

Technical Note

00840-0700-4016, Rev AA

February 2009

Rosemount 1199

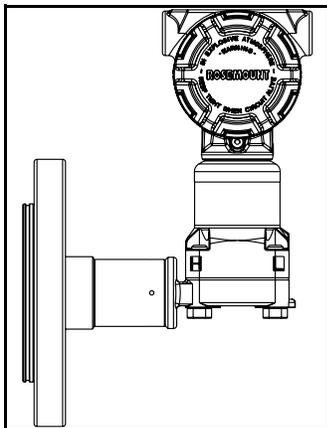
1199 Direct Mount Connection Guidelines

INTRODUCTION

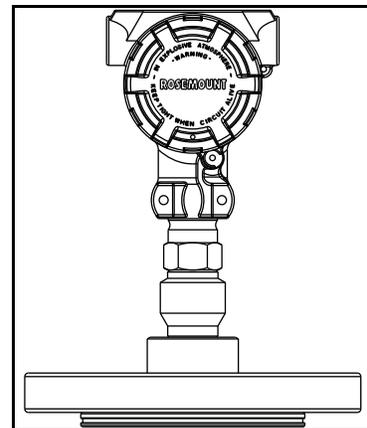
In this document, you will find direct mount guidelines for the Rosemount 1199 Diaphragm Seal System. Direct mount remote seal systems provide a compact way of directly connecting a pressure transmitter to vessel fittings. This note discusses direct mount configurations, direct mount operating limits, and installation guidelines.

DIRECT MOUNT CONFIGURATIONS

Direct mount configurations can be ordered as an integrated level transmitter (i.e: 3051S2L) or as an 1199 seal system. The 1199 direct mount connections are available to attach to Coplanar™ and In-line sensor modules and almost every seal type. There are three direct mount extension lengths for Coplanar configurations and two extension lengths for In-line configurations with longer extension lengths used to separate the transmitter from higher process temperatures. The different configurations and associated model codes are listed below.



Coplanar Connections



In-line Connections

Coplanar Connections				
Direct Mount Extension "X"	Welded Repairable		All-Welded Vacuum	
	1 Seal	2 Seals	1 Seal	2 Seals
0 in (0 mm)	93	94	97	96
2 in (50 mm)	B3	B4	B7	B6
4 in (100 mm)	D3	D4	D7	D6

In-line Connections	
Direct Mount Extension "X"	Option Codes
1 in (25 mm)	95
5.72 (145 mm)	D5

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DIRECT MOUNT OPERATING LIMITS

Temperature: A direct mount seal system protects the transmitter from process temperatures while maintaining the seal system fill fluid within its operating temperature limits. Pressure transmitter ambient limits are based on its electronics (typically -40° to 185°F/85°C) and process temperature limits are based on the module configuration (typically -40° to 250°F/121°C for Coplanar flanges or in-line connections).

The seal system fill fluid is selected to operate within the process and ambient temperature limits for an application. For direct mount systems, heat transferred from the process keeps the fill fluid & direct mount connection warm. This enables the fill fluid to continue to respond properly even at cold ambient conditions. An example is the Thermal Optimizer In-line code D5 designed for high process temperature applications. The Thermal Optimizer separates the In-line sensor module from the high process temperature while insulating the high temperature fill fluid to enable it to operate properly even at the coldest ambient conditions. In capillary seal systems, the process heat is dissipated and most of the fill fluid is exposed to the ambient temperature. At cold ambient temperatures, high temperature fluids like DC704 or DC705 become too viscous to provide acceptable time response.

The tables below highlight temperature limits for the variety of 1199 fill fluids in direct mount or capillary seal system configurations.

Coplanar Transmitter Seal System Fill Fluid Limits				
Fill Fluid	Direct Mount			
	Minimum Temperature	Maximum Temperature		
		LT/O ext.	2-in./ 50 mm ext.	4-in./ 100 mm ext.
DC200	-45 °C/ -49 °F	205 °C/ 401 °F		
DC704	-40 °C/F		240 °C/ 464 °F	260 °C/ 500 °F
DC705	-40 °C/F		240 °C/ 464 °F	260 °C/ 500 °F
Inert (Halocarbon)	-45 °C/ -49 °F	160 °C/ 320 °F		
Glycerine and Water	-15 °C/ 5 °F	95 °C/ 203 °F		
Propylene Glycol and Water	-15 °C/ 5 °F	95 °C/ 203 °F		
Neobee M-20	-15 °C/ 5 °F	205 °C/ 401 °F	225 °C/ 437 °F	
Syltherm XLT	-75 °C/ -102 °F	145 °C/ 293 °F		

In-line Transmitter Seal System Fill Fluid Limits			
Fill Fluid	Minimum Temperature	Maximum Temperature	
		1-in. (25 mm)	5.72-in. (145 mm)
DC200	-45 °C/-49 °F	205 °C/401 °F	
DC704	-40 °C/F		315 °C/599 °F
DC705	-40 °C/F		350 °C/662 °F
Inert (Halocarbon)	-45 °C/-49 °F	160 °C/320 °F	
Glycerine and Water	-15 °C/5 °F	95 °C/203 °F	
Propylene Glycol and Water	-15 °C/5 °F	95 °C/203 °F	
Neobee M-20	-15 °C/5 °F	205 °C/401 °F	225 °C/437 °F
Syltherm XLT	-75 °C/-102 °F	145 °C/293 °F	

Capillary Seal System Fill Fluid Limits		
Fill Fluid	Minimum Temperature	Maximum Temperature
DC200	-45 °C/-49 °F	205 °C/401 °F
DC704	0 °C/32 °F	315 °C/599 °F
DC705	20 °C/68 °F	350 °C/662 °F
Inert (Halocarbon)	-45 °C/-49 °F	160 °C/320 °F
Glycerine and Water	-15 °C/5 °F	95 °C/203 °F
Propylene Glycol and Water	-15 °C/5 °F	95 °C/203 °F
Neobee M-20	-15 °C/5 °F	225 °C/437 °F
Syltherm XLT	-75 °C/-102 °F	145 °C/293 °F

Pressure: The operating pressure limits for a direct mount seal system depend on the process connection and/or sensor URL for the maximum limit and the sensor static pressure limit and remote seal construction for the minimum limit. For example, the maximum limit for a FFW seal with an ANSI class 150 SST flange would be 285 psig(19.6 bar). The maximum limit for a gage Coplanar range 4 the URL would be 300 psig(20.7 bar). The maximum limit would be the lower of these values for a given seal system. For minimum pressure, the sensor limit depends on module and sensor type as shown below.

Module Type	Sensor Type	Lower Pressure Limit
Coplanar	Differential	LRL or 0.5 psia (34.5 mbar abs)
	Gage	LRL or 0.5 psia (34.5 mbar abs)
	Absolute	0 psia (0 bar)
In-line	Gage	-14.7 psig (-1.01 bar)
	Absolute	0 psia (0 bar)

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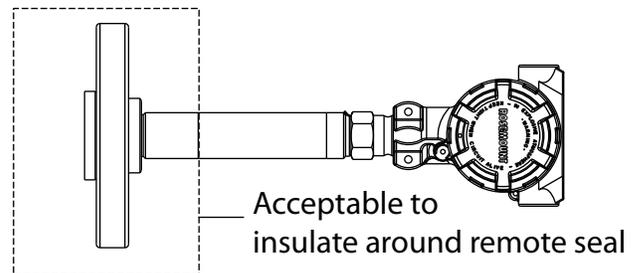
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The remote seal construction also needs to be evaluated for lower limits on vacuum applications. Standard Welded-Repairable remote seal construction on Coplanar modules uses PTFE o-rings, so it can be used for vacuum pressures down to 6 psia (0.41 bar). Below 6 psia (0.41 bar), All-Welded Vacuum construction should be used as it also includes welded isolator caps to eliminate any potential for air to be sucked into the seal system under deep vacuum conditions.

If the minimum process pressure is below the sensor pressure limit, then the pressure transmitter needs to be mounted below the bottom process connection using a short length of capillary. The vertical column of fill fluid creates a head pressure on the sensor module to protect the sensor's fill fluid within its operating limit.

INSTALLATION GUIDELINES

Direct mount remote seal systems need to be installed properly to ensure they operate within the operating limits stated above. In particular, the use and location of insulation will determine if a direct mount remote seal system will operate to its limits. The general recommendation is to wrap insulation around vessel process connections and seal only, not the direct mount transmitter/flange. The direct mount systems are designed to balance the heat dissipation from the remote seal and process connection, so if the entire unit is wrapped in insulation, the transmitter electronics could be overheated. For the example shown to the right, it is acceptable to insulate around the remote seal and process pipe, but not the direct mount extension.



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