MALEMA

MPS-450 PRESSURE SENSOR

User Manual

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Subject to Technical Changes

Owing to our policy of continuous product development, the illustrations and technical data contained in this document may differ slightly from the current version of the device.

Legal Manufacturer

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Certifications/Compliances

CE Compliance via the following testing:
1. EN61000-4-2: Electrostatic Discharge
2. EN61000-4-3: Radiated Immunity (and Radiated Emissions)
3. EN61000-4-4: Electrical Fast Transients
4. EN61000-4-5: Surge - Power Line
5. EN61000-4-6: Conducted Immunity

Support Email Address

Please contact the Malema Customer Support Team at the email addresses below,

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Order Support:
Malema.OrderSupport@psgdover.com

Quote Support:
Malema.QuoteSupport@psgdover.com

Technical Support:
Malema.TechnicalSupport@psgdover.com

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1.00 Introduction

1.01 Safety Precautions

The Model MPS-450 pressure transmitter undergoes rigorous factory testing before shipment. Upon delivery, conduct a visual inspection to ensure no damage occurred during transit.

⚠ CAUTION

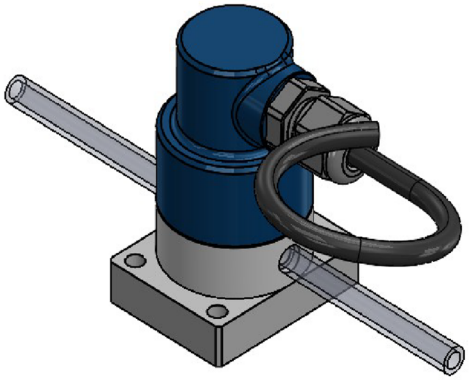
Please read the following cautions carefully before using this instrument. If you have any questions or encounter problems, contact your sales agent or Malema.

- **Pressure Limits:** Do not exceed the maximum allowable pressure. Exceeding this limit may result in injury or damage due to the device bursting or exploding.
- **Corrosive Substances:** Avoid using this device with corrosive substances. Exposure to corrosive materials can lead to device failure and potential hazards.
- **Mechanical Stress:** Do not subject the device to excessive weight, vibration, or shock. This can cause damage or failure.
- **Power Supply:** Use only the specified power supply. Incorrect power supply usage may pose fire or electric shock hazards.
- **Temperature Range:** Operate the device within the specified temperature range. Exceeding this range can result in damage or failure.
- **Wiring:** Connect the wiring accurately according to the wiring diagrams and instructions in the operation manual. Incorrect wiring can lead to injury or fire hazards.
- **Hazardous Environments:** This product is designed for use in non-hazardous areas only.
- **Installation:** Install the device accurately following the installation instructions in the operation manual.
- **Modifications:** Do not attempt to modify or repair the device yourself. Contact Malema Sensors for repairs.

Note: Please ensure you have read the User Manual before installing the Pressure Sensor. Contact Malema Sensors if you require further assistance. Incorrect installation might result in fatal or serious injury due to malfunction or incorrect operation of the product.

1.02 Overview

MPS-450 Pressure Sensors are specifically designed for high-purity applications in the semiconductor industry. The internal flow path is designed to minimize the holdup volume. The wetted components of these nonmetallic transducers are constructed using PTFE, PFA, or other similar high-purity inert materials.



Models	Pressure Sensor Only (MPS-450)

Sizes	1/4"	3/8"	1/2"	3/4"	1"
Single Port	✓	✓	✓		
Flow-Through	✓	✓	✓	✓	✓

Fluid Connections: Tube, Pillar, and Flare

1.00 Introduction

⚠ CAUTION

Malema is not responsible for damage or physical injury caused by the following,

- Repairs or alterations by other companies
- Use of non-authorized parts for maintenance causing damage
- Non-compliance with the precautions outlined in this manual or improper use and service conditions
- Fire, earthquake, water damage or other natural disaster

1.03 Chemicals

The service life of the instrument when used with chemicals can vary significantly depending on the specific working conditions, including chemical concentration, temperature, and pressure. For applications involving strong acids or strong alkalis, consult Malema for guidance.

It is strongly recommended to conduct a thorough confirmation test under actual operating conditions before using the instrument. Please note that the chemical resistance data is a guideline but may require separate testing.

1.04 Storage

⚠ CAUTION

- **Warning:** Risk of Damage from Humidity.
- **Shield from Moisture:** Protect the pressure sensor from rain and humidity.
- **Humidity Control:** Ensure that relative humidity does not exceed 95%.
- **Warning:** Risk of Mechanical Wear.
- **Secure Storage Location:** Store the pressure sensor in an area that is protected from mechanical influences.
- **Temperature Compliance:** Adhere to the specified storage temperature limits outlined in the Operating Conditions.
- **Avoid Direct Sunlight:** Protect the pressure sensor from direct sunlight to prevent overheating.
- **Humidity Protection:** Again, ensure protection from rain and excessive humidity.
- **Maintain Protective Materials:** Keep all protective stickers or covers on process connections intact or reapply them as needed.
- **Preparation for Storage:** Prior to storing a previously used pressure sensor, completely drain all fluids from the measuring tube.

1.05 Maintenance

To ensure optimal performance and longevity, conduct regular inspections of the instrument approximately twice a year, based on usage conditions. If any abnormalities are detected, contact Malema immediately.

Check Items:

- Conduct visual inspection
- Check the pressure inlet for signs of corrosion, dirt, clogging, leaks, etc.
- Verify the output accuracy using a standard pressure gauge.

2.00 Installation

To prevent the product from malfunctioning or deteriorating, be sure to avoid installing it in the following places:

- Areas with extreme temperatures (high or low)
- Locations exposed to corrosive or volatile gases
- Areas subject to strong vibration or noise
- Places prone to lightning strikes
- Areas exposed to liquid splashes or submersion
- Mounting positions where the process connection faces vertically upward

3.00 Standard Specifications

3.01 Performance Specifications

Accuracy	±1% FS
Repeatability	±0.5% FS
Ambient Temperature	0 - 50°C
Media Operating Temperature	10°C to 70°C
Measurable Fluids	Gases or non-phase changing Liquids
Maximum Operating Pressure	Depends on pressure range; typically, 2 bar over max pressure
Ingress Protection Class	IP64

3.02 Electrical Specifications

Output Options	Analog Output	Passive 4 - 20 mA current loop, or 0 - 10 V DC.
Power Supply	24 V DC ± 10%	
Power Consumption	Max 30 mA @ 24 V DC	
Cable	1 meter, 2 meters, 3 meters, or custom length PVC-jacketed cable available	

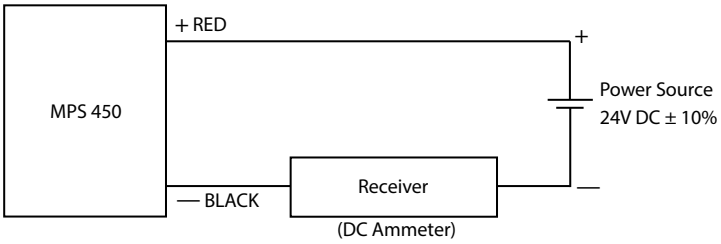
3.03 Material Specifications

Wetted Materials	PFA, FFKM (other seal materials available upon special request)
Non-wetted Materials	PP
Cable Jacket Materials	PVC

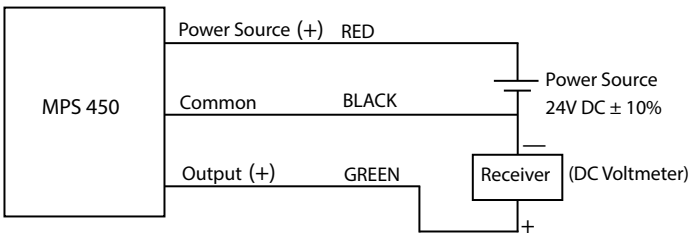
3.04 Electrical Connections

MPS - 450 Cable Version

Option I (Passive 4 - 20 mA)	
Color	**Description**
Red	24 V DC
Black	4 - 20 mA Loop/Ground



Option J (0 - 10 V Option)	
Color	**Description**
Red	24 V DC
Black	Ground
Green	+Analog (0 - 10 V DC) PRESS, Active



3.05 Current Output Load Resistance

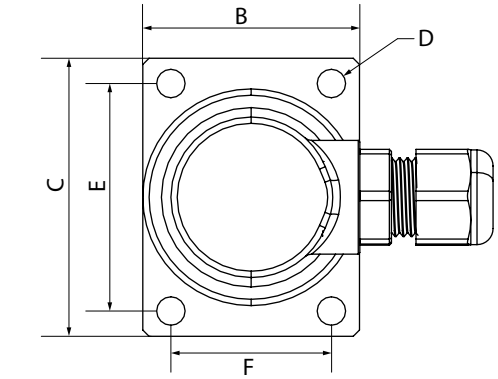
Recommended load resistance for 4-20 mA loop is 250 ohm. If higher load is to be used, the max load resistance and power supply voltage needed can be calculated using the following formula.

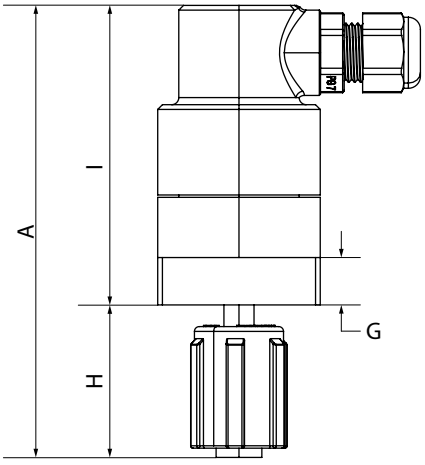
Load Resistance (ohm) = (Vcc- 12)/0.03

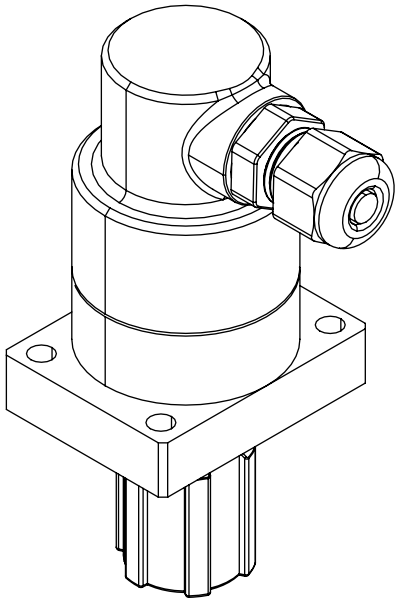
Vcc = Power Voltage in volts

4.00 Dimensional Drawing

4.01 Single Port



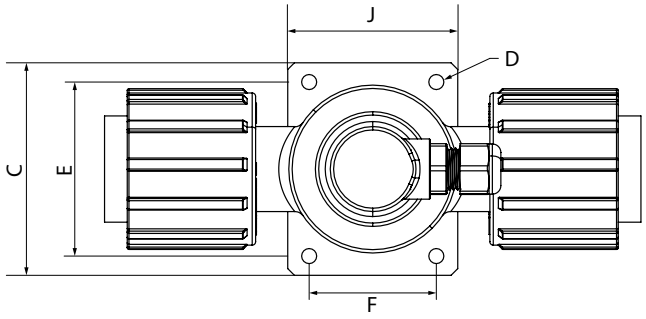


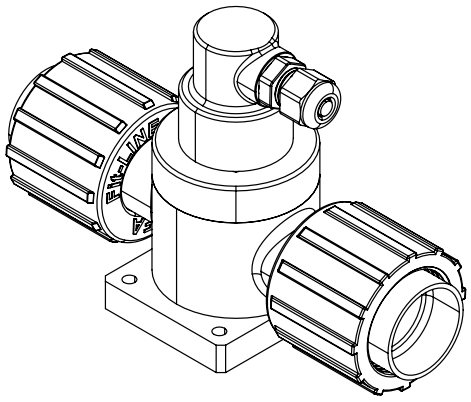


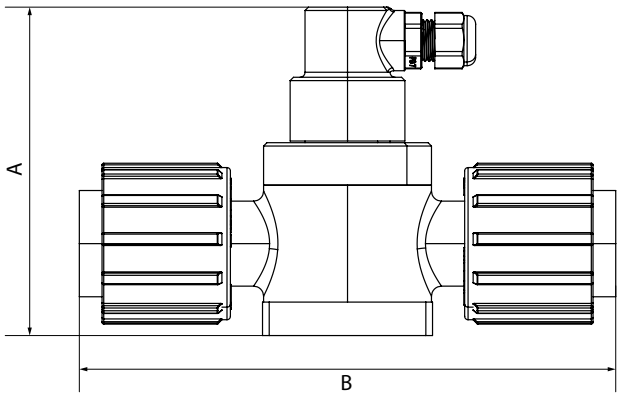
MPS Size	A	B	C	D	E	F	G	H	I
1/4" Female Flare, Single Port	95.4 mm	34.3 mm	44 mm	4.5 mm	36 mm	25.4 mm	10 mm	32.2 mm	63.2 mm
1/4" Pillar S300, Single Port	84.7 mm	34.3 mm	44 mm	4.5 mm	36 mm	25.4 mm	10 mm	21.5 mm	63.2 mm
3/8" Female Flare, Single Port	96.6 mm	34.3 mm	44 mm	4.5 mm	36 mm	25.4 mm	10 mm	33.4 mm	63.2 mm
3/8" Pillar S300, Single Port	90.3 mm	34.3 mm	44 mm	4.5 mm	36 mm	25.4 mm	10 mm	27.1 mm	63.2 mm
1/2" Female Flare, Single Port	98.6 mm	34.3 mm	44 mm	4.5 mm	36 mm	25.4 mm	10 mm	35.4 mm	63.2 mm
1/2" Pillar S300, Single Port	94.5 mm	34.3 mm	44 mm	4.5 mm	36 mm	25.4 mm	10 mm	31.3 mm	63.2 mm

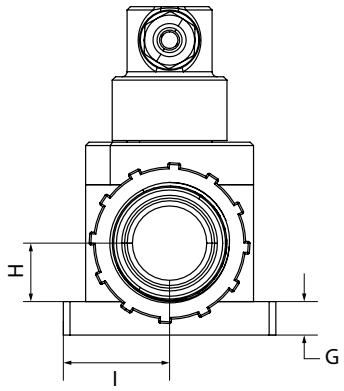
4.00 Dimensional Drawing

4.02 Flow Through









MPS Size	A	B	C	D	E	F	G	H	I	J
1/4" Female Flare, Flow Through	63.2 mm	101.7 mm	44 mm	4.5 mm	36 mm	25.4 mm	10 mm	6.4 mm	22 mm	50.8 mm
1/4" Pillar S300, Flow Through	63.2 mm	81.8 mm	44 mm	4.5 mm	36 mm	25.4 mm	10 mm	6.4 mm	22 mm	50.8 mm
3/8" Female Flare, Flow Through	69.6 mm	106.9 mm	44 mm	4.5 mm	36 mm	25.4 mm	10 mm	9.5 mm	22 mm	50.8 mm
3/8" Pillar S300, Flow Through	69.6 mm	92.2 mm	44 mm	4.5 mm	36 mm	25.4 mm	10 mm	9.5 mm	22 mm	50.8 mm
1/2" Female Flare, Flow Through	83.2 mm	127 mm	63.5 mm	4.5 mm	52 mm	38 mm	10 mm	10 mm	31.8 mm	50.8 mm
1/2" Pillar S300, Flow Through	83.2 mm	117.4 mm	63.5 mm	4.5 mm	52 mm	38 mm	10 mm	10 mm	31.8 mm	50.8 mm
3/4" Female Flare, Flow Through	91.2 mm	143.1 mm	63.5 mm	4.5 mm	52 mm	38 mm	10 mm	14 mm	31.8 mm	50.8 mm
3/4" Pillar S300, Flow Through	91.2 mm	133.9 mm	63.5 mm	4.5 mm	52 mm	38 mm	10 mm	14 mm	31.8 mm	50.8 mm
1" Female Flare, Flow Through	98.1 mm	160.3 mm	63.5 mm	4.5 mm	52 mm	38 mm	10 mm	17.5 mm	31.8 mm	50.8 mm
1" Pillar S300, Flow Through	98.1 mm	146.2 mm	63.5 mm	4.5 mm	52 mm	38 mm	10 mm	17.5 mm	31.8 mm	50.8 mm

5.00 Order Information

Part Number Model Code for Sensor with Integrated Cable								
Model	**-*****	*	*	*	*	**	**-*****	**Description**
MPS-450								
Process Parameters Measured								Pressure Sensing Only
Pressure Range	-007							0-7.5 psig
	-030							0-30 psig
	-100							0-100 psig
	-ZZZ							Custom Range
Configuration		S						Single Port
		F						Flow Through
Size			2					1/4"
			3					3/8"
			4					1/2"
			6					3/4" (Not available in single port design)
			8					1" (Not available in single port design)
Fluid Connection				0				20 mm length Tube stub
				1				Female Flare
				2				Female Pillar
Input/Output					I			2-wire cable (Power, 1 x analog 4-20mA DC o/p)
					J			3-wire cable (Power, 1 x analog 0-10 V DC o/p)
Cable Length						01		1 meter
						02		2 meters
						03		3 meters
						ZZ		Custom length
Ordering Extension (Standard and Custom options)							-S01	Standard version
							-XXX	For any custom options, factory will assign 3 digit unique ID in place of XXX

6.00 Troubleshooting

If you suspect the MPS Pressure Sensor is not sending an output signal, use the following steps to identify the problem.

To troubleshoot MPS Pressure Sensor, use a multimeter to measure the output signal. Connect the multimeter in series with the transducer to measure current output or directly to measure voltage output. This method effectively isolates issues between the transducer and the on-site data acquisition system. By monitoring the output signal, you can determine if the transducer itself is malfunctioning or if the problem lies within the data acquisition system.

7.00 Warranty

7.01 Period of Warranty

Malema Sensors warrants its Products will meet their written specifications when used in accordance with their applicable instructions and within the limits stated in the operating manuals and/or product data sheets for a period of one year from shipment of the Products. Malema Sensors makes no other warranty, expressed or implied. Malema disclaims the warranties of merchantability or fitness for a particular purpose. The express warranty provided herein and the data, specifications and descriptions of Malema Sensors Products appearing in Malema Sensors user manuals may not be altered except by express written agreement signed by an officer of Malema Sensors. Representations, oral or written, which are inconsistent with this warranty or such publications are not authorized and if given, should not be relied upon.

Buyer shall report any claimed defect in writing to Malema Sensors immediately upon discovery and in any event, within the warranty period. If Malema Sensors on receipt of the alleged defective product determines that the defect is due to misuse or modification owing to failure to comply with instructions and/or applicable limits stated in the operating manuals and/or product data sheets or for whatever other reasons (including intentional damage), Malema Sensors shall have the right to impose such repair and other transportation charges as incurred.

7.02 Repair

Where there are manufacturers' defects, Malema Sensors shall, at its sole option, repair the products and/or equipment or furnish replacement equipment or parts thereof, at the original delivery point. Malema Sensors shall not be liable for costs of removal, reinstallation, or gaining access.

7.03 Validity of Warranty

If Buyer or other third parties repair, replace, or adjust equipment or parts without Malema Sensors' prior written approval, Malema Sensors shall be relieved of any further obligation to Buyer under this section with respect to such equipment.

No equipment furnished by Malema Sensors shall be deemed to be defective by reason of normal wear and tear, failure to resist erosive or corrosive action of any fluid or gas (unless otherwise specified in Quotations), Buyer's failure to properly store, install, operate, or maintain the equipment in accordance with good industry practices or specific recommendations of Malema Sensors or in accordance with operating manuals and/or product data sheets limits, or Buyer's failure to provide complete and accurate information to Malema Sensors concerning the operational application of the equipment.

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