

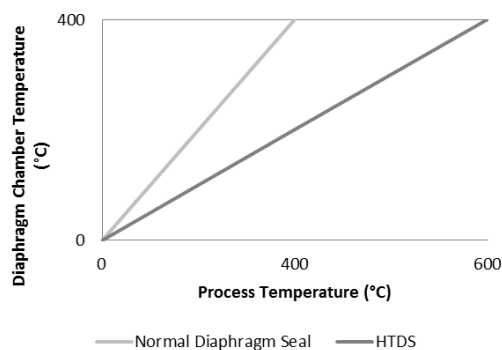
## INTRODUCTION

It is a recognised phenomenon in the process industry that higher process pressure and temperature can improve the overall efficiency. Currently, when measuring with a transmitter with Diaphragm Seals the temperature limit of Diaphragm Seal applications is set at 420°C as this is the maximum allowed temperature of the filling fluid.



## HIGH TEMPERATURE DIAPHRAGM SEAL

Badotherm has developed Diaphragm Seal that can withstand process temperatures up to 600°C. To enable a proper functioning of the Diaphragm Seal at these extreme process temperatures a revolutionary new design and principle is used. The novelty of the design is as such that Badotherm has a Patent on the High Temperature Diaphragm Seal (HTDS).



The HTDS is extensively tested in different circumstances and with various process temperatures. The

graph presents the temperature reduction measured in the diaphragm chamber compared to a normal Diaphragm Seal. The HTDS is suitable for both gauge and differential pressure transmitters.

## TEMPERATURE AND STATIC PRESSURE LIMITS

The maximum temperature limit is determined by a combination of the fill fluid, and the material of the body and of bolts. With AISI-321H body material and 1.4980 bolt material the maximum temperature is 600°C (material specifications and maximum temperature according the ASME B16.5 standard). The maximum operating pressure depends on the flange rating combined with process temperature. The table below presents the temperature and pressure limits for 3 selected filling fluids.

	BSO-46	BSO-42	BSO-02
<b>Temperature Limits</b>			
Max. Process temp.	600°C	550°C	600°C
Min. Ambient temp.	-5°C	-20°C	-40°C
Max. Ambient temp.	50°C	50°C	50°C
<b>dP Static Pressure</b>			
Min. (mbar) <sup>1</sup>	250	1000	5000
Max. (bar)	40.5	40.5	40.5

<sup>1</sup> At maximum process temperature

## ACCURACY AND OTHER SPECIFICATIONS

The table below presents the accuracy specifications of GP and DP HTDS, as well as the temperature effects, and pressure details.

	GP	DP
<b>Min. span required</b>	1000 mbar	250 mbar
<b>Transmitter min. overpressure required</b>	40 bar	40 bar
<b>Accuracy<sup>2</sup></b>		
Span 250 mbar	-	2.0%
Span 500 mbar	-	1.0%
Span >1000 mbar		
0-25%	2.0%	1.5% <sup>3</sup>
25-100%	0.5%	0.5% <sup>3</sup>
<b>Temperature effect</b>		
Process temp.	3.21 mbar/10°C	0.64 mbar/10°C
Ambient temp. /mtr cap.	1.68 mbar/10°C	0.34 mbar/10°C
Transmitter	0.65 mbar/10°C	0.13 mbar/10°C
<b>Capillary length</b>	1-15 mtr	1-15 mtr

<sup>2</sup> Calibrated at nominal value at 20°C ambient temperature

<sup>3</sup> At minimal static pressure of 1 bar

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