

Motorized Valve Shaft Dimensions

TECHNICAL NOTES

MOTORIZED VALVE
SHAFT DIMENSIONS

BODY			BONNET
1	1/2" - 3/4" SWEAT ANGLE 3/4" - 1" SWEAT STRAIT 3/4" STR. THRU THREAD INTERNAL THREADS	2 25/32"	3/4" ϕ = 1-6-7-9 1 1/16" ϕ = 8 1 3/16" ϕ = 2-3 1 5/8" ϕ = 4-5 EXTERNAL THREAD
2	1" ANGLE EXTERNAL	3 11/16"	INTERNAL THREAD
3	1" SWEAT STRAIT 1" STR. THRU THREAD CERRO BODIES 3/4" ANGLE SCREW	3 9/32"	INTERNAL THREAD EXTERNAL THREAD
4	1 1/4" ANGLE INTERNAL OHIO BRASS BODY	4 3/4"	ADAPTER EXTERNAL THREAD
5	1 1/2" SWEAT INTERNAL 1 1/2" STR. THRU THREAD	4 7/32"	ADAPTER EXTERNAL THREAD
a	3/4" ANGLE INTERNAL	3" (use 3 1/32" replacement)	EXTERNAL THREAD
b	3/4" SWEAT STRAIT INT.		EXTERNAL THREAD
c	3/4" SWEAT STRAIT INT.		EXTERNAL THREAD
d	3/4" STR. THRU THD. INT.		EXTERNAL THREAD
e	3/4" ANGLE INTERNAL		EXTERNAL THREAD
7		REPLACED	
8	3/4" RADIATOR INTERNAL	3 25/32"	EXTERNAL THREAD
9	1/2" - 3/4" SWEAT ANGLE 3/4" - 1" SWEAT 3/4" STR. THRU THREAD EXTERNAL THREADS	2 15/16"	INTERNAL THREADS

NOTE: 1 - 9 are for NIBCO bodies.
6b-c-d are by CONSOLIDATED
BRASS to EDWARDS spec.
6e by CERRO to EDWARDS spec.
External and internal threads indicate
thread patterns on the body.

Hale Engineering Company, Inc.
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Elk Grove Village, IL 60007
(847)956-1600 Fax: (847)956-0595
www.Halco-Products.com

NOTE: LUBRICATE VALVE STEM & "O" RINGS WITH HIGH TEMP VALVE STEM SILICONE GREASE FOR BEST RESULTS.

WARNING: DO NOT INSTALL BEFORE CHECKING VALVE SYSTEM

1. IT SHOULD MOVE FREELY WITHOUT STICKING.
 2. IT SHOULD SHOW NO SIGNS OF LEAKING.
 3. CHECK HOUSING. IT MUST BE CLEAN AND FREE FROM ANY OBSTRUCTIONS
- WE WANT TO SAVE YOU AN EXPENSIVE CALLBACK. THIS UNIT HAS BEEN THOROUGHLY TESTED, BUT CANNOT BE GUARANTEED AGAINST A LEAKING OR FROZEN VALVE ASSEMBLY

PARTS POLICY FOR EDWARDS BOILER PARTS & ACCESSORIES:

1. Edwards Zone Valves & Operators have 6 month warranty against defects in material & workmanship
2. All operators will be date coded for tracking purposes.
3. Returns must include original copy of invoice or packing list.
4. Returns without documentation will be honored less 30% handling.
5. Accounts past due or delinquent will not be given warranty claims until cleared by our accounting dept.

SPECIFICATIONS

ELECTRICAL: 24 volts at 60 cycles AC.
MOTOR: Continuous duty, synchronous. Draws current only when opening or closing valve.
POWER CONSUMPTION: 6 watts, 0.2 amps at 24 volts while valve is opening or closing.
APPLICATION: hot water or steam (when specified).
VALVE: Single seat, bronze globe, replaceable washer.
RELAY TRANSFORMER: 115 to 24 volts (to operate zone valves plus switching circuit to burner and circulator); RT-306 for 1 to 6 valves; RT-612 for 1 to 12 valves; RT-1224 for 1 to 24 valves; RT-1836 for 1 to 36 valves. For multiple valve operation from single 24-volt source, see "Wire Size" table.

EMERGENCY OPERATION: In case of power failure, the valve may be opened or closed by rotating the screw that is visible on front cover until dial shows valve position.

LOCATION:

- To obtain correct operation of the mercury bulb switches in the electric operation, MERCURY SWITCH models MUST be installed so that the valve STEM will be in an UPRIGHT POSITION. See Figures 1 and 2 for horizontal and vertical locations of straight and angle-type valve bodies. SOLID STATE SWITCH models may be mounted in any position, except DO NOT mount in positions or locations where leakage of water may damage electric circuits.
- Consult Figure 3 for valve dimensions to ensure proper location of the valve. Remember that sufficient spacing must be provided to allow for installation, wiring, and servicing.

INSTALLATION:

- Remove the bonnet operator from the valve body. **WARNING:** To prevent heat damage to rubber seat and O-rings during sweating, remove bonnet from valve body and sweat into line without shaft and seat.
- Sweat or screw body into position.
- When valve body is installed, replace the bonnet and operator on the body as follows:
 - Loosen two screws holding valve bonnet to the valve operator. (Do not remove screws.)
 - Since the valve bonnet may now rotate freely, place bonnet and operator on valve body and screw on bonnet to body. Do not overtighten.
 - Position the operator and then tighten the two screws holding the operator to the bonnet. Valve now is in position and ready for wiring.

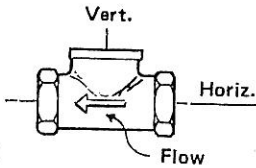


FIG. 1

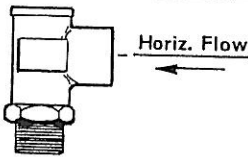


FIG. 2

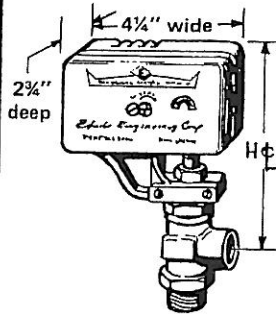


FIG. 3

SWEAT (female) VALVE SIZES, MODELS SMVA-SMV5

Sweat Fitting Size	Weight (lbs.) (approx.)	ANGLE BODY PATTERN (1 male, 1 female threaded fitting)		STRAIGHT BODY PATTERN (Female threaded fittings)	
		Model No.	Height (Hc)	Model No.	Height (Hc)
1/2"	2 3/4 lbs.	1/2 SMV-A	5 1/2"	1/2 SMV-S	5"
3/4"	3 1/4 lbs.	3/4 SMV-A	5 3/4"	3/4 SMV-S	4 7/8"
1"	3 3/4 lbs.	—	—	1 SMV-S	5 1/4"
1 1/4"	4 3/4 lbs.	—	—	1 1/4 SMV-S	5 7/8"

THREADED VALVE SIZES, MODELS MVA-MV5

Valve Pipe Size	Weight (lbs.) (approx.)	ANGLE BODY PATTERN (1 male, 1 female threaded fitting)		STRAIGHT BODY PATTERN (Female threaded fittings)	
		Model No.	Height (Hc)	Model No.	Height (Hc)
1/2"	2 3/4 lbs.	1/2 MVA	4 1/2"	—	—
3/4"	3 1/4 lbs.	3/4 MVA	4 7/8"	3/4 MVS	4 7/8"
1"	3 3/4 lbs.	1 MVA	5 1/2"	1 MVS	5 3/4"
1 1/4"	5 lbs.	1 1/4 MVA	6"	1 1/4 MVS	6 1/4"

THREADED RADIATOR ANGLE VALVES WITH UNION RMV

FEMALE; WITH UNION; RADIATOR ANGLE PATTERN			
Pipe Size	Weight (lbs.) (approx.)	Model No.	Height (Hc)
3/4"	3 1/2 lbs.	3/4 RMV	5 3/8"
1"	3 3/4 lbs.	1 RMV	5 1/2"
1 1/4"	4 3/4 lbs.	1 1/4 RMV	5 5/8"

INSTALLATION INSTRUCTIONS

EDWARDS COMPACT ZONE-A-MATIC VALVE

MODELS: MV-21 (3-wire) & MV-81 (2-wire)

Manufactured by

EDWARDS ENGINEERING CORP.

FORM 1-AS-24M Effective 6/1/71

WIRING:

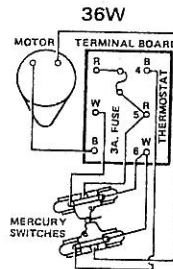
For multiple valve operation from single 24-volt source, see "Wire Size" table.

- Remove front cover (single screw) of motor operator.
- Connect 3-wire thermostat to terminal 4 (blue wire), 5 (red wire), and 6 (white wire) if 3-wire (MV-21) valve; or connect 2-wire thermostat to terminal 4 (blue wire) and 5 (red wire) if 2-wire (MV-81) valve.
- If power for the valve is supplied by an Edwards RT Series relay transformer, wire R-W-B of relay transformer to board.
- If power for valve is supplied by a single transformer, connect one wire of the transformer to terminal R and the other wire of the transformer to terminal B on the lefthand side of the motorized valve terminal board. Make no connection to terminal W.
- On Edwards Motorized Valves, terminals R and W may be used as an isolated closing circuit for low voltage, and terminals W and B may be used as the 24-volt source when the valve is in the OPEN position. Power takeoff from terminals W and B must not exceed the transformer supply power.

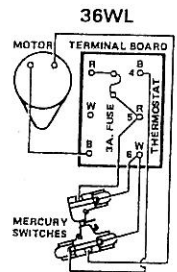
OPERATION:

After the valve has been installed, it is advisable to check the position of the operating dial when the room calls for heat. The dial must read "open" for proper operation. The same effect may be obtained by adjusting the thermostat to its maximum setting and checking the dial position. When the flow through the system is started, the packing nut should be checked for leakage. This nut should be adjusted finger-tight, no more than 1/4 turn with a wrench, to stop leaking. **DO NOT OVER-TIGHTEN.** Standard valves (1/2" and 3/4") are not to be used on systems with operating pressures above 70 and 55 p.s.i. respectively. For other models and higher pressures, consult factory.

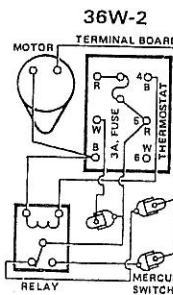
INTERNAL WIRING



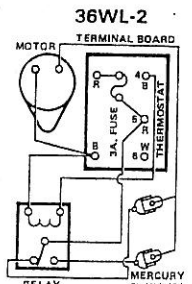
3-WIRE MODEL WITH END SWITCH



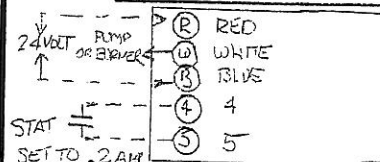
3-WIRE MODEL WITHOUT END SWITCH



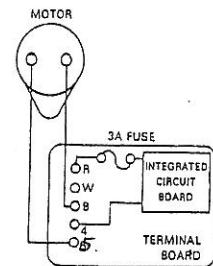
2-WIRE MODEL WITH END SWITCH



2-WIRE MODEL WITHOUT END SWITCH



SOLID-STATE SWITCH MODEL

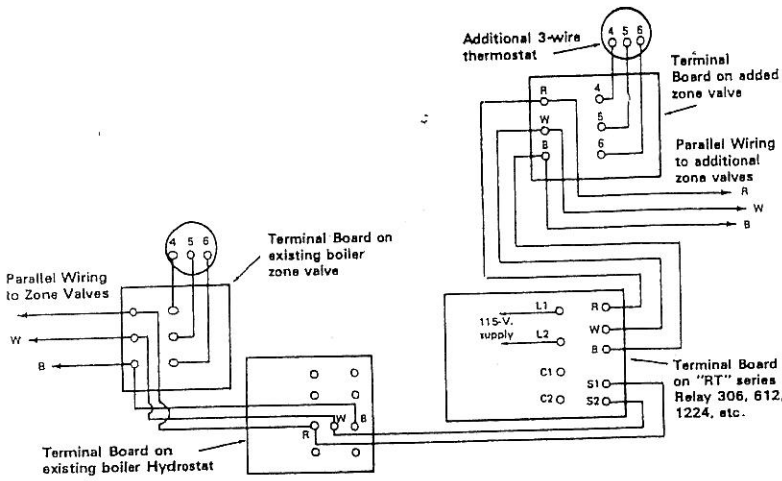


2-WIRE MODEL

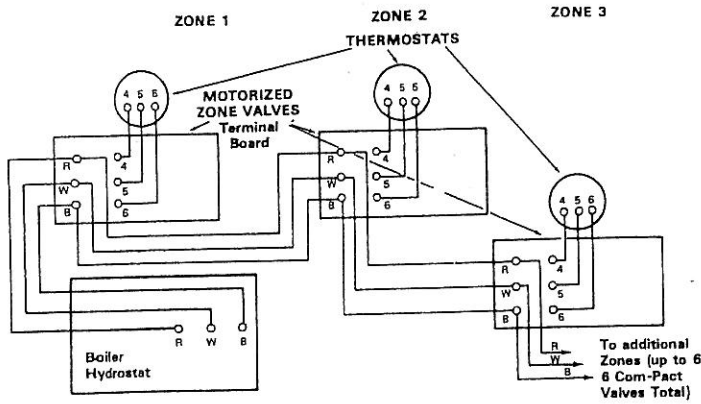
1. WIRING: Adding Zone Valves to an existing zoned boiler.

NOTES: 1. Hydrostats supplied with Edwards packaged boilers have electrical capacity to handle up to a maximum of 2 commercial Valves or 6 Com-Pact Valves. To add more than these numbers of valves to an existing system, it is necessary to install a Relay-Transformer (Edwards Series RT-306, 612, or 1224, etc.).

2. To the RT-Relay Transformer connect 115-volts to terminals L1 and L2. Then follow the wiring shown.

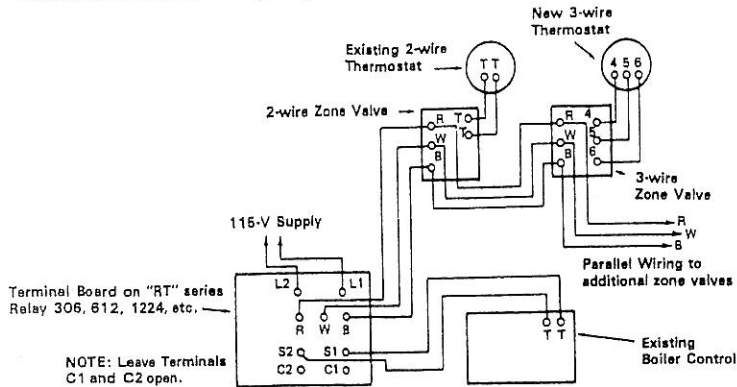


2. WIRING: Standard Wiring 3-wire Zone Valves on Edwards packaged boiler.

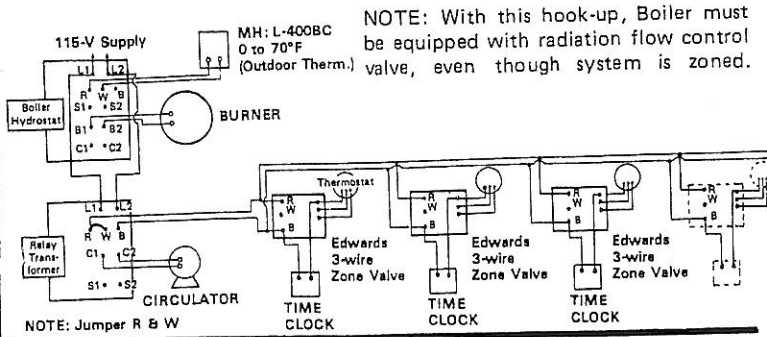


3. WIRING: Conversion of existing non-zone boiler (with 2-wire thermostat) to zone heating system.

- NOTES: 1. Remove 2-wire thermostat connection at existing boiler control.
2. Mount Edwards Relay-Transformer (Series RT-306, 612, or 1224, etc.) on wall or joist. Connect 115-Volt supply to terminals L1 and L2. Connect terminals S1 and S2 to existing boiler control 2-wire thermostat connection. Leave terminals C1 and C2 open.
3. Install Edwards 2-wire zone valve in system and connect R-W-B terminals on RT-Unit.
4. If additional zone valves are desired in system, use 3-wire thermostat models and follow wiring diagram.

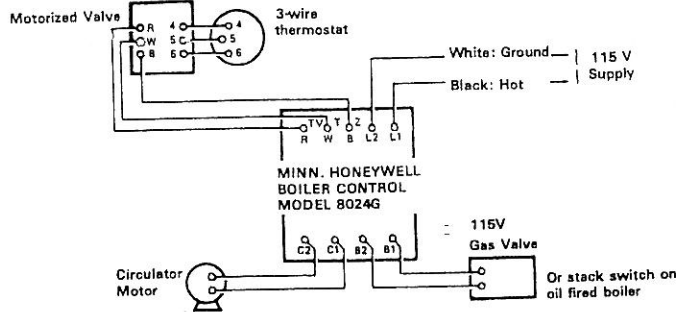


4. WIRING: Installation of Recording Time Clocks in Zone Valve System.

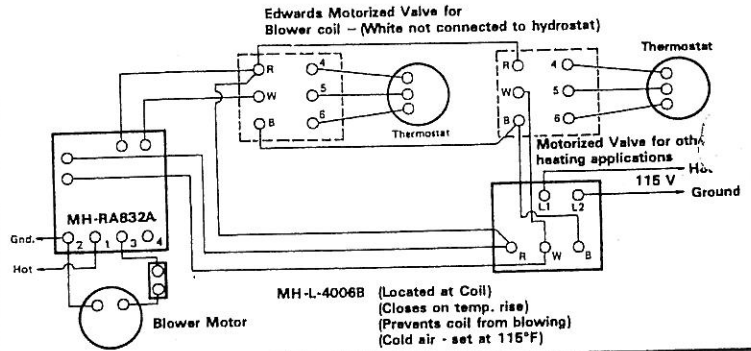


NOTE: With this hook-up, Boiler must be equipped with radiation flow control valve, even though system is zoned.

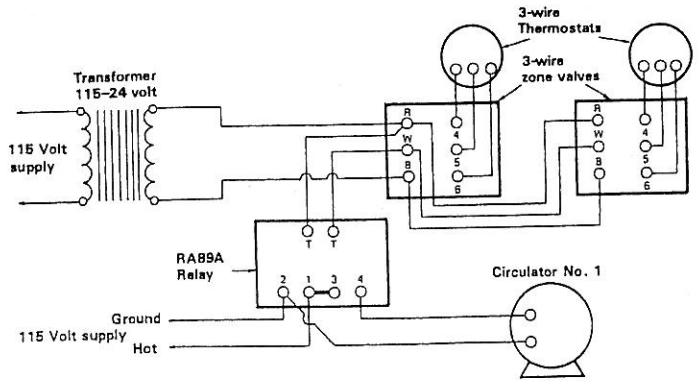
4A. WIRING: FOR BOILERS WITH ZONE CONTROL VALVES Oil Burner or 115 Volt Gas Valve Using MH Control 8024G.



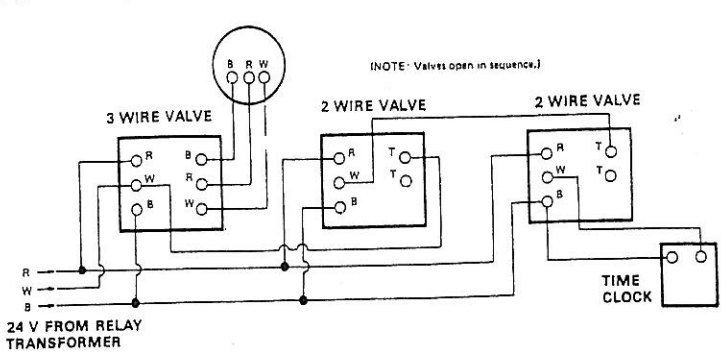
5. WIRING: Edwards Motorized Valve operating a Unit Heater.



6. WIRING: Edwards Motorized Valve with RA89A Relay.

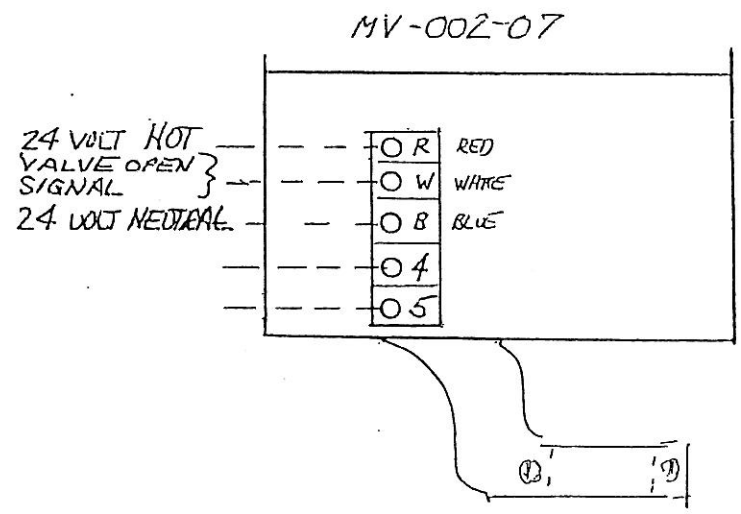
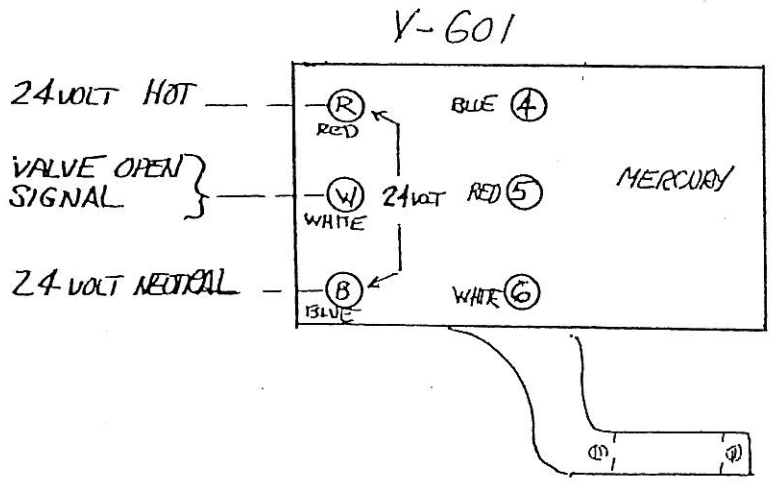


7. WIRING: Operating multiple valves from single thermostat.



- A) — RED #5 TO BLUE #4 OPENS VALVE
 B) — RED #5 TO WHITE #6 CLOSES VALVE

- A) #4 TO #5 OPENS VALVE
 B) WHEN #4 TO #5 CIRCUIT IS BROKEN VALVE AUTOMATICALLY CLOSES



NOTES:

- 1) V-601 MERCURY OPERATORS OBSOLETE DUE TO MERCURY (TOXIC WASTE)
- 2) NEW 2 WIRE MV-00207 OPERATORS WILL WORK IN PLACE OF OLD V-601
- 3) WIRE CONNECTIONS ARE SAME FOR 24 VOLT
 HOT = RED
 NEUTRAL = BLUE
- 4) 3 WIRE STATS DROVE VALVE OPEN #5 TO #4
 DROVE VALVE CLOSED #5 TO #6
- 5) NEW OPERATOR ONLY NEEDS #4 & #5 TO OPEN
 FOLD #6 WIRE BACK AND TAPE

HALE ENGINEERING 847-956-1600
 100 N. GORDON
 ELK GROVE, IL. 60007

1-21-00	NO SCALE
C. BRIAN HALE	
ZONE VALVE CONVERSION 3 TO 2 WIRE	EDWS-106

HOW YOUR EDWARDS HEATING UNIT OPERATES

1. FOR UNITS WITHOUT ZONE VALVES

A. High Limit Control

Normally, when a thermostat calls for heat, both the burner (oil or gas) and the circulator will start. With the high limit control, however, if the boiler water temperature rises to the high limit setting (200° to 230°) on the hydrostat during a call for heat, the burner will shut off, but the circulator will continue to run as long as the thermostat is calling for heat. If the call for heat continues, the resultant drop in boiler water temperature below the high limit setting will bring the burner back on. Thus, the burner will cycle until the thermostat is satisfied; then both burner and circulator will shut off.

B. Low Limit Control

This control prevents the running of the circulator whenever the boiler water temperature is below the low limit setting (80° to 210°). If the thermostat is calling for heat at the same time or shortly after domestic hot water has been drawn through the tankless coil, the water temperature may be low. Despite the call for heat, the circulator will not run until the burner has operated long enough to bring the boiler water temperature up above the low limit setting. The high limit control should be set at least 20° higher than the low limit.

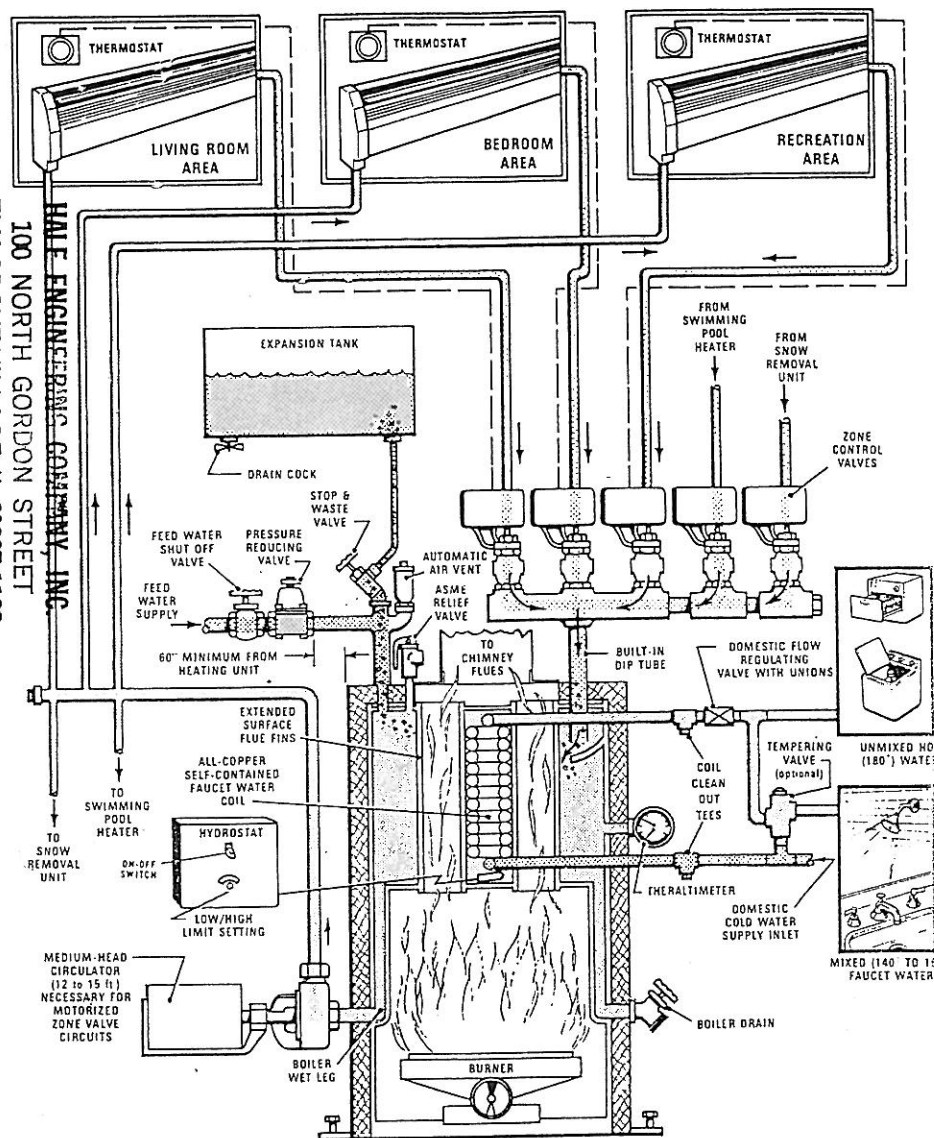
2. FOR UNITS WITH ZONE VALVES

When a thermostat calls for heat, the zone valve motor begins to run, opening the valve slowly; when the valve is fully opened, the valve motor stops. At that time, the operating relay in the hydrostat is energized, closing its contacts to the burner and to the circulator circuits. The high limit control contacts (usually set at 210° to 220°) are normally closed so that the burner now will fire and operate. If the boiler water temperature reaches 220°, the high limit contacts will open and the burner will stop; but, the circulator will continue to run as long as the thermostat is calling for heat. If the call for heat continues, the resultant drop in boiler water temperature below the high limit setting will bring the burner back on. Thus, the burner and circulator will shut off.

In the above description, note that the circulator operation is absolutely governed by the low limit control set at 180° to 190°. After the operating relay "pulls in," the circulator will operate only if the boiler water temperature is 190° or more. Thus, if domestic water has just been drawn, and the boiler water temperature has dropped to 180°, the circulator will not supply heat to the radiation until the boiler water temperature has been raised. The burner may also operate, without signal from the thermostat, if the boiler water temperature drops to 180°. When the thermostat is satisfied, the zone valve motor again is made to run, closing the valve slowly. While the valve is closing, the burner and circulator circuits are opened. In this manner no water hammer occurs. When the valve is fully closed, the valve motor stops. The high limit control should be set at least 20° higher than the low limit.

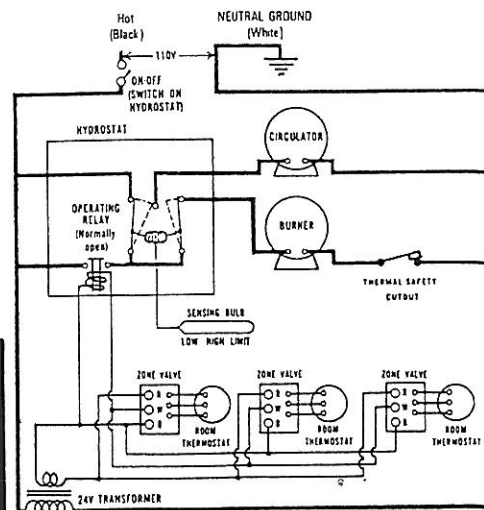
THE EDWARDS ZONE-A-MATIC HOT WATER HEATING SYSTEM

HALE ENGINEERING COMPANY, INC.
100 NORTH GORDON STREET
ELK GROVE VILLAGE, IL 60007-1193
TELEPHONE (708) 956-1600
FAX (708) 956-0595



In the procedures above, the operation of only one zone calling for heat has been described. Since zone valves with each thermostat are connected electrically in parallel, any one or more zone circuits can dictate the operation of the hydrostat. Note, however, that the absolute "captain" of the team is the low limit control. If the low limit contact is closed at 180°, the circulator will not operate regardless of the thermostat signal, and the burner will operate to increase the boiler temperature. Only when the boiler temperature is at least 190° will the low limit control permit the circulator to operate.

SIMPLIFIED CONTROL CIRCUIT



HEATING UNIT WITH ZONE CONTROLS

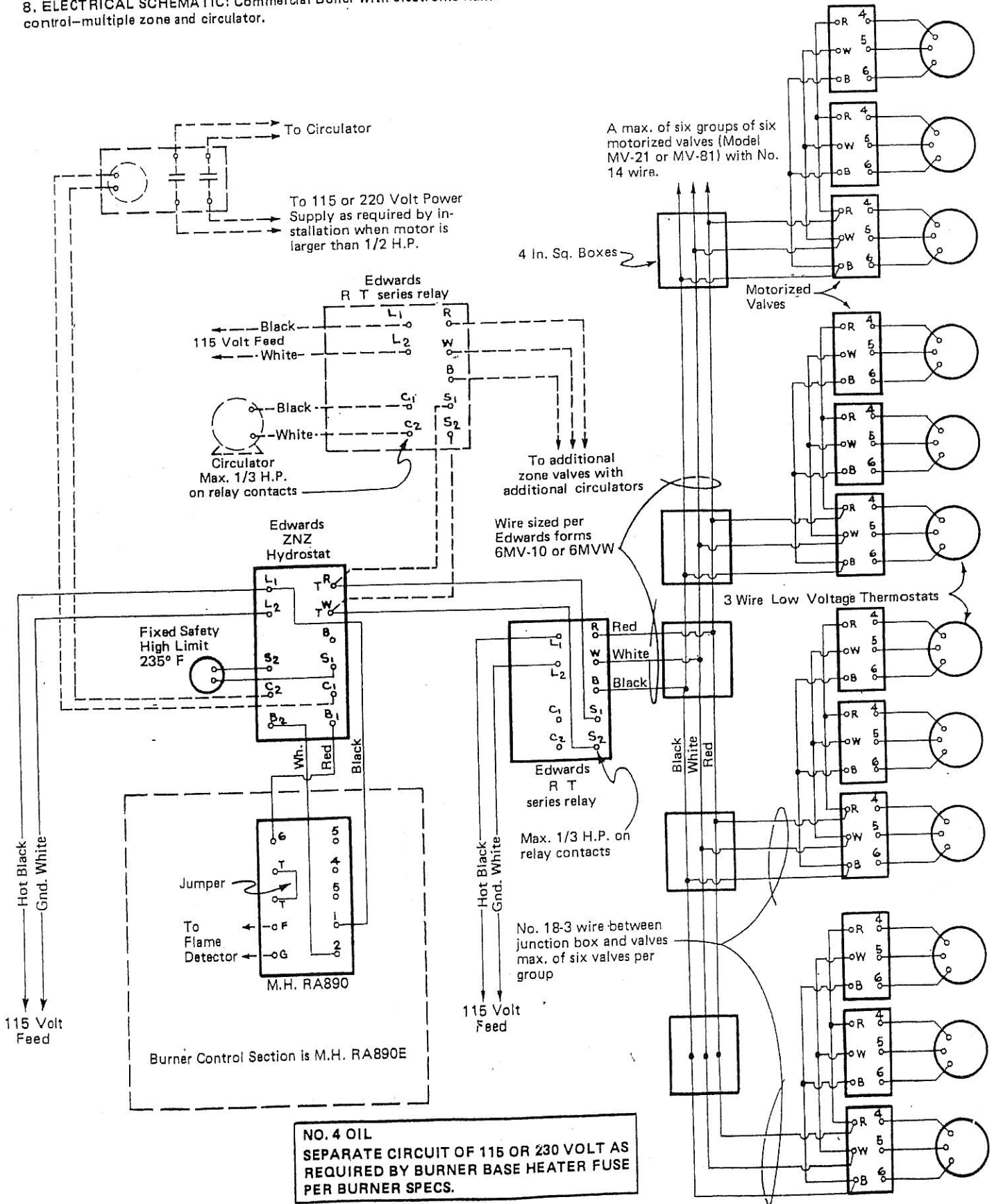


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FORM 1-AS-13.10G Effective 12/1/83

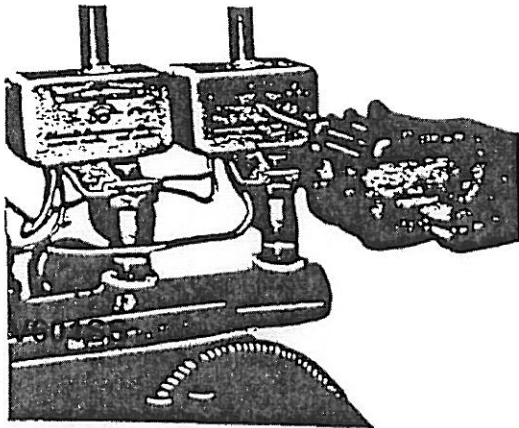
WIRE SIZES			NUMBER OF COM-PACT MOTORIZED VALVES WIRED AT VARIOUS DISTANCES FROM 24-VOLT SOURCE				
A.W.G. SIZE	WIRE DIA., INCHES	WIRE AREA, SQ. INCHES	Up to 25 ft.	25 to 50 ft.	50 to 100 ft.	100 to 150 ft.	150 to 200 ft.
18	.0403	.0013	12 Valves	8 Valves	4 Valves	2 Valves	0 Valves
16	.0508	.0020	48 Valves	24 Valves	12 Valves	6 Valves	3 Valves
14	.0641	.0032	96 Valves	48 Valves	24 Valves	18 Valves	12 Valves
12	.0808	.0051	160 Valves	80 Valves	40 Valves	30 Valves	20 Valves
10	.1019	.0082	256 Valves	128 Valves	64 Valves	48 Valves	32 Valves

8. ELECTRICAL SCHEMATIC: Commercial Boiler with electronic flame control—multiple zone and circulator.



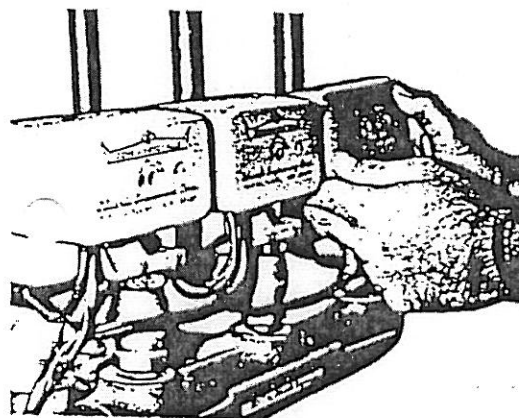
COMPACT MOTORIZED VALVE

STEM REPLACEMENT



STEP 3 & 7

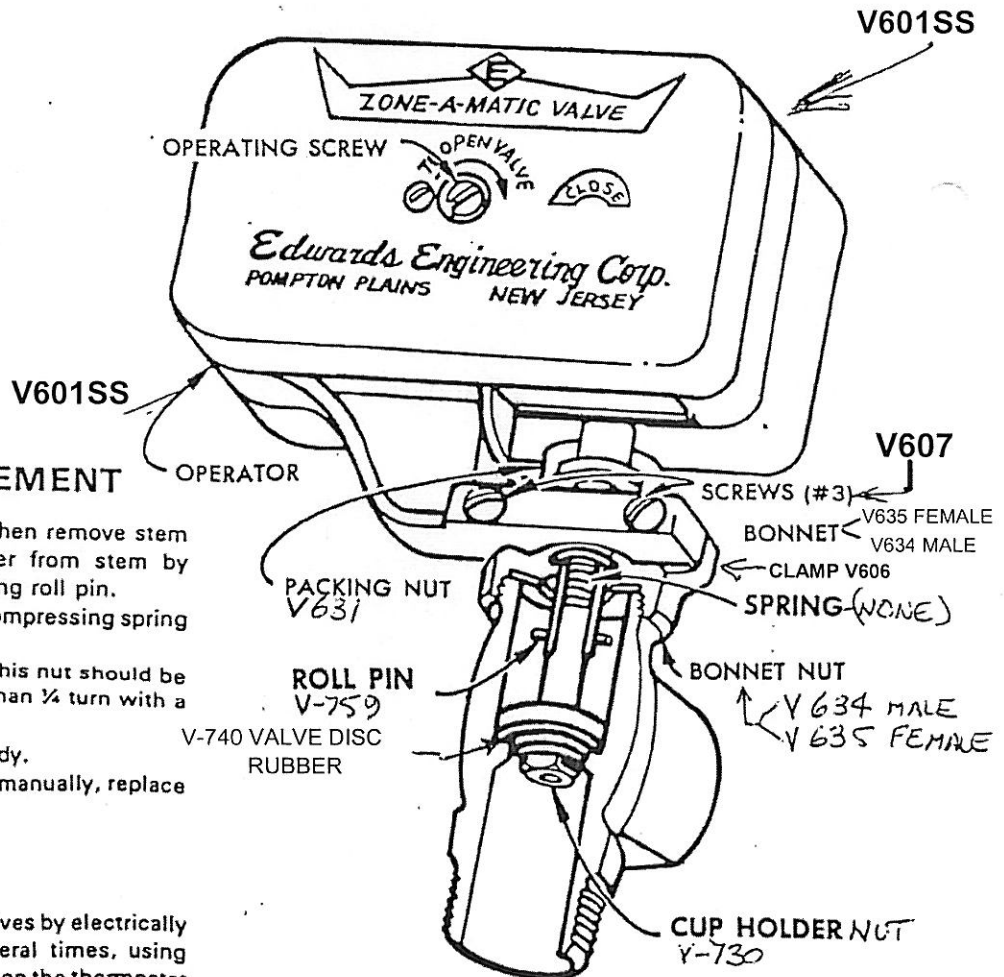
- Step 1 Shut off current to boiler
- Step 2 Close valve to expansion tank and all automatic vents on boiler.
- Step 3 Turn valve to OPEN position using manual operating screw on front cover.
- Step 4 Close water supply valve to boiler.
- Step 5 Connect hose to boiler draw-off cock.
- Step 6 Drain system.
- Step 7 Turn valve to CLOSED position using manual operating screw on front cover.
- Step 8 Remove two screws (#3) holding operating bonnet.
- Step 9 Simultaneously tilt operator backward and lift upward.
- Step 10 Back off packing nut one or two turns.
- Step 11 Unscrew bonnet nut.
- Step 12 Remove stem from body and replace with new stem. Then proceed to steps 3 - 9 below.



STEP 9

CUP HOLDER REPLACEMENT

- Step 1 Complete steps 1 - 11 above, then remove stem from body. Remove cup holder from stem by compressing spring and replacing roll pin.
- Step 2 Replace cup holder in stem by compressing spring and replacing roll pin.
- Step 3 Replace packing nut on stem. This nut should be adjusted finger-tight, no more than 1/4 turn with a wrench, to stop leaking.
- Step 4 Tighten bonnet nut on valve body.
- Step 5 After opening motorized valves manually, replace operator on stem.
- Step 6 Turn on current.
- Step 7 Purge all air from system.
- Step 8 Open valve to expansion tank.
- Step 9 Check operation of motorized valves by electrically opening and closing them several times, using either the thermostat or a jumper on the thermostat valve terminals 4 and 5 (to open) and 5 and 6 (to close).



EDWARDS ENGINEERING CORP.

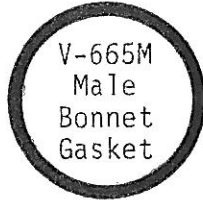
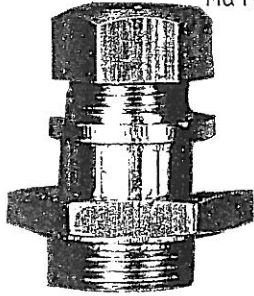
HALE ENGINEERING CO., INC.

FEBRUARY 6, 1997

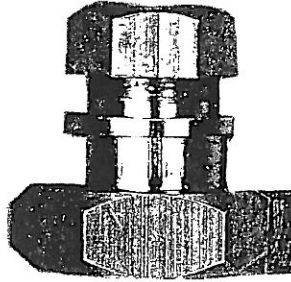
EDWARDS HYDRONIC VALVE BONNETS

Manufacturers Representative
Commercial and Industrial Heating, Ventilating
and Air Conditioning Equipment

V-634 Heating
Male Thread



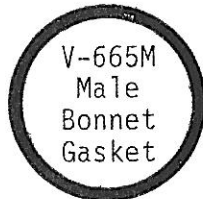
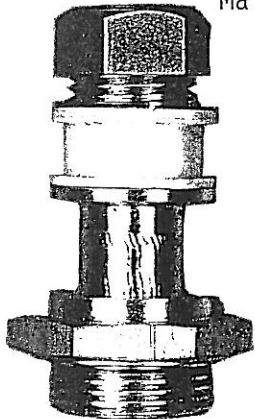
V-635 Heating
Female Thread



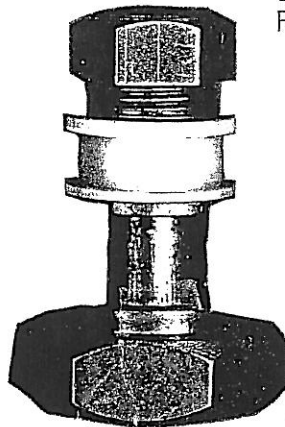
V-665F
Female
Bonnet
Gasket



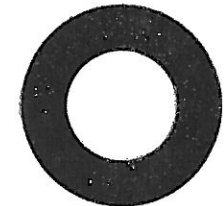
V-654 Cooling
Male Thread



V-654B Cooling
Female Thread



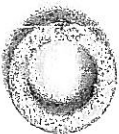
V-665F
Female
Bonnet
Gasket



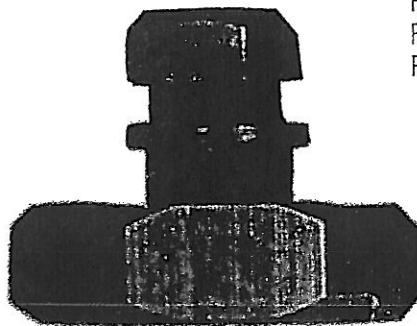
V-632 O-Ring
Viton
*Lubricate with
silicone grease
only



V-630 Teflon
Packing



V-638/V-639 Heating
Female Thread
For 1" Angle V-638
For 1" Straight V-639



V-666
Female
Bonnet
Gasket

