

## R8182D,E,F,H,J Combination Protectorelay™ and Hydronic Heating Controls

PRODUCT DATA



### FEATURES

- Depending on model, these single unit devices provide combinations of high limit, low limit, and circulator control.
- All models use a 24V thermostat and C554A Cadmium Sulfide Flame Detector.
- R8182D,E,H and J have auxiliary terminals ZC and ZR for circulator zone control. Additional zones require a separate 24V thermostat and R845 Relay.
- All models have capability for zone control with zone valves. Each additional zone requires a separate 24V thermostat and a V8043 or V8044 Zone Valve.
- Ideal for packaged boiler systems requiring compact, multipurpose controls.
- R8182D,E,F mode
- R8182H,J models mount on a 4 x 4 inch junction box, and have a 5 ft (1.5m) armored capillary for remote sensor location.
- Aquastat® Controller section is field replaceable.
- Oil burner circuit includes an improved safety shutoff in the event the burner fails to start.
- Flame failure during the running cycle results in a 45 second attempt to restart. If unsuccessful, safety shutoff occurs, requiring manual reset before burner can be restarted.

### GENERAL

The R8182 is a combination Protectorelay™ intermittent ignition oil burner primary and immersion type Aquastat® controller for oil-fired, hydronic heating systems.

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## SPECIFICATIONS

### IMPORTANT

The specifications given in this publication do not include normal manufacturing tolerances. Therefore, this unit may not exactly match the listed specifications. 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.

**TRADELINER® Models:** TRADELINE® models are selected and packaged for ease of handling, ease of stocking, and maximum replacement value. TRADELINE® model specifications are the same as those of standard models except as noted below.

### TRADELINER® Models Available:

R8182D Combination Protectorelay™ Primary Control and Aquastat® Controller.

R8182H Combination Protectorelay™ Primary Control and Aquastat® Controller.

### Additional Features:

- Well not included. To order wells or well adapters, refer to form 68-0040, Wells and Fittings for Temperature Controllers, for part numbers and descriptions.
- Heat-conductive compound supplied for better bulb response in oversized well.
- Field addable stops for Aquastat® Controller.
- Conversion to R8182E or F.
- TRADELINE® pack with special instructions.
- Wire nut.

### Mounting Means:

R8182D,E,F: Case clamps to horizontal immersion well installed through boiler wall.

R8182H,J: Mounts on standard 4 x 4 inch junction box.

**Dimensions:** Refer to Fig. 1 and 2.

**Table 1. Standard Models:**

Model	Switching	Adjustable Control Range		Differential	
		°F	°C	°F	°C
R8182D <sup>a</sup>	High Limit, Spst	130 to 240	54 to 116	10 Fixed	6 Fixed
	High Limit/Circulator, Spdt	110 to 220	43 to 104	10 to 25 Adj	6 to 14 Adj
R8182E <sup>a</sup>	High Limit, Spst	180 to 240	82 to 116	15 Fixed	8 Fixed
R8182F	High Limit, Spst	130 to 240	54 to 116	10 Fixed	6 Fixed
	Circulator, Spst	110 to 220	43 to 104	10 Fixed	6 Fixed
R8182H <sup>a</sup> Remote Bulb	High Limit, Spst	130 to 240	54 to 116	10 Fixed	6 Fixed
	Low Limit/Circulator, Spdt	110 to 220	43 to 104	10 to 25 Adj	6 to 14 Adj
R8182J <sup>a</sup> Remote Bulb	High Limit, Spst	180 to 240	82 to 116	15 Fixed	8 Fixed

<sup>a</sup> Auxiliary ZC and ZR terminals can be used to provide circulator zone control through an R845A Switching Relay.

### Electrical Ratings:

Power Supply: 120 Vac, 60 Hz.

Ignition: 360 VA in addition to motor load rating.

Maximum Power Consumption:

R8182D,E,H and J: 9W.

R89182F: 5.5W.

Burner Circulator Contact Rating: 4.4A full load; 26.4A locked rotor at 120 Vac.

**Safety Switch Timing:** Approximately 45 seconds.

**Flame Detector Required:** C554A Cadmium Sulfide Flame Detector (ordered separately).

**Thermostat Required:** 24V, 2-wire thermostat such as the T87F.

## 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

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.

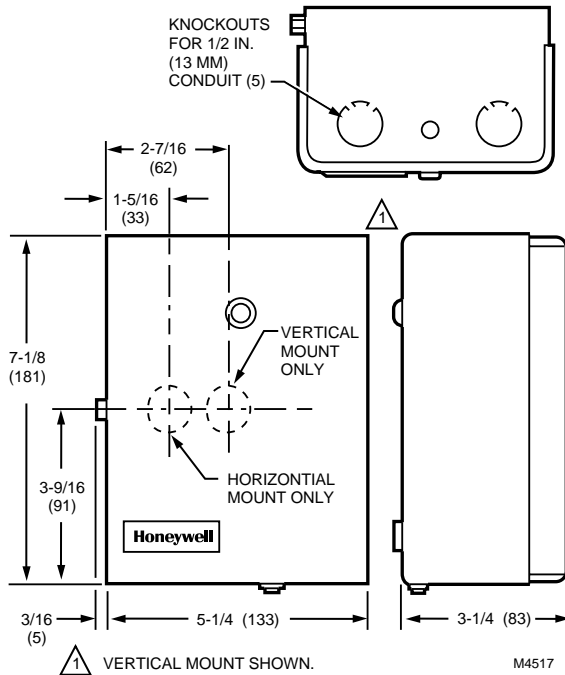


Fig. 1. R8182D,E,F installation dimensions in in. (mm).

**Thermostat Anticipator Setting:** 0.2A for R8182, 0.4A for each R845A Switching Relay used.

**Maximum Ambient Temperature (at Element):** 250°F (121°C).

**Maximum Pressure Rating:**  
200 psi (1379 kPa) on immersion well.  
100 psi (689.5 kPa) direct immersion.

**Internal Views:** Refer to Fig. 4 through 8.

**Well Insertion Length:** 3-3/8 in. (86 mm).

**Immersion Well Dimensions (Order Well Separately):**  
Refer to Fig. 3.

**Aquastat® Assembly Repair Parts:** 125026AAE Aquastat® Assembly: Replaces R8182D,F Sensing Bulb.

**Replacement Well Assemblies:** Refer to form 68-0040, Wells and Fittings for Temperature Controllers, for part numbers and descriptions.

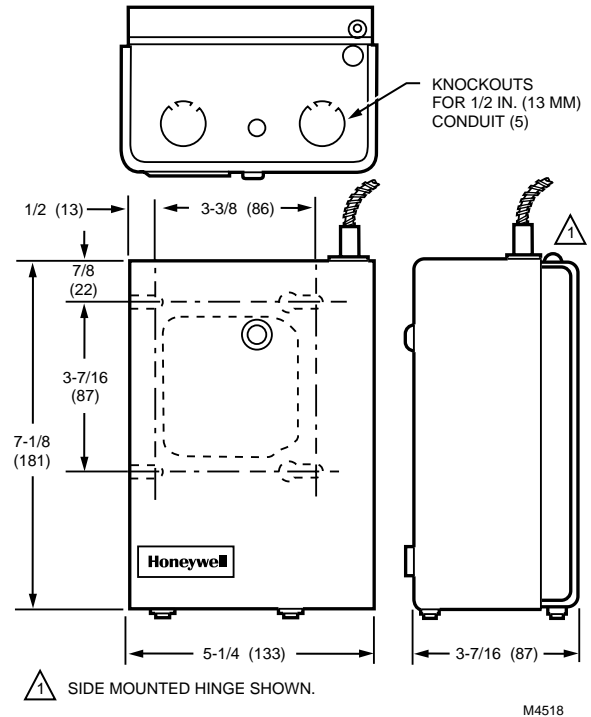
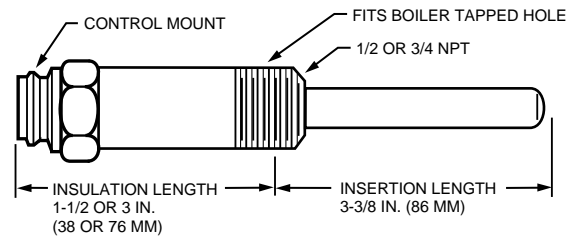


Fig. 2. R8182H,J installation dimensions in in. (mm).

**R8182D,E,F**



**R8182H,J**

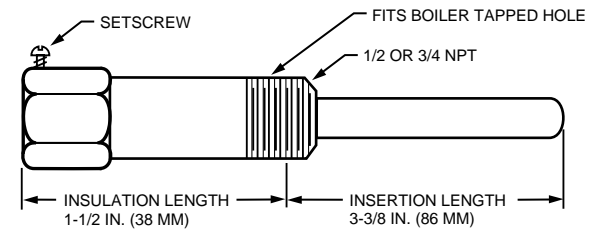


Fig. 3. Approximate immersion well dimensions.

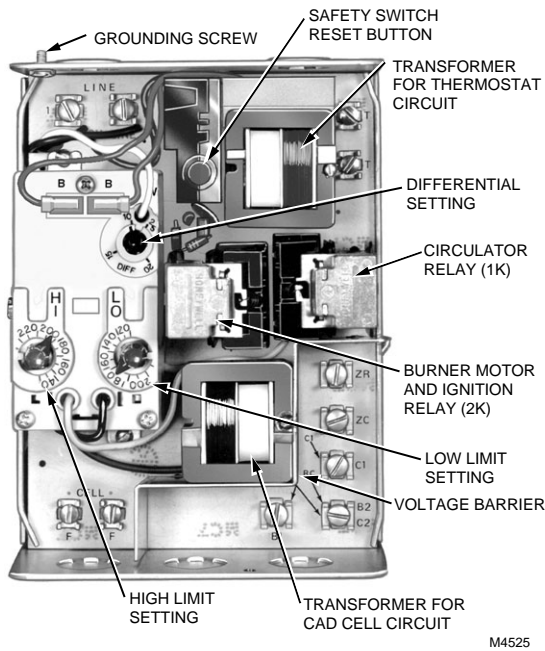
Device	Description	Part Number
R8182D	1-1/2 in. (38 mm) insulation, horizontal or vertical; 3 in. (76 mm) insulation horizontal.	125026AAD
	3 in. (76 mm) insulation, vertical.	125026AAE
R8182E	1-1/2 in. (38 mm) insulation, horizontal or vertical; 3 in. (76 mm) insulation horizontal.	123726AV
	3 in. (76 mm) insulation, vertical.	123726AW

Device	Description	Part Number
R8182F	1-1/2 in. (38 mm) insulation, horizontal or vertical; 3 in. (76 mm) insulation horizontal.	125017AAB
	3 in. (76 mm) insulation, vertical.	125017AAC
R8182H	1-1/2 in. (38 mm) insulation.	125026AAJ
R8182J		123726AT

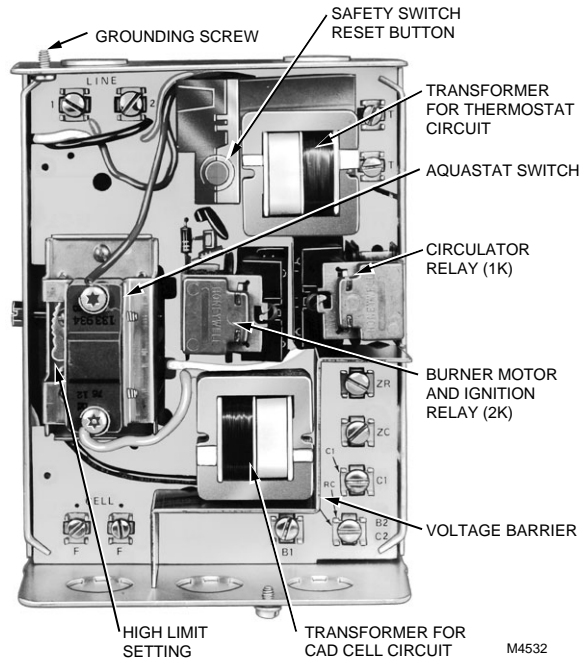
**Dial Stop:** For restricting range, part no. 4074BRR for R8182D,F,H.

**Optional Specifications:**

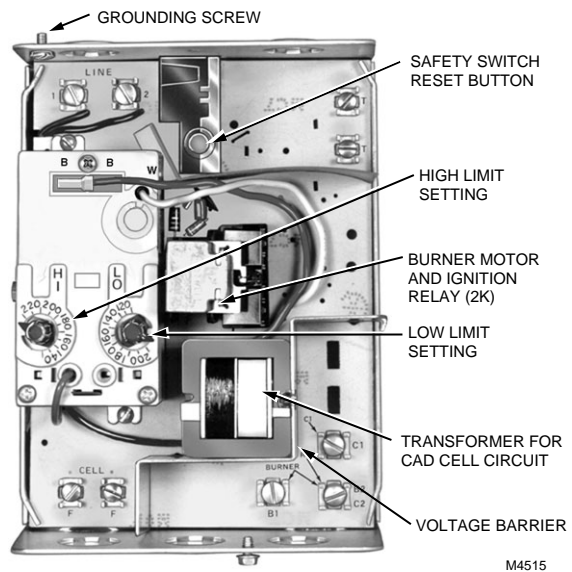
R8182D,E,F: Case with long dimension horizontal.  
 R8182H,J: End mounted hinge.



**Fig. 4. Internal view of R8182D.**



**Fig. 5. Internal view of R8182E.**



**Fig. 6. Internal view of R8182F.**

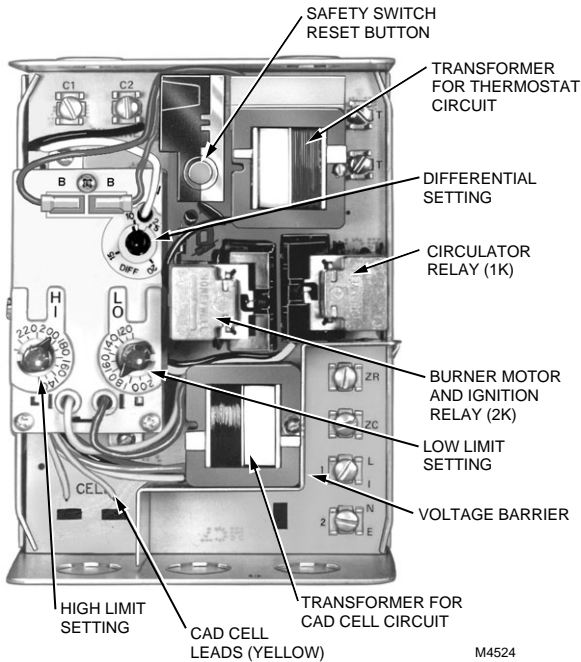


Fig. 7. Internal view of R8182H.

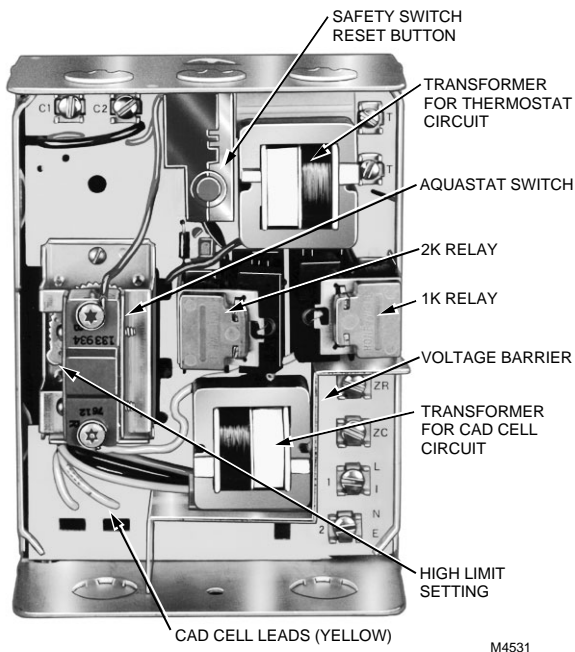


Fig. 8. Internal view of R8182J.

## INSTALLATION

### ⚠ WARNING

**Explosion Hazard.**  
**Can cause severe injury, death or property damage.**

This product is intended for use only in systems with a pressure relief valve.

### 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 these instructions and on the product to be sure the product is suitable for your application.
3. The installer must be a trained, experienced service technician.
4. After completing installation, use these instructions to check product operation.

### ⚠ WARNING

**Explosion or Electrical Shock Hazard.**  
**Can cause severe injury, death or property damage.**

1. Disconnect the power supply before beginning installation to prevent electrical shock or equipment damage.
2. Be sure that combustion chamber is clear of oil or oil vapor before starting burner.
3. Be sure that the ambient temperature at the element will not exceed 250°F (121°C).

### IMPORTANT

*Be sure that the sensing bulb fits snugly inside the immersion well and that the sensing bulb rests against the bottom of the immersion well. Refer to Fig. 9.*

### Mounting the R8182

1. Disconnect the power supply.
2. Drain all water from the boiler.
3. Generally, boilers are equipped with a tapping that allows horizontal mounting of the immersion well where average temperature boiler water circulates freely. If no tapping is provided, prepare one.
4. Install the immersion well or compression fitting (ordered separately) by threading the immersion well into the tapped hole.
5. For R8182D,E,F models:
  - a. Loosen the immersion well clamp screw on the side of the R8182 case.
  - b. Insert the bulb into the immersion well until it bottoms.
  - c. If necessary, bend the capillary tube to hold the bulb against the bottom of the immersion well.

**NOTE:** Do not make sharp bends in the tubing. A sharp bend can break the tubing and cause a loss of fill. In models with an adjustable tubing length, pull the extra tubing out of the controller case.

- d. Fit the controller case onto the immersion well so that the immersion well clamp slides over the flange of the immersion well.
- e. Securely tighten the immersion well clamp screw.
- 6.** For R8182H,J models:
  - a. Loosen the screw holding the hinged backplate to the controller case and swing the backplate away from the controller case.
  - b. Screw the backplate to a 4 by 4 inch junction box.
  - c. Insert the bulb into the immersion well until it bottoms.
  - d. If necessary, bend the capillary tube to hold the bulb against the bottom of the immersion well.

**NOTE:** Do not make sharp bends in the tubing. A sharp bend can break the tubing and cause a loss of fill. In models with an adjustable tubing length, pull the extra tubing out of the controller case.

- e. Tighten the immersion well screw over the brass collar.
- f. After wiring, swing control against the backplate and refasten with the screw.
- 7.** Refill the boiler and check for water leakage.

## Mounting the R8182D TRADELINE®

If the existing immersion well does not fit the R8182D immersion well clamp, use a 1249094 immersion well adapter (order separately; see form 68-0040, Wells and Fittings for Temperature Controllers).

- 1.** Disconnect the power supply.
- 2.** Drain all water from the boiler.
- 3.** Fasten the R8182D immersion well clamp to the flange on the immersion well adapter. Refer to Fig. 9.
- 4.** Place the adapter on the capillary tube.
- 5.** Put the adapter end into the hole in the controller case and tighten the clamp screw.
- 6.** Insert the sensing bulb into the immersion well and bend the capillary tubing, if necessary, to hold the sensing bulb against the bottom of the immersion well.

**NOTE:** Do not make sharp turns while bending the capillary tubing. In models with an adjustable tubing length, pull the extra tubing out of the controller case.

- 7.** Apply the heat-conductive compound into the immersion well (if necessary).
  - a. Fold the plastic bag of heat-conductive compound lengthwise and twist it gently.
  - b. Cut off the end of the plastic bag and work the open end of the bag all the way into the immersion well.
  - c. Slowly pull the bag out of the immersion well while squeezing it firmly to evenly distribute the heat-conductive compound.
- 8.** Wipe off any excess grease and tighten the set screw against the adapter.

If the existing immersion well is not usable, remove the existing immersion well and order a new one using form 68-0040, Wells and Fittings for Temperature Controllers.

- 1.** Disconnect the power supply.
- 2.** Drain all water from the boiler.
- 3.** Install the new immersion well by threading it into the threaded hole.
- 4.** Loosen the immersion well clamp screw. See Fig. 9.
- 5.** Insert the sensing bulb into the immersion well and bend the capillary tubing, if necessary, to hold the sensing bulb against the bottom of the immersion well.

**NOTE:** Do not make sharp turns while bending the capillary tubing. In models with an adjustable tubing length, pull the extra tubing out of the controller case.

- 6.** Apply heat-conductive compound into the immersion well (if necessary).
  - a. Fold the plastic bag of heat-conductive compound lengthwise and twist it gently.
  - b. Cut off the end of the plastic bag and work the open end of the bag all the way into the immersion well.
  - c. Slowly pull the bag out of the immersion well while squeezing it firmly to evenly distribute the heat-conductive compound.
- 7.** Be sure the immersion well fits the hole in the controller case.
- 8.** Position the immersion well clamp snugly over the immersion well flange. Securely tighten the clamp screw.
- 9.** Refill the boiler and check for water leakage.

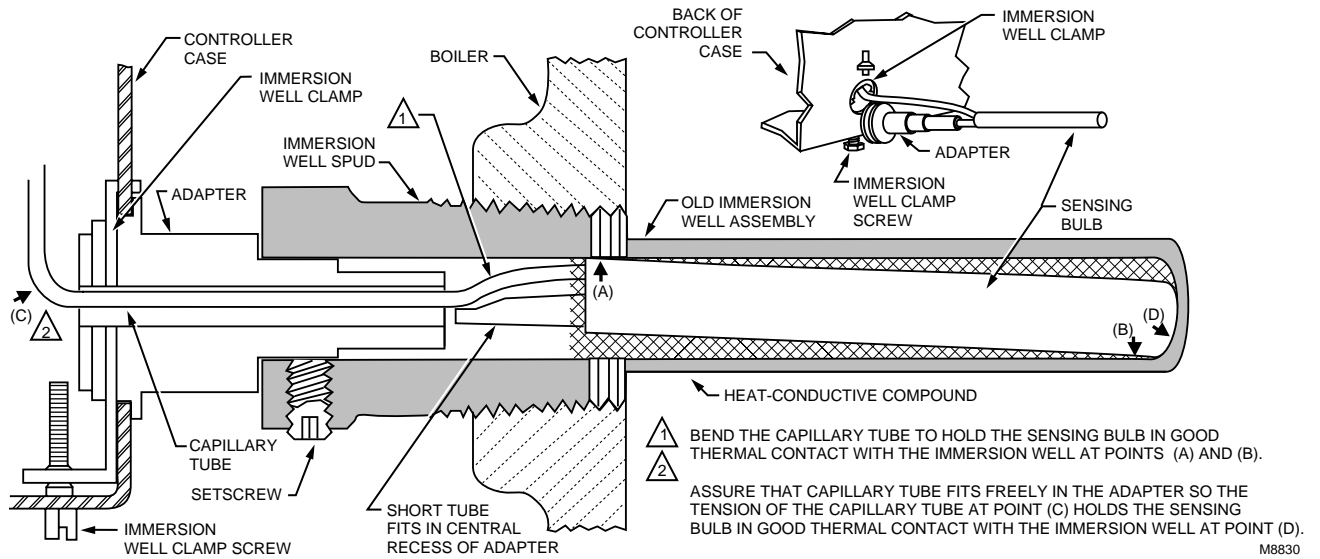


Fig. 9. Positioning the sensing bulb in the immersion well.

## WIRING

### IMPORTANT

Use Underwriters Laboratories Inc. listed connectors when making external circuit connections to the orange and white line voltage burner and ignition leadwires of the R8182H,J.

## ⚠ WARNING

**Electrical Shock Hazard.**  
**Can cause severe injury, death or property damage.**  
 Disconnect power supply before wiring to prevent electrical shock or equipment damage.

All wiring must comply with local codes, regulations, and ordinances.

### IMPORTANT

Terminals on the R8182 are approved for copper wire only.

Follow the wiring instructions furnished by the appliance manufacturer, if available, or refer to Fig. 11 through 17. For wiring multiple zoning systems, refer to Fig. 16 and 17.

The R8182 is equipped with special wiring terminals. Wires can be wrapped around the terminal screw or inserted from the side.

## Method 1

1. Strip 7/16 in. of insulation from the wire end.
2. Wrap the wire 3/4 of the distance around the screw as shown in method 1.
3. Using a standard, flat-headed screwdriver, tighten the screw until the wipe is snugly in contact with the screw and contact plate.
4. Tighten the screw pin an additional one-half turn.

## Method 2

1. Strip 5/16 in. of insulation from the wire end.
2. Insert wire beneath the screw as shown in method 2.
3. Using a standard, flat-head screwdriver, tighten the screw until the wire is snugly in contact with the screw and contact plate.
4. Tighten the screw an additional one-half turn.

NOTE: Do not use a push-type ratchet screwdriver.

The TRADELINE® R8182D,H can be converted to replace an R8182B,C,E,F or a White Rodgers 6C92-2 or 6C92-3. When replacing a White Rodgers model, the immersion well must also be replaced. Refer to Fig. 10 for Aquastat® limit connections necessary for each R8182D conversion.

To release the wires from the R8182, insert a screwdriver into the rectangular hole adjacent to the wire, push inward to release the locking-grip on the wire, and pull the wire out of the terminal hole.

To reinsert the wire into a new terminal hole, simply push the wire into the new slot.

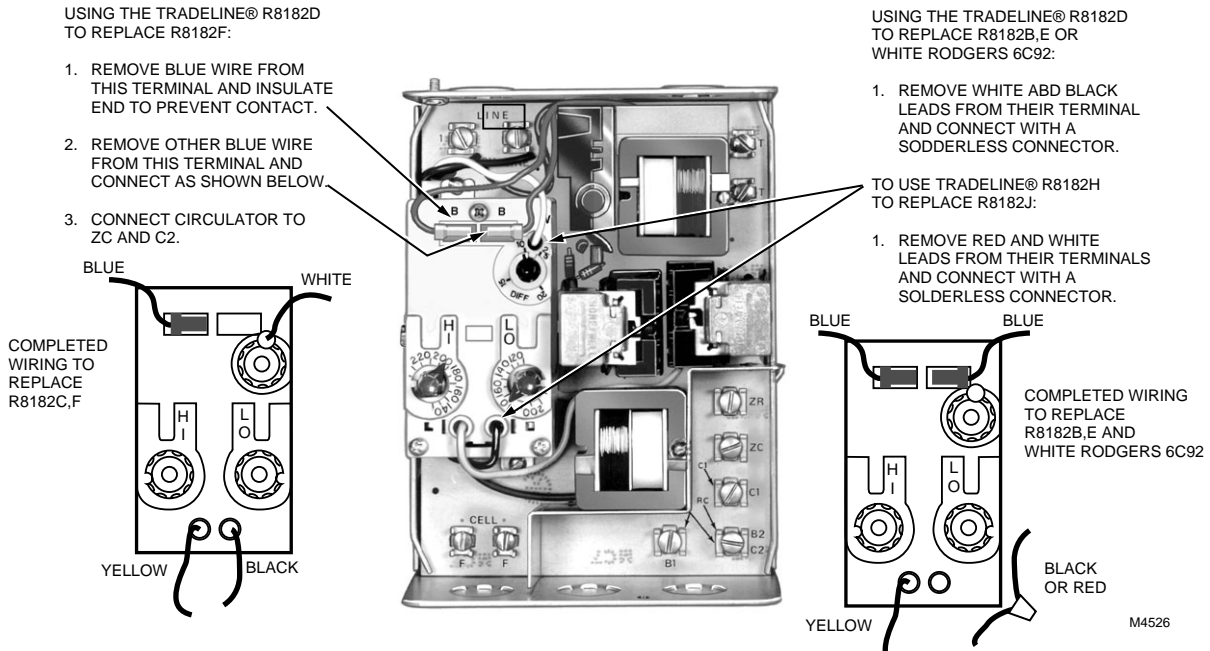
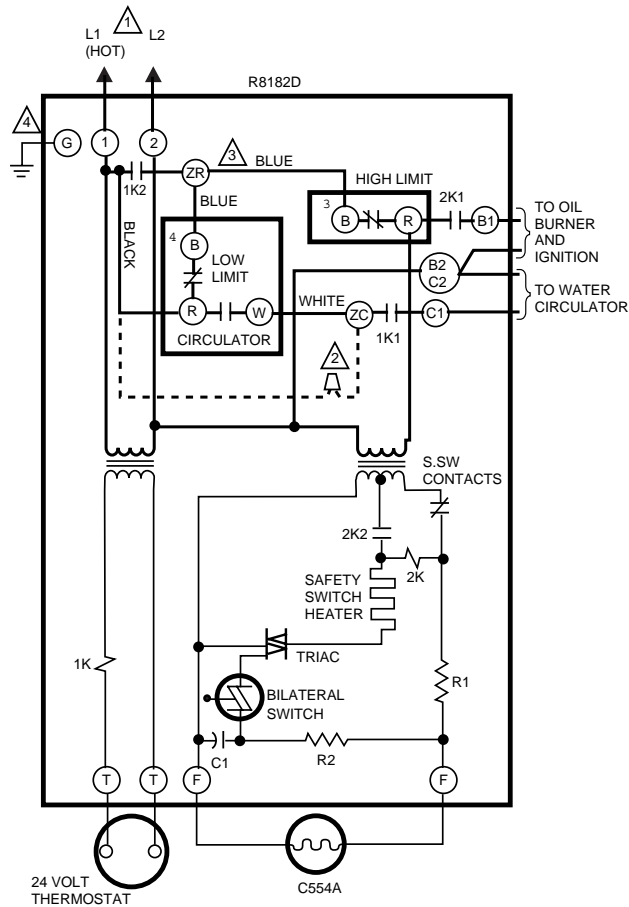


Fig. 10. Converting TRADELINE® R8182D,H to replace other controls.





- 1 120 VAC POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 WHEN THE BLACK AND WHITE WIRES ON THE TRADELINE® R8182D AQUASTAT® CONTROLLER ASSEMBLY ARE DISCONNECTED FROM THE CIRCULATOR SWITCH AND ARE INTERCONNECTED, LOW LIMIT AND CIRCULATOR CONTROL ARE BYPASSED. CIRCULATOR OPERATES WITHY THEROMSTAT ONLY.
- 3 TO REPLACE R8182C,F, REMOVE BLUE WIRE AND INSULATE END. DISCONNECT THE THE OTHER BLUE WIRE AT 4 AND WIRE TO B AT 3. WHEN CIRCULATOR IS CONNECTED BETWEEN ZC AND C2, LOW LIMIT FUNCTION IS REMOVED AND CIRCULATOR OPERATES WITH CIRCULATOR CONTROL (R TO W) ONLY.
- 4 CONTROL CASE MUST BE CONNECTED TO EARTH GROUND. USE GROUNDING SCREW PROVIDED.

Fig. 11. R8182D internal schematic and wiring diagram.

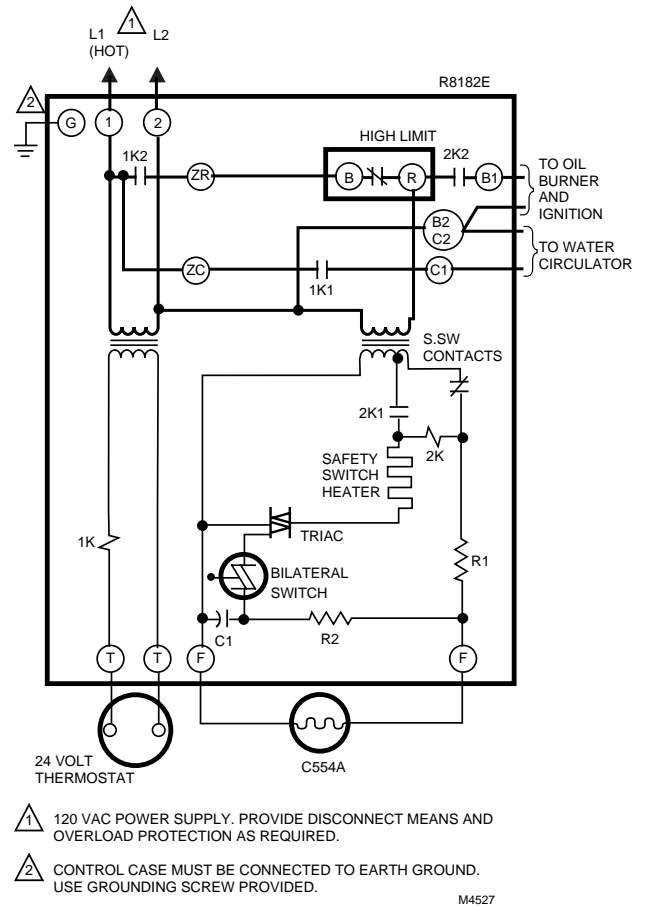
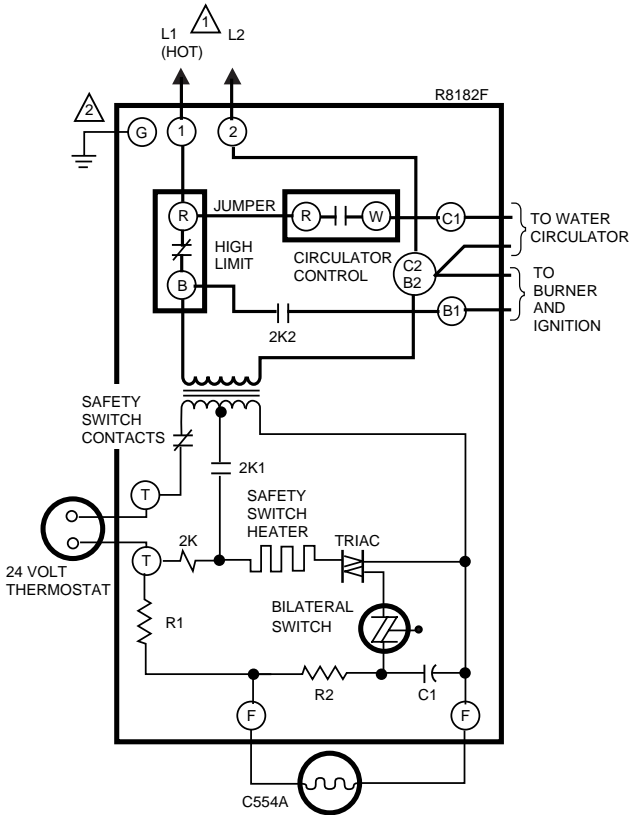


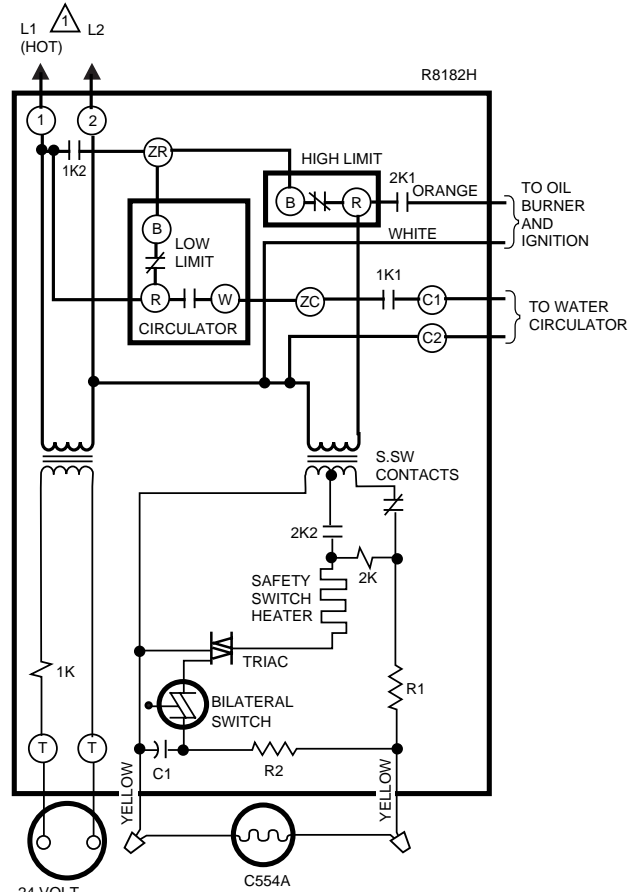
Fig. 12. R8182E internal schematic and wiring diagram.



- 1 120 VAC POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 CONTROL CASE MUST BE CONNECTED TO EARTH GROUND. USE GROUNDING SCREW PROVIDED.

M4528

Fig. 13. R8182F internal schematic and wiring diagram.



- 1 120 VAC POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

M4520

Fig. 14. R8182H internal schematic and wiring diagram.

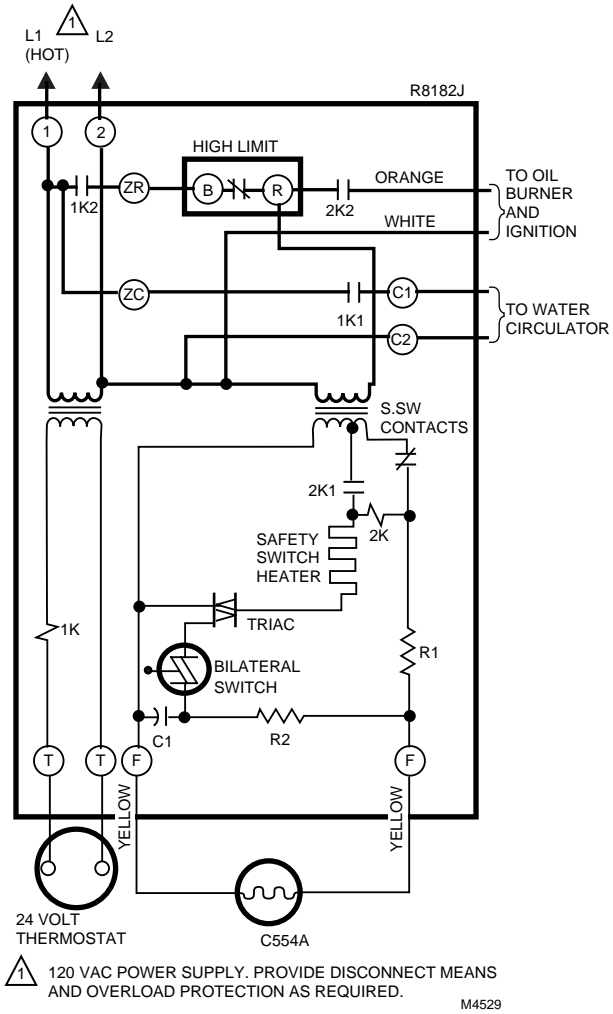
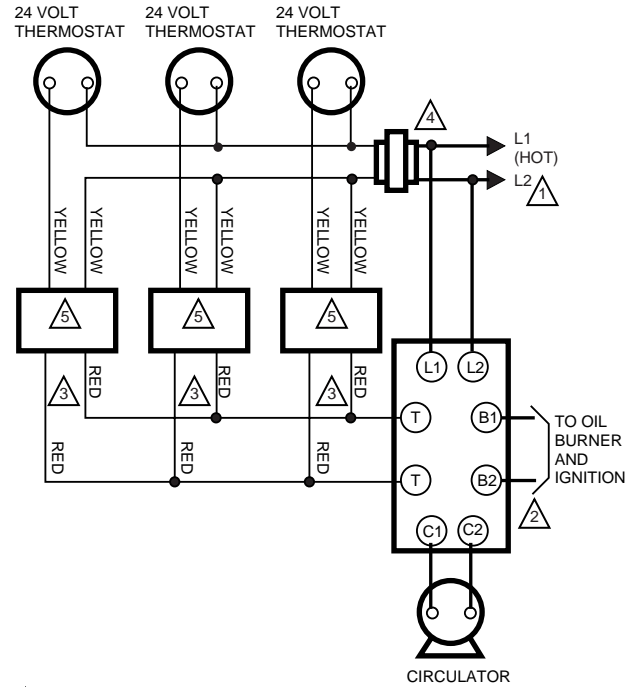


Fig. 15. R8182J internal schematic and wiring diagram.



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 R8182H AND J HAVE WHITE AND ORANGE LEADWIRES FOR OIL BURNER AND IGNITION CONNECTIONS.
- 3 RED LEADWIRES PROVIDED ONLY ON MODELS WITH END SWITCH.
- 4 CHOOSE AT72, AT87, OR AT88 TRANSFORMER TO MATCH MAXIMUM SYSTEM LOAD.
- 5 USE V8043 OR V8044 ZONE VALVES WITH AUXILIARY END SWITCH ONLY.

Fig. 16. R8182D,E,F,H and J in a typical zoning application using zone valves.

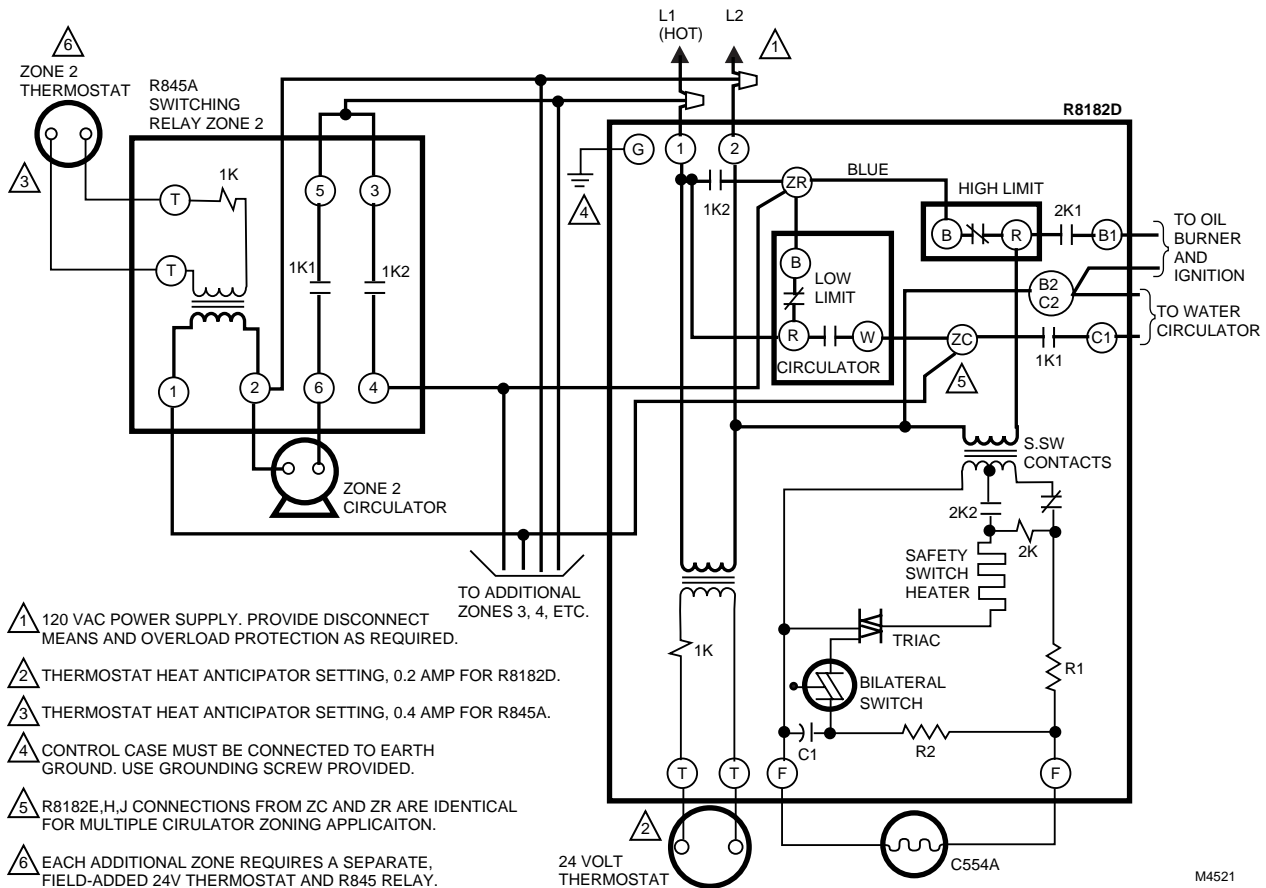


Fig. 17. R8182D and R845A in a typical multiple circulator zoning application.

## OPERATION

### R8182D

A call for heat by the thermostat pulls in relay 1K, which energizes the safety switch circuit and relay 2K to turn on the burner. Safety switch starts to heat. If burner ignites within safety switch timing, the cadmium sulfide flame detector sees flame and the safety switch heater circuit is bypassed. The burner operates until the call for heat is satisfied. The circulator operates when relay 1K pulls in only if R to W is made in the Aquastat™ limit.

When R to B (low limit) is made by a drop in water temperature, it acts as a call for heat, pulling in relay 2K to turn on the burner. The circulator cannot operate. See Fig. 11, 16, 17 and 19.

### R8182E

The burner and circulator operate whenever the thermostat calls for heat. Relay 2K pulls in. When the cadmium sulfide flame detector sees flame, the safety switch heater circuit is bypassed, and 2K is held in through 2K1. If temperature rises to a high limit setpoint, R to B breaks, shutting off the burner. The circulator continues operation under the thermostat direction. See Fig. 12, 16, 17 and 20.

### R8182F

The thermostat call for heat pulls in relay 2K to turn on the burner. When the cadmium sulfide flame detector sees flame, safety switch the heater circuit is bypassed. The circulator is independent of the thermostat circuit, being controlled only by the Aquastat™ limit switch. See Fig. 13, 17 and 20.

### R8182H

A call for heat by the thermostat pulls in relay 1K, which energizes the safety switch circuit and relay 2K to turn on the burner. The safety switch starts to heat. If the burner ignites within the safety switch timing, the cadmium sulfide flame detector sees the flame and the safety switch heater circuit is bypassed. The burner shuts Off when a call for heat is satisfied. The circulator operates when relay 1K pulls in only if R to W in the Aquastat™ limit is made.

When R to B (low limit) is made by a drop in water temperature, it acts as a call for heat, pulling in relay 2K to turn on the burner. The circulator cannot operate. See Fig. 14, 16, 17 and 18.

## R8182J

The burner and circulator operate whenever the thermostat calls for heat. Relay 2K pulls in. When the cadmium sulfide flame detector sees flame, the safety switch heater circuit is bypassed, and 2K is held in through 2K1. If temperature rises to a high limit setpoint, R to B breaks, shutting off the burner. The circulator continues operation under direction of the thermostat. See Fig. 15, 16, 17 and 19.

## Multizone Control

In all multizone applications, a call for heat in any zone energizes the safety switch circuit and relay 2K pulls in. If the burner ignites within the safety switch timing, the cadmium sulfide flame detector sees flame and the safety switch heater is bypassed.

In all multizone applications with R8182D and H, the low limit control in the Aquastat® limit acts independently to turn on the main burner on a drop in water temperature. When R to B (low limit) is made, relay 2K pulls in to turn on the main burner, the same as for single-zone application.

## Zone Circulator Control with R8182D,H

The relay for each zone is connected to the Aquastat® limit through terminals ZC and ZR. The R845 Relay and thermostat for each zone can energize the zone circulator through ZC only if R to W in the Aquastat® limit is made. If R to B (high limit) is made, the zone thermostat energizes the burner through ZR.

## Zone Circulator Control with R8182E,J

The relay for each zone is connected to the Aquastat® limit through terminals ZC and ZR. The R845A Relay and thermostat in each zone can energize the zone circulator through ZC on a call for heat. If R to B (high limit) is made, the zone thermostat energizes the burner through ZR.

## Zone Valve Control with R8182

The valve for each zone is connected to the Aquastat® limit by wiring end switches on the zone valve to T-T on the R8182. On a call for heat from any zone, the R8182 operates the same as for single zone applications.

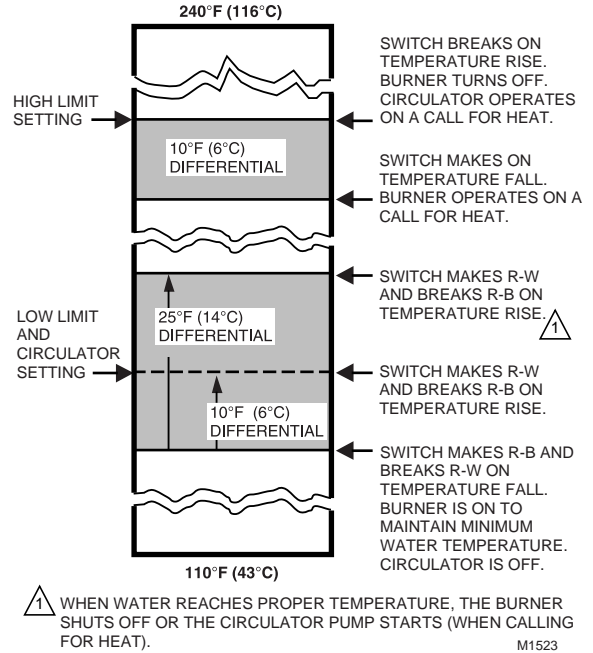


Fig. 18. R8182D,H Aquastat® limit switching.

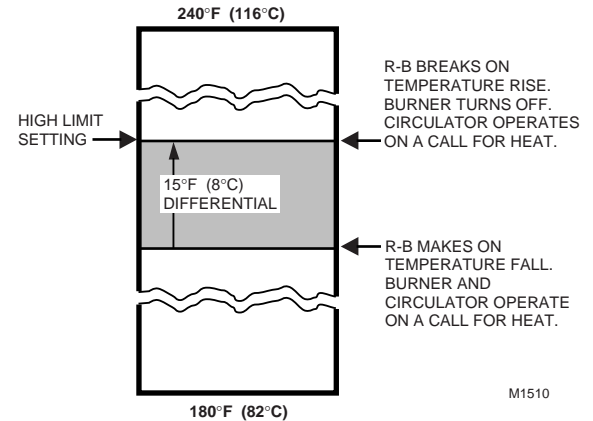


Fig. 19. R8182E,J Aquastat® limit switching.

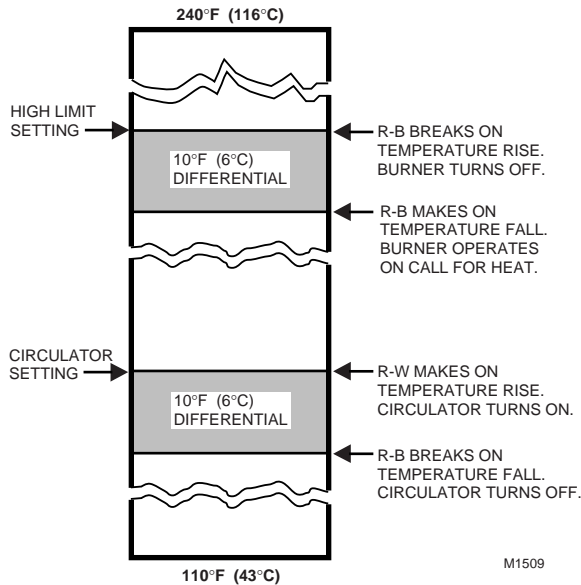


Fig. 20. R8182F Aquastat® limit switching.

## Low Limit/Circulator Setting—D And H Models

On a temperature rise, with the adjustable differential at the minimum setting of 10°F (6°C), the burner circuit (R-B) breaks and the circulator circuit (R-W) makes at the low limit setpoint. See Fig. 19. On a temperature drop of 10°F (6°C) below the setpoint, the R-B circuit makes and the R-W circuit breaks.

At any differential setting greater than 10°F (6°C), the R-B make temperature and R-W break temperature remains the same— setting minus 10°F (6°C). The R-B break and R-W make temperature are the setpoint temperature plus the difference between the differential setting and 10°F (6°C).

EXAMPLE: Setpoint of 140°F (60°C); differential set at 25°F (14°C). On a temperature rise, R-B breaks and R-W makes at 155°F (68°C). On a temperature fall, R-B makes and R-W breaks at 130°F (54°C).

Set the low limit indicator at the minimum temperature recommended for domestic hot water supply. This setting must be at least 20°F (11°C) below the high limit setting to prevent one switch from locking out the other.

Set the differential the desired number of degrees.

## STARTUP AND CHECKOUT

### ⚠ WARNING

**Explosion Hazard.**  
**Can cause severe injury, death or property damage.**  
 This product is intended for use only in systems with a pressure relief valve.

Because heating systems differ, the correct temperature setting for one system may not be correct for another. Follow the boiler manufacturers recommendations for proper selection of settings.

### High Limit Setting—All Models

The high limit opens and turns off the burner when the water temperature reaches the setpoint. The high limit automatically resets after the water temperature drops past the setpoint and through the 10°F (6°C) [15°F (8°C) with R8182E,J] differential.

Set the indicator at the desired shutoff temperature.

### Circulator Setting—F Models

Set the circulator indicator at the minimum water temperature recommended for hydronic heating comfort.

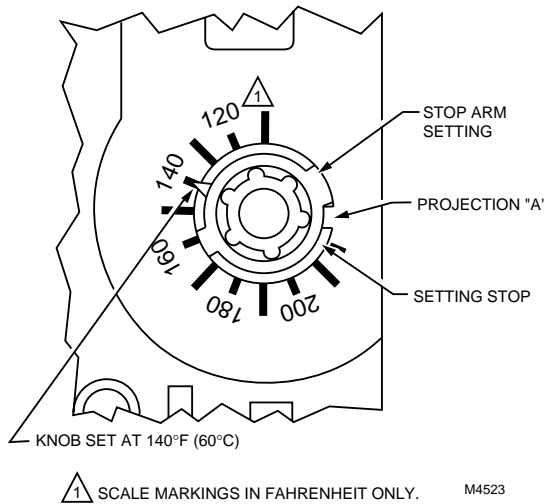
### Setting Stops (R8182D,H TRADELINE®)

Part no. 126580 Setting Stops can be installed on the low and high limit adjusting knobs to prevent turning the knobs beyond a predetermined point. To install the setting stops, proceed as follows:

#### IMPORTANT

*Once the setting stops are in place, they cannot be replaced. If they must be removed, cut off with cutters—do not twist off.*

1. On low limit knob, turn the knob to the setting that is to be established as the limit.
  2. Place the setting stop over the knob so that the arm of the setting stop (after the stop is pressed into place) strikes projection A and prevents turning the knob beyond the chosen limit setting. See Fig. 21.
  3. Press the setting stop tightly onto the knob so its inner teeth securely engage the knob.
  4. Turn knob back and forth several times to make sure stop functions properly.
  5. Repeat steps 1 to 4 for the high limit knob.
- After settings are made, replace the cover.



**Fig. 21. Setting stop in position to restrict low limit setting to 180°F (82°C) or lower.**

## Startup

### **⚠ WARNING**

#### **Explosion Hazard.**

**Can cause severe injury, death or property damage.**

Be sure combustion chamber is free of oil or vapor.

1. Push red reset button and release.
2. Open hand valve on oil supply line.
3. Set thermostat to call for heat.
4. Close line switch; burner will start.
5. Under normal conditions, burner operates until thermostat is satisfied or line switch is opened.

## MATERIAL SAFETY DATA SHEET (MSDS)

### SECTION 1. PRODUCT AND COMPANY IDENTIFICATION.

Product Name: Heat conductive compound.

MSDS ID: DS9021.

Synonyms: MS1699.

Product Use: Heat conductive material used to enhance contact and heat transfer in temperature sensor applications.

Make certain the system operates as described in the OPERATION section. Use the following procedure to verify that the Protectorelay™ burner sequencing relay is controlling properly.

### Flame Failure Check

Shut off the oil supply hand valve while the burner is on. After 45 seconds, the safety switch locks out, the motor stops, and the oil valve closes. Allow five minutes for the burner to cool, then manually reset the safety switch.

### Ignition Failure Check

Test by closing the oil supply while the burner is off. Run through the starting procedure but do not open the oil supply line hand valve. The safety switch locks out as in flame failure. Then turn the oil back on, and reset the safety switch.

### Power Failure Check

Turn off the power supply while the burner is on. When the burner goes out, restore power and the burner will restart.

NOTE: If operation is not as described, see cover insert for additional information and check wiring.

### Aquastat® Controller Replacement

The Aquastat® limit section of the Protectorelay™ control is field replaceable. When ordering a replacement assembly, specify the complete model number of the R8182.

### Replace the Aquastat® Limit

1. Disconnect power supply.
2. On all models—Note the position of the connecting wires.
3. Remove fastening screws and wires.
4. Remove Aquastat® limit and install the new assembly.

Manufacturer: Honeywell Inc., 1985 Douglas Drive North, Minneapolis, MN 55422.

Date Released: October 8, 1999.

Emergency Telephone Information: 1-888-809-3787.

NFPA Ratings:

Health 0; Flammability 1; Reactivity 0; Personal Protection B.

## Section 2. Composition, Information on Ingredients (Table 3).

Table 2. Ingredients of Heat Conductive Compound<sup>a</sup>.

Ingredients	CAS Number	Percent	PEL	TLV
No. 2 Lithium Complex Grease (70%):				
Mineral Oil	64742-65-0	35-50	5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
Mineral Oil	64742-62-7	20-25	5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
Lithium Hydrostearate/Sebacate Complex	68815-49-6	4-9	—	—
Zinc Alkyldithiophosphate	68649-42-3	0-2	—	—
Aluminum Paste (30%):				
Aluminum, as Al	7429-90-5	20-25	15 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
Aliphatic Petroleum Distillates	8052-41-3	10-15	2900 mg/m <sup>3</sup>	525 mg/m <sup>3</sup>
Stearic Acid	57-11-4	1-2	—	—
Aromatic Petroleum Distillates	64742-95-6	1-2	5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>

<sup>a</sup> Additional Information: Part No. 120650 (0.5 oz. tube); Part No. 107408 (4 oz. can); Part number 197007 (5 gallon container). May also contain minute amounts of lithium and molybdenum lubricant compounds.

## Section 3. Hazard Identification

### Acute Health Effects:

Skin—Excessive contact can cause skin irritation and dermatitis.

Eye—Direct contact with eye will cause irritation.

Inhalation—No adverse effects are expected.

Ingestion—Ingestion of product may cause nausea, vomiting and diarrhea.

### Chronic Health Effects:

Existing skin rash or dermatitis may be aggravated by repeated contact.

### OSHA Hazard Classifications:

None.

### Carcinogenicity:

Not considered to be a carcinogen by either OSHA, NTP, IARC, or ACGIH.

### Target Organs:

None known.

## Section 4. First Aid Measures

### Eye Contact:

Flush eyes with water for 15 minutes. Remove any contact lenses and continue to flush. Obtain medical attention if irritation develops and persists.

### Skin Contact:

Remove excess with cloth or paper. Wash thoroughly with mild soap and water. Obtain medical attention if irritation develops and persists.

### Ingestion:

Contact physician or local poison control center immediately.

### Inhalation:

Remove patient to fresh air and obtain medical attention if symptoms develop.

## Section 5. Fire Fighting Measures

### Flash Point:

>383°F (195°C). Will burn if exposed to flame.

### Extinguishing Media:

Carbon dioxide, dry chemical or foam.

### Special Fire Fighting Procedures:

None.

### Explosion Hazards:

None. Aluminum powder can react with water to release flammable hydrogen gas. In the form of this product, this reaction is not expected.

## Section 6. Accidental Release Measures

Scrape up and dispose as solid waste in accordance with state and federal regulations.

## Section 7. Handling and Storage

Store in dry place. Keep container closed when not in use.



## Section 8. Exposure Controls and Personal Protection

### Ventilation:

No special ventilation is required when working with this product.

### Respiratory Protection:

None required.

### Eye Protection:

Not normally required. However, use chemical safety goggles or faceshield if potential for eye contact exists, especially if material is heated.

### Hand/Clothing Protection:

Not normally required. Protective gloves and clothing are recommended, as material is difficult to remove from skin and clothing.

### Other Protective Equipment:

None required.

## Section 9. Physical and Chemical Properties

### Appearance/Odor:

Aluminum color, semi-solid material, pleasant odor.

### Solubility in Water:

Negligible.

### Specific Gravity:

0.86.

## Section 10. Stability and Reactivity

### Stability:

Stable.

### Reactivity:

Hazardous polymerization will not occur.

### Incompatibilities:

Strong oxidizing agents and halogens.

### Hazardous Decomposition Products:

Carbon dioxide, carbon monoxide.

## Section 11. Toxicology Information

No data available.

## Section 12. Ecological Information

### Chemical Fate Information:

Hydrocarbon components will biodegrade in soil; relatively persistent in water.

## Section 13. Disposal Consideration

Dispose of as solid waste in accordance with Local, State and Federal regulations.

## Section 14. Transportation Information

### DOT Classification:

Not classified as hazardous.

## Section 15. Regulatory Information

### SARA Title III Supplier Notification:

Include in Section 311/312 inventory reports if amounts exceed 10,000 pounds. Aluminum compounds are subject to the reporting requirements under Section 313 of Emergency Planning and Community Right-to-Know Act of 1986 (40 CFR 372). Ingredients listed in TSCA Inventory.

## Section 16. Other Information

This information is furnished without warranty, expressed or implied, except that it is accurate to the best of our knowledge.

### Prepared By:

PROSAR, 1295 Bandana Boulevard, Suite 335, St. Paul, MN 55108 (651-917-6100).





**Honeywell**

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**Automation and Control Solutions**

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