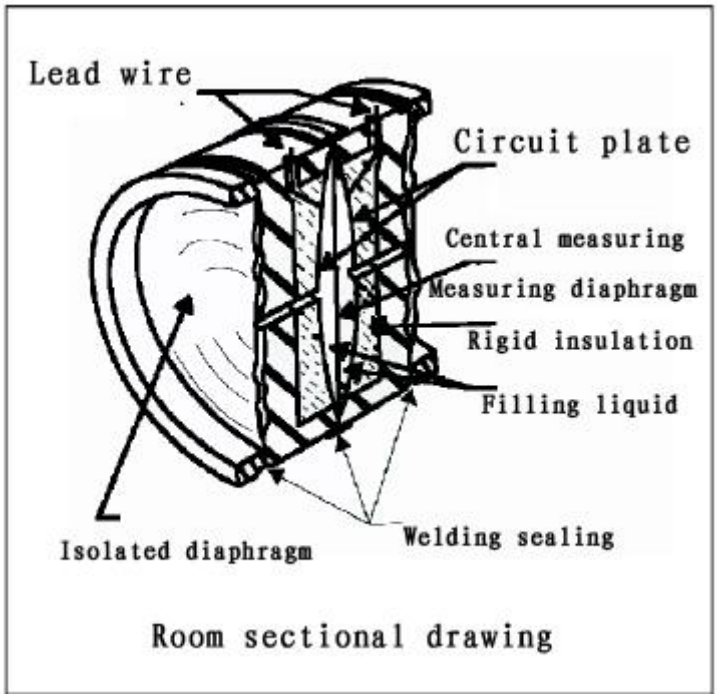
S800 series Capacitance differential pressure Transmitter

Range: 0-40MPa Optimal precision: 0.1%

1. Product features

- Dynamic three-diaphragm overload resistance structure, which could measure the lowest differential pressure under the extreme high static pressure.
- Selective Monocrystalline Silicon sensor
- Apply the Hart communication protocol, network constructing with most onsite
- 500% Positive suppression, and 600% Negative suppression
- Could be installed diversified and reasonable in the complex and serious working condition
- No mechanical mobile parts, less in maintenance and the adjustable damping.

2. Product Overview



The structure of S800 series Capacitance differential pressure Transmitter is most applied kind in the global pressure/ differential pressure measuring field, which is the perfect combination of micro mechanical working with strong communication function. And provide the

extreme high measuring precision and stability in the conditions of high static pressure and low differential pressure especially.

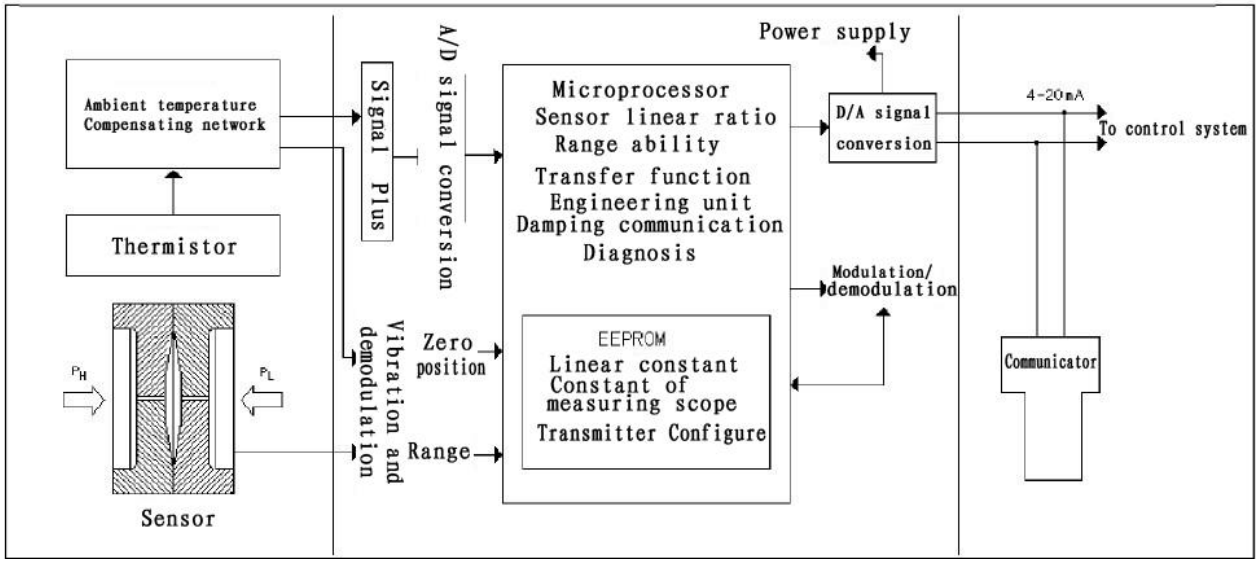
There are three series products for S800:

S800 Common pressure/ differential pressure transmitter

S800 LT pressure/ differential pressure transmitter

S800 Remote pressure/ differential pressure transmitter

3 Schematic diagram



4 • The perfect combination of the 7 dominant technologies

1) Output and communication works simultaneously

S 800 communicates with the Hart protocol, and applied the industrial standard Bell 202 Frequency-shift keying （FSK）technology. Add a high frequency signal selectively on the scope of 4-20mA output signal to reach the remote communication. This technology could avoid the damage of the integrity of the loop when output and communication is worked simultaneously.

2) Data storage (intelligent)

Configure data stored in nonvolatile EEPROM memory of the circuit board of the transmitter. The data could be stored even if the power failure of the transmitter. So the transmitter would work immediately when it is energized.

3)Circuit board module (intelligent)

The circuit board module of the transmitter is the board that applied the special integrated circuit （ASICS）and Surface package technology. The circuit board module normalized and linearized the signal when it received the digital signal and correction factor from sensing head. The outputting part of the circuit board module will converse the digital signal to an analog outputting signal, and through the special software to communicate with computer or HART manipulator.

Optional LCD header inserted to circuit board, which could display the digital output that on the

unit of pressure engineering unit or percentage of module range value. LCD head is suitable for the standard transmitter.

4) Digital/analog conversion and signal transmission （intelligent）

Process Variable is stored as digital data that could process the precision normalization and engineering unit conversion. Then the normalized digital data is conversed a analog outputting signal.

5) Configure Software function

HART protocol could let user to configure, test and detail set up the S800 Intelligence differential pressure transmitter. Or communicate through the any upper host system that supports HART communication protocol. The configure is consist of two aspects:
First, Setting up the operating parameter of the transmitter, including: zero position and range setting point, line style and square root output, selection of the damping and engineering unit;
Second, the informational date that could be stored in the transmitter, which used to identify transmitter and make the physical description of the transmitter. These data include: Station number, numeric character, descriptor, information, date, unified header installation, flange style and material, the material of drain valve/ outlet valve, O circle material and the information of the remote transmission facilities.
Except for the above mentioned configure parameters, the software of S800 Intelligence differential pressure transmitter includes many non-user amending information: the style of the transmitter, the limit of the sensor, minimal range, filling liquid, material of the isolated diaphragm，the series number of the head of the diaphragm and the version number of the transmitter software.

6）Fault continuous self-diagnosis

S800 Intelligence differential pressure transmitter could process the fault continuous self-diagnosis. If any fault occurred, transmitter actives the user optional analog outputting alarm. HART manipulator could inquire transmitter to determine the fault, and transmitter sends the special information to manipulator in order to identify the fault, and repair it quickly. If operator thinks it’s the fault of the loop, transmitter could provide the special output according to the requirements and used for testing the loop.

7) The setting could be fine-adjusted

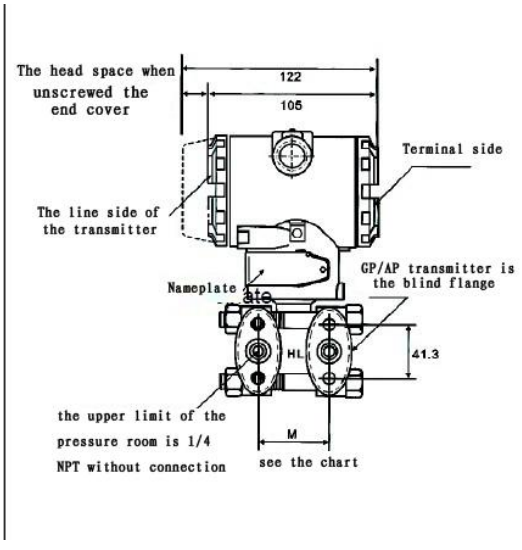
Detailed setting is used in the transmitter first setting and digital plate repairing, which allows the fine-adjustment for sensor and analog output, in order to reach the pressure standard of the factory. Additionally, characterization function could avoid user’s unexpected or intended adjust the setting point of the analog output.

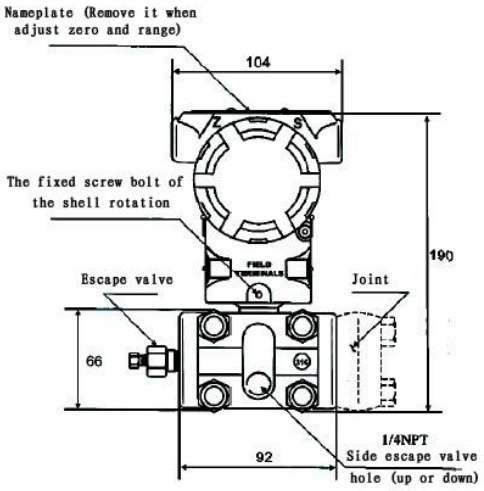
5. Technical Parameter

Items	Technical parameter
Power supply voltage	16-28VDC
Output signal	4-20mA or Hart digital output

Load resistance	RL≤50（Vs—9）The communication needs 250 Ω line loop resistance at least
Cable	Shielded Twisted Pair
Integrative precision	±0.1%FS； ±0.25%FS； ±0.5%FS
Zero point temperature drift	≤0.2%FS/℃（0～70℃）
Overload	2 times
Range ratio	15:1
Maximal static pressure	32 MPa
Explosion-proof marker	d II BT6
Media temperature	Amplifier work temperature: −29～+93℃ (LT: −25～+70℃) The measuring elements filling silicone oil: -40~+104℃(Remote transmission transmitter: fill high temperature silicone oil:+15~+31 ℃ ; fill the common silicone oil: −40～+150℃)
Ambient temperature	−20～85℃
Shock resistant	≤±0.1%F.S （From 15-2000HZ）
Filling liquid	Silicone oil
Shell	Die-casting aluminum, and epoxy coatings IP 65 on surface
Sealing ring	Fluorous rubber
Weight	5.5KG

6. Dimensioned drawing

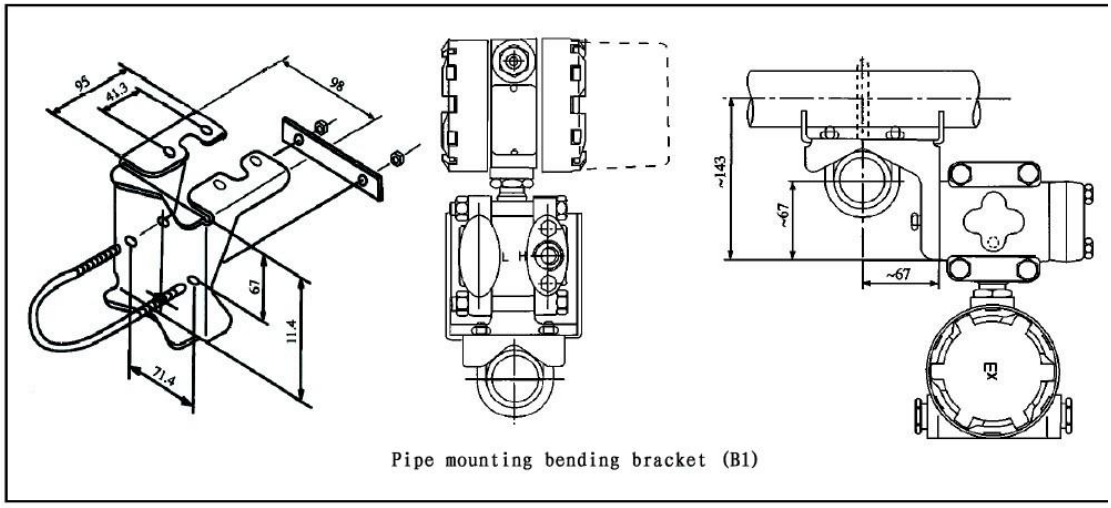




hole (up or down)

Measuring scope (Code)	2,3,4,5	5	6	7	8	9
M (mm)	54	55.2	55.2	55.6	57.2	59

7. Installation Sketch Map



Pipe mounting bending bracket (B1)

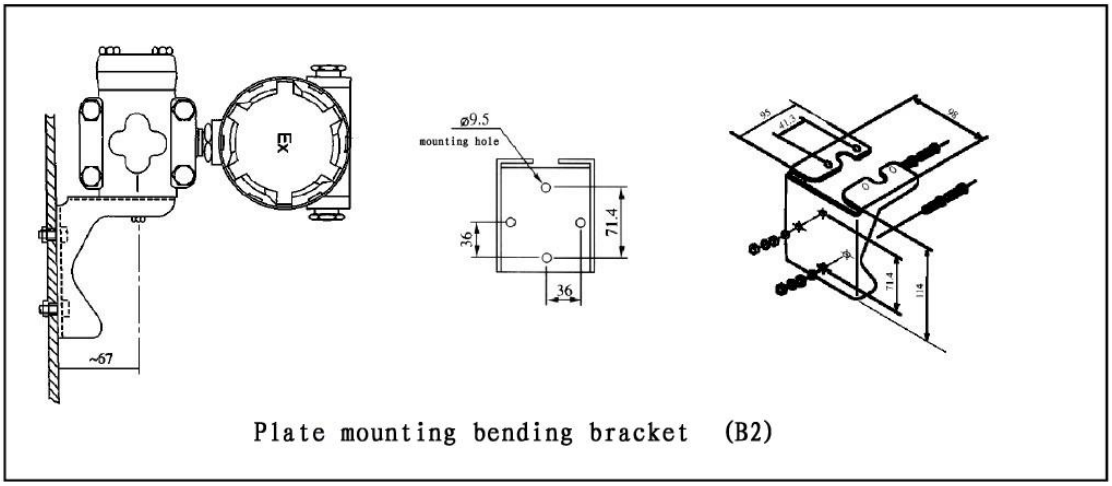
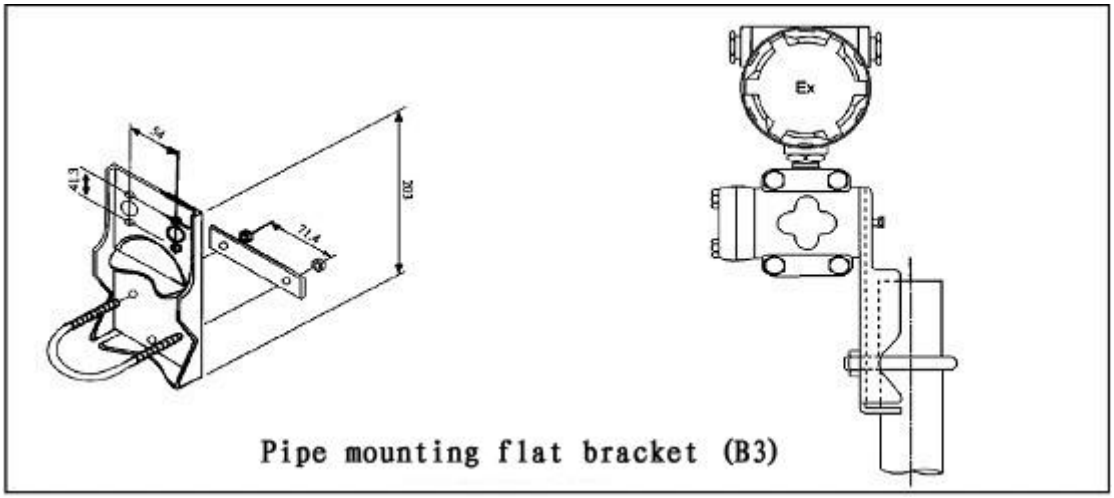
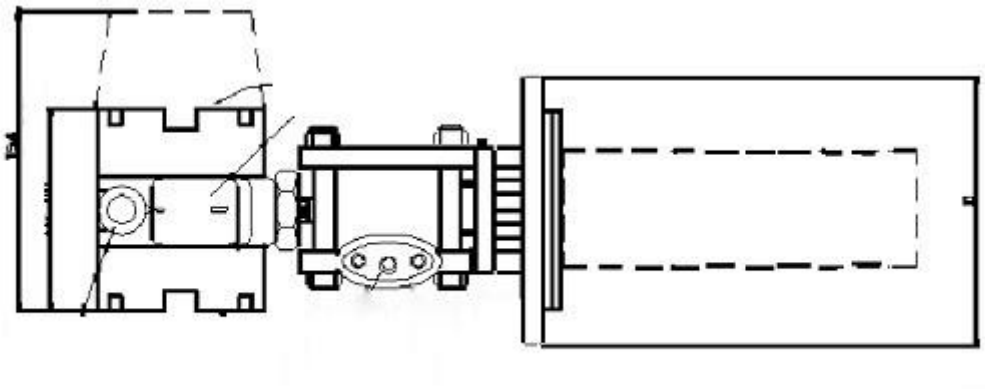


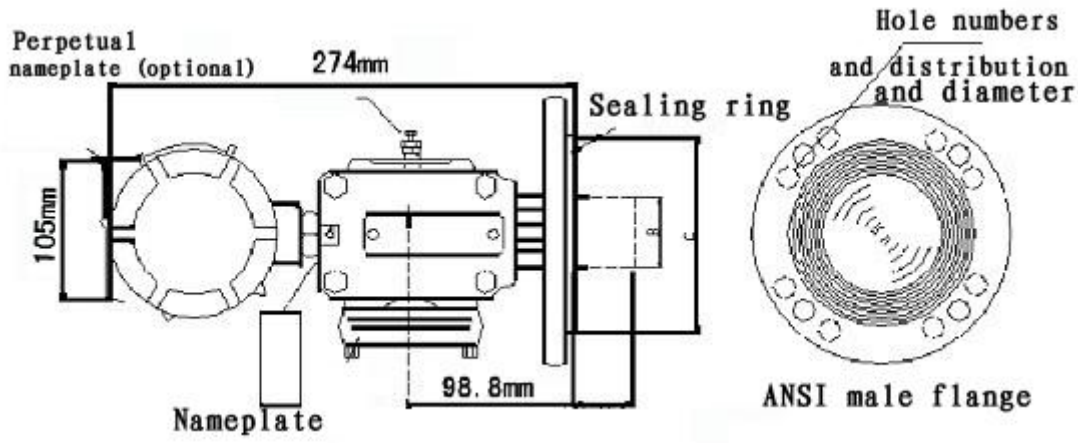
Plate mounting bending bracket (B2)



Pipe mounting flat bracket (B3)

8. Dimensioned drawing of the S800 Level transmitter

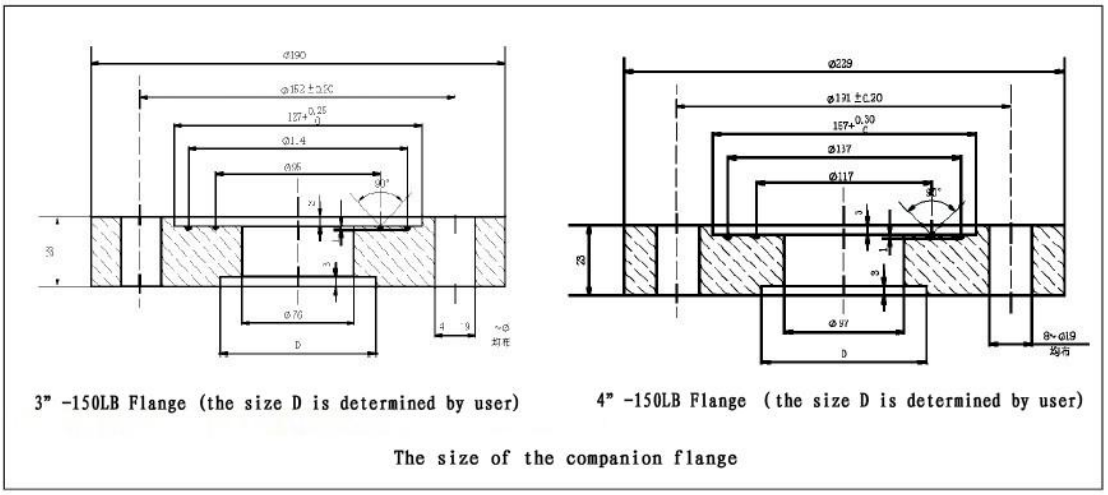


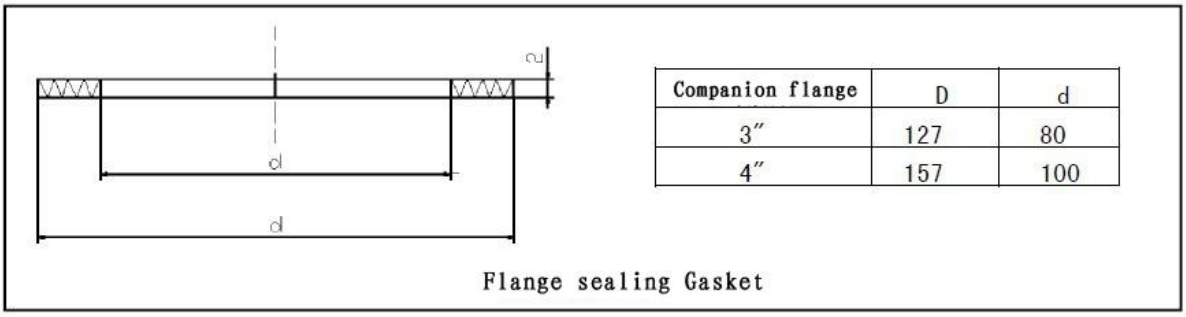


The mounting flange of the S800 flange level transmitter is made in accordance with the ANSI standard, the pressure grade of the flange is 2.5 MPa (150LB)， 3” and 4 ”two kind of specification, if user applied the GB9116-88 standard, the corresponding PN=2MPa, DN=80 and 100.

本体与法兰尺寸 The size of body and flange

The size of flange (mm)					Bolt hole		
The size of the nominal flange	Outer diameter D	Thickness A	B	C	Number n	Diameter d(mm)	Distribution diameter D1 (mm)
3	190	30	66	127	4	19	152
4	229	30	89	157	8	19	191

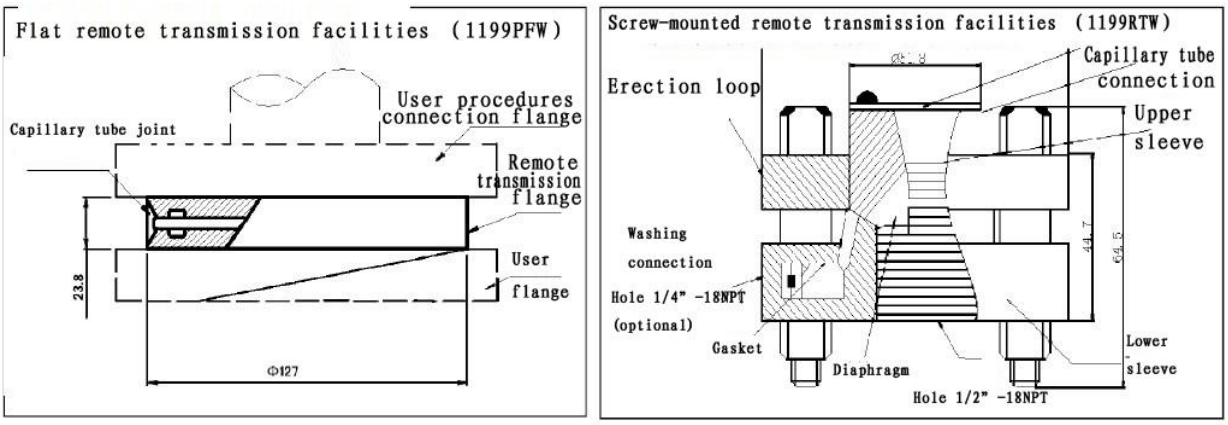




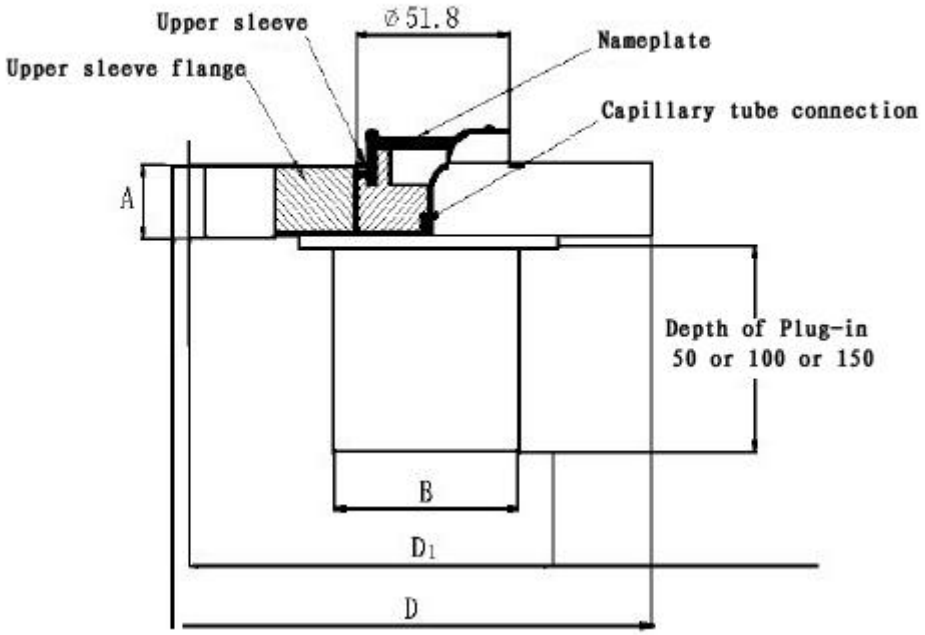
Companion flange	D	d
3″	127	80
4″	157	100

Flange sealing Gasket

9. The size of the installing connection of the series remote transmission facilities for connection body

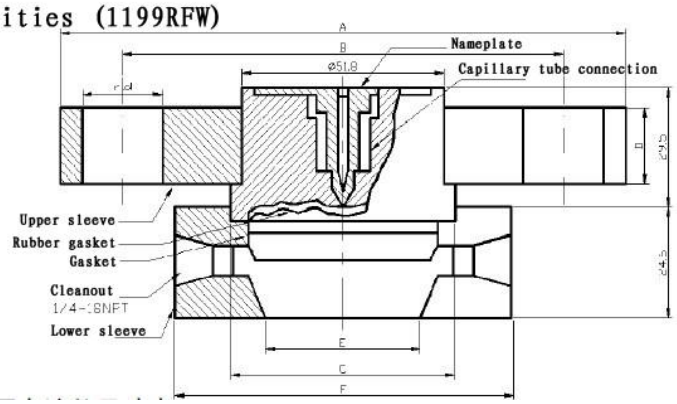


Plug-in remote transmission facilities (1199EFW)



The size of flange (mm)					Bolt hole		
The size of the nominal flange	Outer diameter D	Thickness A	B	C	Number n	Diameter d(mm)	Distribution diameter D1 (mm)
3	190	30	66	127	4	19	152
4	229	30	89	157	8	19	191

Flange Remote transmission facilities (1199RFW)



The size sheet of the Upper sleeve/ Lower sleeve flange of the Flange Remote transmission facilities (1199RFW)

The size of the Upper sleeve flange								The size of the Lower sleeve flange	
Nominal pipe diameter（inch）	Nominal pressure (LB/MPa)	convex plate diameter C	Outer diameter A	Thickness D	screw hole center distance B	screw hole Number n	cotter hole diameter d	Diameter E(mm)	Diameter F(mm)
1	150/2	61.4	108	14.3	79.4	4	16	26.9	66.5
	300/5	66.9	124	17.2	88.9	4	20		
1-1/2	150/2	73	127	17.2	98.4	4	16	41.9	78.7
	300/5	73	156	20.7	114.5	4	23		
2	150/2	92.1	152	19.1	120.6	4	20	52.5	95.2
	300/5	92.1	165	22.2	127.0	8	20		
3	150/2	127	191	23.8	152.4	4	20	79	127
	300/5	127	210	25.5	168.3	8	23		

10． S800 Common Pressure/ differential pressure transmitter Type selection sheet (- means no supply, . means supply)

Code	Type of the transmitter (choose one)	DR	DP	HP	GP	AP
S800DR	Micro differential pressure transmitter	•	-	-	-	-
S800DP	Differential pressure transmitter	-	•	-	-	-
S800HP	High static pressure differential pressure transmitter	-	-	•	-	-
S800GP	Gauge pressure transmitter	-	-	-	•	-
S800AP	Absolute pressure transmitter	-	-	-	-	-

Code	Pressure measuring scope (only choose one)	DR	DP	HP	GP	AP
2	0-0.8~1.6kpa	•	-	-	-	-
3	0-1~6kpa	-	•	-	•	-
4	0-6~40kpa	-	•	•	•	•
5	0-40~250kpa	-	•	•	•	•
6	0-0.16~1mpa	-	•	•	•	•
7	0-0.4~2.5mpa	-	•	•	•	•
8	0-1.6~10mpa	-	•	-	•	•
9	0-4~25mpa	-	-	-	•	-
0	0-6~40mpa	-	-	-	•	-

Code	Transmitter output (only choose one)	DR	DP	HP	GP	AP
E	4-20mA	`·•	• ·	• ·	·•	•
H	Intelligent (With Hart communication protocol)	·•	• ·	• ·	• ·	• ·

Code	Material of the structure (only choose one) Flange/joint drain/exhaust valve Diaphragm filling liquid	DR	DP	HP	GP	AP
12	carbon steel Chrome Plated 316SST 316LSST silicon oil	-	•	•	•	•
13	carbon steel Nickel Plated Hastelloy alloy C Hastelloy alloy C silicon oil	-	•	-	•	•
14	carbon steel Nickel Plated Monel Monel silicon oil	-	•	-	•	•
15	carbon steel Nickel Plated 316SST Tantalum silicon oil	-	•	-	•	•

22	316SST	316SST	316LSST	silicon oil	•	•	•	•	•
23	316SST	316SST	Hastelloy alloy C	silicon oil	-	•	-	•	•
24	316SST	316SST	Monel	silicon oil	-	•	-	•	•
25	316SST	316SST	Tantalum	silicon oil	-	-	-	•	-
33	Hastelloy alloy C	Hastelloy alloy C	Hastelloy alloy C	silicon oil	-	•	-	•	•

Code	Maximum pressure	DR	DP	HP	GP	AP
A	2 Mpa	•	-	-	-	-
B	4 Mpa	•	•	-	-	-
C	10 Mpa	-	•	-	-	-
D	25 Mpa	-	-	•	-	-
E	32 Mpa	-	-	•	-	-

Code	Attached function (Only choose one in the same item)	DR	DP	HP	GP	AP
M1	Analog scaling, liner gauge head 0-100%	•	•	•	•	•
M3	LCD digital display gauge head	•	•	•	•	•
B1	2 in Pipe installation of the bending bracket	•	•	•	•	•
B2	Plate installation of the bending bracket	•	•	•	•	•
B3	2 in Pipe installation of the flat bracket	•	•	•	•	•
C0	1/2”-1/4” NPT taper pipe negative thread	•	•	•	•	•
C1	Welding the ¢14 Probe in the back of the 1/2”-1/4” NPT pressure joint	•	•	•	•	•
C2	Typeface screw thread joint M20 X1.5	•	•	•	•	•
D1	Side drain/exhaust is located on the pressure room	•	•	•	•	•
D2	Side drain/exhaust is located under the pressure room	•	•	•	•	•
d	Explosion proof d II BT6	•	•	•	•	•
i	Intrinsic safe type is II CT6	•	•	•	•	•

S800DP	4	E	22	B	M1	（Type selection for example）

Code	Type of the Transmitter
S800LT	Flange level (pressure) transmitter, the maximum work pressure is 2.5 MPa

Code	Measuring scope
4	0-6~40kpa
5	0-40~25kpa
6	0-0.16~1kpa

Code	Transmitter output
E	4-20mA
H	Intelligent (With Hart communication protocol)

Code	Nominal diameter	The length of the insert tube	the material of the isolated diaphragm
A0	80	Flat	316LSST
A2	80	50	316LSST
A4	80	100	316LSST
A6	80	150	316LSST
B0	100	Flat	316LSST
B2	100	50	316LSST
B4	100	100	316LSST
B6	100	150	316LSST
C0	80	Flat	Hastelloy alloy C
C2	80	50	Hastelloy alloy C
C4	80	100	Hastelloy alloy C
C6	80	150	Hastelloy alloy C
D0	100	Flat	Hastelloy alloy C

D2	100	50	Hastelloy alloy C
D4	100	100	Hastelloy alloy C
D6	100	150	Hastelloy alloy C
E0	80	Flat	Tantalum
F0	100	Flat	Tantalum

Code	Mounting flange
A	3” 150LB carbon steel galvanizing
B	4” 150LB carbon steel galvanizing
C	3” 300LB carbon steel galvanizing
D	4” 300LB carbon steel galvanizing

Code	Material of the structure (only choose one)			
	Flange/joint	drain/exhaust valve	Diaphragm	filling liquid
12	carbon steel Chrome Plated	316SST	316LSST	silicon oil
15	carbon steel Nickel Plated	316SST	Tantalum	silicon oil
22	316SST	316SST	316SST	silicon oil
23	316SST	316SST	Hastelloy alloy C	silicon oil
24	316SST	316SST	Monel	silicon oil
25	316SST	316SST	Tantalum	silicon oil
33	Hastelloy alloy C	Hastelloy alloy C	Hastelloy alloy C	silicon oil
35	Hastelloy alloy C	Hastelloy alloy C	Tantalum	silicon oil

Code	Attached function (Only choose one in the same item)
M1	Analog scaling, liner gauge head 0-100%
M3	LCD digital display gauge head
B1	2 in Pipe installation of the bending bracket
B2	Plate installation of the bending bracket

B3	2 in Pipe installation of the flat bracket
C0	1/2”-1/4” NPT taper pipe negative thread
C1	Welding the ∅14 Probe in the back of the 1/2”-1/4” NPT pressure joint
C2	Typeface screw thread joint M20 X1.5
D1	Side drain/exhaust is located on the pressure room
D2	Side drain/exhaust is located under the pressure room
d	Explosion proof d II BT6
i	Intrinsic safe type is II CT6
	Factory Range (R=)

D800LT	5	E	A6	A	22	B3 (R=0-25Kpa)	(Type selection for example)

Code	Type of the transmitter
S800GP	Remote transmission pressure transmitter
S800DP	Remote transmission differential pressure transmitter

Code	Measuring scope
4	0-6~40kpa
5	0-40~250kpa
6	0-0.16~1mpa
7	0-0.4~2.5mpa
8	0-1.6~10mpa

Code	Transmitter output
E	4-20mA
H	Intelligent (With Hart communication protocol)

Code	Material of the structure	
	Material of flange	Isolated Diaphragm
12	Carbon steel Chrome Plated	316LSST
22	316LSST	316LSST

Code	Remote transmission facilities
S1	One Remote transmission facilities (fit for S800 GP pressure)
S2	Two Remote transmission facilities (fit for S800 DP differential pressure)

Code	Attached functions	
M1	0-100% liner indicator	
M3	3.5” LCD digital display	
B1	Pipe bending mounting plate	
B2	Panel bending mounting plate	
B3	Pipe flat mounting plate	
d	Explosion proof d II BT6	
i	Intrinsic safe type is II CT6	
	Factory Range	(R=)

S800 GP	4	E	22	S1	M3B1 (R=0-20KPa), with 1199RFW21A11A13-30	(Type selection for example)

Remarks: S800 remote transmission pressure/differential pressure transmitter type selection is composed by two parts: one is the body part of the transmitter, another is the 1199 remote transmission parts (the following the is type selection)

10. 1199 series remote transmission facilities type selection sheet

Code	Type of the remote transmission facilities				
1199PFW	Flat remote transmission facilities				
	Code	Specification of the flange			
	11	3”-150LB			
		Code	Material of the diaphragm		
		A	316LSST		
		B	Hastelloy alloy C		
		C	Tantalum		
			Code	Material of the shell	
			12	316LSST	
				Factory Range	(R=)

1199PFW 11 A 12 (Type selection for example)

Remarks: The type selection of the Capillary tube sees the next page.