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OWNERS HANDBOOK
BA-BC BioDisc

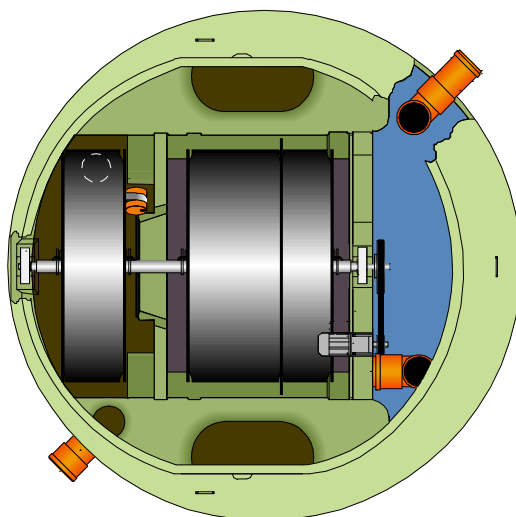


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MANAGED FLOW
BIODISC®
BA BAX BB BC NB NC

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HEALTH AND 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 the guidelines supplied with the equipment.

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

A qualified electrician should carry out electrical work.

Sewage and sewage effluent can carry micro-organisms harmful to human health. Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.

Covers must be kept locked.

Observe all hazard labels and take appropriate action to avoid exposure to the risks indicated.

The correct ongoing maintenance is essential for the proper operation of the equipment. Service contracts are available and recommended. Please contact Kingspan for details of your local service provider.

Should you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

BioDisc units contain rotating machinery and associated drive belts.

Ensure that you are familiar with the safe working areas and accesses.

Ensure that the working area is adequately lit.

The power supply to the equipment must be isolated at the control panel(s) before lifting the covers. Where a specific maintenance procedure requires the equipment to be running with the covers off, all care must be taken to avoid contact with moving parts and electrical components or conductors. Drive guards must be replaced and secured if removed during maintenance.

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.

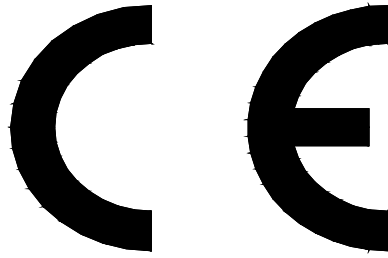
Use only the designated access walkways. Do not walk on the cover or deep well safety mesh(es).

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.

Desludging should be carried out by a licensed waste disposal contractor holding the relevant permits to transport and dispose of sewage sludge. The contractor must refer to the desludge instructions in this Handbook, a copy of the instructions are fastened under the covers.

There are separate installation guidelines available to provide full instructions for installations.

In keeping with the Company policy of continuing research and development Kingspan reserve the right to alter specifications and dimensions without notice



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07

EN 12566-3

BA - BF BioDisc

Hydraulic daily load:	1.2m³/day - 10m³/day
Material:	GRP Glass Reinforced Plastic
Watertightness (water test):	Pass
Structural Calculation:	Pass
Treatment efficiency:	COD: 89%
	BOD₅: 96%
	SS: 95%
	Total P: 48%
	NH₄: 89%
	Total N: 46%
Electrical consumption:	1.3 kWh/d - 3.1 kWh/d
Sludge production:	0.21 litres per person per day

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1 INTRODUCTION

- 1.1.1 Thank you for choosing a Kingspan product. This manual will help you to keep it operating efficiently over a long service life. Please read this manual thoroughly, preferably before installation.
- 1.1.2 This manual should be referred to by:
- The installer
 - The electrician
 - The service engineer
 - The maintenance engineer
 - The desludge contractor
 - The owner/user

2 TECHNICAL DATA

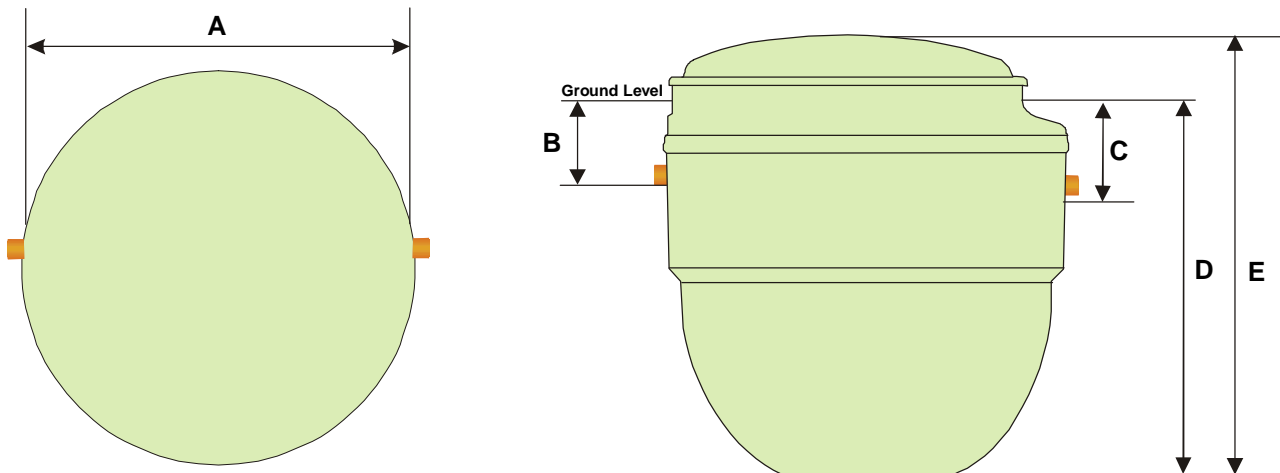


Fig. 1 General Dimensions

UNIT		BA/BAx/BB/NB			BC/NC	
Diameter	A mm	1995			2450	
Inlet Invert depth	B mm	450	750	1250	600	1100
Outlet Invert Depth C mm	Gravity discharge	535	835	1335	685	1185
	Pumped discharge	425	425	425	N/A	N/A
Depth Below Ground	D mm	1850	2150	2650	2420	2920
O/A Height	E mm	2160	2460	2960	2825	3325
Standard Power Supply		1 phase				
Optional Power Supply		3 phase				
Drive Motor Rating 1ph/3ph		60/60 watts			75/60 watts	
Sludge Return Pump Rating 1ph		480 watts (NB only)			480 watts (NC only)	
Integral Discharge Pump* Rating		480 watts (Not NB)			N/A	

*Optional

UNIT		BA	BAx	BB	BC
Maximum number of properties		1	1	2	Consult Kingspan
Maximum number of bedrooms		4	7	< 4 in each house	
Maximum Daily BOD	kg	0.36	0.54	0.72	1.08
Maximum Daily Flow	m ³	1.2	1.8	2.4	3.6
Peak Flow Rate **	m ³ /hr	0.15	0.22	0.30	0.45

** For ½ hour max. in any 2 hour period

- 2.1.1 All surface water must be excluded. These units should be used exclusively for the treatment of sewage from domestic properties. Contact Kingspan if your sewage results, wholly or partly, from any commercial function.

3 DESCRIPTION AND PROCESS

3.1 Introduction

- 3.1.1 BioDisc systems are designed to accept crude domestic sewage and produce an effluent of suitable quality for discharge to a watercourse or soakaway system, subject to the approval of the appropriate regulatory authority. These BioDisc's are self-contained single piece units.

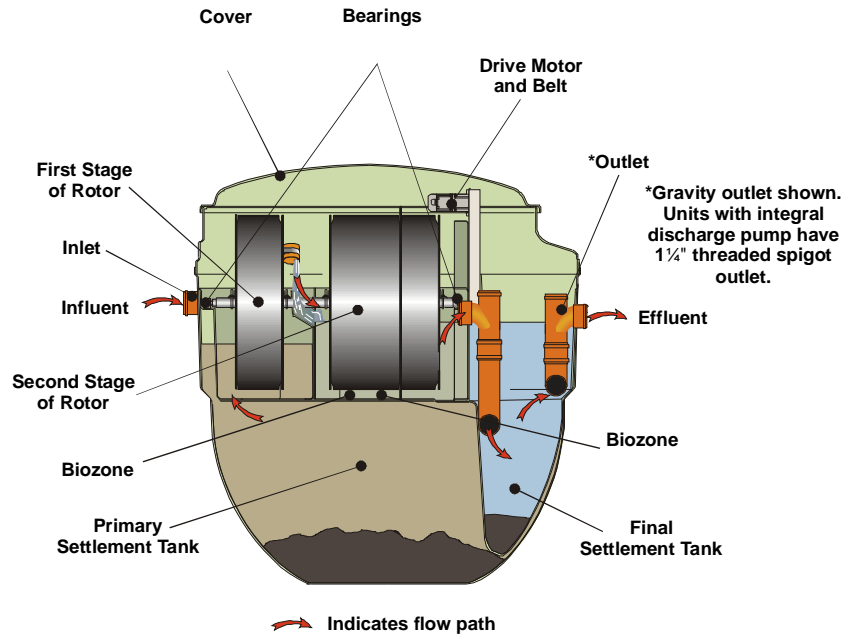


Fig. 2 - General Arrangement of BioDisc System

- 3.1.2 The main casing and cover of the BioDisc are constructed of Glass Reinforced Plastic (GRP). All steel parts are stainless, galvanised or surface coated to protect against corrosion. The discs are vacuum formed polyethylene.
- 3.2 Primary Settlement Tank**
- 3.2.1 Crude sewage enters the Primary Settlement Tank (PST), through an inlet pipe in the side of the BioDisc. Solids are settled out and retained for periodic desludging.
- 3.2.2 The PST is designed to have sufficient capacity to accept high flows over a short period and the patented Managed Flow System allows the liquid level to fluctuate to accommodate such surges.
- 3.3 Biozone**
- 3.3.1 The Biozone contains the Rotor, which consists of corrugated polyethylene discs mounted on a horizontal shaft, supported by a bearing at each end. The rotor is slowly rotated by an electric motor and reduction gearbox with a belt drive.
- 3.3.2 A flat GRP walkway along either side of the Biozone contains a number of ports which give desludge access to the Primary Settlement Tank.
- 3.3.3 The surface of the discs becomes colonised by naturally occurring micro-organisms, which form a visible coating known as the Biomass. As the discs rotate, the Biomass is alternately submerged in the settled sewage and aerated by exposure to the atmosphere. Under these conditions the Biomass can efficiently break down the pollutants in the sewage.
- 3.3.4 The Biozone and discs are divided into two stages, separated by a fixed baffle. Settled sewage enters the first stage of the Biozone through a submerged transfer slot. The liquid level in this stage will fluctuate in the same way as in the PST and the bacteria are exposed both to the fluctuating liquid level and to fluctuations in sewage strength and concentration of domestic chemicals such as washing powders. One of the functions of this stage is to minimise the effect of such shock loads, which could otherwise inhibit the process.
- 3.3.5 The second stage of the Biozone is hydraulically sealed from the first stage and maintains a constant liquid level. Liquid is transferred from the first to the second stage, at a steady rate, by a series of buckets attached to the rotor. This controlled flow of effluent is at the heart of the patented Managed Flow System, which promotes healthy and balanced growth of the micro-organisms essential for efficient treatment.
- 3.3.6 Excess Biomass (also referred to as humus) sloughs off the surface of the discs and passes with the flow, to the Final Settlement Tank.

3.4 Final Settlement Tank

- 3.4.1 The Final Settlement Tank (FST) is situated under the drive motor and receives a steady flow of treated effluent from the Biozone. The humus settles out and is retained for periodic desludging.
- 3.4.2 In NB and NC units the settled humus is periodically returned to the Primary Settlement Tank, for co-settlement, by a timer controlled pump system.
- 3.4.3 Final treated effluent discharges from the FST through a dip pipe (excepting units with an Integral Discharge Pump).

3.5 Optional Integral Discharge Pump (BA/BB only)

- 3.5.1 The discharge pump sits within a moulded chamber, positioned in the Final Settlement Tank. Treated effluent flows into the chamber, by gravity from the FST. When the liquid in the chamber reaches a pre-determined level, a float switches on the pump which then pumps effluent out of the chamber. The same float also switches off the pump when the liquid level has been sufficiently lowered, thus protecting the pump from running dry. We do recommend when this option is purchased, that a high level alarm is also fitted to warn against pump mal-operation or failure.

3.6 Control Panel

- 3.6.1 The weatherproof control panel need not be mounted next to the plant. It can be wall mounted or fixed to the mounting frame (available separately). Panel options are :
 - 3.6.1.a Standard Control Panel: (and all panels) include a 3 amp fuse which protects the motor should there be an electrical problem within the BioDisc.
 - 3.6.1.b Loss of Rotation Alarm Control Panel: This replaces the Standard Control Panel and also includes a Loss of Rotation (LOR) Alarm, which will activate if the rotor stops turning after a delay of 2-3 minutes (other than a failure in the power supply). An additional remote slave beacon may also be fitted. The loss of rotation of the rotor is sensed by a reed switch mounted near the BioDisc motor in conjunction with a magnet attached to the rotor.
 - 3.6.1.c Integral Discharge Pump Panel also includes a current overload protected supply for the discharge pump.
 - 3.6.1.d Nitrification Unit Panels contain a timer to control the operation of the sludge return pump and current overload protection for the pump motor.
- 3.6.2 All units will restart following a power cut, unless there has been a power surge greater than the pre-set limit of 3 amps.

4 INITIAL START UP PROCEDURE

4.1 Introduction

- 4.1.1 Every care is taken to ensure that all mechanical components are correctly fitted, adjusted and lubricated prior to leaving the factory. However, subsequent handling during transportation and installation may result in the movement of components and a subsequent need to re-adjust prior to starting the unit. Your installing contractor should have thoroughly checked the unit but if, on inspection, you consider that any components require adjustment, please contact Kingspan. We do recommend you purchase a Pre-service Agreement Inspection from an approved engineer.
- 4.1.2 Once the unit has been installed it should be left filled with water. Please switch on the motor, following the procedure below and leave the unit running, even if there is no sewage being fed into the plant. **If the unit has been installed with no operational power supply, then remove the motor/gearbox unit and store it in a dry or heated environment until such time as the unit is ready for permanent operation. The motor gearbox unit and drive belt should then be replaced and tensioned by Kingspan or an experienced contractor.**
- 4.1.3 We recommend that the system should be inspected. Please contact Kingspan. Where an immediate start-up is necessary, the following basic procedures should be carried out. Ensure that all Health and Safety precautions are observed.

4.2 Water

- 4.2.1 Check that the BioDisc is full of water to the outlet level.

4.3 Electrical

- 4.3.1 Check that the power supply is connected to the control panel. Check that all electrical components and conductors are earthed.

4.4 BioDisc

- 4.4.1 Check that the BioDisc is in order, with no obvious damage or misalignment of parts. If any problems are discovered, contact Kingspan.
- 4.4.2 Check that all electrical components: Drive Motor, Sludge Return Pump and LOR Alarm sensor, (where applicable) are connected to the Control Panel.
- 4.4.3 NB/NC units only: Check that the Sludge Return Timer in the BioDisc Control Panel is set correctly, as described in the installation instruction.



Fig. 3 - Pump Position

Units with optional discharge pump: Check that the pump float and associated pipework are positioned as shown and that the float can move freely.

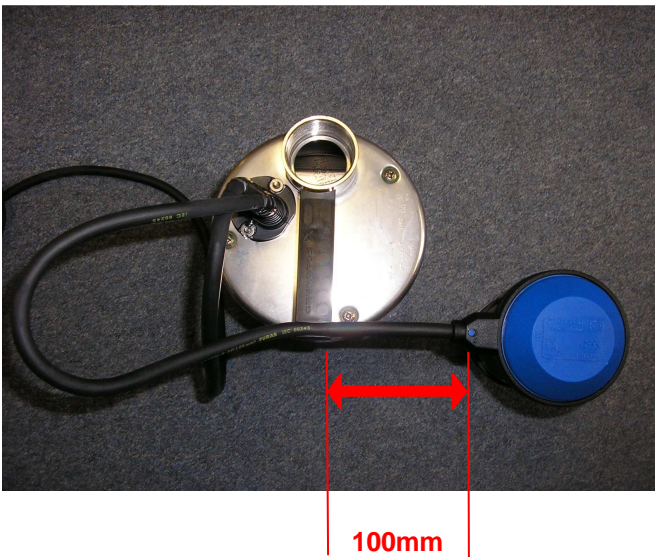


Fig. 4 - Float Setting

The float cable length is pre-set during assembly to a dimension of 100mm. Check that this dimension has not been altered. If for any reason the cable becomes disconnected from the retaining clip it should be replaced so that there is 100mm of cable between the clip and the float. Note: Setting less free cable will cause the pump to operate more frequently and may shorten its working life.

Important: With the pump chamber empty of water the float must hang clear of the chamber floor. The correct float position and distance is essential. The float must not be able to either trap or tangle, as this will prevent its correct operation. The float must not jam.

4.5 Switch On

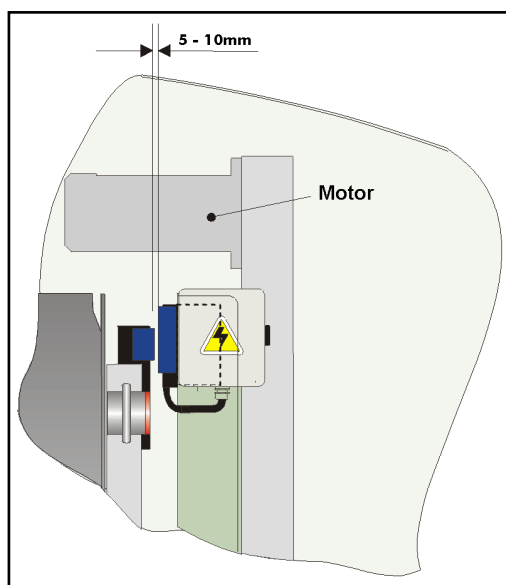
- 4.5.1 Open the Panel. Put the isolating switch into the “on” position. Close the panel. Note: If the unit is fitted with a sludge return pump, this will start immediately and will run for the pre-set period.

4.6 Running Checks

- 4.6.1 Check that the rotor is running smoothly in the correct direction of rotation and is not contacting any part of the fixed structure.
- 4.6.2 Check that the forward feed buckets are discharging correctly from the first to the second stage of the Biozone.
- 4.6.3 Units with optional Discharge pump: Once the rotor is turning, a flow through the FST and into the pump chamber will be generated. Check that the pump switches on at high level and off at low level.
- 4.6.4 **Note:** The pump switch-on level must be below the pump chamber inlet.

4.7 Optional Loss of Rotation Alarm

- 4.7.1 The alarm sensor (reed switch) is mounted adjacent to the motor/gearbox assembly. The sensor may be supplied out of position, to allow for possible minor rotor movement during transport. Check the sensor position and if necessary adjust to provide a gap of 5 - 10 mm between the sensor and the actuator magnet.



Check operation of the Loss of Rotation (LOR) Alarm as follows:

- 4.7.1.a Remove the main cover and switch off the Control Panel.
 - 4.7.1.b Remove the safety cover. At this point the display will read "F1".
 - 4.7.1.c Disconnect the cable to the motor.
 - 4.7.1.d Replace the safety cover.
 - 4.7.1.e Switch the control panel on.
 - 4.7.1.f After no more than a couple of minutes the display will read "F8".
 - 4.7.1.g Switch the panel off and remove the safety cover.
 - 4.7.1.h Reconnect the cable to the motor.
 - 4.7.1.i Replace the safety cover.
 - 4.7.1.j Switch the control panel on. The display will read "- -".
 - 4.7.1.k Press the orange reset button. The display will return to normal running mode.
 - 4.7.1.l Replace the main cover on the control panel.
- 4.7.2 Malfunctioning of the LOR Alarm does not prevent operation of the BioDisc System, but it should be reported to your maintenance engineer for early rectification.

4.8 Process Initiation

- 4.8.1 During installation, the unit will have been filled with water. Allow sewage to enter the unit, this will gradually displace the clean water used during installation.
- 4.8.2 Colonisation by micro-organisms will commence naturally and an operating biomass will develop on the discs after approx. 3-6 weeks, depending on individual site conditions and season.

5 OPERATION

5.1 Introduction

- 5.1.1 The biological treatment process of your BioDisc is self regulating and it requires no specialised operational knowledge, but it is important that you are aware of the following:
- 5.1.2 Your BioDisc system uses colonies of live natural micro-organisms (biomass), to break down the pollutants in the sewage. Many chemicals used in households and commercial establishments can inhibit or kill these micro-organisms; particularly if used in excessive amounts.
- 5.1.3 Bear in mind that treatment plants serving small populations do not have the benefit of dilution that occurs at a large sewage works. A bottle of bleach tipped down the toilet in Birmingham would be virtually lost amongst the millions of gallons of sewage arriving at the city's treatment works; a bottle of bleach in a plant serving one or two houses could be a lethal dose for the biomass.

- 5.1.4 If the biomass is damaged, it will usually recover in time. But in the meanwhile one of the more obvious symptoms may be an unpleasant smell, so it is in the operators interest to avoid this.
- 5.1.5 Generally speaking all common household cleaning fluids are acceptable, provided they are used in accordance with the manufacturers instructions and stipulated concentrations. The following "Do's and Don'ts" includes the most common household chemicals, but it is not an exhaustive list and the golden rule is "If in doubt - leave it out."
- 5.1.6 Bear in mind too that it isn't only the toilet that is connected to the treatment plant; anything that goes down the sink, bath etc., also ends up there.
- 5.1.7 During normal operation the control panel displays a single flashing red light between the two digits. During battery recharge a second red light will flash on the right of the display.

5.2 Do's and Don't's

5.2.1 Washing machine and dishwasher detergents, washing up liquids:

- 5.2.2 These are generally all right to use in the normal concentrations and usage found in domestic housing applications. Problems can occur if, for instance, you are washing the jerseys of the local rugby club's five teams!
- 5.2.3 BioDisc incorporates a unique flow management system which enhances its ability to handle shock loads of detergent waste, but there are limits even to this, so if you have to do unusual amounts of clothes washing it would be a good idea to spread it over a few days.
- 5.2.4 Excessive use of Biological washing powders can cause degradation of the biomass. Non-biological detergents, without enzymes, may be substituted.

5.2.5 Floor cleaners, disinfectants and bleaches:

- 5.2.6 These are safe to use in accordance with the makers recommendations and in the minimum necessary concentration. Do not pour neat disinfectant or bleach down sinks or outside gullies. If these are smelly it usually indicates a build up of decaying material or a plumbing problem and should be dealt with accordingly.
- 5.2.7 **Nappy disinfectants and bottle sterilising fluids e.g. Milton**
- 5.2.8 When disposing of the used fluid, ensure that it is well diluted with water. The easiest way of doing this is usually to flush it away down the toilet.

5.2.9 Waste disposal units:

- 5.2.10 These do not inhibit the biomass, but, depending on use, they can present the treatment plant with considerable extra load. This can result in the treatment process becoming unbalanced, leading to problems. Much better to compost your vegetable peelings etc - it's cheaper and environmentally friendly.
- 5.2.11 **Home beer and wine making.**
- 5.2.12 This presents a similar problem to waste disposal units. The BioDisc has to work as hard to treat one pint of beer tipped down the drain as it does to treat all the normal waste produced by one person in 24 hours. See also the notes above regarding sterilising fluids.

5.2.13 THE FOLLOWING MUST NOT BE DISCHARGED INTO THE DRAINS

- 5.2.13.a Motor oil, grease, anti-freeze, brake fluid etc.
- 5.2.13.b Cooking oil and fat.
- 5.2.13.c Weed-killers, insecticides, fungicides and other gardening chemicals.
- 5.2.13.d Paint, thinners, white spirit, turpentine, creosote etc.
- 5.2.13.e Chemical drain cleaners.
- 5.2.13.f Acid based brick/stone floor cleaners.
- 5.2.13.g Medicines
Take unused medicines to a pharmacist for safe disposal.
- 5.2.13.h Photographic developing fluids.
- 5.2.13.i Nappies, sanitary towels, rags, soft toys, tennis balls etc.
- 5.2.14 This may seem obvious, but it is amazing what gets flushed down the loo from time to time. Although such items are not directly damaging to the biomass they can cause problems, not the least of which is simple blockage of the drains.
- 5.2.15 Even so-called disposable nappies and sanitary towels often do not degrade fully in the treatment plant and can lead to malfunction, so it is best to dispose of them by other means.

5.3 Desludging and Maintenance

- 5.3.1 These are vital to the plant's ongoing operation and should be carried out in accordance with the guidelines in the maintenance section of this manual.
- 5.3.2 Maintenance contracts are available. Please contact Kingspan for your local service provider.

6 MAINTENANCE

6.1 Introduction

- 6.1.1 Kingspan BioDisc units are designed and engineered for the minimum possible maintenance requirements, consistent with proper performance. Nevertheless, it is important that routine preventive electro/mechanical maintenance and de-sludging are carried out at the appropriate intervals by suitably qualified persons.
- 6.1.2 Please contact Kingspan for your local service provider.

6.2 Customer Checks

- 6.2.1 As a back-up to routine servicing and to assist trouble-free operation, we recommend that you familiarise yourself with the operation of your BioDisc and make the following checks from time to time: (Refer to Fig. 6 for positions of parts mentioned.)
- 6.2.2 Your attention is specifically drawn to the Health and Safety section of this manual.
 - 6.2.2.a Review the appearance of the Biomass. It may be light grey to grey at the first bank, gradually changing to brown in the second stage and dark brown at the drive end of the rotor. If the growth is excessively thick and the colour predominantly grey throughout, an overload condition is indicated.
 - 6.2.2.b Visually check the general condition of the BioDisc.
 - 6.2.2.c Check that the inlet and outlet pipes (C) are clear. Remove any debris if necessary.
 - 6.2.2.d Check that the dosing bucket(s) (D) are transferring liquid consistently from the first to second biozone section.
 - 6.2.2.e Check that the buckets are clear of gross accumulations of biomass, simply clean with a water jet from a hose pipe.
 - 6.2.2.f Units with an Integral Discharge Pump: Check that the pump float can move freely and switches the pump on and off as the level in the pump chamber rises and falls. If a high level alarm is fitted check that the alarm float can move freely.
 - 6.2.2.g Familiarise yourself with the normal operating sound of your BioDisc. Report any unusual noises to your maintenance engineer.
- 6.2.3 If any malfunction is discovered, contact your maintenance engineer.

6.3 Failure of Power Supply or of Discharge Pump

- 6.3.1 BioDiscs with gravity discharge: In the event of a power failure, the control panel will show fault code "F1". Flow through the BioDisc will continue by gravity, although the quality of the discharge will gradually deteriorate. When power is re-established, check that the rotor has re-started and is turning correctly (see Section 3.0 paragraphs (5) and (6)). If the BioDisc has not been working for some time, the rotor may become unbalanced. This can cause the rotor to turn unevenly or prevent the unit restarting. In the event of any difficulties, contact your local service provider.
- 6.3.2 **Low Voltage Power Supply**
- 6.3.3 Motors may burn out if this condition is experienced. Consult electrician.

6.4 IMPORTANT - READ THIS. TAKE IMMEDIATE ACTION IF A PROBLEM ARISES

- 6.4.1 BioDiscs with pumped discharge (Integral or external pumps): During power cuts, or in the event of pump failure (indicated by fault code "F5" on the control panel), the level of sewage in the BioDisc will rise and if unchecked will lead to overflowing and/or possible damage to the motor/gearbox. At normal flow rates, sewage will reach the level of the motor in about 40 hours (6 people) or 20 hours (12 people). If pump operation cannot be re-established within this time the sewage level in the BioDisc must be carefully monitored and incoming flow restricted. If necessary the BioDisc should be emptied by a licensed waste contractor to avoid sewage overflowing the internal baffles or damaging the motor. **Do not allow the motor/gearbox to come into contact with sewage.**
- 6.4.2 *We advise that a High Level Alarm is fitted on all units with a pumped outlet. Contact Kingspan for more details.*

- 6.4.3 When normal operation is resumed, check for solids in the Biozone and FST and de-sludge if necessary. Check rotor rotation as above.

6.5 Sludge Removal from BioDiscs BA, BAx, BB, NB, BC AND NC.

- 6.5.1 Refer to the illustration below for recommended desludge positions.

(Note: Illustration is typical; individual units may vary).

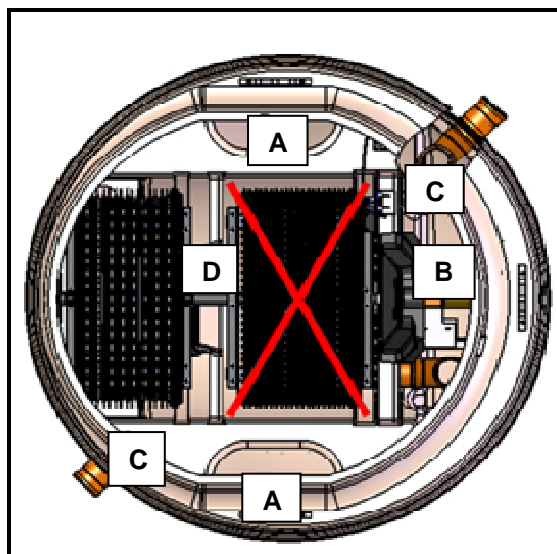


Fig. 6 - Desludge Positions

- 6.5.2 Isolate power to the BioDisc.
- 6.5.3 Undo the BioDisc cover latches and remove the cover. Hinged covers should be folded before removal.
- 6.5.4 Remove surface scum and about half the contents of the Primary Settlement Tank through the desludge ports [A] on either side of the rotor. Use the ports alternately. If port covers are fitted, keep the port not in use covered.
- 6.5.5 Empty the Final Settlement Tank [B]. **DO NOT** attempt to remove liquid from the discharge pump chamber (if fitted).
- 6.5.6 Remove remaining matter from the Primary Settlement tank.
- 6.5.7 **DO NOT** attempt to remove any liquid from the rotor section.
- 6.5.8 **DO NOT** attempt to clean off the gelatinous biomass growth on the rotor.
- 6.5.9 Ensure that the BioDisc inlet and outlet pipes [C] and the forward feed buckets [D] are free of debris. Ensure that the desludge port covers, if fitted, are replaced, then close and lock the BioDisc covers.
- 6.5.10 Re-connect the power supply. Ensure that the control panel door is locked shut.
- 6.5.11 Units with Loss of Rotation Alarms only: Wait for two minutes. If the alarm on the control panel does not activate, this indicates that the rotor has successfully re-started. If the alarm activates, switch off the power at the control panel and immediately switch on again. If the alarm continues to activate, isolate the power supply and notify the plant owner so that the problem can be investigated.

6.6 Desludge Volumes

Model	BA	BAx	BB/NB	BC/NC
Primary Settlement Tank	2200 litres (485 galls)	2200 litres (485 galls)	2200 litres (485 galls)	4580 litres (1009 galls)
Final Settlement Tank	400 litres (88 galls)	400 litres (88 galls)	400 litres (88 galls)	850 litres (187 galls)
Desludge Period	12 months Maximum	9 months Maximum	6 months Maximum	7 months Maximum
You should not exceed the maximum desludge periods given above.				

7 TROUBLE SHOOTING GUIDE FOR BIODISC UNITS BA/BAX/BB/NB/BC/NC

SYMPTOM	CAUSE	ACTION
Strong odour	Excessive build up of sludge and scum	Desludge the unit.
	Grease (white/cream crust in primary tank and/or thick, smooth biomass ¹)	De-sludge unit. If necessary hose off discs. Avoid excessive use of fats and oils. Please note removal of Biomass will reduce treatment until new Biomass establishes.
	Chemicals in the system (very sparse or no biomass ¹)	In most instances, units will recover naturally from toxic inhibition events. Refer to section 4 of the Owners Handbook for general guidance on use of domestic chemicals.
	Excessive laundry use (thick, stringy whitish biomass ¹ on first section)	Spread out laundry operations. Avoid biological powders where possible and use the minimum possible amounts of detergent. Refer to section 4.
	Unit overloaded (thick/grey biomass ¹) over most of rotor	Check section 1 of the Owners Handbook for the process capability of the unit. If in doubt, contact Kingspan.
	Rotor stopped	See rotor stopped section below.
	Drains inadequately ventilated	Check that there is an open high level vent at the head of the drains (not "Durgo" valve or tile vent).
Rotor stopped	Switched off	Check that the motor switch on the panel is in the "on" position. Re-set if necessary.
	Power failure	Check the fuse/trip at the supply board. Replace/re-set as necessary. If the problem persists, contact Kingspan.
	Wiring fault	Have the wiring to control panel checked by a competent electrician. If the supply wiring is OK contact Kingspan.
	Drive belt broken	Contact Kingspan.
	Drive motor faulty	Contact Kingspan.
	Loose pulleys on rotor or gearbox output shaft	Contact Kingspan.
Rotor fails to re-start after a stoppage	Rotor unbalanced	Hose off excess Biomass on the heavy side of the rotor. Note removal reduces treatment.
Rotor turns intermittently	Drive motor overheating	Contact Kingspan.
Effluent discharge not to required standard	See strong odour and rotor stopped sections.	
	Managed flow system in-operative.	Check that bucket(s) are in place and discharging correctly into the biozone second stage.
	Sludge return pump inoperative (NB/NC only)	Contact Kingspan.
Unit flooded (units with integral discharge pump)	Discharge pump not working.	Check that the pump switch on the panel is in the "on" position. Re-set if necessary. Check that pump control float is clear of obstructions and set at the correct length. If the problem persists consider emptying unit to protect motor and gearbox and contact Kingspan or service provider. (See Section 5).

8 CONTROL PANEL FAULT CODES & FUSES

CODE	FAULT CONDITION	FUSE	Amp
F1	No power to the unit	Customer Fuse box	N/A
F3	The high level alarm has activated (where fitted)	N/A	N/A
F4	The fuse to the motor has failed	F3	3.15
F5	The fuse to the discharge pump (where fitted) has failed	F1	5.0
F6	The fuse to the chemical dosing pump has failed	F4	0.25
F7	The fuse to the recirculation pump has failed	F2	5.0
F8	The loss of rotation alarm has been activated	N/A	N/A
--	The unit has had a fault which has now corrected itself	N/A	N/A

All fuses are Time Lag HBC 20mm type.

9 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.

Our service provider: Kingspan Environmental Services: 0844 846 0500

NOTICE:



KINGSPAN BioDisc®

The foul drainage from this property discharges into a package treatment works.

Maintenance is required, the frequency of which depends upon the model installed, its use and its application. Please consult your owners pack.

- * A BA BioDisc requires annual maintenance and desludging.
- * A BB BioDisc requires annual maintenance and desludging at 6 month intervals.
- * Other BioDisc models require more frequent desludging and maintenance (see individual operating manuals)

Maintenance and Desludging should be carried out by the owner in accordance with the Manufactures instructions.

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 maintenance and service visits, the log should detail the date and any action taken, e.g. Regular maintenance service, breakdown visit, desludge volume removed, parts replaced.

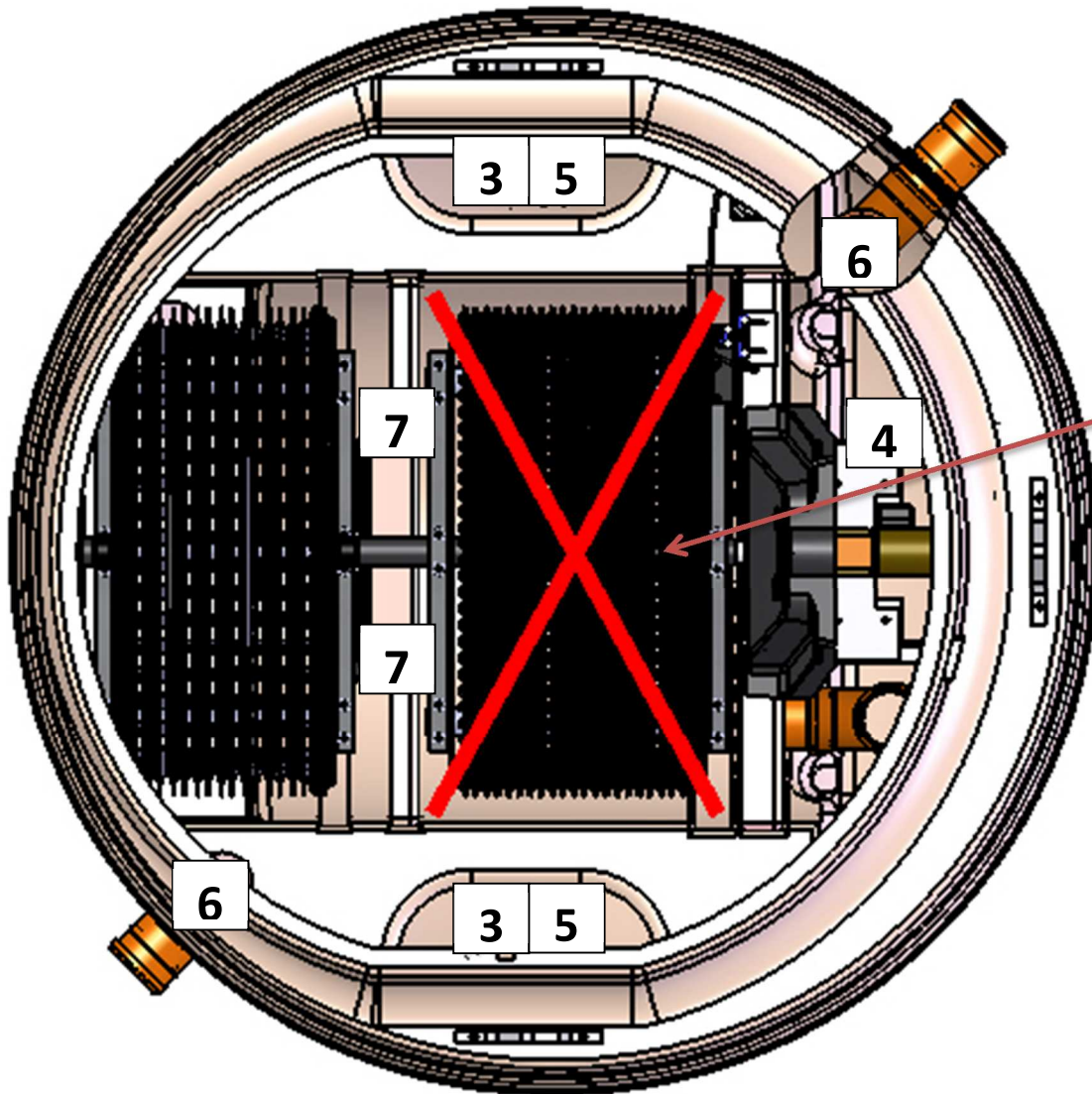
This notice should be fixed by the owner within the building alerting current and future owners to the maintenance requirement. (Building regulation H2 (1.57))

Please contact Kingspan Environmental Services on +44 (0) 844 846 0500 to arrange a maintenance service or to request replacement operating instructions. It would be helpful if you provide your equipment serial number.

IMPORTANT

Isolate power to unit before attempting any maintenance and ensure that all local procedures are complied with concerning the Health and Safety at work act.

Refer to Owner's Handbook for Maintenance Details



Desludge Procedure:

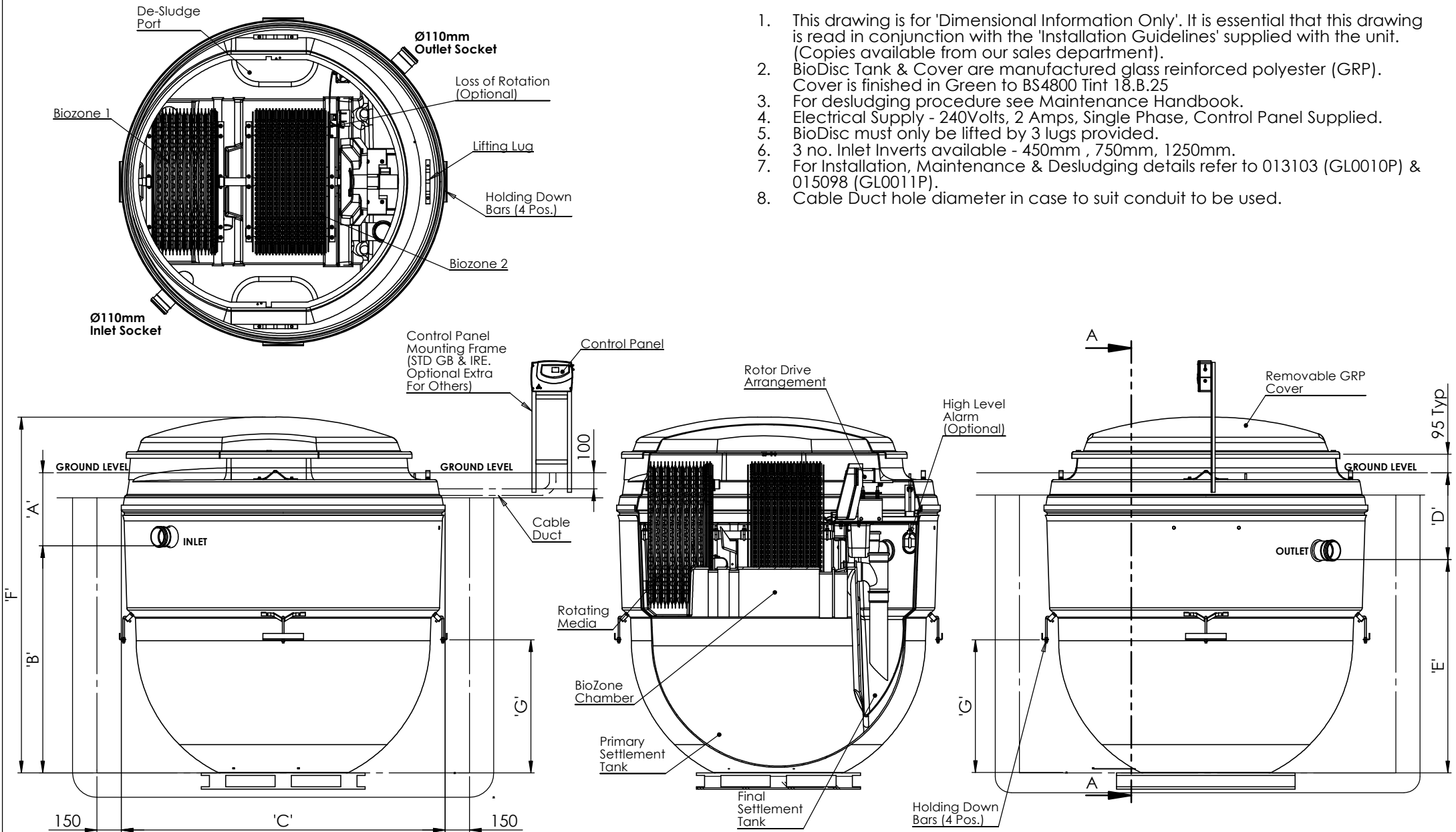
1. Isolate power to unit.
2. Unlock and remove cover, taking care to avoid any damage (Standard cover weight $\approx 22\text{kg}$. Insulated split cover weight $\approx 43\text{kg}$).
3. Lower Desludge Hose into Primary tank and using the desludging holes on either side of the rotor, remove half the contents of the Primary Settlement Tank. Use the desludge holes alternatively. The liquid level in the First Stage of the Biozone will empty at the same rate as the Primary Tank, where as the Second Stage will remain full.

DO NOT remove liquor from the Biozone.


4. Lower the hose into the Final Settlement Tank, under the drive arrangement, and remove the contents. DO NOT attempt to remove liquid from the discharge pump chamber (if fitted).
5. Return the hose to the Primary Tank and remove the remaining material.
6. Ensure Inlet and Outlet pipes are clear of debris. Clean as necessary. Take care not to disturb the outlet pump if fitted.
7. Ensure Forward Feed buckets are clear of debris.
8. Replace and lock cover and restart unit.
9. Whilst not strictly necessary you may wish to refill firstly the Final Settlement Tank and then the Primary Settlement Tank. This action may improve the process performance.

Notes:

1. This drawing is for 'Dimensional Information Only'. It is essential that this drawing is read in conjunction with the 'Installation Guidelines' supplied with the unit. (Copies available from our sales department).
2. BioDisc Tank & Cover are manufactured glass reinforced polyester (GRP). Cover is finished in Green to BS4800 Tint 18.B.25
3. For desludging procedure see Maintenance Handbook.
4. Electrical Supply - 240Volts, 2 Amps, Single Phase, Control Panel Supplied.
5. BioDisc must only be lifted by 3 lugs provided.
6. 3 no. Inlet Inverts available - 450mm , 750mm, 1250mm.
7. For Installation, Maintenance & Desludging details refer to 013103 (GL0010P) & 015098 (GL0011P).
8. Cable Duct hole diameter in case to suit conduit to be used.



SECTION A-A

Please check with Kingspan Environmental that this drawing is the latest issue					Material : Various		Tolerance :		Drawing : DS1146P		Page 1 of 3
Issue	Date	Drawn by	Approved by	Description	Finish :	Thickness : n/a					
05	30/10/15	L.Steward		CC1241 - 1.0m Invert Option Included For Europe/ ROW	Weight : 566.42 Kg Kgs	Surface Area :	BA-BB-BAX BioDisc Gravity Sales Drawing				
04	19.08.15	T.Kelly		CC1259 - Control Panel Mounting Frame Options Updated							
All dimensions in mm				Scale: Not to scale		Kingspan Environmental reserve the right to alter the details of this drawing without prior notice. This drawing is copyright and may not be reproduced or used without the written permission of Kingspan Environmental.					
T:\Luke S\Drawings\CC1241\DS1146P											

BA Gravity BioDisc Dimension & Weight Chart (All Markets**)**

Unit Dimension Chart (Gravity Systems).								
Dim 'A' (mm)	Dim 'B' (mm)	Dim 'C' (mm)	Dim 'D' (mm)	Dim 'E' (mm)	Dim 'F' (mm)	Dim 'G' (mm)	Dry Weight (Incl. Pallet) (Kgs)	Full Weight (Exclud. Pallet) (Kgs)
450	1400	1995	535	1315	2160	820	310	3290
750	1400	1995	835	1315	2460	820	325	3305
1250	1400	1995	1335	1315	2960	820	380	3360

BAX & BB Gravity BioDisc Dimension & Weight Chart (All Markets Except France**)**

Unit Dimension Chart (Gravity Systems).								
Dim 'A' (mm)	Dim 'B' (mm)	Dim 'C' (mm)	Dim 'D' (mm)	Dim 'E' (mm)	Dim 'F' (mm)	Dim 'G' (mm)	Dry Weight (Incl. Pallet) (Kgs)	Full Weight (Exclud. Pallet) (Kgs)
450	1400	1995	535	1315	2160	820	335	3315
750	1400	1995	835	1315	2460	820	350	3330
1250	1400	1995	1335	1315	2960	820	405	3385

BB Gravity BioDisc Dimension & Weight Chart (France Only**)**

Unit Dimension Chart (Gravity Systems).								
Dim 'A' (mm)	Dim 'B' (mm)	Dim 'C' (mm)	Dim 'D' (mm)	Dim 'E' (mm)	Dim 'F' (mm)	Dim 'G' (mm)	Dry Weight (Incl. Pallet) (Kgs)	Full Weight (Exclud. Pallet) (Kgs)
450	1650	1995	535	1565	2410	1070	355	3335
750	1650	1995	835	1565	2710	1070	370	3350
1250	1650	1995	1335	1565	3210	1070	425	3405

Material :	Tolerance :	Drawing : DS1146P	Page 2 of 3
Finish :	Thickness :		
Weight : Kgs	Surface Area :		

BA-BB-BAX BioDisc Gravity Sales Drawing

All dimensions in mm

Scale: Not to scale

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BA Gravity BioDisc 1.0m Invert Dimension & Weight Chart (Europe & ROW Only**)**

Unit Dimension Chart (Gravity Systems).								
Dim 'A' (mm)	Dim 'B' (mm)	Dim 'C' (mm)	Dim 'D' (mm)	Dim 'E' (mm)	Dim 'F' (mm)	Dim 'G' (mm)	Dry Weight (Incl. Pallet) (Kgs)	Full Weight (Exclud. Pallet) (Kgs)
1000	1400	1995	1085	1315	2730	820	345	3325

BB Gravity BioDisc 1.0m Invert Dimension & Weight Chart (Europe & ROW Only**)**

Unit Dimension Chart (Gravity Systems).								
Dim 'A' (mm)	Dim 'B' (mm)	Dim 'C' (mm)	Dim 'D' (mm)	Dim 'E' (mm)	Dim 'F' (mm)	Dim 'G' (mm)	Dry Weight (Incl. Pallet) (Kgs)	Full Weight (Exclud. Pallet) (Kgs)
1000	1400	1995	1085	1315	2730	820	373	3350

BB Gravity BioDisc 1.0m Invert Dimension & Weight Chart (France Only**)**

Unit Dimension Chart (Gravity Systems).								
Dim 'A' (mm)	Dim 'B' (mm)	Dim 'C' (mm)	Dim 'D' (mm)	Dim 'E' (mm)	Dim 'F' (mm)	Dim 'G' (mm)	Dry Weight (Incl. Pallet) (Kgs)	Full Weight (Exclud. Pallet) (Kgs)
1000	1650	1995	1085	1565	2980	820	373	3350

Material :	Tolerance :	Drawing : DS1146P	Page 3 of 3
Finish :	Thickness :		
Weight : Kgs	Surface Area :		

BA-BB-BAX BioDisc Gravity Sales Drawing

All dimensions in mm

Scale: Not to scale

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