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

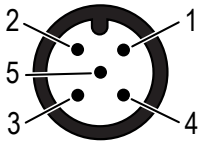
Models

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

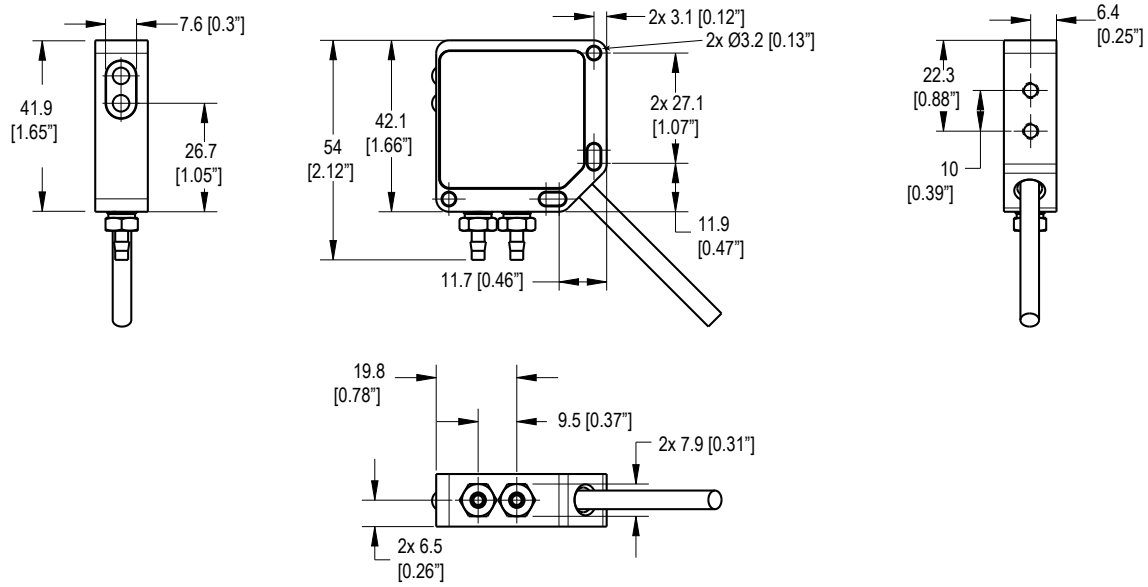
Construction
Black anodized aluminum alloy

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



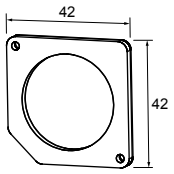
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Accessories

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

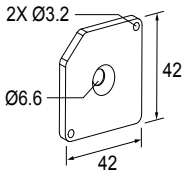
BWA-BK-001

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



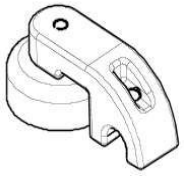
BWA-BK-005

- 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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