

# Rosemount DP Level

## Rosemount 1199 Direct Mount Seal Systems



Tuned-System Assembly Comprised of 3051\_L with 1199 Flanged Seal

Rosemount 1199 Direct Mount Seals are used commonly at the bottom of the vessel. Their advanced design minimizes oil volume improving performance and eliminates the need for mounting hardware.

Product features and capabilities include:

- Direct Mount gage or absolute seal system can be used for open or vented to atmosphere tank applications
- Tuned-System Assemblies can be used for DP measurements in closed or pressurized tank applications
- Variety of process connections
- Quantified performance for the entire transmitter / seal assembly (QZ option)

### Additional Information

Specifications: page Level-91

Dimensional Drawings: page Level-106

### Rosemount 1199 Direct Mount Seal

The 1199 Direct Mount Seal also requires specification of a Rosemount pressure transmitter. See the appropriate Product Data Sheet for the desired transmitter and include the option indicated in the table below for the configuration desired.

Table 12. When ordering Rosemount 1199 Direct and Remote Mount Seals, please make sure to add the correct seal system ordering code to the transmitter model

Transmitter Model	2 Seals	1 Seal
3051S_C	B12	B11
3051C - Welded-Repairable	S2	S1
3051C - All Welded	S8 or S9	S7 or S0
2051C	S2	S1
3051T, 2051T, 2088	—	S1

A 1199 Direct Mount Seal consists of 2 parts. First, specify the direct mount connection model codes found on page Level-38. Then, specify a remote seal found on page Level-40.

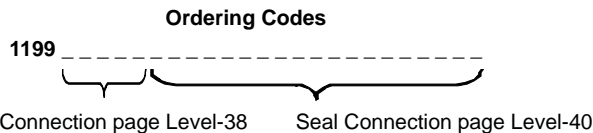


Table 13. Rosemount 1199 Direct Mount Seal Systems Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Model	Product Description			
1199	Seal Systems			
Connection Type	Seal System	Seal Location		
<b>Standard</b>				<b>Standard</b>
<b>3051S and 2051C Coplanar Transmitters (3051S_C and 2051C)</b>				
W	Welded-Repairable	One or Two Seal System	High Side of Transmitter	★
R <sup>(1)</sup>	All Welded	One Seal System	High Side of Transmitter	★
T <sup>(1)</sup>	All Welded	Two Seal System	High Side of Transmitter	★

# Product Data Sheet

00813-0100-4016, Rev LA  
Catalog 2011 - 2012

# Rosemount DP Level

Table 13. Rosemount 1199 Direct Mount Seal Systems Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

All In-Line Transmitters (3051S_T, 3051T, 2051T, 2088)							
W	All Welded	One or Two Seal System		High Side of Transmitter		★	
3051C Coplanar Transmitters (3051C)							
W	Determined by Transmitter Code	One or Two Seal System		High Side of Transmitter		★	
Seal Fill Fluid	Specific Gravity at 77 °F (25 °C)	Temperature Limits <sup>(2)</sup>					Standard
		No Extension	2-in. (50 mm) Extension	4-in. (100 mm) Extension	Thermal Optimizer		
Standard							★
A	Syltherm XLT	0.85	-102 to 293 °F (-75 to 145 °C)	-102 to 293 °F	102 to 293 °F (-75 to 145 °C)	102 to 293 °F (-75 to 145 °C)	★
C	Silicone 704	1.07	32 to 401 °F (0 to 205 °C) <sup>(3)</sup>	32 to 464 °F (0 to 240 °C) <sup>(3)</sup>	32 to 500 °F (0 to 260 °C) <sup>(3)</sup>	32 to 599 °F (0 to 315 °C)	★
D	Silicone 200	0.93	-49 to 401 °F (-45 to 205 °C)	-49 to 401 °F (-45 to 205 °C)	-49 to 401 °F (-45 to 205 °C)	-49 to 401 °F (-45 to 205 °C)	★
H	Inert (Halocarbon)	1.85	-49 to 320 °F (-45 to 160 °C)	-49 to 320 °F (-45 to 160 °C)	-49 to 320 °F (-45 to 160 °C)	-49 to 320 °F (-45 to 160 °C)	★
G <sup>(4)(5)</sup>	Glycerine and Water	1.13	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)	★
N <sup>(4)</sup>	Neobee M-20	0.92	5 to 401 °F <sup>(3)</sup> (-15 to 205 °C)	5 to 437 °F (-15 to 225 °C)	5 to 437 °F (-15 to 225 °C)	5 to 437 °F (-15 to 225 °C)	★
P <sup>(4)(5)</sup>	Propylene Glycol and Water	1.02	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)	★
Seal Connection Type							
Standard							Standard
A	Direct Mount						★
Direct Mount Connection Type							
	Extension Length	Seal System			Connection Type		
Standard							Standard
All Coplanar Transmitters (3051S_C, 3051C and 2051C)							
94	Direct Mount, No Extension		Tuned-System Assembly, two seals		Welded-Repairable		★
93	Direct Mount, No Extension		One Seal System		Welded-Repairable		★
96	Direct Mount, No Extension		Tuned-System Assembly, two seals		All Welded		★
97	Direct Mount, No Extension		One Seal System		All Welded		★
B4	Direct Mount, 2 in. (50 mm) Extension		Tuned-System Assembly, two seals		Welded-Repairable		★
B3	Direct Mount, 2 in. (50 mm) Extension		One Seal System		Welded-Repairable		★
B6	Direct Mount, 2 in. (50 mm) Extension		Tuned-System Assembly, two seals		All Welded		★
B7	Direct Mount, 2 in. (50 mm) Extension		One Seal System		All Welded		★
D4	Direct Mount, 4 in. (100 mm) Extension		Tuned-System Assembly, two seals		Welded-Repairable		★
D3	Direct Mount, 4 in. (100 mm) Extension		One Seal System		Welded-Repairable		★
D6	Direct Mount, 4 in. (100 mm) Extension		Tuned-System Assembly, two seals		All Welded		★
D7	Direct Mount, 4 in. (100 mm) Extension		One Seal System		All Welded		★
All In-Line Transmitters (3051S_T, 3051T, 2051T, 2088)							
95	Direct Mount, No Extension		One Seal System		All Welded		★
D5	Thermal Optimizer		One Seal System		All Welded		★

Level  
DP Level

- (1) All welded system connection types require either a 316L SST or Alloy C-276 isolating diaphragm in the pressure transmitter model codes.
- (2) At ambient pressure of 14.7 psia (1 bar-a) and ambient temperature of 70°F and must be further derated if ambient, temperature exceeds 70 °F (21 °C).
- (3) Maximum process temperature is limited by heat transfer to the transmitter.
- (4) This is a food grade fill fluid.
- (5) Not suitable for vacuum applications.

# Rosemount DP Level

**Continue specifying a completed model number by choosing a remote seal type below:**

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

			● = Transmitter Availability — = Unavailable					
Flanged Seal Assemblies			Coplanar Extensions				Process Connections	
			Inline	0 in.	2-in.	4-in.		
<b>Standard</b>								<b>Standard</b>
	page Level-49	FFW Flush Flanged Seal	●	(1)	●	●	2-in. / DN 50 / 50A 3-in. / DN 80 / 80A 4-in. / DN 100 / 100A	★
	page Level-52	RFW Flanged Seal	●	—	●	●	1/2-in. / DN 15 3/4-in. 1-in. / DN 25 / 25A 1 1/2-in. / DN 40 / 40A	★
	page Level-55	EFW Extended Flanged Seal	●	(1)	●	●	1 1/2-in. / DN 40 / 40A 2-in. / DN 50 / 50A 3-in. / Headbox / DN 80 / 80A 4-in. / Headbox / DN 100 / 100A	★
<b>Expanded</b>								
	page Level-59	FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface	●	(1)	●	●	2-in. 3-in.	
	page Level-61	RCW Ring Type Joint (RTJ) Flanged Seal	●	—	●	●	1/2-in. 3/4-in. 1-in. 1 1/2-in.	
	page Level-63	FUW and FVW Flush Flanged Type Seals	●	●	●	●	DN 50 DN 80	
Threaded Seal Assemblies			Coplanar Extensions				Process Connections	
			Inline	0 in.	2-in.	4-in.		
<b>Standard</b>								<b>Standard</b>
	page Level-64	RTW Threaded Seal	●	—	●	●	1/4 –18 NPT 3/8 –18 NPT 1/2 –14 NPT 3/4 –14 NPT 1 – 11.5 NPT 1 1/4 –11.5 NPT 1 1/2 –11.5 NPT G 1/2 A DIN 16288 R 1/2 per ISO 7/1	★
<b>Expanded</b>								
	page Level-67	HTS Male Threaded Seal	●	●	●	●	G1 G1 1/2 G2 1-11.5 NPT 1 1/2 -11.5 NPT 2-11.5 NPT	

Level



DP Level

# Product Data Sheet

00813-0100-4016, Rev LA  
 Catalog 2011 - 2012

# Rosemount DP Level





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Hygienic Seal Assemblies			Inline	Coplanar Extensions			Process Connections	
				0 in.	2-in.	4-in.		
<b>Standard</b>								
	page Level-68	SCW Hygienic Tri-Clover Style Tri-Clamp Seal	●	●	●	●	1 ½-in. 2-in. 2 ½-in. 3-in. 4-in.	★
	page Level-69	SSW Hygienic Tank Spud Seal	●	●	●	●	2-in. Extension 6-in. Extension	★
<b>Expanded</b>								
	page Level-70	STW Hygienic Thin Wall Tank Spud Seal	●	—	●	●	0.8 in Extension	
	page Level-71	EES Hygienic Flanged Tank Spud Extended Seal	●	●	●	●	DN 50 DN 80	
	page Level-72	VCS Tri-clamp® In-Line Seal	●	—	—	—	1-in. 1 ½-in. 2-in. 3-in. 4-in.	
	page Level-73	SVS Varivent® Compatible Hygienic Connection Seal	●	●	●	●	Tuchenhagen Varivent® Compatible	
	page Level-74	SHP Hygienic Cherry-Burrell "I" Line Seal	●	—	—	—	2-in. 3-in.	
	page Level-75	SLS Dairy Process Connection - Female Thread Seal per DIN 11851	●	—	—	—	DN 40 DN 50	
Specialty Seal Assemblies			Inline	Coplanar Extensions			Process Connections	
				0 in.	2-in.	4-in.		
<b>Expanded</b>								
	page Level-76	WSP Saddle Seal	●	—	●	●	2-in. 3-in. 4-in. or Larger	

Level  
DP Level

# Rosemount DP Level

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
 The Expanded offering is subject to additional delivery lead time.

	page Level-77	UCP Male Threaded Pipe Mount Seals and PMW Paper Mill Sleeve Seals	●	●	—	—	1 ½-in. with Threaded Knurled Nut 1-in. with Cap Screw Retainer	
	page Level-78	CTW Chemical Tee Seal	●	—	●	●	Retro-fit	
	page Level-79	TFS Wafer Style In-Line Seal	●	—	—	—	1-in. / DN 25 1 ½-in. / DN 40 2-in. / DN 50 3-in. / DN 80 4-in. / DN 100	
	page Level-80	WFW Flow-Thru Flanged Seal	●	—	●	●	1-in. 2-in. 3-in.	

(1) Available with ANSI Class 300 or EN 1092-1 PN 40 or JIS B2238 20K or lower flange ratings.

## Rosemount 1199 Remote Mount Seal Systems



Tuned-System Assembly  
 Comprised of 3051\_L with  
 1199 Flanged Seal

Rosemount 1199 Remote Mount Seals are used commonly at the top of the vessel when a DP measurement is required. They are available in three different diameters to optimize time response and reduce temperature effects.

Product features and capabilities include:

- Remote Mount Seals can be used for high temperature applications
- Remote Mount Seals are used on the low pressure side of the transmitter for Tuned-System Assemblies that can be used for DP measurements in closed or pressurized tank applications
- Variety of process connections
- Quantified performance for the entire transmitter / seal assembly (QZ option)

### Additional Information

Specifications: page Level-81

Certifications: page Level-93

Dimensional Drawings: page Level-106

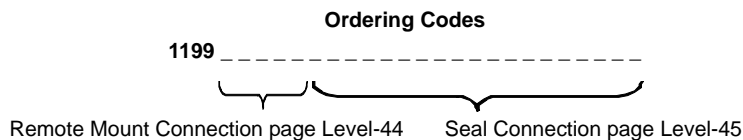
### Rosemount 1199 Remote Mount Seal

The 1199 Remote Mount Seal also requires specification of a Rosemount pressure transmitter. See the appropriate Product Data Sheet for the desired transmitter and include the option indicated in the table below for the configuration desired.

Table 14. When ordering Rosemount 1199 Direct and Remote Mount Seals, please make sure to add the correct seal system ordering code to the transmitter model

Transmitter Model	2 Seals	1 Seal
3051S_C	B12	B11
3051C - Welded-Repairable	S2	S1
3051C - All Welded	S8 or S9	S7 or S0
2051C	S2	S1
3051T, 2051T, 2088	—	S1

A 1199 Remote Mount Seal consists of 2 parts. First, specify the capillary model codes found on page Level-44. Then, specify a remote seal found on page Level-45.



Level  
 DP Level

# Rosemount DP Level

## Capillary/Fill Fluid

**NOTE:**

Use Table 15 for Capillary Type Connections. Use Table 13 for Direct Mount Type Connections.

Table 15. Rosemount 1199 Remote Mount Seal Systems Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

Model	Product Description			
1199	Seal System			
Connection Type		Seal System	Seal Location	
<b>Standard</b>				<b>Standard</b>
<b>3051S and 2051 Coplanar Transmitters (3051S_C and 2051C)</b>				
W	Welded-Repairable	One or Two Seal System	High Side of Transmitter	★
M	Welded-Repairable	One or Two Seal System	Low Side of Transmitter	★
D	Welded-Repairable	Two Seal System	Balanced System - Same Seal on Low and High Side	★
R <sup>(1)</sup>	All Welded	One Seal System	High Side of Transmitter	★
T <sup>(1)</sup>	All Welded	Two Seal System	High Side of Transmitter	★
S <sup>(1)</sup>	All Welded	Two Seal System	Low Side of Transmitter	★
<b>All In-Line Transmitters (3051S_T, 3051T, 2051T, 2088)</b>				
W	All Welded	One or Two Seal System	High Side of Transmitter	★
<b>3051 Coplanar Transmitters (3051C)</b>				
W	Determined by Transmitter Code	One or Two Seal System	High Side of Transmitter	★
M	Determined by Transmitter Code	One or Two Seal System	Low Side of Transmitter	★
D	Determined by Transmitter Code	Two Seal System	Balanced System - Same Seal on Low and High Side	★
Seal Fill Fluid		Specific Gravity at 77 °F (25 °C)	Temperature Limits <sup>(2)</sup>	
<b>Standard</b>				<b>Standard</b>
A <sup>(3)</sup>	Syltherm XLT	0.85	-102 to 293 °F (-75 to 145 °C)	★
C	Silicone 704	1.07	32 to 599 °F (0 to 315 °C)	★
D	Silicone 200	0.93	-49 to 401 °F (-45 to 205 °C)	★
H	Inert (Halocarbon)	1.85	-49 to 320 °F (-45 to 160 °C)	★
G <sup>(4)(5)</sup>	Glycerin and Water	1.13	5 to 203 °F (-15 to 95 °C)	★
N <sup>(4)</sup>	Neobee M-20	0.92	5 to 437 °F (-15 to 225 °C)	★
P <sup>(4)(5)</sup>	Propylene Glycol and Water	1.02	5 to 203 °F (-15 to 95 °C)	★
<b>Seal Connection Type / Capillary ID, Description</b>				
<b>Standard</b>				<b>Standard</b>
B	0.03-in. (0.711 mm) ID			★
C	0.04-in. (1.092 mm) ID			★
D	0.075-in. (1.905 mm) ID			★
E	0.03-in. (0.711 mm) ID, PVC Coated			★
F	0.04-in. (1.092 mm) ID, PVC Coated			★
G	0.075-in. (1.905 mm) ID, PVC Coated			★
H	0.03-in. (0.711 mm) ID, 4-in. Support Tube			★
J	0.04-in. (1.092 mm) ID, 4-in. Support Tube			★
K	0.075-in. (1.905 mm) ID, 4-in. Support Tube			★
M <sup>(6)</sup>	0.03-in. (0.711 mm) ID, PVC Coated, 4-in. Support Tube with Closed End			★
N <sup>(6)</sup>	0.04-in. (1.092 mm) ID, PVC Coated, 4-in. Support Tube with Closed End			★
P <sup>(6)</sup>	0.075-in. (1.905 mm) ID, PVC Coated, 4-in. Support Tube with Closed End			★
<b>Capillary Length / Direct Mount</b>				
<b>Standard</b>				<b>Standard</b>
01	1 ft (0.3 m)			★
05	5 ft (1.5 m)			★

Level

DP Level

# Product Data Sheet

00813-0100-4016, Rev LA  
 Catalog 2011 - 2012

# Rosemount DP Level

Table 15. Rosemount 1199 Remote Mount Seal Systems Ordering Information



★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
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10	10 ft (3.0 m)	★
15	15 ft (4.5 m)	★
20	20 ft (6.1 m)	★
51	1.6 ft (0.5 m)	★
52	3.3 ft (1.0 m)	★
53	4.9 ft (1.5 m)	★
54	6.6 ft (2.0 m)	★
55	8.2 ft (2.5 m)	★
56	9.8 ft (3.0 m)	★
57	11.5 ft (3.5 m)	★
58	13.1 ft (4.0 m)	★
59	16.4 ft (5.0 m)	★
60	19.7 ft (6.0 m)	★
<b>Expanded</b>		
25	25 ft (7.6 m)	
30	30 ft (9.1 m)	
35	35 ft (10.7 m)	
40	40 ft (12.2 m)	
45	45 ft (13.7 m)	
50	50 ft (15.2 m)	
61	23 ft (7.0 m)	
62	26.2 ft (8.0 m)	
63	29.5 ft (9.0 m)	
64	32.8 ft (10.0 m)	
65	36.1 ft (11.0 m)	
66	39.4 ft (12.0 m)	
67	42.6 ft (13.0 m)	
68	45.9 ft (14.0 m)	
69	49.2 ft (15.0 m)	

- (1) All welded system connection types require either a 316L SST or Alloy C-276 isolating diaphragm in the pressure transmitter model codes.
- (2) At ambient pressure of 14.7 psia (1 bar-a) and ambient temperature of 70°F and must be further derated if ambient, temperature exceeds 70 °F (21 °C).
- (3) Temperature limits are reduced in vacuum service and may be limited by seal selection.
- (4) This is a food grade fill fluid.
- (5) Not suitable for vacuum applications.
- (6) Compression fitting does not provide a hermetic seal.

### Continue specifying a completed model number by choosing a remote seal type below:

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
 The Expanded offering is subject to additional delivery lead time.

Flanged Seal Assemblies			Process Connections	
<b>Standard</b>				<b>Standard</b>
	page Level-49	FFW Flush Flanged Seal	2-in. / DN 50 / 50A 3-in. / DN 80 / 80A 4-in. / DN 100 / 100A	★
	page Level-52	RFB Flanged Seal	1/2-in. / DN 15 3/4-in. 1-in. / DN 25 / 25A 1 1/2-in. / DN 40 / 40A	★

Level  
DP Level



# Rosemount DP Level

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

	page Level-55	EFW Extended Flanged Seal	1 1/2-in. / DN 40 / 40A 2-in. / DN 50 / 50A 3-in. / Headbox / DN 80 / 80A 4-in. / Headbox / DN 100 / 100A	★
	page Level-57	PFW Pancake Seal	2-in. / DN50 3-in. / DN 80	★
<b>Expanded</b>				
	page Level-59	FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface	2-in. 3-in.	
	page Level-61	RCW Ring Type Joint (RTJ) Flanged Seal	1/2-in. 3/4-in. 1-in. 1 1/2-in.	
	page Level-63	FUW and FVW Flush Flanged Type Seals	DN 50 DN 80	
<b>Threaded Seal Assemblies</b>			<b>Process Connections</b>	
<b>Standard</b>				<b>Standard</b>
	page Level-64	RTW Threaded Seal	1/4 –18 NPT 3/8 –18 NPT 1/2 –14 NPT 3/4 –14 NPT 1 – 11.5 NPT 1 1/4 –11.5 NPT 1 1/2 –11.5 NPT G 1/2 A DIN 16288 R 1/2 per ISO 7/1	★
<b>Expanded</b>				
	page Level-67	HTS Male Threaded Seal	G1 G1 1/2 G2 1-11.5 NPT 1 1/2 -11.5 NPT 2-11.5 NPT	
<b>Hygienic Seal Assemblies</b>			<b>Process Connections</b>	
<b>Standard</b>				<b>Standard</b>
	page Level-68	SCW Hygienic Tri-Clover Style Tri-Clamp Seal	1 1/2-in. 2-in. 2 1/2-in. 3-in. 4-in.	★

Level


DP Level

# Product Data Sheet

00813-0100-4016, Rev LA  
 Catalog 2011 - 2012

# Rosemount DP Level

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
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	page Level-69	SSW Hygienic Tank Spud Seal	2-in. Extension 6-in. Extension	★
<b>Expanded</b>				
	page Level-70	STW Hygienic Thin Wall Tank Spud Seal	0.8 in Extension	
	page Level-71	EES Hygienic Flanged Tank Spud Extended Seal	DN 50 DN 80	
	page Level-72	VCS Tri-clamp® In-Line Seal	1-in. 1 ½-in. 2-in. 3-in. 4-in.	
	page Level-73	SVS Varivent® Compatible Hygienic Connection Seal	Tuchenhagen Varivent Compatible	
	page Level-74	SHP Hygienic Cherry-Burrell "I" Line Seal	2-in. 3-in.	
	page Level-75	SLS Dairy Process Connection - Female Thread Seal per DIN 11851	DN 40 DN 50	
<b>Specialty Seal Assemblies</b>			<b>Process Connections</b>	
<b>Expanded</b>				
	page Level-76	WSP Saddle Seal	2-in. 3-in. 4-in. or Larger	
	page Level-77	UCP Male Threaded Pipe Mount Seals and PMW Paper Mill Sleeve Seals	1 ½-in. with Threaded Knurled Nut 1-in. with Cap Screw Retainer	

Level

DP Level

# Rosemount DP Level

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
 The Expanded offering is subject to additional delivery lead time.

	page Level-78	CTW Chemical Tee Seal	Retro-fit	
	page Level-79	TFS Wafer Style In-Line Seal	1-in. / DN 25 1 ½-in. / DN 40 2-in. / DN 50 3-in. / DN 80 4-in. / DN 100	
	page Level-80	WFW Flow-Thru Flanged Seal	1-in. 2-in. 3-in.	

Level

DP Level

## Flanged Seal Assemblies



### FFW FLUSH FLANGED SEAL

Table 16. FFW Flush Flanged Seal – Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

Code		Industry Standards			
<b>Standard</b>					<b>Standard</b>
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)				★
D	EN 1092-1 (European Standard)				★
<b>Expanded</b>					
J	JIS B2238 (Japanese Industrial Standard)				
<b>Process Connection Style</b>					
<b>Standard</b>					<b>Standard</b>
FFW	Flush Flanged Seal				★
<b>Process Connection Size</b>					
	<b>ANSI/ASME B16.5</b>	<b>EN 1092-1</b>	<b>JIS B2238</b>		
<b>Standard</b>					<b>Standard</b>
G	2-in.	DN 50	50 A		★
7	3-in.	—	80 A		★
J	—	DN 80	—		★
9	4-in.	DN 100	100 A		★
<b>Flange / Pressure Rating</b>					
	<b>ANSI/ASME B16.5</b>	<b>EN 1092-1</b>	<b>JIS B2238</b>		
<b>Standard</b>					<b>Standard</b>
1	Class 150	—	10K		★
2	Class 300	—	20K		★
4	Class 600	—	40K		★
G	—	PN 40	—		★
<b>Expanded</b>					
E	—	PN 10 / 16 (DN 100 only)	—		
5	Class 900	—	—		
6	Class 1500	—	—		
7	Class 2500	—	—		
H	—	PN 63	—		
J	—	PN 100	—		
K	—	PN 160	—		
<b>Diaphragm and Wetted, Upper Housing, Flange Material</b>					
	<b>Diaphragm and Wetted</b>	<b>Upper Housing</b>	<b>Flange</b>		
<b>Standard</b>					<b>Standard</b>
CA <sup>(1)(2)</sup>	316L SST	316L SST	CS		★
DA <sup>(2)</sup>	316L SST	316L SST	316 SST		★
CB <sup>(1)(3)</sup>	Alloy C-276, seam welded	316L SST	CS		★
DB <sup>(3)</sup>	Alloy C-276, seam welded	316L SST	316 SST		★
CC <sup>(1)</sup>	Tantalum, seam welded	316L SST	CS		★
DC	Tantalum, seam welded	316L SST	316 SST		★
C3 <sup>(1)(2)(3)(4)</sup>	Tantalum, brazed	316L SST	CS		★
D3 <sup>(1)(2)(3)(4)</sup>	Tantalum, brazed	316L SST	316 SST		★

# Rosemount DP Level

Table 16. FFW Flush Flanged Seal – Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

<b>Expanded</b>			
MB <sup>(1)(2)</sup>	Alloy C-276, solid faceplate	Alloy C-276 / 316L SST	CS
KB <sup>(1)(2)</sup>	Alloy C-276, solid faceplate	Alloy C-276 / 316L SST	316 SST
DJ	Alloy B	316L SST	316 SST
DF	304L SST	316L SST	316 SST
DV	Alloy 400	316L SST	316 SST
RH <sup>(2) (5)</sup>	Titanium Grade 4	Titanium GR.4	316 SST
DH <sup>(6)</sup>	Titanium Grade 4	316L SST	316 SST
DE	Alloy 600	316L SST	316 SST
DP	Nickel 201	316L SST	316 SST
WW <sup>(2)(7)</sup>	316Ti SST (WNR 1.4571)	316Ti SST (WNR 1.4571)	316Ti SST (WNR 1.4571)
DZ <sup>(6)</sup>	Zirconium 702	316L SST	316 SST
D4	Alloy C-22	316L SST	316 SST
D5	Duplex 2507 SST	316L SST	316 SST
<b>Flushing Connection Ring Material (Lower Housing)<sup>(8)</sup></b>			
<b>Standard</b>			<b>Standard</b>
0	None		★
A	316L SST		★
B	Alloy C-276		★
<b>Expanded</b>			
2	Duplex 2205 SST		
H	Titanium Grade 4		
6	Nickel 201		
V	Alloy 400		
<b>Flushing Connection Options, Quantity (Size)</b>			
<b>Standard</b>			<b>Standard</b>
0	None		★
1	1 (1/4-18 NPT)		★
3	2 (1/4-18 NPT)		★
7	1 (1/2-14 NPT)		★
9	2 (1/2-14 NPT)		★

## Options (Include with selected model number)

<b>Gasket Material</b>			
<b>Standard</b>			<b>Standard</b>
J	PTFE gasket (for use with flushing connection ring)		★
<b>Expanded</b>			
N	Grafoil gasket (for use with flushing connection ring)		
K	Barium Sulfate filled PTFE gasket (for use with flushing connection ring)		
<b>Flushing Plug, Vent/Drain Valve</b>			
<b>Standard</b>			<b>Standard</b>
D	Alloy C-276 plug(s) for flushing connection(s)		★
G	316 SST plug(s) for flushing connection(s)		★
H	316 SST vent/drain for flushing connection(s)		★
<b>Diaphragm Thickness</b>			
<b>Expanded</b>			
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications		
7	0.002-in. (50 µm) available with 316L SST and Alloy C-276		
<b>Mounting Flange</b>			
<b>Expanded</b>			
4 <sup>(9)</sup>	Flat face, flush flanged		

Level

DP Level

# Product Data Sheet

00813-0100-4016, Rev LA  
 Catalog 2011 - 2012

# Rosemount DP Level

Table 16. FFW Flush Flanged Seal – Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
 The Expanded offering is subject to additional delivery lead time.

Code Conformance		
<b>Standard</b>		<b>Standard</b>
T <sup>(10)</sup>	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	★
<b>Gasket Surface Finish</b>		
<b>Expanded</b>		
1	Gasket Surface Ra 125 Max.	
<b>Cold Temp Application</b>		
<b>Standard</b>		<b>Standard</b>
B	Extra Fill For Cold Temp Application	★
<b>Diaphragm Coating</b>		
<b>Expanded</b>		
U <sup>(11)</sup>	0.001-in. (25 µm) gold plated Diaphragm	
V <sup>(12)</sup>	PTFE coated diaphragm for nonstick purposes only	
<b>Capillary Change</b>		
<b>Expanded</b>		
2	Radial capillary connection	
<b>Alternate Design</b>		
<b>Standard</b>		<b>Standard</b>
E <sup>(12)</sup>	One Piece Design	★
<b>Typical Model Number: 1199 W DC 1 0 A FFW 7 1 DA 0 0</b>		

- (1) Only available with two piece design.
- (2) For use with spiral wound metallic gaskets.
- (3) Not available with option code C.
- (4) Only available in Process Connection Size code G, 7, and J.
- (5) Not available with welded capillary connections or direct mount.
- (6) Operating temperature limited to 302 °F (150 °C).
- (7) Only available with one-piece design, option code E.
- (8) Supplied standard with ThermoTork TN9000.
- (9) The mounting flange and upper housing are a single item for the one-piece design. Only available with diaphragm and wetted part material codes DA, DB, DJ, DF, DV, DH, DE, DP, WW, DZ, D4, DC, and D5.
- (10) Materials of Construction comply with metallurgical requirements highlighted within NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.
- (11) Only available on 316LSS, Alloy 400 and Alloy C-276.
- (12) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

Level  
DP Level

# Rosemount DP Level



## RFW FLANGED SEAL

Table 17. RFW Flanged Seal Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

Code	Industry Standard			
<b>Standard</b>				<b>Standard</b>
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)			★
D	EN 1092-1 (European Standard)			★
<b>Expanded</b>				
J	JIS B2238 (Japanese Industrial Standard)			
<b>Process Connection Style</b>				
<b>Standard</b>				<b>Standard</b>
RFW	Flanged Seal			★
<b>Process Connection Size</b>				
<b>Standard</b>				<b>Standard</b>
	<b>ANSI/ASME B16.5</b>	<b>EN 1092-1</b>	<b>JIS B2238</b>	
2	1-in.	—	25A	★
4	1 <sup>1</sup> / <sub>2</sub> -in.	—	40A	★
D	—	DN 25	—	★
F	—	DN 40	—	★
<b>Expanded</b>				
1	1/2-in.	—	—	
A	3/4-in.	DN 10	10A	
B	—	DN 15	15A	
C	—	DN 20	20A	
<b>Flange/Pressure Rating</b>				
	<b>ANSI/ASME B16.5</b>	<b>EN 1092-1</b>	<b>JIS B2238</b>	
<b>Standard</b>				<b>Standard</b>
1	Class 150	—	10K	★
2	Class 300	—	20K	★
4	Class 600	—	40K	★
G	—	PN 40	—	★
<b>Expanded</b>				
5	Class 900	—	—	
6	Class 1500	—	—	
7	Class 2500	—	—	
H	—	PN 63	—	
J	—	PN 100	—	
K	—	PN 160	—	
<b>Diaphragm, Upper Housing, Flange Material</b>				
	<b>Diaphragm</b>	<b>Upper Housing</b>	<b>Flange</b>	
<b>Standard</b>				<b>Standard</b>
CA	316L SST	316L SST	CS	★
DA	316L SST	316L SST	316 SST	★
CB	Alloy C-276	316L SST	CS	★
DB	Alloy C-276	316L SST	316 SST	★
CC	Tantalum	316L SST	CS	★
DC	Tantalum	316L SST	316 SST	★
<b>Expanded</b>				
DF	304L SST	316L SST	316 SST	
DJ	Alloy B	316L SST	316 SST	
DE	Alloy 600	316L SST	316 SST	

Level

DP Level

# Product Data Sheet

00813-0100-4016, Rev LA  
Catalog 2011 - 2012

# Rosemount DP Level

Table 17. RFW Flanged Seal Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

DV	Alloy 400	316L SST	316 SST	
DP	Nickel 201	316L SST	316 SST	
DK	Alloy 20	316L SST	316 SST	
RH <sup>(1)</sup>	Titanium Grade 4	Titanium Grade 4	316 SST	
DH	Titanium Grade 4	316L SST	316 SST	
D4	Alloy C-22	316L SST	316 SST	
D5	Duplex 2507 SST	316L SST	316 SST	
DZ	Zirconium 702	316L SST	316 SST	
<b>Flushing Connection Ring Material (Lower Housing)<sup>(2)</sup></b>				
<b>Standard</b>				<b>Standard</b>
A	316L SST			★
B	Alloy C-276			★
D	Plated CS			★
<b>Expanded</b>				
2	Duplex 2205			
F	304L SST			
H	Titanium Grade 4			
V	Alloy 400			
C	Tantalum lined 316L SST (no flushing connection allowed)			
<b>Flushing Connection Options, Quantity Size</b>				
<b>Standard</b>				<b>Standard</b>
5	None			★
1	1 (1/4-18 NPT)			★
3	2 (1/4-18 NPT)			★
<b>Expanded</b>				
7	1 (1/2-14 NPT)			
9	2 (1/2-14 NPT)			

## Options (Include with selected model number)

<b>Gasket Material</b>				
<b>Standard</b>				<b>Standard</b>
J	PTFE gasket			★
<b>Expanded</b>				
N	Grafoil <sup>®</sup> gasket			
K	Barium Sulfate filled PTFE gasket			
R	Ethylene Propylene gasket			
<b>Flushing Plug, Vent/Drain Valve</b>				
<b>Standard</b>				<b>Standard</b>
D	Alloy C-276 plug(s) for flushing connection(s)			★
G	316 SST plug(s) for flushing connection(s)			★
H	316 SST vent/drain for flushing connection(s)			★
<b>Diaphragm Thickness</b>				
<b>Expanded</b>				
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications			
<b>Bolt Material</b>				
<b>Expanded</b>				
3	304 SST Bolts (Only available for Stud Bolt Design)			
<b>Code Conformance</b>				
<b>Standard</b>				<b>Standard</b>
T <sup>(3)</sup>	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103			★
<b>Gasket Surface Finish</b>				
<b>Expanded</b>				
1	Gasket Surface Ra 125 Max.			

Level

DP Level



# Rosemount DP Level

Table 17. RFW Flanged Seal Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
 The Expanded offering is subject to additional delivery lead time.

Cold Temperature Application		
Standard		Standard
B	Extra Fill For Cold Temp Application	★
Diaphragm Coating		
Expanded		
U <sup>(4)</sup>	0.001-in. (25 µm) Gold plated diaphragm	
V <sup>(5)</sup>	PTFE coated diaphragm for nonstick purposes only	
Large Diaphragm Size		
Expanded		
9	4.1-in. (104 mm) Diaphragm Diameter	
<b>Typical Model Number: 1199 W DC 1 0 A RFW 2 1 DA A 5</b>		

(1) Not available with welded capillary connections or direct mount.

(2) Supplied with C4401 Aramid fiber gasket.

(3) Materials of Construction comply with metallurgical requirements highlighted within NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.

(4) Only available on 316LSS, Alloy 400 and Alloy C-276.

(5) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

Level

DP Level



**EFW EXTENDED FLANGED SEAL**

Table 18. EFW Extended Flanged Seal Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Code	Industry Standard				● = Available — = Unavailable						
<b>Standard</b>											<b>Standard</b>
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)										★
D	EN 1092-1 (European Standard)										★
<b>Expanded</b>											
J	JIS B2238 (Japanese Industrial Standards)										
<b>Process Connection Style</b>											
<b>Standard</b>											<b>Standard</b>
EFW	Extended Flanged Seal										★
<b>Process Connection Size</b>											
	ANSI/ASME B16.5		EN 1092-1		JIS B2238		Extension Diameters				
<b>Standard</b>											<b>Standard</b>
7	3-in.		DN 80		80A		2.58-in. (66 mm)				★
9	4-in.		DN 100		100A		3.50-in. (89 mm)				★
<b>Expanded</b>											
4	1 1/2-in.		DN 40		40A		1.45-in. (37 mm)				
G	2-in.		DN 50		50A		1.90-in. (49 mm)				
H	3-in. (Headbox)		DN 80 (Headbox)		—		2.875-in. (74 mm)				
K	4-in. (Headbox)		DN 100 (Headbox)				3.780-in. (97 mm)				
<b>Flange/Pressure Rating</b>											
	ANSI/ASME B16.5		EN 1092-1		JIS B2238						
<b>Standard</b>											<b>Standard</b>
1	Class 150		—		10K						★
2	Class 300		—		20K						★
4	Class 600		—		40K						★
G	—		PN 40		—						★
<b>Expanded</b>											
E	—		PN 10/16 (DN 100 only)		—						
5	Class 900		—		—						
6	Class 1500		—		—						
7	Class 2500		—		—						
H	—		PN 63		—						
J	—		PN 100		—						
K	—		PN 160		—						
<b>Diaphragm, Extension and Gasket Surface, Upper Housing, Flange Material</b>					<b>Available with Process Connection Code</b>						
Code	Diaphragm	Extension/ Gasket Surface	Upper Housing	Mounting Flange	7	9	4	G	H	K	
<b>Standard</b>											<b>Standard</b>
DA	316L SST	316L SST	316L SST	316 SST	●	●	●	●	●	●	★
CA	316L SST	316L SST	316L SST	CS	●	●	●	●	●	●	★
DB	Alloy C-276	Alloy C-276	316L SST	316 SST	●	●	●	●	●	●	★
CB	Alloy C-276	Alloy C-276	316L SST	CS	●	●	●	●	●	●	★
<b>Expanded</b>											
DM	Alloy C-276	316L SST	316L SST	316 SST	●	●	●	●	●	●	
DD	Tantalum	316L SST	316L SST	316 SST	●	●	—	—	—	—	
DC	Tantalum	Tantalum Lined	316L SST	316 SST	●	●	—	●	—	—	

Level  
DP Level

# Rosemount DP Level

Table 18. EFW Extended Flanged Seal Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

D5	Duplex 2507 SST	Duplex 2205 SST	316L SST	316 SST	●	●	●	●	●	●		
D9	Duplex 2507 SST	316L SST	316L SST	316 SST	●	●	●	●	●	●		
<b>Extension Length</b>												
	<b>ANSI/ASME B16.5</b>		<b>EN 1092-1 / JIS B2238</b>									
<b>Standard</b>											<b>Standard</b>	
2	2-in.		50 mm									★
4	4-in.		100 mm									★
6	6-in.		150 mm									★
<b>Expanded</b>												
8	8-in.		200 mm									
1	1-in.		25 mm									
3	3-in.		75 mm									
5	5-in.		125 mm									
7	7-in.		175 mm									
9	9-in.		225 mm									
<b>Fractional Extension Length</b>												
	<b>ANSI/ASME B16.5</b>		<b>EN 1092-1 / JIS B2238</b>									
<b>Standard</b>											<b>Standard</b>	
0	0-in.		0 mm									★

## Options (Include with selected model number)

<b>Diaphragm Thickness</b>											
<b>Expanded</b>											
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications										
<b>Code Conformance</b>											
<b>Standard</b>											<b>Standard</b>
T <sup>(1)</sup>	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103										★
<b>Gasket Surface Finish</b>											
<b>Expanded</b>											
1	Gasket Surface Ra 125 Max.										
<b>Cold Temperature Application</b>											
<b>Standard</b>											<b>Standard</b>
B	Extra Fill For Cold Temperature Application										★
<b>Diaphragm Coating</b>											
<b>Expanded</b>											
U <sup>(2)</sup>	0.001-in. (25 µm) Gold plated diaphragm										
V <sup>(3)</sup>	PTFE coated diaphragm for nonstick purposes only										
<b>Typical Model Number: 1199 W DC 1 0 A EFW 7 1 DA 2 0</b>											

(1) Materials of Construction comply with metallurgical requirements highlighted within NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.

(2) Only available on 316LSS, Alloy 400 and Alloy C-276.

(3) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

Level

DP Level



**PFW PANCAKE SEAL**

Table 19. PFW Pancake Seal Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
 The Expanded offering is subject to additional delivery lead time.

Code	Industry Standard			
<b>Standard</b>				<b>Standard</b>
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)			★
D	EN 1092-1 (European Standard)			★
<b>Process Connection Style</b>				
<b>Standard</b>				<b>Standard</b>
PFW	Pancake Seal			★
<b>Process Connection Size</b>				
	<b>ANSI</b>	<b>EN 1092-1</b>		
<b>Standard</b>				<b>Standard</b>
G	2-in.	DN 50		★
7	3-in.	—		★
J	—	DN 80		★
<b>Flange/Pressure Rating</b>				
	<b>ANSI</b>	<b>EN 1092-1</b>		
<b>Standard</b>				<b>Standard</b>
0	Seal MWP based on customer supplied flange			★
1	Class 150	—		★
2	Class 300	—		★
4	Class 600	—		★
G	—	PN40		★
<b>Expanded</b>				
5	Class 900	—		
6	Class 1500	—		
7	Class 2500	—		
H	—	PN 63		
J	—	PN 100		
<b>Diaphragm and Wetted, Upper Housing, Flange Material</b>				
	<b>Diaphragm and Wetted</b>	<b>Upper Housing</b>	<b>Flange</b>	
<b>Standard</b>				<b>Standard</b>
LA <sup>(1)</sup>	316L SST	316L SST	None	★
CA <sup>(1)</sup>	316L SST	316L SST	CS	★
DA <sup>(1)</sup>	316L SST	316L SST	316 SST	★
LB	Alloy C-276, Seam Welded	316L SST	None	★
CB	Alloy C-276, Seam Welded	316L SST	CS	★
DB	Alloy C-276, Seam Welded	316L SST	316 SST	★
LC	Tantalum, Seam Welded	316L SST	None	★
CC	Tantalum, Seam Welded	316L SST	CS	★
DC	Tantalum, Seam Welded	316L SST	316 SST	★
<b>Flushing Connection Ring Material (Lower Housing)<sup>(2)</sup></b>				
<b>Standard</b>				<b>Standard</b>
0	None			★
A	316L SST			★
B	Alloy C-276			★

Level  
DP Level

# Rosemount DP Level

Table 19. PFW Pancake Seal Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

Flushing Connection Options, Quantity (Size)		
<b>Standard</b>		<b>Standard</b>
0	None	★
1	1 (1/4-18 NPT)	★
3	2 (1/4-18 NPT)	★
7	1 (1/2-14 NPT)	★
9	2 (1/2-14 NPT)	★

## Options (Include with selected model number)

Gasket Material		
<b>Standard</b>		<b>Standard</b>
J	PTFE gasket	★
<b>Expanded</b>		
N	Grafoil® gasket	
K	Barium Sulfate filled PTFE gasket	
Flushing Plug, Vent/Drain Valve		
<b>Standard</b>		<b>Standard</b>
D	Alloy C-276 plug(s) for flushing connection(s)	★
G	316 SST plug(s) for flushing connection(s)	★
H	316 SST vent/drain for flushing connection(s)	★
Diaphragm Thickness		
<b>Expanded</b>		
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications	
Code Conformance		
<b>Standard</b>		<b>Standard</b>
T <sup>(3)</sup>	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	★
Gasket Surface Finish		
<b>Expanded</b>		
1	Gasket Surface Ra 125 Max.	
Cold Temperature Application		
<b>Standard</b>		<b>Standard</b>
B	Extra Fill For Cold Temp Application	★
Diaphragm Coating		
<b>Expanded</b>		
U <sup>(4)</sup>	0.001-in. (25 µm) Gold plated diaphragm	
V <sup>(5)</sup>	PTFE coated diaphragm for nonstick purposes only	
<b>Typical Model Number: 1199 W DC 1 0 A PFW 7 1 DA 0 0</b>		

(1) For use with customer supplied spiral wound metallic gaskets.

(2) Supplied standard with Thermo Torque TN9000 gasket.

(3) Materials of Construction comply with metallurgical requirements highlighted within NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.

(4) Only available on 316LSS, Alloy 400, and Alloy C-276.

(5) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

Level

DP Level



**FCW FLUSH FLANGED SEAL – RING TYPE JOINT (RTJ) GASKET SURFACE**

Table 20. FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface Ordering Information  
 This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code		Industry Standards	
<b>Expanded</b>			
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)		
<b>Process Connection Style</b>			
<b>Expanded</b>			
FCW	Flush Flanged Seal - Ring Type Joint Gasket Surface		
<b>Process Connection Size</b>			
<b>Expanded</b>			
G	2-in.		
7	3-in.		
<b>Flange/Pressure Rating</b>			
<b>Expanded</b>			
1	Class 150		
2	Class 300		
4	Class 600		
5	Class 900		
6	Class 1500		
7	Class 2500		
<b>Diaphragm and Wetted, Upper Housing, Flange Material</b>			
	<b>Diaphragm and Wetted</b>	<b>Upper Housing</b>	<b>Flange</b>
<b>Expanded</b>			
DA	316L SST	316L SST	316 SST
KB	Alloy C-276	316L SST	316 SST
K5	Duplex 2507 SST/Duplex 2205	316L SST	316 SST
<b>Flushing Connection Ring Material (Lower Housing)</b>			
<b>Expanded</b>			
0	None		
A	316L SST		
B	Alloy C-276		
2	Duplex 2205 SST		
<b>Flushing Connection Options</b>			
<b>Expanded</b>			
0	None		
1	1 (1/4-18 NPT)		
3	2 (1/4-18 NPT)		
7	1 (1/2-14 NPT)		
9	2 (1/2-14 NPT)		
<b>Options</b> (Include with selected model number)			
<b>Flushing Plug, Vent/Drain Valve</b>			
<b>Expanded</b>			
D	Alloy C-276 plug(s) for flushing connection(s)		
G	316 SST plug(s) for flushing connection(s)		
H	316 SST vent/drain for flushing connection(s)		

Level  
DP Level

# Rosemount DP Level

Table 20. FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface Ordering Information

This seal is part of the Expanded offering and is subject to additional delivery lead time.

<b>Diaphragm Thickness</b>	
<b>Expanded</b>	
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications
7	0.002-in. (50 µm) available with 316L SST and Alloy C-276
<b>Code Conformance</b>	
<b>Expanded</b>	
T <sup>(1)</sup>	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103
<b>Cold Temp Application</b>	
<b>Expanded</b>	
B	Extra Fill For Cold Temp Application
<b>Diaphragm Coating</b>	
<b>Expanded</b>	
U <sup>(2)</sup>	0.001-in. (25 µm) Gold plated diaphragm
V <sup>(3)</sup>	PTFE coated diaphragm for nonstick purposes only
<b>Alternate Design</b>	
<b>Expanded</b>	
E	One Piece Design
<b>Typical Model Number: 1199 W DC 1 0 A FCW 7 1 DA 0 0</b>	

(1) *Materials of Construction comply with metallurgical requirements highlighted within NACE MRO175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.*

(2) *Only available on 316LSS and Alloy C-276.*

(3) *Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.*

Level

DP Level



**RCW RING TYPE JOINT (RTJ) FLANGED SEAL**

Table 21. RCW Ring Type Joint Flanged Seal Ordering Information

This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code	Industry Standard		
<b>Expanded</b>			
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)		
<b>Process Connection Style</b>			
<b>Expanded</b>			
RCW	Flanged Seal - Ring Type Joint Gasket Surface		
<b>Process Connection Size</b>			
<b>Expanded</b>			
1	1/2-in.		
A	3/4-in.		
2	1-in.		
4	1 1/2-in.		
<b>Flange/Pressure Rating</b>			
<b>Expanded</b>			
1	Class 150		
2	Class 300		
4	Class 600		
5	Class 900		
6	Class 1500		
7	Class 2500		
<b>Diaphragm, Upper Housing, Flange Material</b>			
	<b>Diaphragm</b>	<b>Upper Housing</b>	<b>Flange</b>
<b>Expanded</b>			
DA	316L SST	316L SST	316 SST
DB	Alloy C-276	316L SST	316 SST
DC	Tantalum	316L SST	316 SST
DE	Alloy 600	316L SST	316 SST
DF	304L SST	316L SST	316 SST
DJ	Alloy B316L SST	316L SST	316 SST
DV	Alloy 400	316L SST	316 SST
DP	Nickel 201	316L SST	316 SST
RH	Titanium Grade 4	Titanium Grade 4	316 SST
DH <sup>(1)</sup>	Titanium Grade 4	316L SST	316 SST
D4	Alloy 22	316L SST	316 SST
D5	Duplex 2507 SST	316L SST	316 SST
DZ <sup>(1)</sup>	Zirconium 702	316L SST	316 SST
DK	Alloy 20	316L SST	316 SST
<b>Flushing Connection Ring Material (Lower Housing)</b>			
<b>Expanded</b>			
A	316L SST		
B	Alloy C-276		
F	304L SST		
H	Titanium Grade 4		
2	Duplex 2205 SST		
V	Alloy 400		
<b>Flushing Connection Options</b>			
<b>Expanded</b>			
5	None		
1	1 (1/4-18 NPT)		

Level  
DP Level



# Rosemount DP Level

Table 21. RCW Ring Type Joint Flanged Seal Ordering Information

This seal is part of the Expanded offering and is subject to additional delivery lead time.

3	2 (1/4-18 NPT)
7	1 (1/2-14 NPT)
9	2 (1/2-14 NPT)

## Options (Include with selected model number)

<b>Gasket Material</b>	
<b>Expanded</b>	
J	PTFE gasket
N	Grafoil® gasket
K	Barium Sulfate filled PTFE gasket
R	Ethylene Propylene gasket
<b>Flushing Plug, Vent/Drain Valve</b>	
<b>Expanded</b>	
D	Alloy C-276 plug(s) for flushing connection(s)
G	316 SST plug(s) for flushing connection(s)
H	316 SST vent/drain for flushing connection(s)
<b>Diaphragm Thickness</b>	
<b>Expanded</b>	
C	0.006-in. (150 µm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications
<b>Bolt Material (Optional)</b>	
<b>Expanded</b>	
3	304 SST Bolts (Only available for Stud Bolt Design)
<b>Code Conformance</b>	
<b>Expanded</b>	
T <sup>(2)</sup>	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103
<b>Cold Temperature Application</b>	
<b>Expanded</b>	
B	Extra Fill For Cold Temp Application
<b>Diaphragm Coating</b>	
<b>Expanded</b>	
U <sup>(3)</sup>	0.001-in. (25 µm) Gold plated diaphragm
V <sup>(4)</sup>	PTFE coated diaphragm for nonstick purposes only
<b>Large Diaphragm Size</b>	
<b>Expanded</b>	
9	4.1-in. (104 mm) Diaphragm Diameter
<b>Typical Model Number: 1199 W DC 1 0 A RCW 2 1 DA A 5</b>	

(1) Operating temperature is limited to 302 °F (150 °C).

(2) Materials of Construction comply with metallurgical requirements highlighted within NACE MRO175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MRO103 for sour refining environments.

(3) Only available on 316LSS, Alloy 400, and Alloy C-276.

(4) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

Level

DP Level



**FUW AND FVW FLUSH FLANGED TYPE SEALS**

Table 22. FUW and FVW Flush Flanged Type Seals – EN Ordering Information  
 This seal is part of the Expanded offering is subject to additional delivery lead time.

Code		Industry Standard	
<b>Expanded</b>			
D	EN 1092-1 (European Standard)		
<b>Process Connection Style</b>			
<b>Expanded</b>			
FUW	Flush Flanged, EN 1092-1 Type D (Groove)		
FVW	Flush Flanged, EN 1092-1 Type C (Tongue)		
<b>Process Connection Size</b>			
<b>Expanded</b>			
G	DN 50		
J	DN 80		
<b>Flange/Pressure Rating</b>			
<b>Expanded</b>			
G	PN 40		
<b>Diaphragm and Wetted, Upper Housing, Flange Material</b>			
	<b>Diaphragm and Wetted</b>	<b>Upper Housing</b>	<b>Flange</b>
<b>Expanded</b>			
DA <sup>(1)</sup>	316L SST	316L SST	316 SST
KB <sup>(2)</sup>	Alloy C-276	316L SST	316 SST
DC <sup>(1)</sup>	Tantalum	316L SST	316 SST
<b>Flushing Connection Ring Material (Lower Housing)</b>			
<b>Expanded</b>			
0	None		
<b>Flushing Connection Options, Quantity (Size)</b>			
<b>Expanded</b>			
0	None		

**Options** (Include with selected model number)

<b>Cold Temperature Application</b>	
<b>Expanded</b>	
B	Extra Fill For Cold Temperature Application
<b>Alternate Design</b>	
<b>Expanded</b>	
E	One Piece Design
<b>Typical Model Number: 1199 W DC 1 0 A FUW J G DA 0 0</b>	

(1) Only available with one piece design, option code E.  
 (2) Only available with two-piece design.

Level  
DP Level

# Rosemount DP Level

## Threaded Seal Assemblies



### RTW THREADED SEAL

Table 23. RTW Threaded Seal Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

Code	Industry Standard			
<b>Standard</b>				<b>Standard</b>
A	ANSI/ASME B1.20.1 (American National Standards Institute/American Society of Mechanical Engineers)			★
D	EN 10226-1 (European Standard)			★
<b>Process Connection Style</b>				
<b>Standard</b>				<b>Standard</b>
RTW	Threaded (standard thread is female, for male select Option code 9)			★
<b>Process Connection Size</b>				
	<b>ANSI/ASME B1.20.1</b>	<b>EN 10226-1</b>		
<b>Standard</b>				<b>Standard</b>
3	1/2-14 NPT	—		★
4	3/4-14 NPT	—		★
5	1-11.5 NPT	—		★
7 <sup>(1)</sup>	1 1/2-11.5 NPT	—		★
<b>Expanded</b>				
1	1/4-18 NPT	—		
C	—	Parallel thread: G 1/2A DIN 16288		
2	3/8-18 NPT	—		
6 <sup>(1)</sup>	1 1/4-11.5 NPT	—		
N	—	Tapered thread: R 1/2 per ISO 7/1		
<b>Pressure Rating</b>				
	<b>ANSI/ASME B1.20.1</b>	<b>EN 10226-1</b>		
<b>Standard</b>				<b>Standard</b>
0	2500 psi	172 bar		★
<b>Expanded</b>				
2 <sup>(2)</sup>	5000 psi	344 bar		
3 <sup>(2)(3)</sup>	10000 psi	—		
8	1500 psi (4.1-in. (104 mm) diaphragm)	103 bar (4.1-in. (104 mm) diaphragm)		
<b>Diaphragm, Upper Housing, Flange Material</b>				
	<b>Diaphragm</b>	<b>Upper Housing</b>	<b>Flange</b>	
<b>Standard</b>				<b>Standard</b>
CA	316L SST	316L SST	CS	★
DA	316L SST	316L SST	316 SST	★
CB	Alloy C-276	316L SST	CS	★
DB	Alloy C-276	316L SST	316 SST	★
CC	Tantalum	316L SST	CS	★
DC	Tantalum	316L SST	316 SST	★
<b>Expanded</b>				
DJ	Alloy B	316L SST	316 SST	
DF	304L SST	316L SST	316 SST	
DP	Nickel 201	316L SST	316 SST	
DV	Alloy 400	316L SST	316 SST	
RH <sup>(4)</sup>	Titanium Grade 4	Titanium Grade 4	316 SST	
DH <sup>(5)</sup>	Titanium Grade 4	316L SST	316 SST	

Level

DP Level

# Product Data Sheet

00813-0100-4016, Rev LA  
 Catalog 2011 - 2012

# Rosemount DP Level

Table 23. RTW Threaded Seal Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
 The Expanded offering is subject to additional delivery lead time.

D4	Alloy 22	316L SST	316 SST	
D5	Duplex 2507 SST	316L SST	316 SST	
DE	Alloy 600	316L SST	316 SST	
DZ <sup>(5)</sup>	Zirconium 702	316L SST	316 SST	
DK	Alloy 20	316L SST	316 SST	
RZ <sup>(4)</sup>	Zirconium 702	Zirconium 702	316 SST	
<b>Flushing Connection Ring Material (Lower Housing)<sup>(6)(7)</sup></b>				
<b>Standard</b>				<b>Standard</b>
A	316L SST			★
B	Alloy C-276			★
<b>Expanded</b>				
D	Plated Carbon Steel			
2	Duplex 2205 SST			
H	Titanium Grade 4			
V	Alloy 400			
F	304L SST			
<b>Flushing Connection Options</b>				
<b>Standard</b>				<b>Standard</b>
5	None			★
1	1 (1/4-18 NPT)			★
3	2 (1/4-18 NPT)			★
<b>Expanded</b>				
7	1 (1/2-14 NPT)			
9	2 (1/2-14 NPT)			

## Options (Include with selected model number)

<b>Gasket Material</b>				
<b>Standard</b>				<b>Standard</b>
J	PTFE gasket (for use with flushing connection ring)			★
N	Grafoil <sup>®</sup> gasket (for use with flushing connection ring)			★
R	Ethylene Propylene gasket (for use with flushing connection ring)			★
<b>Expanded</b>				
K	Barium Sulfate filled PTFE gasket (for use with flushing connection ring)			
<b>Flushing Plug, Vent/Drain Valve</b>				
<b>Standard</b>				<b>Standard</b>
D	Alloy C-276 plug(s) for flushing connection(s)			★
G	316 SST plug(s) for flushing connection(s)			★
H	316 SST vent/drain for flushing connection(s)			★
<b>Diaphragm Thickness</b>				
<b>Expanded</b>				
C	0.006-in. (150 μm) available with 316L SST, Alloy C-276, and Duplex 2507 SST for abrasive applications			
<b>Bolt Material</b>				
<b>Standard</b>				<b>Standard</b>
3	304 SST Bolts			★
<b>Expanded</b>				
4	316 SST Bolts			
<b>Code Conformance</b>				
<b>Standard</b>				<b>Standard</b>
T	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103			★
<b>Cold Temperature Application</b>				
<b>Standard</b>				<b>Standard</b>
B	Extra Fill For Cold Temp Application			★

Level

DP Level

# Rosemount DP Level

Table 23. RTW Threaded Seal Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
 The Expanded offering is subject to additional delivery lead time.

<b>Diaphragm Coating</b>		
<b>Expanded</b>		
U <sup>(8)</sup>	0.001-in. (25 µm) Gold plated diaphragm	
V <sup>(9)</sup>	PTFE coated diaphragm for nonstick purposes only	
<b>Special Threads in Lower Housing</b>		
<b>Expanded</b>		
9	Male Threads	
<b>Typical Model Number: 1199 W DC 1 0 A RTW 3 0 DA A 5</b>		

- (1) Flushing connection not available.
- (2) Consult an Emerson Process Management representative for pricing and availability on Pressure Rating codes 2 or 3.
- (3) The following process connection sizes are D rated: 3/4-in (9000 psi/621 bar), 1-in. (8700 psi/600 bar), 1 1/4-in (7000 psi/483 bar), and 1 1/2-in. (6000 psi/414 bar).
- (4) Not available with welded capillary connections or direct mount.
- (5) Operating temperature is limited to 302 °F (150 °C).
- (6) Supplied with C4401 aramid fiber gasket.
- (7) Flushing Connection Ring/ Lower Housing assembly bolts provided as standard are carbon steel for ANSI and 304 SST for EN.
- (8) Only available on 316LSS, Alloy 400, and Alloy C-276.
- (9) Not available with transmitter option code Q8, for Material Traceability per EN 10204 3.1 of the transmitter / seal assembly.

Level

DP Level



**HTS MALE THREADED SEAL**

Table 24. HTS Male Threaded Flush Type Seal Ordering Information<sup>(1)</sup>

This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code	Industry Standard	
<b>Expanded</b>		
A	ANSI/ASME B1.20.1 (American National Standards Institute/American Society of Mechanical Engineers)	
D	EN 10226-1 (European Standard)	
<b>Process Connection Style</b>		
<b>Expanded</b>		
HTS	Male Threaded Seal	
<b>Process Connection Size, Pressure Rating</b>		
	<b>ANSI/ASME B1.20.1</b>	<b>EN 10226-1</b>
<b>Expanded</b>		
5A	1-11,5 NPT, 8700 psi (600 bar)	—
7A	1½-11,5 NPT, 6000 psi (414 bar)	—
9A	2-11,5 NPT, 4000 psi (276 bar)	—
EA	—	G1, 455 bar (6598 psi)
GA	—	G1 <sup>1</sup> / <sub>2</sub> , BSP, 400 bar (5800 psi)
JA	—	G2, BSP, 280 bar (4060 psi)
<b>Diaphragm and Wetted, Upper Housing Material</b>		
	<b>Diaphragm and Wetted</b>	<b>Upper Housing</b>
<b>Expanded</b>		
LA00	316L SST	316L SST
<b>Typical Model Number: 1199 W DC 1 0 A HTS 7 A LA 0 0</b>		

<sup>(1)</sup> Consult an Emerson Process Management representative for use with low calibrated spans.

# Rosemount DP Level

## Hygienic Seal Assemblies



### SCW HYGIENIC TRI-CLOVER STYLE TRI-CLAMP SEAL

Table 25. SCW Hygienic Tri-Clover Style Tri-Clamp Seal Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.  
The Expanded offering is subject to additional delivery lead time.

Industry Standard			
<b>Standard</b>			<b>Standard</b>
S	Hygienic Seal (Conforms to 3-A Standard 74-03)		★
<b>Process Connection Style</b>			
<b>Standard</b>			<b>Standard</b>
SCW <sup>(1)</sup>	Tri-Clover Style Tri-Clamp Seal		★
<b>Process Connection Size</b>			
<b>Standard</b>			<b>Standard</b>
30 <sup>(2)</sup>	1½-in.		★
50 <sup>(3)</sup>	2-in.		★
70	3-in.		★
<b>Expanded</b>			
60	2½-in.		
90	4-in.		
<b>Diaphragm and Wetted, Upper Housing Material</b>			
	<b>Diaphragm and Wetted</b>	<b>Upper Housing</b>	
<b>Standard</b>			<b>Standard</b>
LA00	316L SST	316L SST	★
<b>Expanded</b>			
LB00	Alloy C-276	316L SST	

### Options (Include with selected model number)

<b>Surface Finish</b>			
<b>Expanded</b>			
D	10 µin. (0.25 µm) R <sub>a</sub> surface finish		
G	15 µin. (0.375 µm) R <sub>a</sub> surface finish		
H	20 µin. (0.50 µm) R <sub>a</sub> surface finish		
<b>Non-Hygienic Fill Fluid</b>			
<b>Expanded</b>			
P	Non-Hygienic fill fluid (does not conform to 3-A Standard 74)		
<b>Clamp and Gasket Material</b>			
<b>Expanded</b>			
2	High-Pressure Ladish Clamp & Nitrile butadiene (NBR) gasket		
3	Nitrile butadiene (NBR) gasket		
<b>Polishing</b>			
<b>Expanded</b>			
6	Electro polishing		
<b>Typical Model Number: 1199 W NC 1 0 S SCW 7 0 LA 0 0</b>			

(1) Clamp and gasket furnished by user. The maximum working pressure is dependent upon the clamp pressure rating.

(2) Consult factory for calibrated spans lower than 15 psi (1034 mbar).

(3) Consult factory for calibrated spans lower than 5 psi (345 mbar).

Level

DP Level



**SSW HYGIENIC TANK SPUD SEAL**

Table 26. SSW Hygienic Tank Spud Seal Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Code	Industry Standard		
<b>Standard</b>			<b>Standard</b>
S	Hygienic Seal (Conforms to 3-A Standard 74-03)		★
<b>Process Connection Style</b>			
<b>Standard</b>			<b>Standard</b>
SSW <sup>(1)</sup>	Tank Spud Seal		★
<b>Process Connection Size, Pressure Rating</b>			
<b>Standard</b>			<b>Standard</b>
A0	4-in. Sch. 5 Tri-Clamp, 600 psi (41 bar)		★
<b>Upper Housing</b>			
<b>Standard</b>			<b>Standard</b>
A	316L SST		★
<b>Diaphragm and Wetted, Extension Material</b>			
	<b>Diaphragm and Wetted</b>	<b>Extension</b>	
<b>Standard</b>			<b>Standard</b>
AL	316L SST <sup>(2)</sup>	316L SST <sup>(2)</sup>	★
<b>Expanded</b>			
BB	Alloy C-276	316L SST	★
<b>Extension Length</b>			
<b>Standard</b>			<b>Standard</b>
2	2-in.		★
6	6-in.		★

**Options** (Include with selected model number)

<b>Surface Finish</b>			
<b>Expanded</b>			
G <sup>(3)</sup>	15 μin. (0.375 μm) diaphragm surface finish		
H	20 μin.(0.5 μm) diaphragm surface finish		
<b>Diaphragm Thickness</b>			
<b>Expanded</b>			
C	0.006-in. (150 μm)		
<b>Tank Spud</b>			
<b>Standard</b>			<b>Standard</b>
1	Tank Spud Included with Shipment		★
<b>Non-Hygienic Fill Fluid</b>			
<b>Expanded</b>			
P	Non-Hygienic fill fluid (Does not conform to 3-A Standard 74)		
<b>Non-Hygienic Fill Fluid</b>			
<b>Expanded</b>			
3	Nitrile butadiene (NBR) O-ring instead of Standard Ethylene Propylene O-ring (Conforms to 3-A Standard 74)		
4	Flouorocarbon (FMK) <sup>®</sup> O-ring, instead of Standard Ethylene Propylene O-ring (Conforms to 3-A Standard 74)		
<b>Polishing</b>			
<b>Expanded</b>			
6	Electro polishing		
<b>Typical Model Number:</b> 1199 W NC 1 0 S SSW A 0 AA L 2			

(1) Clamp and Ethylene Propylene o-ring (conforms to 3-A standard 74 and USP class VI) supplied.

(2) Diaphragm brazed and TIG-welded to extension.

(3) Requires Option code 6, Electro polishing.

Level  
DP Level



# Rosemount DP Level



## STW HYGIENIC THIN WALL TANK SPUD SEAL

Table 27. STW Hygienic Thin Wall Tank Spud Seal Ordering Information  
 This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code		Industry Standard	
<b>Expanded</b>			
S	Hygienic Seal (Conforms to 3-A Standard 74-03)		
<b>Process Connection Style</b>			
<b>Expanded</b>			
STW <sup>(1)</sup>	Thin Wall Tank Spud Seal		
<b>Process Connection Size, Pressure Rating</b>			
<b>Expanded</b>			
B0	4-in. Tri-Clamp, 600 psi (41 bar)		
<b>Diaphragm and Wetted, Extension Material</b>			
	<b>Diaphragm and Wetted</b>		<b>Extension</b>
<b>Expanded</b>			
LA00	316L SST		316L SST
BB00	Alloy C-276		Alloy C-276
<b>Options</b> (Include with selected model number)			
<b>Surface Finish</b>			
<b>Expanded</b>			
G <sup>(2)</sup>	15 µin. (0.375 µm) diaphragm surface finish		
H	20 µin.(0.5 µm) diaphragm surface finish		
<b>Non-Hygienic Fill Fluid</b>			
<b>Expanded</b>			
P	Non-Hygienic fill fluid (Does not conform to 3-A Standard 74)		
<b>Polishing</b>			
<b>Expanded</b>			
6	Electro polishing		
<b>Typical Model Number: 1199 W NC 1 0 S STW B 0 LA 0 0</b>			

(1) For tank walls up to <sup>3</sup>/<sub>16</sub>-in. thick. Clamp and Ethylene Propylene o-ring supplied.

(2) Requires Option code 6, Electro polishing.

Level

DP Level



**EES HYGIENIC FLANGED TANK SPUD EXTENDED SEAL**

Table 28. EES Hygienic Flanged Tank Spud Extended Seal Ordering Information  
 This seal is part of the Expanded offering and is subject to additional delivery lead time.

<b>Code</b>	<b>Industry Standard</b>	
<b>Expanded</b>		
S	Hygienic Seal (Conforms to 3-A Standard 74-03)	
<b>Process Connection Style</b>		
<b>Expanded</b>		
EES	Flanged Tank Spud Seal	
<b>Process Connection Size, Pressure Rating</b>		
<b>Expanded</b>		
GG	DN 50, PN 40	
JG	DN 80, PN 40	
<b>Diaphragm and Wetted, Extension Material</b>		
	<b>Diaphragm and Wetted</b>	<b>Extension</b>
<b>Expanded</b>		
LA	316L SST	316L SST
LB	Alloy C-276	316L SST
<b>Extension Length<sup>(1)</sup></b>		
<b>Expanded</b>		
10	25 mm (1-in.)	
<b>Options</b> (Include with selected model number)		
<b>Surface Finish</b>		
<b>Expanded</b>		
G <sup>(2)</sup>	15 µ-in. (0.375 µm) Ra surface finish	
H	20 µ-in. (0.50 µm) Ra surface finish	
<b>Gasket Material</b>		
<b>Expanded</b>		
1	Flouorocarbon (FMK) O-ring, instead of Standard Ethylene Propylene O-ring (Conforms to 3-A Standard 74)	
<b>Cold Temperature Application</b>		
<b>Expanded</b>		
B	Extra Fill For Cold Temperature Application	
<b>Polishing</b>		
<b>Expanded</b>		
6	Electro polishing	
<b>Typical Model Number: 1199 W NC 1 0 S EES J G LA 1 0</b>		

(1) Other extension lengths are available upon request.

(2) Requires Option code 6, Electro polishing.

Level  
DP Level

# Rosemount DP Level



## VCS TRI-CLAMP® IN-LINE SEAL

Table 29. VCS Tri-Clamp In-Line Seal Ordering Information

This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code	Industry Standard	
<b>Expanded</b>		
S	Hygienic Seal (Conforms to 3-A Standard 74-03)	
<b>Process Connection Style</b>		
<b>Expanded</b>		
VCS <sup>(1)</sup>	In-Line Tri-Clover Style Tri-Clamp Seal	
<b>Process Connection Size</b>		
<b>Expanded</b>		
20 <sup>(2)</sup>	1-in.	
30 <sup>(3)</sup>	1½-in.	
50	2-in.	
70	3-in.	
90	4-in.	
<b>Diaphragm and Wetted, Upper Housing Material</b>		
	<b>Diaphragm and Wetted</b>	<b>Upper Housing</b>
<b>Expanded</b>		
LA00	316L SST	316L SST
<b>Options</b> (Include with selected model number)		
<b>Surface Finish</b>		
<b>Expanded</b>		
G <sup>(4)</sup>	15 µ-in. (0.375 µm) Ra surface finish	
H	20 µ-in. (0.50 µm) Ra surface finish	
<b>Non-Hygienic Fill Fluid</b>		
<b>Expanded</b>		
P	Non-Hygienic fill fluid (does not conform to 3-A Standard 74)	
<b>Polishing</b>		
<b>Expanded</b>		
6	Electro polishing	
<b>Typical Model Number: 1199 W NC 1 0 S VCS 7 0 LA 0 0</b>		

(1) Gasket and clamp are furnished by the user. The maximum working pressure is dependent upon the clamp pressure rating.

(2) Consult factory for calibrated spans lower than 15 psi (1034 mbar).

(3) Consult factory for calibrated spans lower than 5 psi (345 mbar).

(4) Requires Option code 6, Electro polishing.

Level

DP Level



**SVS VARIVENT® COMPATIBLE HYGIENIC CONNECTION SEAL**

Table 30. SVS Varivent® Compatible Hygienic Connection Seal Ordering Information  
 This seal is part of the Expanded offering and is subject to additional delivery lead time.

<b>Code</b>	<b>Industry Standard</b>	
<b>Expanded</b>		
S	Hygienic Seal (Conforms to 3-A Standard 74-03)	
<b>Process Connection Style</b>		
<b>Expanded</b>		
SVS	Tuchenhagen Varivent Compatible Seal	
<b>Process Connection Size</b>		
<b>Expanded</b>		
V0 <sup>(1)</sup>	Varivent® Type N DN 40-162	
<b>Diaphragm and Wetted, Upper Housing Material</b>		
	<b>Diaphragm and Wetted</b>	<b>Upper Housing</b>
<b>Expanded</b>		
LA00	316L SST	316L SST
<b>Options</b> (Include with selected model number)		
<b>Non-Hygienic Fill Fluid</b>		
<b>Expanded</b>		
P	Non-Hygienic fill fluid (does not conform to 3-A Standard 74)	
<b>Cold Temperature Application</b>		
<b>Expanded</b>		
B	Extra Fill For Cold Temperature Application	
<b>Polishing</b>		
<b>Expanded</b>		
6	Electro polishing	
<b>Typical Model Number: 1199 W NC 1 0 S SVS V 0 LA 0 0</b>		

(1) Consult factory for calibrated spans lower than 15 psi (1034 mbar).

Level  
 DP Level

# Rosemount DP Level



## SHP Hygienic Cherry-Burrell "I" LINE SEAL

Table 31. SHP Hygienic Cherry-Burrell "I" Line Seal Ordering Information

This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code		Industry Standard	
<b>Expanded</b>			
S	Hygienic Seal (Conforms to 3-A Standard 74-03)		
<b>Process Connection Style</b>			
<b>Expanded</b>			
SHP <sup>(1)</sup>	Cherry-Burrell "I" Line Style Seal		
<b>Process Connection Size</b>			
<b>Expanded</b>			
50 <sup>(2)</sup>	2-in.		
70	3-in.		
<b>Diaphragm and Wetted, Upper Housing Material</b>			
	<b>Diaphragm and Wetted</b>		<b>Upper Housing</b>
<b>Expanded</b>			
AA00	316L SST		316L SST
<b>Options</b> (Include with selected model number)			
<b>Non-Hygienic Fill Fluid</b>			
<b>Expanded</b>			
P	Non-Hygienic fill fluid (does not conform to 3-A Standard 74)		
<b>Typical Model Number: 1199 W NC 1 0 S SHP 7 0 AA 0 0</b>			

(1) Clamp and gasket furnished by user. Maximum working pressure is the lesser of either clamp pressure rating or 500 psi.

(2) Consult factory for calibrated spans lower than 5 psi (345 mbar).

Level

DP Level



**SLS DAIRY PROCESS CONNECTION - FEMALE THREAD SEAL PER DIN 11851**

Table 32. SLS Hygienic Dairy Process Connection Female Thread Seal Ordering Information  
 This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code		Industry Standard	
<b>Expanded</b>			
S	Hygienic Seal (Conforms to 3-A Standard 74-03)		
<b>Process Connection Style</b>			
<b>Expanded</b>			
SLS	Dairy Process Connection - Female Thread		
<b>Process Connection Size, Pressure Rating, Material</b>			
<b>Expanded</b>			
F0 <sup>(1)</sup>	DIN 11851 with coupling nut DN 40, PN 40, 304 SST		
G0 <sup>(2)</sup>	DIN 11851 with coupling nut DN 50, PN 25, 304 SST		
<b>Diaphragm and Wetted, Upper Housing Material</b>			
	<b>Diaphragm and Wetted</b>		<b>Upper Housing</b>
<b>Expanded</b>			
LA00	316L SST		316L SST
<b>Options</b> (Include with selected model number)			
<b>Polishing</b>			
<b>Expanded</b>			
6	Electro polishing		
<b>Typical Model Number: 1199 W HC 1 0 S SLS J 0 LA 0 0</b>			

(1) Consult factory for calibrated spans lower than 15 psi (1034 mbar).

(2) Consult factory for calibrated spans lower than 5 psi (345 mbar).

# Rosemount DP Level

## Specialty Seal Assemblies



### WSP SADDLE SEAL

Table 33. WSP Saddle Seal Ordering Information

This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code	Industry Standard	
<b>Expanded</b>		
N	Non-Industry Standard	
<b>Process Connection Style</b>		
<b>Expanded</b>		
WSP	Saddle Seal	
<b>Process Connection Size</b>		
<b>Expanded</b>		
G	2-in. Pipe size	
7	3-in. Pipe size	
9	4-in. or larger Pipe size	
<b>Pressure Rating</b>		
<b>Expanded</b>		
1	1500 psig at 100 °F (103 bar at 38 °C) eight bolt holes	
0	1250 psig at 100 °F (86 bar at 38 °C) six bolt holes	
<b>Diaphragm, Upper Housing Material</b>		
	<b>Diaphragm</b>	<b>Upper Housing</b>
<b>Expanded</b>		
LA	316L SST	316L SST
LB	Alloy C-276	316L SST
LC	Tantalum	316L SST
<b>Lower Housing Material<sup>(1)(2)</sup></b>		
<b>Expanded</b>		
00	None	
L5	316L SST	
B5	Alloy C-276	
D5	Plated Carbon Steel	
<b>Options</b> (Include with selected model number)		
<b>Gasket Material</b>		
<b>Expanded</b>		
J	PTFE gasket	
N	Grafoil <sup>®</sup> gasket	
<b>Code Conformance</b>		
<b>Expanded</b>		
T	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	
<b>Diaphragm Coating</b>		
<b>Expanded</b>		
V <sup>(3)</sup>	PTFE Coated Diaphragm for nonstick purposes (316L SST and Alloy C-276 diaphragms only)	
<b>Typical Model Number: 1199 W DC 1 0 N WSP 7 1 LA L N</b>		

(1) Standard pipe schedule 40/40S, for other pipe schedules consult the factory.

(2) Supplied with C4401 Aramid fiber gasket.

(3) Not available with transmitter option code Q8, for Material Traceability per EN10204 3.1 of the transmitter / seal assembly.



**UCP MALE THREADED PIPE MOUNT SEALS AND PMW PAPER MILL SLEEVE SEALS**

Table 34. UCP and PMW Threaded Pipe Mount Seal Ordering Information  
 This seal is part of the Expanded offering and is subject to additional delivery lead time.

<b>Industry Standard</b>		
<b>Expanded</b>		
N	Non-Industry Standard	
<b>Process Connection Style</b>		
<b>Expanded</b>		
UCP	Male Threaded Pipe Mount Seal	
PMW	Paper Mill Sleeve	
<b>Process Connection Size, Pressure Rating</b>		
<b>Expanded</b>		
30 <sup>(1)</sup>	1 1/2-in., Threaded Knurled Nut, 600 psi at 100 °F (41 bar at 38 °C) (UCP only)	
50 <sup>(2)</sup>	1-in., Cap Screw Retainer, 300 psi at 100 °F (21 bar at 38 °C) (PMW only)	
<b>Diaphragm and Wetted, Upper Housing Material</b>		
	<b>Diaphragm and Wetted</b>	<b>Upper Housing</b>
<b>Expanded</b>		
AA	316L SST	316L SST
BB	Alloy C-276	Alloy C-276
<b>Lower Housing Material</b>		
<b>Expanded</b>		
00	None	
A0	316L SST	
B0	Alloy C-276	
<b>Options</b> (Include with selected model number)		
<b>Diaphragm Coating</b>		
<b>Expanded</b>		
V <sup>(3)</sup>	PTFE coated diaphragm for nonstick purposes only	
<b>Typical Model Number: 1199 W DC 1 0 N UCP 3 0 AA A 0</b>		

- (1) Only available with UCP process connection size. Consult factory for calibrated spans lower than 50 psi (3,4 bar).
- (2) Only available with PMW process connection size. Consult factory for calibrated spans lower than 100 psi (6,9 bar).
- (3) Not available with transmitter option code Q8, for Material Traceability per EN10204 3.1 of the transmitter / seal assembly.

Level  
DP Level



# Rosemount DP Level



## CTW CHEMICAL TEE SEAL

Table 35. CTW Chemical Tee Seal Ordering Information

This seal is part of the Expanded offering and is subject to additional delivery lead time.

<b>Code</b>	<b>Industry Standard</b>	
<b>Expanded</b>		
N	Non-Industry Standard	
<b>Process Connection Style</b>		
<b>Expanded</b>		
CTW	Chemical Tee Seal	
<b>Maximum Working Pressure (Flange Rating)</b>		
<b>Expanded</b>		
20	300 psi (21 bar)	
<b>Diaphragm and Wetted, Upper Housing Material</b>		
	<b>Diaphragm and Wetted</b>	<b>Upper Housing</b>
<b>Expanded</b>		
AA	316L SST	316L SST
BB	Alloy C-276	Alloy C-276
<b>Lower Housing</b>		
<b>Expanded</b>		
00	None	
<b>Options</b> (Include with selected model number)		
<b>Code Conformance</b>		
<b>Expanded</b>		
T	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	
<b>Diaphragm Coating</b>		
<b>Expanded</b>		
V <sup>(1)</sup>	PTFE coated diaphragm for nonstick purposes only	
<b>Typical Model Number: 1199 W NC 1 0 N CTW 2 0 AA 0 0</b>		

(1) Not available with transmitter option code Q8, for Material Traceability per EN10204 3.1 of the transmitter / seal assembly.

Level

DP Level



**TFS WAFER STYLE IN-LINE SEAL**

Table 36. TFS Wafer Style In-Line Seal Ordering Information  
 This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code	Industry Standard	
<b>Expanded</b>		
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)	
D	EN 1092-1 (European Standard)	
<b>Process Connection Style</b>		
<b>Expanded</b>		
TFS	Wafer Style In-Line Seal	
<b>Process Connection Size</b>		
	<b>ANSI/ASME B16.5</b>	<b>EN 1092-1</b>
<b>Expanded</b>		
G	2-in.	DN 50
7	3-in.	—
J	—	DN 80
9	4-in.	—
2 <sup>(1)</sup>	1-in.	—
4 <sup>(2)</sup>	1½-in.	—
D <sup>(1)</sup>	—	DN 25
F <sup>(2)</sup>	—	DN 40
K	—	DN 100
<b>Pressure Rating</b>		
<b>Expanded</b>		
0	Seal MWP based on customer supplied flange	
<b>Diaphragm and Wetted, Upper Housing Material</b>		
	<b>Diaphragm and Wetted</b>	<b>Upper Housing</b>
<b>Expanded</b>		
LA	316L SST	316L SST
LB	Alloy C-276	316L SST
<b>Housing Body Length</b>		
<b>Expanded</b>		
00	3.54-in. (90 mm)	
<b>Typical Model Number: 1199 W DC 1 0 A TFS 7 0 LA 0 0</b>		

(1) Consult factory for calibrated spans lower than 15 psi (1034 mbar).

(2) Consult factory for calibrated spans lower than 5 psi (345 mbar).

Level  
DP Level

# Rosemount DP Level



## WFW FLOW-THRU FLANGED SEAL

Table 37. WFW Flow-Thru Flanged Seal Ordering Information

This seal is part of the Expanded offering and is subject to additional delivery lead time.

Code	Industry Standard	
<b>Expanded</b>		
A	ANSI/ASME B16.5 (American National Standards Institute/American Society of Mechanical Engineers)	
<b>Process Connection Style</b>		
<b>Expanded</b>		
WFW <sup>(1)</sup>	Flow-Thru Flanged Seal	
<b>Process Connection Size<sup>(2)</sup></b>		
<b>Expanded</b>		
G	2-in.	
7	3-in.	
2	1-in.	
<b>Flange Rating<sup>(2)</sup></b>		
<b>Expanded</b>		
1	Class 150 <sup>(2)</sup>	
<b>Diaphragm, Upper Housing Material</b>		
	<b>Diaphragm</b>	<b>Upper Housing<sup>(2)</sup></b>
<b>Expanded</b>		
LA	316L SST	316L SST
<b>Lower Housing Material<sup>(1)</sup></b>		
<b>Expanded</b>		
L	316L SST	
<b>Pipe Schedule<sup>(2)</sup></b>		
<b>Expanded</b>		
N	40/40S	

### Options (Include with selected model number)

<b>Gasket Material</b>		
<b>Expanded</b>		
J	PTFE O-ring	
K	Barium Sulfate filled PTFE gasket	
N	Grafoil <sup>®</sup> gasket	
R	Ethylene Propylene gasket	
<b>Bolt Material</b>		
<b>Expanded</b>		
3	304 SST bolts	
<b>Code Conformance</b>		
<b>Expanded</b>		
T	Wetted Materials Compliance to NACE MRO175/ISO 15156, MRO103	
<b>Cold Temperature Application</b>		
<b>Expanded</b>		
B	Extra Fill For Cold Temperature Application	
<b>Typical Model Number: 1199 W DC 1 0 A TFS 7 0 LA 0 0</b>		

(1) Supplied with C4401 Aramid fiber gasket.

(2) Consult factory for special process connection sizes, flange pressure ratings, diaphragm/lower housing materials, and pipe schedules.

## Specifications

### LIQUID LEVEL TRANSMITTER SPECIFICATIONS

#### Performance Specifications

For zero-based spans, reference conditions, silicone oil fill, glass-filled PTFE O-rings, SST materials, Coplanar flange (3051SMV, 3051S\_C) or 1/2-in.- 14 NPT (3051S\_T) process connections, digital trim values set to equal range points.

#### Conformance to Specification ( $\pm 3\sigma$ (Sigma))

Technology leadership, advanced manufacturing techniques, and statistical process control ensure measurement specification conformance to  $\pm 3\sigma$  or better.

#### Reference Accuracy<sup>(1)</sup>

Stated reference accuracy equations include terminal based linearity, hysteresis, and repeatability, but does not include analog output reference accuracy of  $\pm 0.005\%$  of span.

For FOUNDATION™ fieldbus and wireless devices, use calibrated range in place of span.

<b>3051SAL_C</b>	$\pm 0.065\%$ of span; For spans less than 10:1, $\pm \left[ 0.015 + 0.005 \left( \frac{URL}{span} \right) \right] \%$ of span
<b>3051L</b> All Ranges	$\pm 0.075\%$ of span For spans less than 10:1, accuracy = $\pm \left[ 0.025 + 0.005 \left( \frac{URL}{Span} \right) \right] \%$ of Span
<b>2051L</b> Ranges 2-4	$\pm 0.075\%$ of span For spans less than 10:1, accuracy = $\pm \left[ 0.025 + 0.005 \left( \frac{URL}{Span} \right) \right] \%$ of Span

(1) Stated reference accuracy equations include terminal based linearity, hysteresis, and repeatability, but does not include analog only reference accuracy of  $\pm 0.005\%$  of span.

#### DP Reference Accuracy of 3051S ERS System<sup>(1)</sup>

Two Coplanar Gage Sensors (3051SAM__G)		
	Ultra	Classic
Ranges 2-4	$\pm 0.035\%$ of DP span	$\pm 0.078\%$ of DP span
Range 5	$\pm 0.071\%$ of DP span	$\pm 0.092\%$ of DP span
Two Coplanar Absolute Sensors (3051SAM__A)		
	Ultra	Classic
Ranges 1-4	$\pm 0.035\%$ of DP span	$\pm 0.078\%$ of DP span
Two In-Line Gage Sensors (3051SAM__T) Two In-Line Absolute Sensors (3051SAM__E)		
	Ultra	Classic
Ranges 1-4	$\pm 0.035\%$ of DP span	$\pm 0.078\%$ of DP span
Two Liquid Level Sensors (3051SAL)		
	Ultra	Classic
Ranges 1-5	$\pm 0.092\%$ of DP span	$\pm 0.092\%$ of DP span

(1) DP Accuracy specifications for the 3051S ERS System assume that the configuration contains two sensors with identical ranges that are calibrated 0 – URL, and that the DP Span = 10% of each sensor's URL.

Level  
DP Level

# Rosemount DP Level

## Warranty<sup>(1)</sup>

Models <sup>(1)</sup>	Ultra	Classic
3051SAM and 3051SAL	12-year limited warranty <sup>(2)</sup>	1-year limited warranty <sup>(3)</sup>

(1) Warranty details can be found in Emerson Process Management Terms and Conditions of Sale, Document 63445, Rev G (10/06).

(2) Rosemount Ultra and Ultra for Flow transmitter have a limited warranty of twelve (12) years from date of shipment. All other provisions of Emerson Process Management standard limited warranty remains the same.

(3) Goods are warranted for twelve (12) months from the date of initial installation or eighteen (18) months from the date of shipment by seller, whichever period expires first.

## Dynamic Performance

See Instrument Toolkit®.

## Ambient Temperature Effect

See Instrument Toolkit.

## Mounting Position Effects

With liquid level remote mount seal in vertical plane, zero shift of up to ±1 inH<sub>2</sub>O (2,49 mbar); with remote mount seal in horizontal plane, zero shift of up to ±5 inH<sub>2</sub>O (12,45 mbar) plus extension length on extended units; all zero shifts can be zeroed; no span effect.

## Vibration Effect

<b>3051SAM</b> <b>3051SAL</b>	Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field or pipeline with high vibration level (10-60 Hz 0.21mm displacement peak amplitude / 60-2000 Hz 3g).  For Housing Style codes 1J, 1K, 1L, 2J, and 2M: Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field with general application or pipeline with low vibration level (10-60 Hz 0.15mm displacement peak amplitude / 60-500 Hz 2g).
<b>3051L</b>	Measurement effect due to vibrations is negligible except at resonance frequencies. When at resonance frequencies, vibration effect is less than ±0.1% of URL per g when tested between 15 and 2000 Hz in any axis relative to pipe-mounted process conditions.
<b>2051L</b>	Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field or pipeline with high vibration level (10-60 Hz 0.21mm displacement peak amplitude / 60-2000 Hz 3g).

## Power Supply Effect

Less than ±0.005% of calibrated span per volt.

## Electromagnetic Compatibility (EMC)

Meets all relevant requirements of EN 61326 and NAMUR NE-21.<sup>(1)</sup>

(1) NAMUR NE-21 does not apply to wireless output code X.

Level

DP Level

# Product Data Sheet

00813-0100-4016, Rev LA  
Catalog 2011 - 2012

# Rosemount DP Level

## Transient Protection (Option T1)

<b>3051SAM</b> <b>3051SAL</b>	Meets IEEE C62.41.2-2002, Location Category B 6 kV crest (0.5 μs - 100 kHz) 3 kA crest (8 × 20 microseconds) 6 kV crest (1.2 × 50 microseconds) Meets IEEE C37.90.1-2002 Surge Withstand Capability SWC 2.5 kV crest, 1.0 MHz wave form
<b>3051L</b>	Meets IEEE C62.41, Category B 6 kV crest (0.5 μs - 100 kHz) 3 kV crest (8 × 20 microseconds) 6 kV crest (1.2 × 50 microseconds)
<b>2051L</b>	Meets IEEE C62.41, Category Location B 6 kV crest (0.5 μs - 100 kHz) 3 kV crest (8 × 20 microseconds) 6 kV crest (1.2 × 50 microseconds)

## Functional Specifications

### Range and Sensor Limits

Table 38. 3051SAM\_\_G, 3051SAL\_\_D, 3051SAL\_\_G Range and Sensor Limits

Range	Minimum Span		Range Limits		
	Ultra	Classic	Upper (URL)	Lower (LRL)	
				3051S_LG <sup>(1)(2)</sup>	3051S_LD <sup>(1)</sup>
2	1.3 inH <sub>2</sub> O (3,11 mbar)	2.5 inH <sub>2</sub> O (6,23 mbar)	250.0 inH <sub>2</sub> O (0,62 bar)	-250.0 inH <sub>2</sub> O (-0,62 bar)	-250.0 inH <sub>2</sub> O (-0,62 bar)
3	5.0 inH <sub>2</sub> O (12,4 mbar)	10.0 inH <sub>2</sub> O (24,9 mbar)	1000.0 inH <sub>2</sub> O (2,49 bar)	-393.0 inH <sub>2</sub> O (-979 mbar)	-1000.0 inH <sub>2</sub> O (-2,49 bar)
4	1.5 psi (103,4 mbar)	3.0 psi (206,8 mbar)	300.0 psi (20,7 bar)	-14.2 psig (-979 mbar)	-300.0 psi (-20,7 bar)
5	10.0 psi (689,5 mbar)	20.0 psi (1,38 bar)	2000.0 psi (137,9 bar)	-14.2 psig (-979 mbar)	-2000.0 psi (-137,9 bar)

(1) When specifying a 3051SAL Ultra, use Classic minimum span.

(2) Assumes atmospheric pressure of 14.7 psig (1 bar).

Table 39. 3051SAM\_\_A, 3051SAL\_\_A Range and Sensor Limits<sup>(1)</sup>

Range	Minimum Span		Range and Sensor Limits	
	Ultra	Classic	Upper (URL)	Lower (LRL)
1	0.3 psia (20,7 mbar)	0.3 psia (20,7 mbar)	30 psia (2,07 bar)	0 psia (0 bar)
2	0.75 psia (51,7 mbar)	1.5 psia (0,103 bar)	150 psia (10,34 bar)	0 psia (0 bar)
3	4 psia (275,8 mbar)	8 psia (0,55 bar)	800 psia (55,16 bar)	0 psia (0 bar)
4	20 psia (1,38 bar)	40 psia (2,76 bar)	4000 psia (275,8 bar)	0 psia (0 bar)

(1) When specifying a 3051SAL Ultra, use Classic minimum span.

Table 40. 3051SAM\_\_T, 3051SAM\_\_E, 3051SAL\_\_T, 3051SAL\_\_E Range and Sensor Limits

Range	Minimum Span		Range and Sensor Limits		
	Ultra	Classic	Upper (URL)	Lower (LRL) (Abs.)	Lower <sup>(1)</sup> (LRL) (Gage)
1	0.3 psi (20,7 mbar)	0.3 psi (20,7 mbar)	30 psi (2,07 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
2	0.75 psi (51,7 mbar)	1.5 psi (0,103 bar)	150 psi (10,34 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
3	4 psi (275,8 mbar)	8 psi (0,55 bar)	800 psi (55,16 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
4	20 psi (1,38 bar)	40 psi (2,76 bar)	4000 psi (175,8 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
5	1000 psi (68,9 bar)	2000 psi (137,9 bar)	10000 psi (689,5 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)

(1) Assumes atmospheric pressure of 14.7 psig (1 bar).

Level  
DP Level

# Rosemount DP Level

Table 41. 3051L Range and Sensor Limits

Range	Minimum Span	Range and Sensor Limits		
		Upper (URL)	Lower (LRL)	
			3051L Differential	3051L Gage
2	2.5 inH <sub>2</sub> O (6,2 mbar)	250 inH <sub>2</sub> O (0,62 bar)	-250 inH <sub>2</sub> O (-0,62 bar)	-250 inH <sub>2</sub> O (-0,62 bar)
3	10 inH <sub>2</sub> O (24,9 mbar)	1000 inH <sub>2</sub> O (2,49 bar)	-1000 inH <sub>2</sub> O (-2,49 bar)	0.5 psia (34,5 mbar abs)
4	3 psi (0,20 bar)	300 psi (20,6 bar)	-300 psi (-20,6 bar)	0.5 psia (34,5 mbar abs)
5	20 psi (1,38 bar)	2000 psi (137,9 bar)	NA	NA

Table 42. 2051L Range and Sensor Limits

Range	Minimum Span	Range and Sensor Limits		
		Upper (URL)	Lower (LRL)	
			2051L Differential	2051L Gage <sup>(1)</sup>
2	2.5 inH <sub>2</sub> O (6,2 mbar)	250 inH <sub>2</sub> O (0,62 bar)	-250 inH <sub>2</sub> O (-0,62 bar)	-250 inH <sub>2</sub> O (-0,62 bar)
3	10 inH <sub>2</sub> O (24,9 mbar)	1000 inH <sub>2</sub> O (2,49 bar)	-1000 inH <sub>2</sub> O (-2,49 bar)	-393 inH <sub>2</sub> O (-979 mbar)
4	3 psi (0,207 bar)	300 psi (20,6 bar)	-300 psi (-20,7 bar)	-14.2 psig (-979 mbar)

(1) Assumes atmospheric pressure of 14.7 psig.

## Service

Liquid, gas, and vapor applications

Maximum loop resistance is determined by the voltage level of the external power supplied as described by:

## Protocols

### 4–20 mA (Output Code A)

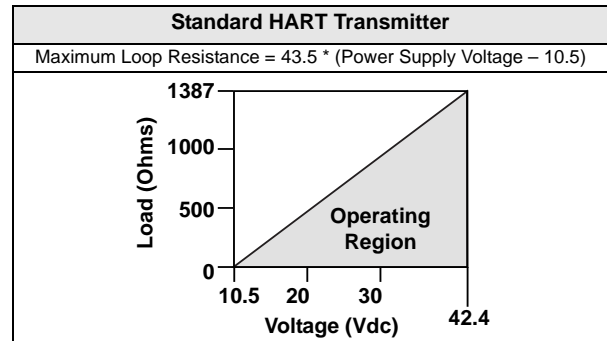
#### Output

Two-wire 4–20 mA, user-selectable for linear or square root output. Digital process variable superimposed on 4–20 mA signal, available to any host that conforms to the HART protocol.

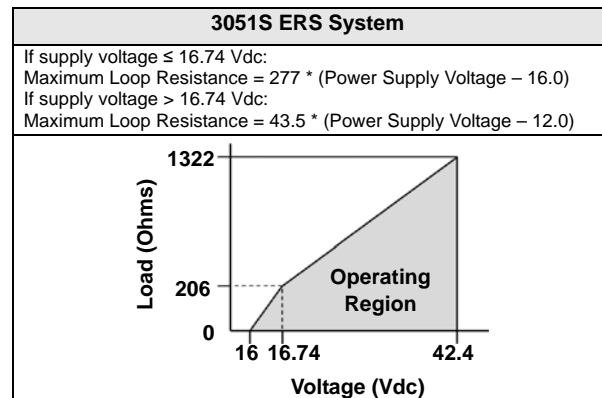
#### Power Supply

External power supply required. Standard transmitter (4–20 mA) operates on 10.5 to 55 Vdc with no load. The 3051S ERS System operates on 16 - 42.4 Vdc with no load.

#### Load Limitations



The Field Communicator requires a minimum loop resistance of 250Ω for communication.



The Field Communicator requires a minimum loop resistance of 250Ω for communication.

Level

DP Level

# Product Data Sheet

00813-0100-4016, Rev LA  
Catalog 2011 - 2012

# Rosemount DP Level

## FOUNDATION fieldbus (output code F)

### Power Supply

External power supply required; transmitters operate on 9.0 to 32.0 Vdc transmitter terminal voltage.

### Current Draw

17.5 mA for all configurations (including LCD display option)

### Indication

Optional two line LCD Display

## FOUNDATION fieldbus Function Block Execution Times

Block	Execution Time (Milliseconds)		
	3051SAL_C	3051L	2051L
Resource	-	-	-
Transducer	-	-	-
LCD Block	-	-	-
Analog Input 1, 2	20	30	35
PID	35 <sup>(1)</sup>	45	45
Input Selector	20	30	30
Arithmetic	20	35	35
Signal Characterizer	20	40	40
Integrator	20	35	35
Output Splitter	20	N/A	N/A
Control Selector	20	N/A	N/A

(1) PID with Auto-tune.

## FOUNDATION fieldbus Parameters

Schedule Entries	7 (max.)
Links	20 (max.)
Virtual Communications Relationships (VCR)	12 (max.)

## Standard Function Blocks

### Resource Block

Contains hardware, electronics, and diagnostic information.

### Transducer Block

Contains actual sensor measurement data including the sensor diagnostics and the ability to trim the pressure sensor or recall factory defaults.

### LCD Block

Configures the local display.

### 2 Analog Input Blocks

Processes the measurements for input into other function blocks. The output value is in engineering units or custom and contains a status indicating measurement quality.

### PID Block

Contains all logic to perform PID control in the field including cascade and feedforward.

## Backup Link Active Scheduler (LAS)

The transmitter can function as a Link Active Scheduler if the current link master device fails or is removed from the segment.

## Advanced Control Function Block Suite (Option Code A01)

### Input Selector Block

Selects between inputs and generates an output using specific selection strategies such as minimum, maximum, midpoint, average, or first "good."

### Arithmetic Block

Provides pre-defined application-based equations including flow with partial density compensation, electronic remote seals, hydrostatic tank gauging, ratio control, and others.

### Signal Characterizer Block

Characterizes or approximates any function that defines an input/output relationship by configuring up to twenty X, Y coordinates. The block interpolates an output value for a given input value using the curve defined by the configured coordinates.

### Integrator Block

Compares the integrated or accumulated value from one or two variables to pre-trip and trip limits and generates discrete output signals when the limits are reached. This block is useful for calculating total flow, total mass, or volume over time.

## FOUNDATION fieldbus Diagnostics Suite (Option Code D01)

The FOUNDATION fieldbus Diagnostics provide Abnormal Situation Prevention (ASP) indication. The integral statistical process monitoring (SPM) technology calculates the mean and standard deviation of the process variable 22 times per second. The 3051S\_L and 3051L use these values and highly flexible configuration options for customization to detect many user-defined or application specific abnormal situations (e.g. detecting plugged impulse lines and fluid composition change).

## Profibus PA (Output Code W)

### Profile Version

3.02

### Power Supply

External power supply required; transmitters operate on 9.0 to 32.0 Vdc transmitter terminal voltage.

### Current Draw

17.5 mA for all configurations (including LCD display option)

### Output Update Rate

Four times per second

## Standard Function Blocks

### Analog Input (AI Block)

The AI function block processes the measurements and makes them available to the host device. The output value from the AI block is in engineering units and contains a status indicating the quality of the measurement.

### Physical Block

The physical block defines the physical resources of the device including type of memory, hardware, electronics, and diagnostic information.

### Transducer Block

Contains actual sensor measurement data including the sensor diagnostics and the ability to trim the pressure sensor or recall factory defaults.

### Indication

Optional two line LCD display

### Local Operator Interface

Optional external configuration buttons

Level

DP Level



# Rosemount DP Level

## 3051SAL\_C Wireless Self-Organizing Networks

### Output

WirelessHART, 2.4 GHz DSSS.  
 Wireless, 2.4 GHz DSSS or 900 MHz FHSS.

### Local Display (WirelessHART only)

The optional five-digit LCD can display user-selectable information such as primary variable in engineering units, percent of range, sensor module temperature, and electronics temperature. Display updates at up to once per minute.

### Local Display

The optional five-digit LCD can display primary variable in engineering units. Display updates at update rate up to once per minute.

### Update Rate

WirelessHART, user selectable 8 sec. to 60 min.  
 Wireless, user selectable 15 sec. to 60 min.

### Power Module (WirelessHART only)

Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride Power Module with polybutadine terephthalate (PBT) enclosure. Ten-year life at one minute update rate.<sup>(1)</sup>

- (1) Reference conditions are 70 °F (21 °C), and routing data for three additional network devices.  
 NOTE: Continuous exposure to ambient temperature limits of -40 °F or 185 °F (-40 °C or 85 °C) may reduce specified life by less than 20 percent.

### Power Module

Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride Power Module with polybutadine terephthalate (PBT) enclosure. Five-year life at one minute update rate, ten-year life at ten minute update rate.<sup>(1)</sup>

- (1) Reference conditions are 70 °F (21 °C), and routing data for three additional network devices.  
 NOTE: Continuous exposure to ambient temperature limits of -40 °F or 185 °F (-40 °C or 85 °C) may reduce specified life by less than 20 percent.

## Overpressure Limits

Limit is 0 psia to the flange rating or sensor rating, whichever is lower.

Table 43. 3051L and Level Flange Rating Limits

Standard	Type	CS Rating	SST Rating
ANSI/ASME	Class 150	285 psig	275 psig
ANSI/ASME	Class 300	740 psig	720 psig
ANSI/ASME	Class 600	1480 psig	1440 psig
<i>At 100 °F (38 °C), the rating decreases with increasing temperature, per ANSI/ASME B16.5.</i>			
DIN	PN 10-40	40 bar	40 bar
DIN	PN 10/16	16 bar	16 bar
DIN	PN 25/40	40 bar	40 bar
<i>At 122 °F (50 °C), the rating decreases with increasing temperature per EN 1092-1 Annex F.</i>			

Level

DP Level

# Product Data Sheet

00813-0100-4016, Rev LA

Catalog 2011 - 2012

# Rosemount DP Level

## Temperature Limits

### Ambient

-40 to 185 °F (-40 to 85 °C)

With LCD display<sup>(1)</sup>: -40 to 175 °F (-40 to 80 °C)

With option code P0: -20 to 185 °F (-29 to 85 °C)

(1) LCD display may not be readable and LCD updates will be slower at temperatures below -4 °F (-20 °C).

### Storage

-50 to 185 °F (-46 to 85 °C)

With LCD display: -40 to 185 °F (-40 to 85 °C)

With Wireless Output: -40 to 185 °F (-40 to 85 °C)

## Process Temperature Limits

Table 44. Fill Fluid Specifications

Seal	Fill Fluid	Specific Gravity at 77 °F (25 °C)	Coeff. Of Therm. Exp. (cc/cc/°C)	Viscosity at 77 °F (25 °C) (Centistokes)	Temperature Limits <sup>(1)</sup>				
					No Extension	2-in. (50mm) Extension	4-in. (100mm) Extension	Thermal Optimizer	Capillary
A	Syltherm XLT	0.85	0.001199	1.6	-102 to 293 °F (-75 to 145 °C)	-102 to 293 °F (-75 to 145 °C)	102 to 293 °F (-75 to 145 °C)	102 to 293 °F (-75 to 145 °C)	102 to 293 °F (-75 to 145 °C)
C	Silicone 704	1.07	0.00095	44	32 to 401 °F (0 to 205 °C) <sup>(2)</sup>	32 to 464 °F (0 to 240 °C) <sup>(2)</sup>	32 to 500 °F (0 to 260 °C) <sup>(2)</sup>	32 to 599 °F (0 to 315 °C)	32 to 599 °F (0 to 315 °C)
D	Silicone 200	0.93	0.000108	9.5	-49 to 401 °F (-45 to 205 °C)	-49 to 401 °F (-45 to 205 °C)	-49 to 401 °F (-45 to 205 °C)	-49 to 401 °F (-45 to 205 °C)	-49 to 401 °F (-45 to 205 °C)
H	Inert (Halocarbon)	1.85	0.000864	6.5	-49 to 320 °F (-45 to 160 °C)	-49 to 320 °F (-45 to 160 °C)	-49 to 320 °F (-45 to 160 °C)	-49 to 320 °F (-45 to 160 °C)	-49 to 320 °F (-45 to 160 °C)
G <sup>(3)(4)</sup>	Glycerin and Water	1.13	0.00034	12.5	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)
N <sup>(4)</sup>	Neobee M-20	0.92	0.001008	9.8	5 to 401 °F (-15 to 205 °C) <sup>(2)</sup>	5 to 437 °F (-15 to 225 °C)	5 to 437 °F (-15 to 225 °C)	5 to 437 °F (-15 to 225 °C)	5 to 437 °F (-15 to 225 °C)
P <sup>(3)(4)</sup>	Proylene Glycol and Water	1.02	0.00034	2.8	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)	5 to 203 °F (-15 to 95 °C)

(1) Temperature limits are reduced in vacuum service and may be limited by seal selection.

(2) Maximum process temperature is limited by heat transfer to the transmitter electronics and must be further derated if ambient temperatures exceed 70°F (21°C).

(3) Not suitable for vacuum applications.

(4) This is a food grade fill fluid.

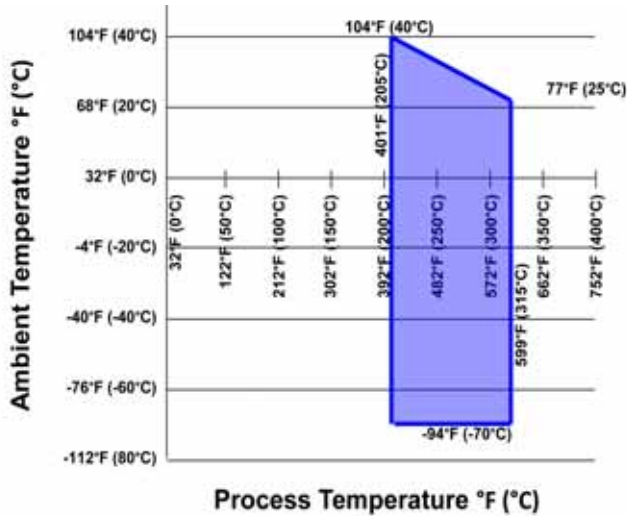
For more information on Fill Fluids please see technical note Rosemount 1199 Fill Fluid Specifications 00840-2100-4016.

Level

DP Level

# Rosemount DP Level

Figure 1. Thermal Optimizer with Silicone 704 Fill Fluid Temperature Limits



## Humidity Limits

0–100% relative humidity

## Turn-On Time

3051SAL_C	Performance within specifications less than 2.0 seconds after power is applied to the transmitter.
3051L	Performance within specifications less than 2.0 seconds (10.0 s for Profibus protocol) after power is applied to the transmitter
2051L	Performance within specifications less than 2.0 seconds after power is applied to the transmitter.
ERS	Performance within specifications less than 6.0 seconds after power is applied.
System:	

## Volumetric Displacement

Less than 0.005 in<sup>3</sup> (0.08 cm<sup>3</sup>)

## Damping<sup>(1)</sup>

Software damping is in addition to sensor module response time.

3051SAL_C	Analog output response to a step change is user-selectable from 0 to 60 seconds for one time constant.
3051L	Analog output response to a step input change is user-selectable from 0 to 36 seconds for one time constant.
2051L	Analog output response to a step input change is user-selectable from 0 to 25.6 seconds for one time constant.
ERS	The PHI and PLO Pressure measurements and the DP calculation may be independently dampened from 0 – 60 seconds for one time constant.
System:	

(1) Does not apply to wireless option code X.

# Product Data Sheet

00813-0100-4016, Rev LA  
Catalog 2011 - 2012

# Rosemount DP Level

## Physical Specifications

### Electrical Connections

$\frac{1}{2}$ -14 NPT, PG 13.5, G $\frac{1}{2}$ , and M20 x 1.5 conduit. HART interface connections fixed to terminal block.

### Non-Wetted Parts

	3051SAL	3051L	2051L
<b>Electrical Housing</b>	Low-copper aluminum alloy or SST: CF-3M (Cast 316L SST) or CF-8M (Cast 316 SST) NEMA 4X, IP 66, IP 68 (66 ft (20 m) for 168 hours) Note: IP 68 not available with Wireless Output.	Low-copper aluminum or CF-3M (Cast version of 316L SST, material per ASTM-A743). NEMA 4X, IP 65, IP 66	Low-copper aluminum or CF-8M (Cast version of 316 SST). Enclosure Type 4X, IP 65, IP 66, IP 68
<b>Coplanar Sensor Module Housing</b>	SST: CF-3M (Cast 316L SST)	CF-3M (Cast version of 316L SST, material per ASTM-A743)	CF-3M (Cast version of 316L SST)
<b>Bolts</b>	Plated carbon steel per ASTM A449, Type 1 Austenitic 316 SST per ASTM F593 ASTM A453, Class D, Grade 660 SST ASTM A193, Grade B7M alloy steel ASTM A193, Class 2, Grade B8M SST Alloy K-500	ASTM A449, Type 1 (zinc-cobalt plated carbon steel) ASTM F593G, Condition CW1 (Austenitic 316 SST) ASTM A193, Grade B7M (zinc plated alloy steel) Alloy K-500	ASTM A449, Type 1 (zinc-cobalt plated carbon steel) ASTM F593G, Condition CW1 (Austenitic 316 SST) ASTM A193, Grade B7M (zinc plated alloy steel)
<b>Sensor Module Fill Fluid</b>	Silicone or inert halocarbon (Inert is not available with 3051S_CA). In-Line series uses Fluorinert <sup>®</sup> FC-43.	Silicone 200 or Fluorocarbon oil (Halocarbon or Fluorinert <sup>®</sup> FC-43 for 3051T)	Silicone 200 or Fluorocarbon oil (Halocarbon or Fluorinert <sup>®</sup> FC-43 for 2051T)
<b>Process Fill Fluid</b>	Syltherm XLT, Silicone 704, Silicone 200, inert, glycerin and water, Neobee M-20, propylene glycol and water.	Syltherm XLT, Silicone 704, Silicone 200, inert, glycerin and water, Neobee M-20 or propylene glycol and water	Syltherm XLT, Silicone 704, Silicone 200, inert, glycerin and water, Neobee M-20 or propylene glycol and water
<b>Paint for Aluminum Housing</b>	Polyurethane	Polyurethane	Polyurethane
<b>Cover O-ring</b>	Nitrile butadiene (NBR)	Nitrile butadiene (NBR)	Nitrile butadiene (NBR)
<b>Wireless Antenna</b>	PBT/ polycarbonate (PC) integrated omnidirectional antenna	N/A	N/A
<b>Power Module</b>	Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride Power Module with PBT enclosure	N/A	N/A

Capillary Armor is SST.

Level  
DP Level

# Rosemount DP Level

## NOTE

If a lower housing is supplied, then the following gaskets are the default gaskets for each seal.

## Wetted Materials

Seal	Gaskets
FFW	ThermoTork TN-9000 gasket
FCW	No gasket is supplied
FUW	No gasket is supplied
FVW	No gasket is supplied
RCW	C-4401 gasket
RFW	C-4401 gasket
FTW	C-4401 gasket
PFW	ThermoTork TN-9000 gasket
PCW	No gasket is supplied

## Shipping Weights

Table 45. 3051SAL Weights Without SuperModule Platform, Housing, or Transmitter Options

Flange	Flush lb. (kg)	2-in. Ext. lb (kg)	4-in. Ext. lb (kg)	6-in. Ext. lb (kg)
2-in., 150	9.5 (4,3)	—	—	—
3-in., 150	15.7 (7,1)	16.4 (7,4)	17.6 (8,0)	18.9 (8,6)
4-in., 150	21.2 (9,6)	20.9 (9,5)	22.1 (10,0)	23.4 (10,6)
2-in., 300	11.3 (5,1)	—	—	—
3-in., 300	19.6 (8,9)	20.3 (9,2)	21.5 (9,8)	22.8 (10,3)
4-in., 300	30.4 (13,8)	30.3 (13,7)	31.5 (14,3)	32.8 (14,9)
2-in., 600	12.8 (5,8)	—	—	—
3-in., 600	22.1 (10,0)	22.8 (10,3)	24.0 (10,9)	25.3 (11,5)
DN 50 / PN 40	11.3 (5,1)	—	—	—
DN 80 / PN 40	16.0 (7,3)	16.7 (7,6)	17.9 (8,1)	19.2 (8,7)
DN 100 / PN 10/16	11.2 (5,1)	11.9 (5,4)	13.1 (5,9)	14.4 (6,5)
DN 100 / PN 40	12.6 (5,7)	13.3 (6,0)	14.5 (6,6)	15.8 (7,1)

Table 46. 3051SAM and 3051SAL Transmitter Option Weights

Option Code	Option	Add lb (kg)
1J, 1K, 1L	SST PlantWeb Housing	3.5 (1,6)
2J	SST Junction Box Housing	3.4 (1,5)
7J	SST Quick Connect	0.4 (0,2)
2A, 2B, 2C	Aluminum Junction Box Housing	1.1 (0,5)
1A, 1B, 1C	Aluminum PlantWeb Housing	1.1 (0,5)
M5	LCD Display for Aluminum PlantWeb Housing <sup>(1)</sup> , LCD Display for SST PlantWeb Housing <sup>(1)</sup>	0.8 (0,4) 1.6 (0,7)
	Aluminum Standard Cover	0.4 (0,2)
	SST Standard Cover	1.3 (0,6)
	Aluminum Display Cover	0.7 (0,3)
	SST Display Cover	1.5 (0,7)
	Wireless Extended Cover	0.7 (0,3)
	LCD Display <sup>(2)</sup>	0.1 (0,04)
	Junction Box Terminal Block	0.2 (0,1)
	PlantWeb Terminal Block	0.2 (0,1)
	Power Module	0.5 (0,2)

(1) Includes LCD display and display cover.

(2) Display only.

# Product Data Sheet

00813-0100-4016, Rev LA  
Catalog 2011 - 2012

# Rosemount DP Level

Table 47. 3051L Weights without Options

Flange	Flush lb. (kg)	2-in. Ext. lb (kg)	4-in. Ext. lb (kg)	6-in. Ext. lb (kg)
2-in., 150	12.5 (5,7)	—	—	—
3-in., 150	17.5 (7,9)	19.5 (8,8)	20.5 (9,3)	21.5 (9,7)
4-in., 150	23.5 (10,7)	26.5 (12,0)	28.5 (12,9)	30.5 (13,8)
2-in., 300	17.5 (7,9)	—	—	—
3-in., 300	22.5 (10,2)	24.5 (11,1)	25.5 (11,6)	26.5 (12,0)
4-in., 300	32.5 (14,7)	35.5 (16,1)	37.5 (17,0)	39.5 (17,9)
2-in., 600	15.3 (6,9)	—	—	—
3-in., 600	25.2 (11,4)	27.2 (12,3)	28.2 (12,8)	29.2 (13,2)
DN 50/PN 40	13.8 (6,2)	—	—	—
DN 80/PN 40	19.5 (8,8)	21.5 (9,7)	22.5 (10,2)	23.5 (10,6)
DN 100/PN 10/16	17.8 (8,1)	19.8 (9,0)	20.8 (9,5)	21.8 (9,9)
DN 100/PN 40	23.2 (10,5)	25.2 (11,5)	26.2 (11,9)	27.2 (12,3)

Table 48. 3051L Transmitter Options Weights

Code	Option	Add lb (kg)
J, K, L, M	Stainless Steel Housing (T)	3.9 (1,8)
J, K, L, M	Stainless Steel Housing (C, L, H, P)	3.1 (1,4)
M5	LCD display for Aluminum Housing	0.5 (0,2)
M6	LCD display for SST Housing	1.25 (0,6)

Table 49. 2051L Weights without Options

Flange	Flush lb. (kg)	2-in. Ext. lb (kg)	4-in. Ext. lb (kg)	6-in. Ext. lb (kg)
2-in., 150	12.5 (5,7)	—	—	—
3-in., 150	17.5 (7,9)	19.5 (8,8)	20.5 (9,3)	21.5 (9,7)
4-in., 150	23.5 (10,7)	26.5 (12,0)	28.5 (12,9)	30.5 (13,8)
2-in., 300	17.5 (7,9)	—	—	—
3-in., 300	22.5 (10,2)	24.5 (11,1)	25.5 (11,6)	26.5 (12,0)
4-in., 300	32.5 (14,7)	35.5 (16,1)	37.5 (17,0)	39.5 (17,9)
DN 50/PN 40	13.8 (6,2)	—	—	—
DN 80/PN 40	19.5 (8,8)	21.5 (9,7)	22.5 (10,2)	23.5 (10,6)
DN 100/PN 10/16	17.8 (8,1)	19.8 (9,0)	20.8 (9,5)	21.8 (9,9)
DN 100/PN 40	23.2 (10,5)	25.2 (11,5)	26.2 (11,9)	27.2 (12,3)

Table 50. 2051L Transmitter Options Weights

Code	Option	Add lb (kg)
J, K, L, M	Stainless Steel Housing	3.9 (1,8)
M5	LCD display for Aluminum Housing	0.5 (0,2)

## SEAL SPECIFICATIONS

### Functional Specifications

#### Hygienic Seal Approvals

Hygienic Seals: Tri-Clamp, tank spud, thin wall tank spud, Tri-Clamp inline, and Cherry Burrell "I" line seal conform to 3-A Hygienic Standards for Sensor and Sensor Fittings and Connections used on Milk and Milk Product Equipment, Number 74-03.

Hygienic Fill Fluids: The hygienic fill fluids glycerin & water and Propylene Glycol & water meet United States Pharmacopeia (USP) and Food Chemical Codex (FCC) requirements and is Generally Recognized as Safe (GRAS) in accordance with the FDA Code of Federal Regulations Title 21. The hygienic fill fluid Neobee M-20 is approved under 21CFR 172.856 as a direct food additive and under 21 CFR 174.5 as an indirect food additive.

Hygienic O-rings: The EPDM, Fluorocarbon (FMK), and Nitrile butadiene (NBR) O-rings for the SSW Tank Spud Seal meet 3-A Hygienic Standard Number 18 Class 1 requirements. The EPDM O-ring also meets USP class VI approval requirements.

#### Surface Finish Certification (Q16 Option)

When ordering the Q16 option in the pressure transmitter model number, the surface finish of the seal diaphragm is certified per BPE 2002 requirements. This surface finish certification is available for Tri-Clamp, Tri-Clamp Inline, Tank Spud, and Thin Wall Tank Spud seal types.

#### NACE Standard (T Option)

NACE (National Association of Corrosion Engineers) standard MR0175/ISO 15156 defines metallic material requirements for resistance to sulfide stress cracking when applied on petroleum production, drilling, gathering and flow line equipment, and field processing facilities to be used in H2S bearing hydrocarbon service. MR0103 provides material requirements exclusive to sour petroleum refining environments. Compliance guidelines are intended to include "wetted" materials as recommended by both NACE standards. The option code T in several of the general purpose seal types limits the wetted material offering.

Metallurgical requirements for alloys used are virtually identical for the two standards, but application conditions enforced are different and can limit material acceptance. Contact an Emerson Process Management representative to aid in selecting the proper materials to meet the NACE standard.

#### Material Traceability (Q8 Option)

Material traceability is provided for the seal, upper housing, and if applicable, lower housing/flushing connection or diaphragm extension, upon selecting the option code Q8 in the pressure transmitter model number. Material traceability for the transmitter/seal system is provided per the DIN EN10204 3.1 standard, and is only available for general purpose seal types.

Level

DP Level

# Rosemount DP Level

## Performance Specifications

Instrument Toolkit calculates the remote seal system performance and validates model number configuration.

### Remote Seal System Performance Calculation Report (QZ Option)

When the QZ option code is specified within the pressure transmitter model structure, Emerson will generate a remote seal system calculation report for the given application. This report quantifies all aspects of remote seal system performance including seal temperature effects, head temperature effects, seal response time, and transmitter total probable error.

## Physical Specifications

### Material of Construction

Remote seal materials of construction (diaphragm, upper housing, flange, lower housing/flushing connection, bolts, and gaskets/O-rings) are listed for each remote seal type. Fill fluids specifications are listed in Table 44.

### Tagging

The 1199 remote seal model number is marked on the transmitter nameplate (neck or top label). The pressure transmitter will be tagged in accordance with customer requirements. The standard stainless steel tag is wired to the transmitter. Tag is 0.02-in. (0.051 cm) thick with 0.125-in. (0.318 cm) high letters. A permanently attached tag is available upon request.

### Calibration

Transmitters are factory calibrated to customer's specified range. If calibration is not specified, then the transmitters are calibrated at maximum range. Calibration is performed at ambient temperature and pressure.

## Custom Configurations

### Rosemount 3051S, 3051, and 2051 (Option Code C1)

If code C1 is ordered, the customer may specify the following data in addition to the standard configuration parameters. Refer to the respective configuration data sheet within the device PDS.

Descriptor: 16 alphanumeric characters.

Message: 32 alphanumeric characters.

Date: Day, month, year.

Damping: Sec.

Level

DP Level

## Rosemount 3051S Liquid Level Certifications

### Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA  
Emerson Process Management GmbH & Co. — Wessling, Germany  
Emerson Process Management Asia Pacific Private Limited — Singapore  
Beijing Rosemount Far East Instrument Co., LTD — Beijing, China  
Emerson Process Management LTDA — Sorocaba, Brazil  
Emerson Process Management (India) Pvt. Ltd. — Mumbai, India  
Emerson Process Management, Emerson FZE — Dubai, United Arab Emirates

### Ordinary Location Certification for FM

As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

### European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found at [www.rosemount.com](http://www.rosemount.com). A hard copy may be obtained by contacting an Emerson Process Management representative.

#### *ATEX Directive (94/9/EC)*

Emerson Process Management complies with the ATEX Directive.

#### *European Pressure Equipment Directive (PED) (97/23/EC)*

Models 3051S\_CA4; 3051S\_CD2, 3, 4, 5; (also with P9 option)  
Pressure Transmitters — QS Certificate of Assessment - EC No. 59552-2009-CE-HOU-DNV, Module H Conformity Assessment  
All other Model 3051S Pressure Transmitters — Sound Engineering Practice  
Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold — Sound Engineering Practice  
Primary Elements, Flowmeter — See appropriate Primary Element QIG

#### *Electro Magnetic Compatibility (EMC) (2004/108/EC)*

EN 61326-1:2006  
EN 61326-2-3:2006

### HART & FOUNDATION Fieldbus Hazardous Locations Certifications

#### North American Certifications

##### *FM Approvals*

- E5** Explosion-proof for Class I, Division 1, Groups B, C, and D, T5 ( $T_a = 85\text{ °C}$ ); Dust Ignition-proof for Class II and Class III, Division 1, Groups E, F, and G, T5 ( $T_a = 85\text{ °C}$ ); hazardous locations; enclosure Type 4X, conduit seal not required when installed according to Rosemount drawing 03151-1003.
- I5/IE** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D, T4 ( $T_a = 70\text{ °C}$  for output options A or X;  $T_a = 60\text{ °C}$  for output option F); Class II, Division 1, Groups E, F, and G; Class III, Division 1; Class I, Zone 0 AEx ia IIC T4 ( $T_a = 70\text{ °C}$  for output options A or X;  $T_a = 60\text{ °C}$  for output option F) when connected in accordance with Rosemount drawing 03151-1006; Non-Incendive for Class I, Division 2, Groups A, B, C, and D; T4 ( $T_a = 70\text{ °C}$  for output options A or X;  $T_a = 60\text{ °C}$  for output option F) Enclosure Type 4X  
For entity parameters see control drawing 03151-1006.

##### *Canadian Standards Association (CSA)*

All CSA hazardous approved transmitters are certified per ANSI/ISA 12.27.01-2003.

- E6** Explosion-proof for Class I, Division 1, Groups B, C, and D; Dust Ignition-proof for Class II and Class III, Division 1, Groups E, F, and G; suitable for Class I, Division 2, Groups A, B, C, and D, when installed per Rosemount drawing 03151-1013, CSA Enclosure Type 4X; conduit seal not required; Dual Seal.
- I6/IF** Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03151-1016; Dual Seal.  
For entity parameters see control drawing 03151-1016.

Level


DP Level



# Rosemount DP Level

## European Certifications

### I1/IA ATEX Intrinsic Safety

Certificate No.: BAS01ATEX1303X  II 1G  
 Ex ia IIC T4 (T<sub>a</sub> = -60 °C to 70 °C) -HART/Remote  
 Display/Quick Connect/HART Diagnostics  
 Ex ia IIC T4 (T<sub>a</sub> = -60 °C to 70 °C) -FOUNDATION fieldbus  
 Ex ia IIC T4 (T<sub>a</sub> = -60 °C to 40 °C) -FISCO  
**CE** 1180


### Input Parameters

Loop / Power	Groups
U <sub>i</sub> = 30 V	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
U <sub>i</sub> = 17.5 V	FISCO
I <sub>i</sub> = 300 mA	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
I <sub>i</sub> = 380 mA	FISCO
P <sub>i</sub> = 1.0 W	HART / Remote Display / Quick Connect / HART Diagnostics
P <sub>i</sub> = 1.3 W	FOUNDATION fieldbus
P <sub>i</sub> = 5.32 W	FISCO
C <sub>i</sub> = 30 nF	SuperModule Platform
C <sub>i</sub> = 11.4 nF	HART / HART Diagnostics / Quick Connect
C <sub>i</sub> = 0	FOUNDATION fieldbus / Remote Display / FISCO
L <sub>i</sub> = 0	HART / FOUNDATION fieldbus/ FISCO / Quick Connect / HART Diagnostics
L <sub>i</sub> = 60 µH	Remote Display
<b>RTD Assembly (3051SFx Option T or R)</b>	
U <sub>i</sub> = 5 Vdc	
I <sub>i</sub> = 500 mA	
P <sub>i</sub> = 0.63 W	

### Special conditions for safe use (x)

- The apparatus, excluding the Types 3051 S-T and 3051 S-C (In-line and Coplanar SuperModule Platforms respectively), is not capable of withstanding the 500 V test as defined in Clause 6.4.12 of EN 60079-11. This must be considered during installation.
- The terminal pins of the Types 3051 S-T and 3051 S-C must be protected to IP20 minimum.

### N1 ATEX Type n

Certificate No.: BAS01ATEX3304X  II 3 G  
 Ex nL IIC T4 (T<sub>a</sub> = -40 °C TO 70 °C)  
 U<sub>i</sub> = 45 Vdc max  
 C<sub>i</sub> = 11.4 nF (Transmitter Output Option A)  
 C<sub>i</sub> = 0 (Transmitter Output Option F)  
 L<sub>i</sub> = 0  
 For remote display, C<sub>i</sub> = 0, L<sub>i</sub> = 60 µH  
 IP66  
**CE**


### Special conditions for safe use (x)

The apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.8.1 of EN 60079-15. This must be taken into account when installing the apparatus.

### NOTE

RTD Assembly is not included with the 3051SFx Type n Approval.


### ND ATEX Dust

Certificate No.: BAS01ATEX1374X  II 1 D  
 Ex tD A20 IP66 T105°C (-20 °C ≤ T<sub>amb</sub> ≤ 85 °C)  
 V<sub>max</sub> = 42.4 volts max  
 IP66  
**CE** 1180

### Special conditions for safe use (x)

- Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
- Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
- Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
- The 3051S SuperModule must be securely screwed in place to maintain the ingress protection of the enclosure. (The 3051S SuperModule must be properly assembled to the 3051S housing to maintain ingress protection.)

### E1 ATEX Flameproof

Certificate No.: KEMA00ATEX2143X  II 1/2 G  
 Ex d IIC T6 (-50 °C ≤ T<sub>amb</sub> ≤ 65 °C)  
 Ex d IIC T5 (-50 °C ≤ T<sub>amb</sub> ≤ 80 °C)  
 V<sub>max</sub> = 42.4 V  
**CE** 1180

### Special conditions for safe use (x)

- The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.
- The 3051S SuperModule contains a thin wall diaphragm. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
- In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

## Japanese Certifications

### E4 TIIS Flameproof

Ex d IIC T6

Certificate	Description
TC15682	Coplanar with Junction Box Housing
TC15683	Coplanar with PlantWeb Housing
TC15684	Coplanar with PlantWeb Housing and LCD Display
TC15685	In-Line SST with Junction Box Housing
TC15686	In-Line Alloy C-276 with Junction Box Housing
TC15687	In-Line SST with PlantWeb Housing
TC15688	In-Line Alloy C-276 with PlantWeb Housing
TC15689	In-Line SST with PlantWeb Housing and LCD Display
TC15690	In-Line Alloy C-276 with PlantWeb Housing and LCD Display
TC17102	Remote Display
TC17099	3051SFA/C/P SST/Alloy C-276 with PlantWeb Housing and LCD Display
TC17100	3051SFA/C/P SST/Alloy C-276 with PlantWeb Housing and Remote Display
TC17101	3051SFA/C/P SST/Alloy C-276 with Junction Box Housing

Level

DP Level

# Product Data Sheet

00813-0100-4016, Rev LA  
Catalog 2011 - 2012

# Rosemount DP Level

## China Certifications

**E3** China Flameproof, Dust Ignition-proof  
NEPSI Certificate No. (manufactured in Chanhassen, MN): GYJ091035  
Certificate No. (manufactured in Beijing, China): GYJ06366  
Certificate No. (manufactured in Singapore): GYJ06364  
Certificate No. (3051SFx RTC, BMMC, SMMC): GYJ071086  
Ex d IIB+H<sub>2</sub> T3~T5  
DIP A21 T<sub>A</sub> T3~T5 IP66

### NOTE

Refer to Appendix B of the 3051S Reference Manual (document number 00809-0100-4801) for Special Conditions for Safe Use.

**I3** China Intrinsic Safety, Dust Ignition-proof  
NEPSI Certificate No. (manufactured in Chanhassen, MN): GYJ081078  
Certificate No. (manufactured in Beijing, China): GYJ06367  
Certificate No. (manufactured in Singapore): GYJ06365  
Certificate No. (3051SFx RTC, BMMC, SMMC): GYJ071293  
Ex ia IIC T4  
DIP A21 T<sub>A</sub> T4 IP66

### NOTE

Refer to Appendix B of the 3051S Reference Manual (document number 00809-0100-4801) for Special Conditions for Safe Use.

## Input Parameters

Loop / Power	Groups
$U_i = 30\text{ V}$	HART / FOUNDATION fieldbus / Remote Display / Quick Connect / HART Diagnostics
$I_i = 300\text{ mA}$	HART / FOUNDATION fieldbus / Remote Display / Quick Connect / HART Diagnostics
$P_i = 1.0\text{ W}$	HART / Remote Display / Quick Connect / HART Diagnostics
$P_i = 1.3\text{ W}$	FOUNDATION fieldbus
$C_i = 38\text{ nF}$	SuperModule Platform
$C_i = 11.4\text{ nF}$	HART / HART Diagnostics / Quick Connect
$C_i = 0$	FOUNDATION fieldbus / Remote Display
$L_i = 0$	SuperModule Platform / FOUNDATION fieldbus
$L_i = 2.4\text{ }\mu\text{H}$	HART / Quick Connect / HART Diagnostics
$L_i = 58.2\text{ }\mu\text{H}$	Remote Display
<b>RTD Assembly (3051SFx Option T or R)</b>	
$U_i = 5\text{ Vdc}$	
$I_i = 500\text{ mA}$	
$P_i = 0.63\text{ W}$	

**N3** China Type n - Energy Limited  
NEPSI Certificate No.: GYJ101112X  
Ex nL IIC T5 (-40 °C ≤ Ta ≤ 70 °C)  
IP66

Loop / Power	Transmitter Output
$U_i = 30\text{ V}$	HART / FOUNDATION fieldbus
$I_i = 300\text{ mA}$	HART / FOUNDATION fieldbus
$P_i = 1.0\text{ W}$	HART
$P_i = 1.3\text{ W}$	FOUNDATION fieldbus
$C_i = 11.4\text{ nF}$	HART
$C_i = 0\text{ nF}$	FOUNDATION fieldbus
$L_i = 0\text{ }\mu\text{H}$	HART <sup>(1)</sup> / FOUNDATION fieldbus

(1) For remote meter option (M7, M8, M9),  $L_i = 60\text{ }\mu\text{H}$ .

### NOTE

Refer to Appendix B of the 3051S Reference Manual (document number 00809-0100-4801) for Special Conditions for Safe Use.

## Brazil Certifications

**I2** INMETRO Intrinsic Safety  
Certificate number: CEPEL-EX-0722/05X  
(manufacturing in Chanhassen, MN and Singapore)  
Certificate number: CEPEL-EX-1414/07X  
(manufacturing in Brazil)  
INMETRO Marking: BR-Ex ia IIC T4 IP66W

### Special conditions for safe use (x)

The apparatus, excluding the Types 3051S-T and 3051S-C (In-line and Coplanar SuperModule Platforms respectively), is not capable of withstanding the 500 V test as defined in Clause 6.4.12 of IEC60079-11. This must be considered during installation.

**E2** INMETRO Flameproof  
Certificate number: CEPEL-EX-140/2003X  
(manufacturing in Chanhassen, MN and Singapore)  
Certificate number: CEPEL-EX-1413/07X  
(manufacturing in Brazil)  
INMETRO Marking: BR-Ex d IIC T5/T6 IP66W

### Special conditions for safe use (x)

- This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
- For ambient temperature above 60 °C, cable wiring must have minimum isolation temperature of 90 °C, to be in accordance to equipment operation temperature.
- The accessory of cable entries or conduit must be certified as flameproof and needs to be suitable for use conditions.
- Where electrical entry is via conduit, the required sealing device must be assembled immediately close to enclosure.

Level

DP Level

# Rosemount DP Level

## IECEX Certifications

### E7 IECEX Flameproof and Dust (each listed separately)

IECEX Flameproof  
 Certificate No.: IECEXKEM08.0010X  
 Ex d IIC T5 or T6 Ga/Gb  
 T6 (-50 °C ≤ T<sub>amb</sub> ≤ 65 °C)  
 T5 (-50 °C ≤ T<sub>amb</sub> ≤ 80 °C)  
 V<sub>max</sub> = 42.4 V

#### Special conditions for safe use (x)

1. The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.
2. The 3051S SuperModule contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
3. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

IECEX Dust  
 Certificate No. IECEXBAS09.0014X  
 Ex tD A20 IP66 T105 °C (-20 °C ≤ T<sub>a</sub> ≤ 85 °C)  
 Vmax = 42.4 V  
 A = 22 mA  
 IP66

#### Special conditions for safe use (x)

1. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
2. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
3. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
4. The 3051S SuperModule must be securely screwed in place to maintain the ingress protection of the enclosure. (The 3051S SuperModule must be properly assembled to the 3051S housing to maintain ingress protection.)

### I7/IG IECEX Intrinsic Safety

Certificate No.: IECEXBAS04.0017X  
 Ex ia IIC T4 (T<sub>a</sub> = -60 °C to 70 °C) -HART/Remote Display/Quick Connect/HART Diagnostics  
 Ex ia IIC T4 (T<sub>a</sub> = -60 °C to 70 °C) -FOUNDATION fieldbus  
 Ex ia IIC T4 (T<sub>a</sub> = -60 °C to 40 °C) -FISCO  
 IP66

## Input Parameters

Loop / Power	Groups
U <sub>i</sub> = 30 V	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
U <sub>i</sub> = 17.5 V	FISCO
I <sub>i</sub> = 300 mA	HART / FOUNDATION fieldbus/ Remote Display / Quick Connect / HART Diagnostics
I <sub>i</sub> = 380 mA	FISCO
P <sub>i</sub> = 1.0 W	HART / Remote Display / Quick Connect / HART Diagnostics
P <sub>i</sub> = 1.3 W	FOUNDATION fieldbus
P <sub>i</sub> = 5.32 W	FISCO
C <sub>i</sub> = 30 nF	SuperModule Platform
C <sub>i</sub> = 11.4 nF	HART / HART Diagnostics / Quick Connect
C <sub>i</sub> = 0	FOUNDATION fieldbus / Remote Display / FISCO
L <sub>i</sub> = 0	HART / FOUNDATION fieldbus/ FISCO / Quick Connect / HART Diagnostics
L <sub>i</sub> = 60 μH	Remote Display
<b>RTD Assembly (3051SFx Option T or R)</b>	
U <sub>i</sub> = 5 Vdc	
I <sub>i</sub> = 500 mA	
P <sub>i</sub> = 0.63 W	

#### Special conditions for safe use (x)

1. The 3051S HART 4-20 mA, 3051S FOUNDATION fieldbus, and 3051S FISCO are not capable of withstanding the 500 V test as defined in clause 6.4.12 of IEC 60079-11. This must be taken into account during installation.
2. The terminal pins of the Types 3051S-T and 3051S-C must be protected to IP20 minimum.

### N7 IECEX Type n

Certificate No.: IECEXBAS04.0018X  
 Ex nC IIC T4 (-40 °C ≤ T<sub>a</sub> ≤ +70 °C)  
 IP66

#### Special conditions for safe use (x)

The apparatus is not capable of withstanding the 500 V insulation test required by Clause 8 of IEC 60079-15:1987.

## Combinations of Certifications

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

- K1** Combination of E1, I1, N1, and ND
- K2** Combination of E2 and I2
- K5** Combination of E5 and I5
- K6** Combination of E6 and I6
- K7** Combination of E7, I7, and N7
- KA** Combination of E1, I1, E6, and I6
- KB** Combination of E5, I5, I6, and E6
- KC** Combination of E5, E1, I5, and I1
- KD** Combination of E5, I5, E6, I6, E1, and I1

Level

DP Level

## 3051S ERS System Certifications

### Approved Manufacturing Locations

Rosemount Inc. – Chanhassen, Minnesota, USA  
Emerson Process Management GmbH & Co. – Wessling,  
Germany  
Emerson Process Management Asia Pacific Private Limited –  
Singapore  
Beijing Rosemount Far East Instrument Co., LTD – Beijing, China

### Ordinary Location Certification for FM Approvals

As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

### European Directive Information

Consult your Emerson Process Management sales representative for more information about the EC declaration of conformity.

### Hazardous Locations Certifications

#### North American Certifications

##### FM Approvals


- E5** Explosion-proof for Class I, Division 1, Groups B, C, and D; Dust Ignition-proof for Class II and Class III, Division 1, Groups E, F, and G; hazardous locations; enclosure Type 4X, conduit seal not required.
- I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1; Class I, Zone 0 AEx ia IIC when connected in accordance with Rosemount drawing 03151-1306; Non-Incendive for Class I, Division 2, Groups A, B, C, and D Enclosure Type 4X  
For entry parameters see control drawing 03151-1306.

##### Canadian Standards Association (CSA)

All CSA hazardous approved transmitters are certified per ANSI/ISA 12.27.01-2003.


- E6** Explosion-proof for Class I, Division 1, Groups B, C, and D; Dust Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G; suitable for Class I, Division 2, Groups A, B, C, and D, CSA Enclosure Type 4X; conduit seal not required; Dual Seal.
- I6** Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount Drawings 03151-1316; Dual Seal.  
For entry parameters see control drawing 03151-1316.

### European Certifications

- I1** ATEX Intrinsic Safety  
Consult factory for availability.
- N1** ATEX Type n  
Consult factory for availability.
- ND** ATEX Dust  
Certificate No.: BAS01ATEX1374X  II 1 D  
Ex tD A20 IP66 T105 °C (-20 °C ≤ T<sub>amb</sub> ≤ 85 °C)  
V<sub>max</sub> = 42.4 V max  
IP66  
**CE** 1180

#### Special Conditions for safe use (X):

1. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
2. Unused cable entries must be filled suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
3. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
4. Each 3051S ERS transmitter must be securely screwed in place to maintain the ingress protection of the enclosure. (The 3051S Super Module must be properly assembled to the 3051S housing to maintain ingress protection.)

- E1** ATEX Flameproof  
Certificate No.: KEMA00ATEX2143X  II 1/2 G  
Ex d IIC T6 (-50 °C ≤ T<sub>amb</sub> ≤ 65 °C)  
Ex d IIC T5 (-50 °C ≤ T<sub>amb</sub> ≤ 80 °C)  
V<sub>max</sub> = 42.4 V  
**CE** 1180

#### Special Conditions for safe use (X):

1. The Ex d blanking elements, cable glands and wiring shall be suitable for a temperature of 90 °C.
2. Transmitter Model 3051S contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
3. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

### Japanese Certifications

- E4** TIIS Flameproof: Consult factory for availability

### INMETRO Certifications

- E2** INMETRO Flameproof: Consult factory for availability

- I2** INMETRO Intrinsic Safety: Consult factory for availability

### China Certifications

- E3** China Flameproof: Consult factory for availability

- I3** China Intrinsically Safe: Consult factory for availability

Level

DP Level

# Rosemount DP Level

## IECEX Certifications

- I7** IECEX Intrinsic Safety  
Consult factory for availability.
- N7** IECEX Type n  
Consult factory for availability.
- E7** IECEX Flameproof and Dust (each listed separately)  
IECEX Flameproof  
Certificate No.: IECEXKEM08.0010X  
Ex d IIC T6 (-50 °C ≤ T<sub>amb</sub> ≤ 65 °C)  
Ex d IIC T5 (-50 °C ≤ T<sub>amb</sub> ≤ 80 °C)  
V<sub>max</sub> = 42.4 V

### Special conditions for safe use (X)

1. The Ex d blanking elements, cable glands and wiring shall be suitable for a temperature of 90 °C.
2. Transmitter Model 3051S contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for maintenance shall be followed in detail to assure safety during its expected lifetime.
3. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

### IECEX Dust

Certificate No. IECEXBAS09.0014X  
Ex tD A20 IP66 T105°C (-20 °C ≤ T<sub>amb</sub> ≤ 85 °C)  
V<sub>max</sub> = 42.4 V  
A = 22 mA  
IP66

### Special conditions for safe use (x)

1. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
2. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
3. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
4. Each 3051S ERS sensor must be securely screwed in place to maintain the ingress protection of the enclosure. (Each sensor module must be properly assembled to the housing to maintain ingress protection.)

## Combinations of Certifications

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

- K1** Combination of **E1**, **I1**, **N1**, and **ND**  
**K2** Combination of **E2** and **I2**  
**K5** Combination of **E5** and **I5**  
**K6** Combination of **E6** and **I6**  
**K7** Combination of **E7**, **I7**, and **N7**  
**KA** Combination of **E1**, **E6**, **I1**, and **I6**  
**KB** Combination of **E5**, **E6**, **I1**, and **I6**  
**KC** Combination of **E5**, **E1**, **I5**, and **I1**  
**KD** Combination of **E5**, **E6**, **E1**, **I5**, **I6**, and **I1**

Level

DP Level

## 3051L Product Certifications

### Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA  
 Emerson Process Management GmbH & Co. — Wessling, Germany  
 Emerson Process Management Asia Pacific Private Limited — Singapore  
 Beijing Rosemount Far East Instrument Co., LTD — Beijing, China

### European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at [www.rosemount.com](http://www.rosemount.com). A hard copy may be obtained by contacting an Emerson Process Management representative.

#### ATEX Directive (94/9/EC)

All 3051 transmitters comply with the ATEX Directive.

#### European Pressure Equipment Directive (PED) (97/23/EC)

3051CA4; 3051CG2, 3, 4, 5; 3051CD2, 3, 4, 5  
 (also with P9 option); 3051HD2, 3, 4, 5; 3051HG2, 3, 4, 5;  
 3051PD2, 3; and 3051PG2, 3, 4, 5 Pressure Transmitters  
 — QS Certificate of Assessment -  
 EC No. 59552-2009-CE-HOU-DNV  
 Module H Conformity Assessment

#### All other 3051/3001 Pressure Transmitters

— Sound Engineering Practice

#### Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold

— Sound Engineering Practice

#### Electro Magnetic Compatibility (EMC) (2004/108/EC)

All 3051 Pressure Transmitters meet all of the requirements of EN61326-1:2006 EN61326-2-3: 2006 and NAMUR NE-21

#### Ordinary Location Certification for Factory Mutual

As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

### 3051L HART PROTOCOL

### Hazardous Locations Certifications

#### North American Certifications

##### FM Approvals

- E5** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1. Factory Sealed, Enclosure Type 4X
- I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 03031-1019; Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code:T4 (Ta = 40 °C), T3 (Ta = 85 °C), Enclosure Type 4X  
 For input parameters see control drawing 03031-1019.

##### Canadian Standards Association (CSA)

All CSA hazardous approved transmitters are certified per ANSI/ISA 12.27.01-2003.

- E6** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D for indoor and outdoor hazardous locations. Enclosure type 4X, factory sealed
- C6** Explosion-Proof and intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03031-1024. Temperature Code T3C. Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed  
 For input parameters see control drawing 03031-1024.

### European Certifications


- I1** ATEX Intrinsic Safety and Dust  
 Certification No.: BAS 97ATEX1089X  II 1 GD  
 Ex ia IIC T4 (-60 ≤ Ta ≤ +70 °C)  
 Dust Rating: Ex tD A20 T80 °C (-20 ≤ Ta ≤ 40 °C) IP66  
 CE 1180

Table 51. Input Parameters

U <sub>i</sub> = 30 V
I <sub>i</sub> = 200 mA
P <sub>i</sub> = 0.9 W
C <sub>i</sub> = 0.012 μF

Table 52. RTD Assembly (3051CFx Option T or R)

U <sub>i</sub> = 5 Vdc
I <sub>i</sub> = 500 mA
P <sub>i</sub> = 0.63 W

Level

DP Level

# Rosemount DP Level

**Special Conditions for Safe Use (X):**

When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

The enclosure may be made of aluminium alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

**N1** ATEX Type n and Dust

Certification No.: BAS 00ATEX3105X Ⓢ II 3 GD

U<sub>i</sub> = 55 Vdc max

Ex nA nL T5 (-40 °C ≤ T<sub>amb</sub> ≤ 70 °C)

Dust rating: Ex tD A22 T80 °C (-20 ≤ T<sub>a</sub> ≤ 40 °C) IP66

CE

**Special Conditions for Safe Use (X):**

When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding a 500 V r.m.s. test to case. This must be taken into account on any installation in which it is used, for example, by assuring that the supply to the apparatus is galvanically isolated.

**E8** ATEX Flame-Proof and Dust

Certification No.: KEMA 00ATEX2013X Ⓢ II 1/2 GD

Ex d IIC T6 (-50 ≤ T<sub>a</sub> ≤ 65 °C)

T5 (-50 ≤ T<sub>a</sub> ≤ 80 °C)

Dust rating: Ex tD A20/A21 T90 °C, IP66

CE 1180

V<sub>max</sub> = 55 Vdc

**Special Conditions for Safe Use (X):**

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

In case of repair, contact Rosemount for dimensions of the flameproof joints.

**Japanese Certifications**

**E4** TIIS Flame-Proof

Ex d IIC T6

Certificate	Description
C15850	3051C/D/1 4-20 mA HART — no display
C15851	3051C/D/1 4-20 mA HART — with display

**IECEx Certifications**

**I7** IECEx Intrinsic Safety

Certification No.: IECEx BAS 09.0076X

Ex ia IIC T4 (-60 °C ≤ T<sub>a</sub> ≤ 70 °C)

IP66

TABLE 53. Input Parameters

U <sub>i</sub> = 30 V
I <sub>i</sub> = 200 mA
P <sub>i</sub> = 0.9 W
C <sub>i</sub> = 0.012 μF

TABLE 54. RTD Assembly (3051CFx Option T or R)

U <sub>i</sub> = 5 Vdc
I <sub>i</sub> = 500 mA
P <sub>i</sub> = 0.63 W

**Special Conditions for Safe Use (X):**

When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of IEC 60079-11. This must be taken into account when installing the apparatus.

The enclosure may be made of aluminium alloy and given a protective polyurethane paint finish; however care should be taken to protect it from impact or abrasion located in Zone 0.

**E7** IECEx Explosion-Proof (Flame-Proof)

Certification No.: IECEx KEM 09.0034X

Ga/Gb Ex d IIC T6 or T5

Ex tD A20/A21 IP66 T90 °C

IP66

**Special Conditions for Safe Use (X):**

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

For information on the dimensions of the flameproof joints the manufacturer shall be contacted.

**N7** IECEx Type n

Certification No.: IECEx BAS 09.0077X

Ex nA nL IIC T5 (-40 °C ≤ T<sub>a</sub> ≤ 70 °C)

IP66

**Special Conditions for Safe Use (X):**

The apparatus is not capable of withstanding the 500 V insulation test required by clause 6.8.1 of IEC 60079-15. This must be taken into account when installing the apparatus.

**Combinations of Certifications**

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

**K5** E5 and I5 combination

**KB** K5 and C6 combination

**KD** K5, C6, I1, and E8 combination

**K6** C6, I1, and E8 combination

**K8** E8 and I1 combination

**K7** E7, I7, and N7 combination

Level

DP Level

**3051L FIELDBUS PROTOCOL**

**Hazardous Locations Certifications**

**North American Certifications**

*FM Approvals*

- E5** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1. Factory sealed. Enclosure Type 4X.
- I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 03031-1019; Non-incendive for Class I, Division 2, Groups A, B, C, and D.  
  
 Temperature Code: T4 (Ta = 60 °C), T3 (Ta = 85 °C), Enclosure Type 4X  
 For input parameters see control drawing 03031-1019.

*Canadian Standards Association (CSA)*

All CSA hazardous approved transmitters are certified per ANSI/ISA 12.27.01-2003.

- E6** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D for indoor and outdoor hazardous locations. Enclosure type 4X, factory sealed
- C6** Explosion-Proof and intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03031-1024. Temperature Code T3C. Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed  
 For input parameters see control drawing 03031-1024.

**European Certifications**

- I1** ATEX Intrinsic Safety and Dust  
 Certification No.: BAS 98ATEX1355X Ⓢ II 1 GD  
 Ex ia IIC T4 (T<sub>amb</sub> = -60 to +60 °C)  
 Dust Rating: Ex tD A20 T70 °C (T<sub>amb</sub> -20 to 40 °C) IP66  
**CE** 1180

Table 55. Input Parameters

U <sub>i</sub> = 30 V
I <sub>i</sub> = 300 mA
P <sub>i</sub> = 1.3 W
C <sub>i</sub> = 0 μF

Table 56. RTD Assembly (3051CFx Option T or R)

U <sub>i</sub> = 5 Vdc
I <sub>i</sub> = 500 mA
P <sub>i</sub> = 0.63 W

**Special Conditions for Safe Use (X):**

The device is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

The enclosure may be made of aluminium alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

- IA** ATEX FISCO Intrinsic Safety  
 Certification No.: BAS 98ATEX1355X Ⓢ II 1 G  
 Ex ia IIC T4 (T<sub>amb</sub> = -60 to +60 °C)  
 IP66  
**CE** 1180

Table 57. Input Parameters

U <sub>i</sub> = 17.5 V
I <sub>i</sub> = 380 mA
P <sub>i</sub> = 5.32 W
C <sub>i</sub> = ≤ 5 μF
L <sub>i</sub> = ≤ 10 μH

**Special Conditions for Safe Use (X):**

The device is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.

The enclosure may be made of aluminium alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

- N1** ATEX Type n and Dust  
 Certification No.: BAS 98ATEX3356X Ⓢ II 3 GD  
 U<sub>i</sub> = 40 Vdc max  
 Ex nL IIC T5 (T<sub>a</sub> = -40 °C to 70 °C)  
 Dust rating: Ex tD A22 T80 °C (T<sub>amb</sub> = -20 to 40 °C) IP66

**Special Conditions for Safe Use (X):**

The device is not capable of withstanding the 500 V insulation test required by Clause 6.8.1 of EN60079-15. This must be taken into account when installing the apparatus.

- E8** ATEX Flame-Proof and Dust  
 Certification No.: KEMA 00ATEX2013X Ⓢ II 1/2 GD  
 Ex d IIC T6 (T<sub>amb</sub> = -50 to 65 °C)  
                   T5 (T<sub>amb</sub> = -50 to 80 °C)  
 Dust rating: Ex tD A20/21 T90 °C, IP66  
**CE** 1180  
 V<sub>max</sub> = 55 Vdc

**Special Conditions for Safe Use (X):**

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

In case of repair, contact Rosemount for dimensions of the flameproof joints.

Level  
  
DP Level



# Rosemount DP Level

## Japanese Certifications

**E4** TIIS Flame-Proof  
Ex d IIC T6

Certificate	Description
C15852	3051C/D/1 FOUNDATION Fieldbus — no display
C15853	3051C/D/1 FOUNDATION Fieldbus — with display

## IECEX Certifications

**I7** IECEX Intrinsic Safety  
Certification No.: IECEX BAS 09.0076X  
Ex ia IIC T4 (-60 °C ≤ T<sub>a</sub> ≤ 60 °C)  
IP66

TABLE 58. Input Parameters

U <sub>i</sub> = 30 V
I <sub>i</sub> = 300 mA
P <sub>i</sub> = 1.3 W
C <sub>i</sub> = 0 μF
L <sub>i</sub> = 0 μH

TABLE 59. RTD Assembly (3051CFx Option T or R)

U <sub>i</sub> = 5 Vdc
I <sub>i</sub> = 500 mA
P <sub>i</sub> = 0.63W

### Special Conditions for Safe Use (X):

- If the apparatus is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by clause 6.3.12 of IEC 60079-11. This must be taken into account when installing the apparatus.
- The enclosure may be made of aluminium alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

**E7** IECEX Explosion-Proof (Flame-Proof)  
Certification No.: IECEX KEM 09.0034X  
Ga/Gb Ex d IIC T6 or T5  
Ex tD A20/A21 IP66 T90 °C  
IP66

### Special Conditions for Safe Use (X):

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

For information on the dimensions of the flameproof joints the manufacturer shall be contacted.

**N7** IECEX Type n  
Certification No.: IECEX BAS 09.0077X  
Ex nA nL IIC T5 (-40 °C ≤ T<sub>a</sub> ≤ 70 °C)  
IP66

### Special Conditions for Safe Use (X):

The apparatus is not capable of withstanding the 500 V insulation test required by clause 6.8.1 of IEC 60079-15. This must be taken into account when installing the apparatus.

## Combinations of Certifications

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

- K5** E5 and I5 combination
- KB** K5 and C6 combination
- KD** K5, C6, I1, and E8 combination
- K6** C6, I1, and E8 combination
- K8** E8 and I1 combination
- K7** E7, I7, and N7 combination

Level

DP Level

## 2051L Product Certifications

### Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA  
 Emerson Process Management GmbH & Co. — Wessling, Germany  
 Emerson Process Management Asia Pacific Private Limited — Singapore  
 Beijing Rosemount Far East Instrument Co., LTD — Beijing, China

### European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at [www.rosemount.com](http://www.rosemount.com). A hard copy may be obtained by contacting an Emerson Process Management representative.

#### ATEX Directive (94/9/EC)

All 2051 transmitters comply with the ATEX Directive.

#### European Pressure Equipment Directive (PED) (97/23/EC)

2051CG2, 3, 4, 5; 2051CD2, 3, 4, 5 (also with P9 option)  
 — QS Certificate of Assessment -  
 EC No. 59552-2009-CE-HOU-DNV  
 Module H Conformity Assessment

#### All other 2051 Pressure Transmitters

— Sound Engineering Practice

#### Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold

— Sound Engineering Practice

#### Electro Magnetic Compatibility (EMC) (2004/108/EC)

All 2051 Pressure Transmitters meet all of the requirements of EN61326:2006 and NAMUR NE-21.

#### Ordinary Location Certification for Factory Mutual

As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

## 2051L HART PROTOCOL

### Hazardous Locations Certifications

#### North American Certifications

##### FM Approvals

- E5** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1. T5 (Ta = 85 °C), Factory Sealed, Enclosure Type 4X

- I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class 1, Zone 0 AEx ia T4; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 02051-1009; Non-incendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code:T4 (Ta = 70 °C), Enclosure Type 4X  
 For input parameters see control drawing 02051-1009.

#### Canadian Standards Association (CSA)

All CSA hazardous approved transmitters are certified per ANSI/ISA 12.27.01-2003.

- E6** Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D for indoor and outdoor hazardous locations. Enclosure type 4X, factory sealed
- I6** Intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawing 02051-1008. Temperature Code T3C; Ex ia IIC T3C. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed  
 For input parameters see control drawing 02051-1008.

### European Certifications

- I1** ATEX Intrinsic Safety  
 Certification No. Baseefa08ATEX0129X<sup>Ⓢ</sup> II 1 G  
 Ex ia IIC T4 (-60 ≤ Ta ≤ +70 °C)  
 IP66 IP68  
**CE** 1180

Table 60. Input Parameters

U <sub>i</sub> = 30 V
I <sub>i</sub> = 200 mA
P <sub>i</sub> = 1.0 W
C <sub>i</sub> = 0.012 μF
L <sub>i</sub> = 10 μH

Table 61. RTD Assembly (2051CFx Option T or R)

U <sub>i</sub> = 5 Vdc
I <sub>i</sub> = 500 mA
P <sub>i</sub> = 0.63 W

#### Special Conditions for Safe Use (X):

When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of EN60079-11. This must be taken into account when installing the apparatus.


- N1** ATEX Type n  
 Certification No. Baseefa08ATEX0130X<sup>Ⓢ</sup> II 3 G  
 Ex nAnL IIC T4 (-40 ≤ Ta ≤ +70 °C)  
 U<sub>i</sub> = 42.4 Vdc max  
 IP66  
**CE**

Level  
DP Level

# Rosemount DP Level


**Special Conditions for Safe Use (X):**

When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding a 500 V r.m.s. test to case. This must be taken into account on any installation in which it is used, for example by assuring that the supply to the apparatus is galvanically isolated.

- E1** ATEX Flame-Proof  
 Certification No. KEMA 08ATEX0090X  II 1/2 G  
 Ex d IIC T6 (-50 ≤ T<sub>a</sub> ≤ 65 °C)  
 Ex d IIC T5 (-50 ≤ T<sub>a</sub> ≤ 80 °C)  
 IP66  
**CE** 1180  
 V<sub>max</sub> = 42.4 Vdc

**Special Conditions for Safe Use (X):**

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.  
 The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.  
 In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

- ND** ATEX Dust  
 Certification No. Baseefa08ATEX0182X  II 1 D  
 Dust Rating: II 1 D Ex tD A20 T115 °C (-20 °C ≤ T<sub>a</sub> ≤ 85 °C)  
 IP66 IP68  
 V<sub>max</sub> = 42.4 Vdc  
 A = 22 mA  
**CE** 1180

**Special Conditions for Safe Use (X):**

1. The user must ensure that the maximum rated voltage and current (42.4 V, 22 mA, DC) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category "ib" circuit according to EN 60079-1.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.

**IECEX Certifications**

- I7** IECEX Intrinsic Safety  
 Certification No. IECEXBAS08.0045X II 1 G  
 Ex ia IIC T4 (-60 ≤ T<sub>a</sub> ≤ +70 °C)  
**CE** 1180

Table 62. Input Parameters

U <sub>i</sub> = 30 V
I <sub>i</sub> = 200 mA
P <sub>i</sub> = 1.0 W
C <sub>i</sub> = 0.012 μF
L <sub>i</sub> = 10 μH

Table 63. RTD Assembly (2051CFx Option T or R)

U <sub>i</sub> = 5 Vdc
I <sub>i</sub> = 500 mA
P <sub>i</sub> = 0.63 W

**Special Conditions for Safe Use (X):**

When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of IEC60079-11. This must be taken into account when installing the apparatus.

- E7** IECEX Explosion-Proof (Flame-Proof)  
 Certification No. IECEX KEM 08.0024X II 1/2 G  
 Ex d IIC T6 (-50 ≤ T<sub>a</sub> ≤ 65 °C)  
 Ex d IIC T5 (-50 ≤ T<sub>a</sub> ≤ 80 °C)  
**CE** 1180  
 V<sub>max</sub> = 42.4 Vdc

**Special Conditions for Safe Use (X):**

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.  
 The Ex d blanking elements, cable glands, and wiring shall be suitable for a temperature of 90 °C.  
 In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.

- N7** IECEX Type n  
 Certification No. IECEXBAS08.0046X II 3 G  
 Ex nAnL IIC T4 (-40 ≤ T<sub>a</sub> ≤ +70 °C)  
 U<sub>i</sub> = 42.4 Vdc max  
**CE**

**Special Conditions for Safe Use (X):**

When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding a 500 V r.m.s. test to case. This must be taken into account on any installation in which it is used, for example by assuring that the supply to the apparatus is galvanically isolated.

**TIIS Certifications**

- E4** TIIS Flame-Proof  
 Ex d IIC T6

TC18872	Coplanar with Display
TC18873	Coplanar no display

**Inmetro Certifications**

- E2** Flame-Proof  
 Certificate No. CEPEL EX-1767/09X  
 BR-Ex d IIC T6/T5
- I2** Intrinsic Safety  
 Certificate No. CEPEL EX-1768/09X  
 BR-Ex ia IIC T4

Level

DP Level

# Product Data Sheet

00813-0100-4016, Rev LA  
Catalog 2011 - 2012

# Rosemount DP Level

Table 64. Input Parameters

$U_i = 30 \text{ V}$
$I_i = 200 \text{ mA}$
$P_i = 1.0 \text{ W}$
$C_i = 0.012 \text{ }\mu\text{F}$
$L_i = 10 \text{ }\mu\text{H}$

Table 65. RTD Assembly (2051CFx Option T or R)

$U_i = 5 \text{ Vdc}$
$I_i = 500 \text{ mA}$
$P_i = 0.63 \text{ W}$

### Special Conditions for Safe Use (X):

When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.3.12 of IEC60079-11. This must be taken into account when installing the apparatus.

### Combinations of Certifications

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

- K1** E1, I1, N1, and ND combination
- K4** E4 and I4 combination
- K5** E5 and I5 combination
- K6** I6 and E6 combination
- K7** E7, I7, and N7 combination
- KA** E1, I1, E6, and I6 combination
- KB** E5, I5, E6, and I6 combination
- KC** E1, I1, E5, and I5 combination
- KD** E1, I1, E5, I5, E6, and I6 combination

### GOST - Russia Certifications

- IM** Intrinsic Safety  
Consult factory for availability
- EM** Flame-Proof  
Consult factory for availability

### China (NEPSI) Certifications

#### NOTE

Refer to Appendix B of the 3051S Reference Manual (document number 00809-0100-4801) for Special Conditions for Safe Use.

- E3** Flame-Proof  
Certificate No.: GYJ081230  
Ex d IIC T5/T6
- I3** Intrinsic Safety  
Certificate No.: GYJ081231X  
Ex ia IIC T4

Table 66. Input Parameters

$U_i = 30 \text{ V}$
$I_i = 200 \text{ mA}$
$P_i = 1.0 \text{ W}$
$C_i = 0.012 \text{ }\mu\text{F}$
$L_i = 10 \text{ }\mu\text{H}$

### CCoE Certifications

- IW** Intrinsic Safety  
Ex ia IIC T4
- EW** Flame-Proof  
Ex d IIC T5 or T6

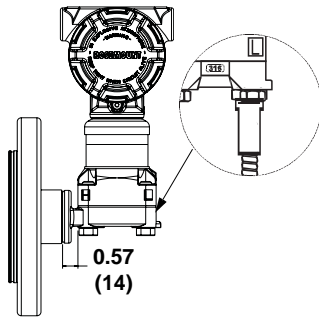
Level

DP Level

# Rosemount DP Level

## Dimensional Drawings

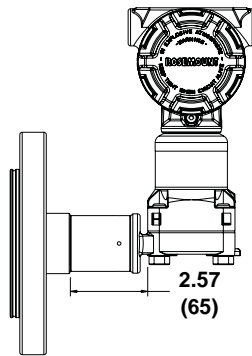
### Rosemount 1199 Direct Mount Connection Types for General Purpose Seal Systems



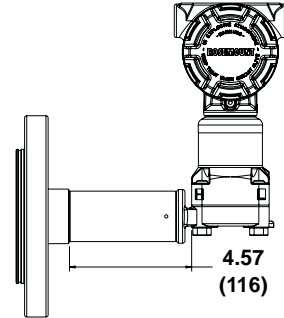
Rosemount 3051  
One-Seal System  
1199 \_\_\_ 93  
1199 \_\_\_ 97

Rosemount 3051  
Two-Seal System  
1199 \_\_\_ 94  
1199 \_\_\_ 96  
(Add Low Side Capillary)

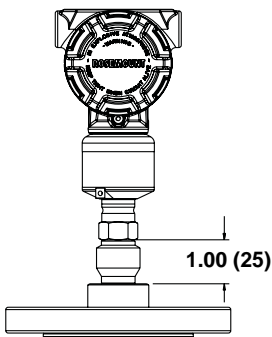
Low Side  
Capillary  
Connection



Rosemount 3051  
One-Seal System  
1199 \_\_\_ B3 (2-in. Connection)  
1199 \_\_\_ B7 (2-in. Connection)



Rosemount 3051  
One-Seal System  
1199 \_\_\_ D3 (4-in. Connection)  
1199 \_\_\_ D7 (4-in. Connection)  
Rosemount 3051  
Two-Seal System  
1199 \_\_\_ D4 (4-in. Conn.)  
1199 \_\_\_ D6 (4-in. Conn.)  
(Add Low Side Capillary)

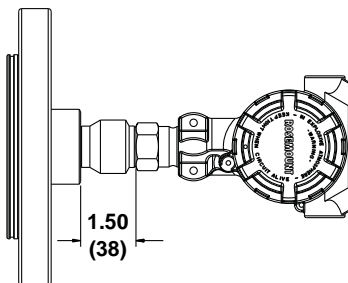


Rosemount 3051T  
1199 \_\_\_ 95

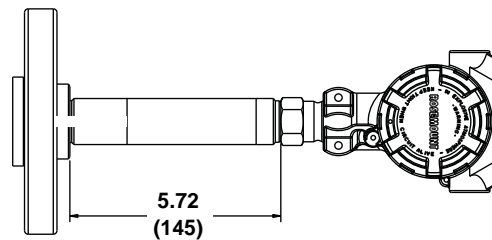
Rosemount 3051  
Two-Seal System  
1199 \_\_\_ B4 (2-in. Conn.)  
1199 \_\_\_ B6 (2-in. Conn.)  
(Add Low Side Capillary)

Level

DP Level



Rosemount 2088  
1199 \_\_\_ 95



Rosemount 2088  
1199 \_\_\_ D5

**NOTES**

Dimensions are in inches (millimeters).

Transmitters are shown with Flush Flanged (FFW) Seals.

Figure 2. FFW Flush Flanged Seal - Two-Piece Design (shown with flushing ring)

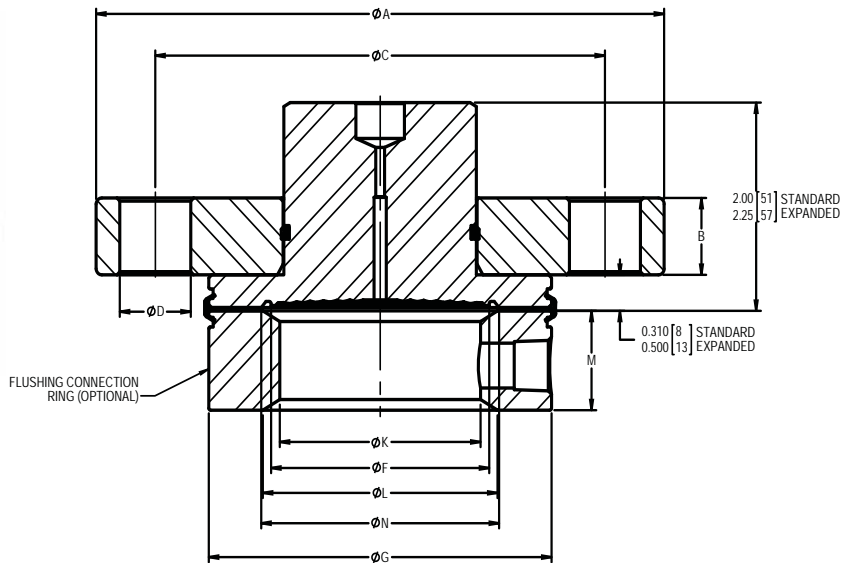


Table 67. Dimensional Table for FFW Flush Flanged Raised Face Seals Two Piece (Upper Housing and Flange) Design<sup>(1)</sup>

	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	Bolt Circle "C"	Bolts	Bolt Hole Diameter "D"	Standard Diaphragm Diameter "F"	Raised Face Diameter "G"
ANSI/ASME	2-in.	150 lb.	6.00 (152)	0.69 (18)	4.75 (121)	4	0.75 (19)	2.30 (58)	3.62 (92)
		300 lb.	6.50 (165)	0.82 (21)	5.00 (127)	8	0.75 (19)	2.30 (58)	3.62 (92)
		600 lb.	6.50 (165)	1.00 (25)	5.00 (127)	8	0.75 (19)	2.30 (58)	3.62 (92)
	3-in.	150 lb.	7.50 (191)	0.88 (22)	6.00 (152)	4	0.75 (19)	3.50 (89)	5.00 (127)
		300 lb.	8.25 (210)	1.06 (27)	6.62 (168)	8	0.88 (22)	3.50 (89)	5.00 (127)
		600 lb.	8.25 (210)	1.25 (32)	6.62 (168)	8	0.88 (22)	3.50 (89)	5.00 (127)
	4-in.	150 lb.	9.00 (229)	0.88 (22)	7.50 (191)	8	0.75 (19)	3.50 (89)	6.20 (157)
		300 lb.	10.0 (254)	1.19 (30)	7.88 (200)	8	0.88 (22)	3.50 (89)	6.20 (157)
		600 lb.	10.75 (273)	1.50 (38)	8.50 (216)	8	1.00 (25)	3.50 (89)	6.20 (157)
EN1092-1	DN 50	PN 40	6.50 (165)	0.79 (20)	4.92 (125)	4	0.71 (18)	2.30 (58)	4.00 (102)
		PN 63	7.08 (180)	1.02 (26)	5.31 (135)	4	0.87 (22)	2.30 (58)	4.00 (102)
		PN 100	7.68 (195)	1.10 (28)	5.71 (145)	4	1.02 (26)	2.30 (58)	4.00 (102)
	DN 80	PN 40	7.87 (200)	0.94 (24)	6.30 (160)	8	0.71 (18)	3.50 (89)	5.43 (138)
		PN 63	8.46 (215)	1.10 (28)	6.69 (170)	8	0.88 (22)	3.50 (89)	5.43 (138)
		PN 100	9.06 (230)	1.26 (32)	7.09 (180)	8	1.02 (26)	3.50 (89)	5.43 (138)
	DN 100	PN 16	8.66 (220)	0.79 (20)	7.09 (180)	8	0.71 (18)	3.50 (89)	6.20 (157)
		PN 40	9.25 (235)	0.94 (24)	7.48 (190)	8	0.87 (22)	3.50 (89)	6.20 (157)
		PN 63	9.84 (250)	1.18 (30)	7.87 (200)	8	1.02 (26)	3.50 (89)	6.20 (157)
JIS	JIS 50A	10K	6.10 (155)	0.55 (14)	4.72 (120)	4	0.75 (19)	2.30 (58)	3.62 (92)
		20K	6.10 (155)	0.63 (16)	4.72 (120)	8	0.75 (19)	2.30 (58)	3.62 (92)
		40K	6.50 (165)	0.94 (24)	5.12 (130)	8	0.75 (19)	2.30 (58)	4.00 (102)
	JIS 80A	10K	7.28 (185)	0.63 (16)	5.91 (150)	8	0.75 (19)	3.50 (89)	5.00 (127)
		20K	7.87 (200)	0.79 (20)	6.30 (160)	8	0.91 (23)	3.50 (89)	5.00 (127)
		40K	8.27 (210)	1.18 (30)	6.69 (170)	8	0.91 (23)	3.50 (89)	5.43 (138)
	JIS 100A	10K	8.27 (210)	0.63 (16)	6.89 (175)	8	0.75 (19)	3.50 (89)	6.20 (157)
		20K	8.86 (225)	0.87 (22)	7.28 (185)	8	0.91 (23)	3.50 (89)	6.20 (157)
		40K	9.84 (250)	1.34 (34)	8.07 (205)	8	0.98 (25)	3.50 (89)	6.20 (157)

(1) Dimensions are in inches (millimeters).

Level  
DP Level

# Rosemount DP Level

Table 57. Dimensional Table for FFW Flush Flanged Raised Face Seals Two Piece (Upper Housing and Flange) Design<sup>(1)</sup>

	Pipe Size	INNER DIAMETER "K"	BEVELED EDGE "L"	THICKNESS WITH 1/4-NPT F.C. "M"	THICKNESS WITH 1/2-NPT F.C. "M"	MINIMUM GASKET I.D. "N"
ANSI / ASME	2-in.	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
		2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
		2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
	3-in.	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
	4-in.	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
EN1092-1	DN 50	2.40 (61)	—	0.97 (25)	1.30 (33)	2.51 (64)
		2.40 (61)	—	0.97 (25)	1.30 (33)	2.51 (64)
		2.40 (61)	—	0.97 (25)	1.30 (33)	2.51 (64)
	DN 80	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
	DN 100	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
JIS	JIS 50A	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
		2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
		2.40 (61)	—	0.97 (25)	1.30 (33)	2.51 (64)
	JIS 80A	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
	JIS 100A	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)

(1) Dimensions are in inches (millimeters).

# Product Data Sheet

00813-0100-4016, Rev LA  
Catalog 2011 - 2012

# Rosemount DP Level

Figure 3. FFW Flush Flanged Seal - One-Piece Design (shown with flushing ring)

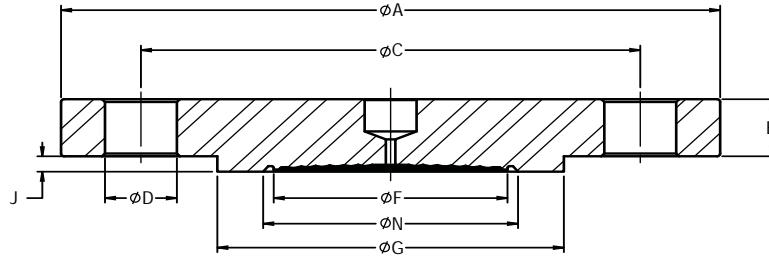


Table 58. Dimensional Table for FFW Flush Flanged Seals One Piece (Upper Housing and Flange) Design (Option code E)<sup>(1)</sup>

	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	Bolt Circle "C"	Bolts	Bolt Hole Diameter "D"	Standard Diaphragm Diameter "F"	Raised Face Diameter "G"	Raised Face Height "J"	MINIMUM GASKET I.D. "N"
ANSI / ASME	2-in.	150 lb.	6.00 (152)	0.69 (18)	4.75 (121)	4	0.75 (19)	2.30 (58)	3.62 (92)	0.06 (1.5)	2.51 (64)
		300 lb.	6.50 (165)	0.82 (21)	5.00 (127)	8	0.75 (19)	2.30 (58)	3.62 (92)	0.06 (1.5)	2.51 (64)
		600 lb.	6.50 (165)	1.00 (25)	5.00 (127)	8	0.75 (19)	2.30 (58)	3.62 (92)	0.25 (6.4)	2.51 (64)
	3-in.	150 lb.	7.50 (191)	0.88 (22)	6.00 (152)	4	0.75 (19)	3.50 (89)	5.00 (127)	0.06 (1.5)	3.70 (94)
		300 lb.	8.25 (210)	1.06 (27)	6.62 (168)	8	0.88 (22)	3.50 (89)	5.00 (127)	0.06 (1.5)	3.70 (94)
		600 lb.	8.25 (210)	1.25 (32)	6.62 (168)	8	0.88 (22)	3.50 (89)	5.00 (127)	0.25 (6.4)	3.70 (94)
	4-in.	150 lb.	9.00 (229)	0.88 (22)	7.50 (191)	8	0.75 (19)	3.50 (89)	6.20 (157)	0.06 (1.5)	3.70 (94)
		300 lb.	10.00 (254)	1.19 (30)	7.88 (200)	8	0.88 (22)	3.50 (89)	6.20 (157)	0.06 (1.5)	3.70 (94)
		600 lb.	10.75 (273)	1.50 (38)	8.50 (216)	8	1.00 (25)	3.50 (89)	6.20 (157)	0.25 (6.4)	3.70 (94)
EN1092-1	DN 50	PN 40	6.50 (165)	0.79 (20)	4.92 (125)	4	0.71 (18)	2.30 (58)	4.00 (102)	0.12 (3.0)	2.51 (64)
		PN 63	7.08 (180)	1.02 (26)	5.31 (135)	4	0.87 (22)	2.30 (58)	4.00 (102)	0.12 (3.0)	2.51 (64)
		PN 100	7.68 (195)	1.10 (28)	5.71 (145)	4	1.02 (26)	2.30 (58)	4.00 (102)	0.12 (3.0)	2.51 (64)
	DN 80	PN 40	7.87 (200)	0.94 (24)	6.30 (160)	8	0.71 (18)	3.50 (89)	5.43 (138)	0.12 (3.0)	3.70 (94)
		PN 63	8.46 (215)	1.10 (28)	6.69 (170)	8	0.88 (22)	3.50 (89)	5.43 (138)	0.12 (3.0)	3.70 (94)
		PN 100	9.06 (230)	1.26 (32)	7.09 (180)	8	1.02 (26)	3.50 (89)	5.43 (138)	0.12 (3.0)	3.70 (94)
	DN 100	PN 16	8.66 (220)	0.79 (20)	7.09 (180)	8	0.71 (18)	3.50 (89)	6.20 (157)	0.12 (3.0)	3.70 (94)
		PN 40	9.25 (235)	0.94 (24)	7.48 (190)	8	0.87 (22)	3.50 (89)	6.20 (157)	0.12 (3.0)	3.70 (94)
		PN 63	9.84 (250)	1.18 (30)	7.87 (200)	8	1.02 (26)	3.50 (89)	6.20 (157)	0.12 (3.0)	3.70 (94)
JIS	JIS 50A	10K	6.10 (155)	0.55 (14)	4.72 (120)	4	0.75 (19)	2.30 (58)	3.62 (92)	0.08 (2.0)	2.51 (64)
		20K	6.10 (155)	0.63 (16)	4.72 (120)	8	0.75 (19)	2.30 (58)	3.62 (92)	0.08 (2.0)	2.51 (64)
		40K	6.50 (165)	0.94 (24)	5.12 (130)	8	0.75 (19)	2.30 (58)	4.00 (102)	0.08 (2.0)	2.51 (64)
	JIS 80A	10K	7.28 (185)	0.63 (16)	5.91 (150)	8	0.75 (19)	3.50 (89)	5.00 (127)	0.08 (2.0)	3.70 (94)
		20K	7.87 (200)	0.79 (20)	6.30 (160)	8	0.91 (23)	3.50 (89)	5.00 (127)	0.08 (2.0)	3.70 (94)
		40K	8.27 (210)	1.18 (30)	6.69 (170)	8	0.91 (23)	3.50 (89)	5.43 (138)	0.08 (2.0)	3.70 (94)
	JIS 100A	10K	8.27 (210)	0.63 (16)	6.89 (175)	8	0.75 (19)	3.50 (89)	6.20 (157)	0.08 (2.0)	3.70 (94)
		20K	8.86 (225)	0.87 (22)	7.28 (185)	8	0.91 (23)	3.50 (89)	6.20 (157)	0.08 (2.0)	3.70 (94)
		40K	9.84 (250)	1.34 (34)	8.07 (205)	8	0.98 (25)	3.50 (89)	6.20 (157)	0.08 (2.0)	3.70 (94)

Level

DP Level

(1) Dimensions are in inches (millimeters).



# Rosemount DP Level

Figure 4. FFW Flush Flanged Seal - Flushing Connection Ring (Lower Housing)

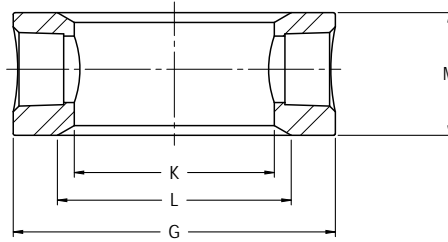


Table 59. Dimensional Table for FFW Flushing Connection Ring (Lower Housing)<sup>(1)</sup>

	Pipe Size	OUTER DIAMETER "G"	Inner Diameter "K"	Beveled Edge "L"	Thickness with 1/4-NPT F.C. "M"	Thickness with 1/2-NPT F.C. "M"
ANSI / ASME	2-in.	3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)
		3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)
		3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)
	3-in.	5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)
		5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)
		5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)
	4-in.	6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
		6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
		6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
EN1092-1	DN 50	4.00 (102)	2.40 (61)	—	0.97 (25)	1.30 (33)
		4.00 (102)	2.40 (61)	—	0.97 (25)	1.30 (33)
		4.00 (102)	2.40 (61)	—	0.97 (25)	1.30 (33)
	DN 80	5.43 (138)	3.60 (91)	—	0.97 (25)	1.30 (33)
		5.43 (138)	3.60 (91)	—	0.97 (25)	1.30 (33)
		5.43 (138)	3.60 (91)	—	0.97 (25)	1.30 (33)
	DN 100	6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
		6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
		6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
JIS	JIS 50A	3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)
		3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)
		4.00 (102)	2.40 (61)	—	0.97 (25)	1.30 (33)
	JIS 80A	5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)
		5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)
		5.43 (138)	3.60 (91)	—	0.97 (25)	1.30 (33)
	JIS 100A	6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
		6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)
		6.20 (157)	3.60 (91)	—	0.97 (25)	1.30 (33)

(1) Dimensions are in inches (millimeters).

Level

DP Level

Figure 5. RFW Flanged Seal (For smaller process connection)

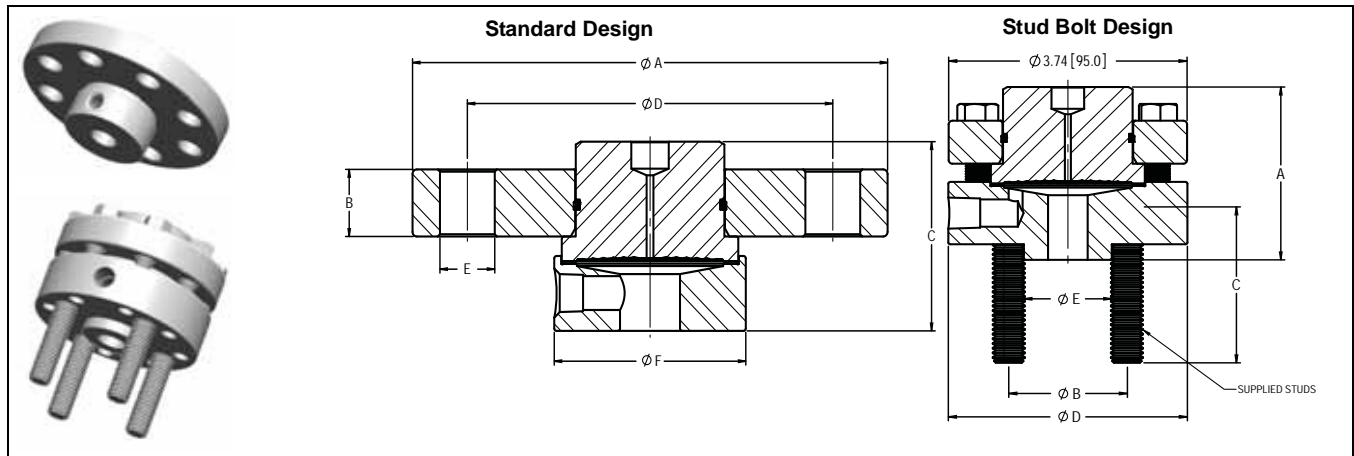


Table 60. RFW Flanged Seal Standard Design Dimensions<sup>(1)(2)</sup>

	Pipe Size / Class	Class	Flange Diameter (A)	Flange Thickness (B)	Overall Height (C)		Bolt Circle Diameter (D)	Bolt Hole Diameter (E)	Lower Housing Diameter (F)
					No or 1/4-in. NPT flush connection	1/2-in. NPT flush connection			
ANSI / ASME	1/2-in.	2500 lb.	5.25 (133.4)	1.19 (30.2)	2.45 (62.2)	2.79 (70.9)	3.50 (88.9)	0.875 (22.2)	2.62 (66.5)
	3/4-in.	300/600 lb.	4.62 (117.3)	0.62 (15.7)	2.45 (62.2)	2.79 (70.9)	3.25 (82.6)	0.75 (19.5)	2.62 (66.5)
	1-in.	150 lb.	4.25 (107.9)	0.50 (12.7)	2.45 (62.2)	2.79 (70.9)	3.12 (79.3)	0.625 (15.9)	2.62 (66.5)
		300 lb.	4.88 (124.0)	0.62 (15.8)	2.45 (62.2)	2.79 (70.9)	3.50 (88.9)	0.75 (19.5)	2.62 (66.5)
		600 lb.	4.88 (124.0)	0.69 (17.5)	2.45 (62.2)	2.79 (70.9)	3.50 (88.9)	0.75 (19.5)	2.62 (66.5)
	1 1/2-in.	150 lb.	5.00 (127.0)	0.62 (15.8)	2.45 (62.2)	2.79 (70.9)	3.88 (98.6)	0.625 (15.9)	2.88 (73.2)
300 lb.		6.12 (155.4)	0.75 (19.1)	2.45 (62.2)	2.79 (70.9)	4.50 (114)	0.875 (22.2)	2.88 (73.2)	
600 lb.		6.12 (155.4)	0.88 (22.4)	2.45 (62.2)	2.79 (70.9)	4.50 (114)	0.875 (22.2)	2.88 (73.2)	
EN 1092-1	DN 25	PN 40	4.53 (115)	0.71 (18.0)	2.45 (62.2)	2.79 (70.9)	3.35 (85)	0.55 (14)	2.68 (68.1)
	DN 40	PN 40	5.91 (150)	0.71 (18.0)	2.45 (62.2)	2.79 (70.9)	4.33 (110)	0.71 (18)	3.47 (88.1)
JIS	20A	40K	4.72 (120)	0.79 (20)	2.45 (62.2)	2.79 (70.9)	3.35 (85)	0.75 (19)	2.62 (66.5)
	25A	10K	4.92 (125)	0.55 (14)	2.45 (62.2)	2.79 (70.9)	3.54 (90)	0.75 (19)	2.62 (66.5)
		20K	4.92 (125)	0.63 (16)	2.45 (62.2)	2.79 (70.9)	3.54 (90)	0.75 (19)	2.62 (66.5)
		40K	5.12 (130)	0.87 (22)	2.45 (62.2)	2.79 (70.9)	3.74 (95)	0.75 (19)	2.88 (73.2)
	40A	10K	5.51 (140)	0.63 (16)	2.45 (62.2)	2.79 (70.9)	4.13 (105)	0.75 (19)	3.46 (88.0)
		20K	5.51 (140)	0.71 (18)	2.45 (62.2)	2.79 (70.9)	4.13 (105)	0.75 (19)	3.46 (88.0)
40K		6.30 (160)	0.94 (24)	2.45 (62.2)	2.79 (70.9)	4.72 (120)	0.91 (23)	3.62 (92.0)	

(1) Dimensions are in inches (millimeters).

(2) Lower housing is loose on standard design, consult factory for retained lower housing options.

# Rosemount DP Level

Table 61. RFW Flanged Seal Stud Bolt Design Dimensions<sup>(1)</sup>

	Pipe Size / Class	Class	Overall Height (A)		Stud Circle Diameter (B)	Stud (Size, Length) (C)	Lower Housing Diameter (D)	Raised Face Diameter (E)
			No or 1/4-in. NPT flush connection	1/2-in. NPT flush connection				
ANSI / ASME	1/2-in.	150 lb.	2.52 (64.0)	2.82 (71.6)	2.38 (60.5)	1/2-13NC, 2.5-in.	3.74 (95.0)	1.38 (35.1)
	1/2-in.	300/600 lb.	2.77 (70.4)	2.87 (72.9)	2.62 (66.5)	1/2-13NC, 2.5-in.	3.75 (95.3)	1.38 (35.1)
	3/4-in.	150 lb.	2.52 (64.0)	2.82 (71.6)	2.75 (69.9)	1/2-13NC, 2.5-in.	3.88 (98.6)	1.69 (42.9)
EN 1092-1	DN 15	PN 40	2.52 (64.0)	2.82 (71.6)	2.56 (65)	M12x1.75, 60mm	3.74 (95.0)	1.77 (45.0)
	DN 15	PN 100/160	2.52 (64.0)	2.82 (71.6)	2.95 (75)	M12x1.75, 60mm	4.13 (105)	1.77 (45.0)
JIS	10A	10K	2.52 (64.0)	2.82 (71.6)	2.56 (65.0)	M10x1.5,60mm	3.74 (95.0)	1.81 (46.0)
		20K	2.52 (64.0)	2.82 (71.6)	2.56 (65.0)	M12x1.75,60mm	3.74 (95.0)	1.81 (46.0)
		40K	2.52 (64.0)	2.82 (71.6)	2.95 (75.0)	M12x1.75,60mm	4.33 (110.0)	2.05 (52.0)
	15A	10K	2.52 (64.0)	2.82 (71.6)	2.76 (70.0)	M10x1.5,60mm	3.74 (95.0)	2.01 (51.0)
		20K	2.52 (64.0)	2.82 (71.6)	2.76 (70.0)	M12x1.75,60mm	3.74 (95.0)	2.01 (51.0)
		40K	2.52 (64.0)	2.82 (71.6)	3.15 (80.0)	M16x2.0,70mm	4.53 (115.0)	2.17 (55.0)
	20A	10K	2.52 (64.0)	2.82 (71.6)	2.95 (75.0)	M10x1.5,60mm	3.94 (100.0)	2.20 (56.0)
20K		2.52 (64.0)	2.82 (71.6)	2.95 (75.0)	M12x1.75,60mm	3.94 (100.0)	2.20 (56.0)	

(1) Upper and lower housing installed bolt torque with CS or SST bolts is 23 ft-lbs. (31 Nm).

Figure 6. EFW Extended Flanged Seal - Extended Flanged Assembly

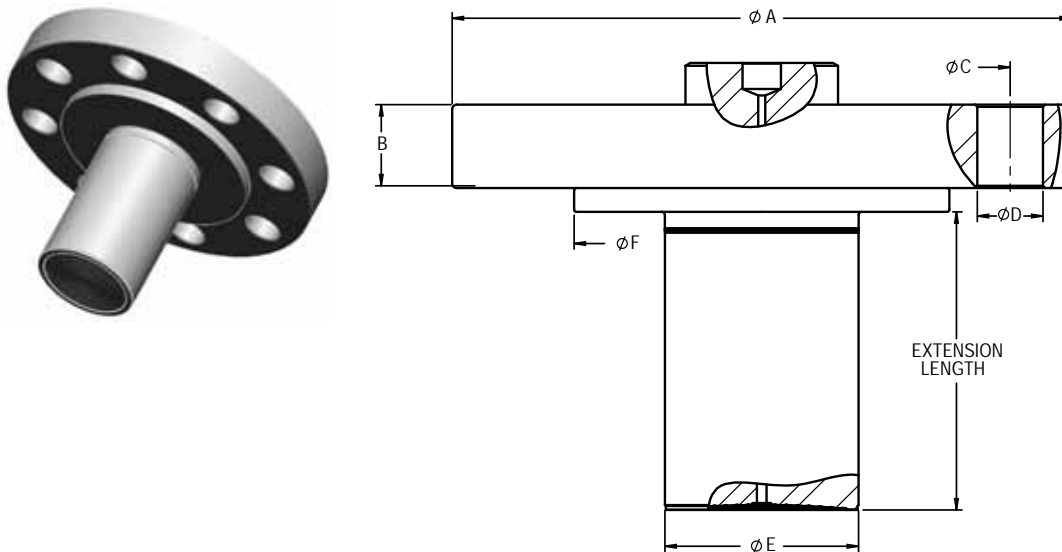


Table 62. EFW Extended Flanged Seal Dimensions<sup>(1)</sup>

	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	Bolt Circle "C"	Bolts	Bolt Hole Diameter "D"	Raised Face Diameter "F"
ANSI / ASME	1 1/2-in.	150 lb.	5.00 (127)	0.62 (16)	3.88 (99)	4	0.63 (16)	2.88 (73)
		300 lb.	6.12 (156)	0.75 (19)	4.50 (114)	4	0.88 (22)	2.88 (73)
		600 lb.	6.12 (156)	0.88 (22)	4.50 (114)	4	0.88 (22)	2.88 (73)
	2-in.	150 lb.	6.00 (152)	0.69 (18)	4.75 (121)	4	0.75 (19)	3.62 (92)
		300 lb.	6.50 (165)	0.82 (21)	5.00 (127)	8	0.75 (19)	3.62 (92)
		600 lb.	6.50 (165)	1.00 (25)	5.00 (127)	8	0.75 (19)	3.62 (92)
	3-in.	150 lb.	7.50 (191)	0.88 (22)	6.00 (152)	4	0.75 (19)	5.00 (127)
		300 lb.	8.25 (210)	1.06 (27)	6.62 (168)	8	0.88 (22)	5.00 (127)
		600 lb.	8.25 (210)	1.25 (32)	6.62 (168)	8	0.88 (22)	5.00 (127)
	4-in.	150 lb.	9.00 (229)	0.88 (22)	7.50 (191)	8	0.75 (19)	6.20 (158)
		300 lb.	10.00 (254)	1.19 (30)	7.88 (200)	8	0.88 (22)	6.20 (158)
		600 lb.	10.75 (273)	1.50 (38)	8.50 (216)	8	1.00 (25)	6.20 (158)
EN 1092-1	DN 50	PN 40	6.50 (165)	0.79 (20)	4.92 (125)	4	0.71 (18)	4.00 (102)
		PN 63	7.08 (180)	1.02 (26)	5.31 (135)	4	0.87 (22)	4.00 (102)
		PN 100	7.68 (195)	1.10 (28)	5.71 (145)	4	1.02 (26)	4.00 (102)
	DN 80	PN 40	7.87 (200)	0.94 (24)	6.30 (160)	8	0.71 (18)	5.43 (138)
		PN 63	8.46 (215)	1.10 (28)	6.69 (170)	8	0.88 (22)	5.43 (138)
		PN 100	9.06 (230)	1.26 (32)	7.09 (180)	8	1.02 (26)	5.43 (138)
	DN 100	PN 16	8.66 (220)	0.79 (20)	7.09 (180)	8	0.71 (18)	6.20 (158)
		PN 40	9.25 (235)	0.94 (24)	7.48 (190)	8	0.87 (22)	6.20 (158)
		PN 63	9.84 (250)	1.18 (30)	7.87 (200)	8	1.02 (26)	6.20 (158)
JIS	JIS 50A	10K	6.10 (155)	0.55 (14)	4.72 (120)	4	0.75 (19)	3.62 (92)
		20K	6.10 (155)	0.63 (16)	4.72 (120)	8	0.75 (19)	3.62 (92)
		40K	6.50 (165)	0.94 (24)	5.12 (130)	8	0.75 (19)	4.00 (102)
	JIS 80A	10K	7.28 (185)	0.63 (16)	5.91 (150)	8	0.75 (19)	5.00 (127)
		20K	7.87 (200)	0.79 (20)	6.30 (160)	8	0.91 (23)	5.00 (127)
		40K	8.27 (210)	1.18 (30)	6.69 (170)	8	0.91 (23)	5.43 (138)
	JIS 100A	10K	8.27 (210)	0.63 (16)	6.89 (175)	8	0.75 (19)	6.20 (158)
		20K	8.86 (225)	0.87 (22)	7.28 (185)	8	0.91 (23)	6.20 (158)
		40K	9.84 (250)	1.34 (34)	8.07 (205)	8	0.98 (25)	6.20 (158)

(1) Dimensions are in inches (millimeters).

Level  
**DP Level**

# Rosemount DP Level

Process Connection Size <sup>(1)</sup>			Diameter (E)
ANSI B16.5	EN 1092-1	JIS B2238	
3-in.	DN 80	80 A	2.58 (66)
4-in.	DN 100	100 A	3.50 (89)
1 ½-in.	DN 40	40 A	1.45 (37)
2-in.	DN 50	50 A	1.90 (49)
3-in. Headbox	DN 80 Headbox	—	2.875 (74)
4-in. Headbox	DN100 Headbox	—	3.78 (97)

(1) Dimensions are in inches (millimeters).

Level

DP Level

Figure 7. PFW Pancake Seal

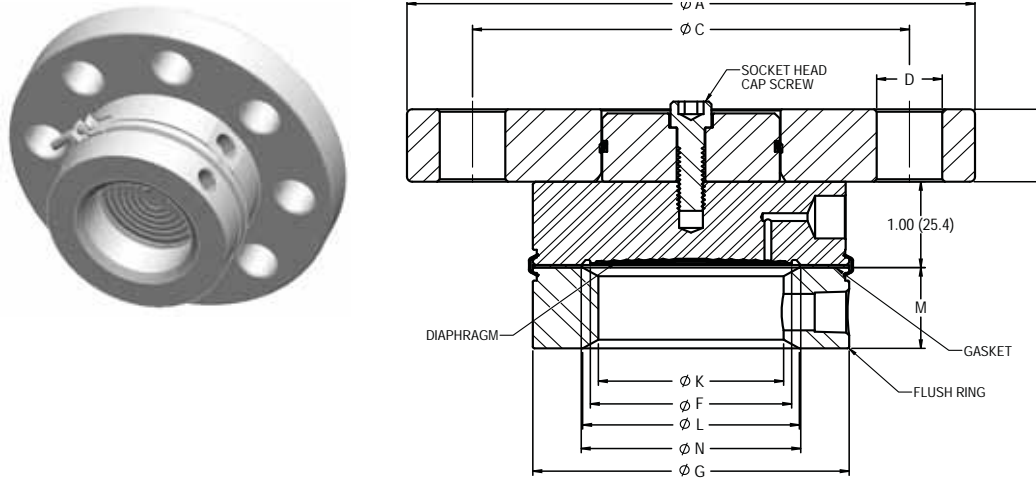


Table 63. PFW Pancake Seal Dimensions<sup>(1)</sup>

ANSI / ASME	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	QTY. of Bolts	Bolt Circle "C"	Bolt Hole Size "D"	Standard Diaphragm Diameter "F"
	ANSI / ASME	2-in.	150 lb.	6.00 (152.4)	0.69 (17.5)	4	4.75 (120.7)	0.750 (19.05)
300 lb.			6.50 (165.1)	0.81 (20.6)	8	5.00 (127.0)	0.750 (19.05)	2.30 (58.4)
600 lb.			6.50 (165.1)	1.00 (25.4)	8	5.00 (127.0)	0.750 (19.05)	2.30 (58.4)
3-in.		150 lb.	7.50 (190.5)	0.88 (22.4)	4	6.00 (152.4)	0.750 (19.05)	3.50 (88.9)
		300 lb.	8.25 (209.6)	1.06 (26.9)	8	6.62 (168.1)	0.875 (22.23)	3.50 (88.9)
		600 lb.	8.25 (209.6)	1.25 (31.8)	8	6.62 (168.1)	0.875 (22.23)	3.50 (88.9)
EN1092-1	DN 50	PN40	6.50 (165)	0.79 (20)	4	4.92 (125)	0.71 (18)	2.30 (58)
		PN63	7.09 (180)	1.02 (26)	4	5.31 (135)	0.87 (22)	2.30 (58)
	DN 80	PN40	7.87 (200)	0.94 (24)	8	6.30 (160)	0.71 (18)	3.50 (89)
		PN63	8.46 (215)	1.10 (28)	8	6.69 (170)	0.87 (22)	3.50 (89)

(1) Dimensions are in inches (millimeters).

ANSI / ASME	Pipe Size	Outer Diameter "G"	Inner Diameter "K"	Beveled Diameter "L"	Thickness with 1/4-NPT F.C. "M"	Thickness with 1/2-NPT F.C. "M"	Minimum Gasket I.D. "N"
	ANSI / ASME	2-in.	3.62 (92)	2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)
3.62 (92)			2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
3.62 (92)			2.12 (54)	2.48 (63)	0.97 (25)	1.30 (33)	2.51 (64)
3-in.		5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		5.00 (127)	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
EN1092-1	DN 50	4.00 (102)	2.40 (61)	—	0.97 (25)	1.30 (33)	2.51 (64)
		4.00 (102)	2.40 (61)	—	0.97 (25)	1.30 (33)	2.51 (64)
	DN 80	5.43 (138)	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)
		5.43 (138)	3.60 (91)	—	0.97 (25)	1.30 (33)	3.70 (94)

Level

DP Level

# Rosemount DP Level

Figure 8. FCW Flush Flanged Seal – Ring Type Joint (RTJ) Gasket Surface Two-Piece Design (shown with flushing ring)

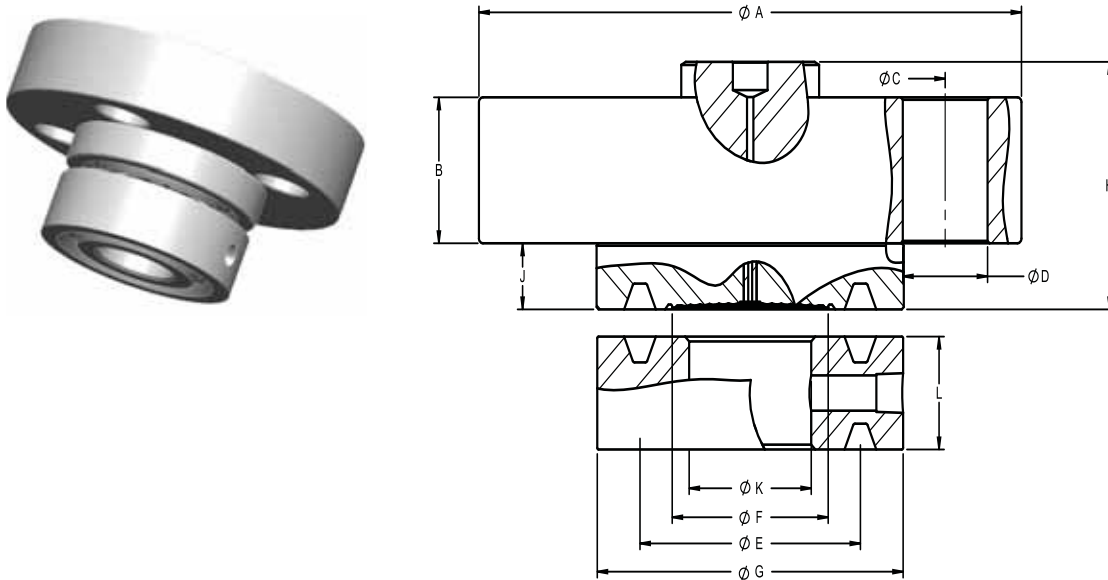


Table 64. Dimensional Table for FCW 2-Piece Flange Type Flush Diaphragm Seal<sup>(1)</sup>

	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	Bolt Circle Diameter "C"	Bolt Hole Diameter "D"	Overall Height "H"	Raised Face Height "J"
ANSI / ASME	2-in.	150 lb.	6.00 (152)	0.69 (18)	4.75 (121)	0.75 (19)	2.43 (61.7)	0.68 (17.3)
		300 lb.	6.50 (165)	0.82 (21)	5.00 (127)	0.75 (19)	2.43 (61.7)	0.68 (17.3)
		600 lb.	6.50 (165)	1.00 (25)	5.00 (127)	0.75 (19)	2.43 (61.7)	0.68 (17.3)
		1500 lb.	8.50 (216)	1.50 (38)	6.50 (165)	1.00 (25)	2.57 (65.3)	0.82 (20.8)
		2500 lb.	9.25 (235)	2.00 (51)	6.75 (171)	1.12 (28)	3.07 (78.0)	0.82 (20.8)
	3-in.	150 lb.	7.50 (191)	0.88 (22)	6.00 (168)	0.75 (19)	2.43 (61.7)	0.68 (17.3)
		300 lb.	8.25 (210)	1.06 (27)	6.62 (168)	0.88 (22)	2.43 (61.7)	0.68 (17.3)
		600 lb.	8.25 (210)	1.25 (32)	6.62 (168)	0.88 (22)	2.43 (61.7)	0.68 (17.3)
		900 lb.	9.50 (241)	1.50 (38)	7.50 (191)	1.00 (25)	2.57 (65.3)	0.82 (20.8)
		1500 lb.	10.50 (267)	1.88 (48)	8.00 (203)	1.25 (32)	3.07 (78.0)	0.82 (20.8)
	2500 lb.	12.00 (305)	2.62 (67)	9.00 (229)	1.38 (35)	4.07 (103.4)	0.82 (20.8)	

(1) Dimensions are in inches (millimeters).

	Pipe Size	RTJ Diameter "E"	Standard Diaphragm Diameter "F"	Outer Diameter "G"	Inner Diameter "K"	Thickness with 1/4-NPT F.C. "L"	Thickness with 1/2-NPT F.C. "L"
ANSI / ASME	2-in.	3.250 (83)	2.30 (58.4)	4.00 (102)	2.12 (54)	1.4 (36)	1.7 (43)
		3.250 (83)	2.30 (58.4)	4.25 (108)	2.12 (54)	1.4 (36)	1.7 (43)
		3.250 (83)	2.30 (58.4)	4.25 (108)	2.12 (54)	1.4 (36)	1.7 (43)
		3.750 (95)	2.30 (58.4)	4.88 (124)	2.12 (54)	1.4 (36)	1.7 (43)
		4.000 (102)	3.50 (88.9)	5.25 (133)	2.12 (54)	1.4 (36)	1.7 (43)
		4.000 (102)	3.50 (88.9)	5.25 (133)	2.12 (54)	1.4 (36)	1.7 (43)
	3-in.	4.500 (114)	3.50 (88.9)	5.25 (133)	3.60 (91)	1.5 (38)	1.8 (46)
		4.875 (124)	3.50 (88.9)	5.75 (146)	3.60 (91)	1.5 (38)	1.8 (46)
		4.875 (124)	3.50 (88.9)	5.75 (146)	3.60 (91)	1.5 (38)	1.8 (46)
		4.875 (124)	3.50 (88.9)	6.12 (155)	3.60 (91)	1.5 (38)	1.8 (46)
		5.375 (137)	3.50 (88.9)	6.62 (168)	3.60 (91)	1.5 (38)	1.8 (46)
		5.000 (127)	3.50 (88.9)	6.62 (168)	3.60 (91)	1.5 (38)	1.8 (46)

Level

DP Level

Figure 9. RCW Flanged Remote Seal Ring Type Joint (RTJ) and Flushing Connection Ring

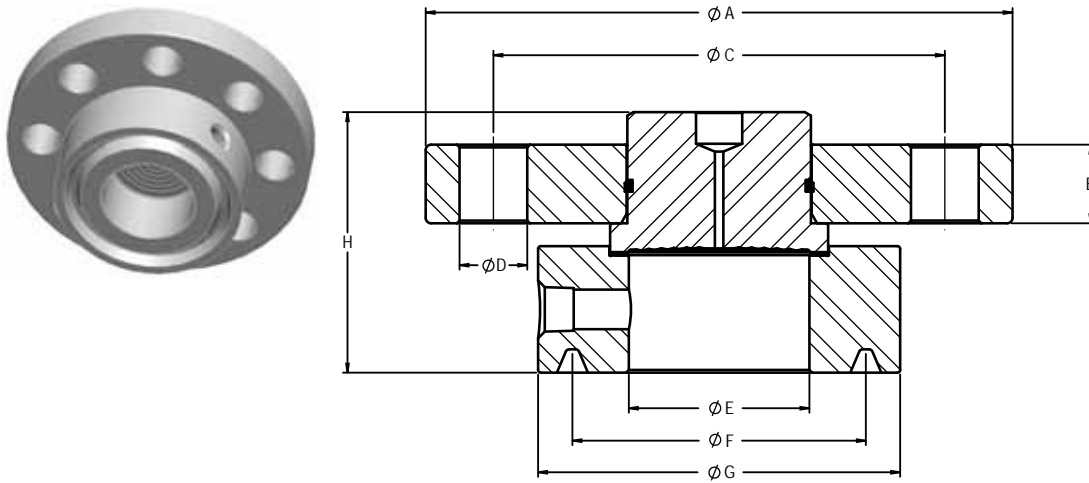


Table 65. RCW Flanged Remote Seal Dimensions<sup>(1)</sup>

Pipe Size	Class	Flange Diameter (A)	Flange Thickness (B)	Bolt Circle Diameter (C)	Bolt Hole Diameter (D)	Lower Housing Inner Diameter (E)	RTJ Groove (F)	Lower Housing Outer Diameter (G)	Overall Height (H)		
									No or 1/4-in. NPT flush connection	1/2-in. NPT flush connection	
ANSI / ASME	1/2-in.	2500 lb.	5.25 (133.4)	1.19 (30.2)	3.50 (88.9)	0.88 (22.2)	0.62 (15.7)	1.69 (42.9)	2.64 (67.1)	2.88 (73.2)	3.18 (80.8)
	3/4-in.	300/600 lb.	4.62 (117)	0.62 (15.8)	3.25 (82.6)	0.75 (19.1)	0.82 (20.8)	1.69 (42.9)	2.64 (67.1)	2.88 (73.2)	3.18 (80.8)
	3/4-in.	900/1500 lb.	5.12 (130)	1.00 (25.4)	3.50 (88.9)	0.88 (22.2)	0.82 (20.8)	1.75 (44.5)	2.64 (67.1)	2.88 (73.2)	3.18 (80.8)
	3/4-in.	2500 lb.	5.50 (140)	1.25 (31.8)	3.75 (95.3)	0.88 (22.2)	0.82 (20.8)	2.00 (50.8)	2.90 (73.7)	2.88 (73.2)	3.18 (80.8)
	1-in.	150 lb.	4.25 (108)	0.50 (12.7)	3.12 (79.3)	0.625 (15.9)	1.05 (26.7)	1.88 (47.6)	2.64 (67.1)	2.88 (73.2)	3.18 (80.8)
	1-in.	300 lb.	4.88 (124)	0.62 (15.8)	3.50 (88.9)	0.75 (19.1)	1.05 (26.7)	2.00 (50.8)	2.77 (70.4)	2.88 (73.2)	3.18 (80.8)
	1-in.	600 lb.	4.88 (124)	0.69 (17.5)	3.50 (88.9)	0.75 (19.1)	1.05 (26.7)	2.00 (50.8)	2.77 (70.4)	2.88 (73.2)	3.18 (80.8)
	1-in.	900/1500 lb.	5.88 (149)	1.12 (28.5)	4.00 (102)	1.00 (25.4)	1.05 (26.7)	2.00 (50.8)	2.83 (71.9)	2.88 (73.2)	3.18 (80.8)
	1-in.	2500 lb.	6.25 (159)	1.38 (35.1)	4.25 (108)	1.00 (25.4)	1.05 (26.7)	2.38 (60.3)	3.27 (83.1)	2.88 (73.2)	3.18 (80.8)
	1 1/2-in.	150 lb.	5.00 (127)	0.62 (15.8)	3.88 (98.6)	0.63 (15.9)	1.61 (40.9)	2.56 (65.1)	3.27 (83.1)	2.88 (73.2)	3.18 (80.8)
	1 1/2-in.	300 lb.	6.12 (155)	0.75 (19.1)	4.50 (114)	0.88 (22.2)	1.61 (40.9)	2.69 (68.3)	3.58 (90.9)	2.88 (73.2)	3.18 (80.8)
	1 1/2-in.	600 lb.	6.12 (155)	0.88 (22.4)	4.50 (114)	0.88 (22.2)	1.61 (40.9)	2.69 (68.3)	3.58 (90.9)	2.88 (73.2)	3.18 (80.8)
	1 1/2-in.	900/1500 lb.	7.00 (178)	1.25 (31.8)	4.88 (123.9)	1.13 (28.6)	1.61 (40.9)	2.69 (68.3)	3.64 (92.5)	2.88 (73.2)	3.18 (80.8)
	1 1/2-in.	2500 lb.	8.00 (203)	1.75 (44.5)	5.75 (146)	1.25 (31.8)	1.61 (40.9)	3.25 (82.6)	4.52 (115)	2.88 (73.2)	3.18 (80.8)

(1) Dimensions are in inches (millimeters).

Level  
DP Level



# Rosemount DP Level

Figure 10. FUW Flush Flanged Type Seal - EN1092-1 Type D

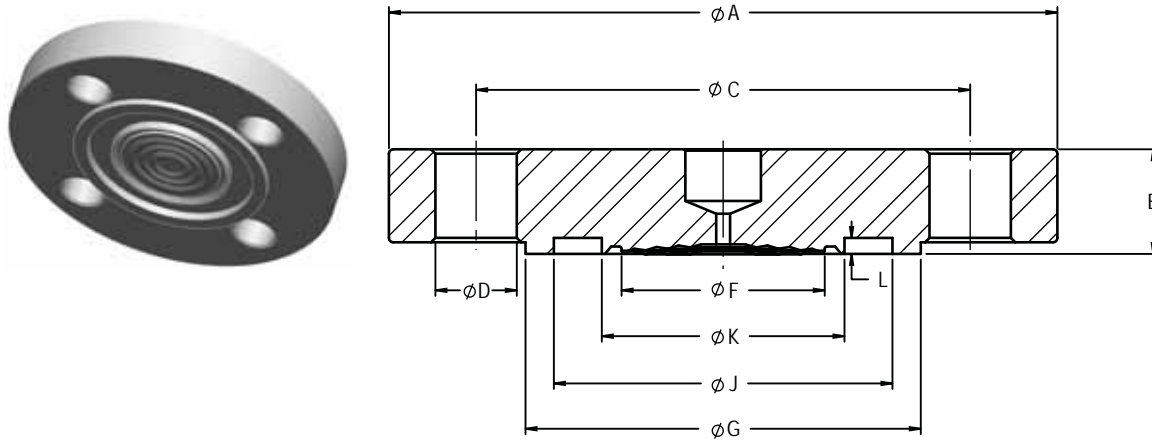


Table 66. FUW Flush Flanged Type Seal Dimensions<sup>(1)</sup>

EN 1092-1	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	Bolt Circle "C"	Bolt Diameter "D"	Bolts	Standard Diaphragm Diameter "F"	Raised Face Diameter "G"	Groove O.D. "J"	Groove I.D. "K"	Groove Depth "L"
	DN 50	PN 40	6.50 (165)	0.79 (20)	4.92 (125)	0.71 (18)	4	2.30 (58)	4.00 (102)	3.46 (88)	2.83 (72)	0.16 (4.0)
	DN 80	PN 40	7.87 (200)	0.94 (24)	6.30 (160)	0.71 (18)	8	3.50 (89)	5.43 (138)	4.76 (121)	4.13 (105)	0.16 (4.0)

(1) Measurement in inches (millimeters).

Figure 11. FVW Flush Flanged Type Seal - EN1092-1 Type C

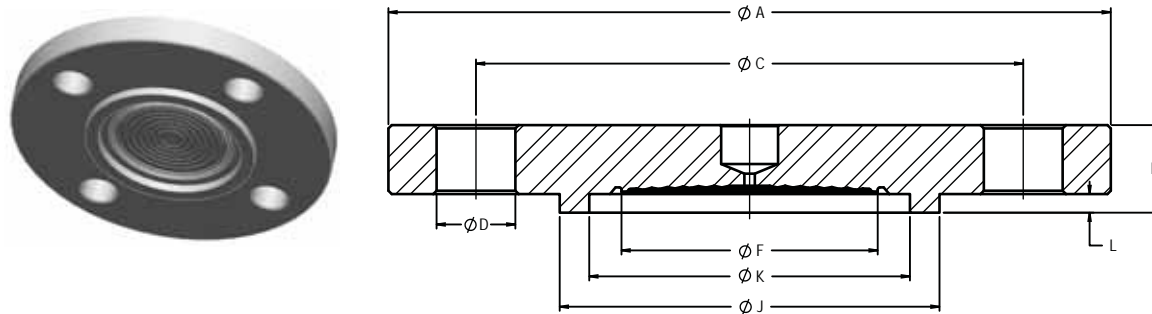


Table 67. FVW Flush Flanged Type Seal Dimensions<sup>(1)</sup>

EN 1092-1	Pipe Size	Class	Flange Diameter "A"	Flange Thickness "B"	Bolt Circle "C"	Bolt Diameter "D"	Bolts	Standard Diaphragm Diameter "F"	Tongue O.D. "J"	Tongue I.D. "K"	Tongue Height "L"
	DN 50	PN 40	6.50 (165)	0.79 (20)	4.92 (125)	0.71 (18)	4	2.30 (58)	3.43 (87)	2.87 (73)	0.18 (4.5)
	DN 80	PN 40	7.87 (200)	0.94 (24)	6.30 (160)	0.71 (18)	8	3.50 (89)	4.72 (120)	4.17 (106)	0.18 (4.5)

(1) Measurement in inches (millimeters).

Level

DP Level

# Product Data Sheet

00813-0100-4016, Rev LA  
 Catalog 2011 - 2012

# Rosemount DP Level

Figure 12. RTW Threaded Seal

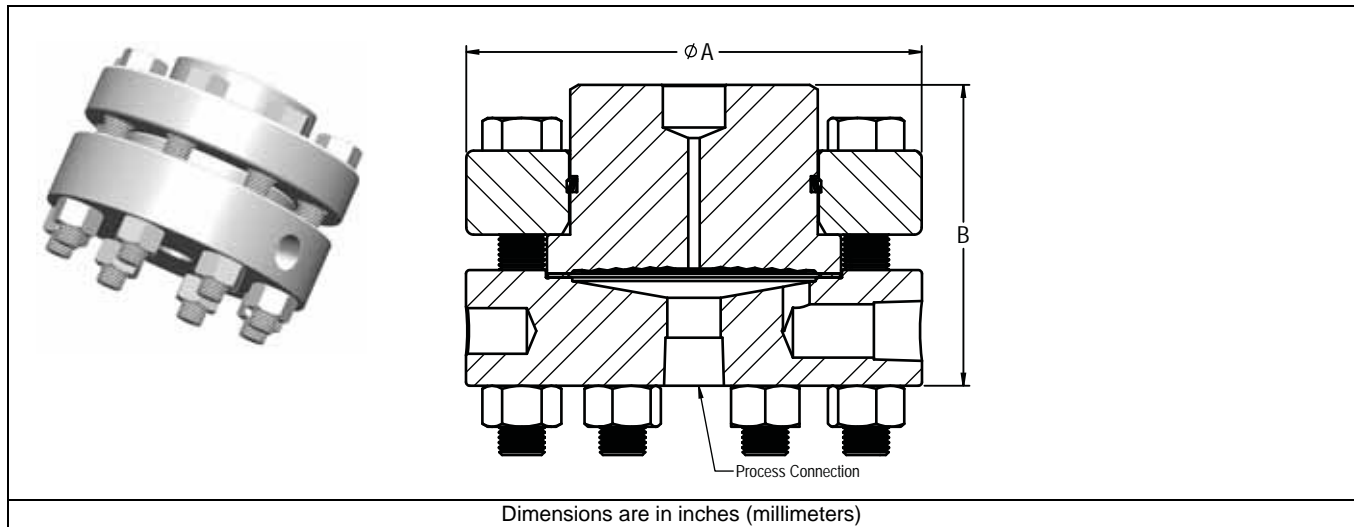


Table 68. RTW Threaded Seal Dimensions<sup>(1)</sup>

Rating	Overall Diameter (A)	Overall Height (B)	
		No or 1/4-in. NPT flush connection	1/2-in. NPT flush connection
2500 psi (172 bar)	3.74 (95.0)	2.47 (62.7)	2.82 (71.6)
5000 psi (345 bar)	3.74 (95.0)	1.95 (49.5)	2.31 (58.6)
10000 psi (690 bar)	4.00 (101.6)	1.95 (49.5)	—

(1) Dimensions are in inches (millimeters).

Figure 13. HTS Threaded Flush Type Seal

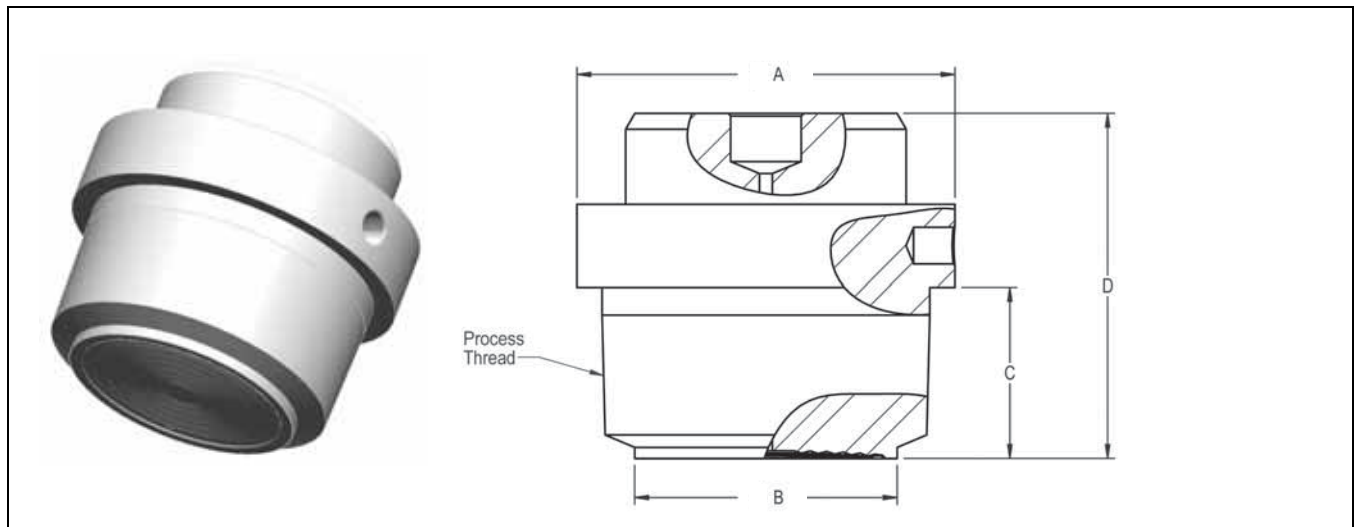


Table 69. HTS Threaded Flush Type Seal Dimensions<sup>(1)</sup>

Process Type	Connection Size	Outer Diameter (A)	Diaphragm Diameter (B)	Length (C)	Overall Height (D)
ANSI NPT	1-in. NPT	2.03 (51.6)	1.10 (27.9)	1.24 (31.5)	2.50 (63.5)
	1 1/2-in. NPT	2.36 (59.9)	1.70 (43.2)	1.24 (31.5)	2.50 (63.5)
	2-in. NPT	2.74 (69.6)	1.90 (48.3)	1.24 (31.5)	2.50 (63.5)
EN 10226 BSP	G1 BSP	2.03 (51.6)	1.10 (27.9)	0.87 (22.0)	2.15 (54.6)
	G1 1/2 BSP	2.36 (59.9)	1.70 (43.2)	0.98 (24.9)	2.24 (56.9)
	G2 BSP	2.74 (69.6)	1.90 (48.3)	1.24 (31.5)	2.50 (63.5)

(1) Dimensions are in inches (millimeters).

Level  
DP Level

# Rosemount DP Level

Figure 14. SCW Tri-Clamp Seal

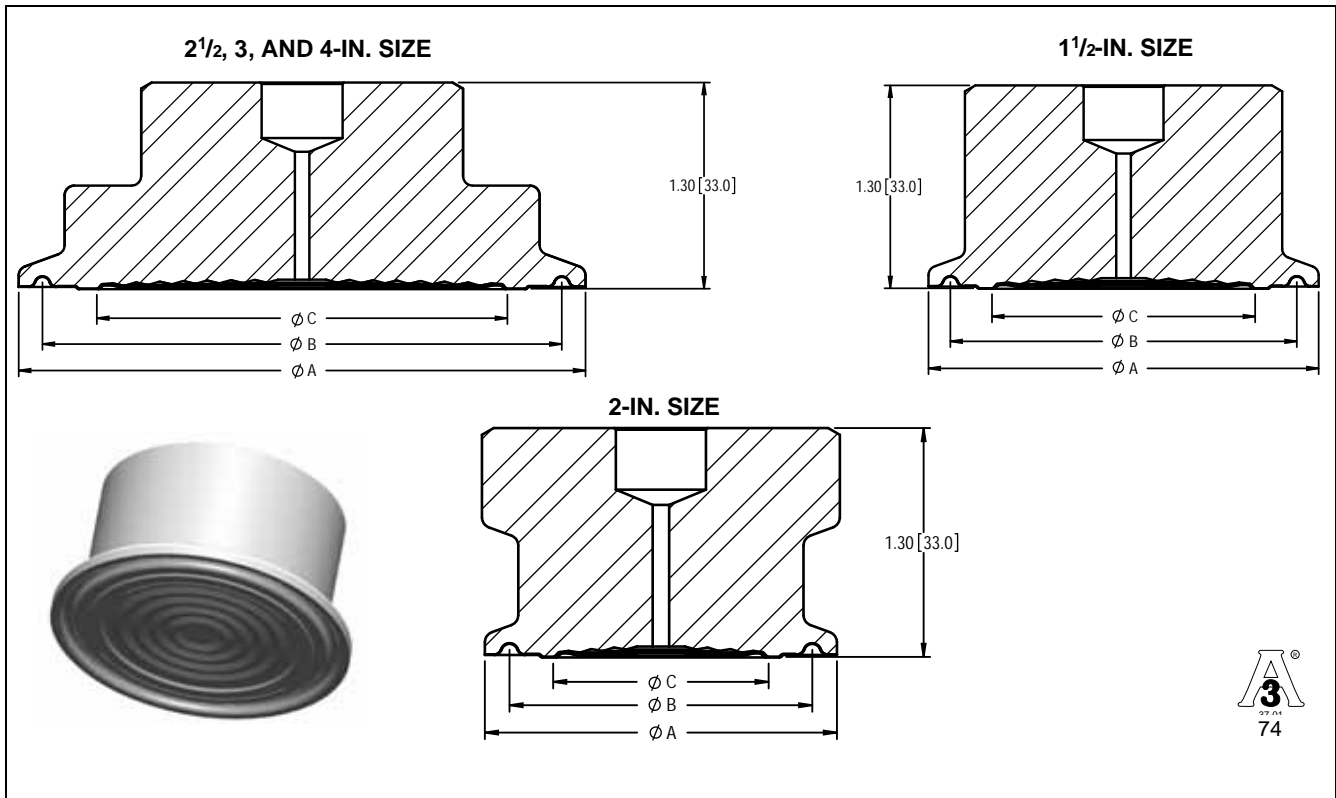


Table 70. SCW Tri-Clamp Seal Dimensions<sup>(1)</sup>

Pipe Size	Outer Diameter (A)	O-ring Groove Diameter (B)	Diaphragm Diameter (C)
1 1/2-in.	2.000 (50.80)	1.720 (43.69)	1.214 (30.84)
2-in.	2.500 (63.50)	2.220 (56.39)	1.675 (42.55)
2 1/2-in.	3.047 (77.39)	2.780 (70.61)	2.072 (52.63)
3-in.	3.580 (90.93)	3.280 (83.31)	2.582 (65.58)
4-in.	4.680 (118.87)	4.350 (110.49)	3.662 (93.01)

(1) Dimensions are in inches (millimeters).

Level

DP Level

Figure 15. SSW Tank Spud Seal

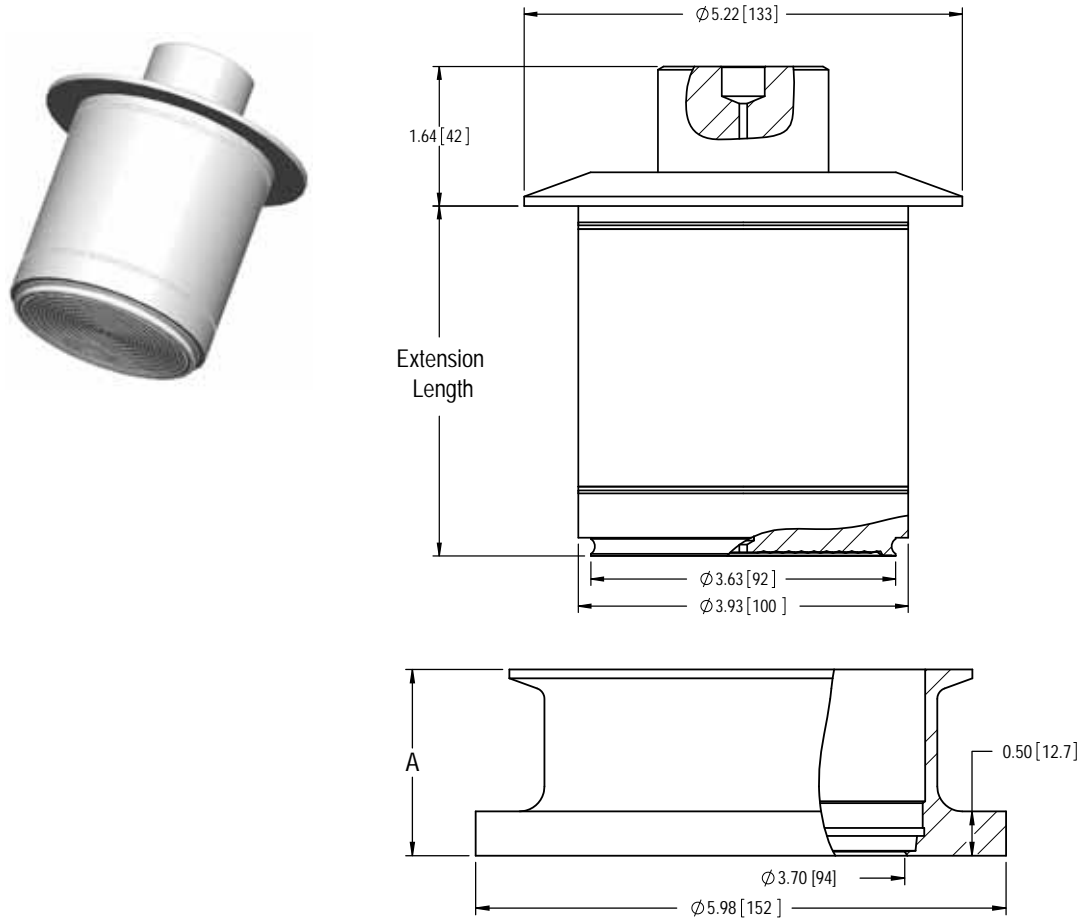


Table 71. SSW Tank Spud Seal Dimensions<sup>(1)</sup>

Pipe Size	Length	A
4-in. SCH 5	2-in. Long	2.10 (53.3)
	6-in. Long	6.10 (154.9)

(1) Dimensions are in inches (millimeters).

# Rosemount DP Level

Figure 16. STW Hygienic Thin Wall Tank Spud Seal

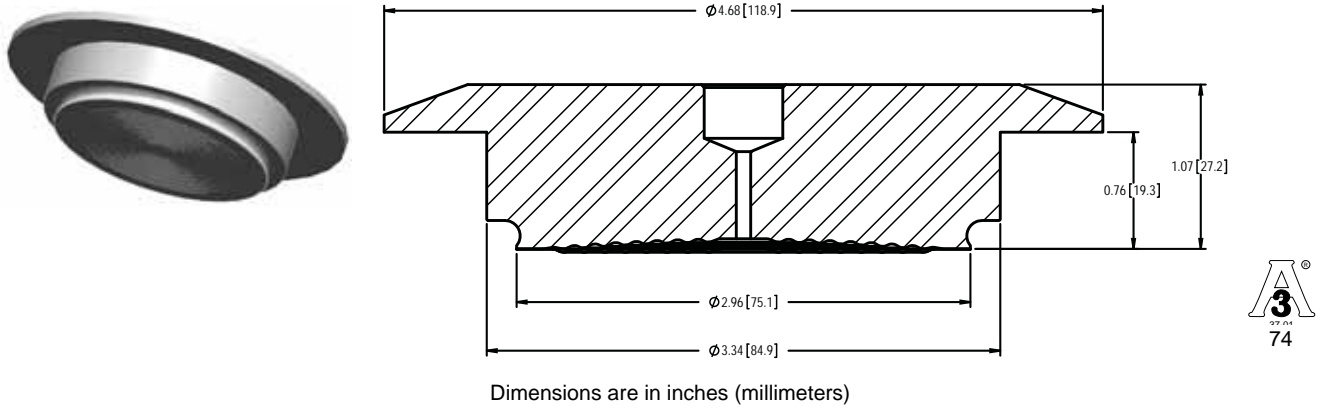


Figure 17. EES Hygienic Flanged Tank Spud Extended Seal

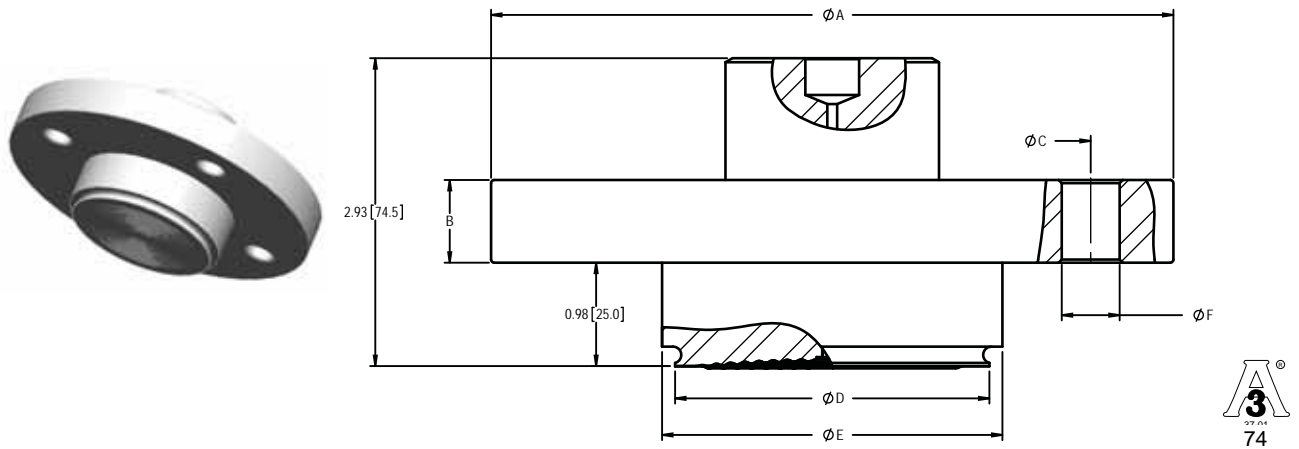


Table 72. EES Hygienic Flanged Tank Spud Extended Seal Dimensions<sup>(1)</sup>

Pipe Size	A	B	Bolts	C	D	E	F
DN50	6.50 (165.0)	0.79 (20.0)	4	4.92 (125.0)	2.99 (76.0)	3.24 (82.3)	0.55 (14.0)
DN80	7.87 (200.0)	0.94 (24.0)	8	6.30 (160.0)	4.04 (102.7)	4.24 (107.8)	0.55 (14.0)

(1) Dimensions are in inches (millimeters).

Figure 18. VCS Tri-clamp In-Line Seal

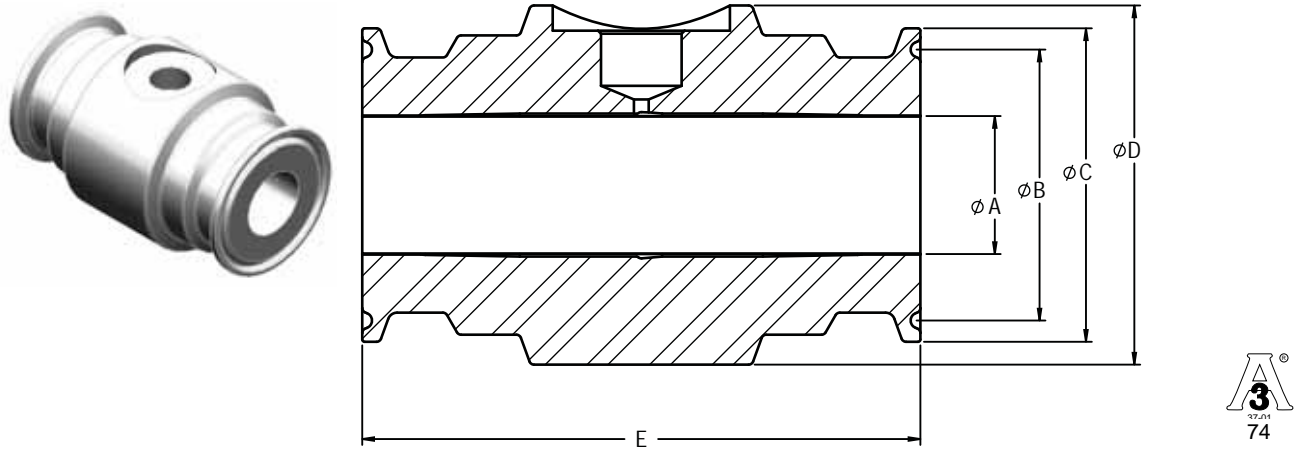
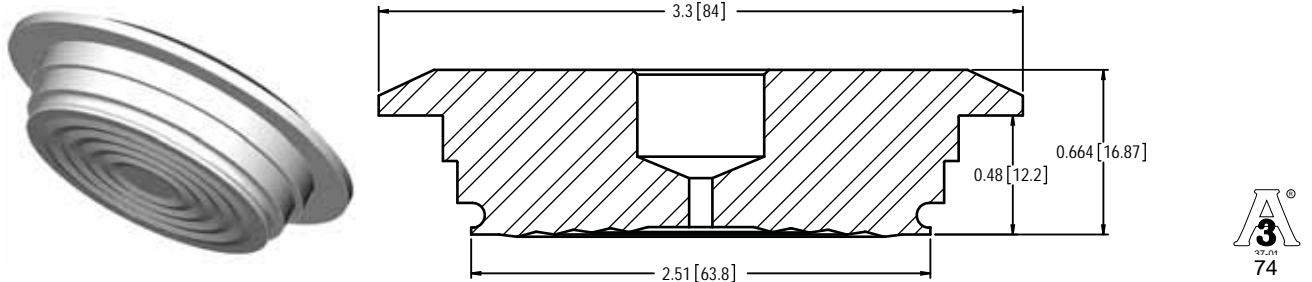


Table 73. VCS Tri-clamp In-Line Seal Dimensions<sup>(1)</sup>

Pipe Size	A	B	C	D	E
1-in.	0.870 (22.10)	1.720 (43.69)	1.990 (50.55)	2.28 (57.9)	3.54 (90.0)
1½-in.	1.370 (34.80)	1.720 (43.69)	1.990 (50.55)	2.73 (69.3)	3.54 (90.0)
2-in.	1.870 (47.50)	2.220 (56.39)	2.520 (64.01)	3.19 (81.0)	3.54 (90.0)
3-in.	2.870 (72.90)	3.280 (83.31)	3.580 (90.93)	4.14 (105.2)	3.54 (90.0)
4-in.	3.820 (97.03)	4.350 (110.49)	4.690 (119.13)	5.06 (128.5)	3.54 (90.0)

(1) Dimensions are in inches (millimeters).

Figure 19. SVS Varivent Compatible Connection Seal



SHP Cherry-Burrell "I" Line Seal

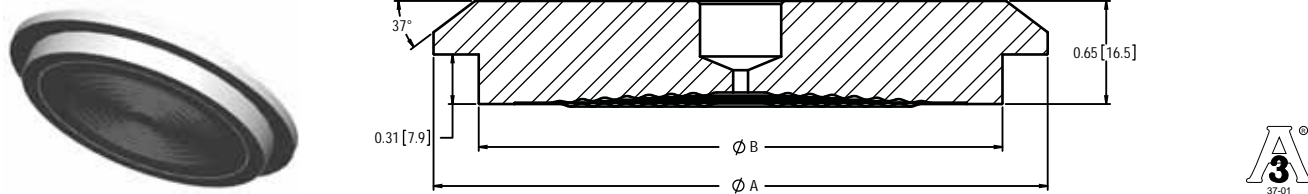


Table 74. SHP Cherry-Burrell "I" Line Seal Dimensions<sup>(1)</sup>

Size	A	B
2-in.	2.640 (67.06)	2.240 (56.90)
3-in.	3.875 (98.43)	3.305 (83.95)

(1) Dimensions are in inches (millimeters).

Level  
DP Level

# Rosemount DP Level

Figure 20. SLS Hygienic Dairy Process Connection Female Thread Seal per DIN 11851

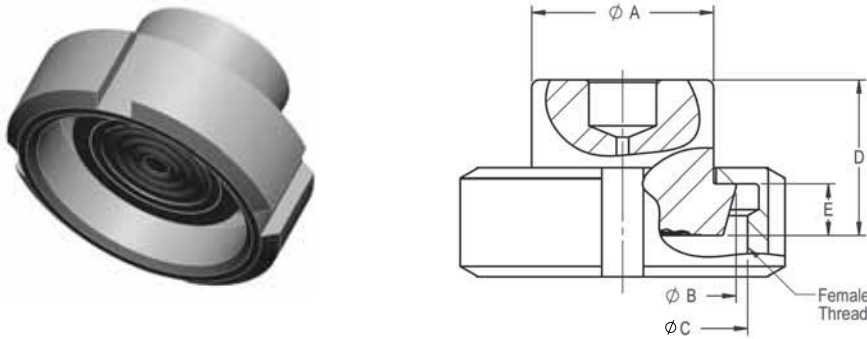


Table 75. SLS Hygienic Dairy Process Connection Female Thread Seal per DIN 11851 Dimensions<sup>(1)</sup>

Female Thread	Process Size / Rating	A	B	Thread (C)	D	E
DIN 11851	DN 40 PN 40	1.89 (48.0)	2.20 (56.0)	Rd 65 X 1/6-in.	1.18 (30.0)	0.39 (10.0)
	DN 50 PN 25	2.40 (61.0)	2.70 (68.5)	Rd 78 X 1/6-in.	1.22 (31.0)	0.43 (11.0)

(1) Dimensions are in inches (millimeters).

Figure 21. WSP Saddle Seal

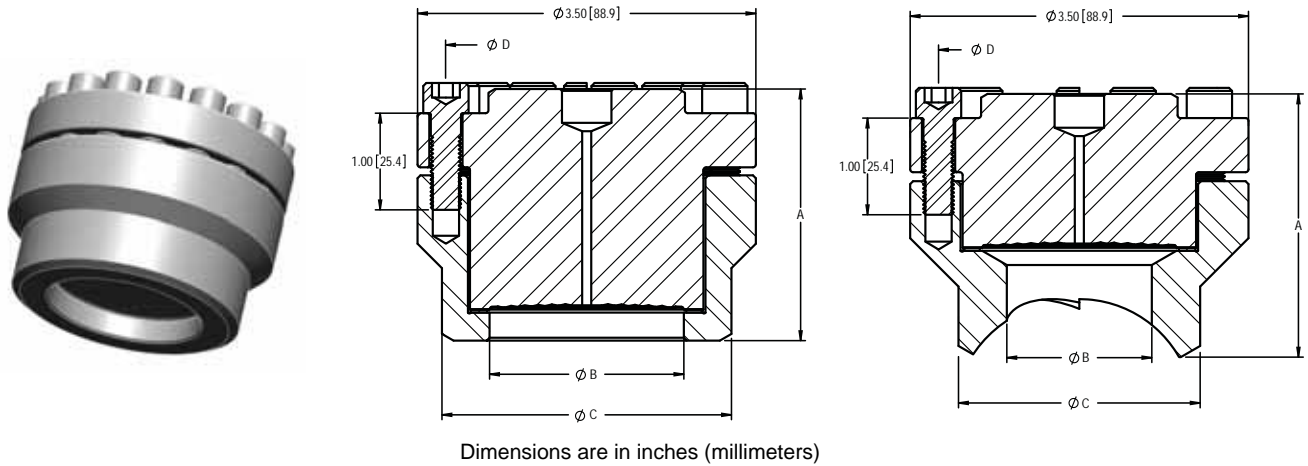


Table 76. WSP Saddle Seal Dimensions<sup>(1)</sup>

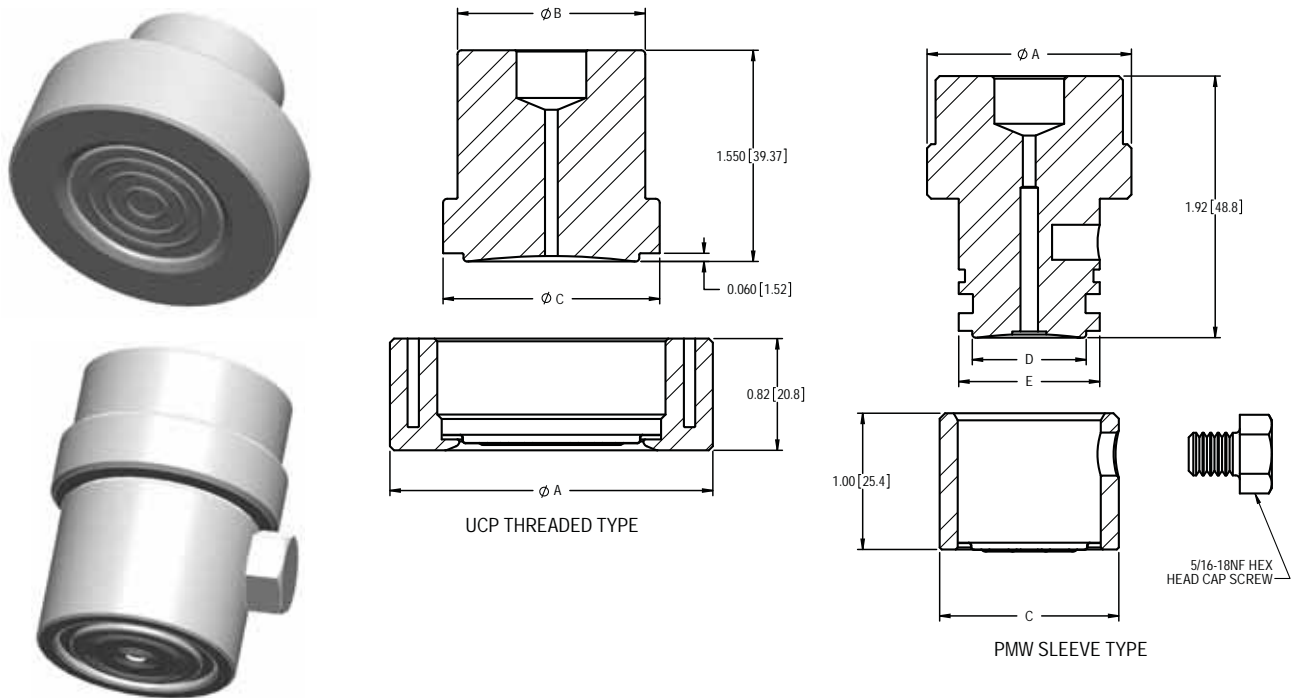
Size	A	B	C	D	
				6 Bolts	8 Bolts
2-in.	2.72 (69.1)	1.50 (38.1)	2.50 (63.5)	2.99 (75.9)	2.91 (78.0)
3-in.	2.46 (62.5)	2.01 (51.1)	3.02 (76.7)	2.99 (75.9)	2.91 (78.0)
4-in. and larger	2.60 (66.0)	2.01 (51.1)	3.00 (76.1)	2.99 (75.9)	2.91 (78.0)

(1) Dimensions are in inches (millimeters).

Level

DP Level

Figure 22. UCP and PMW Threaded Pipe Mount Seals



THREADED PIPE MOUNT (UCP AND PMW) SEALS

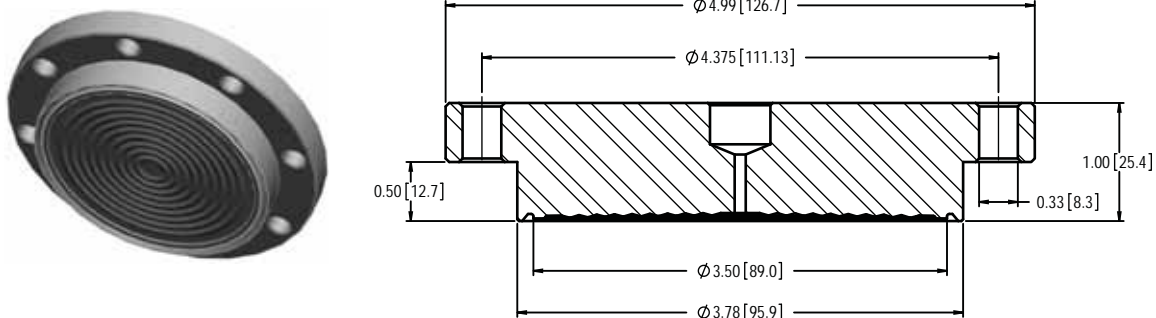
Dimensions are in inches (millimeters)

Table 77. UCP and PMW Threaded Pipe Mount Seals Dimensions<sup>(1)</sup>

Size	Diameter (A)	Diameter (B)	Diameter (C)	Diameter (D)	Diameter (E)
Sleeve 1-in. Pipe	1.50 (38.1)	—	1.32 (33.5)	0.85 (21.6)	1.05 (26.7)
Threaded M44 X 1.25	2.37 (60.2)	1.38 (35.1)	1.59 (40.4)	—	—

(1) Dimensions are in inches (millimeters).

Figure 23. CTW Chemical Tee Seal



Dimensions are in inches (millimeters)

Level  
 DP Level



# Rosemount DP Level

Figure 24. TFS Wafer Style In-Line Seal

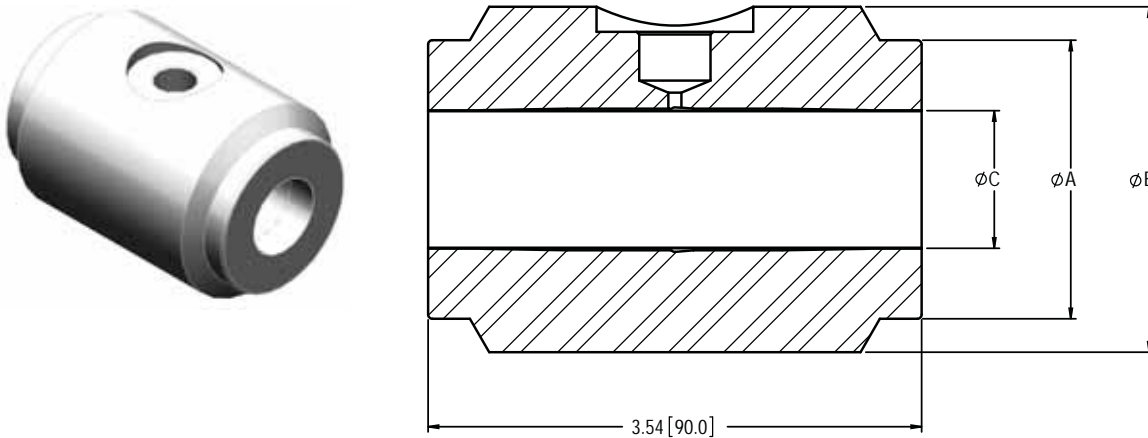


Table 78. TFS Wafer Style In-Line Seal Dimensions<sup>(1)</sup>

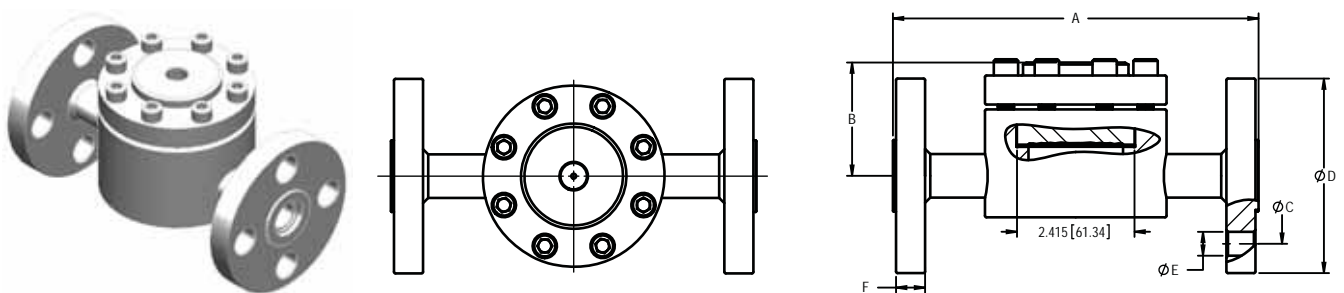
Pipe Size	A	B	C
1-in.	2.00 (50.8)	2.64 (67.0)	1.090 (27.69)
1 1/2-in.	2.88 (73.2)	3.23 (82.0)	1.614 (41.00)
2-in.	3.62 (91.9)	3.74 (95.0)	2.070 (52.58)
2 1/2-in.	4.12 (104.6)	4.21 (107.1)	2.480 (62.99)
3-in.	5.00 (127.0)	5.00 (127.0)	3.070 (77.98)
4-in.	6.00 (152.4)	6.00 (152.4)	4.000 (101.60)
DN25	2.68 (68.0)	2.72 (69.0)	1.090 (27.69)
DN40	3.46 (88.0)	3.46 (88.0)	1.614 (41.00)
DN50	4.02 (102.0)	4.09 (104.0)	1.992 (50.60)
DN80	5.43 (138.0)	5.47 (139.0)	3.236 (82.19)
DN100	6.38 (162.0)	6.46 (164.0)	4.216 (107.09)

(1) Dimensions are in inches (millimeters).

Level

DP Level

Figure 25. WFW Flow-Thru Flanged Seal



Dimensions are in inches (millimeters)

Table 79. WFW Flow-Thru Flanged Seal Dimensions<sup>(1)</sup>

Class (lb.)	Nominal Pipe Size (in.)	Overall Length ± 0.05	Upper to Centerline Height	Bolt Circle Diameter	Outside Diameter	Bolt Hole	Flange Thickness
		A	B	C	D	E	F
150	1	7.00 (177.8)	2.28 (57.91)	3.12 (79)	4.25 (108)	0.62 (16)	0.50 (13)
	2	9.00 (228.6)	3.21 (81.6)	4.75 (121)	6.00 (152)	0.75 (19)	0.69 (18)
	3	11.00 (279.4)	3.50 (88.9)	6.00 (152)	7.50 (191)	0.75 (19)	0.88 (22)

(1) Dimensions are in inches (millimeters).

