FLOWSERVE

*McCANNA/MARPAC Valves*

Product Data Bulletin
FCD MMAPS0003-00
(Part PDB-13)

# Actuator Mountings for High Temperature Service

The purpose of this bulletin is to aid in determining the need for extended mounting brackets or heat shields when ordering a ball valve with an actuator. The purpose of the extended mounting bracket and heat shield is to keep the actuator temperature below the point where a breakdown of materials in the actuator will occur.

## Pneumatic Actuators

Generally speaking, a standard pneumatic actuator has Buna-N seals with No. 2 grease which permits it to be used for temperatures at the actuator mounting flange from -20° to 250°F (-29° to 121°C). High temperature preparation with Viton seals and high temperature grease permits the actuator to be used up to a temperature of 400°F (204°C) at the mounting flange of the actuator.

## Electric Actuators

Standard electric actuators for intermittent duty generally have Class A insulation good up to an internal temperature of 221°F (105°C). However, the capacitor used in most standard actuators and the regular type micro-switches are usually the limiting parts with a maximum temperature of 200°F (930°C) at the mounting flange of the actuator should not be exceeded.

## General Guidelines

In all of the following guidelines, one should be aware of conditions other than the temperature of the pipeline. For example, the line temperature may be 200°F (93°C) but the valve and actuator could be located over a high temperature heat exchanger where the ambient temperature is 260°F (127°C). Thus the actuator should be prepared for use at the highest temperature to which it is exposed.

Where the ambient temperature of the actuator is already at the maximum material breakdown temperature, no additional heat influx from the valves or heat rise due to motor operation can be allowed.

The general guidelines which follow assume a maximum ambient temperature at the actuator of 125°F (52°C). For higher ambient temperature, the conditions have to be carefully evaluated and actuator protections beyond the recommendations in this bulletin have to be considered. Electric actuators in outdoor installations may have to be shielded from high sun loads, and a reduction of duty cycles may be necessary at higher ambient temperatures. The guidelines are based on heat transfer by air convection, radiation, and conduction through the bonnet-stem connection and through the mounting brackets.

The recommendations are based on the following assumptions:

1. The actuator is mounted vertically above the valve. Valves with horizontal stem and actuator generally result in 50°F to 200°F lower temperatures, depending on the type of mounting bracket used. However, we must assume for standard recommendations, that the most unfavorable mounting position (actuator vertically above valve), will be used.
2. Different mountings result in the following heat losses: (Approximate estimates of the difference between the line fluid temperature and the temperature at the mounting flange of the actuator.)

| Heat Loss | | |
|---|---|---|
| **Actuator Mounting** | **Vertical** | **Horizontal** |
| Standard Mounting | 100°F (38°C) | 150°F (66°C) |
| Extended Mounting | 250°F (121°C) | 350°F (177°C) |
| Extended Mounting with Heat Shield | 400°F (205°C) | 500°F (288°C) |
| Double Extended Mounting with Two Heat Shields | 600°F (315°C) | 800°F (427°C) |

## Mounting Selection Guide

**Pneumatic Actuators**

1. Line Temperature to 350°F (177°C). No special mounting and no special actuator preparation required.

2. Line Temperatures from 350°F (177°C) to 500°F (260°C). No special mounting required, but high temperature prepared actuators must be specified.

3. Line Temperatures from 500°F (260°C) to 650°F (343°C). High temperature prepared actuators must be specified. In addition, an extended mounting bracket must be specified. On McCannaSeal® valves, extended bonnets are recommended in addition to above specifications.

4. Line Temperatures from 650°F (343°C) to 800°F (427°C). This temperature range applies only to McCannaSeal valves with G, L or M seats. Extended bonnets must be specified for these valves. High temperature prepared actuators must be specified and, in addition, extended brackets and heat shield just below the actuator must be used. This applies to cases where the valve is properly insulated. When valve is not insulated, double extended brackets with two heat shields must be specified.

5. Line Temperature from 800°F (427°C) to 100°F (538°C). Same requirements apply as under four, but double extended brackets and two heat shields must be specified even for insulated valves.

   (Non-insulated valves have tremendous heat radiation in this temperature range and direct actuator mounting vertically above the valve is impractical. Special remote actuator mounting is required, or valve must at least be mounted with the actuator stem in a horizontal position in addition to above bracket and shield recommendation.)

**Electric Actuators**

1. Line temperature to 300°F (149°C). No special mounting required.

2. Line temperature from 300°F (149°C) to 450°F (232°C). All valves must be specified with extended mounting brackets.

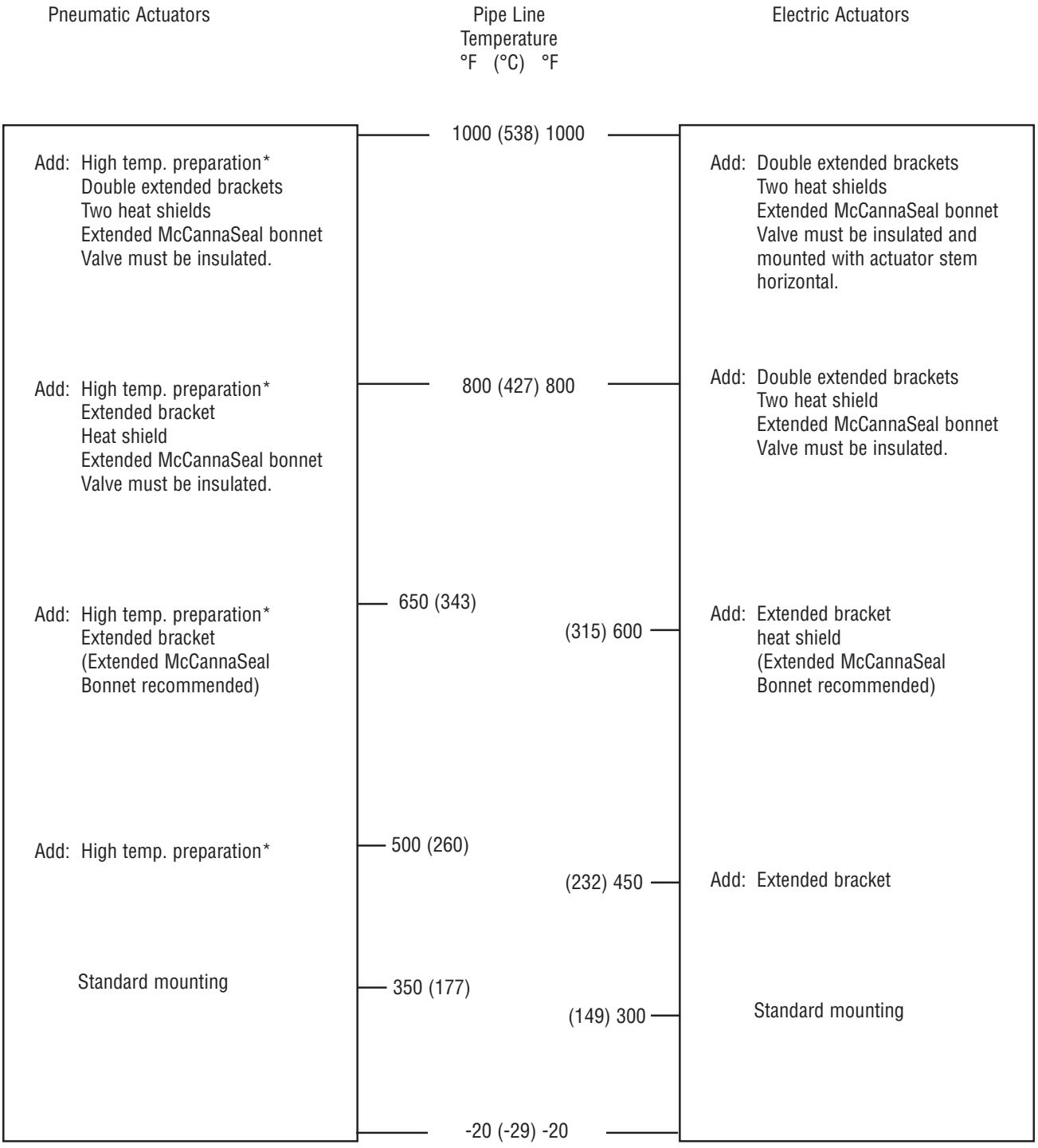
3. Line Temperatures from 450°F (232°C) to 600°F (315°C). All valves must be specified with extended mounting brackets and a heat shield. The heat shield should be just below the actuator with some air space between the shield and actuator gear case. On McCannaSeal valves, extended bonnets are recommended in addition to above specification.

4. Line temperature from 600°F (315°C) to 800°F (427°C). This temperature range applies only to McCannaSeal valves with G, L or M seats. Extended bonnets must be specified with double extended mounting brackets and two heat shields. This applies to cases where the valve is properly insulated.

   When valve is not insulated, direct mounting of actuators vertically above the valve is impractical. Special remote actuator mounting is required or valve must at least be mounted with the actuator stem in a horizontal position in addition to above bracket and shield recommendations.

5. Line temperatures from 800°F (427°C) to 1000°F (538°C). Well insulated valves in this temperature range can be treated the same as insulated valves up to 800°F (see 4 above) with the provision that the valve must be mounted with the actuator stem horizontal. For marginally insulated valves or non-insulated valves, special remote mounting of actuators is a must.

**Recommended Actuator Mounting**




***Includes** Viton seals and high temperature grease

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