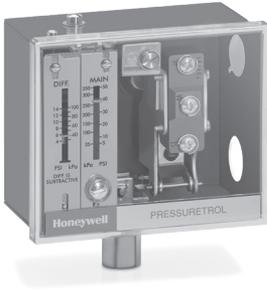


## L404 F, T, V PressureTrol® Controllers

EN

### OPERATING INSTRUCTIONS

Version · Edition 05.23 · 71-2429-08 · EN



### CONTENTS

1 Safety	1
2 Application	2
3 Checking the usage	2
4 Features	2
5 Technical data	2
6 Accessories	3
7 Installation	4
8 Wiring	5
9 Settings and adjustments	6
10 Checkout	7
11 Certification	7
12 Disposal	7

### 1 SAFETY

#### 1.1 Please read and keep in a safe place



Please read through these instructions carefully before installing or operating. Following the installation, pass the instructions on to the operator. This unit must be installed and commissioned in accordance with the regulations and standards in force. These instructions can also be found at [www.docuthek.com](http://www.docuthek.com).

#### 1.2 Explanation of symbols

**1, 2, 3, a, b, c** = Action

→ = Instruction

#### 1.3 Liability

We will not be held liable for damage resulting from non-observance of the instructions and non-compliant use.

#### 1.4 Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:

#### **⚠ DANGER**

Indicates potentially fatal situations.

#### **⚠ WARNING**

Indicates possible danger to life and limb.

#### **⚠ CAUTION**

Indicates possible material damage.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

#### 1.5 Conversion, spare parts

All technical changes are prohibited. Only use OEM spare parts.

## 2 APPLICATION

L404 F PressureTrol controllers provide operating control with automatic limit protection for pressure systems of up to 2070 kPa, or 300 psi.

L404 T, V PressureTrol controllers are for use on oil burner systems for pressures up to 1035 kPa or 150 psi.

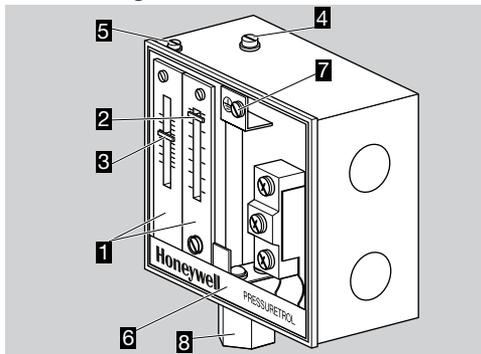
- L404F: Controllers may be used with steam, air, or noncombustible gases, or fluids noncorrosive to the pressure sensing element.
- L404T: High pressure limits, break a circuit on oil pressure rise above setpoint.
- L404V: Low pressure limits, makes a circuit on oil pressure rise above setpoint.

## 3 CHECKING THE USAGE

Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.

This function is only guaranteed when used within the specified limits – see page 2 (5 Technical data). Any other use is considered as non-compliant.

### 3.1 Part designations



- 1 Scales
- 2 Main scale pressure indicator
- 3 Differential setting indicator
- 4 Pressure adjusting screw
- 5 Differential adjusting screw
- 6 Operating lever
- 7 Ground screw
- 8 Diaphragm assembly

## 4 FEATURES

- Models available in a series of control ranges, and pressure scales in kPa and psi.
- All models automatically reset and have an adjustable differential.
- Models have snap switch to open or close a circuit on a pressure rise.
- Case has a clear plastic cover so setpoints can be observed.
- 1/4 inch— 18 NPT connection for pipe on diaphragm assembly.
- Ground screw terminal.

## 5 TECHNICAL DATA

### Pressure ratings

Model number	Operating ranges	
	kPa	psi
L404F1060	15 to 100	2 to 15
L404F1078	35 to 350	5 to 50
L404F1094	140 to 2070	20 to 300
L404F1102	70 to 1035	10 to 150
L404F1219 <sup>3)</sup>	15 to 100	2 to 15
L404F1243 <sup>3)</sup>	35 to 350	5 to 50
L404F1227 <sup>3)</sup>	70 to 1035	10 to 150
L404F1235 <sup>3)</sup>	140 to 2070	20 to 300
L404F1300 <sup>3)</sup>	415 to 1240	60 to 180
L404F1326	0 to 100	0 to 15
L404F1334	0 to 350	0 to 50
L404F1342	35 to 1000	5 to 145
L404F1359	70 to 2000	10 to 290
L404F1367	7 to 55	1 to 8
L404F1375 <sup>4)</sup>	35 to 350	5 to 50
L404F1383 <sup>4)</sup>	70 to 1035	10 to 150
L404F1391 <sup>4)</sup>	140 to 2070	20 to 300
L404F1409 <sup>4)</sup>	15 to 100	2 to 15
L404F1441	34 to 343	5 to 50
L404T1055	35 to 350	5 to 50
L404T1063	70 to 1035	10 to 150
L404V1087 <sup>4)</sup>	70 to 1035	10 to 150
L404V1095d	35 to 350	5 to 50

Model number	Subtractive differential <sup>1)</sup>		Maximum diaphragm pressure	
	kPa	psi	kPa	psi
L404F1060	15 to 40	2 to 6	170	25
L404F1078	40 to 100	6 to 14	590	85
L404F1094	140 to 345	20 to 50	2410	350 <sup>2)</sup>
L404F1102	70 to 150	10 to 22	1550	225
L404F1219 <sup>3)</sup>	15 to 40	2 to 6	170	25
L404F1243 <sup>3)</sup>	40 to 100	6 to 14	590	85
L404F1227 <sup>3)</sup>	70 to 150	10 to 22	1550	225
L404F1235 <sup>3)</sup>	140 to 345	20 to 50	2410	350 <sup>2)</sup>
L404F1300 <sup>3)</sup>	40 fixed	6.0 fixed	1550	225
L404F1326	15 to 40	2 to 6	170	25
L404F1334	40 to 100	6 to 14	590	85

Model number	Subtractive differential <sup>1)</sup>		Maximum diaphragm pressure	
	kPa	psi	kPa	psi
L404F1342	70 to 150	10 to 22	1550	225
L404F1359	140 to 345	20 to 50	2410	350 <sup>2)</sup>
L404F1367	5 to 14	0.75 to 2	170	25
L404F1375 <sup>4)</sup>	40 to 100	6 to 14	590	85
L404F1383 <sup>4)</sup>	70 to 150	10 to 22	1550	225
L404F1391 <sup>4)</sup>	140 to 345	20 to 50	2410	350 <sup>2)</sup>
L404F1409 <sup>4)</sup>	15 to 40	2 to 6	170	25
L404F1441	39 to 98	6 to 14	588	85
L404T1055	40 to 100	6 to 14	590	85
L404T1063	70 to 150	10 to 22	1550	225
L404V1087 <sup>4)</sup>	70 to 150	10 to 22	1550	225
L404V1095d	40 to 100	6 to 14	590	85

- 1) Nominal at midscale operating range.
- 2) Brass bellows instead of stainless steel diaphragm.
- 3) Models with 1/4-19 BSPT thread instead of 1/4-18 NPT thread.
- 4) Make-on-rise models with terminal **B** omitted for non-rising compliance.

### Conversions

Operating range conversions			Subtractive differential conversions		
kg/cm <sup>2</sup>	kPa	psi	kg/cm <sup>2</sup>	kPa	psi
0.1 to 1.05	15 to 100	2 to 15	0.15 to 0.4	15 to 40	2 to 6
0.4 to 3.5	35 to 350	5 to 50	0.4 to 1.0	40 to 100	6 to 14
0.7 to 10.0	70 to 1035	10 to 150	0.7 to 1.6	70 to 150	10 to 22
1.5 to 20.0	140 to 2070	20 to 300	1.5 to 3.5	150 to 300	20 to 50

### Switch ratings

Switch state	120 V AC	240 V AC
Full load	8.0 A	5.1 A
Locked rotor	48.0 A	30.6 A

### Pressure sensing element

Stainless steel diaphragm (140 to 2070 kPa models) has brass bellows.

### Maximum ambient temperature

66°C (150°F). Also, refer to instructions under page 4 (7 Installation).

### Adjustment means

Screws on top of control case. Scales are marked in psi or kPa.

### Mounting means

1/4 inch-18 NPT connection on diaphragm assembly; or surface mounts using holes in back of case.

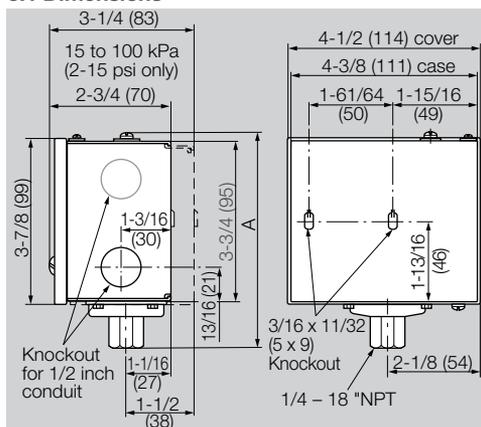
### Switching action

Snap switch breaks **R-B** (closes **R-W**) on pressure rise. Make-on-rise devices omit terminal **B**, see page 5 (8 Wiring).

### Grounding means

Ground screw terminal marked with a circled ground symbol.

### 5.1 Dimensions



### Dimension A

Range psi	Dimension
2 to 15	123
5 to 50	126
10 to 150	126
20 to 300	146

## 6 ACCESSORIES

→ Please refer to the applicable Equipment/Application Standards for compliance.

50024585-001: Brass steam trap, NPT.

14026: Steel steam trap, NPT.

4074BWJ: Range-stop screw, Part No. 107194 and wrench, Part No. 23466, to limit setpoint range.

## 7 INSTALLATION

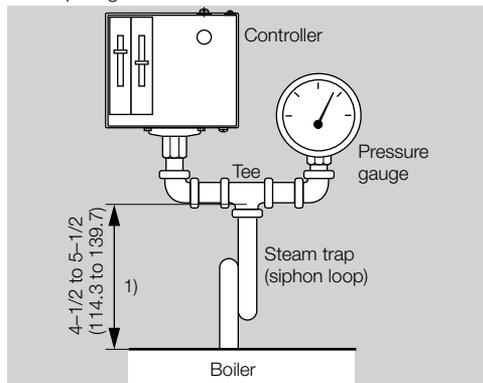
### ⚠ CAUTION

#### Incorrect installation

Please observe the following to ensure that the unit is not damaged during installation:

- For most accurate operation, supplemental heat should be added to installations where temperatures fall below  $-29^{\circ}\text{C}$  ( $-20^{\circ}\text{F}$ ).
- Use only a small amount of pipe compound to seal the connection joints. Any excess dope may clog the small hole in the fitting and prevent the controller from operating properly.

- A steam trap must be connected between the L404F and the boiler to prevent boiler scale and corrosive vapors from attacking the elbows or diaphragm.

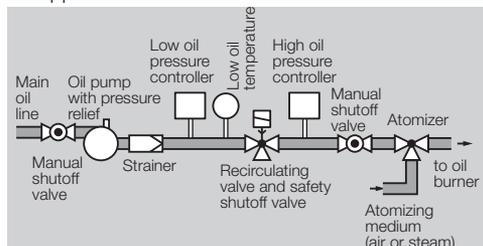


- 1) 1/4"-pipe with 1/4-18 NPT external threads on both ends and 2-1/4" (57 mm) diameter loop.

- Locate the L404F where the ambient temperature will not exceed  $66^{\circ}\text{C}$  ( $150^{\circ}\text{F}$ ).

### 7.1 Installation position

- The L404F can be mounted near the pressure gauge, at a remote location, in a fitting provided by the boiler manufacturer, or in a special mounting on low water cutoffs.
- The L404F should always be mounted above the water line in steam boiler applications.
- These controllers can be mounted at any location in the oil supply line, depending on the application.



Typical locations of pressure controllers in an oil burner system

- 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.

### 7.1.1 Pressure gauge mounting

- 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

### 7.1.2 Remote mounting

### ⚠ CAUTION

Excessive vibration at the boiler may affect the operation of the controller. In these cases, the controller should be remotely located, subject to the following:

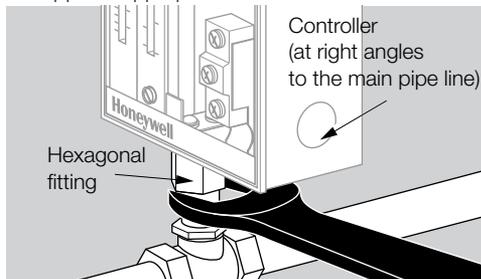
- All piping must be suitable and properly pitched to drain all condensation back to the boiler.
- The remote mounting must be solid.
- A steam trap must be used at one end of the piping.

### 7.1.3 Boiler mounting

- If it is not convenient to install the controller adjacent to the pressure gauge, install a steam trap at the location recommended by the boiler manufacturer, then screw the device directly to the steam trap.

### 7.2 Mounting

- 1 Mount the controller directly on the main pipe.
- 2 Insert a tee in the pipe line, and connect a pipe nipple of appropriate size to the tee.

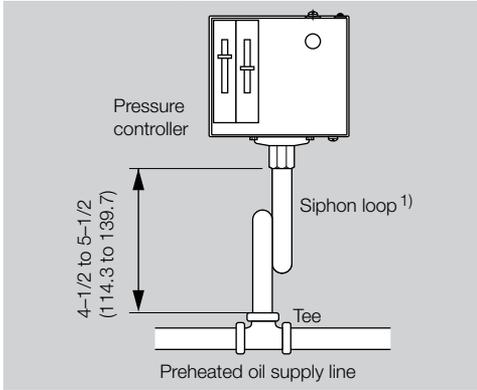


- 3 Screw the hexagonal fitting (1/4-18 NPT internal thread) of the controller to the pipe nipple.
- 4 To avoid leaks and damage to the case, use a parallel jaw wrench on the hexagonal fitting close to the pipe nipple.
- 5 Do not tighten the controller by hand by holding the case.
- 6 Make all pipe connections in accordance with approved standards.

- 7 After installation is complete, check out the product operation as provided in these instructions.

### 7.3 Using with preheated oil

- When used with preheated oil, a siphon loop must always be connected between the controller and the main pipe (see Fig. 5) to provide thermal buffering.



Mounting of a siphon loop, with approximate dimensions in inch (mm)

- 1) 1/4"-pipe with 1/4-18 NPT external threads on both ends and 2-1/4" (57 mm) diameter loop.

## 8 WIRING

### ⚠ WARNING

Electrical shock hazard.

Can cause serious injury, death or equipment.

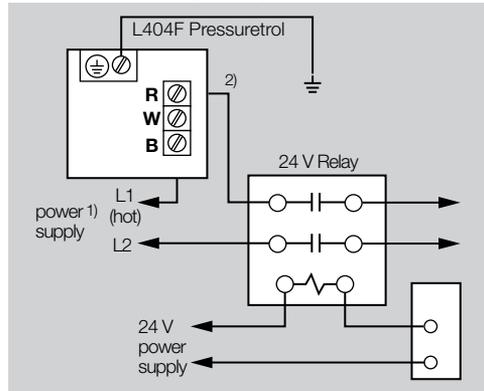
- Disconnect power supply before beginning wiring. More than one power supply disconnect may be required.
- All wiring must comply with applicable local electrical codes, ordinances and regulations.

- For the wiring, see schematics and wiring diagrams.

All wiring must comply with applicable codes and ordinances.

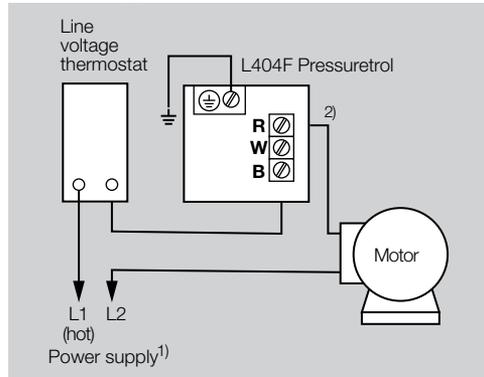
All models have terminals (on the MicroSwitch® snap-acting switch) inside the cover and knockouts for conduit and cable.

### L404F in low voltage relay circuit



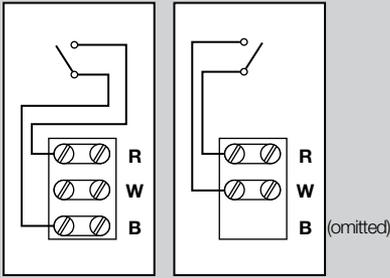
- 1) Provide disconnect means and overload protection as required
- 2) As shown, switch opens on pressure rise. Reverse acting (make on pressure rise) units are wired to **R-W-** terminals and terminal **B** is omitted.

### L404F in a typical 2-wire control circuit



- 1) Provide disconnect means and overload protection as required
- 2) As shown, switch opens on pressure rise. Reverse acting (make on pressure rise) units are wired to **R-W-** terminals and terminal **B** is omitted.

## L404T,V terminal blocks and internal schematics

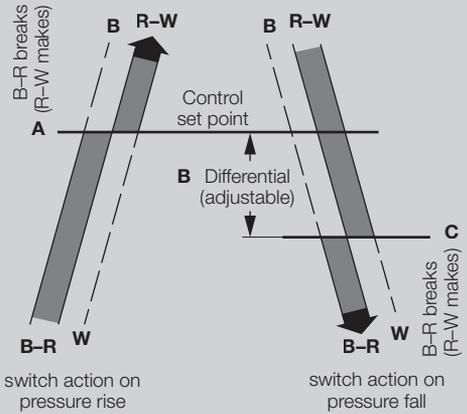


**L404T**

breaks on pressure rise to set point

**L404V**

makes on pressure rise to set point



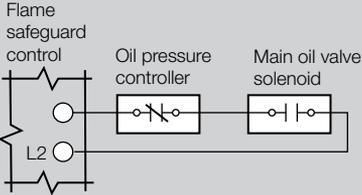
switch action on pressure rise

switch action on pressure fall

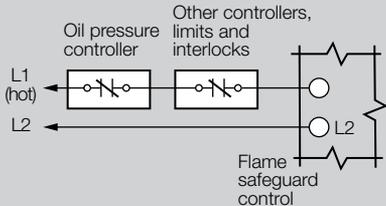
■ indicates closed switch contacts

Operation of switch on pressure rise and fall

## Hookup of an oil pressure controller used on a single burner system with an integral oil pump



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



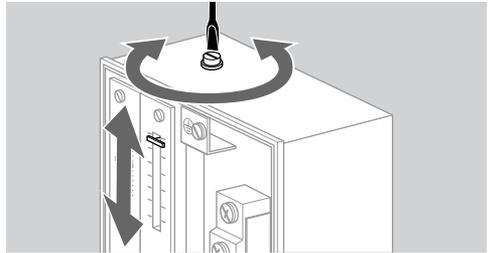
## 9 SETTINGS AND ADJUSTMENTS

When the pressure at the control rises above the L404 setpoint, a circuit opens between the **B-R** terminals. During a pressure fall, **B-R** will close at the setpoint pressure minus the switch differential. For example, if a controller is set to differential **B** with a controller setpoint of **A**, **B-R** will open when the pressure rises to **A**. Then during a pressure fall, the **B-R** terminals will close when the pressure drops to **C** (**A** minus differential **B**).

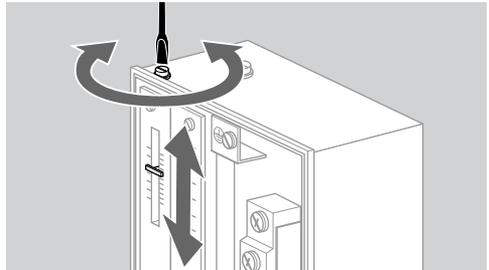
For make on rise applications, the switch is wired to **R-W** terminals. The **R-W** circuit will close on pressure rise to the setpoint. **R-W** will open again on a pressure drop past the switch differential.

### 9.1 Setpoint adjustment

- 1 Turn the pressure adjusting screw on the top of the controller to adjust the setpoint.



- 2 Turn the differential adjusting screw to the desired pressure difference between switch opening and switch closing.



- When the main scale setting is at the lower end of the operating range, the differential range will be less than the differential setting by approximately 20%.

## 9.2 Scaleplate adjustment

- The L404F, T, V has been carefully calibrated during manufacture and should not require recalibration.
- 1 However, if recalibration is necessary, remove the cover.
  - 2 Loosen the setscrews which hold the scaleplate.
  - 3 Adjust the plate up or down, as required, to bring the device into calibration.
  - 4 Tighten the setscrews securely and replace the cover.

## 10 CHECKOUT

- After the controller has been installed, wired and adjusted, it should be tested with the system in operation.
- 1 First, allow the system to stabilize.
  - 2 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.
- 3 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.
- Use a separate, calibrated pressure gauge to verify that the final pressure setpoint is within 5% of the desired value.

## 11 CERTIFICATION

### 11.1 UL listed



Underwriters Laboratories Inc. listed: File No. MP466, vol. 10, Guide No. MBPR.

### 11.2 CSA approved



Canadian Standards Association (CSA): File No. LR1620, Guide No. 400E-0

## 12 DISPOSAL

Devices with electronic components:

### WEEE Directive 2012/19/EU – Waste Electrical and Electronic Equipment Directive



At the end of the product life (number of operating cycles reached), dispose of the packaging and product in a corresponding recycling centre. Do not dispose of the unit with the usual domestic refuse.

Do not burn the product.

On request, old units may be returned carriage paid to the manufacturer in accordance with the relevant waste legislation requirements.

## FOR MORE INFORMATION

The Honeywell Thermal Solutions family of products includes Honeywell Combustion Safety, Eclipse, Exothermics, Hauck, Kromschroder and Maxon. To learn more about our products, visit [ThermalSolutions.honeywell.com](https://ThermalSolutions.honeywell.com) or contact your Honeywell Sales Engineer.

Honeywell Process Solutions  
Honeywell Thermal Solutions (HTS)  
2101 CityWest Blvd  
Houston, TX 77042  
United States  
[ThermalSolutions.honeywell.com](https://ThermalSolutions.honeywell.com)

© 2023 Honeywell International Inc.

EN-8

**Honeywell**

We reserve the right to make technical modifications in the interests of progress.

· Edition 05.23