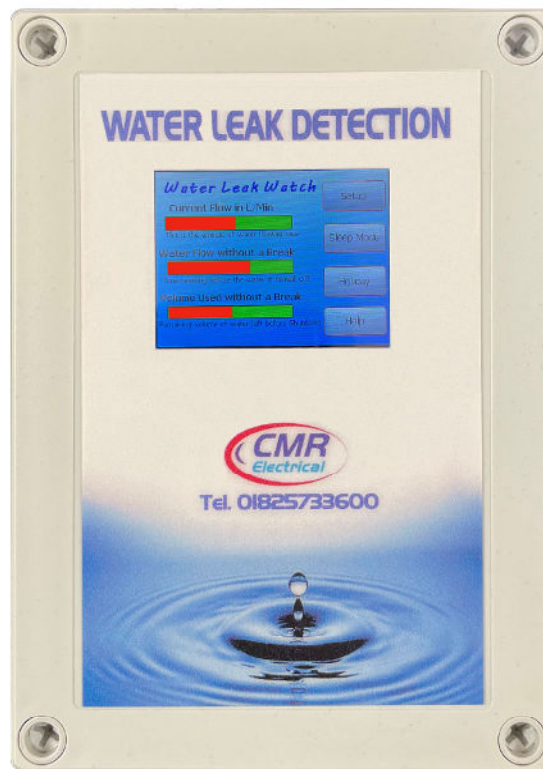




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WLW Water Leak Detection Manual



Contents

- 1) **System Overview**
- 2) **Installation**
- 3) **Wiring**
- 4) **Water Solenoid Valve**
- 5) **Water Flow Sensor**
- 6) **Optional Water Detection Cable Sensor**
- 7) **Relay Output**
- 8) **Home Screen Explained**
- 9) **Setup Page Explained**
- 10) **Sleep Mode Explained**
- 11) **Holiday Mode Explained**
- 12) **Help window Explained**
- 13) **Setting up the System**
- 14) **Alarms**

1) System Overview

This system is fully programmable to suit user requirements. The alarm unit is connected to a flow sensor and water shutoff valve. All three items should be positioned as close as possible to the incoming water supply pipe with the flow sensor and valve fitted just after the internal stopcock. Designed to monitor the flow of water entering the building, flat or area, the unit raises an alarm and shuts off the water supply when the flow exceeds pre-set limits. Three flow patterns are monitored;

Current flow

This is the amount of water in litres, per minute flowing now. A higher than normal flow can indicate a burst pipe. This feature is updated every second and is designed to turn off the water supply within 3 seconds from the time the alarm trip point is exceeded. The alarm trip setting can be adjusted manually or automatically, see item 13, *Setting up the Current Water Flow L/Min alarm trip point*. When set to automatic update mode, the unit will monitor the flow for a seven-day period for the maximum flow seen within that period. At the end of the seven days, the unit will automatically increase the maximum allowable flow or decrease it by an eighth of the difference between the current and past flow periods i.e., the previous seven day period was 42 L/Min, current period is 34 L/Min, $(42-34 / 8 = 1)$ so the new alarm setting will be $(42-1)$ 41. If the property is vacant for a long period i.e. on holiday, the decrease in alarm setting will continue until 22 L/Min when it will stop the decrease. For this reason, its best to put the system into "Holiday Mode" to stop the automatic adjustment.

Water flow without a break

This is a measurement in hours that the water has been flowing without a break. In normal operation, water is consumed for short periods of time i.e., filling a bath can take 10 minutes, when the taps are turned off, the flow of water stops. This results in a period of no water flow, until the next call for water is made i.e., the toilet is flushed. In heavy flow periods, for example; first thing in the morning when showers, toilets, sinks are all being used, the constant flow of water will occur for a longer period of time but will eventually stop. However, if the flow never stops, this would be an indication of a leaking pipe or a tap or garden hose being left on. As the system measures in 3ml volumes, small leaks can be detected such as dripping taps, pipe fittings or radiators.

Volume used without a break

The unit measures the volume of water being consumed within a single flow period. Normally the highest water consumers would be items such as a bath or garden hose. Excessive water volume can indicate a burst pipe, or a tap or garden hose being left on.

Optional remote leak sensor

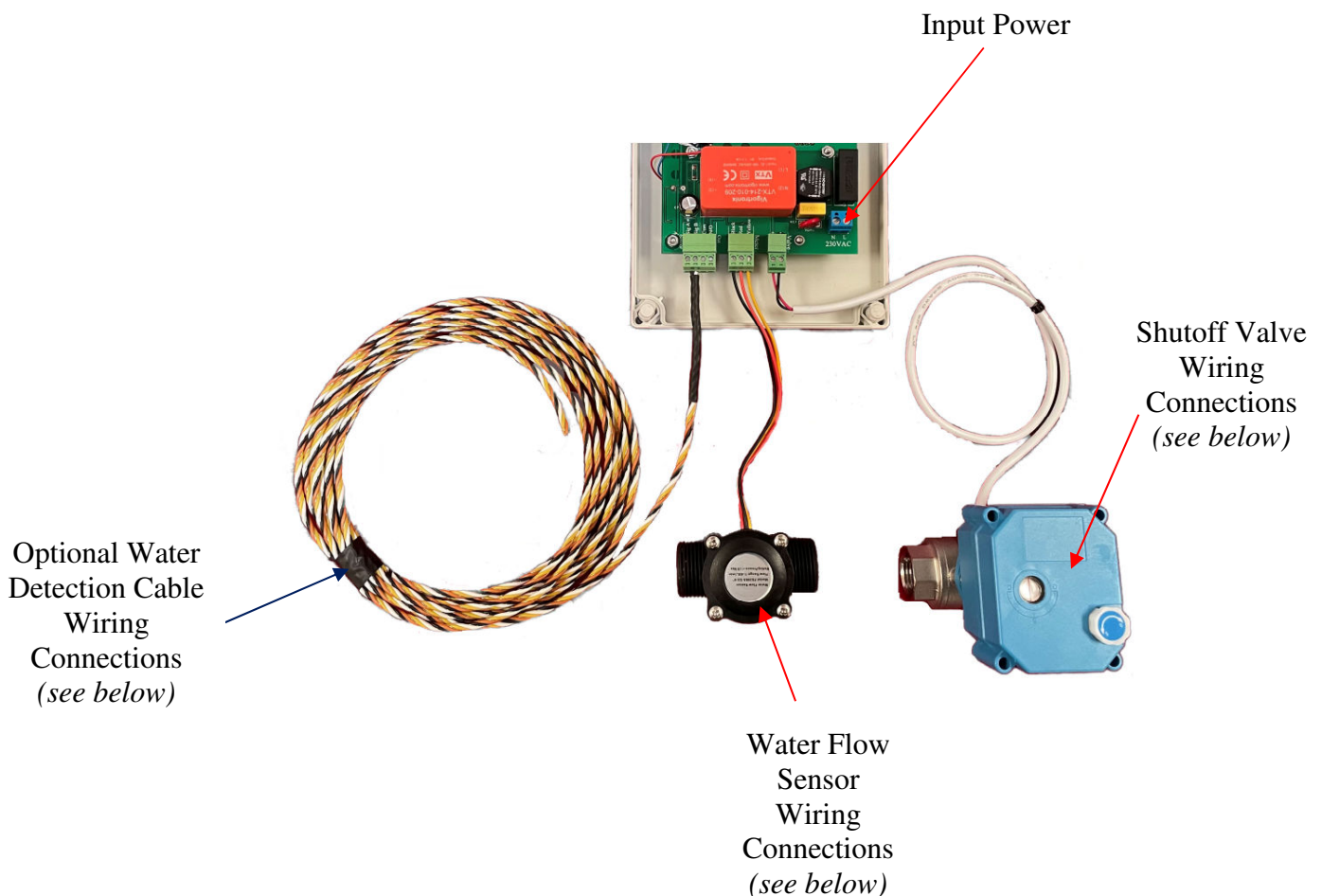
In addition to the flow monitoring, the system can be fitted with either standard water leak detection cable, up to 5m long or spot sensor. As soon as water comes into contact with the cable or sensor, an alarm will be raised and the water turned off.

2) Installation

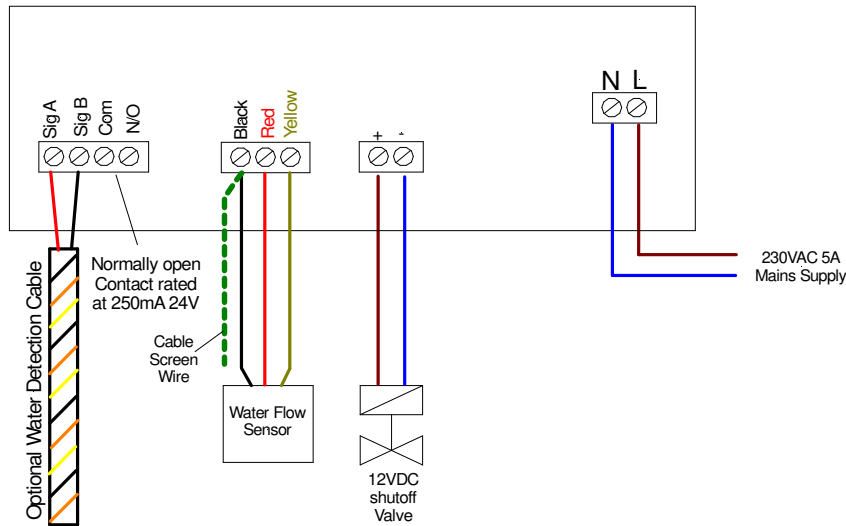
THIS EQUIPMENT SHOULD ONLY BE CONNECTED AND WORKED ON BY A QUALIFIED ELECTRICIAN.

To mount the unit to a wall, first remove the lid to expose the internal equipment. In the bottom and top corners of the housing are fixing points. 3.5mm pozi-drive screws or any screw with a head no bigger than 7mm diameter can be used to fix the housing in place. Cable access into the box should be via cable glands which can be positioned anywhere around the enclosure or on the inside for back entry. Care should be taken not to damage the internal equipment when drilling the enclosure. A 230VAC power supply should be run from a fused spur to the unit's internal terminal block marked "L", & "N". The fuse within the fused spur should be rated at 5 Amps.

The unit should be linked to the water flow sensor by a 0.2/0.5mm² conductor 3 core screened cable up to a maximum 2 meters away ideally with Red, Black and Yellow cables. The cable screen wire should only be connected to the black wire terminal and NOT connected at the flow meter end. The shutoff valve should be installed just after the flow meter and cabled in a 0.5mm² conductor 2 core cable rated for 12VDC 5Watts.



3) Wiring Detail

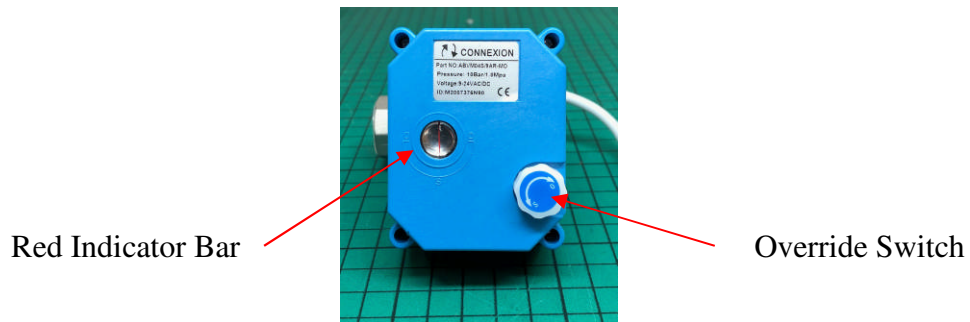


With the exception of the 230VAC mains terminal block, all terminals are of the plugin type allowing the terminal housing to be removed for ease of terminating the cables. If you do un-plug the terminal housing, please check that you haven't reversed the connections when you plug it back into its housing.

4) Water Solenoid Valve

The shutoff valve is a ½" or ¾" BSP female/female, Normally Open, power shut, 12VDC, 5W with position indicator and Override switch.

To override the valve in an emergency, and allow water to flow, with the unit still in alarm. First pull the override switch toward you until the white knob is just clear of the blue housing. Then turn the override switch clockwise (direction marked "O") until the red indicator bar is in line with the pipe run.



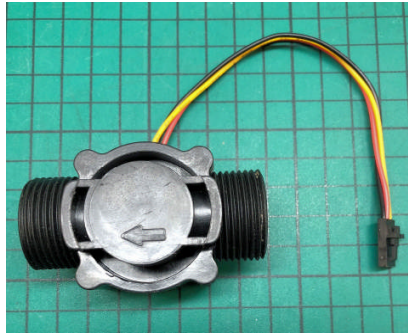
To take the valve out of shutdown and revert back to normal running, push the Override switch toward the blue housing allowing the valve to automatically open itself.

WARNING, IF YOU USE THE OVERRIDE FACILITY YOU MUST TAKE THE VALVE OUT OF OVERRIDE WHEN THE EMERGENCY HAS BEEN RESOLVED.

5) Water Flow Sensor

The sensor is ¾ or 1 inch male/male connections and should be fitted after the water shutoff valve and in close proximity to the stopcock, i.e., stopcock, then shutoff valve then flow sensor. Direction of flow is important for the unit to operate correctly with the arrow (see picture below) inline with the water flow. Three cables emanate from the sensor, Black, Red and Yellow. For correct operation and to avoid damage to the unit, all three wires must be correctly connected to the alarm unit as follows:

| Flow Sensor | Alarm Unit 3-way Terminal Block |
|-------------|---------------------------------|
| Black wire | Terminal marked “Black” |
| Red wire | Terminal marked “Red” |
| Yellow wire | Terminal marked “Yellow” |



WARNING, incorrect connections will cause damage to the sensor. The Maximum pressure of this device is 1.75MPa (17.5 bar) Maximum operating temperature 80°C

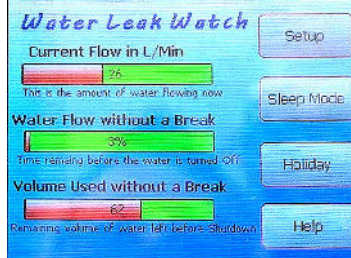
6) Optional Water Detection Cable Sensor

The two water detection cable wires are not polarity conscious and therefore can be fitted to any “Sig” terminal. To connect the cable, first position it around the area to be protected and connect one of the wires to the 4-way terminal block, terminal “SigA” with the other wire to “SigB”

7) Relay Output

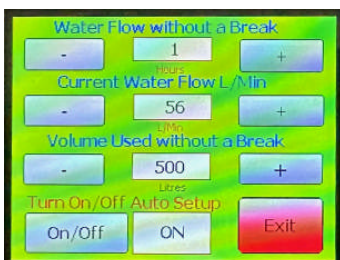
A solid state normally open, close in alarm, contact has been provided to give external alarm indication. The contact is rated for 24VDC 250mA. To use this contact, use the 4 way terminal block, terminals marked “Com” and “N/O”

8) Home Screen



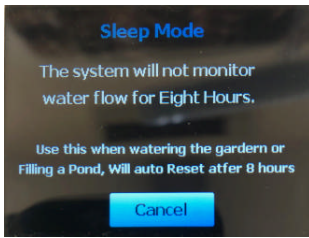
This screen consists of three bar graphs, “*Current Flow in L/Min*”, “*Water Flow without a Break*” and “*Volume Used without a Break*”. Each bar graph will turn red (left to right) to indicate how close to the maximum setting (far right) each parameter is before the water is turned off. For more information about each parameter see section 1. To the right of the screen are four push buttons that will be described in more detail further on. Each bar graph is calibrated from the settings entered in the “Setup” page, so for example; if “Current Flow in L/Min” is set to a maximum of 25, the bar graph will be ranged between 0 far left to 25 L/min far right. Once the system detects a no water flow period of 15 seconds or more, all three bar graphs will reset and fall back to the zero-position waiting for the next water flow period.

9) Setup Page



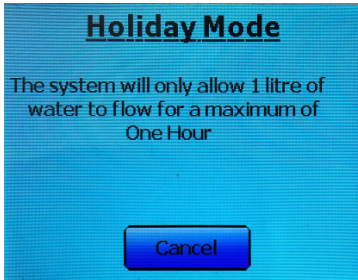
To enter setup, press the “Setup” push button on the home screen. Once the screen is on display, you have 2 minutes to make adjustments before the system automatically reverts back to the home screen. Each parameter can be adjusted buy using the plus (+) and minus (-) buttons positioned to the left and right side of each parameter. This screen also allows the water flow alarm setting to be automatically adjusted, once you have finished press the “Exit” button to save changes. More information about setups can be found in “setting up the system” below.

10) Sleep Mode



This feature is provided to allow long high-volume water flow periods to occur without tuning off the water supply. By pressing the “Sleep Mode” button, the system will stop looking at the water flow for eight hours or until the “Cancel” button is pressed. Once the eight hours have elapsed, the system will automatically reset itself and start monitoring the water flow. This feature can be used when filling a fish pond or long periods of watering the garden.

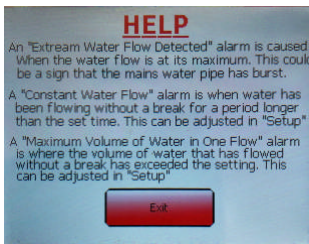
11) Holiday Mode



Holiday mode has been provided to protect your home whilst away for long periods of time. It is presumed that the house, flat or area will be empty and there will be no water used other than for example, a central heating tank topping up. By pressing the “Holiday Mode” button, the system will monitor the water flow allowing only one litre of water to flow over a period of one hour. If this limit is exceeded, the system will automatically turn off the water. To cancel this feature, press the “Cancel” button. In this mode, automatic alarm settings will be terminated, cancelling Holiday mode will reinstate the old alarm settings.

This feature should not be used, if you are expecting someone to enter the property or area during your absence i.e. cleaner or relative.

12) Help Screen



This has been provided to help you remember how the system operates with a description of each alarm parameter.

13) Setting up the System

Historically some houses were built with a water storage tank in the loft. This meant that mains pressure and water flow rates were not very important because all the mains had to do was fill the tank and provide clean water to kitchen. For this reason, houses were normally provided with a 1/2” (15mm) mains water pipe, providing about 18 litres per minute of flow. In more recent or refurbished houses, the plumbing layout feeds water to every device that consumes water i.e., toilet, bath, washing machine etc., this is called a direct or pressure fed system. In a modern house with a direct fed system, a 22mm (3/4”) water supply pipe will be provided to allow approximately 35 l/min to flow. However, the more bathrooms there are, the larger the pipe diameter needs to be. Many new houses now have a 28mm (1”) water supply with some larger houses having a 35mm (1” 1/4”) supply. Flow rate is the amount of water flowing past a given point, for a given period of time, normally measured in litres per minute (l/min). Flow rate is dependent on the pressure, pipe size and length of pipe from the source. If you have good pressure and a large supply pipe you will have a better flow.

The system will automatically be set to the following;

Water Flow without a break = 5 hours
Current Water Flow L/Min = 19 L/Min
Volume Used without a Break = 500 litres

Setting up the “Water Flow without a Break” alarm trip point

To enter setup, press the “Setup” push button. Under the heading “Water Flow without a Break” you will notice a plus (+) button on the right, a minus (-) button on the left. The current alarm setpoint will show in the red rectangle. Use the plus and minus buttons to adjust the current set point (minimum 1, maximum 10 hours). Once you have finished, you can repeat for other parameters or press the “Exit” button to save changes. The display shows the number of hours that water is allowed to flow without a break. You will need to determine if the property is a light consumer or heavy consumer of water. For light usage one would expect only short periods of water flow with the maximum flow period being when filling a bath or having a shower once a day. For light users, the system should usually be set to 1 hour and increased if the unit goes into alarm. For heavy users where the flow is constant all day, set between 8 and 10 hours.

Setting up the “Current Water Flow L/Min” alarm trip point

Enter setup and adjust the alarm setpoint as described in “Setting up the Water Flow without a Break alarm trip point”. The alarm trip point can be set manually or automatically, pressing the “Turn On/Off Auto Setup” button until the box states “On” will allow the system to automatically adjust the flow alarm each 7 day period to a higher or lower value based on what has happened over the past seven day period. To cancel this feature, press the same button until the box states “Off”. Whilst in automatic mode, the settings can still be adjusted manually as described below. If setting up the system for the first time, set the system into automatic mode and adjust the “Current Water Flow L/Min” to the maximum i.e. 60 allowing the unit to determine the optimum setting. If you want to set the “Current Water Flow L/Min” manually adjust the alarm setpoint to the maximum amount of water in litres per minute (minimum 18, maximum 60 L/Min), that can flow through your incoming mains water pipe. Please see information below;

Average flow rate

| Supply Pipe Size | Low Pressure Flow rate, (L/Min) 3 bars or less | Normal Pressure Flow rate, (L/Min) 3-6 bars | High Pressure Flow rate, (L/Min) 6 bar or more |
|------------------|--|---|--|
| 15mm | 10 | 19 | 28 |
| 22mm | 20 | 39 | 58 |
| 28mm | 33 | 65 | 97 |

The above table can be used to determine the maximum water flow for your application. This will help when setting up the “Current Water Flow L/Min” alarm setting, i.e., if you have a 15mm mains water pipe emanating from your stopcock, and the water pressure is between 3-6 bar, set the alarm trip point to 20 L/Min or just above.

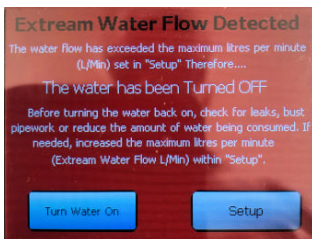
Setting up the “Volume Used without a Break” alarm trip point

Enter setup and adjust the alarm setpoint as described in “Setting up the Water Flow without a Break alarm trip point” (minimum 100 maximum 2000 litres). This setting is volume based and is dependent upon whether the property uses large quantities of continually flowing water i.e. garden hose used every day. For light users where only one person occupies the property, set the trip point between 100 and 200 litres. Where there are a number of occupants that could have baths or showers at a set time i.e. bath time where the washing machine, dishwasher or both could be going, adjusted between 500 and 800 litres. Obviously for gardeners, this setting will require a bit of trial and error to workout how much water you use on the garden at any one time. But to help, the average hose or sprinkler can consume 900 litres per hour.

14) Alarms; their meanings and what to do about it

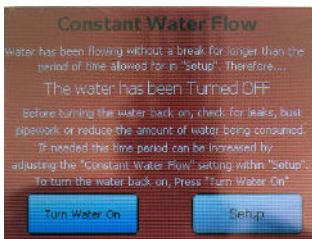
The unit has four alarms as outlined below. Each alarm will sound the audible warning device, display the nature of the alarm and close the water shutoff valve to stop further damage. Before pressing the “Turn Water On” push button, turn off all water outlets including the garden hose and check the house for leaks. Once you are happy that there are no water leaks, press the “Turn Water On” push button to open the shutoff valve and cancel the alarm. You will notice that the “Setup” button has been provided on the alarm screen. Once you are happy that there are no leaks, you can use this button instead of the “Turn Water On” button to increase the alarm setpoint as well as resetting the alarm. This feature is useful when setting up the system for the first time, where the water flow rate is unknown and the system keeps going back into alarm as soon as the “Turn Water On” button is pressed.

Extreme Water Flow Detected



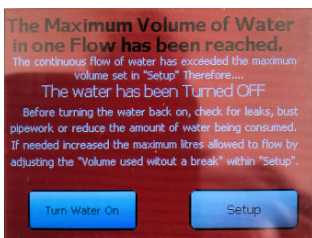
This screen will be displayed when the water flow exceeds the alarm “*Current Water Flow L/Min*” setting and could be an indication of a burst pipe. Another reason for this alarm to be activated could be that several kitchen appliances, sink, bath and garden hose are asking for water at the same time. If the unit is in automatic alarm setting update, pressing the “Turn Water On” button will automatically change the alarm setting to the to the new maximum.

Constant Water Flow Alarm



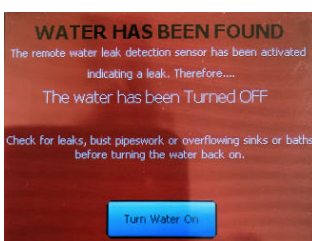
Displayed when the water flow has not stopped for the period of time set in the setup. If the unit “Water Flow without a Break” setting is set to 1 hour for example, regardless of how much water is flowing, providing the water keeps flowing for one hour without a break, the unit will go into alarm. The constant flow monitoring is reset every time the unit sees a 15 second or longer, no flow period. Therefore, if the constant flow timeout reaches 58 minutes, two minutes before an alarm is instigated, and the water stops flowing for 15 seconds, the alarm monitoring is reset and the timeout begins again.

The Maximum Volume of Water in one Flow has been reached




This screen will be displayed when the amount of water consumed within a single flow exceeds the alarm “*Volume used without a Break*” setting. Reasons for this alarm could be; a leak from a damaged fitting, burst pipework, fractured water tank, bath taps or garden hose left on.

Water Has Been Found



This screen will only be activated if you have an external water detection sensor or cable (see section 2) connected to the device and the device has come into contact with water. This is an On or Off alarm with no setting to adjust.

| | | |
|--|---|---|
| <p>Media: air – water – gas – liquid Pressure range: 0 to 10 bar max Media temperature: -15°C +100°C max Ambient temperature: -20°C to +45°C Media viscosity: 500 centistokes max Duty cycle: 70,000+ Mounting: Any Seals: PTFE</p> | <h2>Actuated Ball Valve</h2> <p>3/8 – 1 NORMALLY CLOSED 2 WAY DIRECT 0 – 10 Bar TYPE ABVM-AR</p> |  |
|--|---|---|

| PRESSURE | | | | | | | |
|------------|------------|--------------------------|--------------------------|-----------|-----------|-------------------|-------------|
| Ø Port BSP | Orifice mm | Max Opening Time Seconds | Max Closing Time Seconds | Min (Bar) | Max (Bar) | Voltage | Part Number |
| 1/2 | 15 | 3 | 3 | 0 | 10 | 5 to 6vDC | ABVM04S-6V |
| | | | | | | 9 to 24v AC or DC | ABVM04S-9AR |
| | | | | | | 85 to 265v AC | ABVM04S-2AR |
| 3/4 | 20 | 5 | 5 | 0 | 10 | 5 to 6vDC | ABVM06S-6V |
| | | | | | | 9 to 24v AC or DC | ABVM06S-9AR |
| | | | | | | 85 to 265v AC | ABVM06S-2AR |
| 1 | 25 | 5 | 5 | 0 | 10 | 5 to 6vDC | ABVM08S-6V |
| | | | | | | 9 to 24v AC or DC | ABVM08S-9AR |
| | | | | | | 85 to 265v AC | ABVM08S-2AR |

OPTIONS

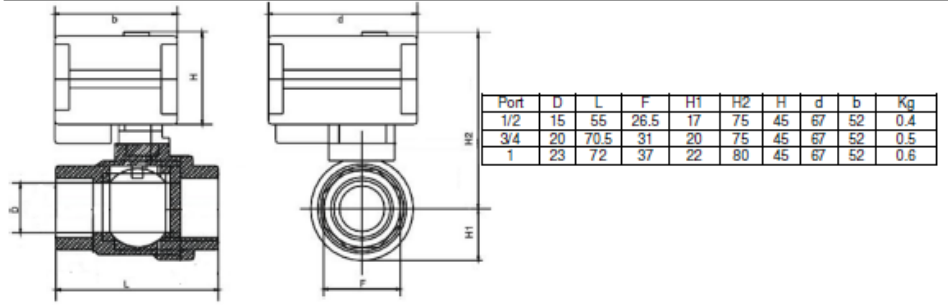
Manual Over Ride, Visual Position Indicator, 316 Stainless Steel or Brass Valve
 Failsafe open, 2 wire control, 3 wire 2 point control, 3 wire 1 point controls and open / closed signal position feedback.

| ELECTRICAL DATA | | | | | |
|---|----------|--------|---------|-----------|---------------------------|
| Voltage Min - Max Continuous duty 100% | Actuator | | Power | Enclosure | Electrical connections |
| | Model | Torque | | | |
| 5 to 6 volts DC | ABVM | 2 Nm | 5 Watts | IP65 | 2 lead wires 0.5 meter |
| 9 to 24 volts AC 50/60Hz or DC | | | | | |
| 85 to 265 volts AC 50/60Hz | | | | | |

CONSTRUCTION

Valve Body: 304 stainless steel, Optional Brass or 316 stainless steel
 ABVM Actuator: ABS Engineering Plastic, Gears Metal and POM

OVERALL DIMENSIONS



Requires minimum 60 second power ON time to charge the reserve power to close.

