



PowerDrain - Welfare Cabin Pumping Station



Where is it used?

- **Construction Sites**
(for site welfare cabins, toilets & shower blocks)
- **Events & Festivals**
(for luxury toilet units & shower blocks)
- **Semi Off Grid Locations**
(for glamping sites, shepherds' huts, lodges)

No mains drainage on site? No problem!
Pump wastewater from temporary site accommodation, toilets & showers to large storage tanks or a mains sewer

The Welfare Cabin Pumping Station is a packaged pumping solution for transferring toilet waste (sewage) or greywater (shower and sink water) from one or more site cabins, glamping pods, toilets and shower blocks etc, over distance (and height*) to a mains drain or large, waste collection tank.

Typical reasons for using this solution include:

- complex sites e.g. limited space availability
- multi-storey site cabin setups with large volumes of waste
- to collect waste in one central point for simplicity
- to reduce the number of site visits from waste tankers etc.

No two sites are the same, so we offer two main pump variants, which cover most scenarios. Other options are available.

* Please note:

All pumps have a maximum pumping distance and a maximum pumping height. They cannot simultaneously achieve both maximums. In general terms, as you pump upwards the pumping distance decreases.

Key Features

- Full assembly includes:
240 litre collection tank, electric pump & control panel
Unit dimensions (cm) 96 L x 68 H x 74 W.
- Simple plug and play installation - speedy site setup.
 - 110mm Ø waste entry point - pre-drilled, with seal.
 - 63mm Ø OD compression fitting for waste outlet.
 - Commando 230v 50Hz male socket.
- 240 litre collection chamber receives waste from source(s).
- Pumps utilise an accurate pressure transducer rather than a float switch.
- Wastewater is pumped over distance (see overleaf) to a mains sewer or a suitable storage tank (for later removal).



Typical site setup



Pump in waste chamber (left)



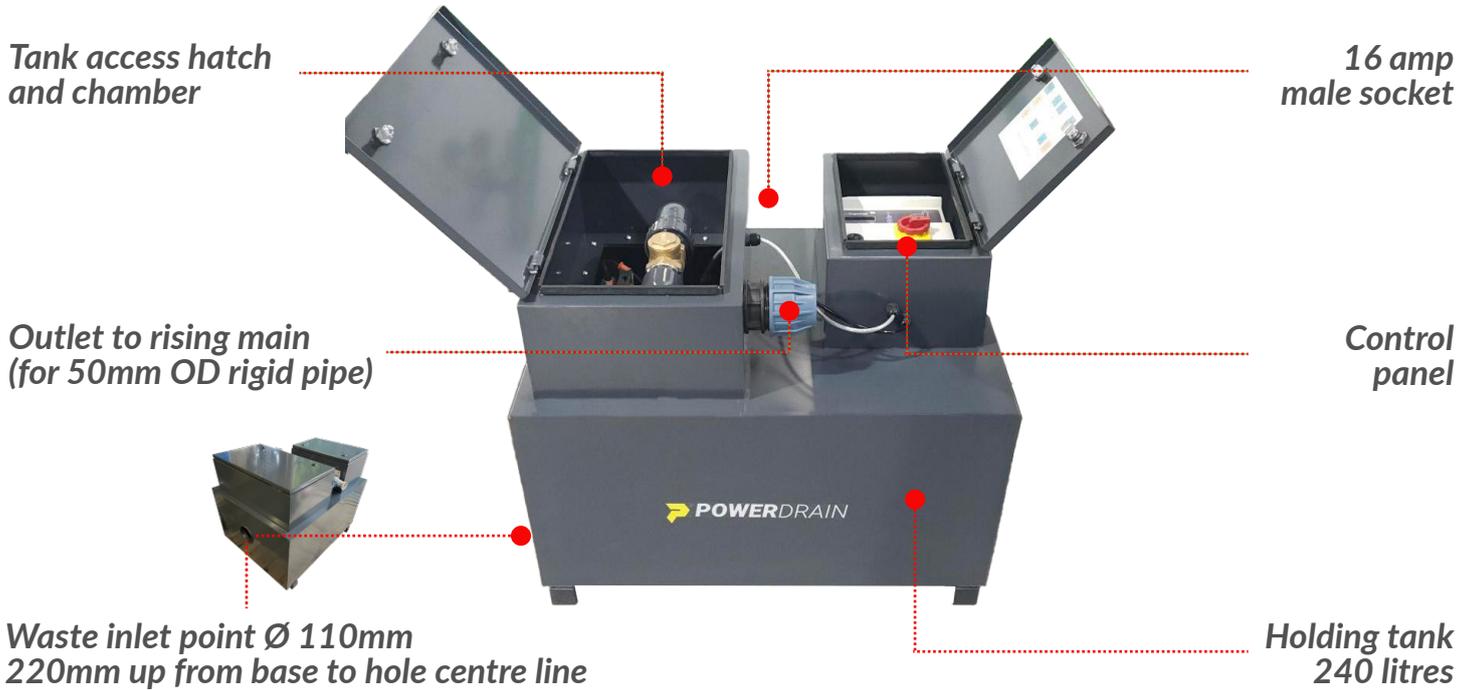
Control panel (right)



Control panel



What's included?



The Internal Workings

The holding tank includes:

- choice of vortex or grinder pump
- internal pipework from pump to outlet
- pressure transducer for level detection
- non-return valve to prevent backflow



Grinder pump



Vortex pump



Pressure transducer

The above details just two of the many pump options available, and they will cover most (but not all) scenarios. Other options are available, including twin pump variants. **Please consult us if you have specific requirements for volume, height and distance.**



How Does It Work?

Pump types & performance



As toilets, sinks and showers are used on site, the resultant sewage and grey water waste is channeled via 110mm waste pipework into the pump station's 240 litre holding tank.

The holding tank contains the pump (see below). A lockable access hatch gives access to the pump and internal pipework, which includes a non-return valve so that pumped liquid does not flow back into the holding tank once the pump turns off.

The pump's operation is governed by a control panel linked to a pressure transducer mounted inside the tank.

As the waste level in the tank rises, the pressure transducer activates the pump at a preset level, pumping the waste liquid away through 50mm ID rigid or semi-rigid pipework connected to tank's the inbuilt compression fitting.

Pump Options - [1] Vortex & [2] Macerator / Grinder

[1] Vortex Pump



Sewage - VXm 10/50

Typical performance example:



PUMP DETAILS	
Pump Type	Vortex
Power Supply / Rating	230v / 0.75 kW
Power Connection	16A Commando Plug
Rated / Starting Current	5.5 A / 20 A
Max Starts / hour	20
Thermal Protection	Included

PERFORMANCE REQUIRED PIPEWORK	
Max Flow Rate*	550 litres/minute
Max Head	8.5 metres
Liquid Temperature	Min 0°C - Max 40° C
Pumping Main Required	50mm ID / 63mm OD
Pumping Main Pipe	Black MDPE, SDR11
Pipe Pressure Rating	12.5 bar

The standard pump for most common setups is a VXm 10/50 vortex pump for foul water / sewage waste. Ideal for construction and industrial sites, events and glamping applications.

Vortex pump achieves up to 300m on the flat through 50mm ID rigid MDPE pipework with no pipework bends at 2 litres (1 metre) per second, i.e. 120 litres per minute.

[2] Macerator pump



Sewage - TIGm 0.75

Typical performance example:



PUMP DETAILS	
Pump Type	Macerator / grinder
Power Supply / Rating	230v / 0.75 kW
Power Connection	16A Commando Plug
Rated / Starting Current	5.5 A / 14.41 A
Max Starts / hour	20
Thermal Protection	Included

PERFORMANCE REQUIRED PIPEWORK	
Max Flow Rate*	140 litres/minute
Max Head	18.5 metres
Liquid Temperature	Min 0°C - Max 40° C
Pumping Main Required	50mm ID / 63mm OD
Pumping Main Pipe	Black MDPE, SDR11
Pressure Rating	12.5 bar

When pumping distances and/or the required head are greater. Compared with the vortex pump, this pump's flow rate from reduces, whilst the max. distance and/or head increase.

Macerator / grinder pump achieves up to 500m on the flat through 50mm ID rigid MDPE pipework with no pipework bends at 1½ litres (0.8 metres) per second, i.e. 90 litres per minute.

* Please note: the maximum flow rate is purely an industry standard measure to indicate at what level the pumps could "theoretically" perform. In practice, as with any machinery, running over time at maximum is unrealistic. The pumps in the welfare cabin pump station run at a fixed and realistic speed set at the factory. If site requires flow rates beyond 90-120 litres per minute then a different solution should be discussed and offered. Please consult us.



How much waste will the pump station handle?

How does the pump station work?

As toilets are flushed, and sinks, showers and kitchenettes are used, the resultant sewage and grey water waste is piped into the 240 litre holding tank. The holding tank contains the pump and a pressure transducer. As the level of liquid inside the holding tank rises, at a preset level (300mm) the transducer recognises the physical pressure of liquid and creates an electric signal, which ultimately turns on the pump.

How much waste is created per person in typical scenarios?

Water consumption and waste creation on any site or application are not an exact science owing to a range of variances such as: the number of users, user health, ambient temperatures, peak usage times and the mixture of facilities each site provides.

British Water's Code of Practice "Flows and Loads 4" generally expects each member of staff to "use" 50-60 litres per 8 hour shift (office/factory/industrial site without canteen) to 100 litres per day (office/factory). This is never an exact science: averages are a guideline.

When does the pump switch on?

The system is configured to hold 150mm of liquid in the bottom of the tank at all times. The liquid level will rise a further 150mm (i.e. to 300mm from the bottom of the tank) before the transducer turns on the pump.

The effective volume of liquid pumped per "cycle" is **between 80-100 litres**. In typical scenarios, the Vortex pump is programmed to run at 120 litres per minute; the grinder pump at 90 litres per minute. Therefore, each pump cycle will last up to 60 seconds. Although the tank volume is 240 litres, the "unused" capacity is designed as a fail-safe / redundancy level in the event of a power outage on site.

What is the realistic liquid moving volume per hour?

The pumps are designed to comfortably operate up to 20 times per hour. Assuming 80-100 litres per cycle is the typical pumping volume then the maximum pump rate is 1600-2000 litres per hour whilst still operating within the pumps' optimum parameters.

When we multiply that hourly rate by an average 8 hour working day then we arrive at 12,800-16,000 pumped litres per day. At 100 litres per person, that would equate to 150-160 members of staff.

Typical site scenario?

A group of six office cabins, side by side on a concrete car park. Site conditions dictate you can't lift the cabins on stilts or run pipework underground.

Waste is channeled from the cabins to a single pipe leading into the welfare station, and is then pumped away to a mains sewer or waste holding tank.

The pumped run may be up to 300m (vortex pump) or 500m (grinder pump), but could be to an adjacent tank.

More typically, it will simply be pumped a few metres to a separate holding tank. This may be a flat tank such as one of our 1000 gallon / 4546 litre Tuff Tanks, or could be a large vertical tank, which are sized up to 30,000 litres. This would have the effect of reducing the number of site tanker visits.

Note: pumping upwards into a large vertical tank - typically up to 4.5m tall for the largest - will affect the pumping distance. Please consult us for advice.



pipe run to mains sewer or holding tank





Welfare Cabin Pump Station

Dimensions - power supply - pipework - flow rate

Product details	
Main Chamber Material	Medium Density Polyethylene (MDPE) / OR aluminium (option from 11.2025)
Main Chamber Dimensions	960mm (L) x 740mm (W) x 490mm (H) - overall height including access hatch is 680mm
Chamber Max Volume	240 litres / 52.86 gallons
Non Return Valve & Outlet	Brass swing check valve - rubber seat - prevents liquid flowing back into holding tank when pump switches off
Inlet	ø110mm - typically positioned and pre-drilled on holding tank's vertical face and long edge
Power Supply	IP67 rated 220v 50Hz socket - requires MK K9024BLU 220v plug to maintain IP67 rating
Discharge Connection	50mm ID /63mm OD, PVC, 126 bar socket adaptor with compression fitting for rigid or semi-rigid pipework
Internal Pipework & Fittings	All manufactured to EN1452-2/3, ISO161/1, BS21, DIN2999, ISO7. Note, threaded fittings are rated at 12 bar
Pump(s)	[1] Pedrollo VXm 10/50 220v Vortex or [2] Pedrollo Titrus Inox Grinder TIG 0.75
Pressure Transducer	4:20ma sewage pressure transducer complete with stainless steel anti-clogging cage
Inlet Seal	1 x ø110mm EDPM tank gasket
Optional Extras	Control panel regulates pump at a fixed speed and includes a spare channel for alarm, beacon, telemetry etc.

IMPORTANT PUMPING CONSIDERATIONS - UNDERSTANDING FLOW RATE

When pumping sewage from any pump station through pipework to a sewer or interim holding tank, you will need to use a pump that will perform at a minimum flow rate of **1½ litres per second**.

In true terms, that equates to at least 90 litres per minute.

Known as the **self-cleansing** or **minimum flow velocity**, this flow rate is necessary to prevent solids from settling within a drainage pipe.

Below this flow rate, particles such as grit, silt and organic matter can deposit, possibly leading to blockages and reducing pumping ability.

The pumps we have selected will **perform at and beyond this level**.



Using the required 50mm ID pipework these pumping stations will perform at a flow rate exceeding 1½ litres (0.8 metres) per second, pumping over distance and height.

In layman's terms, when adding height ("head") into the equation, the overall pumping distance is reduced because the pump has to work harder to "lift" liquid. The pump cannot provide maximum flow and maximum head simultaneously - it works on a reducing scale of distance vs height.



Dimensions & Weights



DIMENSIONS & WEIGHTS

Holding tank length	960mm
Holding tank height	490mm
Holding tank depth	740mm
Overall height including access hatch	680mm
Complete unit weight with pump	50Kgs
Pump weights (Vortex / Grinder)	14Kgs / 14.7Kgs



Less common, plastic holding tank version

This unit will ship on a pallet on account of its size and weight



Welfare Cabin Pump Station

Welfare Cabin Pump Installation Checklist

Action	Check
1. Check the power supply Ensure an approved 220V 50Hz socket is available on site for electrical connection	<input type="checkbox"/>
2. Use the correct plug To maintain the IP67 rating, fit an MK K9024BLU 220V plug to the power lead	<input type="checkbox"/>
3. Connect the inlet pipe Insert your 110mm waste pipe into the pre-drilled inlet hole in the holding tank	<input type="checkbox"/>
4. Connect the outlet pipe Attach the 50mm ID MDPE rising main into the compression fitting provided	<input type="checkbox"/>
5. Unpack & Position the pump The pump is supplied separately boxed to prevent damage in transit. Carefully unpack it and position it within the pump station	<input type="checkbox"/>
6. Join the PVC union Connect the PVC union on the pump to the matching half in the pump station	<input type="checkbox"/>
7. Connect the power supply Plug in the waterproof power connector supplied with the unit	<input type="checkbox"/>
8. Power up the control unit Turn on the rotary isolator located on the pump controller	<input type="checkbox"/>
9. Fill & test the tank Fill the tank with clean water to check for leaks and proper operation	<input type="checkbox"/>
10. Set pump parameters Follow the setup instructions inside the controller lid to automatically set the pump's running parameters	<input type="checkbox"/>
11. Switch to automatic mode Press the AUT button on the controller to leave the system in automatic operation	<input type="checkbox"/>
12. Final test run Run clear water through the system for a couple of cycles to ensure everything is functioning correctly	<input type="checkbox"/>