

COMPACT ZONE VALVES

2-WIRE, 2-WAY

For use on systems up to 142 PSI

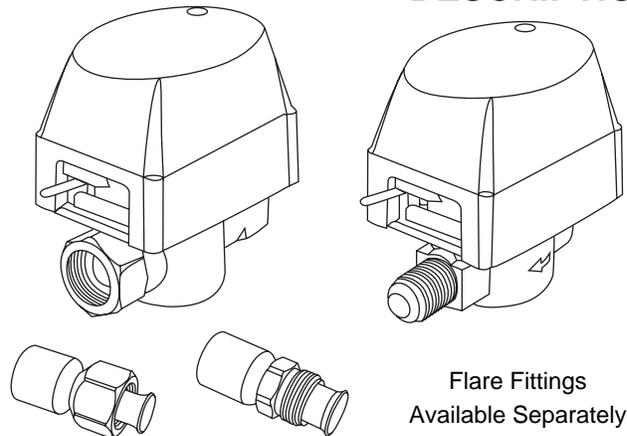
INSTALLATION INSTRUCTIONS

Operator: Save these instructions for future use!

FAILURE TO READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY BEFORE INSTALLING OR OPERATING THIS CONTROL COULD CAUSE PERSONAL INJURY AND/OR PROPERTY DAMAGE.

The compact zone valves are 2-way straight through, available as a normally open or normally closed valve. The zone valves come with or without a SPST normally open auxiliary switch and feature a swing-type ball valve, which is designed to rotate which causes the ball plug to seat on a different section of its surface on each closing. They are available in several piping options, sweat, NPT, inverted flare and flare fitting end connections for standard copper tubing, for use with 2-wire thermostats. These zone valves provide a low cost system of zoned temperature control wherever hot water is the heating medium. In new construction, the piping system can be laid out to produce any number of independent temperature controlled zones by use of these valves. In existing buildings, a variety of zone combinations can be obtained, depending on the particular piping layout. Each zone requires one zone valve and one thermostat, but only one circulator is normally required for the entire system.

DESCRIPTION



This compact zone valve is intended for use with a low voltage system; do not use this zone valve with a millivolt or line voltage system. If in doubt about whether your wiring is millivolt, line or low voltage, have it inspected by a qualified heating contractor or electrician.

Do not exceed the specification ratings.

All wiring must conform to local and national electrical codes and ordinances.

PRECAUTIONS

CAUTION

To prevent injuries from scalding always drain system before installing or removing valve. To avoid gear damage operate lever slowly.

WARNING

Do not use on circuits exceeding specified voltages. Higher voltages will damage control and could cause shock or fire hazard.

All guarantees are void if these specifications are exceeded.

SPECIFICATIONS

Maximum System Pressure: 142 PSI

Differential Across Valve: 20 PSI

Maximum Water Temperature: 230°F

Minimum Water Temperature: 41°F

Maximum Ambient Temperature: 140°F

Approx. Time Cycle: 10 seconds from full close to full open;
4 seconds from full open to full close.

Electrical Rating:

Valve motor – 0.35A @ 25VAC, 50/60 Hz., 6 W nominal

Auxiliary switch: 3.0A Max. @ 25VAC

Thermostat: Use two-wire heating thermostat, .35A heat anticipation is required.

Flow Coefficient - Cv Rating:

1/2" valves – 3.5 Cv (3.0 Kv)

3/4" valves – 3.5 Cv (3.0 Kv)

1" valves – 3.5 Cv (3.0 Kv)

MOUNTING POSITIONS:
Upright or 0° to 90° from upright

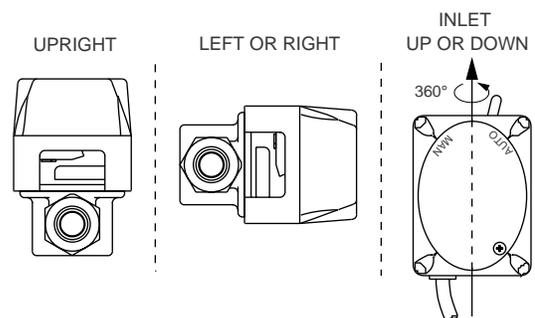


Fig. 1 Zone valve mounting positions

OPERATION

The schematic drawing Fig. 2 is for a normally closed valve. As shown, the valve is closed and the thermostat is satisfied. When the thermostat closes its contacts, the valve begins to open as a circuit is made from the transformer to the motor and thermostat, back to the transformer. Shortly after the valve begins to open, the auxiliary switch closes (providing a low voltage auxiliary circuit for starting burner and/or circulator). After an elapsed time of about 10 seconds, the valve reaches the full open position. The valve motor now remains energized to keep the valve in the open position. When the thermostat is satisfied, the circuit through the valve motor is broken and a return spring begins to close the valve. Just before the valve reaches the closed position, the auxiliary switch opens to stop burner and/or circulator.

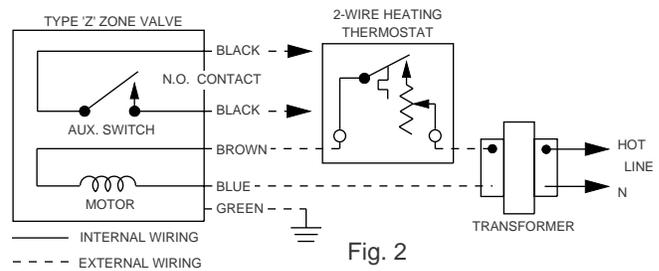


Fig. 2

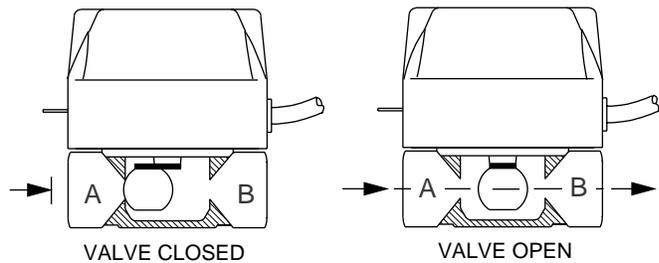
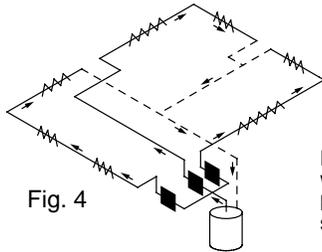


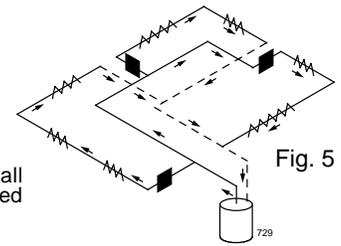
Fig. 3 Operation for normally close (N.C.) valve

PIPING



PLAN 1
Water valves installed at the boiler header to provide a separate supply to each zone.

The two most commonly used piping systems are shown below. Plan 1 is popular for new installations, while plan 2 is frequently used when converting two-pipe systems.



PLAN 2
A common main supplies all zones, with a water valve installed on the riser to each zone.

INSTALLATION

ALL GUARANTEES ARE VOID IF THE VALVE IS NOT ASSEMBLED ACCORDING TO THESE INSTRUCTIONS.

1. Disconnect electric power before connecting wiring to prevent electrical shock or equipment damage.
2. Select suitable valve location. Valve may be installed in any position, except upside down. The arrow on the side of the body indicates direction of flow through the valve. ("A" is inlet, "B" is outlet)
3. Mount valve directly in the tube or pipe, as follows:

NOTE

For normally closed (N.C.) models, with sweat fittings, set the manual lever to the "MAN" position before applying heat to the fittings. This will protect the plug ball inside the valve by removing it from the seat. After installation, place manual lever in the "AUTO" position.

Flare fitting models

Use new, properly reamed pipe, free from chips. The valve body is threaded for standard 5/8 in. OD copper, 45° SAE flare-fitting nuts. These nuts are not furnished with the valve and must be obtained separately.

Sweat copper models

Use new, properly reamed pipe, free from dents or corrosion. Sweat the joints, keeping the outer surface free from solder. DO NOT use silver solder because of the high melting temperatures required.

NPT pipe models

Use new pipe that is properly chamfered, reamed and free of burrs and chips. If using old pipe, be sure it is clean and free of rust, scale, burrs, chips and old pipe joint compound.

Apply pipe joint compound or teflon tape, only to the male threads of the pipe joint. **DO NOT** apply compound or teflon tape to the first two threads. If using a vise or open-end wrench to hold the valve while installing piping, do not tighten excessively, as this may damage the valve.

4. Support piping with a pipe hanger on each side of valve.

WIRING

All wiring should be done according to local and national electrical codes

Follow any specific wiring instructions provided by the boiler manufacturer. If none are supplied, the following diagrams offer typical wiring installations using 2-wire heating thermostats (.35A Heat-Anticipation) and other related controls.

A 40VA Transformer will handle up to 4 zone valves. A 20VA will handle up to 2 zone valves.

All wiring should be done according to local and national electrical codes

DIAGRAMS FOR SYSTEMS WHERE BURNER AND CIRCULATOR OPERATION IS INDEPENDENT OF THERMOSTATS

Fig. 6 Zone Valve (N.C.)

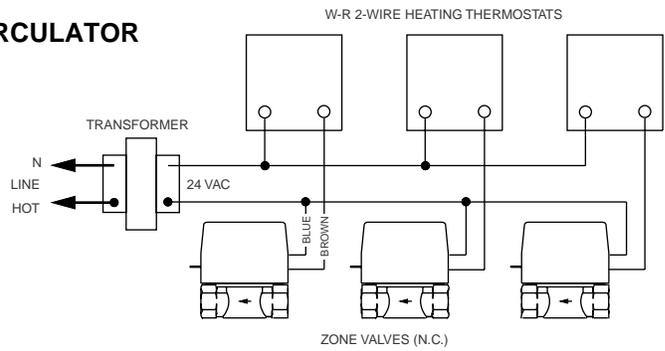


DIAGRAM FOR SYSTEMS WHERE INTERNAL TRANSFORMER OF RELAY CONTROL SUPPLIES POWER FOR ZONE VALVES

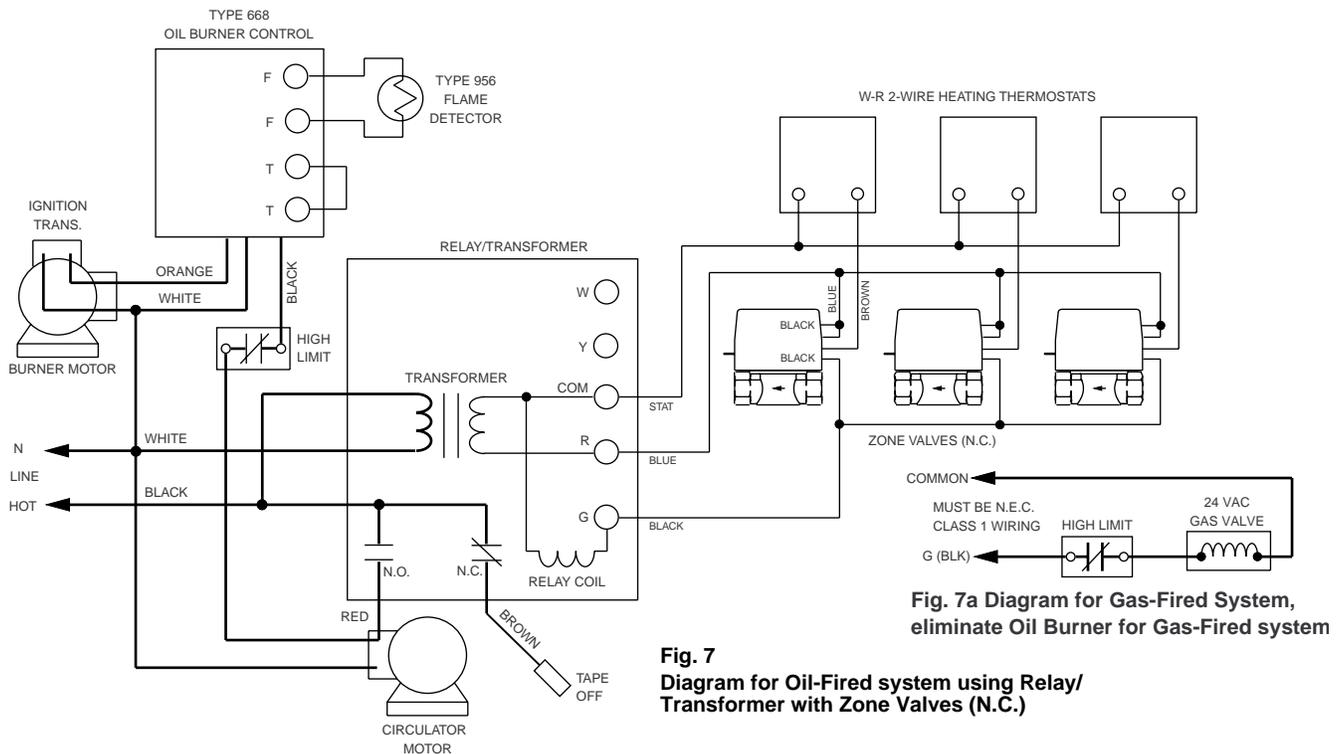


Fig. 7
Diagram for Oil-Fired system using Relay/
Transformer with Zone Valves (N.C.)

DIAGRAMS FOR SYSTEMS WHERE EXTERNAL TRANSFORMER REQUIRED FOR POWERING FOR ZONE VALVES

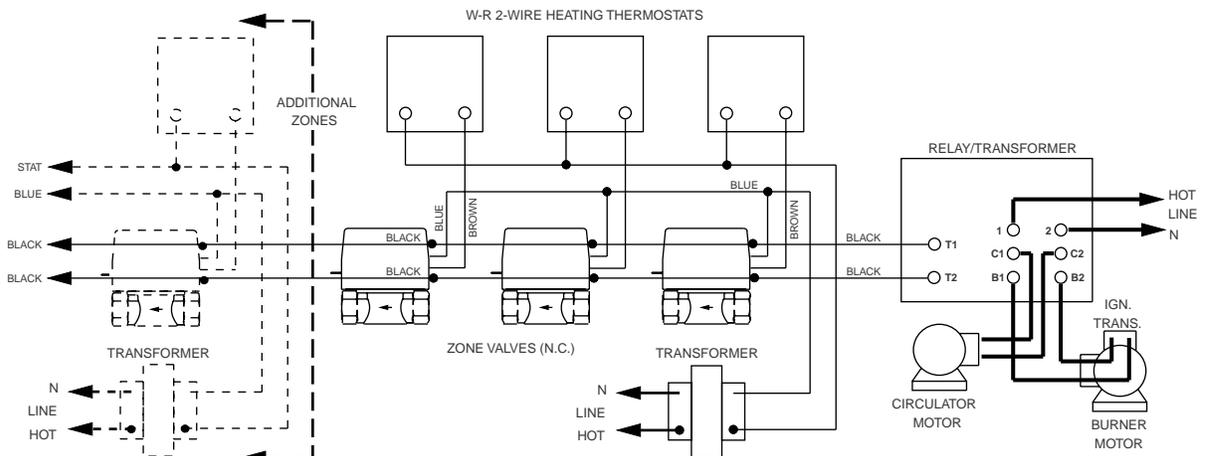
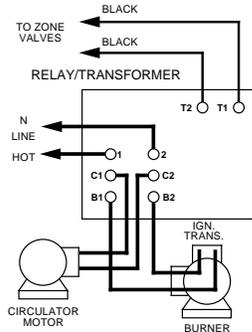


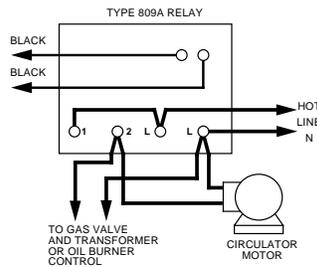
Fig. 8
Diagram for System using Relay/transformer
with Zone Valves (N.C.)

WIRING (Continued)

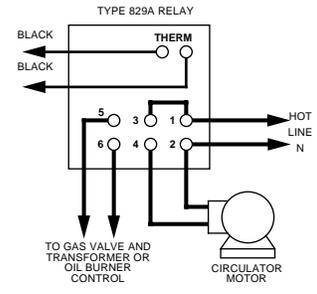
DIAGRAMS FOR SYSTEMS WHERE EXTERNAL TRANSFORMER REQUIRED FOR POWERING FOR ZONE VALVES



Alternate Connections For Relay/Transformer



Alternate Connections For Type 809A Relay



Alternate Connections For Type 829A Relay

OPERATION

Automatic (AUTO) (N.C. valve) (Fig. 9)

On a call for heat by the thermostat, the valve opens and its auxiliary contacts close, providing a low voltage auxiliary circuit for starting the burner and/or circulator. After an elapsed time of about 10 seconds, the valve reaches the full open position. The valve motor now remains energized to keep the valve in the open position. When the thermostat is satisfied, the valve closes by its integral return spring. The auxiliary contacts open, de-energizing the auxiliary circuit.

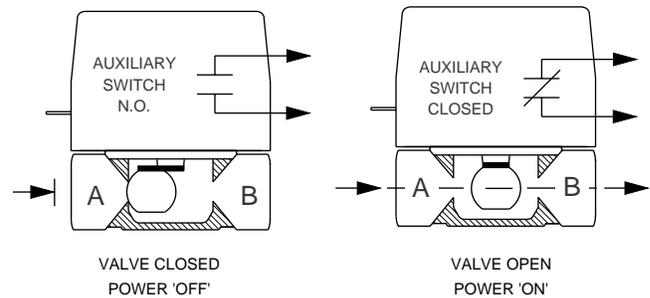


Fig. 9 Normally close (N.C.) zone valve

Manual (MAN) (Fig. 10)

Use manual lever in case of power failure or for servicing the system. If power fails while valve is open, valve will return to the closed position. To manually open the valve, move the manual lever to the "MAN" position and lock in place. The valve will return to the "AUTO" position when the valve is electrically energized. The auxiliary contacts close in the "MAN" position. The manual lever is not operational on normally open (N.O.) valve models.

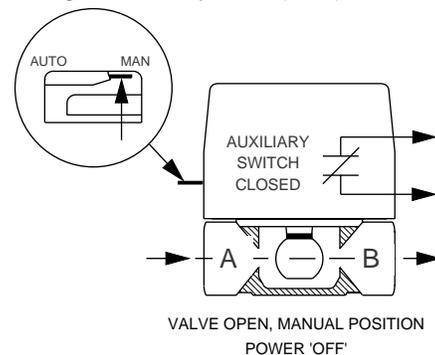


Fig. 10 Manual operation of normally close (N.C.) valve

Normally open models (N.O.) (Fig. 11)

A normally open valve operates opposite to a normally closed valve. It is open in the de-energized position and closes when the valve is energized. A reverse-acting (close-on-rise) thermostat is required to control a normally open (N.O.) valve.

CHECKING THE SYSTEM

Turn on the electricity. If gas fired, be sure pilot is lit. Then check **each zone separately** as follows:

1. Turn thermostat to highest setting. Zone valve for that zone will open and furnace burner will come on as auxiliary circuit is made on valve motor.
2. Turn thermostat to lowest setting. Zone valve for that zone will close and furnace burner will shut off as auxiliary circuit is broken on zone valve.

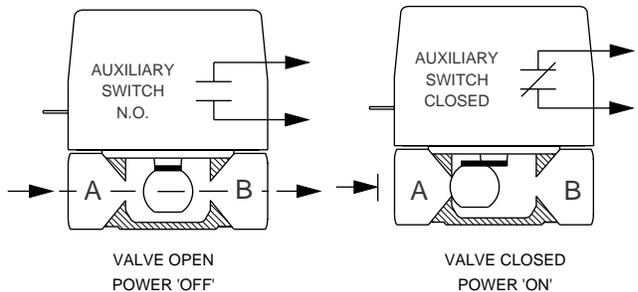


Fig. 11 Normally open (N.O.) zone valve