MDM3051S-DAP

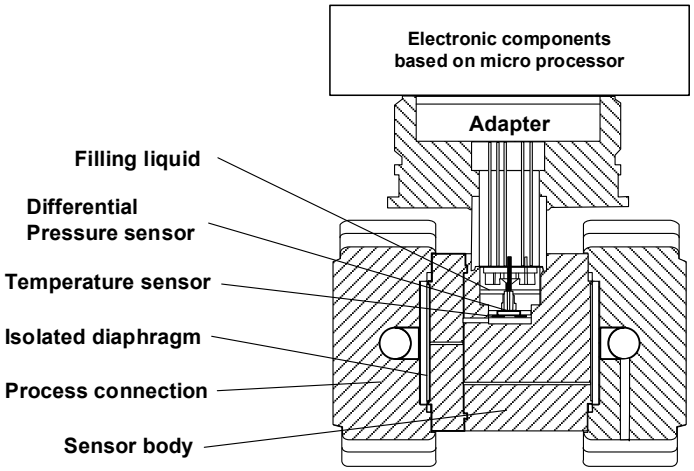
Intelligent Pressure Transmitter

Brief Introduction

Bracket Installation Absolute Pressure Transmitter (DAP)

- Measured media: gas,steam, liquid
- Measured range(with no shift): 0bar~0.4bar…30bar
- Basic error: ±0.075%
- Diaphragm contacting with liquid: Stainless Steel 316L, Hast-alloy

Working Principle



Differential pressure transmitter includes two functional units:

1. Main unit
2. Auxiliary unit

Main unit includes sensor and process connection, working principle as followed:

The sensor module uses whole welded technology, in which has a compact overload diaphragm, a differential pressure sensor and a temperature sensor. The temperature is taken as a reference for temperature compensation. The positive end of the differential pressure sensor is connected with high pressure chamber of sensor capsule; the negative end is connected with low pressure chamber of sensor capsule. Through the isolated diaphragm and filling liquid, the differential pressure is transmitted to silicon die in the inner of differential pressure sensor, which makes the resistor of sensor die change. So the detection system outputs different voltage. The output voltage is in proportion to the pressure variation, and then it is transmitted to standard output by adapter and amplifier.

MDM3051S-DAP Bracket Installation

MDM3051S series Bracket Installation Absolute Pressure Transmitter is used for level, density and pressure measurement of liquid, gas and steam. Then it will output 4mA~20mA DC HART signal and also it could be connected to MS-HART375 hand communicator or RSM295 Modem to do the specification setting and process control.

Standard Specification

(Standard zero as the reference calibration range, Stainless steel 316L diaphragm, filling liquid is silicone oil)

Performance Specification

Reference Basic error for range calibration

Reference Basic error for range calibration (including linearity, hysteresis and repeatability from zero): ± 0.075%)

If TD>10(TD=Max. Pressure range/calibration range), the Basic error is ± (0.0075×TD)%

Environmental Temperature Effect

Range code	-20℃ ~65℃ Total effect value
1L	±(0.30×TD+0.20)%×Span
other	±(0.20×TD+0.10)%×Span
Range code	-40℃ ~-20℃ and 65℃ ~85℃ Total effect value
1L	±(0.30×TD+0.20)%×Span
others	±(0.20×TD+0.10)%×Span

Over range effect: ±0.075%×Span

Long-term stability

Range code	Effect value
1L	±0.2%×Span/1 year
other	±0.1%×Span/1 year

Power effect

±0.001% /10V(12V~42V DC), negligible.

Functional Specification

Pressure range and limits

range/limits		bar
1L	range	0.02~0.4
	limits	0~0.4
1M	range	0.025~2.5
	limits	0~2.5
1O	range	0.3~30
	limits	0~30

Pressure range limit

The pressure is adjustable within the upper and lower limit.

It is recommended to choose the range code with the lowest pressure range proportion to optimize the performance specification.

Zero setting

The zero and pressure range could be adjust to any value within the measured rang in the table, only the calibrated range≥Min.Range is valid.

Mounting position effect

The change of mounting position parallel to diaphragm could not influence the zero drift. If the angle between mounting position and diaphragm is over 90°, the zero drift is<4bar which could be calibrated by zero setting. No effect on pressure range.

Output

2-wire, 4mA~20mA DC, HART communication protocol, linearity or square root output optional. Output signal limit: Imin=3.9mA, Imax=20.5mA.

Response time

The damping constant of amplifier parts is 0.1s, time constant of sensor is 0.1s~1.6s, which is depended on the pressure range and pressure range proportion. The additional adjustable time constant is 0.1s~60s.

Warm-up time

< 15s

Environmental temperature

-40℃ ~85℃

With LCD display and viton sealing ring, the temperature is -20℃ ~65℃ .

Storage temperature/ transportation temperature

-50℃ ~85℃ ; with LCD display: -40℃ ~85℃

Pressure limit
It is from vacuum to Max.Pressure range.

Overpressure Limit

Pressure range	0.4bar (1L)	2.5bar (/M)	30bar (1O)
Overpressure limit	160bar	160bar	160bar

EMC
Please refer to next page"EMC table"

Physical Specification

Material
Diaphragm: Stainless Steel 316L, Hast-alloy C
Process Connection: Stainless steel 304
Filling liquid: silicone oil
Transmitter housing: Aluminum alloy material, epoxy resin glue sprays on the surface
Housing sealing ring: NBR
Nameplate: Stainless steel 304

Weight
3.3kg (not including LCD display, mounting support and process connection)

Housing protection
IP67

Installation

Power and load condition
Power supply: 24V DC, R≤ (Us-12V)/Imax(kΩ)
Imax=23mA
Max. Voltage supply: 42V DC
Min. Voltage supply:
12V DC, 15V DC (Backlit LCD display)
Digital communication load resistance range:
230Ω~600Ω

Electrical Connection
M20×1.5 cable sealing buckle, terminals are suitable for (0.5~2.5) mm^2 wire.

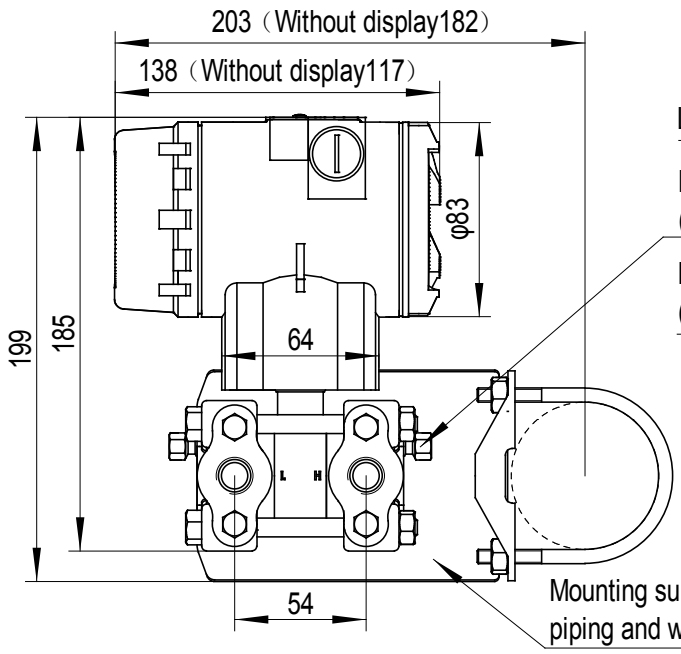
Process connection
NPT 1/4 and UNF 7/16″female at both sides of process connection flange.

EMC Table

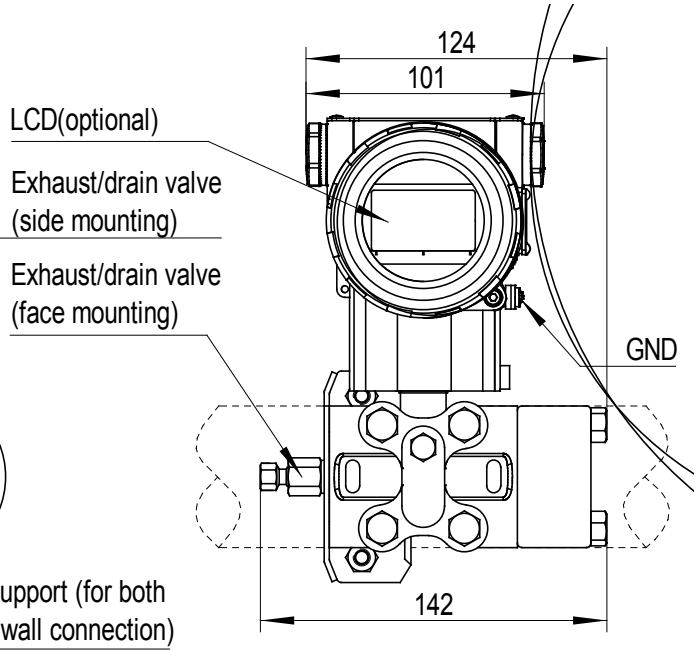
Code	Test terms	Standard	Test condition	Performance degree
1	Radiated interference(housing)	GB/T 9254-2008 table5	30MHz~1000MHz	qualified
2	Transmission interference (DC power port)	GB/T 9254-2008 table1	0.15MHz~30MHz	qualified
3	ESD immunity	GB/T 17626.2-2006	4kV(contact) 8kV(air)	B
4	Radio frequency ectromagnetic field immunity	GB/T 17626.3-2006	10V/m (80MHz~1GHz)	A
5	Power frequency magnetic field immunity	GB/T 17626.8-2006	30A/m	A
6	EFT immunity	GB/T 17626.4-2008	2kV(5/50ns,5kHz)	B

Notes
1. A degree: performance is normal within the technical standard range during testing.
2. B degree: During testing, the function or performance is lowered or lost temporarily, but it could be recovered by itself. Actual operation state, storage and data will keep the same.

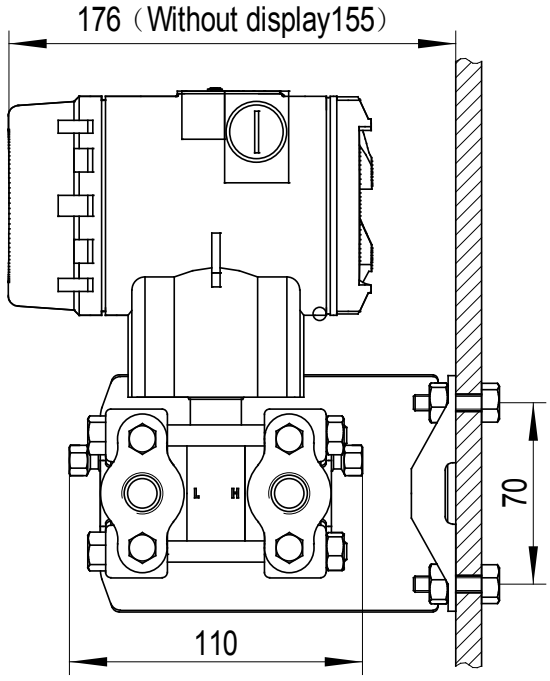
Outline Dimension(Unit: mm)



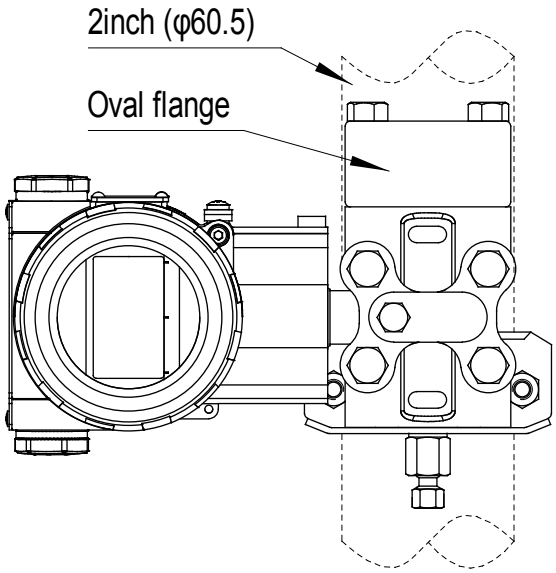
Horizontal Piping Installation (side view)



Horizontal Piping Installation (front view)

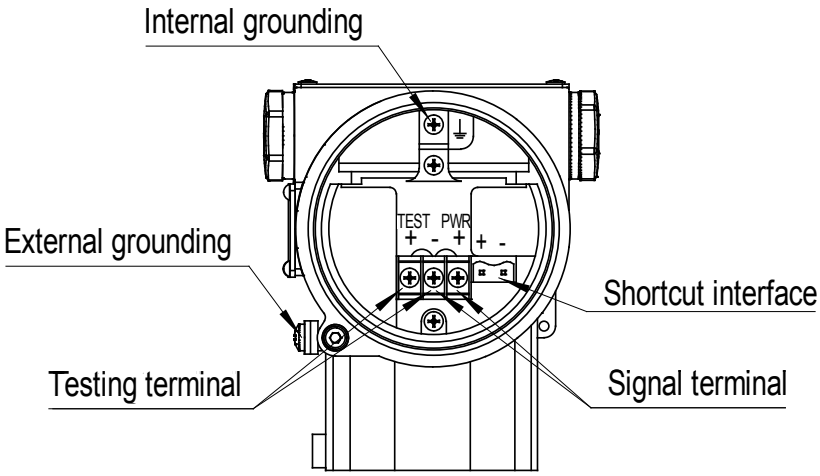


Wall Installation



Vertical Piping Installation

Electrical connection

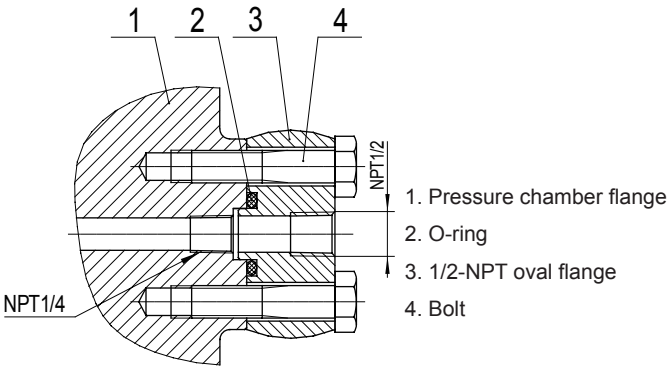


Note: the function of shortcut interface is equal to signal terminal.

Process connection instruction

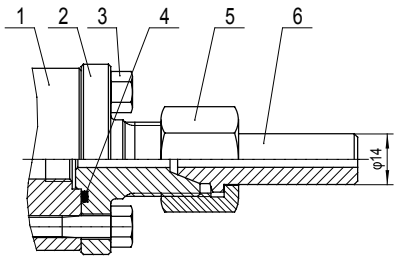
Process flange joint

NPT1/2 Stainless steel oval flange (Code1)



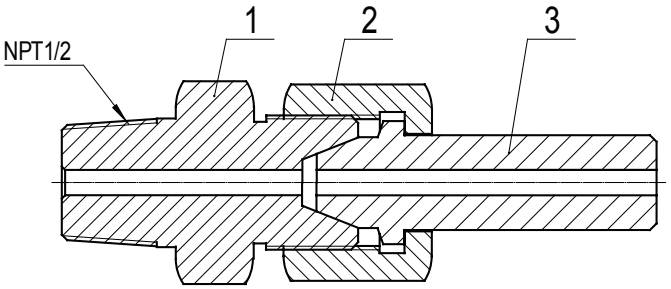
1. Pressure chamber flange
2. O-ring
3. 1/2-NPT oval flange
4. Bolt

M20x1.5 Stainless steel T joint (Code2)



1. Pressure chamber flange
2. M20x1.5T male joint
3. Bolt
4. O-ring
5. Nut M20x1.5
6. Press-leading tube

NPT1/2 male with bolts and pressure tube, SS304 (Code3)



1. NPT1/2 and core connection joint
2. Nut M20x1.5
3. Pressure leading tube, welded, SS304

Order Guide

MDM3051S-DAP	Intelligent Pressure Transmitter

Code	Output
H	4mA~20mA DC with HART

Code	Pressure Range
1L	0mmH_2O~200mmH_2O...4000 mmH_2O/0mbar~20mba...400mbar
1M	0mbar~25mbar...2500mbar
1O	0bar~0.3bar...30bar

Code	Diaphragm material	Filling
A	Stainless steel316L	Silicone oil
C	Hastelloy C	Silicone oil

Code	Process connection
N	1/4 NPT and 7/16 UNF thread hole without release valve
B	1/4 NPT and 7/16 UNF thread hole, release valve mounting in the end-face of flange back
U	1/4 NPT and 7/16 UNF thread hole, release valve mounting in upper flange side
D	1/4 NPT and 7/16 UNF thread hole, release valve mounting in lower flange side

Code	Additional function
N	None
O	No oil processing(For oxygen measurement: fluorocarbon oil filling, viton sealing ring, <60bar, <60℃)

Code	Mounting bracket
N	None
1	Stainless steel
2	Galvanized Carbon Steel

Code	Display
N	None
1	LCD with back-light

Code	Others
N	None
1	1/2 NPT Female with stainless steel oval flange
2	M20×1.5 male with stainless steel T joint
3	1/2-14NPT guiding pressure transition join and rear welding guiding pressure tube (SS)

Code	Others
N	None
A	Intrinsic safe
D	Exd version with Explosion-proof cable joint
S	Stainless steel 316 plate
T	Ship-use

MDM3051S-DAP	H	[0~0.2]bar	A	N	N	1	1	N	N	The whole spec.