



ECONOMIC
EFFICIENT
SUSTAINABLE
SEWAGE TREATMENT >



www.marshindustries.co.uk

MARSH INDUSTRIES >

Based in Northamptonshire, England, Marsh Industries is a leading manufacturer of sewage treatment plant and off-mains drainage products for both UK and overseas markets.

Marsh supplies sewage treatment plants and off-mains drainage products for domestic, commercial and industrial applications as well as design and technical support. The company has one of the largest merchant distributor networks available in Europe.

Brand names include Ensign and Ultra Polylok wastewater treatment plants and Marsh Holland pump chambers. Marsh Industries is the sole distributor of Polylok tertiary filters in the UK.



TANK DESIGN

Construction Products Regulations (CPR) state that it is mandatory for manufacturers to apply CE marking to any of their products covered by a harmonised European Standard. Building Regulations have also adopted CE marking as the primary route to show 'Fitness for Purpose' in the UK.

With this in mind Marsh products are fully type-tested and certified in accordance with BSEN12050 (pump chambers) and BSEN12566 (septic tanks, sewage treatment plants and cesspools) to ensure compliance with environmental permitting programmes and relevant Building Regulations.

MATERIALS AND MANUFACTURING

Marsh Industries uses the highest quality parts and materials to ensure complete assurance in every aspect of build quality.

Tanks and chambers are typically made from the following materials:

Virgin unfilled resin (no 'fillers' such as chalk)
Provides consistent wall thickness to ensure superior structural strength and durability. This also enables the tank to be significantly lighter for on-site handling/positioning and better suited to withstand greater hydrostatic pressures when in use.

ISO gel-coat / flo-coat
Protecting the fibres in the laminates reduces UV degradation whilst improving water and chemical resistance. This inherent integrity allows Marsh to offer an unrivalled 50 year design life, backed by a 25 year structural guarantee.



SEWAGE TREATMENT WHAT ARE YOUR OPTIONS?



Choosing the right sewage treatment and disposal method for your site is essential to ensure effective long-term performance, protection of public health and the environment, and compliance with relevant legislation.

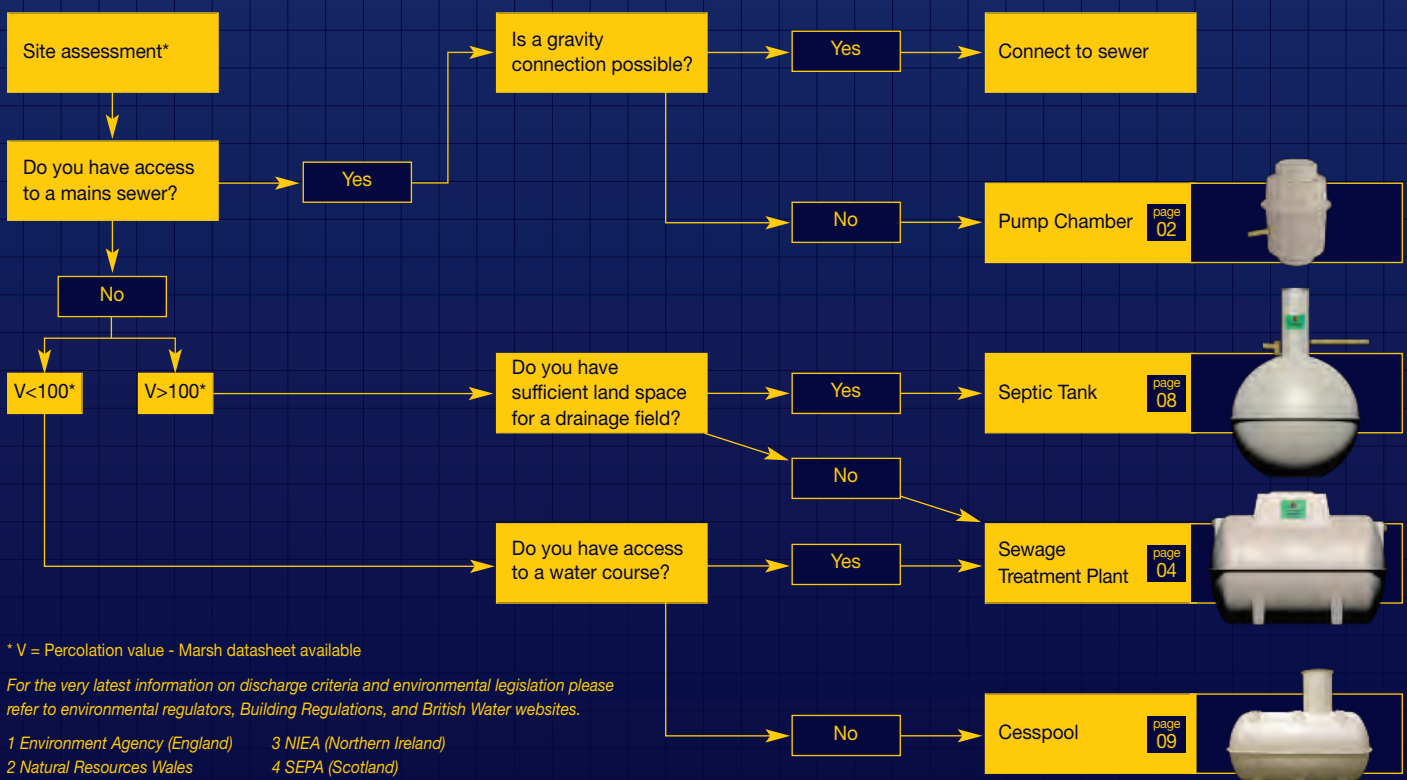
Sewage treatment and disposal can be provided by a public (foul) sewer provider or by a private sewage system. Developments proposing the use of private systems are only usually acceptable where connection to the public sewer is not possible and must take account of the requirements of Building Regulations which should be discussed with the local Planning Authority at an early stage.

Before sewage effluent can be discharged to 'controlled waters' it must receive at least primary and secondary treatment:

- > For a discharge to ground the micro-organisms in the soil provide the secondary treatment
- > For a discharge to a water course the sewage treatment must be provided by a Package Sewage Treatment Plant (PSTP) or equivalent.

SYSTEM SELECTION

Hierarchy of off-mains discharge routes as laid out by the environmental regulators and British Water



PUMP CHAMBERS >

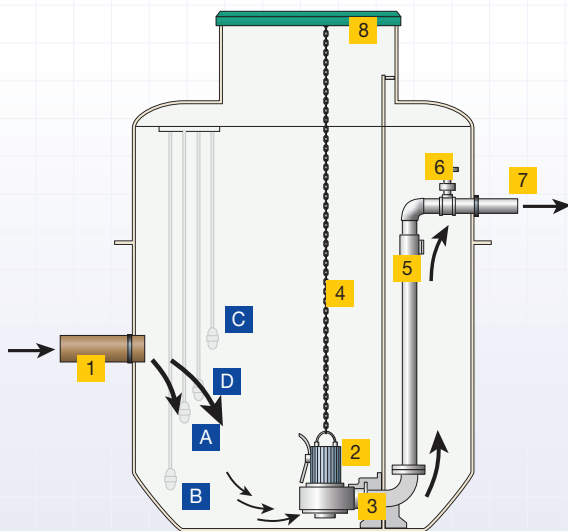
FOR PUMPING SEWAGE AND WATER TO MAINS

When discharge to mains is required, but to do so by gravity is impractical, a pump chamber system will be needed. Although available as floor-mounted units for indoor applications such as basements, the vast majority are installed outdoors at levels to suit on-site conditions and topography.

The Marsh range incorporates systems for pumping surface water or domestic sewage to mains, septic/PSTP effluent to drainage fields/watercourses, and bespoke systems for larger domestic and industrial applications.



- > Where foul water drainage from a domestic property is to be pumped to the mains the effluent receiving chamber should be sized to contain 24-hour inflow to allow for disruption in service, the minimum daily discharge being taken as 150 litres per person per day.
- > For other building types the capacity of the receiving chamber should be based on the calculated daily demand of the water intake for the building, or when only a proportion of the foul sewage is to be pumped then the capacity should be based pro-rata.
- > If the sewer is to be 'adopted' by a local water authority, please contact Marsh Industries as Sewers for Adoption (SFA) specification and additional local authority related criteria may apply.



HOW DOES IT WORK?

Each pump chamber contains a number of float switches linked to a control panel that automatically controls flow and levels.

In a **single pump chamber** there are three float switches:

Float A: Actuates the pump cycle until level drops to low level

Float B: Low level float stops the pump

Float C: High level alarm – positioned above the pump actuator float (min 100mm)

For **twin pump chamber** operation there is an additional float switch (Float D) – usually positioned 150mm above first actuator (A) – which actuates the second pump in periods of higher flow.

After each cycle the pumps alternate to extend pump life and are designed to run for a minimum of 60 seconds with no more than 15 starts per hour.

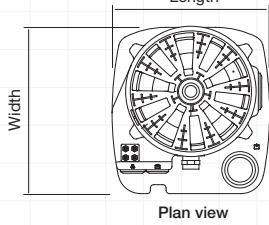
KEY

- | | |
|-----------------------------|--------------------|
| 1 Inlet | 5 Non-return valve |
| 2 Submersible pump | 6 Isolation valve |
| 3 Pump guide rails/pedestal | 7 Outlet |
| 4 Pump retrieval chains | 8 Access cover |

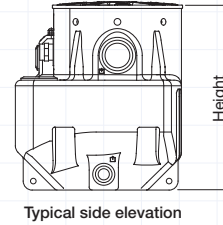
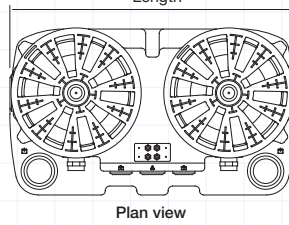
PUMP CHAMBER BENEFITS

- > Designed to BSEN12050 for structural strength and water-tightness and to BSEN752 to comply with hydrostatic and electrical requirements
- > Smooth internal walls and integral pump well improves pump efficiency and eliminates 'dead spots' which can lead to odours and septicity
- > Pre-assembled pipework for fully automatic operation (pump/control equipment separate).
- > Heavy duty (industrial) 'peardrop' floats and Lowara (Xylem) pumps throughout ensure robust, reliable design and maximum efficiency of pump with minimal clogging or wear
- > Unique 'keying-in' lip to assist anchoring into concrete surround
- > High level alarm as standard
- > Variable invert depths and orientations to suit individual site conditions

Marmicro Single



Marmicro Twin

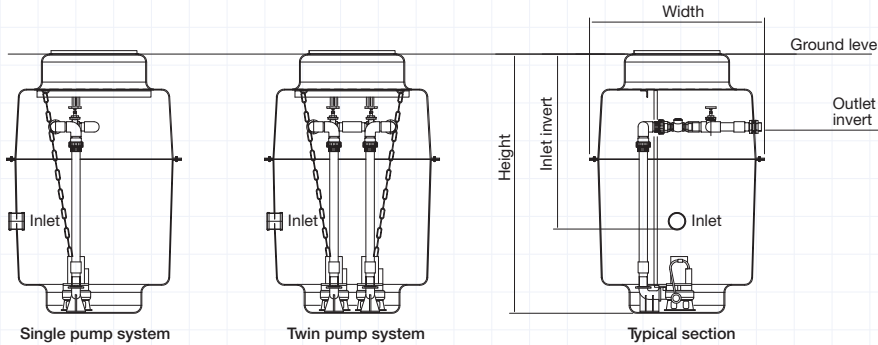


MARMICRO SPECIFICATIONS

For small flows from a single dwelling

Model	Length	Width	Height	Inlet		Outlet		Total storage Litres
				Invert	Ø	Invert	Ø	
Marmicro Single	700	740	840	350	110	250	50	270
Marmicro Twin	1270	740	840	350	110	250	50	550

All dimensions in mm



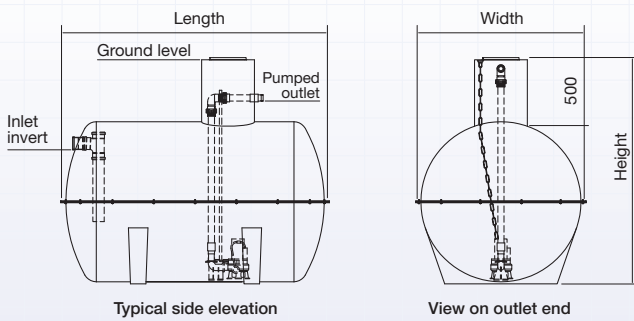
All pump chambers are available for dirty water (DW) or sewage (SW), in single pump (SP) and twin pump (TP) configurations.
Pump chambers are usually bespoke. The dimensions given on this page are for guidance only

VERTICAL SPECIFICATIONS

For housing projects and small commercial developments

Model	Diameter	Height	Inlet		Outlet		Storage below invert	Total storage Litres
			Invert	Ø	Invert	Ø		
Mini	600	1100	500	110	300	63	120	234
Midi	600	1500	500	110	300	63	280	421
Maxi	600	2000	500	110	300	63	421	561
CPS1	1100	1100	500	110	300	63	470	867
CPS2	1100	1500	700	110	300	63	780	1183
CPS3	1100	2200	900	110	300	63	1025	1735
CPS4	1100	2600	900	110	300	63	1340	2050
CPS5	1700	2100	900	110	300	63	2440	3700
CPS6	1700	3400	900	110	300	63	4000	6000

All dimensions in mm



HORIZONTAL SPECIFICATIONS

For larger housing projects, and commercial/industrial developments

Model	Length	Width	Height	Inlet		Outlet		Total storage Litres
				Invert	Ø	Invert	Ø	
AT2800	3000	1250	1750	800	110	300	63	2800
AT3800	4000	1250	1750	800	110	300	63	3800
AT4500	2650	1600	2100	800	110	300	63	4500
AT6000	2950	1900	2400	800	160	300	63	6000
AT8000	3640	1900	2400	800	160	300	63	8000
AT10000	4200	1900	2400	800	160	300	63	10000
AT12000	5200	1900	2400	800	160	300	63	12000
AT14000	5840	1900	2400	800	160	300	63	14000
AT16000	6700	1900	2400	800	160	300	63	16000
AT18000	7500	1900	2400	800	160	300	63	18000
AT20000	8100	1900	2400	800	160	300	63	20000

All dimensions in mm

ENSIGN PACKAGE SEWAGE TREATMENT PLANT

INTENSIVE BIOLOGICAL PROCESSING FOR OFF-MAINS WASTEWATER



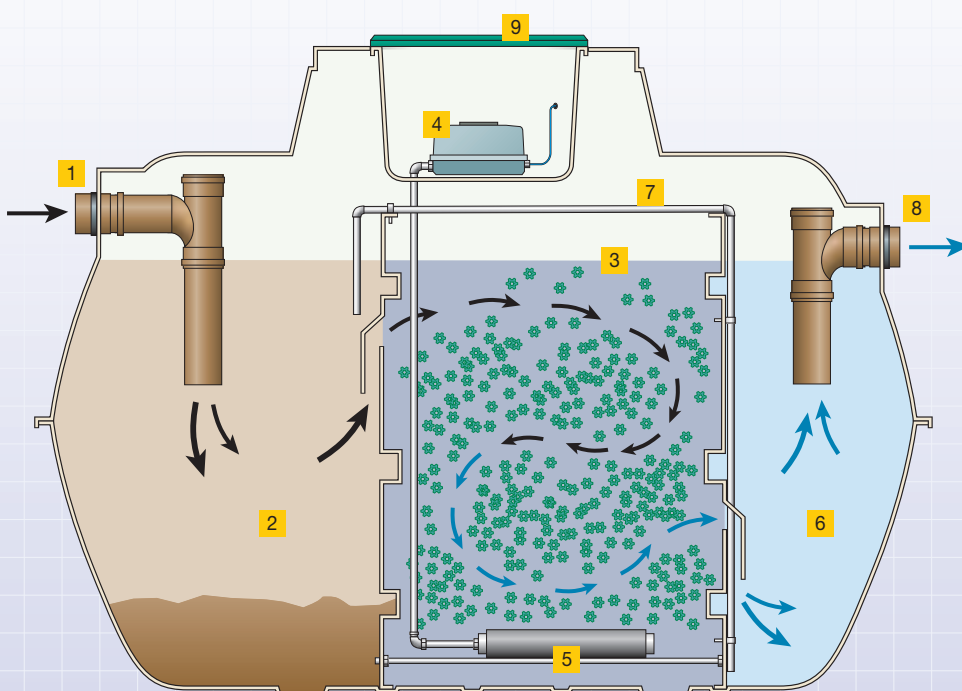
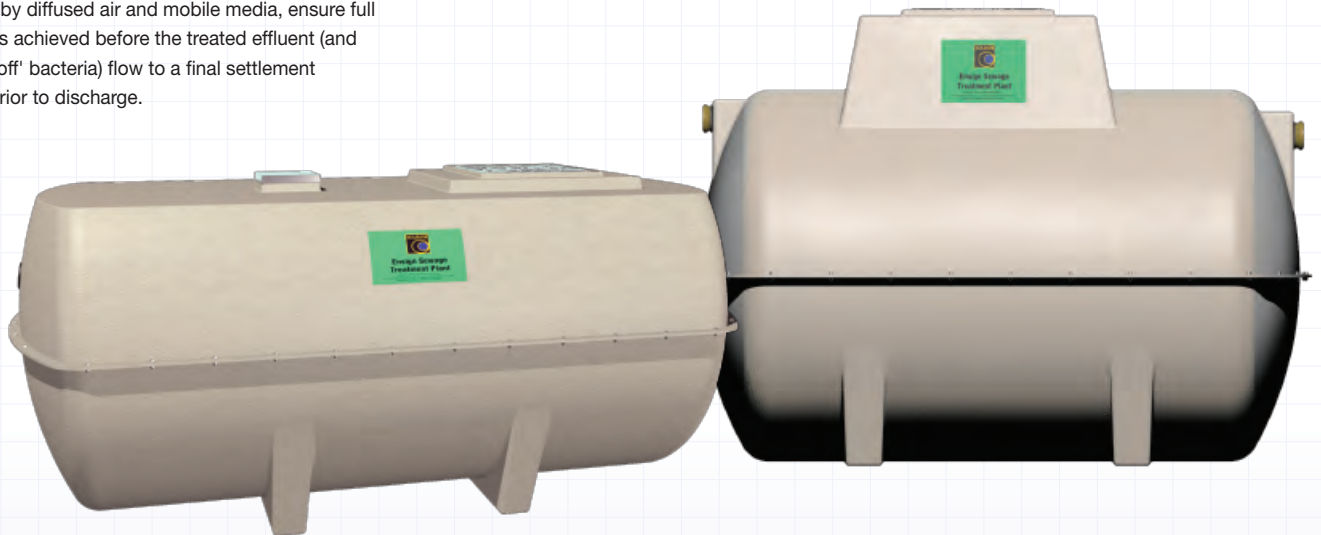
Package Sewage Treatment Plant's (or PSTP's) are often a suitable option where groundwater in the surrounding environment is vulnerable, drainage field percolation values are restrictive, or direct discharge to watercourse or surface water sewer is the preferred discharge method.

In addition to the anaerobic digestion taking place in the primary settlement tank (as septic tanks) the Ensign unit allows the clarified water to pass into a second 'aeration' chamber where it is treated to remove the dissolved constituents. Here aerobic bacteria, supported by diffused air and mobile media, ensure full treatment is achieved before the treated effluent (and 'sloughed off' bacteria) flow to a final settlement chamber prior to discharge.

- > PSTP's should be sized using the latest version of British Water Flows & Loads which provides detailed information on sewage production figures and sizing calculations
- > Regulatory authorities for the control of pollution in the UK normally require treatment plants conforming to BSEN12566:3 to be demonstrated as capable of producing a minimum effluent discharge quality of 20:30:20 (Biochemical

Oxygen Demand;Suspended Solids: Ammoniacal Nitrogen in mg/ltr), although in certain areas more stringent site-specific qualities may be required

- > No surface water should enter the system as this can reduce the system's capacity and cause solids to be flushed out which may prematurely block drainage field or cause pollution
- > As with septic tanks sludge should be removed annually or in line with manufacturers instructions



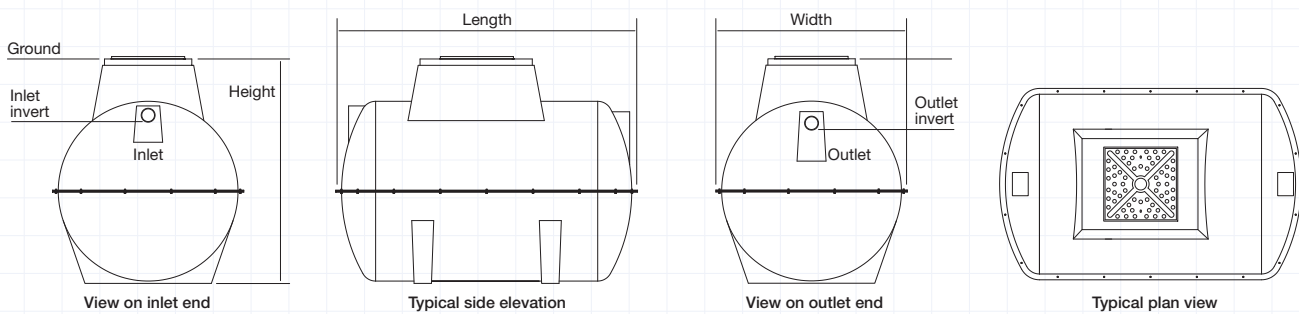
KEY

- 1 Inlet
- 2 Primary chamber
- 3 Aeration chamber
- 4 Compressor
- 5 Diffuser
- 6 Final (or 'humus') chamber
- 7 Recirculation to primary chamber
- 8 Outlet
- 9 Manway access

ENSIGN BENEFITS

- > Tested to BSEN12566:3 and CE-marked to ensure compliance with latest environmental and Building Regulations requirements
- > Class-leading effluent quality of **11.5:19.2:8.4 (BOD:SS:NH₄)** ensures discharges well within national consent standards
- > Three chamber system correctly sized for separation and retention of solids improves final effluent quality
- > Standard or shallow options enable suitability for all site conditions (including driveways - subject to plinth/surround to prevent superimposed loadings)
- > Shallow option ideal for groundworks involving bedrock or high water table as the low profile allows for safe, cost effective installation
- > Low energy compressors ensure minimal running, maintenance and servicing costs
- > High specification bio-media (310m³ per m²) and membrane diffusers ensure even circulation to eliminate 'dead spots'
- > Internal recirculation (from final to primary chamber) continues treatment process to provide higher effluent quality whilst balancing flow over 24 hour period or periods of intermittent use
- > Integral lifting eyes for improved on-site handling
- > Unique 'keying-in' lip to assist anchoring into granular or concrete surround
- > Optional extras include patented Polylok filter to further reduce suspended solids and extend life of drainage field; extensions for deep installations; pumped outlets for sites with adverse levels; and many more

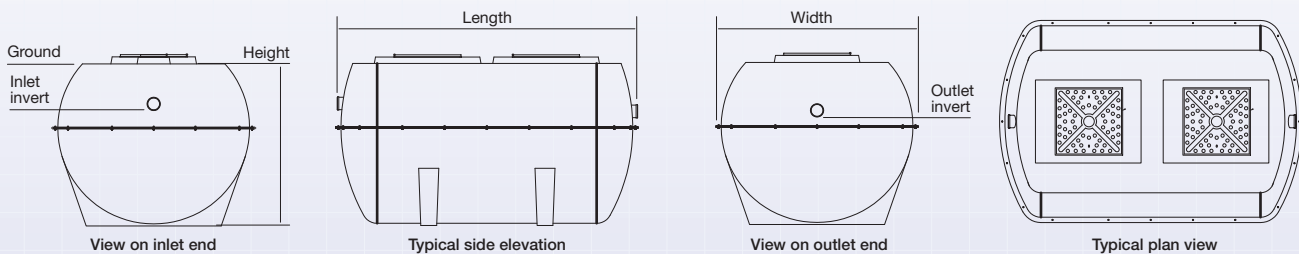
ENSIGN SPECIFICATIONS



Model	Length	Width	Height	Inlet		Outlet	
				Invert	Ø	Invert	Ø
6	2602	1650	1935	550	110	625	110
10	2602	1650	1935	550	110	625	110
12	2860	1912	2139	550	110	625	110
16	2860	1912	2284	720	110	800	110
20	3650	1912	2284	720	160	800	160
25	3650	1912	2284	770	160	850	160
30	4550	1912	2284	770	160	850	160
35	4550	1912	2284	770	160	850	160
40	5200	1912	2284	770	160	850	160
45	5200	1912	2284	770	160	850	160
50	5200	1912	2284	770	160	850	160

All dimensions in mm

ENSIGN SHALLOW SPECIFICATIONS



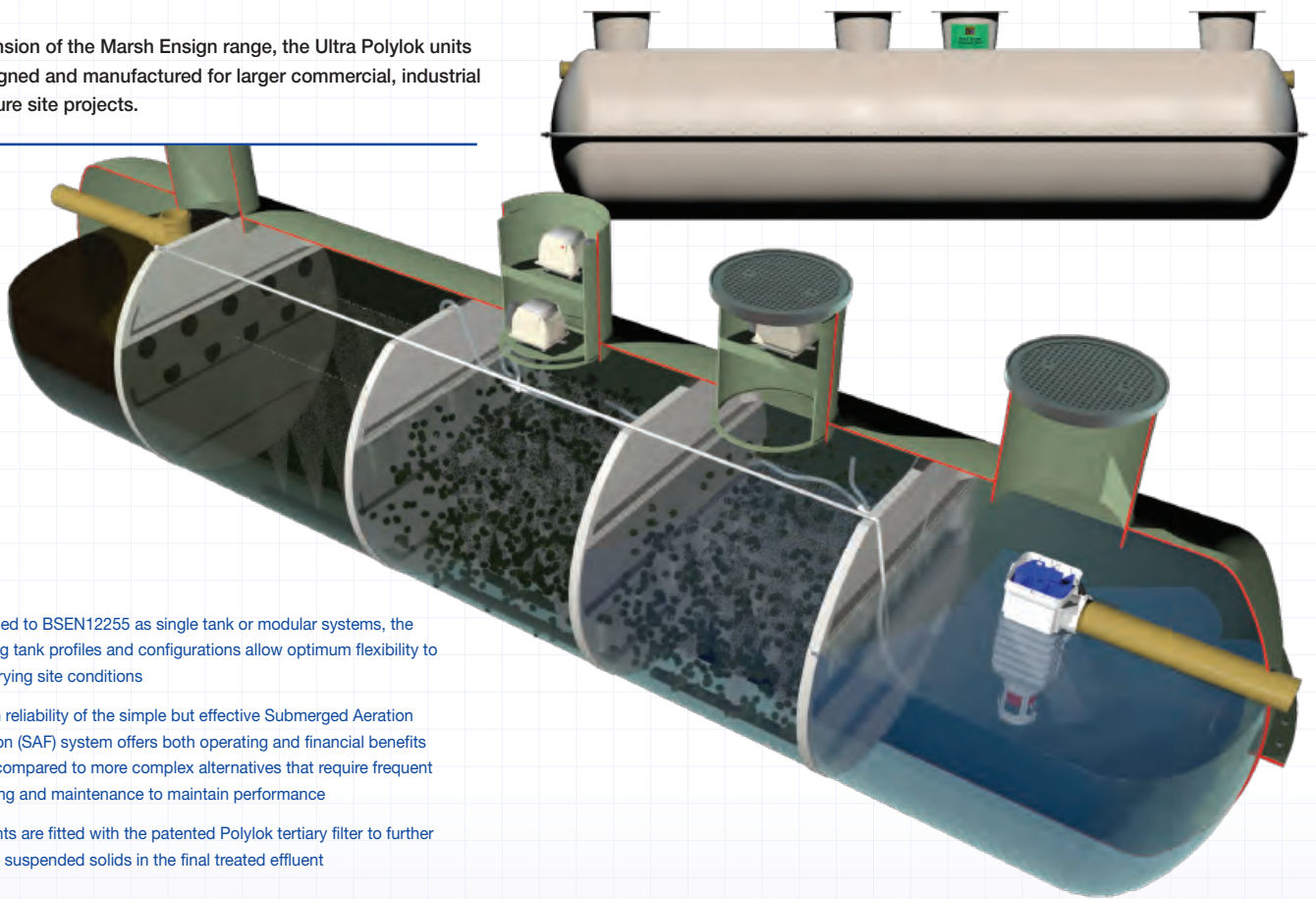
Model	Length	Width	Height	Inlet		Outlet	
				Invert	Ø	Invert	Ø
6	2860	1912	1600	500	110	575	110
10	2860	1912	1600	500	110	575	110
12	2860	1912	1600	500	110	575	110
16	3400	1912	1600	500	110	575	110
20	4550	1912	1600	500	160	575	160
25	4550	1912	1600	500	160	575	160
30	5500	1912	1600	500	160	575	160
35	5500	1912	1600	500	160	575	160

All dimensions in mm

ULTRA POLYLOK ADVANCED SEWAGE TREATMENT PLANT >

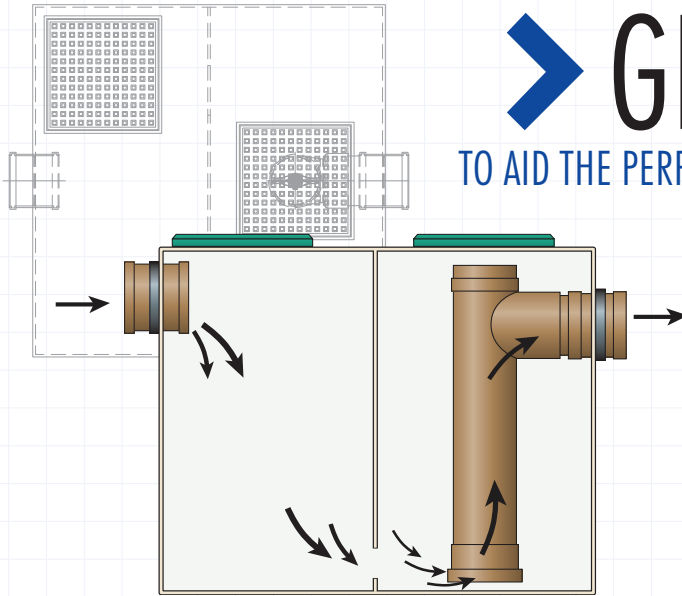
ADVANCED BIOLOGICAL TREATMENT TO OFF-MAINS WASTEWATER FROM 55-300PE +

An extension of the Marsh Ensign range, the Ultra Polylok units are designed and manufactured for larger commercial, industrial and leisure site projects.



- > Designed to BSEN12255 as single tank or modular systems, the differing tank profiles and configurations allow optimum flexibility to suit varying site conditions
- > Proven reliability of the simple but effective Submerged Aeration Filtration (SAF) system offers both operating and financial benefits when compared to more complex alternatives that require frequent servicing and maintenance to maintain performance
- > All plants are fitted with the patented Polylok tertiary filter to further reduce suspended solids in the final treated effluent





GREASE TRAPS

TO AID THE PERFORMANCE OF SEWAGE TREATMENT PLANTS

Through a system of internal baffles and polylok filters, Marsh grease traps aid the performance of sewage treatment plants by preventing fats, oils and greases from entering the drainage channel.



PHOSLOK

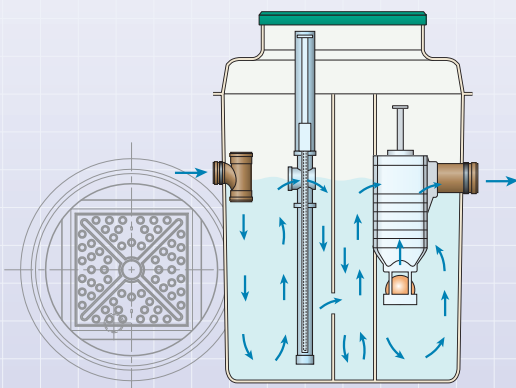
TERTIARY PHOSPHATE TREATMENT

Available for domestic or commercial sites the Marsh Phoslok is single piece plant which adds timed doses of a coagulant to treated effluent to further remove phosphates.

Easily installed downstream from a sewage treatment plant, this tertiary treatment option is the best available method to prevent eutrophication in sensitive discharge locations such as protected waters.

ULTRA POLYLOK UV FILTER

ULTRA-VIOLET DISINFECTION



Specifically designed for disinfecting the effluent from residential and commercial aerobic treatment plants by destroying viruses, parasites and pathogenic bacteria.

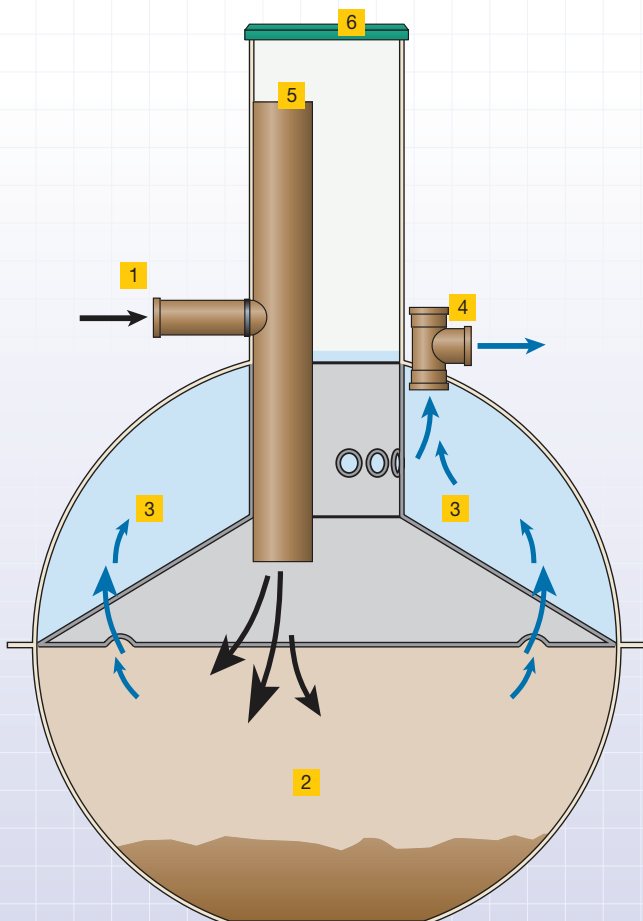
The Ultra Polylok UV chambers can be installed as part of a Marsh Ultra Polylok sewage treatment plant or as a stand-alone plant to further improve the effluent from an existing sewage treatment plant.

SEPTIC TANKS

FOR BASIC TREATMENT TO OFF-MAINS WASTEWATER

Normally the simplest and most economical means of treating wastewater from small developments, a septic tank is a two or three chamber system which holds sewage to allow solids to settle into sludge at the bottom of the tank. Here it is naturally broken down, by a process known as anaerobic digestion, which provides settlement and some biological treatment but the effluent is not fully treated and must receive additional treatment before discharge to the water environment – the most common method being to spread the effluent to land via an underground drainage field.

- > For domestic dwellings the capacity of a septic tank should be a minimum of 2700ltrs for up to 4 users, with the size increased by 150ltrs for each additional user
- > Sewage treatment is an ongoing process. For the micro-organisms to stay healthy the system should be desludged regularly to prevent the build-up of sludge and to allow sewage to flow freely through the unit

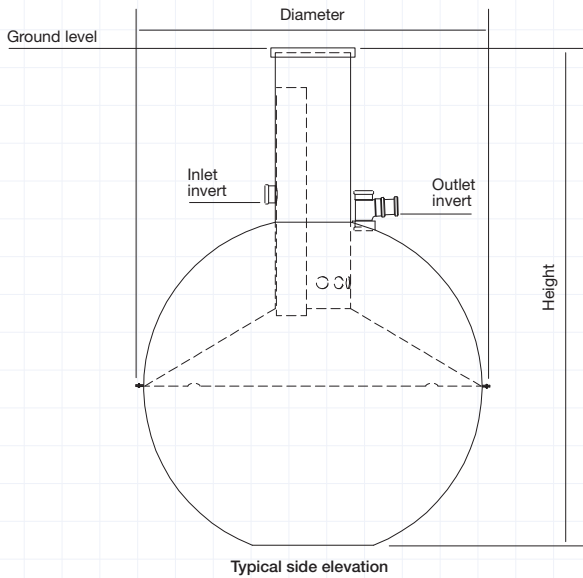


SEPTIC TANK BENEFITS

- > Tested to BSEN12566:1 and CE-marked to ensure compliance with latest environmental and Building Regulations requirements
- > Traditional 'onion-style' tanks for standard installations
- > Low profile versions for high water table or hard rock site conditions
- > Heavy duty shell as standard to enable installation in all ground conditions
- > Integral lifting eyes for improved on-site handling
- > Unique 'keying-in' lip to assist anchoring into granular or concrete surround
- > Pedestrian cover and frame included as standard
- > Additional 'Green Filter' range incorporating patented Polylok filter on outlet to reduce suspended solids, improving effluent quality and prolonging drainage field life

KEY

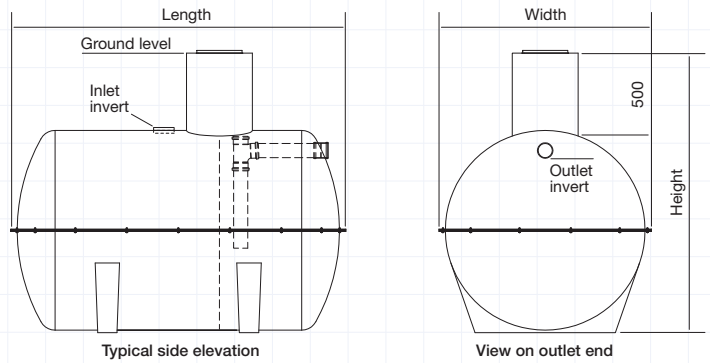
- 1 Inlet
- 2 Primary settlement chamber
- 3 Secondary chamber
- 4 Outlet
- 5 Desludge port
- 6 Access cover



STANDARD SEPTIC TANK SPECIFICATIONS

Size	Dia	Height	Inlet		Outlet	
			Invert	Ø	Invert	Ø
2800L	1870	2780	1000	110	1075	110
3800L	2075	3000	1000	110	1075	110
4500L	2196	3100	1000	110	1075	110

All dimensions in mm



HORIZONTAL SEPTIC TANK SPECIFICATIONS

Size	Length	Width	Height	Inlet		Outlet	
				Invert	Ø	Invert	Ø
2800L	3000	1250	1750	500	110	800	110
3800L	4000	1250	1750	500	110	800	110
4500L	2650	1600	2100	500	110	800	110
6000L	2950	1900	2400	500	160	800	160
8000L	3640	1900	2400	500	160	800	160
10000L	4200	1900	2400	500	160	800	160
12000L	5200	1900	2400	500	160	800	160
14000L	5840	1900	2400	500	160	800	160
16000L	6700	1900	2400	500	160	800	160
18000L	7500	1900	2400	500	160	800	160
20000L	8100	1900	2400	500	160	800	160

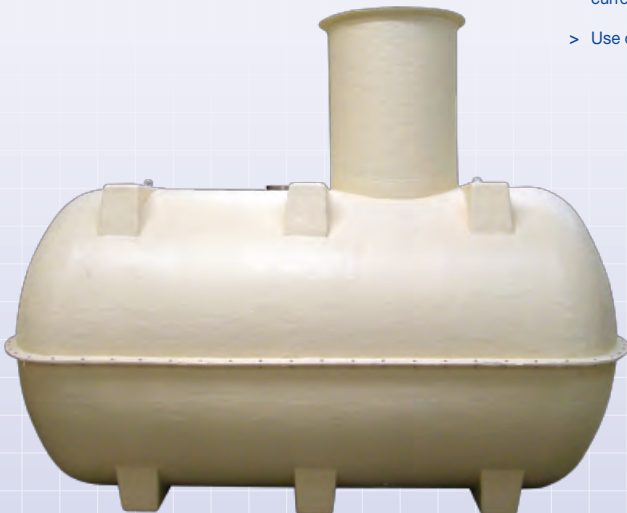
All dimensions in mm

➤ CESSPOOLS

FOR BASIC STORAGE AND DISPOSAL OF OFF-MAINS WASTEWATER

A cesspool is a covered, watertight tank used for storing sewage. It has no outlet and relies on road transport for the removal of raw sewage. No treatment is involved.

- > For domestic applications cesspools should have a capacity below the level of the invert of at least 18,000ltrs for two users, and should be increased by 6800ltrs for each additional user. Cesspools for commercial premises have no such restrictions
- > Installation of a high level alarm is recommended to indicate when it is nearly full
- > Whoever empties your cesspool (or septic/PSTP) should be a registered Waste Carrier and hold a current discharge licence from the local water authority
- > Use of cesspool is not permitted in Scotland



CESSPOOL SPECIFICATIONS

Model	Length	Width	Height	Inlet	
				Invert	Ø
AT2800	3000	1250	1750	500	110
AT3800	4000	1250	1750	500	110
AT4500	2650	1600	2100	500	110
AT6000	2950	1900	2400	500	160
AT8000	3640	1900	2400	500	160
AT10000	4200	1900	2400	500	160
AT12000	5200	1900	2400	500	160
AT14000	5840	1900	2400	500	160
AT16000	6700	1900	2400	500	160
AT18000	7500	1900	2400	500	160
AT20000	8100	1900	2400	500	160

All dimensions in mm



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