

# 2-Way Sensing Valve

## Model 4109 - Vibro-Guard

### Overview

AMOT Model 4109 Vibro-Guard Valve is a 2-way acceleration sensing valve with optional electric microswitch. Failing bearings, broken blades, cracked, broken or bent shafts, misfiring, and accumulated deposits are a few of the items which the Vibro-Guard can detect. This unit is weatherproof and corrosion protected for salt spray atmospheres (Gulfproofed).

### Typical applications

- Motors
- Engines
- Pumps
- Compressors
- Fan drives
- Any moving equipment

### Key benefits

- Gulf-proofed finish
- Pneumatic and electric versions available
- Reliable repeatability
- Pneumatic reset/override available



**Model 4109**  
**2-Way Sensing Valve**

# 2-Way Sensing Valve - Model 4109 Vibro-Guard

## Operation

Model 4109 makes use of a pivoted lever assembly with a high strength, potted magnet near the end opposite the pivot. When the unit is reset, the magnet is thrust toward the steel armature imbedded in the base and is held there by magnetic force plus the force of the loading spring until the inertia of the lever assembly exceeds the holding force of the magnet and spring. When this occurs, the lever assembly

snaps to the tripped position and remains there until manually or pneumatically reset.

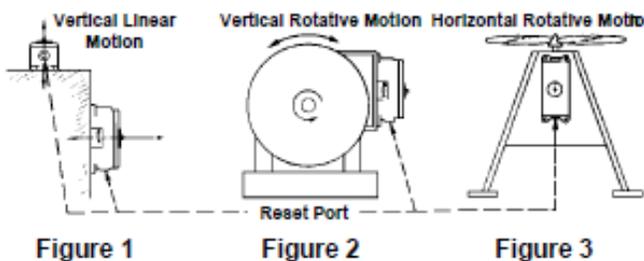
Tripping of the lever assembly allows the valve to vent. Changes in adjustment are made by removing the cover and turning adjusting wheel which changes the spring bias.

## Installation

Vibro-Guard Valves are sensitive in the direction parallel to the axis of the reset plunger. This axis must be parallel to the direction of the anticipated motion of the protected machine. When used to detect vibration in the horizontal plane, the Vibro-Guard should be attached to a vertical surface with the reset port at the bottom. Mounted in this way, the AMOT name on the cover will read in an upright position. Some general installation locations are given in Figures 1, 2 and 3.

If brackets are to be used in mounting the units on irregular surfaces, they should be of 1/4" minimum thickness steel, rigidly secured to prevent generation of undesired vibrations.

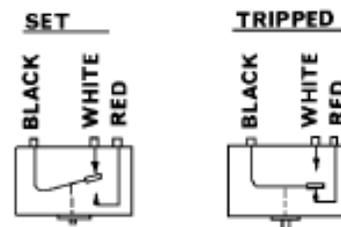
When making electrical connections to Vibro-Guard's electrical switch, Nameplate (34) can be removed to facilitate making electrical connections. The lead wires may be left inside the housing as long as they don't interfere with the action of the lever assembly. Lead wires provided are 6 inches long, AWG #18 stranded, and are color-coded red, white, and black as shown in Fig. 4. A junction box may be attached at the 1/2" NPT conduit connection if desired to facilitate the joining and storage of heavier wiring.



The 4109 is provided with 2 vent ports, Vent A and Vent B, both of which vent the valve and the case. Use Vent A with air control systems venting to atmosphere where rain or moisture may enter Vent B which faces up. Install the 4125 vent closure on Vent A, plug Vent B. Use Vent B with gas control systems and piped vents. Plug Vent A with the plug provided.

Connecting tubing should be 1/4" O.D. minimum. Apply a good quality sealant such as Loctite™ Pipe Sealant to pipe threaded connections. Ensure that all connecting tubing and fittings are clean and that no chips, dirt, rust, sealant, etc. are allowed to enter the valve.

**SNAP SWITCH CONNECTIONS**  
Model 4109(-)1



**Figure 4**

# 2-Way Sensing Valve - Model 4109 Vibro-Guard

## Adjustment

Vibro-Guard is factory set at approximately 2 G's in the horizontal position. Should this setting not be suitable for the intended application, an adjustment will be necessary. To adjust the trip point, isolate the Vibro-Guard from the safety circuit and bring the protected machine to its rated speed and load. Remove Cover (47) and check Lever Assembly (24) to see if the unit has tripped. If it has, attempt to reset by firmly pressing the rectangular leaf spring on the lever assembly at Point B (see assembly drawing on the back page). If the unit stays latched, increase the sensitivity by rotating the top of Adjusting

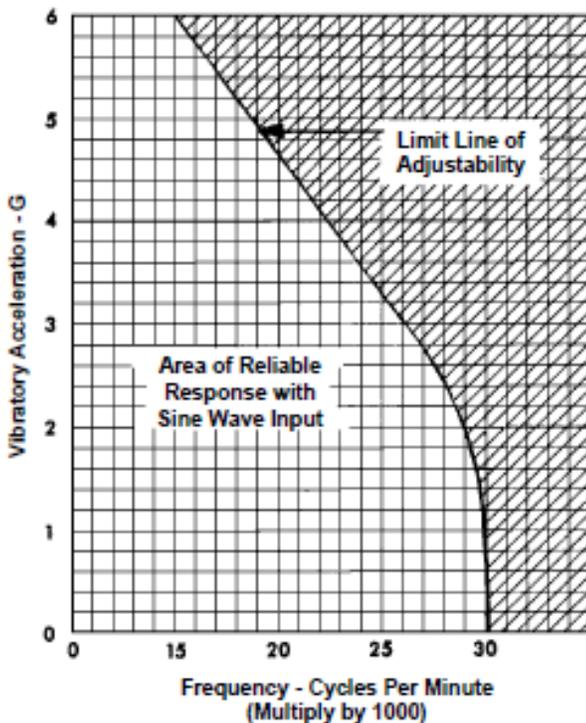
Wheel (8) away from the nameplate. If the unit will not reset, decrease the sensitivity by rotating the top of the wheel toward the nameplate. After the trip point has been determined, decrease the sensitivity (rotate top of adjusting wheel toward the nameplate) to a point where the equipment will continue to operate under normal conditions without causing tripping of the Vibro-Guard. This may be from 30° to 90° depending on the type and purpose of the machine. A change of 1G in the setting requires approximately 1-1/2 turns of the adjusting wheel. Replace Cover (47) after making the final setting.

## Resetting

The Vibro-Guard is reset manually by pressing firmly on the Reset Button in the middle of the cover. It can be remotely set or "locked out" by pressurizing the reset port with 2 - 17 bar (30 to 250 psi). Clean dry air or gas should be used

in the control and reset systems. Be sure that the reset pressure is vented to atmosphere or to a manifold where there will be zero residual pressure, or the vent may not be completely "unlocked" when the reset pressure is removed.

## Response graph

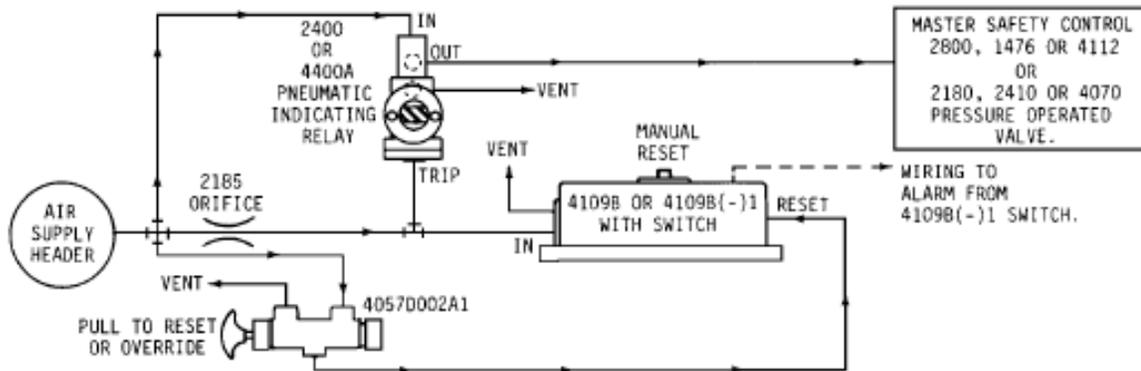


# 2-Way Sensing Valve - Model 4109 Vibro-Guard

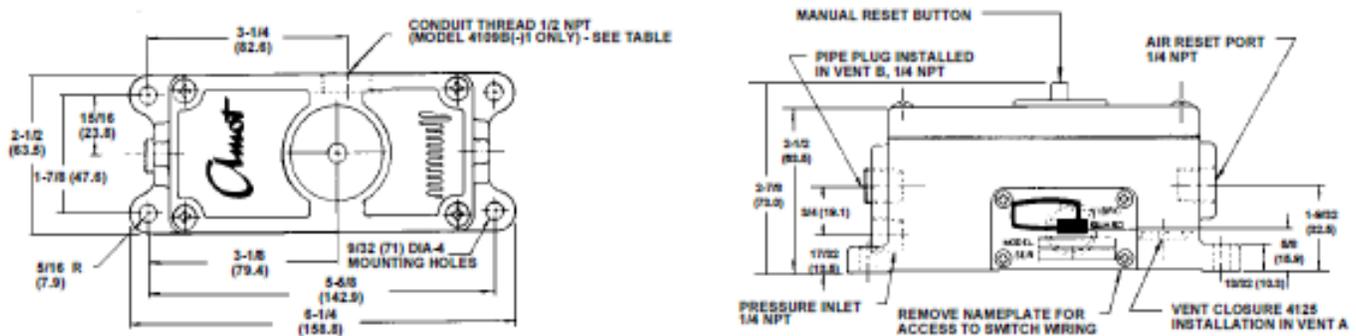
## Typical piping diagram

This circuit will actuate a Master Safety Control or Pressure Operated Valve upon excessive vibration as detected by the AMOT Model 4109. The

Pneumatic Indicating Relay will show the cause of the shutdown and the Model 4057 Valve can be used to remotely reset or override the 4109.



## Dimensions



Dimensions in inches (mm)

## Maintenance

Properly applied and installed, Model 4109 requires practically no maintenance. An inspection of the unit at yearly intervals is adequate to detect and make provision for normal wear.

It is recommended that inspection and cleaning be incorporated in a normal preventive maintenance program. Inspect Reset Cylinder Seals (37), (42) and (43) for wear, damage or hardness and replace as necessary. To clean the Valve Assembly (6) and seat, remove Screws (30) and Lockwashers (31) and lift out Bracket (29). Remove Valve Assembly (6).

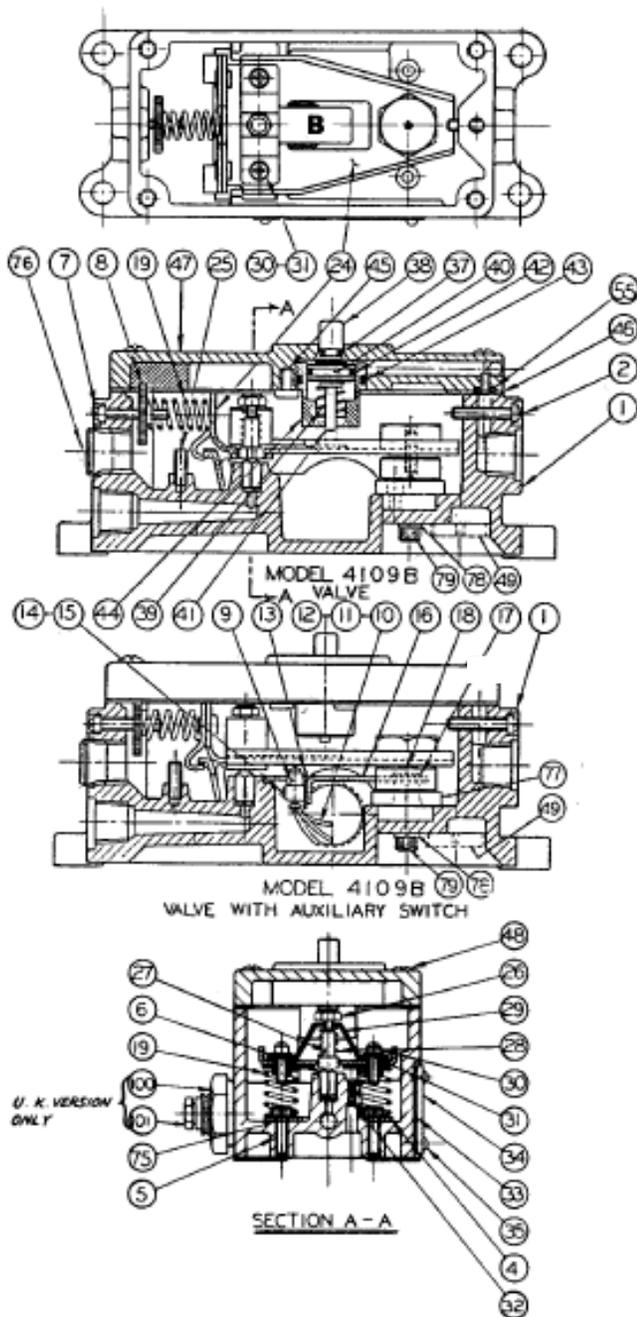
After cleaning the Body and parts, reassemble the unit. Lightly coat the cleaned or new O-rings with Dow-Corning No. 33 Grease (AMOT Part No. 911L001) before installing them. It is

recommended that the valve be checked them. It is recommended that the valve be checked weekly for proper functioning by simulating an unsafe condition.

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. When communicating with AMOT regarding operation of a control, always give the Model No. and Serial No. If ordering service parts, also include the Description, Part No., and quantity desired. If any parts are ordered by Reference No. only, please also include the datasheet title.

# 2-Way Sensing Valve - Model 4109 Vibro-Guard

## Maintenance continued



For Model 4109B(-)1B Kit 9163X004			
-	9163X002	1	Kit, Viton (above)
9	6968	1	Switch
10	7075L001	1	Leadwire (White)
11	7075L002	1	Leadwire (Red)
12	7075L003	1	Leadwire (Black)
13	7002	1	Insulator

# 2-Way Sensing Valve - Model 4109 Vibro-Guard

## Specification

<b>Housing and cover material:</b>	Precision cast aluminum black anodized	
<b>Internal parts:</b>	Aluminum or plated steel	
<b>Standard seals:</b>	Viton	
<b>Maximum operation temperature:</b>	93°C	200°F
<b>Maximum valve inlet pressure:</b>	6.2 bar	90 psi
<b>Reset pressure:</b>	2.1 to 17.2 bar	30 to 250psi
<b>Valve capacity (tipped) at 20 psi:</b>	0.09 m3/min	3 scfm
<b>Flow coefficient</b>	Kv = 0.17	Cv = 0.2
<b>Vibration sensing range</b>	on horizontal surface	6G
	on vertical surface	5G
<b>Switch ratings</b>	125/250 VAC - 1/4 hp	
	125/250 VAC - 10 amp	
	28 VDC - 3amp (inductive)	
	28 VDC - 24 amp max. inrush	
<b>Net weight:</b>	1.25 kg	2.75 lb

## How to order

Example	4109B	1	1	B	-AA	Comments
						<b>Model</b>
<b>Basic Model</b>	4109B					Basic model code
						<b>Thread</b> <b>Finish</b>
<b>Thread and Finish</b>		1				NPT      Gulfproofed
						<b>Switch and Contact</b>
<b>Switch</b>			0			without switch
			1			with SPDT switch Silver contacts
			2			with SPDT switch Gold contacts
						<b>Seal</b>
<b>Seal Material</b>				B		Viton
						<b>Special Requirements</b>
<b>Special Requirements</b>					-AA	Standard
					-**	Made to Order

## Europe and Africa

---

AMOT  
Western Way  
Bury St Edmunds  
Suffolk, IP33 3SZ  
England

Tel +44 (0) 1284 762222  
Fax +44 (0) 1284 760256  
Email info@amot.com

AMOT Controls GmbH  
Rondenbarg 25  
22525 Hamburg  
Germany

Tel +49 (0) 40 8537 1298  
Fax +49 (0) 40 8537 1331  
Email germany@amot.com

## Asia and Australasia

---

AMOT Shanghai  
Rm A8-671 Jiahua Business Center  
808 Hongqiao Road  
Shanghai 200030  
China

Tel +86 (0) 21 6447 9708  
Fax +86 (0) 21 6447 9718  
Email shanghai@amot.com

AMOT Singapore  
10 Eunos Road 8 #12-06  
Singapore Post Centre  
Singapore 408600

Tel +65 6408 6265  
Fax +65 6293 3307  
Email singapore@amot.com

## Americas

---

AMOT USA  
8824 Fallbrook Dr  
Houston, TX 77064  
USA

Tel +1 (281) 940 1800  
Fax +1 (713) 559 9419  
Email sales@amotusa.com