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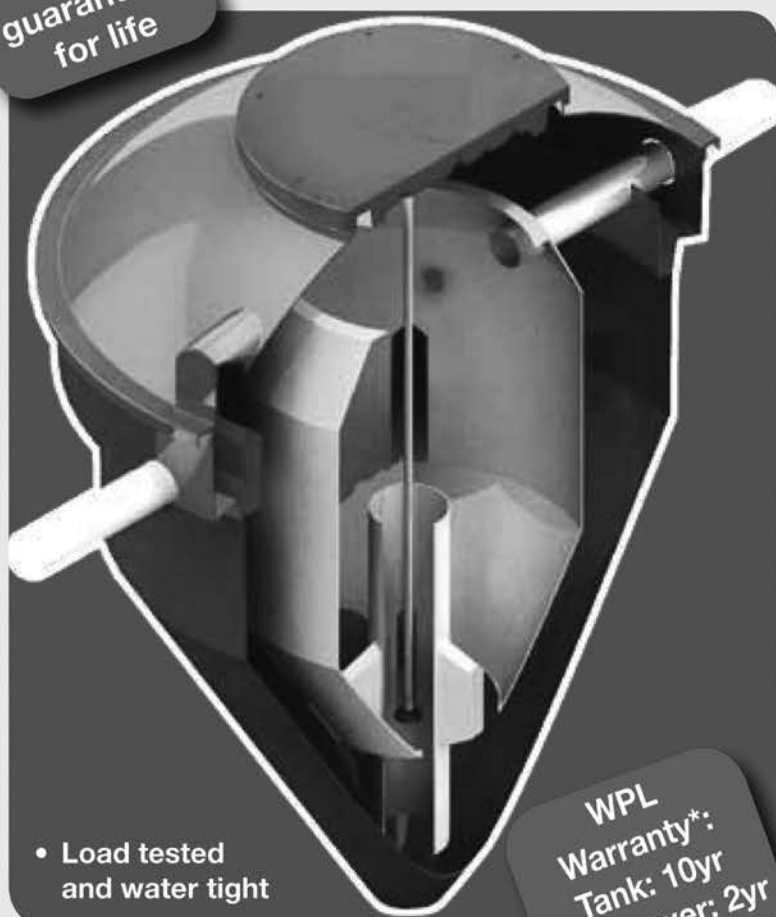


Package Sewage Treatment

Diamond

DMS & DMC Plants for 1 - 55 people

Process
guaranteed
for life



- Load tested and water tight

WPL
Warranty*:
Tank: 10yr
Air blower: 2yr



- **Compact design**
Reduced excavation and handling costs
- **Robust construction**
No concrete backfill in some situations



- **Low visual impact**
Small lid, flush with the ground
- **Easy to install with minimal labour**

INSTALLATION INSTRUCTIONS

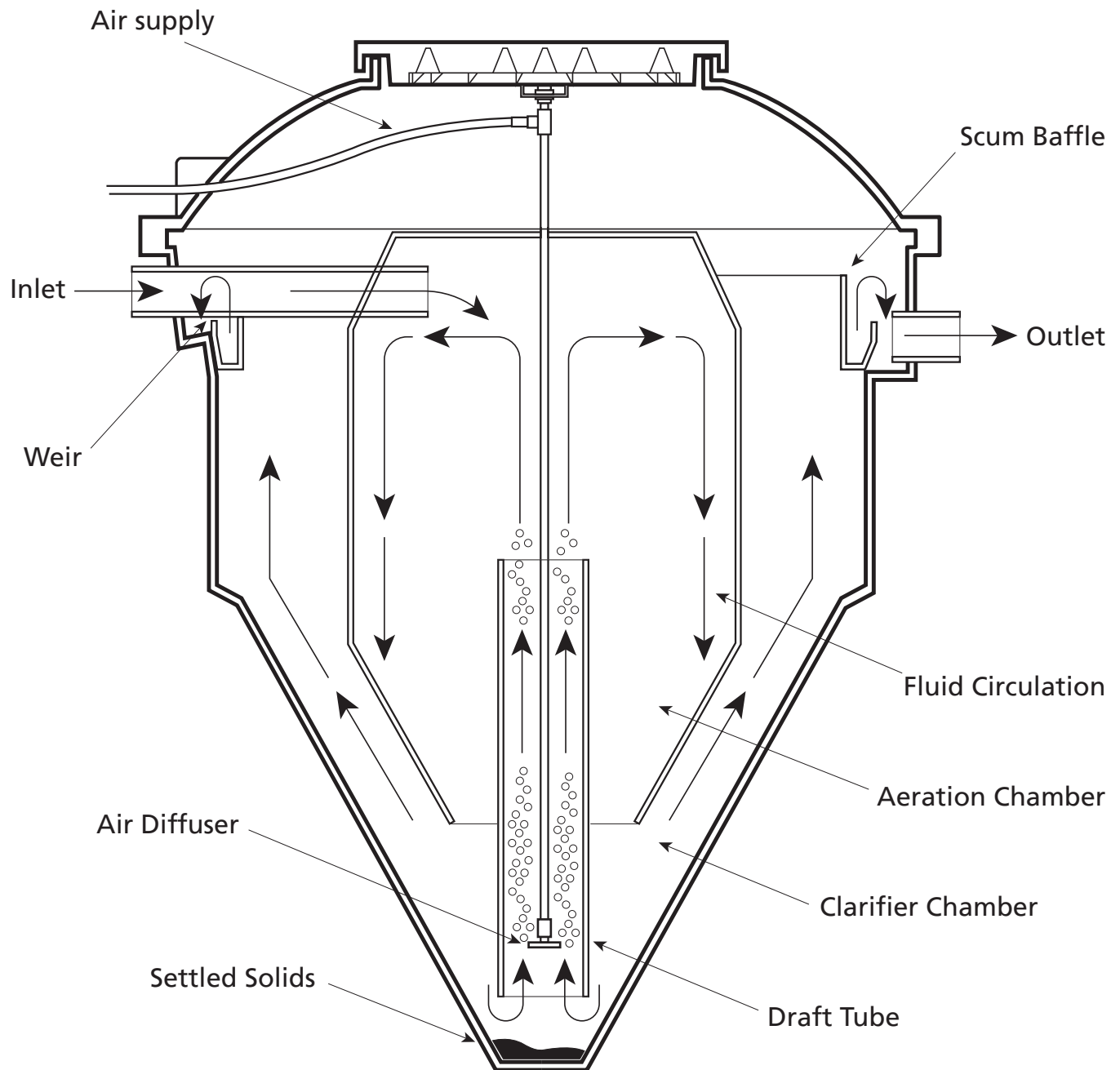
WPL recommends that the installer and all sub-contractors should read this document before commencing the installation to avoid loss of warranty

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How the Diamond works

3



The sectional drawing above shows a typical DMS treatment tank but the larger DMC models work on exactly the same principle. To calculate the trench size for the Diamond plant to be installed refer to the size chart and groundworks diagram on page 6 & 9.

Any questions? Call a member of our technical team on 023 9224 2600

DMS - Gravity fed systems:

Models DMS 2 / DMS 3 / DMS 4 / DMS 5

- Diamond DMS sewage tank
- Tank lid with bolts
- Blower
- Blower kiosk, complete with beacons, hose and hose clips
- 10m Air Hose
- Home Owner's Pack (Important - see back page for guidance)

DMS - Internal Pumped outlet systems (IPC):

Models DMS 2-IPC / DMS 3-IPC / DMS 4-IPC / DMS 5-IPC

- Diamond DMS sewage tank
- Tank lid with bolts
- Pumped outlet lid
- Blower
- Blower kiosk, complete with beacons, hose and hose clips
- 10m Air Hose
- Submersible pump and integral float switch
- Non-return valve
- High level float switch and mounting tube
- Isolation valve
- 32mm MPDE pipe outlet
- Junction box
- Home Owner's Pack (Important - see back page for guidance)

DMC - Gravity fed systems:

DMC 6 / DMC 7 / DMC 8 / DMS 9

- Diamond DMC sewage tank
- Tank lid with bolts
- Blower
- Blower kiosk, complete with beacons, hose and hose clips
- 10m Air Hose
- Home Owner's Pack (Important - see back page for guidance)

Installation options when specified:

- Turret Extensions - see Page 6
- Body Extensions - see Page 6
- Sample Chamber - see Page 9

Please check the delivered items immediately against the delivery inventory and if any items are missing please call the WPL technical team.

Equipment & Material Required

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NOT supplied by WPL

EXCAVATION & LIFTING

- An excavator with sufficient reach to attain depth required
- Slings and Shackles for lifting

BACKFILLING

- Backfill material - see recommendations on Page 10
- Adequate supply of water to ballast the tank during backfilling

HOSE

- Hose duct pipework - rigid or flexible

ELECTRICAL

- Electrical cable - armoured or ducted - 2.5mm² twin and earth
- 1 x IP55 rated outdoor double socket with RCD
- 1 x 3-pin plug fused at 13 amps (UK only)

MISCELLANEOUS

- 1 x tube of acrylic or polyurethane mastic
- 1 x aerosol of expanding polyurethane foam - to seal hose and ducts

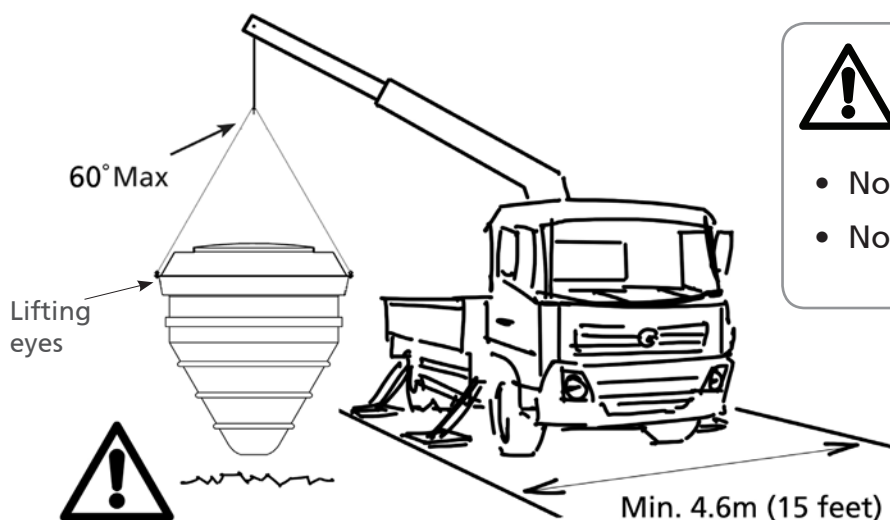
Delivery to Site

Off-loading will only be at the nearest roadway to site that is suitable for heavy goods vehicles. If there are electrical cables overhead, ensure that there is adequate clearance or that power is turned off.

If the nearest road access for a heavy goods vehicle is not adjacent to the site, it is the responsibility of the purchaser to arrange transport from the road to the site. If in doubt contact WPL as soon as possible with any queries.

Inspect the unit for any damage before placing on the ground. The unit should be placed on level ground with no sharp stones or bricks as they may damage the unit.

Electrical equipment must be stored in dry, condensation free conditions until required.



Additional safety notes:

- No lifting with water inside
- No walking on smooth surfaces

Any questions? Call a member of our technical team on 023 9224 2600

Model	Max Outside diameter (m)	Height to inlet (m)	*Inlet invert depth (mm)	**Height to outlet (m)	Max height/ In ground depth (m)	Weight empty (Kg)	Total capacity (L)
DMS2	1.85	1.72	610	1.62	2.34	155	2270
DMS3	2.07	1.84	780	1.74	2.62	192	3030
DMS4	2.07	2.00	800	1.90	2.81	210	3975
DMS5	2.07	2.00	800	1.90	2.81	210	3975
DMC6	3.30	2.78	570	2.68	3.35	380	9056
DMC7	3.30	2.78	570	2.68	3.35	380	9056
DMC8	3.30	3.14	580	3.04	3.72	460	15038
DMC9	3.30	3.14	580	3.04	3.72	460	15038

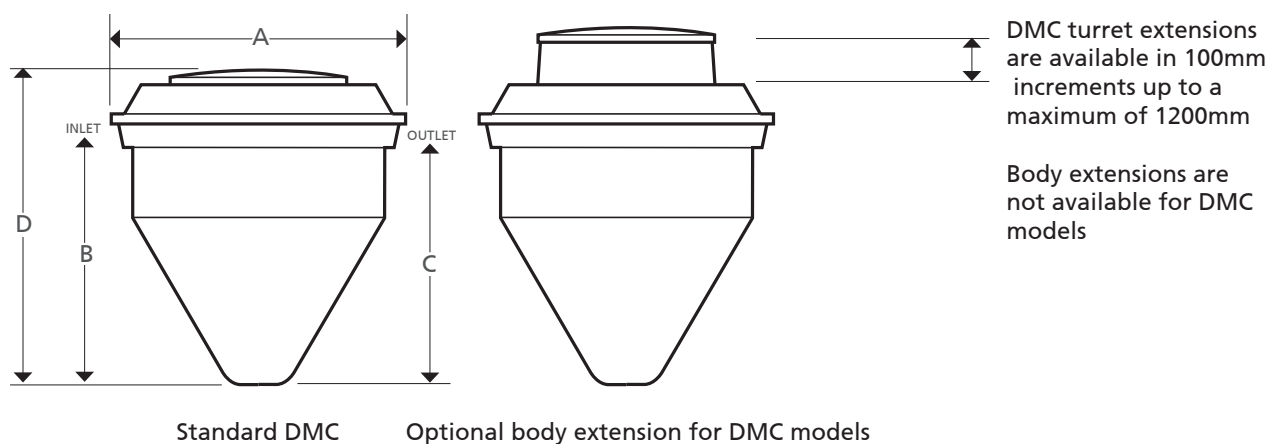
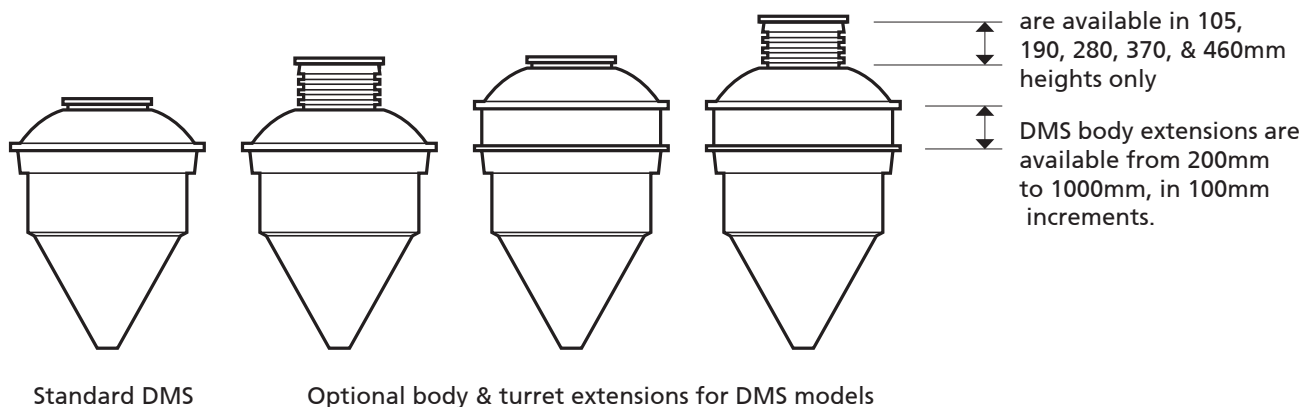
* Deeper inverts can be accommodated with our range of standard invert extensions (see below). All dimensions +/- 3% tolerance.

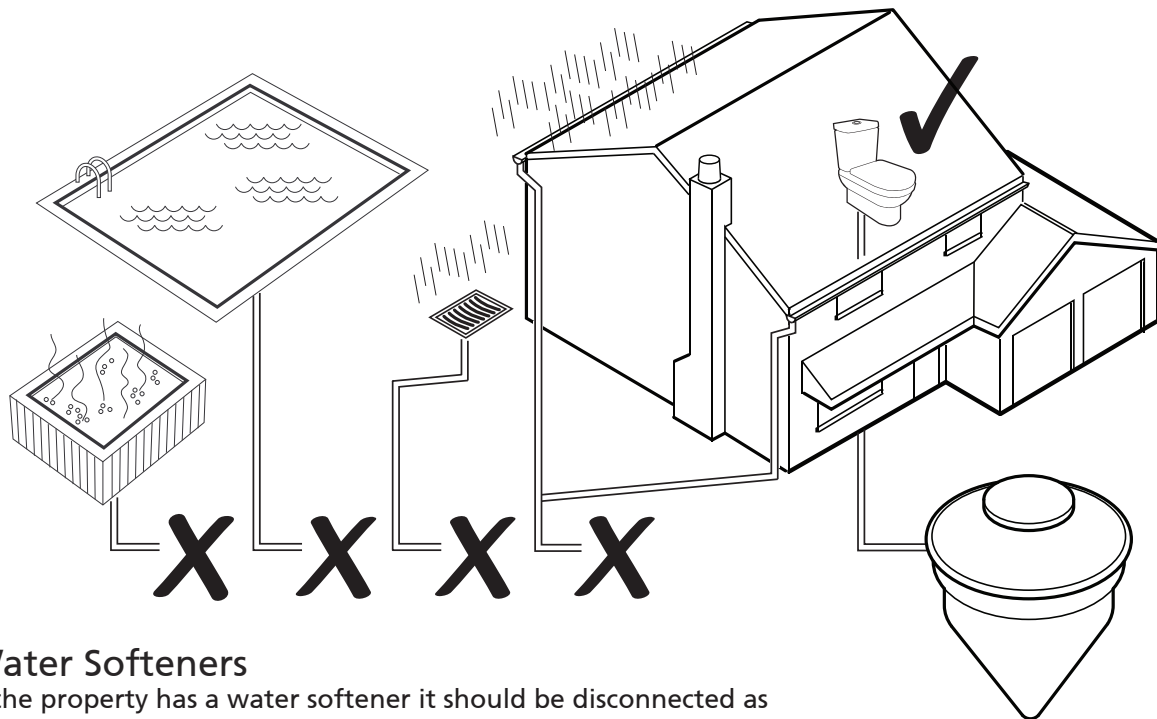
**Diamond units equipped with an IPC have a 32mm MDPE Pipe outlet and the outlet invert depth is 250mm for all models.

For more information on any of the above, contact a member of the WPL sales team.

Extension Options

Separate instruction manuals will be supplied with the extension if fitted on site





Water Softeners

If the property has a water softener it should be disconnected as salt will reduce significantly the performance of the plant.

Size of Diamond Plant

Before commencing installation please ensure that the Diamond plant been sized to suit the home-owner's requirements (using the current British Water Flows and Loads) for:

- LAUNDRY
- WASTE DISPOSAL UNIT
- GREASE FROM KITCHENS



The Diamond plant should be protected from excess grease and fats.

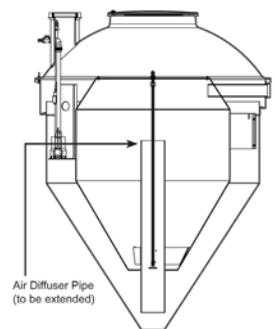
Diamond DMS-IPC 'Integral Pump Chamber' Models

Diamond DMS models may be supplied with an optional, factory fitted "Integral Pump Chamber (IPC)" if specified when ordered. The model number indicates whether an IPC is fitted as follows: DMS2-IPC, DMS3-IPC, DMS4-IPC, DMS5-IPC. (DMC models are not available with an IPC.)

A standard invert level will be supplied with any Diamond DMS-IPC model unless otherwise specified. If a deeper invert is specified when ordered, then the IPC will be factory fitted accordingly, to suit the body or turret extension.

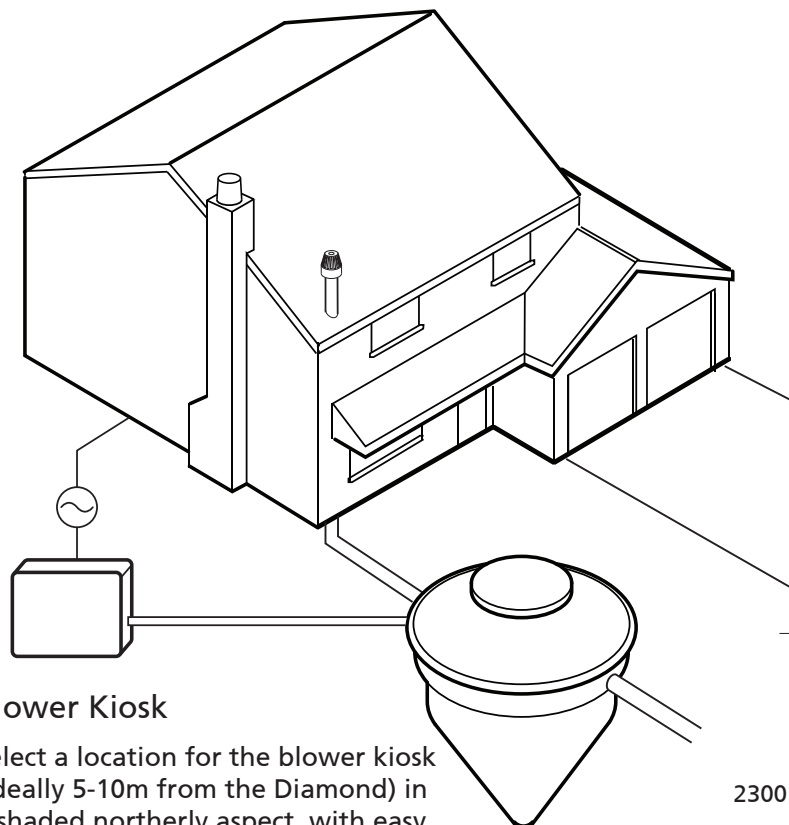
If you have a DMS-IPC model which has been specified and factory fitted with an Integral Pump Chamber, with the standard invert AND a deeper invert is subsequently required, please contact your supplier as a turret and/or body extension can be supplied and fitted on site.

When fitting a turret or body extension on site, you will require an extension kit for your Integral Pump Chamber and/or diffuser pipe, which can also be supplied and fitted on site. Please contact your supplier to order an extension kit from WPL, or contact WPL for advice.



Installing the IPC Extension Kit

A separate installation manual will be supplied for all extensions.

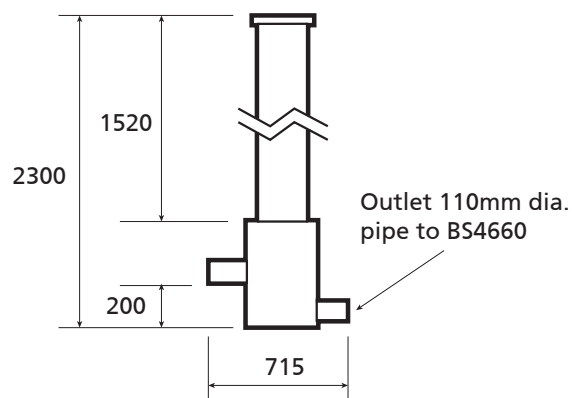


Pipework Gradients:
as per Building Regulations

Ensure that there is sufficient fall (gradient) from the dwelling to give a self-cleansing velocity that prevents blockages in the pipes.

Soakaway pipework to be constructed as per building regulations. If unsure seek professional advice.

WPL Sampling Chamber

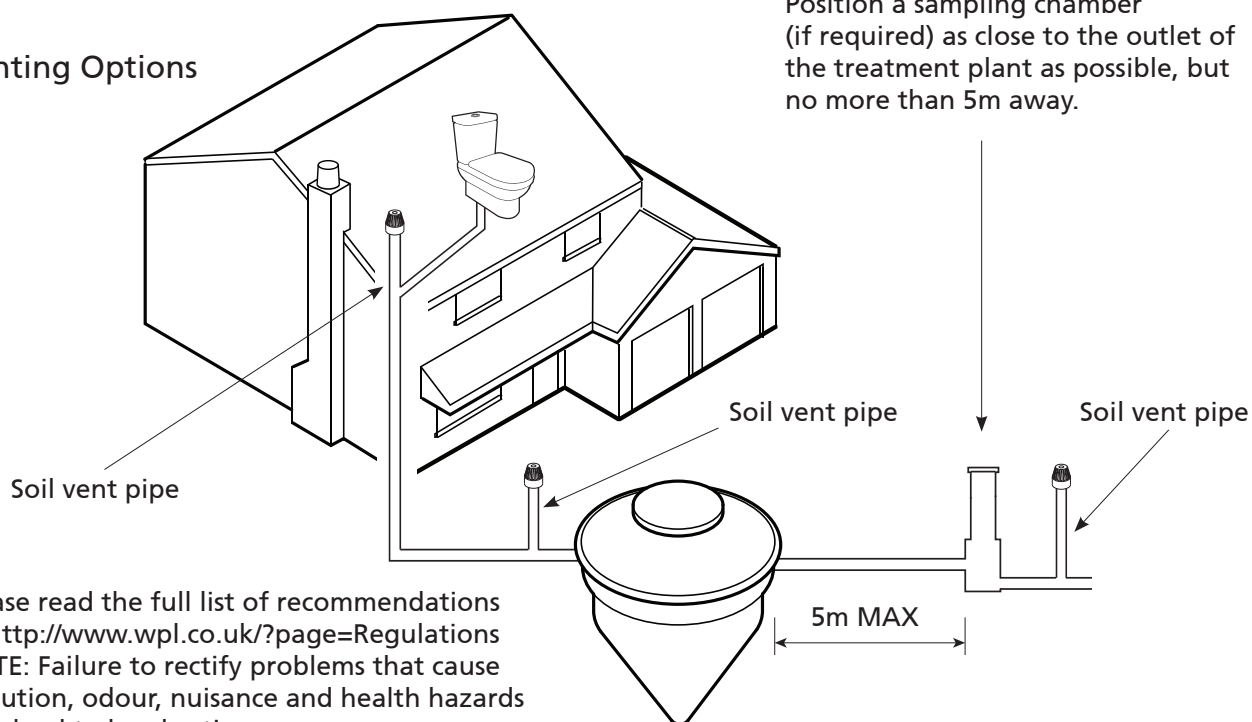


Blower Kiosk

Select a location for the blower kiosk (ideally 5-10m from the Diamond) in a shaded northerly aspect, with easy access for maintenance and avoids direct sun light, vegetation/plant overgrowth, dust and flood water. Ensure beacons can be seen if there is a failure of any kind.

See Page 11 for further guidance

Venting Options



Position a sampling chamber (if required) as close to the outlet of the treatment plant as possible, but no more than 5m away.

Please read the full list of recommendations at <http://www.wpl.co.uk/?page=Regulations>
NOTE: Failure to rectify problems that cause pollution, odour, nuisance and health hazards may lead to legal action.

WPL strongly recommends installation is carried out by a suitably qualified and experienced installer. A qualified civil engineer should be consulted for advice if required.

High Water Table

Installing in an excavation that allows water to enter. High ground water table or flood conditions will cause problems during installation and may affect the plant during de-sludging

For installations in a high water table or clay soiled areas backfill with a dry, lean concrete mix (RC25 mix with a 20 slump) to approximately 150mm below the lid.

- **Base Construction**

Both the base on which the tank sits and the backfill material must support the tank when full and not allow it to sink.

- **Backfill Material**

In some circumstances it is possible to backfill with a granular material such as pea shingle.

However, due to variations in ground conditions, WPL strongly recommends that all DMS models are installed in a dry, lean concrete (RC25 mix with a 20 slump) to approximately 150mm below the lid. All DMC models must always be installed in a dry, lean concrete mix (as above).

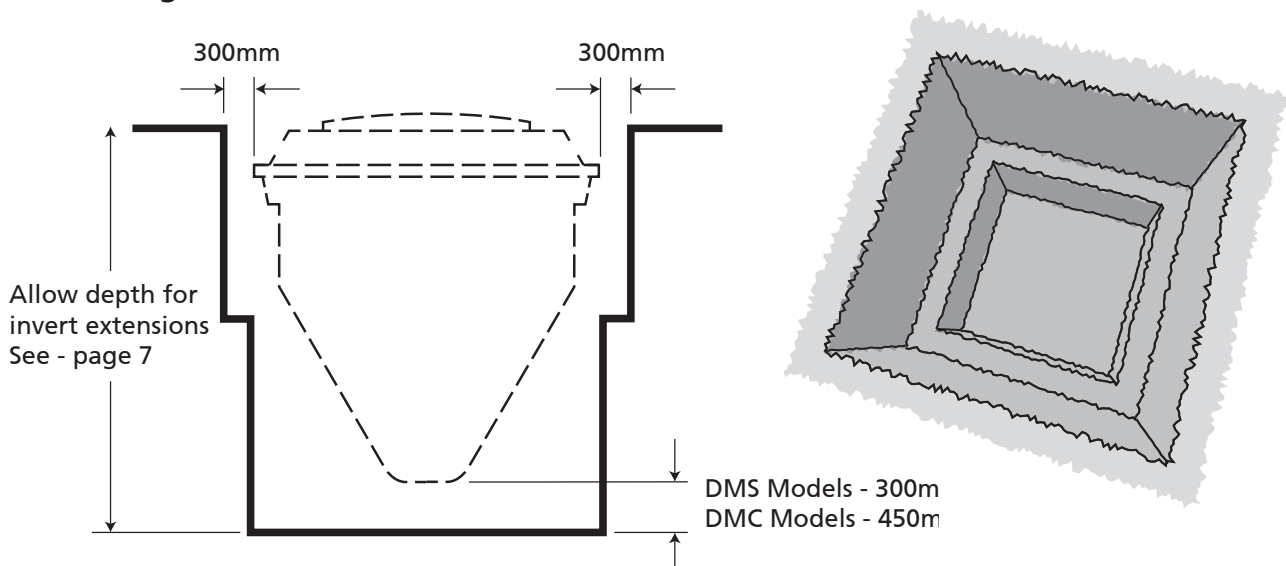
DO NOT USE VIBRATING POKERS

Under no circumstances should the backfill material be vibrated to achieve compaction and the backfill pour must not outpace the ballasting of the tank with water. Backfill outside can only equal the level of the water inside - see Page 10.

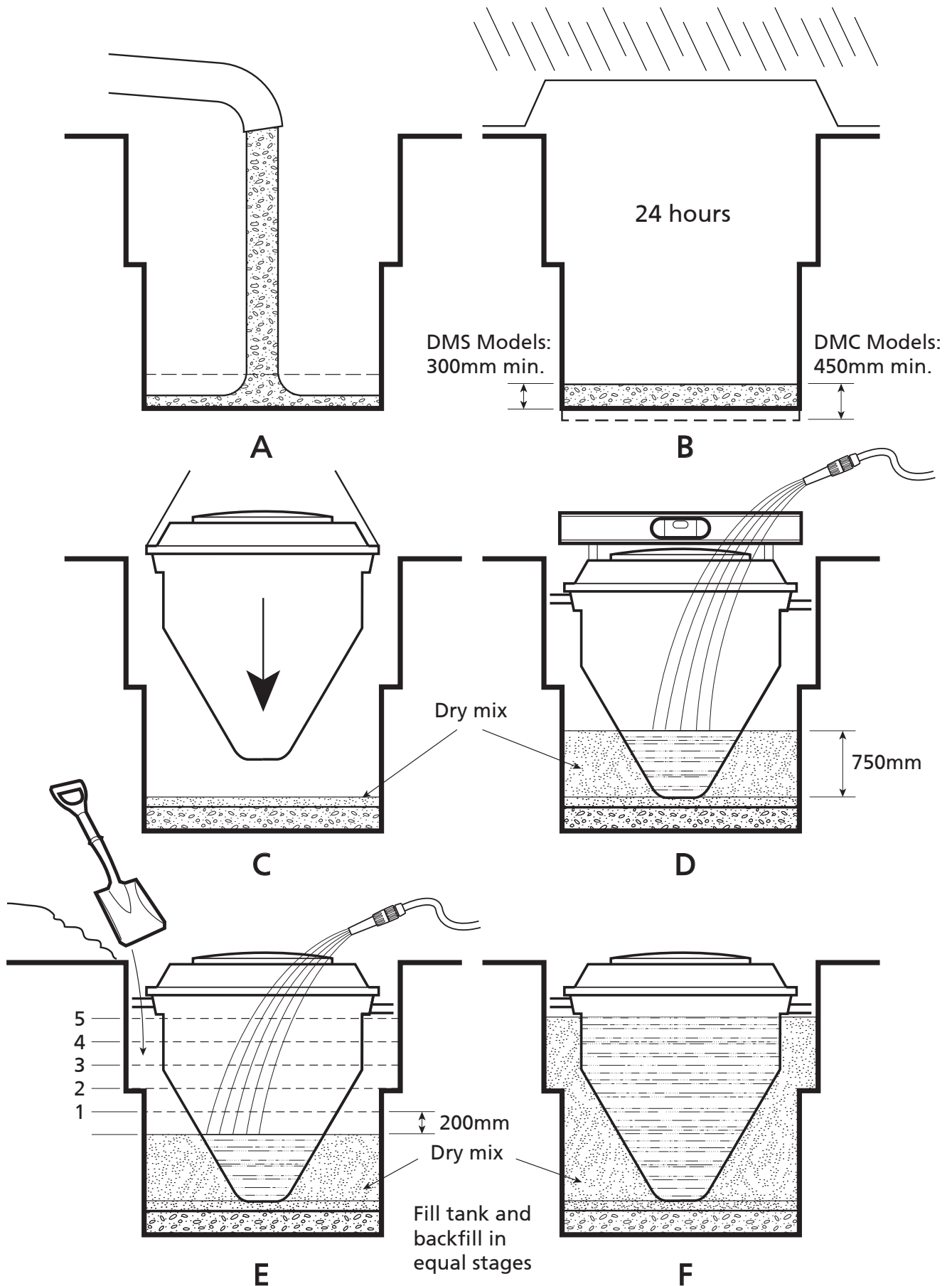
If in any doubt consult a qualified civil engineer.

Groundworks

Excavating the correct size trench



A square stepped excavation may be used due to the physical shape of the Diamond plant. Allow adequate clearance for all pipes and any other connections the unit.



Positioning DMS & DMC Blowers

- It is important that the electrical installation is carried out by a qualified electrician in accordance with the 17th or later edition of the Institute of Electrical Engineers (I.E.E.) regulations, with appropriate current protection devices for the site configuration.

- An earth leakage circuit breaker is recommended and should be incorporated into the supply. A device with a 30mA maximum trip current is recommended.

- Three Phase Connection – DMC units only are supplied with single phase electrics as standard. If a three-phase supply was specified and supplied for a DMC model, check the rotation of the blower is correct when the power is switched on initially. Incorrect rotation will cause damage if run for more than a brief check. This observation must be done with the hose disconnected from the blower as liquid may be sucked from the tank.

- See Page 12 for electrical connections for the Integral Pump Chamber.

Groundworks - DMS & DMC:

- Dig a narrow trench to a depth of approx. 500mm, from the tank to the site of the blower kiosk and lay the hose duct in it.

- Lay ducting from the kiosk to the mains power supply.

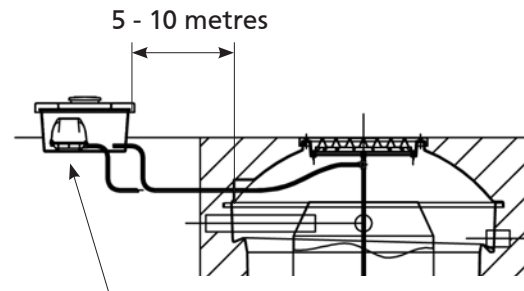
- Feed the hose through the duct.

- Cut a hole the diameter of the duct in either the bottom or the side of the blower kiosk and pass the duct through the hole.

- Apply a 10mm bead of mastic/silicon sealant inside and out to stick the duct to the kiosk. Allow to cure. Ensure no water can enter the kiosk.

- Cut/drill another hole to suit the entry of the electrical cabling or ducting.

DMS Kiosk Installation

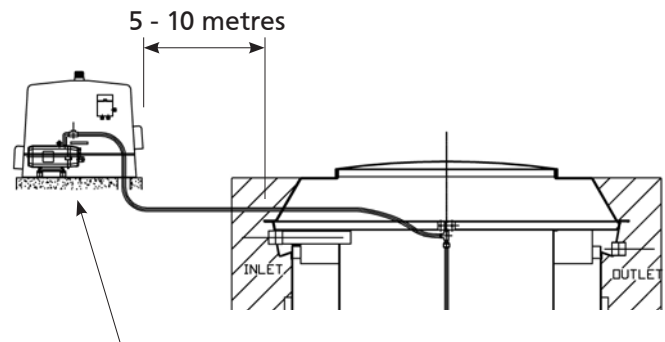


- Dig a hole approximately 100mm wider and longer than the kiosk and approximately 200mm deep.

- Put a 50mm layer of sand, sharp sand or dry lean mix concrete in the bottom of the hole and bed the kiosk onto it, ensuring that there is not a void underneath. Any void will amplify the noise of the blower.

- Backfill around the kiosk with sand, sharp sand or dry, lean mix concrete.

DMC Kiosk Installation



- Lay a concrete slab to match the blower kiosk size.

- Ensure the kiosk cannot be flooded.

- Secure kiosk to the slab through the unistrut and seal to the concrete with mastic. Do not secure until the concrete slab has fully cured.

Hose connections

- Connect and secure the hose to the hose tail on the air distribution pipe in the centre of the tank with the hose clip supplied. Ensure there are no kinks in the lines. Cut the hose to length, connect to the hose tail on the blower in the kiosk and secure with the hose clip supplied. Ensure that the hose does not bend sharply because it becomes warm during operation, softens and may deform at sharp bends.

IPC - Electrical Connections

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Diamond DMS-IPC 'Integral Pump Chamber' Models

The IPC pump has been developed to provide a means of delivery for treated final effluent where the existing terrain and invert levels of the pipework prevent normal gravitational discharge. The unit delivers up to 100 litres/minute of effluent at a head of 3.7m.

The pump operates automatically via the combined floatswitch and requires minimal maintenance.

A high level alarm is supplied that will operate in the event of a high level within the pump chamber.

IPC Installation

WPL strongly recommend that all electrical connections are performed by a suitably qualified electrician.

- Install a suitable conduit/pipe to carry all wires from the pump and high level alarm floatswitch.
- Run a draw line through the conduit/pipe.
- Fit the conduit/pipe into the access pipe and down to the blower kiosk.
- Tie the draw line to the cables and pull the cables through the fittings, into the conduit/pipe and through to the blower kiosk.

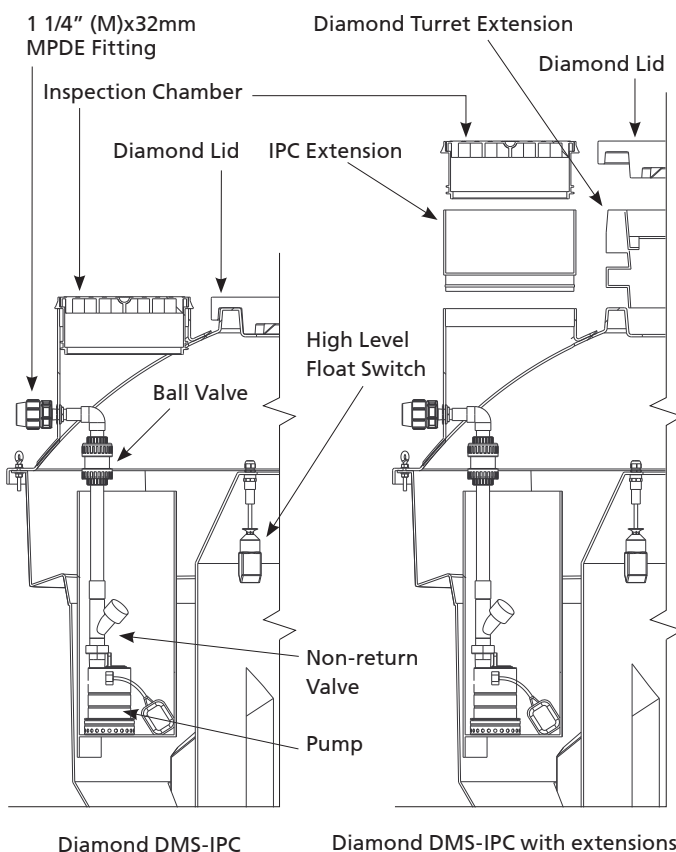
- Connect the floatswitch (for high level alarm supplied) to the junction box.
- Connect the mains supply from an RCD protected supply and turn on.
- Plug the flying lead from the red beacon into the junction box.

IPC Testing

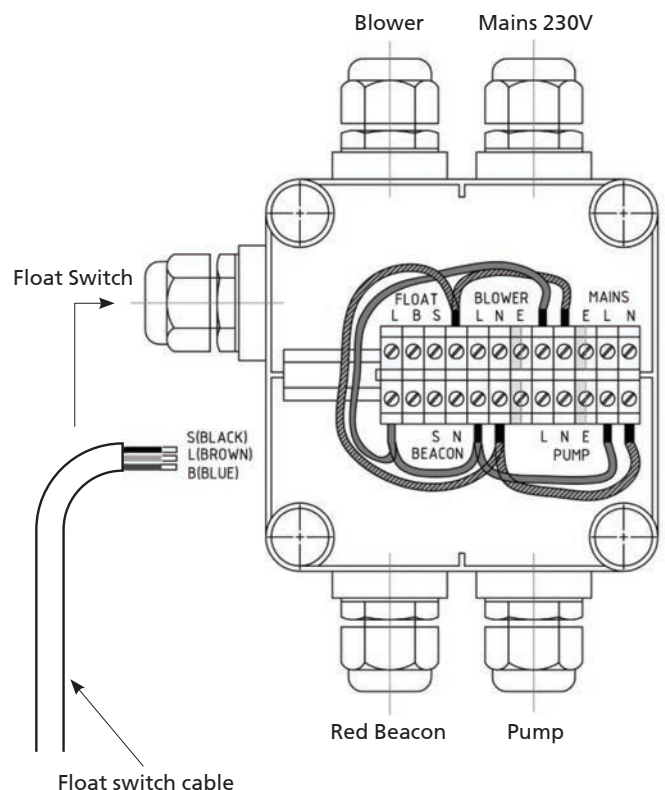
To ensure that the system operates correctly WPL advise that the pump and high level alarm are tested BEFORE sewage is introduced into the unit.

- Fill the Diamond with water until it begins to enter the pump chamber.
- Continue filling until the floatswitch on the pump has reached the horizontal position.
- At this point the pump should operate.
- Turn off the pump at the supply.
- Continue filling the Diamond until the water raises the float and switches on the red beacon.
- If there is no alarm check all wiring connections and power supply.

Diamond DMS-IPC detail sections



Wiring layout for Junction Box for all Diamond DMS-IPC Models

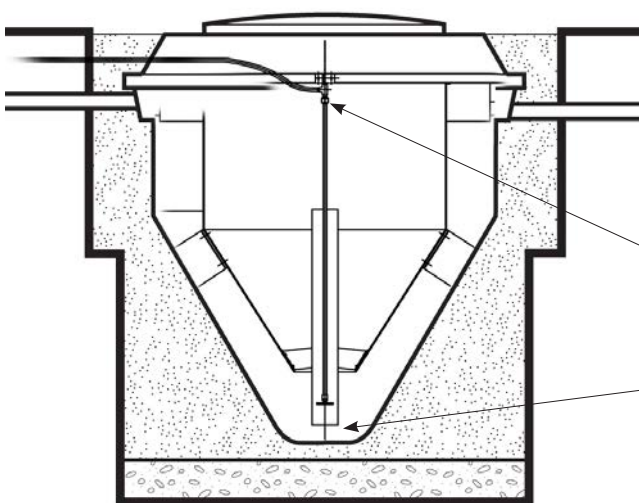


Before turning on the electrical supply

Before turning on the electrical supply to the blower and before allowing sewage wastewater to enter the treatment plant, please check the following:

Inside the Diamond tank

- Check the security of the air diffuser – Unscrew the union on the vertical section of the rigid air pipe down leg, taking care not to lose the rubber 'O' ring inside the union. Lift out the down leg and check the plastic clips securing the rubber membrane to the diffuser body. Replace the down leg, ensuring that it goes back inside the draft tube. If the 'O' ring in the union is dry, moisten with a little water.
- Check the security of the air hose where it passes through the aeration chamber cross member – Tighten the lock nut with a suitable spanner if required, taking care not to over tighten.
- Check the security of the hose tail, flexible hose connection and hose clip – tighten as required, taking care not to over tighten.
- If the flexible hose is too long and sags, shorten it or secure it to the cross member with a suitable cable tie.
- Remove any construction/installation debris from all areas of the tank.
- Check that the inside of any ducts are sealed with expanding polyurethane foam to prevent rodent/ insect entry.



Blower kiosk

- Check that the blower kiosk is secure and cannot be easily moved. Movement may cause damage to the electrical and hose connections.
- Ensure that the DMS blower kiosk is well bedded, with no voids underneath. Any voids will allow the bottom of the kiosk to act as a resonance board and will amplify the sound of the blower.
- Check that the inside of any ducts are sealed with expanding polyurethane foam to prevent rodent/insect entry.
- Check that the joint between the duct/cable entries where they pass through the bottom or the side of the kiosk, are sealed with a good quality sealant to prevent water ingress.
- Ensure that the inside of the kiosk is dry. Moisture may affect the electrical connections and cause nuisance tripping.

After switching on the power

- Listen to the blower. It should hum quietly and vibrate slightly.
- Listen for air leaks. Tighten joints as required.
- Check the water turbulence in the aeration chamber; it should be as a Jacuzzi. The bubbles should break the surface in a circle and disperse outwards. The water may splash out of the aeration chamber. This is normal until the liquid thickens with age.
- Run some taps in the house and observe an inflow. Remove any debris brought in by the inflow.
- Continue running the taps until liquid is displaced to the outlet weir. Check that the overflow is fairly even around the tank.
- Replace all covers and secure.

See Page 15 regarding Safety Precautions.

This section is a guide and as such does not cater for every situation that may be experienced during installation. WPL assumes that the installer/end user has ensured that all necessary permissions have been sought and granted, and that all installation procedures will be carried out observing the requirements of the Health & Safety at Work Act involving good building and sound civil engineering practice.

Please ensure that due consideration/ appropriate action has been given/ taken regarding the following:

- Planning Permission, Building Regulations, and other regulating or interested parties
- Environment Agency (or other regulator) consent to discharge (Environment Permit)
- The legal responsibility for the plant for operation and maintenance and ongoing discharge
- The size of the plant is relevant to the number and types of people and types of users that will be using it, eg. domestic, light industrial, etc.

The plant must be sited:

- Within 30 metres of heavy vehicle access for de-sludging. The point should, where possible, be sited above the high water table mark and above and beyond the flood plain.
- As far from the habitable parts of the dwelling as possible - many local authorities recommend 7 metres as a minimum, but easements are possible for smaller sites.

Please ensure that local ground conditions are suitable for the installation and that specialist knowledge of ground conditions is utilised in the following circumstances:

- Underground rivers, running sand, chemicals in the soil.
- Proximity of designated protection areas, wells, bore holes, & springs used as sources of potable water, existing non-mains sewerage systems and soakaways, water courses, ponds & lakes, other services, pipes, cables and ducts.
- Sites which are close to trees (particularly willows) or shrubs. This is not recommended as roots may invade the joints in the tank. If necessary, the excavation should be lined with a root proof membrane prior to back filling.
- The water table at the time of installation - specialist knowledge is required when installing in an excavation that allows water to enter. The installation will need to be installed so it cannot 'float' out of the ground and provision made for continued discharge of the treated effluent should the pipe work/ soakaway be under water.

Please read the full list of recommendations at <http://www.wpl.co.uk/?page=Regulations>



NOTE: Failure to comply with any regulation may result in pollution, odour, nuisance and health hazards which lead to legal action.

HEALTH AND SAFETY

United Kingdom Health and Safety at Work Act 1974 Section 6a of this act requires manufacturers to advise their customers on safety and handling precautions to be observed when operating, maintaining and servicing their products.

All the sections of this manual must be read before working on the equipment. Suitably trained and qualified personnel must carry out the installation. Normal safety precautions must be taken and appropriate procedures observed to avoid accidents.



The lids have been tested with a load at 1.0Kn/m² and will withstand accidental passage. They are not designed as pedestrian walkways.

Leptospirosis

It is the client's responsibility to ensure that all necessary protective clothing/ equipment is available. There are two types of Leptospirosis that affects people in the UK:

Weil's disease. This is a serious infection transmitted to humans by contact with soil, water or sewage that has been contaminated with urine from infected rats.

Hardjo-type Leptospirosis, which is transmitted from cattle to humans. Typical symptoms for both diseases start with flu-like illness with a persistent and severe headache, muscle pains and vomiting. Jaundice appears about the fourth day of illness. The bacteria can enter your body through cuts and scratches and through the lining of the mouth, throat and eyes.

Sensible precautions

After having worked with sewage or with anything contaminated with sewage, wash your hands and forearms thoroughly with soap and water. If your clothing or boots are contaminated with sewage then wash them thoroughly after use. Take immediate action to wash thoroughly with clean water any cut, scratch or abrasion of the skin immediately prior to applying any protective covering. Do not handle food, drink or smoking material without first washing your hands. If you display the symptoms described after coming into contact with sewage, report to your doctor immediately advising them of the circumstances.

Vaccinations

To avoid illness, it is recommended that site personnel have the following vaccinations. WPL recommends you consult your doctor regarding any additional vaccinations which may also be appropriate.

- Hepatitis A
- Hepatitis B
- Polio
- Tetanus
- Typhoid/Cholera – probably carried out as a child (but must be checked)

Service & Maintenance

Service and maintenance advice is available from WPL, please contact the Service Team on 023 9224 2600 for further information.

Other Products by WPL Limited:

HiPAF Commercial Sewage Treatment
Grease Guzzler Commercial Grease Management
Transportable Wastewater Treatment Modules
Industrial Effluent Treatment
Utility Sewage Treatment
Rainwater Harvesting Systems

About WPL Limited

WPL Limited provides innovative and reliable wastewater treatment, rainwater harvesting and grease management systems for domestic, commercial and industrial markets as well as holding a prominent position as a supplier to the water companies. As an internationally recognised leader in the design, manufacture and supply of both standardised, and bespoke environmental solutions, WPL Limited is dedicated to ensure the provision of high quality products and services.

Environmental Policy

WPL Limited is ISO14001 accredited. WPL Limited rigorously fulfils its vision of protecting the environment by delivering reliable wastewater solutions. A strong focus on quality and compliance ensures that all wastewater treatment systems are designed to work within the guidelines of the British Water Code of Practice and exceed all present and proposed discharge consent standards enforced by the Environment Agency, SEPA and other regulatory authorities.



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