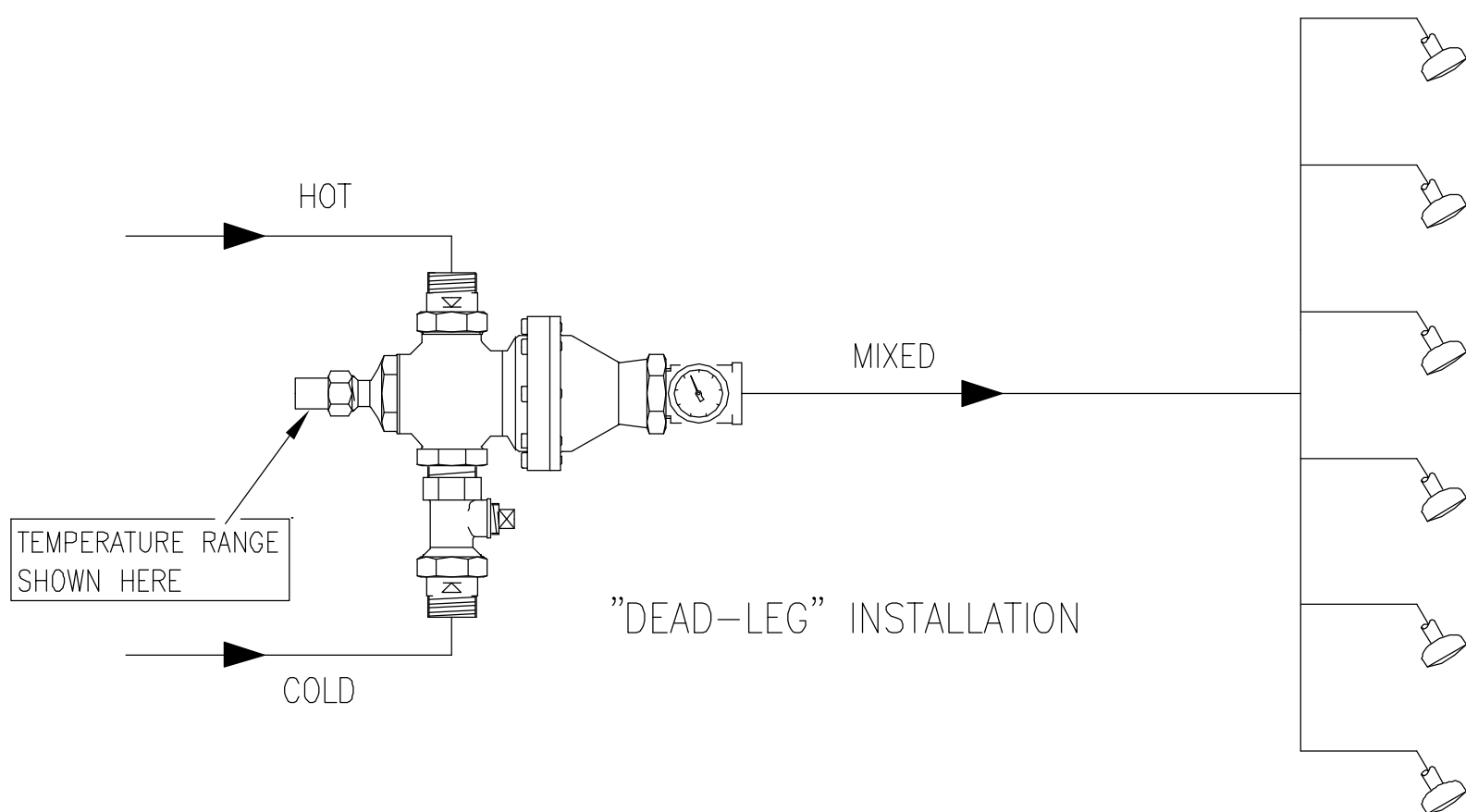
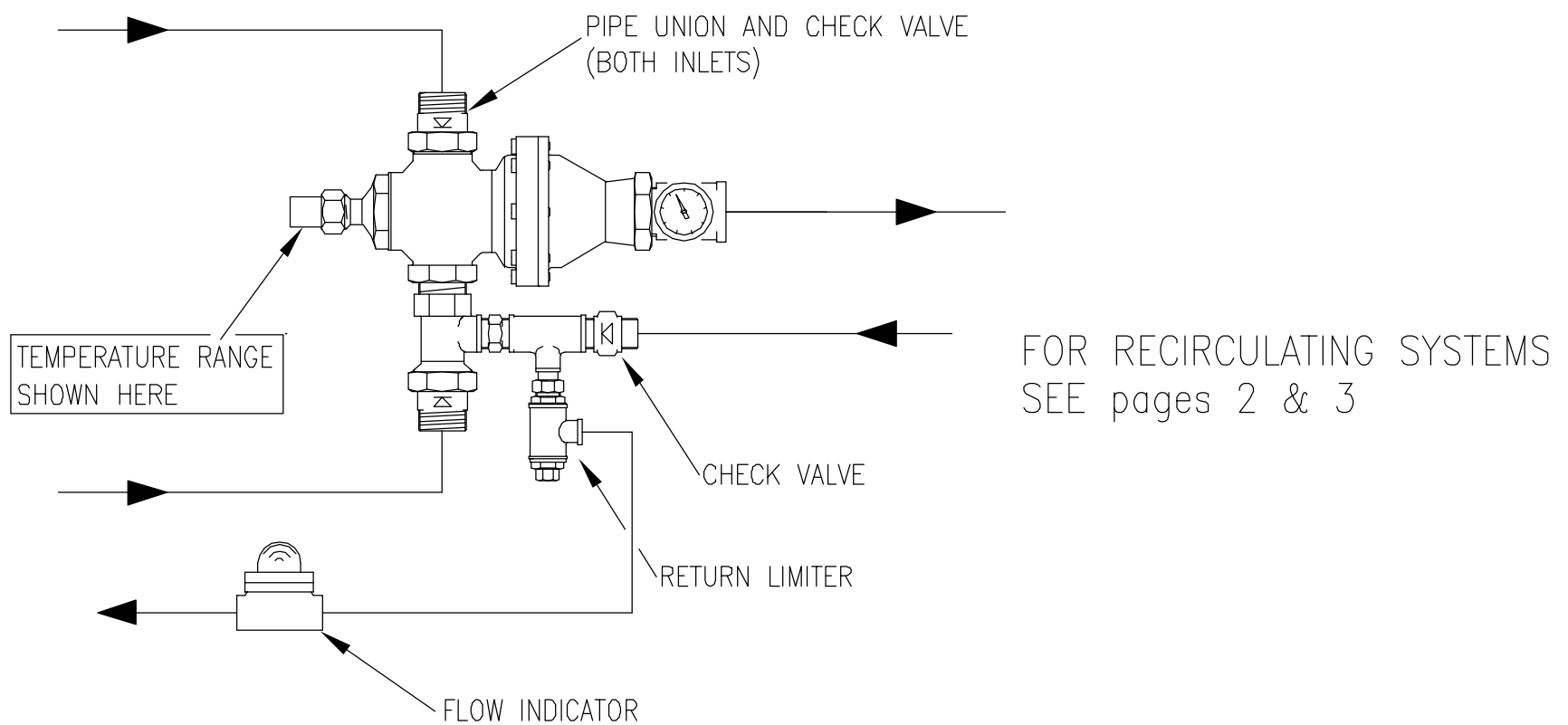


HORNE® THERMOSTATIC MIXING VALVES

INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS

MODELS: H-40 (1,1/2"), H-50 (2")



NOTE: BEFORE INSTALLATION, CHECK THAT THE TEMPERATURE ADJUSTMENT RANGE IS SUITABLE FOR THE INTENDED USE. THE TEMPERATURE RANGE IS SHOWN ON THE LOCKSHIELD NUT AT THE ADJUSTING SCREW. (SEE ABOVE)

THE FOLLOWING TEMPERATURE RANGES ARE AVAILABLE:

(15 to 32°c)	(32 to 52°c)
(45 to 62°c)	(58 to 80°c)

OPERATING CONDITIONS:

MAX'M. HOT WATER SUPPLY TEMPERATURE: 85°C

MIN'M. HOT WATER SUPPLY TEMPERATURE: MIXED TEMPERATURE + 10 K

MAX'M. COLD WATER SUPPLY TEMPERATURE: MIXED TEMPERATURE - 10 K

MAX'M. MIXED WATER FLOW-RATE: { H-40: 4.5 LITRE/sec
 { H-50: 5.7 LITRE/sec

MAX'M. STATIC PRESSURE: 10, bar

HOT AND COLD SUPPLY PRESSURES SHOULD BE NOMINALLY EQUAL. (THE HOT AND COLD STATIC HEAD SHOULD BE EQUAL).

INSTALLATION:

From the following diagrams, identify the type of system to be installed.

The associated pipework on site should be schematically the same as that shown, and the recirc. pump(s) should be located where shown.

Ensure that the TEMPERATURE RANGE shown on the ADJUSTMENT LABEL matches the requirement for the job.

The MIXING VALVE can be fitted horizontal or vertical, but the FLOW INDICATOR must be in a horizontal pipe with the glass dome uppermost. (NOTE DIRECTION OF FLOW)

Before final fitting, ensure that the hot and cold supply pipework is internally clean: if possible, flush thro' before final connection to the MIXING VALVE.

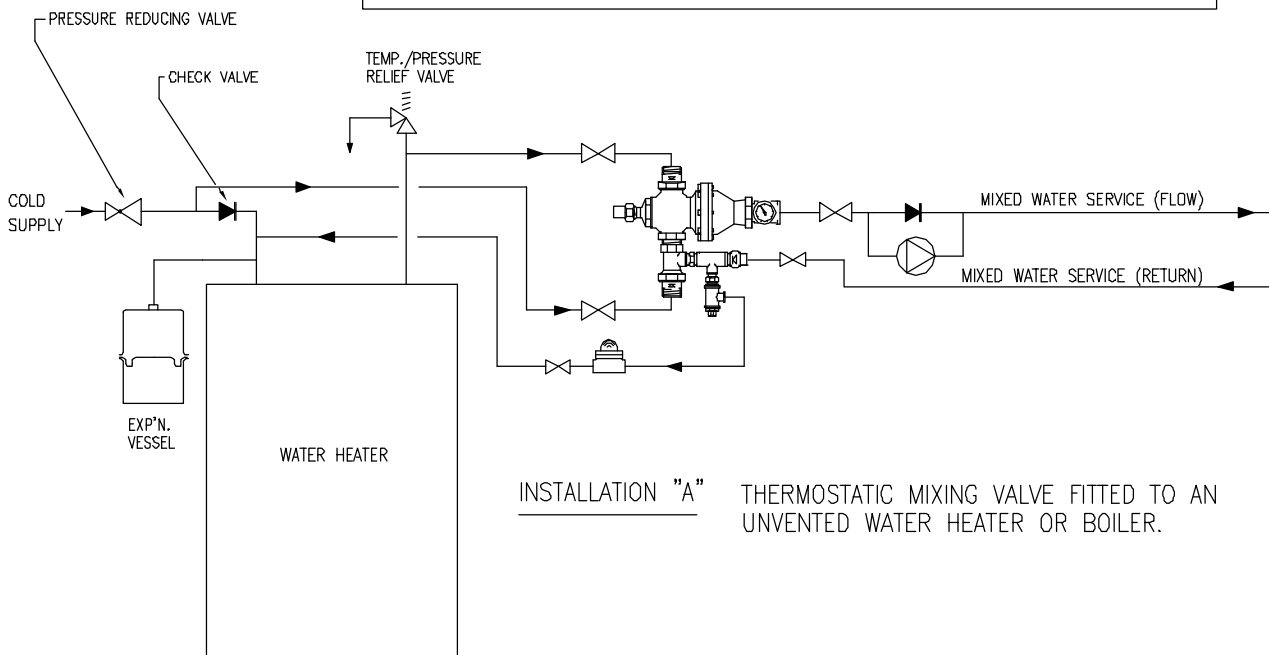
NEVER apply torque to the MIXING VALVE ASSEMBLY: when making-up pipework connections, ALWAYS use two wrenches or spanners.

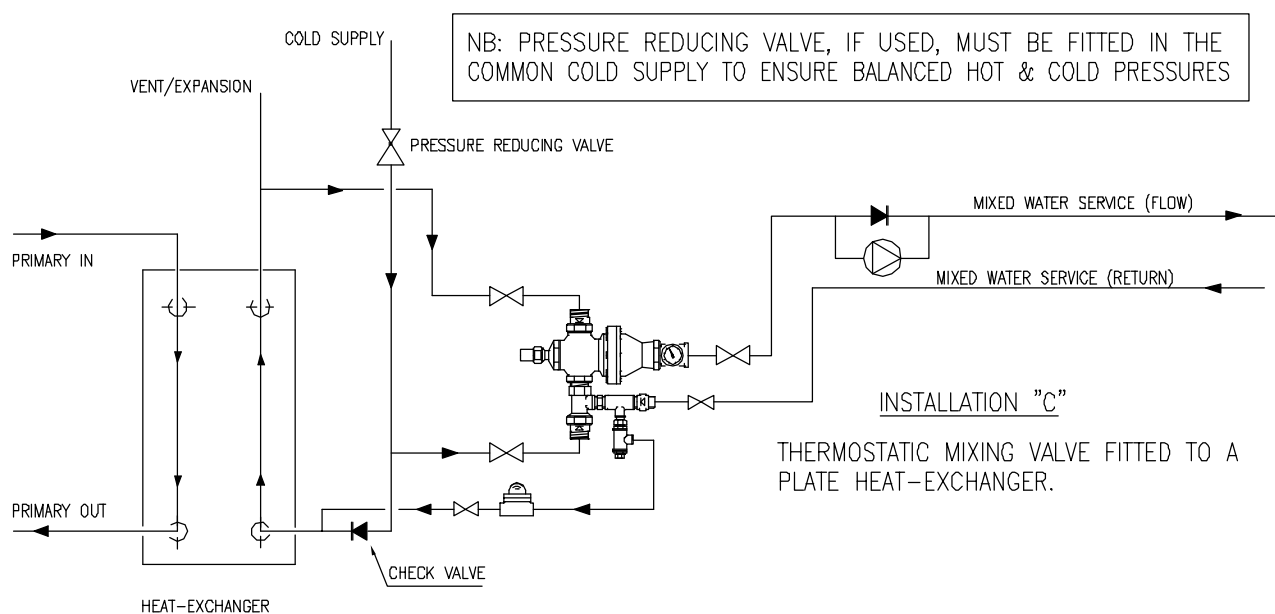
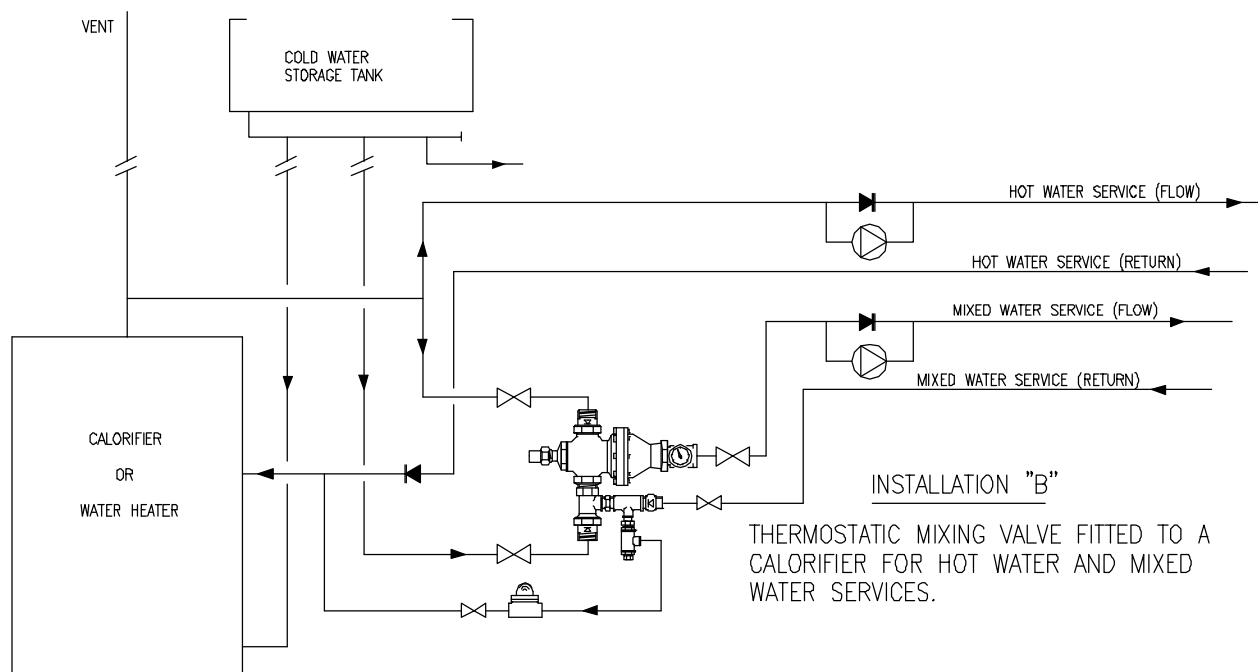
If brazed or soldered pipe fittings are used they should be made-up before connecting to the MIXING VALVE.

IMPORTANT: Special instructions for fitting the RETURN LIMITER are shown on page 7.

TYPICAL INSTALLATIONS:

NB: PRESSURE REDUCING VALVE, IF USED, MUST BE FITTED IN THE COMMON COLD SUPPLY TO ENSURE BALANCED HOT & COLD PRESSURES





COMMISSIONING and TEMPERATURE ADJUSTMENT:

To flood the system, open both hot and cold inlet isolating valves.

Ensure that the hot and cold supplies are at their designed pressures and temperatures.

Open a few mixed water outlets and wait until the hot and cold inlet temperatures are stable.

If the mixed water temperature requires adjustment, turn the adjusting key clockwise to reduce the temperature or anti-clockwise to increase it. Turn the key only 1/2-TURN at a time and allow the temperature to settle.

When the mixed water temperature has been set, close the taps and start the recirculation pump.

Observe the FLOW INDICATOR; while the recirculation pipework is heating up, the ball in the glass dome should be moving actively; (at this stage, the mixed water temperature may show a slight increase).

When all the pipework has heated thro' the FLOW INDICATOR will show a reduced flow and any temporary increase in mixed water temperature will return to normal.

REMEMBER: When making temperature adjustments, two or three outlets must be running.

When checking the recirculation temperature, all outlets must be closed; when outlets are running the FLOW-INDICATOR may show no flow, this is normal.

RETURN LIMITER: The RETURN LIMITER is pre-set; to alter this setting see instructions on page 7.

ROUTINE INSPECTION:

The MIXING VALVE should be inspected annually, or more frequently on sites where scaling is prevalent.

Stop the recirculation pump and close all the isolating valves.

Clean the strainers, (if fitted), at the hot and cold inlets.

Remove the VALVE COVER and CARTRIDGE from the THERMOSTATIC MIXING VALVE. (See page 5, SERVICING THE THERMOSTATIC MIXING VALVE).

If scaling has occurred on the internal parts, a full service should be carried out.

After re-assembling the THERMOSTATIC MIXING VALVE, re-open all the isolating valves and re-start the recirc. pump. Check at the FLOW INDICATOR that recirculation has been established.

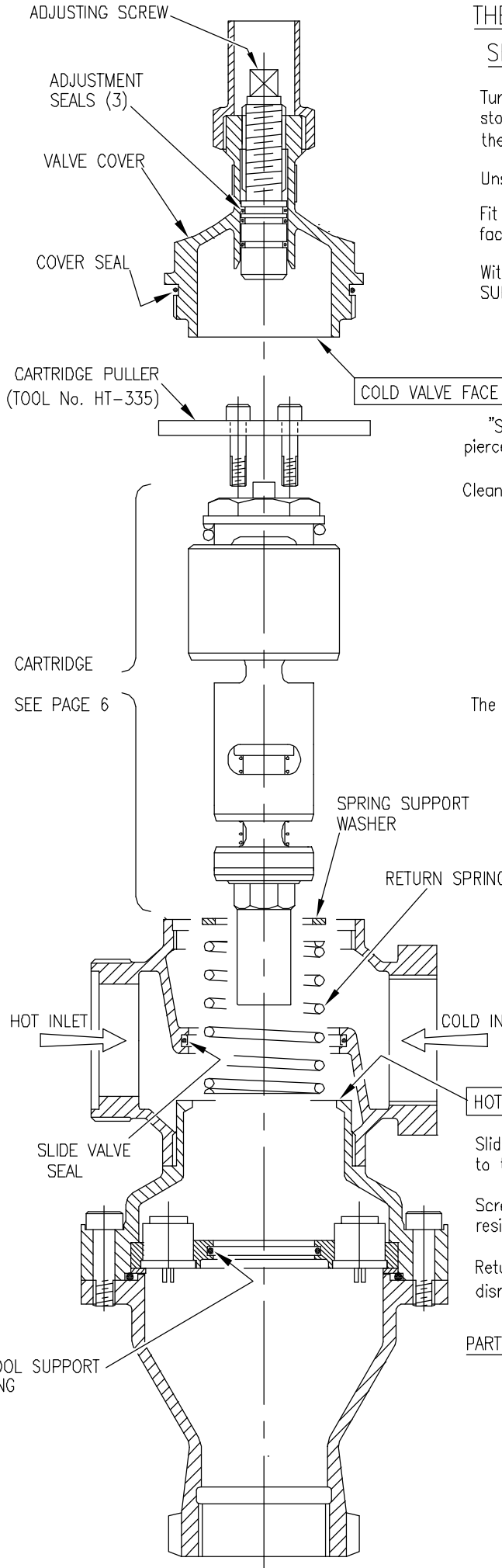
Open a few taps and check that the mixed water temperature is normal.

FAULT FINDING

SYMPTOM	POSSIBLE CAUSE	ACTION
Mixed water temperature too high, when mixed water is being used.	Temperature setting too high.	Re-adjust temperature setting.
	Temperature has been set when hot supply temperature is too low.	Re-adjust when hot supply is at design temperature.
	Hot water has migrated into cold water supply.	Close all mixed water outlets and check that cold supply pipework remains cold.
	Thermostat Element has failed.	Replace Thermostat Element. See page 6.
Mixed water temperature increases when no mixed water is being used, (Recirculation only).	Return Limiter requires adjustment, or servicing.	Follow instructions on page 7.
Mixed water temperature too low, when mixed water is being used.	Temperature setting too low.	Re-adjust temperature setting. See page 3
	Hot supply temperature is low.	Check temperature at hot supply pipework. Check temperature at boiler or water-heater.
Mixed water temperature too low when mixed water is being used and there is vigorous flow of cold water through the FLOW INDICATOR (Recirc. only)	Unbalanced pressures at hot/cold inlets.	Check position of any pressure reducing valve in the system. See 'Installation A', Page 2.
Mixed water temperature too low, when no mixed water is being used, (Recirculation only).	Recirculation has failed due to pump failure or air-lacking.	Check "FLOW INDICATOR" as described in Commissioning, page 3.
	Return Limiter requires adjustment, or servicing.	Follow instructions on page 7.
Mixed water temperature varies, and does not respond to adjustment.	The "CARTRIDGE" has seized in the THERMOSTATIC MIXING VALVE.	Carry out a full service. See pages 5 & 6
	The Thermostat Element has failed.	Replace Thermostat Element. See page 6
Mixed water flow-rate is reduced.	Partly blocked Strainers	Clean the Strainers at the hot and cold inlets.
	Supply pressure has fallen.	Check pressurisation unit and boiler pressure. Check all valves are full open.
	Extra demand has been added to the system.	Check maximum flow-rate for the "MIXING VALVE" against maximum expected flow-rate. (page 2)
Mixed water temperature Suddenly runs cold.	Maximum allowable flow-rate has been exceeded. (see OPERATING CONDITIONS))	Fit auxilliary mixing valve in parallel, or, reduce the system demand.

THERMOSTATIC MIXING VALVE

SERVICING THE H-40 and H-50



Turn the "ADJUSTING SCREW" anti-clockwise till it comes to a stop; NOTE THE NUMBER OF TURNS (this helps when resetting the valve).

Unscrew and remove the "VALVE COVER".

Fit the "CARTRIDGE PULLER" to the two tapped holes on the face of the "CARTRIDGE".

Withdraw the "CARTRIDGE", "RETURN SPRING", and "SPRING SUPPORT WASHER".

Turn the "ADJUSTING SCREW" fully clockwise and remove it from the "VALVE COVER".

Remove the 3-"ADJUSTMENT SEALS", "COVER SEAL", and "SLIDE VALVE SEAL". To remove the "SLIDE VALVE SEAL", pierce it with a sharp pointed probe and ease it from its groove.

Clean the internal machined surfaces, in particular the
 "HOT VALVE FACE"
 "COLD VALVE FACE"
 O-RING GROOVES
 THE BORE AT THE "SLIDE VALVE SEAL"
 THE BORE AT THE "ADJUSTMENT SEALS"

For cleaning use scouring cloth e.g. "SCOTCHBRITE", or a domestic pot cleaner.

The "CARTRIDGE" servicing instructions are shown on page 6.

RE-ASSEMBLY:

SEALS and O-RINGS which have been removed should be replaced by new ones and lightly smeared with silicone grease before fitting.

The "SLIDE VALVE SEAL" is in two parts, fit the black O-RING first, then fold the white "TEFLON" ring into a heart shape and enter it into its groove; make sure it is fully entered and flush with the machined bore.

On the "VALVE COVER", lightly smear the bore which carries the "ADJUSTMENT SEALS" with silicone grease and screw-in the "ADJUSTING SCREW" all the way to its stop.

Slide the "SPRING SUPPORT WASHER" and "RETURN SPRING" on to the CARTRIDGE and insert into the valve body.

Screw on the "VALVE COVER", while pushing against the resistance of the "RETURN SPRING".

Return the "ADJUSTING SCREW" to its original setting prior to dismantling.

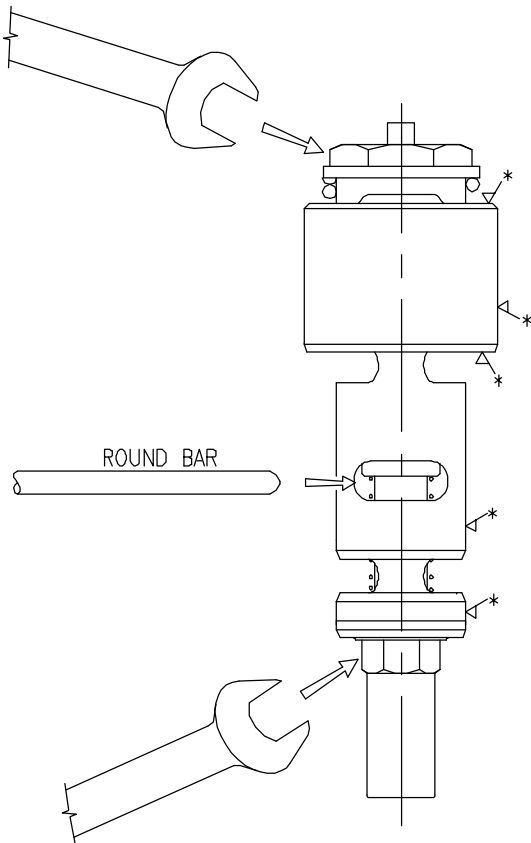
PARTS REPLACEMENT SCHEDULE:

O-RING SEALS	3-YEARS
SLIDE-VALVE SEAL	6-YEARS
THERMOSTAT ELEMENT	6-YEARS

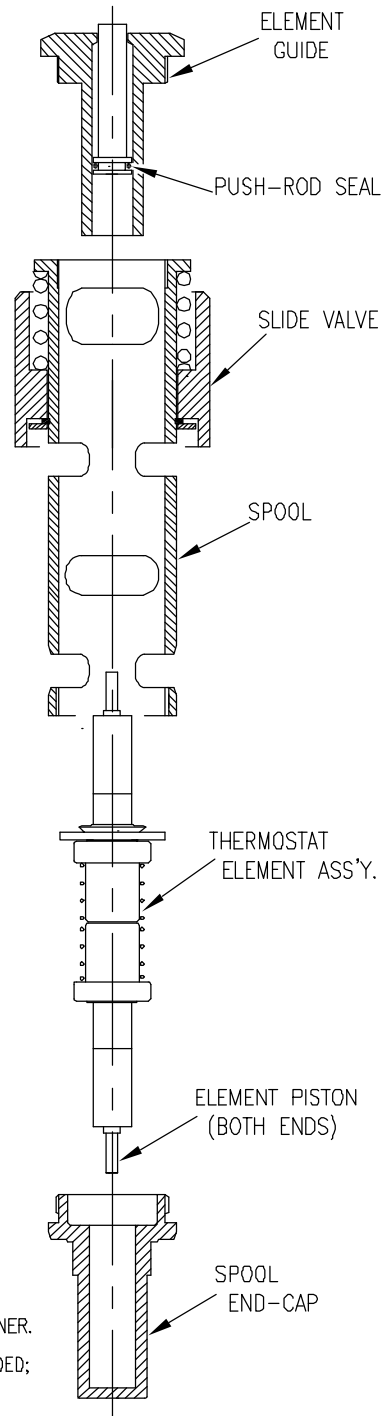
All other parts are available but need only be replaced if physical damage has occurred.



TO ORDER SPARE PARTS: SEE PAGE 8

SERVICING THE CARTRIDGE H-40 and H-50

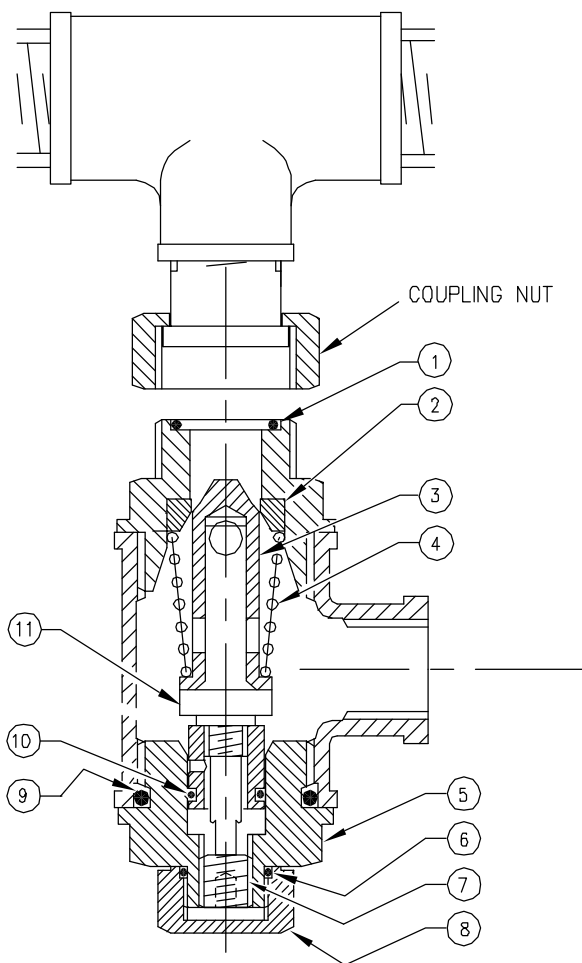


* : INDICATES SEALING SURFACES WHICH MUST BE CLEAN, SMOOTH, AND UNDAMAGED.



- 1) GRIP THE HEX. AT BOTH ENDS OF THE CARTRIDGE, WHERE SHOWN ABOVE. 
 - 2) UNSCREW AND REMOVE WHICHEVER END-PIECE COMES LOOSE.
 - 3) REMOVE THE "THERMOSTAT ELEMENT ASS'Y."
 - 4) UNSCREW THE REMAINING END-PIECE BY INSERTING A ROUND "TOMMY-BAR" WHERE SHOWN ABOVE. 
 - 5) DO NOT ATTEMPT TO REMOVE THE "SLIDE VALVE" FROM THE "SPOOL."
 - 6) CLEAN THE "SLIDE VALVE", USING SCOURING CLOTH, e.g. "SCOTCHBRITE", OR A DOMESTIC POT CLEANER.
- NOTE: THE SPOOL HAS AN ANTI-FOULING SURFACE TREATMENT WHICH MUST NOT BE SCRATCHED OR ABRADED; IF IT REQUIRES CLEANING, USE A SOFT CLOTH AND WATER.
- 7) ENSURE THE INNER SURFACES OF THE "ELEMENT GUIDE", "SPOOL", AND "SPOOL END-CAP" ARE CLEAN.
 - 8) RENEW THE "PUSH-ROD SEAL".
 - 9) RENEW THE "THERMOSTAT ELEMENT ASS'Y." IF IT IS MORE THAN 6-YEARS OLD.
 - 10) IF RE-USING THE "THERMOSTAT ELEMENT ASS'Y." ; PULL-OUT THE 2-"PISTONS" AND ENSURE THAT THEY ARE CLEAN AND SMOOTH, AND SLIDE FREELY IN THEIR HOUSINGS.
 - 11) SMEAR THE "PISTONS" WITH SILICONE GREASE BEFORE REPLACING THEM.
 - 12) REASSEMBLE THE CARTRIDGE USING A SPANNER AT BOTH ENDS, AND APPLY A LIGHT TORQUE TO SECURE.

THE THERMOSTATIC RETURN LIMITER



PARTS LIST

REF.	DESCRIPTION
1	COUPLING SEAL
2	VALVE SEAT
3	VALVE PLUG
4	RETURN SPRING
5	VALVE COVER
6	CAP SEAL
7	ADJUSTING SCREW
8	ADJUSTMENT CAP
9	COVER SEAL
10	GUIDE RING
11	ELEMENT ASSEMBLY

PARTS REPLACEMENT SCHEDULE:

O-RING SEALS 3-YEARS
 ELEMENT ASSEMBLY 6-YEARS

All other parts are available but need only be replaced if physical damage has occurred.

TEMPERATURE ADJUSTMENT

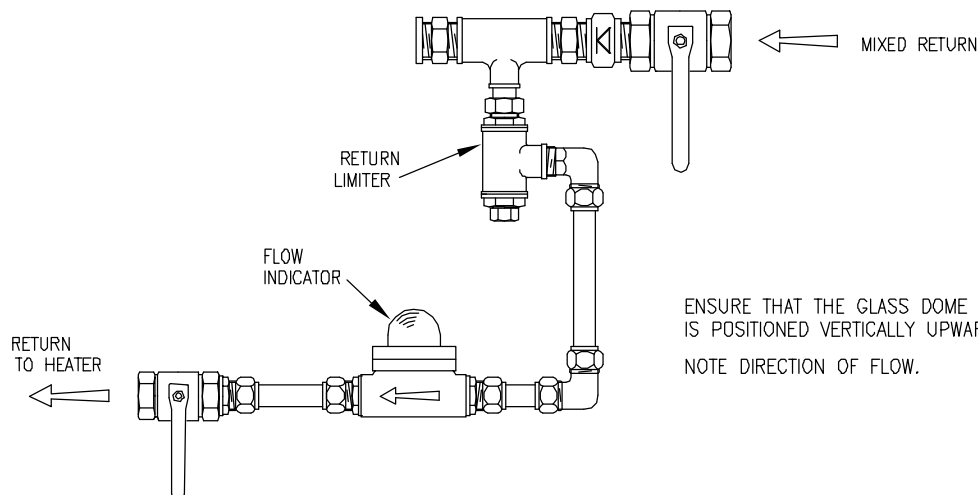
The RETURN LIMITER is factory pre-set according to your order, it controls the temperature of the recirculating mixed water when all the draw-off taps are closed. If, during these periods the mixed water temperature is too high or too low, the RETURN LIMITER can be re-set as follows.

Unscrew the ADJUSTMENT CAP (8), and turn the ADJUSTING SCREW (7) clockwise to reduce the temperature, or anti-clockwise to increase it. The calibration is approx. 6°C per 1/2-turn of the adjusting screw. While the ADJUSTMENT CAP is off, there may be a slight leakage of water.

SERVICING

Unscrew the VALVE COVER (5) and withdraw and clean the internal parts. Check that the VALVE PLUG (3) is free to slide through the VALVE SEAT (2), and that the ELEMENT ASS'Y. (11) is free to slide in the VALVE COVER (5). Lubricate O-RINGS with silicone oil or grease.

When a new ELEMENT ASS'Y. is required, a slight re-adjustment may be necessary.

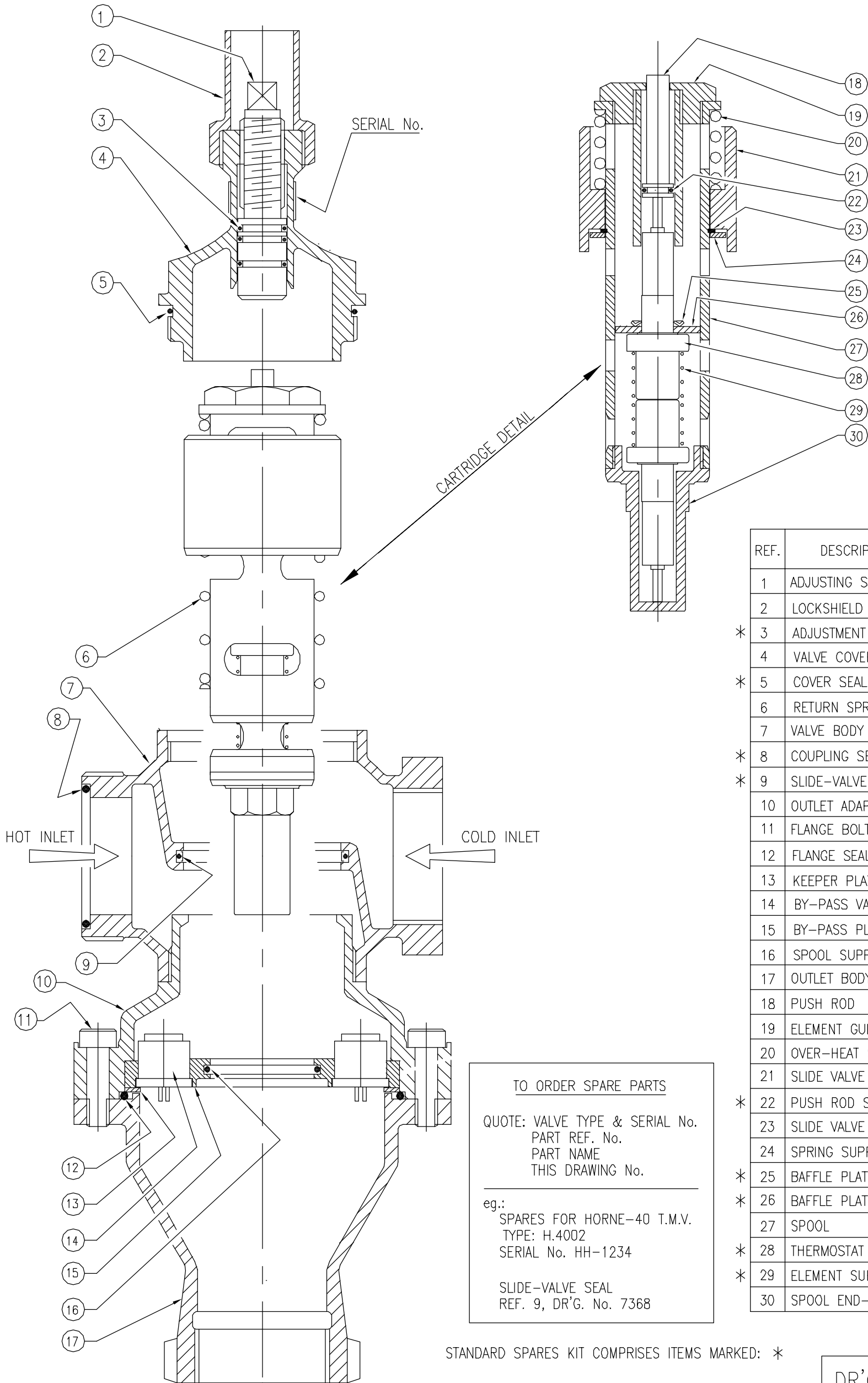


ENSURE THAT THE GLASS DOME ON THE FLOW INDICATOR IS POSITIONED VERTICALLY UPWARDS.
 NOTE DIRECTION OF FLOW.

THERMOSTATIC MIXING VALVE

{ H-40, TYPE: H.4002 }
 { H-50, TYPE: H.5002 }

PARTS LIST



REF.	DESCRIPTION
1	ADJUSTING SCREW
2	LOCKSHIELD NUT
*	3 ADJUSTMENT SEAL (3)
4	VALVE COVER
*	5 COVER SEAL
6	RETURN SPRING
7	VALVE BODY
*	8 COUPLING SEAL
*	9 SLIDE-VALVE SEAL
10	OUTLET ADAPTOR
11	FLANGE BOLT (8)
12	FLANGE SEAL
13	KEEPER PLATE
14	BY-PASS VALVE (6)
15	BY-PASS PLATE
16	SPOOL SUPPORT RING
17	OUTLET BODY
18	PUSH ROD
19	ELEMENT GUIDE
20	OVER-HEAT SPRING
21	SLIDE VALVE
*	22 PUSH ROD SEAL
23	SLIDE VALVE RETAINER
24	SPRING SUPPORT WASHER
*	25 BAFFLE PLATE RETAINER
*	26 BAFFLE PLATE
27	SPOOL
*	28 THERMOSTAT ELEMENT (2)
*	29 ELEMENT SUPPORT SPRING
30	SPOOL END-CAP

TO ORDER SPARE PARTS
 QUOTE: VALVE TYPE & SERIAL No.
 PART REF. No.
 PART NAME
 THIS DRAWING No.
 eg.:
 SPARES FOR HORNE-40 T.M.V.
 TYPE: H.4002
 SERIAL No. HH-1234
 SLIDE-VALVE SEAL
 REF. 9, DR'G. No. 7368

STANDARD SPARES KIT COMPRISES ITEMS MARKED: *

DR'G. No. 7368