



# TECH BULLETIN

002  
12/76

*Published regarding engineering changes and improvements*

## SUBJECT: Inlet pressure vs water temperature

As the temperature of the pumped water increases, the likelihood of vaporization and cavitation increases. Several aspects of the system should be considered with elevated temperatures to achieve optimum performance.

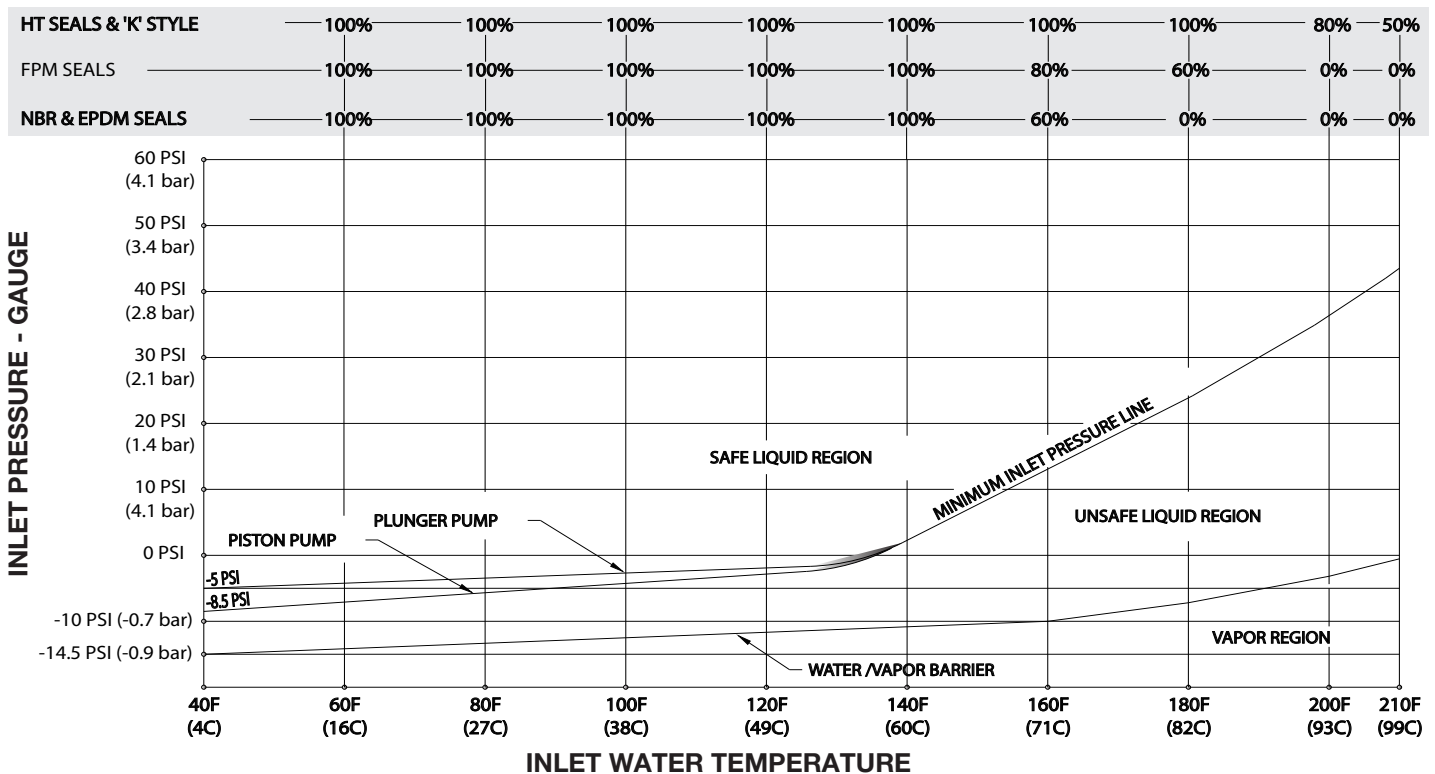
- pressurize inlet above 130°F
- reduce pump RPM
- install Captive Acceleration Tube (C.A.T.) in inlet line
- increase inlet line size to the pump
- properly sized and baffled supply tank

### PRESSURIZED INLET

With ambient temperatures, **piston pumps** can handle a maximum negative suction of **-8.5 PSI** (20 feet of water) and **plunger pumps** can handle a maximum negative suction **-5 PSI** (11.5 feet of water). As the temperature of the water increases, the vapor pressure (pressure required to remain liquid) also increases. By increasing the inlet pressure to the pump, you can minimize the increased risk of cavitation.

To achieve the recommended inlet pressures with elevated temperatures, it is often necessary to use a booster pump. The booster pump should be approximately twice the system capacity to assure adequate flow into the pump. See chart below.

**MAXIMUM PUMP SPEED VS WATER TEMPERATURE**



Continued on back

Rev. 03/12

## **C.A.T.**

The optimum installation for ambient temperature water requires a properly sized baffled supply tank. The tank should be enclosed and 6-10 times the system capacity with at least two baffles. If more than 5-6 feet from the pump or long feed lines or a booster pump or high temperature are present, the C.A.T. should be installed to stabilize inlet pressure. **Note:** The C.A.T. will not function with a negative suction inlet.

## **REDUCTION IN RPM**

In addition to increasing the inlet pressure to the pump as temperature increases, reducing the pump RPM will also offer added protection. Reducing the **RPM** reduces the acceleration and vaporization of the water. Lower **RPM** reduces the risk of cavitation and its damaging effects. See chart on front for recommended **RPM**.

## **INCREASED LINE SIZE**

It is always important to have the inlet supply line sized to match or be one size larger than the pump inlet port for optimum performance, but it is most critical when the pumped liquid is at elevated temperatures. Under sizing the line will only compound the problems of high temperature vaporization. See individual pump data sheet.

## **CAT PUMPS**

**Technical Services Department**