Medium and Ambient Temperature Influence on Pressure Transmitter, Type MBS 33

Description

The MBS 33 operational temperature range has been chosen to ensure correct function and to protect the vital parts against damage caused by the temperature. Therefore the temperature of the pressure transmitter enclosure and the sensor element must not exceed -40°C to +85°C.

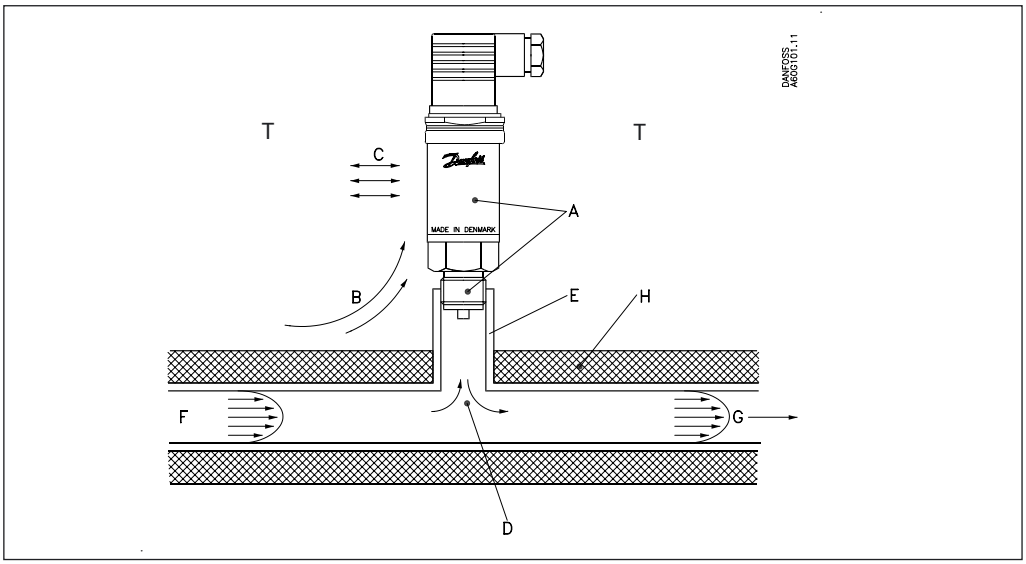
The operational temperature of MBS 33 is a combination of the medium temperature and the ambient temperature.

If the medium and/or ambient temperature cause the operational temperature to rise above 85°C this can - to some degree - be prevented by appropriate mounting of the pressure transmitter.

We have stated below some of the factors that influence the operational temperature and how this influence can be reduced.

The maximum operational temperature for the pressure transmitter MBS 33 is +85°C. Therefore, the temperatures of the sensor element and the enclosure must not exceed +85°C. In practice this depends on a number of factors, some of which are shown in fig. 1.

Fig. 1



A. Operational temperature of transmitter
B Radiant and heat convected
C. Heat convection to environment
D. Heat exchange during medium flow
E. Heat conduction in the pipe
F. Medium temperature
G. Velocity
H. Insulation
T. Environmental temperature

The maximum ambient and medium temperatures are often stated in pressure transmitter technical specifications. Although these two temperatures are important (fig. 1), the pressure transmitter's operational temperature (item A) also depends on other conditions.

Item D depends on: Velocity, medium type (steam, liquid, air) medium viscosity and also the pipe length, pipe dimension and pipe layout (twisted, straight, horizontal etc.).

Item E depends on: the same conditions as mentioned under item D and also on the heat exchange to environment. The heat exchange depends on insulation as well as convection and heat radiation.

Items B and C depend on: the transmitter's thermal environment which depends on convection and heat radiation conditions. These conditions are dependent on horizontal or vertical installation, forced cooling etc.

The pressure transmitter is often mounted on a 2 to 3 cm connecting branch which will reduce the operational temperature by 30 to 35°C at a max medium temperature of 120°C. If this is not sufficient, we recommend that the length of the connecting branch is increased.

If the medium is steam, it is recommended to mount the pressure transmitter so that the steam will condense and create a water column in front of the transmitter. The following values are guiding values, measured in stagnant air at an ambient temperature of 40°C.
(Only natural air convection.)

Guiding values

Medium temperature	Pipe length	Transmitter temperature (Operational temperature)
120°C	2 cm	85°C
	5 cm	75°C
	10 cm	70°C
100°C	2 cm	75°C
	5 cm	65°C
	10 cm	60°C