

LED digital vacuum sensor User's Manual

Thank you for purchasing our LED digital pressure sensor. Please be sure to read this User's Manual before using the sensor, so you can use it without any trouble. Please keep this manual handy with care so you can refer to it whenever necessary.

Warning

- Since the sensors are neither drip-proof nor dust-proof, do not use them in locations where they may be exposed to water or oil drops or dust.
- Since the sensors are not explosion-proof, do not use them in an inflammable or explosive gas, fluid or atmosphere.
- Do not use the sensor in an atmosphere exceeding the range of application temperature or causing heat as sensor malfunction may result.
- Do not use it with an ambience or gas containing a corrosive substance.
- Malfunction may result if the wiring is designed or the sensor used in a way that subjects the unit to noise or other disturbance.

Caution

- Make sure that any pressure higher than 0.2MPa is not normally applied at vacuum release.
- Keep the fluid used as clean as possible.
- For power source, use DC which is stable.
- Incorporate a surge absorber circuit in relays, solenoid valves, etc. which are to be connected with output and source terminals. Avoid any use which involves over 80mA in current.
- Ground the FG terminal when using a unit power source such as switching current.
- Do not short-circuit output terminals (black with a gray lead wire) and other terminals.
- Avoid strong impacts and excessive force to the sensor body.
- When setting the pressure or differential response, turn the trimmer gently with the attached screwdriver within the rotation limits of the trimmer.

1.Characteristics

- To enhance visibility, an LED display is used for the vacuum switch.
- LED displays are used for set-up pressure and impression pressure.
- Two types of vacuum switch -- two-point output and analog -- are provided, the application determining which should be used.
- In respect to wiring, a connector system has been chosen for ease of layout.
- Three pipe connection methods are offered -- one-touch, M5 metric female screw, and direct connection. The application will determine which method is the most appropriate.
- Output detection accuracy is enhanced by the use of electronic switches.
- Differential response can be adjusted freely in the set value of about 0 ~ 15 %F.S.(Only available for the pressure sensor with analogue output VUS21 □ A- □ type)

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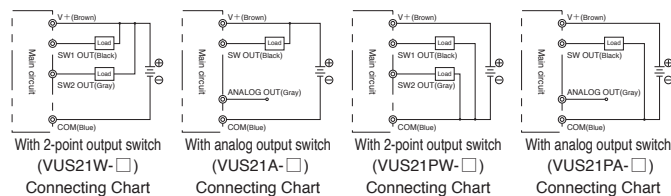


Chart 1 Connecting method of Vacuum Sensor with LED display

- Do not give strong drawer pull or extreme bending to the drawer cable.
- The cable can be connected or disconnected from connector. In case of disconnection, please hold connector and withdraw the cable while pushing stop bar. Avoid connection and disconnection unless it is absolutely necessary, for it will put burdens on the sensor board.
- The pressure intake port of VUS21 □□-M5 type is M5 metric female thread. Please apply PISCO Tube Fittings whose tightening torque should be 1.0~1.5N·m. Use a spanner to the hexagonal part of fittings for tightening.

5.Pressure setting

- Making contact (confirm wiring and apply a direct current)
- Put indication change-over switch in pressure setting mode (ME → S1 or S2, SW)
- (Applicable to analog output vacuum switch only)
Turn differential response setting trimmer (HYS) all the way to the right (counterclockwise) to put setting at a minimum value.
Note) Care must be taken as output will be unstable by minimizing differential response when vacuum level is unstable.
- Use a small screwdriver to adjust the pressure setting trimmer (S1 or S2, SW) to the desired value.
- Set indication change-over switch at ME, apply pressure and confirm if HYS works.
(When 2-point output vacuum switch is used)
Switch output1 (S1) : Activation indication lamp (red LED) is illuminated when pressure exceeds prescribed level.
Switch output2 (S2) : Activation indication lamp (green LED) is illuminated when pressure exceeds prescribed level.
(When analog output vacuum switch is used)
Switch output (SW) : Activation indication lamp (red LED) is illuminated when pressure exceeds prescribed level.

6.Differential response setting (Vacuum sensor with analogue output : VUS21 □ A- □ type only)

- Differential response (hysteresis) can be regulated using differential response trimmer (HYS).
- Differential response is regulated in the range of between 0 and 15% of set value. Turn HYS counterclockwise to increase differential response.
- Confirmation of differential response
Put indication change-over switch in pressure indication mode (ME), increase or decrease pressure in the neighborhood of set pressure to read activation indication lamp's illumination on/off values. Differences in displayed values are taken as differential response.
- Examples of differential response regulation
 - Increase differential response when pressure pulsates with output repeatedly showing small on/off movements.
 - When an allowable range is to be set for the lowering of pressure.

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2.Specifications

| Specification | Equipped with 2-point output switch (-NW) | Equipped with analog output switch (-NA) | Equipped with 2-point output switch (-PW) | Equipped with analog output switch (-PA) |
|-----------------------------|--|---|--|---|
| Current consumption | 40mA max. | | | |
| Pressure detection | Diffused semiconductor pressure switch | | | |
| Service pressure range | 0 ~ 100kPa | | | |
| Pressure setting range | 0 ~ 99kPa | | | |
| Proof pressure | 200kPa | | | |
| Storage temperature range | -20 ~ 80°C (Atmospheric pressure, humidity less than 60%RH) | | | |
| Operating temperature range | 0 ~ 50°C (No freezing) | | | |
| Operating humidity range | 35 ~ 85%RH (No freezing) | | | |
| Power requirements | DC12 ~ 24V ± 10% Ripple (P-P) 10% max. | | | |
| Protective structure | IEC standard IP40 equiv. | | | |
| No. of pressure setting | 2 | 1 | 2 | 1 |
| Operating accuracy | ±3% F.S. max. (at Ta=25°C) | | | |
| Differential response | Fixed (2% F.S. max.) | Variable (About 0 ~ 15% of Set Value) | Fixed (2% F.S. max.) | Variable (About 0 ~ 15% of Set Value) |
| Switch output | NPN Open collector output : 30V 80mA max. Residual voltage 0.8V max. | | | |
| Analog output | Output voltage | 1 ~ 5V | 1 ~ 5V | 1 ~ 5V |
| | Zero-point voltage | 1 ± 0.1V | 1 ± 0.1V | 1 ± 0.1V |
| | Span voltage | 4 ± 0.1V | 4 ± 0.1V | 4 ± 0.1V |
| | Output current | 1mA max. (Load Resistance 5kΩ max.) | 1mA max. (Load Resistance 5kΩ max.) | 1mA max. (Load Resistance 5kΩ max.) |
| | LIN/HYS | ±0.5% F.S. max. | ±0.5% F.S. max. | ±0.5% F.S. max. |
| Response | 2msec max.sec | | | |
| Indication | 0 ~ 99kPa (2-digit Red LED display) | | | |
| No. of indications | About 4 times/sec | | | |
| Indication accuracy | ±3% F.S. ±2digit | | | |
| Resolution | 1digit | | | |
| 動作表示 | SW1 : Red LED lighting up when pressure is above setting. SW2 : Green LED lighting up when pressure is above setting. | Red LED lighting up when pressure is above setting. | SW1 : Red LED lighting up when pressure is above setting. SW2 : Green LED lighting up when pressure is above setting. | Red LED lighting up when pressure is above setting. |
| 機能 | 1. MODE selector switch (ME or S1 or S2) 2. S1 setting trimmer (2/3-turn trimmer) 3. S2 setting trimmer (2/3-turn trimmer) | 1. MODE selector switch (ME or SW) 2. SW setting trimmer (2/3-turn trimmer) 3. HYS setting trimmer (About 0 ~ 15% of Set Value) | 1. MODE selector switch (ME or S1 or S2) 2. S1 setting trimmer (2/3-turn trimmer) 3. S2 setting trimmer (2/3-turn trimmer) | 1. MODE selector switch (ME or SW) 2. SW setting trimmer (2/3-turn trimmer) 3. HYS setting trimmer (About 0 ~ 15% of Set Value) |

3.Attaching the Main Body (Stand alone type)

- Install the sensor with attached screws(M2.5×26L) to two M2.5-thread holes at a regulated torque(0.5 ~ 0.8N·m)
- Please refer to the appearance dimensions for pitch of installation holes and pressure intake port dimensions of direct mounting type. In case of screw cuttings for installation, effective screw depth should be more than 5mm.

4.Wiring/piping

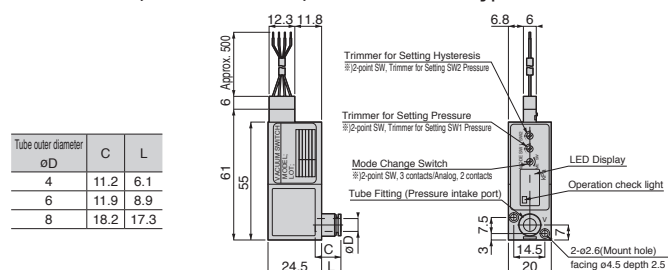
- Be sure to shut off the power before wiring.
- In conducting the wiring, distinguish the wire colors and confirm the terminal output.
- Please refer to Chart 1. Connecting Method for wiring.

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7.External Dimensions

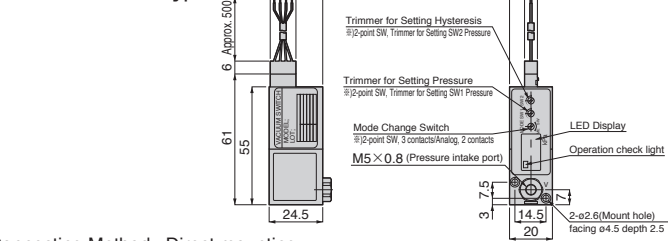
Connecting Method : Tube Fitting

VUS21 □□- 4, VUS21 □□- 6, VUS21 □□- 8 type



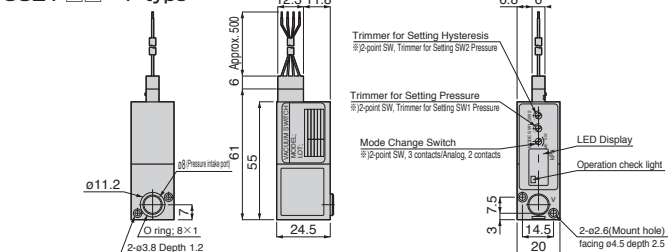
Connecting Method : M5 metric (female) thread

VUS21 □□- M5 type



Connecting Method : Direct mounting

VUS21 □□- F type



※ For details, please make inquiries from followings.

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