1199 Remote Diaphragm Seals

- **Fluid: liquid, steam, gas**
- **Process pressure: up to 68.9 MPa**
- **Process temperature: –128 to 370 °C**
- **Process connections: flanged, threaded, special.**
- **Transmitter connection: remote diaphragm seals may be used together with Metran-75, Metran-150 differential, absolute and gage pressure transmitters.**

Remote diaphragm seals are designed to measure flow, pressure and level in challenging environments such as extreme hot and cold temperatures, corrosive or viscous media.

Benefits:

- Measurement system combined with Metran pressure transmitters;
- All welded construction for high measurement accuracy and long life
- Reference accuracy of the assembly up to ±0.075% of rdg;
- Unique fill fluids that ensure reliable operation of the pressure transmitter and seal assembly in the most severe environments;
- Ability to calculate temperature effect and system response speed in operating conditions;
- Control at all production steps both for the pressure transmitter and the remote seal;
- A wide range of remote seal designs and an opportunity for individual analysis allow you to select a solution for a specific task.

Transmitter/diaphragm seal systems should be considered when:

- Process temperature is outside of the operating ranges of a pressure transmitter;
- Process is corrosive and may require specific exotic materials of construction;
- Process contains suspended solids or is viscous and is prone to plugging of connections;
- There is a requirement for easier cleaning of the process from the connections to avoid contamination between batches;
- The process medium may freeze or solidify inside the transmitter or impulse line.

High Temperature and Vacuum Applications

There are three factors to be considered when selecting a transmitter/diaphragm seal system for high temperature applications: fill fluid compatibility, configuration, and installation.

Fill Fluid Compatibility

The fill fluid must be in an equilibrium state, compatible with the harshest process conditions in order for the transmitter/diaphragm seal system to function properly.

Remote Diaphragm Seal Design

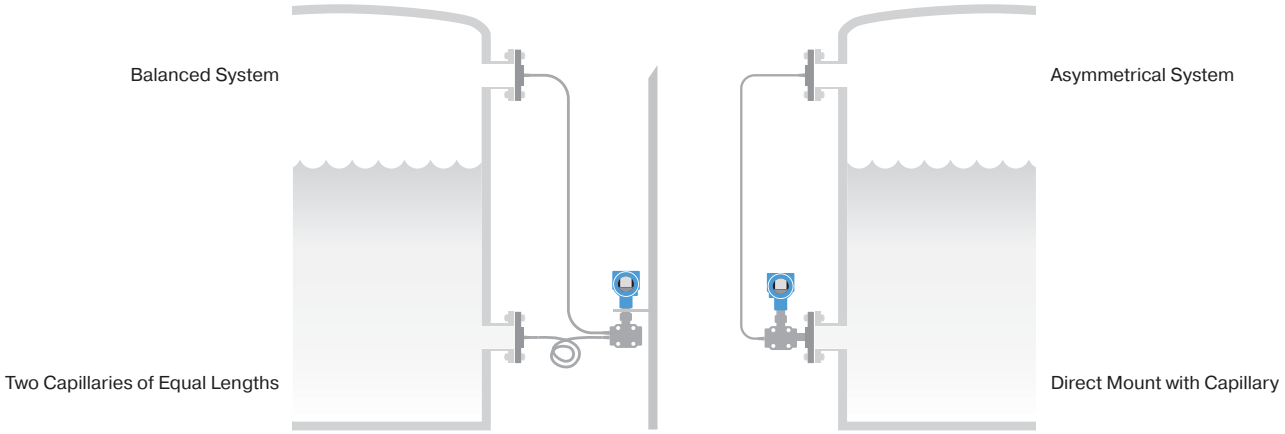
In terms of connection to capillary lines (if any) and the pressure transmitter, 1199 remote diaphragm seal is an all welded (vacuum) construction filled with special fluid and sealed to exclude any negative factors affecting measurement quality.

DP Level

A balanced remote seal system is a symmetrical system that uses equal seals and capillary length on the high and low pressure sides of the transmitter. Since the capillary lengths are the same, each side ideally has the same amount of fill fluid, minimizing or completely eliminating the seal temperature effect due to equal pressure on both sides of the transmitter diaphragm. The balanced systems are still affected by the head pressure.

Asymmetrical remote seal systems with two seals are also available: one seal is directly mounted and another seal is connected via capillary. Another possible asymmetrical system is any remote seal system with unequal lengths of capillary or two different remote seals on the high and low pressure connections. Due to the unequal lengths of capillary, there are seal temperature effects. However, this seal temperature effect counters the head pressure from the oil-filled capillary and reduces total temperature effects on the entire system.

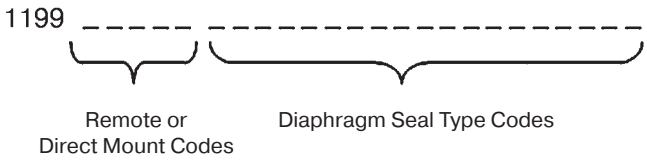
Asymmetrical systems are ideal for applications with shorter spans and higher operating pressures. They deliver improved performance at a lower cost compared to a traditional balanced system.



ORDERING INFORMATION

Best-selling styles that have minimum lead time are marked with ● symbol in Standard column.

1199 Remote Diaphragm Seal model string consists of two parts. First, the model code for remote (capillary) or direct mount is specified. Then the code for the diaphragm seal type is specified.



Direct Mount

Table 1

Model	Product			Standard
1199	Remote Diaphragm Seal			
Connection type		**Seal system**	**Diaphragm seal location**	
		Flanged transmitters		
W	Welded	One or two seal system	High side of transmitter	●
		In-line transmitters		
W	All welded	One seal system	—	●
Seal fill fluid		**Specific gravity at 25 °C**	**Temperature limits, °C**	
A	Sylthern XLT	0.85	–105 to 145	●
D	Silicone 200	0.934	–45 to 205	●
L	Silicone 704	1.07	0 to 205	●
R	Silicone 705	1.09	20 to 205	●
H	Halocarbon (inert)	1.85	–45 to 160	
T	Neobee M-20 (food)	0.94	–15 to 205	
J	Tri-Therm 300	0.795	–40 to 205	
Seal connection type				
A	Direct mount			●
Direct mount connection type				
Extension length		**Seal system**	**Connection type**	
		Flanged transmitters		
93	Direct mount, no extension	One-seal system	Welded	●
94	Direct mount, no extension	Asymmetrical system, seal direct mount on the high pressure side	Welded	●
		In-line transmitters		
95	Direct mount	One-seal system	All welded	●

Remote Mount

Best-selling styles that have minimum lead time are marked with ● symbol in Standard column.

Table 2

Model	Product			Standard
1199	Remote Diaphragm Seal			
Connection type		**Seal system**	**Diaphragm seal location**	
		Flanged transmitters		
W	Welded	One or two seal system	High side of transmitter	●
M	Welded	One or two seal system	Low side of transmitter	●
D	Welded	Two seal system	Balanced system - identical high and low sides	●
		In-line transmitters		
W	All welded	One seal system	—	●
Fill fluid		**Specific gravity at 25 °C**	**Temperature limits, °C**	
A	Syltherm XLT	0.85	–105 to 145	●
D	Silicone 200	0.934	–45 to 205	●
L	Silicone 704	1.07	0 to 315	●
R	Silicone 705	1.09	20 to 370	●
H	Halocarbon (inert)	1.85	–45 to 160	
T	Neobee M-20 (food)	0.94	–15 to 205	
J	Tri-Therm 300	0.795	–40 to 300	
Capillary ID				
B	0.6 mm capillary ID			●
C	1.0 mm capillary ID			●
D	1.8 mm capillary ID			●
Capillary length				
51	0.5 m			●
52	1.0 m			●
53	1.5 m			●
54	2.0 m			●
55	2.5 m			●
56	3.0 m			●
57	3.5 m			●
58	4.0 m			●
59	5.0 m			●
60	6.0 m			●
61	7.0 m			●
62	8.0 m			●
63	9.0 m			●
64	10.0 m			●
65	11.0 m			●
66	12.0 m			●
67	13.0 m			●
68	14.0 m			●
69	15.0 m			●
70	16.0 m			●
71	17.0 m			●
72	18.0 m			●
73	19.0 m			●
74	20.0 m			●

Seal Assemblies

Best-selling styles that have minimum lead time are marked with ● symbol in Standard column.

Table 3

Flanged seal assemblies		Process connections
	FFW Flush Flanged Seal	2-in., DN 50 3-in., DN 80 4-in., DN 100
	FCW Flush Flanged Seal - Ring Type Joint (RTJ) Gasket Surface	2-in. 3-in.
	RFW Flanged Seal for Smaller Process Connections	1-in., DN25 1/2-in., DN40
	EFW Extended Flanged Seal	2-in., DN 50 3-in., DN 80 4-in., DN 100
Threaded seal assemblies		**Process connections**
	RTW Remote Threaded Seal	1/2-14 NPT, 1/4-18 NPT, M20x1.5, G 1/2

FLANGED SEALS

Best-selling styles that have minimum lead time are marked with ● symbol in Standard column.

FFW Flush Flanged Seal

Table 4

Code	Industry standard			Standard
A	ANSI/ASME B16.5 (RF sealing surface by default)			●
D	EN 1092-1 (B sealing surface by default)			
T	GOST 33259-2015 (B sealing surface by default)			●
Seal style				
FFW	Flush flanged seal			●
Process connection size				
	ANSI/ASME B16.5	**GOST 33259-2015/EN1092-1**		●
G	2-in.	DN 50		●
7	3-in.	—		●
J	—	DN 80		●
9	4-in.	DN 100		
Flange/pressure rating				
	ANSI/ASME B16.5	**GOST 33259-2015/EN1092-1**		
1	Class 150	—		●
2	Class 300	—		●
4	Class 600	—		●
5	Class 900	—		
6	Class 1500	—		
7	Class 2500	—		
E	—	PN 16		●
G	—	PN 40		●
H	—	PN 63		
J	—	PN 100		
K	—	PN 160		
Seal material				
	Diaphragm	**Diaphragm case**	**Flange**	
DA	316L SST	316L SST	Stainless steel	●
DB	Hastelloy C-276	316L SST	Stainless steel	
Flushing ring material				
0	None			●
A	316L SST			●
Flushing connections				
0	None			●
1	One connection (¼–18 NPT)			●
3	Two connections (¼–18 NPT)			●
7	One connection (½ –14 NPT)			●
9	Two connections (½ –14 NPT)			●

ADDITIONAL NON-MANDATORY OPTIONS (include with selected model number)

Sealing gasket material		
N	Graphite gasket	
J	PTFE gasket	●
Flushing connection ring plug		
G	Plug, SST	●
H	Drain valve, SST	
NACE certificate		
Q15	Certificate of compliance to NACE MR0175/MR0103	
Material traceability certification		
Q8	Material traceability certification per EN 10204 3.1	●
Diaphragm coating		
V	Polymer diaphragm coating	
Z	Hydrogen-resistant diaphragm coating	

Table 4 (Continued)

Extended product warranty		**Standard**
WR5	5-year limited warranty	●
Special sealing surface form		
SSH	GOST 33259-15/EN 1092-1 Type E	●
SSJ	GOST 33259-15/EN 1092-1 Type F	●

TYPICAL MODEL NUMBER: 1199 W D C T FFW G G DA A 9

FCW Flush Flanged Seal - RTJ Gasket Surface

Best-selling styles that have minimum lead time are marked with ● symbol in Standard column.

Table 5

Code	Industry standards			Standard
A	ANSI/ASME B16.5			●
Seal style				
FCW	Flush flanged seal - ring type joint (RTJ) gasket surface			●
Process connection size				
G	2-in.			●
7	3-in.			
Flange/pressure rating				
1	Class 150			●
2	Class 300			●
4	Class 600			●
5	Class 900			
6	Class 1500			
7	Class 2500			
Seal material				
	Diaphragm	**Diaphragm case**	**Flange**	
DA	316L SST	316L SST	Stainless steel	●
DB	Hastelloy C-276	316L SST	Stainless steel	
Flushing ring material				
0	None			●
A	316L SST			
Flushing connections				
0	None			●
1	One connection (¼–18 NPT)			
3	Two connections (¼–18 NPT)			
7	One connection (½ –14 NPT)			
9	Two connections (½ –14 NPT)			

ADDITIONAL NON-MANDATORY OPTIONS (include with selected model number)

Flushing connection ring plug		
G	Plug, SST	
H	Drain valve, SST	
NACE certificate		
Q15	Certificate of compliance to NACE MR0175/MR0103	
Material traceability certification		
Q8	Material traceability certification per EN 10204 3.1	●
Diaphragm coating		
V	Polymer diaphragm coating	
Z	Water-resistant diaphragm coating	
Extended product warranty		
WR5	5-year limited warranty	●

TYPICAL MODEL NUMBER: 1199 W D C A FCW G 4 DA 0 0

Flanged Seal for Smaller Process Connections (RFW)

Best-selling styles that have minimum lead time are marked with ● symbol in Standard column.

Table 6

Code	Industry standard			Standard
A	ANSI/ASME B16.5 (RF sealing surface by default)			
D	EN 1092-1 (B sealing surface by default)			
T	GOST 33259-2015 (B sealing surface by default)			●
Seal style				
RFW	Flanged seal for smaller process connections			
Process connection size				
	ANSI/ASME B16.5	**GOST 33259-2015/ EN 1092-1**		
2	1-in.	—		
4	1 1/2-in.	—		●
D	—	DN 25		
F	—	DN40		●
Flange/pressure rating				
	ANSI/ASME B16.5	**GOST 33259-2015/ EN 1092-1**		
1	Class 150	—		●
2	Class 300	—		●
4	Class 600	—		●
5	Class 900	—		
6	Class 1500	—		
7	Class 2500	—		
C	—	PN 16		●
G	—	PN 40		●
H	—	PN 63		
Seal material				
	Diaphragm	**Diaphragm case**	**Flange**	
DA	316L SST	316L SST	Stainless steel	●
DB	Hastelloy C-276	316L SST	Stainless steel	
Flushing ring material				
0	None			●
A	316L SST			
Flushing connections				
0	None			●
1	One connection (¼–18 NPT)			
3	Two connections (¼–18 NPT)			
7	One connection (½ –14 NPT)			
9	Two connections (½ –14 NPT)			

ADDITIONAL NON-MANDATORY OPTIONS (include with selected model number)

Sealing gasket material		
N	Graphite gasket	●
J	PTFE gasket	
Flushing connection ring plug		
G	Plug, SST	
H	Drain valve, SST	
NACE certificate		
Q15	Certificate of compliance to NACE MR0175/MR0103	
Material traceability certification		
Q8	Material traceability certification per EN 10204 3.1	●

Table 6 (End)

Diaphragm coating		Standard
V	Polymer diaphragm coating	
Z	Hydrogen-resistant diaphragm coating	
Extended product warranty		
WR5	5-year limited warranty	

TYPICAL MODEL NUMBER: 1199 W D C T RFW F G DA 0 0

EFW Extended Flanged Seal

Best-selling styles that have minimum lead time are marked with ● symbol in Standard column.

Table 7

Code	Industry standard				Standard
A	ANSI/ASME B16.5 (RF sealing surface by default)				
D	EN 1092-1 (B sealing surface by default)				
T	GOST 33259-2015 (B sealing surface by default)				●
Seal style					
EFW	Extended flanged seal				
Process connection size					
	ANSI/ASME B16.5	**GOST 33259-2015/ EN 1092-1**			
G	2-in.	DN 50			
7	3-in.	DN 80			●
9	4-in.	DN 100			●
Flange/pressure rating					
	ANSI/ASME B16.5	**GOST 33259-2015/ EN 1092-1**			
1	Class 150	—			●
2	Class 300	—			●
4	Class 600	—			●
5	Class 900	—			
6	Class 1500	—			
7	Class 2500	—			
E	—	PN 16			
G	—	PN 40			●
H	—	PN 63			●
J	—	PN 100			
K	—	PN 160			
Seal material					
	Diaphragm	**Extension**	**Diaphragm case**	**Flange**	
DA	316L SST	Stainless steel	316L SST	Stainless steel	●
DB	Hastelloy C-276	Stainless steel	316L SST	Stainless steel	
Seal extension length					
1	1-in. (25 mm)				●
2	2-in. (50 mm)				●
3	3-in. (75 mm)				●
4	4-in. (100 mm)				●
5	5-in. (125 mm)				
6	6-in. (150 mm)				
7	7-in. (175 mm)				
8	8-in. (200 mm)				
9	7-in. (225 mm)				

Table 7 (End)

Fractional extension length		Standard
0	None	●
1	2.5 mm	
2	5 mm	
3	7.5 mm	
4	10 mm	
5	12.5 mm	
6	15 mm	
7	17.5 mm	
8	20 mm	
9	22.5 mm	

ADDITIONAL NON-MANDATORY OPTIONS (include with selected model number)

NACE Certificate		
Q15	Certificate of compliance to NACE MR0175/MR0103	
Material traceability certification		
Q8	Material traceability certification per EN 10204 3.1	●
Diaphragm coating		
V	Polymer diaphragm coating	
Z	Hydrogen-resistant diaphragm coating	
Extended product warranty		
WR5	5-year limited warranty	
Special sealing surface form		
SSH	GOST 33259-15/EN 1092-1 Type E	
SSJ	GOST 33259-15/EN 1092-1 Type F	

TYPICAL MODEL NUMBER: 1199 W D C T EFW G G DA 4 0

THREADED SEALS

Best-selling styles that have minimum lead time are marked with ● symbol in Standard column.

RTW Remote Threaded Seal

Table 8

Code	Industry standard			Standard
A	ANSI/ASME B1.20.1			●
D	EN 10226-1/ISO 228-1			
T	GOST 24705			●
Seal style				
RTW	Threaded (standard thread is female, for male select Option code 9 at the end)			
Process connection size				
	ANSI/ASME B1.20.1	**ISO 228-1**	**GOST 24705**	
1	1/4-18 NPT	—	—	
3	1/2-14 NPT	—	—	●
C	—	G 1/2	—	
R	—	—	M20x1.5	●
Pressure rating				
	ANSI/ASME B1.20.1	**ISO 228-1**	**GOST 24705**	
0	2500 psi	172 bar	17.2 MPa	●
2	5000 psi	344 bar	34.4 MPa	●
3	10000 psi	689 bar	68.9 MPa	●

Seal material				
	Diaphragm	**Diaphragm case**	**Upper flange**	
DA	316L SST	316L SST	Stainless steel	●
DB	Hastelloy C-276	316L SST	Stainless steel	

Table 8 (End)

Flushing connection ring material (lower housing)		**Standard**
A	316L SST	●
Flushing connections (connection size)		
1	One connection (¼–18 NPT)	
3	Two connections (¼–18 NPT)	
5	None	●
7	One connection (½ –14 NPT)	
9	Two connections (½ –14 NPT)	

ADDITIONAL NON-MANDATORY OPTIONS (include with selected model number)

Sealing gasket material		
N	Graphite gasket	●
J	PTFE gasket	
Flushing connection ring plug		
G	Plug, SST	
H	Drain valve, SST	
NACE Certificate		
Q15	Certificate of compliance to NACE MR0175/MR0103	
Material traceability certification		
Q8	Material traceability certification per EN 10204 3.1	●
Diaphragm coating		
V	Polymer diaphragm coating	
Z	Hydrogen-resistant diaphragm coating	
Bolting material		
4	Stainless steel	
Special threads in lower housing		
9	Male thread	●
Extended product warranty		
WR5	5-year limited warranty	●

TYPICAL MODEL NUMBER: 1199 W D C T RTW R 0 D A A 5 J 9