



TCU Series Temperature Control Unit for Liquid Nitrogen Piping

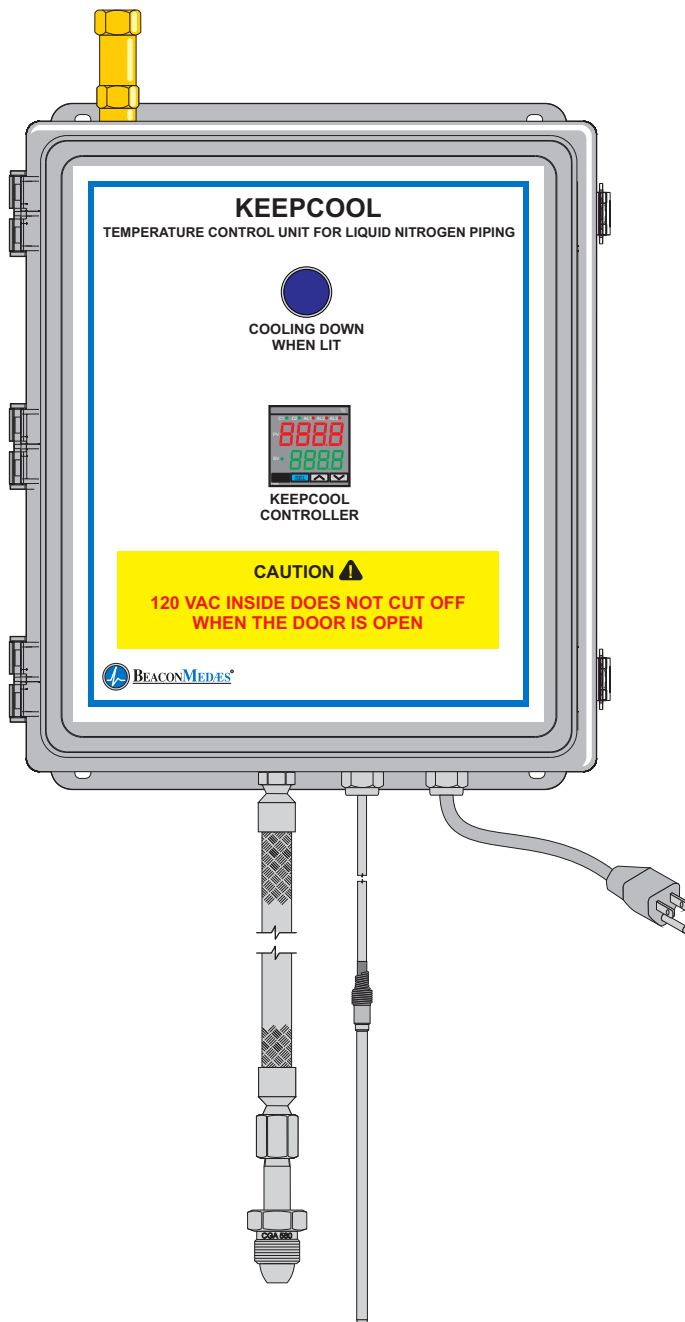
Key Features

Keep low temperature inside vacuum insulated piping

Field changeable temperature set points

Indoor or outdoor installation

Two (2) solenoid valves opening and closing at the same time for better leak integrity



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Description

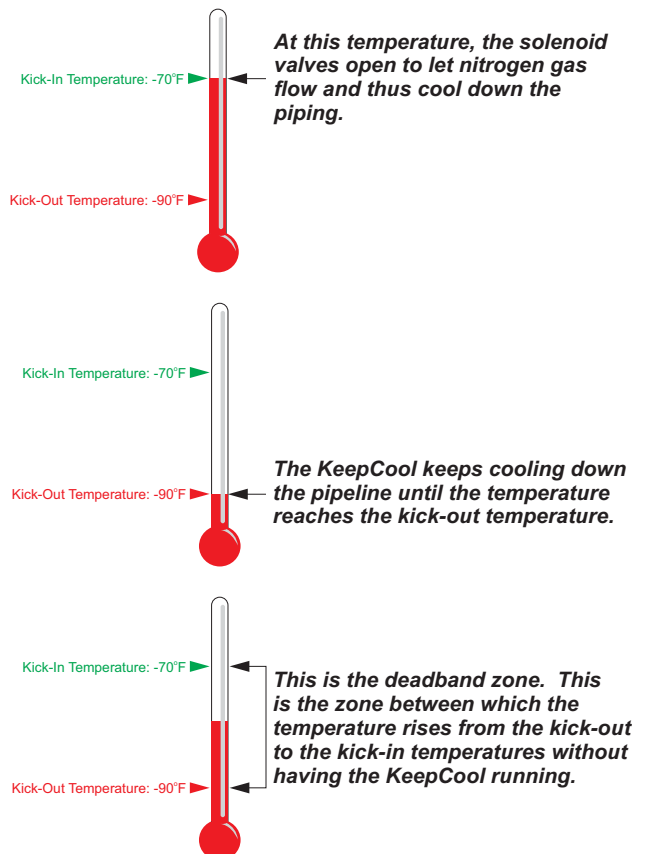
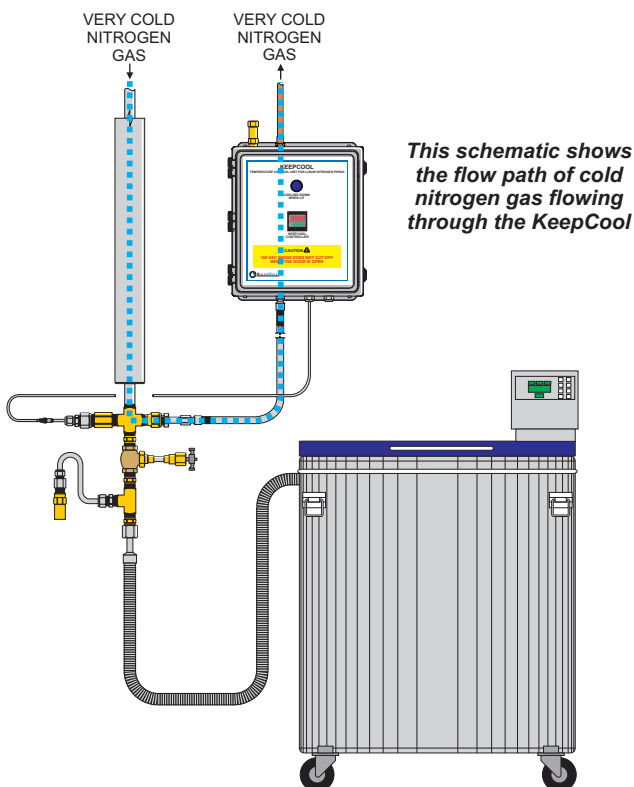
The KeepCool has been designed for a very specific purpose; reducing the time it takes to cool down a vacuum jacketed pipe. This task is achieved by keeping the temperature inside the vacuum jacketed pipe at a low temperature without being flooded by liquid nitrogen.

This system is particularly suitable when the source of liquid nitrogen is liquid cylinders. Unlike bulk cryogenic liquid tanks, liquid cylinders contain small amounts of liquid nitrogen that can be wasted to atmosphere through venting just to keep liquid nitrogen inside the piping. **The KeepCool uses both very cold nitrogen gas and liquid nitrogen to maintain the temperature inside the piping halfway between ambient temperature (say 70°F) and the cryogenic temperature of liquid nitrogen (-319°F).**

The main application for the KeepCool is cryopreservation. Cryopreservation is the storage of biological species inside cryogenic freezers. But why is it so important to keep low temperature inside a vacuum jacketed piping system for cryopreservation applications? There are three (3) reasons:

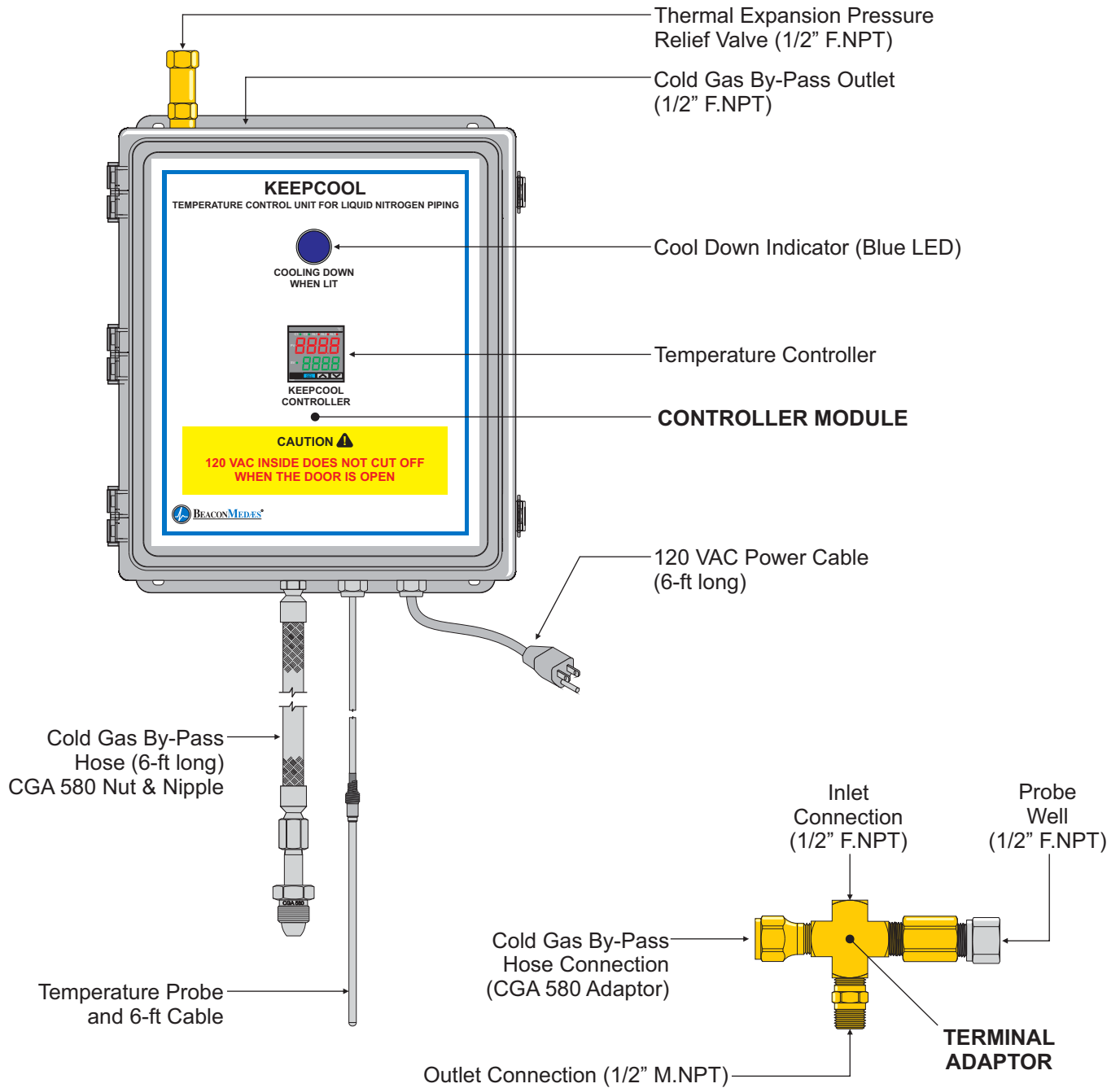
- a) **For cryogenic freezers not equipped with hot-gas by-passes**, it is important to avoid introducing hot nitrogen (coming from a "hot" vacuum jacketed piping) inside freezers. Introducing hot nitrogen inside a cryogenic freezer tends to increase the temperature inside the freezer and increase the evaporation rate of the liquid nitrogen already in the freezer. In other words, the KeepCool acts as a hot-gas by-pass for the vacuum jacketed pipe.
- b) **For freezers equipped with hot-gas by-passes**, the KeepCool helps to minimize the amount of nitrogen vented inside the laboratory through the vent valve. Because the temperature is already very low, the hot-gas by-pass cycle of the freezer is reduced to a minimum which reduces the amount of nitrogen vented to atmosphere.
- c) But the main benefit of the KeepCool is to **bring liquid nitrogen to the freezers much faster** than if you wouldn't have one. This is particularly important when cryogenic freezers are programmed with maximum fill time. In many cases, freezers are programmed to be filled within a certain period of time (120 minutes maximum). If freezers are not filled within a given period of time, the fill process is aborted and the freezer falls into alarm mode.

How it Works



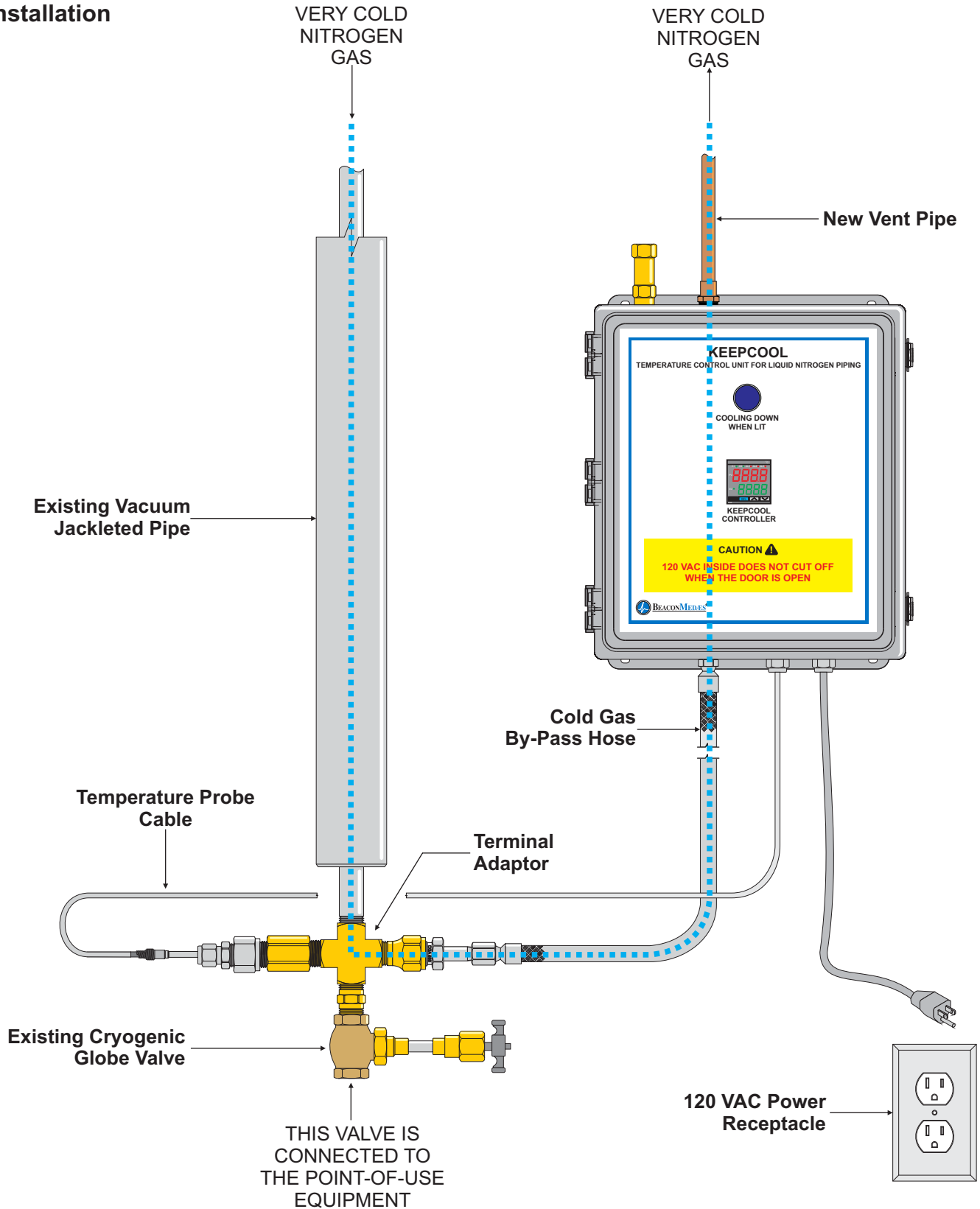
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Equipment Overview



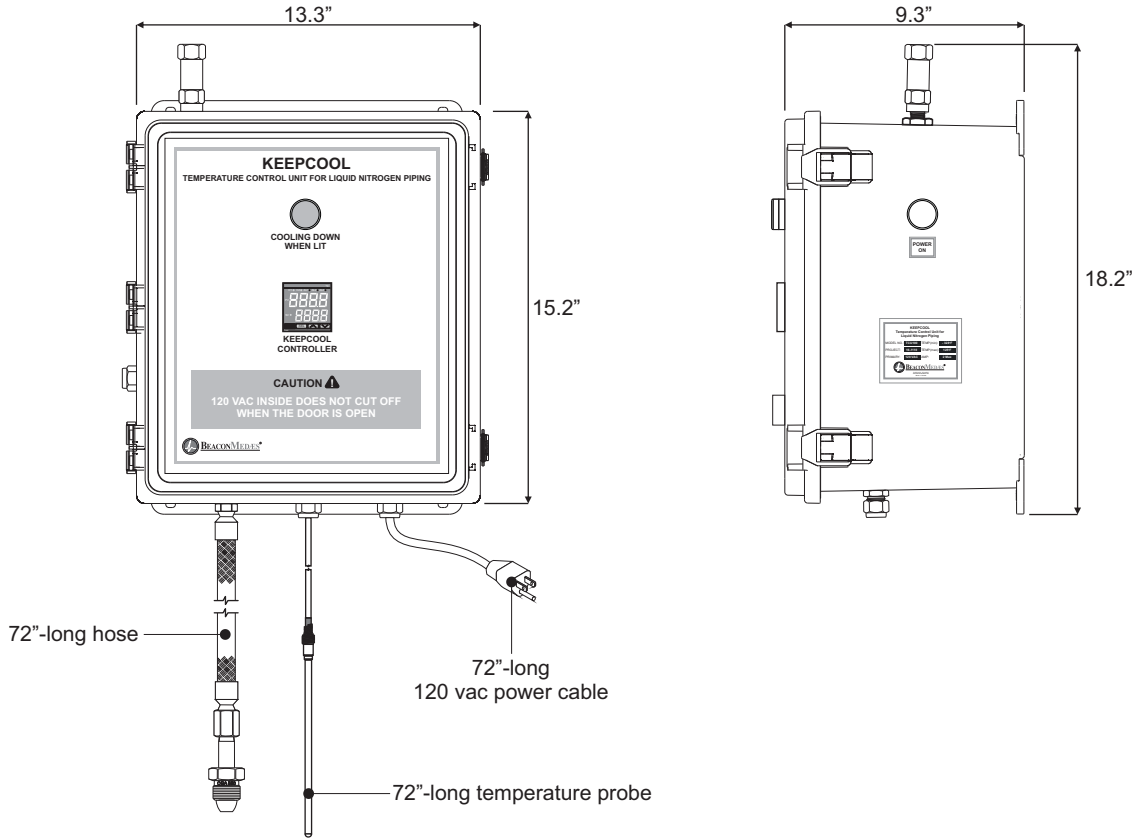
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Installation



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Dimensions



Specifications

Enclosure	NEMA 4X
Power Consumption	120 VAC
Max. Working Pressure	150 PSIG
Temperature Range	-328°F to 1112°F (-200°C to 600°C)
Visual Indicators	22 mm
Temperature Probe	RTD, capsule type, 3-wire cable
Surge Protection	10 amp. fuse
Relief Valve Outlet Connection	1/2" F.NPT
Vent Line Outlet Connection	1/4" F.NPT

Materials

Enclosure	Polyester
Solenoid Valves	Stainless Steel 304, Teflon Seat
Relief Valve	Brass, Teflon Disc, Stainless Steel 316
Fittings	Brass
Tubing	Copper, 3/8" O.D.
Hose	All Stainless Steel Construction
Thermowell	Type 316 Stainless Steel

Part Number Matrix

