SM39PWB-DFLYC single flange remote transmission diaphragm pressure transmitter

1 Apply

The membrane box of the remote transmission transmitter is a pressure sensor assembly used to prevent the medium in the pipeline from directly entering the transmitter, and the filling liquid such as silicone oil is used to transfer the pressure between the transmitter and the transmitter.

The SM39PWB-DFLYC series surface pressure / absolute pressure far transmission transmitter is used to measure the liquid level, density, 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-DFLYC series (without migration) is 0-6 kPa ~ 25 MPa, and the rated pressure of remote flange is 1. 6 / 4M P a, 6. 4 MPa 10MPa, 150 psi, 300 psi or 600 psi, respectively.

2 Working principle and structure

SM39PWB-DFLYC series gauge pressure / voltage remote transmission transmitter structure consists of SM39PWB-DFLYC series gauge pressure / voltage transmitter and welded mounted capillary remote transmission flange. The working principle is the same as that of the SM39PWB-DFLYC series pressure / pressure transmitter, but the pressure transfer path is slightly different: the pressure acting on the side of the remote flange, first through the diaphragm and filling fluid on the remote flange, then through the capillary, and finally to the measuring end of the measuring sensor.

2. Input

Measurement parameters:

surface pressure, absolute

pressure, liquid level

measurement range

Mege pressure remote transmitter:

Lower limit: -100% URL

(continuously adjustable)

Upper limit: to + 100% URL

(continuously adjustable)

Pressure remote transmitter:

Lower limit: from 0% ~ 100% URL

(continuously adjustable)

Upper limit: to + 100% URL

(continuously adjustable)

Table 1 Compartable of relationship between range code and range

Quota code	minimum range	metre fullscale	Rated pressure (max.)
C	6kPa	40kPa	Rated pressure of a single flange
D	25kPa	250kPa	
F	30kPa	3MPa	
G	1MPa	10MPa	
H	2.1MPa	21MPa	
I	4MPa	40MPa	
L	6kPa absolute pressure	40kPa absolute pressure	
M	25kPa absolute pressure	250kPa absolute pressure	
0	At 30kPa of absolute pressure	3MPa absolute pressure	

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

flange	nominal diameter	Minimum / maximum range	Longest capillary length
Flat type	DN25/1″	160kPa/25MPa	10m
	DN50/2″	10kPa/10MPa	12m
	DN80/3″	6kPa/10MPa	16m
	DN4″	6kPa/3MPa	16m
plug-in	DN50/2″	16kPa/10MPa	10m
	DN80/3″	6kPa/10MPa	16m
	DN4″	6kPa/25MPa	16m
Threaded installation Terrestrial transmission	external diameter 109mm	160kPa/25MPa	10m

Note: The minimum range of the surface pressure / remote 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 gauge / pressure remote transmitter shall be the minimum value of the maximum

range and the rated pressure of the remote flange.

3 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

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 surface pressure / absolute pressure remote transmission transmitter without capillary can be installed directly through the remote transmission flange, 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.

The pressure / remote flange is connected to supporting flanges conforming to ANSI / DIN standard, which shall be provided with soft gasers and mounting bolts and nuts (optional mounting bolts and nuts).

For the surface pressure / absolute pressure remote transmitter with capillary, if the remote seal device is lower than the transmitter body, the maximum height drop between the remote seal device and the transmitter body should be <5m.

When the working pressure is below 100kPa absolute pressure, the transmitter body must be below the remote transmission seal. 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, maximum:

85℃

-20℃ ~65℃ with liquid crystal display and fluorine rubber sealing ring

Minimum: Depending on the filling fluid, maximum:

85℃

Relative humidity: 0%~100% impact resistance

Acceleration: 50g

Duration: 11ms

for vibration resistance

2g to 500Hz

electromagnetic compatibility (EMC)

See Table 4 on the next page

5.3 Process medium limit temperature Limit

medium temperature: -30℃ ~400℃

Table 3 Table of filling fluid, working temperature and minimum working pressure

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 pressure relationship range, the requirements can be met by special design. Transmitter body pressure limit: Vacuum to maximum pressure remote flange rated pressure:

ANSI standard: 150 psi ~ 600 psi

DIN Standard: PN1.6MPa~PN 10MPa

weight:

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

Explosion proof performance:

NEPSI Isolation permit: Ex d

ⅡC T6 NEPSI License: Ex ia

ⅡC T4 allowed temperature:

-40℃ ~65℃

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

Filler liquid: silicone oil, high temperature

silicone oil, ultra-high temperature silicone

oil, vegetable oil transmitter shell:

aluminum alloy material, exterior spraying

epoxy resin

Housing 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:

Remote pass flanges meet ANSI standards or DIN standards. Can be

installed directly, refer to the dimension table. Level of enclosure

protection:

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

(2) B performance level description: during the test, the function or performance is temporarily reduced or lost, but it can be restored by itself, and the actual operation status, storage and data do not change.

6 outline dimension

Unit is mm

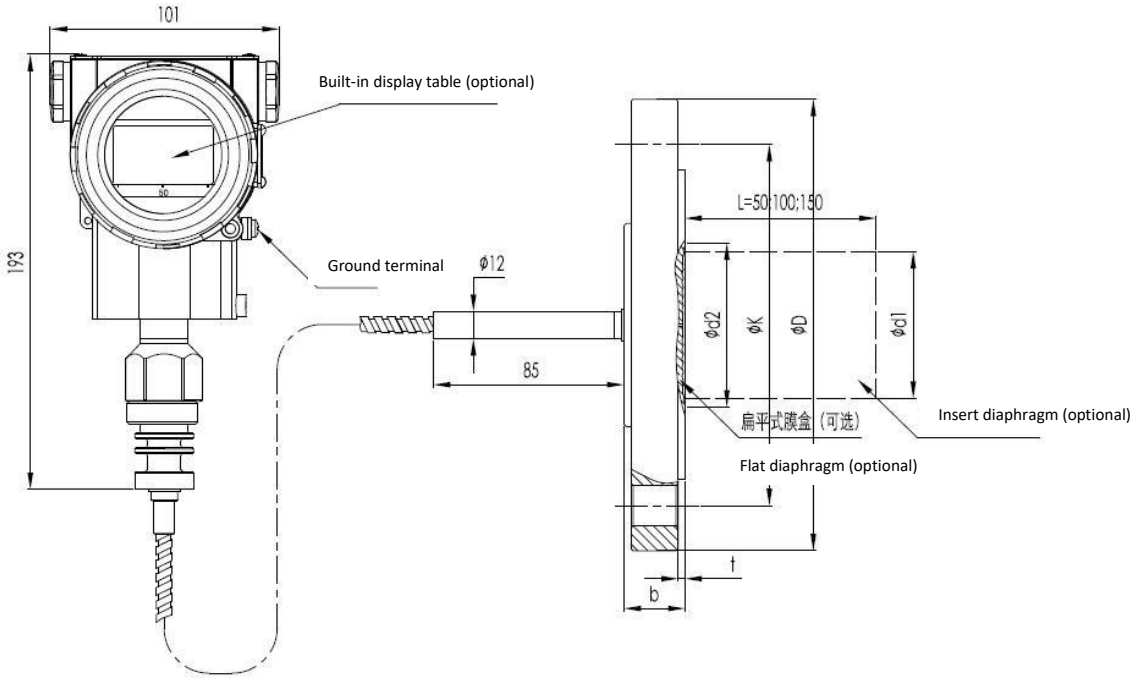


Figure 1 Drawing of basic type remote transmission sealing device (RS type)

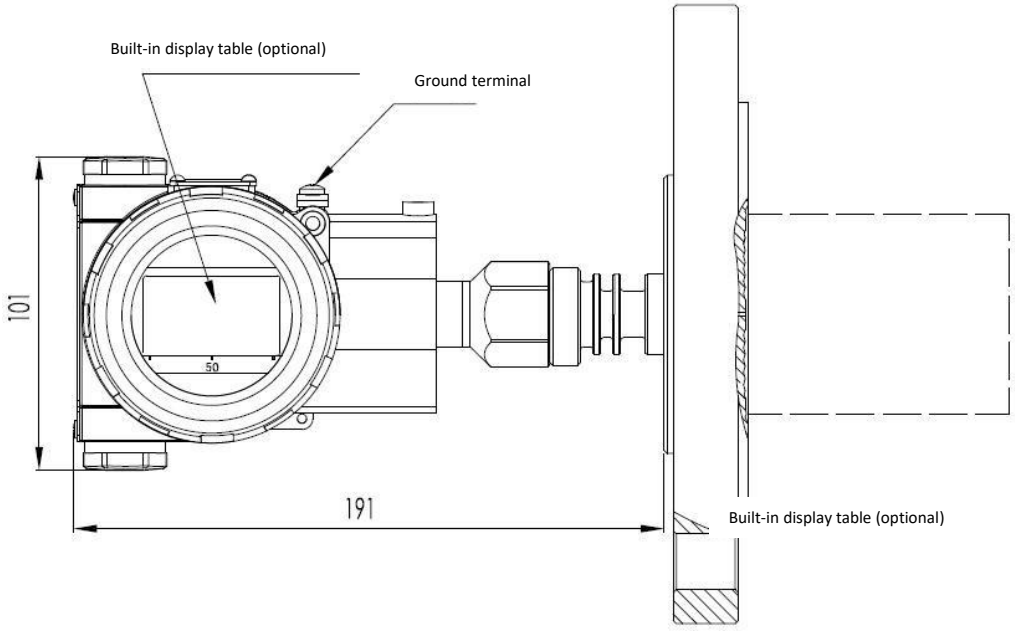


Figure 2 Direct installation pattern of basic remote transmission sealing device (RN)

nominal diameter							t	b	Requires the bolt	
									quantity	screw thread
DN50 (Seal surface DIN2526E (Flange, DIN2501)							3+0.5 3+0.5 3+0.5	20 26 28	4 4 4	M16 M20 M20
DN80 (Seal surface DIN2526E (Flange, DIN2501)							3+0.5 3+0.5 3+0.5	24 28 32	8 8 8	M16 M20 M24
DN 2″ (ANSI B 16.5 RF type							3+0.5 3+0.5 6.35	17.4 20.6 31.7 5	4 8 8	M1 8 M1 8 M1 8
DN 3″ (ANSI B 16.5 RF type							3+0.5 3+0.5 6.35	22.2 27.0 38.0 5	4 8 8	M1 6 M2 0 M2 0
DN 4″ (ANSI B 16.5 RF type							3+0.5 3+0.5	30 32	8 8	M18 M18

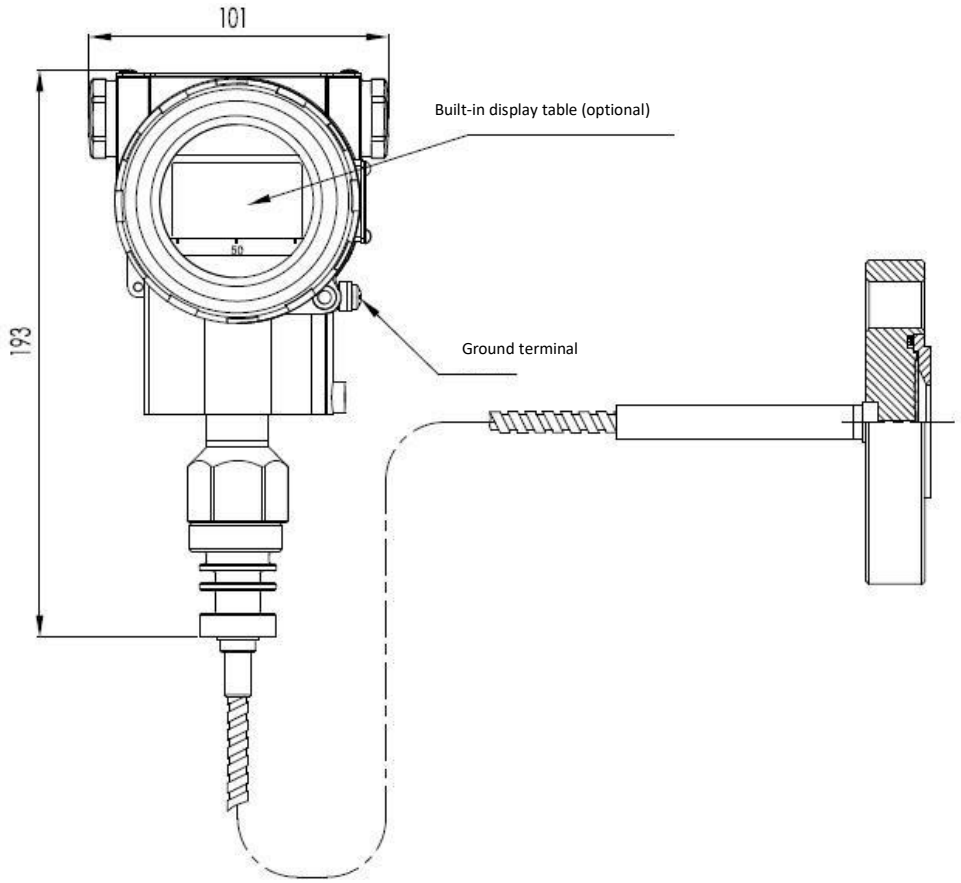


Figure 3 Drawing of remote transmission sealing device with internal diaphragm (US type)

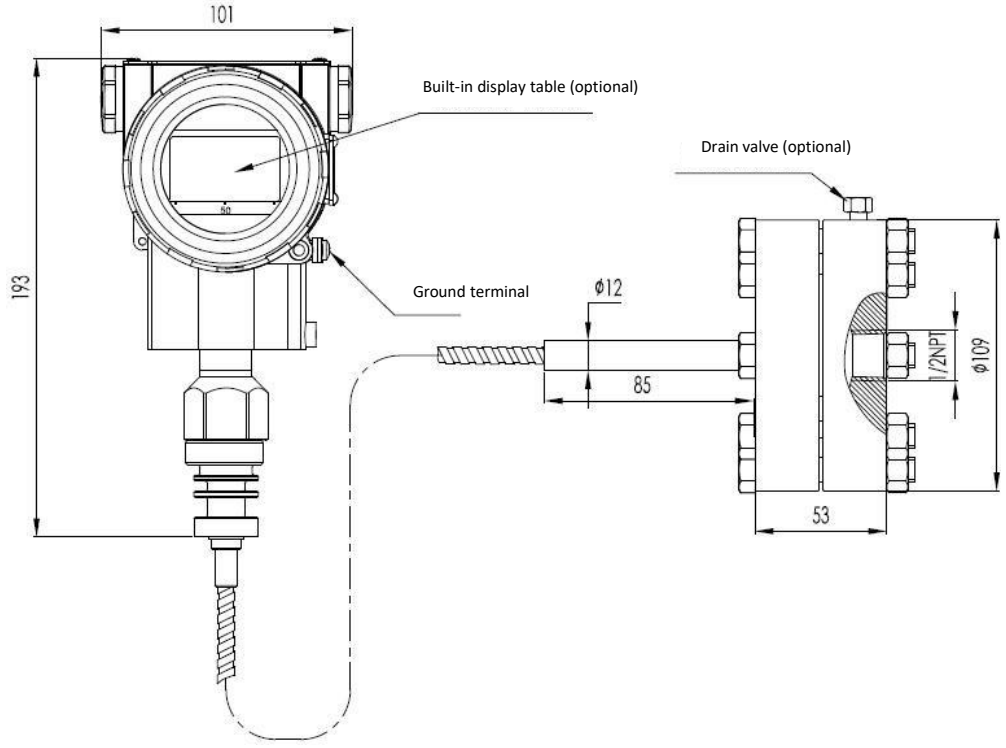


Fig. 4 Direct Installation Drawing of remote transmission device with internal diaphragm (UN)

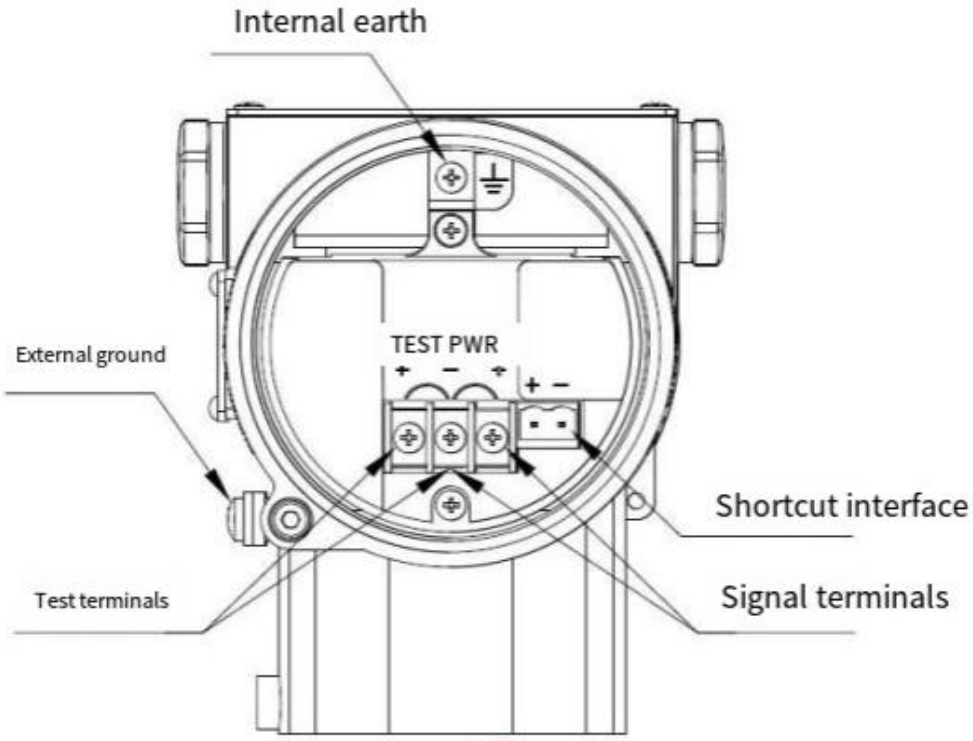
Table 6 Structural dimensions of remote transmission seal device with internal diaphragm conforming to DIN 2501 standard

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 Structural dimensions of remote transmission seal device with internal diaphragm conforming to ANSI B 16.5 standard

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

7 Electrical connection



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

Figure 6. Electrical connection diagram

8 Basic selection of flange

RN- Direct mounted, no capillary

Basic pressure / pressure remote sealing device

RS- With a capillary

procedure linkage form	nominal diameter	Sealed face 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, 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 of 150mm
L Insert, Haret C Inset length of 50mm
M Insert, Haret C Insertion length of 100mm
N Insert, Haret CInsert a length of 150mm code Filler
S silicone oil-30℃ ~200℃
H High-temperature silicone oil-10 ℃ ~350 ℃ U ultra-high-temperature silicone oil-10 ℃ ~400 ℃ V vegetable oil 0℃ ~250℃
Code of the capillary length
1 1m
2 2m
3 3m
4 4m
5 5m
6 6m
8 8m
A 10m
S Special length
code Capillary part properties N
not have
P With a PVC protective layer of the capillary tube
code Connect the liquid flange membrane box face form N not have
1 316 L coated FEP (fluorinated ethylene propylene copolymer) (temperature 18 0℃)
2 316L coated with PFA (overfluoroalkyl) (temperature 260℃)
3 PTFE film (flat only)

Selection of pressure / pressure sealing device with internal diaphragm

Remote transmission seal device with internal diaphragm			
UN-	Direct mounted, capillary		
US-	With a capillary		
procedure linkage	nominal diameter	Sealed face form	rated pressure
A	DN25 DIN 2501	Type D, and DN2526	PN 1MPa/4MPa
B	DN25 DIN 2501	Type D, and DN2526	PN 6.3MPa/10MPa
C	DN25 DIN 2501	Type D, and DN2526	PN 16MPa
D	DN25 DIN2501	Type E, and DN2526	PN 25MPa
E	DN1″ ANSI B 16.5	The RF type of ANSI B 16.5	150psi
F	DN1″ ANSI B 16.5	The RF type of ANSI B 16.5	300psi
G	DN1″ ANSI B 16.5	The RF type of ANSI B 16.5	600psi
H	DN1″ ANSI B 16.5	The RF type of ANSI B 16.5	1500psi

code	Filler
S	silicone oil -30℃～200℃
H	High temperature silicone oil -10℃～350℃
V	Vegetable oil ranged from 0℃ to 250℃

code	Length of capillary
1	1m
2	2m
3	3m
4	4m
5	5m
6	6m
S	Special length

code	Capillary component characteristics
N	not have
P	With a PVC protective layer of the capillary tube

Selection of thread mounted pressure / remote pressure remote seal device

Threaded mounted pressure / pressure pressure seal device

TS- With a capillary

code	Membrane / sealing material
U	Stainless steel, 316L
V	hastelloy C
W	Ta

code	Rinse spare holes
1	not have
0	have

code	Filler
S	silicone oil -30℃～200℃
H	High temperature silicone oil -10℃～350℃
U	Ultra-high temperature silicone oil-10℃ ~400℃
V	Vegetable oil ranged from 0℃ to 250℃

code	Length of capillary
1	1m
2	2m
3	3m
4	4m
5	5m
6	6m
8	8m
S	Special length

code	Capillary component characteristics
N	not have
P	With a PVC protective layer of the capillary tube