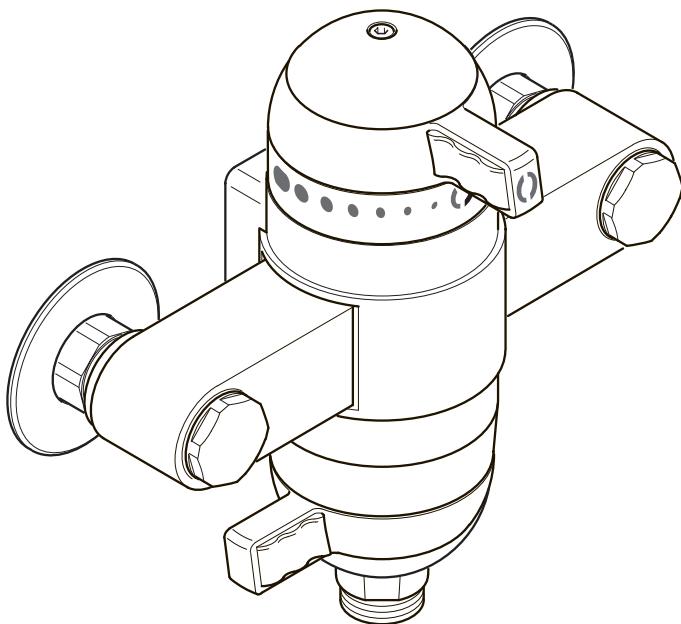


## Exact-3



These instructions must be left with the user

Product Manual

**rada**

# INTRODUCTION

Please take time to read this guide thoroughly, having done so retain it for future reference and pass it on in the event of change to site ownership.

The Rada Exact-3 Thermostatic shower control is specified to meet the highest standards of safety, comfort and economy as demanded by today's users. All Rada Exact-3 Thermostatic shower controls are designed, manufactured and supported in accordance with accredited BS EN ISO 9001:2008 Quality Systems.

The manual covers all Rada Exact-3 Thermostatic shower controls manufactured from May 1995.

The suffix '3' indicates that this mixer has been certified for use in UK Healthcare premises as a Type 3 valve under the BUILDCERT TMV3 scheme. For Healthcare installation refer to the TMV3 Requirements Manual.

The approved designations for Type 3 Valves are as follows:

Model	Designation
Rada Exact 3	HP-S, LP-S

## GENERAL

1. Make sure that the product is installed and maintained by a competent installer.
2. Make sure they are installed, commissioned, operated and maintained in accordance with the recommendations in this guide.
3. The installation must comply with all current regulations and practices, specified by the local water supply regulations and building codes.
4. The function of a thermostatic mixing valve is to deliver water consistently at a safe temperature. Provided that the thermostatic mixing valve is installed, commissioned and operated within the specification limits and regularly maintained according to this guide, the risk of malfunction, if not eliminated, is considerably reduced.
5. Follow all warnings, cautions and instructions contained in this guide.
6. For Type 2 & 3 installations, TMV valves are only to be used for applications covered by their approved designations, refer to the TMV 2 & TMV 3 Requirements Manuals.

# SAFETY

1. The use of the word 'failsafe' to describe the function of a thermostatic mixing valve is both incorrect and misleading. In keeping with every other mechanism it cannot be considered as being functionally infallible.
2. Malfunction of thermostatic mixing valves is almost always progressive in nature and will be detected by the use of proper temperature checking and maintenance routines.
3. Certain types of system can result in the thermostatic mixing valve having excessive 'dead-legs' of pipework. Others allow an auxiliary cold water supply to be added to the mixed water from the mixing valve. Such systems can disguise the onset of thermostatic mixing valve malfunction.
4. Ultimately, the user or attendant must exercise due diligence to ensure that the delivery of warm water is at a stable, safe temperature. Particular consideration should be given to the young, the elderly, the infirm or anyone inexperienced in the correct operation of the controls. This is particularly important in such healthcare procedures as supervised bathing of patients unable to respond immediately to unsafe temperatures.
5. Care is required when making any adjustments to flow or temperature, make sure that the temperature is suitable and has stabilised.
6. To ensure continued safe operation of this product, all '**Critical Components**' should be changed every **5 years**.
7. The designed service life of all critical components used in this product is 5 years providing it is operated within the recommended operating conditions and parameters. However when supply conditions and/or usage patterns do not conform to the recommended operating parameters and/or conditions the critical components may need to be replaced more frequently in line with appropriate risk assessments (refer to 'Specification').
8. **Continued use of this product in conditions outside the specification limits given in this manual can present potential risk to users.**
9. **Important! In healthcare applications such as hospitals, aged person facilities, residential care homes, etc. and in any other applications where the user is similarly at risk, irrespective of supply and usage conditions or the evidence of in-service tests, the critical components must be replaced at intervals of no more than 5 years.**

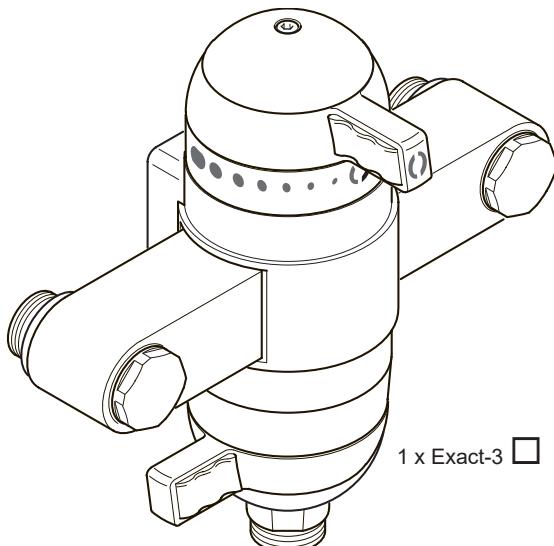
## 10. Critical Component Table

408.72	Checkvalve Cartridge Assembly
1578.046	Thermostatic Cartridge Assembly

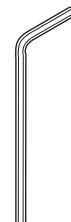
# PACK CONTENTS

Tick the appropriate boxes to familiarize yourself with the part names and to confirm that the parts are included.

## Exact-3

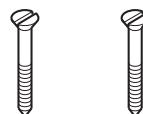


1 x Exact-3



1 x 2.5 mm A/F Hexagonal Wrench

2 x Screws



2 x Wall Plugs

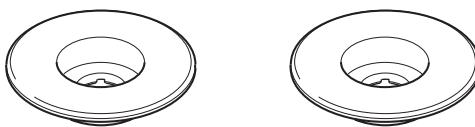
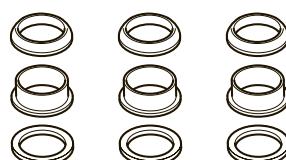


3 x Compression Nuts

3 x Flat Faced Inserts



3 x Olives

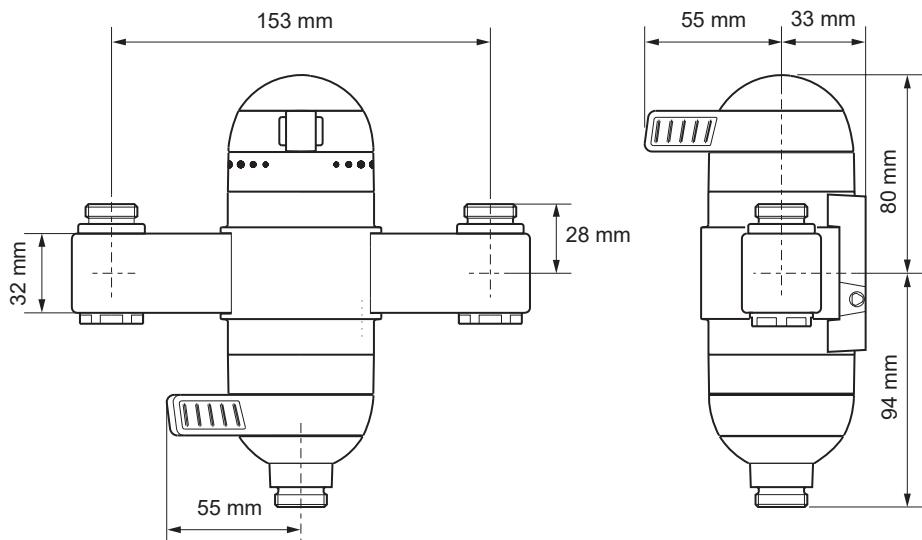


2 x Pipe Concealing Plates

1 x TMV3 Requirements Manual

# DIMENSIONS

## Rada Exact-3



# SPECIFICATION

## Normal Operating Conditions

are considered as:

- Inlet dynamic pressures nominally balanced to within 10% of each other during flow
- A differential of approximately 50°C between the hot and cold inlet temperatures, and with differentials of 15-35°C between the blend setting and either supply
- Daily usage of 1-6 hours
- Installation and usage environment not subject to extremes of temperature, unauthorised tampering or wilful abuse.

## Other Applications

For information on other specific applications or suitability, refer to Kohler Mira Ltd, or local agent.

## Disinfection

In applications where system chemical disinfection is practised, chlorine can be used (calculated chlorine concentration of 50 mg/l [ppm] maximum in water, per one hour dwell time, at service interval frequency). Such procedures must be conducted strictly in accordance with the information supplied with the disinfectant and with all relevant Guidelines/Approved Codes of Practice.

If in any doubt as to the suitability of chemical solutions, refer to Kohler Mira Limited, or Local Agent.

## Operating Parameters

For Type 3 installations, the supply conditions specified in the TMV3 Requirements Manual take precedence over the operating parameters which follow.

### Pressures/Flow Rates

For **optimum** performance, dynamic supply pressures should be nominally equal.

**Recommended Minimum Flow Rate:** 3 litres/minute at mid-blend with equal dynamic supply pressures.

**Recommended Maximum Flow Rate:** 35 litres/min at mid-blend (which equates to a maximum pressure loss of 1.9 bar).

**Maximum Pressure Loss Ratio\***: should not exceed 10:1, in favour of either supply, during flow.

**Recommended Minimum Dynamic Supply Pressure:** 0.15 bar (15 kPa) - 0.2 bar (20 kPa) healthcare.

**Recommended Maximum Dynamic Supply Pressure:** 5 bar (500 kPa).

**Maximum Static Supply Pressure:** 10 bar (1000 kPa).

Recommended maximum flow velocity in pipelines is 2 metre/second.

*\*Pressure Loss Ratio is determined by subtracting the resistance to flow at the outlet (generally known as “back pressure”, and measured at the outlet of the mixing tap) from the dynamic pressures of the hot and cold water at each inlet of the mixing tap. This is at its extreme when the mixing tap is being used at its lowest flow rate and when the maximum inequality occurs in the pressure of the hot and cold water supplies.*

## Hydraulic restriction: Flow Rate/Pressure Loss Graph - all models

(Shower control only, equal dynamic supply pressures, unrestricted outlet and mid-blend temperature setting)



## Connections:

### Rada Exact-3

Inlets and Outlet: 1/2" BSP external union or 15 mm compression (nut and olive provided).

Standard Connections are:

<b>Hot</b>	-	<b>left (marked red)</b>
<b>Cold</b>	-	<b>right (marked blue)</b>

**Note!** Should the supplies be reversed then the shower control will not be able to control temperature. This can be corrected by reversing the position of the Thermostatic cartridge within the control body, as described in **INSTALLATION**.

**Outlet** - **bottom** (can be altered to top outlet if required, refer to **INSTALLATION**)

All models can operate in any plane, and may be inverted if necessary for supply pipework layout convenience, provided hot and cold pipework is connected to the appropriate inlets (hot - red, cold - blue).

**Outlet Fittings:** The outlet connector is designed to accept Rada/standard flexible hose (1/2" BSP) unions and flat-faced/flanged unions (maximum flange diameter 20 mm); use flat-faced insert (408 71)

15 mm pipework; use compression olive (542 10).

## Inlet/ Outlet Options:

	INLETS: <sup>*</sup>	OUTLET: <sup>*</sup>
Exact-3	<b>top</b> , bottom, rear-fed	<b>bottom</b> , top

\* Products are supplied in the format shown in bold.

## Temperature

**Cold Water Temperature Range: 1°C-25°C.**

**Cold Water Temperature Range for TMV 3 valves: 5°C to 20°C.**

**Maximum Hot Water Temperature: 70°C\*.**

**Factory Preset: 43°C under ideal installation conditions.**

**Optimum Thermostatic Control Range: 35°C - 50°C**

**Minimum Temperature Differential between hot supply and outlet temperature: 12°C**

**\*Note!** For optimum performance reasons it is recommended that the maximum hot water temperature is limited to 65°C.

**Caution!** During thermal disinfection the mixing valve can operate up to 85°C for short periods. Ensure safety precautions are followed during discharge. Chemical disinfection agents e.g.chlorine/chloramines combined with higher temperatures will affect the life of the product adversely and could detrimentally affect the thermostatic performance.

## Flow Control:

Rada Exact-3 series shower controls have integral flow control; no other user-operated flow controller should be used with this shower control.

## INSTALLATION

**Installation must be carried out in accordance with these instructions, and must be conducted by designated, qualified and competent personnel.**

1. Installations must comply with all Local/National Water Supply Authority Regulations/Bye-Laws, and building and Plumbing Regulations.
2. The mixing valve should be positioned for easy access during use and maintenance. All routine maintenance procedures can be conducted with the mixing valve body in place. For all models, allow a minimum 100 mm clearance in front of the temperature control to enable removal of the cartridge assembly during maintenance.

3. Conveniently situated isolating valves must be provided for maintenance.
4. The use of supply-line or zone strainers will reduce the need to remove debris at each mixing valve point. The recommended maximum mesh aperture dimension for such strainers is 0.5 mm..
5. Inlet and outlet pressure tappings should be provided to enable continuing accurate assessment of operating conditions. This is especially important in healthcare applications.
6. Pipework must be rigidly supported.
7. Pipework dead-legs should be kept to a minimum. The mixed water outlet piping should not exceed 2 m and the overall length from the hot water circuit to the discharge point should not exceed 5m.
8. Supply pipework layout should be arranged to minimise the effect of other outlet usage upon the dynamic pressures at the mixing valve inlets.
9. Inlet and outlet threaded joint connections should be made with PTFE tape or liquid sealant. Do not use oil-based, non-setting jointing compounds.
10. To eliminate pipe debris it is essential that supply pipes are thoroughly flushed through before connection to the mixing valve.
11. Inlet isolators must be used in the fully open position.
12. Do not install the Rada Exact valve in a position where it may become frozen

## Outlet Position/Reversed Inlets (Refer to Figures 1 to 4)

All Rada Exact-3 series shower controls are supplied with inlet connections configured **hot - left, cold - right, and bottom outlet** as standard. It is essential that inlet supplies correspond with the red and blue markings on the Thermostatic cartridge.

Should the existing hot and cold pipework make this configuration inconvenient, or a top outlet position be required, the inlets or outlet can be reversed.

1. If the shower control body has already been installed, isolate the supplies to the shower control, and open the flow control to release pressure and to assist the draining of residual water. **Note!** If both the outlet and inlet positions require reversing, it is easier to simply rotate the complete shower control by 1/2 turn.
2. **Standard** (Refer to Figure 1)
  - As supplied.

### **3. Top Outlet (Refer to Figure 2)**

- (a) Remove the temperature knob assembly, using the 3 mm A/F hexagonal wrench (supplied) (Refer to Figure 8). Do not remove the temperature hub.
- (b) With removal clip still in place, unscrew the head nut using a 35 mm A/F wrench; this will release the body shroud and also begin to draw the Thermostatic cartridge out of the body (Refer to Figure 8).
- (c) Pull the Thermostatic cartridge free of the shower control.
- (d) Rotate the Thermostatic cartridge 1/2 a turn (this reverses the position of the cartridge hot and cold inlets).
- (e) Carefully push the Thermostatic cartridge back into the shower control body. Make sure that the 2 cartridge inlet port seals remain in place, and locate the cartridge lugs into the body slots.

**Note!** The red and blue markings on the cartridge will now not correspond with the body markings, so to avoid future confusion remove the red and the blue stickers from the cartridge.

- (f) Carefully align and then tighten the headnut. Do not overtighten (maximum torque 2.5 Nm (1.85 lbf ft)).
- (g) Rotate the shower control 1/2 turn.

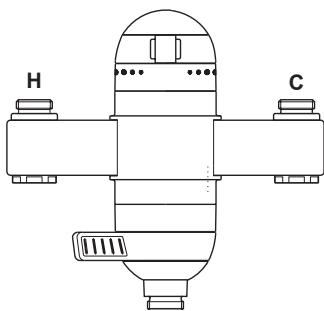
**Note!** The inlet elbows may need repositioning (Refer to Installation).

### **4. Reversed Inlets (Refer to Figure 3)**

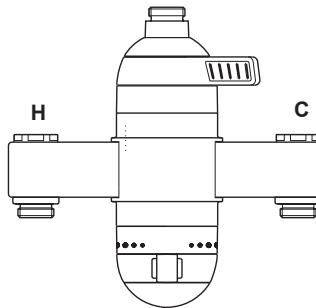
- (a) Remove the temperature knob assembly, using the 3 mm A/F hexagonal wrench (supplied) (Refer to Figure 8). Do not remove the temperature hub.
- (b) With removal clip still in place, unscrew the head nut using a 35 mm A/F wrench; this will release the body shroud and also begin to draw the Thermostatic cartridge out of the body (Refer to Figure 8).
- (c) Pull the Thermostatic cartridge free of the shower control.
- (d) Rotate the Thermostatic cartridge 1/2 a turn (this reverses the position of the cartridge hot and cold inlets).
- (e) Carefully push the Thermostatic cartridge back into the shower control body. Make sure that the 2 cartridge inlet port seals remain in place, and locate the cartridge lugs into the body slots.

**Note!** The red and blue markings on the cartridge will now not correspond with the body markings, so to avoid future confusion remove the red and the blue stickers from the cartridge.

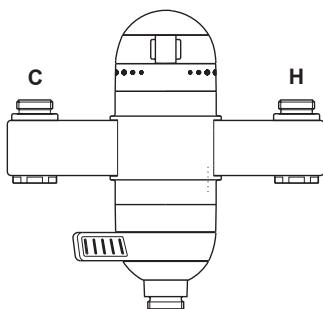
- (f) Carefully align and then tighten the headnut. **Do not** overtighten (maximum torque 2.5 Nm (1.85 lbf ft)).
5. Reversed inlets and top outlet (Refer to Figure 4)
- (a) Rotate the shower control 1/2 turn.
- Note!** The inlet elbows may need repositioning (Refer to Installation).
6. Complete INSTALLATION, if appropriate.



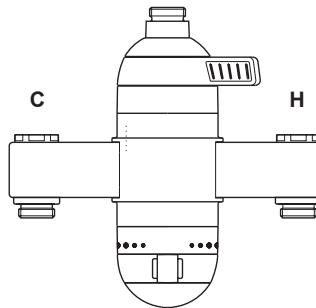
**Standard**  
**Figure 1**



**Top Outlet**  
**Figure 2**



**Reversed Inlets**  
**Figure 3**



**Reversed Inlets and Top Outlet**  
**Figure 4**

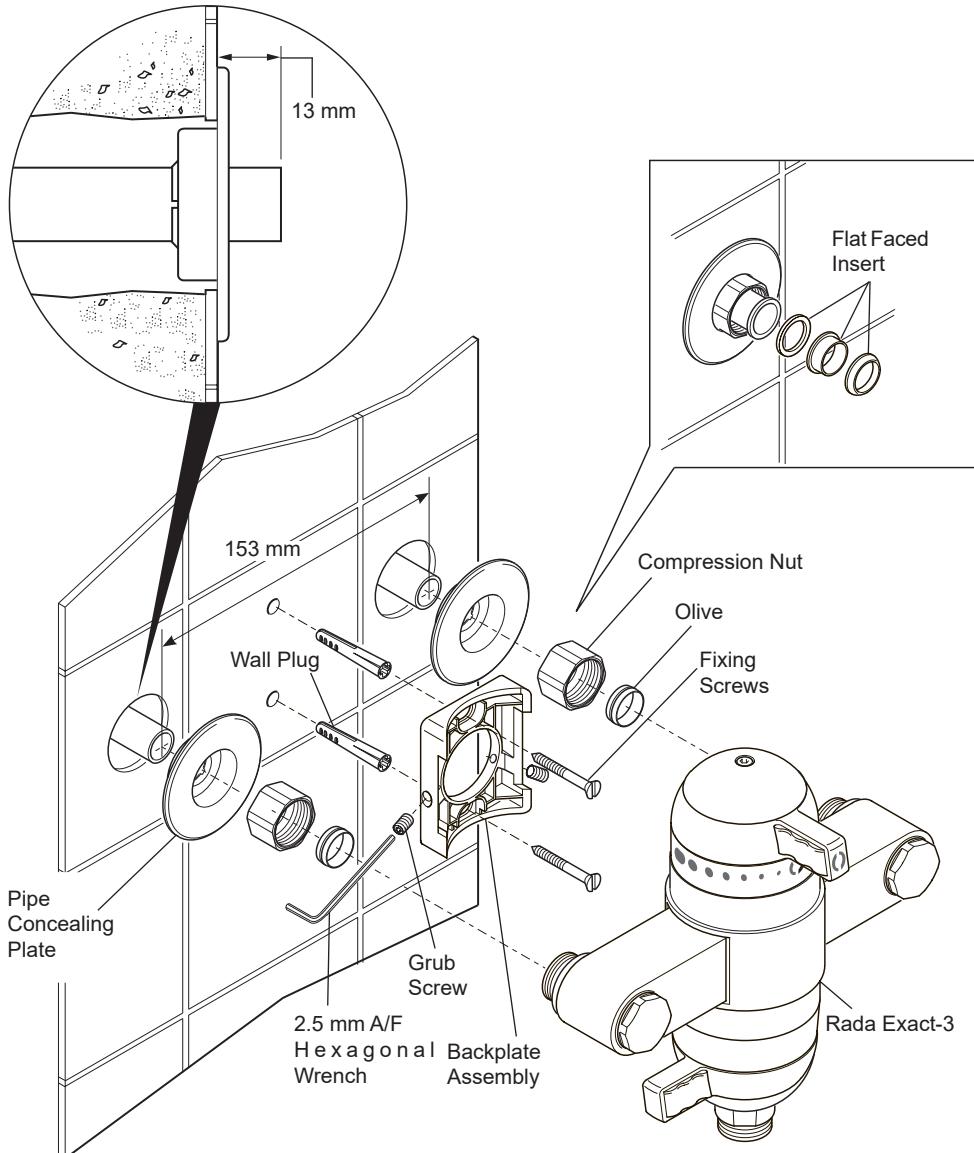
7. If the shower control body has already been installed, restore the hot and cold supplies and check for any leaks.
8. Align and refit the body shroud and temperature knob assembly so that the markings will be visible to the user.
9. The maximum temperature may now need resetting; check, and if necessary refer to COMMISSIONING.

## **Installation: Rada Exact-3** (Refer to Figure 5)

1. When unpacked, the inlet elbows are positioned to accept falling supplies.

Should the installation require rising or rear-fed supplies then the elbows will need adjusting.

    - (a) Loosen each elbow grub screw using the 2.5 mm A/F hexagonal wrench (supplied)
    - (b) Pull the elbow away from the body and refit in the desired position.
    - (c) Tighten the grub screw.
  2. Where rear-fed supplies are required, pipe concealing plates are provided which recess into the tiling for a neater finish.
  3. Mount the backplate securely to wall surface (with the grub screws pointing downwards) using wall screws/plugs provided.
  4. Install the supply pipework to the respective inlets.
- Important!** Flush through the hot and cold supplies thoroughly before connection to shower control. Failure to do so may result in reduced performance and/or product damage.
5. Refit body onto backplate and tighten the grub screws.
  6. Connect inlet pipework, checking that the hot and cold supplies have been piped to the correct inlets.
    - (a) For 15 mm compression pipework inlet (or outlet) connections: Use compression nuts and olives supplied.
    - (b) For 1/2" BSP union inlet (or outlet) connections: Use flat-faced inserts supplied, press in firmly.
  7. Connect outlet shower hose or rigid outlet pipework. Check all connections are watertight. Refer to COMMISSIONING.



**Exact-3 - Installation**

**Figure 5**

Supplies (pipe centres between 115-165 mm) must terminate in 1/2" BSP internal sockets to within 3 mm, above or below, the final wall surface.

**Note!** It is essential that inlet supply sockets are parallel, and square with wall surface.

# COMMISSIONING

Commissioning must be carried out in accordance with these instructions, and must be conducted by designated, qualified and competent personnel.

## Exercising the Thermostat

Thermostatic mixing valves are inclined to lose their responsiveness if not used. Valves which have been in storage, installed but not commissioned, or simply not used for some time should be exercised before setting the maximum temperature or carrying out any tests.

A simple way to provide this exercise is:

- (a) ensure that the hot and cold water are available at the valve inlets, and the outlet is open.
- (b) move the temperature control rapidly from cold to hot and hot back to cold several times, pausing at each extreme.

## Maximum Temperature

The maximum blend temperature obtainable by the user should be limited, to prevent accidental selection of excessive hot temperatures.

All Rada thermostatic shower controls are fully performance tested, and the maximum temperature is preset to approximately 43°C under ideal installation conditions at the factory.

Site conditions and personal preference may dictate that the maximum temperature has to be reset following installation.

**Note!** For Type 3 valves in healthcare installations the maximum blend temperature is determined by the application, refer to the TMV3 Requirements Manual.

This shower control is provided with a levered, adjustable temperature control knob, which allows the user to select the blend temperature between ambient cold up to a preset maximum.

## Maximum Temperature Setting (Refer to Figure 7)

Check that an adequate supply of **hot** water is available at the hot inlet of the shower control.

During resetting, the hot supply to the shower must be as close to the typical maximum to offset the possibility of any blend shift due to fluctuating supply temperatures. However, the minimum temperature of the hot water **must** be at least 12°C above the desired blend for correct operation.

Temperatures should always be recorded using a thermometer with proven accuracy.

Check that both inlet isolating valves are fully open. Turn the temperature knob to maximum and operate the flow control. Allow the temperature to stabilize and check the outlet temperature.

- If the outlet temperature is set correctly then refer to Commissioning Checks.
- If adjustment of the temperature is required, carry out the procedure shown below and refer to Figure 7.

1. Remove the temperature knob, using the 3 mm A/F hexagonal wrench (supplied).
2. Pull off the temperature hub.
3. Rotate the spindle until the required maximum blend temperature is obtained at the discharge point (clockwise = decrease temperature).

When resistance is felt do not use force to turn any further, as this can damage the internal parts.

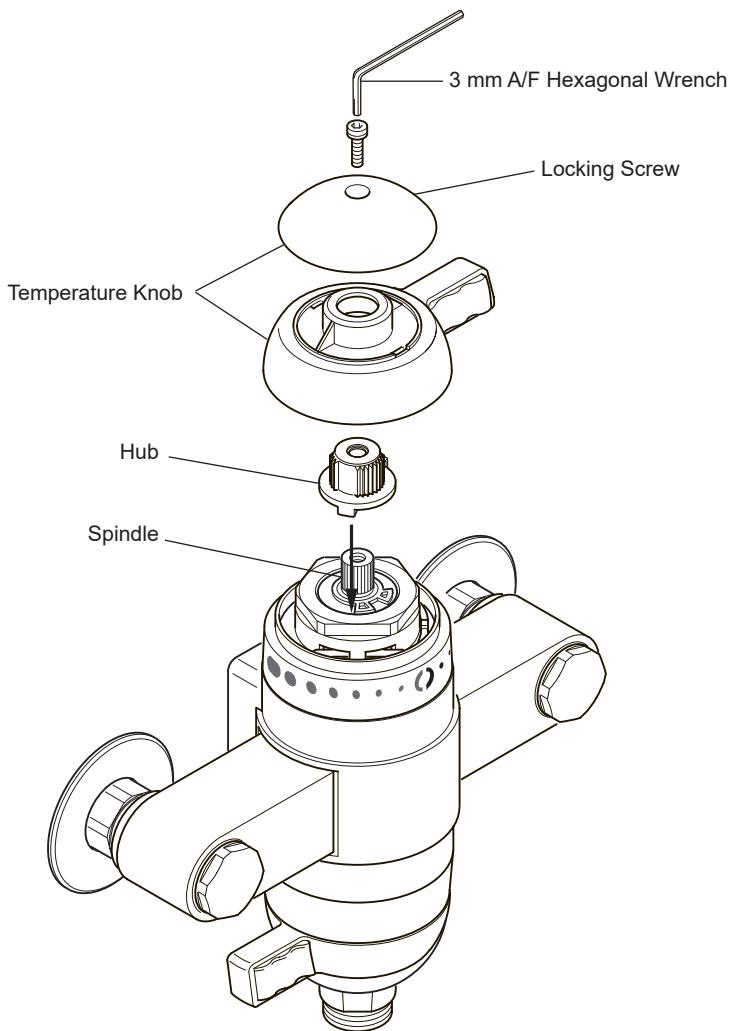
4. Once the desired maximum blend temperature is achieved, refit the hub without disturbing the spindle, positioning it so that the lug is against the stop on cartridge face, preventing further rotation. Check that blend temperature has not altered.
5. Refit the temperature knob so that the lever is aligned with the maximum hot position shown on the body shroud.
6. Refit the cap and locking screw.

## Commissioning Checks

(Temperatures should always be recorded using a thermometer with proven accuracy)

1. Check inlet pipework temperatures for correct function of checkvalves.
2. Operate the flow control and check:
  - Flow-rate is sufficient for purpose.
  - Temperatures obtainable are acceptable.
  - All connections and control body are watertight.
  - Supply pressures are within the range of operating pressures for the valve
3. It is advisable to establish a performance check at this time, which should be noted for future reference as part of a Planned Maintenance Programme (a Maintenance Record Card has been provided with this Manual).

The procedure should be chosen to imitate both typical and difficult operating conditions, such as any supply pressure fluctuations that may be likely. An ideal method is to locate another outlet on the common cold water supply close to the shower control (operating this outlet should cause a drop in supply pressure), and note the subsequent effect on blend temperature (should be no more than 2°C change). Exercise the thermostat as described on page 17.



### Maximum Temperature Setting

Figure 7

## OPERATION

Adjustment of blend temperature from preset maximum to cold is achieved by clockwise rotation of the temperature knob.

The flow control knob operates through 180° rotation, with full flow when the lever is fully to the right and flow closure when fully to the left for bottom outlet applications (this configuration reverses for top outlet). The rate of flow can be readily controlled within this rotation.

# FAULT DIAGNOSIS

Symptom	Cause/Rectification
1. Only hot or cold water from outlet.	<p>a. Inlet supplies reversed (hot supply to cold inlet). Check.</p> <p>b. No hot water reaching shower control. Check.</p> <p>c. Check strainers and inlet/outlet fittings for blockage.</p> <p>d. Refer symptom 5 below.</p> <p>e. Installation conditions continuously outside operating parameters: refer to <b>SPECIFICATION</b>, and 2e below.</p>
2. Fluctuating or reduced flow rate.	<p>Normal function of thermostatic control when operating conditions are unsatisfactory;</p> <p>a. Check strainers and inlet/outlet fittings for flow restriction.</p> <p>b. Make sure that minimum flow rate is sufficient for supply conditions.</p> <p>c. Make sure that dynamic inlet pressures are nominally balanced and sufficient.</p> <p>d. Make sure that inlet temperature differentials are sufficient.</p> <p>e. (Subsequent to rectification of supply conditions) Check thermostatic performance; renew Thermostatic cartridge, if necessary.</p>
3. No flow from shower control outlet.	<p>a. Check strainers and inlet/outlet fittings for blockage.</p> <p>b. Hot or cold supply failure; thermostat holding correct shutdown function: rectify, and refer to symptom 2.e. above.</p>
4. Blend temperature drift.	<p>Indicates operating conditions changed.</p> <p>a. Refer to symptom 2. above.</p> <p>b. Hot supply temperature fluctuation.</p> <p>c. Supply pressure fluctuation.</p>
5. Hot water in cold supply or vice versa.	Indicates checkvalves require maintenance, refer to <b>MAINTENANCE</b> .
6. Maximum blend temperature setting too hot or too cool.	<p>a. Indicates incorrect <b>maximum temperature setting</b>; refer to <b>COMMISSIONING</b>.</p> <p>b. As symptom 4. above.</p> <p>c. As symptom 5. above.</p>

Symptom	Cause/Rectification
7. Water leaking from shower control body.	Seal(s) worn or damaged. a. Obtain service pack and renew all seals. b. (If leak persists from around temperature spindle) Renew Thermostatic cartridge.
8. Flow knob or temperature knob stiff to operate.	a. Impaired free movement of internal components. Renew the appropriate cartridge. b. Supply pressures too high. Fit pressure reducing valve.

## MAINTENANCE

### General

This Product is precision engineered and should give continued safe and controlled performance, provided:

1. It is installed, commissioned, operated and maintained in accordance with manufacturers recommendations.
2. Periodic attention is given, when necessary, to maintain the product in good functional order.

The Rada Exact 3 Shower Valve is designed for the minimum of maintenance in normal use. The only serviceable parts are the inlet filters which should be checked and cleaned every 12 months. If a malfunction occurs with the Thermostatic Cartridge then this will necessitate a complete cartridge replacement.

**Note!** The cartridge contains no internally serviceable parts.

If you require a Rada trained engineer or agent, refer to section: 'Customer Service'.

### Planned Maintenance

**Important!** For Type 3 Valves use the In-Service Tests given in the TMV3 Requirements Manual. In the absence of any other instruction or guidance on the means of determining the appropriate frequency of in-service testing, the procedure contained within this guide (taken from Annex F of D08) should be used.

For other commercial installations it is recommended that the correct blend setting is checked every 6 months and that the In-Service Test procedure is followed every 12 months.

# Critical Components

See 'Safety' section for critical components and replacement intervals

## Lubricants

Silicone based lubricants must only be used on the rubber seals.

Caution! Oil based or other lubricant types may cause rapid deterioration of seals.

## Cleaning

The chrome plated parts should be cleaned using a mild washing up detergent or soap solution, rinsed and then wiped dry with a soft cloth.

Warning! Many household cleaners contain abrasive and chemical substances, and should not be used for cleaning plated or plastic fittings.

Do not use descalents on this product.

## Maintenance Procedure - Thermostatic Cartridge (Ref to Fig 8)

### Removal

1. Isolate the supplies to the shower control, and open the flow control to release pressure and to assist the draining of residual water.
2. Remove the temperature knob assembly, using the 3 mm A/F hexagonal wrench (supplied). Do not remove the temperature hub.
3. With removal clip still in place, unscrew the head nut using a 35 mm A/F wrench. This will release the body shroud and also begin to draw the Thermostatic cartridge out of the shower control body.  
**Warning!** some residual water may be released.
4. Note which inlet aligns with the hot (marked H and red) lug on cartridge.
5. Pull the Thermostatic cartridge free of the shower control body.

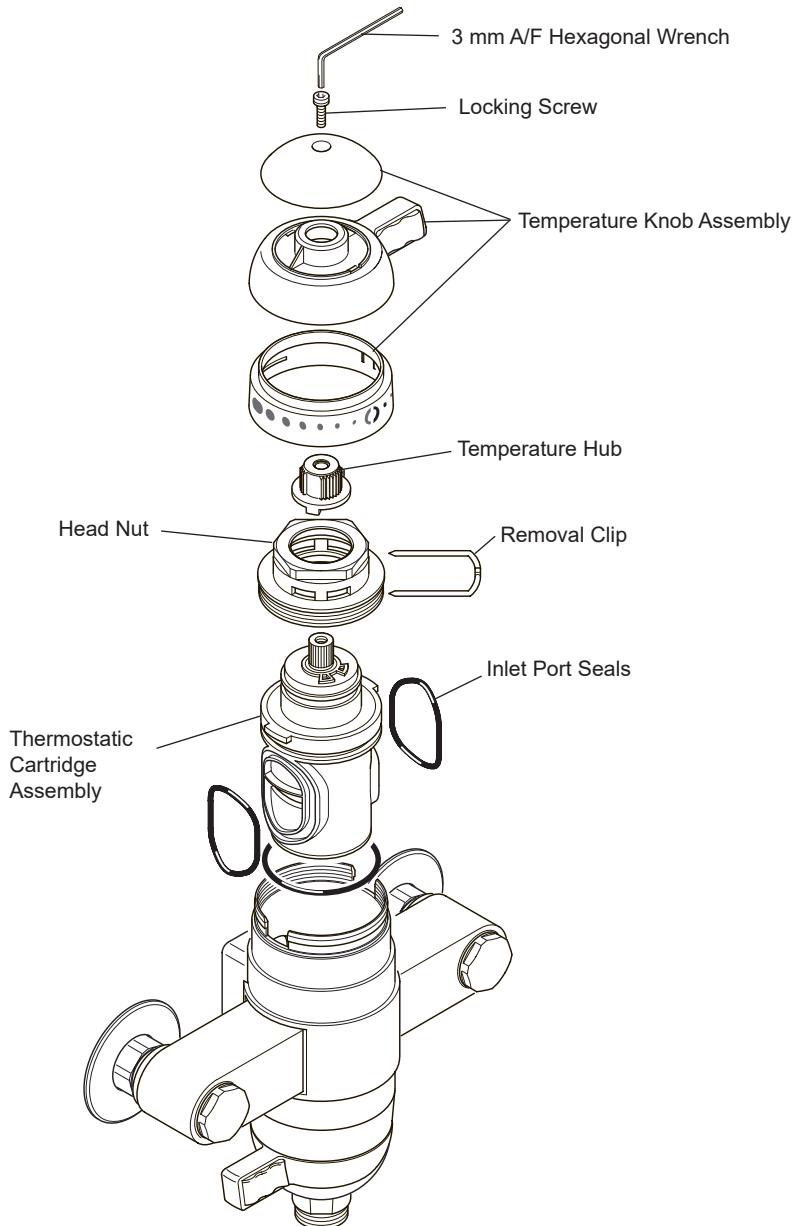
### Cleaning/Renewal of Parts

6. The interior surface of the shower control body must be clean before refitting cartridge. If scale or deposition is present, clean (without Thermostatic, flow and checkvalve cartridges fitted) using a mild proprietary inhibited scale solvent, e.g. domestic kettle descaler. After descaling, rinse body thoroughly in clean water before refitting cartridges. **Note!** The body interior must be cleaned carefully and not damaged in any way. Do not use any abrasive material.
7. Cartridges may only be cleaned by flushing through under a jet of clean water to remove lodged particles. Do not descale. Cartridges are not serviceable, and must not be dismantled. Cartridges cannot be tested individually, service condition should be assessed as part of the performance check; refer to Commissioning Checks.

8. When renewing Thermostatic cartridge, retain the removal clip and head nut off the displaced unit and refit.
9. Examine all accessible seals for signs of deformation or damage, and renew as necessary, taking care not to damage seal grooves (a Service Pack is available, containing all seals and strainer screens that may be necessary for renewal during maintenance or servicing).
10. Lightly coat all seals with a silicone-only based lubricant to assist reassembling (see lubricants).

## Re-assembly

11. Identify which is the hot inlet to the shower control body, and align the Thermostatic cartridge accordingly. Carefully push the Thermostatic cartridge back into the body, checking that the 2 cartridge inlet port seals remain in place, and locate cartridge lugs into body slots.
12. Carefully align and then tighten the head nut; do not overtighten (max. torque 2.5 Nm (1.85 lbf ft)).
13. Align and refit the body shroud and temperature knob assembly, so that the markings will be visible to the user.
14. Restore hot and cold supplies and check for any leaks.
15. The maximum temperature will now need resetting; refer to COMMISSIONING.



### Thermostatic Cartridge Removal

Figure 8

# Maintenance Procedure- Flow Cartridge (Refer to Figure 9)

## Removal

1. Isolate the supplies to the shower control, and open the flow control to release pressure and to assist the draining of residual water.
2. Release outlet fittings from outlet connector.
3. Locate removal slot, and carefully prise off the flow control cap. Lever out and remove locking pin, and lift off outlet connector and flow control knob. Carefully pull or lever the body shroud free.
4. Release and remove the 4 cartridge retaining screws, and carefully pull the flow cartridge free of the body.

**Warning! some residual water may be released.**

## Cleaning/Renewal of Parts

5. The shower control body surface must be clean before refitting cartridge. If scale or deposition is present, clean (without Thermostatic, flow and checkvalve cartridges fitted) using a mild proprietary inhibited scale solvent, e.g. domestic kettle descaler. After descaling, rinse body thoroughly in clean water before refitting cartridges. **Note!** The shower control body must be cleaned carefully and not damaged in any way. Do not use any abrasive material.
6. Cartridges may only be cleaned by flushing through under a jet of clean water to remove lodged particles. Do not descale. Cartridges are not serviceable, and must not be dismantled.

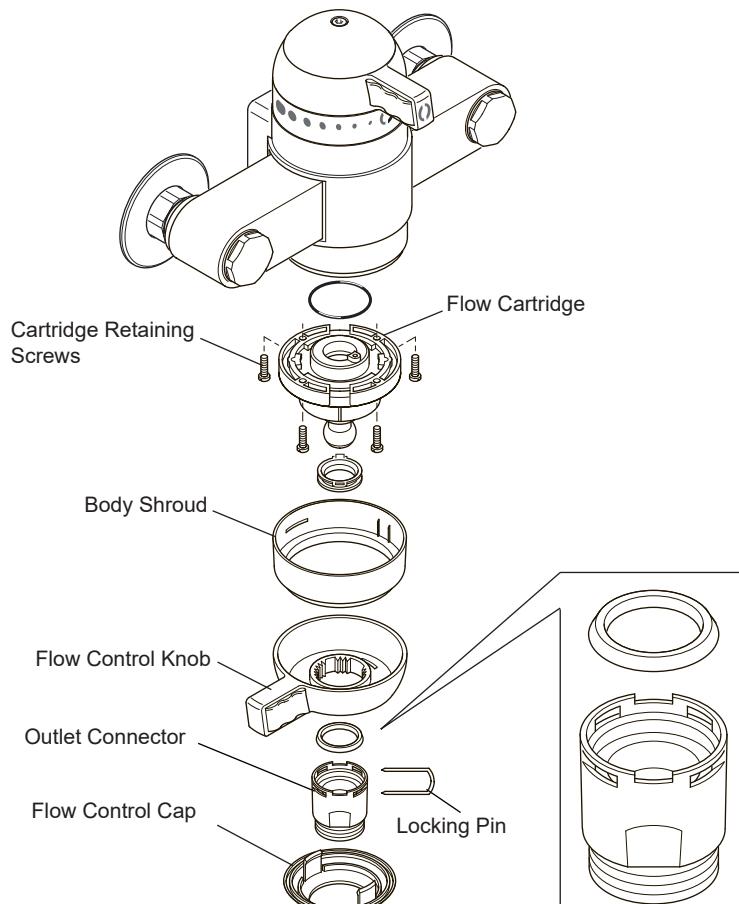
Cartridges cannot be tested individually, service condition should be assessed as part of the performance check; refer to Commissioning Checks.

7. When renewing the flow cartridge, retain the locking pin with the outlet connector off the displaced unit and refit.
8. Examine accessible seals for signs of deformation or damage, and renew as necessary, taking care not to damage seal grooves. **Note!** The outlet lip seal must be inserted into the outlet connector before assembly onto flow cartridge.
9. Lightly coat all seals with a silicone-only based lubricant to assist reassembling.

## Re-assembly

10. Check that flow cartridge seal is in place. Align the cartridge rear tab and body lug, push the cartridge firmly onto body, and secure with 4 screws. Check that the outlet retainer is in place on flow cartridge outlet.  
**Note!** Models prior to August 1995 were fitted with an earlier pattern flow cartridge having a beige coloured housing. These cartridges did not require the outlet retainer and used an earlier design (non-slotted) outlet connector which is not interchangeable with the current flow cartridge (all-black).

11. Align and refit the body shroud and flow knob assembly, so that the markings will be visible to the user.
12. **Check that lip seal is correctly located in outlet connector**, apply a light coat of **silicone-only based lubricant**, and carefully refit outlet connector. Secure with locking pin.
13. Align and refit flow control cap, and reconnect outlet fittings.
14. Restore hot and cold supplies and check for any leaks.



**Flow Cartridge Detail**

**Figure 9**

# Maintenance Procedure- Checkvalve Cartridges

(Refer to Figure 10)

Hot water entering the cold supply, or vice versa, indicates that immediate attention is necessary. This is carried out by removing and cleaning, or renewing as necessary, the two Checkvalve cartridges.

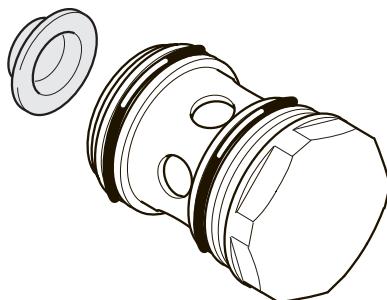
1. Isolate the supplies to the shower control, and open the flow control to release pressure and to assist the draining of residual water.
2. Location and removal of Checkvalve cartridges varies according to shower control model:

**Exact-3:** The Checkvalve cartridges are located in each inlet elbow, to remove undo the Checkvalve cartridge head hexagon using a 24 mm A/F wrench and pull free.

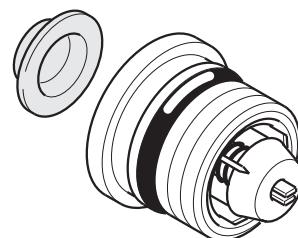
**Exact-3 z:** The Checkvalve cartridges are located at the inlet of each elbow. To remove, first release the outlet connection, then release the shower control body from the offset connectors using a 32 mm wrench. Release the Checkvalve cartridges using a 12 mm A/F hexagon wrench.

**Caution!** Some water may be released at this point.

3. The Checkvalve cartridge assembly may be cleaned by removal of the inlet strainers, and flushing through under a jet of water to remove lodged particles. Do not descale.
4. Lightly wipe external seals and thread with a silicone-only based lubricant to assist refitting.
5. Re-assembly into the shower control is a reversal of the above procedures. Do not overtighten when re-inserting cartridges.
6. Restore the water supplies and check for leaks.



Exact-3



Exact-3 z

## Checkvalve Cartridges

Figure 10

## Maintenance Procedure - Inlet Strainers

Blockage of the inlet strainer screens can lead to poor flow performance and reduced temperature control. It is essential that the inlet strainer screens are cleaned or, if necessary, renewed as part of the six-monthly maintenance operations.

A Strainer pack is available for all Exact-3 and 215 series models, containing 2 strainer screens and all the seals (plus lubricant) and nylon washers that may need to be renewed during Strainer inspection (see **component matrix**).

1. Isolate the supplies to the shower control, and open the flow control to release pressure and to assist the draining of residual water.
2. The strainer screens are located at the inlet of each Checkvalve cartridge.

To access the inlet strainer screens:

**Exact-3:** remove the Checkvalve cartridges.

**Exact-3 z:** remove the shower control body from its pipework connections.

3. The strainer screens are dished outwards and are a push-fit into the housing. Remove carefully.
4. The strainer screens may be cleaned under a jet of water, or renewed.
5. Re-assembly into the shower control is a reversal of the previous procedures. Do not overtighten when re-inserting cartridges.
6. Restore the water supplies, and check for leaks.

## Maintenance Procedure - Elbow/Body Seals

Both models have inlet and/or elbow adaptor seals and elbow seals, which are static and should rarely require renewal. These seals are included in the service pack and may be accessed if necessary:

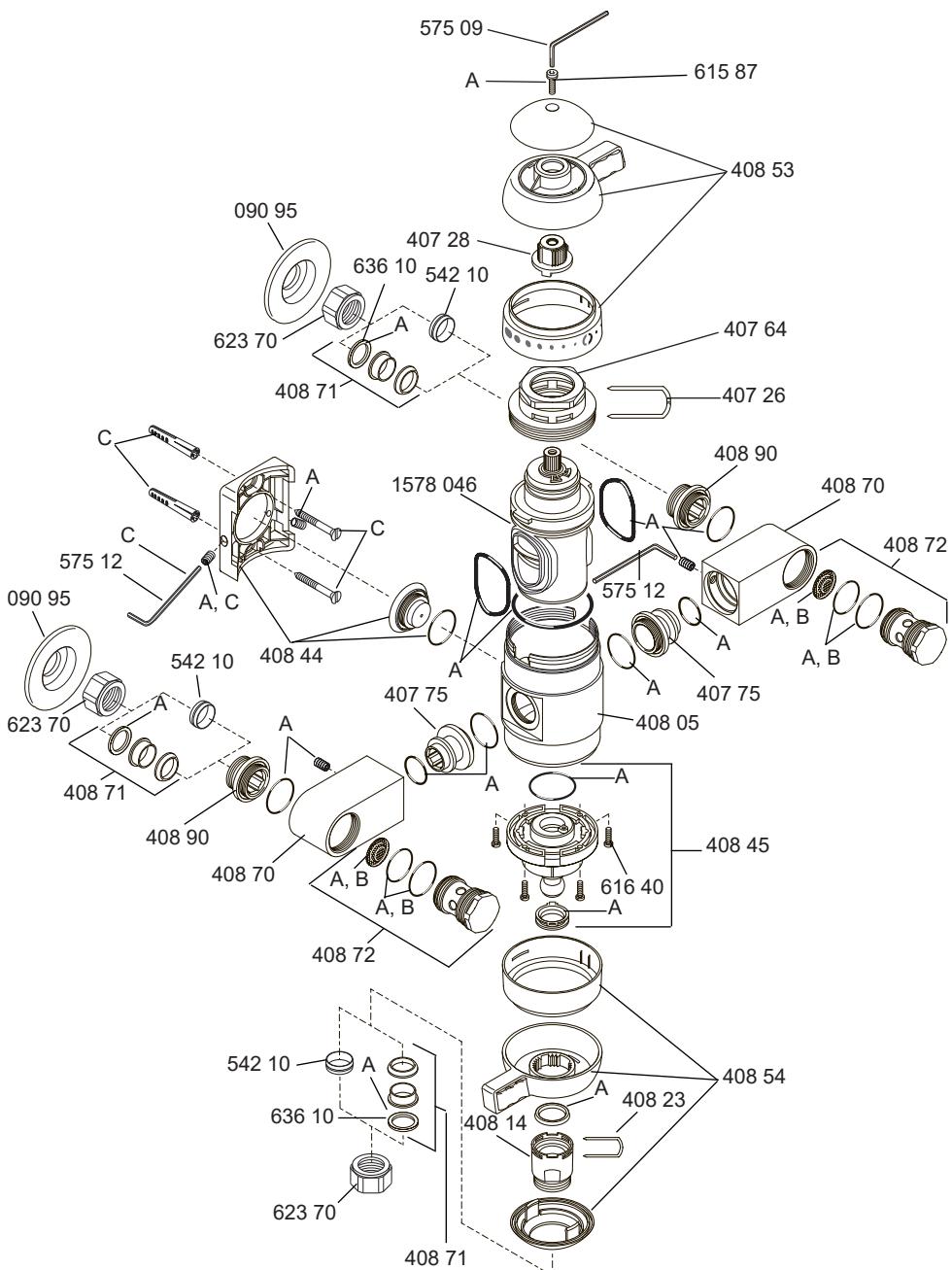
1. Isolate the supplies to the shower control, and open an outlet fitting to release pressure and to assist the draining of residual water.
2. Release inlet and outlet connections.
3. Remove elbows by loosening each elbow grub screw using 2.5 mm A/F hexagonal wrench.
4. Remove the adaptors using a 12 mm hexagonal wrench.
5. Lightly coat seals with a silicone-only based lubricant to assist re-assembly.
6. When re-inserting adaptors, do not overtighten.
7. Refit and remake pipework connections, restore hot and cold supplies and check for any leaks.

## SPARE PARTS

### 1. Rada Exact-3 Spare Parts List

Part No.	Description
090 95	Pipe Concealing Plate
407 26	Removal Clip - black
407 28	Hub - black
407 64	Head Nut
407 75	Elbow Adaptor
408 05	Body
408 14	Outlet Connector
408 23	Locking Pin
408 44	Backplate Assembly
408 45	Flow Cartridge
408 46	Component Pack - components identified 'C'
408 53	Temperature Knob Assembly - chrome
408 54	Flow Control Knob Assembly - chrome
408 70	Elbow
408 71	Component Pack, Flat-Faced Insert
408 72	Checkvalve Cartridge Assembly
408 90	Inlet Adaptor
408 91	Strainer Pack - components identified 'B'
408 92	Service Pack - components identified 'A'
542 10	Olive - 15 mm
575 09	3 mm A/F Hexagonal Wrench
575 12	2.5 mm A/F Hexagonal Wrench
615 87	Locking Screw
616 40	Screw
623 70	Compression Nut - 15 mm - chrome
636 10	Nylon Washer
983 07	Lubricant Sachet
1578 046	Thermostatic Cartridge Assembly

## 2. Rada Exact-3 Spare Parts Diagram



# CUSTOMER SERVICE

Your product has the benefit of our manufacturer's guarantee which commences from date of purchase or from the date of commissioning when product commissioning has been conducted within the UK by the Rada Commercial Field Service Team.

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