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## I & M Mark 86

### Installation & Maintenance Instructions for Mark 86 Temperature Regulator

**Warning:** Jordan Valve Temperature Regulators must only be used, installed and repaired in accordance with these Installation & Maintenance Instructions. Observe all applicable public and company codes and regulations. In the event of leakage or other malfunction, call a qualified service person; continued operation may cause system failure or a general hazard. Before servicing any valve, disconnect, shut off, or bypass all pressurized fluid. Before disassembling a valve, be sure to release all spring tension.

#### Please read these instructions carefully!

Your Jordan Valve product will provide you with long, trouble-free service if it is correctly installed and maintained. Spending a few minutes now reading these instructions can save hours of trouble and downtime later. When making repairs, use only genuine Jordan Valve parts, available for immediate shipment from the factory.

### Introduction

The Mark 86 AMBITEMP II Ambient Temperature Sensing Control Valve, our AMBITEMP II, responds to temperature changes of the air surrounding the actuator. The most common application for the Mark 86 is the automatic control of tracing steam or other hot fluids, to prevent freezing of process piping. As the temperature of the area in which the valve is installed decreases to near the freezing point, the valve opens. As the temperature increases to a safe level the valve will close and thereby conserve the heat energy lost on manually controlled constantly flowing systems.

The Mark 86 is identical to the Mark 80 Temperature Regulator except that the Mark 86 requires no capillary or sensing bulb. The actuator on the Mark 86 serves as both the sensing element and the power element.

### Installation

All of the Installation and Maintenance instructions for the Mark 80 apply also to the Mark 86 except for the instructions which pertain specifically to the sensing bulb.

Additional instructions regarding the installation of a Mark 86 are as follows:

- Do not install the valve so that the actuator is near a source of heat, such as another steam or hot oil line.
- Insulate the piping adjacent to the Mark 86 to prevent radiant heating of the actuator.
- Install the valve upright in the line on outdoor applications so that precipitation does not collect in the

underside of the actuator.

- The temperature at which the valve is fully open, as indicated on the Set Point Indicator, can be changed by turning the adjusting wheel under the spring. Turn the wheel to compress the spring to increase the setting. Turn the wheel downwards to release compression on the spring to decrease the temperature setting. The limits of adjustment are indicated on the nameplate under "Range".

### Field & Shop Testing Procedures

#### Field Testing (Valve Closed):

1. Observe that Stem Position Indicator points to "CLOSED".
2. Observe SET POINT on the Set Point Scale. This indicates the temperature at which the Mark 86 will be fully open. (See Temp. Span Chart on P.2 Ambitemp II Bulletin to find temperature at which regulator is fully closed.)
3. By spraying the top of the SST Diaphragm Actuator (Thermal Head) with Freon-22, thus simulating lowering ambient temperature, the valve stem position indicator will move to the "Open" position (in about 15-20 seconds) showing the valve is functioning.
  - a. ALTERNATE TEST METHOD: Tape a piece of cardboard or sheet metal around the circumference of the actuator so that it extends about two inches above the edge. Place ice, cubes or crushed, on the top of the actuator to cover as much surface as possible. The valve will stroke within five minutes and should indicate full open on the STEM POSITION INDICATOR.

#### Shop Calibration and Setting (For 32°F Set Point):

1. Place entire SST Diaphragm actuator (Thermal Head) in ice water. Wait approximately five minutes.
2. Now turn the adjusting wheel until seats are completely open.
3. If necessary, reposition set point scale so that set point indicator points to 32°F.
4. If a different "wide open" set point is desired, turn the adjusting wheel until the set point indicator

point to the desired temperature on the temperature set point scale. (This method of setting the Ambitemp II is quite accurate  $\pm 2-3^\circ$ .)

For precise setting at temperatures other than 32°F, the actuator must be enclosed by an insulated housing (such as a split box). A thermometer is inserted to indicate the temperature inside this enclosure. By using a Vortex Tube arrangement, the desired "Ambient" Temperature (at which the Ambitemp II is to be wide open) can now be simulated. Once stabilized, turn adjusting wheel until seats are wide open; then reset set point indicator scale as previously described.

NOTE 1: To stroke the Mark 86 the actuator must be cooled to below the valve set point. To do this we use a vortex and insulated housing around the actuator. This vortex tube is capable of cooling the entire actuator assembly to approximately 0° F.

NOTE 2: To set the Mark 86, the probe from the digital thermometer is inserted into the insulated housing surround the actuator assembly. The actuator assembly is brought to the temperature required by the set point. When this temperature is reached, the adjustment screw is turned so that the valve is fully open.

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## Factory Test Procedure For MK86 Ambitemp

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First the body and cap are hydrostatically tested at a pressure of 1½ times the maximum working pressure of the valve.

The valve is then assembled and sent to the final test department where it is tested as follows:

1. All nuts and bolts are checked for tightness.
2. The valve is checked against the written order to assure the proper size, action, range, and Cv.
3. The valve is then clamped in a test fixture and 100 psi of air pressure is applied to the inlet side of the valve.
4. With 100 psi of inlet air pressure and the outlet open to atmosphere, the valve is stroked (see note 1) several times.
5. The valve is then stroked to the closed position, the outlet of the test fixture is closed and the seat leakage is checked. Seat leakage is measured by means of a flow meter calibrated in standard cubic feet per hour (SCFH). All Jordan Valves have a leakage rate of .01 percent of the rated flow capacity or less per class IV of ANSI B16.104.
6. The valve being tested is then stroked to the open position allowing both the cap and the body to be pressurized.
7. All pressure containing areas are checked with a soap solution for external leakage.
8. The valve is then set to the customer specified set point (see note 2).
9. The set point indicator is now installed. Because the set point indicator is installed after the valve is tested and set, we are insured of the correct calibration for this particular valve.