DracoDrum™

# Medius & Magna

# User Guide and

# Installation Manual

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# Introduction

Congratulations on the purchase of your DracoDrum Combi Drum

The drum is designed for simplicity of installation and use.  The most challenging requirement for you, is to decide where you wish your control box to be placed.

On the following pages we will show you the different components of your drum, how to install it and how to perform fault finding if something should stop working as it should.

# Product Information

**The following components are all IP54 rated**

- Control box
- Junction box
- Umbilical plug and socket

**Incoming Power Rating**
100 – 230V, 50-60hz
Stepped down to 12V DC via the control box

**Environmental**
Operational temperature range – 4 to 42 Celsius. The unit should be protected outside this range

**Motor**
12V DC Brushless, 4 step planetary gear, direct drive, output approximately 22RPM

**Valve / Wash pump**
12V DC Solenoid type ¾" BSP / 12v DC Diaphragm pressure pump

| | | |
|---|---|---|
| **Mesh Screen** | 58 or 77 Micron Stainless Steel | |
| | **Medius** | **Magna** |
| **Maximum flow Rate** | 16000 LPH @ 58µm | 50,000 LPH @ 58µm |
| | 23,000 LPH @ 77µm | N/A |
| **Biological Capacity (media)** | 150 litres | 250 litres |

| **Dimensions** | **Medius** | **Magna** |
|---|---|---|
| Width – | 608mm | 740mm |
| Overall height – | 865mm | 1045mm |
| Depth- | 1180mm | 1340mm |
| Height above water level (gravity fed) – | 170mm | 160mm |
| Height above water level (pump fed) – | 215mm (minimum) | 210mm (minimum) |

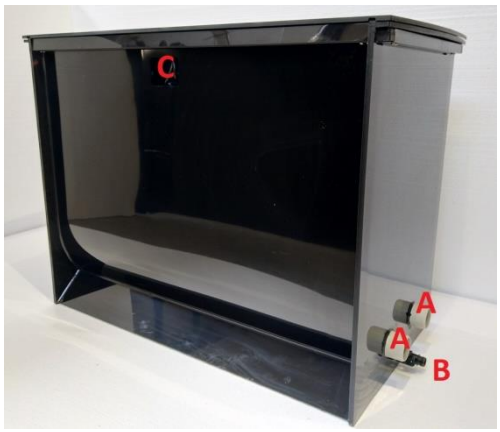
## Getting to know your DracoDrum Combi


A – Removable Waste Tray

B – Waste Outlet

C – Water Inlets from Pond

D- Services Port




A - Water outlet to pump/pond

B – Drain valve

C – Services port


A – Dirty water/Inlet Chamber

B – Drive Motor

C – Drum

D – Spraybar

E – Water Valve for Spraybar

F – Electrical Junction box

G – Airbar termination

H – Umbilical socket for Controller connection

I – Services port

J – Float switch

K – Biological chamber

L – Equipment / Services tray

# Installation

Make sure that the combi is placed onto a flat, strong surface, such as a concrete plinth. Or flagstones with foundation. Wood  or paving stones placed on bare ground will not support the weight of the filter long term and may damage the unit.

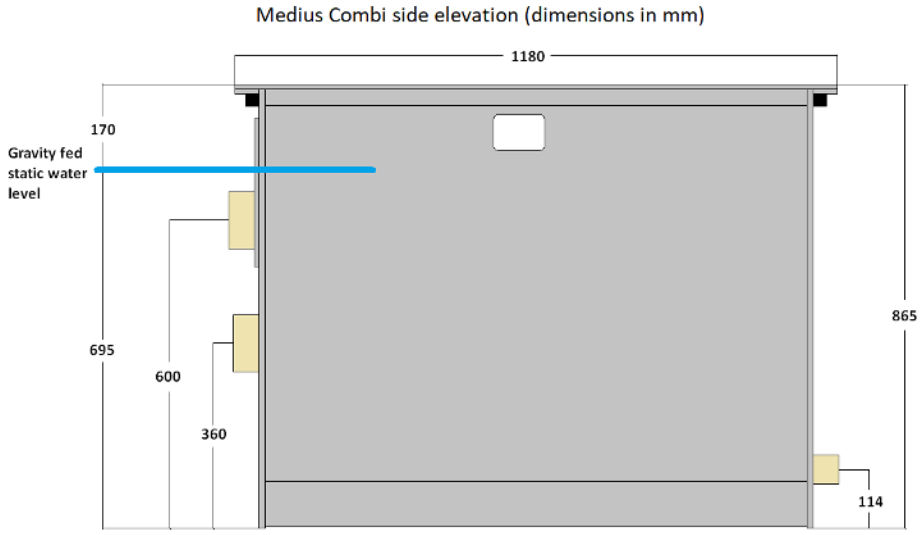
If you do not need to use both the inlet or outlets make sure you seal the unused inlet/outlet securely to stop any leakage. The pipes are standard 110mm and 54mm (2”)

The unit should also be protected from freezing temperatures

## Siting the filter

### Gravity installation

When installing for gravity operation, the Water level in the filter should match the water level in the pond. The height of the water level is given in the diagram below –




The diagram shown equates to static water level (no pumps running) almost brimming the waste tray in the drum. This gives maximum coverage of the drum screen.  There should be as little restriction as possible in the 4” pipework before the filter.

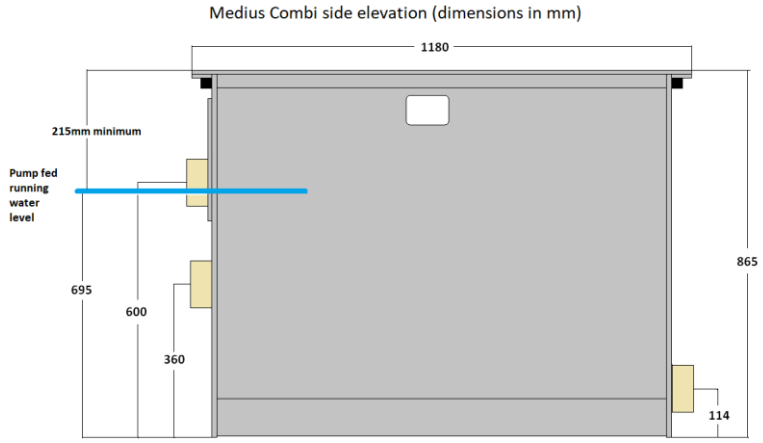
The outlet of the filter can be attached directly to the circulation pump which can then be plumbed to the pond return.

When starting up, there should be no more than a 35mm drop between the static water level and the running water level. If there is, check the pump for excessive flow rate or the pipework upstream of the filter for restrictions.

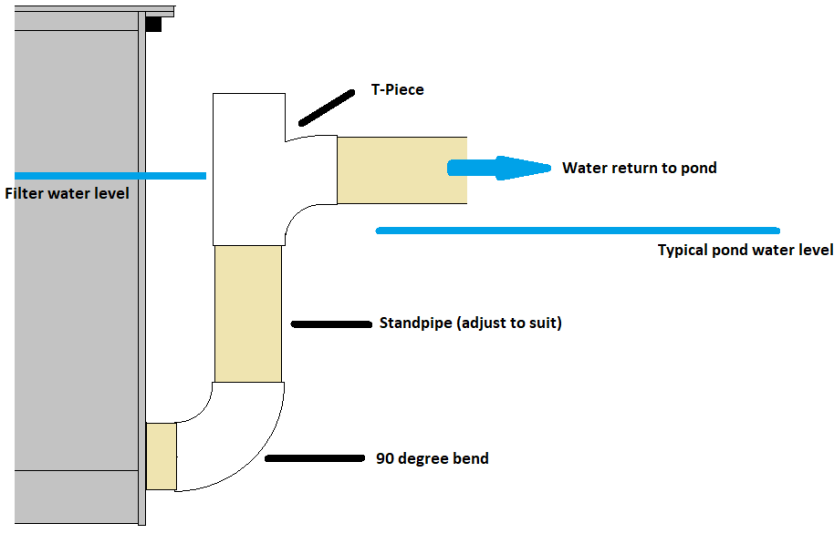
So to recap, maximum water height within the filter is 170mm below filter top. Maximum drop of water when pump(s) are running is 35mm from original water level.

## Pump fed installation

For pump fed installation, the top of the filter should be sitting higher than the pond water level by at least 370mm. This should allow a running water level within the filter of a minimum gap of 215mm below the top of the filter. The following diagram should give guidance on water levels –




Also in pump fed installations, the filter needs to have the water level set at this height by an external standpipe return. The following diagram shows this layout –



In short runs, the return pipe should be no less than 3” in diameter. For longer runs, 4” is preferable. In the magna, 2 x 4” runs would be advisable. In the above diagram, a vertical standpipe governs the height of the water in the filter. A t-piece then returns the water to the pond. A t-piece is recommended as it stops syphoning and/or surging in the return pipe on longer runs.

Never, under any circumstances, allow the water to drain straight out from the filter outlet into the pond. This leaves an empty bio chamber and the drum will be put under excessive stress and is likely to damage the screen and running gear. Such installations will void the warranty. The following examples show incorrect and correct installation.

Correct installation –

Incorrect installation –

To Recap, maximum height water level should be when pumps are running is 215mm below filter top and the top of the filter should sit 370mm above pond level.

## Connecting the Water

**Water valve operated spray bars**, connect your incoming water supply to the valve, through one of the services ports. In the UK this should be via a standard 15mm pipe. For international, an adaptor will be required and the valve body uses a standard 3/4" BSP female thread.

**Optional Pressure Pump** the above can be ignored as the water is taken from the “clean” side of the drum.

## Float Switch

**Gravity fed**, adjust the internal (Clean side) float switch so that when fully floating, the sensor is just below running water level (see Attaining correct water level). Finger tighten the M6 bolt to secure.

**Pump fed**, adjust the external (dirty side) float switch so that the float switch should be 35mm above running level. (see Attaining correct water level)

## Control Unit

You now need to decide where you want your control unit to be and ensure it is securely attached. The unit comes with a 4 metre cable to allow you a considerable amount of flexibility. If you do not need to use the entire 4 metre length we suggest you use a cable tie or equivalent to ensure it is kept tidily and safely out of the way rather than cutting it, just in case you should change your mind in the future.

The Control unit should be sited so that it is vertical, not laid flat on the ground or where water may accumulate.

**Ensure that the red off button is pushed in and self-locked in the “off” position before you plug the unit into the power supply and before you attach the umbilical onto the Combi**

Once you have secured your control unit, route the cable back to the Combi unit through one of the services ports and plug it in. The cable socket has an alignment notch, which faces up from the equipment tray base.

Attach an air supply from a minimum size 80 litres per minute pump to the airbar termination and thread the ariline through one of the services ports . A standard 90 degree rubber air boot will fit snugly.

Add your choice of biological media to the unit. If already mature, then it can be added in one go. If it is new media, we recommend adding small amounts in stages to allow it to start circulating.

# Using Your DracoDrum Combi

## Starting your Drum for the First Time

Turn on controller by twisting and unlocking the stop button. You should see a green light and a red zero. The drum is now ready to go.

## Operation

When running, the drum should show a green light to confirm power is on. Initially you will see a red zero to the right of the unit. This will change as it displays the minutes between the last 2 washes. When triggered, the red sensor led will flash. This flashing will only occur whilst the sensor is actually triggering or whilst you are pressing the green button in. Once triggered this initiates a wash "cycle" and 2 blue leds will light. One for the wash pump and one for the drive motor.

A wash cycle is approximately 30 seconds. Once the 30 seconds is up, the blue leds will extinguish and the drum will stop. If the red led continues to flash, the drum will continue to wash until the red led stops flashing. If this situation lasts for more than 4 minutes, the drum will auto stop, wait for 2 minutes and then continuously monitor the sensor. Once the sensor is no longer active, it will auto restart. Whilst it is monitoring, the red led will come on solidly (failsafe mode).

You can select up to 4 wash cycles for your wash duration, so you can set the drum to wash for up to 2 minutes each time. If you need to manually trigger a wash, for example maintenance, you can press the green button on the controller to start the drum. If there is an issue with the drum, pushing the emergency stop will shut off all power within the controller as a safety feature.

## Making Adjustments

Your DracoDrum allows you to make 2 adjustments to it, the length of the wash and the height of the water sensors.

### Rotations per wash

You can select between 1 and 4 periods per wash.  A period is *not* a full rotation but rather lasts for approximately 30 seconds. This is to ensure the same part of the screen is not constantly underwater and all parts of the drum are used equally.

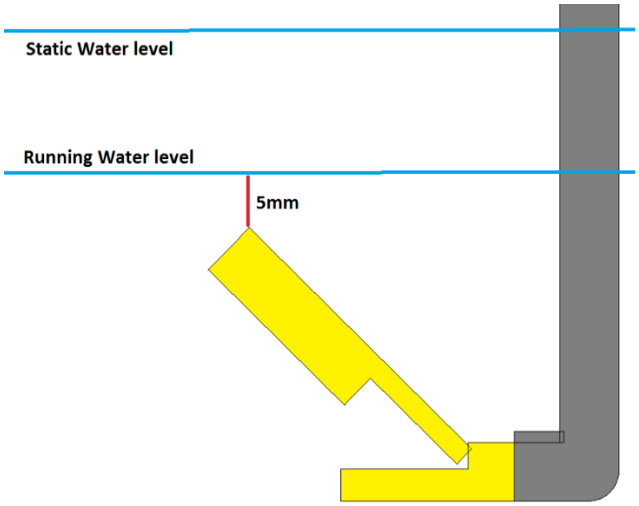
To adjust the number of periods, simply turn the dial on the control box to the required number

NB: The system will over ride and continue to wash for more durations if the water level should not have reached the required minimum height that you have set with the internal water sensor after a wash.

### Adjusting the height of the sensor

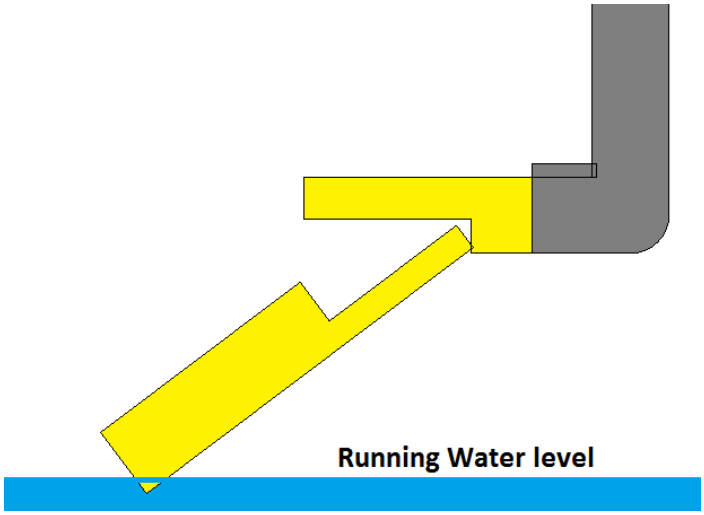
**For gravity fed units** the sensor is on the clean side of the drum.  This sensor is triggered when the micron screen becomes dirty and blocked and the water level starts to drop as not enough water is able to get through.

With the system running, and the drum has just washed, you will have behind the drum what is referred to as “running water level”. This can and usually is lower than if the main circulation pump is turned off. To maximise the area of filter screen under water, the waste tray should be almost completely submerged at static water level. Turning the pump on will drop the water level and this is called the “running water level”. The float switch should then be set so that the floating tip of it is approximately 5mm below that.




Gravity Fed

**For pump fed units** the sensor is on the dirty side of the drum and is triggered by a rise of water level as the screen is blocked. The water level in this case should be midway up the side of the waste tray and the suspended float switch should be just touching the water.




Pump Fed

The unit will continue to wash for as many rotations as necessary until the water level reaches the required height to re-cover this sensor. E.g. if you have your unit set to only 1 rotation but a single rotational cycle is not enough to clear the debris attached to the micron screen then it will continue to rotate and clean until the sensor is re-submerged in water. If however you have the system set to four rotational cycles even if one rotation clears the screen and allows the water to return to the normal running height the unit will continue for the specified number of cycle rotations.

## Timed wash Option

This works in conjunction with the auto wash NOT as an either/or scenario. The auto wash function has not changed.

The 'Wash override' allows you to choose between 3 settings, Off, 45, 99 (the latter 2 referring to minutes between washes). This forces the system into a wash at either 45 or 99 minutes since the last wash, or you can choose to not have this feature in use by leaving it on 'Off'.

If you select the 45 or 99 and your screen blocks, the auto wash will activate so it may be a case that your system has to wash much more frequently to deal with the solids within your system than either 45 or 99 minutes. As said it is a dual system, you cannot switch off the auto wash.

This may be particularly relevant in the winter months when reduced feeding, algae growth means you water stays quite clear in comparison to warmer months. In these instances the system auto trigger system will not be activated for longer periods of time.

## LED Lights on the Control Box

There are 4 LED lights on your control box which tells you what the drum is doing

Green – There is power going to the controller

Red – When lit and flashing, the sensor is active and detecting low water level to trigger a wash, or you are pressing the manual wash button.

Blue – When lit they indicate if the motor is currently active (rotating the drum) and if the wash bar is currently active

## Day to Day usage

Once you are initially satisfied with the settings of your sensor and number of rotations per wash cycle, simply ensure that the green on LED is lit, the lid is down and you can walk away and leave it to do its thing.

Initially the drum will wash more frequently as it is removing all the particulates from your water down to 58 or 77 microns.

You can adjust the sensors and wash duration as many times as you want to until you get to the optimum setting for your particular filter set-up.

**NB always ensure the red Off Button is activated before doing anything within the drum to ensure it will not start a cleaning cycle**

All drums produce some noise whilst they are going through a wash cycle and the DracoDrum Combi is no different.  However with the lid down and, in our own system, the decking covers down , it is very much just a background noise, it does not sound like someone is trying to excavate your back garden and in fact we have found it allows you a smile knowing that your Drum is doing its thing whilst you can enjoy the serenity of your koi and garden.

DracoDrum Combi will automatically restart without any external intervention upon any power failure

## Maintenance

**NB always ensure the red Off Button is activated before doing anything within the drum to ensure it will not start a cleaning cycle**

All drums at some point will either suffer from biofilm build-up or limescale deposits. This is easy to see on a Dracodrum Solum as the "time between washes" display will start to decrease.

### Cleaning the Screen

Set the wash duration to 4, press the manual button and jetwash the screen with a standard nozzle, not a pulsating one. The nozzle should be about 3 to 4inches from the screen to gain maximum benefit. Once done, set the wash duration back to how it was.

### Waste Tray

Every fortnight or so (or more if there is a blanketweed/heavy leaf issue), power off the drum, unscrew the 6 bolts holding the waste tray on, disconnect the drain pipe and withdraw the waste tray. Make sure it is clean and then replace. All 6 bolts on the front of the drum holding the plate should be finger tight only. We actually use a socket without the ratchet to tighten them up in the factory.

### General

Periodically to is wise to purge your filter. Although DracoDrum filters down to 58 micron, there are still particles smaller than this in the waste column. These can congregate within a filter and on our own heavily stocked system, a bi-monthly cleanout is usually carried out. You will get a feeling for how often you need to do this as every system is different.

### Tips

All drum filtered systems should have a trickle in. This is crucial on a pressure pump wash system as the drum extracts water from the pond to wash itself. It is highly important in any event as you will now no longer be doing water changes by cleaning your filter. Failure to do so will likely result in a build up of nitrate (and increased algae and blanketweed issues) and a drop in Carbonate hardness (KH) and buffering capacity of the pond.

There may be a slight nitrite level increase after fitting any drum. This is down to a switchover in the type of nitrobacter inhabiting your system to a "clean loving" variety. This usually lasts no more than a couple of weeks and has not been seen to be detrimental to fish stocks.

**Gravity fed systems**, you can do a partial bottom drain purge by switching off your drum but not the circulation system. Allow the water level within the filter to drop as low as it can, then turn the drum back on. The backfilling water should increase flow down the bottom drain pipe and clean the pipe run. If using the optional pressure pump, allow the water level to drop to nearly the bottom of the inlet tube. You will not damage the wash pump by running it dry as it is self-priming.

If the pond is not entirely clear, it may be that the float switch is too low in the water for gravity fed systems or the drum is too high up for pump fed. If that is the case, the water pressure “differential”

between the inside and the outside of the drum screen is too great and waste can extrude itself through the screen and cause the water quality to become turbid. Readjust the float switch higher in the water (gravity) or drop the drum lower in the water (pump) to resolve this.

## Diagnostics

The DracoDrum should be virtually problem free, but like any electro mechanical device, it may occasionally need help. The 4 LED's on the control panel can help to diagnose issues.

- **RED sensor led** goes solid (stops flashing) And drum stops washing after 4 minutes (drum failsafe mode – see paragraph 2 in "operation")

  Water sensor is too high (gravity) too low (pump fed). Reset height.

  Waste Tray is full of dirt and is not expelling water - clean waste tray.

  Screen is blocked but tray is empty (will be accompanied by low "time between washes" display), jetwash screen.

  If screen is clean, maximum flow rate of the drum has been exceeded, so water level cannot return to running level. Reduce flow.

  Tap fed systems – Water supply has been turned off/pressure reduced substantially. Check incoming water supply.

  Failed / disconnected water valve – disconnect incoming water supply and visually check ball valve operation when pressing the "manual wash" button.

- Drum does not trigger, manual wash button has no effect

  Green led is off - no power to controller.

  Green led is on - umbilical is not correctly plugged into drum.

  NB for pump fed, drum still refuses to trigger but above points are ok, remove waste tray and clean out float switch.

- BLUE LED's continuously on, drum always washing and also no red flashing LED
- Only one blue LED comes on

  Faulty control board in both cases - Contact dealer

- BLUE LED's come on when triggered, drum rotates but no wash

  Faulty or disconnected pressure pump or water valve. Check connections in the drum terminal box (there is a diagram within the box to make this easier).

- BLUE LED's come on when triggered, drum washes but does not rotate

  Faulty or disconnected drive motor - again check the drum terminal box.

- In wash cycle, motor rotates but drum does not

  Drum is jammed. Turn drum off, remove waste tray and clear obstruction. Restart drum. If drum still does not rotate but motor shaft does, contact dealer.

- Weird display digits / “elements” missing in display numbers

  This is caused by the time between washes exceeding 99 minutes. To resolve, adjust float switch higher to bring wash time back below 99 minutes. This should also stop waste sitting in the drum for long periods of time.

- Water not coming through all jets  in wash cycle

  Undo blue holding cap on blocked jet by quarter turn and remove jet assembly. "blow backwards" into the jet with your mouth and this should clear the obstruction. Check the inside of the jet to see if the obstruction is now visible and remove. Replace jet.

  In hard water areas, an old toothbrush applied to the jet should clean it. If this is unsuccessful, spare jets are available from your dealer.

## Breakages

The DracoDrum is completely modular meaning that if you should have an accident, all parts are replaceable without having to buy a new drum.

We are able to supply your local dealer with all replacement parts, up to and including the chassis and drum itself,  so that your drum can be fixed and up and running again in a short period of time.

## DracoDrum Guarantee

This product comes with a 1 year 'Return to Base' guarantee for manufacturer faults, including the screen and all seals, which is valid from date of purchase.

In the first instance the consumer should contact the DracoDrum agent from which the unit was purchased. Proof of purchase will be required along with a serial number.

Any unauthorised repairs, modifications or alterations to this unit will invalidate the guarantee.

Liability is limited to replacement of the defective parts. This guarantee is not transferable. It does not affect your statutory rights. DracoDrum Ltd and its agents shall not be held liable for any consequential loss caused by or arising from the use of any DracoDrum products including loss of fish, plants or any other livestock as a result of any failure or defect of this product.

The guarantee undertaking consists at the option of DracoDrum the elimination free of charge of material and manufacturing defects through repair, exchange of parts or replacement of the entire product. If DracoDrum repairs the product, exchanges parts or replaces the product, then the guarantee claim for the defect in question or the replaced product is valid for the remaining duration of the original guarantee period.

In cases where, upon inspection, the fault is not covered by the manufacturer's guarantee, DracoDrum reserves the right to recover from the customer the costs of handling the guarantee claim.

DracoDrum reserves the right to alter product specifications without notification.

What isn't covered by the DracoDrum guarantee

There are some circumstances in which a DracoDrum guarantee doesn't cover the repair or replacement of a machine. These aren't hidden in the small print. Here's what isn't covered:

- Fair use wear and tear
- Accidental damage
- Damage caused by not carrying out the recommended maintenance.
- Damage from external sources such as transit, weather, electrical outages or power surges.
- Failures caused by circumstances outside of DracoDrum's control.
- Faults caused by:
    - Negligent use, misuse, neglect or careless operation of the unit;
    - Use of the unit which is not in accordance with the DracoDrum's User/Install Guide;
    - Use of parts not assembled or installed in accordance with the instructions of DracoDrum.
    - Use of parts and accessories which are not DracoDrum Genuine Components.
    - Repairs or alterations carried out by parties other than DracoDrum or its authorised agents.

Any dispute arising from the provisions of the manufacturer's guarantee will be dealt with under the laws of England and Wales.