Water Management Solutions

Klargester

BioFicient 1 & 3 Sewage Treatment Plants Installation Manual

BIOFICIENT 3 GRP –GRAVITY

BIOFICIENT 1 MDPE –GRAVITY

BIOFICIENT 3 GRP –IPS

BIOFICIENT 1 MDPE –IPS

Part Code	Issue	Description	Date
017902	08	ECN1648	Jan 2023

Kingspan®

HEALTH AND SAFETY

You must read these warnings carefully before installing or using the equipment. Always ensure that all relevant documents are supplied with the equipment transferred to a new owner. Observe all hazard labels and take appropriate action to avoid exposure to the risks indicated. Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary.

- Only experienced contractors should carry out installation, following the guidelines.
- The unit should have a Pre-Service Agreement Inspection by an approved engineer.
- A qualified electrician should carry out electrical work.
- Covers must be kept locked.
- Observe all hazard labels and take appropriate action to avoid exposure to the risks indicated.

CLOTHING

- We recommend the use of a dust mask and gloves when cutting GRP components.
- Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves.

MAINTENANCE AND INSPECTION PROCEDURES

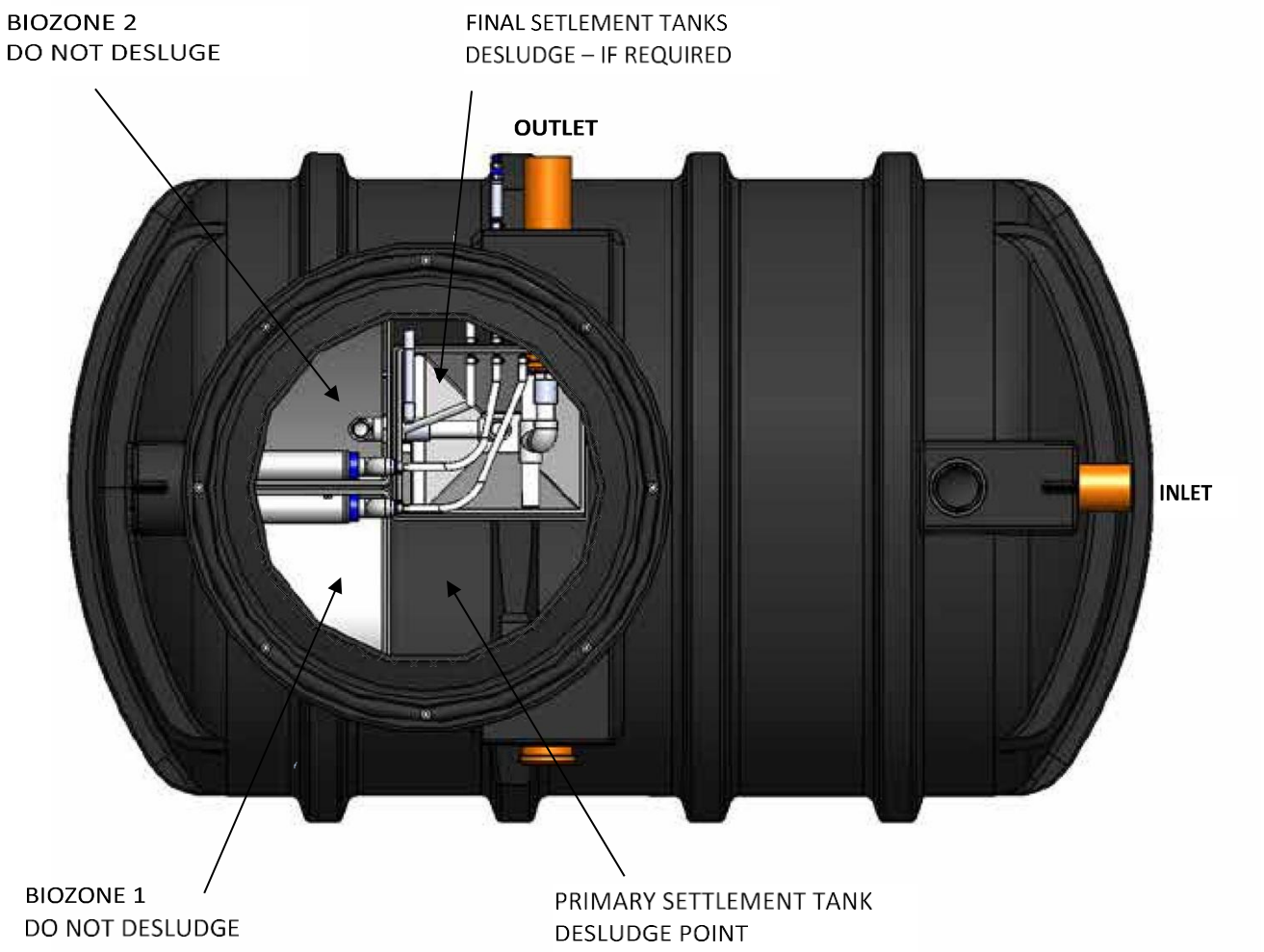
- If you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.
- The power supply to the equipment must be isolated at the control panel(s) before lifting the covers.
- If the equipment should run with the covers off, all care must be taken to avoid contact with moving parts and electrical components or conductors.
- Once power has been isolated, the control panel must be kept locked shut to avoid accidental re-connection whilst work or inspection is being carried out.

WORKING AREA

- Ensure that the working area is adequately lit.
- Ensure that you are familiar with the safe working areas and accesses.
- Use only the designated access walkways. Do not walk on the cover or deep well safety mesh(es).
- Always keep proper footing and balance to avoid any sharp edges.

DESLUDGING

- Desludging should be carried out by a licensed waste disposal contractor holding the relevant permits to transport and dispose of sewage sludge.



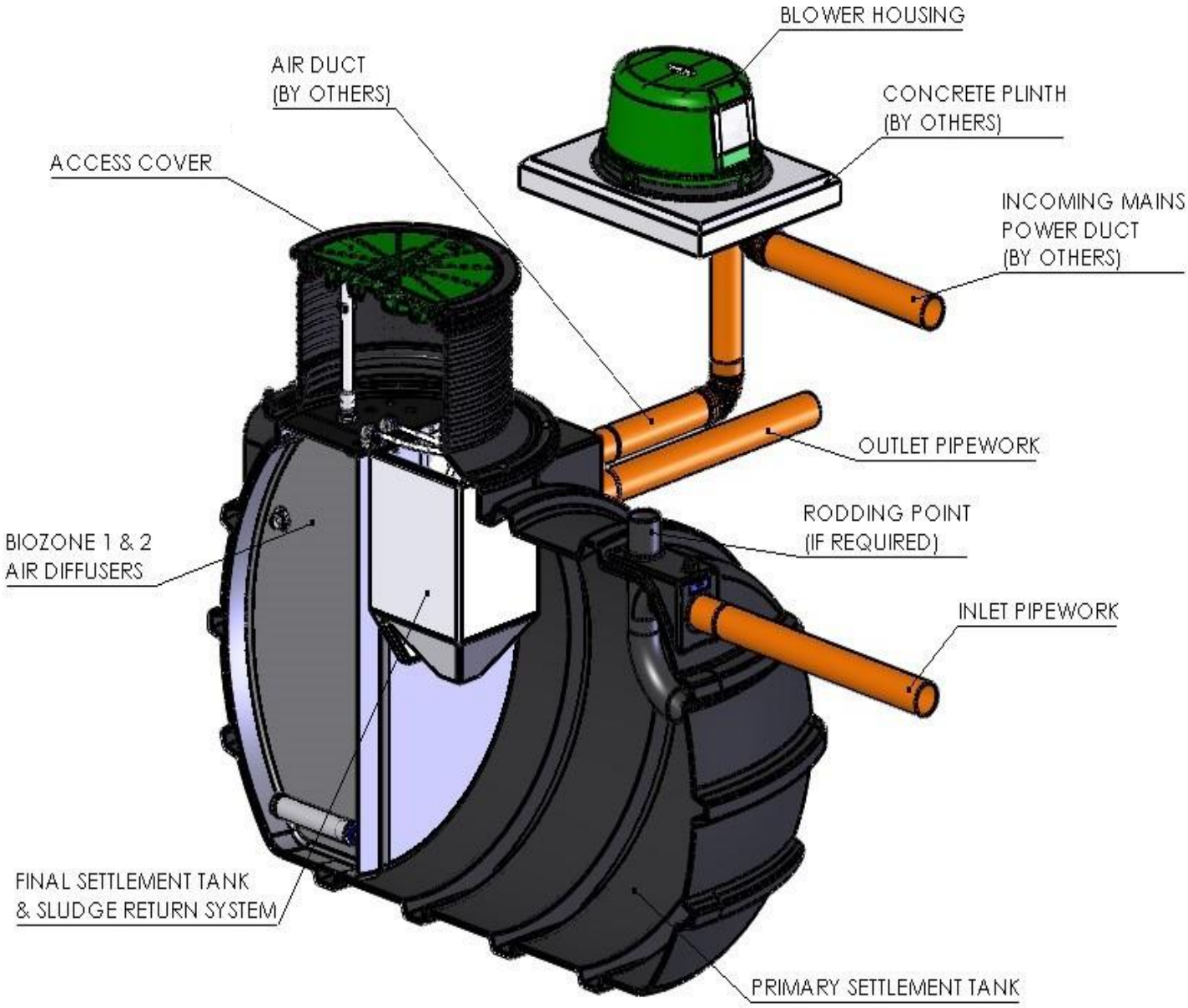
Desludge Volumes

Model	BFP 1	BFG 2	BFG 3
Primary Settlement Tank	2000 Litres (440 gal)	3600 Litres (800 gal)	3600 Litres (800 gal)
Final Settlement Tank	54 Litres (12 gal)	90 Litres (20 gal)	90 Litres (20 gal)
Desludge Period	12 Months Maximum	12 Months Maximum	12 Months Maximum

Contents

SYSTEM OVERVIEW

Pictorial representation below indicates basic requirements for a standard system, please note that not all of the items required are supplied by Kingspan.



BioFicient® CHECKLIST

The delivery paperwork will have 2 no. items listed; check that the Tank Code (Item 1) & Blower Assembly Code (Item 2) are the same as the codes on the units delivered.

Example;

Top Level Product Code – BFP1GPPK

Item 1 – BFPTANK1GK (Tank Code)

Item 2 - BHBF1GPPK (Blower Assembly Code)

Sewage Treatment Tank

Item 1

NB: Storage tanks vary in design and volume (6PE to 10PE). Please check your order and cross reference with relevant sales drawing. (BioFicient MDPE Gravity shown).

Blower Housing Assembly

Item 2

The Blower Assembly consists of the Blower Unit, Control Panel or Isolator, Solenoid Valve and associated pipework and fittings.

13 mm Hose Coil - 15 Metres

13 mm Hose required to connect from 1/2” Hose Connector in Blower Housing to Sludge-return Pipework located with the Tank (Supplied inside Blower Housing Packaging).

19 mm Hose Coil - 15 Metres

19 mm Hose required to connect from 3/4” Hose Connector in Blower Housing to Air Diffuser Manifold located with the Tank (Supplied inside Blower Housing Packaging).

SELF HELP

To minimise the need for dealing with emergency situations we recommend that Sewage Treatment Plants have a Pre-service Agreement Inspection, and then is regularly serviced by us or an approved Service Engineers. Provided that your plant is installed, operated correctly and serviced, you should not need to get into much – if any – self-help. However, some of the most likely question and answer situations are listed below.

Blower Failure

Blower Stopped:

- Check the unit is switched on, the incoming power supply circuit and fuse.

Blower works but no water distribution inside the plant:

- Check hose connections.
- Check distributor heads.
- If the air lift pipes are suspected to be blocked, call for service which number and other details you can find on the back page of this manual.
- Check regulating valve is not closed.

Plant flooding

- Check for blocked outlet system.
- If pumped outlet is all right, check for pump operation, check floats and pump power supply.

Plant odour

- Check blower working.
- If blower working, plant probably needs desludging.
- Check vent circuit is clear.
- Check that the air duct entering the blower housing has been sealed with foam.

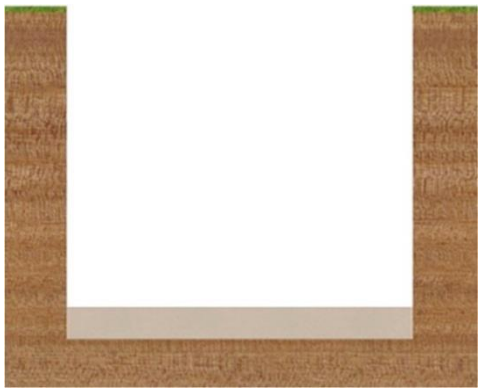
DO's

Do take out a service agreement and let the experts look after your plant.
Do contact us for advice if you have any cause for concern. All contact details are at the end of this manual.

DON'TS

Don't pump feed the plant without seeking advice from Kingspan or installer.
Don't use a waste disposal unit as you will be adding to the biological load, and your system may not be large enough to cope with the waste. If you are unsure, please refer to our sales team for guidance.
Don't throw any medicines down the toilet.
Don't empty large quantities of bleach or similar cleaning reagents into the system.
Don't empty cooking oil or similar down the sink.
Don't cover the plant with soil material or prevent access for service and desludging.
Don't apply a hose or jet wash to the biological filter unless specifically advised to do so.
Don't try to enter the plant.
Don't put sanitary towels, incontinence pads, nappies, tampons or other non-biodegradable items' down the toilet.

INSTALLATION



1. EXCAVATE A HOLE & LAY CONCRETE BED

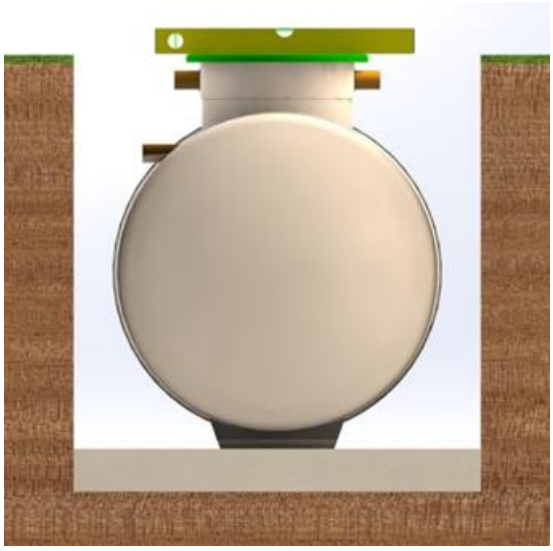
Approximate dimensions

MODEL	DIAMETER/ WIDTH (mm)	LENGTH (mm)	INLET INVERT* (mm)	OUTLET INVERT** (mm)	INSTALLATION DEPTH** (mm)
BioFicient 1	1420	2500	500	600	1795
BioFicient 2	1425	3760	500	600	1830
BioFicient 3	1425	3760	500	600	1830

*BioFicient 1 inverts available - 500 to 810, 1000 &1500 mm
*BioFicient 2 & 3 inverts available - 500, 1000 & 1500 mm
** Based on 500 mm invert

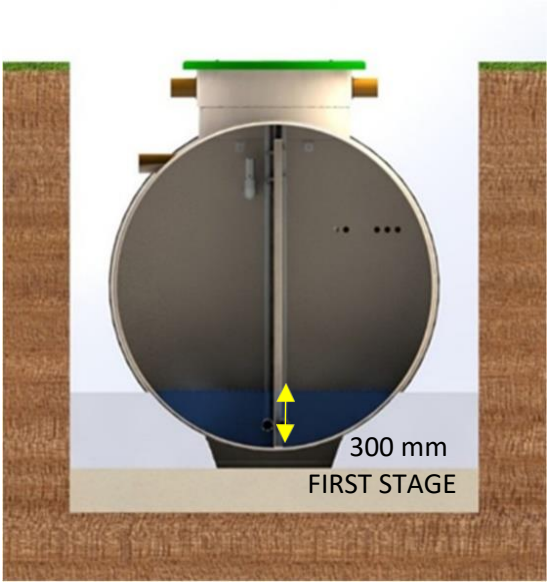
- Excavate a hole with clearance on all sides and base of the unit of 150 – 200 mm, depending on site conditions.
- If shuttering is required to maintain a vertical wall, increase the width of the excavation to accommodate.
- If the excavation has an unstable base, excavate an additional 250 – 300 mm and fill with compacted hard-core.
- If water is present in the excavation, de-water using suitable pumping equipment. Place a sheet of polythene over the base and up the sides of the excavation before creating the concrete slab.
- A minimum base of 150 – 200 mm of lean mix concrete is required for all ground conditions. The installer must ensure that the base is adequate to support the weight of the tank and its contents. (FOR CONCRETE SPEC. SEE BELOW).
- It is recommended to backfill with C25 SEMI-DRY MIX.

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		



2. LOWER UNIT ONTO CONCRETE & ENSURE LEVEL

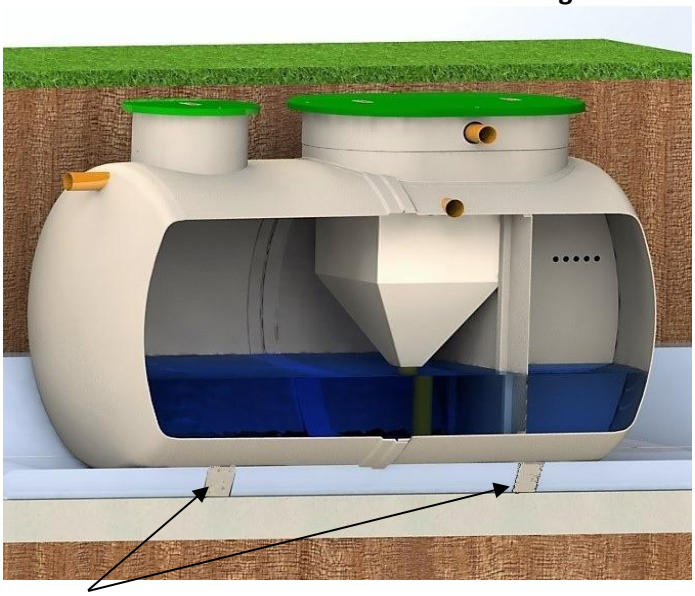
- Lower the tank into the hole. A suitable spreader bar must be used with lifting slings located through the lifting points provided on the tank.
- The slings must not be attached to the inlet or the outlet pipe.
- Tank must not be lifted with any water inside.
- Check the Inlet and Outlet pipe orientation is correct.
- Check the unit is levelled.



3. BACKFILL THE TANK UNIT

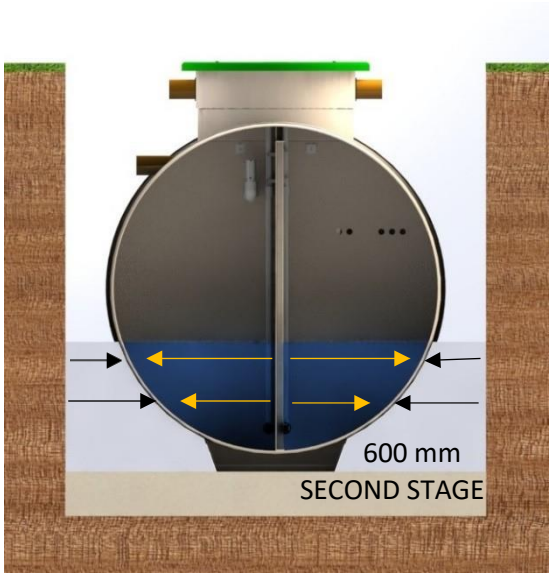
- Our domestic treatment plants are structurally tested in accordance with EN 12566-3, which specifies structural stability testing using pea shingle backfill (worst case scenario), for both wet and dry sites, however due to rising groundwater conditions in GB and Ireland, we strongly recommend that a concrete backfill is used to install the product.
- The backfilling must start before the base has hardened and must be a single continuous operation, so the tank has a full concrete jacket without joins.
- The backfill must be free from organic material, large stones, brick or sharp objects.
- Backfilling must be carried out in layers, making sure that voids are not left under or around the sides of the tank and there are no localised stress concentrations.

The installer must progressively fill the tank via a hose keeping the water level above the backfill to stabilise pressures on the tank. **If the pressures are not stable the tank can become distorted and damaged.**



Make sure tank is ballasted with water in all chambers as you backfill.

Note: The feet on the tank are for transportation purposes only and are not load bearing. Make sure the concrete backfill is spread underneath the tank to take pressure off the feet.

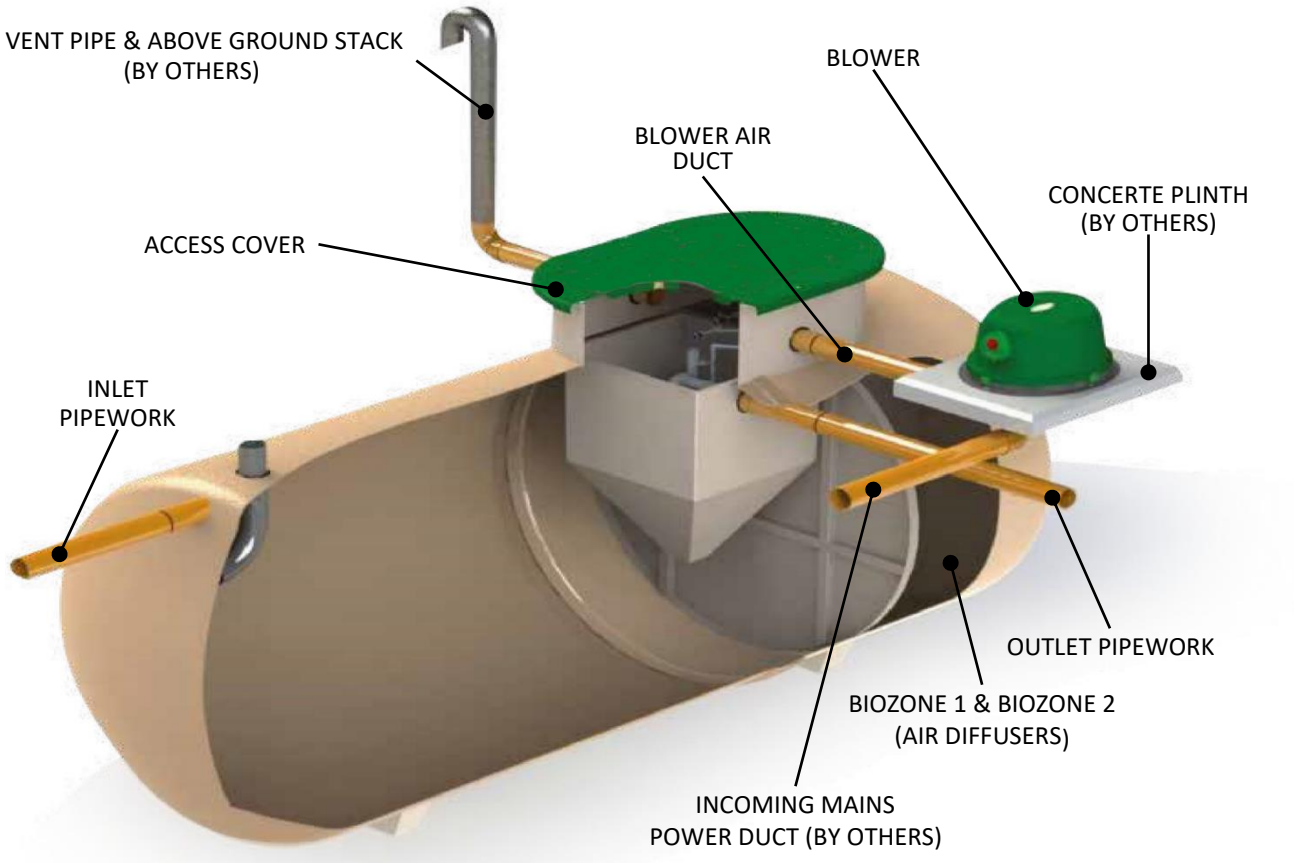


4. SECOND BACKFILL STAGE

- Continue to fill the tank with water and backfill evenly around the tank, consolidating in 300 mm layers.
- DO NOT use vibrating pokers to consolidate concrete.
- DO NOT discharge concrete directly on to the tank.
- Ensure that the concrete is not too wet and that is tamped in around the tank.
- Continue until just below inlet and outlet pipework.
- Remove covers and connect inlet and outlet pipework.
- Continue to backfill

5. VENTING

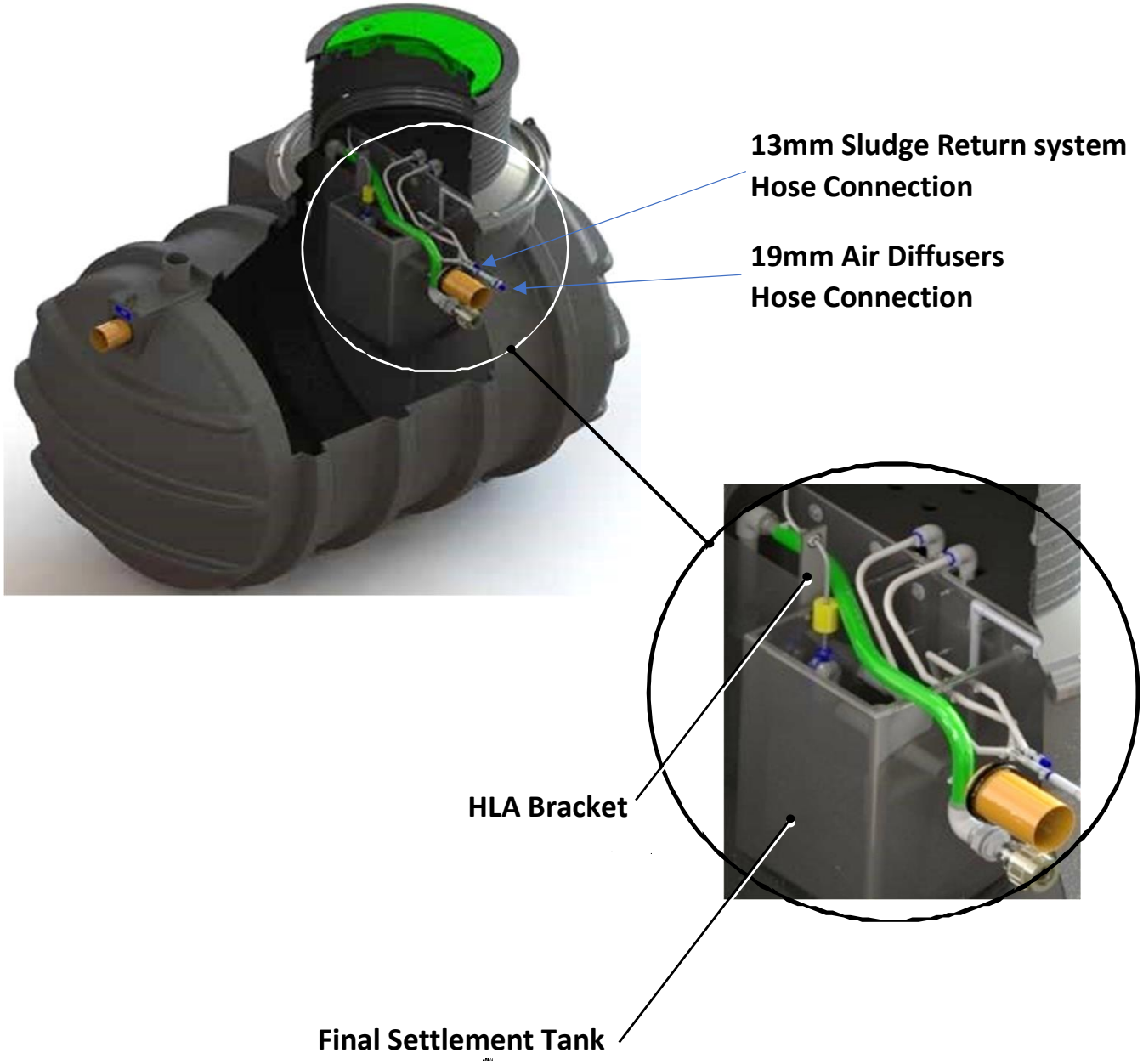
- Installer must ensure adequate venting is provided for treatment plant to work efficiently.
- A vent connection is supplied in the tank neck and is clearly marked. This vent connection should only be used to connect to venting pipework.
- It is also important to seal off the air duct to the blower housing with expanding foam.
- This prevents odour from reaching the blower housing and ensures blower is only drawing in clean air.
- If for a house, the vent can be vented up the vent stack of the house.
- The vent duct can be capped.



BioFicient® IPS HLA

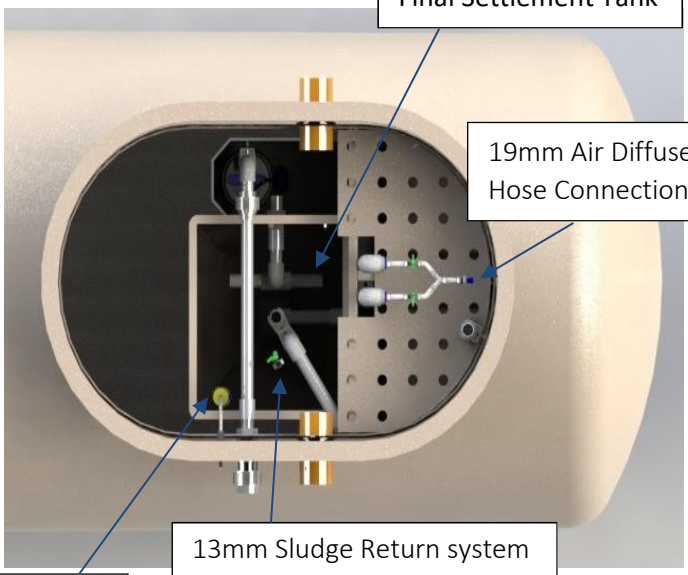
BioFicient 1 HLA installation

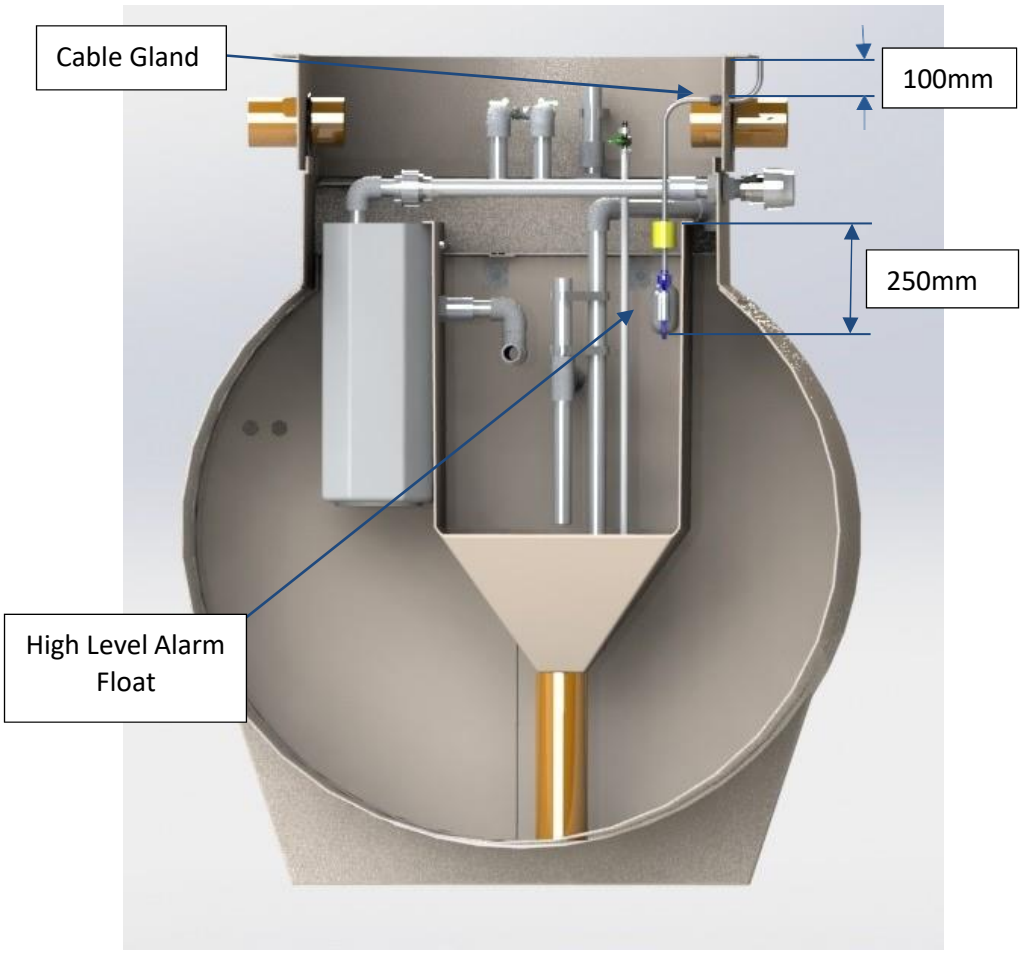
1. Remove the loose float located in the blower housing.
2. Thread the float cable through the gland in the HLA bracket fixed to the Final Settlement Tank (FST) in the plant.
3. Position bottom of the float 200mm from top of the FST and tighten gland to secure the float cable.
4. Connect hoses to Sludge Recycle and diffusers .



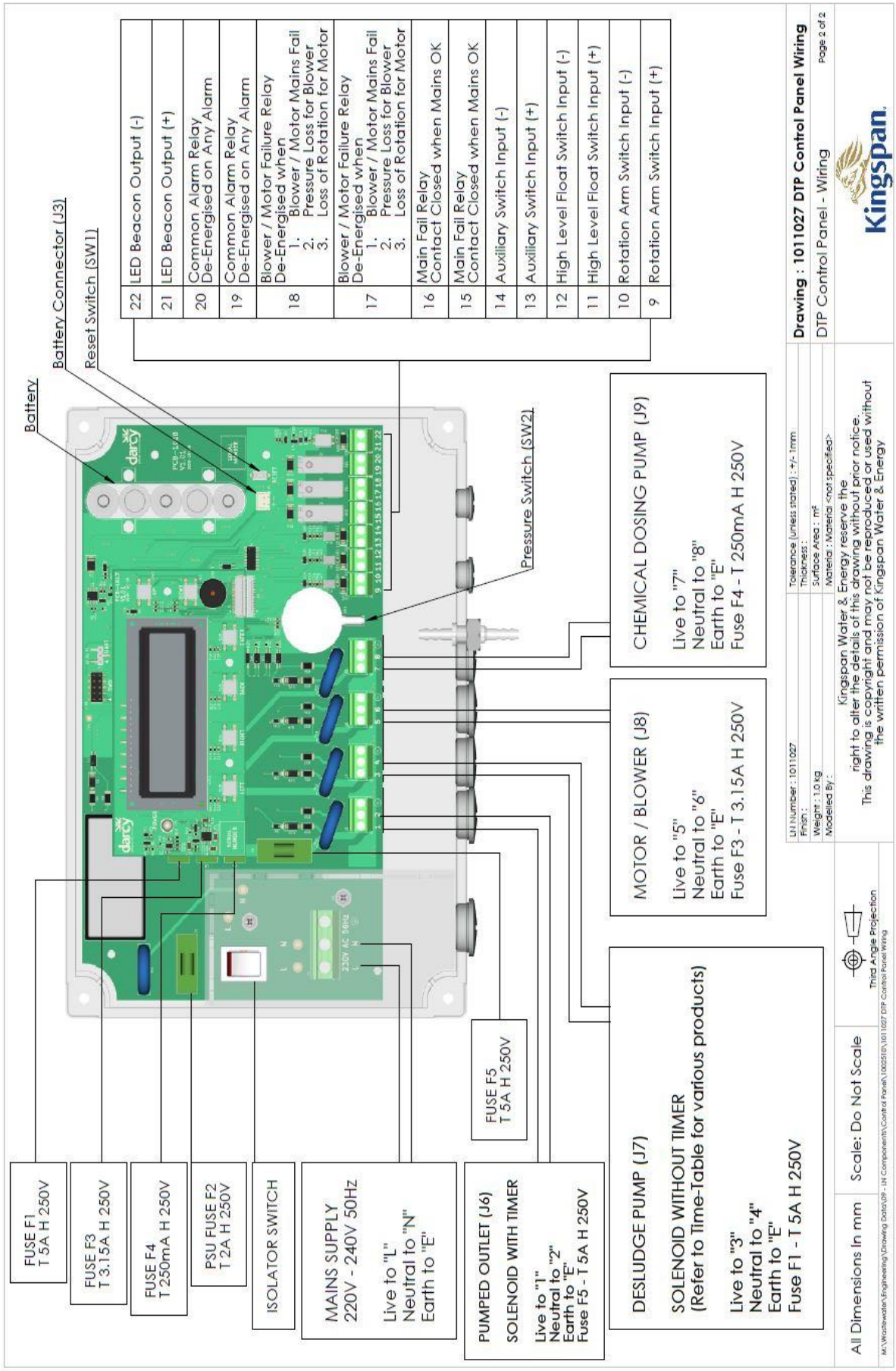
BioFicient 2-3 HLA installation

1. Remove the loose float, pivot weight & cable gland located in the blower housing.
2. Drill Ø20mm hole & fit cable gland in position shown above the FST, approx. 100mm below the top of the turret.
3. The bottom of the float to be approx. 250mm from the top of the pivot weight.
4. Pass the float cable through the cable gland and align the top of the pivot weight with the top of the FST. Tighten the cable gland up.
5. Ensure the operation of the float will not foul on any pipework.
6. If required, float cable to be extended to control panel.
7. Connect hoses to Sludge Recycle and diffusers.

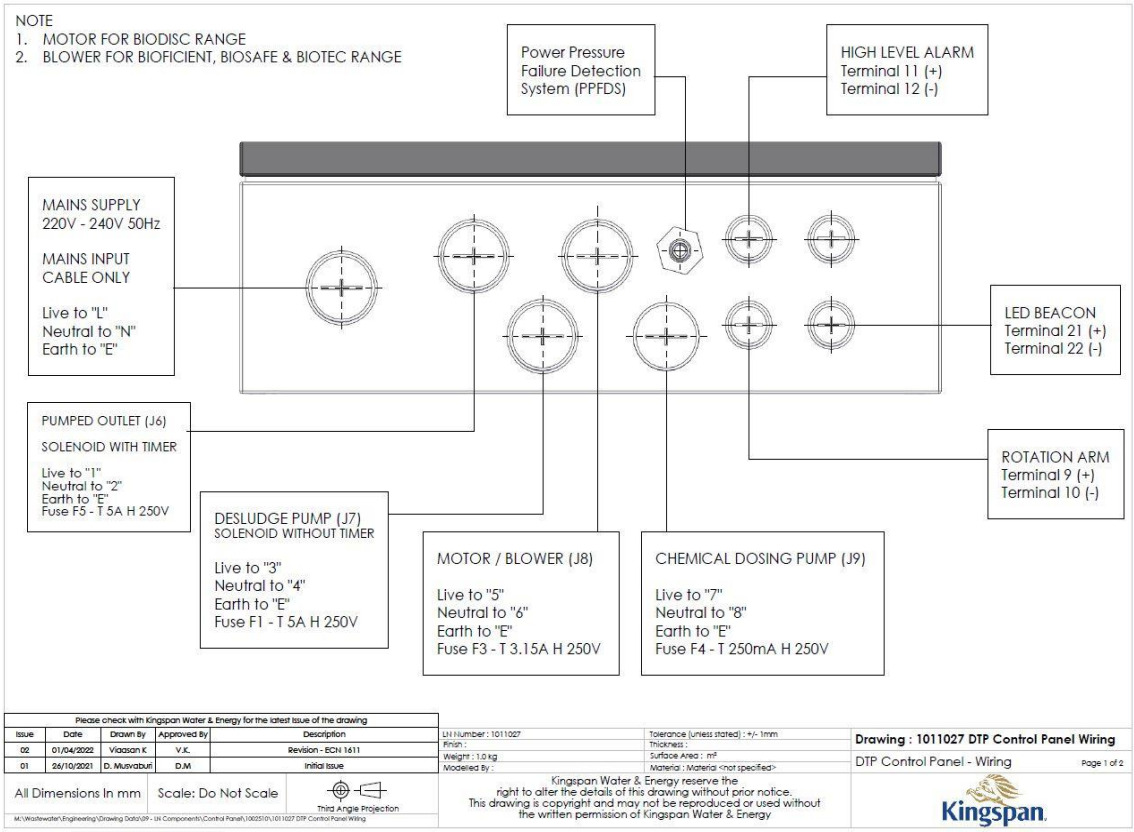


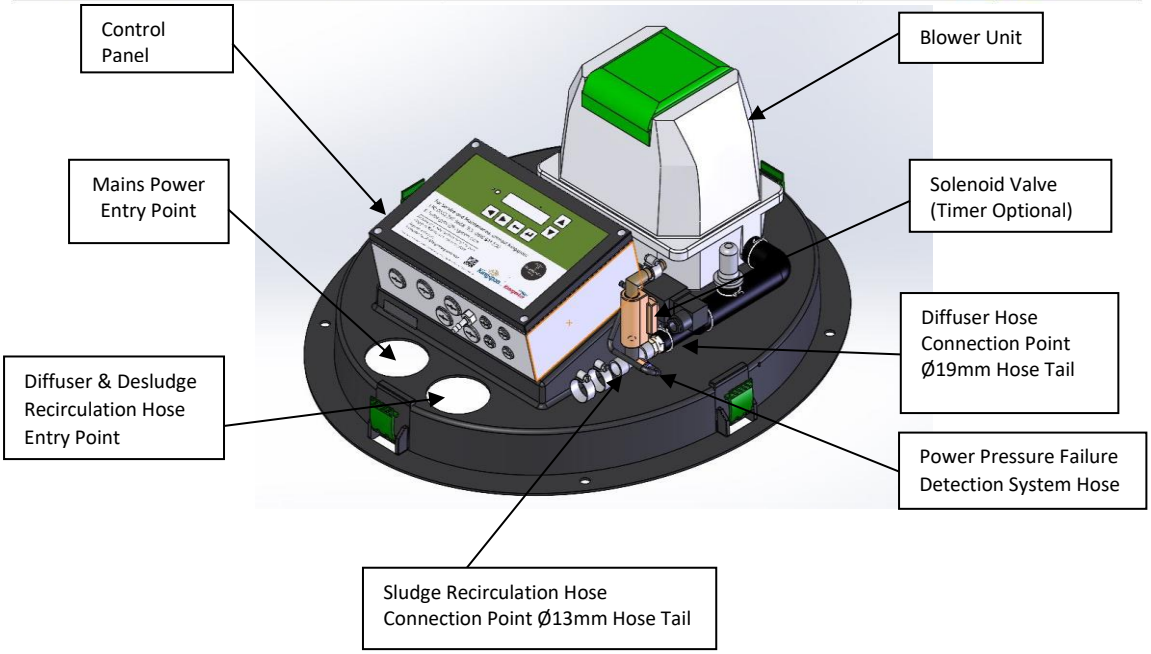


CONTROL PANEL INSTALLATION (Premium Specification – If Applicable)



CONTROL PANEL ENTRY POINTS DEPENDING ON THE EQUIPMENT SUPPLY





		Full Load Current (Amps)		
		BioFicient 1	**BioFicient 2**	**BioFicient 3**
Blower	240 - volt single Phase	0.7	1.0	1.4
Integral discharge pump	240-volt single phase only	2.2	2.2	2.2
Solenoid Valve	Low Voltage	0.08	0.08	0.08

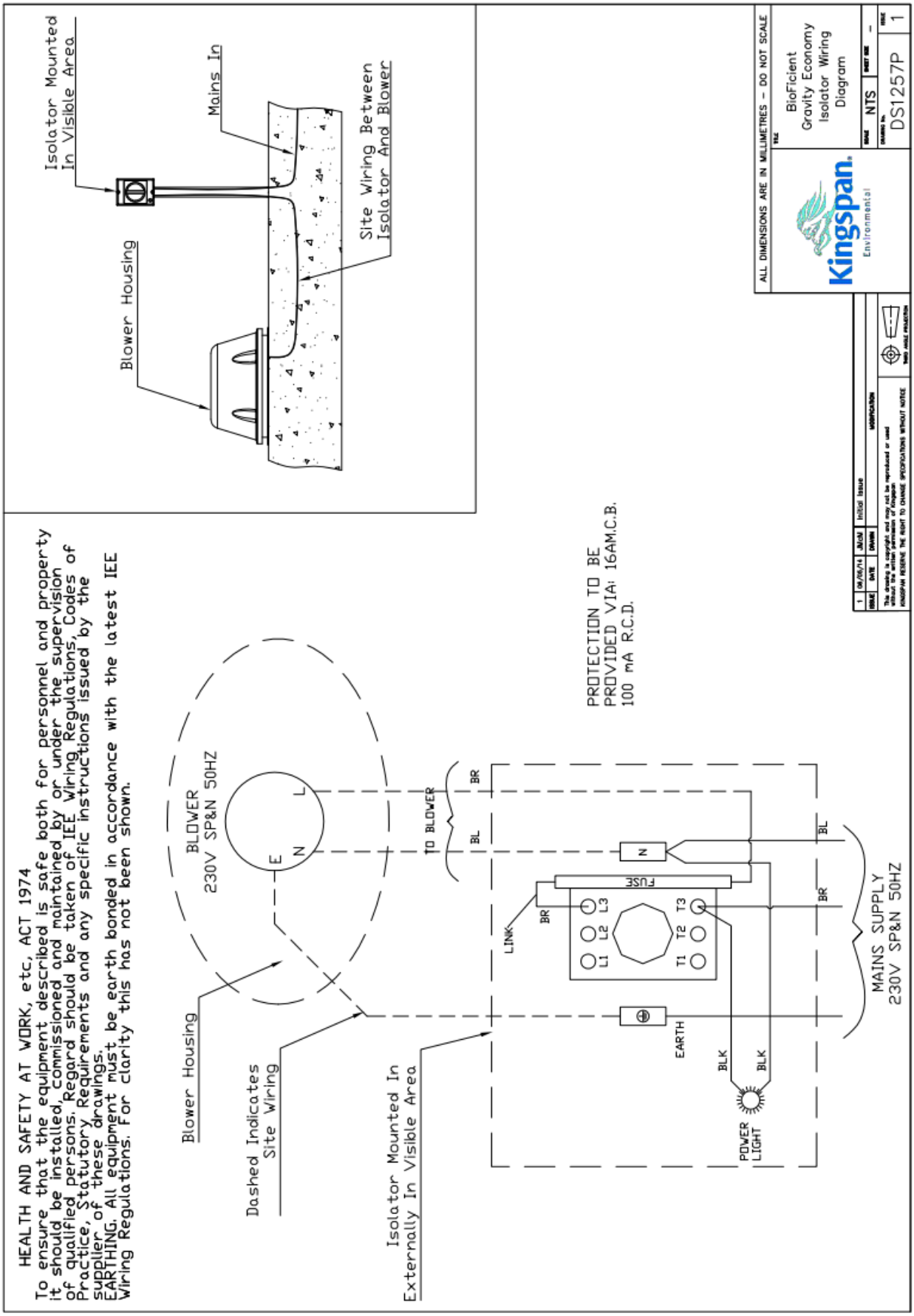
COMPLETING THE INSTALLATION (refer to Control Panel illustration on page 14.)

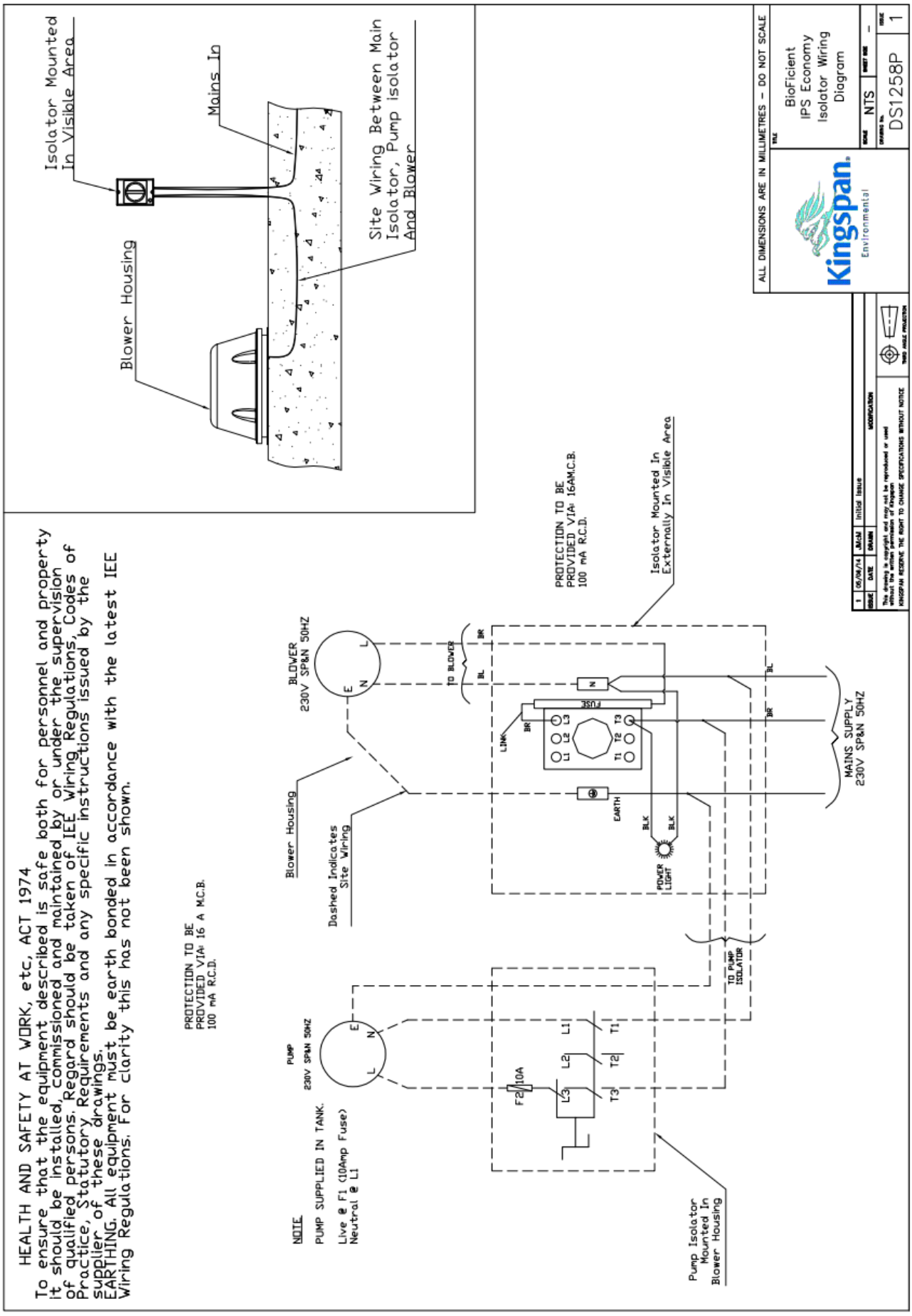
1. Plug the lead from the battery into the small white socket in the top right corner of the PCB
2. Power & Pressure Failure Detection System (where applicable)
3. Installation of High-Level Alarm (where applicable) – Follow instruction from 1011026 DTP Control Panel Manual.

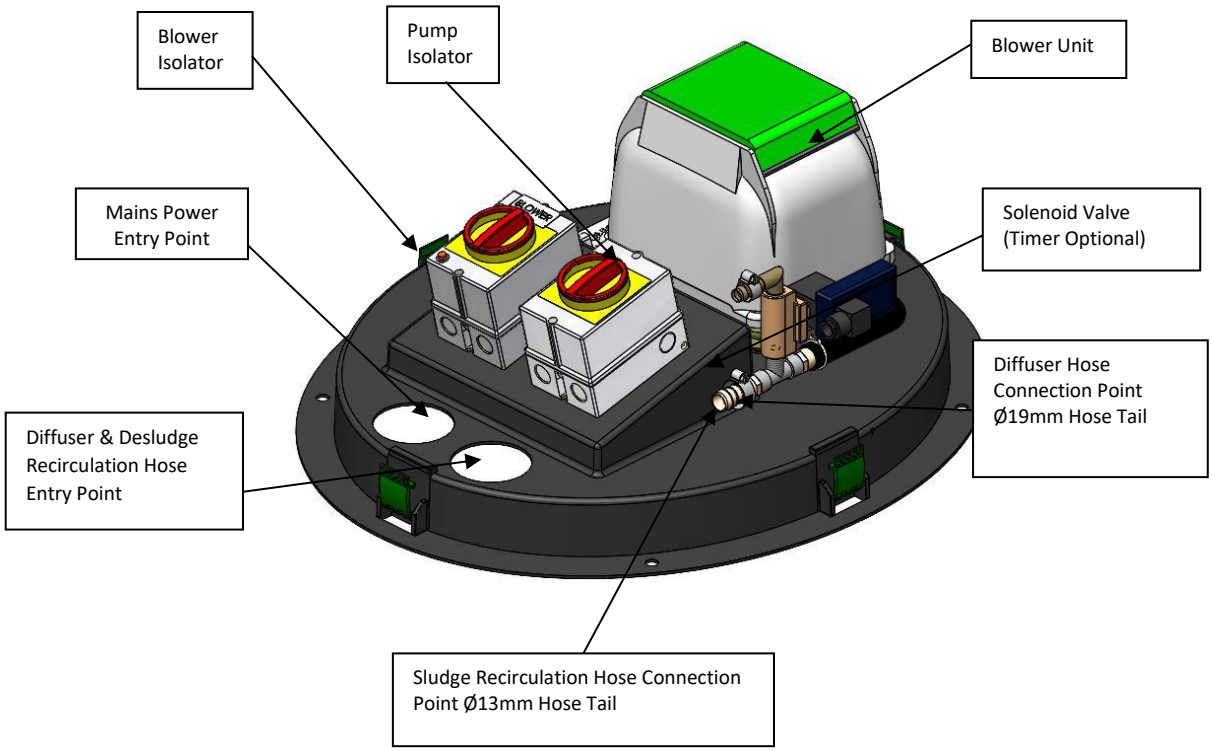
CONTROL PANEL FAULT CODES AND FUSES

1. Refer to Manual 1011026 – DTP Control Panel for Fault Codes

ISOLATOR INSTALLATION (Economy Specification – If Applicable)




Isolator Mounted In Visible Area
Mains In
Blower Housing
Site Wiring Between Main Isolator, Pump Isolator And Blower
HEALTH AND SAFETY AT WORK, etc, ACT 1974
To ensure that the equipment described is safe both for personnel and property it should be installed, commissioned and maintained by or under the supervision of qualified persons. Regard should be taken of IEE Wiring Regulations, Codes of Practice, Statutory Requirements and any specific instructions issued by the supplier of these drawings.
EARTHING. All equipment must be earth bonded in accordance with the latest IEE Wiring Regulations. For clarity this has not been shown.
PROTECTION TO BE PROVIDED VIA 16 A M.C.B. 100 mA R.C.D.
PROTECTION TO BE PROVIDED VIA 16AM.C.B. 100 mA R.C.D.
Isolator Mounted In Externally In Visible Area
BLOWER 230V SP&N 50HZ
TO BLOWER
Blower Housing
Dashed Indicates Site Wiring
LINK
FUSE
EARTH
POWER LIGHT
MAINS SUPPLY 230V SP&N 50HZ
PUMP 230V SP&N 50HZ
NOTE
PUMP SUPPLIED IN TANK.
Live @ F1 (10Amp Fuse)
Neutral @ L1
F2 10A
TO PUMP ISOLATOR
Pump Isolator Mounted In Blower Housing
ALL DIMENSIONS ARE IN MILLIMETRES – DO NOT SCALE
BioFicient IPS Economy Isolator Wiring Diagram
Kingspan Environmental
NTS
DS1258P
1
Initial Issue
This drawing is copyright and may not be reproduced or used without the written permission of Kingspan
KINGSPAN RESERVE THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE

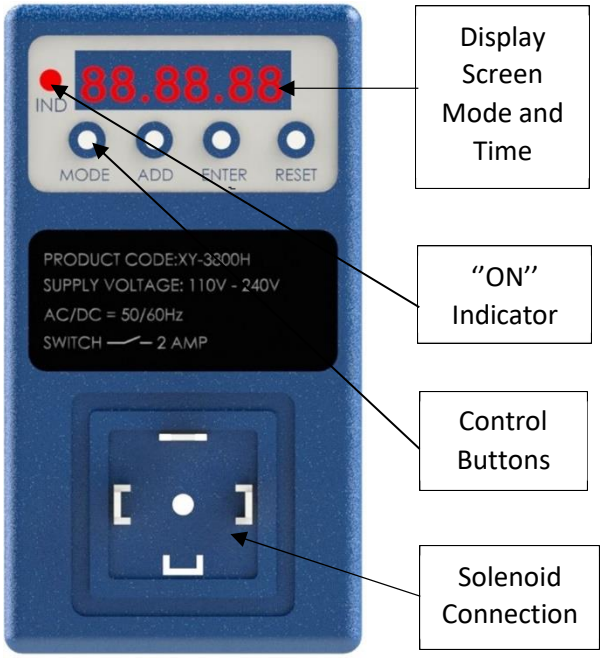


		Full Load Current (Amps)		
		BioFicient 1	**BioFicient 2**	**BioFicient 3**
Blower	240 - volt single Phase	0.7	1.0	1.4
Integral discharge pump	240-volt single phase only	2.2	2.2	2.2
Solenoid Valve	Low Voltage	0.08	0.08	0.08

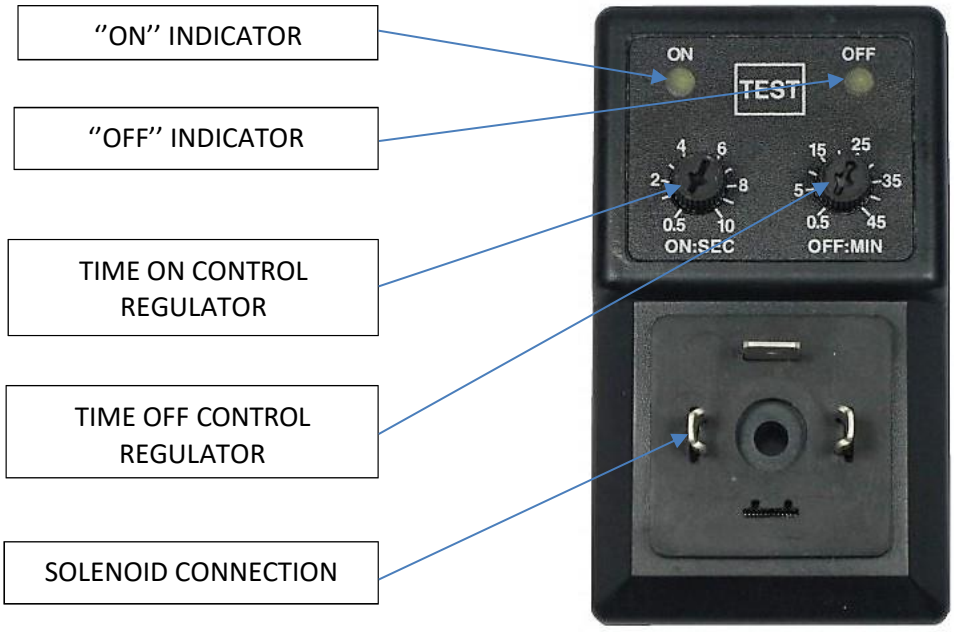
Your Plant will be fitted with one of the following Timers

SLUDGE RETURN SOLENOID RUN AND PAUSE DIGITAL TIMER SETTING

1. When power is present, press ''Mode'' button until the display reads ''on – off''.
2. Press ''Enter'' button to accept mode selected.
3. To set ''ON'' time, press ''Enter'' button to move cursor along indicator to reach single minute's position.
4. Press ''ADD'' button to increment minutes.
5. Press ''Enter'' again to get to the end of display.
6. When display changes back to all zero's, timer is asking for ''OFF'' time.
7. Press ''Enter'' to get to single hour's section.
8. Press ''ADD'' to enter hours.
9. Press ''Enter'' again to get to the end of display.
10. When times have been entered, the ''on – off'' should appear for a few seconds and the timer will start working.
11. When timer is ''ON'' the indicator is illuminated.
12. Pressing ''Reset'' button in operation will cause the timer to re-start the ''ON-OFF'' cycle.
13. The timer should be factory set at the correct settings. (5 minutes ''ON'' and 1 hour ''OFF'')



SLUDGE RETURN SOLENOID RUN AND PAUSE ANALOGUE TIMER SETTING



- The timer should be factory set at the correct settings.
- Factory settings are: 5 minutes for timer ''ON'' and 1 hour for timer ''OFF'

SLUDGE RETURN SOLENOID RUN AND PAUSE CONTROL PANEL SETTING

4. Timer is not required for this method.
5. Connect the Solenoid Valve Directly to the Terminal 3 & 4 (J7).
6. Follow the instruction available on the Manual 1011026 DTP Control Panel for setting the Time Table for the function of J7.
7. Press Left, Right & Up Button Together
8. Enter “Menu – Edit Time Table”
9. Enter “J7 – Desludge Pump”
10. Scroll To “Run – 00:00:20” and change it to “00:05:00” (5 minutes on)
11. Enter Button should be used to enter edit mode.
12. Scroll to “Pause – 02:00:00” and change it to “01:00:00” (1 hour pause)
13. Once completed, press the back button until reaching the front screen.

MAINTENANCE

Every sewage treatment plant needs regular maintenance as does the upkeep of drainage fields and drains. This is the responsibility of the owner/user.

We recommend that plants are maintained by qualified service personnel, however some self help and an awareness of normal operation is helpful in identification of a larger problem.

If the plant appears not to be operating correctly, refer to the Fault Finding section of this manual.

MAINTENANCE SCHEDULE

DAILY

Check the operation of the compressor. It should be possible to hear it running by standing close to the unit.

MONTHLY

Check the operation of the compressors (bubbles should be rising in the reactors and media should be seen slowly rotating).

Visually check that the inlet and outlet zones are clear of debris.

Visually check the biomass growth on the filter media. The biomass colours should vary from light brown colour, (not white or grey.) to rich brown. Odour from the plant should be 'earthy' and hydrogen sulphide odours ('rotten eggs') should not be present.

Visually check the final effluent. If cloudy or containing many suspended particles, then the humus and or primary tank is likely to require desludging.

THREE MONTHLY

Assess the depth of the thickness of the floating sludge in the primary and final zones.

Check the blower filter, and replace if necessary. Note. The filter will collect dirt particles from the air and the location of blower/inlet will influence the frequency of filter change.

ANNUALLY

The unit is designed to be emptied of sludge every 12 months

WARRANTY

Taken from 'Kingspan's Terms & Conditions of Sale'

The company will replace or, at its option, properly repair without charge any goods which are found to be defective and which cause failure in normal circumstances of use within a period of twelve months from the date of delivery.

This warranty is conditional upon:

(a) the Buyer notifying the Company of any claim within seven days of the failure becoming discernible.
(b) the Company being allowed a reasonable opportunity to inspect the goods so as to confirm that they are defective.
(c) the goods not having been modified, mishandled or misused and being used strictly in accordance with any relevant instructions issued by the Company.

The Company's liability under this Clause is limited to the repair or replacement of the defective goods, and does not cover costs of transport, installation or associated site costs, if applicable.

The Company's liability to replace or repair the goods is in lieu of and excludes all other warranties and conditions, and in particular (but without limitation) the Company shall have no liability of any kind for consequential loss or damage.

For any further advice, please contact us.

A Warranty Form is included in this package, to register your unit for Warranty. Please complete ALL sections of the Form, and return it at your earliest convenience.

Also within this package is a Notice, describing the necessary maintenance of the plant in use. This should be fixed within the building.

FAULT FINDING

1. COMPRESSOR NOT RUNNING

Cause	Remedy
Power cut	Do nothing. When power is restored the system will restart automatically Check Mini Circuit Breaker on electrical supply board
Power supply RCD (Residual current Device) tripped	Isolate the power supply and reset the RCD Switch on the blower, which should start automatically If not, switch off the power and call an electrician

2. NO EVIDENCE OF AIR BUBBLES RISING THROUGH THE MEDIA

Cause	Remedy
Blower not running	Refer to fault condition 1 Contact our Service company (Details on front cover)

3. MEDIA NOT MOVING

Cause	Remedy
Blower not running	Refer to fault condition 1 Contact Service company

4. NO BIOMASS GROWTH ON MEDIA OR WHITE GROWTH THROUGHOUT BOTH BIOLOGICAL REACTORS

Cause	Remedy
Blower not running	Refer to fault condition 1 Contact service company
Toxic input	Consider each chemical and the amount used within the properties E.g. washing powders bleaches. Switch to alternative products, consider switch from biological powders to non biological washing liquids and use less per wash

5. SMELL

Cause	Remedy
Blower not running	Refer to fault condition 1 Contact service company
Time for a Desludge	Remove sludge from primary and final compartments

NOTICE

BioFicient Treatment Plant

The foul drainage from this property discharges to a Treatment Tank and an irrigation system / soak-away.

The tank requires monthly inspections of the outlet chamber or sample chamber to observe that the effluent is free-flowing and clear. The soak-away should also be inspected regularly.

The Sewage Treatment tank requires emptying at least once every 12 months by a licensed contractor.

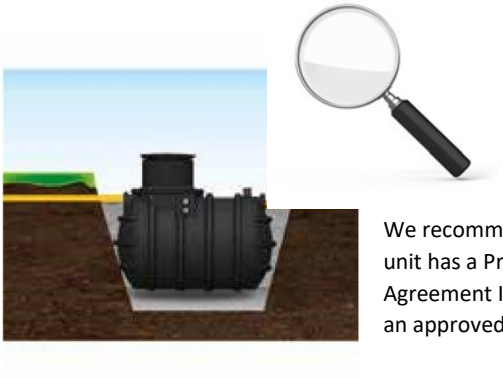
THE OWNER OF THE PROPERTY IS LEGALLY RESPONSIBLE FOR ENSURING THAT THE SYSTEM DOES NOT CAUSE POLLUTION, A HEALTH HAZARD OR A NUISANCE.

We recommend that a separate log is kept of all service visits, the log should detail the date and any action taken, e.g. regular maintenance service and de-sludge volume removed.

This notice should be fixed by the owner within the building alerting current and future owners to the maintenance requirement.

Please contact Kingspan Water and Energy on +44 84 4846 0500 to arrange a maintenance service or to request replacement operating instructions.

START UP



We recommend that the unit has a Pre-Service Agreement Inspection by an approved engineer.

Once the unit has been installed it should be left filled with water.

Contact Details

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