



Model 4103 M, N, T, R

Miniature Temperature Valves



4103M, N, T & R
Miniature Temperature Valves

7280X Replaceable
Fuse Rod Assembly

FEATURES

Protects stationary bearings and other parts from damage due to unsafe high temperature levels.

- RELIABLE PROTECTION
- INSTANT RESPONSE TO EXCESSIVE BEARING TEMPERATURES
- COMPACT DESIGN
- EASE OF INSTALLATION
- USE WITH OIL, AIR, OR GAS
- SIZES TO FIT MOST ENGINES

APPLICATIONS

- HIGH BEARING AND FLUID TEMPERATURE DETECTION
- POWER OR COMPRESSOR CYLINDER OVERLOAD
- HIGH PACKING GLAND TEMPERATURE DETECTION

AMOT Model 4103 Miniature Temperature Valves were developed to extend the capabilities of the 4103 stationary bearing Temperature Valve line. Their small size makes these valves ideal for use on medium and high speed engines. They provide the same low cost reliability for small bearings that have been field proven by their larger counterparts (Model 4103D, E, F, J) in larger stationary bearing applications.

Model 4103 Valves initiate a warning or shutdown upon a sudden temperature rise in critical machine parts. Such temperatures may arise from tight, worn or out-of-round bearings, tight packing glands, cracked or broken shafts, torsional vibration, power or compressor cylinder overload, lack of lubricant flow and many other sources. For similar capabilities in moving bearing applications, refer to AMOT's Model 4102 Temperature Detectors.

Model 4103 has a stainless steel body containing a normally closed valve sealed with a Viton ball. The temperature sensing portion of the 4103 is a thin film of eutectic alloy located near the tip of the Fuse Rod Assembly. This eutectic alloy, less than 0.001 cubic inch in volume, secures a spring loaded fuse rod until the temperature at the sensing end of the rod melts the alloy. The fuse rod is then instantly released and allows the spring-loaded rod to unseat the Viton valve ball. A stainless steel ball is an optional item for use with lube oil as the control medium if high pressures are to be encountered. Generally, the standard Viton ball is recommended for use with air, gas or lower pressure lube oil control systems because it provides a leak-tight seal.

INSTALLATION

AMOT Model 4103 Miniature Temperature Valves are the basic sensing units in a safety system and must be tied into the system through connecting tubing. Control pressure may be clean, dry air, gas, or a non-corrosive liquid such as lubricating oil at up to 60 psi.

Air or gas can be used on many applications, however, the use of gas may not be desired in a hazardous location. Air/gas systems are more versatile and will give faster response than an oil system.

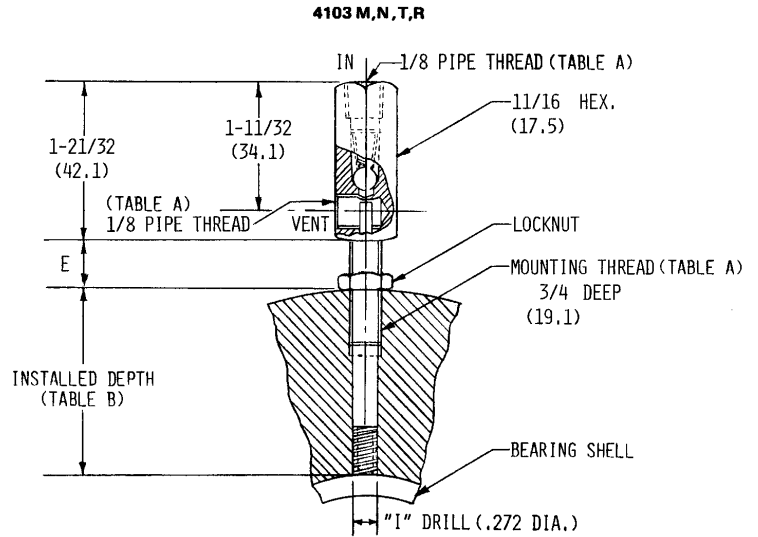
Oil is used in many systems on an engine as shown in Figure 2. Connecting tubing should be 5/16" O.D. Close-tee each sensing device to the control pressure line and pipe them in series with the pressure sensing valve being the last component in the line. Care should be taken not to over-tighten the fitting in the Vent port since it may interfere with the tripping action.

When installing the 4103, allow at least 1/4" of thread engagement when the end of the Fuse Rod is at the normal (untripped) position. To obtain the proper relationship between the end of the Fuse Rod Assembly and the Valve Ball, use the following method:

Install the Valve in the Mounting Hole and apply slight air pressure to the IN Port. Turn the Valve into the hole until the Valve starts to leak at the Vent Port then back out two turns and tighten in place with Locknut (5).

DIMENSIONS

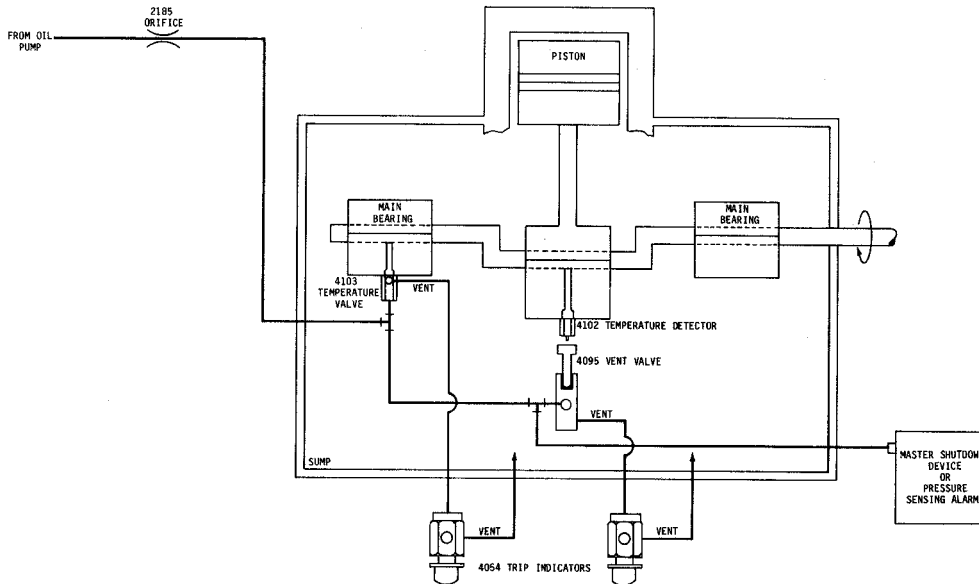
FIG. 1



E = 3/16 (4.8) TO 1/2 (12.7) FOR 5/16 - 24 NF
 E = 15/64 (6.0) TO 35/64 (13.8) FOR M10X 1.5

TYPICAL APPLICATION

FIG. 2



This safety circuit will shut down the engine or sound an alarm on either low oil pressure or high temperature as detected in the stationary main bearings or the moving connecting rod bearings. Model 4054 Trip Indicators will show the origin of the shutdown signal. Additional sensors can easily be added for water jacket temperature, overspeed, water pump output, crankcase pressure and additional bearing temperatures.

HOW TO ORDER

When ordering please specify the following:

1. Indicate Model 4103.
2. Installed Depth, see Table B.
3. Fuse Rod Length, see Table B.
4. Trip Temperature in deg. F: 174, 197, 217, 228, 253, 291, or 343.
5. The following special feature if required:
 - a. Stainless Steel Valve Ball (instead of Viton.)
 - b. M10 x 1.5 metric Mounting Threads (instead of 5/16-24 NF.)
 - c. 1/8 BSP(Tr) Valve Port Threads (instead of NPT.)
Available from UK factory only.

This unit may be ordered using the full description as shown above or by constructing a Model No. using the Model Code System.

HOW TO ORDER REPLACEMENT FUSE RODS

When ordering please specify the following:

1. Fuse Rod Assembly Model 7280X.
2. Fuse Rod length; see Table C.
3. Trip Temperature in deg. F; see Table D.

MODEL CODE SYSTEM

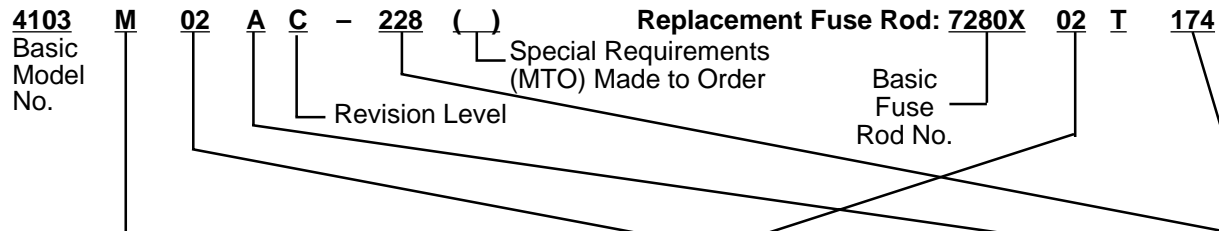


TABLE A Mounting Thread & Valve Port Thread			TABLE B Installed Depth & Fuse Rod				TABLE C Valve Ball		TABLE D Trip Temperature	
Code No.	Mounting Thread	Valve Port Thread	Code No.	Installed Depth		Code No.	Material	°F	(°C)	
				Minimum *	Maximum *					
M	5/16-24 NF	1/8 NPT	00	3/4 (19.1)	1-1/16 (27.0)	A	Viton	174	(79)	
N	M10 x 1.5	1/8 NPT	01	1-5/8 (41.3)	1-15/16 (49.2)	B	Stainless Steel	197	(92)	
R **	M10 x 1.5	1/8 BSP (Tr)	02	1-7/8 (47.6)	2-3/16 (55.6)			217	(103)	
T **	5/16-24 NF	1/8 BSP (Tr)	03	2-1/8 (54.0)	2-7/16 (61.9)			228	(109)	
			04	2-3/8 (60.3)	2-11/16 (68.3)			253	(123)	
			05	2-5/8 (66.7)	2-15/16 (74.6)			291	(144)	
			06	2-7/8 (73.0)	3-3/16 (81.0)			343	(173)	
			07	3-1/8 (79.4)	3-7/16 (87.3)					
			08	3-3/8 (85.7)	3-11/16 (93.7)					
			09	3-5/8 (92.1)	3-15/16 (100.0)					
			10	3-7/8 (98.4)	4-3/16 (106.4)					
			11	4-1/8 (104.8)	4-7/16 (112.7)					
			12	4-3/8 (111.1)	4-11/16 (119.1)					
			13	4-5/8 (117.5)	4-15/16 (125.4)					
			14	4-7/8 (123.8)	5-3/16 (131.8)					

See Figure 1 for dimension identification.

☐ = Non Standard Product, special charge may apply.

* Dimensions in inches; millimeters in ().

** Available from UK factory only.

AMOT designs and tests all its products to ensure that high quality standards are met. For good product life, carefully follow AMOT's installation and maintenance instructions; failure to do so could result in damage to the equipment being protected.

NOTE: Letters or numbers in the MTO space, other than nothing, A1, or AA, indicate the unit is built to special requirements and some of the other code numbers may not be valid. Check with the factory for full specifications of such models.

MAINTENANCE

It is recommended that the overall safety system be checked monthly for proper functioning by simulating an unsafe condition.

AMOT recommends maintenance including visual inspection at the major overhaul of the engine or yearly if lacquering of the lube oil is observed. Excessive lacquering can cause sticking which impairs operation. Unscrew the Detector from the mounting hole and remove Fuse Rod Assembly (4) with a twisting motion. Hold it by the ends and visually examine the eutectic alloy area for exposed alloy. Visible alloy should be a clean fillet around the two brass sections of the Fuse Rod Assembly. Look for cracks in the brass. A stable Fuse Rod Assembly moves slightly showing no wear. Fuse Rod Assemblies should be replaced if the crimp section becomes loose.

Life expectancy of Fuse Rod Assemblies is five (5) years under normal operating conditions and proper maintenance.

If desired, maintenance of the Fuse Rod Assemblies themselves may include random sampling and test firing to ensure correct temperature.

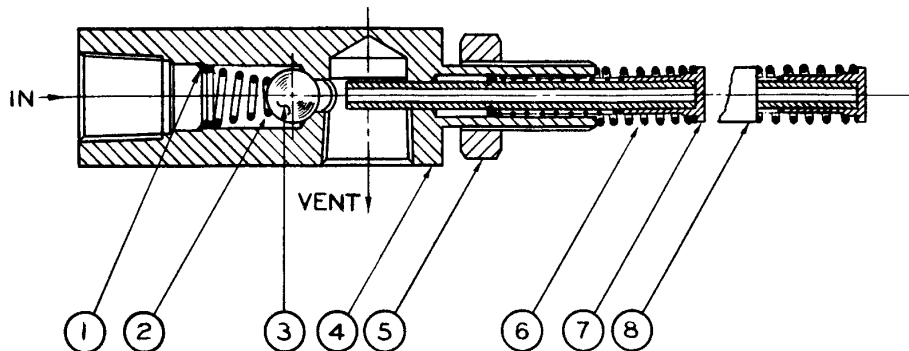
WARNING

When unrestrained Fuse Rod Assemblies are heated, they fire with sufficient force to cause injury or damage. Be sure that the Fuse Rod is restrained or aimed in a safe direction.

Heat a mixture of 50% glycol and 50% water, stirring constantly. Place the Fuse Rod in the heated liquid. Use a mercury thermometer to check the temperature of the liquid. The Fuse Rod Assembly should trip within 4°F of the temperature stamped on the bottom of the rod. DO NOT attempt to re-solder a eutectic Fuse Rod; the Rod expands upon firing.

SERVICE PARTS

Replacement Fuse Rod Assemblies (7) are ordered by Basic Part No. 7280X plus the proper code numbers from Tables B & D of the Model Code System.



FUSE ROD ASSEMBLY REPLACEMENT

When a Model 4103 Miniature Temperature Valve trips, it has detected excessive heat. Check for proper operating temperature of the oil and check the bearing for signs of distress to determine the source of the heat. To replace Fuse Rod Assembly (7), remove the entire Temperature Valve from the mounting hole and twist off Loading Spring (6) and the expended Fuse Rod with the rod tip. Fish the rod tip and spring out of the hole if necessary. Insert the new Fuse Rod Assembly and reassemble the Temperature Valve with the Loading Spring fully seated on the Rod Tip. Reinstall the unit in the mounting hole and adjust the depth as described under installation.

STATEMENT OF POLICY

AMOT Controls Corporation is ready to aid the user in the applications of Model 4103 Temperature Valves to the extent of its knowledge and experience. Decisions such as actual location of the installation, insertion length, details of machining, mounting of vent valves and connection to the safety system should only be made by the user after he has physically checked the equipment under consideration.

AMOT can be responsible only for proper operation of the devices providing they have been installed according to AMOT's instructions. AMOT cannot be responsible for improper adjustment, location, connections, or problems arising from stress concentration. Should there be any reservations or unresolved details concerning the application, the user should contact the manufacturer of the protected equipment for additional information.

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