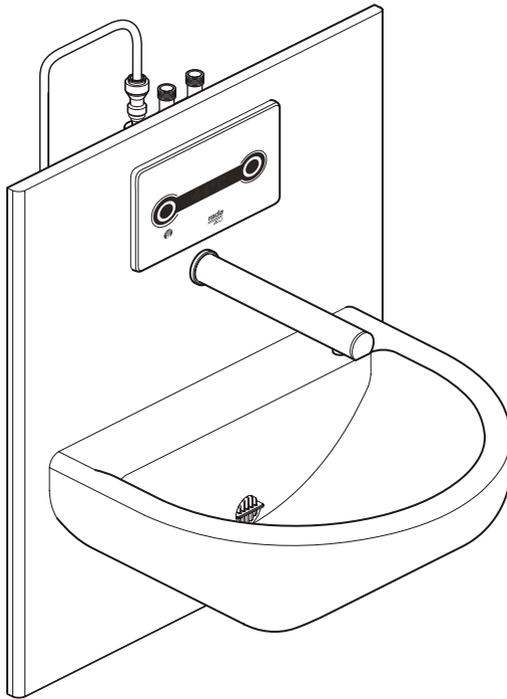




Rada Acu-T3 Digital Mixing Valve



T-logic™ Digital Intelligence



PRODUCT MANUAL

IMPORTANT

Installer: This Manual is the property of the customer and must be retained with the product for maintenance and operational purposes.

CONTENTS

Description	4
Patents and Design Registration.....	5
Safety : Warnings	5
Specifications	6
Installation	7
General.....	7
Make the connections to the Rada Acu.....	8
Commissioning	9
Operation	10
User Modes	10
Programming	13
General.....	13
Main Menu.....	15
Settings	16
Valve Setup	17
Set Mode	18
Flush Setup	19
Set Password	20
Service	21
Manual Flush.....	22
Disinfection.....	23
Commissioning.....	24
Maintenance	25
General.....	25
Planned Maintenance.....	25
Cleaning	26
Duty Flush	26
Disinfection.....	26
Pall Filters.....	26
Filters and Non Return Valves.....	27
Fault Diagnosis	30
General.....	30
Self Diagnostic Errors.....	32
Spare Parts	34

ATTENTION. The Rada Acu must be commissioned in order to activate and set-up the automatic duty flushing function. Please refer to the following instructions to achieve this.

Default Password: 1 1 1 1

User Defined Password: _ _ _ _

DMV Location:

DESCRIPTION

A panel mounted 1/2" Digital Mixing Valve (DMV) with a non touch on/off sensor mounted in the spout and a non touch control panel for temperature control. Functions include timed flow control, duty flush and thermal disinfection.

Suitable for HTM64 TB H6 basin assemblies for use in conjunction with clinical procedures. Use as an alternative to TP6 in conjunction with personal washing or hand washing.

Type 3 Valves

The suffix '3' indicates that this DMV has been certified for use in UK Healthcare premises as a Type 3 valve under the BUILDCERT TMV3 scheme.

Application

The approved designations for **Type 3 Valves** are as follows:

Model	Designation Code
Rada Acu	HP-WE

For Type 3 Valves refer to the TMV3 Requirements Manual

Key Features

- Non touch ON/OFF spout activation or timed flow control
- 3 optional pre-programmed modes and 1 user defined mode:
 - **Patient:** Activation of the water supply via the spout sensor, flow preset at 38°C with temperature adjustment up to 41°C and full cold.
 - **Clinical:** Activation of the water supply via the spout sensor, flow preset at 41°C with no temperature adjustment.
 - **Surgical:** Activation of the water supply via the spout sensor, 3 minute timed flow with temperature adjustment in 2 degree increments between 35°C and 43°C.
 - **Free Mode** (user defined mode): Activation of the water supply via the spout sensor, flow duration adjustment up to 5 minutes, temperature adjustment: Full Cold or 30°C to 48°C
- Programmable 'duty flushing'
- Thermal disinfection
- D08 commissioning regime/temperature logging, an automatic cycle that measures hot, cold and blend temperatures and displays them on the interface.
- Valve information and usage data

Patents and Design Registration

Patents:

GB: 2 421 297

USA: 7 669 776

1108900-W2-L

Patent Applications:

Europe: 2 227 647

USA: US-2010-0282326-A1

China: CN101918743A

India: 1306/MUMNP/2010

Design Registration:

001065023-0004

SAFETY : WARNINGS

The function of this Digital Mixing Valve (DMV) is to deliver water consistently at a desired temperature. This requires that:

1. It is installed, commissioned, operated and maintained in accordance with the recommendations given in this Manual.
2. For Type 3 installations, DMV's are only to be used for applications covered by their approved designations.
3. Periodic attention is given, as necessary, to maintain the DMV in good functional order. Recommended guidelines are given in the **Planned Maintenance** section in the TMV3 Requirements Manual.
4. Using this DMV outside the specification limits given in this Manual can present potential risk to users.
5. The electrical installation must comply to "BS 7671 - Requirements for Electrical Installations", commonly referred to as the IEE Wiring Regulations, or any particular regulations and practices, specified by the local electricity supply company.
6. The supply cable to the PSU cannot be replaced, if the supply cable is damaged then the PSU should be discarded.

The use of the word 'failsafe' to describe the function of any DMV is both incorrect and misleading. This DMV incorporates additional shut-off devices to improve the level of safety however, in keeping with every other mechanism it cannot be considered as being functionally infallible.

Where chlorine disinfection is practised, **DO NOT** exceed a chlorine concentration of 50 mg/l (ppm) in water, per one hour dwell time. Such procedures must be conducted strictly in accordance with the information supplied with the disinfectant and with all relevant Guidelines/Approved Codes of Practice.

SPECIFICATIONS

For Type 3 installations, the supply conditions specified in section: ‘**Type 3 Valves, Application**’ in the TMV3 Requirements Manual take precedence over the operating parameters which follow.

Standards and Approvals

This Digital Mixing Valve complies with all relevant directives for CE marking.

This Digital Mixing Valve is a type 1 electronic, panel mounted control.

General	
Rated Impulse Voltage	Mains Supply 12 V DC & 5 V DC supply to valve
Suitability for Drinking	Suitable
Connections	15 mm compression / Flat Faced Union

Pressures and Flow Rate				
Maximum Static Pressure	1000 kPa (10 bar)			
Minimum Static Pressure	100 kPa (1 bar)			
Supply Pressure Differential	Equal pressure recommended - for optimum performance pressure must be stable			
Maximum Flow Rate	6 L/min Flow Regulator Fitted			
Temperatures	Clinical	Patient	Surgical	User Defined
Maximum (Blend)	41°C	41°C	43°C	43 - 48°C
Minimum (Blend)	41°C	Full Cold	35°C	Full Cold, 30 - 38°C
Blend (Default at start-up)	41°C	38°C	41°C	33 - 41°C
User adjustment	None	38°C to 41°C and Full Cold	35°C to 43°C	Optional
Duty Flush <small>(Factory Setting)</small>	Disabled	Disabled	Disabled	Disabled
Minimum Blend Temperature Differential from Hot Supply	2°C			
Optimum Thermostatic Control Range	30°C - 48°C			
Cold Water Range	for healthcare applications supplies should be in the range: 5°C to 20°C			
Hot Water Range	for healthcare applications supplies should be in the range: 50°C - 65°C			
Temperature Stability	± 1°C at recommended supply conditions			
Ambient Temperature	Greater than 1°C, max. 40°C			
Maximum Relative Humidity	95% non-condensing at 25°C			
Electrical				
Supply Voltage	100 - 230 V RMS 50 - 60 Hz			
Maximum Load	20 W			
Mains Cable Length (to PSU)	3 m			
Times	Factory Settings	Programmable Range		
Flow Time to Auto Shut-off	2 seconds	0 seconds to 5 minutes		
Duty Flush Cycle	3 minutes	1 - 59 minutes		
Duty Flush Waiting Time	1 Day	4h, 12h, 18h, 1d - 7d, 14d, 28d		
Duty Flush Temperature	41°C	38°C - 43°C		
Disinfection				
Minimum Temperature	60°C			
Minimum Time	5 minutes			

INSTALLATION

General

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

Before commencing, make sure that the installation conditions comply with the information given in section: **'Specifications'**.

The plumbing installation must comply with the requirements of UK Water Regulations / By-laws (Scotland), Building Regulations or any particular regulations and practices, specified by the local water company or water undertakers.

Observe all local plumbing and building regulations.

Warning! Failure to achieve parallel inlet supply pipework will result in the inability to service the mixing valve.

Do not install the Rada Acu opposite a mirror, a highly reflective surface or into direct sunlight.

Caution! The Digital Mixing Valve (DMV) must be installed in a dry area and where it will not freeze.

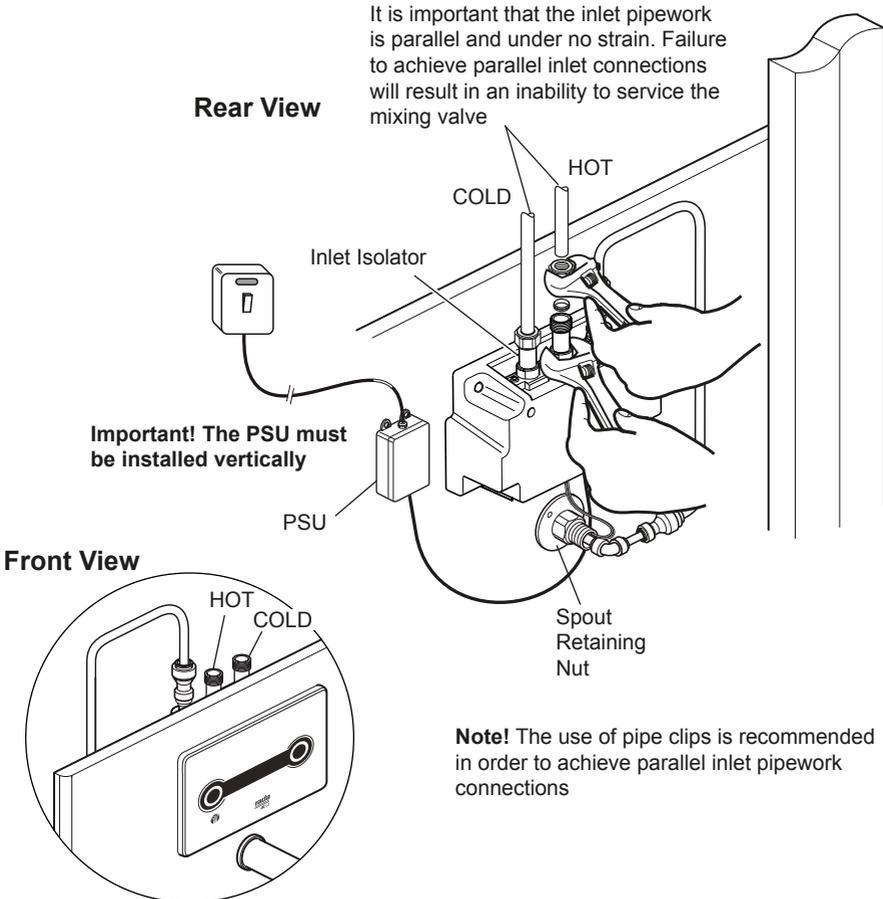
Note! The DMV must be installed in an environment that provides access to the power supply and rear box, ideally an IPS panel.

The installation of the panel assembly is not covered by these instructions.

1. The use of supply-line or zone strainers will reduce the need to remove debris at each DMV point. The recommended maximum mesh aperture dimension for such strainers is 0.5 mm.
2. Inlet pressure tapings which allow measurement of the inlet pressures to the DMV under operating conditions are particularly recommended for healthcare applications.
3. Pipework must be rigidly supported and avoid any strain on the connections. It is important that the inlet supply pipework is parallel, therefore should the mixing valve need to be removed the inlet pipework will remain in place allowing easy mixing valve re-installation. Failure to achieve parallel connections will result in an inability to service the mixing valve.
4. Pipework dead-legs should be kept to a minimum.
5. Supply pipework layout should be arranged to minimise the effect of other outlet usage upon the dynamic pressures at the DMV inlets.
6. Inlet threaded joint connections should be made with PTFE tape or liquid sealant. Do not use oil-based, non-setting joint compounds.
7. To eliminate pipe debris it is essential that supply pipes are thoroughly flushed through before connection to the DMV.

Make the connections to the Rada Acu

1. Connect the hot and cold water supplies to the inlet isolators, connections are: **Hot: Left, Cold: Right**, when viewed from the **front**.
Caution! It is essential that the supply pipework is thoroughly flushed through before connection to the digital mixing valve. Failure to do so may result in product malfunction and will not be covered under the guarantee.
2. Tighten the compression nuts or flat faced connectors.
Note! When tightening the connections, hold the inlet isolator by using a spanner on the spanner flat.
3. Connect the PSU to a 3 amp switched fused spur box (not supplied).
Warning! Isolate mains power before making any electrical connections.
Important! The PSU must be installed vertically, as illustrated.
4. The spout retaining nut is provided with screw holes for the connection of an earth wire to comply with the Meigan Guidance Notes.
5. Go to section: '**Commissioning**'.



COMMISSIONING

ATTENTION. The Rada Acu must be commissioned. Please refer to the following instructions to achieve this.

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

Notes! For Healthcare Installations, all results must be recorded.

The wearing of high visibility or fluorescent jackets can cause false operation during commissioning and programming.

1. Turn on the hot and cold water supplies and check that there are no leaks.
2. Turn on the power supply.
3. Position your hand under the flow sensor on the spout to activate the Digital Mixing Valve, to flush out any air.
4. Check inlet pipework temperatures for correct function of non return valves i.e. the hot water does not cross flow into the cold water supply.
5. Check that the temperature(s) and flow rates obtainable are acceptable.
6. The factory default mode is 'Patient', refer to section: '**Programming**' if you wish to change this mode.
7. Check the supply temperatures and pressures are within the range stated in section: '**Specifications**' and carry out a performance check:

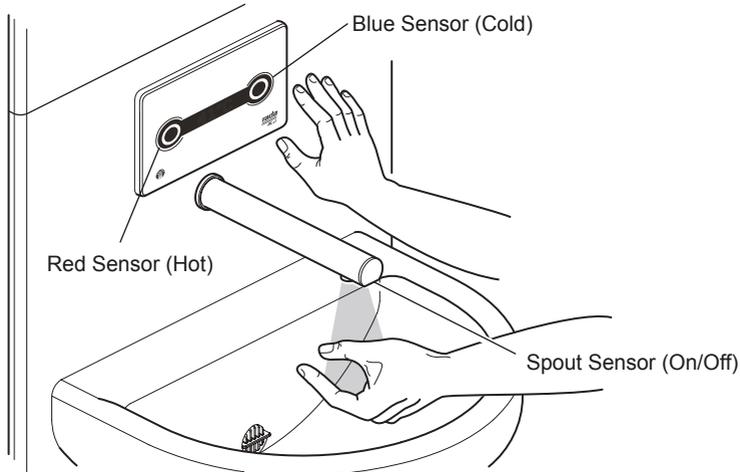
Note! For Type 3 Valves installations refer to the '**TMV3 Requirements Manual**', see supply conditions in section: '**Type 3 Valves**' and follow the procedure detailed in section: '**Method for Commissioning Thermostatic Mixing Valves**'.

The principal means for determining the continuing satisfactory performance of the mixing valve is the in-service test. Refer to the '**TMV3 Requirements Manual**'.

Note! Use the commissioning mode to record maximum, minimum and blend temperatures, refer to section: '**Programming**'.

8. Duty Flush is disabled automatically. Refer to section: '**Programming - Flush Setup**' for instructions on how to alter the settings.

OPERATION



Note! The sensors are designed to operate at a distance of up to 60 mm. There is no need for the user to touch the spout or control panel.

User Modes

The Digital Mixing Valve (DMV) has 4 different modes: Patient, Clinical, Surgical or Free Mode (user defined), to change modes refer to section: '**Programming**'.

Patient Mode (Factory Default):

- Standby - no illumination, interface will read: 'Non touch'
- Activation of the water supply via the spout sensor
- Water flow stops 2 seconds after the user removes their hands
- Activation will illuminate the red and blue sensors and permit temperature adjustment
- Default temperature: 38°C
- Red Sensor temperature adjustment: 38°C up to 41°C
- Blue Sensor temperature adjustment: Full Cold
- The temperature displayed on the interface is the set temperature, this will flash until the temperature is within 1°C of the set point. If the temperature exceeds the set point then the interface will flash more quickly
- The product will remain in pause mode and reactivate at the pre-selected temperature for a period of 30 seconds
- Duty Flush - disabled in this mode, but can be activated
- The maximum continuous flow time is 90 seconds, if this time is exceeded the DMV will shutoff and return to standby

Clinical Mode:

- Standby - no illumination, interface will read: 'Non touch'
- Activation of the water supply via the spout sensor
- Water flow stops 2 seconds after the user removes their hands
- No temperature adjustment offered to the user
- Default temperature: 41°C
- The temperature displayed on the interface is the set temperature, this will flash until the temperature is within 1°C of the set point. If the temperature exceeds the set point then the interface will flash more quickly
- Duty Flush - disabled in this mode, but can be activated
- The maximum continuous flow time is 90 seconds, if this time is exceeded the DMV will shutoff and return to standby

Surgical Mode:

- Standby - no illumination, interface will read: 'Non touch'
- Activation of the water supply via the spout sensor
- The interface displays 'Warmup' until the set point is reached, after which the count down timer will start, water flow stops after 3 minutes (if the set point is not reached within 10 seconds, the count down timer will start but the temperature will flash)
- Activation will illuminate the red and blue sensors and permit temperature adjustment
- Default temperature: 41°C
- Temperature adjustment is offered in 2°C increments from 35°C to 43°C
- The interface displays a count down during the 3 minute flow duration along with the temperature
- The temperature displayed on the interface is the set temperature, this will flash until the temperature is within 1°C of the set point. If the temperature exceeds the set point then the interface will flash more quickly
- If the spout sensor detects no presence after 30 seconds it switches off the flow duration and returns the product to standby
- The product will remain in pause mode and reactivate at the pre-selected temperature for a period of 30 seconds
- Duty Flush - disabled in this mode, but can be activated

Free Mode

- Standby - no illumination, interface will read: 'Non touch'
- Activation of the water supply via the spout sensor
- Water flow stops 2 seconds after the user removes their hands, unless the product has been placed in time flow mode by the selection of flow duration
- Flow Duration - 0 seconds to 5 minutes (if zero is selected no time flow applies and spout activation determines flow duration)
- If the flow duration is pre-set and the spout sensor detects no presence after 30 seconds it switches off the flow duration and returns the product to standby
- Temperature Adjustment - Min: Full Cold, 30°C to 38°C or none, Blend: 33°C to 41°C, Max: 43°C to 48°C or none
- The temperature displayed on the interface is the set temperature, this will flash until the temperature is within 1°C of the set point. If the temperature exceeds the set point then the interface will flash more quickly
- If flow duration is selected the interface displays a count down along with the temperature
- The product will remain in pause mode and reactivate at the pre-selected temperature for a period of 30 seconds
- Duty Flush - disabled in this mode, but can be activated
- The maximum continuous flow time is 90 seconds, if this time is exceeded the DMV will shutoff and return to standby

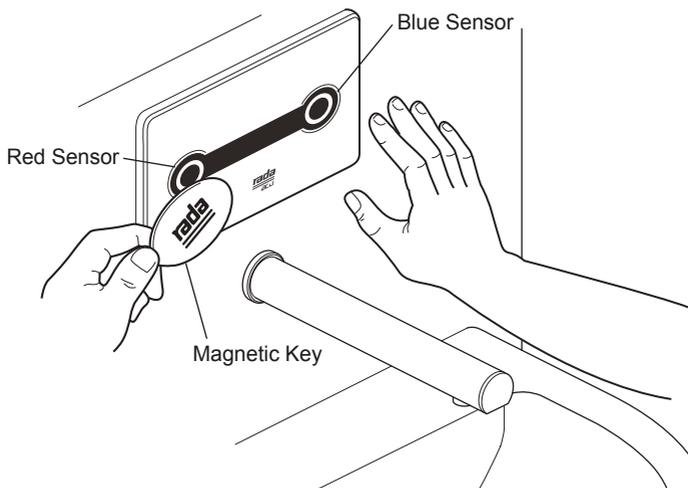
PROGRAMMING

General

Programming via the interface is accessed by swiping/tapping the magnetic key between the red sensor and 'T-Logic' symbol, this will take you to the '**Main Menu**'.

The menus are navigated by scrolling with the blue sensor and selecting with the red sensor.

Important! Hold your hand in front of the sensors to scroll and select (i.e. do not 'wave' at them).



Accessing the main menu allows you to disable the Digital Mixing Valve (DMV), view DMV information and access sub menus to perform setup and operations such as Duty Flush, Thermal Disinfection, etc... To exit the programming mode re-apply the magnetic key.

If the DMV is left in the programming mode it will return to standby after 2 minutes.

The main menu is structured as follows (refer also to section: '**Main Menu**')

'Disable Acu' Disables the valve sensors in order to clean the DMV or carry out maintenance procedures.

Note! To exit the disabled state and return to the operating mode, re-apply the magnetic key.

'Serial No' Displays the valves serial number.

'Usage Count' Displays the number of times the DMV has been operated since installation (stored within the PCB, replacing or re-programming the PCB will reset this to zero).

'Last Used' Displays (in hours) the time elapsed since the last operation.

'Settings' Allows you to scroll through and **view** the current DMV settings.

'Valve Setup' Allows you to change the valve mode, activate the duty flush or reset the password.

Note! This menu is **password protected**.

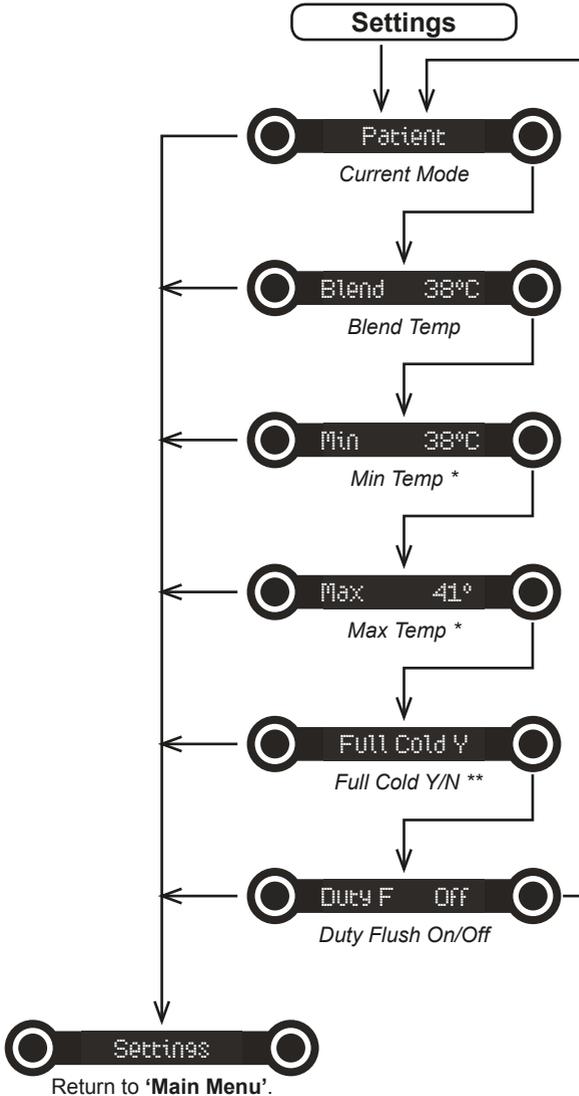
'Service' Allows you to perform a manual duty flush, valve disinfection, or commission the DMV.

Note! This menu is **password protected**.

'Software No' Displays the software revision number.

Settings

The settings menu allows you to scroll through and **view** the current valve settings. Activate the blue sensor to scroll to the next setting, activate the red sensor at any time to go back to the main menu.

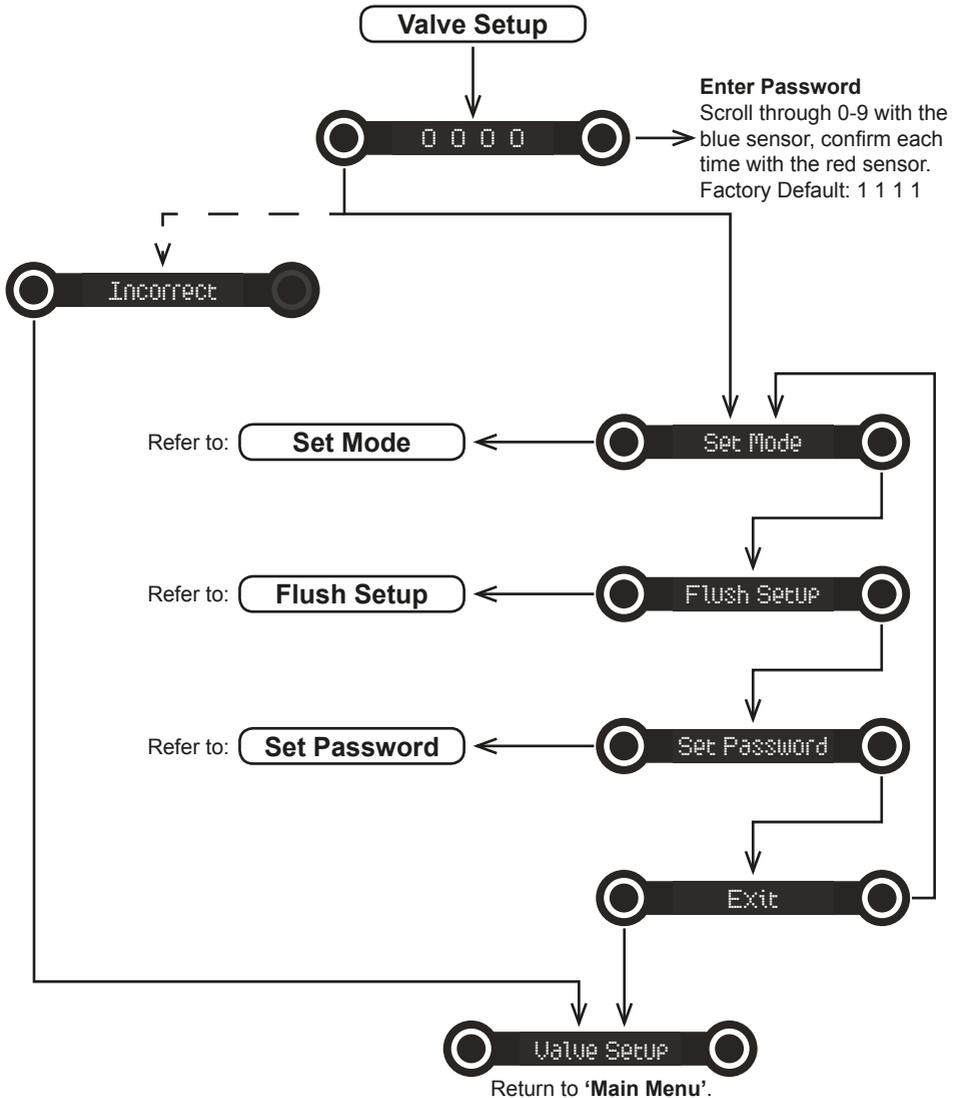


* Not available in 'Clinical' mode.

** Not available in 'Clinical' or 'Surgical' modes.

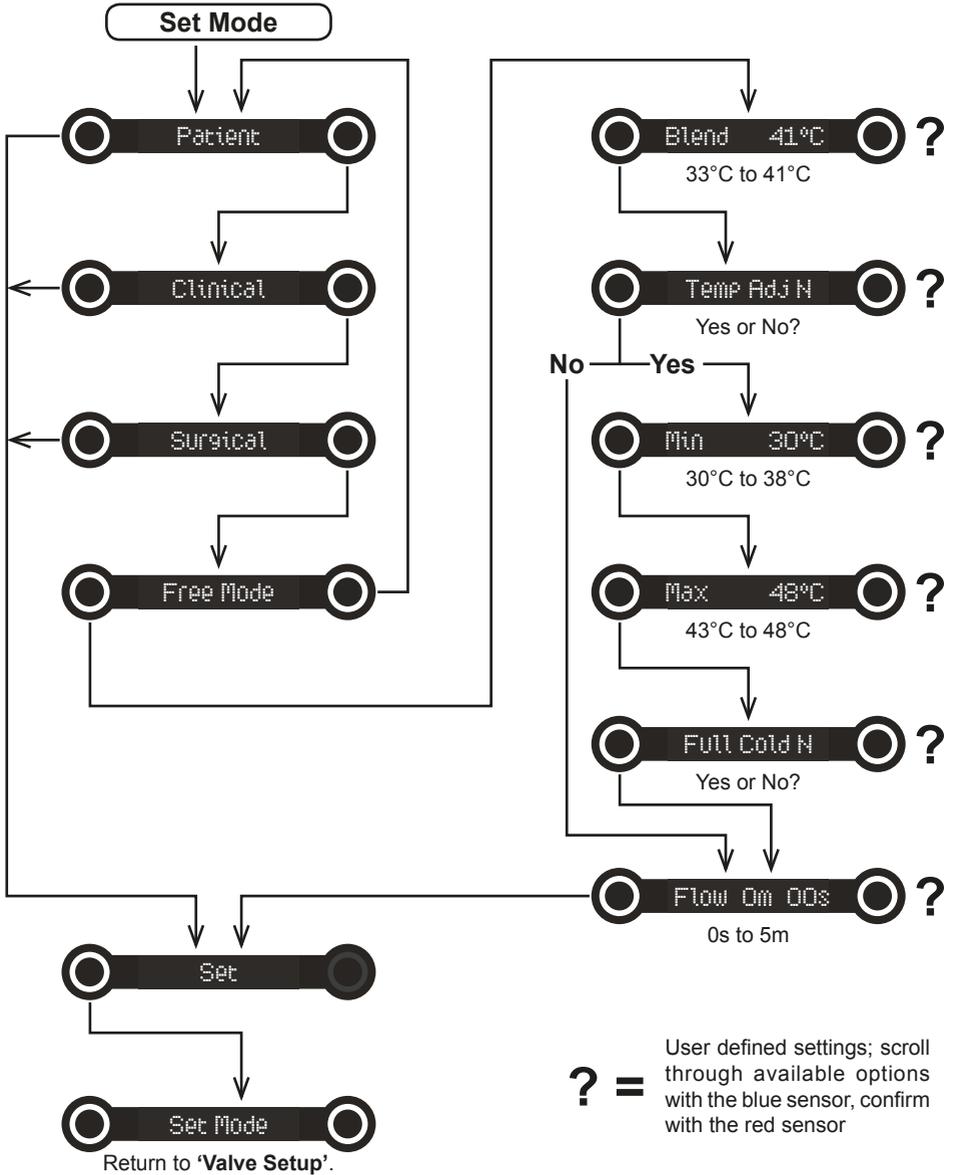
Valve Setup

The valve setup menu allows you to change the valve mode, activate the duty flush or reset the password, refer to menus: **'Set Mode'**, **'Flush Setup'**, or **'Set Password'**. To exit the valve setup menu, scroll through and select exit to return to the main menu.



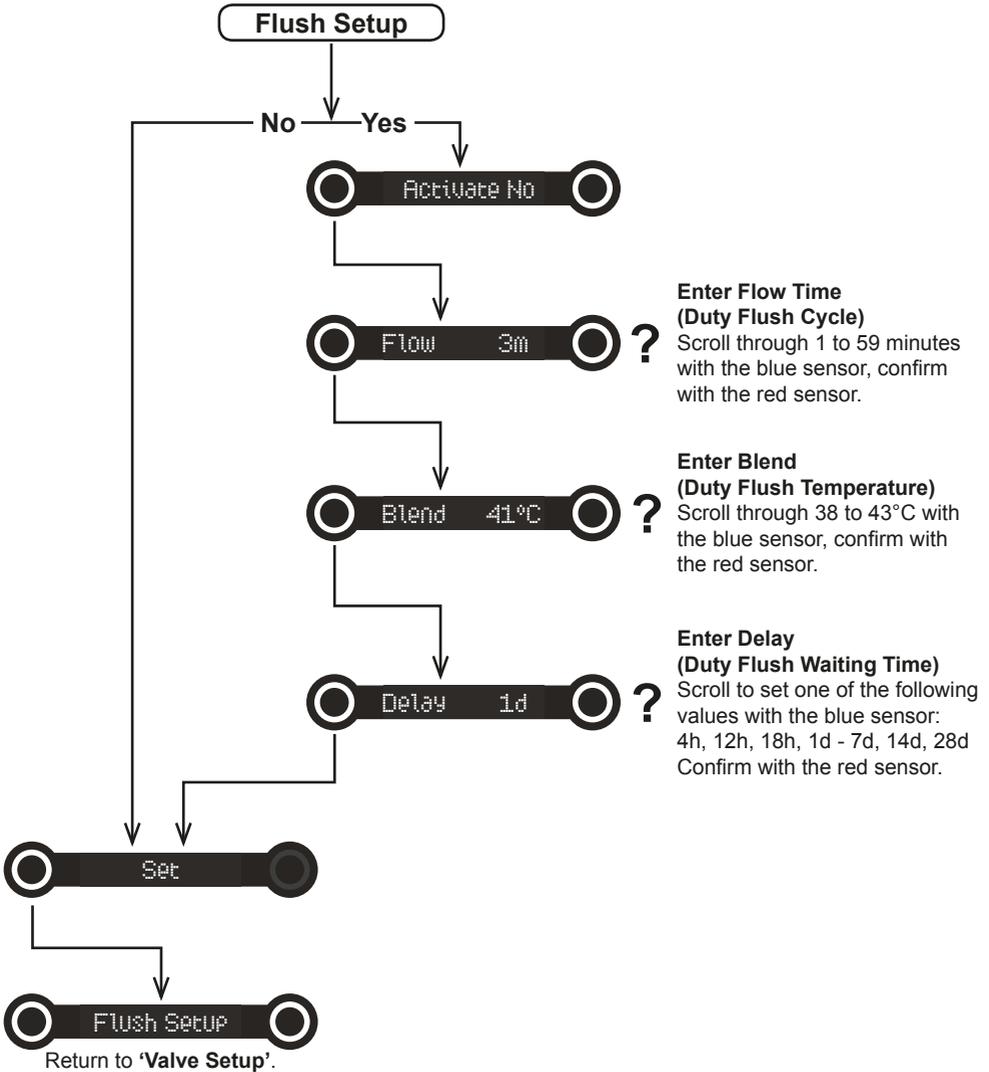
Set Mode

'Set Mode' is accessed via the valve setup menu and allows you to change the valve mode to any of the 3 pre-programmed modes or set the user defined 'free mode'.



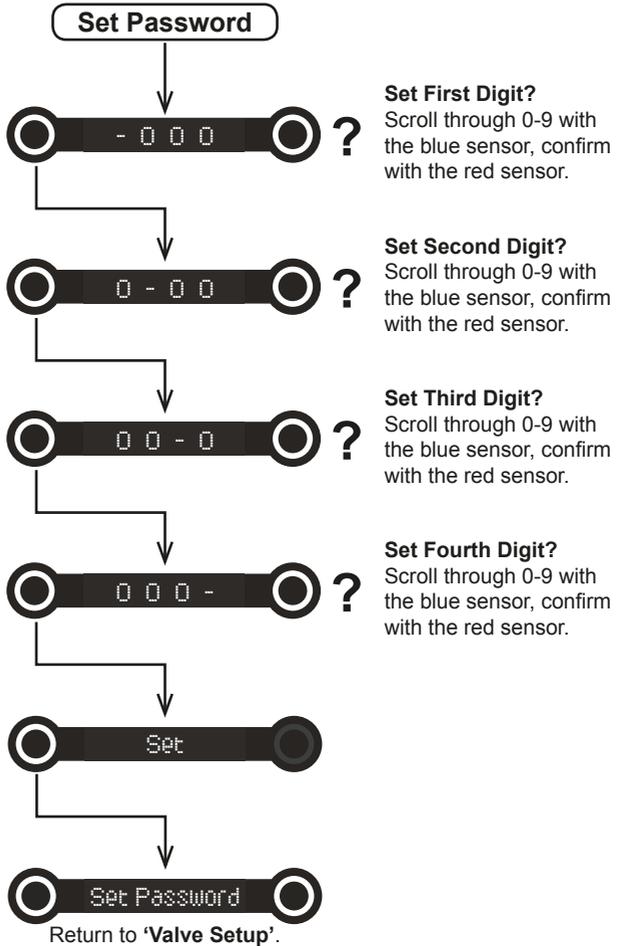
Flush Setup

'Flush Setup' is accessed via the valve setup menu and allows you to activate or deactivate the duty flush feature, set the flow duration and temperature for the flush.



Set Password

'Set Password' is accessed via the valve setup menu and allows you to change the factory default password to your own 4 digit combination.

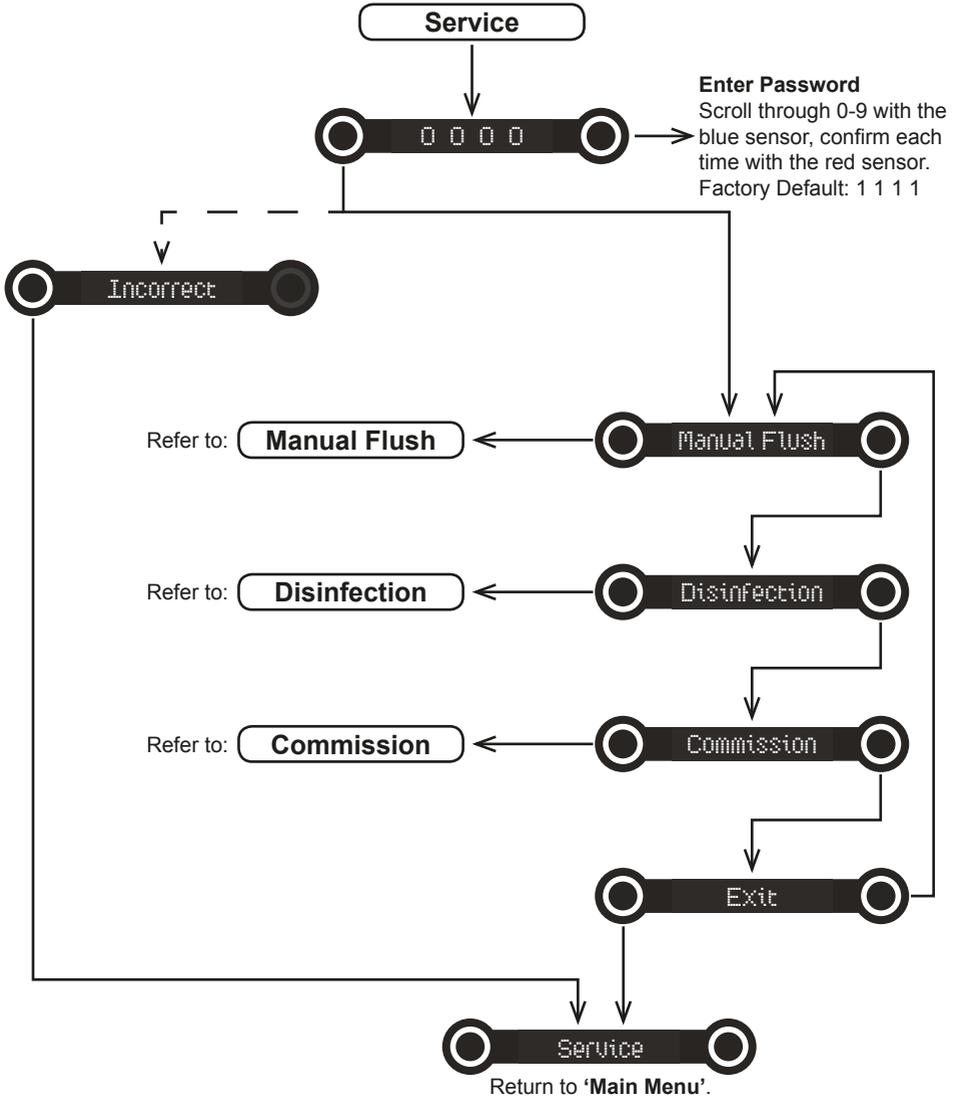


Factory Default Password: 1 1 1 1

Note! If you change the password to your own 4 digit combination we recommend that you record it along with the DMV location on page 3 of this guide.

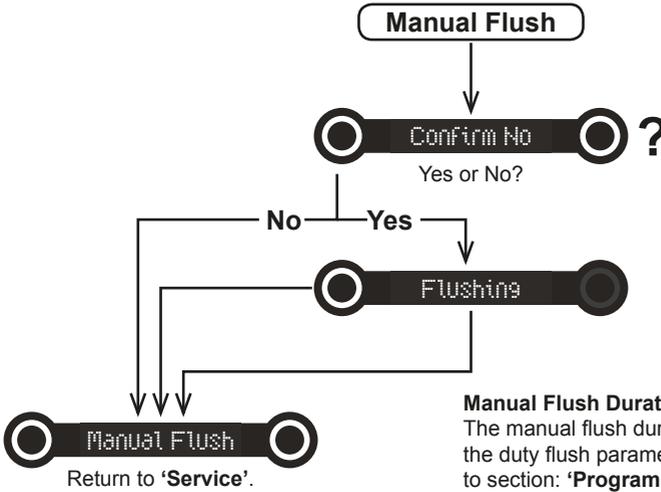
Service

The service menu allows you to perform a manual duty flush, valve disinfection, or commissioning, refer to menus: **'Manual Flush'**, **'Disinfection'**, or **'Commission'**. To exit the service menu, scroll through and select exit to return to the main menu.



Manual Flush

'Manual Flush' is accessed via the service menu and allows you to perform a manual duty flush.



Activate No/Yes?

Toggle Yes/No with the blue sensor, confirm with the red sensor.

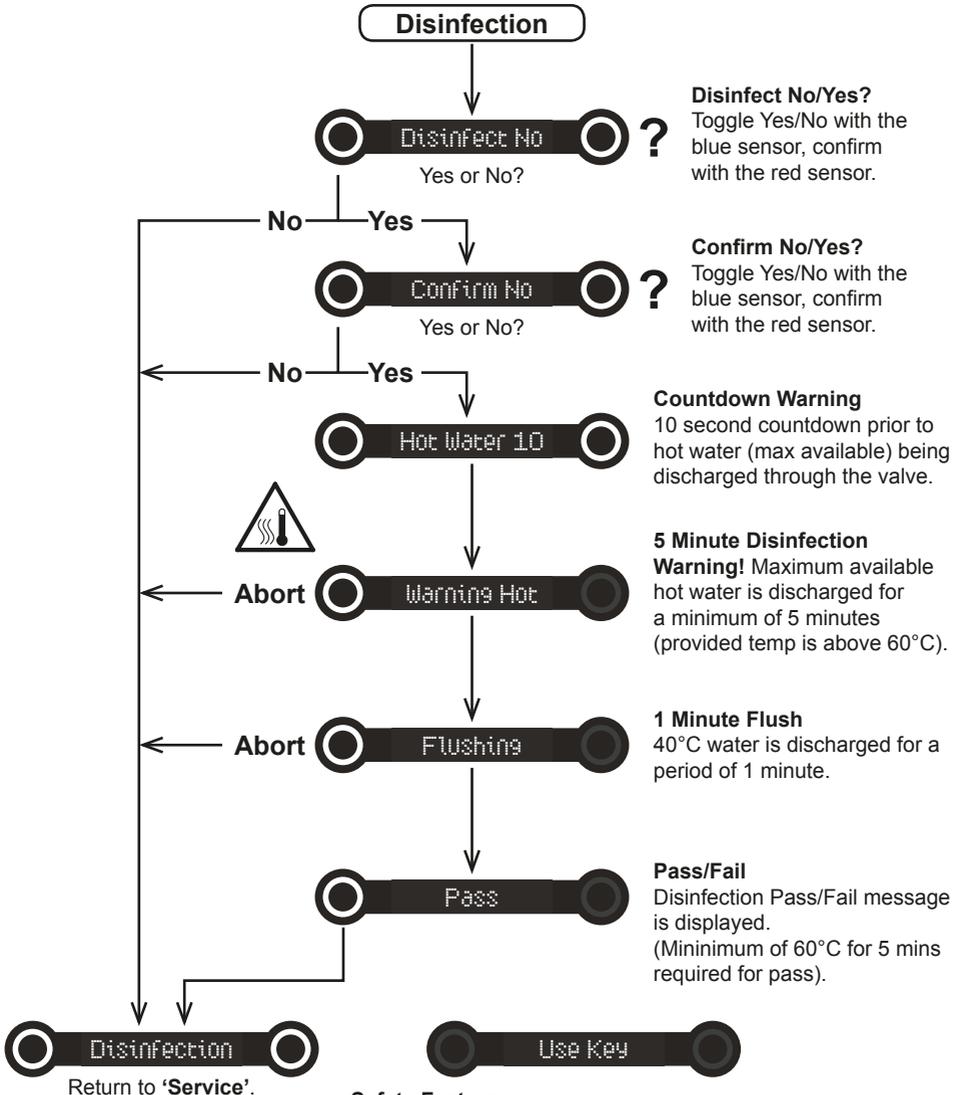
Manual Flush Duration

The manual flush duration is the same as that set in the duty flush parameters (1 to 59 minutes). Refer to section: 'Programming - Flush Setup'.

The manual flush cycle can be aborted by selecting the red sensor, the DMV will then flush at the blend temperature then return to the Service menu. This feature overrides any mode where the duty flush is deactivated.

Disinfection

'Disinfection' is accessed via the service menu and allows you to perform a disinfection cycle.



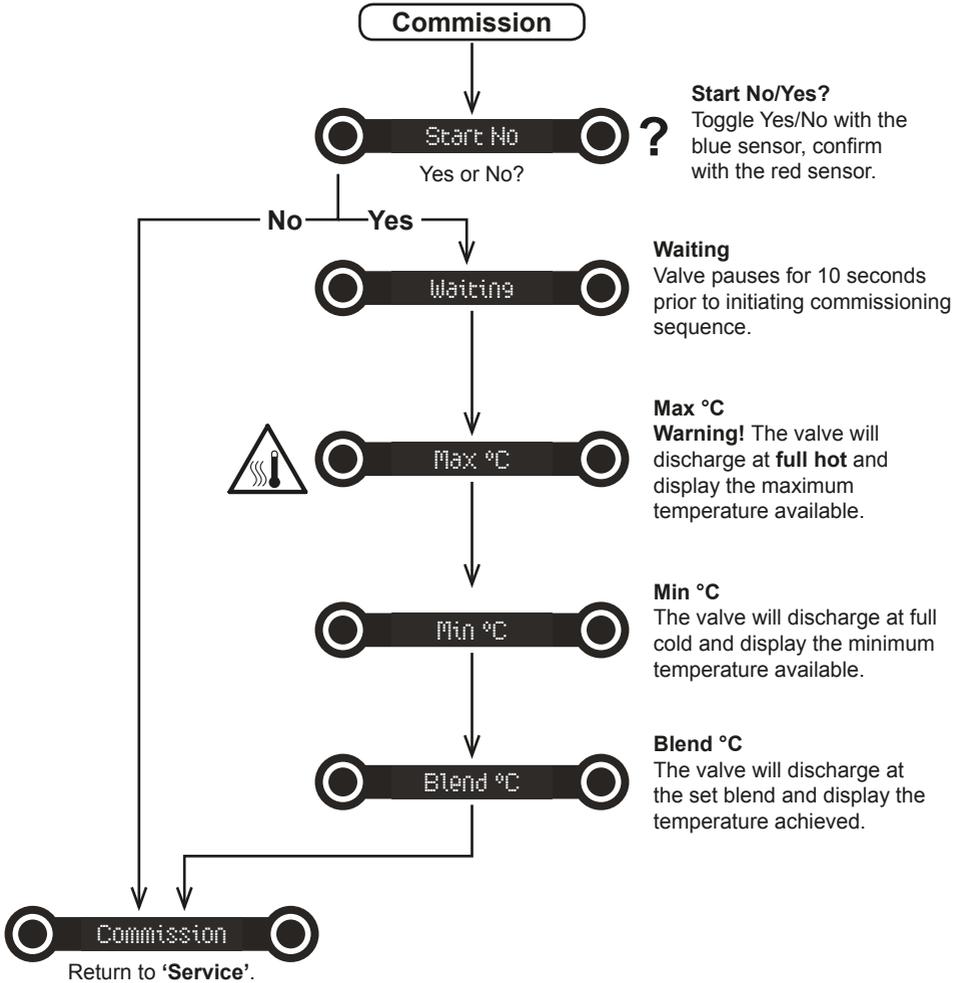
Safety Features

The disinfection cycle can be aborted at any time by selecting the red sensor, the DMV will then flush at the blend temperature then return to the Service menu.

If the sensor detects movement during the disinfection cycle then the valve will shutdown and 'Use Key' is displayed. To exit this mode the magnetic key must be applied and the valve will return to the operating state. **Warning!** Hot water will be purged from the DMV on initial operation.

Commissioning

'**Commissioning**' is accessed via the service menu and allows you to commission the valve, refer to the TMV3 Requirements Manual to assist with the temperature recording as required by the commissioning and in-service test procedures.



Important! The temperatures displayed by the DMV should be checked annually using a thermometer of proven accuracy.

MAINTENANCE

General

Maintenance must be conducted by designated, qualified and competent personnel.

Warning! Isolate power supply and water supply when any maintenance work is carried out on the Digital Mixing Valve (DMV).

The DMV may contain hot water, so care must be taken when draining any residual water.

Planned Maintenance

Malfunction of DMV's is almost always progressive in nature and will be detected by the use of proper temperature checking and maintenance routines.

Certain types of system can result in the DMV having excessive 'dead-legs' of pipework, or auxiliary cold water supply added to the mixed water from the DMV. Such systems can disguise the onset of DMV malfunction and should not be used.

We recommend a preventative maintenance procedure based on site conditions and the risk to the user. All results must be recorded in a log book.

Healthcare

Healthcare applications are hospitals, aged person facilities, residential care homes, etc. and any other applications where the user is similarly at risk.

Ultimately, the user or attendant must exercise diligence to make sure that the delivery of warm water is at a stable, safe temperature. This is particularly important in such procedures as supervised bathing where patients are unable to respond immediately to unsafe temperatures.

Commercial

Check for correct blend setting every 6 months.

Follow the In-Service Test Procedure every 12 months.

Cleaning

External surfaces can be cleaned with products associated with basin cleaning referenced in the NHS cleaning manual.

Caution: Plated or plastic fittings should only be cleaned using a mild detergent or soap solution and wiped dry with a soft cloth.

It is understood that additional chemical disinfection is widely used to clean water systems. Therefore it is strongly recommended that you ensure that these chemicals do **NOT** adversely affect any of the following materials used within this product.

- Acetal
- EPDM
- 40 % Glass Filled Nylon 6
- Polyamide Nylon 66
- Silicon
- Low density Polyethylene
- Nitrile
- Syndiotactic Polystyrene
- Polyphenylene Sulfide PPS
- DZR Brass
- Stainless Steel

It is recommended that flow straighteners are dismantled, descaled and disinfected quarterly or more frequently as required based on a risk assessment. In high risk areas this should be done on a monthly basis.

Duty Flush

The DMV incorporates an option for duty flush. If the duty flush is activated, but the DMV has not been used within the ***Duty Flush Waiting Time*** time, the DMV will activate automatically and flow at the ***Duty Flush Temperature*** for the ***Duty Flush Cycle*** duration.

Refer to section: '**Specifications**' for the default values of the parameters ***Duty Flush Waiting Time***, ***Duty Flush Temperature*** and ***Duty Flush Cycle***.

Refer to section: '**Programming - Flush Setup**' for details of how to set the parameters ***Duty Flush Waiting Time***, ***Duty Flush Temperature*** and ***Duty Flush Cycle***.

Disinfection

The DMV incorporates an option for disinfection which will purge the DMV with the maximum available hot water, this can be activated via the servicing mode, refer to section: '**Programming**'. To achieve a disinfection pass, the hot water system temperatures may need to be increased in accordance with L8 HSE guidelines.

Pall Filters

Pall medical water filters are designed for use on taps in hospitals and other medical applications with immunocompromised patients, they are designed to retain bacteria and fungi.

Pall medical water filters can easily be installed onto the Rada Acu Spout by using a Pall Filter Connector (refer to section: **'Spare Parts'**).

Filters and Non Return Valves

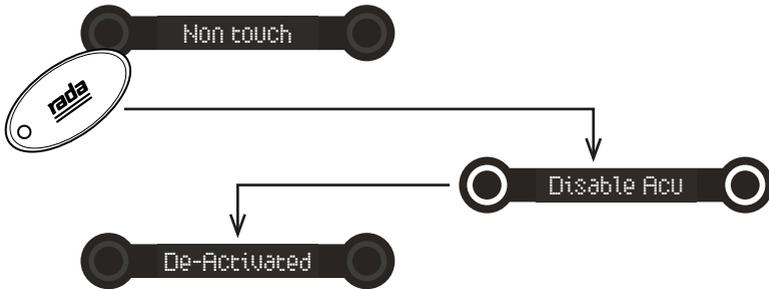
Hot water entering the cold supply, or vice versa, indicates that immediate maintenance of the non return valve is necessary.

The non return valve cartridge may be cleaned by removal of the inlet filters, and flushing through under a jet of water to remove lodged particles.

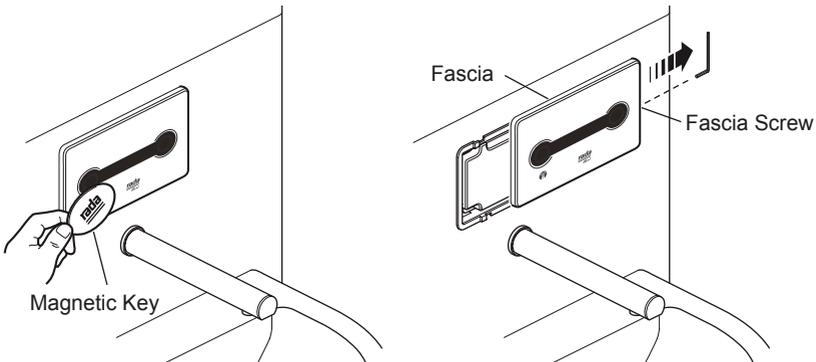
Non return valve cartridges are not serviceable items, so any apparent wear or damage will require renewal.

Blockage of the inlet filters can lead to poor flow performance and reduced temperature control. It is essential that the inlet filters are cleaned or, if necessary, renewed as part of the six-monthly maintenance operations. A non return valve and filter pack is available, refer to section: **'Spare Parts'**.

1. Using the magnetic key, deactivate the DMV.

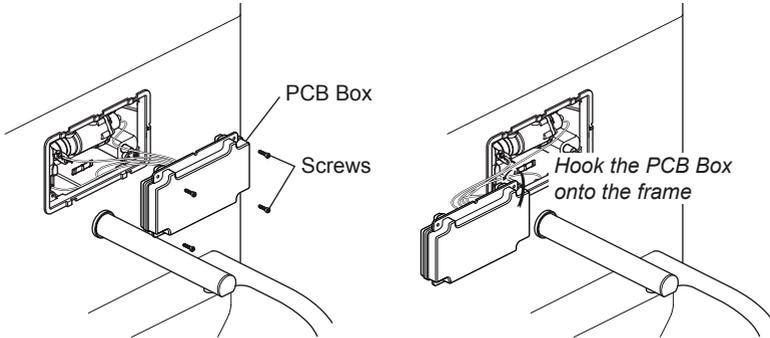


2. Unscrew the fascia screw using a 2 mm hexagonal key, then slide and lift the fascia off the panel.



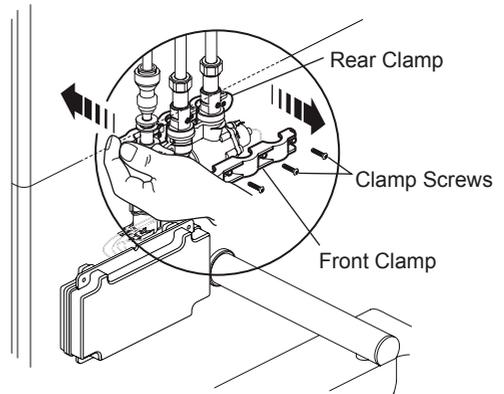
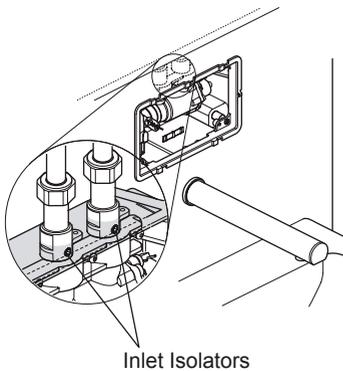
3. Unscrew the 4 PCB box mounting screws using a 3 mm hexagonal key and remove the PCB box.

Note! To aid servicing, secure the PCB box onto the frame with the hook.



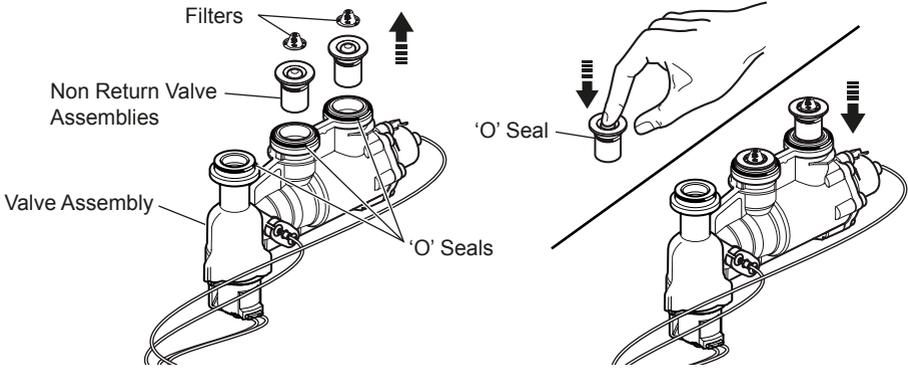
4. Isolate the hot and cold water supplies using a 3 mm hexagonal key or a flat faced screwdriver.
5. Unscrew the 4 clamp screws using a 3 mm hexagonal key.
6. Push the rear clamp away from the valve assembly, and pull off the front clamp.

Note! If necessary, use a screwdriver to push the rear clamp back fully.



7. Carefully remove the valve assembly by pulling the valve downwards.

8. Clean or replace the filters and/or the non return valve assemblies.
9. Make sure that the non return valve assemblies are correctly fitted and pushed fully into the valve assembly and refit the filters.



10. Make sure that all of the 'O' Seals are fitted and replace the valve assembly.
11. Pull the rear clamp forward and fit and secure the front clamp with the 4 clamp screws, tighten using a 3 mm hexagonal key.
12. Turn on the water supplies using a 3 mm hexagonal key or a flat faced screwdriver and check for leaks.
13. Refit the PCB box and secure with the 4 PCB box mounting screws, tighten using a 3 mm hexagonal key.
14. Refit the fascia and secure with the fascia screw, tighten using a 2 mm hexagonal key.
15. Using the magnetic key reactivate the DMV.

FAULT DIAGNOSIS

General

Maintenance must be conducted by designated, qualified and competent personnel.

Warning! Isolate power supply and water supply when any maintenance work is carried out on the Digital Mixing Valve (DMV).

The DMV may contain hot water, so care must be taken when draining any residual water.

Symptom	Cause/Rectification
1. Control panel not illuminated.	<ul style="list-style-type: none"> a. The mains power supply has been disabled, check and rectify. b. The power supply unit has been disabled, check the fuse and connections. c. Electrical connections to/from the DMV have been disturbed, make sure the connections are secure. d. Memory requires resetting, switch the power supply to the DMV, OFF then ON. e. LCD connector is not pushed fully home into PCBA socket.
2. Only cold water from the spout.	<ul style="list-style-type: none"> a. No hot water reaching the mixing valve, check and rectify. b. The hot water inlet may be blocked, check filter and clean or renew as necessary. c. The inlet isolator may be closed, check and rectify. d. Installation conditions are outside the operating parameters, refer to section: 'Specifications'. e. Hot and cold inlet supplies reversed, rectify.
3. Continuous flow.	<ul style="list-style-type: none"> a. DMV will not switch off, isolate power supply and water supply and contact Rada Customer Care or your local agent.
4. DMV takes at least 30 seconds to reach blend temperature.	<ul style="list-style-type: none"> a. Remove and clean or renew the non return valves. b. Hot and cold inlet pipes are too close together causing the cold inlet water to heat up prior to use.

<p>5. Fluctuating or reduced flow rate (normal function of mixing valve when operating conditions are unsatisfactory).</p>	<p>a. The inlets may be blocked, check filters and clean or renew as necessary.</p> <p>b. Installation conditions are outside the operating parameters, refer to section: 'Specifications'.</p>
<p>6. Blend temperature drift or temperature cycling. Temperature on interface constantly flashing.</p>	<p>a. Remove and clean or renew the non return valves.</p> <p>b. The inlets may be blocked, check filters and clean or renew as necessary.</p> <p>c. Installation conditions are outside the operating parameters, refer to section: 'Specifications'.</p> <p>d. Hot water supply temperature fluctuation, check and rectify.</p>
<p>7. Water leaking from the DMV.</p>	<p>Warning! Isolate mains electricity and water supplies.</p> <p>a. Check that the connections are secure.</p> <p>b. Seal(s) worn or damaged on the inlet/outlet connections, obtain seal pack and renew all seals.</p> <p>c. Valve Assembly is leaking. Renew.</p>
<p>8. An error message is displayed on the fascia and the DMV will not operate.</p>	<p>a. An error has been detected, refer to section: 'Fault Diagnosis, Self Diagnostic Errors'.</p> <p>b. DMV requires resetting, switch the power supply to the DMV, OFF then ON).</p>
<p>9. The DMV switches off before the completion of the programmed timed flow period (safety feature).</p>	<p>a. Blend temperature too hot. Make sure that the inlet temperatures are within specification, refer to section: 'Specifications'.</p> <p>If the fault has not been rectified contact Rada Customer Care or your local agent.</p>

Self Diagnostic Errors

Symptom	Cause/Rectification
	<ul style="list-style-type: none"> a. DMV requires resetting, switch the power supply to the DMV, OFF then ON. b. Connections to/from the thermistor have been disturbed, make sure the connections are secure. c. Fault with the thermistor, replace. <p>If the fault has not been rectified contact Rada Customer Care or your local agent.</p>
	<ul style="list-style-type: none"> a. Blend temperature too hot at the control thermistor, reset the DMV by switching the power supply to the DMV, OFF then ON. b. Hot inlet temperature higher than recommended, see 'SPECIFICATIONS'. c. Inlet water pressure unstable, check system water pressures and stabilise. <p>If the fault has not been rectified contact Rada Customer Care or your local agent.</p>
	<ul style="list-style-type: none"> a. Blend temperature too hot at the outlet thermistor, reset the DMV by switching the power supply to the DMV, OFF then ON. b. Hot inlet temperature higher than recommended, see 'SPECIFICATIONS'. c. Inlet water pressure unstable, check system water pressures and stabilise. <p>If the fault has not been rectified contact Rada Customer Care or your local agent.</p>
	<ul style="list-style-type: none"> a. Error with the PCB, reset the DMV by switching the power supply to the DMV, OFF then ON. b. Fault with the PCB, replace. <p>If the fault has not been rectified contact Rada Customer Care or your local agent.</p>
	<ul style="list-style-type: none"> a. Error with the PCB, reset the DMV by switching the power supply to the DMV, OFF then ON. b. Fault with the PCB, replace. <p>If the fault has not been rectified contact Rada Customer Care or your local agent.</p>

 <p>MOTOR STUCK</p>	<p>a. Error with the PCB, reset the DMV by switching the power supply to the DMV, OFF then ON.</p> <p>b. Fault with the Valve Assembly, replace. If the fault has not been rectified contact Rada Customer Care or your local agent.</p>
 <p>FLOW TIMEOUT</p>	<p>a. The maximum continuous flow time has been exceeded.</p> <p>b. The spout sensor has been covered or damaged, check and replace if necessary.</p>
 <p>NOT IN SETUP</p>	<p>a. The DMV is not ready, wait and retry command.</p> <p>b. The DMV is incorrectly configured for the requested command, check settings.</p>
 <p>Flash Error</p>	<p>a. Software error, reset the DMV by switching the power supply to the DMV, OFF then ON. If the fault has not been rectified contact Rada Customer Care or your local agent.</p>
 <p>EERam Error</p>	<p>a. Software error, reset the DMV by switching the power supply to the DMV, OFF then ON. If the fault has not been rectified contact Rada Customer Care or your local agent.</p>
 <p>Ram Error</p>	<p>a. Software error, reset the DMV by switching the power supply to the DMV, OFF then ON. If the fault has not been rectified contact Rada Customer Care or your local agent.</p>
 <p>Controller</p>	<p>a. Software error, reset the DMV by switching the power supply to the DMV, OFF then ON. If the fault has not been rectified contact Rada Customer Care or your local agent.</p>

SPARE PARTS

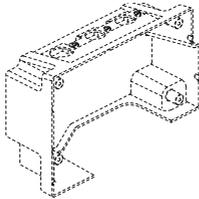
Recommended Spares Minimum Stock List

Component	Spares per quantity of Digital Mixing Valves installed			
	1-5	6-20	21-50	51+
1664.100 Mixing Valve Assembly	1	2	2	2
1664.102 Thermistor Assembly	1	1	2	2
1664.103 Non Return Valve and Filter Assembly	1	1	2	2
1664.107 Screw Pack	1	1	1	1
1664.108 PCB Box Assembly	1	1	2	2
1664.109 Front Facia	1	1	2	2
1664.110 Flow Straightener	1	2	2	2
1664.116 Seal Pack	1	1	2	2
1664.119 Spout Sensor	1	2	2	3
1664.125 Flow Straightener Seal (10)	1	1	2	3

463.84
Magnetic Key (x4)



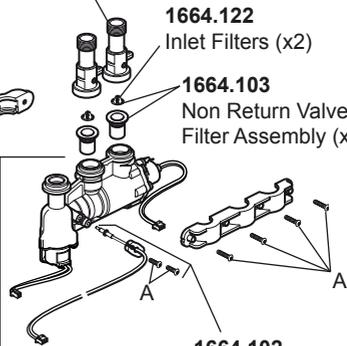
1664.106
Inlet Clamps (includes
front and rear clamps)



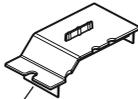
1664.104
Inlet Isolator

1664.122
Inlet Filters (x2)

1664.103
Non Return Valve and
Filter Assembly (x2)

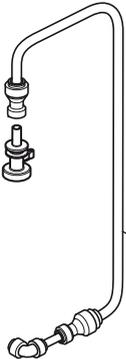


1664.114
Access Panel



1664.102
Thermistor Assembly

1664.100
Mixing Valve Assembly

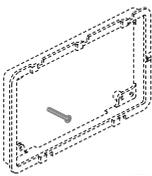


1664.105
Outlet Connector
Assembly

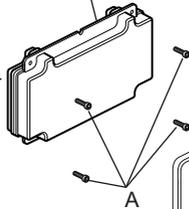
1664.124
Solenoid
Extension Cable

1664.123
Stepper Motor
Extension Cable

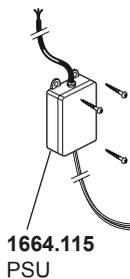
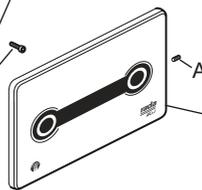
1664.108
PCB Box Assembly



1664.117
PCB Box Door



1664.109
Fascia



1664.115
PSU

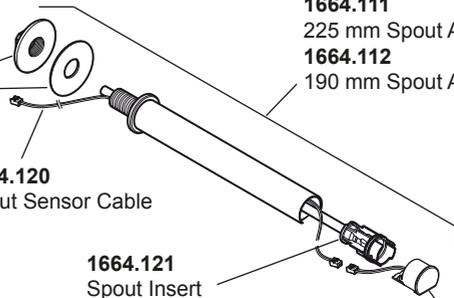
1664.113
Nut and Washer



1664.111
225 mm Spout Assembly

1664.112
190 mm Spout Assembly

1664.120
Spout Sensor Cable



1664.121
Spout Insert

1664.110
Flow Straightener

1664.119
Spout Sensor

1664.107
Screw Pack - Indicated 'A'

1664.116
Seal Pack - Not Illustrated

1664.125
Flow Straightener Seal (10 per pack) - Not Illustrated

CUSTOMER CARE

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 by the UK Rada Commercial Field Team (available UK Only).

Please visit www.radacontrols.com or contact your local agent for all terms and conditions including details of the Rada commissioning service for the UK

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