

**SAILSORS INSTRUMENTS Ltd.**

# V SERIES SMART PRESSURE TRANSMITTERS



V Series  
Pressure  
Transmitter  
VERSION2008

[www.sailsors.com](http://www.sailsors.com)

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**General Overview**

The V Series Smart Pressure Transmitters from Sai sors Instruments Ltd., Beijing, is a moderately priced, full featured family of products that raise the performance and accuracy expectations of pressure transmitter users to new levels. The typical Instruments produced boast an uncertainty's better than +/- 0.075% (FS). This unparalleled accuracy and attractive price make the V series one of the most significant pressure measuring devices on the market today.

Sai sors can provide this also in their state-of-the-art calibration lab and ship the instrument to the user. Alternately the products can be re-ranged in the field or 'trimmed' to field installation condition to virtually eliminate all bias error component of the measurement uncertainty.

**V Series Comparison:**

MODEL	V-6	V-8	V-10
Accuracy	0.075% (FS)	0.075% (FS)	0.075% (FS)
Temp Effect	+/- 0.1% (FS)	+/- 0.1% (FS)	+/- 0.1% (FS)
Long term Stability	0.1% FS/yr.	0.1% FS/yr.	0.1% FS/yr.
Operating Temp	-20 – 70 C	-40 – 85 C	-20 – 70 C
Communication	RS232/485	HART	HART
Display	LCD	N/A	LCD
Operable Turn-down	100:1	100:1	100:1
Effective Turndown	30:1	30:1	30:1
Zero Elevation/Suppression	No limit except minimum span from 0 to 100% URL	No limit except minimum span from 0 to 100% URL	No limit except minimum span from 0 to 100% URL
Effect on accuracy of adjustment w/o a pressure source	0.1%	0.1%	0.1%
Operator Interface	Internal & External keys	Internal & External keys HART or PC	Internal & External keys HART or PC
Power Supply	15 to 36 VDC	15 to 36 VDC	15 to 36 VDC
Damping	0-32 s	0-32 s	0-32 s
Self - Diagnosis/Alarm	User Configurable	User Configurable	User Configurable

**Detailed Specifications:**

Supply Voltage: 15~36VDC

Output: 4~20mADC (all models) + RS232 (select models only)

Loop Resistance:  $RL = (U_s - 9V) / 0.023A$

RL= Max. Resistance Us = Power Voltage

**NOTE:** H.A.R.T. can only communicate if  $250\Omega < RL < 600\Omega$

Response Time: 0~32sec. (User Adjustable)

Accuracy: 0.075% (R)

Operating Temperature: -25C to +70C

Storage Temperature: -40C to +85C

Ambient Temperature Effect:

Temperature Effect: Zero and Span : 0.1% FS from -40C to +80C

Temperature coefficient: Zero and Span: 0.04% FS / 10C from -40C to +80C

Humidity: 90%RH Non condensing

Calibration Stability: 12 months

Electronics Housing: ZL104 Aluminum alloy, Powder coated, with Electrostatic flameplating

Gasket Material: Nitrile rubber, Optional: Fluorine-rubber

Enclosure Protection: IP65 Rated

Electrical Connection: M20×1.5F ;1/2NPTF

Approvals: CUL Pending

Optional Display: 4 1/2 LCD (User configurable)

**Shipping Weight/Dimensions**

	V-6 GP	V-6 D/P	V-8 GP	V-8 D/P	V-10 GP	V-10 D/P
Wt. (kg)	1.5Kg	5.3Kg	1.4Kg	5.5Kg	1.5Kg	5.3Kg
Dim. (mm)	235 X 180 X 120	280 X 230 X 225	235 X 180 X 120	280 X 230 X 225	235 X 180 X 120	280 X 230 X 225

**Pressure & Temperature limits**

Type	Pressure Limit	Storage Temp	Ambient Temp.
Silincon Piezoresistive Sensor	(1.5~3)X	-50~125°C	-40~85°C
Ceramic capacitive sensor	(3~100)X	-50~125°C	-40~85°C
Differential Capacitive sensor	7/14/31MPa	-50~125°C	-40~85°C
Electronic Parts	-----	-50~85°C	-40~85°C
LCD	-----	-40~85°C	-20~85°C

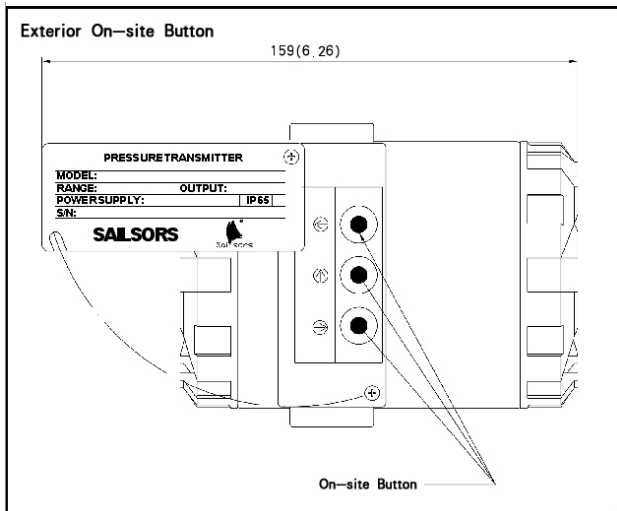
Note: X presents range of sensor

**Sensor Material**

Sensor Type	Diaphragm	Seal	Fill Fluid	Process Connection
Silicon Sensor	316SS	Nitrile rubber	Silicon Oil	316SS
Ceramic sensor	AL <sub>2</sub> O <sub>3</sub>	Fluorine Rubber	N/A	316SS
Capacitive sensor	316SS/C276	Fluorine Rubber	Silicon Oil	316SS

**Display and Operation Panel**

Communication: HART Protocol    Handheld: HART275/375 or approved by HCF  
 Display: Two lines, five characters and units indication



**Order Information**

**Range & Sensor Code Selector**

Range Code	Range	Measuring style Code				
		GP	DP	AP	HP	DR
2	0-0.22 PSI / 0-1.5KPa	E	N/A	N/A	N/A	E
3	0-1 PSI / 0-7KPa	E/C	E	N/A	N/A	N/A
4	0-7 PSI / 0-35KPa	E/C/S	E	N/A	E	N/A
5	0-30 PSI / 0-200KPa	E/C/S	E	S	E	N/A
6	0-100 PSI / 0-700KPa	E/C/S	E	S	E	N/A
7	0-300 PSI / 0-2.1MPa	E/C/S	E	S	E	N/A
8	0-500 PSI / 0-3.5MPa	E/C/S	E	N/A	N/A	N/A
9	0-1000 PSI / 0-7MPa	E/C/S	E	N/A	N/A	N/A
10	0-3000 PSI / 0-21MPa	E/S	N/A	N/A	N/A	N/A
11	0-5000 PSI / 0-35MPa	S	N/A	N/A	N/A	N/A
12	0-6000 PSI / 0-42MPa	S	N/A	N/A	N/A	N/A

Note:

S-- Silicon Piezoresistive Sensor

C-- Ceramic capacitive sensor

E-- Differential Capacitive sensor

\*S / \*E/ \*C--Code for Range and Sensor

N/A—Not Available

V Series Smart Pressure /Differential Pressure														
6	Accuracy: 0.075% (FS) Communication: RS232/485 Display: LCD													
8	Accuracy: 0.075% (FS) Communication: HART/Modbus Display N/A													
10	Accuracy: 0.075% (FS) Communication: HART/Modbus Display: LCD													
	Measuring style code:													
	GP	AP	DP	DR	HP									
	Range & sensor													
	Please see the Range & Sensor Code Selector													
	Protocols(V8,V10)													
	H	Hart	M	Modbus										
	Voltage( Only for Modbus)													
	1,	0.8~5.5VDC	2,	4.5~24VDC	3,	18~36VDC								
	Material of Diaphragm(For DP sensor)													
	B	316L Stainless Steel(can be omitted)	H	Hastelloy C-276	T	Diaphragm								
	Filling Liquid(For DP sensor)													
	G	Silicone Oil (can be omitted)	F	Inert Liquid(Fluorocarbon Oil)										
	Engineering Units													
	1:	Psi	2:	Pa/KPa/MPa	3:	mbar/bar	4:	mmHg	5:	torr	6:	atm	7:	%
	8:	mm/cm/m	9:	in.H2O/ft. H2O	10:	in.Hg	11:	g or Kg/cm <sup>2</sup>	12:	mA				
	Process Connection													
	N1:	1/2-14NPT (male)												
	M1:	M20×1.5 (male)												
	G1:	G1/2 (male)												
	C0:	1/2-14NPT (female)												
	C1:	With welding tube												
	C2:	Conical connection												
	Agency Approval													
	E0	Without approval	E5	CSA, Intrinsic Safety										
	E1	FM, Intrinsic Safety	E6	CSA, Ex-proof										
	E2	FM,Ex-proof	E7	KEMA, Intrinsic Safety										
	E3	NEPSI, Intrinsic Safety	E8	KEMA, Ex-proof										
	E4	NEPSI, Ex-proof												
	Mounting Bracket													
	Using Differential Capacitive Sensor													
	B1:	Bracket, pipe mount (flange connection)												
	B2:	Bracket, flat, pipe mount												
	B3:	Bracket, panel mount												
	Using Silicon Piezoresistive Sensor/ Ceramic capacitive													
	B4:	Bracket, wall mount												
	B5:	Bracket, pipe mount (thread connection)												
	B0:	No bracket												
	Vent/Drain Position (Required by using Differential Capacitive Sensor only)													
	V0:	No drain/vent valve												
	V1:	Drain/vent valve is at the back of flange												
	V2:	Side drain/vent valve, top position												
	V3:	Side drain/vent valve, bottom position												
	Manual													
	S1	English	S2	Chinese										
	Configuration Selection													
	W1	Linear output, calibrated to upper limit, standard damping and alarm												
	W2	User-defined calibration and configuration												
V	8	DP	5E	H	1	B	G	1	CO	E1	B1	V1	S1	W1

**Gauge pressure and negative gauge pressure (GP)**

Sensors Standard Ranges Codes		piezoresistive silicon		Ceramic capacitance		Differential capacitance	
		Model code	Overload capacity	Model code	Overload capacity	Model code	Overload capacity
2	0-0.22psi/0-1.5KPa	--	--	--	--	2E	7MPa
3	0-1psi/0-7KPa	--	--	3C	200KPa	3E	14MPa
4	0-7psi/0-35KPa	4S	3X	4C	350KPa	4E	14MPa
5	0-30psi/0-200KPa	5S	3X	5C	1MPa	5E	14MPa
6	0-100psi/0-700KPa	6S	3X	6C	3.5MPa	6E	14MPa
7	0-300psi/0-2.1MPa	7S	3X	7C	10MPa	7E	14MPa
8	0-500psi/0-3.5MPa	8S	3X	8C	12MPa	8E	14MPa
9	0-1000psi/0-7MPa	S9S	2X	9C	14MPa	9E	14MPa
10	0-3000psi/0-21MPa	10S	1.5X	--	--	10E	30MPa
11	0-5000psi/0-35MPa	11S	1.5X	--	--	--	--
12	0-6000psi/0-42MPa	12S	1.5X	--	--	--	--

**Differential Pressure(including DP,DR&HP)**

Differential Capacitance Sensor Standard Ranges Codes		DP		DR		HP	
		Model code	Static Pressure	Model code	Static Pressure	Model code	Static Pressure
2	0-0.22psi/0-1.5KPa	--	--	2E	7MPa	--	--
3	0-1psi/0-7KPa	3E	14MPa	-	-	--	--
4	0-7psi/0-35KPa	4E	14MPa	-	-	4E	31MPa
5	0-30psi/0-200KPa	5E	14MPa	-	-	5E	31MPa
6	0-100psi/0-700KPa	6E	14MPa	-	-	6E	31MPa
7	0-300psi/0-2.1MPa	7E	14MPa	-	-	7E	31MPa
8	0-500psi/0-3.5MPa	8E	14MPa	-	-	--	31MPa
9	0-1000psi/0-7MPa	9E	14MPa	-	-	--	31MPa

**Absolute Pressure(AP)**

Sensor Standard Ranges Codes		piezoresistive silicon sensor	
		Model code	Overload capacity
5	0-30psi/0-200KPa	5S	3X
6	0-100psi/0-700KPa	6S	3X
7	0-300psi/0-2.1MPa	7S	3X

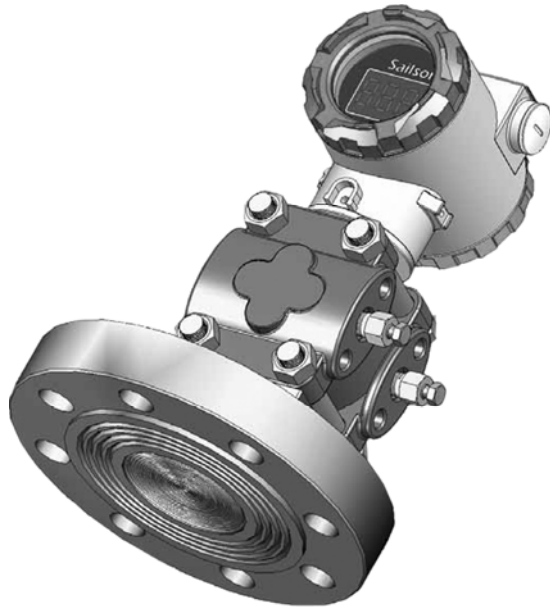
## Specifications

**Range:** 0-6 KPa (min),  
0-7 MPa (max)  
**Temperature:** -40~300°C  
**Static Pressure:** 3.5 KPa ~ 10 MPa  
**Weight:** about 11Kg

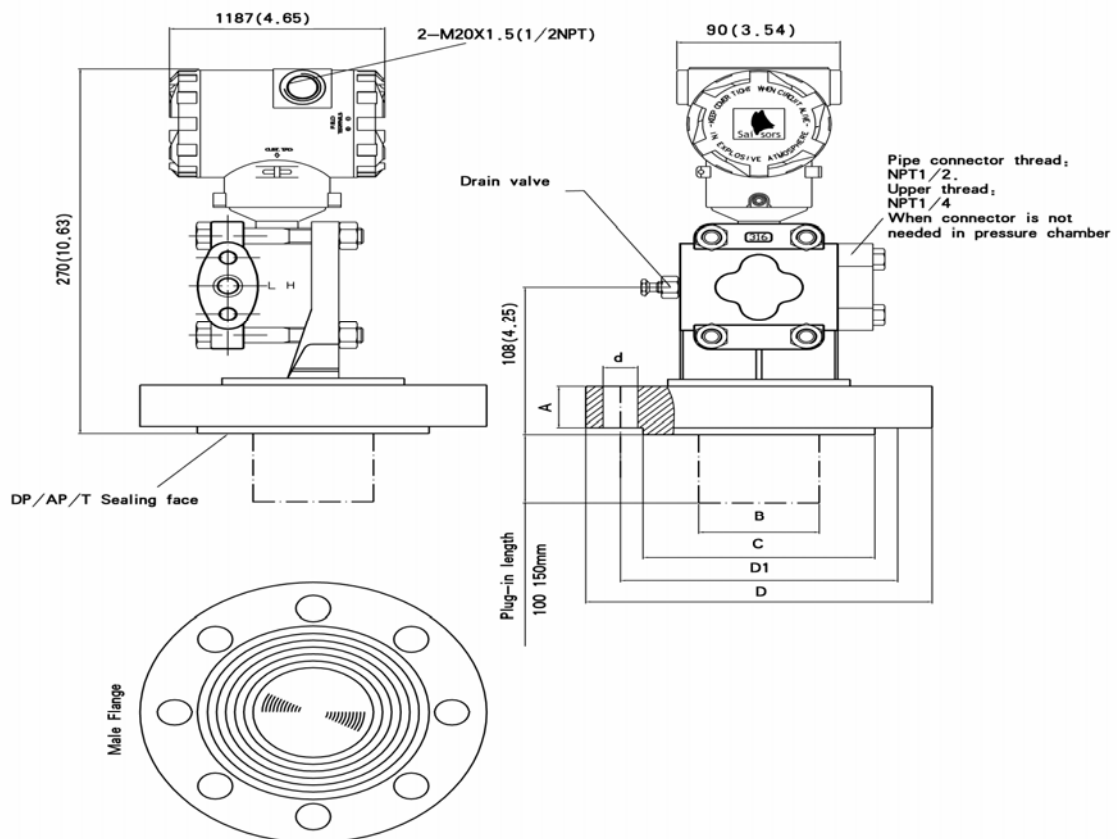
**Note:** Other specifications are equivalent to V-series smart transmitters.

## Applications

V-series flange level transmitter is applicable in high temperature, sticky, crystallization, and corrosive medium. Users may choose 316L ss and Hastelloy C for diaphragm material. It is suitable for different process medium.



## Dimensions(mm)



Model Chart for Flange Type Level Transmitter

Series Number

V series smart plane or plug-in flange type level transmitter

circuit module/protocol/voltage/filling oil

4 6 8 10 Please see the chart on page 5

Range

LT4E 0-35KPa LT5E 0-200KPa LT6E 0-700KPa

Engineering units

Please see the chart on page 5

structure dimensions & diaphragm materials

codes	Nominal diameter(mm)	Length of plugged part	Diaphragm material
A0	80	Plane	316LSST
A2	80	50	316LSST
A4	80	100	316LSST
A6	80	150	316LSST
B0	100	Plane	316LSST
B2	100	50	316LSST
B4	100	100	316LSST
B6	100	150	316LSST
C0	80	Plane	Hastelloy C-276
C2	80	50	Hastelloy C-276
C4	80	100	Hastelloy C-276
C6	80	150	Hastelloy C-276
D0	100	Plane	Hastelloy C-276
D2	100	50	Hastelloy C-276
D4	100	100	Hastelloy C-276
D6	100	150	Hastelloy C-276

mounting flange(galvanized carbon steel)

A 3" 150Ib B 4" 150Ib

structure material

Code	flange connection	drain valve	diaphragm
22	316L	316L	316L
23	316L	316L	Hastelloy C

Ex-proof

Please see the chart on page 12

Accessories

Please see the chart on page 12

Filling oil

NA Common silicone oil, temperature:-29~149℃,  
specific gravity:0.934g/cm3  
S high temperature Silicone oil, specific gravity:1.07g/cm3

V 8 LT4E 2 A0 A 22 E0 W1 S ← Model selection



# V-series Remote Diaphragm Transmitter

## Specifications

**Range:** 0-6 KPa (min),  
 0-7 MPa (max)  
**Temperature:** -40~300°C  
**Static Pressure:** 3.5 KPa ~ 10 MPa  
**Weight:** about 11Kg  
**Capillary:** 0.15 kg/m

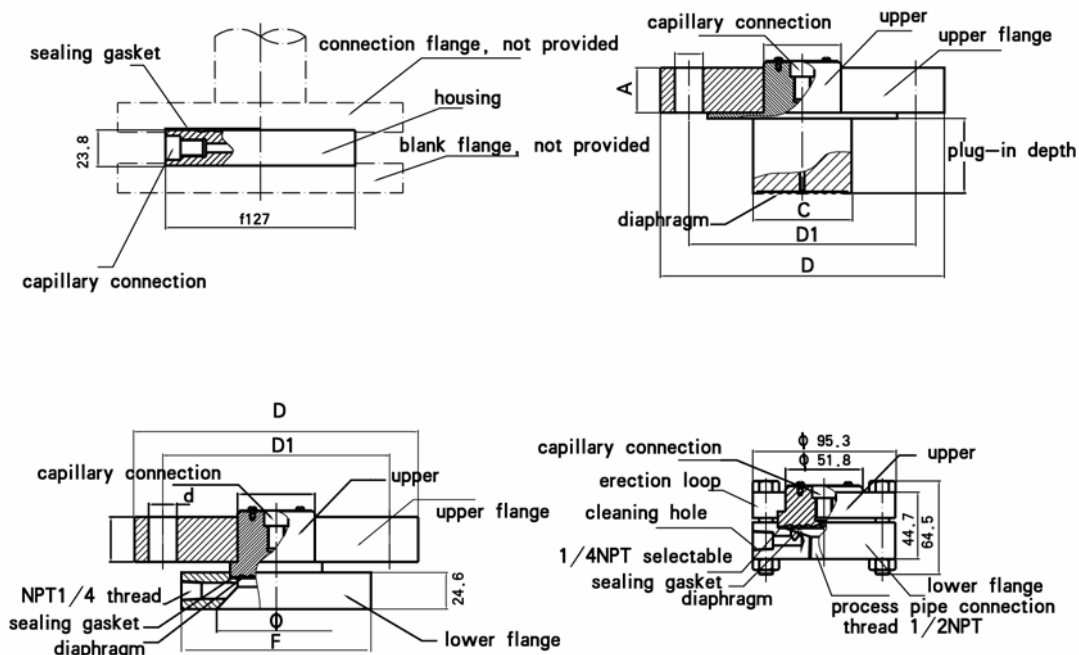
**Note:** Other specifications are equivalent to V-series smart transmitters.



## Applications

The Remote Diaphragm Transmitter consists of a V-series pressure transmitter and a diaphragm seal system, which are connected with capillary tubing. In operation, the fill fluid and flexible diaphragm work as a mechanism separating the sensor of the transmitter from the process medium. Installation for various types of V Remote Diaphragm Transmitter includes: flanged type seals, pancake type seals, threaded type seals, and insertion type seals. Hastelloy C, Tantalum and 316L ss are all the available materials of wetted parts for customers to select, according to different installation requirements and process medium. Differential capacitive sensors have been used in all V Remote Diaphragm Transmitters.

## Dimensions(mm)



Model Chart for Remote Diaphragm Transmitter

Series No.							
V series	smart differential pressure,pressure transmitter with remote transmission equipment						
circuit module/testing/protocol/voltage							
6 8 10	see the chart on page 5						
ranges							
4E	0-35PKa	5E	0-200KPa	6E	0-700KPa		
7E	0-2.1MKa	8E	0-3.5MPa	9E	0-7MPa		
Engineering units							
Please see the chart on page 5							
Diaphragm system							
Sensor positive pressure connection +PFW +RTW +ETW +RFW							
Sensor negative pressure connection NA without diaphragm -PFW -RTW -ETW -RFW							
Ex-proof							
Please see the chart on page 5							
accessories							
Please see the chart on page 5							
V	10	5E	2	+PFW-PFW	E0	B1S1W1	← model selection

Series No.					
PFW type	flat type remote transmission flange				
Model					
11	standard 3" -150LB				
Diaphragm material					
A	316LSST	B	Hastelloy C	C	Tantalum
Housing material					
11	316LSST				
Capillary tube length					
CAP15	1.5m	CAP30	3.0m	CAP45	4.5m
CAP60	6.0m	CAP75	7.5m		
Filling oil					
NA Common silicone oil, temperature:-29~149℃, specific gravity:0.934g/cm3					
S high temperature Silicone oil, temperature:15~300℃, specific gravity:1.07g/cm3					
PFW	11	A	11	CAP30	← Model selection for flat type remote transmission flange

Series No.						
ETW type	plane plug-in type flange					
The diameter of the plug-in flange and material of the parts touching the service						
11	66mm(3" ) 316LSST	12	66mm(3" ) Hastelloy C-276(special order)			
13	89mm(4" ) 316LSST	14	89mm(4" ) Hastelloy C-276(special order)			
Diaphragm material						
A 316LSST only suitable for code 11,13						
The length of the plug-in flange sleeve(mm)						
20	50(2" )	40	100(4" )	65	150(6" )	
Flange material and rated pressure(the temperature is 38℃)						
A11 galvanized carbon steel, the max. work temperature is 2.5MPa						
A12 galvanized carbon steel, the max. work temperature is 5MPa(irrecommended)						
The length of capillary						
CAP15	1.5m	CAP30	3.0m	CAP45	4.5m	
CAP60	6.0m	CAP75	7.5m			
Filling oil						
NA Common silicone oil, temperature:-29~149℃, specific gravity:0.934g/cm3						
S high temperature Silicone oil, temperature:15~300℃, specific gravity:1.07g/cm3						
ETW	11	A	20	A11	CAP30	← Model selection for plug-in type remote transmission flange

Series No.	
RTW type	NPT mounting remote transmission flange(the max. working temperature is 10MPa)
Flush spare holes	
11 NA	21 with
Material for remote transmission flange	
A 316LSST	B Hastelloy C C Tantalum
Upside ring structure material	
11	carbon steel for upside mounting ring, asbestos or Viton for gasket
12	316LSST for upside mounting ring, asbestos or Viton for gasket
Under ring material	
A 316LSST	B Hastelloy C C Tantalum
Pressure adopting connector	
13	1/2" NPT
The length of capillary	
CAP15	1.5m CAP30 3.0m CAP45 4.5m
CAP60	6.0m CAP75 7.5m
Filling oil	
NA	Common silicone oil, temperature:-29~149℃, specific gravity:0.934g/cm <sup>3</sup>
S	high temperature Silicone oil, temperature:15~300℃, specific gravity:1.07g/cm <sup>3</sup>
RTW 11 A 11 A 13 CAP30 ← Model selection for NPT mounting remote transmission flange	

Series No.	
RFW	flange mounting remote transmission equipment
Flush spare holes	
11 NA	21 with
Material for remote transmission equipment	
A 316LSST	B Hastelloy C-276
Upside ring structure material	
11	galvanized carbon steel for upside flange, asbestos or Viton for gasket
12	316LSST for upside flange, asbestos or Viton for gasket
Under ring material	
Code	under ring dimension max. working pressure(38℃) material
A21	1" 2.5MPa 316SST
E21	1" 2.5MPa galvanized carbon steel
A41	1 1/2" 2.5MPa 316SST
E41	1 1/2" 2.5MPa galvanized carbon steel
A51	2" 2.5MPa 316SST
E51	2" 2.5MPa galvanized carbon steel
A71	3" 2.5MPa 316SST
E71	3" 2.5MPa galvanized carbon steel
A22	1" 5MPa 316SST
E22	1" 5MPa galvanized carbon steel
A42	1 1/2" 5MPa 316SST
E42	1 1/2" 5MPa galvanized carbon steel
A52	2" 5MPa 316SST
E52	2" 5MPa galvanized carbon steel
A72	3" 5MPa 316SST
E72	3" 5MPa galvanized carbon steel
The length of capillary	
CAP15	1.5m CAP30 3.0m CAP45 4.5m
CAP60	6.0m CAP75 7.5m
Filling oil	
NA	Common silicone oil, temperature:-29~149℃, specific gravity:0.934g/cm <sup>3</sup>
S	high temperature Silicone oil, temperature:15~300℃, specific gravity:1.07g/cm <sup>3</sup>
RFW 11 A 11 A21 CAP30 ← Model selection for flange mounting remote transmission equipment	