

Differential Pressure Sensors

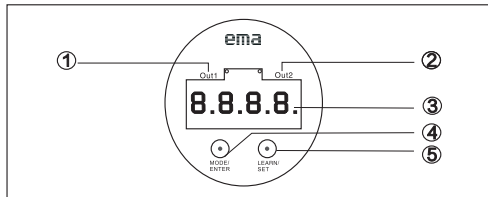
Analogue+Switching output

■ English



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Display and visual indication



| | | |
|---|-------------------|---|
| ① | Out1 | Out1 status; lights on under connecting to the output terminal |
| ② | Out2 | Out2 status; lights on under connecting to the output terminal |
| ③ | 7-segment Display | System differential pressure range display, Parameter and parameter value display |
| ④ | MODE/ENTER | Selection of parameter and acknowledgement of parameter value |
| ⑤ | LEARN/SET | Setting of learn mode and parameter value |

Functions and features

By the probe, the differential pressure sensor can detect and then display the current system pressure; meanwhile, it can output two signals according to the setting of output.

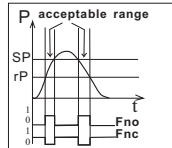
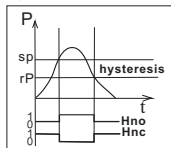
| Output 1 | Output 2 |
|-------------------------------|------------------------|
| Hysteresis function/N.O.(Hno) | Analogue 4~20 mA(I) |
| Hysteresis function/N.C.(Hnc) | |
| window function/N.O.(Fno) | Analogue 0~10 V(U) |
| window function/N.C.(Fnc) | |

Hysteresis

The hysteresis keeps the switching state of the outputs stable if the system pressure varies about the preset value. When the system pressure is increasing, the output switches when the switch-on point has been reached (SP1); when the system pressure is decreasing again, the output switch-off point (rP1) has been reached. The hysteresis can be adjusted: first the switch-on point is set, then the switch-on point with the requested difference.

Window function:

The window function enables the monitoring of a defined acceptable range. When the system pressure varies between the switch-on point (SP1) and the switch-off point (rP1), the output is switched (window function/NO) or not switched (window function/NC). The width of the window can be set by means of the difference between SP1 and rP1. SP1=upper value, rP1=lower value.



Operating modes

Run mode:

(Normal operating mode)

When the supply voltage has been applied, the unit is in the Run mode. It monitors and switches the transistor output according to the set parameters.

The value of the analogue output depends on the system pressure.

The digit display indicates the current system differential pressure range; the red LED indicates the switching state of the transistor output.

Display mode:

(Indication of parameters and the set parameter values)

When the "MODE/ENTER" button is pressed briefly, the unit passes to the Display mode which allows parameter values to be read. The internal sensing, processing and output functions of the unit continue as if in Run mode.

- The parameter names are scrolled with each pressing of the "MODE/ENTER" button.

- when the "LEARN/SET" button is pressed briefly, the corresponding parameter value is displayed for 5 sec. After another 5 sec. The unit returns to the Run mode.

Programming mode:

(Setting of the parameter values)

The unit passes to the programming mode when after the selection of a parameter value (Display mode) the "LEARN / SET" button is pressed until the display of the parameter value is changed. Internally the unit remains in the operating mode. It continues its monitoring function with the existing parameters until the change has been terminated.

You can change the parameter value by pressing the "LEARN /SET" button and confirm it by pressing the "MODE/ENTER" button. The unit returns to the Run mode when no button has been pressed for 5 second.




The unit returns to the Run mode when no button has been pressed for 5 second.

Menu setting

| Menu | Function | Range | |
|----------------------------------|--|--------------------------|------------------------------------|
| OU1 | Output1 | SP1 Switch point1 | See table 1 |
| | | rP1 Switch point | |
| | | FUN function | Hno Hysteresis NO |
| | | | Hnc Hysteresis NC |
| | | | Fno Window NO |
| | | | Fnc Window NC |
| | | N-P Output selection | NPN |
| | | | PNP |
| | | dS1 Delay for switch on | Range: 0~50s Step of range:0.1s |
| | | dr1 Delay for switch off | Range: 0~50s Step of range:0.1s |
| dA1 Damping for switching output | Filter out high frequency pressure spikes or instantaneous Setting range 0~2s Step past 0.008s | | |

| | | | | | |
|-----|----------|-------------------------------|---|--|-------|
| OU2 | Output 2 | U_I | Analogue output selection | U(0-10V) I(4-20MA) | |
| | | ASP | Analogue start point | See table 1 for corresponding pressure range | |
| | | AEP | Analogue end point | See table 1 for corresponding pressure range | |
| | | DA2 | Damping for Analogue output | 0~2s | 0.08s |
| UNI | | Unit selection | | bar | |
| | | | | psi | |
| | | | | kgf/cm ² | |
| | | | | MPa | |
| DIS | DEL | Update rate and display | 0ms/50ms/200ms/600ms/OFF | | |
| | P_D | Positive and Opposite display | P positive display, D opposite display | | |
| EF | COF | Calibration | -5%~+5% of Full Sensing Range | 0.1 | |
| | CAR | Zero-point Calibration | Clean the COF setting value | | |
| | PH | Max. value record | Recording Max. value during operation and back to zero after power off. | | |

Programming

| | | |
|---|---|--|
| ① |  | Press the “MODE/ENTER” button several times until the respective parameter is displayed. |
| ② |  | Press the “SET” button and keep it pressed. The current parameter value is indicated in 5 sec., then the value is increased (incremental by pressing briefly or scrolling by holding pressed). |
| ③ |  | Press the “MODE/ENTER” button briefly (=acknowledgement). The parameter is displayed again; the set parameter value becomes effective. |

Decrease parameter value: Make the parameter value displayed reach the highest of the parameter setting, and then recycle to the highest value from the lowest.

Lock/Unlock:

Lock: This unit features auto-lock function. When there is no button being pressed in 1 minute, it will be locked automatically. The monitor of the pressure is running normally.

Unlock: Keep pressing “LEARN/SET” button under the normal pressure display mode (run mode), and then press “MODE/ENTER” for 5 sec. until the “ULC” is displayed, meaning that it's unlock. The original setting is under lock mode.

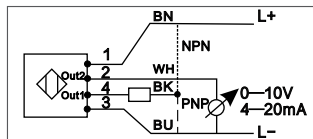
Error status

Detecting safety of device if the operation works ineffective.
Error status:

| | |
|----|---|
| OL | If the instantaneous pressure is too high, please immediately check whether the onsite pressure is too high. If the pressure is too high for a long time, the pressure components could be cracked, causing product damage. |
| LO | The pressure is too low. Please check whether the onsite pressure is too low. |
| SC | Overload or short circuit, causing product damage. The LED light of PNP/NPN will flash, indicating that the output circuit is abnormal |

Please refer to the wiring carefully. If the wiring method is incorrect, the product could be damaged.

Connection



Core color:

- 1 = BN (brown);
- 2 = WH (white);
- 3 = BU (blue);
- 4 = BK (black)

Electrical Connection



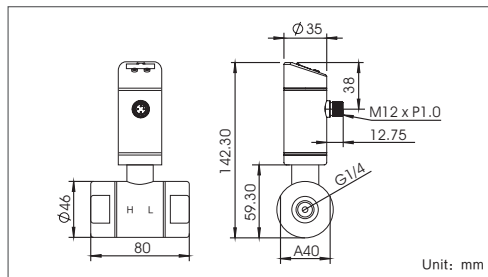
1. The unit must be connected by a technical electrician.
2. The national and international regulations for the installation of electrical equipment must be adhered to Voltage supply to EN50178, SELV, PELV.
3. Disconnect the power before connecting the unit.
4. Please purchase 2ma qualified Ex-proof wire for this Ex-proof product.

Technical data

Detected objects: Relative medium for gas and liquid

| | |
|-----------------------------------|--|
| Electric design | DC |
| Operating voltage[V] | 18...36DC |
| Measuring range[bar] | 0.35/1/2/5/10 |
| Static pressure[bar] | 250 |
| One line static pressure[bar] | 150 |
| Load current[mA] | 300 |
| Short-circuit protection | pulse |
| Reverse polarity protection | Yes |
| Overload protection | Yes |
| Watchdog | Yes |
| Voltage drop[V] | <2 |
| Current consumption[mA] | <60 |
| Switching output | PNP/NPN programmable |
| The accuracy of switch point[%] | <± 0.5 |
| Analogue output | 4...20mA/0...10V programmable |
| Analogue output 4-20mA load[Ohm] | Max 500 |
| Analogue output 0-10V load[Ohm] | Min 1000 |
| Analogue output Reaction time[ms] | <3 |
| Operating temperature[°C/°F] | -25...+70/-13...+158 |
| Medium temperature[°C/°F] | -25...+70/-13...+158 |
| Storage temperature[°C/°F] | -40...100/-40...+212 |
| Insulation resistance[MΩ] | >100(500 V DC) |
| Shock resistance[g] | 50 |
| Vibration resistance[g] | 20 |
| Min. switching cycles | 100 million |
| Housing material | Stainless steel 304 |
| Probe material | Stainless steel 316L |
| Protection classification | IP68 |
| EX marking | PE: Ex nA IIC T4 Gc / Ex tD A21 IP67 T90°C |

Dimensions



Mounting and maintenance

1. To reduce the shock to the product, please install this product vertically to the flow of medium.
2. The static pressure of the device shall not exceed 250 bar, and the one line static pressure shall not exceed 150 bar.

Table1

| Range [bar] | Unit | SP1/2 Setting Range | rP1/2 Setting Range | Step Range |
|-------------|---------------------|---------------------|---------------------|------------|
| 0.35 | bar | 0.02...0.35 | 0.01...0.34 | 0.01 |
| | Psi | 0.40...5.2 | 0.20...4.96 | 0.20 |
| | kgf/cm ² | 0.02...0.36 | 0.01...0.35 | 0.01 |
| | Mpa | 0.002...0.035 | 0.001...0.034 | 0.001 |
| 1 | bar | 0.02...1 | 0.01...0.99 | 0.01 |
| | Psi | 0.40...14.6 | 0.2...14.4 | 0.20 |
| | kgf/cm ² | 0.02...1.02 | 0.01...1.01 | 0.01 |
| | Mpa | 0.002...0.10 | 0.001...0.099 | 0.001 |
| 2 | bar | 0.02...2.00 | 0.01...1.99 | 0.01 |
| | Psi | 0.40...29.0 | 0.20...28.8 | 0.20 |
| | kgf/cm ² | 0.02...2.04 | 0.01...2.03 | 0.01 |
| | Mpa | 0.002...0.20 | 0.001...0.199 | 0.001 |

| Range [bar] | Unit | SP1/2 Setting Range | rP1/2 Setting Range | Step Range |
|-------------|---------------------|---------------------|---------------------|------------|
| 5 | bar | 0.04...5.00 | 0.02...4.98 | 0.02 |
| | Psi | 0.80...72.4 | 0.40...72.0 | 0.40 |
| | kgf/cm ² | 0.04...5.10 | 0.02...5.08 | 0.02 |
| | Mpa | 0.004...0.50 | 0.002...0.498 | 0.002 |
| 10 | bar | 0.10...10.0 | 0.05...9.95 | 0.05 |
| | Psi | 2.00...145 | 1.00...144 | 1.00 |
| | kgf/cm ² | 0.10...10.2 | 0.05...10.1 | 0.05 |
| | Mpa | 0.01...1.00 | 0.005...0.995 | 0.005 |