

HR3051-LGP Gauge Pressure Remote Transmitter

HR3051-LAP Absolute Pressure Remote Transmitter

1 application

The membrane box of the remote transmitter is used to prevent the medium in the pipeline from directly entering the pressure sensor component of the transmitter. It uses a filling fluid such as silicone oil to transmit pressure between the transmitter and the transmitter.

The HR3051-LGP/LAP gauge/absolute remote transmitter is used to measure the liquid level, density, and pressure of a liquid, gas, or vapor, and then convert it to a 4-20 mA DC HART current signal output. The HR3051-LGP/LAP can also communicate with the RST375 handheld terminal or the RSM100 Modem for parameter setting, process monitoring, and more. The measuring range of HR3051-LGP/LAP type gauge pressure/absolute pressure remote transmitter is 0-6kPa~25MPa, and the rated pressure of remote flange is 1.6/4MPa, 6.4MPa, 10MPa, 150 psi, 300 psi or 600 psi.

2 Working principle and structure

The HR3051-LGP/LAP type gauge/absolute pressure remote transmitter is composed of HR3051-GP/AP type gauge pressure/absolute pressure transmitter and welded remotely mounted flange with capillary. Its working principle is the same as HR3051-GP/AP type gauge pressure/absolute pressure transmitter (see HR3051-GP/AP type gauge pressure/absolute pressure series transmitter technical specification), but the pressure transmission path is slightly different: role The pressure on the side of

the remote flange is first transmitted through the diaphragm and filling fluid on the flange, through the capillary, and finally to the measuring end of the measuring sensor.

3 Input

Measurement parameter : Gauge pressure, absolute pressure, liquid level

Measuring range

Gauge pressure remote transmitter:

lower limit: --100% URL (continuously adjustable)

Upper limit: To +100% URL (continuously adjustable)

Absolute pressure remote transmitter:

lower limit: 0 - 100% URL (continuously adjustable)

Upper limit: To +100% URL (continuously adjustable)



Range

Table 1 Comparison of range code and its range

Range code	Minimum range	Maximum range	Rated pressure (maximum)
C	6kPa	40kPa	Rated pressure of the liquid level flange
D	25kPa	250kPa	
F	30kPa	3MPa	

Underreport mode (minimum): 3.7 mA

High-report mode (maximum): 21 mA

No report mode (hold): Maintain the effective current value before the fault

Alarm current standard setting: High-report mode

5 Response time

The amplifier component has a damping constant of 0.1 s; the sensor and remote flange time constant is 0.2 to 6 s, depending on the sensor's range, turndown ratio, capillary length, and viscosity of the fill fluid. The additional adjustable time constant is 0.1 to 60 s.

6 General conditions

6.1 Installation conditions

Gauge/absolute remote transmitters without capillaries can be mounted directly from the remote flange and positional offsets will produce a correctable zero offset. The electronic case can be rotated up to 360° and the set screw can be fixed in any position.

The gauge/absolute remote flange is connected to the ANSI/DIN-compliant mating flange. The mating flange should be equipped with soft gaskets and bolts and nuts (user-selectable mounting bolts and nuts). . For a gauge/absolute remote transmitter with a capillary, if the remote seal is lower than the transmitter body, the maximum height drop of the remote seal and the transmitter body should be <5 m. When the working pressure is below 100 kPa absolute, the

transmitter body must be lower than the remote seal.

The minimum bending radius of the capillary is 75mm, and it is strictly prohibited to entangle!

6.2 Environmental conditions

Ambient temperature

lowest: Depending on the filling liquid

highest: 85°C

With LCD display, fluoro rubber seal -20~65°C

Storage temperature / transport temperature

Lowest: Depending on the filling liquid

Highest: 85°C

Relative humidity: 0~100%

Impact resistance

Acceleration: 50g

Duration: 11ms

Shock resistance

2g to 500Hz

Electromagnetic compatibility (EMC)

See Table 4 "Electromagnetic Compatibility Schedule" on the next page.

6.3 Process medium limit temperature limit

Medium temperature: -30~400°C

Table 3 Table of relationship between filling liquid, working temperature and minimum working pressure.

Filling fluid	Silicone oil (S)	High temp. silicone oil (H)	Ultra high temp. silicone oil (U)	Vegetable oil (V)
Density 25°C	960 kg/m ³	980 kg/m ³	1020 kg/m ³	937 kg/m ³
Operating temp. range	-30~200°C	-10~350°C	-10~400°C	0~250°C
Temperature Operating pressure range (kPa absolute pressure)				
20°C	>10	>10	>10	>25
100°C	>25	>25	>25	>50
150°C	>50	>50	>50	>75
200°C	>75	>75	>75	>100
250°C		>100	>100	>100
350°C		>100	>100	
400°C			>100	

Note: Exceeding the above range of operating temperature and pressure relationships should be specifically noted, and special designs can be used to meet the requirements.

Transmitter body pressure limit: vacuum to maximum pressure

Remote flange rated pressure:

ANSI standard: 150psi~600psi

DIN standard: PN 1.6MPa~PN 10MPa

Weight

DN 50/2" about 7~10kg, DN 80/3" about 8~11kg, DN 4" about 9~12kg.

Explosion-proof performance

NEPSI flameproof license: Ex dII C T6

NEPSI intrinsically safe license: Ex iaII C T4

Allowable temperature is -40°C~65°C

6.4 Power and load conditions

The power supply voltage is 24V

$R \leq (U_s - 12V) / I_{max}$ kΩ

among them $I_{max} = 23$ mA

Maximum supply voltage: 42VDC

Maximum supply voltage : 12VDC , 15VDC (Backlight LCD display)

Digital communication load range: 250~600Ω

Material

Measuring bellows: stainless steel 316L

Diaphragm: Stainless steel 316L, Hastelloy C, Ta

Process flange: Stainless steel 304

Filling fluid: Silicone oil, high temperature silicone oil, ultra high temperature silicone oil, vegetable oil

Transmitter shell: Aluminum alloy, exterior epoxy resin

Shell seal: Nitrile rubber (NBR)

Nameplate: stainless steel 304

Electrical connections

M20X1.5 cable sealing buckle, terminal block is suitable for 0.5-2.5mm² wire.

Process connection

The remote flange is ANSI or DIN compliant. Can be installed directly to participate in the dimensional drawing.

Protection level: IP67

Table 4 Electromagnetic compatibility schedule

No.	Test items	Basic standard	Test Conditions	Performance degree
1	Radiation interference (shell)	GB/T 9254-2008 form 5	30MHz ~1000MHz	qualified
2	Conducted interference (DC power port)	GB/T 9254-2008 form 1	0.15MHz~30MHz	qualified
3	Electrostatic discharge (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

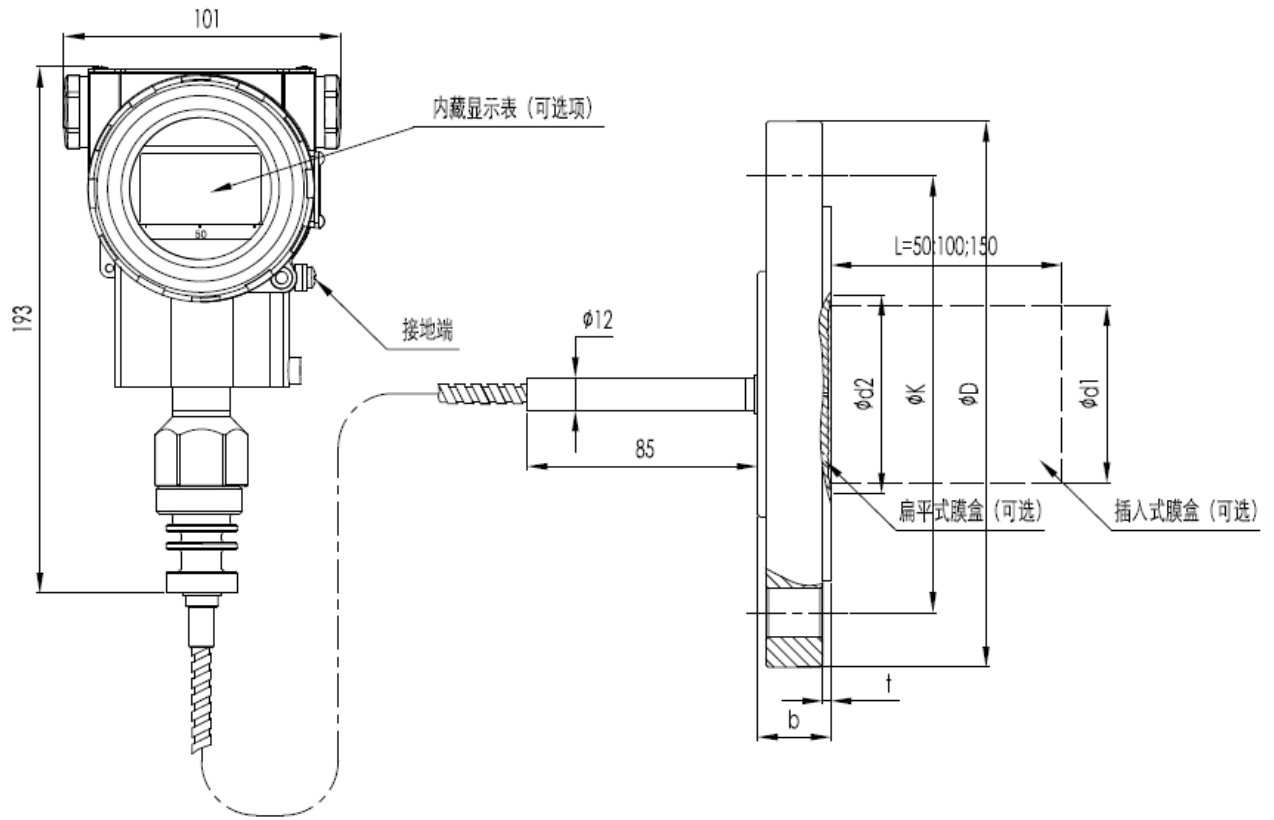
Note:(1) A degree: performance is normal within the technical standard range during testing.

(2) B degree: During 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.

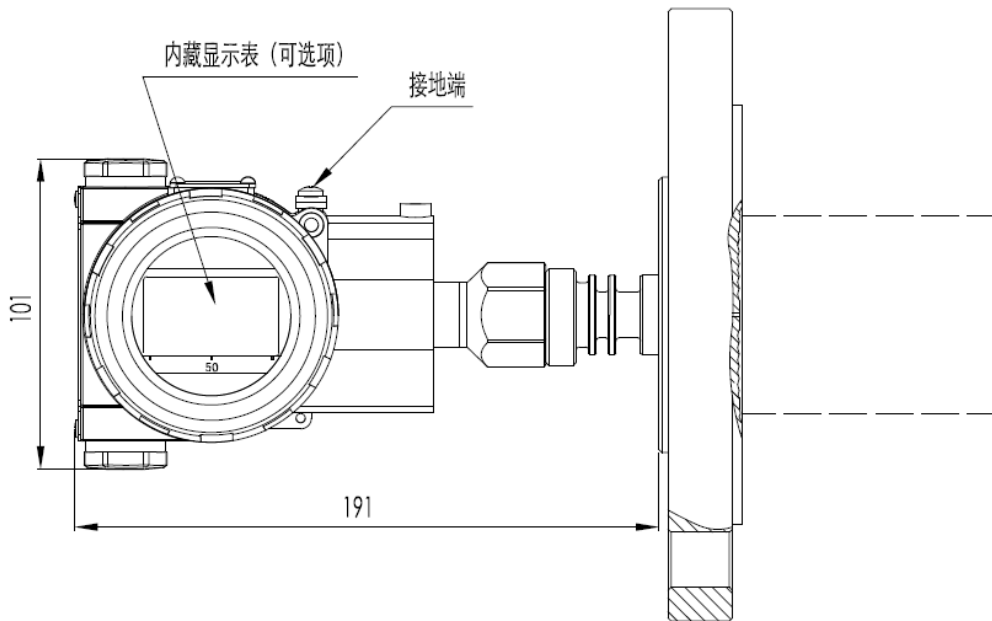
7. Dimensions

Unit (mm)

P1 Basic type remote sealed installation diagram(RS type)



P2 Basic type remote sealed direct installation diagram(RN type)

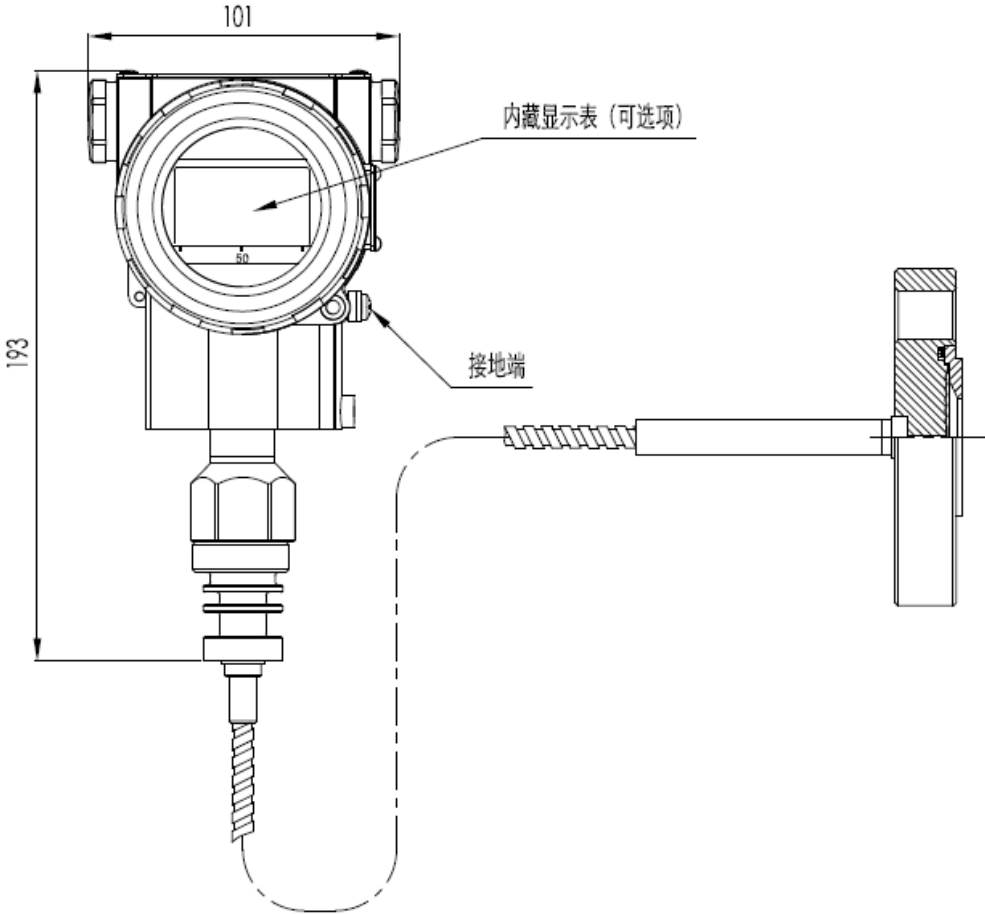


Basic type remote sealed construction table 5

Nominal Diameter	Rated Pressure	ΦD	ΦK	Φd1 Plug-in	Φd2 Flat	Φd3	t	b	Bolt	
									Qty	Size
DN 50 (DIN 2526E type sealed face) (Flange DIN 2501)	PN1.6/4MPa	165	125	48.3	57	102	3 ^{+0.5}	20	4	M16
	PN 6.4MPa	18	135	48.3	57	102	3 ^{+0.5}	26	4	M20
	PN 10MPa	195	145	48.3	57	102	3 ^{+0.5}	28	4	M20
DN 80 (DIN 2526Etype sealed face) (Flange DIN 2501)	PN1.6/4MPa	200	160	76	75	138	3 ^{+0.5}	24	8	M16
	PN 6.4MPa	215	170	76	75	138	3 ^{+0.5}	28	8	M20
	PN 10MPa	230	180	76	75	138	3 ^{+0.5}	32	8	M24
DN 2" (ANSI B 16.5 RF type)	150psi	152.4	120.6	48.3	57	92.1	3 ^{+0.5}	17.4	4	M18
	300psi	165.1	127.0	48.3	57	92.1	3 ^{+0.5}	20.6	8	M18
	600psi	165.1	127.0	48.3	57	92.1	6.35	31.75	8	M18
DN 3" (ANSI B 16.5 RF type)	150psi	190.5	152.4	76	75	127	3 ^{+0.5}	22.2	4	M16
	300psi	209.5	168.3	76	75	127	3 ^{+0.5}	27.0	8	M20
	600psi	209.5	168.3	76	75	127	6.35	38.05	8	M20
DN 4 " (ANSI B 16.5 RF type)	150psi	229	191	89	89	157	3 ^{+0.5}	30	8	M18
	300psi	255	200	89	89	157	3 ^{+0.5}	32	8	M18

Note: Bolts and nuts are optional for customers.

P3 With inner diaphragm remote sealed installation (US type)



P4 With inner diaphragm remote sealed direct installation (UN type)

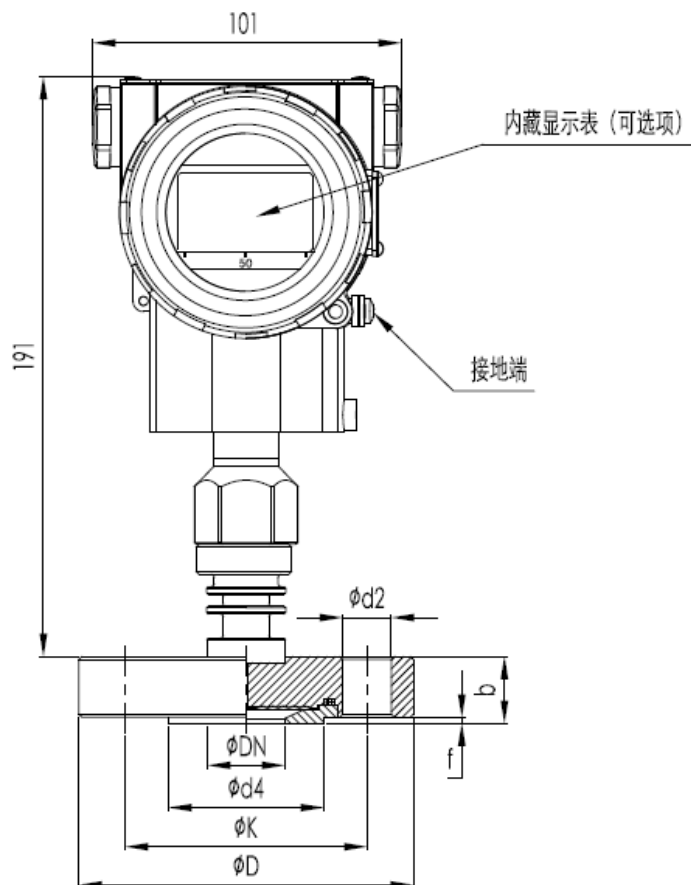


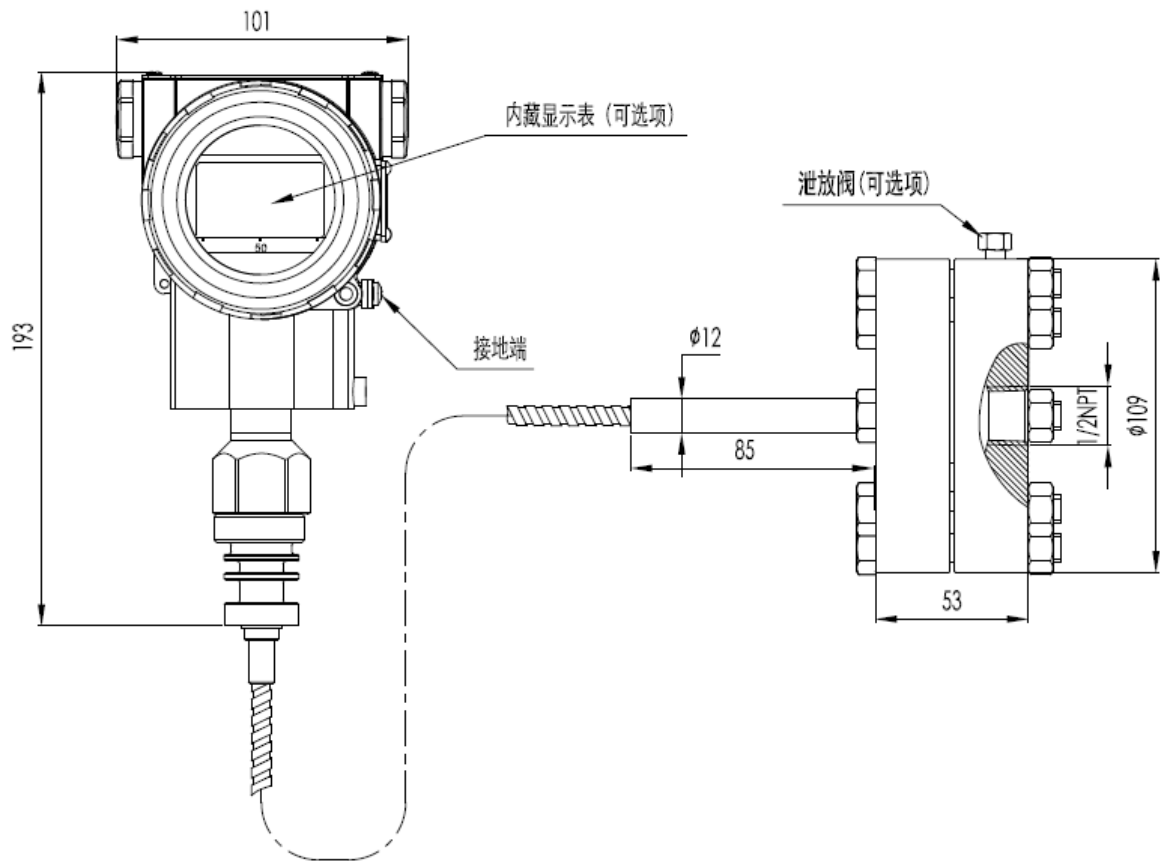
Table 6 Construction size of connecting with DIN 2501 standard inner diaphragm remote sealed installation

DN	PN	Size, mm								Weight kg
		D	K	d4	b	f	H	d2	G2	
25	1MPa/4MPa	115	85	68	22	2	-	14	-	1.5
25	6.3MPa/10MPa	140	100	68	24	2	52	-	4×M16	3.2
	16MPa	140	100	68	24	2	52	-	4×M16	3.6
	25MPa	150	105	68	28	2	96	-	4×M20	4

Table 7 Construction size of connecting with ANSI B 16.5 standard inner diaphragm remote sealed installation

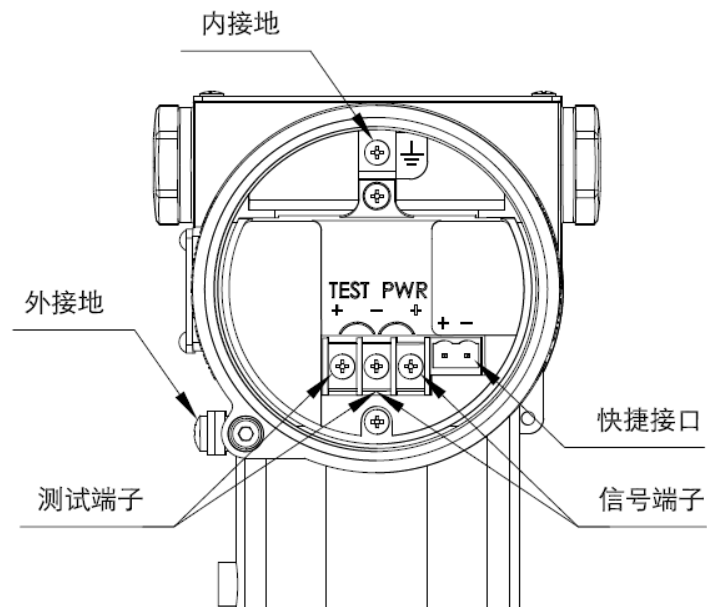
DN	psi	Size, mm								Weight kg
		D	K	d2	d4	b	f	H	G ₂ UNC	
1"	150	110	79.5	16	51	22	2	-	-	1.4
	300	125	89	20	51	22	2	-	-	1.7
1"	600	125	89	-	51	25	7	53	4×5/8"	3.6
	1500	150	101.5	-	51	36	7	64	4×7/8"	4.0

P5 Thread mounted remote sealing device (TS type)



8 Electrical connection

P6 Electrical connection diagram



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

9 Model and specification code¹⁾

1 Pressure/Absolute remote transmitter flange selection				
10	Pressure/Absolute remote sealing device			
	RN-	Direct-mounted no capillary		
	RS-	With capillary		
20		Process Connection	Nominal Diameter	Sealing type Diaphragm/Sealing material
	A	DN50 DIN 2501	E type DN2526	stainless steel 316L
	B	DN50 DIN 2501	E type DN2526	Hastelloy C
	C	DN50 DIN 2501	E type DN2526	Ta
	H	DN80 DIN 2501	E type DN2526	stainless steel 316L
	I	DN80 DIN 2501	E type DN2526	Hastelloy C
	G	DN80 DIN 2501	E type DN2526	Ta
	D	DN2" ANSI B 16.5	RF type ANSI B 16.5	stainless steel 316L
	E	DN2" ANSI B 16.5	RF type ANSI B 16.5	Hastelloy C
	F	DN2" ANSI B 16.5	RF type ANSI B 16.5	Ta
	K	DN3" ANSI B 16.5	RF type ANSI B 16.5	stainless steel 316L
	L	DN3" ANSI B 16.5	RF type ANSI B 16.5	Hastelloy C
	M	DN3" ANSI B 16.5	RF type ANSI B 16.5	Ta
	N	DN4" ANSI B 16.5	RF type ANSI B 16.5	stainless steel 316L
	O	DN4" ANSI B 16.5	RF type ANSI B 16.5	Hastelloy C
	P	DN4" ANSI B 16.5	RF type ANSI B 16.5	Ta
	Q	DN100 DIN 2501	E type DN2526	stainless steel 316L
	S	DN100 DIN 2501	E type DN2526	Hastelloy C
	T	DN100 DIN 2501	E type DN2526	Ta
30		Rated Pressure	Pressure Level	Flange Pressure
	1	PN 1MPa/4MPa	DIN 2501	
	2	PN 6.4MPa	DIN 2501	
	3	PN 10MPa	DIN 2501	
	6	150psi	ANSI B 16.5	
	7	300psi	ANSI B 16.5	
	8	600psi	ANSI B 16.5	
40		Connecting type		
	F	Flat		
	H	Plug-in, stainless steel 316L	Length: 50mm	
	I	Plug-in, stainless steel 316L	Length: 100mm	
	G	Plug-in, stainless steel 316L	Length: 150mm	
	L	Plug-in, Hastelloy C	Length: 50mm	
	M	Plug-in, Hastelloy C	Length: 100mm	
	N	Plug-in, Hastelloy C	Length: 150mm	
50		Filling fluid		
	S	Silicone oil	-30~200°C	
	H	High temp. silicone oil	-10~350°C	
	U	Ultra-temperature silicone oil	-10~400°C	
	V	Vegetable oil	0~250°C	

					F	Fluoro oil	-30~260°C
					L	Low temp. filling fluid	-100~100°C
					Z	Ultra-temperature filling fluid	10~600°C
60					Capillary length		
					00	No capillary	
					01	1m	
					02	2m	
					03	3m	
					04	4m	
					05	5m	
					06	6m	
					07	7m	
					08	8m	
					09	9m	
					10	10m	
					11	11m	
					12	12m	
					
70					Capillary		
					N	None	
					P	With PVC protection	
80					Contacting liquid flange diaphragm housing type		
					N	None	
					1	FEP on 316L (FEP) (temp. ≤180°C)	
					2	PFA on 316L (PFA) (temp. ≤260°C)	
					3	PTFE on diaphragm(only for flat type)	
					4	FEP on 316L (FEP) (temp. ≤180°C) (only for plug-in type)	
					5	PFA on 316L (PFA) (temp. ≤260°C) (only for plug-in type)	
					6	Anti-vacuum treatment	

2 Sealing device of Pressure/Absolute with inner diaphragm ^{[6]With}							
10	Sealing device with inner diaphragm						
	UN-	Direct-mounted No capillary					
	US-	With capillary					
20		Process Connection	Nominal Diameter	Sealing face type		Diaphragm material	
		U	DN25 DIN 2501	D type	DN2526	stainless steel 316L	
		V	DN25 DIN 2501	D type	DN2526	Hastelloy C	
		W	DN25 DIN 2501	D type	DN2526	Ta	
		X	DN1" ANSI B 16.5	RF type	ANSI B 16.5	stainless steel 316L	
		Y	DN1" ANSI B 16.5	RF type	ANSI B 16.5	Hastelloy C	
		Z	DN1" ANSI B 16.5	RF type	ANSI B 16.5	Ta	

30		Rated pressure	Pressure level	Flange size
			1	PN 1MPa/4MPa DIN 2501
			2	PN 6.3MPa/10MPa DIN 2501
			3	PN 16MPa DIN 2501
			4	PN 25MPa DIN 2501
			5	150Psi ANSI B 16.5
			6	300Psi ANSI B 16.5
			7	600Psi ANSI B 16.5
			8	1500Psi ANSI B 16.5
40		Filling liquid		
			S	Silicone oil -30~200°C
			H	High temp. Silicone oil -10~350°C
			V	Vegetable oil 0~250°C
			F	Fluoro oil -30~260°C
50		Capillary length		
			01	1m
			02	2m
			03	3m
			04	4m
			05	5m
			06	6m
		
60		Capillary		
			N	None
			P	With PVC protection
70		Contacting liquid flange diaphragm housing type		
			N	None
			3	PTFE on diaphragm (PTFE) (temp. ≤200°C)
			6	Anti-vacuum treatment
80		Sealing ring material		
			1	PTFE
			2	stainless steel 316
			3	Hastelloy C
			4	Ta

Note: Before select **Sealing device of Pressure/Absolute with inner diaphragm**, choose HR3051-GP/AP transmitter first, then choose remote type on 40.

3 Sealing device of thread mounted			
Gauge/Absolute Remote Selection			
10	Sealing device of thread mounted		
	Gauge/Absolute Remote		
	TS-	With Capillary	
20	Diaphragm/sealing		
	face material		
		U	stainless steel 316L
		V	Hastelloy C
		W	Ta
30	Washing back-up hole		
		1	None
		0	Yes
40	Filling liquid		
		S	Silicone oil -30~200°C
		H	High temp. Silicone oil -10~350°C
		U	Ultra-temperature Silicone oil -10~400°C
		V	Vegetable oil 0~250°C
		F	Fluoro oil -30~260°C
		L	Low temp. Filling liquid -100~100°C
	Z	Ultra-temperature Filling liquid 10~600°C	
50	Capillary length		
		01	1m
		02	2m
		03	3m
		04	4m
		05	5m
		06	6m
		08	8m
	
60	Capillary		
		N	None
	P	With PVC protection	
70	Contacting liquid		
	flange diaphragm		
	housing type		
		N	None
		P	Anti-vacuum treatment

Note 10: Before selecting thread mounted flange sealing device, select HR3051-GP/AP transmitter first, then

choose remote option on the 40 line.
