Flying lead models use the listed wire colors and sensor connections.

*Wiring*

| 5-pin M12 Male Connector | Pin | Wire Color | Sensor Connection |
|---|---|---|---|
|  | 1 | brown (bn) | Power IN (+): 10 to 30 V DC |
| | 2 | white (wh) | RS485 / D1 / B / + |
| | 3 | blue (bu) | Ground (-) |
| | 4 | black (bk) | RS485 / D0 / A / – |
| | 5 | gray (gr) | Not Used |



## Holding Registers

*Holding registers for the **QM42-DPS1-2Q** model*

| Modbus Register | Output | I/O Range | | Holding Register Representation | | Measured Results |
|---|---|---|---|---|---|---|
| | | Minimum | Maximum | Minimum (Decimal) | Maximum (Decimal) | |
| 1 | Pressure (Inches of Water) | -1 | 1 | -1000 | 1000 | Register value ÷ 1000 |
| 2 | Pressure (PSI) | -0.036 | 0.036 | -36 | 36 | Register value ÷ 1000 |
| 3 | Temperature (F) | -40 | 221 | -4000 | 22100 | Register value ÷ 100 |
| 4 | Temperature (C) | -40 | 105 | -4000 | 10500 | Register value ÷ 100 |
| 5 | Pressure (Pa) | -248 | 248 | -248 | 248 | Register value |
| 1201 | Pressure Sample Interval | 0 | 65000 | 0 | 65000 | |
| 1202 | Temperature Sample Interval | 0 | 65000 | 0 | 65000 | |
| 6101 | Baud | 0=9.6k, 1=19.2k (default), 2=38.4k | | | | |
| 6102 | Parity | 0=none (default), 1=odd, 2=even | | | | |

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Original Instructions
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| Modbus Register | Output | I/O Range | | Holding Register Representation | | Measured Results |
|---|---|---|---|---|---|---|
| | | Minimum | Maximum | Minimum (Decimal) | Maximum (Decimal) | |
| 6103 | Modbus Server Address | 1 (default) through 247 | | | | |

*Holding registers for the **QM42-DPS5-2Q** model*

| Modbus Register | Output | I/O Range | | Holding Register Representation | | Measured Results |
|---|---|---|---|---|---|---|
| | | Minimum | Maximum | Minimum (Decimal) | Maximum (Decimal) | |
| 1 | Pressure (Inches of Water) | -5 | 5 | -5000 | 5000 | Register value ÷ 1000 |
| 2 | Pressure (PSI) | -0.180 | 0.180 | -180 | 180 | Register value ÷ 1000 |
| 3 | Temperature (F) | -40 | 221 | -4000 | 22100 | Register value ÷ 100 |
| 4 | Temperature (C) | -40 | 105 | -4000 | 10500 | Register value ÷ 100 |
| 5 | Pressure (Pa) | -1244 | 1244 | -1244 | 1244 | Register value |
| 1201 | Pressure Sample Interval | 0 | 65000 | 0 | 65000 | |
| 1202 | Temperature Sample Interval | 0 | 65000 | 0 | 65000 | |
| 6101 | Baud | 0=9.6k, 1=19.2k (default), 2=38.4k | | | | |
| 6102 | Parity | 0=none (default), 1=odd, 2=even | | | | |
| 6103 | Modbus Server Address | 1 (default) through 247 | | | | |

*Holding registers for the **QM42-DPS20-2Q** model*

| Modbus Register | Output | I/O Range | | Holding Register Representation | | Measured Results |
|---|---|---|---|---|---|---|
| | | Minimum | Maximum | Minimum (Decimal) | Maximum (Decimal) | |
| 1 | Pressure (Inches of Water) | -20 | 20 | -20000 | 20000 | Register value ÷ 1000 |
| 2 | Pressure (PSI) | -0.722 | 0.722 | -722 | 722 | Register value ÷ 1000 |
| 3 | Temperature (F) | -40 | 221 | -4000 | 22100 | Register value ÷ 100 |
| 4 | Temperature (C) | -40 | 105 | -4000 | 10500 | Register value ÷ 100 |
| 5 | Pressure (Pa) | -4977 | 4977 | -4977 | 4977 | Register value |
| 1201 | Pressure Sample Interval | 0 | 65000 | 0 | 65000 | |
| 1202 | Temperature Sample Interval | 0 | 65000 | 0 | 65000 | |
| 6101 | Baud | 0=9.6k, 1=19.2k (default), 2=38.4k | | | | |
| 6102 | Parity | 0=none (default), 1=odd, 2=even | | | | |
| 6103 | Modbus Server Address | 1 (default) through 247 | | | | |

The default pressure and temperature sample intervals are 5 seconds (holding register value of 80). The holding register values increment the sample rate in intervals of 62.5 ms.

# Installing the Pressure Sensor

The pressure sensor can be mounted to any surface using fasteners sized for the 1/8-inch (3.2 mm) diameter through-holes on the base of the unit. The optional **BWA-BK-001** bracket may be used for mounting to a magnetic surface.

The supplied tubing has an 1/8 inch inner diameter and is intended to fit the barbed fittings on the high (+) and low (-) pressure ports. Cut the tubing to the length required, but for the best results, keep the tubing as short as possible. Install the high (+) side to the upstream or high-line pressure and install the low (-) side to downstream or low-line pressure.

# Specifications

**Supply Voltage**
10 V DC to 30 V DC

**Current Consumption**
< 3 mA

**Pressure Range**
**QM42-DPS1-2Q**: ±1 inches water column (wc)
**QM42-DPS5-2Q**: ±5 inches water column (wc)
**QM42-DPS20-2Q**: ±20 inches water column (wc)


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**Output**
RS-485 Serial

**Accuracy**
0.2% full scale

**Proof and Burst Pressure**
**QM42-DPS1-2Q**: Proof Pressure: 100× Maximum Operating Pressure
**QM42-DPS1-2Q**: Burst Pressure: 300× Maximum Operating Pressure
**QM42-DPS5-2Q**: Proof Pressure: 40× Maximum Operating Pressure
**QM42-DPS5-2Q**: Burst Pressure: 60× Maximum Operating Pressure
**QM42-DPS20-2Q**: Proof Pressure: 10× Maximum Operating Pressure
**QM42-DPS20-2Q**: Burst Pressure: 25× Maximum Operating Pressure

**Stability**
≤ 0.2% full scale per year

**Communication Hardware**
Interface: RS-485 Serial
Baud rates: 9.6k, 19.2k (default), or 38.4k
Data format: 8 data bits, no parity (default, 1 stop bit)
Active Communications Current: 2.95 mA at 30 V DC
Protocol: RS-485 Modbus RTU

**Pressure Interface**
Dual barbed ports

**Temperature**
Compensated: –20 °C to +85 °C (–4 °F to +185 °F)
Operating: –25 °C to +85 °C (–13 °F to +185 °F)

**Indicators**
Green flashing: Power ON
Amber flashing: Serial Tx

**Measuring Media**
Gaseous

**Electrical Connection**
Conduit fitting with cable

**Included PVC Tubing**
Inner diameter: 0.125 in
Outer diameter: 0.25 in
Length: 10 ft

**Connection**
2.09 m (6.9 ft) cable with a 5-pin M12 male quick disconnect

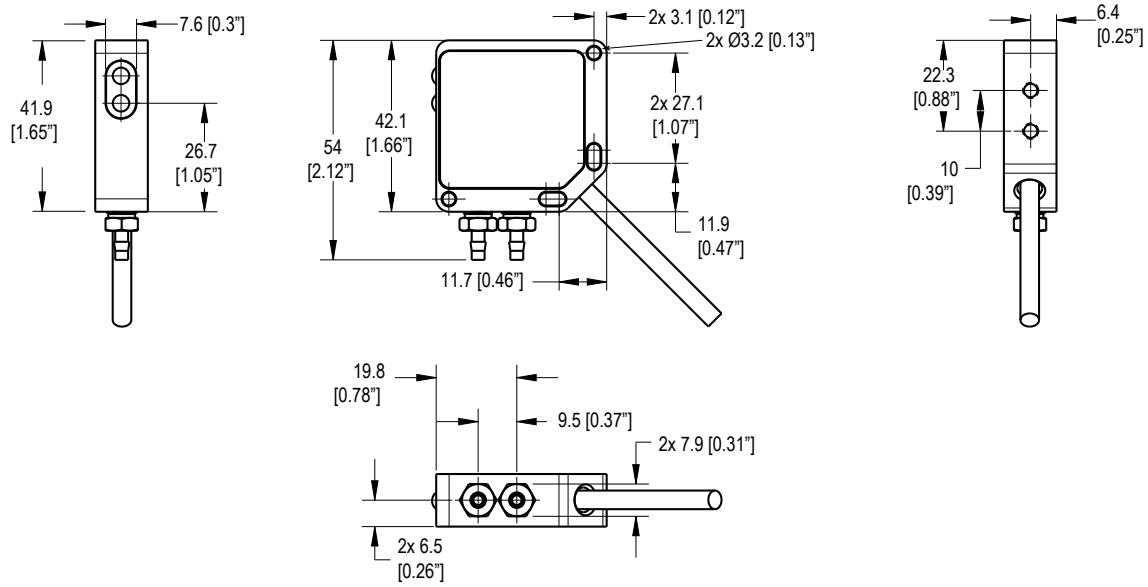
**Construction**
Black anodized aluminum alloy

**Zero/Span Offset Tolerance**
Zero temperature drift
± 0.5% full scale per °C
Humidity Limits (non-condensing) 0 to 95% RH

## Dimensions

All measurements are listed in millimeters [inches], unless noted otherwise. The measurements provided are subject to change.

*Dimensions*





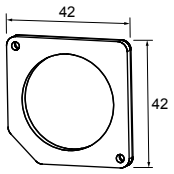
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# Accessories

Bracket BWA-BK-005 is included with the QM42-DPSx-2Q sensor.

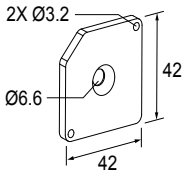
**BWA-BK-001**

- Includes magnetic mounting bracket **SMB42FLM12** and 2 mounting screws
- CAD Files: DXF, PDF, IGS, STP



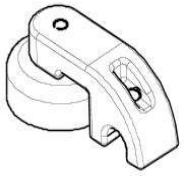

**BWA-BK-005**

- Use when measuring high-frequency vibrations or when mounting the sensor to curved surfaces
- Includes **SMB42FLAT** stainless steel bracket, 1/4"-28 screw mount, and one piece of 3M™ thermally conductive adhesive transfer tape
- CAD Files: DXF, PDF, IGS, STP




**BWA-M12CAB-MAG**

- Magnetic bracket to manage Banner M12 cables
- 34 mm x 19 mm overall
- CAD Files: DXF, PDF, IGS, STP



**BWA-DPS-PROBE**

- Duct pressure probe with 2-inch length hose barb
- 38 mm diameter flange mount



**BWA-TUBE-001** Tubing

- Clear PVC Durometer 65A
- Max Pressure 60 PSI at 70°F
- 10 ft long, 1/8 in ID, 1/4 in OD

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