

# Differential Pressure Transmitter

# MSP3100



LIQUID



GAS



## OVERVIEW

### Operation

MSP3100 Gauge, absolute and differential pressure measurement in gases, steam or liquids in all areas of process control field.

### Features

- Compact design
- Protection type IP67 or EX-proof as optional
- High sensitivity
- MEMS technology
- Cost effective
- Short delivery
- High pressure
- High long-term stability

### Application

- Level, volume or mass measurement in liquids.
- Working with detecting element

## OPERATING DATA

Temperature Limit	-40...125°C
Storage Temp. Limit	-45...125°C
Stability	±0.25% of URL for 5
Accuracy	years±0.075% URL
Humidity limit	0-100% relative
Temperature Drift	±0.03% of URL/10°C
Overpressure	Full scale ranges x3
Weight	4 kg (without connection)
Turndown Ratio	10:1

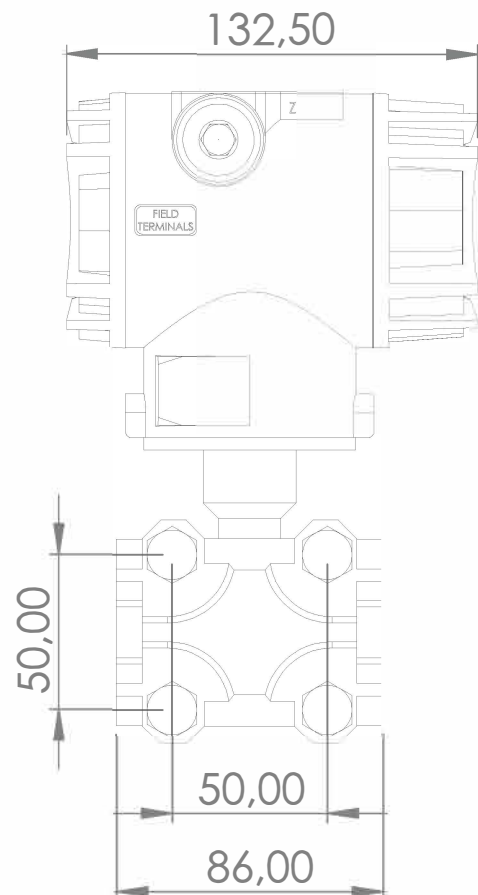
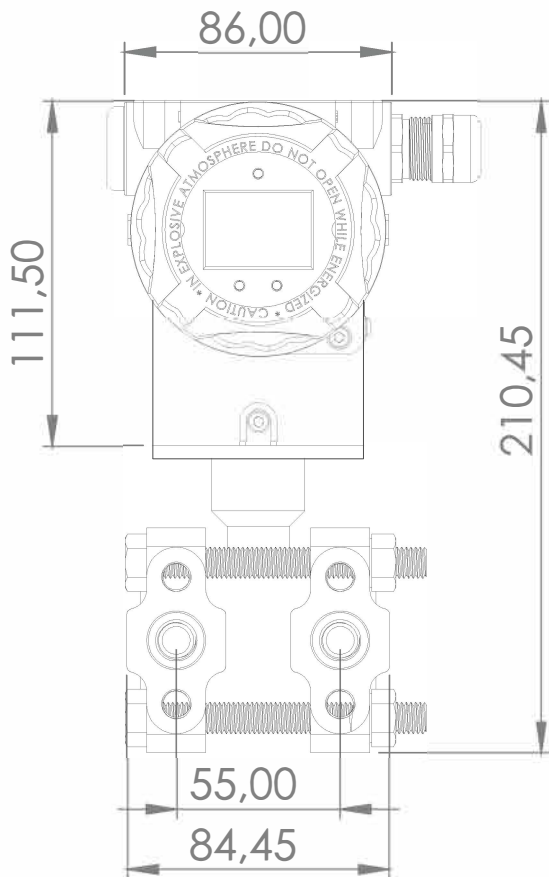
## MEASURING RANGES

Overpressure Range	0-300 bar
--------------------	-----------

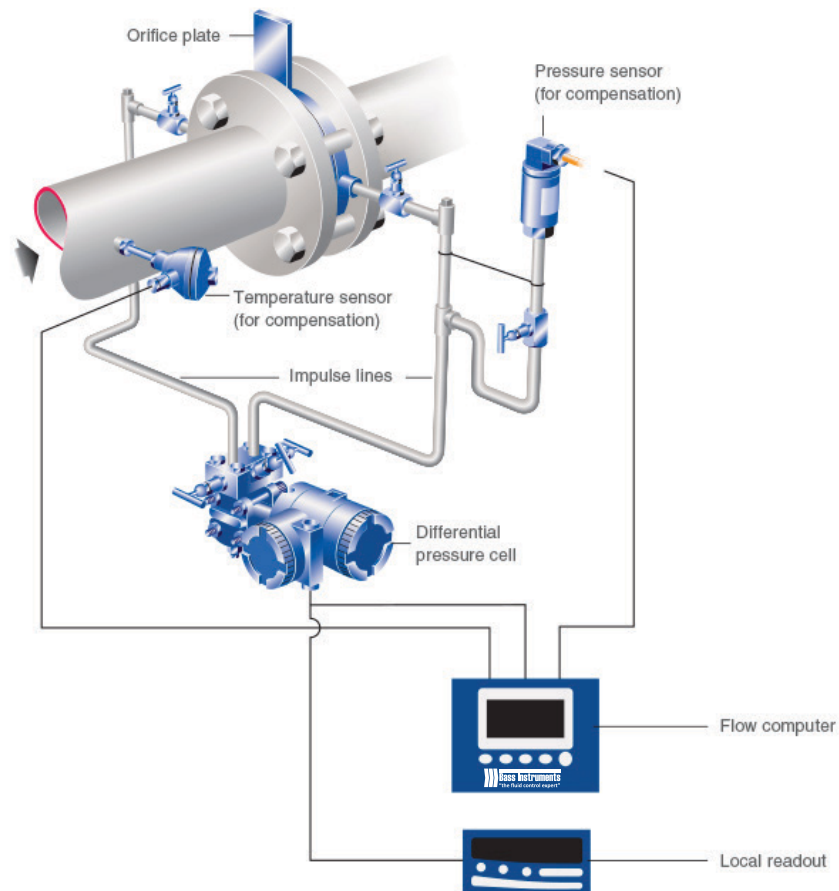
## MATERIALS

Wetted Part	AISI316
Others	On request

## TECHNICAL DRAWINGS AND DIMENSIONS



## ■ INSTALLATION



### 1. Select the Right Gauge

Before you pull out a wrench, first make sure you have the right type of gauge for the application. The pressure gauge you choose must be the correct one for the:

- Expected pressure range to be measured. The selected range should be double the operating range.
- Process media compatibility.
- Process temperature
- Severe operating conditions (e.g., vibrations, pulsations, pressure spikes).

However, even if you install the gauge perfectly, you could face the same problems you had before the installation if the gauge isn't the right one for the job.

## 2. Apply Force on Wrench Flats

Once you've chosen the correct gauge, pay attention to how you install the gauge. Rather than turning the case by hand, use an open-end wrench and apply force to the wrench flat. Applying the force through the case could damage the case connection as well as the gauge internals. Not applying sufficient torque could result in leaks.

## 3. Seal the Deal

Notice the type of threads. If the gauge has tapered threads for any pipe fitter because

the gauge before you seal it. If the gauge has parallel threads, seal it using sealing rings, washers, or additional means of sealing, such as PTFE tape, are recommended. This is standard practice and threads do not provide complete sealing on their own.

## 4. Use a Clamp Socket or

When tapered threads are used, the installer has the luxury of adjusting the gauge even after sufficient torque has been applied. This allows for convenient re-orientation of the gauge face. However, with straight threads the face orientation is not adjustable once it bottoms out. You should use an open-end wrench to the wrench flat to continue turning the gauge. At this point you have approximately one turn left to put the gauge into the desired position.

## on Nut with Straight Thread

When tapered threads are used, the installer has the luxury of adjusting the gauge even after sufficient torque has been applied. This allows for convenient re-orientation of the gauge face. However, with straight threads the face orientation is not adjustable once it bottoms out. You should use an open-end wrench to the wrench flat to continue turning the gauge. At this point you have approximately one turn left to put the gauge into the desired position.

## 5. Leave Space for Blow

For personnel safety, some gauges and the Bourdon tube, and in the event of a rupture, all the energy and pressure will be directed to the back of the gauge, thus protecting the people reading the gauge. In order for the safety pattern to function properly, it is important to keep a minimum space of 1/2 inches. Process gauges come standard with integr

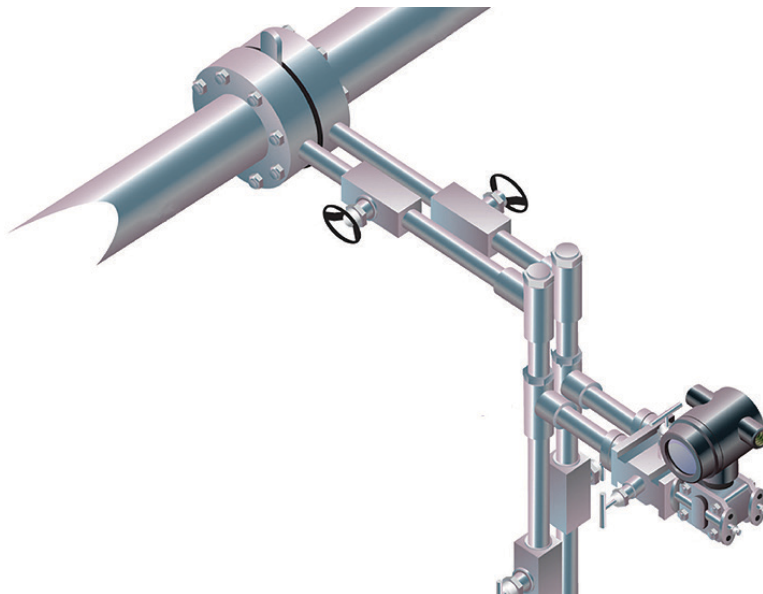
Some gauges come with a safety pattern design consisting of a solid wall between the front of the gauge and the Bourdon tube, and in the event of a rupture, all the energy and pressure will be directed to the back of the gauge, thus protecting the people reading the gauge. In order for the safety pattern to function properly, it is important to keep a minimum space of 1/2 inches. Process gauges come standard with integr

## 6. Vent the Gauge Case

Some gauges come with a compensation valve on top of the case. Users who don't understand the purpose of the valve are confused about why it's included. During shipment, liquid-filled gauges can go through temperature changes that create internal pressure build-up. This can cause the needle pointer to be off zero. When installing the gauge, open the compensation valve to allow this pressure to vent. It should be closed again to prevent any external ingress. After you mount the gauge, set the compensating valve from

Some gauges come with a compensation valve on top of the case. Users who don't understand the purpose of the valve are confused about why it's included. During shipment, liquid-filled gauges can go through temperature changes that create internal pressure build-up. This can cause the needle pointer to be off zero. When installing the gauge, open the compensation valve to allow this pressure to vent. It should be closed again to prevent any external ingress. After you mount the gauge, set the compensating valve from CLOSED to OPEN.

A pressure gauge can do its job only if it's installed properly. Whether you're an operator or a maintenance technician, use these tips for proper gauge installation to make sure your gauges perform as they should. Contact Bass Instrument's technical support team if you have questions about properly installing gauges.



# CONNECTION

Standard

Please refer ordering table

## MENU

### Menu 1: Change LCD Display Variables:

Normal display state, press "↑" key, it will alternate display current, PV, and PV %, release the key when it display what you need. If LCD alternates display two variables with the interval of 3 seconds, repeat operate when it display the variable that you don't need.

### Menu 2: PV Unit Setting

Normal display state, press "↵" key, the LCD will display '00000', until the last 0 on the LCD flashes, release "↵" key. Then press "↑" key twice, the number become to "00002". Then press "↵" key once, the left bottom of LCD will display "2". You may press "↑" key to change the unit now. Press "↵" key to save until the required unit displays on LCD.

### Menu 3/4: PV Range Value Setting

Normal display state, press "M" key, the LCD will display '00000', until the last 0 on the LCD flashes, release "M" key. Then press "↑" key three times, the number become to "00003". Then press "↵" key once, the left bottom of LCD will display "3". Press "↑" key once, the left arrow on the LCD will flashes. Press "M" key to shift right, press "↑" key to change the setting number. When the last 0 on the LCD flashes, press "M" key, all decimal points will bright. Then you may press "↑" key to set the decimal point position. Press "↵" key to save data and automatically switch to set the upper limit. The left bottom display "4" now, you may repeat these steps to set new URV (upper range value).

### Menu 5: Damping Setting

Normal display state, press "M" key, the LCD will display '00000', until the last 0 on the LCD flashes, release "M" key. Then press "↑" key five times, the number become to "00005". Then press "↵" key once, the left bottom of LCD will display "5". Press "↑" key once, the left arrow on the LCD will flashes. Press "M" key to shift right, press "↑" key to change the setting number. When the last 0 on the LCD flashes, press "↵" key, all decimal points will bright. Then you may press "↑" key to set the decimal point position. Press "↵" key to save data and automatically switch to menu 6.

### Menu 6: Zero Trim

Normal display state, press "↵" key, the LCD will display '00000', until the last 0 on the LCD flashes, release "↵" key. Then press "↑" key six times, the number become to "00006". Then press "↵" key once, the left bottom of LCD will display "6". Press "↑" key to alternate "NO (Not Trim)" or "YES (Trim)" on the right bottom of LCD. Press "↵" key to trim zero when it display "YES". Shortcut key: Normal display state, Press ↵+M key, and keep it for 5 seconds at least, the left bottom of LCD will display "6", and you may trim zero now.

### Menu 7: Output Type Setting

Normal display state, press "M" key, the LCD will display '00000', until the last 0 on the LCD flashes, release "M" key. Then press "↑" key eight times, the number become to "00008". Then press "↵" key once, the left bottom of LCD will display "8". Press "↑" key to alternate current output mode "LIN (Linear output mode)" or "SQRT (Square root output mode)" on the right bottom of LCD. Press "↵" key to save output mode when it displayed on LCD.

### Menu 8 and 9: Pressure Low Trim and High Trim

Normal display state, press "M" key, the LCD will display '00000', until the last 0 on the LCD flashes, release "M" key. Then press "↑" key until the number become to "00009". Then press "↵" key once, the left bottom of LCD will display "9". Press "↑" key once, the left arrow on the LCD will flashes. Using a pressure source with the accuracy three to ten times the desired calibrated accuracy, and apply a pressure equivalent to the Low Trim Value. Press "M" key to shift right, press "↑" key to change the setting number. When the last 0 on the LCD flashes, press "M" key, all decimal points will bright. Then you may press "↑" key to set the decimal point position. After input Low Trim Value, press "↵" key to save data and automatically switch to High Trim Menu. The left bottom display "10" now, you may repeat these steps to apply High Trim. Note: Low Trim and High Trim must be applied together! And Low Trim value must not equal High Trim value.

### Menu 10: Pressure Bias

The left bottom of LCD will display "11" after High Trim. Please input the actual correct pressure value, and press "↵" key to adjust pressure value to input value.

## ELECTRICAL DATA

<b>Output</b>	2 wires, 4-20 mA 2 wires, 4-20 mA+HART MODBUS (no analog output)
<b>Power Supply</b>	10.5-55 VDC power
<b>Electrical Connection</b>	M20x1.5 - Aluminium or AISI316SS as optional
<b>Enclosure</b>	IP67

## MEASURING RANGES

Code	Range (DIN Flange)	Min. Span	Code	Range (DIN Flange)	Min.Span
001	10 mBar (PN160)	1 mBar	007	40 Bar (PN160)	4 Bar
002	30 mBar (PN160)	3 mBar	008	500 mBar (PN420)	50 mBar
003	100 mBar (PN160)	10 mBar	009	3 Bar (PN420)	300 mBar
004	500 mBar (PN160)	50 mBar	010	16 Bar (PN420)	1600 mBar
005	3 Bar (PN160)	300 mBar	011	40 Bar (PN420)	4 Bar
006	16 Bar (PN160)	1600 mBar	012	300 Bar (PN420)	30 Bar

# ORDERING

MSP3100										Differential Pressure Transmitter
Approval	N									None
	Xi									II 1/2G Ex ia IIC T4 Gb(Ga)
Output		H								4-20 mA + HART
		M								MODBUS
Display			A							No display
			L							LCD
Measuring Range				XXX						Please see "Measuring range table"
Calibration					1					Sensor range, mBar/Bar
					2					Sensor range, kpa/Mpa
					3					Sensor range, mmH2O/mH2O
					4					Sensor range, psi
Diaphragm Material					1					AISI 316
					2					Alloy C-276
					X					On request
Process Connection						A				Female thread 1/4"NPT
						B				Female thread 1/2"NPT
						C				Male thread M20x1.5
Drain Valve							T			Emission exit at tail
							S			Emission exit at side
Process Connection Material								G		AISI 304
								N		AISI 316
								H		Hastelloy C
Mounting Bracket									A	None
									U	Mounting bracket for pipe