Specific solutions – Extreme High Temperature

Description

Pressure measurement in extreme high temperature conditions is challenging for the pressure instrument. With the introduction of a new solution Badotherm commits itself and sets a new benchmark for diaphragm seals. Accurate pressure measurement up to 800 °C

Simplified solution description

The past decades Badotherm always found the pride and commitment in the challenges of extremities in pressure measurement. More than 20 years ago Badotherm introduced the temperature compensator and is now seen as the market standard for a temperature barrier between high temperature process conditions and proper functioning of electronic pressure transmitters. 5 years ago Badotherm introduced the patented HTDS design for temperature solution up to 625 degC. The experience and knowledge Badotherm gained in the development trajectory led to the introduction of possibilities of even more extreme temperature measurement up to 800 degC.

The combination of the market feedback on the HTDS, the knowledge from our R&D, the experience with the Temperature compensator gave us the ultimate solutions for pressure measurement under extreme high temperatures.

The EHT solution is the combination of the Temperature Compensator system with a special fill fluid BSO60. This combination can be applied om all seal models with diaphragm sizes 58mm, 72mm, and 81mm. So basically, all the 2” and 3” flanged seals.

Advantages

The presented solution has the advantages over other high temperature pressure measurement solutions such as nozzle extensions or our own HTDS.

- Higher temperature range
- No need of branches or extension nozzles so closer to the medium results in realistic measurements
- Crystallisation or solidification is less due to flush diaphragm
- Cleaning is more efficient due to less dead spaces
- Wide range of ASME and EN flanges so no need of adapters and extra gaskets.

Accuracy @ 100°C

Span	Accuracy @100°C
<100 mbar	0,4% of the Span
>100 mbar	0,25% of the Span

Static Pressure effect @ 100°C

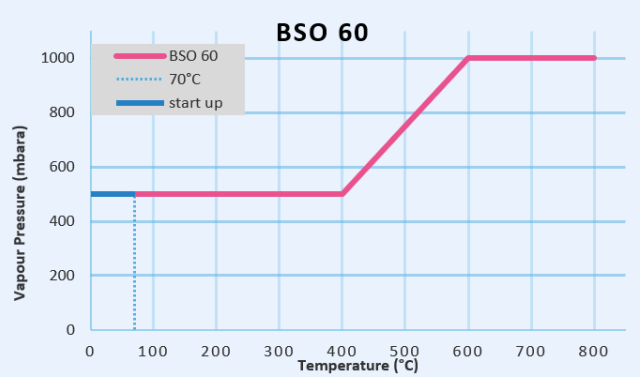
Span	Accuracy @100°C
0…MWP	0,025% of the Span
-500…0 mbar	1% of the Span

Process conditions

The EHT is designed to function for high temperatures higher than 400 °C. This is where it outperforms other solutions. To be able to measure pressures at these high temperatures it engages from 70 °C. Below this temperature it will not give a pressure reading but will not be damaged and will keep its function after 70 °C

Fill Fluid

Selected fill fluid is BSO60 for the section nearest to the process. After the compensator module the standard BSO fill fluid range may be selected.



Process Connection

The process connection of the EHT solution is flanged. These flanges connections can be executed in line with all common flange standards such as ASME, ISO and EN flange standards. The material selection is depending on the pressure and temperature under process and design conditions. Most common materials are Alloy 625 and 825 under these harsh conditions. The Badotherm BF seal is the leading type to be used. Logically the RJF metal to metal construction is commonly used. For sizing details of the BF seal the datasheet can be consulted: BF Flush diaphragm flange type

Mounting

Mounting the EHT solution is the same as normal flanges. However, to reduce the radiation of the process temperature to the cooling mechanism and capillary it is advised to mount it vertically to the process line when possible. Due to the high temperatures extra attention is needed for parts such as stud bolts, gaskets, and torque.

Insulation

To prevent a heat sink the flange should be insulated. This reduce temperature loss of the main process and reduces radiation to the other diaphragm seal components. Under no conditions the tube and cooling element may be insulated. This will lead to overheating of the system and reduces the lifetime of the assembly.