

L404T,V,W,Y PressureTrol® Controllers

PRODUCT DATA



APPLICATION

L404T,V,W and Y PressureTrol® Controllers are line voltage pressure controllers for use on oil burner systems using any type of fuel oil, including heavy preheated oils, for pressures up to 150 psi (10.5 kg/cm²).

FEATURES

- L404T and L404W models are high pressure limits; they break a circuit and shutdown the system if the oil pressure rises to the set point.

- L404V and L404Y models are operating controllers and low pressure limits; they prevent the system from starting until the oil pressure rises to the set point, and they shut down the system if the oil pressure falls to the set point minus the differential.
- L404T and L404V models have an adjustable subtractive differential.
- L404T and L404V models automatically recycle after switch action and return of pressure to within the set operating range.
- L404W and L404Y models are manual reset models which prevent system restart until normal operating conditions return and the reset lever is pushed down and released.
- Trip-free mechanism on manual reset models ensures that the limit function of the controller cannot be defeated by jamming the reset lever.
- Stainless steel diaphragm to resist corrosion.
- Dustproof, trouble-free mercury switch.
- Adjustments are made by screws on top of the case.
- Adjustment screw protective cover assembly (4074BVA) provided with L404T,W,V, and Y.
- Scaleplates are marked in both English (psi) and metric (kg/cm²) units.
- Case has clear plastic cover so that pressure settings and switch action can be observed.
- Leveling indicator visible through cover.
- Black iron siphon loop (included with L404T,W,Y models) provides thermal buffering between a supply line carrying preheated oil and the diaphragm of the controller.
- Hexagonal fitting with 1/4-18 NPT internal threads for direct mounting to the siphon loop.
- Can be surfaced mounted using screws through holes (knockouts) in the back of the case.

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SPECIFICATIONS

IMPORTANT

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



MERCURY NOTICE

This control contains mercury in a sealed tube. Do not discard by placing the control in the trash.

Contact your local waste management authority for instructions regarding recycling and the proper disposal of an old control containing mercury in a sealed tube.

Models:

L404T,V,W,Y PressureTrol® Controllers. See Tables 1 and 2. All models except L404V include a 14026 Siphon Loop to provide thermal buffering if preheated oil is used. All models include 4074BVA Protective Cover Assembly.

Table 1. Models Available.

Model	Function	Switching Action on Rise to Set Point	Reset After Limit Action
L404T	High Pressure Limit	Spst, Breaks	Automatic
L404V	Operating Controller and Low Pressure Limit	Spst, Makes	Automatic
L404W	High Pressure Limit	Spst, Breaks	Manual ^a
L404Y	Operating Controller and Low Pressure Limit	Spst, Makes	Manual ^a

^a The L404W and L404Y models are designated as "Manual Reset 2" controllers; the trip-free reset mechanism does not permit the controller to function as an automatic-reset device if the manual reset lever is held in the "reset" position.

Electrical Ratings:

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

Model	Load	120 Vac	240 Vac	120 Vdc	240 Vdc
L404T,V,W,Y	Full Load	8.0	5.1	2.4	1.2
	Locked Rotor	48.0	30.6	24.0	12.0
	Noninductive	10.0	5.0	5.0	2.0

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 Home and Building Control Sales Office (check white pages of your phone directory).
2. Home and Building Control Customer Relations
Honeywell, 1885 Douglas Drive North
Minneapolis, Minnesota 55422-4386 (800) 328-5111

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Scarborough, 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.

Switch: Spst mercury switch in all models.

Electrical Connections: Internal screw terminals; hole (knockout) in side of case for 1/2 in. conduit.

Pressure Sensing Element: Stainless steel diaphragm.

Maximum Ambient Temperature: 150°F (66°C) at the diaphragm; black iron siphon loop is included to provide thermal buffering if preheated oil is used.

Minimum Ambient Temperature: 32°F (0°C); also refer to not under Location in the Installation section.

Adjustment Means: Screws on top of controller case (see Fig. 9). Scaleplates, marked in psi and kg/cm².

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

Weight: 2 lb., 2 oz. (0.96 kg).

Finish: Gray enamel.

Dimensions: See Fig. 1; also, see Fig. 4 for mounting siphon loop.

Approvals:

Underwriters Laboratories Inc. Listed:
File No. MP2168, Vol. 3, Guide No. MFHX.
Factory Mutual Approved: Report No. 26036.

Table 3. Operating Ranges Available.

Models	Pressure Ranges			Midscale Subtractive Differential (adjustable ^a)			Maximum Surge Pressure		
	psi	kg/cm ²	kPa	psi	kg/cm ²	kPa	psi	kg/cm ²	kPa
L404T,V	10 to 50	0.7 to 3.5	69 to 345	4 to 8	0.3 to 0.6	28 to 55	85	6.0	586
L404T,V,W,Y	25 to 150	1.8 to 10.5	172 to 1034	8 to 16 ^b	0.6 to 1.1	55 to 110	225	15.8	1551

^a L404W and Y manual reset models have a fixed, subtractive differential.

^b Fixed at 8 psi (0.6 kg/cm²) on L404W, Y.

Replacement Parts:

- 129178 Thermoplastic Cover.
- 14026 Siphon Loop (1/4-18 NPT external thread black iron pipes), included with L404T,W,Y models.
- 4074BVA Adjustment Screws, Protective Cover; includes 129185 cover and 111568 Screw.

Accessories:

- 33312B Knurled Adjustment Knob, with setscrew. Fits on main scale pressure adjusting screw.
- 4074BWJ Limit Stop Assembly. Used to limit set point ranges; includes 129564 Range Stop, 107194 Range Stop Screw and 23466 Wrench.

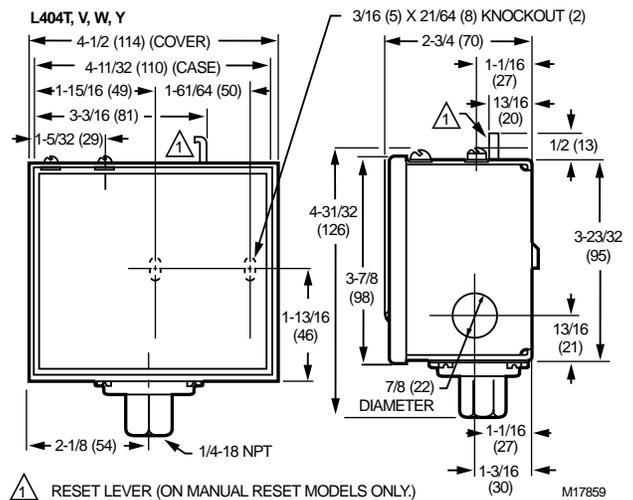


Fig. 1. Mounting dimensions of the L404T,V,W,Y PressureTrol® Controllers in in. (mm).

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 flame safeguard control technician.
4. After installation is complete, check out product operation as provided in these instructions.

! WARNING

Electric Shock Hazard and Equipment Damage Hazard.
Can cause severe injury, death or property damage.

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

! CAUTION

Equipment Damage Hazard.
Can cause equipment damage or shorten equipment life.

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

IMPORTANT

1. Locate the controller where the ambient temperature at the diaphragm will not exceed 150°F (66°C). If using preheated oil, connect a siphon loop between the controller and the main pipe.
2. Use pipe compound sparingly to avoid clogging the orifice in the pipe fitting.
3. Do not tighten the controller by hand by holding the case.
4. The controller must be accurately leveled for proper operation.

Location

NOTE: For most accurate operation, supplemental heat should be added to installations where the temperature falls below -20°F (-29°C). Never locate the controller where the temperature falls below 35°F (-37°C), as mercury in the switch will freeze at this temperature.

These controllers can be mounted at any location in the oil supply line depending on the application. Typical locations are shown in Fig. 2. The low oil pressure controller should be located upstream from the safety shutoff valve(s). In a downstream location, there would be zero pressure when the burner is not running and the safety shutoff valve(s) is (are) closed. This could prevent startup or require manual reset every time the burner is started. The high oil pressure controller should be located as near to the burner as possible.

Mounting

Mount the oil pressure controller directly on the main pipe. Insert a tee in the pipe line, and connect a pipe nipple of appropriate size to the tee (see Fig. 3). Screw the hexagonal fitting (1/4-18 NPT internal thread) of the pressure controller to the pipe nipple. To avoid leaks and damage to the case, use a parallel jaw wrench on the hexagonal fitting close to the pipe nipple. Do not tighten the pressure controller by hand by holding the case.

Make all pipe connections in accordance with approved standards. Use only a small amount of pipe compound to seal the connection joints. Excess pipe compound may clog the orifice in the pipe fitting and prevent the controller from operating properly.

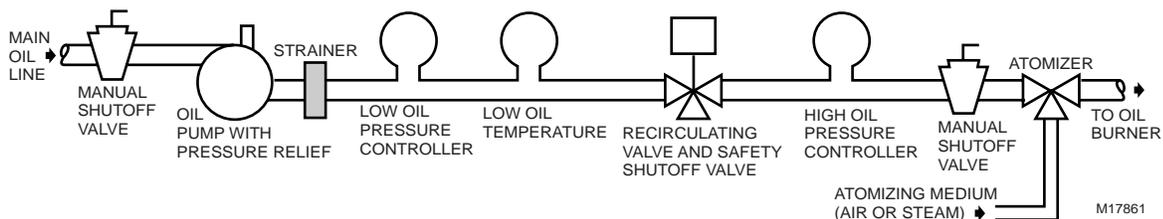


Fig. 2. Typical locations of pressure controllers in an oil burner system.

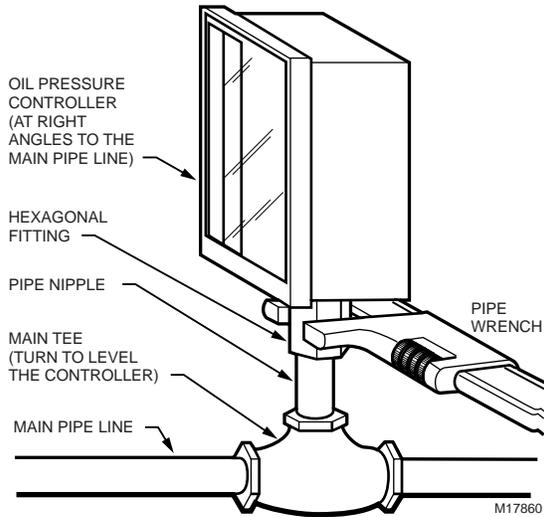


Fig. 3. Mounting an oil pressure controller directly on the main pipe.

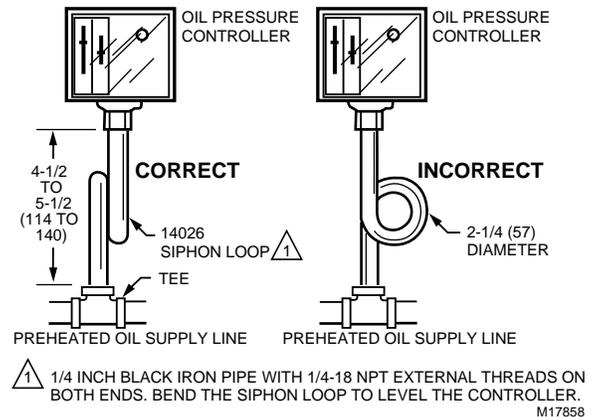


Fig. 4. Right and wrong mounting of a siphon loop, with approximate dimensions in in. (mm).

Using with Preheated Oil

When used with preheated oil, a siphon loop (part number 14026) must always be connected between the controller and the main pipe (see Fig. 4) to provide thermal buffering. The loop must always be perpendicular to the face of the controller. If the loop is parallel to the controller, expansion or contraction of the loop will tip the controller and cause the switch to operate inaccurately.

Leveling

The oil pressure controllers have mercury switches, so they must be accurately leveled for proper operation. If mounting directly on the main pipe (Fig. 3), install the controller at right angles to the pipe; leveling can then be accomplished by turning the pipe tee. If using a siphon loop with preheated oil (Fig. 4), leveling can be accomplished by carefully bending the siphon loop. The controller is level when the leveling indicator (Fig. 9) hangs freely with its pointer directly over the index mark inside the back of the case.

Wiring

⚠ WARNING

Electrical Shock Hazard.

Can cause severe injury, death or equipment damage.

Disconnect the power supply before beginning wiring to prevent electrical shock and equipment damage.

All wiring must comply with applicable electrical codes, ordinances and regulations. Use NEC Class 1 (line voltage) wiring.

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 a least 194°F (90°C) if you are using it with a programming control.

For high temperature installations, use moisture-resistant No. 14 wire, selected for a temperature rating above the maximum operating temperature.

All models have a terminal block inside the cover (Fig. 5) and a 7/8 in (22 mm) hole in one side for 1/2 in. conduit, cable or wires. Remove the front cover of the controller by loosening the screw at the bottom of the main scale.

If the oil burner system is a single burner system with an integral oil pump, connect the oil pressure controller in series between the flame safeguard control and the main oil valve solenoid (Fig. 6). If the oil burner system is a single burner or a multiburner system with an external oil pump, connect the oil pressure controller in series with the other controllers, limits and interlocks (Fig. 7). Follow the burner manufacturer wiring diagram, if provided.

Make sure the loads do not exceed the Switch Contact Ratings in the Specifications section.

Replace the front cover when the wiring is completed.

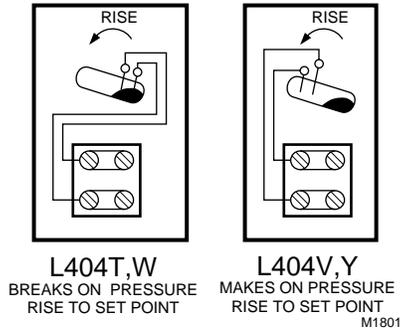


Fig. 5. L404T,V,W,Y terminal blocks and internal schematics.

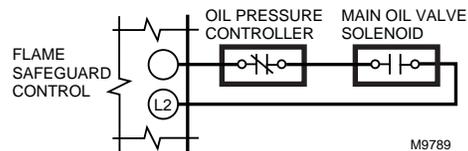


Fig. 6. Hookup of an oil pressure controller used on a single burner system with an integral oil pump.

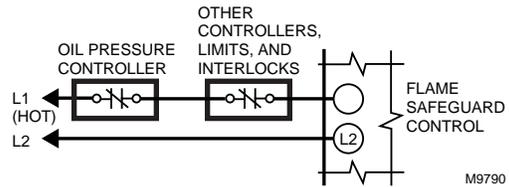


Fig. 7. Hookup of an oil pressure controller used on a single burner or multiburner system with an external oil pump.

SETTING AND CHECKOUT

Setting

In all models, the differential is subtractive from the main scale set point. The upper operating point is determined by the main scale set point, while the low operating point is determined by the main scale setting less the differential setting. Operating points are shown in Fig. 8.

Remove the protective cover over the adjusting screws on top of the controller. Adjust the main scale set point for the desired operating pressure by turning the main scale adjusting screw (Fig. 9) on the top of the case until the main scale setting indicator is at the desired value. The scaleplates are marked in both psi and kg/cm². Replace the protective cover over the adjusting screws when you have finished making the controller adjustments.

Trip-Free Manual Reset Feature (L404W and L404Y Only)

The L404W breaks and the L404Y makes when the pressure rises to the main scale set point. They will not return to their former positions automatically. To reset one of these controllers, wait until the pressure falls to the set point minus the differential (Fig. 8). Then depress the manual reset lever (Fig. 9) and release it. The controller will not be reset until you release the manual reset lever. This prevents the controller from becoming an automatic reset device if the reset lever is stuck, held in or tied down.

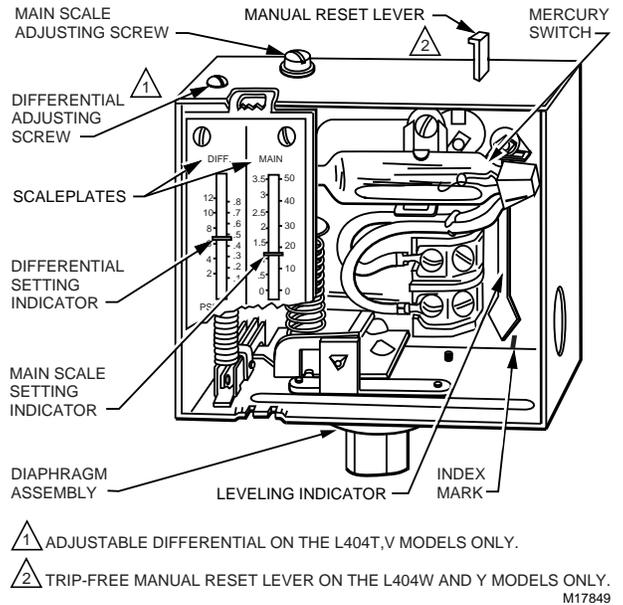


Fig. 9. Setting a PressureTrol® Controller.

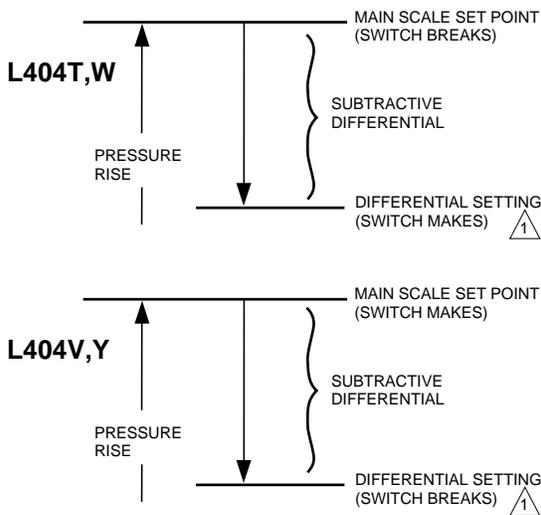


Fig. 8. L404T,V,W,Y operating points.

Checkout

After the controller has been installed, wired and adjusted, 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 set point. Pressure should increase when the set point is raised and decrease when the set point 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.

If a Controller Appears to Operate Improperly

If the controller is suspected of operating improperly, it may be further checked as follows:

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 set point 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 (an L404T or L404W should break; an L404V or L404Y should make). If it makes, the ohmmeter will read zero; if it breaks, the ohmmeter will read infinity.
5. Raise the set point of the controller (simulating a pressure decrease) through a range greater than the differential. The switch should make or break, just the opposite of its action in step 4 above (except the L404W and L404Y manual reset models).
6. An approximation of the differential can be made by observing the change in set point required for a resistance change from zero to infinity.

CAUTION

Equipment Damage Hazard.

Failure to complete tests can damage equipment.

Do not put the system into operation until you have satisfactorily completed all applicable tests described in this checkout section, in the Checkout section of the applicable instruction sheet for the flame safeguard control, and any others required by the burner and boiler manufacturers.

SERVICE INFORMATION

Calibration

The controller was carefully calibrated during manufacture and should not require calibration. Most calibration errors are caused by improper leveling. The controller should be level if the pointer on the leveling indicator is directly over the index mark (Fig. 9). In some cases, the leveling indicator may not be accurate enough. The pointer may be over the index mark, but the controller still may not be operating within the tolerance of the scale setting. In this case, carefully bend the siphon loop until the controller switches properly.

Maintenance

The cover of the controller should be in place at all times to protect the internal components from dirt, dust and physical damage. Routine maintenance should consist of occasional inspection and blowing or brushing away any 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.

Honeywell

Home and Building Control

Honeywell
1985 Douglas Drive North
Golden Valley, MN 55422

Home and Building Control

Honeywell Limited-Honeywell Limitée
35 Dynamic Drive
Scarborough, Ontario
M1V 4Z9

Honeywell Asia Pacific Inc.

Room 3213-3225
Sun Hung Kai Centre
No. 30 Harbour Road
Wanchai
Hong Kong

Honeywell Europe S.A.

3 Avenue du Bourget
1140 Brussels
Belgium

Honeywell Latin American Region

480 Sawgrass Corporate Parkway
Suite 200
Sunrise FL 33325

