



AT401D & AT401DS

Hard Wired Leak Detection System Installation and Owners Manual

Read this entire Manual carefully before Installation and Use

1. STAGE ONE — Installation Preparation

This AquaTrip Leak Detection System must be installed by a licensed plumber according to Local Government Building, Plumbing and Water Utility Supply regulations. Local government approvals may be required.

WARNING  **Fire Suppression Lines** — Do not install the system on any Fire Suppression Supply lines. If a Fire Suppression system is present, make certain that the AquaTrip is installed downstream of the supply lines to that system, so that it has no influence on the water supply to the Fire Suppression system.

Before installing the system, determine if any of the following devices are installed on the property.

- | | | |
|-----------------------|----------------------------|---------------------------------------|
| 1.) Irrigation System | 2.) Solar Hot Water System | 3.) Water Softener |
| 4.) Icemaker | 5.) Automatic Pool Filler | 6.) Reverse Osmosis Filtration System |

Check for these or any other appliance that may use water in an automated or sporadic manner. Take account of the water usage requirements of these appliances when programming the AquaTrip. Ensure that you program the Flow Time settings so that there is no interference to the normal operating requirements of these systems. Alternatively, install the AquaTrip downstream of these systems. If you do this, they will **not** be monitored by the AquaTrip.

WARNING  **Freezing Conditions** - Do not fit the AquaTrip Control Unit and Shutoff Valve in an area where it is likely be exposed to freezing conditions. The AquaTrip will not function below freezing. If conditions are likely to drop to zero, only the metal valve version of this product can be installed, and it must be insulated from the cold. The PVC valve version cannot be installed in zero or sub zero temperatures.

WARNING  **Pressure Rating** - Do a pressure test on the main incoming supply to the property. Check that the pressure does not exceed the pressure rating of the AquaTrip Shutoff Valve version that you are installing. If the pressure is within 80% of the maximum rated pressure of the valve, then a Pressure Reduction Valve (PRV) must be fitted. This is to allow for surges in pressure in the mains supply which may then exceed the maximum rated pressure of the Shutoff Valve. The valves respective pressure ratings can be found under the Specifications section.

WARNING  **Pumped Supply** - If the water supply to the property is pressurised using a pump, the AquaTrip may not be suitable for the application. If the pump has a pressure vessel to maintain a constant pressure in the pipes, it will work in most circumstances. However if the pump has no pressure vessel the AquaTrip will not be able to detect smaller leaks, as the pressure drop from a small leak may be insufficient to cause the pump to come on, and maintain the pressure in the system. (*See Stage Eight for Pump Setup*)

WARNING  **Backflow Prevention** - If there is backflow down the pipe from the house to the AquaTrip Control Unit, due to very long distance piping and/or large diameter piping or undulating terrain or other circumstances creating reverse flow and pressure, then it may be necessary to install a backflow prevention valve after the AquaTrip. This is because the backflow may prevent the Flow Sensor from detecting the continuous flow caused by a leak. In addition, it may also be necessary to engage the Pump Mode setting to compensate for the ebb and flow in the pipe. (*See Stage Eight for Pump Setup*)

WARNING  **Hard Water** - In hard water areas where calcification is a problem with plumbing fixtures, this could inhibit functionality of the AquaTrip. Therefore advise the user to increase scheduled servicing and system check procedures to compensate for this, as required by the severity of the water hardness.
NOTE - If a Water Softener is fitted, if possible install the Shutoff Valve downstream of it.

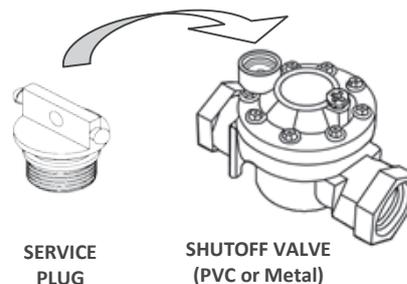
Always install the Shutoff Valve in a location easily accessible for installation, programming and maintenance. There must be a manual stop cock upstream of its installation point, so the system can be isolated from the incoming supply.

In installations using rain water tanks, bore water or water supplied in some rural areas, we would recommend installing an inline filter (if not already fitted) on the incoming main line to minimise debris entering the system.

2. STAGE TWO — Shut Off Valve Installation

Screw the **Service Plug** into the **Shutoff Valve**. After you complete the installation, replace the Service Plug in the Zip Lock bag provided, and attach the bag to the Shutoff Valve. The Shutoff Valve may be **PVC or Metal** depending on the AquaTrip model version.

Install the Shutoff Valve on the incoming main COLD water line, just after the main shut off valve, water meter and fire suppression system (if fitted). This will allow the AquaTrip to monitor as much of the property's plumbing as possible. Make sure you have sufficient access to safely run the connection cable from the Shutoff Valve and Control Unit location, up to the mounting location of the Control Panel.



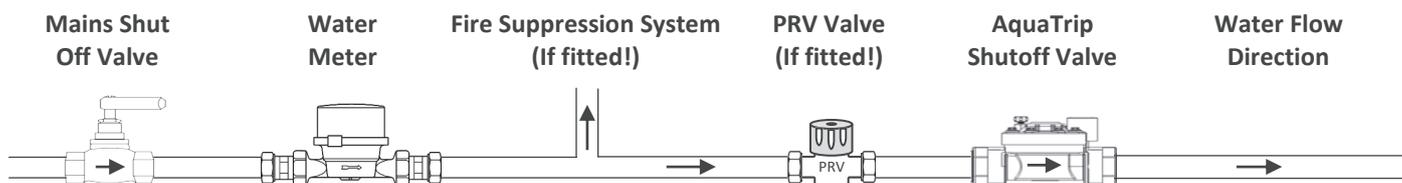
WARNING The Shutoff Valve is directional and the water flow direction must match the direction of the arrow stamped on the valve, else the system will not function. **DO NOT** install the valve in Hot Water Lines. The maximum water operating temperature is 50 °C or 122 °F.

Horizontal Pipe Installations

The Shutoff Valve must preferably be mounted horizontally in line on the incoming pipe. This is because the Control Unit must always be upright in a vertical plane. If the installation is in a horizontal plane, the parts will generally be arranged as per Diagram A. The AquaTrip must be installed according to local government plumbing and building regulation requirements, and the installer must take into account the plumbing and appliances already at the installation, which may have a bearing on the functionality of the system and its interaction with those appliances.

Diagram A

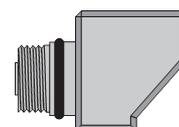
Typical Horizontal Installation format (Example only)



Vertical Pipe Installations

If the incoming pipe runs vertically, e.g. coming up through the floor from under the house slab or in the basement, the Shutoff Valve may be mounted vertically in line on that pipe. BUT, if this is the case, you **MUST** fit the optional **Right Angle Adapter** (Part # EXT- RA90) see Diagram B alongside, before you screw the Control Unit into the Shutoff Valve. (See *Stage Four of this manual for vertical pipe installations*).

Diagram B



EXT- RA90
Right Angle
Adapter

NOTE: Whether the Shutoff Valve is mounted horizontally or vertically, the Control Unit **MUST ALWAYS** sit vertically or the system will **NOT** function.

External or Below Ground Installations

If it is necessary to install the Shutoff Valve outside or underground, install a suitable **ground box** or **valve box** to protect the AquaTrip from the elements. Do not leave it exposed out in the open if possible. The Control Unit is fully waterproof and can be immersed in water if required. If it is mounted outside in below zero temperatures, make sure the ground box is **fully insulated** to prevent it freezing. The AquaTrip cannot operate below freezing temperatures.

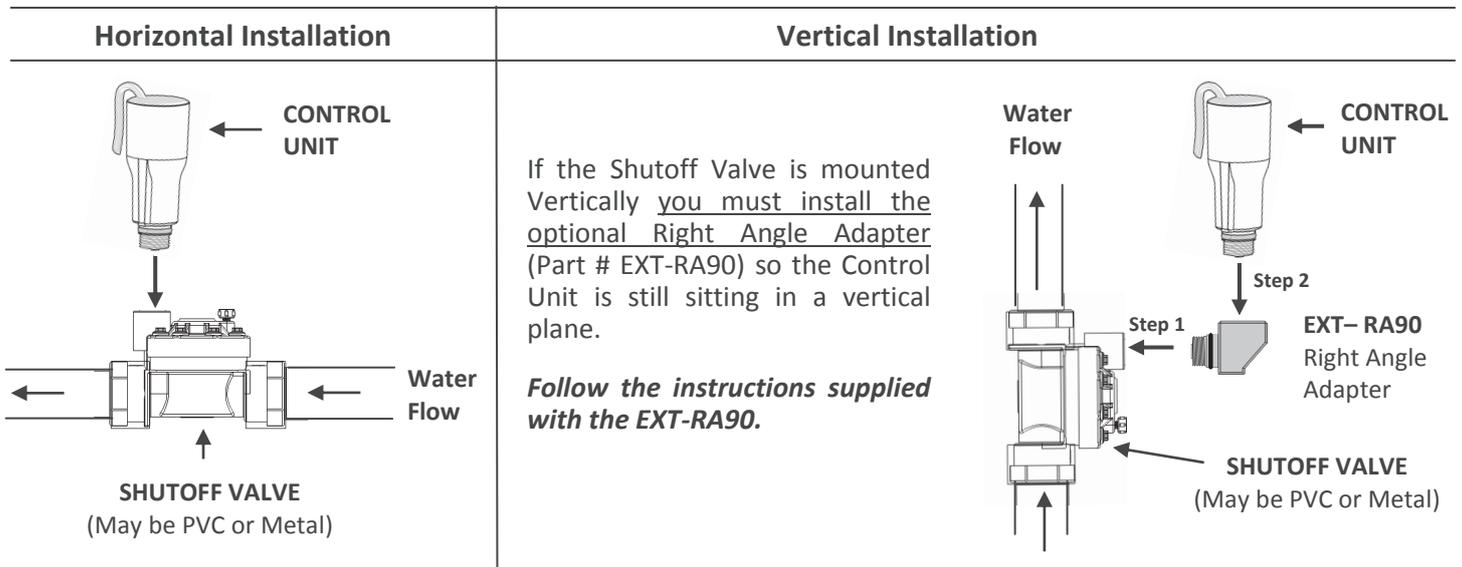
WARNING If it is likely that the AquaTrip may be exposed to zero or sub zero temperatures, you must use the Metal Shutoff Valve only. **DO NOT FIT** the PVC valve version in an installation where the Control Unit and Shutoff Valve may be exposed to freezing temperatures.

If mounted underground, make sure the underside of the ground box lid has at least 2" or 5cm clearance above the TOP of the Control Unit, when the lid is replaced on the ground box. This is to prevent damage to the Control Unit if the lid is forced down by some impact to it.

3. STAGE THREE — Installing the Control Unit into the Shutoff Valve

Turn off the main water supply. Open a tap to release the pressure, then close that tap. Now remove the Service Plug (slowly as some water may escape). Now carefully screw the Control Unit into the Shutoff Valve firmly until it stops, but do not over tighten it. **Take great care not to cross thread the Control Unit as you screw it into the Shutoff Valve.** The Control Unit seals using the O-Ring fitted above the threads, so **DO NOT put PTFE (plumbers) tape on the Control Unit threads.** Once the Control Unit is screwed into place, turn the main water supply back on.

NOTE: Screw the Control Unit into the Shutoff Valve by hand before you connect the cable up to the Control Unit, if you do not, the winding action of screwing in the Control Unit will put twists and kinks in the connection cable.



4. STAGE FOUR — Connecting the Control Unit to the Control Panel

You must run a connection cable from the Control Unit to the Control Panel. The gauge of the cable which must be used, is dependent on the distance it needs to travel.

- 1.) For cable runs of up to 20 metres or yards, a minimum cable diameter of 0.25mm² is suitable
- 2.) For cable runs of up to 100 metres or yards, a minimum cable diameter of 0.5mm² is suitable.
- 3.) For cable runs of up to 300 metres or yards, a minimum cable diameter of 0.75mm² is suitable.

You will need a power point to plug in the 12V Transformer which will supply power to the Control Panel. There are two options to get the power supply from the 12V Transformer to the Control Panel.

Option 1 - You can plug the 12V Transformer into a power point near to the Control Panel, and then connect the cable from the Transformer directly to the connection point on the back of the Control Panel. In this case you will only need to run a 4 core cable from the Control Unit to the Control Panel.

Option 2 - You can plug the 12V Transformer into a power point close to the Control Unit, and then connect the cable from the Transformer to two free wires in the connection cable that you are running up to the Control Panel. In this case you would then connect these two wires that carry the 12V power to the connection point on the back of the Control Panel. If you choose this method, you will need to run a 6 core cable from the Control Unit to the Control Panel.

If the Control Unit is installed outside or underground, quality irrigation cable suitable for subterranean applications must be used. For extra protection, the cable should be routed through conduit or irrigation poly pipe. Make sure to leave at least 15" or 40cm of excess cable at each end for easy access when making the connections.

If the connection cable is run entirely inside the house, then it does not need to be underground quality, but still needs to maintain the conductor sizes recommended above, and should be neatly routed and secured to prevent it rubbing or touching any other wires, pipes or fittings.

Once the cable is run, use the supplied 3M Quick Connectors to join the wires on the Control Unit to the wires at the end of the cable that you have run up to the Control Panel. Make sure the ends of the wires are CLEANLY cut with sharp side cutters or similar, and DO NOT strip the insulation. Insert the two wire ends fully into the 3M Quick Connector, and using parallel jawed fishing pliers (**preferred**) or slightly opened water pump type pliers, carefully squeeze the Red Cap firmly until it is flush with the clear plastic surround, and the grease appears around the wires.

Match colour to colour if using similar type of wiring. If not, write down the new wire colour matching sequence, to enable correct connection to the Control Panel. The 3M Connectors are fully waterproof and are able to be submersed under water. ***If the system does not appear to work correctly, please carefully re-check these connections (It is VITAL that these connections are watertight if fitted outdoors).***

5. STAGE FIVE — Mounting the Control Panel

Remove the Wall Mount Plate from the Control Panel by gently inserting a small flat blade screwdriver into each of the three slots or the two corners on the LOWER side of the Control Panel. Lever apart gently, to remove the Wall Plate.

Using the Wall Mount Plate as a template, mark out the mounting position on the wall, bearing in mind that you **MUST** be able to cut through the Plasterboard wall into the cavity behind (allows for wiring access and space for Backup Battery). Choose a spot that avoids any wall studs and any pipes or electrical cabling that may be located in the wall cavity.

Now fold out the two battery mounting tabs on the wall plate, so they sit at 90 degrees to the wall plate. (Do NOT repeatedly fold these tabs, as they will break off.)

Mount the Wall Mount Plate to the wall using appropriate fixings for the wall surface. It is also designed to fit to a standard horizontally mounted switch plate bracket, when fitting to a Plasterboard wall (use standard switch plate screws).

Cut out enough of the wall behind the mounting point to allow the backup battery mounting tabs to fit into the recess of the wall. For Brick or Cement wall mounting, a pocket may need to be cut or drilled to accommodate the battery mounting tabs.

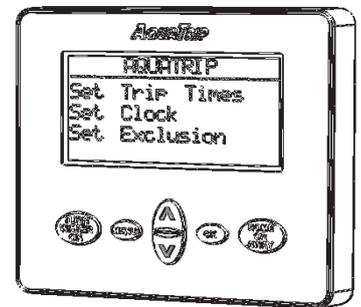
Feed the connection cable which comes in from the Control Unit through the wall cavity to the location of the Control Panel, leaving at least 15" or 40cm of excess cable so that the wires are not too stretched in reaching the Control Panel.

Pass the connection cable through the battery cavity section to allow for easy access to the terminal blocks located on the back of the Control Panel front housing. This will allow for easy connection to the Control Panel, and no problems when removing/attaching it to the wall.

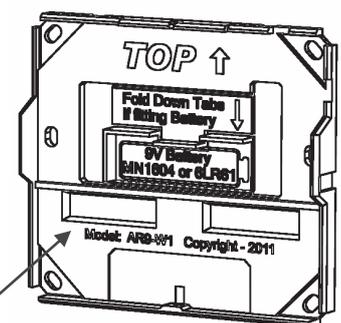
NOTE: DO NOT pass the connection cable through the two long narrow slots. It must go through the battery cavity section.

If the wires from the 12V Transformer to the Control Panel, were run separately from the connection cable (Option 1 from Stage Four), then also feed these wires through the battery cavity section, leaving at least 15" or 40cm of excess cable to allow easy access for connection to the Control Panel and to prevent the connection cable being stretched.

Control Panel



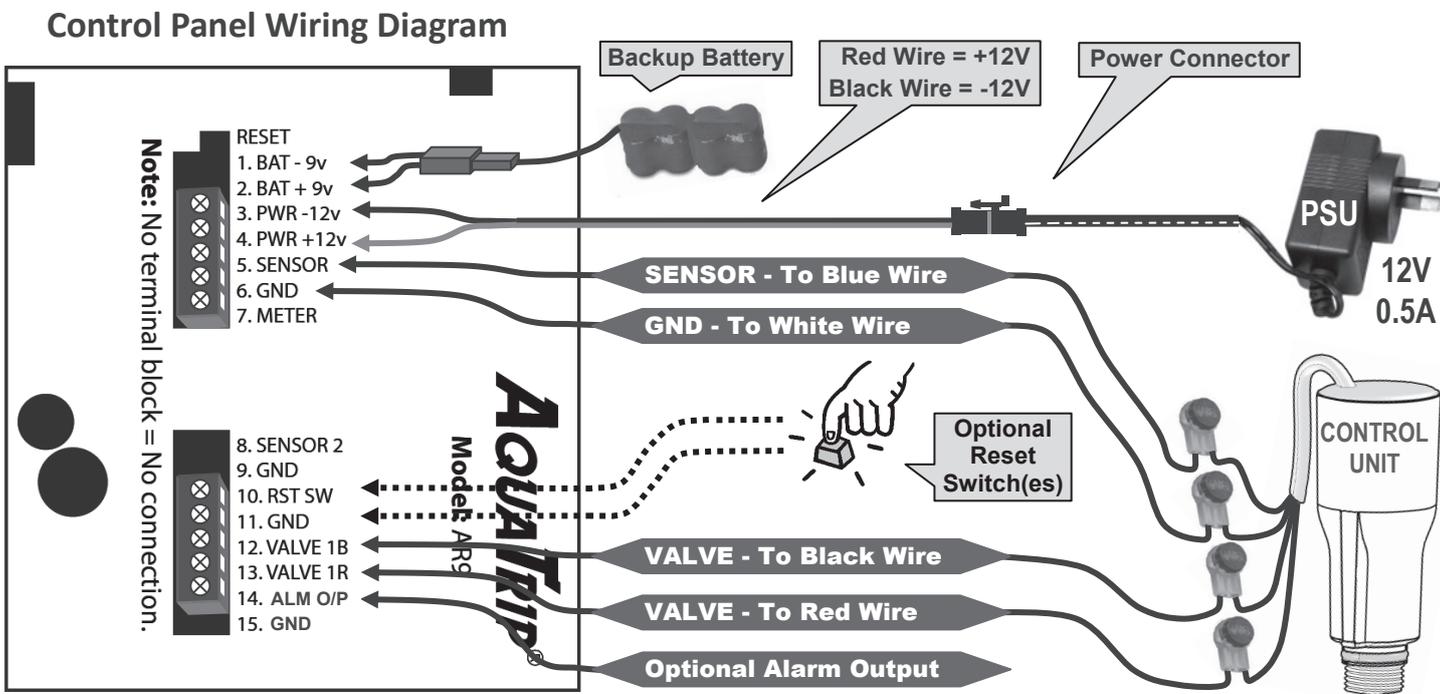
Wall Mount Plate



6. STAGE SIX — Wiring the Control Panel

Strip the outer insulation from the connection cable from the Control Unit back about 10cm or 4". Then strip 5mm or 1/8" of insulation off each inner wire, including the wire from the 12v Transformer power supply. **(Do not plug the 12v Transformer into the power point plug socket until everything is already connected)**. Now connect each wire to the terminal blocks on the Control Panel as per the diagram below using the small screwdriver supplied with the System.

NOTE: If you do not require the 3m Red/Black extension cable from the transformer, then the White Stripe wire of the Power Supply is the positive one. If the unit fails to power up after connecting and turning on the supply, try swapping these power wires around.



RESET SWITCH INPUT - This input is for connection to any type of Momentary switch (like a Bell Push), to allow the water to be turned on from other rooms. The switches must be Normally Open types, and you may fit as many as you like (connect them in parallel). This connection can also be used for optional AquaTrip Movement Sensors, which automate the system for use in public or commercial or school washroom facilities. This can also receive inputs from a BMS system and allow a Building Manager to switch the water back on remotely using the BMS or other system.

ALARM OUTPUT - This optional connection is used when you wish to have a remote indication that the system has tripped. **NOTE:** The alarm output will only activate if the Flow Time has been exceeded, it will NOT activate if the water has been turned off using the Water Off function.

The Alarm Output is an UNPROTECTED negatively switched 'open collector' transistor output, with a maximum current sink capability of 500ma. This output may be used to trigger say a spare 24 hour zone on the properties alarm system. This will then alert the user or a monitoring service to the fact that the system has tripped, as a leak has been detected. This output can also be used to trigger other devices, such as a remote LED Indicator, Building Management System or GSM dialler. If you wish to trigger a device which requires more than 500ma to drive it, you must use the output to switch a relay. **WARNING: Damage to this output is NOT covered under warranty. Use with CAUTION!**

BACKUP BATTERY - Next plug in the Backup Battery. At this point, the Control Panel should power up, waiting for the Clock to be set. If it does not, the battery may have insufficient charge for the initial power up. If this happens, plug in the 12V Transformer, turn on the power point and the system should now turn on. The battery will take about 48 hours to charge up.

SETTING THE CLOCK - Press the MENU button, and complete the Clock setting procedure. This is very important, as if the clock is not set to the right time, the system will not function correctly.

WATER METER CONNECTION - If you wish to connect the water meter to the Control Panel. You will need to purchase the correct Sensor to suit the property's water meter. Attach the Sensor to the water meter and connect the two wires coming from the Sensor pickup to the Ground (6. or 9.) and Meter (7.) connection points on the Control Panel connection system. Set up the water meter by turning on the Water Metering function in the Settings menu.

7. STAGE SEVEN — The System Check Procedure (Five Steps)

Before clipping the Control Panel to the Wall Plate, you **must** conduct all five steps of this System Check Procedure to make sure the system is correctly connected and working correctly. If you encounter problems please refer to Section 10 and Section 14 for Diagnostics advice and Troubleshooting.

NOTE: If no water flows initially, reset the AquaTrip by pressing the **Turn Water On** button on the Control Panel, and the water will be able to flow.

STEP 1 - Flow Sensor Test - Turn on a tap so that the water is flowing at a **slow trickle** of at least 40 to 50ml or 1.25 to 1.5oz per minute, this is when a drip just becomes a constant trickle. On the Control Panel you should see the animated water droplet icon in the top row of the display near the clock. This confirms the Flow Sensor sees the flow.

If no water droplet icon appears, check the Control Unit is firmly screwed into the Shutoff Valve and test again. If need be, increase the flow slightly, and retest. If flow now registers, then scale the flow back to around 40 to 50ml or 1.25 to 1.5oz per minute, and recheck the Flow Sensor can see the reduced flow. This test is very important as it confirms the flow rate that the Flow Sensor can detect. It should be able to see flow down to around 50ml or 1.5 oz per minute. Due the effect of hysteresis, a slightly larger flow may be required to start the Flow Sensor, but once it can sense the flow, it will be able to see the flow even if it drops down to approximately 50ml or 1.5oz per minute.

STEP 2 - Water Shutoff Test - Turn the tap on again, the droplet will appear on the display to let you know the Flow Sensor is seeing the Flow. Now press the **Home Away** button, this will engage the Away mode which allows one minute of continuous water flow. After approximately one minute has passed, the water will turn off. This confirms that the Shutoff Valve is working correctly.

STEP 3 - Water Reset Test - Now that the water has been shut off, press the **Turn Water On** button, and the water will come on. This confirms the Control Unit and Shutoff Valve are working correctly.

STEP 4 - Leak Detection Test - Turn the tap on again to a slow flow so that the droplet icon indicating water flow appears in the Display. Now turn off the tap. The droplet icon should disappear within 15 to 45 seconds, indicating NO Flow. If the droplet continues flowing it means that the Flow Sensor is still sensing water flowing on the property somewhere. Check for taps dripping or left running or leaking toilets etc.
NOTE: *As long as the Sensor is seeing water flow, the animated droplet icon will remain on the screen.*

STEP 5 - Flow Sensor Functionality Test - If the Sensor continues to detect water flow, and you are certain that there is no water flowing anywhere, you need to test and see if the Flow Sensor is working correctly. To do this, turn on a tap to a flow of about 50ml or 1.5oz per minute. This time, turn **off** the MAIN incoming tap to the property. Since you are now cutting off the main supply, the droplet should stop flowing almost immediately. This confirms that the Flow Sensor is no longer seeing any flow and is working correctly. If the droplet continues flowing with the main incoming supply now turned off, it means the Flow Sensor may be jammed or damaged and therefore the Control Unit needs servicing.

FAST TEST MODE - For experienced installers, an even quicker Fast Test mode is available to assist with installation. With water flowing and the Droplet icon appearing in the Display Panel, press the **MENU** button to move to the second menu called **Water Options**. Use the **Down Arrow** and select **Turn Water Off** and then press **OK** button. The water will now turn off. This saves waiting the one minute you would wait if using the AWAY mode in Step 2.

Clipping the Control Panel onto the Wall Plate - Once the System Check Procedure has been successfully completed, the Control Panel may now be clipped to the wall plate. Before you do, apply a small piece of the supplied double sided tape to the Backup Battery. Then, while holding the Control Panel against the wall to the right of the Wall Mount Plate, carefully insert it between the folded out Battery Tabs.

Now clip the Control Panel housing onto the rear Wall Mount Plate, be careful to feed the wires back into the wall cavity and not trapping the red Backup Battery connector. Clip the two top locking tabs on the topside of the housing in first, then press fit the bottom of the housing towards the wall. It will click into place.

If you need to unclip the panel from the wall, insert a small flat head screwdriver into the slot in the centre of the underside of the Panel and gently lever the Panel off.

8. STAGE EIGHT — Control Panel programming and Features explanation

Once the Clock has been set, use the **MENU** button to scroll through the various menu screens available and use the arrows to move up and down the selection options within each screen. Use the **OK** button to make a selection.

There are four possible screen function menus - the system is supplied with only the three Leak Detection function menus activated. The fourth menu option is for Water Metering and is only used if you wish to connect the Control Panel to the water meter to log the water consumption. To enable this feature, you will have to turn the Water Metering menu on, and also run a cable and a sensor to connect to the meter. (see instructions below)

Along the top line of the display are the following Icons representing the screen function menus which are available.

ICON	MENU	DESCRIPTION
	HOME	This is the default menu which will always appear after 20 seconds, no matter what menu you leave on the screen. There are two Home screen options depending on whether the Water Meter is connected to the Control Panel or not.
	WATER OPTIONS	This is where you can select certain Control and Information functions
	METERING	This only appears if water metering is enabled and the Water Meter is connected. (this is defaulted to OFF — use the Settings Menu to turn Metering on if the water meter is connected to the Control Panel)
	SETTINGS	This is where you select and program all the System Settings

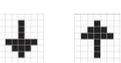
THE HOME MENU



The HOME screen will always appear after 20 seconds, no matter what menu you leave on the screen. There are two HOME screens options which can appear depending on whether you have the Metering function turned on or not.

<u>Option 1</u> <i>Without the Water Meter interface (Default)</i>	<u>Option 2</u> <i>With the Water Meter interface</i>
The current status of the unit (Active or Inactive) The longest single water use in minutes (from Sun 12pm) Time and day the last leak was detected	The current status of the unit (Active or Inactive) Average daily water use in litres Consumption today in litres and dollars

On the Home Screen you will also see certain of the following Icons appear under certain circumstances :-

ICON	DESCRIPTION
	The Water is Flowing - an Animated Water Droplet will appear if the Sensor can see the flow
	The Mains Power is Disconnected - an Alarm will also beep every 5 minutes
	An Alarm message has been received - press OK to view the message
	The arrows indicate that the Menu continues onto the next screen, and you can access these extra screens by using the arrows to scroll up or down as appropriate

WATER OPTIONS MENU



This menu allows to you to access and activate the following functions -

- De/Reactivate System** This function will turn off the Leak Detection ability for the next 3 hours – For example, when filling a pool, doing building work, or pressure cleaning the house etc.
- Turn Water Supply Off** This function will turn off your Main water supply. To turn the water back on the user will have to press the Turn Water On button and then follow the instructions on the screen. This is a two step procedure, preventing accidental turning on of the water, in case it was turned off for plumbing maintenance or some other deliberate purpose.
- Trip Counter** Keeps a count of the number of times the system has cut the water (Tripped). It does NOT add to the count if you have turned the water off manually. You may also reset the Trip Counter back to zero by pressing OK.
- Manual Override** This function allows you to completely override the system in an Emergency and enable unrestricted water flow. E.G. Use when Fire Fighting, or for other long term continuous water usage. Rotate the Control Unit **one half turn anti clockwise**. The system will now be fully disabled and there will be no leak detection function. To re-engage the system, rotate the Control Unit clockwise until you feel it stiffen. You must complete the System Check Procedure again to confirm it is engaged and functioning correctly.

WATER METERING MENU



This menu only appears if the Water Metering is turned ON in the Settings menu AND the Water Meter is connected to the Control Panel. Use the Up/Down arrow to scroll through the three Water Metering menus which give the following water usage data and consumption information:-

- Longest single water use in minutes
- Today's consumption in litres and dollars
- Previous seven days consumption in litres and dollars
- Up to 4 weeks consumption in litres and dollars
- Total water consumption in Kilolitres (cubic metres)
- Last Trip Time (last time the system tripped due to a leak or excess use)
- Daily consumption for the past seven days in litres and dollars

There is a Water Usage Alarm in the Water Meter Settings menu where you can set a daily consumption amount, and if you exceed that amount, an alarm will sound to enable you to monitor and control your consumption.

SYSTEM SETTINGS MENU



Use the Up/Down arrows to scroll through the two screens which give access to the System Setting options :-

Water Flow Trip Times - The Aqua Trip measures how long water flows for, every time water flows. If the water flows continuously without a break in flow, for longer than the programmed Flow Time, it assumes there is a leak or burst pipe and shuts off the water. You can set these Flow Times and the periods that they will apply to, using this menu. (*see Section 9 - How does it work?*)

You must first choose your **Peak Water Usage period**. This is the period of the day or night when your usage is likely to be at its highest, choose one of the two options below:-

6 am to 9 am AND **6 pm to 9 pm** (Typical **Residential** user Peak Water Usage Periods) OR
6 am to 6 pm (Typical **Commercial** user Peak Water Usage Period)

Once you have chosen your **Peak Water Usage Period**, you must then choose your maximum water **Flow Time** for that Peak Water Usage period. The system allows you to set a Flow Time from as short as 1 minute and up to a maximum of 3 hours. You must choose your Flow Time based on how long you believe water will be used continuously in your home, without a break in the flow. Remember, appliances like washing machines and dishwashers, while their cycle may last 30 or 45 minutes, are actually only consuming water for perhaps 2 to 5 minutes continuously at any one time.

Next, you must choose your **OFF Peak** maximum water **Flow Time** - This is the time period outside the Peak Water Usage period. Generally this is when there is a lower level of occupancy and thus a lower level of water usage in the building. You can then set your maximum water Flow Times during this period to be considerably lower, as there is likely to be less water being used. Choose the shortest possible time that will not interfere with daily use.

Warning Pause length - So you can never be caught out by the water turning off when you do not expect it, e.g. being caught in the shower without water, there is an **early warning function**. The AquaTrip can pause the water flow 3 minutes before the **programmed** Flow Time is reached, as a warning that the water will be shut off in 3 minutes if flow/usage continues. If you do not want this function set the time to zero (default). You can set the warning pause to last from 1 to 15 seconds. If there is extensive plumbing or a long run to your water meter, you may need to use a longer time. (Refer to the System Warnings section before setting this feature).

Exclusion Time Period - This function works as a "Sleep Mode" and allows you to put your AquaTrip to sleep (**no leak detection**) for a certain time of the day or night, and the AquaTrip will ignore all water use during the Exclusion Period.

For example: If you have irrigation which turns on for two hours from 6pm to 8pm every Monday, Wednesday and Friday, you can program the AquaTrip to ignore all water use during those time periods. This function is also used for busy Commercial Washroom Facilities where you may only want after hours monitoring. Use the **OK** button to access this menu and follow the prompts on the screen. Once it is set, if you return to this menu option, it will display your current Exclusion Period setting. Note that there is only one time setting available for all chosen days. You cannot set different times on different days. Only whole hours may be set at this time.

If you do **NOT** want this function enabled, set the same start and end time for the Exclusion Period.

Automatic Water Reset - This menu appears after you set your Exclusion Period (if you do). On this Menu you can turn ON or OFF the "**Auto Reset**" Function. *This function ONLY WORKS when an Exclusion Period has been set.* When the AUTO RESET function is turned on, if the AquaTrip detects a leak and shuts off the water, when the Exclusion Period starts, the AquaTrip will turn the water ON AGAIN, *even if the leak or water flow is still present.* Then, when the Exclusion Period ends, and the AquaTrip wakes up, if the water flow is still present, the AquaTrip will turn the water OFF AGAIN.

The reason for this is, in some commercial facilities, the AquaTrip can perform an overnight monitoring function, and shut off the water if a leak is present, then turn the water back on again in the morning when the facility needs to be used. Therefore, you can use the Exclusion Period to put the unit to sleep when the facility is in operation, and then have it wake up and monitor when the facility is not in use. If a leak is detected, and the water is turned ON AGAIN, a message and alarm will appear on the Display Panel, so that the leak is known about and can be investigated, however the water will be operating in the facility as normal. (**Use this function with Caution**).

Auto Home/Away Time - This function allows you to automatically reduce the Flow Time down to ONE minute, for certain days and times. This is ideal for when you are regularly away from home for set periods and there is likely to be little or no water usage. That way if there is a burst pipe or leak the longest time the water can flow for is one minute. **Warning - refer to the Section 11. on System Warnings on Home Away mode before using this function.**

For example, if your house is unattended every week day from Monday to Friday from say 7am to 5pm, you can set the AquaTrip to automatically go to Away mode during that time period each day, and then you will have total peace of mind that while you are out, the system is automatically set to a high level of detection and protection. You can cancel this function at any time, by just pressing the **HOME or AWAY** button.

You can also set the Home/Away function by pressing the **HOME or AWAY** button on the Control Panel when you leave the building. This reduces the maximum water Flow Time down to one minute. **Button lights up Red = Away, Button lights up Blue = Home** (Refer to Section 11. on System Warnings before engaging the Home/Away mode).

Alarm/Sound/Backlight - This menu allows you to set the following audio and visual functions ON or OFF:-

- (ALL) Speaker Sounds (no audible warnings)
- Push Button Sound
- Warning Alarm Sound
- Backlight for the Display
- Backlight off at Night (6pm till 6am)

Clock - Set the Clock using this menu. DON'T press **OK** again after setting, press **MENU** when finished.

Away/Night Watch - From this menu you can turn these two features on or off. The default setting is OFF.
Away Watch - With Away Watch ON - if the system sees NO flow for a clear 24 hours after midnight, it will automatically assume the householder is Away and reduce the maximum Flow Time down to 1 minute. Only set this feature after having read the System Warning section!

Night Watch - With Nightwatch ON - the Flow Time between 12 midnight and 5am will be reduced to 3 minutes. If the Shutoff Valve is tripped and then reset during that time period, the AquaTrip will know the user is awake and using water, and will cancel Night Watch for that specific period. The Nightwatch mode will resume the following midnight.

Water Metering - This menu is only used if you have the Water Meter connected and is used to set the following:

Is your Water Meter connected - YES or NO

Water Meter Pulse Rate - Enter the pulse rate of your meter. (Eg:10 litres per pulse)

Water Cost per Kilolitre - Enter the cost per kilolitre that you pay for water.

Water Usage Alarm - Enter the expected daily consumption, alarm will sound if this amount is exceeded to alert user to excessive use.

Clear Meter history - You can zero your water usage history using this menu.

Other Settings - Pressure **Pump Mode** - If the property water supply is fed by a pump with no accumulator tank or pressure vessel to maintain pressure in the system, you must turn ON the Pump Mode.

NOTE: In Pump mode the AquaTrip may not be able to detect smaller leaks.

9. How does it work ?

The AquaTrip monitors the flow of water into your property. It is able to shut off the water automatically in the event of a water leak, a cracked pipe, a tap or faucet left running, a leaky toilet cistern or some other plumbing failure. AquaTrip can detect very low flows, and is more sensitive than most water meters. **You can use AquaTrip's System Check Procedure to check your plumbing system for leaks. This must be done at least every six months (preferably quarterly). Fill in the test results on the Service Record forms pages at the back of this manual.**

AquaTrip works by measuring water flow over time, and is equipped with a Flow Sensor linked to a Timer. You must program the Flow Time setting on your AquaTrip with the longest period of time you think water may flow **continuously** on your property (without a break in flow), during normal use. This Flow Time can be set from 1 to 180 minutes. **The AquaTrip will shut off the water if it sees continuous water flow for longer than the Flow Time that you have programmed into it.**

For example: If you set the Flow Time to 30 minutes and the water flows continuously for more than 30 minutes, the AquaTrip will shut off the water supply. Note that household appliances like dishwashers and washing machines, start and stop the water supply several times during their cycle. As long as all water flow stops at some point within the 30 minutes, the Flow Sensor timer is reset. The timer then restarts from zero when the water flow resumes. Think carefully about your normal water use patterns and then set the Flow Time to suit. You can change the Flow Time settings at any time.

The AquaTrip has several different settings and features which can be programmed to maximise the efficiency with which it can detect a leak and respond to it, without any interference to your normal water use. Please read this manual to make sure you are familiar with all the available system settings.

What to do if the water turns OFF ? - If your AquaTrip detects a water leak or a tap left on, it will shut off the water supply after the Flow Time is exceeded. The Control Panel will then emit a beep every 5 minutes, to let you know the water is OFF. (To ensure peaceful sleep, the Panel will not beep between 10pm and 6am). To turn the water back on, press the **TURN WATER ON** button on the Control Panel. The water will turn on immediately. You must look for any obvious leaks (like water on the floor etc) to identify the cause of the 'Trip' before turning the water back on. If none are evident, turn the water on and look for a less evident cause.

If the Control Panel does not respond for some reason, you can always turn the water on manually by using the Emergency Manual Override procedure explained in Section 17 on the back page of this manual.

10. Control Panel Diagnostics

PROBLEM:- No water flow detected

If the display does not show the droplet icon when a tap is opened, there may be a wiring issue or the Control Unit is in manual override. On the Control Panel turn off the water supply - [MENU button] – [Water Options] - [Turn Water Supply OFF]. Check that the water has turned off by opening a tap. If the water is still flowing, or is flowing slowly, then turn the Control Unit anticlockwise half a turn, and then re-tighten it by turning it clockwise gently by hand, until resistance is felt and the tap should cease flowing. Turn water on by pressing the **Turn Water ON** button on the Control Panel, and check for the droplet icon.

If there is still no icon, then there is a wiring issue, check that the white wire is connected to 6. GND and the blue wire is connected to the 5. SENSOR. Possible issues – (1) Insulation caught in the terminal block (no contact with copper wires); (2) The 3M Quick connector failed to make contact and the wires are not connected; (3) Mismatched wiring connections.

PROBLEM:- Water flow Icon won't go away.

If you close all the taps, and the droplet icon stays on the display, there is water flowing or a wiring issue. Close the incoming water main. If the flow icon is gone then there is a leak or water flow on the property. If the droplet icon remains after closing the water main, there is either a possible wiring issue OR the Flow Sensor may be faulty. Re-check the connections to the 5.SENSOR and 6.GND connectors and / or conduct the five System Check procedure steps.

PROBLEM:- Water turns OFF when pressing the [TURN WATER ON] button

If this is occurring, then the connections to the Control Unit are back to front. Check that the 12.VALVE 1B is connected to the Black wire, and the 13.VALVE 1R is connected to the Red wire.

PROBLEM:- The Water Meter/Water Used information is not changing!

If the water meter is not showing a reading in the “Today” section on the main screen, check the following:-

The water meter sensor has been correctly fitted to the water meter.

The correct pulse rate for the meter has been selected in the [Settings] [Water Meter] menu.

That enough water has flowed to get the meter to pulse. (Some meters only pulse once every 100L or every 1000L)

That the unit is wired correctly. Check that the wiring is making proper contact within the 3M quick connectors.

PROBLEM:- Mains Power Fail icon stays on

Test the power point is working by plugging in another electrical appliance. If there is no power, use another working power point or get your electrician to rectify the fault.

Check the wiring to the control panel. The power pack should be connected to 3.PWR -12v and 4.PWR +12v. Check that the wire insulation is not preventing the wire contacting within the terminal block.

Check that the polarity is correct. Turn off the power pack and swap the wires around. Turn power pack back on and check the icon. *(You cannot damage the unit by wiring the power with the polarity reversed)!*

QUESTION:- How do I charge and/or test the Backup battery?

If the backup battery is flat, it will be recharged automatically by the Control Panel when it is connected to the 12v Transformer. It will take 48 hours to become fully charged. To test, turn off the power point supplying your system, and check its operation. Perform a Manual Water Off test, and see that it turns the water back on. Do not forget to turn the power back on after testing. The backup battery should be replaced every five years. Advise the user to test this feature once a year.

QUESTION:- What will happen if the mains power fails?

When the Control Panel senses that the mains power is off, it will emit an alarm every five minutes to alert the user. The alarm will stop once the warning is acknowledged. The system will run on the backup battery for approximately 30 days. In this state it turns off the screen to save battery power. Press any button to wake up the display, then use buttons as normal. **Note:** The Control Panel continues to monitor your water flow when operating on the backup battery, and can turn off/on the water supply using power from the backup battery.

QUESTION:- How do I stop the warning beep?

The alarm warning beep will stop when the message on the screen has been acknowledged by pressing the OK button. The bell warning icon will then disappear. To minimise annoyance, it will also not sound after 10pm at night until 6am the next day.

11. System Use and Function Warnings - READ CAREFULLY

Fire Fighting - In the event of a fire on the property, you must immediately engage the Emergency Manual Override mode of your AquaTrip. (see the back page of this Manual) This will allow uninterrupted water flow for fire fighting.

WARNING  It is the system owner and the users responsibility to make sure that **ALL** occupants of the property are made fully aware of the features and functions of the AquaTrip system, and are clearly shown and understand how to override the system in an emergency.

No Water Use Warning - Your AquaTrip system will constantly monitor the water usage on your property. If it does NOT detect water flow for a period of 24 hours or more, it WILL alert you by sounding the buzzer for the first day, and with the following warning message on the Control Panel thereafter. "**No flow detected in 24 hours**"

WARNING  Under no circumstances should you ignore this message. It may well be legitimate if you have been away from the property for more than 24 hours, however, if you know that water has flowed within this time, then you **MUST** check to see if your system has been overridden or is faulty. If in any doubt as to why this message appeared, consult your plumber, as the system may need to be serviced.

Hard Water Areas - If your property is in an area of hard water, the AquaTrip system may require more regular testing and servicing. Calcification may build up within the system and inhibit its performance.

WARNING  Hard Water may cause interference with the Flow Sensor or other components of your AquaTrip system. It is preferable that the AquaTrip be fitted downstream of a Water Softener system if fitted. In any case, regular inspections of the Debris Filter are highly recommended.

Flow Time Setting Optimisation - To enable the AquaTrip to alert you to a potential plumbing problem as quickly as possible, set the Flow Times to be the shortest time possible, that does not interfere with your normal day to day water usage. Make use of the different Flow Time settings and the automatic Away and manual Away settings.

WARNING  Your AquaTrip is designed as a warning system to alert you to possible leaks or plumbing failures. It cannot prevent leaks or prevent damage from leaks, however the AquaTrip may help to minimize water loss and may reduce potential property damage, if the shortest possible Flow Time settings (comfortable for the users), are applied .

The HOME AWAY mode - This is used to switch the System from Home Mode with all the user defined programmed Flow Time and other settings, into **AWAY** Mode where the Flow Time is only one minute under all circumstances. Pressing the button again will toggle the status back to **HOME** Mode.

When you activate AWAY mode it cancels all other Flow Time settings and defaults the AquaTrip to a one minute Flow Time. This is for any time the property is left unattended. Remember to return the system to HOME on your return.

WARNING  In AWAY mode, if any Exclusion Period settings are active, these will still apply. The system ignores all water flow during those time periods. However, if there is a leak outside of those times the system will shut off the water, which will remain off during the next Exclusion Period, unless the Automatic Reset function has been enabled.

If a leak should occur while the Exclusion Period is active, and say water is flowing due to irrigation, and is leaking elsewhere at the same time (e.g. irrigation valve failure), the AquaTrip will only be able to respond to the real leak, one minute after the Exclusion Period ends.

Leaving the Home unattended - If you leave the property, you should engage the AWAY mode on the Control Panel. It is a single button press and reduces the maximum Flow Time down to 1 minute.

WARNING  Before you use AWAY mode, take into account the water use requirements of your house while you are away. e.g. Irrigation, solar hot water, auto refilling pools, evaporative air conditioners etc. Always check that there are no appliances which need more than 1 minutes worth of water flow, as if this is the case, they will trip the system. Check no appliances will be damaged if their water supply is cut off.

Early Warning Pause Timer - This is an optional feature which halts the water flow for from 1 to 15 seconds, three minutes before the maximum Flow Time is reached. It is designed as an early warning indicator that you are close to reaching the maximum Flow Time set.

WARNING  In some plumbing situations, if the water supply is momentarily halted, the warning pause may give rise to a short rush of cold or hot water. If you enable this feature, you must test to ensure there are no extreme water temperature changes which may cause scalding from hot water, or shock from cold water. To test, set the Flow Time to 5 minutes, and the Pause Timer to your preferred setting. Then, run the shower at your preferred temperature until the Flow stops (after +/- 2 Minutes) and then restarts after the warning pause. Check for any temperature changes during the starting and stopping of the water flow which may cause discomfort. **If in any doubt, do NOT enable this feature**

12. System Service and Maintenance Requirements

Regular System Testing - To make sure your system is working correctly, conduct all five steps of the System Check Procedure at least every six months. Re-confirm that the Flow Time settings suit your water usage requirements and are set as short as possible. This allows the system to act upon a leak or inadvertent use as quickly as possible.

Certified System Testing - Further to the point above, in some countries, if you are receiving a discount from your insurance company through the installation of the system, it may be a requirement that a plumber complete the Service History records on a regular basis, in order to keep your Insurance discount current.

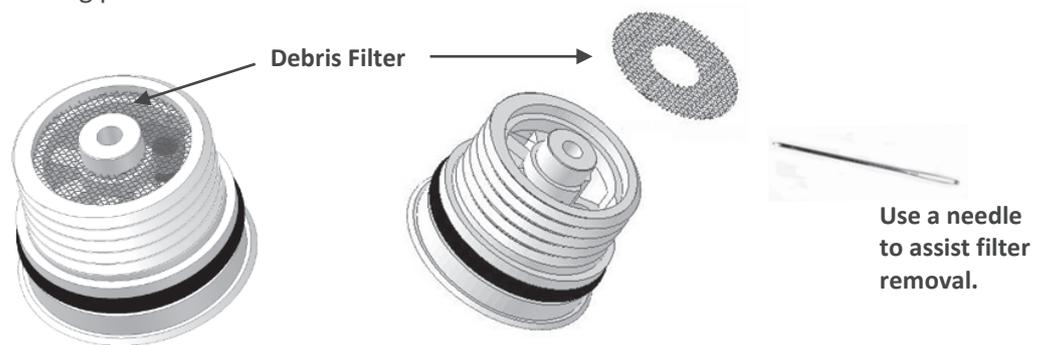
Control Unit Servicing - If you ever need to have the Control Unit serviced, the Control Unit will need to be unscrewed, and the Service Plug (supplied at installation) screwed in its place. The Service Plug should be in a small zip lock bag attached to the Shutoff Valve or Control Unit with a piece of tie wire. With the Service Plug installed, water is able to flow without restriction, but you will have no leak detection functionality until the Control Unit is re-fitted. We recommend that you contact your installing plumber to do this.

Shutoff Valve Servicing - The Diaphragm in the Shutoff Valve must be replaced every five years, however varying local conditions may require it to be replaced more frequently. A symptom of the diaphragm exceeding its service limits, will be a loss of pressure or a resonance from the valve body.

Debris Filter Servicing - There is a small stainless steel mesh debris filter located in the threaded base of the Control Unit. If you notice any pressure loss on the property, this filter screen may have become clogged. If on a mains water supply with hard water prone to calcification, or tank water or bore water supply, this will need to be monitored more regularly. Cleaning or replacing the filter will usually restore the plumbing to full pressure. We recommend you contact your installing plumber to do this.

CONTROL UNIT
Threaded section
showing debris filter

CAUTION
The filter has sharp
edges, and don't prick
your finger with the needle.



13. Shut Off Valve Specifications

Material	PVC Valve		Stainless Steel SS316 Valve		
	1" 25mm	2" 50mm	3/4" 20mm	1" 25mm	1 1/2" 40mm
Operating Pressure Range	10 - 150 PSI	20 - 150 PSI	7 - 142 PSI	7 - 142 PSI	7 - 142 PSI
	69 - 1034 KPa	138 - 1034 KPa	49 - 980 KPa	49 - 980 KPa	49 - 980 KPa
	0.69 - 10.3 Bar	0.69 - 10.3 Bar	0.5 - 9.8 Bar	0.5 - 9.8 Bar	0.5 - 9.8 Bar
Maximum Operating Pressure	150 PSI	150 PSI	213 PSI	213 PSI	213 PSI
	1034 KPa	1034 KPa	1470 KPa	1470 KPa	1470 KPa
	10.3 Bar	10.3 Bar	14.7 Bar	14.7 Bar	14.7 Bar
Operating Temperature Range	0 °C - 50 °C Cold Water only				
	33 °F - 122 °F Cold Water Only				

14. Troubleshooting

Q: How do I tell the difference between a 'real' leak or just accidental tripping?

A: If your AquaTrip shuts off the water at random times, it maybe an intermittent leak like a leaky toilet washer. If the system continuously trips in SUCCESSION after resetting, then you must look for the leak and/or conduct a Leak Detection Test. Refer to the System Check Procedure in Step 7.

Q: My water often goes off during the night, but not during the day?

A: At night, there are less people accessing the mains water supply, so the pressure in the supply is higher and more constant. This causes small leaks that are difficult to detect when the pressure is fluctuating during the day.

Q: My water goes off occasionally and I cannot find a leak?

A: The AquaTrip cannot be triggered unless water is actually flowing, even if it is only a small amount. Therefore a small amount of water is leaking somewhere. Immediately after resetting the water, conduct the System Check Procedure to confirm the presence of the leak and the functionality of the system.

Q: How do I find out the source or cause of a leak?

A: Firstly check the toilets. Turn off the supply tap to each individual toilet cistern, then you can either wait to see if the AquaTrip trips again, or you can use the System Check Procedure on the Control Unit. By a process of elimination, cutting off the supply to each water consuming appliance or fitting, you can usually work out which one is causing the problem.

Q: What do I do if I cannot find the leak?

A: The leak may be hidden underground or in a cavity wall or under the house slab or somewhere inaccessible and not readily visible. In this case you should contact a Leak Detection company who will have the specialised equipment needed to locate the leak. You may have to leave your AquaTrip in Manual Override Mode until the leak is repaired. **WARNING: Leaving the system in Manual Override will result in an increase to the amount of property damage and water loss while the leak goes un-repaired!**

Q: My water pressure has decreased over time.

A: If you observe a noticeable drop in your water pressure, this may be caused by the Mesh Filter in the base of the Control Unit becoming clogged. It may also be caused by the diaphragm within the Shutoff Valve no longer being within service limits and requiring replacement. The service life of the diaphragm is very dependent on local conditions, but in any event the diaphragm should be replaced every five years. This job must be done by your plumber.

15. Potential causes of water leaks

If the AquaTrip has detected a leak, it is important you find the cause of the leak, or the AquaTrip will keep turning off the water. Finding the cause of some leaks can be difficult, but generally they can be traced to something simple to fix. The AquaTrip can detect very low flow rates. It is more sensitive than most water meters and in some cases it will detect water flow before the water meter begins turning. Use the AquaTrip's System Check Procedure explained in Section 7, to test for water flow and identify if you have a leak.

- COMMON LEAK CAUSES**
- Worn Tap or Faucet washers causing taps to not shut off
 - Hoses left on with the spray nozzle closed but not fully shut off
 - Toilet flush button/lever not returning properly (Very common)
 - Toilet cistern flush washer not sealing properly (Very common)
 - Irrigation valves not sealing properly
 - Fractured underground pipes and pipe joints
 - Washing machine inlet pipes leaking out to the waste line
 - Hot water cisterns leaking out the overflow vent
 - Braided flexible lines/hoses bulge and perish
 - Garden hose spray nozzles left under pressure, blowing off the nozzle
 - Refrigerator or Water dispenser supply fittings failing

16. Service Records

Regularly test your Systems functionality by completing the five step System Check Procedure in Section 7. Fill out the forms below each time this is done. This task may need to be done by an authorised person if Insurance or other compliance requirements need to be met and records kept.

Test Date	System Check Results ✓		Completed By
Date	Flow Sensor		Name
Notes:	Water Shutoff		
	Water Reset		Company
	Leak Detection		
	Flow Sensor Functionality		
Date	Flow Sensor		
Notes:	Water Shutoff		Company
	Water Reset		
	Leak Detection		
	Flow Sensor Functionality		
Date	Flow Sensor		Name
Notes:	Water Shutoff		Company
	Water Reset		
	Leak Detection		
	Flow Sensor Functionality		
Date	Flow Sensor		Name
Notes:	Water Shutoff		Company
	Water Reset		
	Leak Detection		
	Flow Sensor Functionality		
Date	Flow Sensor		Name
Notes:	Water Shutoff		Company
	Water Reset		
	Leak Detection		
	Flow Sensor Functionality		
Date	Flow Sensor		Name
Notes:	Water Shutoff		Company
	Water Reset		
	Leak Detection		
	Flow Sensor Functionality		

WARRANTY Please refer to the separate warranty documentation supplied with the product or refer to our website for warranty policy details for your country. www.aquatrip.com

17. Fire fighting and the Emergency Manual Override Procedure

The AquaTrip has an **Emergency Manual Override** facility, ensuring that you can always disengage the system in an Emergency, and that you will have unrestricted access to water. The Emergency Manual Override is used when you need to use water nonstop for an extended period, e.g. **FIRE FIGHTING**, or in the event of a system malfunction.

WARNING *When the AquaTrip is in Emergency Manual Override, it cannot shut off the water in the event of a leak. DO NOT leave the AquaTrip in this mode unnecessarily, as there will be no leak detection capability.*

1. To place the AquaTrip in Emergency Manual Override, rotate the Control Unit housing **HALF** a turn anti-clockwise.
2. To cancel Emergency Manual Override, gently rotate the Control Unit housing clockwise until it seats firmly, but **DO NOT OVERTIGHTEN**.
3. If you have re-engaged the Control Unit after using the Manual Override facility, you **MUST ALWAYS** confirm that the AquaTrip is functioning correctly by running the System Check Procedure as covered in Step 7 of this manual.

18. Customer Handover and Installation Checklist

Customer Handover - Once the system is set up and functioning correctly, do the following:

- 1) Place the Service Plug in the Zip Lock Bag and attach it to the Shutoff Valve.
- 2) Program the Control Panel to the customers requirements. Show the customer the location of all the components of the system. Explain the features, programming, maintenance and service aspects of the system. Tick off each item on the Installation Checklist with them, making sure they understand each item.
- 3) Complete the table below on the Installation Checklist to finalise the installation. Hand the customer the Installation and Owners Manual.

Plumbers Installation Checklist - Complete this checklist and table. *Leave this document with the Customer.*

- The Customer has been advised and understands the following :-
- How to locate the Control Unit and Shutoff Valve.
- How to operate and program Control Panel.
- How to test the backup battery.
- How to manually override the system in an emergency.
- How to temporarily override the system using the Control Panel.
- How to conduct the FIVE steps of the System Check Procedure every six months.
- How to set the ,Automatic Away mode and the manual Home/Away mode.
- Explain the Night Watch and Away Watch functions.
- The importance of reading this Manual.
- The importance of registering this product online — See below.

For Canada, visit - www.dcpro.ca - and quote the registration # on the hang tag provided.

For the rest of the world, visit - www.aquatrip.com - and quote the serial number on the Control Unit.

Name of Customer	
Installation Address	
Date of Installation	
Installation Company	
Installer Name	
AquaTrip Model #	
AquaTrip Serial #	