



# MODEL 135

## PNEUMATIC CONTROLLER

### LOW TEMPERATURE SHUTOFF

#### SECTION I

##### I. DESCRIPTION AND SCOPE

The Model 135 thermal probe is a low temperature shutoff device with an integral, rigid insertion bulb used to protect downstream piping systems and equipment from experiencing temperature excursions below desired minimum operating temperature due to equipment malfunction or customer overdraw of system capacity. This is **NOT** a SAFETY DEVICE.

The Model 135 is not a stand-alone device. Primarily installed with a pressure loaded reducing regulator with fail-close action upon the loss of loading pressure. It is used with any compatible fluid that can be vented to atmosphere in an environmentally acceptable method. This combination of equipment is known as a PRESSURE/LOW TEMPERATURE CONTROL MODULE (PTCM). It typically consists of a Model 135 thermal probe, an unloading back pressure valve, flow restricting orifices and a main regulator.

#### SECTION II

##### II. PRINCIPLES OF OPERATION

As the Model 135 thermal probe external sheath is exposed to lower temperatures, it contracts in length. The internal Invar rod remains unchanged in length, pushing a ball/plug away from its seat, allowing the inlet gas pressure to be "vented".

The PTCM low temperature protection is provided through the Model 135 thermal probe. When the fluid

is approximately 8°F (4.5°C) above the setpoint, the Model 135 thermal probe will begin to open, lowering the loading pressure and thereby the delivery pressures. The delivery flow rate is reduced by this action. When the fluid is at the setpoint, the Model 135 thermal probe will reduce the loading pressure to 5 psig (.34 Barg), essentially closing the main regulator. When the fluid is slightly below setpoint the main regulator will close tight.

#### SECTION III

##### III. INSTALLATION

1. Inspect the SST tag on the Model 135 and note the Calibration and Re-Calibration dates. If the Re-Calibration date has expired, return the Model 135 to Cashco, Inc, for recalibration. If the tag is missing do not install the unit, return it to Cashco, Inc,. Each probe is factory calibrated per customer's order and set point specifications.
2. Prior to installation, check that the Model 135 operates within the desired window for the set point. If it does not operate correctly, return it to Cashco, Inc.,.



#### CAUTION

**Setpoint for the probe can shift if it is mis-handled prior to installation.**

3. Apply a compatible sealant to the 1/2" (DN15) NPT threads and insert the Model 135 probe into the upstream pipe line requiring control. With a wrench, secure the flat surfaces on the body and rotate the probe clockwise (CW) until probe is tight. See Figure 1.

## SECTION IV

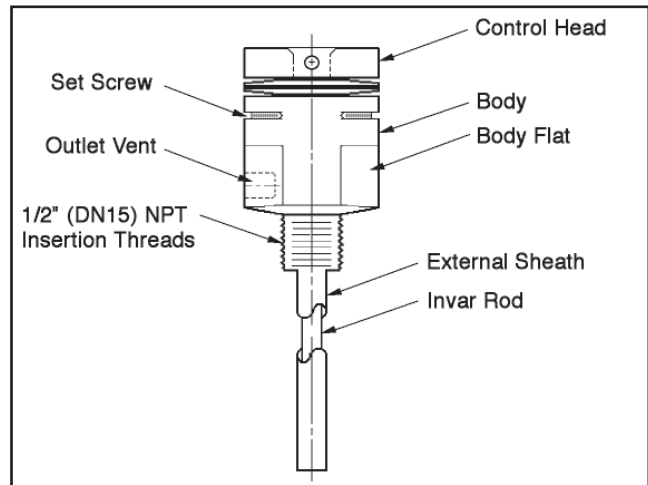
### IV. MAINTENANCE

1. The Model 135 is shipped from the factory preset per the customer's order specifications. All maintenance should be preformed at the factory.



#### WARNING

**SYSTEM UNDER PRESSURE. Relieve all pressure prior to removing the Model 135 from the piping system or performing any maintenance on the PTCM. Failure to do so could result in personal injury.**



**Figure 1**

## SECTION V

### V. CALIBRATION

All Model 135 thermal probes should be re-calibrated annually if the unit has been in service. Refer to Section IV for instructions to remove and replace the Model 135 thermal probe. Write the main valve serial number on an adhesive label and apply to the probe. Return all used thermal probes to the factory for examination and calibration.

## SECTION VI

### VI. TROUBLE SHOOTING GUIDE

#### 1. No/Low Flow or Pressure at Normal Operating Temperatures

Possible Causes	Remedies
A. No supply pressure to PTCM.	A. Check gauges.
B. Lockout valves closed.	B. Open valves.
C. Unloading valve incorrectly set.	C. Reset.
D. Model 135 thermal probe vent leaking.	D. Under normal operating conditions, there should be no flow coming from the outlet vent. If there is flow and the temperature of the gas is not suspect then replace the Model 135 thermal probe.
E. Upstream filter/orifice blocked.	E. Inspect and replace if necessary.
F. Unloading valve malfunction.	F. Inspect and replace if necessary.
G. Leaking or broken fitting.	G. Inspect and replace if necessary.
H. Main regulator stuck closed.	H. Verify dome pressure.
I. Strainer blocked.	I. Inspect and replace if necessary.

#### 2. Poor Pressure Control

Possible Causes	Remedies
A. Back Pressure valve failed	A. Inspect and replace if necessary.
B. Upstream filter/orifice blocked.	B. Inspect and replace if necessary.
C. Leaking or broken fitting.	C. Inspect and replace if necessary.
D. Diaphragm in main regulator failed.	D. Inspect and replace if necessary.

#### 3. Delivery Pressure Rise at No/Low Flow

Possible Causes	Remedies
A. Main regulator seat leakage.	A. Inspect and replace if necessary.
B. By-pass valve leaking.	B. Inspect and replace if necessary.

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