



Digital Pressure Sensor with LED Display

Thank you very much for choosing the JTZSE4 Digital Pressure Sensor from ANVER. Please read this Instruction Sheet carefully and thoroughly for the correct and optimum use of this sensor. Please keep this manual in a convenient place for quick reference.

- **This product is not a safety sensor.** Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal pressure detection sensor.

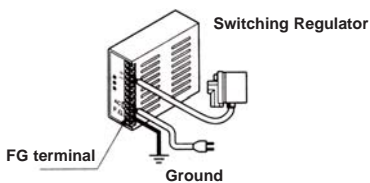
Specifications

Sensor Type	Vacuum pressure 101 kPa type
Type of pressure	Gauge pressure
Rated pressure range	0 to -101.3kPa
Set pressure range	5.1 to -101.3kPa
Maximum Pressure Rating	490kPa
Applicable fluid	Non-corrosive gas
Selectable units	kgf/cm ² , bar, psi, mmHg, inHg
Supply voltage	12 to 24V DC ^{+10%} / _{-15%} Ripple P-P 10% or less
Current consumption	50mA or less
Comparative Outputs	Standard PNP output- Flat- IP67 types
Comparative Output 1	PNP open-collector transistor
Comparative Output 2	• Maximum source current: 100mA
	• Applied voltage: 30V DC or less (between comparative output and +V)
	• Residual voltage: 2V or less (at 100mA source current)
Output modes	Equipped with 4 types of modes: hysteresis mode, window comparator mode, dual output mode, automatic sensitivity setting mode (selectable by key operation)
Hysteresis	1 digit (However, variable in hysteresis mode and 2 digits when using psi unit)
Repeatability	Within ±0.2% F.S. ±1 digit
Response time	2.5ms or less
Short-Circuit Protection	Incorporated
Analog voltage output	Output voltage: 1 to 5V (over rated pressure range) Zero-point: within 1V ±5% F.S. Span: within 4V ±5% F.S. Linearity: within ±1 % F.S.
Output impedance: 1kΩ approx.	
Display	3½ digit red LED display (Sampling rate: 4 times/sec. approx.)
Displayable Pressure Range	5.1 to -101.3kPa
Analog bar display	LED bar display in steps of 10% F.S. approx.
Operation Indicators	
Comparative Output 1	Orange LED (lights up when Comparative Output 1 is ON)
Comparative Output 2	Green LED (lights up when Comparative Output 2 is ON)
Protection	IP40 (IEC)
Ambient temperature	-10 to +50°C (No dew condensation or icing allowed). Storage: -10 to +60°C
Ambient humidity	35 to 85% RH. Storage: 35 to 85% RH
Temperature characteristics	Over ambient temperature range -10 to +50°C: within ±1 % F.S. of detected pressure at 20°C
Pressure Port	NPTF 1/8 female thread
Material	Front case: ABS • Rear case: PPS (glass fiber reinforced) Display surface: Acrylic • Pressure port attachment: Die-cast zinc alloy
Cable	0.15mm ² 5-core oil-resistant cabtyre cable, 2m long
Cable extension	Extension up to total 100m is possible with 0.3mm ² , or more, cable
Weight	95g approx.
Accessories	One (1) Hexagon-socket-head plug for pressure port One (1) Pressure unit label

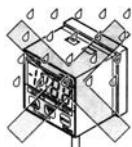
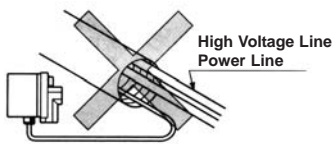
Cautions

The JTZSE4 Series is designed for use with non-corrosive gas. It cannot be used for liquid or corrosive gas.

- Use within the rated pressure range.
- Do not apply pressure exceeding the maximum pressure rating. The diaphragm will be damaged and correct operation cannot be maintained.
- Make sure power is **off** while wiring power supply.
- Verify that the supply voltage variation is within the rated range.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.



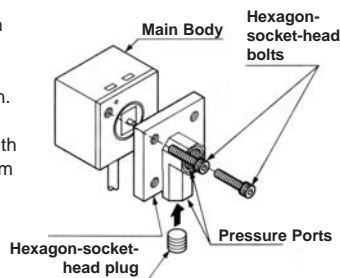
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this sensor, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not use during the initial transient time (0.5 sec.) after the power supply is switched on.
- Do not run the wires together with high voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- Cable extension, using 0.3mm² (or more) cable, should be 100m or less, overall.
- Avoid use of sensor in places where steam and dust are excessive.
- Take care that the sensor does not come in direct contact with water, oil, grease, or organic solvents such as thinner, etc.
- Do not insert wires, etc. into the pressure port. The diaphragm will be damaged and correct operation cannot be maintained.
- Do not operate the keys with pointed or sharp objects.



1. Setting of Pressure Lead Direction and Piping

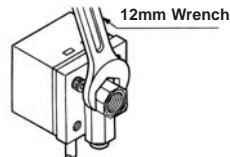
• Setting of pressure lead direction

The pressure lead direction can be changed by dismantling the pressure port attachment and changing the mounting direction. The tightening torque of the hexagon socket-head bolt (length 9mm or less) should be 0.29N•m or less.



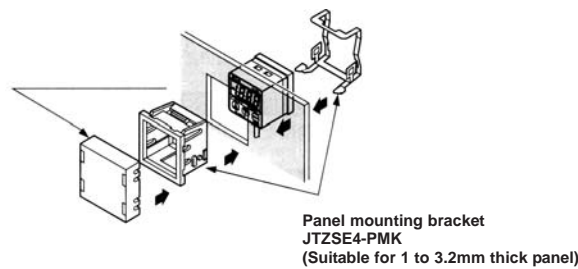
• Piping

When connecting a hexagon-socket-head plug or coupling to the pressure port, hold the hexagonal part of the pressure port with a 12mm spanner and make sure that the tightening torque is 9.8N•m or less.

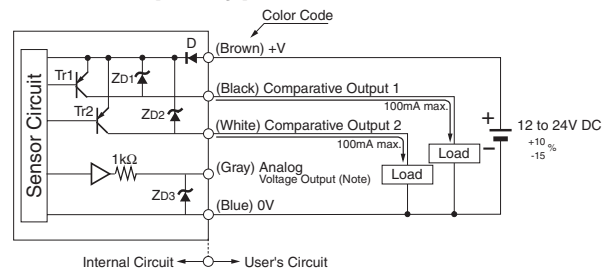


2. Mounting of Standard Type Sensor

A Panel Mounting Bracket, JTZSE4-PMK (optional) is available.



3. PNP Output Type



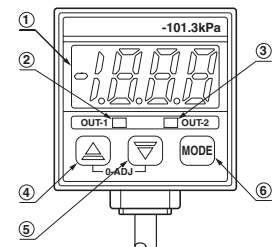
Note: The analog voltage output is not incorporated with a short-circuit protection circuit. Do not directly connect a power supply or a capacitive load. When using the analog voltage output, take care to connect external equipment having the proper input impedance.

Also, when a cable extension is used, voltage drop due to cable resistance should be taken into account.

Symbols

- D = Reverse supply polarity protection diode
- ZD1, ZD2, ZD3 = Surge absorption zener diode
- Tr1, Tr2 = PNP output transistor

4. Functional Description of Operational Panel



Description	Function
1 3½ digit LED display (Red)	Displays measured pressure, settings, error messages and key-protect status.
2 Comparative Output 1 (Orange)	Lights up when Comparative Output 1 is ON.
3 Comparative Output 2 (Green)	Lights up when Comparative Output 2 is ON.
4 Increment key (▲)	<ul style="list-style-type: none"> • In the initial setting mode, pressing the key charges the settable digit. • In the Set Value 1, 2 modes, pressing the key changes the set value to the high vacuum side. • In the sensing mode, it the key is pressed continuously for 4 sec. or more, the display shows peak hold value.
5 Decrement Key (▼)	<ul style="list-style-type: none"> • In the Initial setting mode, pressing the key changes the set conditions. • In the Set Value 1, 2 modes, pressing the key changes the set value to the low vacuum side. • In the sensing mode, if the key is pressed continuously for 4 sec. or more, the display shows bottom hold value.
6 Mode selection key (MODE)	<ul style="list-style-type: none"> • Pressing the key changes the selected mode to sensing mode, Set Value 1 (P1) set mode and Set Value 2 (P2) set mode. • In the sensing mode, if the key is pressed continuously for about 3 sec., key-protect can be set released. • In the sensing mode, if the mode selection key is pressed while pressing the increment key (▲), the initial setting mode is obtained.

In the sensing mode, pressing both the keys simultaneously results in zero-point adjustment.

5. Error Messages

When an error message appears, take the corresponding corrective action.

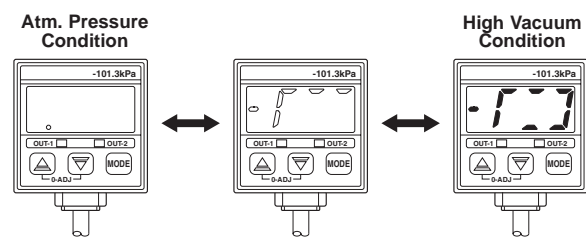
Error Message	Cause	Corrective action
E-1	Overcurrent due to short-circuit	Switch off the power supply and check the load.
E-3	Pressure is being applied during zero-point adjustment pressure and zero-point adjustment should be done again.	Applied pressure at the pressure port should be brought to atmospheric
- - -	Applied pressure exceeds the lower limit of displayable pressure range.	Applied pressure should be brought back within the rated pressure range.
- - -	Applied pressure exceeds the upper limit of displayable pressure range.	

6. Analog Bar Display

Pressure changes are displayed in an analog fashion by using LED bars. Hence, any sudden changes in pressure can be detected at a glance.

The analog bar display shows the measured pressure, irrespective of the pressure unit, in steps of approx. 10% F.S.

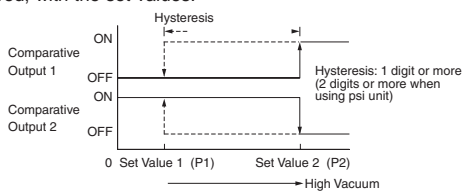
Please refer to 9- SETTING 9.2- Initial Setting for the procedure to changing the analog bar display.



7. Output Modes and Their Characteristics

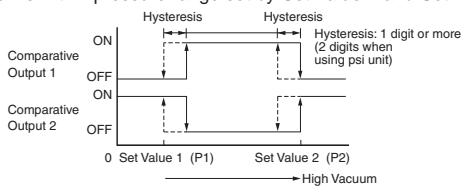
• Hysteresis mode (H)

The common hysteresis of the comparative outputs can be set, as desired, with the set values.



• Window comparator mode (L)

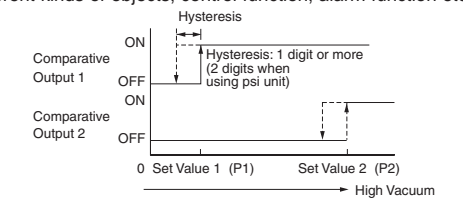
The comparative outputs can be turned ON or OFF by a pressure which is within pressure range set by Set Value 1 and Set Value 2.



When operating in window comparator mode (L) Set Value 1 (P1) and Set Value 2 (P2) should be set with a difference of 3 digits or more. However, when the pressure unit is set to 'psi', the difference should be 6 digits or more.

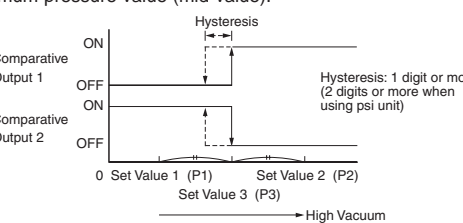
• Dual output mode (d)

The outputs can be put to different uses, such as detection of different kinds of objects, control function, alarm function etc.



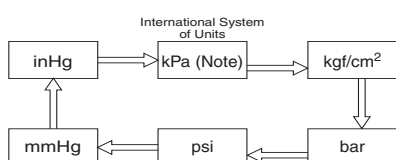
• Automatic sensitivity setting mode (A)

Using actual objects, if the pressure values for OK objects and NG objects are input, then the sensor is automatically set to the optimum pressure value (mid-value).



8. Pressure Units

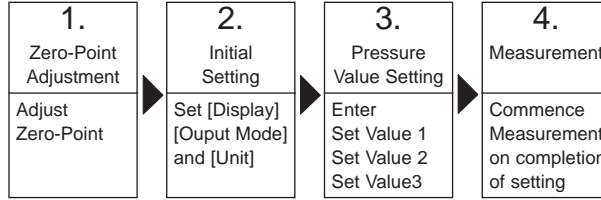
- The pressure unit can be selected according to the requirements of the user. The pressure unit can be changed from International System of Units (SI) 'kPa' to 'kgf/cm²', 'bar', 'psi', 'mmHg' or 'inHg'.
- When the pressure unit is changed, the set values and the measured value are automatically converted.
- Please refer to 9- SETTING 9.2- Initial Setting for the procedure to change the pressure unit.



9. Setting

- If key-protect has been set, make sure to release key-protect before operating keys. (Please refer to 12- KEYPROTECT FUNCTION for this procedure.)
- The conditions which are set are stored in an EEPROM. Please note that the EEPROM has a life span and its guaranteed life is 100,000 write operation cycles.

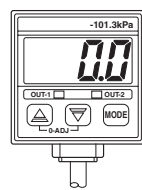
Setting Procedure



9.1 Zero-Point Adjustment

- The displayed pressure when the pressure port is left open is adjusted to zero.

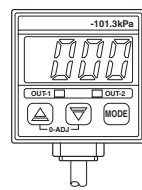
Set to Sensing Mode



The sensor will automatically enter the sensing mode when power is supplied.

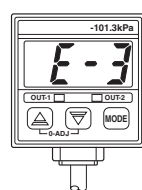
- The figure on the left shows the display when the pressure unit and display are set to 'kPa' and 'digital display', respectively.

Perform Zero-Point Adjustment



- Pressure port should be at atmospheric pressure (i.e., a no applied pressure condition), and simultaneously and continuously press the increment and decrement keys.

'0.00' is displayed and, when the finger is released, zero-point adjustment is completed and the sensor returns to the sensing mode.

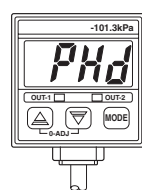


- If pressure has been applied during zero point adjustment, 'E-3' is displayed when the keys are pressed. Bring the applied pressure to atmospheric pressure (i.e., a no applied pressure condition) and carry out the zero-point adjustment once again.

9.2 Initial Setting

- Pressure [Unit], [Display] and [Output] Mode of the comparative outputs are set.

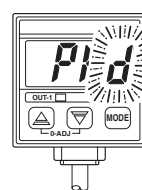
Set to Initial Setting Mode



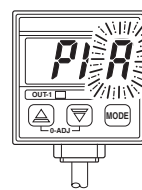
- In the sensing mode, press MODE key while pressing ADJ key.

- Initial setting is displayed.
- If sensor is being used for the first time, 'PHd' is displayed.

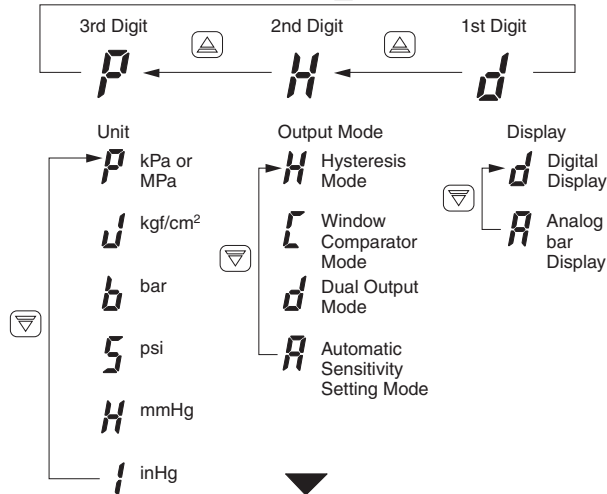
Set Initial Conditions



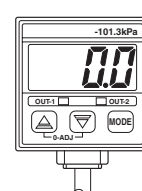
- The settable digit blinks.
- The settable digit changes when ADJ key is pressed.
- Change the setting of each digit as desired. The setting is changed when MODE key is pressed.



Change with ADJ key



Set to Sensing Mode



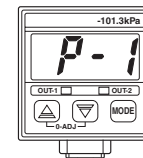
- Press MODE key.
- The sensor returns to sensing mode after the initial conditions have been set.
- Since the initial conditions which have been set are stored in an EEPROM, they are not erased even if the power supply is switched off.
- The figure on the left shows the display when the unit and display are set to 'kPa' and 'digital display', respectively.

9.3 Setting of Pressure Values

For situations in which output mode is set to either the hysteresis mode H, window comparator mode L or dual output mode d.

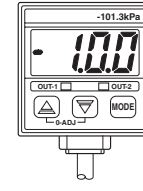
- [Set Value 1 (P1)] and [Set Value 2 (P2)] of the comparative outputs are set.
- The high vacuum setting of Set Value 2 (P2) must be higher than Set Value 1 (P1).
- Set Value 1 (P1) and Set Value 2 (P2) can be made common for all the output modes. However, when a changeover is made to the automatic sensitivity setting mode, since Set Value 3 (P3) has not been set, make sure to set pressure value settings for the automatic sensitivity mode.

Set to Set Value 1 (P1) Set Mode

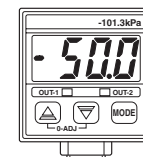


- In the sensing mode, press MODE key.
- 'P-1', and Set Value 1 (P1) which is being set, are displayed alternately.
- The figure on the left shows the display when the pressure unit has been set to 'kPa'.

Displayed Alternately

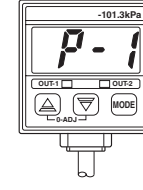


Enter Set Value 1 (P1)



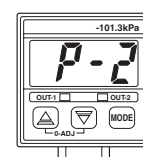
- Enter using ADJ key and MODE key.
- If ADJ key is pressed once, the set value changes toward the high vacuum side by 1 digit; if MODE key is pressed once the set value changes toward the low vacuum side by 1 digit.
- If ADJ key or MODE key is pressed continuously, the set value changes quickly.

Displayed Alternately



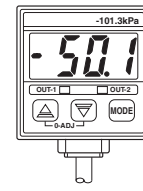
- (If the set pressure range is exceeded, either UP (upper limit exceeded) or LB (lower limit exceeded) is displayed.)

Set to Set Value 2 (P2) Set Mode

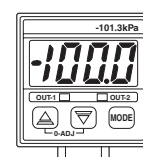


- In the Set Value 1 (P1) set mode, press MODE key.
- 'P-2', and Set Value 2 (P2) which is being set, are displayed alternately.

Displayed Alternately

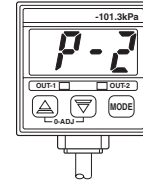


Enter Set Value 2 (P2)

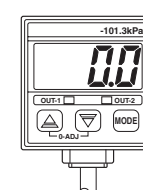


- Using ADJ key and MODE key, enter in a manner similar to that for entering Set value 1 (P1).
- If the set pressure range is exceeded, either UP (upper limit exceeded) or LB (lower limit exceeded) is displayed.

Displayed Alternately



Set to Sensing Mode

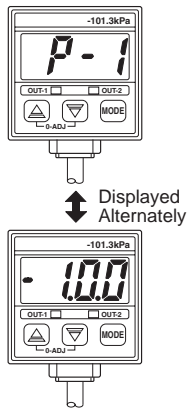


- Press MODE key.
- The sensor returns to sensing mode after Set Value 1 (P1) and Set Value 2 (P2) have been set.
- Since the initial conditions which have been set are stored in an EEPROM, they are not erased even if the power supply is switched off.

For situations in which output mode is set to automatic sensitivity mode **A**.

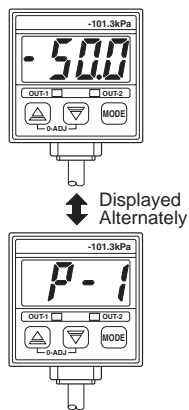
- Comparative outputs [Set Value 1 (P1)], [Set Value 2 (P2)] and [Set Value 3 (P3)] are set.
- The high vacuum setting of Set Value 2 (P2) must be higher than Set Value 1 (P1).
- Set Value 3 (P3) is automatically set to the mid-value of Set Value 1 (P1) and Set Value 2 (P2). However, if Set Value 1 (P1) is set to a value on the positive pressure side, Set Value 3 (P3) is automatically set to the mid-value of 'zero' (atmospheric pressure) and Set Value 2 (P2). In addition, if both Set Value 1 (P1) and Set Value 2 (P2) are set on the positive pressure side, Set value 3 (P3) is automatically set to 'zero' (atmospheric pressure).
- The automatically set Set Value 3 (P3) can be changed manually.
- Since display of error messages is not possible during pressure value setting in the automatic sensitivity mode, make sure that the sensor is operated within the rated pressure range.

Set to Set Value 1 (P1) Set Mode



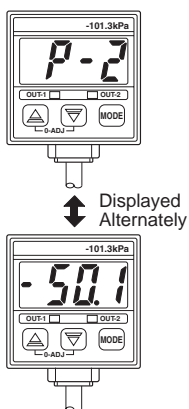
- In the sensing mode, press **MODE** key.
- P-1**, and Set Value 1 (P1) which is being set, are displayed alternately.
- The figure on the left shows the display when the pressure unit has been set to 'kPa'.

Enter Set Value 1 (P1)



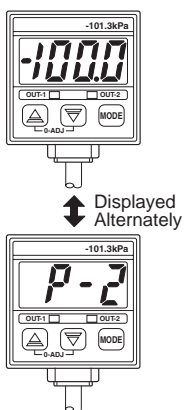
- Within the required permissible pressure range, having created a pressure state which is nearest to atmospheric pressure, press **MODE** key.
- The pressure value at the time of pressing the **MODE** key is entered as Set Value 1 (P1). Set Value 1 (P1) and **P-1** are displayed alternately.
- If the set pressure range is exceeded, either **UP** (upper limit exceeded) or **LO** (lower limit exceeded) are displayed and Set Value 2 (P2) is set automatically to the upper or lower limit of the set pressure range. The setting of Set Value 2 (P2) can be repeated several times in the Set Value 2 (P2) set mode.

Set to Set Value 2 (P2) Set Mode



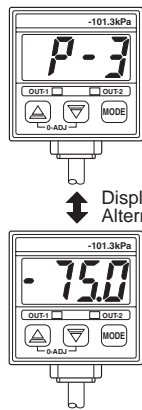
- In the Set Value 1 (P1) set mode, press **MODE** key.
- P-2**, and Set Value 2 (P2) which is being set, are displayed alternately.

Enter Set Value 2 (P2)



- Within the required permissible pressure range, having created a pressure state which is nearest to the high vacuum end, press **MODE** key.
- The pressure value at the time of pressing the **MODE** key is entered as Set Value 2 (P2). Set Value 2 (P2) and **P-2** are displayed alternately.
- If the set pressure range is exceeded, either **UP** (upper limit exceeded) or **LO** (lower limit exceeded) are displayed and Set Value 2 (P2) is set automatically to the upper or lower limit of the set pressure range. The setting of Set Value 2 (P2) can be repeated several times in the Set Value 2 (P2) set mode.

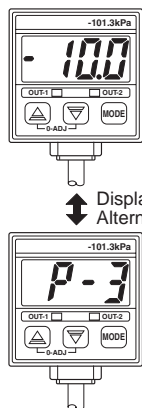
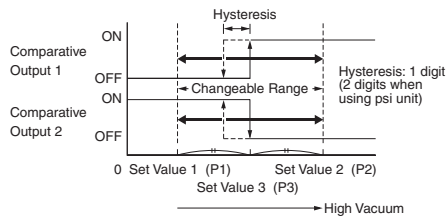
Set to Set Value 3 (P3) Set Mode



- In the Set Value 1 (P1) set mode, press **MODE** key.
- P-2**, and Set Value 3 (P3) which is being set, are displayed alternately.
- When Set Value 1 (P1) = -50.0kPa and Set Value 2 (P2) = -100.0kPa then Set Value 3 (P3) = $\frac{-50.0 + (-100.0)}{2} = -75.0\text{kPa}$ (Digits smaller than the displayed digits are discarded.)

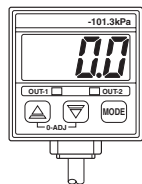
When Set Value 3 (P3) is Changed

- The automatically set Set Value 3 (P3) can be manually changed to a value between Set Value 1 (P1) and Set Value 2 (P2). However, Set Value 3 (P3) cannot be set to the positive pressure side.



- Enter using **MODE** key and **MODE** key.
- If **MODE** key is pressed once the set value changes towards the high vacuum side by 1 digit and if **MODE** key is pressed once the set value changes towards the low vacuum side by 1 digit.
- If **MODE** key or **MODE** key is pressed continuously, the set value changes quickly.
- (If the set pressure range is exceeded, either **UP** (upper limit exceeded) or **LO** (lower limit exceeded) is displayed.)

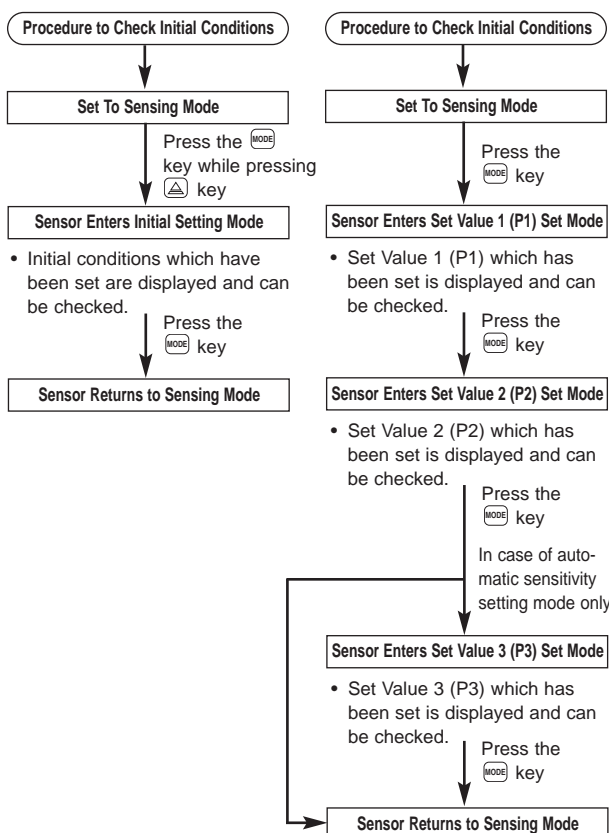
Set to Sensing Mode



- Press the **MODE** key.
- The sensor returns to the sensing mode after Set Value 1 (P1), Set Value 2 (P2) and Set Value 3 (P3) have been set.
- Since the values which have been set are stored in an EEPROM, they are not erased even if the power supply is switched off.

10. Procedure for Checking Set Values

- The conditions which have been set in the initial setting and the pressure settings can be checked by the following procedure.



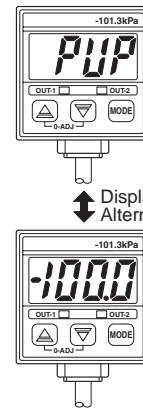
- Please Note** that if any key, except **MODE** key, is pressed in any setting mode, the set conditions will be changed.

11. Peak Hold and Bottom Hold Functions

- Peak hold and bottom hold functions enable the display of the peak value (maximum vacuum pressure value) and the bottom value (minimum vacuum pressure value) of the varying measured pressure. These functions are convenient for finding the pressure variation range or for determining the reference for pressure settings.
- Please Note:** The peak value and the bottom value data are erased when no longer displayed, and the response time of the comparative outputs becomes slower during peak hold and bottom hold display.

Peak Hold Display

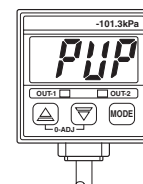
Initiating Peak Hold Display



- In the sensing mode, keep **MODE** key pressed until **PUP** is displayed. (4 sec. approx.) When the finger is released after **PUP** is displayed, the peak value and **PUP** are displayed alternately.
- If the applied pressure exceeds the displayable pressure range, error message (--- or ----) and **PUP** are displayed alternately. In this case, bring the applied pressure back to within the rated pressure range.

The figure on the left shows the display of a vacuum type sensor when the pressure unit has been set to 'kPa'.

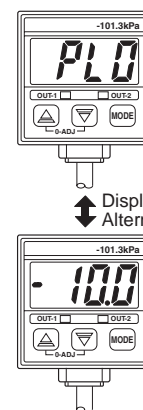
Ending Peak Hold Display



- Press **MODE** key.
- Sensor returns to sensor mode.

Bottom Hold Display

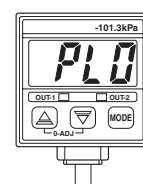
Initiating Bottom Hold Display



- In the sensing mode, keep **MODE** key pressed until **PLD** is displayed. (4 sec. approx.) When the finger is released after **PLD** is displayed, the peak value and **PLD** are displayed alternately.
- If the applied pressure exceeds the displayable pressure range, error message (--- or ----) and **PLD** are displayed alternately. In this case, bring the applied pressure back to within the rated pressure range.

The figure on the left shows the display of a vacuum type sensor when the pressure unit has been set to 'kPa'.

Ending Bottom Hold Display

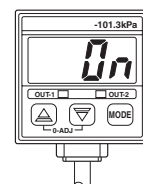


- Press **MODE** key.
- Sensor returns to sensing mode.

12. Key-Protect Function

- Key-protect is a function which prevents any unintentional change in the conditions which have been entered in each setting mode by making the sensor not to respond to the key operations.

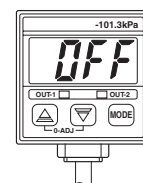
Setting of Key-Protect



- In the sensing mode, press **MODE** key continuously for about 3 sec. and release it immediately when **On** is displayed.
- Key-protect is set and the sensor returns to the sensing mode.

- Since the key-protect information is stored in an EEPROM, it is not erased even if the power supply is switched off. Please take note and remember when the key-protect function has been set.

Release of Key-Protect

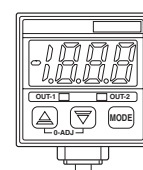


- In the sensing mode, press **MODE** key continuously for about 3 sec. and release it immediately when **OFF** is displayed.
- Key-protect is released and the sensor returns to the sensing mode.

- When operating the keys, make sure that key-protect is released.

13. Label for Changing Pressure Units

- When a pressure unit other than 'kPa' or 'MPa' has been selected in the initial setting mode, the label (supplied as accessory) which corresponds to the selected unit should be applied in the position shown in the figure below.



- Apply the pressure unit label in position shown