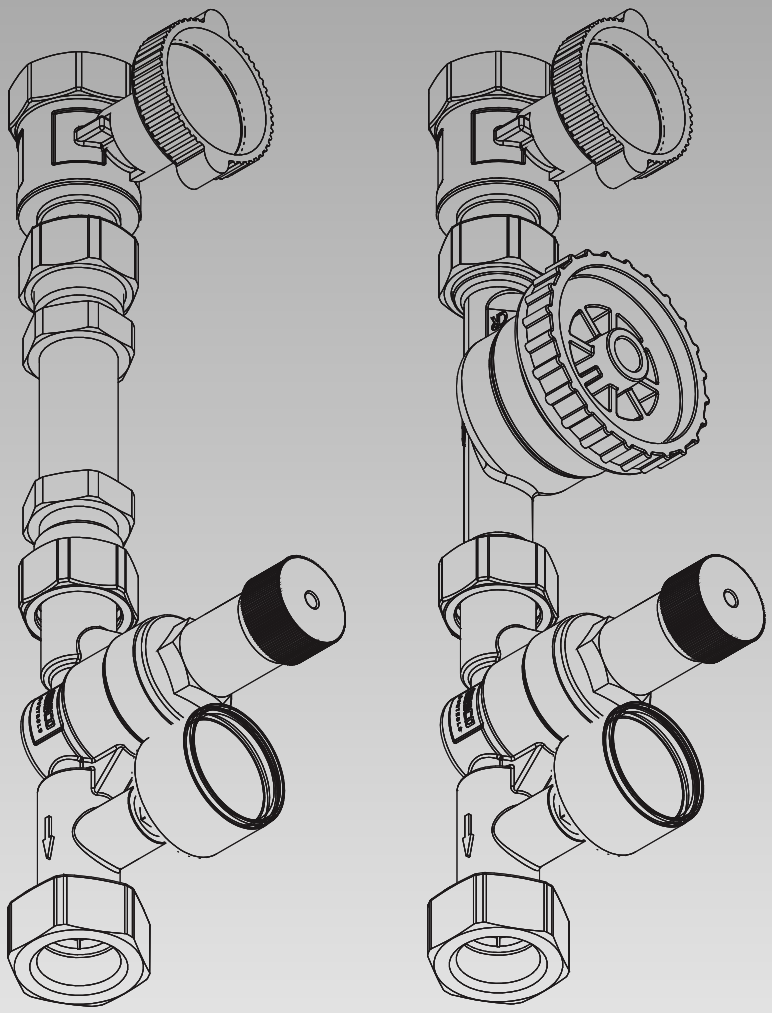
essco

FIT & FORGET



WMA – Water Meter Assembly

Installation, Operation and Maintenance (IOM)

essco
FIT & FORGET

Contents

1. Key symbols and safety instructions

1.1 Key to symbols

Warnings

	Warnings in this document are identified by the warning triangle adjacent. Keywords are used at the start of a warning triangle to indicate both the type, and seriousness of the risk identified, if measures to prevent the risk are not taken.

• **NOTICE** Indicates a situation that could result in damage to property or equipment.
• **CAUTION** Indicates a situation that could result in minor to medium injury.
• **WARNING** Indicates a situation that could result in severe injury or death.
• **DANGER** Indicates a situation that will result in severe injury or death.

1.2 General safety instructions

Guidelines

- Adhere to national and regional regulations, technical rules, and guidelines always.
- Observe the safety instructions and warnings identified and take appropriate care.
- Before starting the installation, any installation instructions (WMA, water meters, PRV's etc.) should be carefully read through.
- Record all work carried out.

Risk of electrical shock

- Due to risk of electrical shock any electrical work or maintenance must only be carried out by qualified / registered personnel.
- Before carrying out any work on electrical components, isolate them from the power supply (fuse, circuit breaker) and secure against unintentional reconnection.

WMA operation
Cleaning and user maintenance should only ever be carried out by competent and authorised personnel.

Important handling instructions
Care should be taken when transporting, lifting, and carrying products, particularly when loads are still palletised.

- Use a means of transport suitable for handling bulk product (e.g., sack truck with strap, stair climbing or step trolley).
- When handling products in bulk, secure them against a fall.
- Let only trained personnel undertake the handling.
- The correct method for handling heavy objects should be strictly observed, always.

General handling guidelines
Only remove packaging at the time of the final installation to protect products from damage.

Always assess the weight of products before attempting to lift on your own. During handling and unpacking, wear safety gloves to prevent injuries to your hands through sharp-edged components.

Dispose of packaging materials appropriately.

Packaging
The following points should be observed during unpacking:

- Check the delivery immediately upon receipt for completeness and transport damage.
- In the event of transport damage, the delivery should only be accepted conditionally.
- Do not use damaged components for assembly.
- Carefully unpack the unit(s).

Siting and installation
Correct siting, assembly and installation of the product is the fundamental requirements for safe and economical operation of the product.

- Only trained contractors are to site and install the WMA and its components.
- The product must only be installed in rooms and locations that meet the manufacture's requirements.

Commissioning

- The WMA must only be commissioned by a competent person.
- Check all connections for leakages prior to starting up the heating system.
- All fixings and fittings must be checked and tightened if required after the unit has been installed.

Risk of damage due to operator error
Operator errors can result in injury and damage to property.

- Ensure that only personnel who can operate this product correctly have access to it.
- Inspection, maintenance, and repairs must only be carried out by competent persons.
- Use only original spare parts from the manufacturer. The manufacturer can assume no liability for damage caused by spare parts not supplied by the manufacturer.

Electrical work
Electrical work must only be carried out by a qualified electrician:

- Before starting electrical work
  - Ensure that the electricity supply is safely isolated and secure to prevent inadvertent re-connection.
  - Information on safe isolation can be found in the Health and Safety Executive Guidance HSG85.
  - Using test equipment approved to GS38 confirm that the electricity supply is disconnected.
- Refer to the manufacturer's information when installing other components with Essco equipment within the system.

Danger of burns and scalds

- Surfaces of individual components, connections and leaking water can be very hot and cause severe burns and scalds.
- Do not touch hot surfaces.
- Caution should be taken not to touch any leaking water or drained system water unless the temperature is known and safe.

Leakage

If leaks are observed:

- Fully isolate WMA immediately.
- Ensure all leaks are repaired by a suitably qualified professional.

Instructing the customer

- When handing over, instruct the user how to operate the product correctly and inform them about its operating conditions.
- Explain how to operate the heating system and draw the user's attention to any safety-relevant action.
- Explain that modifications and repairs must only be carried out by an authorised contractor.
- Hand customers the product documentation for safekeeping.

2. WMA information

2.1 General Information

The Essco Water Meter Assembly (WMA) can be used on multi-dwelling buildings, such as apartments and office blocks to control and meter the cold-water supply to each individual dwelling.

This document must be read in conjunction with any relevant IOM material from the water board or water meter manufacturer. Any installation and maintenance must also be carried out by trained and competent engineers in accordance with CIBSE Commissioning Code W:2010 and in line with BSRIA BG 29/2012 Pre-Commission Cleaning of Pipework Systems.

Main features

- Compact and space saving (half the size of traditional branch valve assemblies).
- Easy to install, either horizontally or vertically.
- Position of water meter can be adjusted to suit, making it easy to read the display.
- Supplied pre-tested to save time on site.
- Robust, with minimal service and maintenance requirements.
- Supplied with carrier, ready to fit any approved water meter (or with 80-110mm spacer where required).
- Dust cap on water meter carrier protects from contamination during installation.
- Supplied with insulation as standard, which provides protection and makes a neat installation.
- KIWA UK Regulation 4 (KUKreg4) approved for peace of mind.

2.2 Intended use

The WMA is a multi-function valve assembly, designed to perform the following tasks:

- Validate and display outlet pressure after Pressure Reducing Valve (PRV), to confirm setting.
- Prevent backflow of water through use of Double Check Valve (DCV)
- Protection of PRV and downstream outlets from build-up via inline strainer fitted within PRV sub-assembly.
- Provides carrier for type A or type D water meters (order option).
- Provides 80mm or 110mm spacer for water meters (order option).
- Provides isolation of cold-water supply into each dwelling.

The outlet pressure of the WMA is pre-set to 4 bar at point of manufacture. If the working pressure required is different, this can be adjusted during commissioning to reflect design requirements.

2.3 Misuse

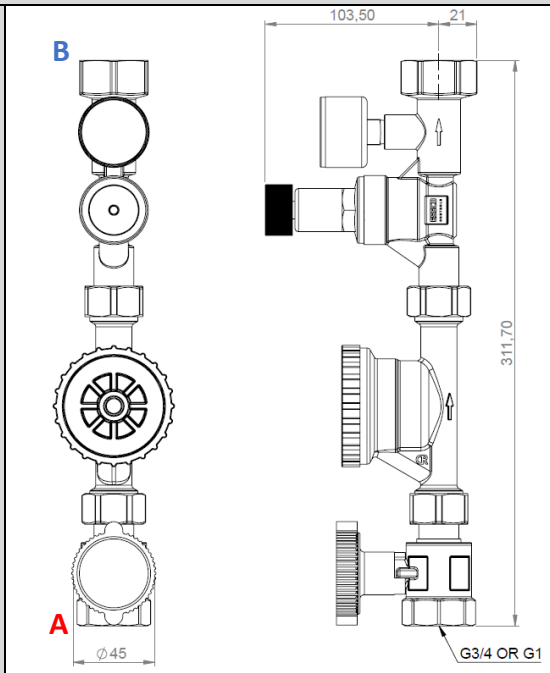
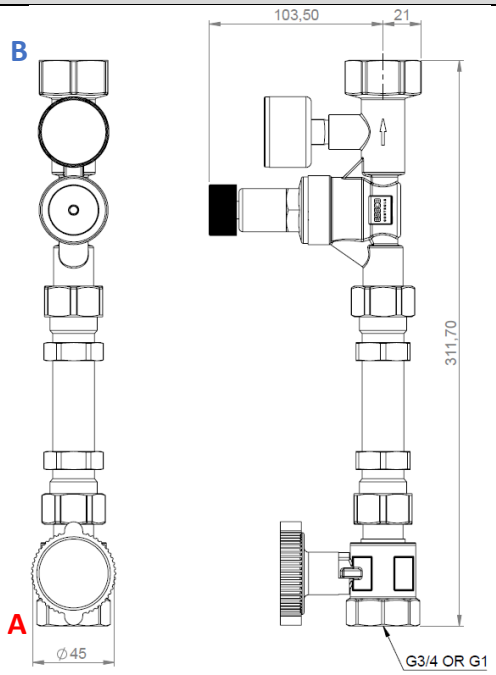
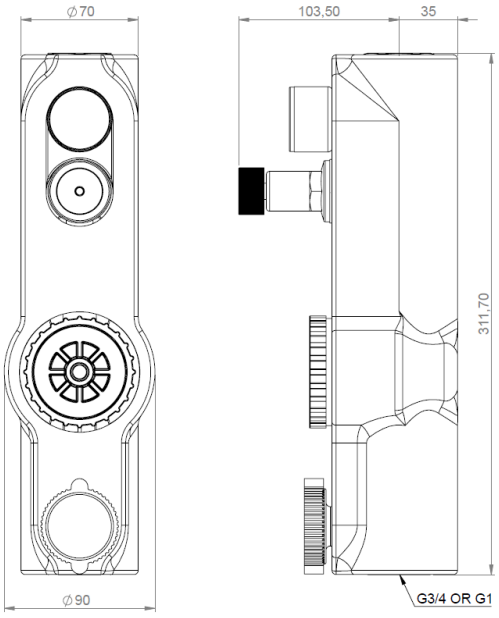
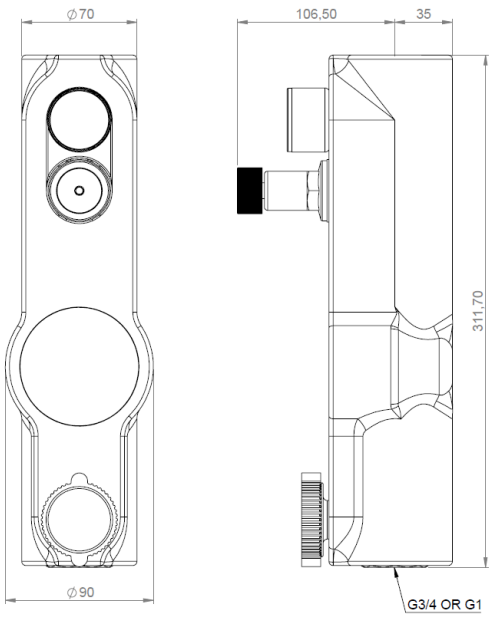
This product must be used as per the intended use statement. Operation outside the parameters of the intended use is considered misuse and could cause harm to people and damage to property. Using the product outside of its intended use may also invalidate the manufacturer's guarantee.

2.4 Declaration of conformity

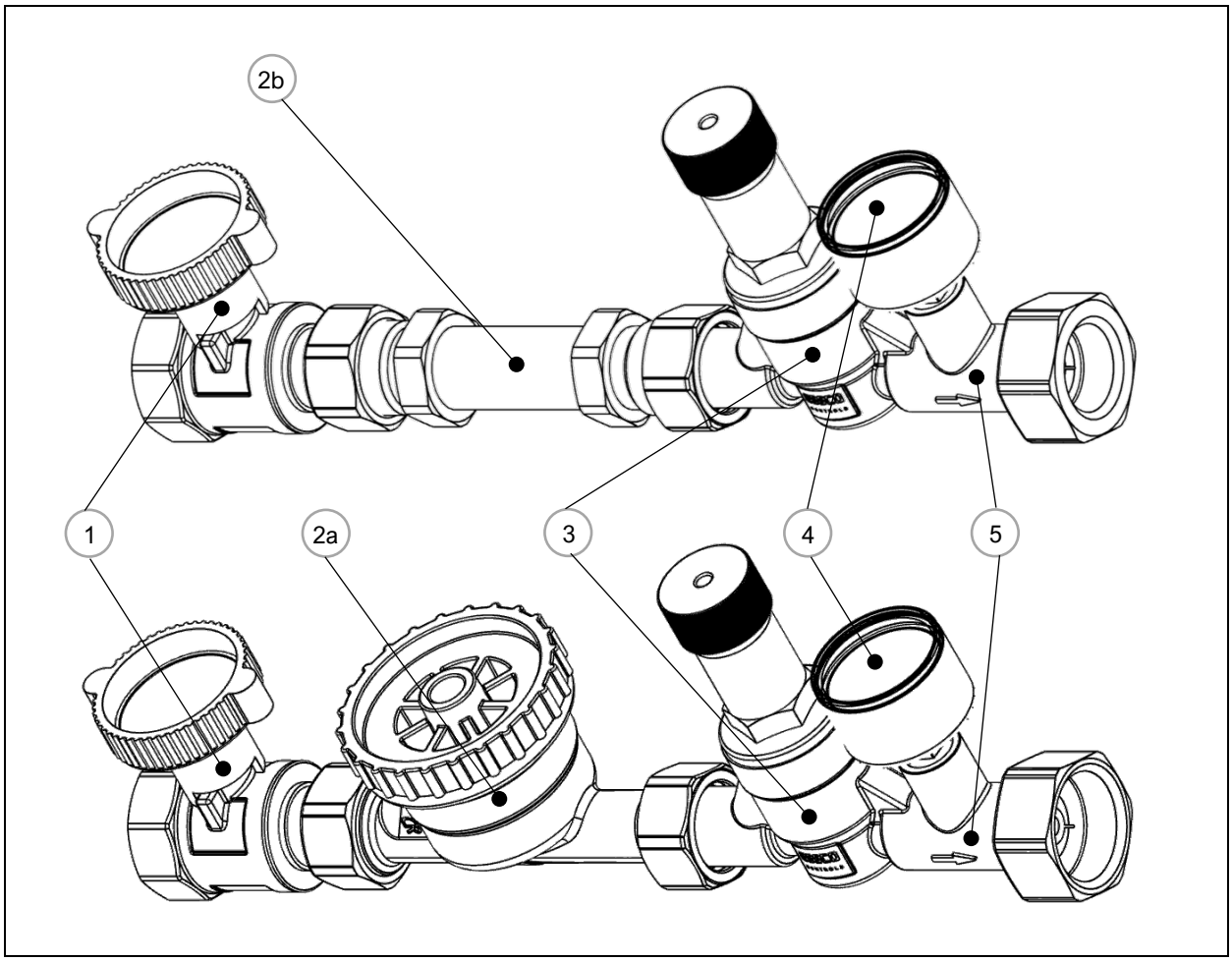
This product, in design and operation, conforms to the European Directives and supplementary national requirements.

You can request the declaration of conformity for the product. To do so, send your request to the address on the back of the manual.

2.5 Dimensions and hydraulic connections

	With Carrier	With Spacer
Excluding Insulation		
Including Insulation		
	Connections	
	Primary	**Secondary**
	A – Primary Inlet	**B** – Dwelling Connection

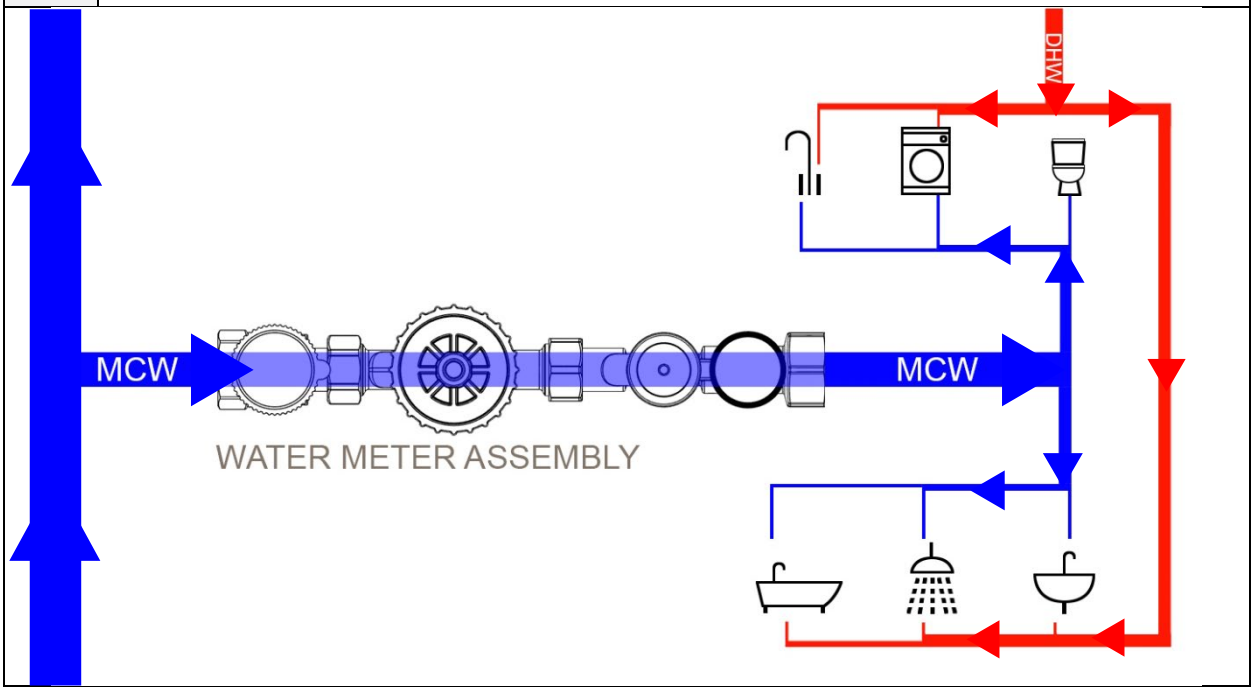
2.6 Internal layout



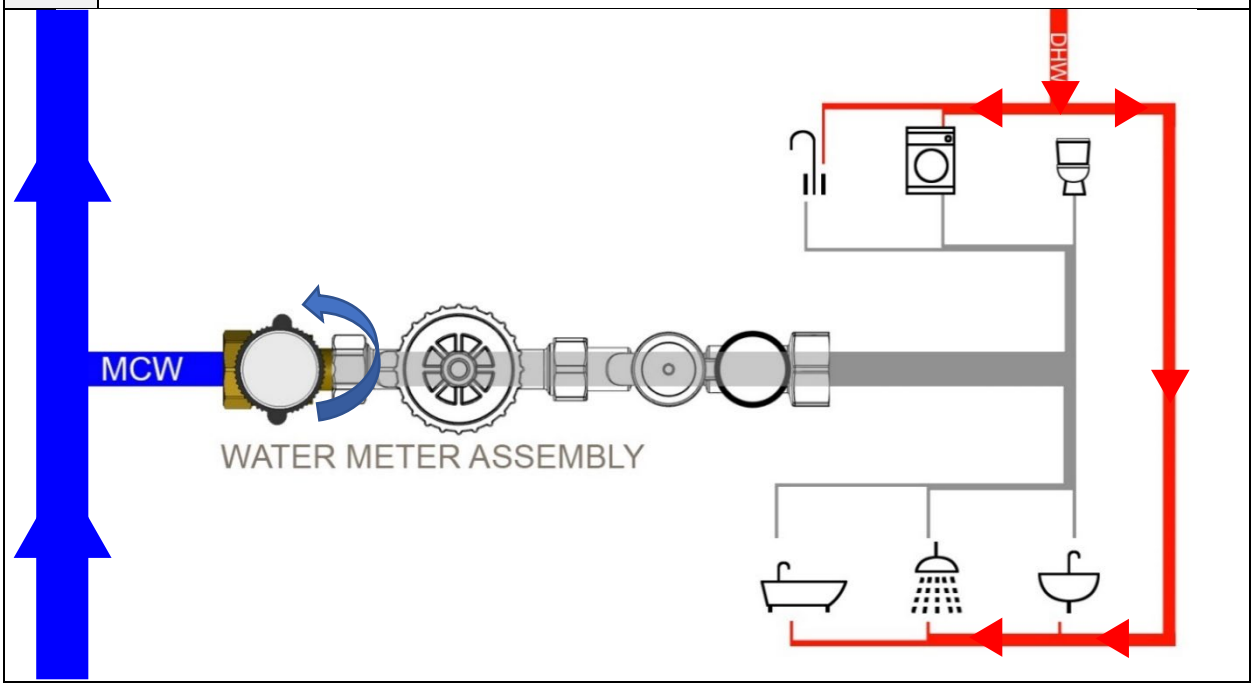
Item No.	Component Description
[1]	Isolation Valve
[2a]	Water Meter Carrier (order option)
[2b]	Water Meter Spacer (order options, 80mm or 110mm)
[3]	Pressure Reducing Valve (PRV)
[4]	Pressure Gauge (16 bar scale)
[5]	Double Check Valve (DCV)

2.7 Modes of operation

1	**Normal Operation:** Isolation valve open to allow cold-water flow to outlets. Purpose: To control delivery pressure of cold-water supply to dwelling and prevent back-flow, while protecting PRV and outlets downstream from debris build-up through inclusion of strainer.



2	**Full Isolation**: Isolation valve is shut-off to ensure no cold-water flow to dwelling side of WMA. Purpose: For WMA maintenance / cleaning of WMA strainer.



2.8 Technical specification

Description		Units		With Carrier		With 110mm Spacer	
				Exc. Insulation	Inc. Insulation	Exc. Insulation	Inc. Insulation
General							
Height		mm		312			
Width		mm		Ø67	Ø90	45	Ø90
Depth		mm		104			
Total weight		kg	¾"	1.02	1.06	1.57	1.61
			1"	0.92	0.96	1.47	1.51
Suitable media				Potable water			
Standards & approvals				WRAS, KIWA Regulation 4 (KUKreg4) PRV conforms to BSEN 1567			
Mounting position				Horizontal or vertical			
Operating temperature range		°C		5 – 85			
Max. operating temperature medium according to EN 1567		°C		30			
Operating inlet pressure range		bar		1 – 16			
Outlet adjustable pressure range		bar		1.5 – 6			
Factory pre-set outlet pressure		bar		4			
Internal insulation layer (10mm PE 3013)	Thermal conductivity of internal insulation layer at 10°C	W/mK		0.0320			
	Thermal conductivity of internal insulation layer at 40°C	W/mK		0.0404			
Density of internal insulation shell		Kg/m^3		30			
Density of external insulation shell		Kg/m^3		80			
Fire resistance of insulation (where ordered) to DIN 75200		mm/min		<100			
Transportation & storage requirements							
Ambient temperature range permissible		°C		5 – 55			
Ambient relative humidity range permissible		°C		25 – 85 (non-condensing)			

3. Regulations

3.1 General

The installation and maintenance of the unit must be performed by a qualified person in accordance with regulations and rules of the local area where installation is to take place.

3.2 Standards and guidelines

When installing and operating, please refer to country-specific regulations and standards, note in particular:

- The local standards and regulations on the installation conditions.
- The provision for the electrical connection to the power supply.
- The standards and regulations relating to the safety equipment of the water heating system.

3.3 Inspection and maintenance

The installation should be inspected regularly for the following reasons:
To achieve and maintain a high efficiency.
To ensure operational safety.
The recommendation from BSRIA BG62/2015 is a maintenance check every 3 years should be sufficient, however water quality should be checked frequently, and strainers checked/emptied as often as required.

Notice: Risk of system damage!

Damage to the system caused by lack of, or insufficient cleaning and servicing.
- Ensure that the heating system is inspected regularly by an authorised heating engineer.
- Carry out any repairs immediately to avoid any damage to the system.

4. Pre-Installation requirements

4.1 General

Notice:
The pressure differential across the mains cold-water inlet and cold-water outlet must not exceed the maximum reduction ratio of 3:1, to avoid noise issues.

4.2 Cleaning primary system

Ensure that the system has been pressure tested and properly flushed in accordance with BS EN 806-2.

Notice: Risk of damage to system or product.
Debris from the system can damage the product and reduce efficiency. Failure to comply with the guidelines for the use of water treatment with the WMA will invalidate the product warranty.

- Before installation, ensure that the system is cleaned and thoroughly flushed in accordance with the standards and guidelines of the country of installation. WMA strainer should also be checked and emptied as often as necessary.

4.3 Application location and clearances

4.3.1 Location

- Follow local regulations for the location within the property that the product is to be installed.
- This product is only suitable for installing internally within a property at a suitable location onto mains cold water pipework, capable of supporting the product weight.
- The product is not suitable for external installation.

4.3.2 Installation and maintenance clearances

When the WMA is fitted to mains cold-water installation, the front of the assembly needs to be accessible for setting, adjustment, isolation, and maintenance. The sides should also leave sufficient room to be able to remove the insulation shells when fitted, or remove the assembly in the event of a replacement going in. The components requiring access for maintenance or measurement are on the side profile as shown below. For this reason, it is necessary to provide sufficient space on this side for access.

5. Installation

5.1 Pipework installation

All pipework and joints used for potable water shall conform to the relevant standards, including but not limited to BS EN 806 parts 1-4.

In installations with limited straight runs and many bends and offsets, thermal movement is accommodated automatically. Where this is not the case, allowance for thermal expansion and contraction must be made to reduce thermal movement and prevent unwanted noise. This can be done by forming expansion loops, introducing changes of direction to avoid long straight runs or by fitting proprietary expansion joints.

Where applicable, pipes should be fitted clear of joints, beams, floorboards, and other pipes. Where this is not possible, pads of insulating material should be fitted between the pipe and the structure to minimise noise. At all times installations shall be such as to minimise noise and in accordance with national regulations. Where pipes for hot and cold potable water are arranged one above another, the hot water pipe shall also be located above the cold-water pipe.

Supply pipes and valves shall be marked, and colour banded in accordance with national regulations where these exist. In any building other than a single dwelling, every supply pipe, and every pipe for supplying water solely for fire-fighting purposes shall be clearly and indelibly marked to distinguish them from each other and from every other pipe in the building to indicate the service they carry.

After the Essco WMA, a service valve shall be provided in a convenient and accessible position in every cold feed pipe. In cistern fed installations this valve shall be fitted close to the feed cistern.

5.2 WMA installation

Before installation, the operating parameters of the dwelling(s) should be reviewed against the technical specification of the WMA in this document, to ensure that the assembly meets requirement.

The installation location should be protected against frost and be easily accessible to ensure adequate access to the WMA for setting, adjustment, and maintenance. The pressure gauge and water meter should also be able to be read off easily. When tube cutting, mounting brackets/supports or jointing pipework, risk assessments are recommended along with appropriate PPE.

The following instructions are guidelines and will not cover all installation scenarios. If unsure, please contact an Essco Group technical representative before installation.

1	Ensure that the system has been pressure tested and properly flushed in accordance with BS EN 806-2

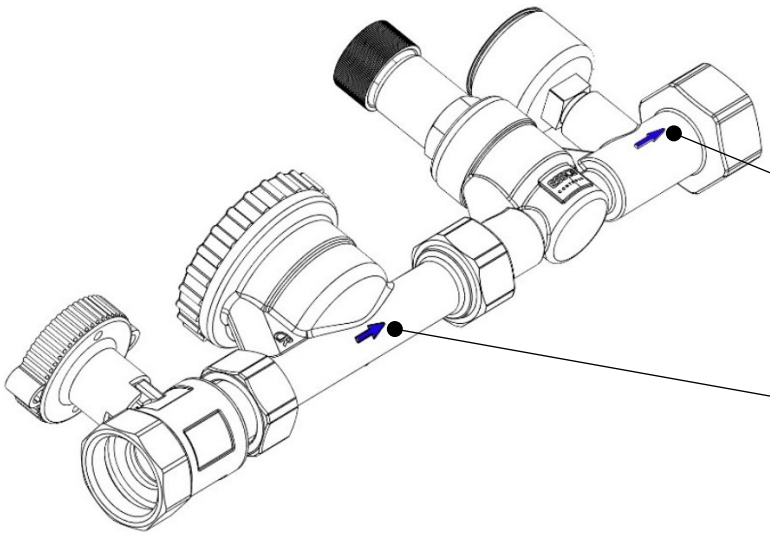
Note:

Where a private water supply is to be used in addition to water supplied by a statutory water supplier, the supplier's approval to the proposals shall be obtained before work commences.

As per BS EN 1717, there shall be no cross connection of systems carrying water from different water suppliers or of different sources from one supplier.

Where disinfection of potable-water installations is necessary:
Essco recommend Hydrogen Peroxide as it has rapid decomposition, weak disinfection solutions of hydrogen peroxide and can be drained into sewers without problems. In addition to this, <5% concentrations of hydrogen peroxide are not classified as dangerous and are therefore not hazardous. For dosing solutions, a concentration of 1.5% hydrogen peroxide per 100 l of potable water is recommended, this gives a disinfection solution of 150 mg/l of Hydrogen Peroxide.

2	Fit the WMA to the dwelling pipework, correctly in the direction of flow as indicated on the brass bodies. Note that all joints used for potable water must also conform to the relevant standards.



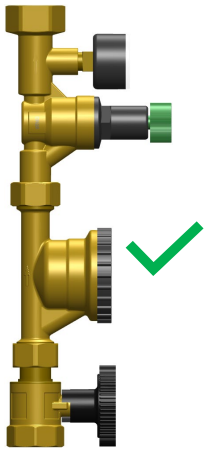
DCV (Double Check Valve)
Arrow denotes direction of cold-water flow from primary side to dwelling.

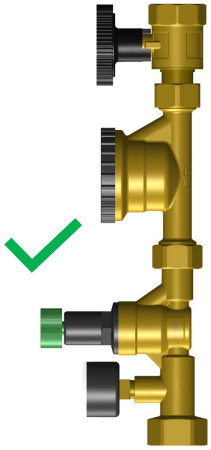
Water Meter Carrier
Arrow denotes direction of cold-water flow from primary side to dwelling.

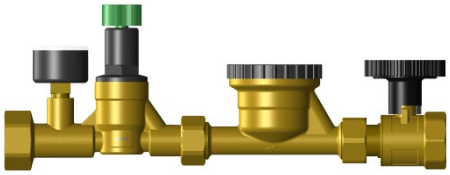
Provide a straight section of pipework of at least five times the nominal valve size after the pressure reducing valve (in accordance with EN 806-2) to prevent back pressure effects.

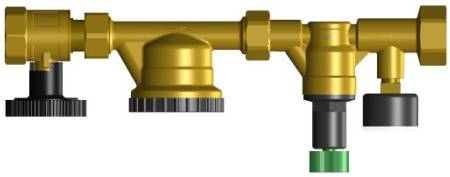
For threaded connections to the WMA Essco recommend using thread sealant or 4-6 layers of tape wrapped around the thread in a clockwise direction. Said products must be checked to be fit for use on potable water systems.

Possible installation orientations









Installers must check that water meters ordered can be fitted both vertically and horizontally to allow all the orientation options shown as possible above.

5.3 Application example

Four WMA's fitted vertically within a riser access panel. Each WMA serves an individual dwelling on the same level, controlling the supply of mains cold-water to the outlets within it. The compact design and front facing components allow assemblies to be fitted close together and tighter to the riser wall.

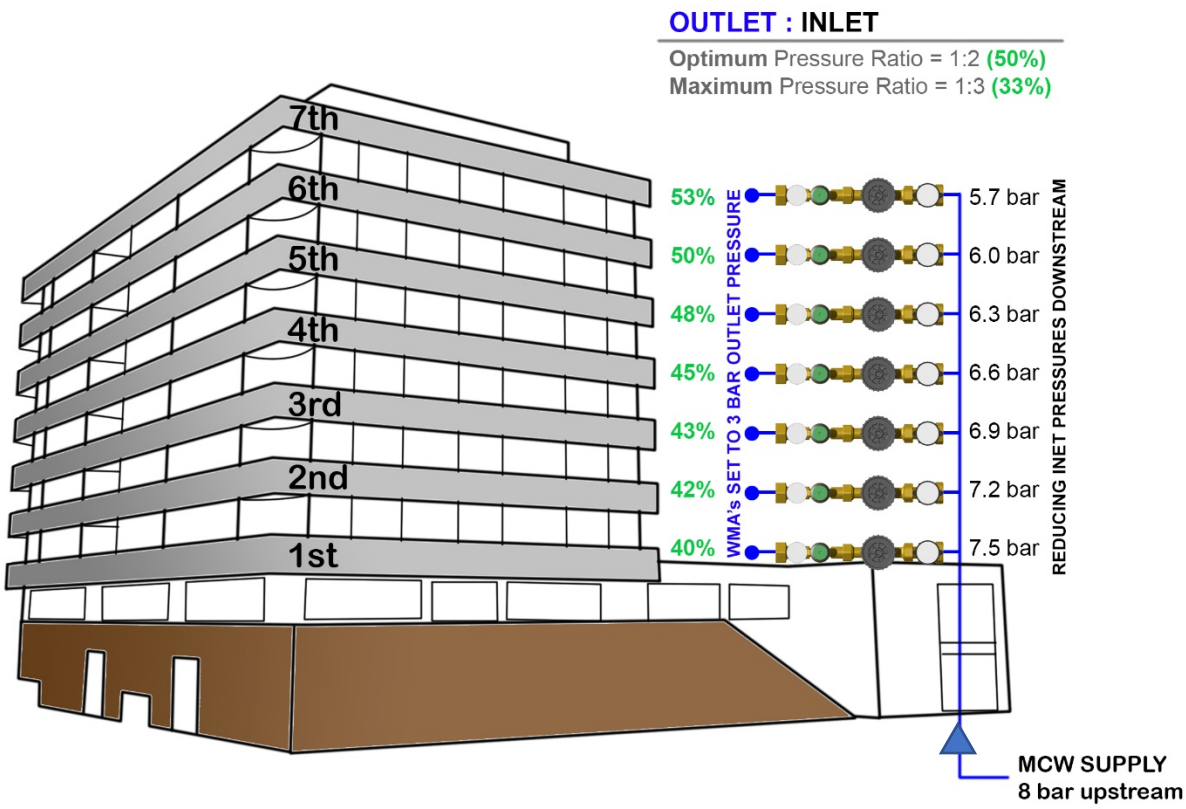
Essco WMA's must be accessible for service and maintenance. Sufficient clearance should also be left between assemblies to remove insulation shells or replace assemblies when necessary.

5.4 High rise installations

In the case of high-rise buildings, it is advisable to install a pressure reducing valve at the input of each dwelling, and not a larger centralised pressure reducing valve in the plant room of the building. This is because if we assume a height of 3 metres for each level, each level loses 0.3 bar of pressure.

Therefore, if a single central pressure reducing valve was fitted at the bottom of the building set to 3 bar, while the first storey may be supplied at the right pressure, the further you go up in the building, the more the pressure will drop. It is therefore necessary to install an individual reducing valve, adjusted to the required outlet pressure (e.g., 3 bar), at the entry of each dwelling.

Example Installation:
7 storey building with 8 bar mains cold-water pressure and a desired outlet pressure in each dwelling of 3 bar, set on the WMA



⚠	**Care should be taken to ensure that the ratio of outlet to inlet pressure does not exceed 1:3, to avoid excessive pressure change and associated noise issues.**
ⓘ	If there is insufficient MCW supply pressure, a pressure booster set may be needed. Similarly, if the supply pressure is too high, it may be necessary to fit a separate PRV on the supply line to preserve better pressure reduction ratios and avoid noise. For very high buildings, the highest storeys may not require the installation of a pressure reducing valve when the pressure is already less than the required working pressure (e.g., 3 bar).

5.5 Water meter options

The Essco WMA has been designed to allow the contractor to order meters directly from the manufacturer, rather than be limited to meters we may stock.

When ordering meters for WMA's, it's important to consider:

- Water meter capacity (subject to amount of water that runs through the water meter)
- Accuracy of meter required (see meter types below)
- Possible installation orientations of meter (does it suit the installation orientation?)
- Pulsed / Mbus outputs required for any remote reading or display within apartments

Meter types

There are four recognised types of water meter in the UK, from type A to type D, and the higher the letter, the better the accuracy of the meter at low flow rates.

DN20 (¾") Specification	**Nominal Flow Rate, Qn (l/h)**			
	Class A	**Class B**	**Class C**	**Class D**
Qn (m^3/h)	2.5			
Qmax (m^3/h)	5			
Qmin (l/h)	100	50	25	18.75
Qt (l/h)	250	200	37.5	28.75
Usage	Widely used in India	Originally popular in Europe	Original standard sufficient in UK	Improved UK standard, low flow accuracy

Key		
Qn	Nominal flow rate	The designation flow rate of the meter
Qmax	Maximum flow rate	The highest flow rate at which the meter accuracy will be within the maximum permitted error
Qmin	Minimum flow rate	The lowest flow rate at which the meter accuracy will be within the maximum permitted error
Qt	Transitional flow rate	The flow rate at which the maximum permitted error of the meter changes from ±5% to ±2%
Between Qmin and Qt the meters accuracy is ±5%. Between Qt and Qmax the accuracy is ±2%.		

The view from the UK National Weights and Measures Laboratory is that Class D meters are appropriate where there is indirect water supply, i.e. from storage within the house, but Class C is acceptable where the supply is direct.

Type D (the most accurate) are often required by local authority due to the higher accuracy of reading they provide; however project specification should always be referred to when selecting the correct class of meter required.

In the absence of specification, it should be noted that regulatory boards such as Ofwat and the Consumer Council for Water do not dictate or hold details of which water meter is put forward by each water company. It is best therefore to speak with the individual water company on the project, as they are best placed to provide information on any chosen water meters and its requirements.

6. Pre-commissioning

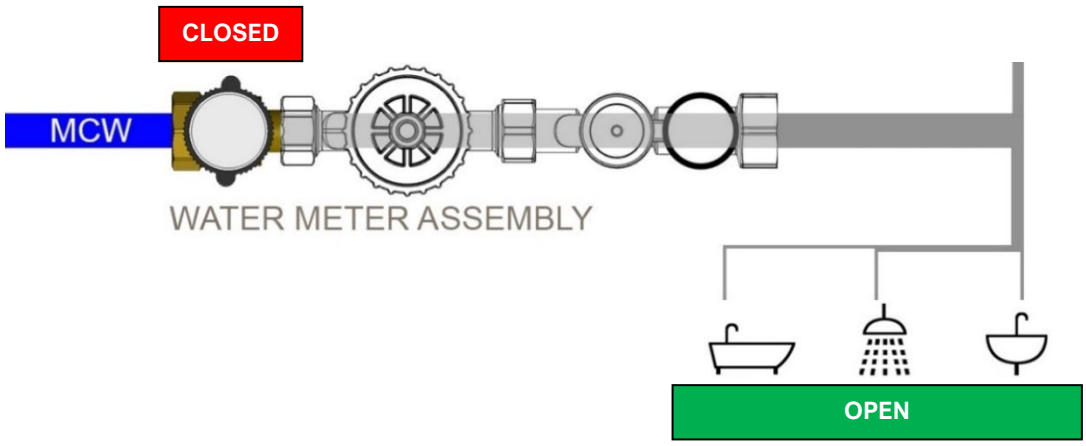
6.1 WMA pre-commissioning checklist

Pre-commissioning checklist		
1	Mains cold-water network and Essco WMA's fitted as per the hydronic connections, also in accordance with BS EN 806-4.	
2	Pressure test and flush mains cold-water network with water and/or air, again in accordance with BS EN 806-4, selecting the correct test method based on the material and size of the installed pipes.	
3	Where there is a need to do so, installation to be disinfected after flushing.	
4	In accordance with EN 806-4, records of all pipe runs, cisterns, valves, outlets, etc. plus records of the testing, flushing and disinfection process, as well as inspection results, must be submitted to the owner of the building for the documentation process.	
5	MBUS connections and supply are in place and network is functional.	
6	Design schedule of outlet pressures to adjust pressure reducing valve during commissioning	

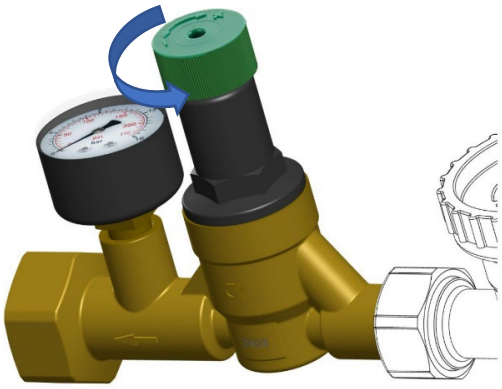
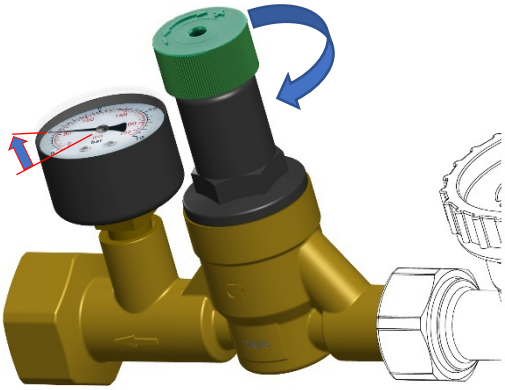
* The pipework systems connected to Essco WMA's must have been cleaned and flushed in accordance with the relevant standards and regulations.

7. Commissioning

1	With the shut-off valve closed on the WMA inlet, release pressure on outlet side (e.g., through water taps) until the pressure gauge reads '0'. Several outlets can be opened to relieve the pressure in the water lines. Once released, return any outlets to closed positions.



<table>
<tr><td>2</td><td colspan="3">The double check valve after the PRV means there is no requirement for isolation valves after the assembly and all maintenance can be carried out without the need for draining down the system.

Essco WMAs are factory set to 4 bar outlet pressure but are adjustable within a 1.5 – 6 bar range. To adjust the pre-set outlet pressure:</td></tr>
<tr><td rowspan="2">(a)</td><td>Slacken tension in PRV compression spring by turning the adjustment handle counter clockwise (-) until it does not move any more.</td><td rowspan="2">(b)</td><td>Re-open shut-off valve on the WMA inlet, then turn the adjustment handle of the PRV clockwise until the pressure gauge displays the required pressure.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>ⓘ</td><td colspan="3">Less outlet water pressure means less water used, and therefore less energy consumed, so it is important to adjust the outlet pressure on the PRV to suit the requirements of the dwelling. Note however that a minimum of 1 bar outlet pressure is necessary for the product to work correctly.</td></tr>
<tr><td>ⓘ</td><td colspan="3">The green adjustment knob must stay fitted to prevent dirt from entering the assembly.</td></tr>
</table>

8 Handover

- Where supplied, complete the Essco WMA commissioning label tags and secure around the valve body for future reference.
- Set up the water meters and show the customer how to operate correctly.
- Show the customer where the product information is when they call in with a problem.
- Show the customer how to safely isolate the WMA and how they can check and clean the strainer.
- Advise the customer they can find information on the Essco website, https://esscogroup.co.uk/essco-oem/water-meter-assembly/.
- Ensure that the installation and maintenance manual and other details are provided as part of handover.

Product guarantee
This product has a non-transferable 2-year guarantee from the date of delivery. This covers faulty product or workmanship to the terms and conditions that can be found on our website.

This O&M has been designed to provide recommendations throughout, which if carried out will help to prolong product lifespan and provide better functionality and accuracy. Essco recommend the use of over pressure limitation in any systems where the maximum operating valves of the WMA might be exceeded.

Warranty will be voided where actuators used are not supplied or recommended by Essco Group. Similarly, if a valve fails and is returned to us for inspection and damage can be seen because of water quality or through overpressure, this will also void the warranty.

For further details and to read full terms and conditions please visit us online at https://esscogroup.co.uk/wp-content/uploads/2021/04/Essco-B2B-Terms-Conditions-APRIL-2021.pdf.
Your statutory rights are not affected by the manufacturer's guarantee.

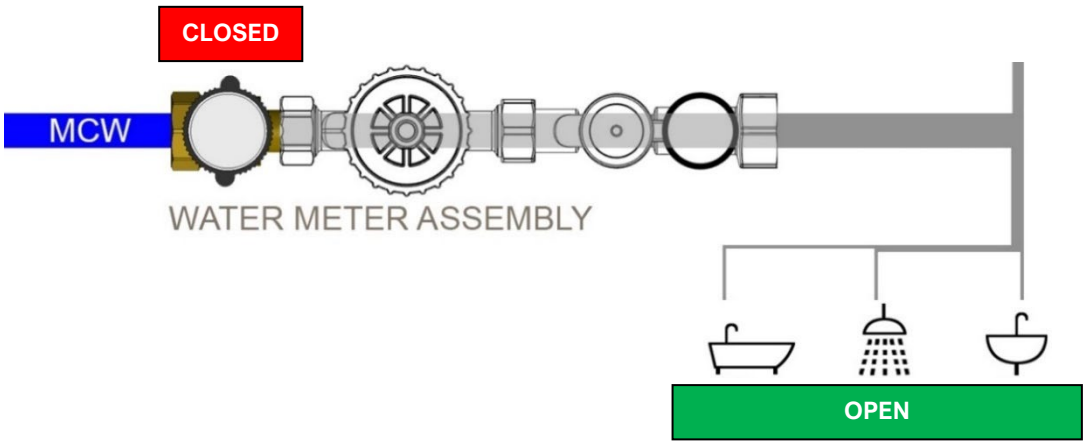
9. Maintenance

The system requires regular maintenance in accordance with EN 806-5. There is however very little maintenance required at the WMA. The assembly should be checked periodically for any leaks or change in pressure outside of the set value, and the strainer should also be checked/cleaned as often as necessary.

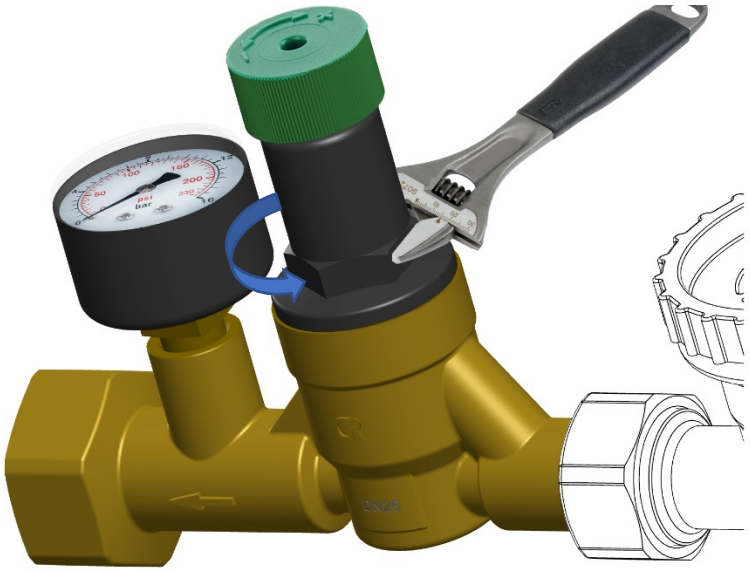
9.1 Draining the WMA & filter removal

	The double check valve after the PRV means there is no requirement for isolation valves after the assembly and all maintenance can be carried out without the need for draining down the system.		**Notice:** Risk of water damage to product or property! Damage from disconnecting water pathways which may have retained some water. Take care after draining WMA to protect equipment / property from residual water content within components.

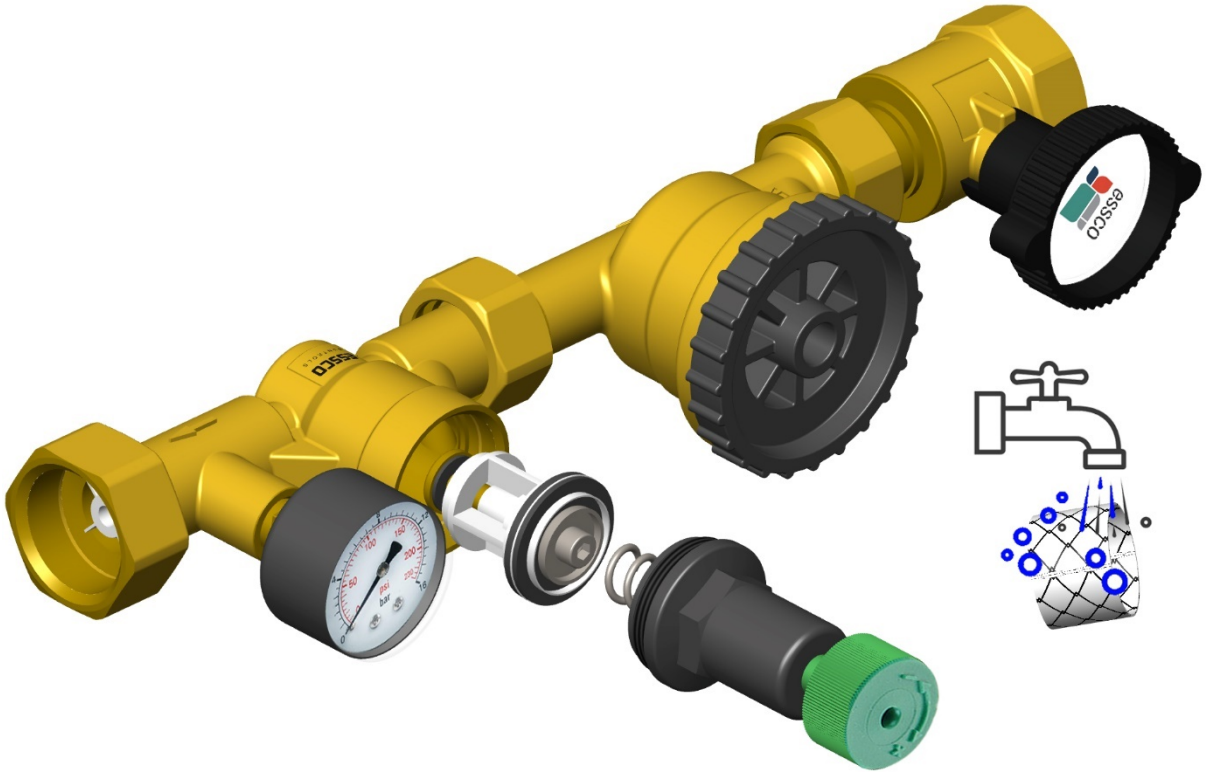
1	With the shut-off valve closed on the WMA inlet, release pressure on outlet side (e.g. through water taps) until the pressure gauge reads '0'. Several outlets can be opened to relieve the pressure in the water lines. Once released, return any outlets to closed positions.



2	Use a wrench at the base nut of the pressure reducing valve and turn counter clockwise to remove the cartridge.



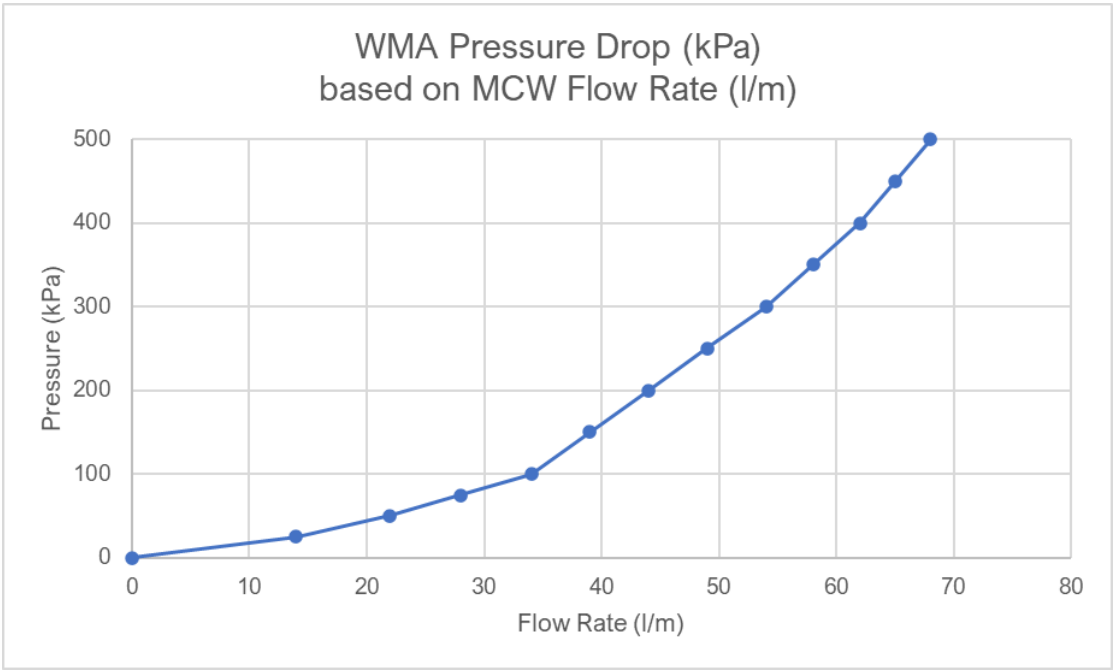
3	Once the cartridge has been removed, take out the strainer and clean under running water before refitting / resealing as required.



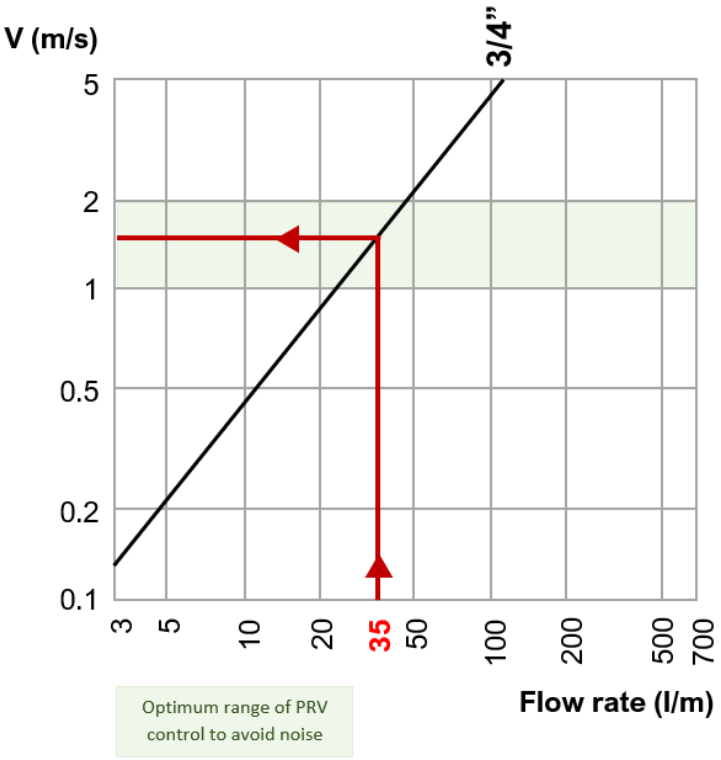
4	When complete, reopen the shut-off valve on the WMA inlet slowly, checking for leaks. Check & readjust outlet pressure as necessary and add details of visit to maintenance log.

10.0 Appendix

10.1 Appendix A1: Pressure drops.



10.2 Appendix A2: Recommended velocities for noise avoidance.



essco

essco
PROCESS VALVES

essco
HYDRONICS

essco
ENERGY

essco
FIT & FORGET

Essco Group
Unit 5, Nelson Industrial Park
Herald Road
Southampton
SO30 2JH

T. 01489 779068
F. 01489 779069

www.esscogroup.co.uk

NOV-2021