

# ROSEMOUNT™ THERMAL OPTIMIZER

## Extend direct mount temperature limits for processes

A Rosemount™ thermal optimizer allows for pressure measurement with increased process temperatures in low ambient climates. The Rosemount™ thermal optimizer is a solution for high temperature gauge pressure applications.

The Rosemount™ thermal optimizer is different than the traditional cooling towers on the market. It uses 704, or a variety of other fill fluids, to accommodate higher process temperatures.

But how does it still retain low temperature performance?

The key is that the thermal optimizer is not used to dissipate heat. It is used to conduct heat from the process to the fill fluid. This keeps the fill fluid at a temperature where it will be less viscous when installed in ambient temperatures below the normal operating ranges of the fill fluid (i.e. -50°C in northern Canada).

In extremely cold ambient temperatures, the thermal optimizer conducts heat from the process to the fill fluid and transmitter to keep the fill fluid from becoming too viscous. By maintaining the fill fluid in its optimal zone, while preventing the transmitter from becoming overheated, excellent accuracy with low time delay is achieved.

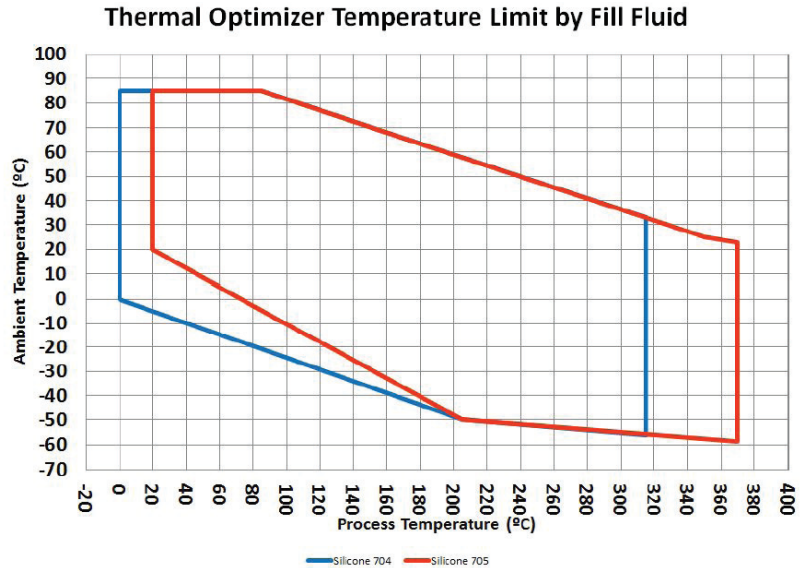
- Available for all Rosemount™ gauge pressure seal systems
- Predictable year-round seal performance
- Avoid seasonal insulation blanket installation and removal
- Thermal optimizer extends direct mount temperature limits for processes from 205°C up to 370°C
- A thermal optimizer separates the in-line sensor module from high process temperatures while insulating the high temperature fill fluid to enable it to operate properly even at the coldest ambient conditions



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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 (-40°C to 85°C) and process temperature limits are based on the module configuration (50°C to 121°C ) for coplanar flanges or inline 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 and the direct mount connection warm. This enables the fill fluid to continue to respond properly even at cold ambient conditions.

The thermal optimizer separates the inline 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 704 or 705 become too viscous to provide acceptable time response.

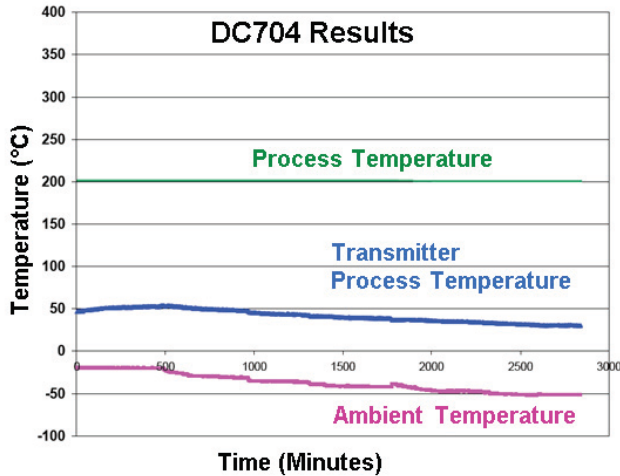
### Response Times

Fill Fluid	Silicone 7-4	Silicone 704	Silicone 705	Silicone 705
Process Temperature	315°C	10°C	370°C	10°C
Ambient Temperature	-56°C	-40°C	-50°C	-20°C
Response Time	0.6 seconds	32.8 seconds	0.8 seconds	54.2 seconds

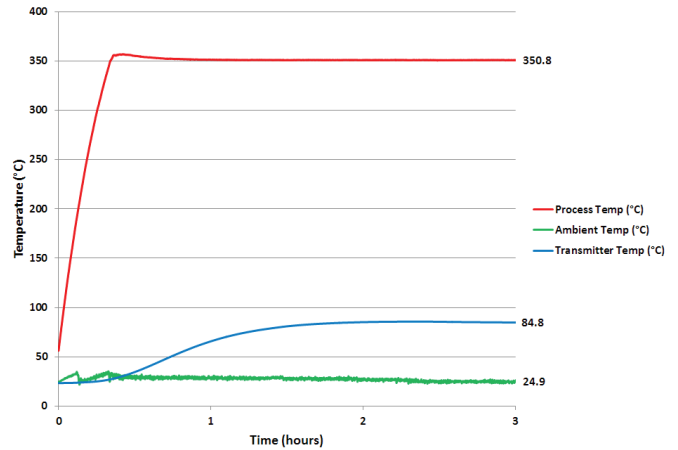
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## Extend direct mount temperature limits for processes

**Cold Ambient Test -50 °C**

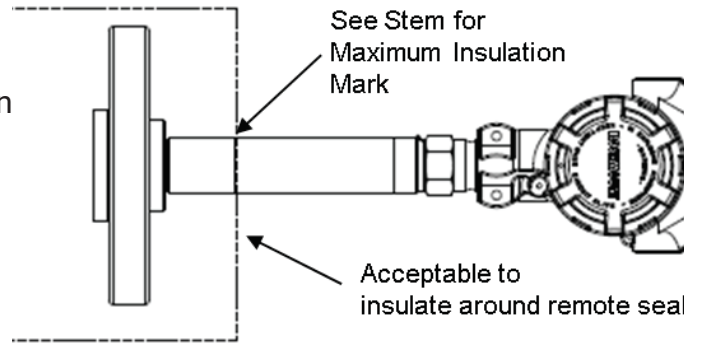


**Hot Ambient Test**



### Insulation Installation Guidelines

Direct mount remote seal systems must be installed properly to ensure they operate within the operating limits. The general recommendation is to wrap insulation around vessel process connections and seal only, not the direct mount transmitter/flange. Direct mount systems are designed to balance the heat dissipation from the remote seal and process connection. In the example to the right, it is acceptable to insulate around the remote seal and process pipe, but not the direct mount extension. There is no requirement to add and remove insulation dependent on the season.



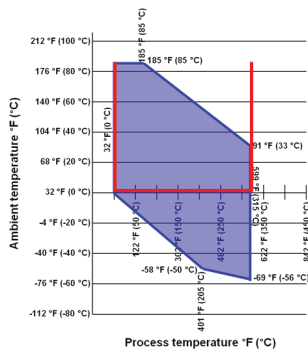
### Thermal Optimizer Keeps Fill Fluid from Gelling in Cold Ambient Temperatures

High process heat warms the capillary and fill fluid in low ambient temperature conditions.

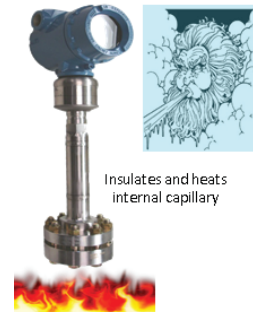
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## Extend direct mount temperature limits for processes

**Thermal Optimizer Keeps Fill Fluid from Gelling in Cold Ambient Temperatures**  
High process heat warms the capillary and fill fluid in low ambient temperature conditions.



Thermal Optimizer (D5)



### 1199 Direct Mount Fill Fluid (Model 2051T/3051T/3051S2T/2088 In-Line Transmitters)

Model	Product Description
1199	Seal System
Code	Seal Location Direct Mount Connection Type
W	All Welded, One Seal System, High Pressure Side of Transmitter
Code	Fill Fluid Process Temperature Limits
A	Syltherm® XLT -75 to 145°C (-102 to 293°F)
C	Silicone 704® 0 to 315°C (32 to 599°F)
V	Silicone 705® 20 to 370°C (68 to 698°F)
D	Silicone 200® -45 to 205°C (-49 to 401°F)
Code	Seal Connection Type
A	Direct Mount
Code	Direct Mount Connection Type
D5	Thermal optimizer. One-seal system.

#### Notes:

1. A 1199 Direct Mount Seal consists of 2 parts. First, specify the direct mount connection codes as per above. Then, specify a remote seal as found in the Rosemount DP Level PDS 00813-0100-4016.
2. Ordering Codes
3. Thermal Optimizer is not available for Range 5 transmitters.

