Installation Manual

for RainTech® Direct commercial rainwater harvesting systems

January 2016

Calf Way, Bisley, Gloucestershire GL6 7BX 01452 772000

ON COMPLETION OF INSTALLATION PLEASE CONTACT US TO ARRANGE COMMISSIONING BY OUR ENGINEERS

CONTENTS

Section 1

Receipt of goods and off-loading procedure

Receipt of Goods

Deliveries to site will be arranged where possible to fit in with customer requirements, but we cannot always delivery precisely when required. We will always however arrange deliveries with the site supervisor. NOTE THAT IN GENERAL THE TANK AND FILTER(S) WILL BE DELIVERED DURING THE GROUNDWORKS STAGE OF THE DEVELOPMENT, WITH THE REMAINING M&E EQUIPMENT BEING CALLED OFF AT A LATER DATE.
The site supervisor is advised to ensure that all goods are thoroughly checked against delivery documents. Any missing or damaged items must be reported within 3 working days of delivery.
In particular it should be noted that the condition of the tank becomes the responsibility of the site supervisor once unloading has commenced.

Off-loading of tanks

Please read and understand the following instructions fully before commencing off-loading. These instructions are provided as a general guide and do not allow for non-standard site-specific issues which may arise. Failure to adhere to these instructions may compromise the structural or operational integrity of the product, which will be deemed outside the responsibility of Rainharvesting Systems Ltd. or the tank manufacturer.

Disclaimer:
These notes are for guidance only. Rainharvesting Systems Ltd are not contracted for the offloading and installation activities of the product. It is the responsibility of the customer and their designated contractor to ensure safe and proper offloading and installation. We can not accept liability for this activity.

THESE INSTRUCTIONS ARE OFFERED FOR GUIDANCE ONLY.

- OFF-LOAD THE UNIT USING SUITABLE MECHANICAL EQUIPMENT OPERATED BY TRAINED PERSONNEL.
- THE EYELETS ON TOP OF THE TANK ARE FOR GUIDE ROPES ONLY. DO NOT LIFT THE TANK BY THE EYELETS!
- LIFTING STRAPS – THE TANK SHOULD BE HOISTED USING CERTIFIED WEBBING STRAPS WHICH MUST BE SUFFICIENTLY RATED FOR THE WEIGHT OF THE UNIT BEING LIFTED. DO NOT EXCEED THE LIMIT STATED FOR THE WEBBING STRAPS USED.
- LIFTING STRAPS SHOULD BE OF EQUAL LENGTH.
- ONLY LIFTING STRAPS ARE PERMITTED TO BE IN DIRECT CONTACT WITH THE UNIT (NO CHAINS). CHAINS CAN ONLY BE USED BETWEEN THE STRAPS AND CRANE IF CERTIFIED.
- LIFTING STRAPS ARE NOT PERMITTED TO BE PULLING IN ON THE BODY OF THE UNIT. PLEASE ENSURE THAT THE SLINGING ANGLE DOES NOT EXCEED 60O AT THE HOOK IN ORDER TO ELIMINATE EXCESSIVE COMPRESSIVE LOADS ON THE SIDE OF THE UNIT.
- DO NOT LIFT THE TANK IF IT CONTAINS ANY WATER

- USE GUIDE ROPES TO MAINTAIN LATERAL CONTROL OF TANK WHEN LIFTING UNIT
- DO NOT SUBJECT THE TANK TO SHARP IMPACTS
- THE GRAVITATIONAL BALANCE OF THE UNIT SHOULD BE TESTED BY THE CRANE MAN AND BANKS MAN BY TRIAL LIFTING THE UNIT NO MORE THAN 6 INCHES BEFORE COMMENCING ANY POSITIONAL ACTIVITY.
- THE WEIGHT OF THE TANK DEPENDS ON THE MODEL AND THE INCLUSION OF OPTIONAL EXTRAS. PLEASE CONTACT US IF YOU NEED TO DETERMINE THE WEIGHT OF YOUR UNIT.

STORAGE

- DURING STORAGE ON SITE THE TANK SHOULD BE PLACED ON LEVEL GROUND AVOIDING ALL POSSIBILITY OF ACCIDENTAL DAMAGE.
- ALL OPENINGS TO THE TANK MUST REMAIN COVERED TO PREVENT INGRESS OF UNWATED MATERIAL
- THE TANK SHOULD BE TIED DOWN DURING PERIODS OF HIGH WINDS. IF THE TANK DOES NOT CONTAIN STABILISING FEET THEN IT SHOULD BE CHOCKED WITH SUITABLE MATERIALS TO PREVENT IT ROLLING.
- DO CHECK THAT ALL ITEMS DELIVERED CORRESPOND WITH THE PACKING NOTE - IF IN DOUBT WITH REGARD TO ANY ASPECT OF THESE INSTRUCTIONS, PLEASE CALL FOR ASSISTANCE.

Section 2

Health and Safety

PLEASE READ CAREFULLY THIS ENTIRE SECTION OF THE DOCUMENT BEFORE COMMENCING WORK.

We advise that all relevant Health & Safety precautions applying to such works are implemented and that risk assessments and method statements are prepared as required.

Rainharvesting Systems Ltd. can provide generic risk assessments and method statements on request.

IMPORTANT: It is the installers' responsibility to ensure that the installation is carried out in accordance with:

- Health & Safety at Work Act
- Water Supply (Water Fittings) Regulations 1999
- WRAS Guidelines - esp. Guidance note 9-02-05 Marking & Identification of Pipework
- BS EN 16941-1:2018 Rainwater Harvesting Systems - Code of Practice (formerly BS 8515)
- EN 1717 Protection against pollution of potable water (Category 5 air gap)
- The Building Regulations Part G - Sanitation, hot water safety and water efficiency
- The Building Regulations Part H - Drainage and waste disposal

All electrical work must be carried out by a qualified electrician.

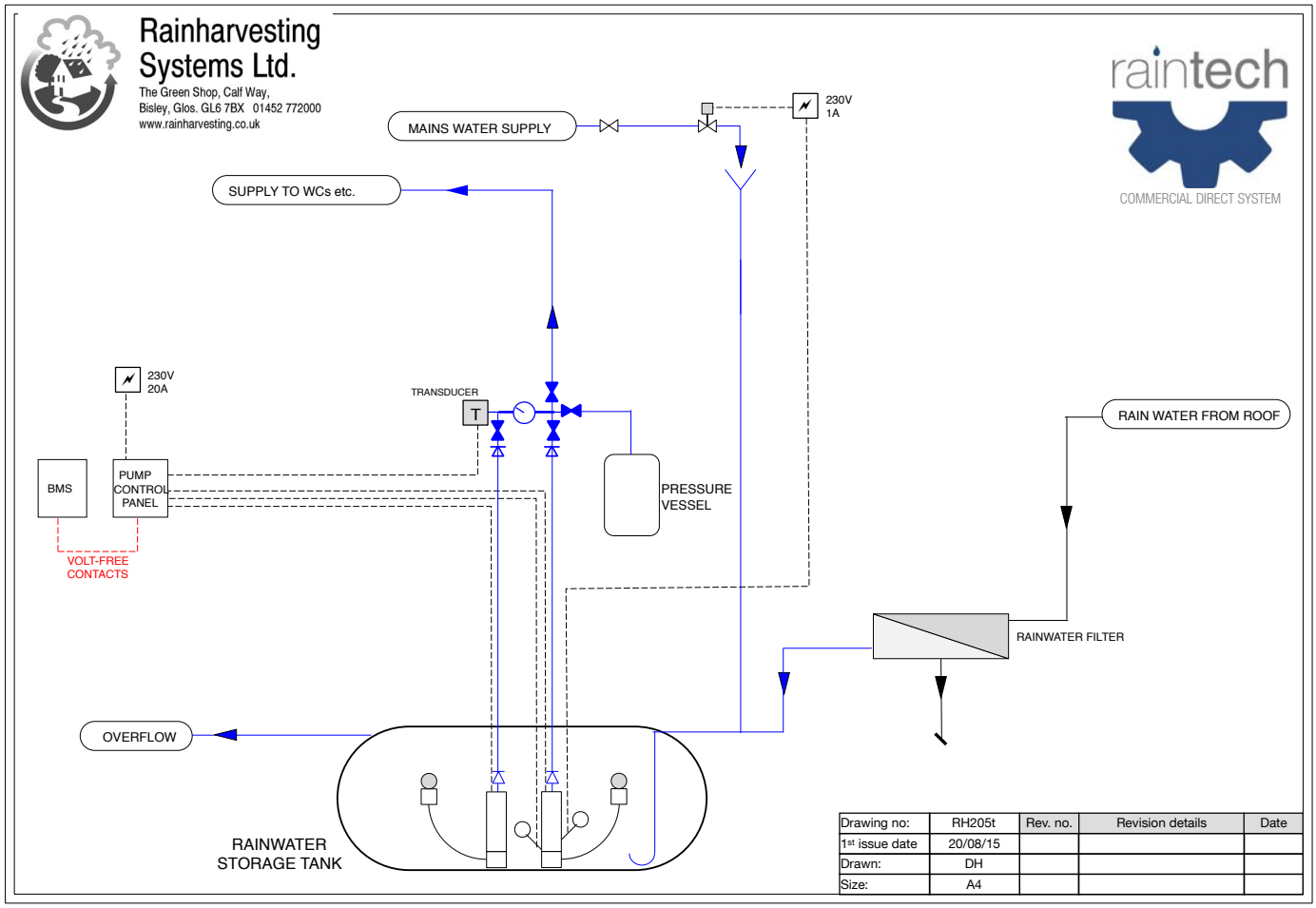
Section 3

General Principles and Preparatory Notes

Operating Principles

It is essential to have general understanding of the operating principles of a rainwater harvesting system in order to ensure a simple and successful installation. The diagram below gives a schematic example of the system.

Water is collected from the buildings' roof drainage system via a filter unit, into a tank. The filter removes all particles greater than 0.38mm. The filtered water then enters the tank through a special calmed inlet to reduce turbulence. If there is too much water, the tank overflows through a special overflow trap that incorporates a non-return device. This prevents water from the storm drain flowing back in to the tank.



The collected water is then pumped on demand to specific points (usually WCs, irrigation taps etc.). If insufficient water is available in the tank, the system provides a low level 'top-up' to the tank. This raises the water level by 4cm, leaving the remainder of the tank empty to catch the next rainfall.

Connections between plant room and tank

100mm pipe from plant room for mains top-up water (N.B. this must connect in to the pipe that joins the filter to the tank)

150mm service duct from tank to plant room. – This takes the two 32mm MDPE pipes from the pumps, plus the cables from the pumps and the float switches.

Note:

- The pumps are of the submersible type, located within the tank
- Mains water must not connect directly to rainwater (or any other non-potable source)
- The mains water top-up incorporates a 'Type AA' air gap in compliance with Water Regulations. This means that the water from this point must reach the tank by gravity. The pipe leading from the air gap to take water to the tank must have a fall of at least 1:100 and must be a minimum of 50mm diameter (70mm if the top-up unit is 1")
- The top-up water should connect to the pipe that links the filter unit to the tank, and not to the tank itself

It is very important that any water entering the tank should be as clean as possible and this is ensured by use of high quality rainwater filters. It must therefore be observed that the filter elements are only removed for cleaning purposes and that this is done when no water is flowing through the unit (i.e. in dry weather!)

It is essential that these filters are kept clean and this must be done on a regular basis once the system is in operation as part of the regular maintenance work. If the filter is in place for any length of time before the building is handed over to the client, then the filter should be cleaned approximately every 3 months, and in any event before commissioning

Important

Please read and understand these notes fully and plan where each of the components will be fitted before commencing work.

Plan pipe runs and levels carefully before commencing work. Note that both the filter unit and the tank have overflow connections, which must connect to soakaway or storm drain.

Rainwater downpipes should connect directly to the underground drainage pipes. Do not have open gullies connected to the system. This avoids the risk of undesirable materials entering the tank (e.g. painters slops, pesticides residues).

Once the tank is on site ensure all openings are kept covered until the installation is completed. DO NOT allow soil or other material to enter the tank, and keep the inside of the tank as clean as possible.

If the tank is to be installed within an area subject to vehicular traffic, a reinforced slab must be cast over the top of the tank such that it spans the excavation. Consult a structural engineer if necessary.

The MDPE pipes carrying rainwater to the building must be black with green stripes to distinguish it from the mains water supply. Standard blue pipe must **only** be used for mains water.

Interior pipework should also be clearly identified as non-potable. We stock self-adhesive marker tape for this purpose, as well as valve tags and appliance labels.

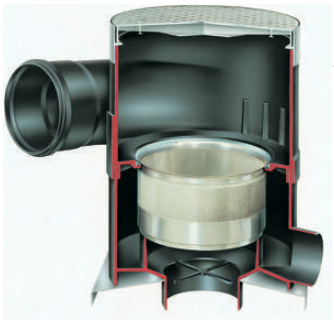
WC cisterns are best fitted with compact float valves; e.g. 'Fluidmaster' rather than conventional ballcocks.

Section 4

System Components

THE MAIN COMPONENTS OF YOUR SYSTEM. NOTE IMAGES ARE NOT TO SCALE.

RainTech® GRP rainwater storage tank



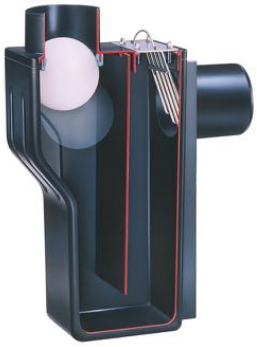
WFF300 Vortex filter. - located prior to the tank

Flow calming inlet diffuser. Pre-fitted into the tank during manufacture. Provides gentle, turbulence free flow and oxygenation.

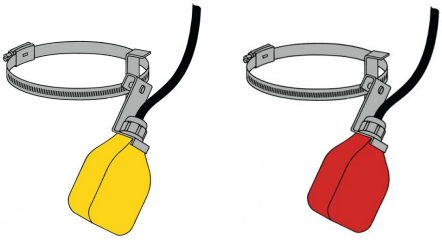
Pump manifold switch-board. Isolating & non-return valves, pressure transmitter, gauge and outlets for expansion vessel.

Pump control panel. Controls pumps, provides duty cycling and dry-run protection

'Multisiphon' overflow trap. Pre-fitted into the tank during manufacture. Provides effective seal against drain odours and incorporates a backflow prevention device.



RainTech® mains water top-up unit. Solenoid valve opens when activated by float switch. The tundish provides the statutory air gap to comply with Water Regs.



Precision float switches c/w clamps for attaching to pumps. Red body provides dry-run protection, yellow body controls mains water top-up.

Submersible pressure pumps. Shown here with fitted floating suction filter.

Rainwater delivery pipes. 32mm OD x 25m coils of MDPE pipe for pumped supply between tank and plant room.

Expansion vessel

(OPTIONAL) Acoustic and visible remote alarm unit to indicate pump failure

Section 5

Suggested work schedule

Phase 1 - Civils

These works constitute part of the buildings drainage system and are normally carried out at groundworks stage.

- Ascertain depth of excavation for storage tank. This is dependent upon the invert level of the drain, the type of filter used, and the size of tank. particular attention should be paid to this in order that the tank is installed at the correct depth.
- Excavate hole and install tank (refer to manufacturers installation guide)
- Connect tank overflow to soakaway or storm drain
- Install service duct from tank to building (e.g. plant room). N.B. – ensure that suitable draw cords are laid into the duct in order to pull the pipe and cables through at a later stage. KEEP THE DUCT AS STRAIGHT AS POSSIBLE AND USE ONLY LONG-RADIUS BENDS
- Insert the pump delivery pipes (either flexible hoses or MDPE pipes) through the duct. This is best achieved by inserting the pipes into the duct at the tank end. The pipes can then be pulled through from the top end using one of the draw cords, Use care to ensure that no debris enters the pipes (or is left in it) during this operation.
- Excavate hole and install rainwater filter and connecting pipes (refer to manufacturers installation guide)
- Connect pipe from filter to tank inlet.
- Install mains water top-up pipe from building to join this pipe. (i.e. it should connect into the pipe between the tank and the filter)
- Connect filter waste outlet to soakaway or storm drain

Phase 2 – Mechanical and Electrical

The following works constitute part of the mechanical and electrical installation and are normally carried out at the final stage of building.

- Install the pump and suction filter assemblies and the depth transducer into the tank.
- Connect the outlet hoses of the pumps to the MDPE pipes using the brass elbow connectors provided.
- Pull the pump cables and depth transducer cables through the duct, using the second draw cord.
- Fit the control panel, mains water top-up unit, pressure vessel, pressure transducer and solenoid valve for the filter backwash.
- Make electrical connections to the control panel from the pumps, transducers, solenoid valve and mains water top-up unit.
- Commission the system.

Section 6

Installation – External Works

Rainwater storage tank and vortex filter

Please read this entire section before commencing work.

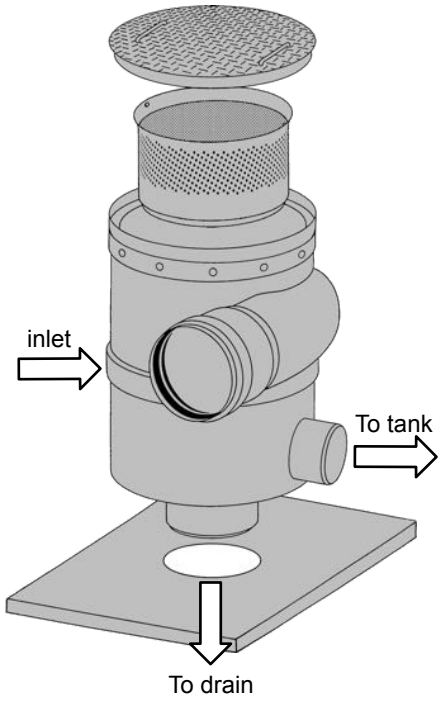
PLEASE PAY PARTICULAR ATTENTION TO THE FOLLOWING NOTES:

- It is very important that the tank is installed at the correct depth to allow the installation of the pre-tank filter unit(s). There is always a difference between the inverts of the filter inlet and outlet connections.
- The tank will normally have three connections; the inlet, the overflow and a third connection on the access shaft, which is to act as a service duct for the pump delivery pipe(s) and/or cables.
- The service duct connection accepts standard 160mm underground drainage pipe. It is important that when the pipe that is to act as duct is installed, it should be as straight as possible and that any bends are 'slow' or long-radius bends. One or more draw-cords must be fed through the duct as it is being laid.
- It is important that **no site material or dirty water** is allowed to enter the tank. As soon as the tank is installed, all connecting pipes must be sealed wherever there is an open end to prevent this from happening. The tank must have its' access cover fitted and must not be left open.
- The same applies to the pre-tank filter unit(s). The filter element must be in place to prevent leaves etc. or any other debris entering the tank.
- The pipes that connect into the system upstream of the filter and tank must ONLY carry rainwater collected from roof surfaces. No grey water or water from paved or trafficked areas should be allowed to enter the system.
- If the system requires mains top-up water to the underground tank, the pipe carrying mains water must not enter the system before the filter unit. We recommend that it connects to the pipe which links the filter to the tank, as shown below. N.B. – this is not required if your system uses a break tank (header tank).

1. Plan the pipe runs to and from the filter and tank, and the pipe to carry mains water top-up plus the pipe to act as a cable duct. Ensure that the pipe carrying mains water has a fall of at least 1:100.

2. Decide upon the location of the storage tank and filter unit, bearing in mind pipe runs and invert levels.

3. Install the Wisy® WFF Vortex filter according to the instructions supplied with it. Ensure that the two outlet connections of the filter are connected to the appropriate pipes. The large inlet must connect to the storm drain, the lower outlet to the tank, and the outlet at the bottom of the filter back to the storm drain (overflow).



WFF300 Vortex filter

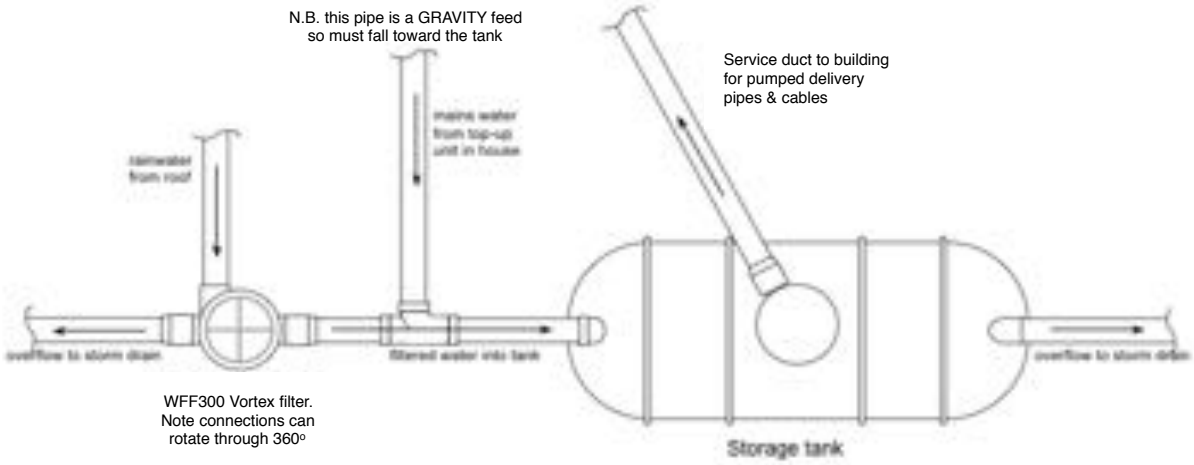
4. Install the tank in the ground allowing for a sufficient fall from the filter outlet. *Rainsava* tanks supplied by ourselves are supplied with full installation instructions; it is very important that these instructions are followed strictly.

5. Lay the pipework to and from the filter and from the tank to the soakaway. Rainwater down-pipes should join directly to drainage pipes via drain connectors and not via gully traps. This avoids the risk of someone inadvertently pouring undesirable liquids into the system, resulting in contaminated water. (e.g. painters slops, garden chemicals etc.) The pipe leading into the filter must only be connected to rainwater downpipes and must not receive surface water run off.

6. In high ground water conditions, where there is a risk of water backing up from the soakaway into the filter unit, we recommend the use of an inline flap valve on the waste outlet pipe from the filter unit. The tank is already protected by the inclusion of the special anti-backflow overflow trap.

7. Lay the pipe for the mains top-up water. This must come from the location in the house for the top-up unit and must have a fall towards the tank. This should then join the pipe that connects the filter to the tank (see sketch below). Note this is best done using standard 110mm drainage pipe for the underground pipe run.

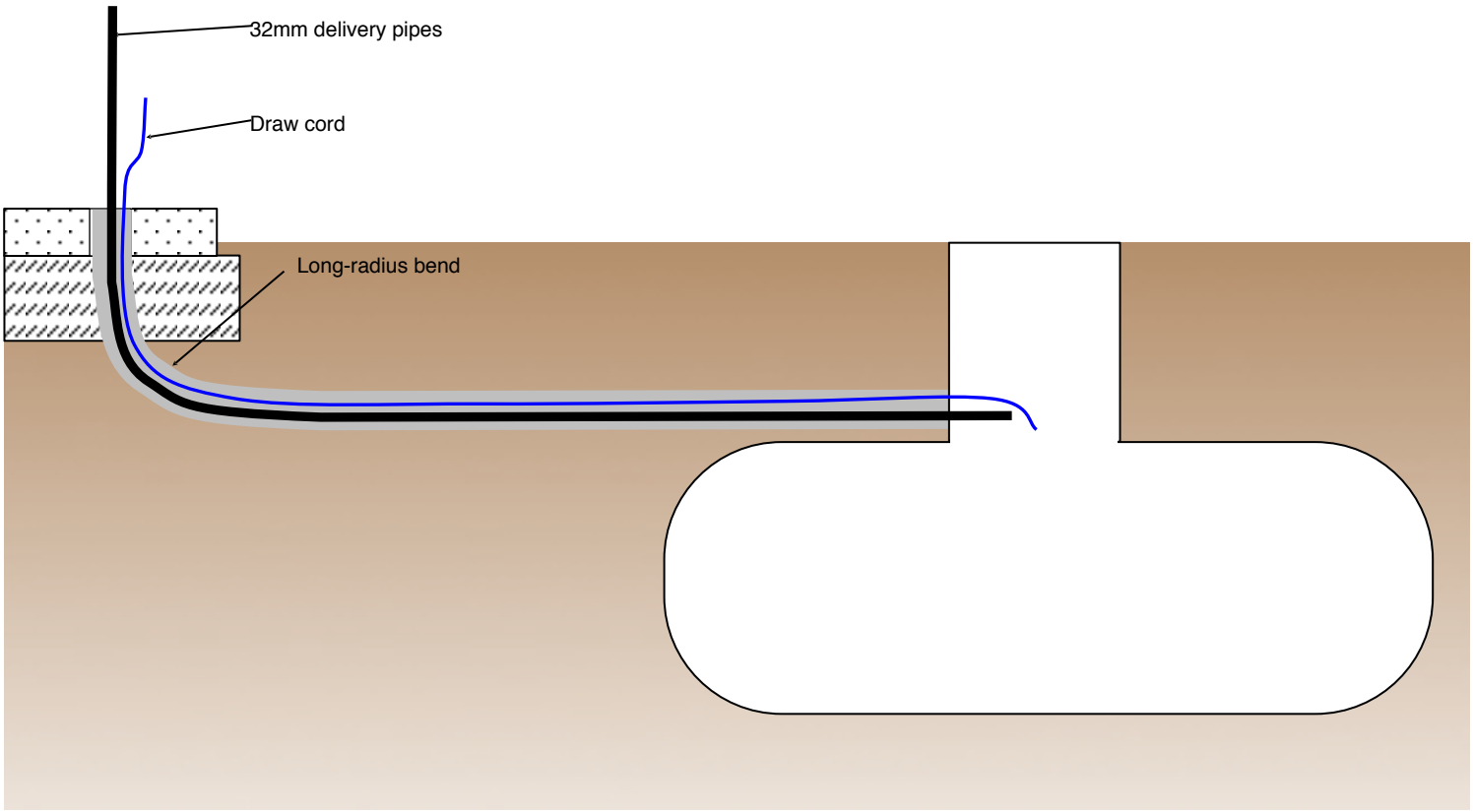
SUGGESTED PIPEWORK LAYOUT FOR UNDERGROUND STORAGE TANK AND SINGLE VORTEX FILTER.
TANK WITH MAINS WATER TOP-UP SUPPLY - THIS MUST JOIN THE INLET PIPE AFTER THE FILTER UNIT, NOT BEFORE IT.
NOTE SERVICE DUCT ON TANK CAN BE FACTORY FITTED TO FACE REQUIRED DIRECTION



8. Lay the 160mm pipe to act as a service duct from the house to the connection on the access shaft of the tank. This pipe must be as straight as possible and where any bends are required they should be of the long-radius or ‘slow’ type. As the pipe is laid, ensure that 2 suitable draw-cords are laid through the pipe. These will be used to pull through electrical cables from the pumps and depth transducer, and the 32mm MDPE rainwater pipes from the pumps.

9. Ensure both ends of the MDPE pipes are capped off or sealed with tape or similar, to prevent dirt and debris from getting in to the pipes. Now feed the two MDPE pipes through the duct from one end, using one of the draw cords to pull them from the opposite end. There should be about 15cm of pipe protruding in to the shaft of the tank. The pipes must reach the plant room and can be extended if necessary.

10. N.B. The other draw cord needs to remain in place for when electrical cables are pulled through.



Important notes

Plan pipe runs and levels carefully before commencing work. Note that both the filter unit and the tank have overflow connections, which must connect to soakaway or storm drain.

Rainwater downpipes should connect directly to the underground drainage pipes. Do not have open gullies connected to the system. This avoids the risk of undesirable materials entering the tank (e.g. painters slops).

Rainwater should only be collected from roof surfaces. Do not collect water from ground level paving etc. We do not recommend collecting water from planted 'green' roofs.

Pipe carrying mains top-up water should join the pipe that connects the filter to the tank as per the sketch on the preceding page.

Once the tank is on site ensure **all openings** are kept covered until the installation is completed. Do not allow soil or other material to enter the tank, and keep the inside of the tank as clean as possible.

If the tank is to be installed within an area subject to vehicular traffic, a reinforced slab must be cast over the top of the tank such that it spans the excavation. Consult a structural engineer if necessary.

Section 7

Installation – Submersible pumps

RainTech® submersible pumps with suction filters and float switches

The submersible pumps will be supplied with float switches and either fixed or floating suction filters, depending on tank size. The suction filters protects the pumps in case any debris gets in to the tank, and avoids water being drawn from the very base of the tank. The float switches attaches to the pump, and are of two different types. The red float is to be attached to one of the pumps and provides dry-running protection for both pumps. The yellow float is to be attached to one of the pumps but is otherwise not connected to it; its' purpose is to activate the mains water top-up unit, not to control the pump.

1. The pumps are supplied complete with four rubber anti-vibration mounts and a lifting rope. Begin by fitting the mounts to the base of the pump with the nuts and washers supplied. Clip the lifting rope on to the small hook at the top of the pump.

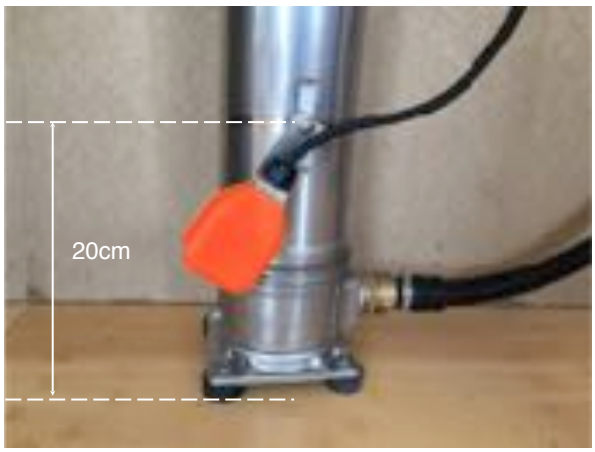
2. Fit the suction filters to the pump inlet ports (bottom of pump):

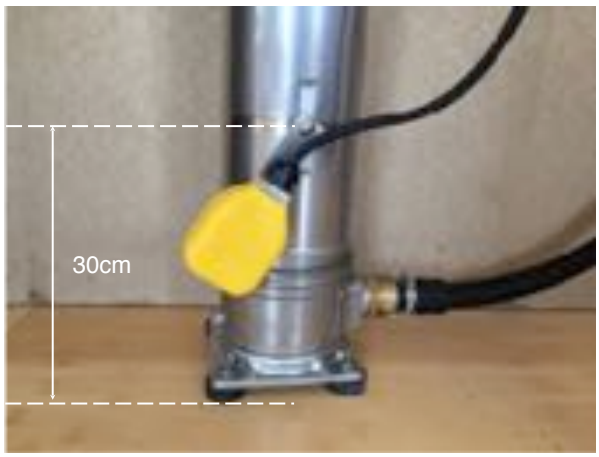
   i) If you have the fixed suction filter, this simple needs to be screwed directly into the pump inlet

   ii) If you have the floating type, first assembly it by pushing the flexible hose on to the filter nozzle, then connect the other end to the pump inlet

3. Fit the float switches. These fit around the body of the pumps using the worm-drive clamps. Note that the yellow float MUST be fitted at a higher level than the red one. The yellow float should be fitted with the clamp about 30cm from the bottom of the pump. The red float should be fitted with the clamp about 20cm from the bottom of the pump. Ensure both are firmly fastened and free to move without being obstructed by the suction filter. As the floats are mounted on the swivel pin, it provides very accurate switching. It is useful to attach the cable to the pump body using cable ties, but make certain there is sufficient cable slack to allow free movement.

The assembled pumps should now look like this:



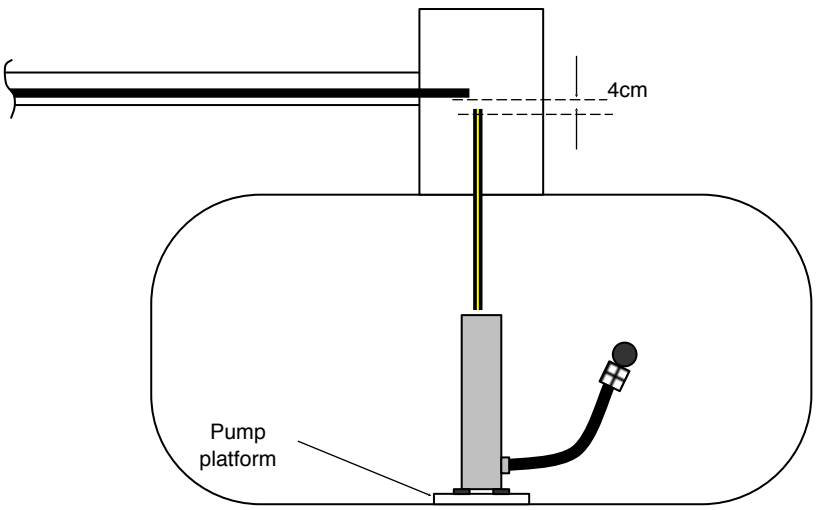


4. Fit the stainless steel non-return valve nozzles into the outlet (top) port of the pumps. Now fit the 1” rubber hoses to the nozzles and secure with the jubilee clips. Ensure all joints are tight. N.B. these hoses will have to be trimmed to length later (see below)

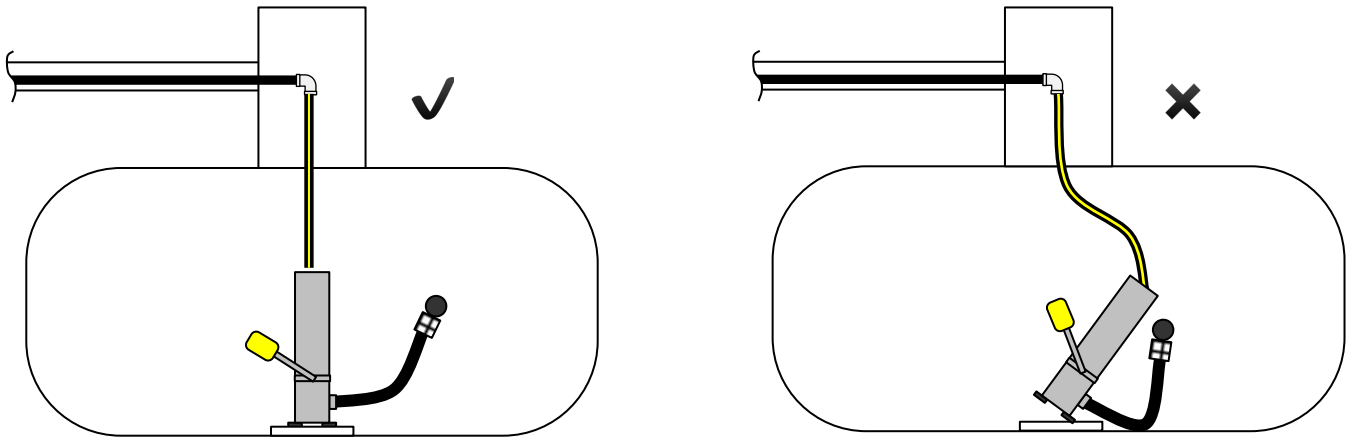
5. At this point it is wise to clip the pump and float switch cables together with the hose at about 20cm intervals, making sure not to pinch the hose. This keeps things neat and prevents cables becoming tangled.

6. Now carefully lower the entire assemblies down into the tank one at a time, taking care to ensure that the weight of the pump is taken by the lifting rope. !DO NOT USE THE CABLES TO LOWER THE PUMP!

7. The rubber hoses must now be trimmed to length so that they can be joined to the MDPE pipes that were installed earlier and should now be protruding from the service duct; with the pumps in place, mark the hoses approximately 4cm lower than the bottom of the MDPE pipe:



8. DO NOT leave the hoses too long, as this will cause lateral pressure at the top of the pump. This can result in the pump leaning sideways, causing stress on the hose and connections. In extreme cases it can cause the pump to topple over, trapping the float switch or damaging the suction filter.

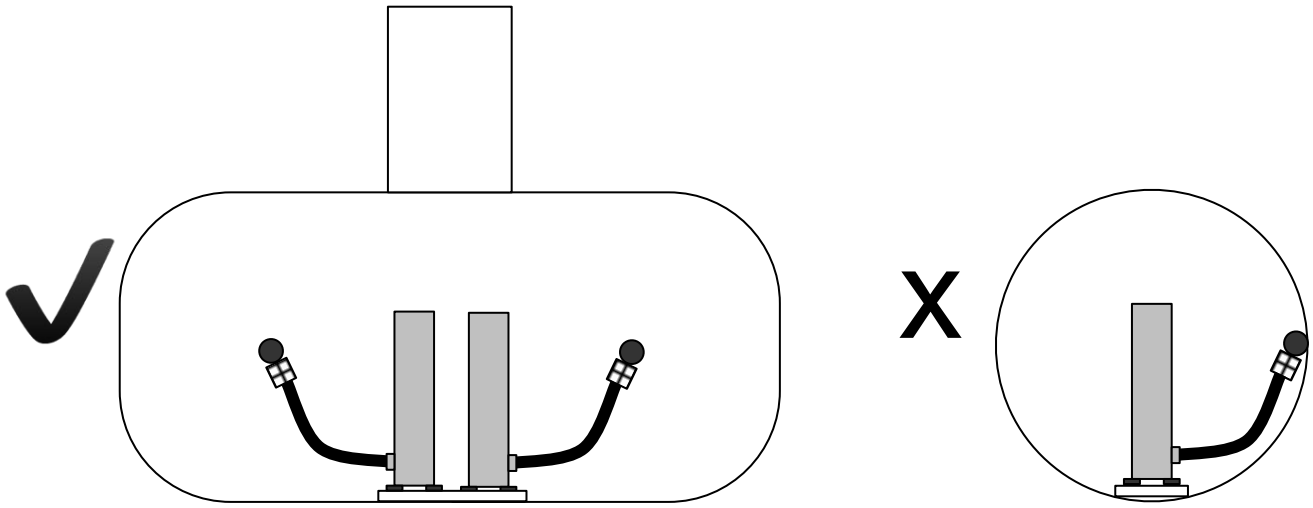


9. Lift the pumps back up to ground level, and cut the hoses where you marked them earlier. The ends of the hoses can now be fitted with the brass connectors as shown. Ensure joints are tight and threads are sealed.

   ☺ *Useful tip: a smear of vaseline or similar in the end of the hose makes it easy to push it on to the brass hose barb.*

10. Carefully lower the pumps back in to the tank again so that they sit upright on the pump platform.

11. Rotate the pumps so that the suction filters are facing along the length of the tank, and let the pump gently rest on the platform in the base of the tank. This prevents the risk of the suction filters getting caught on the side of the tank:



12. Ensure both float switches are free to move and will not obstruct each other.

13. With the pumps in their final position, connect the vertical hoses to the MDPE pipes: ——————————————————→

    Ensure joints are sealed.

14. Ensure that the free ends of the lifting ropes are secured for future use (we provide a stainless steel hook for this purpose). Secure them so that the ropes are slightly taut (but not tight!)

15. The cables from the pumps and float switches can now be pulled through the service duct using the second of the draw cords. The cables are the same length so can easily be taped together. Fix the cables to the draw cord SECURELY (e.g. Gaffa tape or similar) and pull carefully through the duct. – this is best done with two people; one pulling gently at the top end; the other at the tank end ensuring the cables are not getting tangled or caught on anything.

16. Lay the pipe for the mains top-up water. This must come from the location in the building for the top-up unit and must have a fall towards the tank. This should then join the pipe that connects the filter to the tank. Note this is best done using standard 110mm drainage pipe for the underground pipe run.

17. Note: the pipework inside the building from the tundish to floor level can be 50mm, but no smaller. – Ideally this should have a trap arrangement at the bottom of the vertical pipe in order to prevent cold air from the tank entering the building. (see drawing in the following section)

Important notes

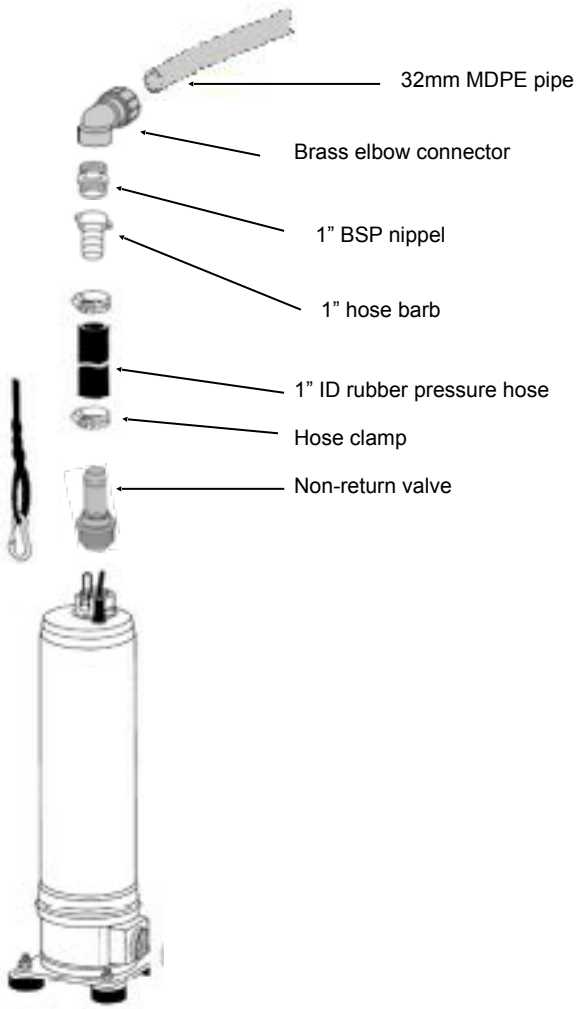
Plan pipe runs and levels carefully before commencing work. Note that both the filter unit and the tank have overflow connections, which must connect to soakaway or storm drain.

Rainwater downpipes should connect directly to the underground drainage pipes. Do not have open gullies connected to the system. This avoids the risk of undesirable materials entering the tank (e.g. painters slops).

Pipe carrying mains top-up water should join the pipe that connects the filter to the tank as per the sketch below.

Once the tank is on site ensure all openings are kept covered until the installation is completed. Do not allow soil or other material to enter the tank, and keep the inside of the tank as clean as possible.

If the tank is to be installed within an area subject to vehicular traffic, a reinforced slab must be cast over the top of the tank such that it spans the excavation. Consult a structural engineer if necessary.



Section 8

Installation – Internal Works

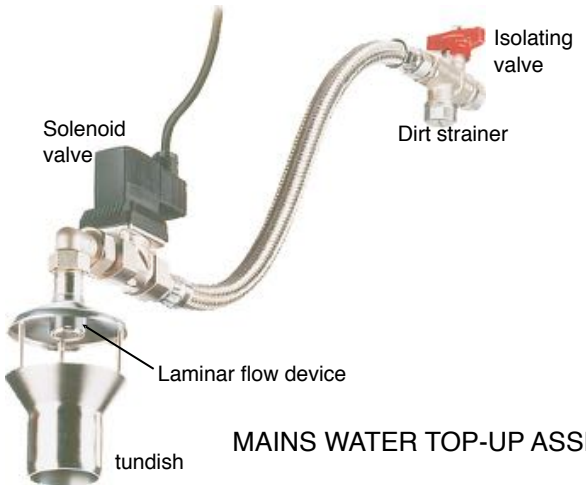
RainTech® mains water top-up unit, manifold board and control panel

MAINS WATER TOP-UP UNIT

1. Decide upon a suitable location for mounting the manifold board, the control panel and the mains water top-up unit. All must be inside the building and in a dry frost-free location e.g. plant room.

2. Fit a pipe to match the tundish vertically to the wall and connect it to the underground pipe that is to carry the top-up water (see Section 6 – External Works). – Ideally this should have a trap arrangement at the bottom of the vertical pipe in order to prevent cold air from the tank entering the building. (see drawing on following page). If the top-up unit is a ¾" version it will require a 50mm pipe; the 1" version will require a 70mm pipe.

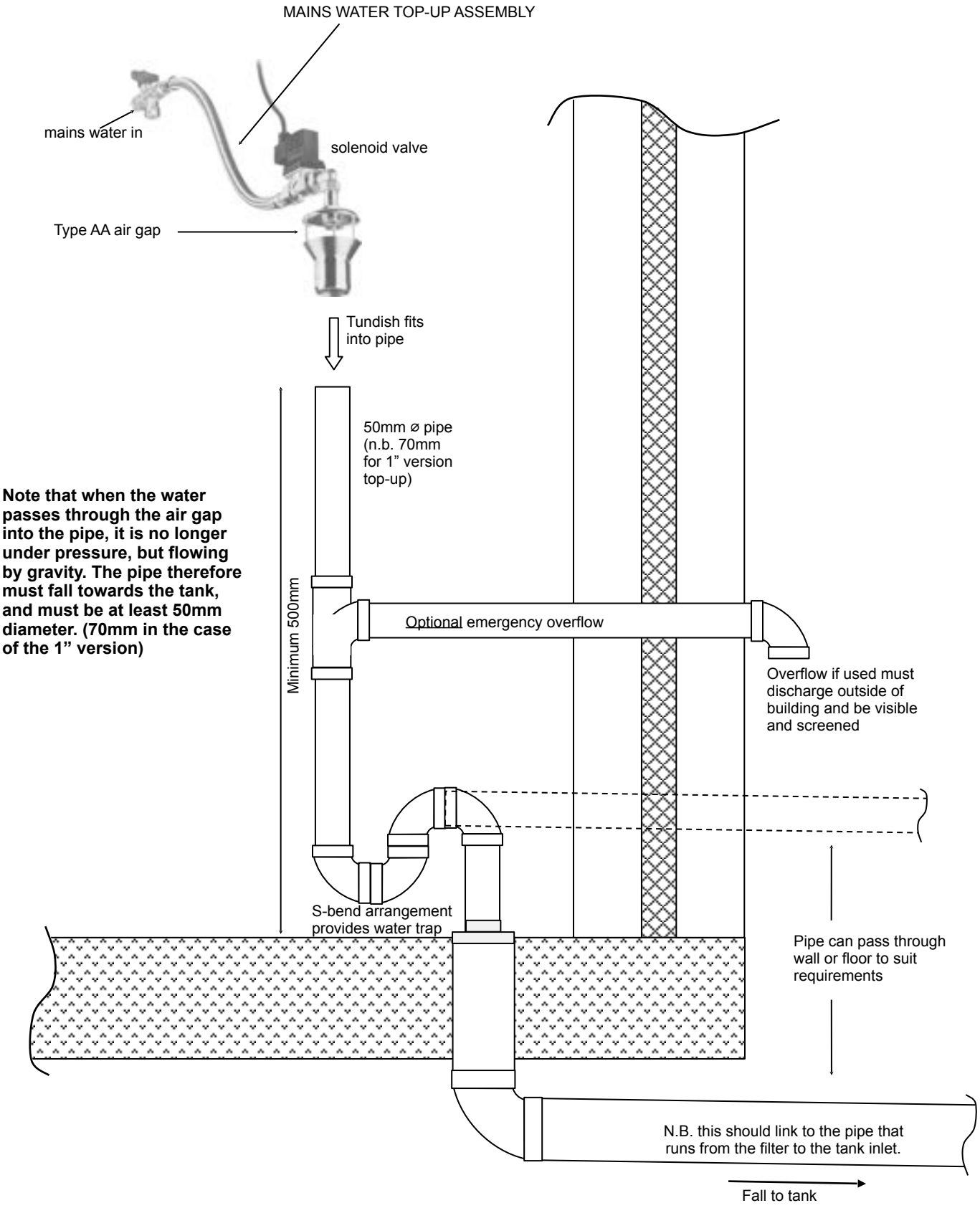
   Note the purpose of the tundish is to provide prevention against backflow of rainwater to the mains water supply, and is required by law under the Water Regulations Act. The idea is that if there were a blockage in the pipe leading to the rainwater tank / filter, water would spill over the edge of the tundish rather than reach the mains water outlet nozzle.
   This is extremely unlikely in most installations, as the water would first back up into the underground filter and through the vent holes in its' lid, and therefore spilling harmlessly on to the ground. (we have never known it to happen in 20 years of experience)
   However, if this is of particular concern, then an emergency overflow arrangement can be fitted such as shown in the diagram on the following page.



MAINS WATER TOP-UP ASSEMBLY

3. Fit the top-up assembly to the pipe. The tundish simply sits into the open end of the pipe and must be vertical. The isolating valve at the end of the flexible hose must now be connected to a 22mm mains water supply (28mm for the 1" version). Ensure that the pipe is fully supported to prevent any lateral strain on the tundish.

SUGGESTED ARRANGEMENT FOR MAINS WATER TOP-UP TO UNDERGROUND TANK



Note that when the water passes through the air gap into the pipe, it is no longer under pressure, but flowing by gravity. The pipe therefore must fall towards the tank, and must be at least 50mm diameter. (70mm in the case of the 1" version)

4. The top-up unit is supplied with a short cable for the solenoid valve. One end of this cable has a small square plug, the other has a round 2-pin plug which should be removed. DO NOT REMOVE THE SQUARE PLUG!

5. Connect the cable with the square plug to the solenoid valve above the tundish, not forgetting the square gasket, and fix with the securing screw.

6. Connect the other end of this cable, and the cable from the yellow float switch to a suitable switched and fused power outlet. The outlet should be single phase 230v rated at 1A and the cables are to be connected as a simple switched circuit. Refer to wiring diagram DP101.

PUMP CONTROL PANEL

7. Mount the control panel securely to a wall in the required location. The control panel controls the pumps in response to signals from the pressure transducer. It also provides pump duty cycling, dry run protection and has volt-free contacts for remote alarm.
The panel has connections for the following components:
   - Pump 1
   - Pump 2
   - Pressure transducer
   - Dry-run protection float switch
   - BMS common fault alarm
   - Remote alarm unit (if used)

   The panel requires a 20A single phase 230v power supply. For internal electrical connections refer to the wiring diagram at the end of this document.

8. Connect the cables from the two pumps into the control panel as shown in wiring diagram DP102.

9. Connect the cable from the red float switch into the control panel as shown in the wiring diagram.

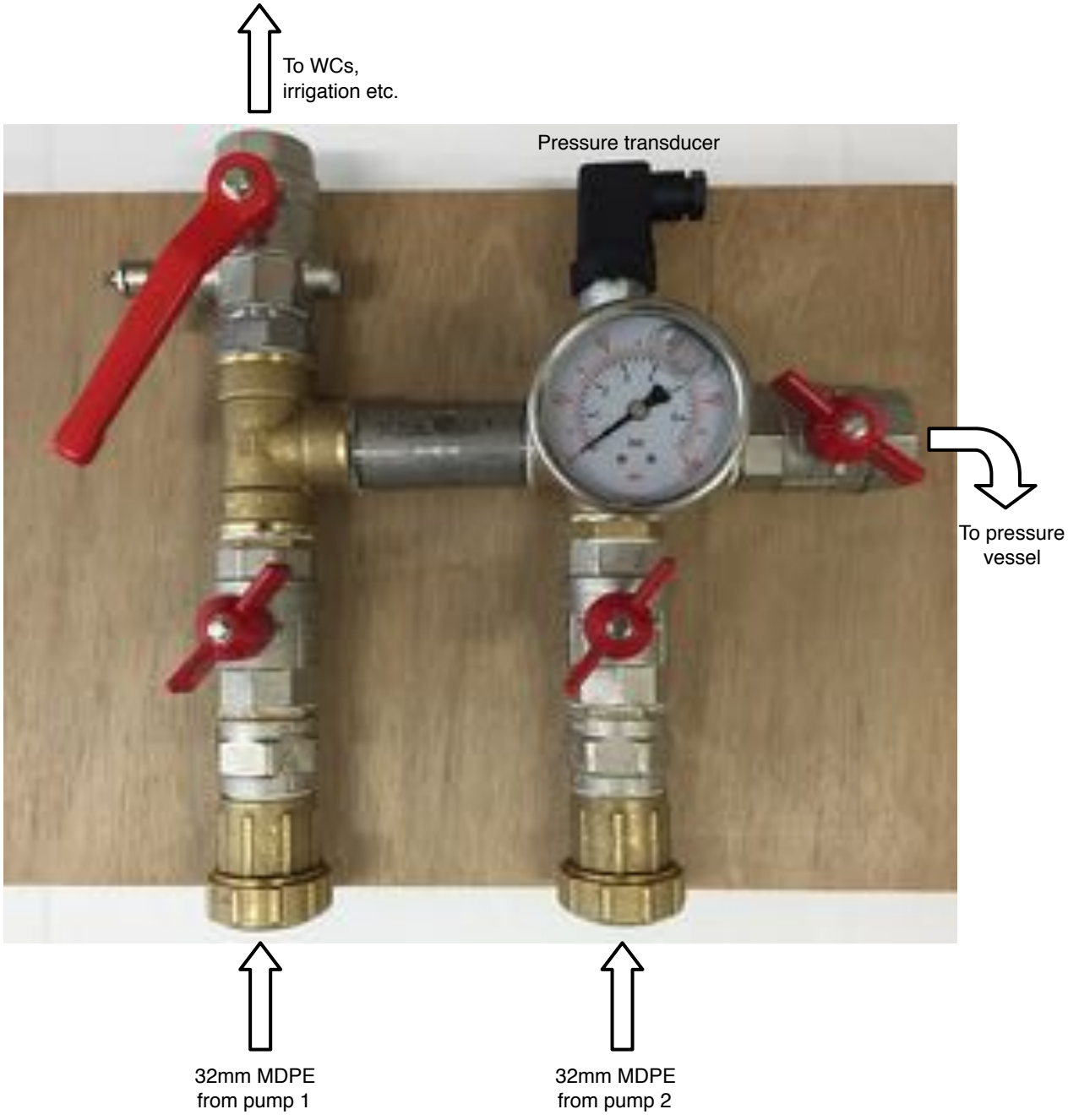
REMOTE ALARM UNIT (OPTIONAL)

10. The remote alarm unit is an optional component for use where a fault indication is required in another location from the plant room. It has a high visibility lamp and an alarm siren (82dB). Mount the unit in the required location and connect a 1A single phase 230v switched and fused power supply to the terminals marked 230V and 0V.

11. Connect a twin-conductor cable from the terminals marked IN to terminals 18 & 19 in the pump control panel

PUMP MANIFOLD BOARD

12. The system is supplied with a board-mounted manifold to be fitted within the plant room. The manifold has five pipe connections, all of which have individual isolating valves. Two connections are for the rising mains from the rainwater pumps, one is the outlet to the rainwater circuit, one for the expansion vessel and one for the backwash function of the rainwater filter (this last one is optional to use).



13. Connect the two MDPE pipes from the pumps to the left and centre connections at the bottom of the manifold. It does not matter which pump connects to which connection, but there must on no account be any outlets between the pump and the manifold.

14. Connect suitable cable from the manifold pressure transducer to the control panel. Refer to the panel wiring diagram.

PRESSURE VESSEL

15. The pressure vessel is floor mounted so should be placed in the desired location. The vessel is supplied with a flexible connecting hose to enable ease of fitting. Connect the hose to the vessel ensuring that the fibre washer is fitted. The other end of this hose must connect to suitable pipe, which in turn connects to the outlet at top right of the manifold. The vessel is pre-charged and will be accurately set during commissioning.

Electrical requirements:		
Component	Voltage	Current
Pump control panel	230v 1~	20A
Mains water top-up unit	230v 1~	1A
Remote alarm unit (if used)	230v 1~	1A
**N.B. – an additional power supply will be required if a solenoid valve / time switch is used to operate the backwash function of the filter unit.*		

PIPE & VALVE IDENTIFICATION

Apply adhesive identification tape to all pipes that are used to convey rainwater to WCs and other outlets. All outlets should be labelled appropriately. Adhesive tape and labels are supplied with each system:

150mm x 33m roll of self adhesive pipe banding tape. Complies with WRAS Guidelines and BS 8515

75 x 100mm rigid sign as per WRAS guidelines

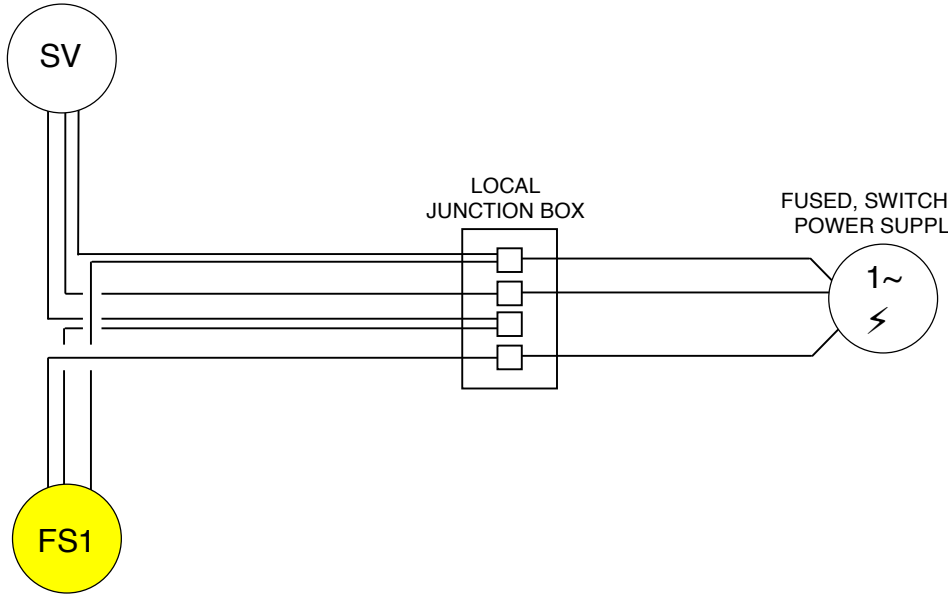
80mm x 30mm valve tags with

Additional items are available on request.

When all mechanical and electrical connections have been made and tested, and both mains water supply and electrical supply are live, the system is now ready for commissioning by a Rainharvesting Systems engineer.

Call us to arrange this on 01452 772000. Note that we require a minimum of two weeks' notice.

SOLENOID VALVE
(MAINS WATER TOP-UP UNIT)



VOLTAGE	CURRENT
240 VAC 1 PHASE	1A

YELLOW DEMAND FLOAT
SWITCH IN RAINWATER TANK

WIRING SCHEMATIC FOR MAINS WATER SUPPLY TO RAINWATER TANK VIA SOLENOID VALVE AND DEMAND FLOAT SWITCH

REFER ALSO TO DRAWING DP-100

RAINHARVESTING SYSTEMS LTD.
CALF WAY, BISLEY, GLOS.
TEL: 01452 772000
www.rainharvesting.co.uk

DRAWING NO.	REV.	DATE
DP-101		15/7/15

CONNECTIONS WITHIN TWIN PUMP CONTROL PANEL

DOOR INTERLOCK SWITCH

N
L
P1 L
N
P2 L
N
9
10
11
12
14
15
16
17
18
19

FUSED, SWITCHED POWER SUPPLY

1~

1~ M
PUMP 1

1~ M
PUMP 2

FS1

DRY-RUN PROTECTION FLOAT SWITCH IN RAINWATER TANK

PT1

PRESSURE TRANSDUCER ON MANIFOLD BOARD

VFC1
VFC2
VFC3

VOLT-FREE CONTACTS

VOLTAGE	CURRENT
230 VAC 1 PHASE	20A

WIRING SCHEMATIC FOR TWIN PUMP CONTROL PANEL MODEL DAB E.BOX BASIC D

WIRED FOR PUMPS WITH DRY-RUN PROTECTION SWITCH AND PRESSURE TRANSDUCER

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DP-102		15/7/15