SM39PWB-SFLYC double flange remote transmission diaphragm pressure transmitter

1 Apply

The membrane box of the double flange remote diaphragm pressure transmitter is used in the pressure sensor assembly to prevent the medium in the pipeline from directly entering the transmitter. The filling liquid such as silicon oil is used between it and the transmitter.

The SM39PWB-SFLYC double flange remote diaphragm pressure transmitter is used to measure the liquid level, density and pressure of liquid, gas or steam, and then convert it into 4 mA to 20 mADC HART current signal output. It can also communicate with HART handheld terminals for parameter setting, process monitoring, etc.

The measurement range of SM39PWB-SFLYC double flange remote diaphragm pressure transmitter (without migration) is 0-1 kPa ~ 2 MPa, and the rated pressure of remote flange is 1.6/4MPa, 6.4MPa 10MPa, 150 psi, 300 psi or 600 psi respectively.

2 operational principle

The SM39PWB-SFLYC double flange remote diaphragm pressure transmitter is composed of SM39PWB-CY series differential pressure transmitter and welded mounted capillary remote transmission flange. Its working principle is the same as that of CY series differential pressure transmitter (technical specifications of CY series differential pressure transmitter), but the pressure transmission path is slightly different: the pressure acting on the side of the remote flange, first through the diaphragm and filling liquid on the remote flange, then through the capillary, and finally to the corresponding positive and negative side of the measuring sensor.

3 Input

Measurement parameters: differential pressure and liquid level measurement range

Lower limit: -100% URL (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	Far pass flange rated pressure
C	4kPa	40kPa	
D	25kPa	250kPa	
E	200kPa	2MPa	

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

Flange liquid level	nominal diameter	minimum range	
		Single remote transmission	Bilateral distant transmission
Flat type	DN50/2″	10kPa	10kPa
	DN80/3″	6kPa	1kPa
	DN4″	6kPa	1kPa
plug-in	DN50/2″	16kPa	16kPa
	DN80/3″	6kPa	1kPa
	DN4″	6kPa	1kPa

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

Output output signal

Second-line system, 4 mA ~ 20 mADC HART output, digital communication, HART protocol loaded on 4 mA ~ 20 mADC signal. Output signal limit: I mi n = 3.9 mA and Imax = 2 0 .5 mA

4 response time

The damping constant of the amplifier component is 0.1s; the time constant of the sensor and remote flange is 0.2s~6s, depending on the range of the sensor, the length of the capillary, and the viscosity of the filling fluid. The additional adjustable time constant is: 0.1s~60s.

5 general conditions

5.1 Installation conditions

The transmitter body can be directly fixed in any position. The best state is to make the process flange axis in the vertical state, 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. The remote transmission flange is connected to the supporting flange conforming to ANSI / DIN standard, which shall be equipped with soft gasket and fixed bolts and nuts (optional mounting bolts and nuts). For bilateral flanges, capillary parts and remote flanges shall only be installed in the same ambient temperature. The minimum bending radius of the capillary is 75mm, and winding is strictly prohibited!

5.2 ambient condition

ambient temperature

Minimum: depending on the filling fluid

The highest: 85℃

-20℃ ~65℃ with liquid crystal display

and fluorine rubber sealing ring

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

relative humidity: 0%～100%

shock resistance Acceleration: 50g

Duration: 11ms

Anti-vibration From 2g to 500Hz

Electromagnetic compatibility (EMC)

See Table 4 on the next page

5.3 Limit-temperature limit of the process medium

Temperature of the medium: -30℃ ~400℃

Table 3 Fill fluid, working temperature and minimum working static pressure relationship table

Filler	silicone oil (S)	High temperature silicone oil (H)	Ultra-high temperature silicone oil (U)	plant oil (V)
Density (25℃)	960kg/m³	980kg/m³	1020kg/m³	937kg/m³
operating temperature range	-30℃～200℃	-10℃～350℃	-10℃～400℃	0℃～250℃
temperature	Working static pressure range (kPa			

	pressure)			
20℃	＞10	＞10	＞10	＞25
100℃	＞25	＞25	＞25	＞50
150℃	＞50	＞50	＞50	＞75
200℃	＞75	＞75	＞75	＞100
250℃		＞100	＞100	＞100
350℃		＞100	＞100	
400℃			＞100	

Note: beyond the above working temperature and static pressure relationship range, the requirements can be met by special design. Transmitter body pressure limit

From 3.5kPa absolute pressure to rated pressure, the protection pressure can be 1.5 times the rated pressure and added to both sides of the transmitter. Far pass flange rated pressure

ANSI standard: 150 psi to 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 rated pressure of the remote transmission flange, which may be a modifiable zero drift.

weight

The single remote transmission is 50 / 2 ″ DN about 7~10kg, DN 80 / 3 ″ about 8~11kg, and DN 4 ″ about 9~12kg;

The bilateral remote transmission is DN 50 / 2 ″ about 10~16.5kg, DN 80 / 3 ″ about 12~18kg, and DN 4 ″ about 14~21kg.

5.4 Powe

r supply and

load condition

power supply

voltage is 24V

R (Us-12 V) / I ma x

kΩ of which I ma x

= 2 3 mA

Maximum power supply voltage: 42VDC

Minimum power supply voltage: 12VDC, 15VDC

(backlit liquid crystal display) digital

communication load range: 250 Ω ~600 Ω

material quality

Measurement membrane box: stainless steel 316L

Membrane: stainless steel 316L, Hab

C, tantalum process flange:

stainless steel 304

Filling liquid: silicone oil, high temperature silicone oil, ultra-high temperature silicone oil, vegetable oil

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

polytetrafluoroethylene (PT F E) transmitter shell: aluminum

alloy material, exterior spray epoxy resin

Housing sealing ring:

nitrile rubber (NBR)

Nameplate:, stainless steel

304

Electrical connection

M20 X 1. 5 Cable seal buckle, wiring terminal is suitable

for 0.5 m m 2~ 2.5 m m 2 wire.procedure linkage

1 / 4 NPT internal thread on the low pressure side of the transmitter.

The level flange on the high pressure side of the transmitter meets ANSI or DIN

standards. Can be installed directly, according to the overall size. Housing

protection level: IP67

Table 4 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

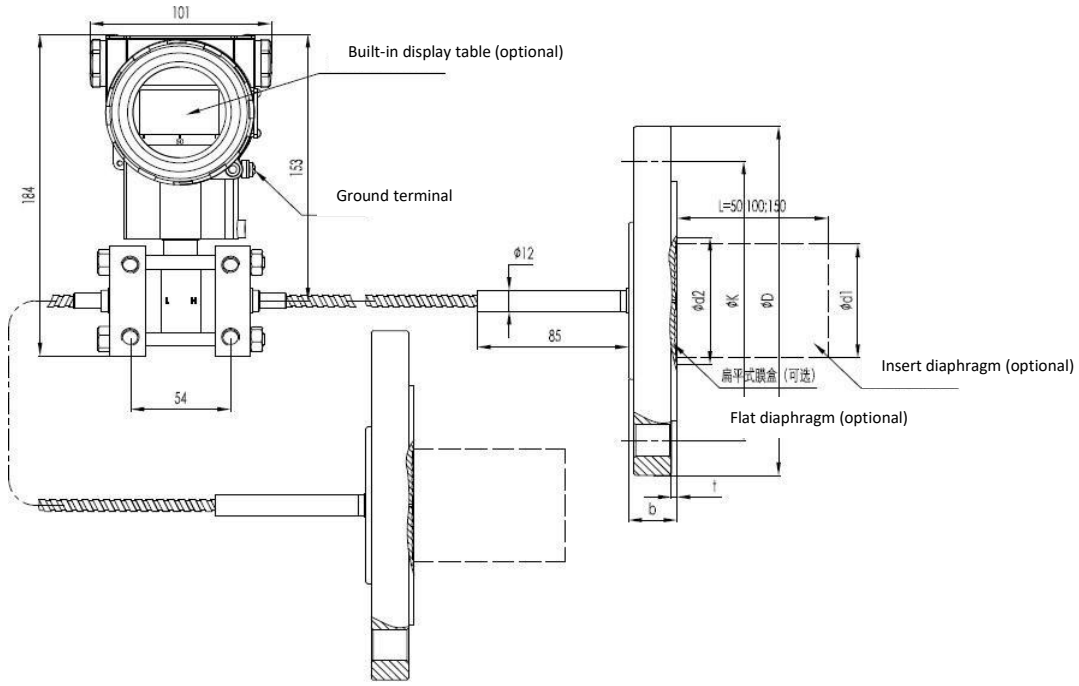
2	conducted interference (DC power supply port)	GB / T 9254-2008 Table 1	0.15MHz～30MHz	qualified
3	Electrostatic discharge (ESD) immunity	GB/T 17626.2-2006	4kV (contact point) 8kV (air)	B
4	RF electromagnetic field immunity	GB/T 17626.3-2006	10V/m (80MHz ～ 1GHz)	A
5	Power-frequency magnetic field immunity	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.

6 outline dimension

unit (mm)



1 Figure of basic bilateral differential pressure far transmission seal device

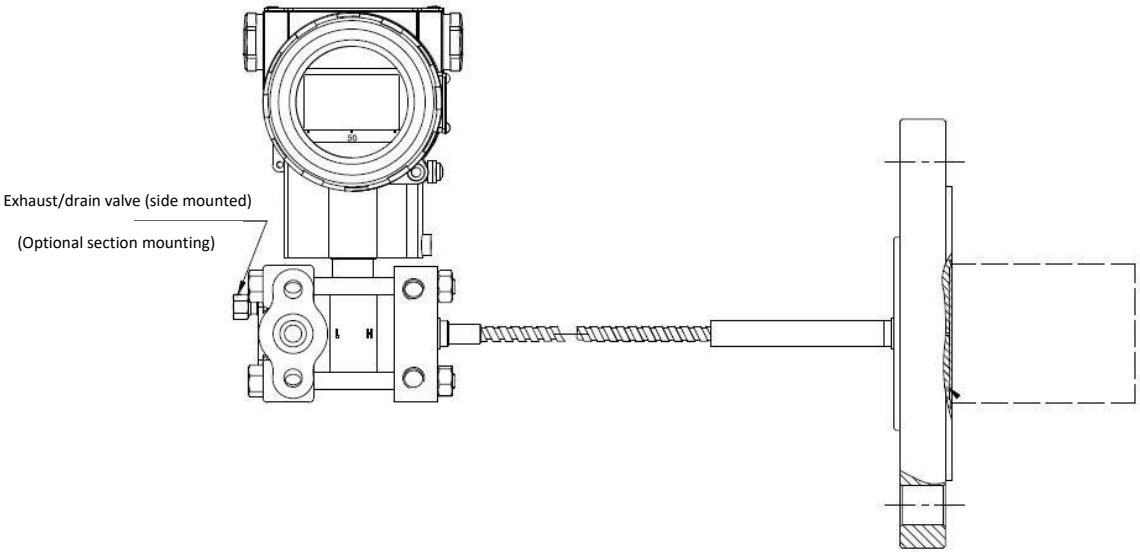


Figure 2 Figure of basic unilateral differential pressure far transmission seal device

Note 1: The unilateral basic differential pressure far transmission seal device can be installed on the high pressure side of the

transmitter body or on the low pressure side of the transmitter;

Note 2: The installation mode of the transmitter body for the unilateral or bilateral basic differential pressure remote transmission sealing device is the same as the SM39PWB-CY series differential pressure transmitter.

Table 5 Table of remote transmission flange structure dimensions

nominal diameter	rated pressure	ΦD	ΦK	Φ d1, inser t set	Φ d2, Flat Eq	Φd3	t	b	Requires the bolt	
									count measur e	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: Users can choose the mounting bolts and nuts.

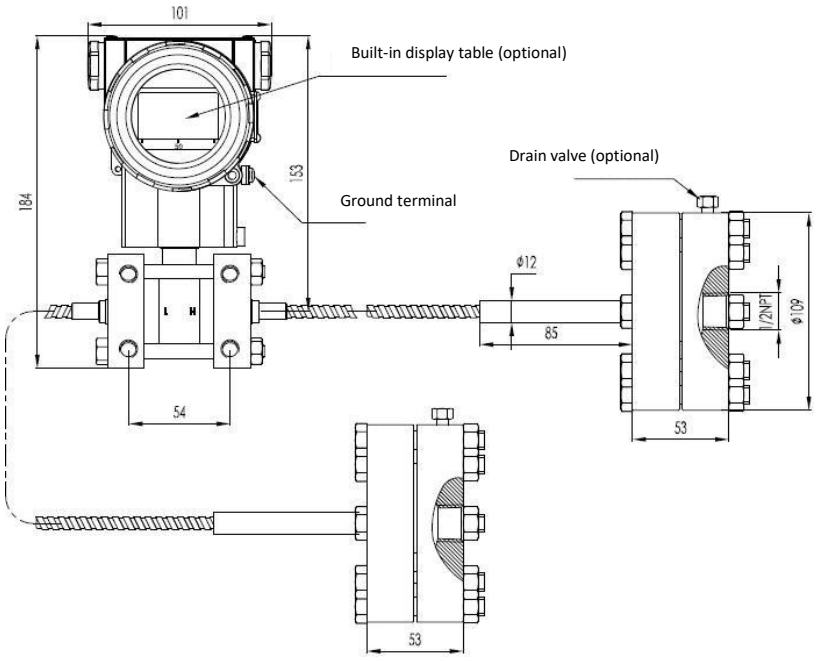


Fig. 3 Diagram of bilateral thread mounting differential pressure remote transmission seal device

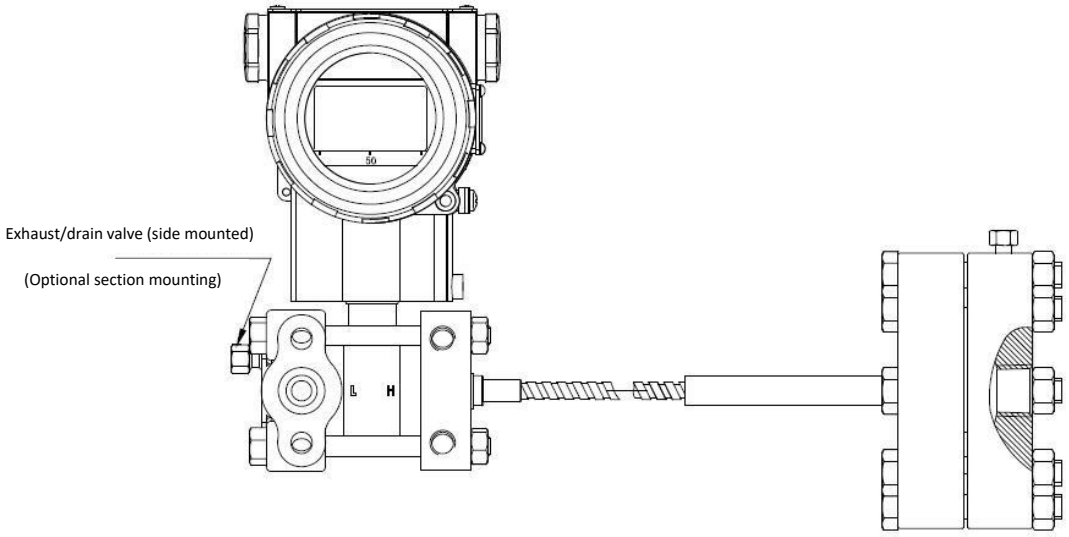
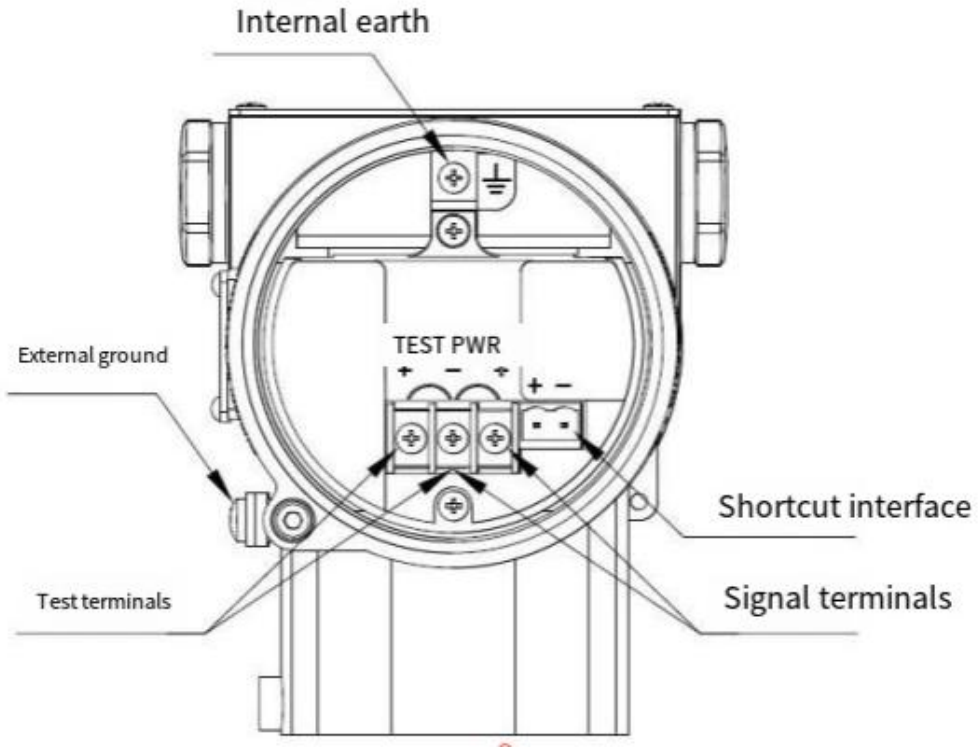


Figure 4 Unilateral thread-mounted differential pressure remote transmission seal device

Note: The single thread-mounted differential pressure seal device can be installed on the high pressure side of the transmitter body or the low pressure side of the transmitter; the transmitter body of the single-sided thread-mounted differential pressure seal device is the SM39PWB-CY series differential pressure transmitter.



7 Electrical connection

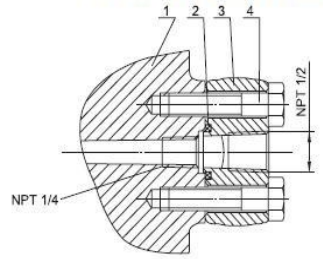
Figure 5. Electrical connection diagram

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

8 Description of process connection of single remote / remote flange end

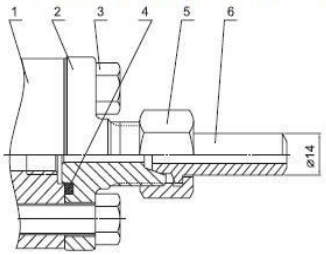
过程法兰接头

1/2-NPT不锈钢椭圆形法兰(代码1)



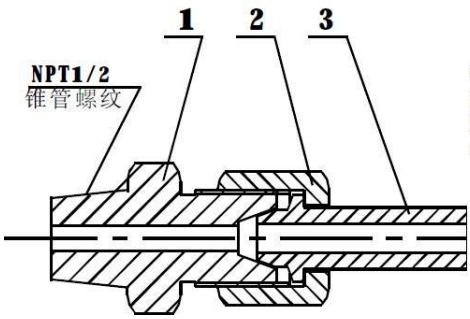
1. 压力腔法兰
2. O 型密封圈
3. NPT 1/2 椭圆形连法兰
4. 螺栓

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

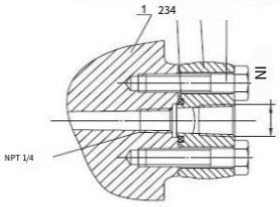
引压接头，1/2NPT-14外螺纹，配螺母及引管，304材质。(代码3)



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

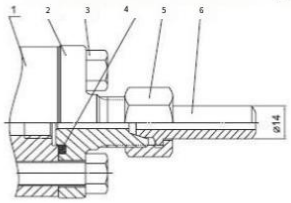
Process flange joint

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



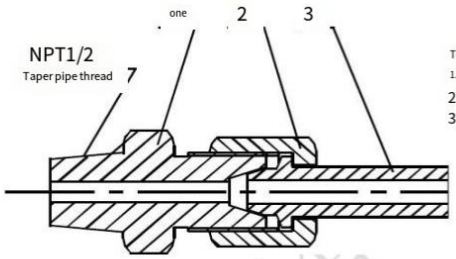
Pressure chamber flange 1
Type 2.0 seal ring
3. NPT 1/2 oval flange
Step 4: Bolts

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 Basic differential pressure transmitter remote transmission sealing device selection [1]

R

H

-

With the capillary ○ + side RL- With the capillary ○ -side

procedure linkage

nominal diameter

Sealed face form Membrane

/ sealing face material A

DN50DIN2501 Type E,

and DN2526 Stainless steel, 316L

B DN50DIN2501

Type E, and DN2526

hastelloy CC

DN50DIN2501

Type E, and DN2526 Ta

H DN80DIN2501 Type

E, and DN2526

Stainless steel with a

316L I DN80DIN2501 Type

E, and DN2526

hastelloy CG

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 CF

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, a 316

LL DN3″ ANSI B 16.5 The

RF type of ANSI B 16.5

hastelloy CM

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 CP

DN4″ ANSI B 16.5 The

RF type of ANSI B 16.5 Ta

rated pressure	pressure rating	Flange pressure standard
	1	PN1.0MPa/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 B16.5

(excluding DN4 ″ ANSI B16.5) 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 is 150mm
L	Insert, Haret C Inset length of 50mm
M	Insert, Haret C Insertion length of 100mm
N	Insert, Haret C Insert a length of 150mm code

Filler

S silicone oil-30℃ ~200℃

H

Hig

h-t

emp

era

tur

e

sil

ico

ne

oil

-10

℃

~35

0 ℃

U

ult

ra-

hig

h-t

emp

era

tur

e

sil

ico

ne

oil

-10

℃

~40

0 ℃

V

veg

eta

ble

oil

0 ℃

~25

0℃

Code of the capillary length

1 1m

2 2m

3 3m

4 4m

5 5m

6 6m

8 8m

A 10m

S Special length

c

o

d

e

Capillary part properties N not have

P With a PVC protective layer of the capillary tube

c

o

d

e

Connect the liquid flange membrane box face form

1 316 L coated FEP (fluorinated ethylene propylene copolymer) (temperature 18 0℃)

2 316L coated with PFA (overfluoroalkyl) (temperature 260℃)

PTFE membrane (PFE) [2] (temperature 200℃)