FLAIR ZONE VALVES VJ, VK, VA SERIES

FIELD SERVICE MANUAL

FLAIR MANUFACTURING CORP.
HAUPPAUGE, L.I., N.Y. 11787 ■ 516-234-3600

BULLETIN No. 8873
SUPERCEDES 5242

INDEX

TEST PROCEDURE FOR THE ZONE VALVE OPERATOR

To avoid damaging the motor, remove the wire from #1 terminal before lifting motor from mounting plate.

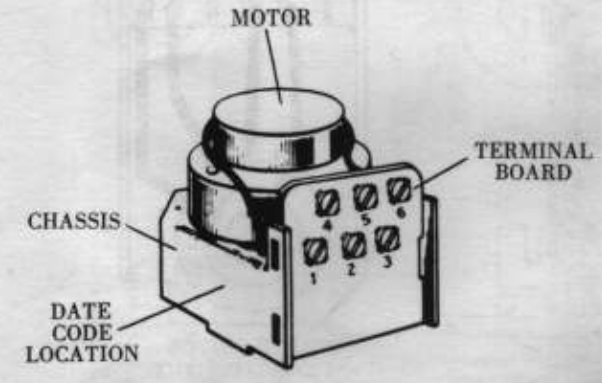
Perform all tests with 24V power supply connected to terminals #1 and #2 with the operator removed from the valve stem and body. (A blue spark should appear when terminals #1 and #2 are momentarily jumped.)

1. Check for and repair any broken or shorted wires.
2. Check motor for manual rotation. Drive SHOULD NOT be able to rotate. (Do not use tools.)
3. Check for a worn, damaged, or excessively dirty wafer switch.
4. Check for obsolete motor. (See Fig. 2.)

If the operator has a broken or worn wafer switch, a drive that rotates manually or an obsolete motor, IT MUST BE REPLACED!

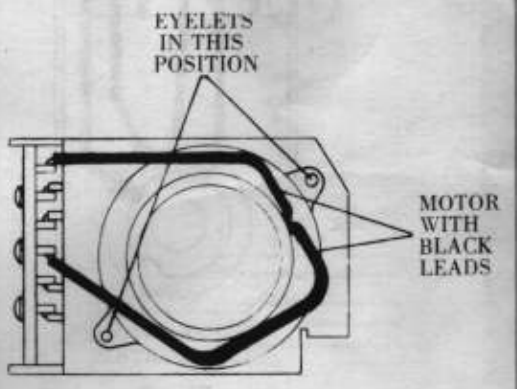
If wafer switch is excessively dirty, spray with an electrical contact cleaner. (Do not use abrasives.)

(Continued on Page 4)



WAFER SWITCH, DRIVE AND RELAY (WHEN USED) LOCATED UNDER CHASSIS.

FIG. 1



OBSOLETE MOTOR

FIG. 2

NOTE:

If the captive screws are supplied with Replacement Parts, be sure to install as shown in instructions.

THREE WIRE MODELS ONLY

5 Remove thermostat wires from terminals #4, #5, and #6 at the operator.

6 Jump terminals #4 and #5 for approximately 1 minute, the wafer switch should rotate to an open position and stop. Fig. 3

7 Jump terminals #5 and #6 for approximately 1 minute, the wafer switch should rotate to a closed position and stop. Fig. 4

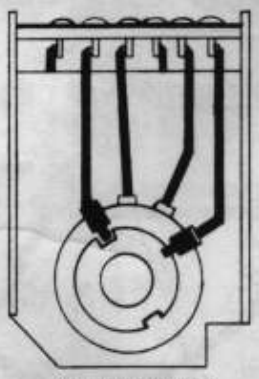
TWO WIRE MODELS ONLY

8 Remove thermostat wires from terminals #4 and #5 at the operator.

9 Jump #4 and #5 terminals for approximately 1 minute, the wafer switch should rotate to an open position and stop. Fig. 3

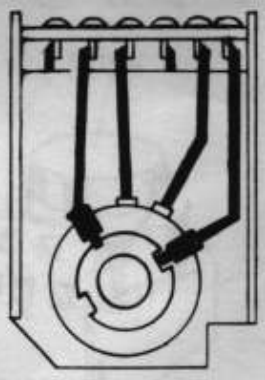
10 Remove the jumper from the terminals #4 and #5, the wafer switch should rotate to closed position and stop. Fig. 4

If the operator performs properly in the tests; check further for defects in the thermostat or thermostat wiring.
If the operator DOES NOT perform properly, it must be replaced with a new unit.
(Check Drawings on Page 7 to determine correct Model Numbers)



WAFER SWITCH
OPEN POSITION

Fig. 3



WAFER SWITCH
CLOSED POSITION

Fig. 4

TEST PROCEDURE FOR ZONE VALVE STEMS

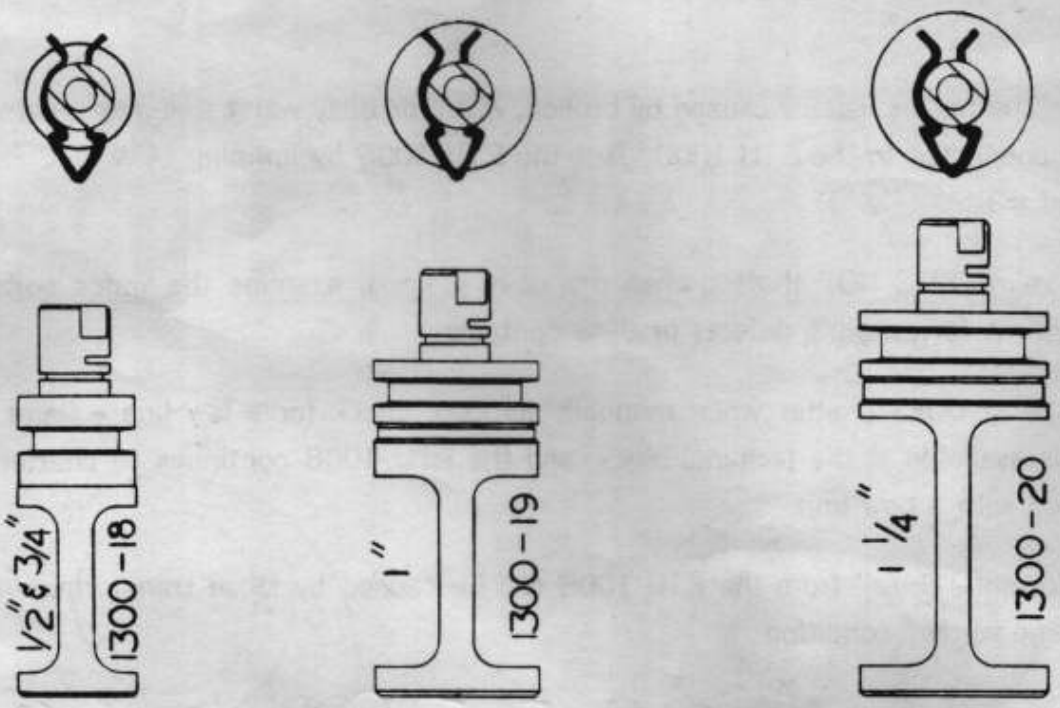
To test for a faulty stem you must remove the operator and attempt to rotate the stem manually thru a full 360°. The stem should rotate freely with a coin inserted in the slot.

Any binding or sticking of the stem indicates stem should be replaced with a new unit. Clean the body of the valve with a wire brush before inserting the new stem.

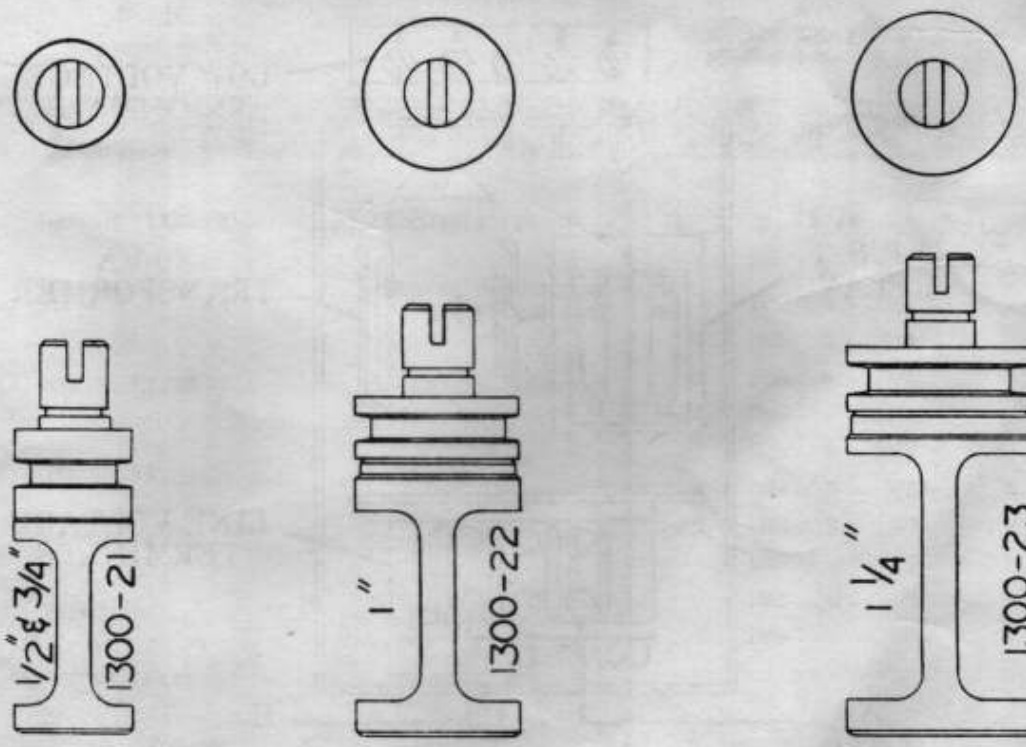
NOTE: If the captive screws are supplied with Replacement Parts, be sure to install as shown in instructions. Do not use grease or oil on the stem. They are factory lubricated.

ZONE VALVE STEMS

VJ and VK SERIES



VA SERIES



Stems are shown actual size. Please use correct part number when ordering.

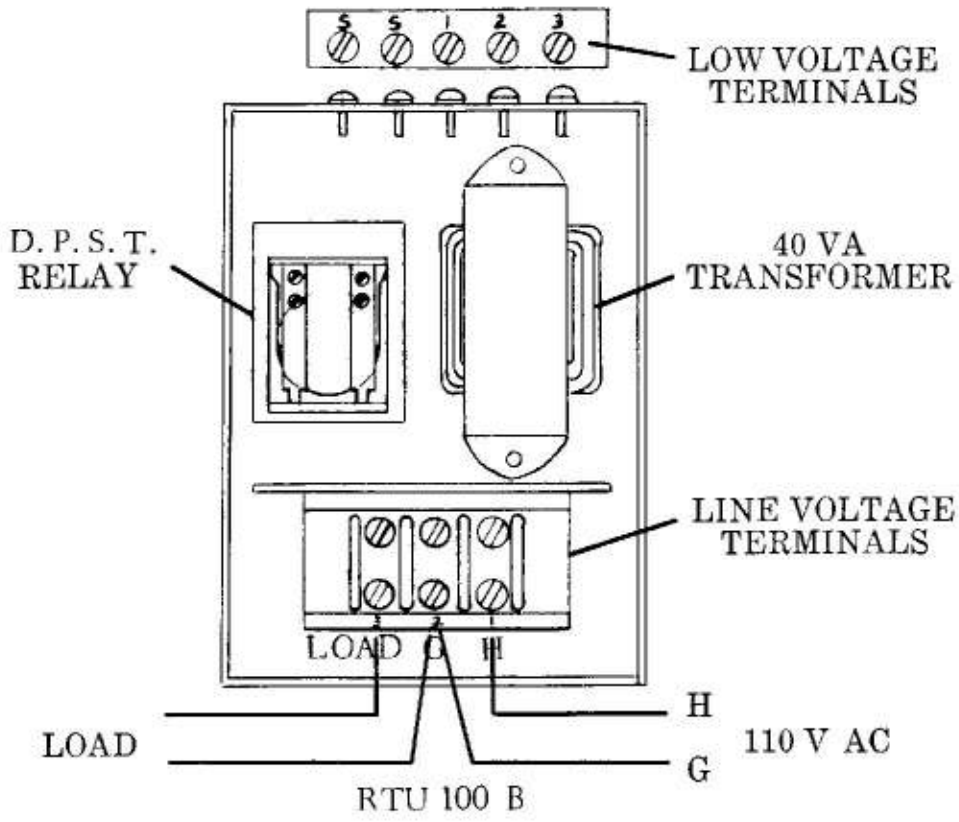
RTU 100B TRANSFORMER

Relay "Chatter" is usually caused by broken, worn, or dirty wafer switches on any of the zone valves connected to the RTU 100B. Test the RTU 100B by jumping LOW VOLTAGE terminals #2 and #3.

1 If the relay DOES NOT chatter when manually jumped, examine the wafer switches on ALL zone valves for possible defects or dirty contacts.

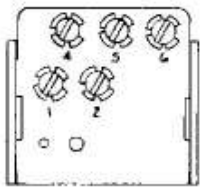
2 If the relay DOES chatter when manually jumped, check for a low line voltage condition. If 110V is available at the terminal block, and the RTU 100B continues to chatter, it must be replaced with a new unit.

3 Transformer "Buzz" from the RTU 100B can be caused by loose transformer mountings or a low line voltage condition.

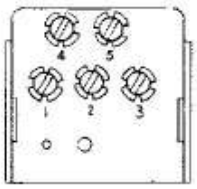


CAUTION: Disconnect 110V power supply before making repairs on the RTU.

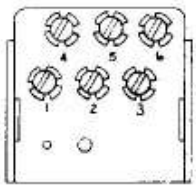
TERMINALS ■ DATE CODES



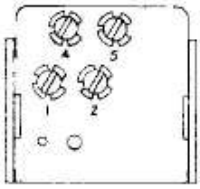
1300-53



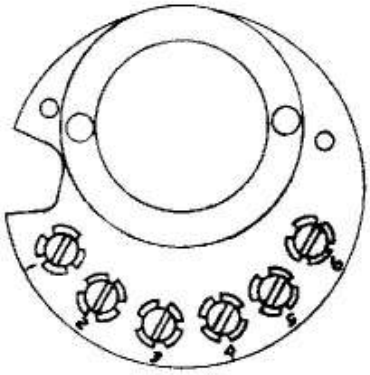
1300-44



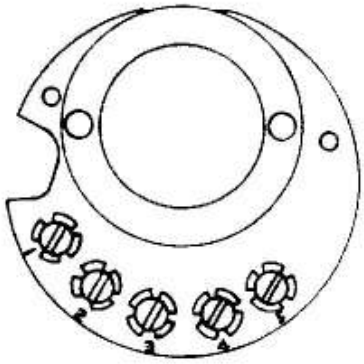
1300-24



1300-181



1300-14



1300-155

REPLACED WITH TRIM STYLE MOTOR AND ADAPTER KIT

2 & 3 WIRE VA & VJ SERIES

- TERMINAL #1 AND #2 ..... CONSTANT 24V SUPPLY
- TERMINAL #2 AND #3 ..... RELAY HOLDING CIRCUIT (END SWITCH)

VK SERIES ← TERMINAL #1 AND #2 ..... CONSTANT 24V SUPPLY

3 WIRE VA, VJ & VK SERIES

- TERMINAL #4 ..... OPENING LEG
- TERMINAL #5 ..... COMMON LEG
- TERMINAL #6 ..... CLOSING LEG
- TERMINAL #4 AND #5 ..... OPEN VALVE
- TERMINAL #5 AND #6 ..... CLOSE VALVE

2 WIRE VA & VJ

- TERMINAL #4 AND #5 ..... OPEN VALVE
- NO CONTACT BETWEEN #4 AND #5 ..... CLOSE VALVE

1st LETTER — YEAR		2nd LETTER — MONTH
A — 1956	L — 1967	A — JAN.
B — 1957	M — 1968	B — FEB.
C — 1958	N — 1969	C — MAR.
D — 1959	O — 1970	D — APRIL
E — 1960	P — 1971	E — MAY
F — 1961	Q — 1972	F — JUNE
G — 1962	R — 1973	G — JULY
H — 1963	S — 1975	H — AUG.
I — 1964	T — 1975	I — SEPT.
J — 1965	U — 1976	J — OCT.
K — 1966	V — 1977	K — NOV.
		L — DEC.

EXAMPLE: GC = 1962 MARCH

Date code stamped on chassis of operator and upper part of stem.

INSTRUCTIONS — Replacement of Straight Flow Round Operator (VA)

REMOVING EXISTING OPERATOR

1. Remove cover by loosening 2 securing screws located on sides.

2. Loosen the 2 small set screws (on earlier models — Allen screws). Turn only the operator assembly counterclockwise until screws line up with enlarged holes in end of slot.

3. Lift operator straight up from mounting plate. **Caution:** Do not disengage snap ring lock on bottom of mounting plate, as this would allow hot water to drain from system.

4. Remove wires. Tag each wire with the number of the terminal from which it was removed.

REPLACING THE NEW OPERATOR (3 WIRE)

1. Rewire the tagged wires to their respective terminals on replacement operator.

2. Valve stem must be in open position when replacing operator. Never attempt to turn the motor actuator on operator unit as this would damage the motor.

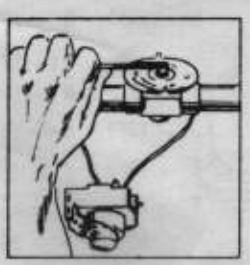
3. Remount new operator to mounting plate. **Note:** Be sure actuator tongue aligns with stem slot when placing operator on mounting plate.

4. Twist operator clockwise and secure 2 set screws. (Reverse of step 2 in instructions on removing existing operator.)

5. Replace cover and secure side screws.

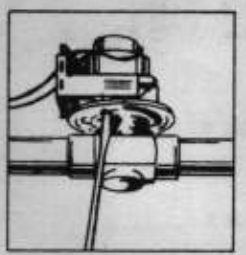
REPLACING NEW CONVERSION OPERATOR (2 WIRE)

1. Rewire the tagged wires to their respective terminals on replacement operator.



2. Valve stem must be in open position when replacing operator. Never attempt to turn the motor actuator on operator unit as this would damage the motor.

3. Remount new operator to mounting plate. **Note:** Be sure actuator tongue aligns with stem slot when placing operator on mounting plate.



4. Twist operator clockwise and secure 2 set screws. (Reverse of step 2 in instructions on removing existing operator.)

5. Replace cover.

NOTE: If the captive screws are supplied with Replacement Parts, be sure to install as shown in instructions.

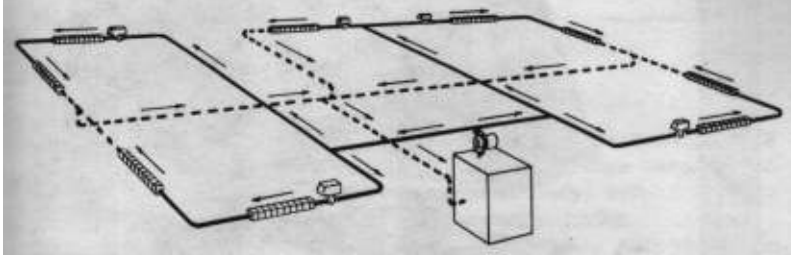
FOR THE FOLLOWING ZONE-A-TROL MODELS

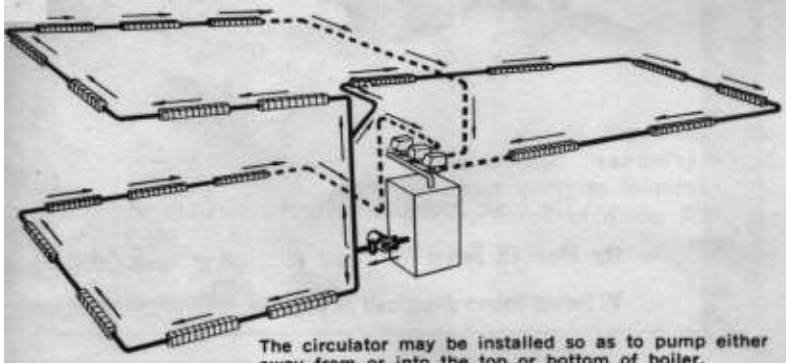
3 WIRE SWEAT		2 WIRE SWEAT	2 & 3 WIRE IPS	
½"	VJ1B0	VJ1B2	¾"	VJ5C0
¾"	VJ1C0	VJ1C2	¾"	VJ5C2
1"	VJ1D0	VJ1D2	1"	VJ5D0
1¼"	VJ1E0	VJ1E2	1"	VJ5D2

TYPICAL PIPING LAYOUTS

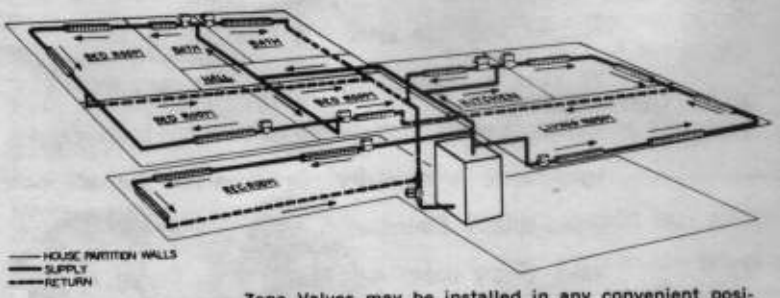
To install and provide Zone-A-Trol Individual Room Temperature Control or Zone Control, requires but the installation of a Zone-A-Trol Valve and thermostat for each room or zone that is to be individually Comfort Controlled.

The design and installation of a Zone Controlled System is basically the same as for an unzoned system, except that consideration must be given to the locating of valves on the system so as to simplify the piping arrangement.





The circulator may be installed so as to pump either away from or into the top or bottom of boiler.



Zone Valves may be installed in any convenient position or location on either the supply or return side of the radiation for each room or zone.

Thermostatically controlled, motorized FLAIR Trimstyle Valves are designed to make it easy to install Individual Room Temperature Control or Zone Control on any new or existing Hydronic Baseboard, Convector, Radiator or Radiant Panel Heating System.

The Trimstyle Valve automatically controls the flow of water through the radiation loop to each room or zone as called for by the associated thermostat. When the associated thermostat calls for heat, the valve slowly rotates to open position, permitting the water to flow through the radiation until the thermostat is satisfied, then automatically closes.

The patented motor switch assembly cycles the valve and provides a built-in end switch which activates boiler controls whenever one or more thermostats call for heat.

Valves may be installed in any position, angle or location on the supply or return piping which is most convenient to controlling the flow of water to each zone. On baseboard installations the compact design of the Trimstyle Valve permits its being installed under the cover of the baseboard enclosure.

Wiring is simple and easy as the Valves operate on low voltage, and no BX cable is required. Each valve is wired to a controlling thermostat, and should be wired as shown in appropriate Wiring Diagram. Valves are rated for 24 volt operation, and will operate on as little as 18 volts, thereby avoiding low voltage problems.

SPECIFICATIONS

Maximum Pressure Across Closed Valve:

½" Model ..... 40 p.s.i.g.
¾" Model ..... 40 p.s.i.g.
1" Model ..... 25 p.s.i.g.
1¼" Model ..... 15 p.s.i.g.

ELECTRICAL RATING:

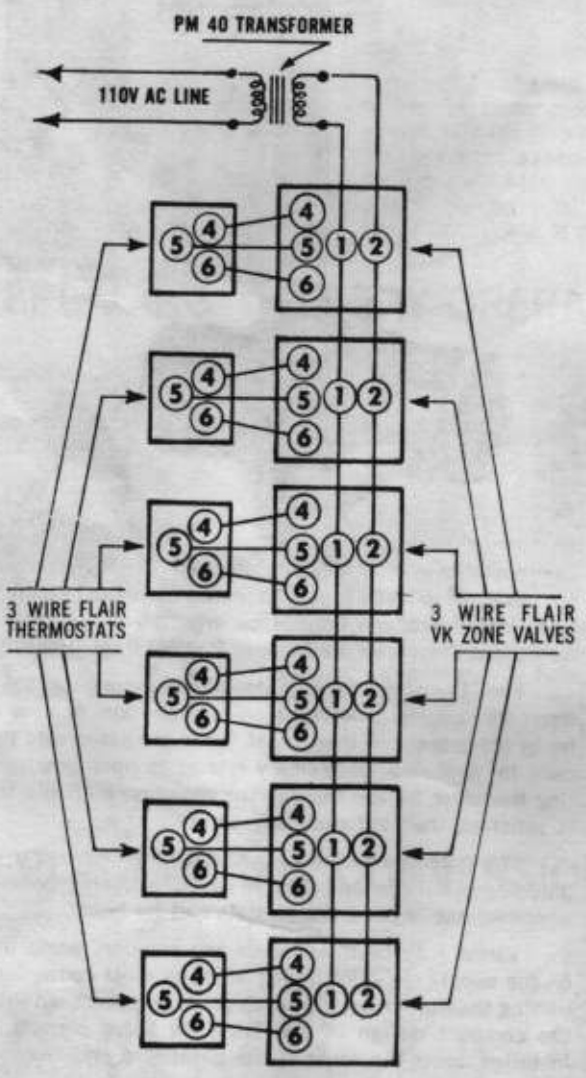
2 Wire Series: 24 Volts AC, .35 amperes
3 Wire Series: 24 Volts AC, .29 amperes

TIMING: Approximately 45-60 seconds from full open to full closed.

INSTALLATION INSTRUCTIONS
WIRING DIAGRAM FOR VK SERIES FLAIR ZONE-A-TROL VALVES

SYSTEM WITH PLATE MOUNTED TRANSFORMER

FOR CONSTANT CIRCULATION ONLY
ONE TRANSFORMER TO POWER SIX ZONES



NOTE: FOR 2 WIRE MODEL OMIT TERMINAL # 6.

SPECIFICATIONS

Maximum Pressure Across Closed Valve:

½" Model	40 p.s.i.g.
¾" Model	40 p.s.i.g.
1" Model	25 p.s.i.g.
1¼" Model	15 p.s.i.g.

ELECTRICAL RATING: 24 Volts AC, .29 amperes

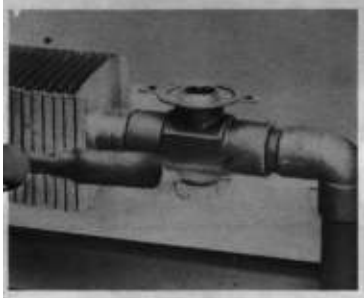
TIMING: Approximately 45-60 seconds from full open to full closed.

FOR ALL VK SERIES ZONE-A-TROL MODELS
2 & 3 WIRE

The basic operation and installation procedures for the Flair VK Series Valve are identical to those of the VJ Series Valves described on page 9.

The only difference has to do with the ability of the valve to control the boiler and circulator. The VK Valve has no end-switch, and therefore **can-not** activate boiler controls when the associated zone calls for heat. The VK Valve is designed for use on light commercial installations where circulation is constant and boiler water temperature is maintained by immersion controls or indoor-outdoor controllers of some type. The VK Series Valve simply opens or closes when activated by the thermostat.

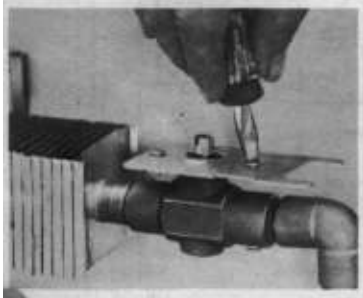
HOW TO INSTALL ZONE-A-TROL VALVES



1. Solder valve body to supply or return side of radiation line.

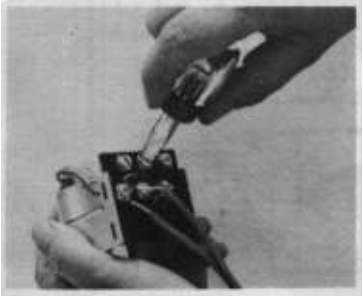
NOTE: ALL GUARANTEES ARE VOID IF THE VALVE STEM IS INSTALLED INTO VALVE BODY PRIOR TO SOLDERING. APPLICATION OF EXCESSIVE HEAT TO VALVE BODY MAY CAUSE WARPAGE OR LEAKAGE. AFTER SOLDERING, CLEAN VALVE BODY THOROUGHLY AND REMOVE PARTICLES OF SOLDER AND ANY OTHER FOREIGN MATERIAL.

2. Do not insert stem into valve body, until body has cooled.



3. Secure mounting plate and valve stem assembly to valve body with 2 captive screws provided.

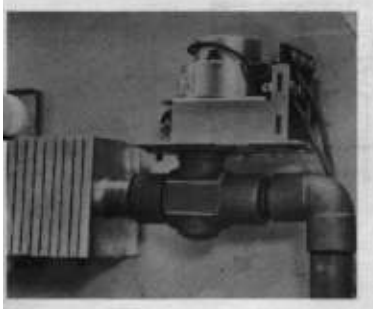
Mounting plate should be loose with screws fully seated.



4. Connect the wires from associated thermostat and from power to terminal board as shown in Wiring Diagram.

5. Motor assembly is shipped with motor drive shaft in VALVE OPEN position. Rotate valve stem to OPEN position, then press motor drive shaft into snap lock of valve stem.

NOTE: DO NOT ATTEMPT TO ROTATE MOTOR MANUALLY.



6. FOLLOW CHECK OUT PROCEDURE.

A. Set all thermostats to highest setting which will open all valves.

B. With all valves open, fill the system.

C. With circulator running, flush system repeatedly with fresh water to remove foreign material from lines and boiler. It is recommended that the circulator be operated for at least one hour with all valves open to further clean lines of foreign matter.

D. Turn all thermostats to low limit. All Zone-A-Trol Valves will then slowly close and turn off circulator.

E. Turn thermostat up to high limit. The valve will open slowly in accordance with timing cycle.

F. If installed under baseboard, be sure baseboard cover does not touch or press on zone valve operator.

IMPORTANT POINTS TO BE OBSERVED WHEN WIRING ZONE-A-TROL VALVES

Zone-A-Trol Valves are made in two types. 2 Wire Valves are for use with 2 Wire Thermostats, and 3 Wire Valves are for use with 3 Wire Thermostats. Always use the correct thermostat for the type of valve you are installing.

Zone-A-Trol Valves will not operate properly unless they are correctly wired. To insure proper wiring, the terminals of all Zone-A-Trol Valves and Thermostats are plainly numbered to correspond with the terminal numbers shown in the wiring diagrams.

It is recommended that only color coded wire be used and that you standardize the color coding for each terminal number throughout the system as shown below.

WIRING COLOR CODE

For Wiring Valves use . . .	For Wiring Thermostat use . . .
BLACK .... for Terminal 1	BLACK .... for Terminal 4
RED ..... for Terminal 2	RED ..... for Terminal 5
WHITE .... for Terminal 3	WHITE .... for Terminal 6

Exercising care in wiring will avoid unnecessary wiring troubles and eliminate any possibility of transformer burn out, or other damage to the system being incurred due to the wrong wire being placed on the wrong terminal.

When connecting wires to terminals, make certain that stripped end of wire does not touch or short out against any other wire or terminal.

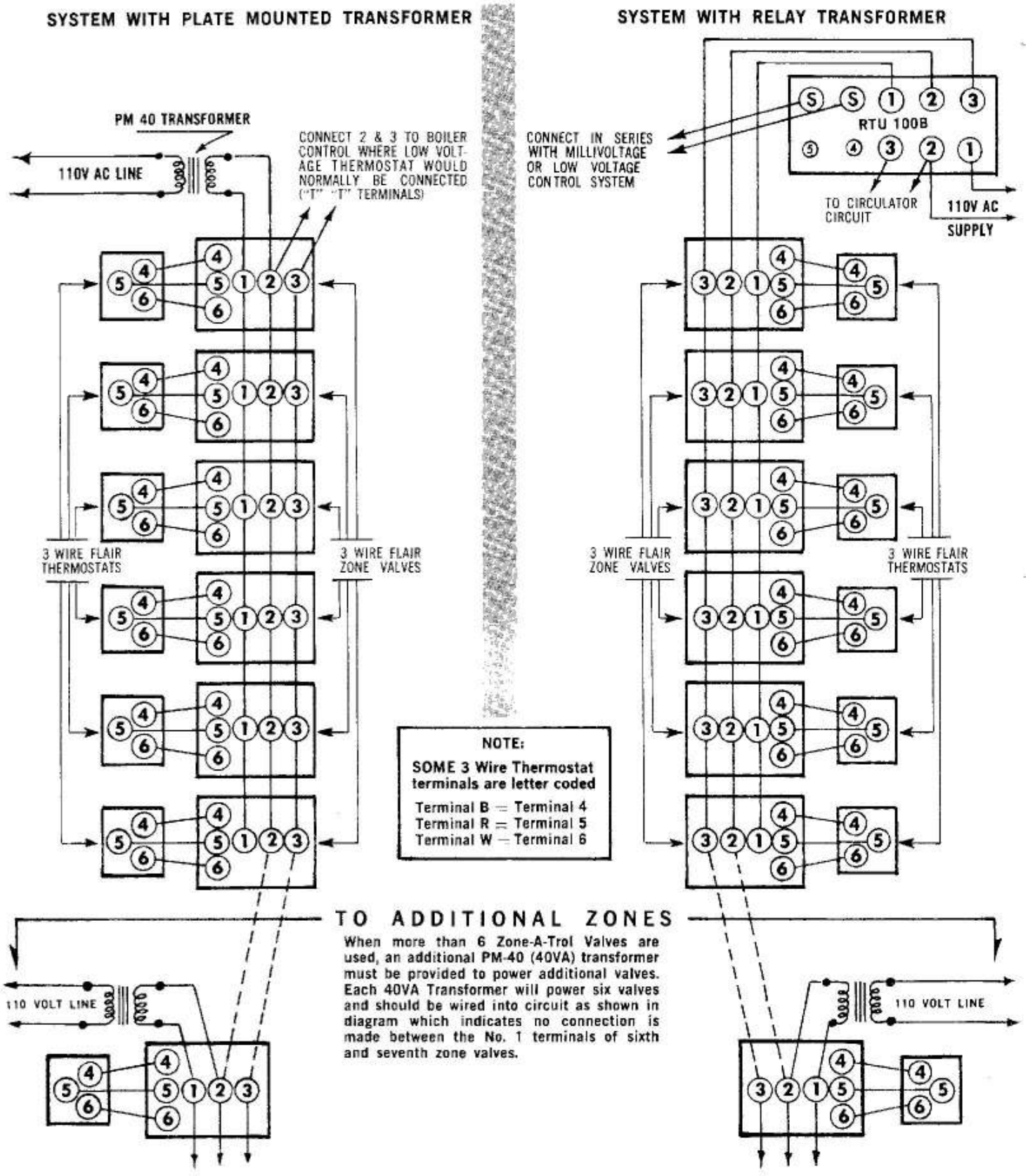
Zone-A-Trol Wiring Diagrams show valves wired in parallel. On many installations it is not convenient or practical to wire from valve to valve as shown in diagram. In such cases, a separate three conductor color coded lead may be run from terminals 1, 2, 3, of each valve to a convenient junction point. By observing color code, conductors from the corresponding numbered terminals of each valve may be joined or spliced together. A single conductor from each of the three terminal group splicings may then be connected to the appropriate power and control terminals as indicated on wiring diagram.

Zone-A-Trol Valves should not be wired in the same circuit with Zone Valves of a different make or manufacturer without first consulting your local Zone-A-Trol representative or our factory engineering department for special wiring information.

MANUAL OPERATION

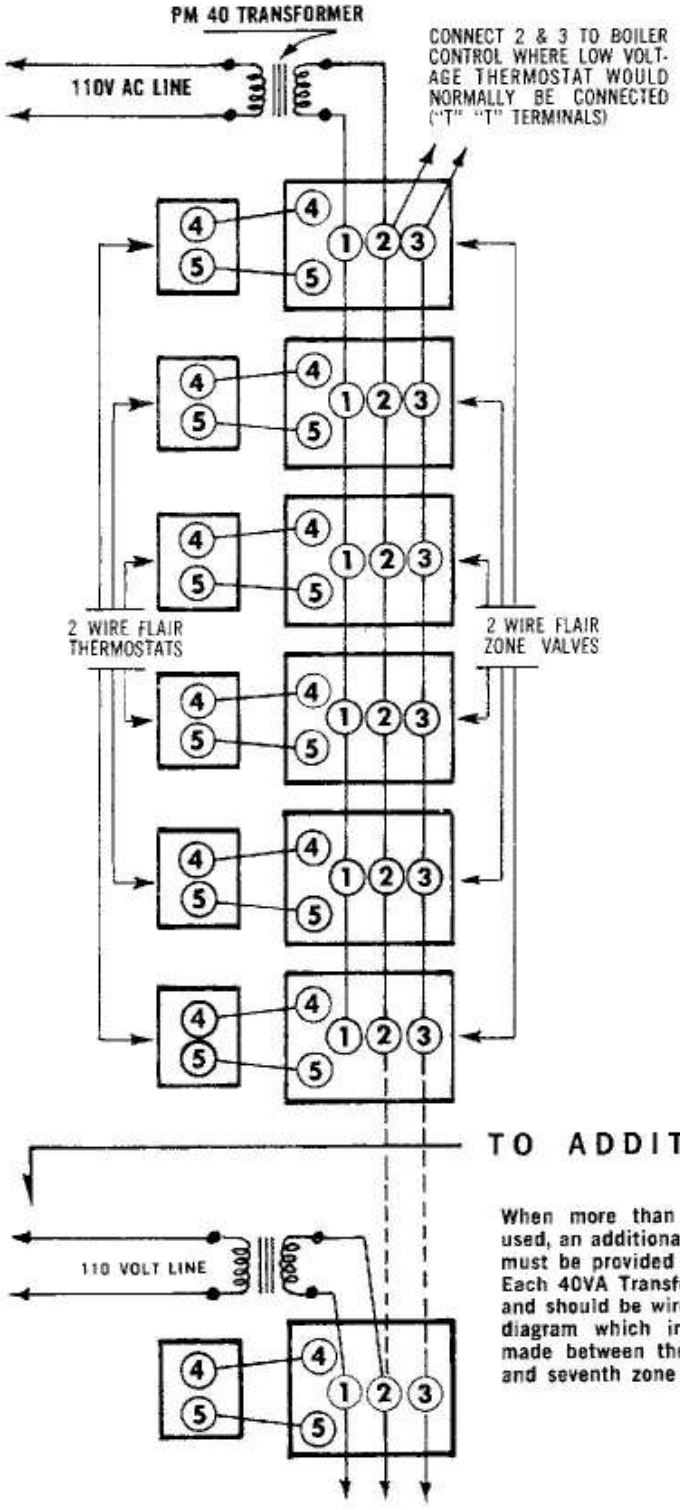
In the event of a power failure, the valve may be opened or closed manually by removing the cover and lifting the Motor Switch Terminal Assembly straight up from the mounting plate. The valve stem may then be rotated to the desired position as indicated on the base plate of the valve. The unique arrow indicator shows the position of the valve stem at all times.

WIRING DIAGRAM FOR 3 WIRE ZONE-A-TROL VALVES

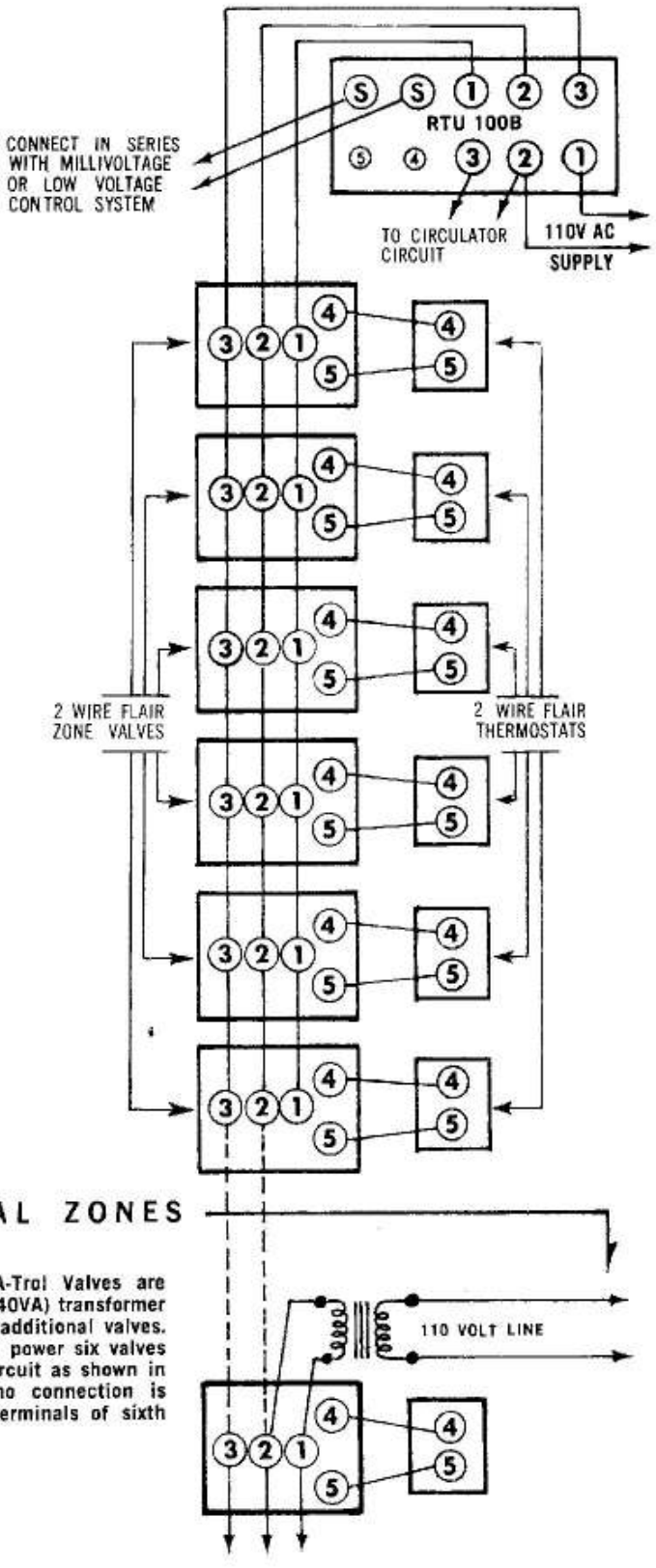


WIRING DIAGRAM FOR 2 WIRE ZONE-A-TROL VALVES

SYSTEM WITH PLATE MOUNTED TRANSFORMER



SYSTEM WITH RELAY TRANSFORMER



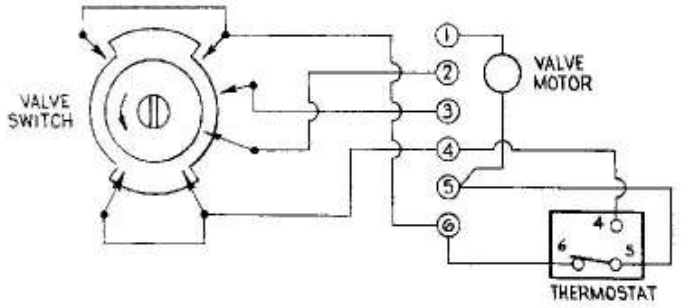
TO ADDITIONAL ZONES

When more than 6 Zone-A-Trol Valves are used, an additional PM-40 (40VA) transformer must be provided to power additional valves. Each 40VA Transformer will power six valves and should be wired into circuit as shown in diagram which indicates no connection is made between the No. 1 terminals of sixth and seventh zone valves.

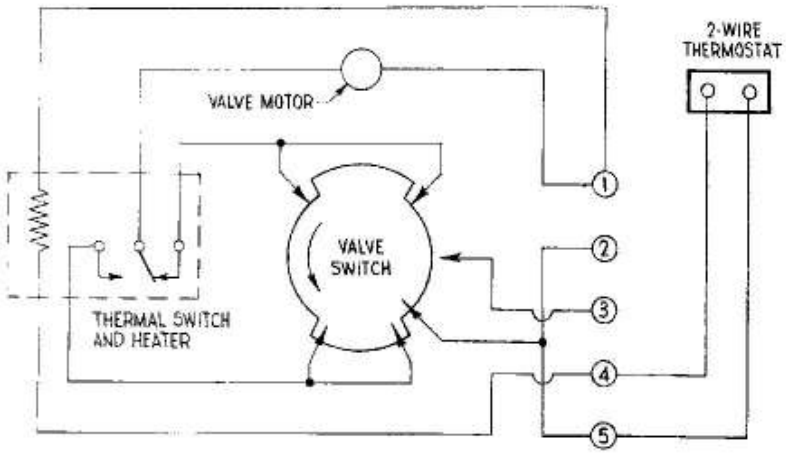
INTERNAL WIRING DIAGRAMS

"OLD" STYLE WAFER SWITCH (6 CONTACT)

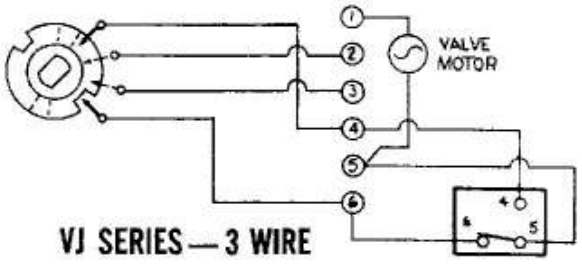
VA AND VJ SERIES—3 WIRE



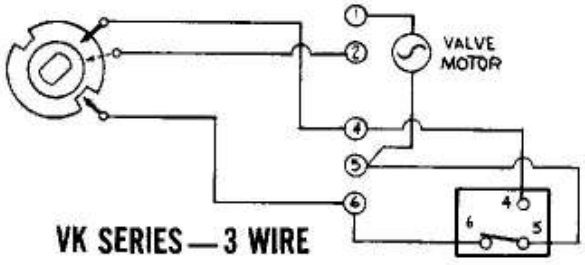
VA AND VJ SERIES—2 WIRE



"NEW" STYLE WAFER SWITCH (3 AND 4 CONTACT)

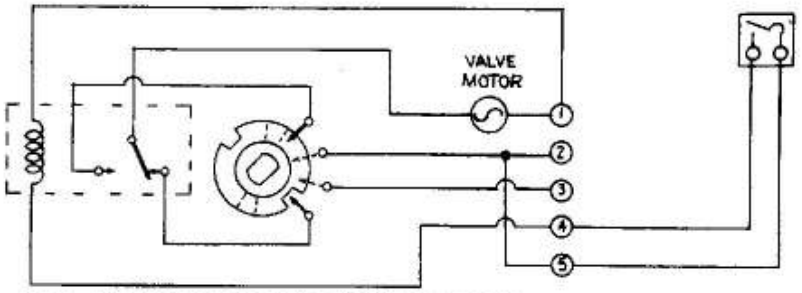


VJ SERIES—3 WIRE



VK SERIES—3 WIRE

VJ SERIES—2 WIRE

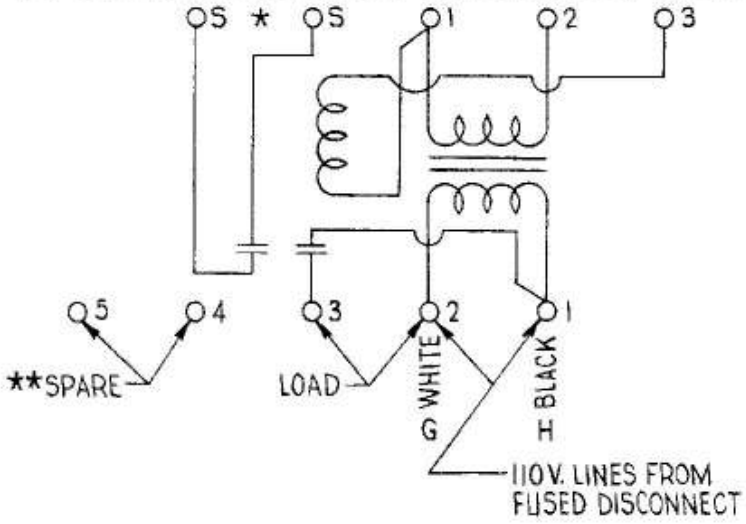


NOTE: ALL VALVES ARE SHOWN IN SATISFIED OR CLOSED POSITION. UPON DEMAND OF THERMOSTAT THEY WILL ROTATE, COUNTER-CLOCKWISE, 90° TO OPEN POSITION.

MISCELLANEOUS INFORMATION

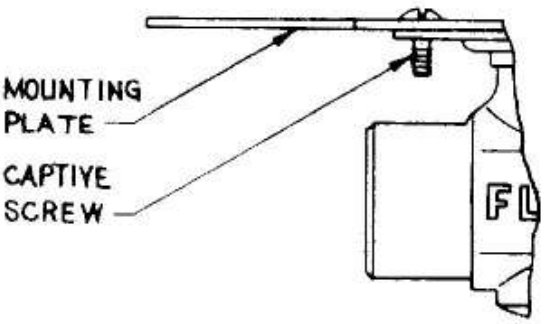
INTERNAL WIRING
RTU 100B

BURNER CIRCUIT RATING: 115V. 60 CYC. SINGLE PH.
LOAD 5.2 AMPS. FULL LOAD 31.2 AMPS LOCKED ROTOR
TRANSFORMER: 115V/24V. 60 CYC.
40 V.A. AT 24V. AVAILABLE FOR EXTERNAL LOAD
LOW VOLTAGE CONTROL SUITABLE FOR NEC. CLASS II WIRING



* Designed for millivoltage from August 1965
** Spare terminals eliminated starting November, 1966

CAPTIVE SCREW INFORMATION



FOR VJ AND VK SERIES

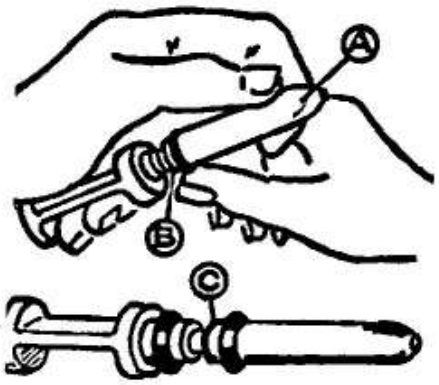
WHEN CHANGING COMPONENT PARTS, REPLACE EXISTING PLATE MOUNTING SCREWS WITH CAPTIVE SCREWS ENCLOSED. (MOUNTING PLATE WILL HAVE LOOSE FIT).

REMOVAL OF CAPTIVE SCREWS

MOUNTING PLATE **MUST BE LIFTED** WHILE REMOVING CAPTIVE SCREWS.

CAUTION

IF OPERATOR (MST) ONLY IS BEING CHANGED, REMOVE AND REPLACE ONE SCREW AT A TIME.

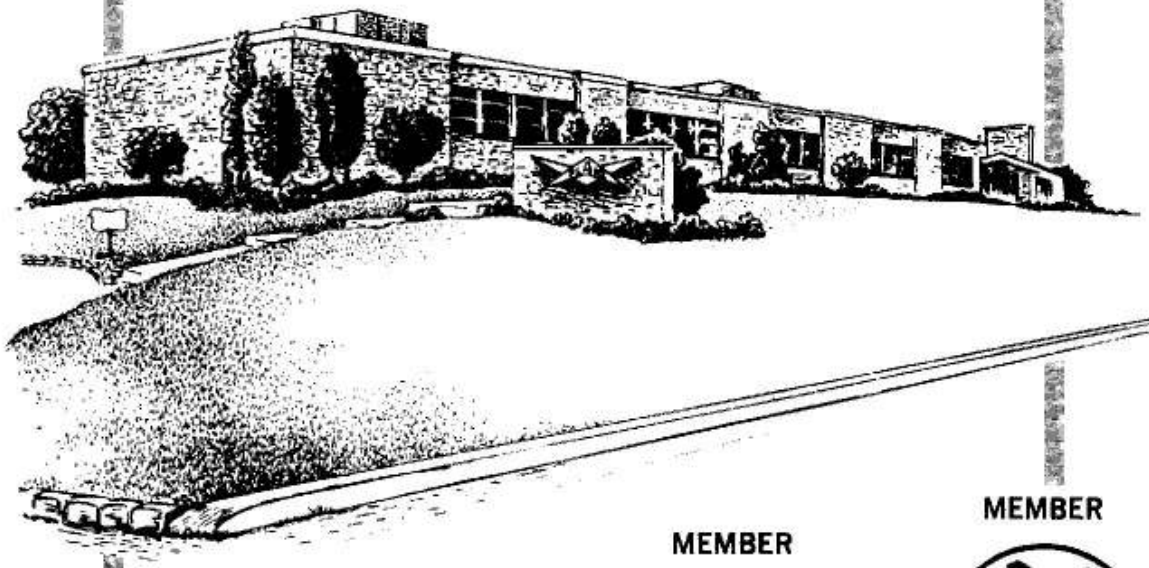


DIRECTIONS FOR REPLACING SMALL O-RINGS ON ZONE-A-TROL STEMS

REMOVE OLD O-RINGS AND CLEAN O-RING GROOVES. DO NOT SCRATCH SURFACE OF O-RING GROOVE. SLIP CONE (A) OVER SHANK OF STEM BRINGING LOWER EDGE OF CONE IN LINE WITH UPPER EDGE OF LOWER O-RING GROOVE (B). SLIP NEW O-RING OVER CONE AND INTO GROOVE. RAISE EDGE OF CONE TO POSITION AT EDGE OF TOP GROOVE (C) AND REPEAT PROCESS. APPLY SPECIAL LUBRICANT IN CAPSULE, ON O-RINGS FOR PERMANENT LUBRICATION. DO NOT LUBRICATE STEM.

NOTE: REPLACE "O" RINGS ONLY, WHEN VALVE LEAKS. FOR A STUCK STEM, REPLACE COMPLETE STEM ASSEMBLY.

FLAIR®



MEMBER

BHC

MEMBER

I-B-R®