



WARNING LABEL PART NO. V56871  
 INSTALLED IN THIS LOCATION.  
 IF MISSING IT MUST BE REPLACED.

# Comfort-Trol®

PATENT NO'S. 4,553,733 AND 4,560,140

## Zone Control Valve

### Installation, Operation and Service Instructions

**INSTALLER:** PLEASE LEAVE THIS MANUAL FOR THE OWNER'S USE.

#### DESCRIPTION

A two wire heat motor operated valve designed for Hydronic Heating/Cooling Systems.



#### SAFETY INSTRUCTION

This safety alert symbol will be used in this manual to draw attention to safety related instructions. When used, the safety alert symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.

#### PERFORMANCE CHARACTERISTICS:

Maximum differential shut off pressure: 35 PSIG

#### WORKING PRESSURE & TEMPERATURE LIMITS (SOLDER TYPE LIMITS FOR ASTM STD. B16.18)

TYPE OF SOLDER	MAXIMUM LIMITATIONS	
	PRESSURE PSI	TEMPERATURE °F
95-5 TIN-ANTIMONY	125	240

**CAUTION:** Heat associated with the use of silver solder will damage the Comfort-Trol and void the product warranty. Use only the low temperature solder specified. Failure to follow these instructions could result in property damage and/or moderate personal injury.

**WARNING:** Solder joints will fail if used at pressures or temperatures above those listed in the above table. Do not exceed the temperature and pressure limitations. Failure to follow the above instruction can cause the joint to fail resulting in serious personal injury and/or property damage.

Maximum ambient temperature: 125°F.  
 Electrical rating: 24 Volt 50/60 Cycle, 1Ø, 15VA AC

#### THERMOSTAT

24 Volt two wire with 0.6 ampere heat anticipator setting.

#### TRANSFORMER

115/24 volt rated at 40 VA for a maximum of three Comfort-Trol Zone Valves. **Note:** This transformer must be dedicated to the Comfort-Trol Zone Valves and not be used to power any other device.



**WARNING:** Hazardous conditions could occur if the following notes are not adhered to:

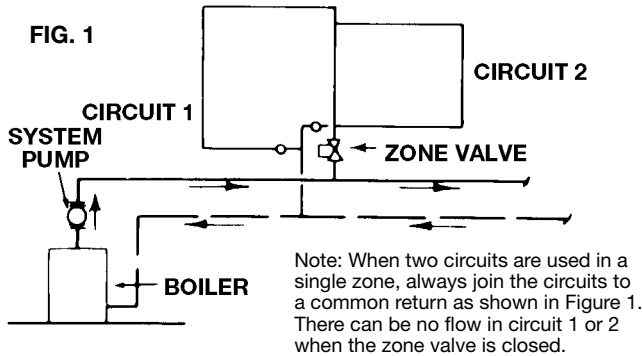
#### WARNING NOTES: READ PRIOR TO INSTALLING COMFORT-TROL

- Do not install Comfort-Trol in a dusty area or in an area where the flow of air to the operator is restricted because erratic operation or premature failure may occur.
- Use 95-5 (Tin-Antimony) solder and a good grad of flux to solder the Comfort-Trol valve body into the system.
  - NOTE:** a. Remove the brass bonnet and retainer assembly from the valve body before applying heat to the body. Failure to do so will damage the valve seals and discs.
  - b. Excessive use of solder in a vertical installation may result in damage to the valve seat.
  - c. Avoid excessive use of flux.
  - d. Heat associated with the use of silver solder may damage the Comfort-Trol.
- Do not install a jumper wire between terminals #1 and #2 because the thermostat heat anticipator may burn out when the Comfort-Trol operator is energized.
- Keep external wiring from contacting the Comfort-Trol operator cover by securing the wiring to a nearby support.
- Use only silicone grease to lubricate the valve gland pin and O-ring seals. Do not use lubricants with a petroleum base. The use of a petroleum base lubricant will cause swelling and failure of U-rings.
- Do not insulate the Comfort-Trol Zone Valve Operator.
- Use of additives to the system may be harmful to the Comfort-Trol.

Failure to follow these instructions could result in serious personal injury or death and property damage.

## INSTALLATION INSTRUCTIONS

The B&G Comfort-Trol Zone Valve can be installed horizontally or vertically. However, the following precautions should be taken: When installing the valve in a vertical position, the electrical connections must be at the top of the operator. On chilled water applications the operator should be above the pipe centerline. If the valves are installed near the boiler, locate them a sufficient distance from the breeching so they are not affected by flue temperatures.



1. Remove the brass bonnet and retainer assembly from the valve body as shown in Figure 3.

**NOTE:** Model with flare connectors can be left assembled if Comfort-Trol is removed from piping before soldering connectors in place.

2. Solder the valve body into position with the arrow on the body pointing downstream.
  - a. Clean the tube ends and Comfort-Trol valve body connections thoroughly.
  - b. Use 95-5 (Tin-Antimony) solder, a good grade of flux and a torch with a sharp pointed flame.

**WARNING:** Damage to Comfort-Trol body or bonnet may occur from improper installation, which can cause leakage or failure of Comfort-Trol.

- a. Avoid excessive use of flux and solder when installing Comfort-Trol in a vertical position because damage to the valve seat may occur.
- b. When soldering the joints, direct the flame with care to avoid subjecting the valve body to excessive heat.
- c. Allow the valve body to cool below 100°F before installing the bonnet and retainer assembly.

Failure to follow these instruction could result in serious personal injury or death and property damage.

3. Insert the bonnet assembly with retainer into the valve body and secure with the two retaining screws. Be careful not to damage the O-ring seal when inserting the bonnet assembly (Fig. 3, Item A). If a lubricant is required, apply silicone grease to the bonnet assembly below the retainer. Do not use lubricants with a petroleum base.

## OPERATING INSTRUCTIONS

The Comfort-Trol is opened by a heat motor, therefore, there is approximately a two minute period between the time the thermostat closes, calling for heat, and the time the Comfort-Trol opens. As long

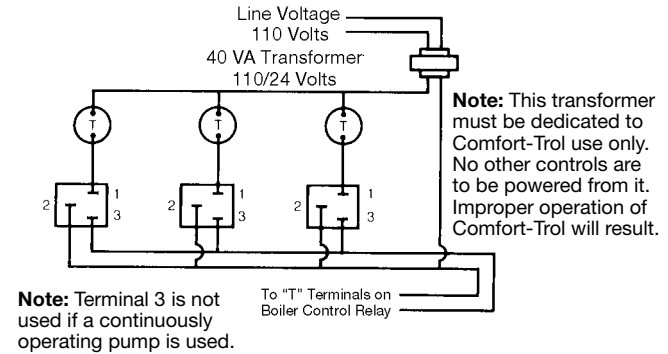
## MANUAL OPERATION

A power failure may necessitate manual operation of the Comfort-Trol. If required, please follow these instructions:

1. Turn the switch bringing power to the Comfort-Trol operator to the OFF position.
2. Squeeze the two formed wire release tabs together and lift up to remove the operator. See Figure 3.
3. The valve is now fully open and will allow gravity circulation through the system.

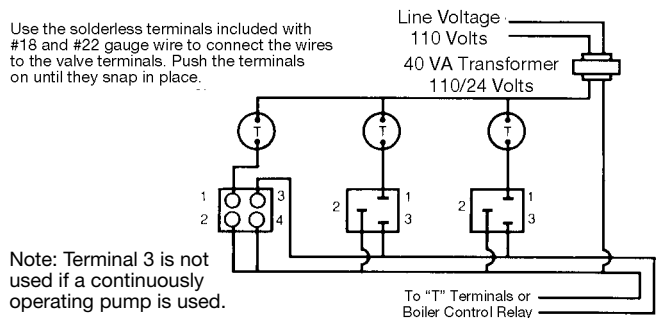
4. Check solder connections for leaks. If resoldering is needed, remove the bonnet assembly and resolder.
5. Assemble the Comfort-Trol operator onto the valve body (the operator can be rotated 360° after it is installed) by pushing down on the operator until the wire retainers into the operator frame (Fig. 3, Item E) snap into the retaining groove on the brass bonnet (Fig. 3, Item C).
6. Electrically wire the Comfort-Trol to the system as described in one of the following wiring diagrams.

**CAUTION:** Transformer overload. Do not wire more than three Comfort-Trol or Modumate Zone Control Valves to one 40 VA Transformer. Failure to follow these instructions could result in property damage and/or moderate personal injury.



**FIGURE 2A**  
1, 2 OR 3 COMFORT-TROLS – SINGLE TRANSFORMER  
INTERMITTENT PUMP OPERATION

**IMPORTANT:** Figure 2B is correct only when the ModuMate was wired per factory recommendations.



**FIGURE 2B**  
COMFORT-TROL AND MODUMATE WIRED  
TO THE SAME TRANSFORMER  
INTERMITTENT PUMP OPERATION

as heat is required, the Comfort-Trol is kept in the open position by a built in control switch, which meters small amounts of electricity to the Comfort-Trol heat motor. When the thermostat opens, indicating that the need for heat has been satisfied, a return spring in the Comfort-Trol slowly closes the Comfort-Trol.

**NOTE:** After power is restored, return the Comfort-Trol to normal operation by:

1. Assembling the operator to the valve by installing the operator over the bonnet assembly and pressing down until the wire form tabs both engage the slots on the bonnet assembly. This is the reverse of the process used to remove the operator from the Comfort-Trol. Do not squeeze the two formed release tabs when reassembling the operator to the Comfort-Trol.
2. Turn the power switch for the Comfort-Trol to the ON position.

## SERVICE INSTRUCTIONS

Comfort-Trol Zone Control Valves are designed for fast and easy maintenance with a standard screwdriver and pliers. It is recommended that the Comfort-Trol be inspected periodically for signs of leakage, corrosion or other damage.

**WARNING:** Corrosion or leakage are indications that the Comfort-Trol may be about to cause serious damage from leakage or rupture. It should be periodically inspected and if noted the Comfort-Trol must be serviced or replaced. Failure to follow these instructions could result in serious personal injury or death and property damage.

The exploded view of the Comfort-Trol in Figure 3 will aid in performing service or maintenance.

To inspect and service the Comfort-Trol follow the steps listed below:

**CAUTION: Burn Hazard.** Turn off the power to the Comfort-Trol and allow Comfort-Trol operator to cool to 100°F or less. This could take 10 to 30 minutes or longer depending on the ambient temperature. The heat motor is surrounded by an electrical heater which can become very hot so care needs to be exercised to avoid being burned. Failure to follow these instructions could result in property damage and/or moderate personal injury.

1. Identify the power leads (#1, #2 and #3 as shown in Fig. 2), and disconnect them by pulling them off the blade type connectors.
2. Remove the Comfort-Trol operator by squeezing the formed wire release tabs (Fig. 3) together and lifting up.
3. Remove the operator cover by spreading the cover at the bottom to disengage the locking tabs and lifting up.
4. The following components can now be inspected and replaced if required.

### A. Seal Kit

In examining the valve seat at the top of the bonnet (Fig. 3, Item B), look for evidence of leakage around the stem and on the underside of the knurled head. If there is an indication of leakage, replace the seal. Failure to replace the seal may cause erratic valve operation resulting in failure of the valve to open. Comfort-Trol is a backseating valve which permits replacing the seal without draining the system. Using a pliers, loosen and remove the seal. Carefully insert the replacement seal kit without disturbing the spring loaded valve disc (Fig. 3, Item D) or system fluid may be discharged from the valve.

**WARNING:** Accidental discharge of hot water fluid. Do not jar or move the valve disc during replacement of the Seal Kit. Backseating of valve disc is by spring load only. Failure to follow these instructions could result in serious personal injury or death and property damage.

Tighten the seal kit, without excessive force, until it is reasonably secure.

## INSTRUCTIONS FOR REPLACING THE HEAT MOTOR

Two versions of the operator frame can be encountered. The design is identical except for a heat motor access hole at the switch end of the frame.

### UNITS WITH HEAT MOTOR ACCESS HOLE

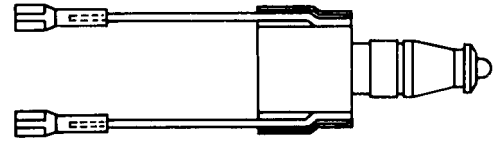
1. Turn off power to the Comfort-Trol operator.
2. Disconnect power leads from the blade switch terminals.

**WARNING: Burn Hazard.** Do not touch the heat motor until it has cooled to 100°F or less. This could take 10 to 30 minutes or longer depending on the ambient temperature. It is heated by an electrical heater which can become very hot. Failure to follow these instructions could result in serious personal injury or death and property damage.

3. If the valve cover has cooled sufficiently, remove it by spreading the cover at the bottom to disengage the locking tabs and lifting up.



SEAL KIT  
V01371



HEAT MOTOR KIT  
V01370  
189137 (CARTON OF 6 V01370)

### B. Heat motor (power pill with heater)

The large end of the heat motor is wrapped with a black material which secures the heater element to the power pill. The normal color of the power pill under the heater is copper. If it turns gray or black and there appears to be leakage around the piston, replace the heat motor. See the instructions for replacing the heat motor.

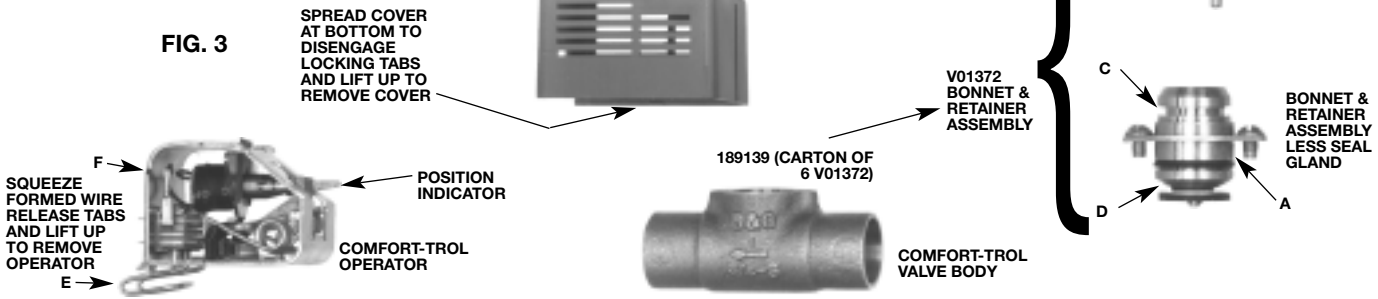
### C. Operator

If the heat motor or switches have failed the entire operator may be replaced rather than replacing the components. This is accomplished by simply placing a new operator on the valve body and pressing down until the wire retainers inside the operator frame (Fig. 3, Item E) snaps into the retaining groove on the brass bonnet (Fig. 3, Item C).

5. After servicing the Comfort-Trol, follow the steps below to return it to operation.
  - a. Replace the cover on the Comfort-Trol operator so that the wide section of the operator frame at the switch end of the operator (Fig. 3, Item F) slips between the end cover and the raised guides located inside and on both sides of the cover. Push down on the cover until the two 3/16" long raised tabs at the bottom of the cover lock over the underside of the operator.
  - b. Assemble the Comfort-Trol operator onto the valve body (the operator can be rotated 360° after it is installed) by pushing down on the operator until the wire retainers inside the operator frame (Fig. 3, Item E) snap into the retaining groove on the brass bonnet (Fig. 3, Item C).
  - c. Reconnect terminal leads #1, #2, and #3 as required by pushing the connectors onto the blade terminals until the locking catch snaps into place.
  - d. Restore power.

**WARNING:** Do not insert screwdrivers or other objects into the operator body to pry the cover off. Movement in the leaf springs will cause the operator to lose calibration and will cause a failure in the Comfort-Trol.

4. Disconnect the heater leads at the solderless terminals on the switch inside the operator (Fig. 4, Item 1).
5. Remove retaining clip (Fig. 4, Item 9).
6. Pull heat motor thru access hole.
7. Replace the heat motor with a V01370 replacement heat motor and secure in place with the retaining clip.
8. Reattach the heater leads to the solderless terminals on the switch assembly (Fig. 4, Item 1), making sure the leads do not contact the operator frame.
9. Replace cover.
10. Restore power.



### UNITS WITHOUT HEAT MOTOR ACCESS HOLE

1. Turn Off power to the Comfort-Trol operator.
2. Disconnect power leads from the blade switch terminals.

**CAUTION: Burn Hazard.** Do not touch the heat motor until it has cooled to 100°F or less. This could take 10 to 30 minutes or longer depending on the ambient temperature. It is heated by an electrical heater which can become very hot. Failure to follow these instructions could result in property damage and/or moderate personal injury.

3. If the valve cover has cooled sufficiently, remove it by spreading the cover at the bottom to disengage the locking tabs and lifting up.

**WARNING:** Do not insert screwdrivers or other objects into the operator body to pry the cover off. Movement in the leaf springs will cause the operator to lose calibration and will cause a failure in the Comfort-Trol.

4. Disconnect the heater leads at the solderless terminals on the switch assembly inside the operator (Fig. 4, Item 1).
5. The operating spring (Fig. 4, Item 2) is under load and requires caution when unloading it. Disconnect the spring legs from the lever by alternately gripping the legs with a pliers (be careful not to score the spring with the pliers) and forcibly lift them out of their notch on the lever (Fig. 4, Item 4) lowering them to the frame. In this position the spring legs will rest on the operator frame outside of the coated ends of the lever (Fig. 4, Item 3).
6. Disengage the switch plate locking feature (Fig. 5, Item 5) by placing a common screwdriver under the bottom of the overlapping tab and lifting up.

**CAUTION:** Disassembly of the Comfort-Trol Operator will likely cause the operator to come out of calibration. Replacement of the power pill should be done by a professional with proper calibration equipment.

7. Before disassembling the operator, note the position of the bottom of the heat motor retaining bracket to the coated ends of the operating lever (Fig 4, Item 10).
8. Remove the heat motor and bracket assembly.
9. Rotate the heat motor until the notch in the side of the unplated retaining clip is exposed beyond the plated bracket. Remove the retaining clip by placing a common screwdriver in the notch and twisting the screwdriver until the retaining clip pops off.
10. Replace the heat motor with a V01370 replacement heat motor. The small end of the heat motor must point in the same direction as the two support legs near the bottom of the plated bracket. Secure the heat motor by attaching the unplated retaining clip to the heat motor (Fig. 4, Item 6) on the side of the plated bracket opposite the large end of the heat motor.

11. Raise the coated ends of the lever, position the heat motor and bracket assembly so that the small end of the heat motor appears in the cutout of the main operator assembly (Fig. 4, Item 7) and the heat motor bracket support legs are situated under the coated ends of the lever (Fig. 4, Item 10).
12. Attach the switch plate assembly by sliding the side of the assembly to which the switch is attached between the formed wire release tabs and the main operator assembly until the locking tabs engage the slots in the switch plate assembly.
13. Complete assembly of the Comfort-Trol operator by closing the switch plate assembly to the main operator assembly and noting the following:
  - a. The two pins or screws under the switch must engage the two holes in the bottom of the main operator assembly.
  - b. The finger on one coated end of the lever must be situated between the two contact arms on the switch (Fig. 4, Item 11).
  - c. The tab at the bottom of the heat motor retaining bracket must be seated in the mating seat slot on the bottom of the main operator assembly (Fig. 4, Item 8).
  - d. The top of the heat motor retaining clip must be in the top vertical position (Fig. 4, Item 9).
  - e. The spring legs must be outside the coated ends of the lever (Fig. 4, Item 3).
14. Squeeze both sections of the operator together until the locking tabs at the top of the switch plate assembly lock over the mating tab section at the top of the main operator assembly (Fig. 4, Item 5).
15. Attach the heater leads to the solderless terminals on the switch assembly inside the operator (Fig 4, Item 1), making sure the leads do not contact the operator frame.
16. Load the valve spring by alternately gripping the legs with a pliers (be careful not to score the spring with the pliers) and forcibly lifting them off the frame and placing them in their notch in the lever (Fig. 4, Item 4).
17. Replace the cover by placing the cover on the operator so that the wide section of the operator frame at the switch end of the operator (Fig 3, Item F) slips between the end of the cover and the raised guides located inside and on both sides of the cover. Push down on the cover until the 3/16" long raised tabs at the bottom of the cover lock over the underside of the operator.
18. Connect power leads to the blade terminals on the Comfort-Trol operator by pushing the connectors onto the blades until the locking catch snaps into place.
19. Restore power.

