

REMOTE SEAL UNIT

DATA SHEET

S2

Seal diaphragm is used to accurately measure the liquid level, density of sealed container and open container, or fluid flow in the pipe. It avoids the measuring element of transmitter directly contacted with measured medium. It's especially suitable for the measurement of high temperature medium, strong corrosive medium, high viscosity medium, easy crystallization medium and strong wear medium, etc.

Features

- Structure**
The seal diaphragm assembly can be connected to FCX-AIII series absolute pressure transmitter directly or through capillary. This connection using the full welding method, there's no gasket in the middle, fill fluid between seal diaphragm and cell is selectable according to the requirements.
- Operating principle**
The measuring pressure is transmitted to the detecting unit by seal diaphragm assembly and its internal fill fluid.
- part material**
The materials of wetted parts (seal diaphragm and gasket) are stainless steel, tantalum, Hastelloy-C, Inconel, titanium, zirconium, nickel, etc. Materials of other parts (capillary, flange, seal device body, direct mounting and connecting parts) are stainless steel. The standard fill fluid is silicone oil, users can select fluorinated oil, high temperature silicone oil, vacuum and sanitary type fill fluid according to the requirements.
- The specification of seal diaphragm assembly**
The following specifications can be selected according to the different mounting and operating conditions:
Flat flange type: DN40~DN100
Flange extension type (with extension length): 50~200mm
The adapter of flange connection, thread connection or short pipe welding meets the clamping unit of DIN, SMS or Tri standard (sanitary type flange).

Specifications

Functional specifications

Application:

Seal diaphragm assembly can be directly welded on the transmitter (for example: mounted at the bottom measuring level of the container), also can remote through capillary (for example: for measurement of high temperature medium). The seal diaphragm assembly directly welded on the transmitter can be customized according to user requirements, there are two types of straight long mounting or L short mounting.

Capillary specification:

Standard capillary length: 1.5m, 3m, 6m (customizable)
Inner diameter of capillary: 1mm (standard), the inner diameter of the vacuum, high temperature and fast response type capillary is 2mm.
Minimum bending radius of capillary: 100mm

External protective Layer of capillary: temperature range: -10~+80°C

Stainless steel protective pipe: temperature range: -40~+400°C

Temperature range:

Ambient temperature: -40~85°C

Process temperature: 40~+150°C (direct mounting type)

-40~+400°C (remote capillary type, also

depend on operating temperature range of fill fluid.)

Pressure limit:

Operating pressure: operating pressure is the operating pressure of transmitter, static pressure or rated pressure of flange of seal diaphragm assembly (the minimum of the three above)

Vacuum limit: according to the fill fluid of transmitter body, the maximum



vacuum of differential pressure and pressure transmitter is 2.7kPa abs, only the absolute pressure transmitter (FKM) can achieve absolute vacuum. When the operating pressure is less than 2.7 kPa abs, the absolute pressure transmitter should be selected.

Performance specifications

Comprehensive performance = Transmitter performance
+ performance of seal diaphragm assembly

Accuracy: (Under standard conditions)

When 1 or 2 seal diaphragms are added to the transmitter, the accuracy of transmitter will be 0.1% lower than standard.

The effect of environmental temperature:

After the transmitter is compensated by the ambient temperature, the effect of ambient temperature change on the transmitter.

Diaphragm Connection	DN50/ 2" SS diaphragm	DN80/ 3" SS diaphragm	DN80/ 3" Other diaphragm	DN100/ 4" SS diaphragm	Adapter SS diaphragm
Absolute pressure	0.203	0.011	0.022	0.004	0.011
Capillary (m)	0.15	0.008	0.02	0.003	0.008

Note: the value above is the variation of indicated value (kPa), when capillary length is 1m, capillary diameter is 1mm and the temperature changing per 10°C.

The effect of transmitter and seal diaphragm assembly after temperature compensation:

Through the additional temperature compensation function, both transmitter body and seal diaphragm assembly are compensated, it makes the zero shift caused by the ambient temperature change to be improved, and reduced by 2-5 times. (refer to 11th digit code of model code label). The capillary is made of insulation or constant temperature and heating measures, it reduces the effect to capillary caused by ambient temperature to the minimum.

Process temperature effect: (kPa/10°C)

Diaphragm Connection	DN50/ 2" SS diaphragm	DN80/ 3" SS diaphragm	DN80/ 3" Other diaphragm	DN100/ 4" SS diaphragm	Adapter SS diaphragm
FKM	0.124	0.017	0.073	0.008	0.017

Response time: (average value) (s)

Fill fluid	7th digit code	Density at 25°C	Response time 0 ~ 32kPa	Response time 0 ~ 64kPa	Response time 0 ~ 130kPa
Silicone oil	Y.G	0.934	0.15	0.08	0.037
Fluorinated oil	W.A.D	1.84	0.17	0.09	0.04
Vacuum or high temperature fill fluid	V.T	1.07	0.25	0.13	0.065

Test condition: the inner diameter of the capillary is 1mm and the length is 1mm. The temperature is 20°C, the input signal is from 0% to 100% of calibration range(it's not including the response time of transmitter body).

Fill fluid of seal diaphragm assembly:

The following values are the normal operating range of the standard fill fluid:

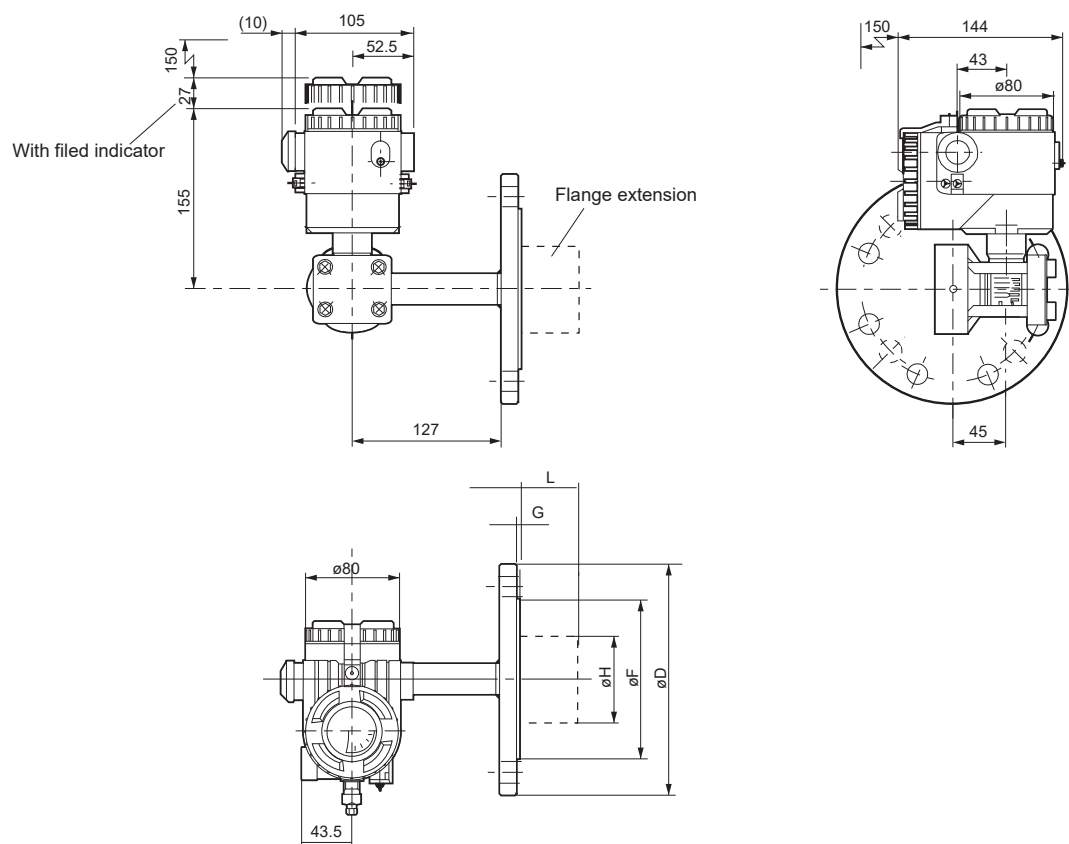
7th digit code	Fill fluid	Operating temperature range (°C)		Density (25°C)
		Absolute pressure ≥ 0.1MPa	Absolute pressure < 0.1MPa	
Y	Silicone oil	-40 ~ 180	-40 ~ 120	0.934
W	Fluorinated oil	-20 ~ 200	-20 ~ 120	1.84
F	Sanitary type fill fluid	-10 ~ 250	-10 ~ 120	0.92
V	Silicone oil		20 ~ 200	1.09
T	Silicone oil	-20 ~ 350	20 ~ 200	1.09

When there are special requirements, please contact Wuxi Kunlun Fuji Instruments Co., Ltd. (High temperature and high vacuum is also available). We also can fill other fluid according to user's requirements.

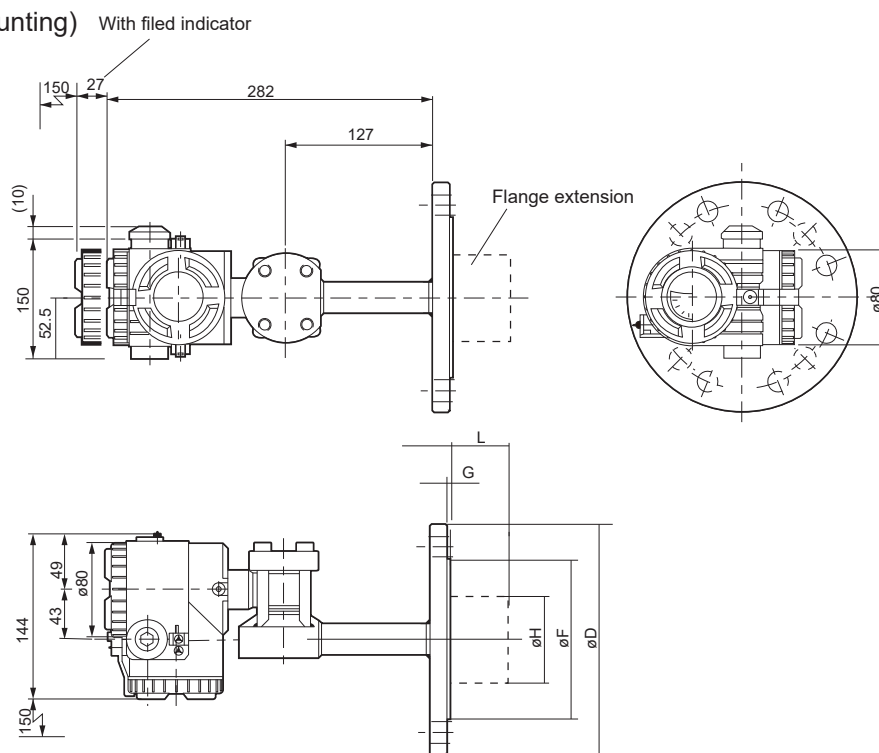
OUTLINE DIAGRAM - "S" direct mounted on pressure or absolute pressure transmitter

(Unit: mm) Please refer to data sheet for the dimensions of seal diaphragm assembly

L type mounting(short mounting)



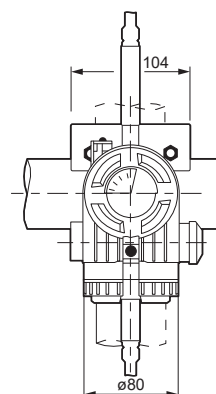
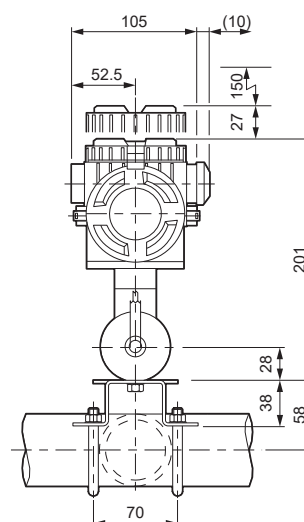
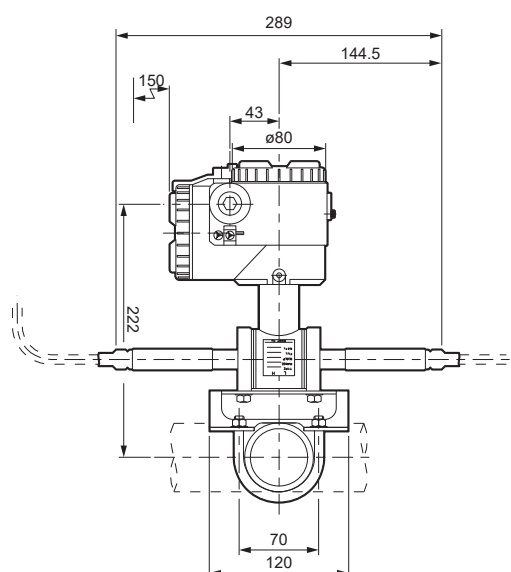
Straight type (long mounting)



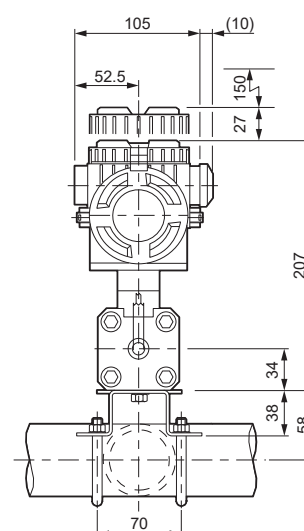
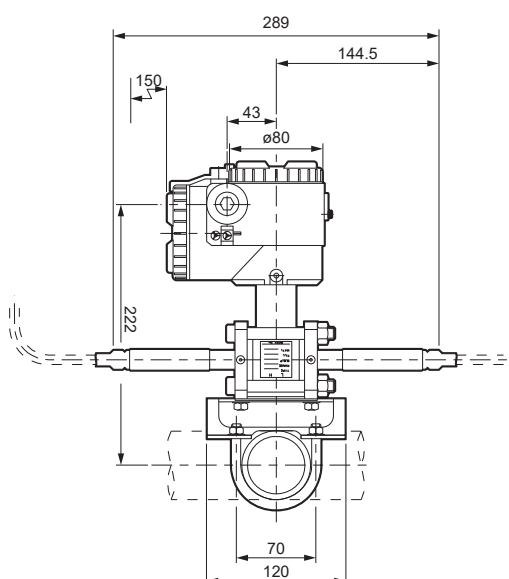
OUTLINE DIAGRAM - "S" mounted on the differential pressure transmitter with capillary

(Unit: mm) Please refer to data sheet for the dimensions of seal diaphragm assembly

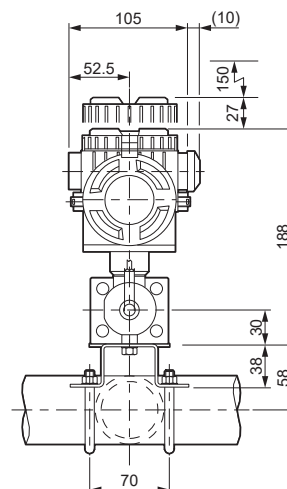
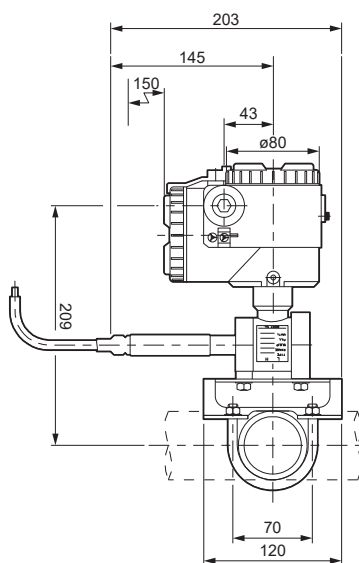
PN ≤ 5MPa: The connecting cover is directly welded on the two sides of transmitter's cell assembly



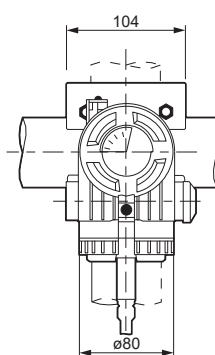
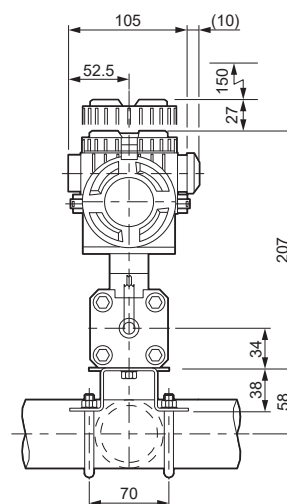
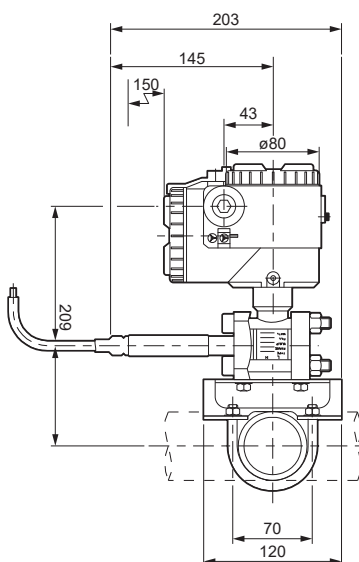
PN > 5MPa: The connecting cover is directly welded on the two sides of transmitter's cell assembly and reinforced with bolts.



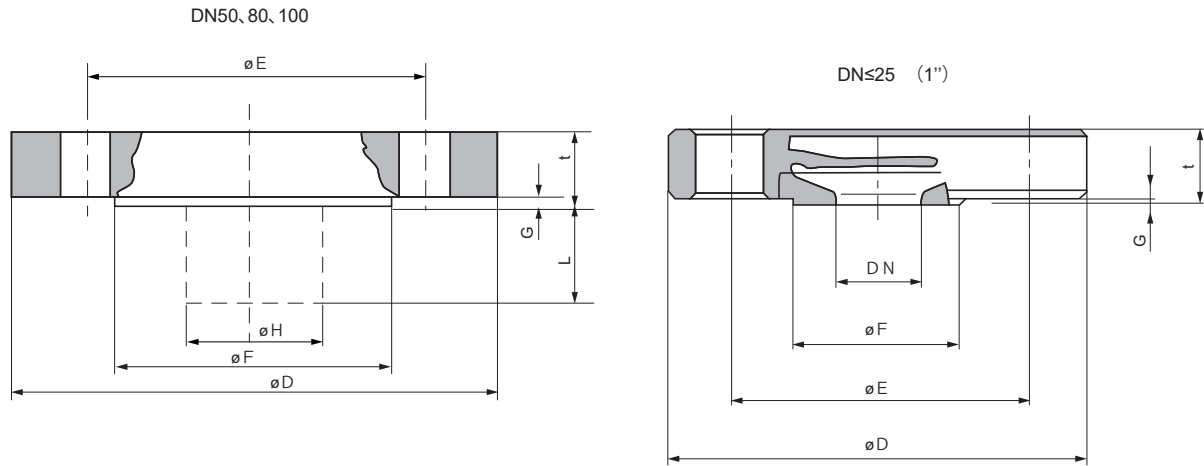
OUTLINE DIAGRAM - "S" direct mounted on pressure or absolute pressure transmitter
(Unit: mm) Please refer to data sheet for the dimensions of seal diaphragm assembly



PN > 5MPa: The connecting cover is directly welded on the two sides of transmitter's cell assembly and reinforced with bolts.



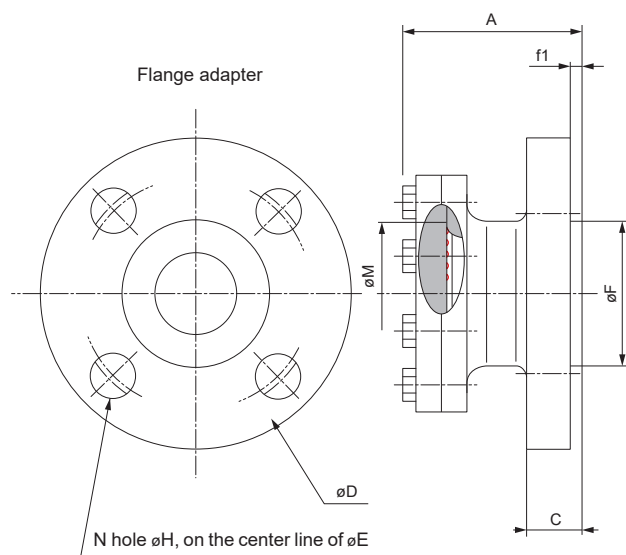
OUTLINE DIAGRAM - STANDARD SEAL DIAPHRAGM ASSEMBLY
- FLAT FLANGE AND FLANGE WITH INSERTION LENGTH (Unit : mm)



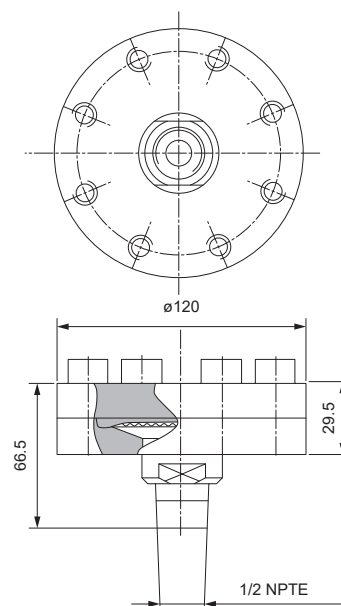
Flange dimensions (DIN 2501 ET B16.5)										
DIN/ISO		ANSI		ϕD	ϕE	ϕF	G	ϕH	t	N x ϕh
PN	DN	NP	NW							
40	15			95	65	45	2		22	4 x 14
40	20			105	75	58	2		22	4 x 14
40	25			115	85	68	2		22	4 x 14
40	50			165	125	102	3	48	20	4 x 18
40	80			200	160	138	3	73	20	8 x 18
16	100			220	180	158	3	96	20	8 x 18
20	15	150 lbs	1/2"	95	60.5	35	2		22	4 x 16
20	20	150 lbs	3/4"	100	70	43	2		22	4 x 16
20	25	150 lbs	1"	110	79.5	51	2		22	4 x 16
50	15	300 lbs	1/2"	95	66.5	35	2		22	4 x 16
50	20	300 lbs	3/4"	120	82.5	43	2		22	4 x 20
50	25	300 lbs	1"	125	89	51	2		22	4 x 20
20	50	150 lbs	2"	150	120.5	92	1.6	48	20	4 x 20
20	80	150 lbs	3"	190	152.5	127	1.6	73	24	4 x 20
20	100	150 lbs	4"	230	190.5	158	1.6	96	24	8 x 20
50	50	300 lbs	2"	165	127	92	1.6	48	22.5	8 x 20
50	80	300 lbs	3"	210	168.5	127	1.6	73	29	8 x 22
50	100	300 lbs	4"	255	200	158	1.6	96	32	8 x 22

OUTLINE DIMENSION DIAGRAM - FLANGE ADAPTER(Unit: mm)

Outline dimension diagram - flange adapter



Thread adapter



⚠ Caution on Safety

* Before using this product, be sure to read its instruction manual in advance.