

HR3051-DGP Bracket Installation Gauge Pressure Transmitter

HR3051-DAP Bracket Installation Absolute Pressure Transmitter

The HR3051-DGP/DAP Bracket Installation Gauge/Absolute Pressure Transmitter is used for level, density, and pressure measurement of liquid, gas and steam. Then it will outputs 4mA~20mA DC HART signal and also it could be connected to RST375 hand communicator or RSM100Modem to do the specification setting and process control.

Standard

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

1 Performance specification

Reference basic error for range calibration

If $TD > 10$ ($TD = \text{maximum range} / \text{adjustment range}$), it is $\pm (0.0075 \times TD) \%$

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

If $TD > 10$ ($TD = \text{Max. Pressure range} / \text{calibration range}$), the Basic error is $\pm (0.0075 \times TD) \%$

Environmental Temperature Effect

Range code	-20°C~65°C Total effect value
B/L	$\pm (0.30 \times TD + 0.20) \% \times \text{Span}$
Other	$\pm (0.20 \times TD + 0.10) \% \times \text{Span}$
Range code	-40°C~-20°C and 65°C~85°C Total effect value
B/L	$\pm (0.30 \times TD + 0.20) \% \times \text{Span}$
Other	$\pm (0.20 \times TD + 0.10) \% \times \text{Span}$

Over range effect: $\pm 0.075 \% \times \text{Span}$

Long-term stability

Range code	Effect value
B/L	$\pm 0.2 \% \times \text{Span} / \text{year}$
Other	$\pm 0.1 \% \times \text{Span} / \text{year}$



Power effect

$\pm 0.001 \% / 10V$ (12~42V DC), negligible

2 Functional specification

Pressure range and limits (HR3051-DGP Gauge Pressure Transmitter)

Range/limit		kPa	bar
B	Range	0.6~6	6~60mbar
	Limits	-6~6	-60~60mbar
C	Range	2~40	0.02~0.4
	Limits	-40~40	-0.4~0.4
D	Range	2.5~250	0.025~2.5
	Limits	-100~250	-1~2.5
E	Range	20~2000	0.2~20
	Limits	-100~3000	-1~30
G	Range	0.1~10MPa	1~100
	Limits	-0.1~10MPa	-1~100
H	Range	0.21~21 MPa	2.1~210
	Limits	-0.1~21 MPa	-1~210
I	Range	0.4~40 MPa	4~400
	Limits	-0.1~40 MPa	-1~400

Range and limits (HR3051-DAP absolute pressure transmitter)

Range/limits		bar
L	Range	0.02~0.4
	Limits	0~0.4
M	Range	0.025~2.5
	Limits	0~2.5
0	Range	0.3~30
	Limits	0~30

Pressure range limit

The pressure is adjustable within the upper and lower limits of the range. It is recommended to select the range code with the lowest possible range ratio to optimize performance specifications.

Zero setting

Zero and span can be adjusted to any value within the measurement range in the table, as long as calibrated range \geq minimum range

Mounting position effect

The change of the mounting position in the direction parallel to the diaphragm surface does not cause zero drift. If the mounting position and the diaphragm surface exceed 90° , there is a zero position in the range of <0.4 kPa, which can be adjusted by adjusting the zero adjustment. No pressure range effect.

Output

2-wire system, 4~20mA DC, optional HART output digital communication, selectable linear or square root output.

Output signal limit: $I_{\min}=3.9\text{mA}$, $I_{\max}=20.5\text{mA}$

Alarm current

Low alarm mode (minimum): 3.7 mA

High alarm mode (maximum): 21 mA

No alarm mode (hold): maintain the effective current value before the fault.

Alarm current standard setting is high-report mode.

Response time

The amplifier component has a damping constant of 0.1 s; the sensor time constant is 0.1~1.6 s, depending on the range and turndown ratio. The additional adjustable time constant is 0.1~60s.

Warm-up time: $< 15\text{s}$

Environmental temperature

$-40\sim 85^\circ\text{C}$

With LCD display, fluoro rubber seal $-20\sim 65^\circ\text{C}$

Storage temperature / transport temperature

$-50\sim 85^\circ\text{C}$

With LCD display: $-40\sim 85^\circ\text{C}$

Pressure limit: From vacuum to maximum range.

Over pressure limit:

Range	6kPa (1B)	40kPa (1C/1L)	250kPa (1D/1M)	
Over pressure limit	16MPa	16MPa	16MPa	
Range	2 (3) MPa (1E/10)	10MPa (1G)	21MPa (1H)	40MPa (1I)
Over pressure limit	16MPa	20MPa	25MPa	45MPa

Electromagnetic Compatibility (EMC): See the Electromagnetic Compatibility Schedule on the next page.

3 installation

Power and load conditions

The power supply voltage is 24V , $R \leq (U_s - 12V) / I_{max}$ k Ω

among them $I_{max} = 23$ mA

Maximum supply voltage: 42VDC

Minimum supply voltage: 12VDC, 15VDC (backlit LCD display)

Digital communication load range: 230 ~ 600 Ω

Electric connections

M20×1.5 cable sealing buckle, terminals are suitable for (0.5~2.5)mm² wire.

Process connection

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

Material

Diaphragm: stainless steel 316L, Hast-alloy C

Process connection: stainless steel 316L

Filling fluid: 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 bracket, process connection)

4 physical specifications

Housing protection: IP67

EMC table

Code	Test items	Basic standard	Test conditions	Performance degree
1	Radiation interference (shell)	GB/T 9254-2008 table 5	30MHz~1000MHz	qualified
2	Transmission interference (DC power port)	GB/T 9254-2008 table 1	0.15MHz~30MHz	qualified
3	ESD immunity	GB/T 17626.2-2006	4kV (contact) 8kV (air)	B
4	Radio frequency electromagnetic 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	Electrical fast transient burst immunity	GB/T 17626.4-2008	2kV (5/50ns, 5kHz)	B
7	Surge immunity	GB/T 17626.5-2008	1kV (Between wires) 2kV (Between wire and ground) (1.2us/50us)	B
8	Radio frequency field induced conducted interference immunity	GB/T 17626.6-2008	3V (150KHz~80MHz)	A

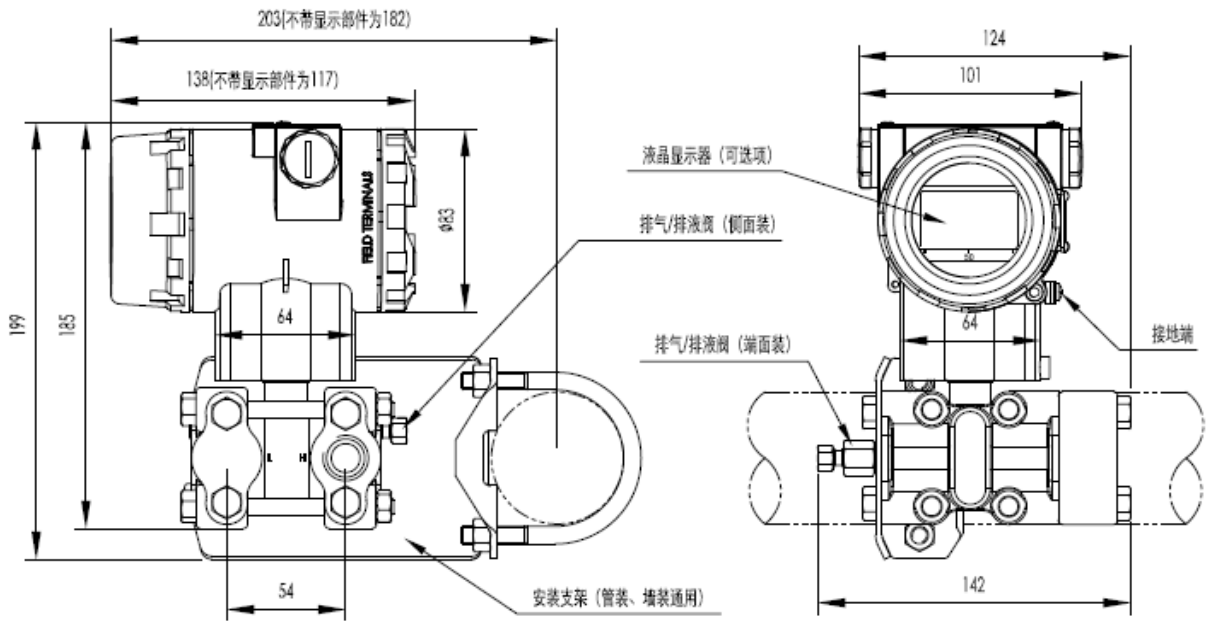
Note: (1) A degree: performance is normal within the technical standard range during testing.
 (2) B degree: During testing, the function or performance is lowered or lost temporarily, but it could be recovered by itself. Actual operation state, storage and data will keep the same.

Outline construction

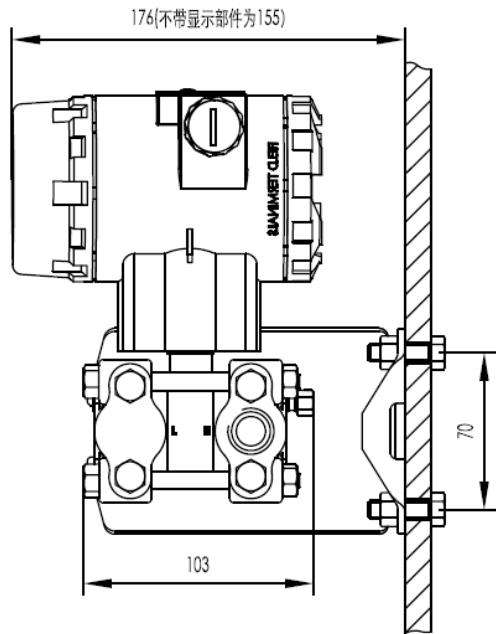
unit (mm)

Horizontal piping connection (side view)

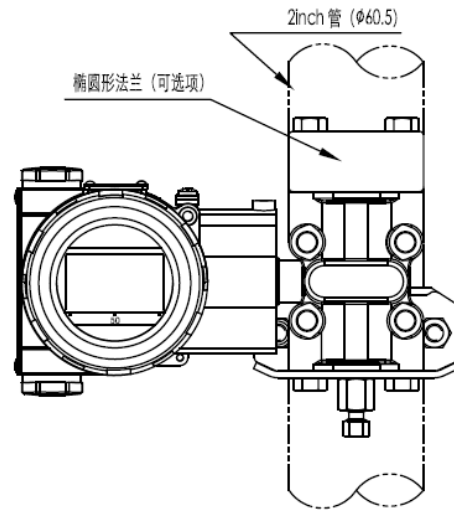
Horizontal piping connection (front view)



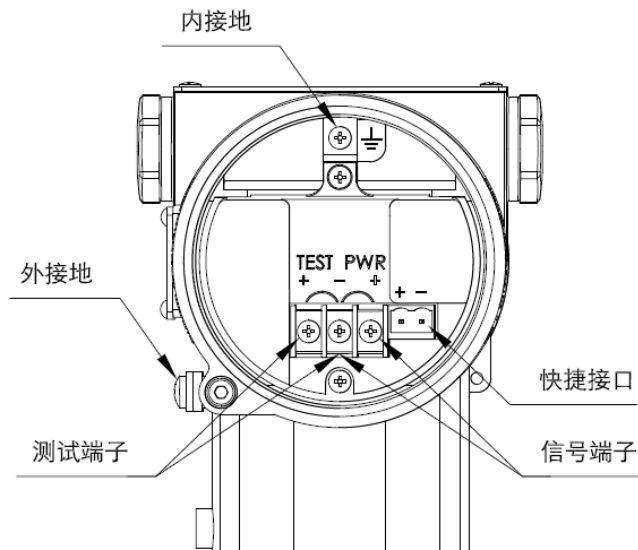
Wall connection



Vertical piping connection



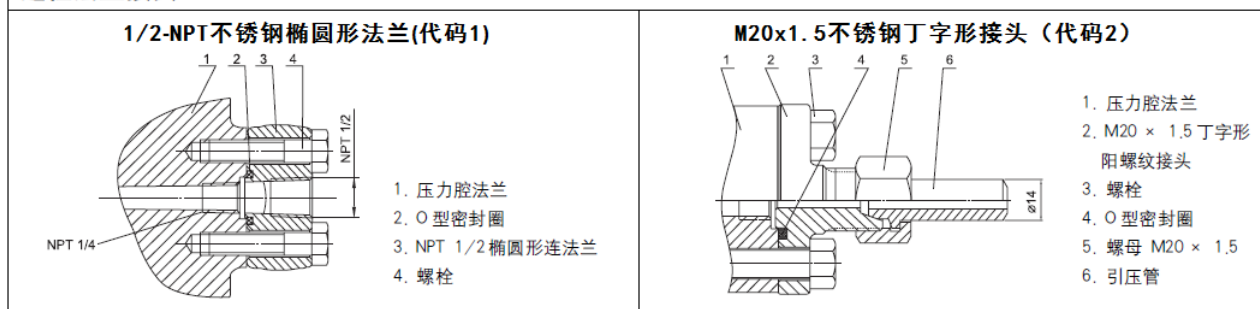
5 Electrical connection



Note: The shortcut interface function is equivalent to the signal terminal.

6 Process Connection Instructions

过程法兰接头



7 model and specification code table

Bracket Installation Intelligent Pressure Transmitter HR3051-DGP			
Bracket Installation Intelligent Absolute Pressure Transmitter HR3051-DAP			
10	precision	output	
	U	Basic error ±0.04%	4-20mA With Hart
	B	Basic error ±0.075%	4-20mA With Hart
	A	Basic error ±0.05%	4-20mA With Hart
	C	Basic error ±0.1%	4-20mA With Hart
	N	4-20mA Analog output	
20	Range	Pressure range RP2012 1B 0-0.6kPa~6kPa / (0-60~600 mmH ₂ O) / (0-6~60mbar) 1C 0-2kPa~40kPa / (0-200~4000 mmH ₂ O) / (0-20~400mbar) 1D 0-2.5kPa~250kPa / (0-0.25~25 mH ₂ O) / (0-25~2500mbar) 1E 0-20kPa~2MPa / (0-2~200 mH ₂ O) / (0-0.2~20bar) 1G 0-0.1MPa~10MPa / (0-1~100bar) 1H 0-0.21MPa~21MPa / (0-2.1~210 bar) 1I 0-0.4MPa~40MPa / (0-4~400 bar) Absolute pressure range RP2013 1L 0-2kPa~40kPa / (0-200~4000 mmH ₂ O) / (0-20~400mbar) 1M 0-2.5kPa~250kPa / (0-25~2500mbar) 10 0-30kPa~3MPa / (0-0.3~30bar)	
30	Diaphragm material	Filling fluid	
		stainless steel 316L	
	A	Silicone oil stainless steel 316L	
	B	Fluorine oil Hastelloy C	
	C	Silicone oil Hastelloy C	
	D	Fluorine oil	
	E	Stainless steel 316L with	

									gold plated Silicone oil Stainless steel 316L with gold plated F Fluorine oil Stainless steel 316L with FEB painted G Silicone oil Ta T Silicone oil
40	Process connection								
									N 1/4" NPT and 7/16" UNF screw holes No bleed valve The relief valve is mounted on the rear end B 1/4" NPT and 7/16" UNF screw holes of the flange 1/4" NPT and 7/16" UNF screw holes U The relief valve is mounted on the upper side of the flange. 1/4" NPT and 7/16" UNF screw holes D The relief valve is mounted on the side of the flange 1/4" NPT and 7/16" UNF screw holes V Vertical mounting flange (with relief valve)
50	Special function								
									N None P Lightning protection Oil-free treatment (oxygen measurement limit fluorine oil 0 filling liquid, fluorine rubber sealing ring, <6MPa, <60° C)
60	Mounting brackets								
									N None 1 stainless steel 2 Galvanized carbon steel
70	LCD								
									N No LCD display 2 LED backlit display (-20 ° C) 3 OLED display (-40°C)
80	annex								
									N None 1/2" NPT internal thread stainless steel oval 1 flange. 2 M20x1.5 male stainless steel T-shaped joint
90	Explosion-proof treatment								
									N Basic type A Intrinsic safe, NEPSI D Explosion-proof type, NEPSI (Explosion-proof cable connector)

100	Additional options											
											D	Exd version with Explosion-proof cable joint
											E	Increased safety cable joint
											V	Low voltage version
											S	All stainless steel case

Note: HR3051-DGP corresponds to the selected gauge pressure range code, HR3051-DAP corresponds to the absolute pressure range code.