ISO Registered Company

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.

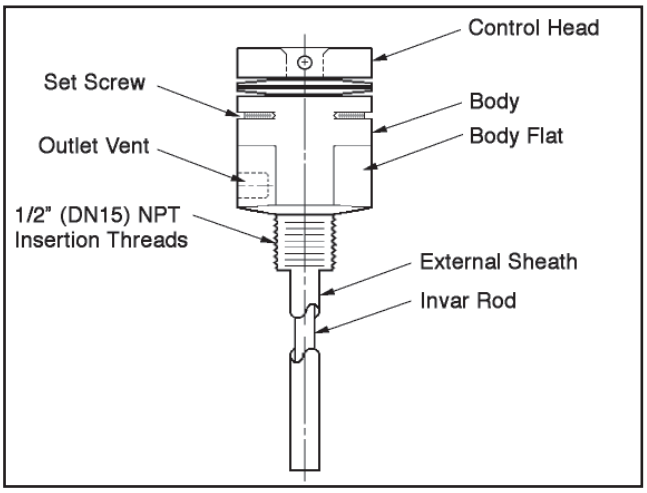

Figure 1

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.

ATEX 2014/34/EU: Explosive Atmospheres and Cashco Inc. Products

Cashco, Inc. declares that the products listed in the table below has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II of the ATEX Directive 2014/34/EU. Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN ISO 80079-36:2016 and EN ISO 80079-37:2016. The product will be marked as follows:

CE Ex II 2 G
Ex h IIB T6... T1 Gb
1000ATEXR1 X

The 'X' placed after the technical file number indicates that the product is subject to specific conditions of use as follows:

1. The maximum surface temperature depends entirely on the operating conditions and not the equipment itself. The combination of the maximum ambient and the maximum process medium temperature shall be used to determine the maximum surface temperature and corresponding temperature classification, considering the safety margins described prescribed in EN ISO 80079-36:2016, Clause 8.2. Additionally, the system designer and users must take precautions to prevent rapid system pressurization which may raise the surface temperature of system components and tubing due to adiabatic compression of the system gas. Furthermore, the Joule-Thomson effect may cause process gases to rise in temperature as they expand going through a regulator. This could raise the external surface temperature of the regulator body and the downstream piping creating a potential source of ignition. Whether the Joule-Thomson effect leads to heating or cooling of the process gas depends on the process gas and the inlet and outlet pressures. The system designer is responsible for determining whether the process gas temperature may raise under any operating conditions.

2. Where the process medium is a liquid or semi-solid material with a surface resistance in excess of 1GΩ, special precautions shall be taken to ensure the process does not generate electrostatic discharge.

3. Special consideration shall be made regarding the filtration of the process medium if there is a potential for the process medium to contain solid particles. Where particles are present, the process flow shall be <1m/s (<3.3 ft/s) in order to prevent friction between the process medium and internal surfaces.

4. Effective earthing (grounding) of the product shall be ensured during installation.

5. The valve body/housing shall be regularly cleaned to prevent build up of dust deposits.

6. Regulators must be ordered with the non-relieving option (instead of the self-relieving option) if the process gas they are to be used with is hazardous (flammable, toxic, etc.). The self-relieving option vents process gas through the regulator cap directly into the atmosphere while the non-relieving option does not. Using regulators with the self-relieving option in a flammable gas system could create an explosive atmosphere in the vicinity of the regulator.

7. Tied diaphragm regulators with outlet ranges greater than 7 barg (100 psig) should be preset to minimize the risk that improper operation might lead to an outboard leak and a potentially explosive atmosphere.

8. All equipment must only be fitted with manufacturer's original spare parts.

9. Ensure that only non-sparking tools are used, as per EN 1127-1, Annex A.

	PRODUCT
REGULATORS	31-B, 31-N
	1164, 1164(OPT-45)
	1171, 1171(OPT-45), 1171(CRYO)
	2171, 2171(OPT-45), 2171(CRYO), 3171
	1465, 3381, 3381(OPT-45), 3381(OPT-40)
	4381, 4381(OPT-37), 4381(CRYO), 4381(OPT-45), 5381
	MPRV-H, MPRV-L
	PBE, PBE-L, PBE-H
	CA-1, CA-2
	CA1, SA1, CA4, SA4, CA5, SA5
	DA2, DA4, DA5, DA6, DA8
	DA0, DA1, DAP, SAP
	SLR-1, SLR-2, PTR-1
	ALR-1, ULR-1, PGR-1
	BQ, BQ(OPT-45), BQ(CRYO)
	123, 123(CRYO), 123(OPT-45), 123(OPT-46G)
	123-1+6, 123-1+6(OPT-45), 123-1+6(OPT-46G), 123-1+6+S, 123-1+6+S(OPT-40)
	1000HP, 1000HP(OPT-37), 1000HP(OPT-45), 1000HP(OPT-45G), 1000HP(CRYO)
	1000HP-1+6, 1000HP-1+8, 1000LP, 1000LP(OPT-45), 1000LP(OPT-46G)
	6987
	8310HP, 8310HP-1+6, 8310HP-1+8, 8310LP, 8311HP, 8311LP
	345, 345(OPT-45)
	BA1/BL1, PA1/PL1
	C-BPV, C-PRV, C-CS
	D, D(CRYO), D(OPT-37), D(OPT-20), D(OPT-45)
	DL, DL(LCC), DL(OPT-45)
	BR, BR(CRYO)
	HP, HP(LCC), HP(OPT-45), HP(OPT46G), HP-1+6+S(OPT-40), HP-1+6+S
	P1, P2, P3, P4, P5, P7
	B2, B7
	POSR-1, POSR-2
	5200P, 5300P
	135
	NW-PL, NW-SO
	CG-PILOT
	FG1
CONTROL VALVES	RANGER, 987, PREMIER
	964, 521, 988, 988-MB, 989
	2296/2296HF
	SCV-30, SCV-S
	FL800/FL200
TANK BLANKETING	8700, 8910, 8920, 8930, 8940
	2100, 2199
	3100, 3200, 3300, 3400, 3500, 3600, 3700
	1078, 1088, 1100, 1049
	5100, 5200, 5400 ,5500
	4100, 4200, 4300, 4400, 4500, 4600
MISC	764P/PD, 764-37, 764T

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