SM39PWB-DFL single-flange differential pressure transmitter

1 apply

The membrane box of a single flange differential pressure transmitter is a pressure sensor assembly used to prevent the medium in the pipeline from directly entering the differential pressure transmitter, using filling fluid such as silicon oil between the transmitter and the transmitter.

The SM39PWB-DFL single flange differential pressure transmitter is used to measure the liquid level, density, pressure, and flow rate of the liquid, gas or steam, and then convert it into a current signal output from 4 mA to 20 mADC HART. It can also communicate with HART hand readers, parameter setting, process monitoring, etc. SM39PWB-DFL single flange differential pressure transmitter measurement

Volume range (when not migrated) is 0...1kPa~2MPa,

The rated pressure of a single flange is 1.6 / 4MPa, 6.4MPa, 10MPa, 150 psi, 300 psi or 600 psi, respectively.

2 Working principle and structure

The SM39PWB-DFL single flange differential pressure transmitter is composed of SM39PWB-CY series differential pressure transmitter and welded single flange. Its working principle is the same as that of the SM39PWB-CY series differential pressure transmitter, but the pressure transmission path on the positive pressure side is slightly different: the pressure acting on the high pressure side first passes through the diaphragm and filling liquid on a single flange, then through the transmitter body, and finally reaches the high pressure side of the measuring sensor.

3 import

Measureme nt range of differential pressure and liquid level

Lower limit: -100% URL from (continuously adjustable) Upper limit: to + 100% URL (continuously adjustable) range

Table 1 Compartable of relationship between range code and range

Quota code	minimum range	metre fullscale	Rated pressure (max.)
B	1kPa	6kPa	

C	4kPa	40kPa	Rated pressure of a single flange
D	25kPa	250kPa	
E	200kPa	2MPa	

Table 2 Control table of the relationship between single flange and minimum range

Single flange	nominal diameter	minimum range
Flat type	DN 50/2″	10kPa
	DN 80/3″	1kPa
	DN 4″	1kPa
plug-in	DN 50/2″	16kPa
	DN 80/3″	1kPa
	DN 4″	1kPa

The minimum range of the differential pressure level transmitter shall be the larger value of the minimum range in Table 1 and Table 2. The adjusted range shall not be less than the minimum range. The maximum range of the liquid level transmitter shall be the minimum value of the maximum range of the transmitter body and the single flange rated pressure.

4 output

output signal

Second-line system, 4 mA ~ 20 mADC HART output, digital communication, HART protocol loaded on the 4 mA ~ 20 m ADC signal.

Output signal limit: I mi n = 3.9 mA and Imax = 2 0 .5 mA

5 response time

The damping constant of the amplifier component is 0.1s; the sensor and single-flange time constant is 0.2s~2s, depending on the range and range ratio. The additional adjustable time constant is: 0.1s~60s. The added adjustable time constant is: 0.1s~60s.

6 general conditions

6.1 Installation conditions

A single flange transmitter can be directly fixed in any position. The best state is to make the process flange axis in the vertical state, and the position deviation will produce a correctable zero offset. The electronic watch case can rotate up to 360°, and the positioning screws can hold it in any position.

6.2 ambient condition

ambient temperature

Minimum: Depending on the filling fluid, maximum: 85℃

Storage temperature / transport temperature at-20℃ ~65℃

Minimum: Depending on the filling fluid, maximum:

85℃

relative humidity

0%～100%

shock resistance

Acceleration: 50g

Duration: 11ms

for vibration

resistance

2g to 500Hz

electromagnetic

compatibility

(EMC)

See Table 3 on the next page

6.3 Process medium limit

Limit of medium temperature: -30℃ ~180℃

The pressure limit of the transmitter body is from 3.5kPa absolute pressure to rated pressure, the protection pressure can be greater than 1.5 times the rated pressure, and added to both sides of the transmitter.

Single-flange-rated pressure

ANSI standard: 150 psi ~ 600 psi DIN

Standard: PN1.6MPa~PN 10MPa

One-way overload limit

The low pressure side is the rated pressure of the transmitter body, and the high pressure side is the single flange rated pressure, which may appear modifiable zero drift.weight

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

Explosion proof performance

NEPSI Isolation permit: Ex d Ⅱ C T6

NEPSI License: Ex ia Ⅱ C T4 allowed

temperature: -40℃ ~65℃

6.4 Power supply and load conditions

The power supply voltage

is 24V R (Us-12V) / I

maxkΩ where Imax = 23

mA

Maximum power supply voltage: 42VDC

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

Range of digital communication load: 230 Ω

~600 Ω material

Measurement membrane box: stainless steel 316L

Membrane:, stainless steel 316L, Hab C, tantalum, FEP, PFA, PTFE coating

process flange: stainless steel 304

Filling liquid: silicone oil, vegetable oil

Seal ring: nitrile rubber (NBR), fluorine rubber (FKM),

polytetrafluoroethylene (PTFE)

Transmitter housing: aluminum alloy material, exterior spray

epoxy resin shell sealing ring: nitrile rubber (NBR)

Nameplate:,

stainless steel 304

electrical connection

M201.5 cable sealing buckle, the wiring terminal is suitable for 0.5 m m 2~ 2. 5 m

m 2 wire.

procedure linkage

UNF 7 / 16 " inner thread on the transmitter LV side. The single flange on the high voltage side of the transmitter meets the ANSI standard or the DIN standard. Can be installed directly, and refer to the dimensional drawing.

Housing

protectio

n class

IP67

Table 3 Table table for electromagnetic compatibility

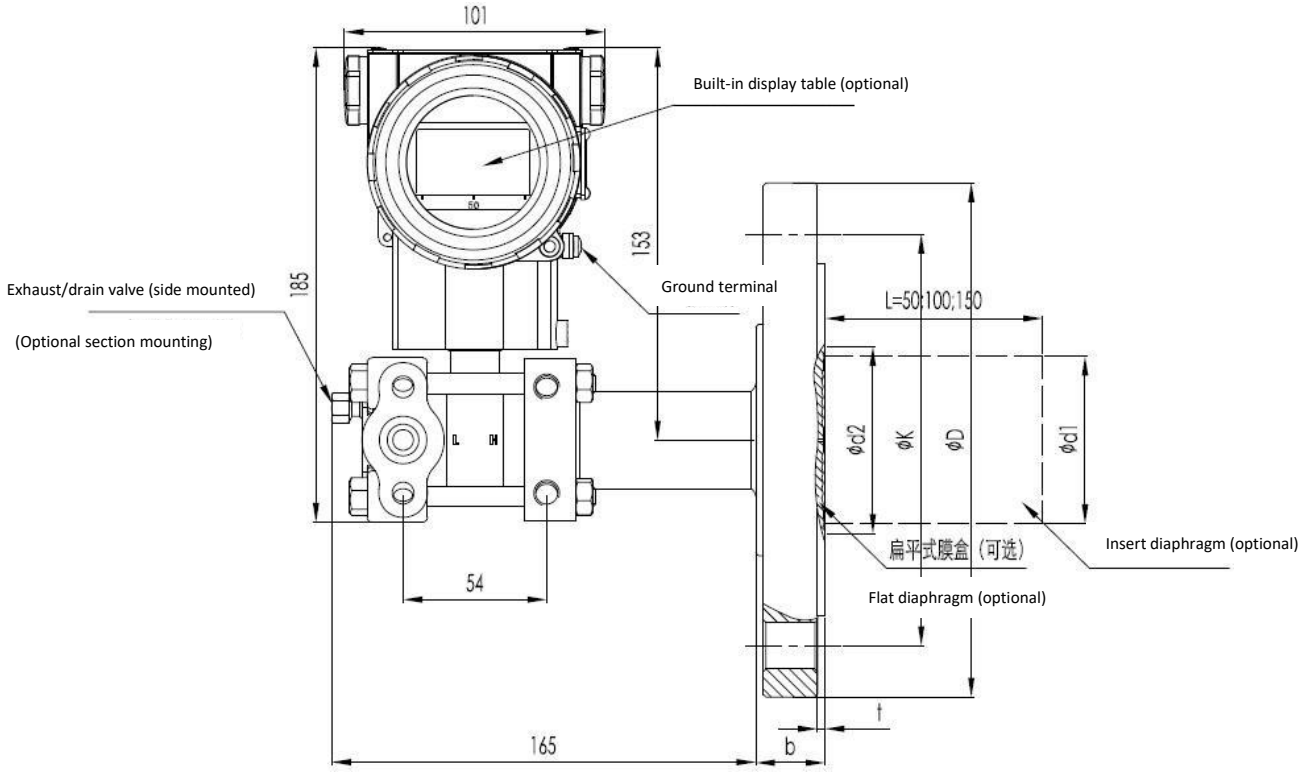
order number	test item	basic criterion	test condition	Performance level
1	Radiation interference (enclosure)	GB / T 9254-2008 Table 5	30MHz～1000MHz	qualified
2	conducted interference (DC power supply port)	GB / T 9254-2008 Table 1	0.15MHz～30MHz	qualified
3	Electrostatic discharge (ESD) immunity	GB/T 17626.2-2006	4kV (contact point) 8kV (air)	B
4	RF 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	Electric fast transient pulse population noise immunity	GB/T 17626.4-2008	2kV(5/50ns,5kHz)	B
7	Wave surge resistance	GB/T 17626.5-2008	1kV (between the lines) 2kV (between lines and ground) （1.2us/50us)	B
8	Conduction of the RF field induction Interference with perturbation	GB/T 17626.6-2008	3V(150kHz～80MHz)	A

Note 1: A Performance grade description: normal within the limit of technical specification.

Note 2: B Performance rating description: During the test, the function or performance is temporarily reduced or lost, but it can be restored by itself, and the actual health, storage and data do not change.

outline dimension

Unit is mm



nominal diameter	rated pressure	ΦD	ΦK	Φ d1, insert set	Φ d2, Flat Eq	Φd3	t	b	Requires the bolt	
									quantity	screw thread
DN50	PN 1.6/4MPa	165	125	48.3	57	102	3+0.5	20	4	M16
(Seal face type DIN2526E)	PN 6.4MPa	180	135	48.3	57	102	3+0.5	26	4	M20
(Flange DIN2501)	PN 10MPa	195	145	48.3	57	102	3+0.5	28	4	M20
DN80	PN 1.6/4MPa	200	160	76	75	138	3+0.5	24	8	M16
(Seal face type DIN2526E)	PN 6.4MPa	215	170	76	75	138	3+0.5	28	8	M20
(Flange DIN2501)	PN 10MPa	230	180	76	75	138	3+0.5	32	8	M24
DN 2″ (ANSI B 16.5 RF)	150psi 300psi 600psi	152.4 165.1 165.1	120.6 127.0 127.0	48.3 48.3 48.3	57 57 57	92.1 92.1 92.1	3+0.5 3+0.5 6.35	17.4 20.6 31.75	4 8 8	M18 M18 M18
DN 3″ (ANSI B 16.5 RF)	150psi 300psi 600psi	190.5 209.5 209.5	152.4 168.3 168.3	76 76 76	75 75 75	127 127 127	3+0.5 3+0.5 6.35	22.2 27.0 38.05	4 8 8	M16 M20 M20
DN 4″	150psi	229	191	89	89	157	3+0.5	30	8	M18
(ANSI B 16.5 RF)	300psi	255	200	89	89	157	3+0.5	32	8	M18

Note: The user can choose the mounting bolts and nuts

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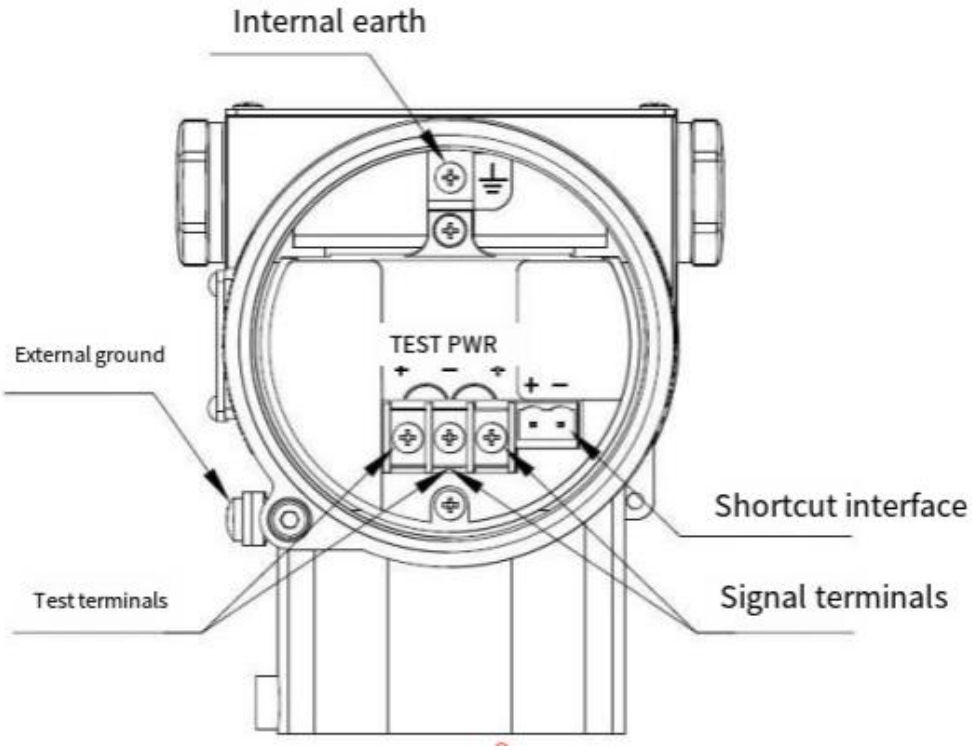
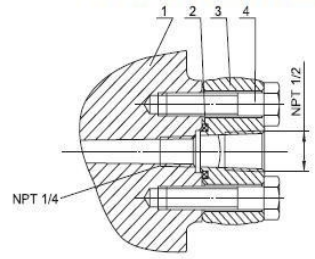
7 Electrical connection diagram



8 Description of the process connection of the low-pressure end

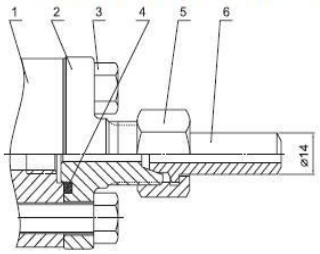
过程法兰接头

1/2-NPT不锈钢椭圆形法兰(代码1)



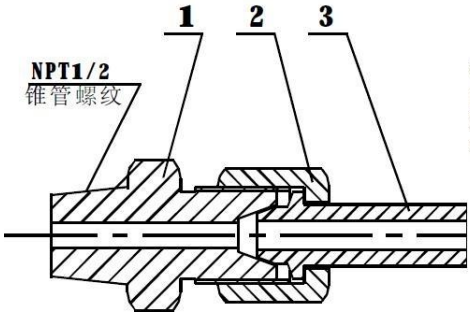
1. 压力腔法兰
2. O 型密封圈
3. NPT 1/2椭圆形连法兰
4. 螺栓

M20x1.5不锈钢丁字形接头（代码2）



1. 压力腔法兰
2. M20 × 1.5 丁字形阳螺纹接头
3. 螺栓
4. O 型密封圈
5. 螺母 M20 × 1.5
6. 引压管

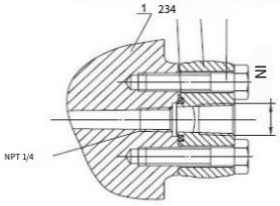
引压接头，1/2NPT-14外螺纹，配螺母及引管，304材质。(代码3)



引压接头与腰型接头搭配使用。
1. NPT1/2与球锥连接过渡接头
2. 螺母M20×1.5
3. 引压管，焊接，304材质

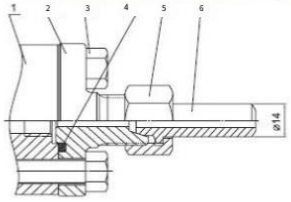
Process flange joint

1/2-NPT stainless steel oval flange (code 1)



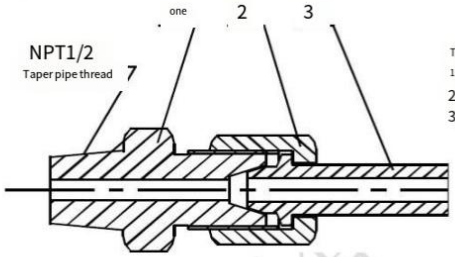
Pressure chamber flange 1
Type 2.0 seal ring
3. NPT 1/2 oval flange
Step 4: Bolts

M20x1.5 Stainless Steel T-fitting (Code 2)



1 Pressure chamber flange
2. M20 x 1.5 Tee shape Male thread joint
3. Bolts
Type 4.0 seal ring
5, nut M20 x 1.5
6. Pressure tube

Pressure coupling,1/2NPT-14 external thread, with nut and lead pipe, 304 material. 20179-001 (Code 3)



The pressure inducer joint is used with the waist joint.
1.NPT1/2 connect the transition joint to the ball and cone
2. Nut M20 x 1.5
3. Pressure tube, welded, 304 material

9 Model and specification code table [1]

Fluid sealing device

LT-	Single flange, no capillary plus pressure ○ + side			
	procedure linkage	nominal diameter	Sealed face form	Membrane / sealing surface material
	A	DN50DIN2501	Type E, and DN2526	Stainless steel, 316L
	B	DN50DIN2501	Type E, and DN2526	hastelloy C
	C	DN50DIN2501	Type E, and DN2526	Ta
	H	DN80DIN2501	Type E, and DN2526	Stainless steel, 316L
	I	DN80DIN2501	Type E, and DN2526	hastelloy C
	G	DN80DIN2501	Type E, and DN2526	Ta
	D	DN2″ ANSI B 16.5	The RF type of ANSI B 16.5	Stainless steel, 316L
	E	DN2″ ANSI B 16.5	The RF type of ANSI B 16.5	hastelloy C
	F	DN2″ ANSI B 16.5	The RF type of ANSI B 16.5	Ta
	K	DN3″ ANSI B 16.5	The RF type of ANSI B 16.5	Stainless steel, 316L
	L	DN3″ ANSI B 16.5	The RF type of ANSI B 16.5	hastelloy C
	M	DN3″ ANSI B 16.5	The RF type of ANSI B 16.5	Ta
	N	DN4″ ANSI B 16.5	The RF type of ANSI B 16.5	Stainless steel, 316L
	O	DN4″ ANSI B 16.5	The RF type of ANSI B 16.5	hastelloy C
	P	DN4″ ANSI B 16.5	The RF type of ANSI B 16.5	Ta

	rated pressure	pressure rating	Flange pressure standard
	1	PN 1.6MPa/4MPa	DIN2501
	2	PN 6.4MPa	DIN2501
	3	PN 10MPa	DIN2501
	6	150psi	ANSI B 16.5
	7	300psi	ANSI B 16.5
	8	600psi	ANSI B 16.5 (excluding DN4 ″ ANSI B 16.5)

		code	type of attachment	
		F	Flat type	
		H	Insert-type, stainless steel 316L	Inset length of 50mm
		I	Insert-type, stainless steel 316L	Insertion length of 100mm
		G	Insert-type, stainless steel 316L	Inset length of 150mm
		L	Insert, Haret C	Inset length of 50mm
		M	Insert, Haret C	Insertion length of 100mm
		N	Insert, Haret C	Inset length of 150mm

			code	Filler	
			S	silicone oil	-30℃～200℃
			V	Vegetable oil ranged from 0℃ to 250℃	

				code	Connect the liquid flange membrane box face form
				N	not have
				1	316L coated FEP (fluorinated ethylene propylene

				copolymer) (temperature 180℃)
				2 316L coated with PFA (overfluoroalkyl) (temperature 260℃)
				3 PTFE membrane (PFE) [2] (temperature 200℃)

Note 1: In the selection of a single flange seal device, the selection of the SM39PWB-CY differential pressure transmitter shall be completed first;

Note 2: diaphragm PTFE, membrane, or F4 diaphragm, can be used for negative pressure measurement, but only for flat single flange.

Note 3: For differential pressure transmitter options, refer to the SM39PWB-CY series transmitter option table;

Note 4: The minimum range of the liquid level transmitter shall be the larger value of the minimum range in Table 1 and Table 2. The adjusted range shall not be less than the minimum range. In order to achieve the optimal performance of the differential pressure transmitter, the range ratio <10 ：1 should be selected.

Note 5: When the measured pressure or working static pressure is <50 kPa (absolute pressure), special remarks should be made, and special treatment is required during manufacturing to ensure performance.