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GL050K

1.2m Envireau Economy Rainwater System Installation & Operation Guidelines



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Enclosed Documents

DS0695K	Rainwater Storage Tank 1200l Customer Drawing
DS0610K	Manhole Cover and Frame Customer Drawing

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HEALTH & SAFETY

These warnings are provided in the interest of safety. You must read them carefully before installing or using the equipment.

It is important that this document is retained with the equipment for future reference. Should the equipment be transferred to a new owner, always ensure that all relevant documents are supplied in order that the new owner can be acquainted with the functioning of the equipment and the relevant warnings.

Installation should only be carried out by a suitably experienced contractor, following these guidelines.

We recommend the use of a dust mask and gloves when cutting GRP components.

Electrical work should be carried out by a qualified electrician.

Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice must also be observed.

Access covers should be selected with reference to the location of the unit and traffic loads to be accommodated. These are not (normally) part of the unit's supply.

When covers are removed precautions must be taken against personnel falling into the unit.

Should you wish to look into the tank, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

Ensure that you are familiar with the safe working areas and accesses. Ensure that the working area is adequately lit.

Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary. Keep proper footing and balance at all times. Avoid any sharp edges.

MAINTENANCE

The correct ongoing maintenance is essential for the proper operation of the equipment.

The removal of solids that accumulate in the unit should be carried out by a contractor. The contractor should refer to the guidelines in this document.

This tank is designed to collect and store rainwater. It should not be used for any other purpose without the agreement of Klargestær.

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Before commencing installation please check that all parts are supplied and are undamaged. Notification of shortages or omissions must be carried out within 48 hours of purchase. Should any shortages or damage be found contact Klargestar on 01296 633000

1.0 Parts List:

1. ENVIREAU ECONOMY Control Unit
2. Float switch with 10 metre cable marked with Tie-wrap. *
3. Pump; complete with 10 metres of cable.
4. “In line” Filter
5. Delivery hose with screw on connectors at each end.
6. Header tank complete with rainwater ball valve, lid and insulation jacket.
7. 1200 litre underground rainwater storage tank with integral leaf filter.
8. Lockable manhole cover.
9. Installation Instructions.
10. Information Labels and Tape.

* Do not remove the marker Tie-wrap as this is used to correctly install the Float Switch. See “Pump and Float Switch Installation”.

2.0 INTRODUCTION

- 2.1.1 These guidelines represent Best Practice for the installation of the above Klargestor Units. Many years of specialist experience has led to the successful installation of thousands of units it must be noted, however, that these Guidelines are necessarily of a general nature. It is the responsibility of others to verify that they are appropriate for the specific ground conditions and in-service loads of each installation. Similarly, a qualified specialist (e.g. Civil engineering consultant) must verify any information or advice given by employees or agents of Klargestor regarding the design of an installation.
- 2.1.2 The unit is designed to be installed underground, as a minimum on a concrete slab with a concrete backfill - unless the height of the water table means that additional hold down straps are required.

3.0 HANDLING & STORAGE

- 3.1.1 Care must be taken to ensure that units are not damaged during delivery and handling on site.
- 3.1.2 The design requirements of Klargestor products will frequently mean that the centre of gravity of the unit is "offset". Care must therefore be taken to ensure that the unit is stable when lifting. Rainwater may also collect inside units, particularly if they have been stored on site prior to installation, adding weight and increasing instability. Check units before lifting and pump out any excess water.
- 3.1.3 When lifting units, use webbing slings of a suitable specification. **DO NOT USE CHAINS.**
- 3.1.4 A suitable spreader bar should be used to ensure that units are stable and that loads are evenly distributed during lifting. When lifting units, a spreader bar should be used where the slings would otherwise be at an angle > 30 degrees to the vertical.
- 3.1.5 Lifting equipment should be selected by taking into account the unit weight, length and the distance of lift required on site.
- 3.1.6 Klargestor Environmental accepts no responsibility for the selection of lifting equipment.
- 3.1.7 Whenever Klargestor units are stored or moved on site, ensure that the storage location is free of rock, debris and any sharp objects, which may damage the unit. The units must be placed on ground, which is flat and level to evenly support the base of the unit. Do not roll units.

4.0 SITE PLANNING

- 4.1.1 **SUITABLE FOR INSTALLATIONS WITH A MAXIMUM 2 STOREY HEIGHT OF 6.6 METRES**
- 4.1.2 The following points should be considered before installation of the equipment:
 - 4.1.3 Position the unit at a minimum distance of 3 metres from the face of the building, so as not to affect either the structural integrity of the building or the tank
 - 4.1.4 Consider placing inspection points in the feed line before and the overflow after the unit.
 - 4.1.5 Ground conditions and water table level should be assessed. If the water table will be above the base of the unit at any time of the year, then you must strap the unit to a concrete base slab or provide adequate concrete backfill to avoid flotation.
 - 4.1.6 If the overflow discharge is to a soak-away, a porosity test should be carried out as part of the assessment of suitability for sub-soil drainage. The soak-away must not drain back into the tank environs.
 - 4.1.7 Do not install the unit deeper than necessary; ensure that you purchase any required extension neck with the tank. Units installed with an invert greater than 1.0m will require a civil design specific to the installation.
 - 4.1.8 Adequate access to the unit must be provided for routine maintenance.

- 4.1.9 Vehicles should not be permitted within a distance equal to the depth of the unit, unless suitable structural protection is provided to the installation.
- 4.1.10 Installation should only be carried out by suitably qualified and experienced contractors in accordance with current Health and Safety Regulations.
- 4.1.11 Electrical work should be carried out by a qualified electrician, working to the latest edition of IEE.

5.0 INSTALLATION GENERAL

- 5.1.1 When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipe-work should be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.
- 5.1.2 For units with burial depths greater than 1000mm from cover level to the top of the unit, specific site conditions should be taken into consideration and the backfill designed to bear any loads which may be applied during and after installation to prevent the tank being subjected to these loads.
- 5.1.3 The excavation must be deep enough to provide bedding and cover depth as determined by the type of surface pavement and loading. Asphalt and concrete pads should extend a minimum of 300mm horizontally beyond the unit in all directions.
- 5.1.4 In situations where the excavation will not maintain a vertical wall, it will be necessary to shore up the side walls of the excavation with suitable trench sheets and bracing systems to maintain a vertical wall from the bottom to the top of the excavation. DO NOT completely remove the shoring system until the back filling is complete. These sites should be considered as wet sites.
- 5.1.5 In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation should be dewatered using suitable pumping equipment and this should continue until the installation is complete.
- 5.1.6 During installation care must be taken to ensure that the body of any unit is uniformly supported so that point loads through the unit are avoided.
- 5.1.7 The Concrete Specification is a *general* specification. It is not a site specific installation design.

GENERAL CONCRETE SPECIFICATION IN ACCORDANCE WITH BS EN 206-1 (BS 8500-1)	
TYPE OF MIX	(DC) DESIGN
PERMITTED TYPE OF CEMENT	BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE (coarse & fine)	BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE	20 mm
GRADES: C25 /30 C25 /30 C16 /20	REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS REINFORCED (EG. FOR HIGH WATER TABLE) UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT	C30 C20 270 - 280 Kg/M ³ 220 - 230 Kg/M ³
SLUMP CLASS	S1 (25mm)
RATE OF SAMPLING	READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS EN 12350-1
NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATES OR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER	

- 5.1.8 The electrical wiring must be installed in accordance with BS 7671: 2001, the IEE's Regulations for Electrical Installations, 16th edition. Additionally in England and Wales, it must be installed in accordance with the requirements of Part P of the Building Regulations 2000 (as amended) (England and Wales) and in Scotland with the relevant requirements of Regulation 9 Standard 4.5 of the Building Standards (Scotland Regulations) 2005.

6.0 UNIT INSTALLATION

6.1 General Installation

- 6.1.1 Excavate a hole of sufficient depth, length and width to accommodate the tank, the pipe-work and a minimum of 150-mm depth concrete base slab.
- 6.1.2 Construct a suitable concrete base slab appropriate to site conditions. Ensure that the slab is flat and level. Fit angles (your supply) into slab to retain webbing hold down straps.
- 6.1.3 When the concrete base slab has set enough to support the installed load, apply a concrete haunch and lower the unit onto the haunch using suitable webbing slings and lifting equipment. Ensure the unit is level.
- 6.1.4 Attach suitable hold down webbing ties (your supply) to iron angles and secure the tank to the concrete slab. The straps should be a minimum width of 75mm and should not be able to cut into the tank. When fitted they should not allow the tank to move if the excavation fills with water at any time following installation.
- 6.1.5 Pour no more than 300mm depth of clean water into the unit, avoiding shock loads, the unit is not designed to be completely filled with water whilst unsupported.
- 6.1.6 Fill the excavation with backfill ensuring that it is packed around the tank.
- 6.1.7 Continue adding water and backfill, keeping the internal water level no more than 300mm above the backfill level at all times, until the backfill is just below the underside of the overflow pipe, giving sufficient room to connect the inlet and overflow pipe-work.
- 6.1.8 Connect inlet and overflow when safe access to the backfill can be gained.
- 6.1.9 **Fit 40-mm diameter ducting (your supply) into the predrilled hole within the neck and seal with proprietary solvent mastic. Ensure that there is a draw cable fitted so as to allow sensor cable and pump cable to be pulled through at a later time.**
- 6.1.10 Supply and connect 25mm diameter medium density polyethylene pipe to the 25mm tank connector.
- 6.1.11 **Temporarily strut the access shaft to avoid distortion whilst back-filling and laying the slab for the access cover and frame.**
- 6.1.12 The access cover top slab should bear on a suitable foundation to prevent superimposed loads being transmitted to the unit and access shafts. Loads applied to covers and frames must bear on the top slab, not the access shaft.

6.2 OPERATION

- 6.2.1 Should excess water be collected within the tank, it will automatically overflow into the discharge pipe which must be connected to a suitable drainage or soak away system.

6.3 MAINTENANCE

- 6.3.1 The tank may accumulate solids; the amount accumulated and retained should be checked by the maintenance engineer who checks the pump operation. It may require emptying periodically.

6.4 DRAINAGE PIPEWORK

- 6.4.1 The rainwater is collected by normal guttering and down-pipes and is connected to the surface water drainage by bends and adapters or by trapped gullies and adapters. Open grates must not be used. The surface water drainage should collect the rainwater from the down-pipes around the building and be brought to a manhole. The underground drainage should be connected to the inlet pipe of the underground storage tank. Drainage from the overflow pipe of the tank should then be taken to the surface water sewer, or soak-away. Ground level water must not be allowed to enter the system as this could contaminate the collected clean water.

6.5 UNDERGROUND WATER PIPEWORK

- 6.5.1 The ENVIREAU system comes complete with a 25mm diameter tank connector.
- 6.5.2 This tank connector is suitable for 25mm diameter M.D.P.E water main.
- 6.5.3 The pipe work should be laid in a trench (minimum 600mm deep, for protection against frost) from the tank to the building and terminated inside with a stop-tap.
- 6.5.4 Any water requirements for outside use, such as external taps, should be teed off after the pipe has passed through the control unit.

6.6 UNDERGROUND ELECTRIC CABLE (See Electrical Installation)

- 6.6.1 A 40mm duct should be laid from the building to the tank, in the same trench as the water supply pipe. A draw cord should be inserted to pull through the electric cables later.
- 6.6.2 Insert the 40mm duct pipe into the hole provided in the side of the tank and seal with a proprietary sealant. The duct should terminate inside the building, and should be sealed with a proprietary sealant, at the cable exit point, on completion of installation.

6.7 INTERNAL PLUMBING ARRANGEMENTS (GENERAL)

- 6.7.1 **All pipe work feeding into the ENVIREAU control unit should be purged of foreign matter**
- 6.7.2 **(Brick dust or Chipping's cement dust, plaster, soldering flux etc.) before connection as this material may cause faulty operation of the solenoid valves within the Control Unit. The ENVIREAU control unit is supplied with 15mm copper pipe spigots. These connections are often used with push-fit connectors although compression fittings with olives can be used.**
- 6.7.3 The requirements for the **ENVIREAU ECONOMY SYSTEM** are as follows:-
- 6.7.4 The installation of the header storage tank, situated at a high level (typically in the roof space) but not exceeding 8.0 metres above the underground storage tank MINIMUM water level.
- 6.7.5 Connections should be made for both stored and mains water, as shown in Fig 1 together with an overflow pipe. The 15mm diameter supply pipe to the ball valve (already fitted) should be fitted on the ENVIREAU supply. An air gap to BS6281 Part 1 : 1992 has already been installed in the header tank provided. The 15mm diameter mains supply to the ball valve (supplied by others) should be fitted on the MAINS supply.
- 6.7.6 The incoming mains water and ENVIREAU supply pipe should be brought into the building together and terminated with stop-taps. The inline filter should be fitted on the ENVIREAU pipe after the stop-tap. Observe the flow arrow on the filter body. A further stop-tap should be fitted after the inline filter and local to it to enable isolation for cleaning. Both mains water and ENVIREAU supply pipes should be connected to their respective inlets on the control unit, **See Fig. 2**. Install pipe work from the outlets of the control unit to the header storage tank, **See Fig. 2**. On entry to the building all potable supplies should be teed off the mains water pipe (i.e. to all cold water taps) directly after the stop-tap and prior to the connection to the control unit, **See Fig. 2**.
- 6.7.7 Following the above installation the normal pipe-work installation should be installed from the header tank to the non-potable outlets.
- 6.7.8 The ENVIREAU pipe-work should be clearly marked with the tape and labels provided.

6.8 PUMP & FLOAT SWITCH INSTALLATION

- 6.8.1 Secure the lifting cord (supplied) onto the bracket at the top of the pump then connect the delivery hose to the top of the pump using the threaded connector. Tighten firmly but without excessive force. Small leaks at this connection will not cause any problems.
- 6.8.2 Gently lower the pump into the tank using the lifting cord, (**DO NOT USE THE MAINS CABLE FOR LIFTING OR LOWERING** and ensure the cables do not become snagged). When the pump has settled on the bottom, secure the cord to the bracket provided, with the lifting cord taught but not causing the pump to become suspended.
- 6.8.3 *It is normal to hear and see the results of air displacement in the pump when lowering. Do not allow the delivery hose to fall into the tank at this stage.*
- 6.8.4 Connect the delivery hose to the tank connector in the access chamber of the tank using the threaded connector. Tighten firmly but without excessive force. Small leaks at this connection will not cause any problems.
- 6.8.5 Gently lower the float switch into the tank. **Observe the Tie-wrap fixed to the float cable.** Line-up this Tie-wrap with the bottom of the turret bracket and secure at this point with another Tie-wrap. Take precautions to ensure the float-switch is not obstructed by the location of the Pump. (**Replace the manhole cover and lock.**)

7.0 ELECTRICAL INSTALLATION INSTRUCTIONS FOR ENVIREAU SYSTEMS

7.1 General Installation

- 7.1.1 These instructions are complete, but a qualified Electrician must install the system. Particular attention should be paid to the following notes:
- 7.1.2 All work to be carried out to a high standard using approved materials and equipment.
- 7.1.3 Depending upon the distance to the ENVIREAU tank from the electricity supply source the correct cable should be used. This also refers to earthing cable requirements. (See “Recommendations”).
- 7.1.4 Take special precautions regarding the insulation and protection of cables in the underground ducts. Do not stretch the cables or subject them to abrasion.
- 7.1.5 Physically check screw-terminal connections, again, particularly earth bonding.
- 7.1.6 Install a suitable Residual Current Device (RCD at the distribution board, to isolate and protect in the event of leakage to earth. The RCD should break Live AND Neutral. A switched fused (13amps) spur should be installed local to the controller.)
- 7.1.7 In England and Wales under the requirements of part P of the Building Regulations, electrical installation work in locations containing a sink must be notified to the Building Control body of must be undertaken by a competent person registered with an electrical self-certification scheme authorised by the Secretary of State

Do not apply power to the completed installation until all supplied items are fully installed. (BE SAFE!)

- 7.1.8 **NOTE! EACH SYSTEM MUST BE INSTALLED VIA A SEPARATE RESIDUAL CURRENT DETECTOR AT THE MAINS SOURCE. THE MAXIMUM STEADY CURRENT DRAWN BY THE SYSTEM IS 5 Amps. (Approx.). EACH SYSTEM SHOULD BE SEPARATELY FUSED AT 15 AMPS (wire or HRC fuse) OR 16 AMPS Max. (MBC) AT THE DISTRIBUTION BOARD.**
- 7.1.9 **ALL electrical connections terminate in the CONTROL UNIT, which is supplied with a rear cutout for placement over a standard plaster-depth single socket outlet back-box. This allows for first-fix installations. Cables may alternatively be glanded or surface-ducted into the CONTROL UNIT using accepted best practice.**
- 7.1.10 Mount the control unit in an accessible position convenient for plumbing in and for maintenance at a height of 1.5 -1.8 metres. Use fixing screws through the locations provided, by removing the control unit lid. The fixing holes are beneath the lid fixing screws entry points.
- 7.2 TO CONNECT THE MAINS SUPPLY INTO THE CONTRL UNIT (STEP 1)**
- 7.2.1 Taking due note of the above, run a suitable cable (not supplied) from the MAINS DISTRIBUTION BOARD via a suitable Residual Current Detector to the Switched Fused Spur (not shown) local to the CONTROL UNIT. Connect from this spur to the CONTROL UNIT terminals designated MAINS, using conventional identification. DO NOT APPLY POWER UNTIL FULLY INSTALLED!
- 7.3 TO CONNECT THE PUMP SUPPLY INTO THE CONTRL UNIT (STEP 2)**
- 7.3.1 Run the pump cable from the tank through the duct to the internally mounted Control Unit and connect into the Terminal Block designated PUMP, using conventional identification L (Live-Brown), N (Neutral-Blue) and E (Earth-Green/Yellow).
- 7.3.2 Please be aware that this cable may be extended up to 100 metres using 2.5mm² flat twin and earth PVC/PVC cable or other equivalent. Conventional coding applies (Live-Red-Brown, Neutral-Black-Blue, Earth-Sleeved earth conductor-Green/Yellow.) A suitable junction box should be used. Mains Installation is complete.

Do not apply power until the system is fully installed!

7.4 INSTALLATION OF THE FLOAT SWITCH (STEP 3)

- 7.4.1 Run the 3-core core float cable from the tank, through the duct to the Control unit. Cut the cable to length.. Connect into the Terminal Block designated “**FLOAT**”, using the following convention:

FLOAT Terminal Block In Control Unit.	Float Cable Colour (With supplied float)	Float Connector Pin Number
FC (Common)	Brown	1
FNO (Normally open)	Blue	2
FNC (Normally Closed)	Black	3

- 7.4.2 Please be aware that this cable may be extended up to 100 metres using similar specified cable (3-cores, 7-16/0.2mm. rated for use at 240V. A.C.). Use a suitable junction box or terminal strip with protection. The maximum voltage on this cable both between cores and to earth is 12 volts D.C.

7.5 COMMISSIONING (STEP 4)

- 7.5.1 Commissioning Notes- APPLICABLE ONLY WHEN THERE IS SUFFICIENT WATER IN THE HOLDING TANK TO ALLOW THE SYSTEM TO OPERATE. i.e. as determined by the FLOAT switch.
- 7.5.2 Turn on both water supplies (Mains and ENVIREAU)at the stop-taps. Check for leaks. Note that water will enter the header tank via the mains water inlet and the mains water ball-cock valve, **until mains electricity is applied to the Control Unit!**
- 7.5.3 Check all electrical connectors and then apply mains electrical power. The pump will run until the ENVIREAU system pressurises. This will occur within 30 seconds of the header tank filling up. To check that pressurisation has occurred, remove the Control Unit lid. Pressurisation is indicated by the illumination of the GREEN indicator on the Control Unit printed circuit board. Note that the header tank may already be full if there has been a delay between turning on the mains water stop-tap and the application of the mains electricity to the Control Unit.
- 7.5.4 Check for leaks.
- 7.5.5 Run off sufficient water from the header tank to allow the ENVIREAU ball-cock valve to open. Observe that there is good flow into the header tank. **NOW CHECK THAT THE PRESSURISED INDICATOR ILLUMINATES ONCE THE WATER LEVEL IN THE HEADER TANK HAS RISEN SUFFICIENTLY TO TURN OFF THE BALL-COCK VALVE! If the PRESSURISED indicator fails to illuminate see “Trouble-shooting” notes below. Switch off the system.**
- 7.5.6 Replace the Control Unit lid and secure.

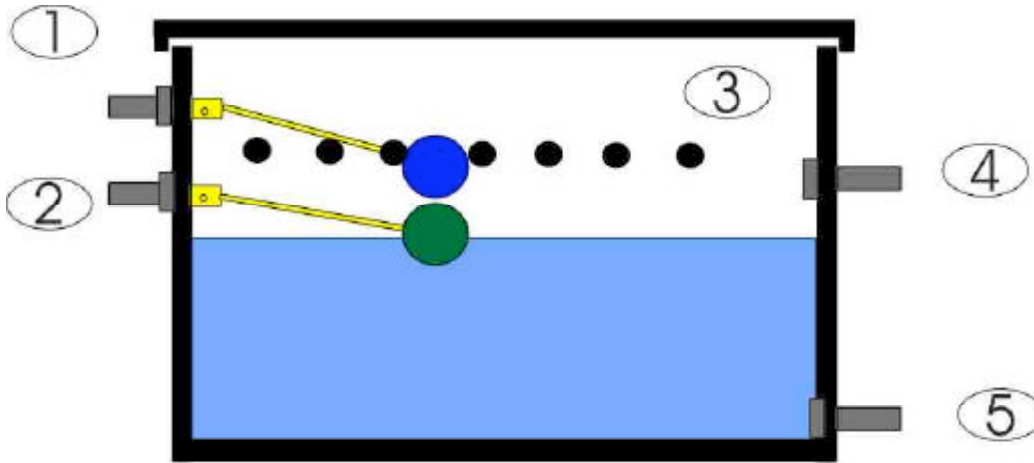
8.0 ENVIREAU – GENERAL NOTES & MAINTENANCE

- 8.1.1 Please note the following points. By observing simple precautions you will greatly extend the life of the ENVIREAU system and its component parts.
- 8.1.2 The controller is factory set to system requirements provided that the head of water measured from the underground tank MINIMUM water level to the highest point of demand (the header tank ball-cock valve) is not in excess of 8.0 metres.
- 8.1.3 **On Economy Systems the system fails-safe in the event of mains voltage supply failure. The solenoid valve OPENS allowing mains water to enter into the header tank.**
- 8.1.4 **General maintenance of the system is simple and basic:-**
- 8.1.5 Test the R.C.D. regularly as per instructions on R.C.D. (owner’s responsibility).
- 8.1.6 Isolate and remove the “In Line” filter cartridge – wash in soapy water and replace. (Generally every 3 month

9.0 TROUBLE SHOOTING

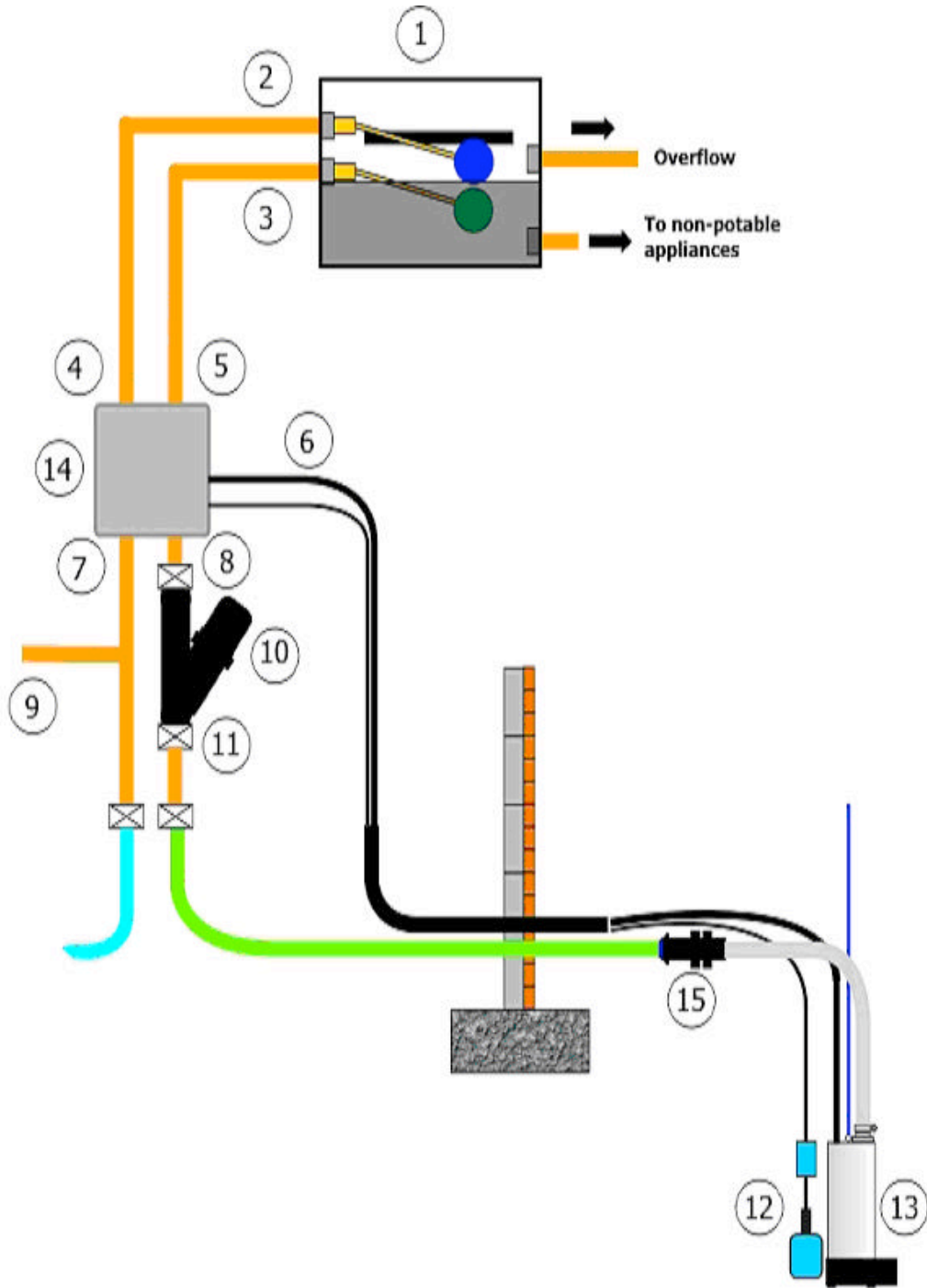
- 9.1.1 In the event of falling flow rate but with normal pressurisation, check the supply pipe to the system from the underground storage tank for compression damage or the PUMP connector hose for “kinks”. Check that all stop-taps are turned on and that the in-line filter is not blocked. If the filter IS blocked determine the nature of the obstructing material and take steps to correct the situation.
- 9.1.2 In the event of failure to pressurise (during or after commissioning) check the supply pipe to the system from the underground storage tank for leaks and check that the PUMP connector hose is securely fixed and not leaking unduly. (A dripping leak will not affect the operation of the system. A running leak will)

- 9.1.3 If the system continually starts and stops the PUMP, this indicates either a continuous and legitimate but small demand or a failure to maintain pressure in the system. Immediately suspect leaks in the plumbing from the ENVIREAU water outlet to the header tank ball-cock valve. Then check that the ball-cock valve is closing FULLY. If all attempts to stop the pressure loss fail, then suspect the ingress of foreign material in the non-return valve within the Control Unit. Contact the ENVIREAU TECHNICAL HELPLINE (01296 633000) for advice.



1	Mains IN
2	Envireau IN
3	Weir Cut-Out
4	Overflow
5	Outlet

Figure 1 – Header Tank Detail



1	Header Tank	8	Envireau Water Inlet
2	Mains Water Ball Valve	9	Potable Water Outlet
3	Envireau Water Ball Valve	10	In-line filter
4	Mains Water Out	11	Stop Cocks
5	Envireau Water Out	12	Float with sinker
6	Cables in at rear	13	Pump
7	Mains Water Inlet		

Figure 2 – Envireau Economy Gravity Schematic