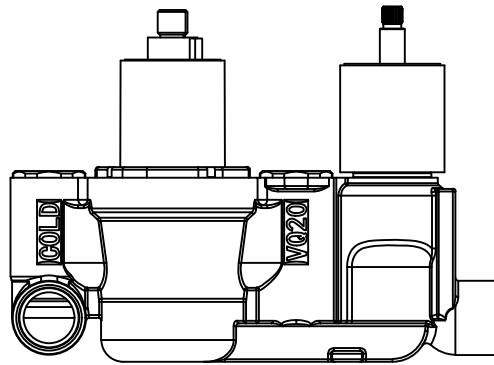
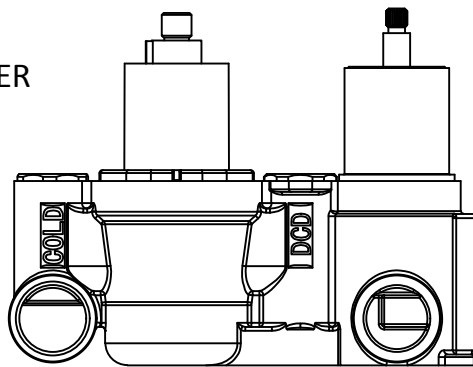


CONCEALED THERMOSTATIC SHOWER VALVES with & without DIVERTER

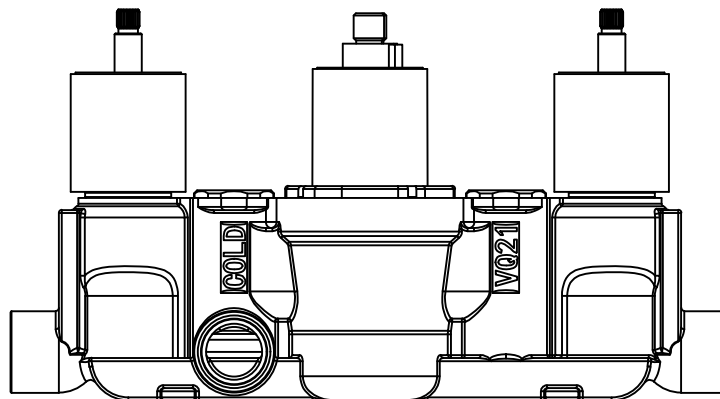
TWIN (VQ20)



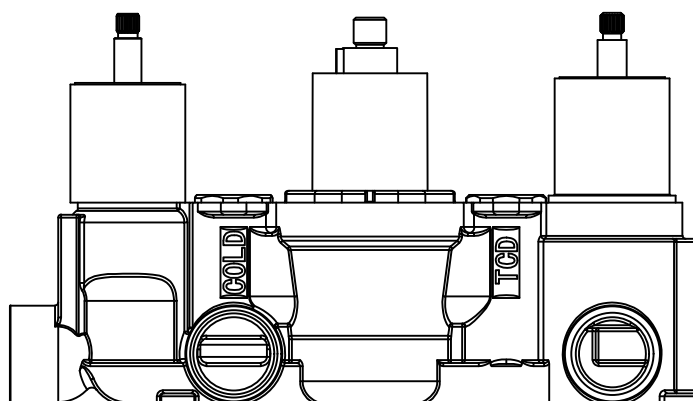
TWIN with DIVERTER



TRIPLE (VQ21)



TRIPLE with DIVERTER



Please leave this installation & user guide with the end user.

CONTENTS	PAGE
• Introduction & Safety	2
• Dimensions - Twin & Triple Valves	3
• Dimensions - Twin & Triple Valves with Diverter	4
• Technical Data - Twin & Triple Valves	5
• Technical Data - Twin & Triple Valves with Diverter	6
• Components - Twin & Triple Valves	7
• Components - Twin & Triple Valves with Diverter	8
• Operation - Twin & Triple Valves	9
• Operation - Twin & Triple Valves with Diverter	10
• Site Installation	11
• Temperature Adjustment	12
• Aftercare	13
• Conditions of Use & Commissioning (Domestic)	13
• Conditions of Use & Commissioning (Commercial)	14/15
• Fault diagnosis	16

IMPORTANT INFORMATION

This installation guide is for all Concealed Thermostatic Shower Valves. It covers the installation, maintenance and operation of the Shower Valve.

All the valves are thermostatically regulated by a wax element. They are designed to provide a flow of water at a safe temperature when installed as described in this manual. The valves are suitable for both low and high pressure installations. The valve are also suitable, without modification, for all types of standard installations.

SAFETY

We recommend that this products are fitted by a fully qualified installer. Installations must comply with all current water regulations.

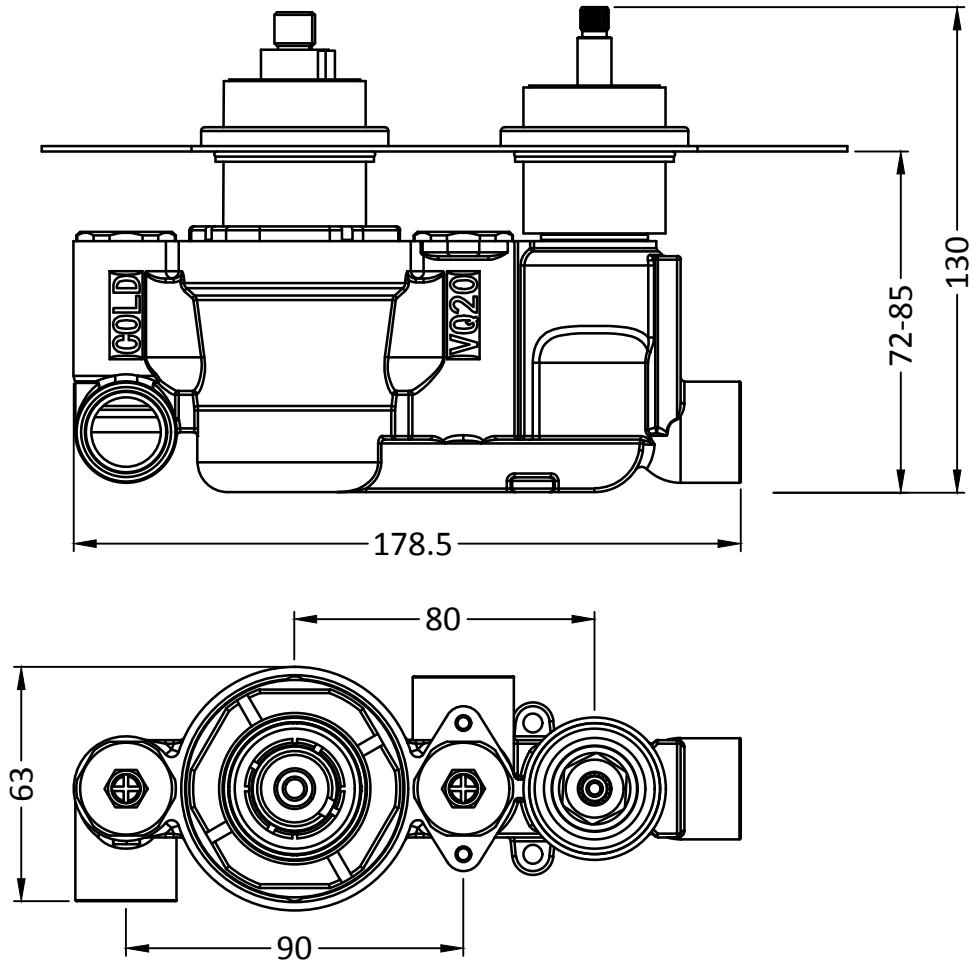
Please note: All valves **MUST** be commissioned on site to suit site conditions.

If the valve is installed in a Healthcare environment (D08) please follow instruction on page 14. In order for this product to operate as designed it must be installed, commissioned and maintained as stated in this manual.

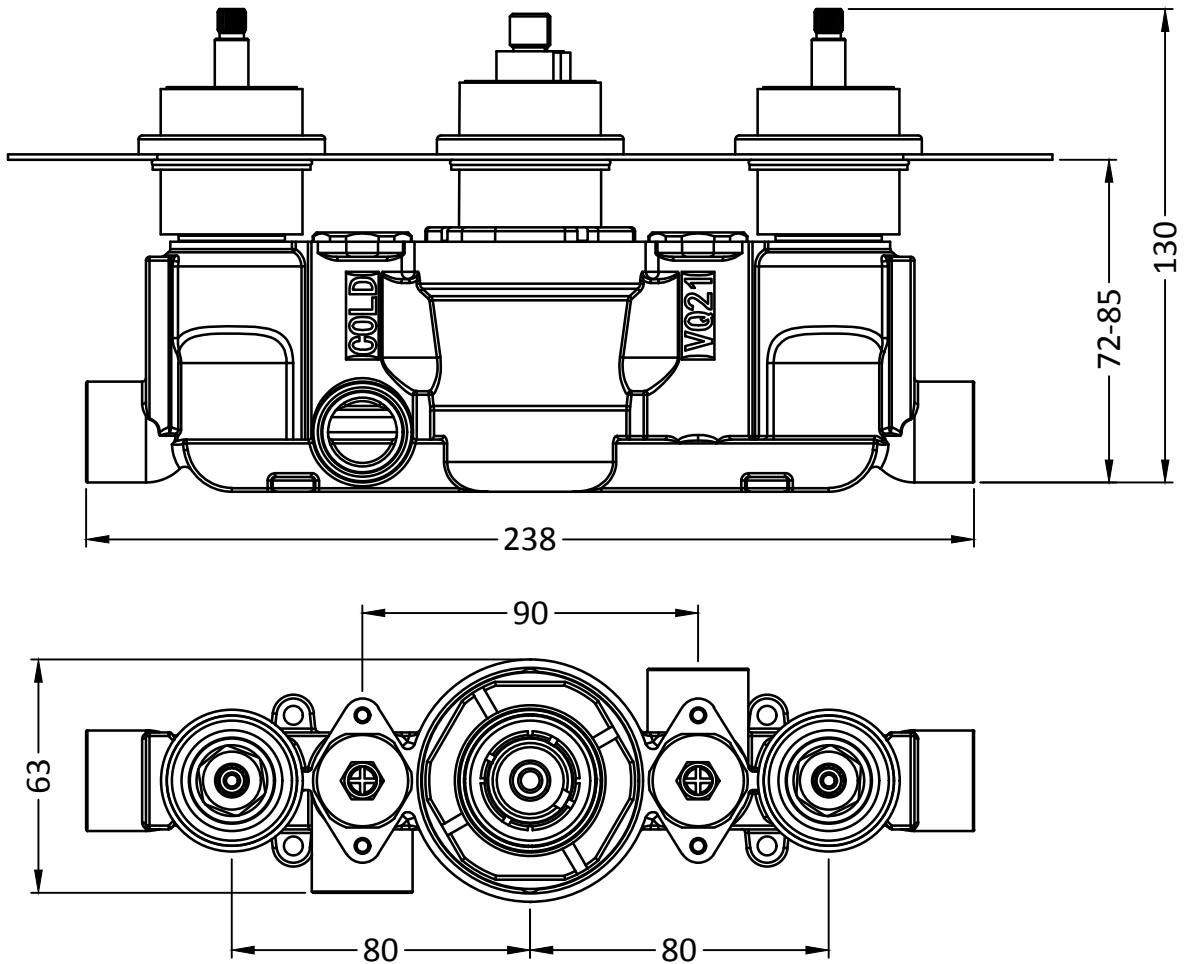


VQ20, VQ21 ONLY

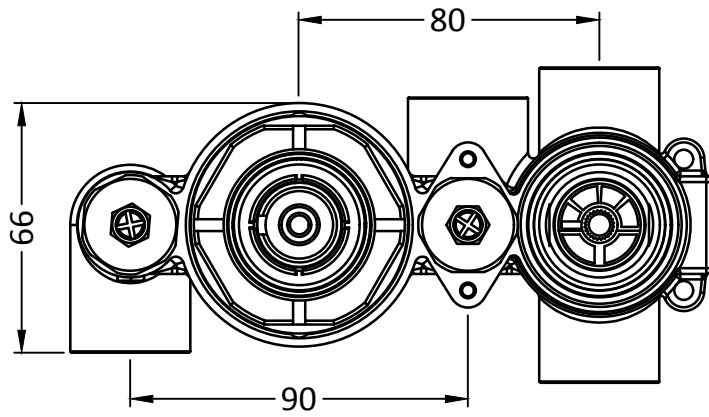
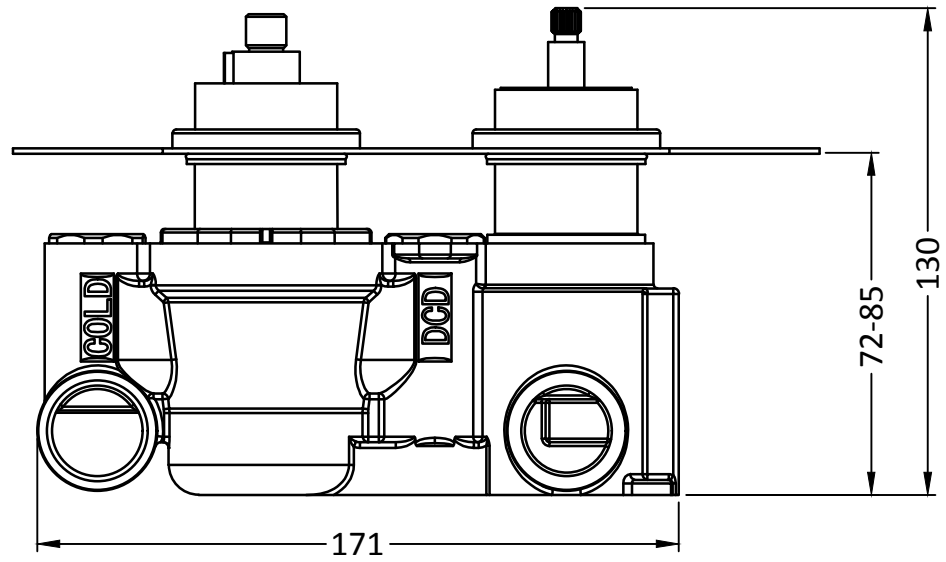
**DIMENSIONS
TWIN VALVE**



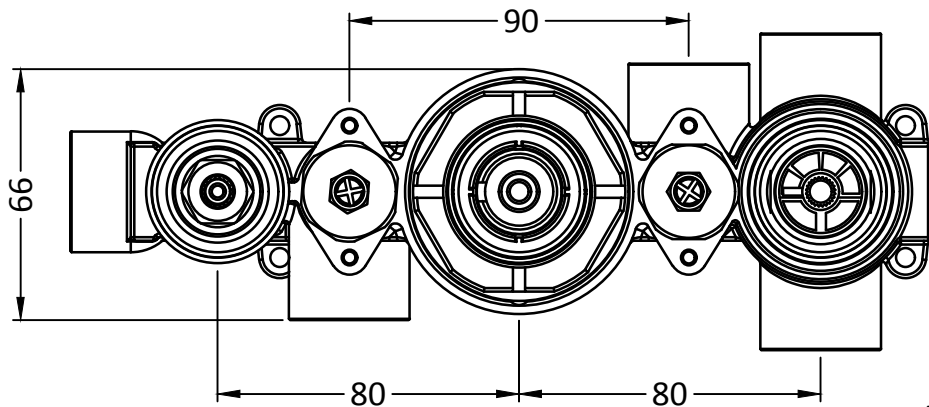
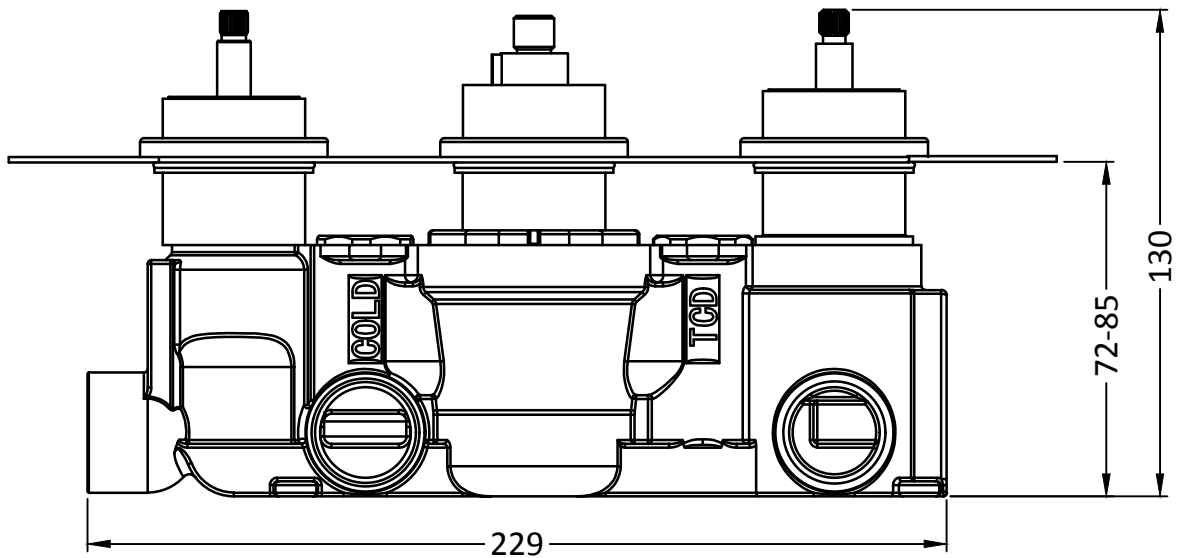
**DIMENSIONS
TRIPLE VALVE**



**DIMENSIONS
TWIN VALVE with DIVERTER**



**DIMENSIONS
TRIPLE VALVE with DIVERTER**



TECHNICAL DATA

For D08 Operating Conditions see Page 14/15.

Max Dynamic Pressure: 5 bar

Min Dynamic Pressure: 0.1 bar

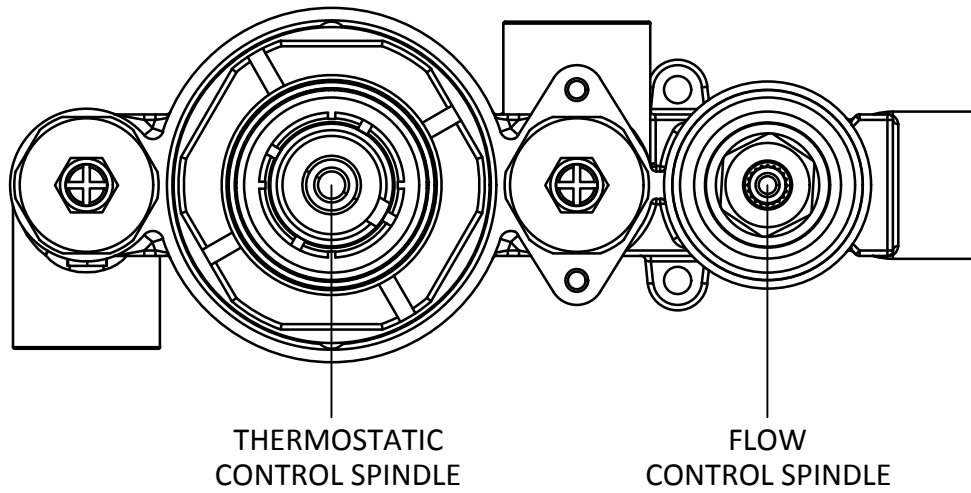
Factory Outlet Temperature Setting: 43°C

Minimum Temperature Differential (Mixed water to hot water): 10°C

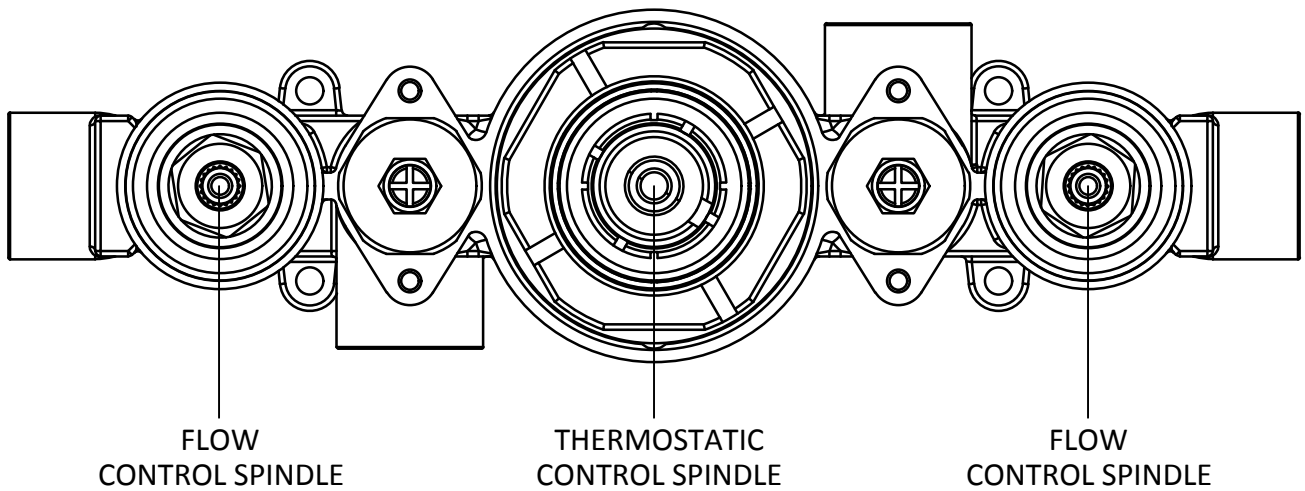
Temperature Stability: $\pm 2^{\circ}\text{C}$

The valve is suitable, without modification, for all types of standard installations.

TWIN VALVE



TRIPLE VALVE



TECHNICAL DATA

For D08 Operating Conditions see Page 12.

Max Dynamic Pressure: 5 bar

Min Dynamic Pressure: 0.5 bar

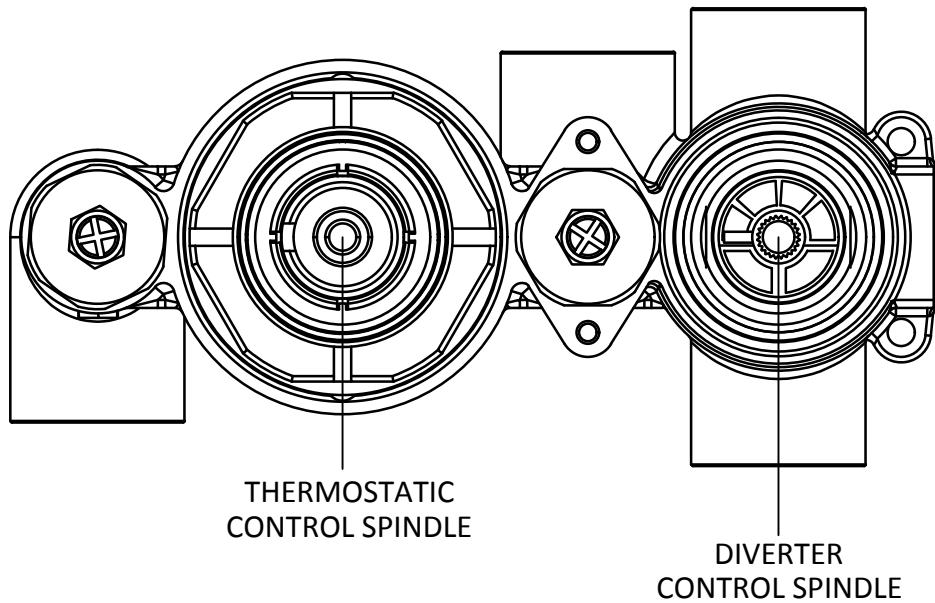
Factory Outlet Temperature Setting: 43°C

Minimum Temperature Differential (Mixed water to hot water): 10°C

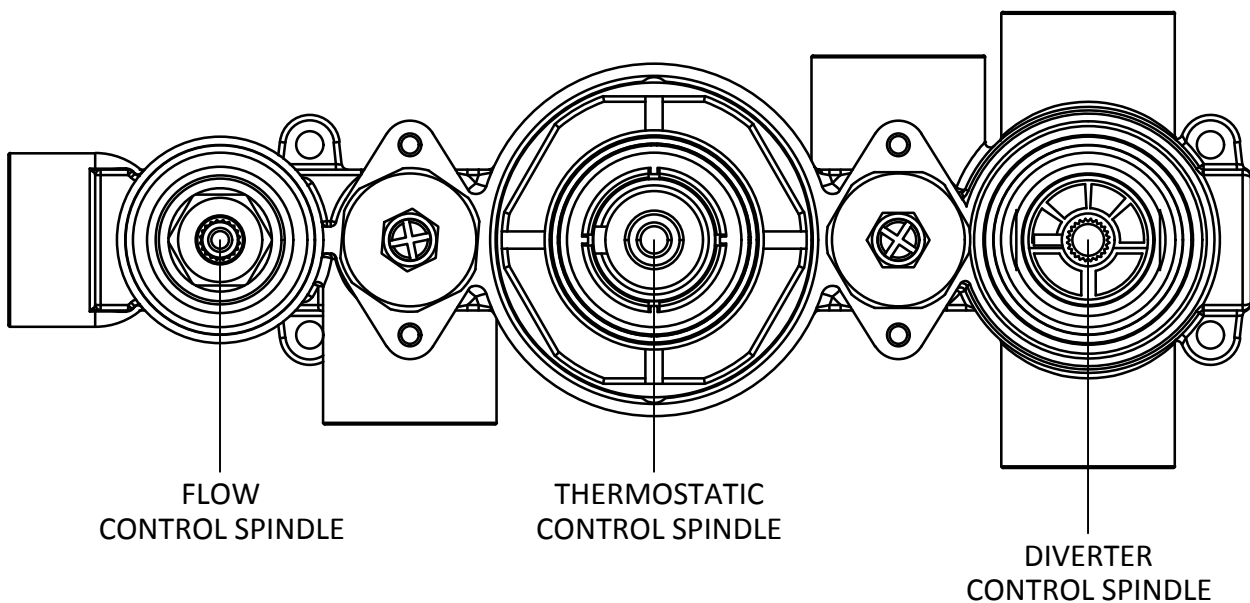
Temperature Stability: $\pm 2^{\circ}\text{C}$

The valve is suitable, without modification, for all types of standard installations.

TWIN VALVE with DIVERTER

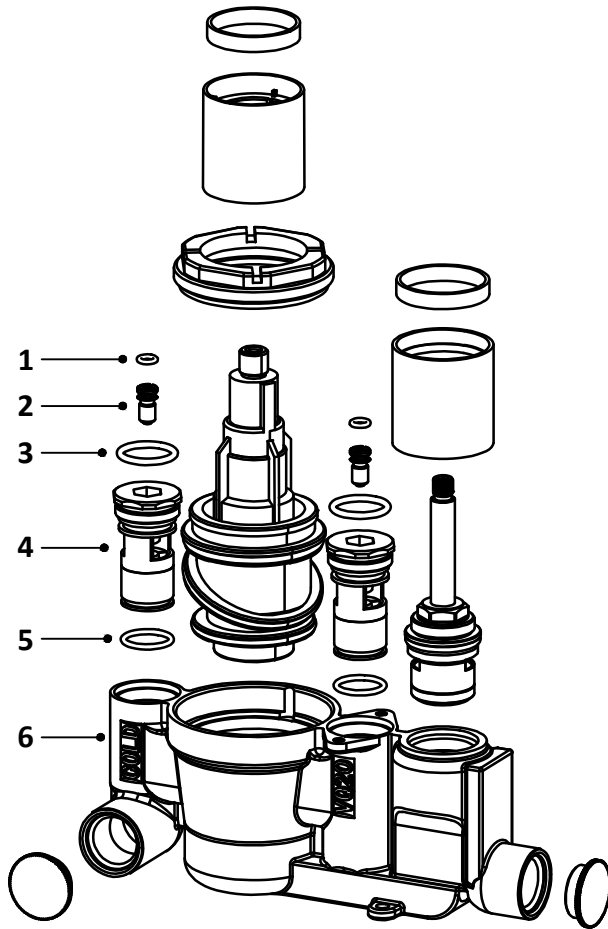


TRIPLE VALVE with DIVERTER



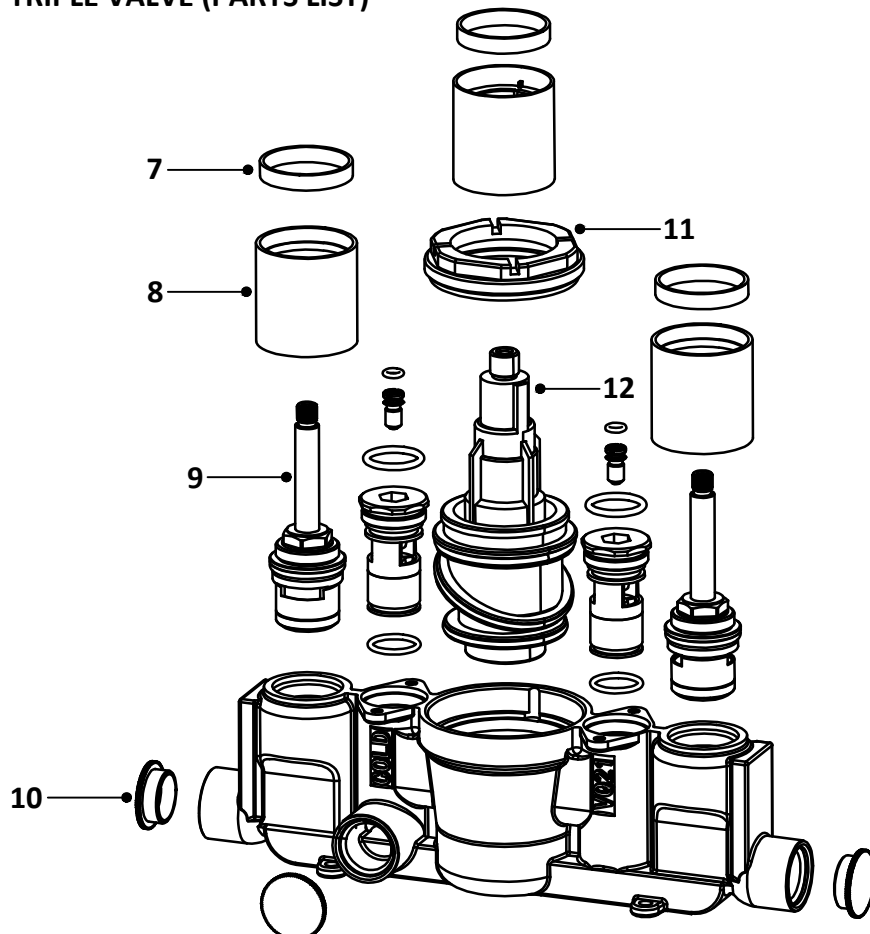
COMPONENTS

TWIN VALVE (PARTS LIST)



COMPONENTS		QTY
1	Sealing Screw 'O' Ring	2
2	Sealing Screw	2
3	Top Sealing 'O' Ring	2
4	Check Valve Housing	2
5	Bottom Sealing 'O' Ring	2
6	Valve Body	1
7	Wear Strips	2
8	Chrome Collars	2
9	CD Valve	1
10	Plugs	3
11	Retaining Nut	1
12	Thermostatic Cartridge	1

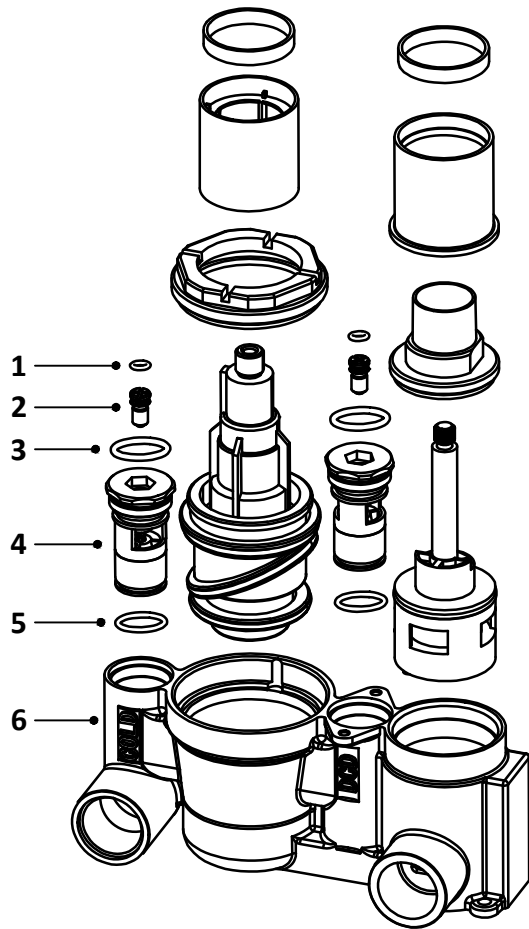
TRIPLE VALVE (PARTS LIST)



COMPONENTS		QTY
1	Sealing Screw 'O' Ring	2
2	Sealing Screw	2
3	Top Sealing 'O' Ring	2
4	Check Valve Housing	2
5	Bottom Sealing 'O' Ring	2
6	Valve Body	1
7	Wear Strips	3
8	Chrome Collars	3
9	CD Valve	2
10	Plugs	4
11	Retaining Nut	1
12	Thermostatic Cartridge	1

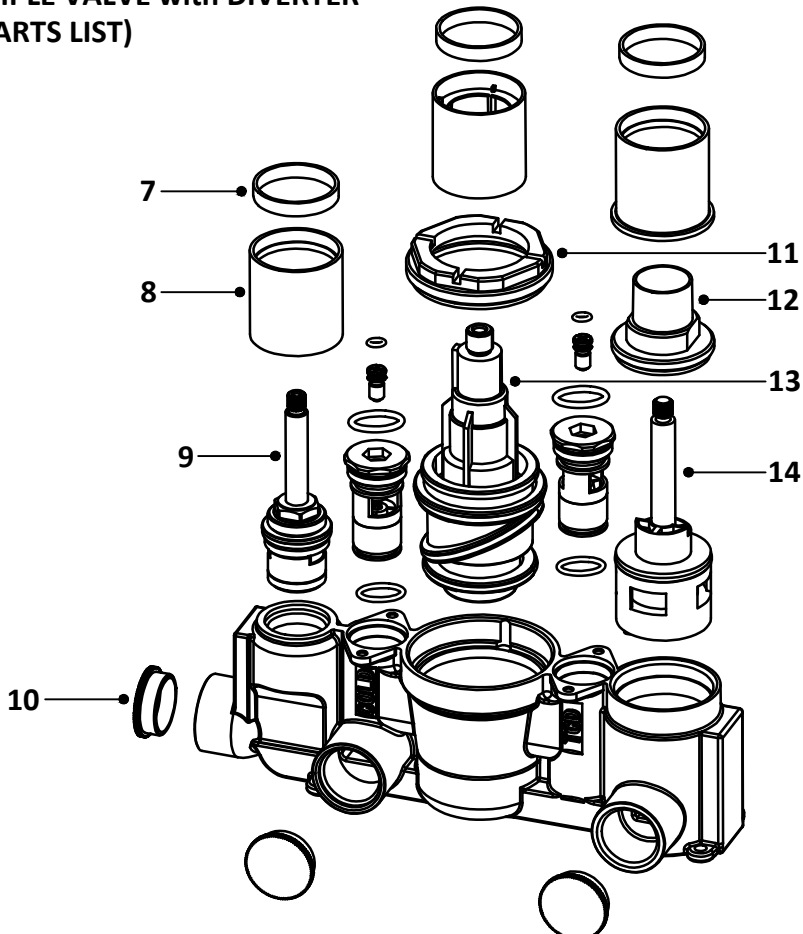
COMPONENTS

TWIN VALVE with DIVERTER (PARTS LIST)



COMPONENTS		QTY
1	Sealing Screw 'O' Ring	2
2	Sealing Screw	2
3	Top Sealing 'O' Ring	2
4	Check Valve Housing	2
5	Bottom Sealing 'O' Ring	2
6	Valve Body	1
7	Wear Strips	2
8	Chrome Collars	2
9	CD Valve	0
10	Plugs	4
11	Retaining Nut	1
12	Diverter Retaining Nut	1
13	Thermostatic Cartridge	1
14	Diverter Cartridge	1

TRIPLE VALVE with DIVERTER (PARTS LIST)



COMPONENTS		QTY
1	Sealing Screw 'O' Ring	2
2	Sealing Screw	2
3	Top Sealing 'O' Ring	2
4	Check Valve Housing	2
5	Bottom Sealing 'O' Ring	2
6	Valve Body	1
7	Wear Strips	3
8	Chrome Collars	3
9	CD Valve	1
10	Plugs	5
11	Retaining Nut	1
12	Diverter Retaining Nut	1
13	Thermostatic Cartridge	1
14	Diverter Cartridge	1

OPERATION

TWIN

TRIPLE

1/2" BSP
FEMALE OUTLET

1/2" BSP
FEMALE OUTLET

HOT 1/2"
BSP FEMALE
INLET

HOT 1/2"
BSP FEMALE
INLET

COLD 1/2"
BSP FEMALE
INLET

COLD 1/2"
BSP FEMALE
INLET

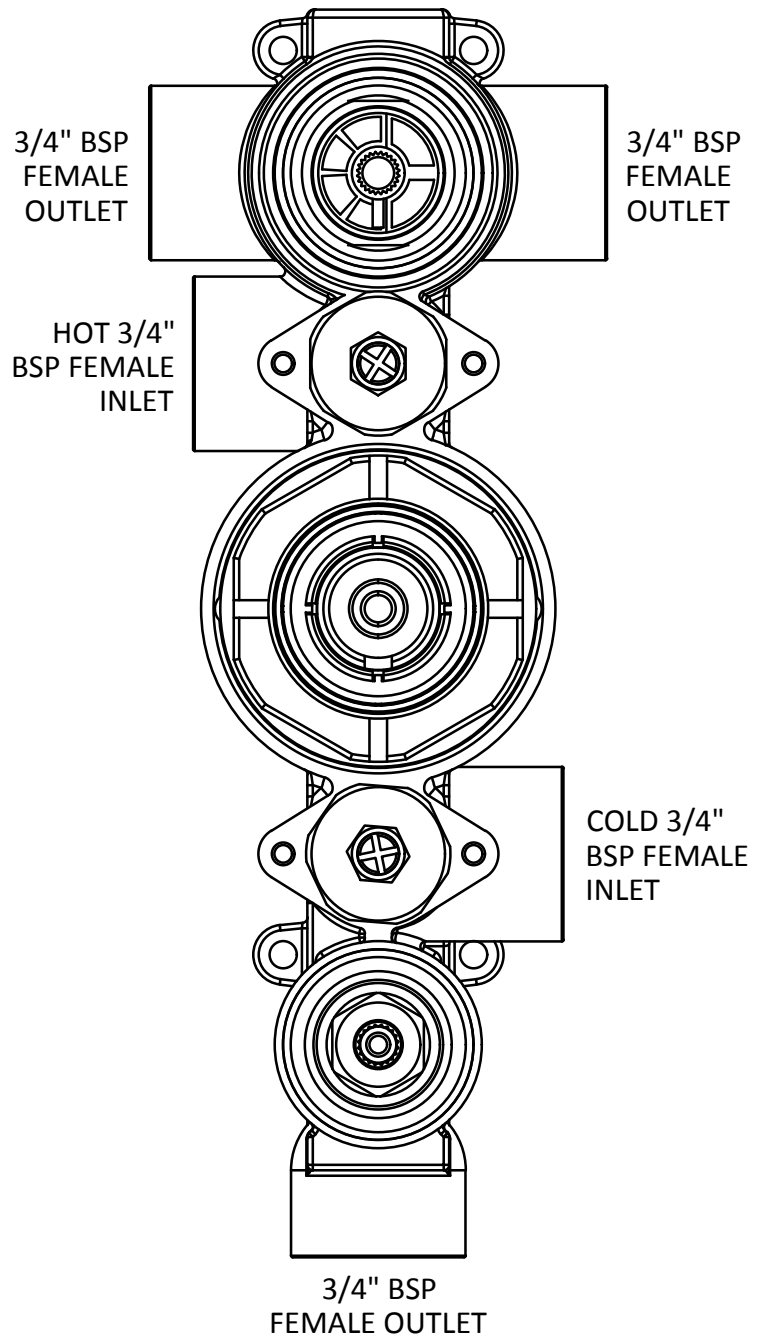
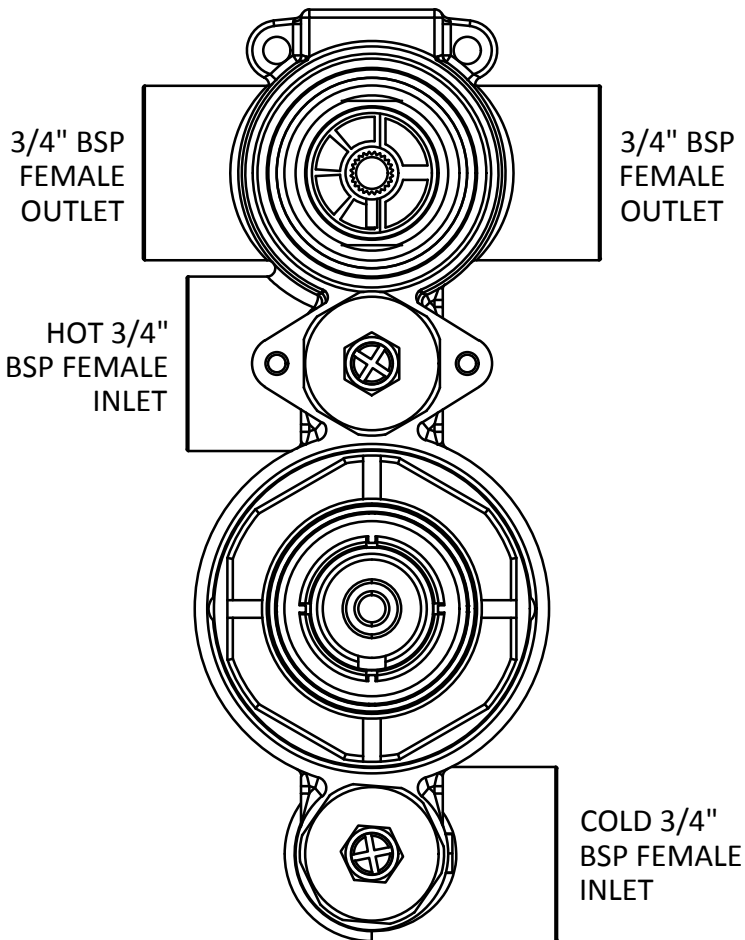
1/2" BSP
FEMALE OUTLET

Twin Valve

The hot inlet of the valve must be connected to the hot pipework. The hot inlet of the valve will be marked. When installed correctly the outlet will be facing up.

Triple Valve

The hot inlet of the valve must be connected to the hot pipe work. The hot inlet of the valve will be marked.

OPERATION**TWIN with DIVERTER****TRIPLE with DIVERTER****Twin Valve with Diverter**

The hot inlet of the valve must be connected to the hot pipework. The hot inlet of the valve will be marked. When installed correctly the outlet will be facing up.

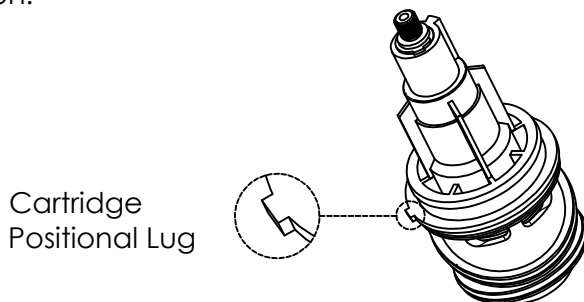
Triple Valve with Diverter

The hot inlet of the valve must be connected to the hot pipe work. The hot inlet of the valve will be marked.

Cartridge Reversal

Please note that the pipework on site should be plumbed with the hot on the left and the cold on the right as you look at it. If this is not the case, instead of turning the valve body around to match the pipe work, the cartridge can be taken out of the valve body, turned 180° and placed back in the valve body. The Hot & Cold inlets will now match the incoming water.

When removing the cartridge, please undo the retaining nut and then pull gently on the cartridge. There may be some residual water behind the cartridge. Remove the cartridge from the valve body and turn it 180° so that the positional lug on the cartridge lines up with the slot in the valve body. Push the cartridge into the valve body making sure the lug is in the slot. Replace the retaining nut being careful not to over tighten.



SITE INSTALLATION

1. Before installation, please read the Conditions of Use & Commissioning section (depending on installation type) and ensure the system supply conditions comply.
Please note: Integral strainers are fitted into the check valve housings.
2. Remove the chrome sleeves from the shower valve body, and leave to one side in a safe place.
3. You must install accessible isolation valves in the HOT & COLD water supply lines for servicing purposes.
4. The plumbing connections on the inlets & outlet are all ½" BSP female threads.
5. Determine the fixing position for the valve and make a recess in the wall to house the valve. It should be from 72 to 85mm deep depending on how far you wish the valve to protrude.
6. Screw the shower valve body in position, using the mounting lugs that are cast into the base of the body.
7. Now the shower valve body is securely mounted onto the wall, make sure the pipe work is thoroughly flushed through to remove any debris from the system before connecting the water supplies. **Failure to do this could invalidate the guarantee.**
8. The plumbing connections should then be made to the HOT & COLD water inlets (which are clearly marked). **If for some reason the pipe work feeds on site are the wrong way around, the cartridge can be taken out of the valve body, turned 180° and placed back in the valve body.**
9. Make the plumbing connection to the water outlet. This will take the water to the chosen auxiliary product (shower kit) you have selected to run with this shower.
10. Turn on the water supply and check for leaks.
11. Check the max water temperature from the terminal fitting with a thermometer. The recommended maximum terminal outlet temperature is 41°C. If the water temperature is not suitable please see the Temperature Adjustment Section.
Please Note: The mixed water temperature at the terminal fitting must never exceed 46°C.
12. The valve can now be commissioned. Depending on the valves application, please see the Conditions of Use & Commissioning sections for commissioning.
13. Re fit the chrome sleeves to the shower body.
14. Apply a small bead of silicone behind the chrome concealing plate (this will give a water tight seal so water cannot ingress into the wall cavity). Slide the plate into position over the chrome sleeves, and fit up against the finished wall surface.
15. Fit the chrome control handles. The thermostatic control handle is clearly marked with H & C. Your shower valve is now ready for use.

TEMPERATURE ADJUSTMENT

1. Remove the handle on the thermostat control. The method will differ depending on the handle type. The spline/Brass stop Ring will now be exposed.
2. If a Brass Stop Ring is in place, please remove it. Turn the shower flow control fully on.
3. If the shower is too cold then turn the spline anti-clockwise. If the shower is too hot then turn the spline clockwise. Let the water temperature stabilise after every adjustment. We recommend a max temperature of 41°C.

The mixed water temperature at the terminal fitting must never exceed 46°C.

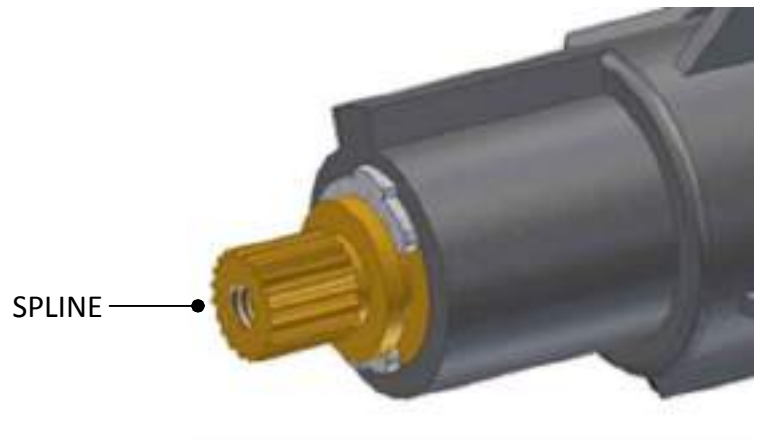
4. When the temperature is correct turn the flow control off. Do not move the spline again until after the handle is secured in place. The max temperature is now set and any movement of the spline will alter the temperature.
5. The handle can now be put back in place. **When the handle is being placed over the spline, please ensure that the handle Stop Lug is against the cartridge Stop Lug preventing the handle from being turned any further anti clockwise. This prevents the shower valve from reaching a temperature that is higher than the set point.**

Depending on your handle type the temperature will be limited by a handle with an in build stop lug or by a separate Brass Stop Ring. Please see the diagrams below.

6. The handle can now be fixed in place. The shower should have a safe maximum showering temperature.

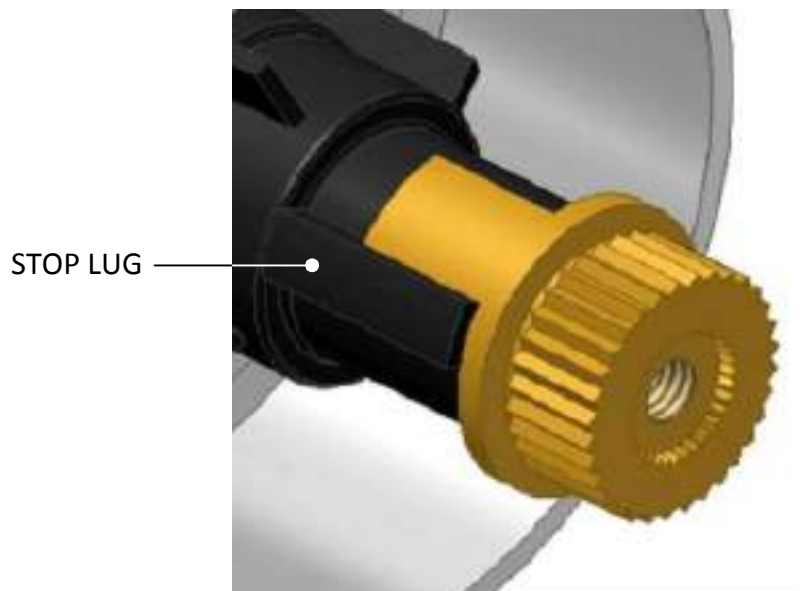
Cartridge Stop Lug

The handle stop lug should be against this face at the maximum temperature setting. This stops further anti-clockwise movement.



Brass Stop Ring

Some handle types have a brass stop ring which is placed over the spline and limits the anti-clockwise movement of the handle.



AFTERCARE

- When cleaning the valve please do not use a substance that could possibly damage the surface finish. We recommend that soapy water with a mild detergent is used.
- Please take care not to damage the surface finish of the valve. The finish is polished chrome and can be easily marked.
- Please follow the servicing requirements for D08 environments as outlined in section 10.

Conditions of Use & Commissioning (Domestic)

Conditions of use for Type 2 valves:

	High Pressure	Low Pressure
Maximum Static Pressure - Bar	10	10
Flow Pressure, Hot & Cold - Bar	1 to 5	0.2 to 1
Hot Supply Temperature - °C	55 to 65	55 to 65
Cold Supply Temperature - °C	Equal to or less than 20°	Equal to or than less 20°

Note: Valves operating outside these conditions cannot be guaranteed by the Scheme to operate as Type 2 valves.

Designation of use:

High Pressure Shower.

Low Pressure Shower.

Recommended Outlet Temperatures

The BUILDCERT TMV scheme recommends the following set maximum mixed water outlet temperatures for use in all premises:

- 44°C for bath fill but see notes below;
- 41°C for showers;
- 41°C for washbasins;
- 38°C for bidets.

The mixed water temperatures must never exceed 46°C. The maximum mixed water temperature can be 2°C above the recommended maximum set outlet temperatures.

Note:

46°C is the maximum mixed water temperature from the bath tap. The maximum temperature takes account of the allowable temperature tolerances inherent in thermostatic mixing valves and temperature losses in metal baths. It is not a safe bathing temperature for adults or children. The British Burns Association recommends 37 to 37.5°C as a comfortable bathing temperature for children. In premises covered by the Care Standards Act 2000, the maximum mixed water outlet temperature is 43°C.

The thermostatic mixing valve will be installed in such a position that maintenance of the TMV and its valves and the commissioning and testing of the TMV can be undertaken.

The fitting of isolation valves is required as close as is practicable to the water supply inlets of the thermostatic mixing valve.

Commissioning notes for Thermostatic Mixing Valves.

The first step in commissioning a thermostatic mixing valve is to check the following:

1. The designation of the thermostatic mixing valve matches the application.
2. The supply pressures are within the valves operating range.
3. The supply temperatures are within the valves operating range.
4. Isolating valves (and strainers preferred) are provided.
5. If all these conditions are met, proceed to set the temperature as stipulated in the manufacturer installation instructions.

It is a requirement that all valves shall be verified against the original set temperature results once a year. When commissioning/testing is due the following performance checks shall be carried out.

Measure the mixed water temperature at the outlet.

Carry out the cold water supply isolation test by isolating the cold water supply to the TMV, wait for five seconds if water is still flowing check that the temperature is below 46°C. If there is no significant change to the set outlet temperature ($\pm 2^{\circ}\text{C}$ or less change from the original settings) and the fail-safe shut off is functioning, then the valve is working correctly and no further service work is required.

Note: If there is a residual flow during the commissioning or the annual verification (cold water supply isolation test), then this is acceptable providing the temperature of the water seeping from the valve is no more than 2°C above the designated maximum mixed water outlet temperature setting of the valve.

Temperature readings should be taken at the normal flow rate after allowing for the system to stabilise.

The sensing part of the thermometer probe must be fully submerged in the water that is to be tested.

Any TMV that has been adjusted or serviced must be re-commissioned and re-tested in accordance with the manufacturers' instructions.

The installation of thermostatic mixing valves must comply with the requirements of the Water Supply (Water Fittings) Regulations 1999.

Conditions of Use & Commissioning (Commercial)

Conditions of use:

Key: High Pressure (HP)
Low Pressure (LP)

This valve is approved for the following designations:

HP-S: High Pressure Shower

HP-S: High Pressure Shower

LP-S (E): Low Pressure Shower

Supply Conditions	High Pressure	Low Pressure
Maximum Static Pressure - Bar	10	10
Flow Pressure, Hot & Cold - Bar	0.5 to 5	0.1 to 1
Hot Supply Temperature - °C	55 to 65	52 to 65
Cold Supply Temperature - °C	5 - 20	5 - 20
Minimum Temperature Differential - °C	10	10

Valve must be installed inside these conditions to ensure operation as Type 3 valves.

Table 2: Recommended Mixed Water Temperature

Application	Recommended Max Hot Water Temperature °C
Shower	41

COMMISSIONING

Method for Commissioning Thermostatic Mixing Valves

Purpose

Since the installed supply conditions are likely to be different from those applied in the laboratory tests it is appropriate, at commissioning, to carry out some simple checks and tests on each mixing valve to provide a performance reference point for future in-service tests.

Procedure

Check that:

The designation of the thermostatic mixing valve matches the intended application.

PROCEDURE

Check that: The designation of the thermostatic mixing valve matches the intended application.

- a) The supply pressures are within the range of operating pressures for the designation of the valve.
- b) The supply temperatures are within the range permitted for the valve and by guidance information on the prevention of Legionella etc.
Adjust the temperature of the mixed water in accordance with the manufacturer's instructions and the requirement of the application and then carry out the following sequence:
- c) Record the temperature of the hot and cold water supplies.
- d) Record the temperature of the mixed water at the largest draw-off flow rate.
- e) Record the temperature of the mixed water at a smaller draw off flow rate, which shall be measured.
- f) Isolate the cold water supply to the mixing valve and monitor the mixed water temperature.
- g) Record the maximum temperature achieved as a result of (d) and the final stabilised temperature.

NOTE: The final stabilised mixed water temperature should not exceed the values in Table 3.

- f) Record the equipment, thermometer etc. used for the measurements.

Table 3: Maximum Mixed Water Temperature °C

Application	Maximum Hot Water Temperature °C
Shower	43

MAINTENANCE

In Service Testing

Purpose

The purpose of in-service tests is to regularly monitor and record the performance of the thermostatic mixing valve. Deterioration in performance can indicate the need for service work on the valve and/or the water supplies.

Procedure

Using the same measuring equipment or equipment to the same specification as used in the commissioning of the valve, adjust the temperature of the mixed water in accordance with the manufacturer's instructions and the requirement of the application. Carry out the following sequence:

- a) Record the temperature of the hot and cold water supplies.
- b) Record the temperature of the mixed water at the largest draw-off flow rate.
- c) Record the temperature of the mixed water at a smaller draw-off flow rate, which shall be measured. If the mixed water temperature has changed significantly from the previous test results (e.g. > 1 K), record the change and before re-adjusting the mixed water temperature check:
 - a) That any in-line or integral strainers are clean.
 - b) Any in-line or integral check valves or other anti-back siphonage devices are in good working order.
 - c) Any isolating valves are fully open.

With an acceptable mixed water temperature, complete the following procedure:

- a) Record the temperature of the hot and cold water supplies.
- b) Record the temperature of the mixed water at the largest draw-off flow rate.
- c) Record the temperature of the mixed water at a smaller draw-off flow rate, which shall be measured.
- d) Isolate the cold water supply to the mixing valve and monitor the mixed water temperature.
- e) Record the maximum temperature achieved as a result of (d) and the final stabilised temperature.
- f) Record the equipment, thermometer etc. used for the measurements.

If at step (e) the final mixed water temperature is greater than the values in Table 3 and / or the maximum temperature exceeds the corresponding value from the previous results by more than about 2 K, the need for service work is indicated.

Note: In-service tests should be carried out with a frequency, which identifies a need for service work before an unsafe water temperature can result. In the absence of any other instruction or guidance, the procedure described in Annex F of D08 may be used.

Frequency of in-service tests

GENERAL

In the absence of any other instruction or guidance on the means of determining the appropriate frequency of in-service testing, the following procedure may be used:

- a) 6 to 8 weeks after commissioning carry out the tests detailed in “In-Service Tests”.
- b) 12 to 15 weeks after commissioning carry out the tests detailed in “In-Service Tests”.
Depending on the results of the above tests, several possibilities exist:
 - a) If no significant changes (e.g. ≤ 1 K) in mixed water temperatures are recorded between commissioning and 6 to 8 week testing, or between commissioning and 12-15 week testing the next in-service test can be deferred to 24 to 28 weeks after commissioning.
 - b) If small changes (e.g. 1 to 2 K) in mixed water temperatures are recorded in only one of these periods, necessitating adjustment of the mixed water temperature, then the next in-service test can be deferred to 24 to 28 weeks after commissioning.
 - c) If small changes (e.g. 1 to 2 K) in mixed water temperatures are recorded in both of these periods, necessitating adjustment of the mixed water temperature, then the next in-service test should be carried out at 18 to 21 weeks after commissioning.
 - d) If significant changes (e.g. > 2 K) in mixed water temperatures are recorded in either of these periods, necessitating service work, then the next in-service test should be carried out at 18 to 21 weeks after commissioning.

The general principle to be observed after the first 2 or 3 in-service tests is that the intervals of future tests should be set to those which previous tests have shown can be achieved with no more than a small change in mixed water temperature.

FAULT DIAGNOSIS

FAULT	POSSIBLE CAUSE
After Installation, shower only runs HOT or COLD	1. Hot & Cold water supplies are plumbed to the wrong sides of the valve. The cartridge can be removed from the body, turned 180° and placed back in the body.
Shower will not run hot enough when first installed.	1. Check HOT water supply temperature. 2. Maximum temperature needs adjusting. See Temperature Adjustment section. 3. Operating conditions are incorrect. 4. Blockage in hot side of the system.
Hot water in cold & vice versa	1. Check and clean the check valves, as they may be obstructed.
Low or no flow from the valve	1. Possible blockage in the system. 2. Operating conditions are incorrect. 3. Valve being obstructed by debris. 4. Valve shut off has activated due to Operating Conditions.
Leak from valve in the off position	1. Debris has gotten into the CD valve.
Fluctuating flow rate	1. Possible blockage in the system. 2. Operating conditions are incorrect. 3. Dynamic inlet pressures are not balanced. 4. Shuttle assembly is faulty.