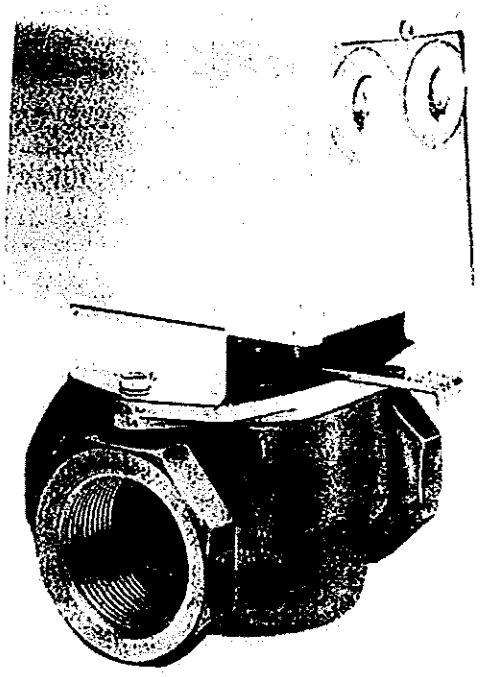
Drayton

INSTRUCTIONS
63-15
ISSUE 8302

DRAYTON CONTROLS (ENGINEERING) LIMITED, West Drayton, Middlesex UB7 7SP. Telephone: (08954) 44012. Telex 896626

# THETA YB VALVE



## 1. DESCRIPTION

### 1.1 General

The YB valve is a motorised three port mixing valve, principally designed to control the temperature of hot water to a heating system by mixing the flow from the boiler with the return flow from the heating system to give a controlled flow temperature at the mixed outlet and is normally operated by one of the Theta range of controllers. It can also be used for controlling such equipment as air heater batteries. The valve has a compact body making it small enough to fit into most boiler casings. It is fitted with a combined valve position indicator and manual actuator which not only provides visual indication of valve position but allows the valve to be positioned by hand whether or not the motorised actuator is fitted.

In addition to feedback potentiometer and limit switches, an auxiliary changeover switch can be fitted as an optional extra. This operates when port 2 (boiler port) is approximately 95% shut.

### 1.2 Specification

| Size | Maximum Working Pressure p.s.i. | Maximum Differential Pressure p.s.i. | Maximum Flow Temperature | Cv Factor | Motor Rating | Time | Materials |
|---|---|---|---|---|---|---|---|
| 1¼" BSP | 125 | 10 | 212°F 100°C | 14 | 4VA | 2½ minutes fully open to fully closed | Brass body with P.T.F.E. facing on valve shoe |
| 1½" BSP | | 10 | | 20 | | | |
| 2" BSP | | 8 | | 35 | | | |

### 1.3 Variations

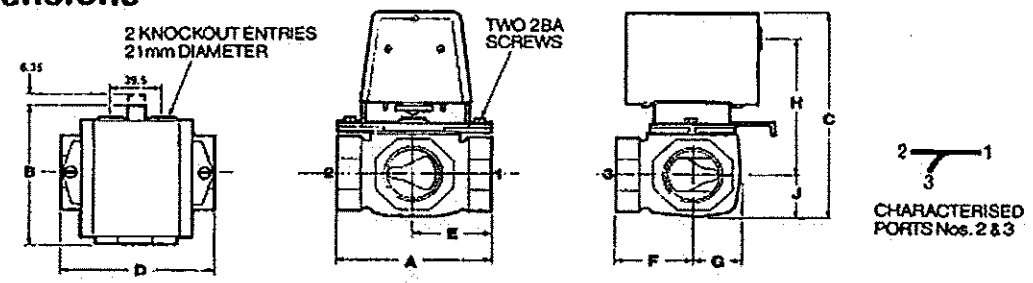
| | YBL1 | YBL1A | YBL3 | YBM2 | YBM2A | YBM3 |
|---|---|---|---|---|---|---|
| Volts | 24 | 24 | 24 | 240 | 240 | 240 |
| Potentiometer | ● | ● | ● | | | |
| Aux. Switch | | ● | | | ● | |
| Changeover Limit Switches | | | ● | | | ● |

## 2. DESCRIPTION OF OPERATION

The supply and signal voltage actuates the valve spindle through 90° rotation to move a sliding shoe across specially shaped ports which give an ideal flow characteristic. The shoe is faced with P.T.F.E. to keep to a minimum the torque required to overcome friction. By pulling the manual override lever outwards the motor becomes disengaged and the lever can be used to rotate the valve by hand.

## 3. INSTALLATION

### 3.1 Dimensions




| VALVE SIZE | A | B | C | D | E | F | G | H | J |
|---|---|---|---|---|---|---|---|---|---|
| 1¼" | 117 | 129 | 190 | 124 | 59 | 59 | 33 | 131 | 33 |
| 1½" | 127 | 134 | 191 | 124 | 63 | 63 | 37 | 129 | 37 |
| 2" | 149 | 145 | 202 | 124 | 75 | 75 | 45 | 133 | 44 |

### 3.2 To install the valve

**For mixing (Theta) applications**

This should be installed in the pipework with port 2 to the boiler, port 3 to the bypass and port 1 to the radiators as shown in Fig. 1. The pump may be installed on the flow or return from the heating system but it must not be put in on the boiler side of the valve or on the bypass connection to the valve.

The valve should be installed before the actuator is mounted on the valve and care should be taken not to distort the valve body. It should be gripped on the flats provided.

NOTE: Overheating may occur in mild weather if "uncontrolled" circuits are brought into the suction side of the pump (see Fig. 1 to 4 for pipe installations). The bypass connection to the valve must be made via a Tee-piece between the pump and the boiler and NOT directly into the boiler manifold.

**For diverting applications**

**When used for diverting applications, the valve should be installed with Port 1 as the common inlet and Ports 2 and 3 as the outlets. Typical diverting applications are shown on 'Draytonplans' available on request.**

### 3.3 To install the actuator

(see fig. 5)

Ensure that actuator is mounted correctly on valve as follows: Rotate operating lever to position shown in Fig. 5. Place actuator onto valve in attitude shown and pull lever in direction of arrow until operating pin is clear of actuator driving plate. Fix actuator, ensuring that the retaining screws are tightened securely.

Push lever inwards and rotate until pin engages with operating plate. For hand operation disengage motor drive by pulling lever outwards.

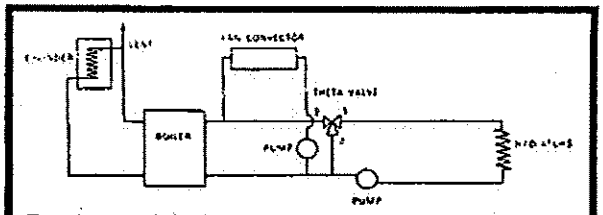


*Fig. 1* **RIGHT** *Cylinder and fan convector installed correctly. Additional pump supplements gravity circulation.*

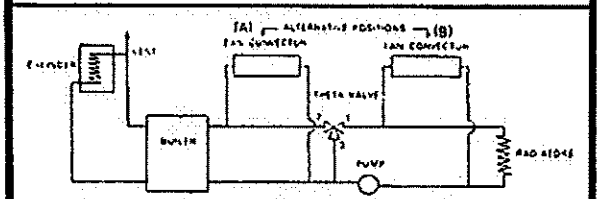


*Fig. 2* **UNSATISFACTORY** *Cylinder correct. Fan convectors incorrect. 'A' will only operate satisfactory if there is sufficient gravity circulation. 'B' may give insufficient heat in mild weather due to low temperature of mixed water.*

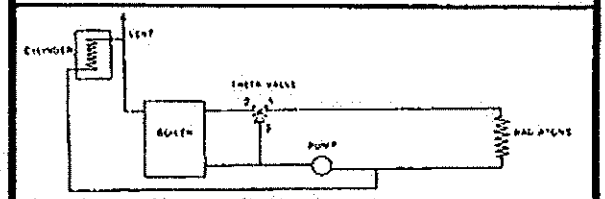


*Fig. 3* **WRONG** *Uncontrolled hot water from cylinder returned to heating system to cause overheating and lack of control in mild weather.*

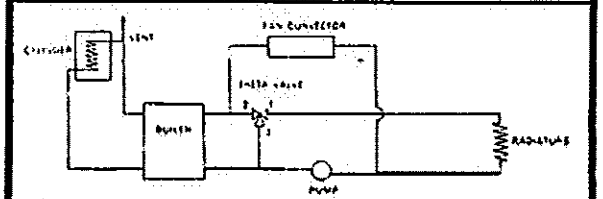


*Fig. 4* **WRONG** *Cylinder now installed correctly, Fan incorrect.*

**Installation diagrams for mixing (Theta) duty. For diverting applications refer to 'Draytonplans'.**

## 5.2.4

Remove the four socket head retaining screws and remove the cover plate, keeping the valve spindle in position.

NOTE. *It is not necessary to remove the spindle and shoe assembly for this purpose.*

## 5.2.5

Remove the gasket, anti-friction washer and the top and bottom spindle seals.

## 5.2.6

Clean the valve spindle, cover plate and body gasket face, and fit the new anti-friction washer, bottom spindle seal (Black) and top spindle seal (White) to the spindle as shown in the diagram.

## 5.2.7

Place body gasket on cover plate and refit plate to valve body, taking care to register cover plate locating pin with drilling in valve body. Insert cover plate retaining screws and tighten evenly.

## 5.2.8

Replace manual lever and lever spring on valve spindle (see Fig. 1). Fit central securing screw and washer.

## 5.2.9

Install actuator as described in section 3.3.

## 5.2.10

Refill system and restore power to controller

**ASSEMBLY OF TYPE YB VALVES**

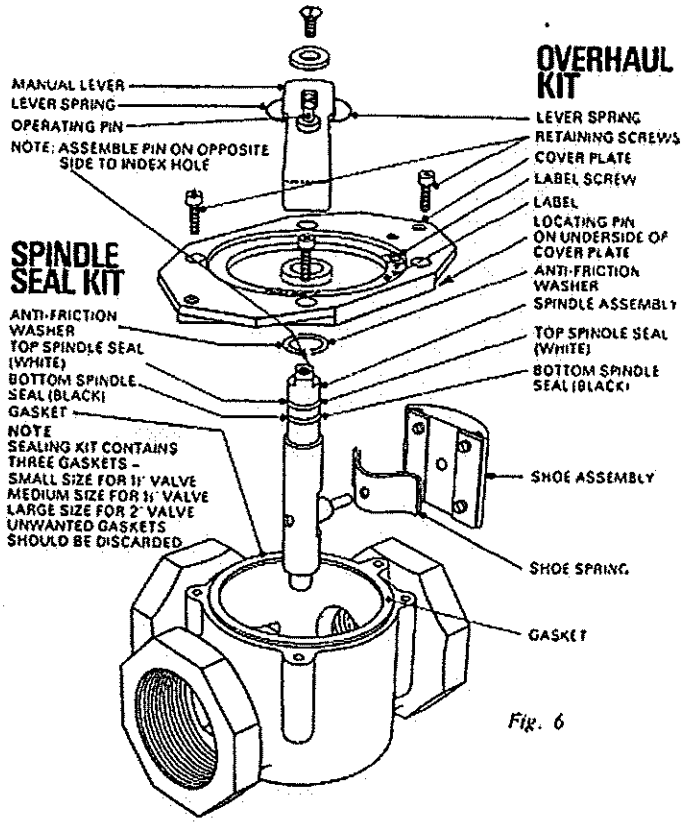



*Fig. 6*

## 5.3 To Overhaul (See available spares lists—Section 6—for overhaul kit)

Overhaul generally as above, but replace all items provided in overhaul kit.

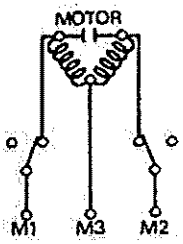
## 6. AVAILABLE SPARES KITS Please order by code number

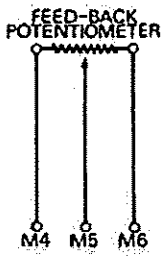
| **Spindle Seal Kit—comprising:** | **Code No.** |
|---|---|
| Anti-friction washer<br>Top spindle seal<br>Bottom spindle seal<br>* Gasket for 1¼" valve<br>* Gasket for 1½" valve<br>* Gasket for 2" valve<br>*Unwanted gaskets to be discarded | For 1¼", 1½" or 2" valves<br>(Code 06 92 009) |

| **Overhaul Kit—comprising:** | |
|---|---|
| Lever Spring<br>Retaining screws<br>Cover plate—with label fitted<br>Anti-friction washer<br>Spindle assembly<br>Top spindle seal (White)<br>Bottom spindle seal (Black)<br>Shoe assembly<br>Shoe spring | For 1¼" valve<br>(Code 06 92 006)<br><br>For 1½" valve<br>(Code 06 92 007)<br><br>For 2" valve<br>(Code 06 92 008) |

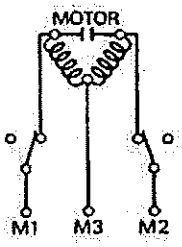
## 3.4 Wiring Diagrams

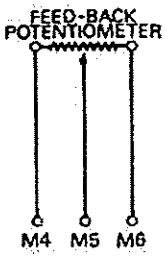
### YBL1

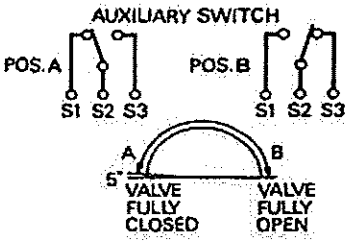


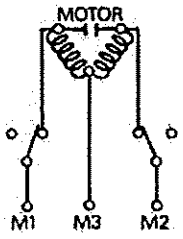

### YBL1A



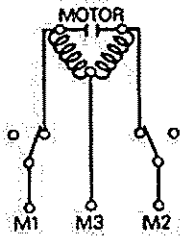



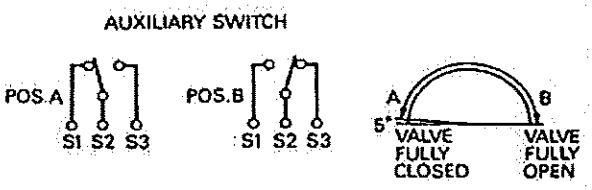




### YBM2

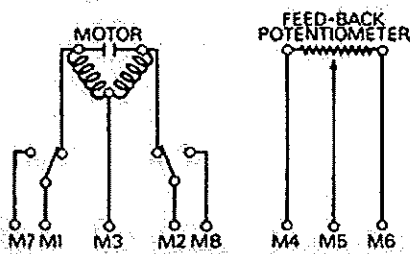



### YBM2A

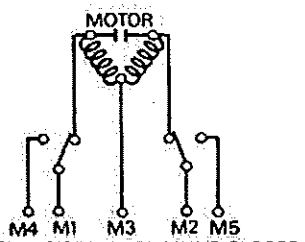


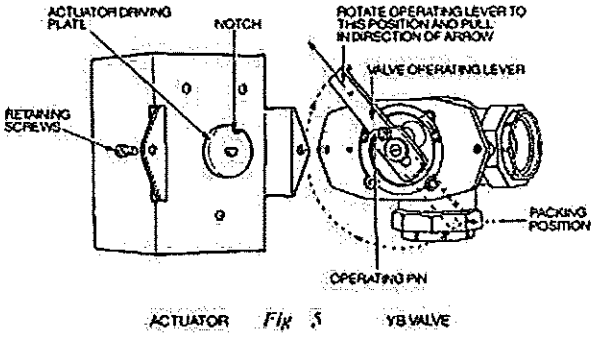

### YBL3




### YBM3




NOTES :-FOR ALL VARIATIONS-ENERGISE M1 & M3 TO CLOSE PORT 2 & OPEN PORT 3. ENERGISE M2 & M3 TO OPEN PORT 2 & CLOSE PORT 3. FOR WIRING TO DRAYTON CONTROLLERS SEE APPROPRIATE CONTROLLER INSTRUCTIONS.




ACTUATOR *Fig. 5* VB VALVE

## 4. COMMISSIONING

Commission in accordance with the appropriate controller instructions.

## 5. MAINTENANCE

### 5.1 Periodic maintenance

No periodic maintenance is necessary.

### 5.2 To renew the Spindle Seals

(see available spares list—section 6—for spindle seal kit).

### 5.2.1

Shut down boiler, drain down system and switch off controller.

### 5.2.2

Remove actuator, held by the two retaining screws, and support it to avoid undue strain on the electrical cables.

### 5.2.3 Referring to Fig. 6

Remove the manual lever and lever spring, held by a central screw.