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L408J VaporStat® Controllers

PRODUCT DATA



FEATURES

- Primarily for use in vapor heating systems, but also may be used with liquids, air, and other noncombustible gases.
- Stainless steel diaphragm also allows use with ammonia, oxygen, distilled water, and similar media.
- Maximum surge pressure of 15 psi (103.4 kPa).
- All models have an adjustable subtractive differential.
- Adjustments are made by screws on top of case.
- Scaleplates are marked in English (psi) and metric (kPa) units.
- Case has clear plastic cover so that pressure settings can be observed.
- Hexagonal fitting with 1/4-18 NPT internal threads for direct mounting to the 50024585-001 Brass or 14206 Steel Steam Trap (siphon loop).
- Can also be surface mounted by screws through holes (knockouts) in back of case.
- Ground screw terminal.

APPLICATION

The L408J VaporStat® Controllers are line voltage pressure controllers that provide operating control or automatic limit protection for pressure systems of up to 4 psi (27.6 kPa).

All models have Microswitch™ snap switches to open or close a circuit on a pressure rise.

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SPECIFICATIONS

IMPORTANT

The specifications given in this publication do not include normal manufacturing tolerances. Therefore, this unit may not match the listed specifications exactly. Also, this product is tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.

Models:

L408J VaporStat® Controllers. See Tables 1, 2, and 3 below.

Table 1. Models Available.

| Model | Switch Type | Switch Action on Pressure Rise |
|-----------|-------------------|--------------------------------|
| L408J1009 | Spdt | Breaks RB; makes RW |
| L408J1017 | Spdt | Breaks RB; makes RW |
| L408J1025 | Spdt ^a | Makes RW ^a |
| L408J1033 | Spdt ^a | Makes RW ^a |

^a Spdt switch with terminal B omitted for miswiring compliance.

Table 2. Switch Contact Ratings (in amperes at 50/60 Hz).

| Model | Load | 120 Vac | 240 Vac |
|-------|--------------|---------|---------|
| L408J | Full Load | 8.0 | 5.1 |
| | Locked Rotor | 48.0 | 30.6 |
| | Noninductive | 10.0 | 5.0 |

Table 3. Operating Ranges Available for All Models.

| Pressure Ranges | | Midscale Subtractive Differential (Adjustable) | |
|-----------------------------|-----------|--|------------|
| English Units | kPa | oz/in. ² | kPa |
| 0 to 16 oz/in. ² | 0 to 6.9 | 4 to 16 | 1.7 to 6.9 |
| 0 to 4 psi | 0 to 27.6 | 4 to 16 | 1.7 to 6.9 |

Maximum Surge Pressure:

15 psi (103.4 kPa).

Switch:

Snap Microswitch™ in all models.

Pressure Sensing Element:

Stainless steel diaphragm.

Maximum Ambient Temperature:

150°F (66°C).

Minimum Ambient Temperature:

-35°F (-37°C); also refer to note under Location and Mounting in the Installation section.

Adjustment Means:

Screws on top of controller case. Scales are marked in psi and kPa.

Electrical Connections:

Internal screw terminals; holes in side of case for 1/2 inch conduit.

Mounting Means:

Hexagonal fitting on diaphragm has 1/4-18 NPT internal threads for mounting on a pipe or steam trap (siphon loop). Also can be surface mounted by screws through two holes (knockouts) in back of case.

ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Honeywell Automation and Control Products Sales Office (check white pages of your phone directory).
2. Honeywell Customer Care
1885 Douglas Drive North
Minneapolis, Minnesota 55422-4386

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Toronto, Ontario M1V 4Z9.

International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

Dimensions:

See Fig. 1; also Fig. 2 for mounting steam trap (siphon loop).

Weight:

2 lb, 4 oz. (1.02 kg).

Finish:

Gray.

Approvals:

Underwriters Laboratories Inc. Listed: File No. MP466, Vol. 10;
Guide No. MBPR.

Canadian Standards Association Certified: File No. LR1620;
Guide No. 400-E-0.

Replacement Parts/Accessories:

129178 Thermoplastic Cover.

50024585-001 Steam Trap (siphon loop)—1/4 inch brass pipe.

14206 Steel Steam Trap.

33312B Knurled Adjustment Knob—with setscrew; fits on main scale pressure adjusting screw.

4074BWJ Limit Stop Assembly—to limit setpoint ranges:
includes 129564 Range Stop, 107194 Range Stop Screw,
and 23466 Wrench.

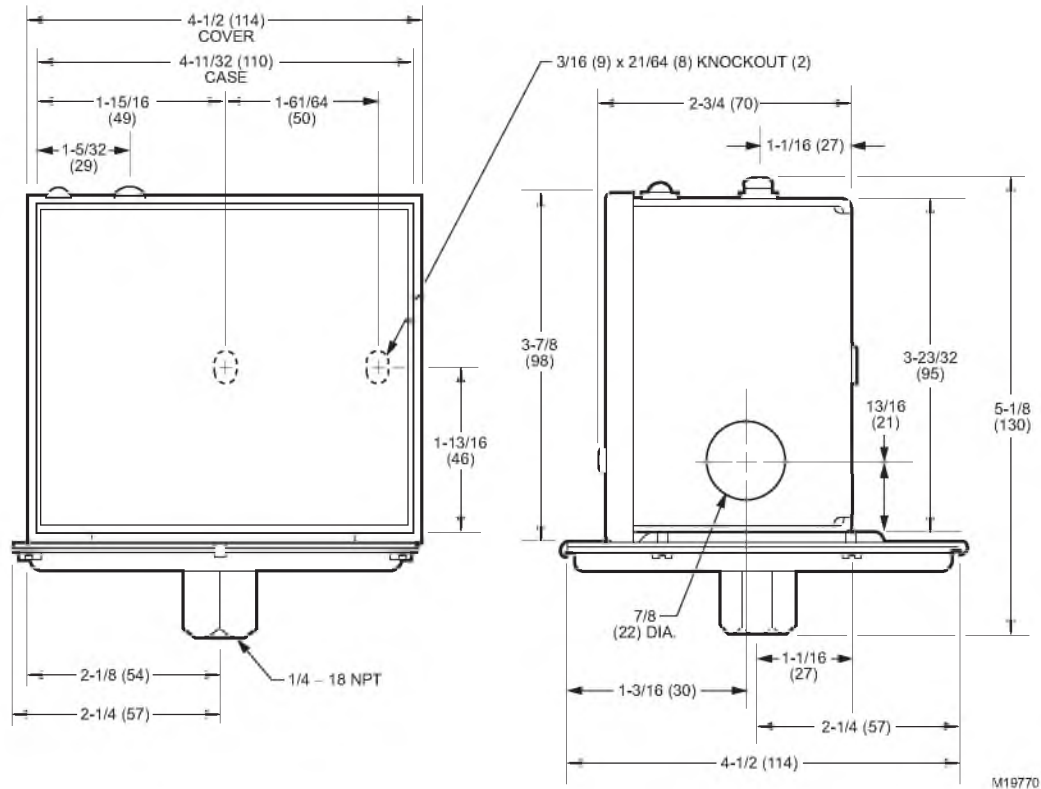


Fig. 1. Mounting dimensions of the L408J VaporStat® controllers in inches (millimeters).

INSTALLATION

When Installing This Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

⚠ WARNING

Electrical Shock Hazard.

Can cause severe injury, death or property damage.

Disconnect the power supply before beginning installation to prevent electrical shock or possible equipment damage.

⚠ CAUTION

Equipment Damage Hazard.

Improper use with a compressor can damage the controller.

When using the controller with a compressor, install a dampening device (such as a needle valve, header, or surge tank) to dampen pulsations that can damage the controller or reduce its life.

IMPORTANT

1. Locate the controller where the ambient temperature will not exceed 150°F (66°C).
2. Use pipe compound sparingly to avoid clogging the hole in the pipe or diaphragm fitting.
3. Do not tighten the controller by hand by holding the case.

Location and Mounting

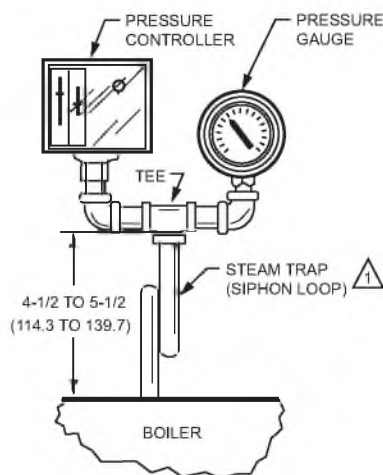
When used with steam boilers, always mount the controller *above the water line* in the boiler. A steam trap (siphon loop) must always be connected between the controller and the boiler (see Fig. 2) to prevent boiler scale and corrosive vapors from attacking the diaphragm.

The controller can be mounted (1) alongside the pressure gauge, (2) in a fitting on the boiler provided by the manufacturer, (3) at a remote location in case of excessive vibration, or (4) in a special mounting on a low water cutoff.

Make all pipe connections in accordance with approved standards. When making pipe connections, use pipe compound sparingly to seal the joints. Excess pipe compound may clog the small hole in the fitting and prevent the controller from operating properly. To avoid leaks and damage to the case, use a parallel jaw wrench on the controller hexagonal fitting. *Do not tighten the controller by hand by holding the case.*

Mounting Alongside a Pressure Gauge

To mount the controller alongside a pressure gauge, remove the gauge. In its place, install a steam trap (siphon loop) with a tee on top. Using elbows and pipe nipples, mount the controller and pressure gauge on the ends of the tee. See Fig. 2.



▲ 1/4 IN. PIPE WITH 1/4 - 18 NPT EXTERNAL THREADS ON BOTH ENDS AND 2-1/4 IN. DIAMETER LOOP.

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Fig. 2. Steam trap mounting of L408J.

Mounting on a Boiler

If it is not convenient to mount the controller alongside the pressure gauge, install a steam trap (siphon loop) in the fitting provided by the boiler manufacturer. Screw the controller directly on the steam trap.

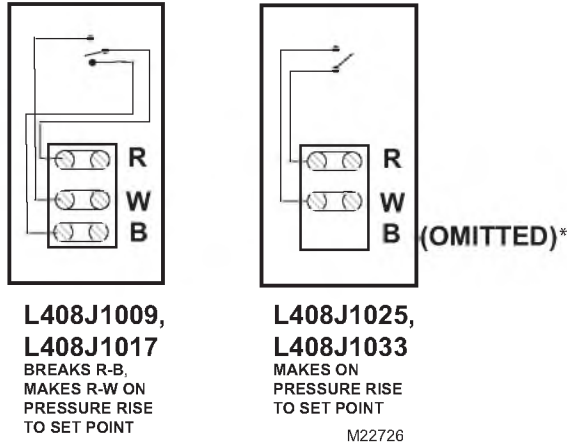
Mounting at a Remote Location

If there is excessive vibration at the boiler which may adversely affect the operation of the controller, the controller should be mounted at a remote location. All piping from the boiler must be suitable and solidly mounted. The piping must be properly pitched to drain all condensation back to the boiler. A steam trap (siphon loop) must be mounted between the remote piping and the controller.

WIRING**▲ WARNING****Electrical Shock Hazard.****Can cause severe injury, death or property damage.**

Disconnect the power supply before beginning wiring. More than one disconnect may be required.

1. All wiring must comply with applicable electrical codes, ordinances and regulations. Use NEC Class 1 (line voltage) wiring.
2. For normal installations, use moisture-resistant NO. 14 wire suitable for at least 167°F (75°C) if you are using the controller with a flame safeguard primary control or at least 194°F (90°C) if you are using it with a programming control.
3. For high temperature installations, use moisture-resistant No. 14 wire, selected for a temperature rating above the maximum operating temperature.
4. Disconnect the power supply before beginning wiring to prevent electrical shock and equipment damage.
5. All models have a terminal block inside the cover (see Fig. 3) and a 7/8 in. (22 mm) hole in one side for 1/2 in. (13 mm) conduit, cable or wires. Remove the front cover by loosening the screw at the bottom of the main scale.
6. Refer to Fig. 4 through 6 for typical hookups. Follow the burner or boiler manufacturer wiring diagram, if provided.
7. Make sure the loads do not exceed the Switch Contact ratings in the Specifications section.
8. Replace the front cover when wiring is complete.



*Terminal B omitted for miswiring compliance.

Fig. 3. L408J terminal blocks and internal schematic.

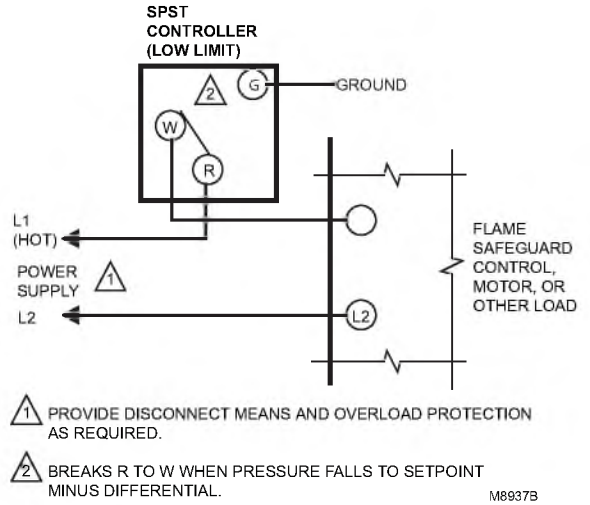


Fig. 5. L408J1025 or L408J1033 used as a low limit.

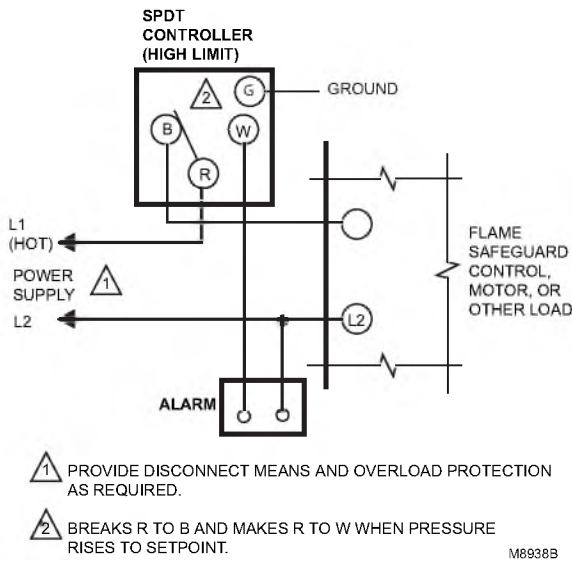


Fig. 4. L408J1009 or L408J1017 used as a high limit, with an alarm circuit.

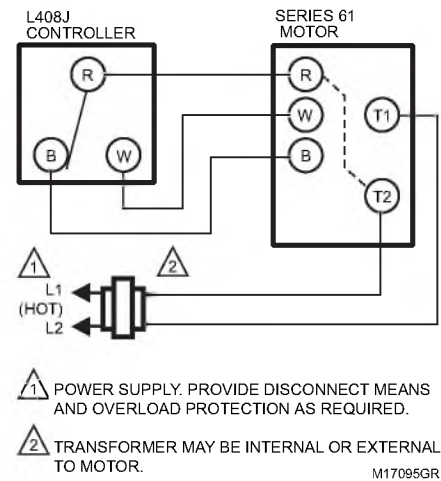


Fig. 6. L408J controlling a Series 61 Motor.

SETTING AND CHECKOUT

Setting

In all models, the differential is subtractive from the main scale setpoint. The upper operating point is determined by the main scale setpoint, while the lower operating point is determined by the main scale setting less the differential setting. Operating points are shown in Fig. 7.

Adjust the main scale setpoint for the desired operating pressure by turning the main scale adjusting screw (see Fig. 8) on the top of the case until the main scale setting indicator is at the desired value. Adjust the differential setting by turning the differential adjusting screw until the differential setting indicator is at the desired value. The scales are marked in psi and kPa.

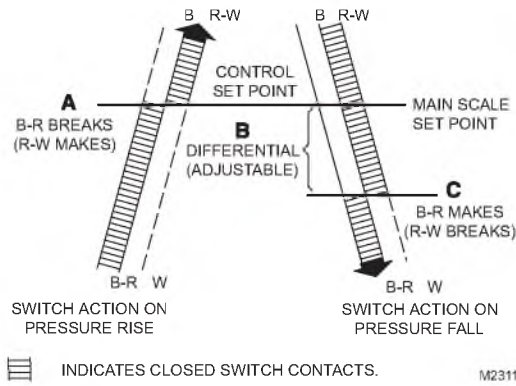


Fig. 7. L408J operating points.

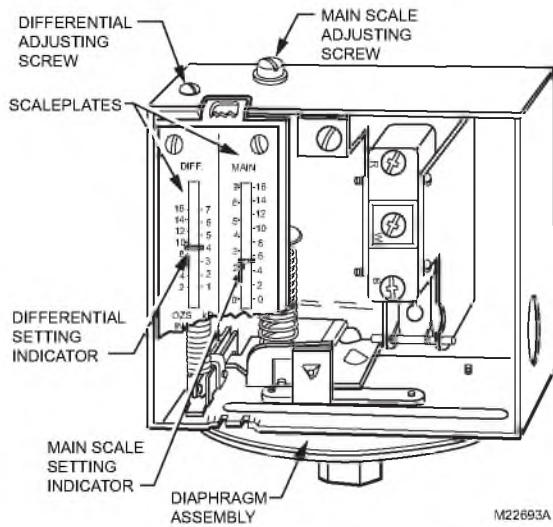


Fig. 8. Setting a VaporStat® Controller.

Checkout

After the controller has been installed, wired, and set, it should be tested with the system in operation. First allow the system to stabilize. Then observe the operation of the controller while raising and lowering its setpoint. Pressure should increase when the setpoint is raised and decrease when the setpoint is lowered.

Also check the make and break points of the controller. If they do not agree with a separate, accurately calibrated, pressure gauge, a slight adjustment of the scaleplate(s) may be necessary.

Use accurate pressure testing equipment when checking out the controller. Do not rely on inexpensive gauges. The controllers are carefully calibrated at the factory.

Boiler Installation

If the controller is being used on a boiler installation, test it as follows:

1. Note the boiler pressure by checking the boiler pressure gauge. (To perform this test properly, the boiler should have a pressure reading near the middle of the controller main scale range.)
2. Turn the main scale adjusting screw (see Fig. 8) until the main scale setting indicator on the controller corresponds to the boiler pressure gauge reading.
3. The L408J should make the R-W and break the R-B circuit automatically when the boiler pressure gauge reading equals or slightly exceeds the controller setting.
4. If the controller is operating properly, turn the main scale adjusting screw (see Fig. 8) until the main scale setting indicator is at the desired setpoint.

If a Controller Seems to Operate Improperly

If the controller is suspected of operating improperly, it may be checked further as follows (see Fig. 9):

1. Disconnect all power to the controller, loosen the cover screw and remove the cover.
2. Disconnect the wires from the controller.
3. Connect an ohmmeter between the switch terminals.
4. Lower the setpoint of the controller (simulating a pressure increase) through a range greater than the differential. The switch should either make or break, depending on the model of the controller. (See Table 1.) If it makes, the ohmmeter will read zero; if it breaks, the ohmmeter will read infinity.
5. Raise the setpoint of the controller (simulating a pressure decrease) through a range greater than the differential. The switch should break or make, just the opposite of the result in step 4.

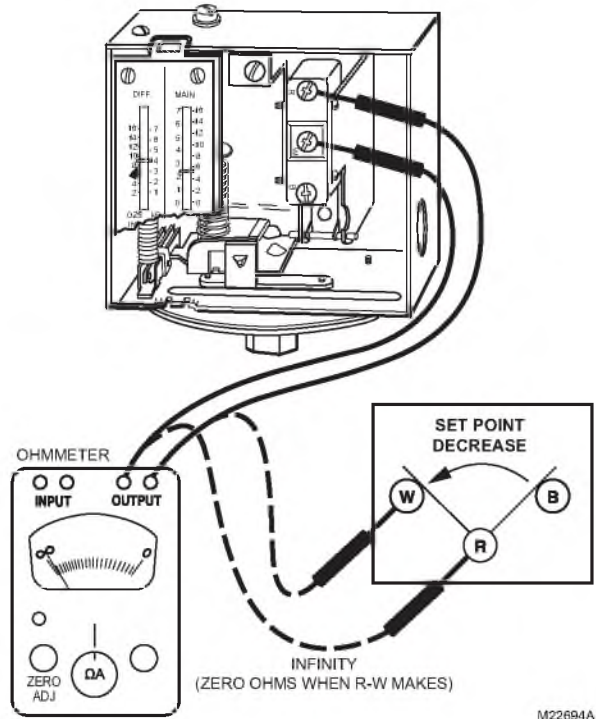


Fig. 9. Checking a VaporStat® controller.



CAUTION

Equipment Damage Hazard.
Failure to follow checkout instructions can damage components or systems.

Do not put the system into service until you have satisfactorily completed all applicable tests described in this Checkout section as well as in the Checkout section of the applicable instruction sheet for the flame safeguard control.

SERVICE INFORMATION

Maintenance

The cover of the controller should be in place at all times to protect the internal components for dirt, dust, and physical damage. Routine maintenance should consist of occasional inspection and blowing or brushing away an accumulated dirt and dust. To ensure proper functioning of the controller at all times, an operational check of the entire system should be performed during routine maintenance checks.

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