

BPF fluids – Case fill fluids, general information

Design description

Many of the Badotherm pressure gauge series have the option of being liquid filled, to decide whether you need a liquid filling consider the below following conditions such as vibration, pulsation, fogging, or corrosive environment.

Vibrations/Pulsations of the gauge that can be caused by process vibration or pulsation. A consequence of this condition is that the moving parts and also the pointer will flutter and the actual reading will be impossible (pointer fluttering). A stable pointer indicating the pressure is essential in the readability of the pressure gauge.

Lubrication of the gearing and joints on the transferring gearing is another benefit of the liquid filling. This helps reducing the impact and wear and tear to the components of the many movements due to pulsations and vibrations. Logically, **high wear** shortens the life cycle of the instrument drastically and is a potential hazard. Liquid filling reduces this effect.

Fogging can be a reason to add a liquid to the pressure gauge case. The fogging of the window can be caused by varying ambient conditions that leads to condensation. The condensation of the damp leads to difficulty in reading and can freeze in winter. A liquid filling in the case ensures no fogging can take place and the pressure gauge dial is clearly visible. The visibility is clearly one of the most



Corrosion on the aluminium parts can occur in corrosive environments. The above described condensate inside case can mix with damp of the aggressive ambient matter. This cannot be entirely excluded because of the natural "breathing". A compatible liquid filling inside the case prevents the aluminium parts from corrosion and increase the durability of the pressure gauge.

Specification overview

name	type	operating temperature (min)	operating temperature (max)	viscosity	density (kg/dm3)
BPF-01	Glycerine 86%	-20°C (-4°F)	+60°C (140°F)	130 Cst	1.23
BPF-02	Silicon	-40°C (-40°F)		1000 Cst	0.97
BPF-03	Silicon for contacts	-20°C (-4°F)		50 Cst	0.96
BPF-04	Mineral oil (foaming service)			50 Cst	0.87
BPF-05	Halocarbon			30 Cst	1.90
BPF-06	Glycerine 99.5%	0°C (32°F)		1000 Cst	1.26

Glycerine fluid BPF-01 & BPF-06

The most commonly used liquid for pressure gauge filling is Glycerine. On average Glycerine has good characteristics for vibration dampening at room temperature. There are two types of glycerine used in the Badotherm pressure gauges. Depending on the pressure range and ambient conditions. The standard fill fluid for gauges with range greater than and including 2.5 bar is BPF-06, for the lower pressure ranges <2.5 bar the BPF-01 is used in order to decrease the negative influences of glycerine with a higher viscosity.

Silicone fluid BPF-02 & BPF-03

Silicon fluids are more suitable to be used in situations with a low ambient temperature or icing may be expected. The normal case fill fluid BPF-02 is used for standard gauges. When the contact gauges BDT30 or the add-on device BDT31 are used the insulating fluid BPF-03 will be applied. The BPF-03 has good characteristics for use in combination with contacts such as a lower viscosity and good dielectric properties.

Mineral fluid BPF-04

A more application specific fluid is the mineral oil. This fluid has specific characteristics that is required for example in the foaming production. Traces or loss of this fill fluid does not affect the foaming characteristics and thus no batches are lost.

Halocarbon fluid BPF-05

Halocarbon fluid is used in pressure gauges placed in combination with oxidizing agents such as oxygen, chlorine and hydrogen peroxide.

Filling level of pressure gauges

Pressure gauges are not filled 100% with fill fluid. The reason is that there needs to be room for volumetric expansion. Therefore the gauge is filled 80-90% of the total volume. This leaves space for expansion as a result of variation in the ambient temperature. Overfilling of the gauge can lead to an excess of fluid in a higher ambient temperature that could lead to leaking.



Change log

Date	Change

Holland – Romania – India – Thailand – Dubai – USA

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