

INSTALLATION, OPERATING & MAINTENANCE GUIDELINES FOR WASH DOWN & SILT SEPARATORS



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HEALTH & 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 these guidelines.

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

Electrical work should be carried out by a qualified electrician.

Contaminated surface water can contain substances 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.

Access covers should be selected with reference to the location of the unit and traffic loads to be accommodated. These are not (normally) part of the Separator supply.

When covers are removed precautions must be taken against personnel falling into the unit.

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

Ensure that you are familiar with the safe working areas and accesses. Ensure that the working area is adequately lit.

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.

CONTENTS

	Page
Health & Safety.....	1
1. Introduction	2
2. Handling & Storage	2
3. Site Planning	3
4. Installation - General	3
Concrete Specification	4
5. Separator Installation	5
6. Operation	6
7. Maintenance.....	6
8. Emergencies	6

Appendices

Separator Maintenance Log

1.0 Introduction

These Guidelines represent Best Practice for the installation of the above Klargester Separator Units. Many years of specialist experience has led to the successful installation of thousands of separator units. It must be noted, however, that these Guidelines are necessarily of a general nature. It is the responsibility of others to verify that they are appropriate for the specific ground conditions and in-service loads of each installation. Similarly, any information or advice given by employees or agents of Klargester regarding the design of an installation must be verified by a qualified specialist (e.g. Civil engineering consultant).

For guidance of Separator selection and application, please refer to the most recent issue of Environment Agency Guidelines pollution prevention guidelines No. 3 (PPG3).and En 858 A range of our units has been independently tested by the British Standard Institute and certified as meeting the PPG3 guidelines

2.0 Handling & Storage

- 2.1. Care must be taken to ensure that units are not damaged during delivery and handling on site. Please take care and place unit so that it cannot fall and become damaged
- 2.2. The design requirements of Klargester products will frequently mean that the centre of gravity of the unit is "offset". Care must therefore be taken to ensure that the unit is stable when lifting. Rainwater may also collect inside units, particularly if they have been stored on site prior to installation, adding weight and increasing instability. Check units before lifting and pump out any excess water.
- 2.3. When lifting units, use webbing slings of a suitable specification. Do not use chains.
- 2.4. A suitable spreader bar should be used to ensure that units are stable and that loads are evenly distributed during lifting. When lifting separators, a spreader bar should be used where the slings would otherwise be at an angle > 30 degrees to the vertical.
- 2.5. Lifting equipment should be selected by taking into account the unit weight, length and the distance of lift required on site.
- 2.6. Klargester Environmental Limited accept no responsibility for the selection of lifting equipment.
- 2.7. Whenever Klargester units are stored or moved on site, ensure that the storage location is free of rock, debris and any sharp objects which may damage the unit. The units must be placed on ground which is flat and level and the unit orientated onto its side with even support. Do not roll separators.

3.0 Site Planning

The following points should be considered before installation of the equipment:

- 3.1. The discharge must have the consent of the relevant Environmental Regulator.
- 3.2. The installation should have Planning and Building Control approval.
- 3.3. Consider installing flow cut-off valves to isolate the separator in an emergency or during site cleaning operations. See Environment Agency Guidelines PPG3.
- 3.4. Consider installation of a sampling point downstream of the separator. There is no suitable facility to effectively sample the waste water from inside the unit. EN 858 Pt 1.
- 3.5. Uncontaminated run off such as roof water should be excluded from separators. (EA Guidelines PPG3.)
- 3.6. Ground conditions and water table level should be assessed. If the water table will be above the base of the units at any time of the year, adequate concrete backfill must be provided to avoid flotation. In poorly draining ground, consideration should also be given to the likelihood of flotation due to surface water collecting in the backfill, and an appropriate installation method devised to avoid this.
- 3.7. The separator must be installed at a level which will allow connection to the incoming drain and a free discharge at the system outlet. The water table must be below the discharge outlet.
- 3.8. Do not install the unit deeper than necessary, ensure that you purchase extension shafts and handles. The minimum invert depth of the unit is shown on the customer drawing.
- 3.9. Adequate access must be provided for routine maintenance. Vehicles should not be permitted within a distance equal to the depth of the unit, unless suitable structural protection is provided to the installation.
- 3.10. There must be at least 1 metre of clear, level ground all around the access covers to allow for routine maintenance.
- 3.11. It is essential that a mains water supply is accessible for routine cleansing and refilling after removal of waste material and liquid.

4.0 Installation – General

- 4.1. When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipework should be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.
- 4.2. For separators with burial depths greater than 1000mm from cover level to the top of the unit, specific site conditions should be taken into consideration and the backfill designed to bear any loads which may be applied during and after installation to prevent the tank being subjected to these loads.
- 4.3. The excavation must be deep enough to provide bedding and cover depth as determined by the type of surface pavement and loading. Asphalt and concrete pads should extend a minimum of 300mm horizontally beyond the unit in all directions.
- 4.4. In situations where the excavation will not maintain a vertical wall, it will be necessary to shore up the side walls of the excavation with suitable trench sheets and bracing systems to maintain a vertical wall from the bottom to the top of the excavation. DO NOT completely remove the shoring system until the backfilling is complete, but before the concrete fully hardens.
- 4.5. In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation should be dewatered using suitable pumping equipment and this should continue until the installation is complete.
- 4.6. During installation care must be taken to ensure that the body of the unit is uniformly supported so that point loads through the unit are avoided.
- 4.7. Concrete Specification SK296 is a *general* specification. It is not a site specific installation design.

**CONCRETE SPECIFICATION SK296
IN ACCORDANCE WITH BS 5328 PARTS 1,2,3 AND 4**

TYPE OF MIX		DESIGN
PERMITTED TYPE OF CEMENT		BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE (coarse & fine)		BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE		20 mm
GRADES: GRADES: C30 (30 N/mm ²)		REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS
C30 (30 N/mm ²)		REINFORCED (EG. FOR HIGH WATER TABLE)
C20 (20 N/mm ²)		UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT	C30 C20	270 - 280 Kg/M ³ 220 - 230 Kg/M ³
SLUMP (NOT IN ACCORDANCE WITH BS 5328)		25mm
RATE OF SAMPLING		READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS 5328 PART 3

**NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATES
OR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER**

5.0 Separator Installation

- 5.9. Excavate a hole of sufficient length and width to accommodate the tank and a minimum 225mm concrete surround and to a depth which allows for the burial depth of the unit plus concrete base slab and haunch.
- 5.2. Construct a suitable concrete base slab appropriate to site conditions. Ensure that the slab is flat and level.
- 5.3. When the concrete base slab has set enough to support the installed load, add a concrete haunch so as to provide even support under the unit, then lower the unit onto the haunch using suitable webbing slings and lifting equipment.
- 5.4. **Pour no more than 300 mm depth of clean water into the unit, avoiding shock loads. For units with more than one chamber, add water to each chamber simultaneously. DO NOT OVERFILL, the unit is not designed to hold water whilst unsupported.**
- 5.5. **Place concrete backfill to approximately 300mm depth under and to the sides of the tank ensuring good compaction to remove voids. DO NOT use vibrating pokers. Continue adding concrete backfill, simultaneously keeping the internal water level no more than 200 mm above the backfill level at all times, until the backfill is just below the underside of the outlet drain, giving sufficient room to connect the inlet and outlet pipework.**
- 5.6. Connect inlet and outlet drains and vent pipes when safe access to the backfill can be gained.

PIPEWORK CONNECTIONS

In all cases, ensure that the outlet pipework level is maintained for correct operation. (Unless specified on the order, the fall across the unit will be as per the customer drawings).

Small units are generally fitted with **PVCu spigots** to both the outlet and the inlet.

Connect using the same size PVCu socket or a suitable reducer.

Larger units are generally fitted with **Klargester GRP** manufactured sockets.

The connecting pipework should be pushed into the socket and a joint made to fill in the gap using rope/hemp with a cement mortar or bonding mix. Ensure that the seal is secure and watertight before backfilling the pipe.

Alternatively, proprietary **flex seal couplings** can be obtained to fit over the outside of the site pipework and the outside of the GRP socket. When using this connection method, please be aware that the outside GRP laminate is not perfectly regular and that you may need to use a sealant on the outside diameter of the GRP. Take care not to over tighten the coupling when connecting to the GRP and ensure that the seal is secure before backfilling the pipe. Drawing DS0185 provides the ID of our GRP sockets. The OD is variable, as the wall thickness can be up to 15-20 mm. If purchasing a

flexseal coupling for use with clay /concrete, we suggest that a size 110 mm larger than the ID is selected.

- 5.7. Continue backfilling with concrete over the tank body to the required level. Build up a shell of concrete, minimum 225mm thick, around the access shaft(s). Temporarily strut the access shaft to avoid distortion.
- 5.8. It is advisable to seal the joints on the extension shafts (particularly on sites with high ground water) with proprietary sealant or by GRP lamination. Temporarily strut the extension neck(s) to avoid distortion during back filling. Where more than one neck section is required to suit a deep invert, consider back-filling section by section. If the extension neck is too long, it can be trimmed using a fine-toothed saw. The original fixing hole bolting the coalsecer in place to the neck should be sealed.
- 5.9. Ensure that the vent socket if cut out, is replaced elsewhere. The maximum recommended inlet invert is 2000mm (using 500mm long extension sections). If you are installing a unit deeper than this then you must make your own arrangements for removing and replacing the coalescer. Consideration must be given to the depth of lift involved.
- 5.10. Continue back-filling, ensuring minimum 225mm concrete thickness around the access shaft/ extension neck and alarm access tube (as applicable).
- 5.11. In traffic areas a suitable top slab must be constructed. The top slab should bear on a suitable foundation to prevent superimposed loads being transmitted to the unit and access shafts. Loads applied to covers and frames must bear on the top slab, not the access shaft.
- 5.12. The unit should be filled with clean water up to the invert level of the outlet pipe. Ensure the unit identification is placed/ marked inside the neck for future information. The unit is now ready for use.

Unit	Total Capacity (Litres)	Max. Recommended Silt Volume
W1/012	1200	600
W1/020	2000	1000
W1/030	3000	1500
W1/040	4000	2000
W1/060	6000	3000
W1/080	8000	4000
W1/100	10000	5000
W1/120	12000	6000
W1/150	15000	7500
W1/190	19000	9500

The units above all include a single chamber, (W1) but on request, we may be able to provide with 2 or 3 chambers. If you require larger units, these are also available. Please contact us to discuss your specific application

Invert depths (E) can be supplied in additional increments of 500mm from the minimum stated above. Please indicate the inlet drain invert required when specifying units. Maximum 2.0 m.

6.0 Operation

As contaminated water passes through the separation chamber, it is retained long enough to allow immiscible hydrocarbon pollutants, such as oils and petrol to accumulate on the surface of the water and settleable solids to sink to the bottom of the unit. Our design uses a maximum of 6 minutes retention time, at the flow rate given. The separator water is able to discharge safely without the risk of oil pollution to the municipal plant. It is generally accepted that greatest separation efficiency for oil is gained by using a single chamber separator as the pollutants have more time to separate.

The nature of the silt varies depending on either the ground or surface receiving the flow. These aspects should be considered when selecting the size of the unit in relation to the flow being treated. .

7.0 Maintenance

Waste Removal and Servicing

- 7.1 Separators should be inspected at least every six months or more frequently if experience dictates. A log should be maintained detailing any silt removal or cleaning carried out. A specimen maintenance log is included in the appendices.
- 7.2 Every site is different, in respect to the amount and type of silt generated by the drain design and installation. Frequently, the construction programme itself generates large and perhaps unusual quantities of silt and grit. We do recommend that following the initial installation, an inspection of the separator contents be made to check that building rubble has not entered the unit. Further inspections at 3 and 6 months should be made so as to be able to assess the volumes of silt and oil accumulated. The inspection and emptying programme can then be defined following the first 6 months site experience. We recommend leaving a maximum interval between inspections of 6 months.

Waste Removal Procedure – Oil & Silt

- 7.3 Remove the access cover and lower the desludging hose in to the separation chamber.
- 7.4 Lower the desludging hose to the base of the tank and withdraw any grit or sludge that may be present. Do not remove more water than is necessary. Ensure that you access and clean both compartments.

8.0 Emergencies

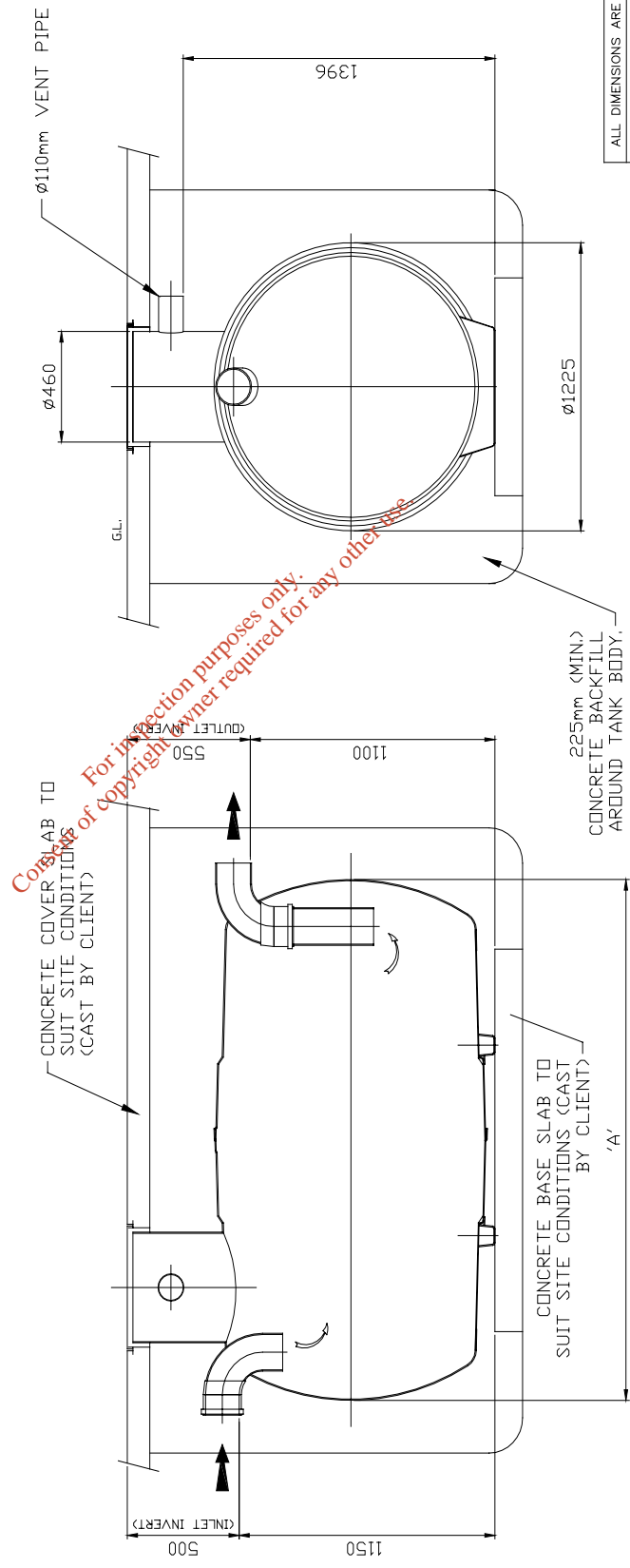
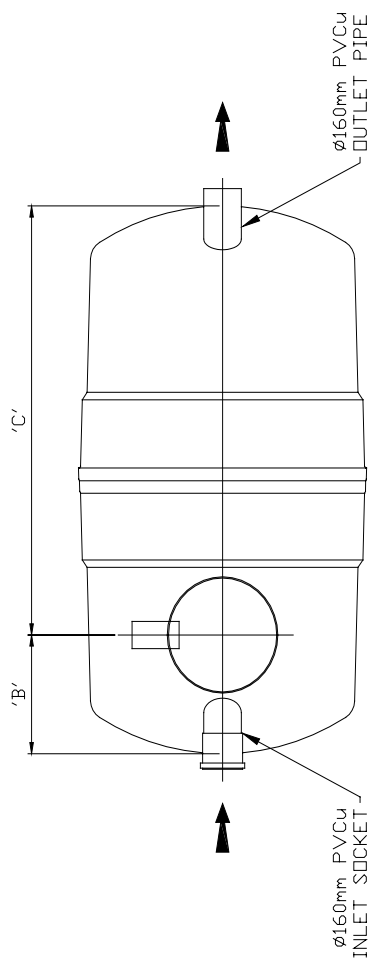
At sites where there is a high risk of spillage, spill kits containing drain seals, absorbent materials, disposal containers and other appropriate equipment should be held. In the event of a spillage on site, the material should be contained, (if a spill kit is not available, sand or soil may be used) and the Environment Agency notified immediately using the appropriate emergency hotline number listed in the Agency Guideline PPG3. Year 2001 - **0800 80 70 60**

Consent of Environment Agency required for other use

NOTES:-

- 1.) UNITS CAN BE SUPPLIED WITH EXTENSION SHAFTS IN 0.5m INCREMENTS.
- 2.) STANDARD INLET / OUTLET PIPES ARE PVCu UNDERGROUND DRAINAGE TO BS4560. FOR OTHER PIPE SIZES AND TYPES AVAILABLE CONSULT KLARGESTER.
- 3.) STANDARD IN-LINE ORIENTATION SHOWN. FOR OTHER ORIENTATIONS SEE DOCUMENT TDS0033.
- 4.) IT IS ESSENTIAL THAT THIS DRAWING IS READ IN CONJUNCTION WITH INSTALLATION INSTRUCTIONS PD0021 (SUPPLIED WITH UNIT). THIS DRAWING SHOULD BE USED FOR DIMENSIONAL INFORMATION ONLY.

UNIT	DIM 'A'	DIM 'B'	DIM 'C'	WORKING CAPACITY.	APPROX. WEIGHT.		CALL ACROSS UNIT
					EMPTY	FULL	
W1/012	1310	655	655	1200 Litres	60 Kg	1260 Kg	50
W1/020	2210	480	1730	2000 Litres	85 Kg	2185 Kg	50
W1/030	3060	480	2580	3000 Litres	115 Kg	3165 Kg	50
W1/040	3910	480	3430	4000 Litres	145 Kg	4145 Kg	50



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1200-4000L
 WASH DOWN & SILT
 SEPARATORS
 W1/012-W1/040

SCALE 1:10 SHEET SIZE A1
 DRAWING No. 800882
 ISSUE 5

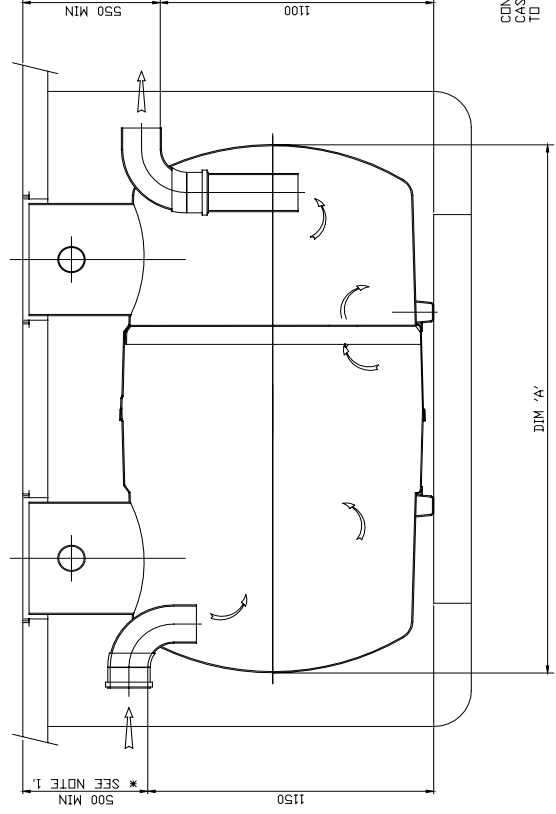
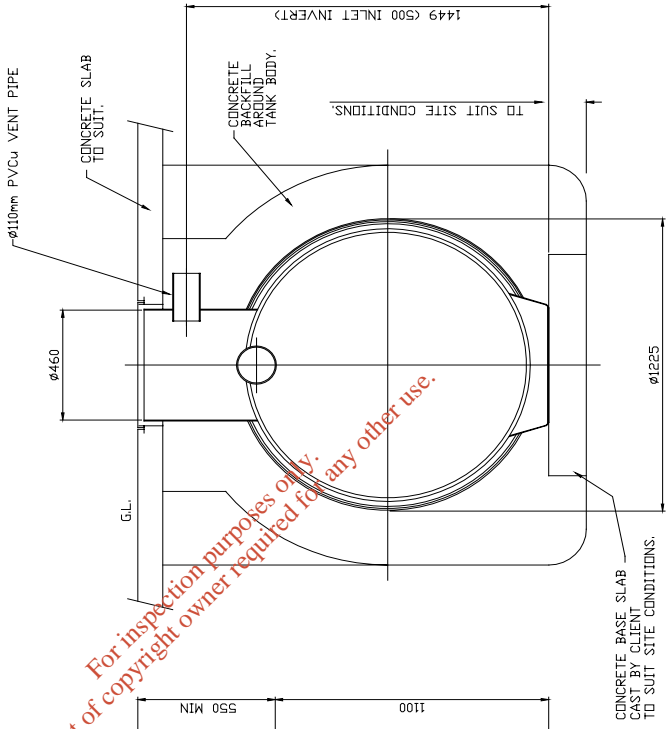
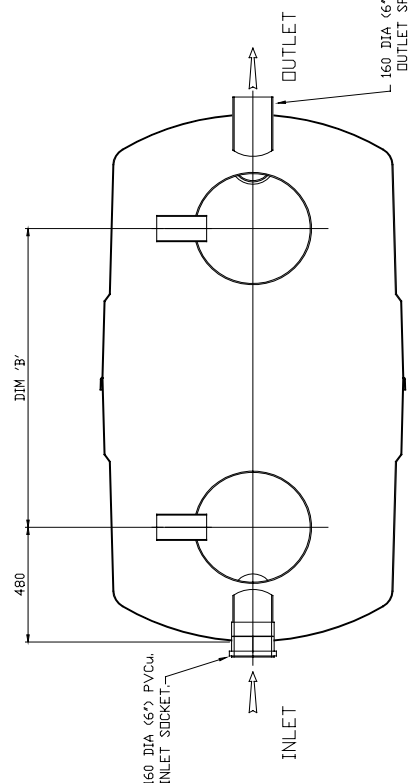
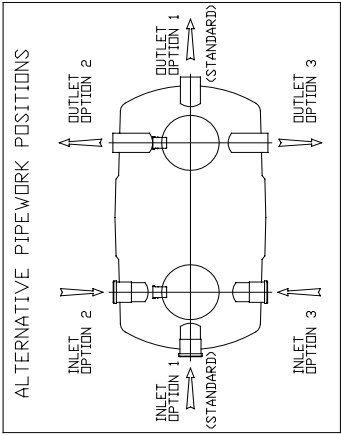
ISSUE	DATE	DRAWN	B.S.	INITIAL ISSUE	MODIFICATION
5	02.10.02	A.L.			DIMENSIONS AMENDED
4	16.09.02	A.L.			FEET AMENDED
3	01.02.02	MRG			AMEND ARTICAL CODES
2	10.1.02	J.A.H.			FEET REMOVED
1	26.1.96	B.S.			INITIAL ISSUE

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NOTES :-

1. UNITS CAN BE PROVIDED WITH EXTENSION SHAFTS IN 0.5Mtr INCREMENTS.
2. STANDARD INLET/OUTLET PIPES ARE PVCu UNDERGROUND DRAINAGE TO BS4660, FOR OTHER PIPE SIZES AND TYPES AVAILABLE CONSULT KLARGESTER.
3. IT IS ESSENTIAL THAT THIS DRAWING IS READ IN CONJUNCTION WITH DATA SHEET PD0021 (SUPPLIED WITH UNIT) GIVING INSTALLATION DETAILS. THIS DRAWING SHOULD BE USED FOR DIMENSIONAL INFORMATION ONLY

UNIT	DIM 'A'	DIM 'B'	WORKING CAPACITY	APPROX WEIGHT		FALLS ACROSS UNIT
				EMPTY	FULL	
V2H020	2210	1250	2000 Litres	100 Kg	2200 Kg	50
V2H030	3060	2100	3000 Litres	130 Kg	3180 Kg	50
V2H040	3910	2950	4000 Litres	160 Kg	4160 Kg	50



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2000-4000L
 WASH DOWN & SILT
 SEPARATORS
 (W2/020-W2/040)

SCALE 1:10 SHEET SIZE A1
 DRAWING No. **800883** ISSUE **5**

ISSUE	DATE	DRAWN	DESCRIPTION
5	02.10.02	A.L.	DIMENSIONS AMENDED
4	16.09.02	A.L.	FEET AMENDED
3	28.01.02	MRG	AMEND ARTICAL CODES
2	29.10.01	A.L.	FOOTPADS / BORDER / DIMENSIONS / NOTES. UPDATE
1	26.01.96	B.S.	INITIAL ISSUE

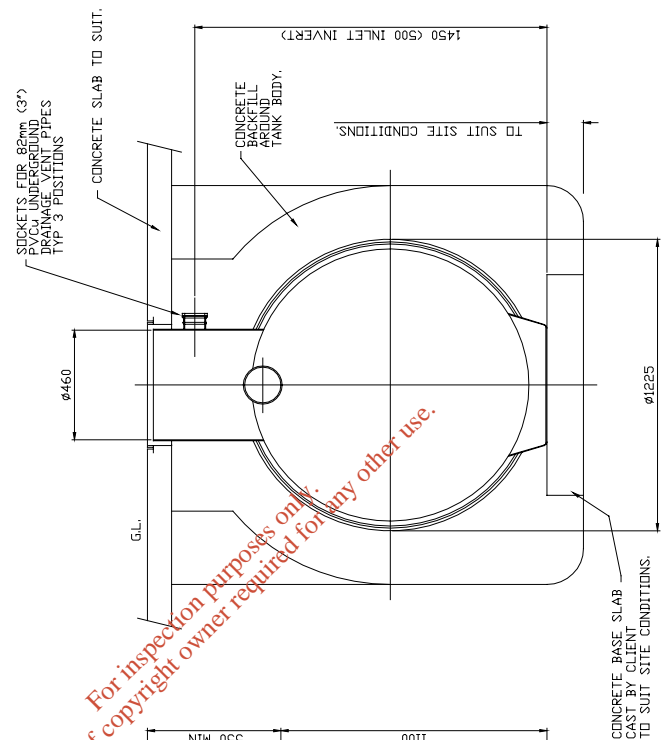
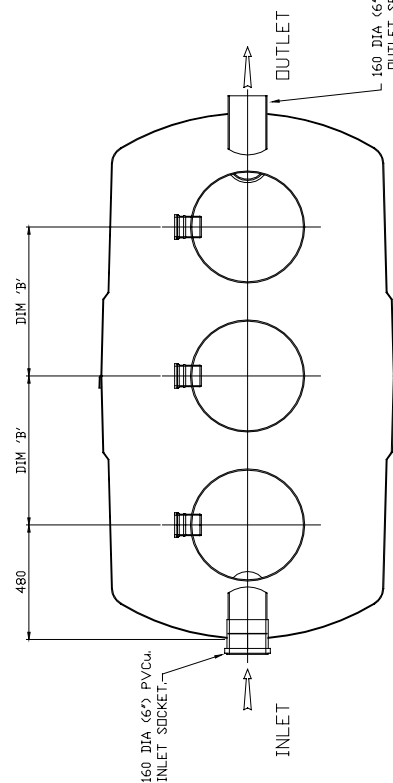
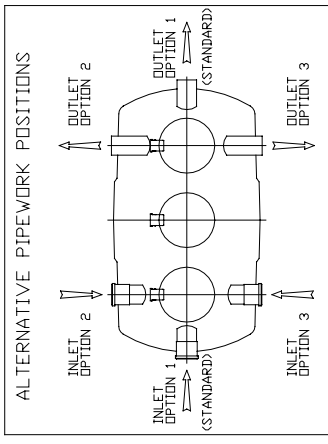
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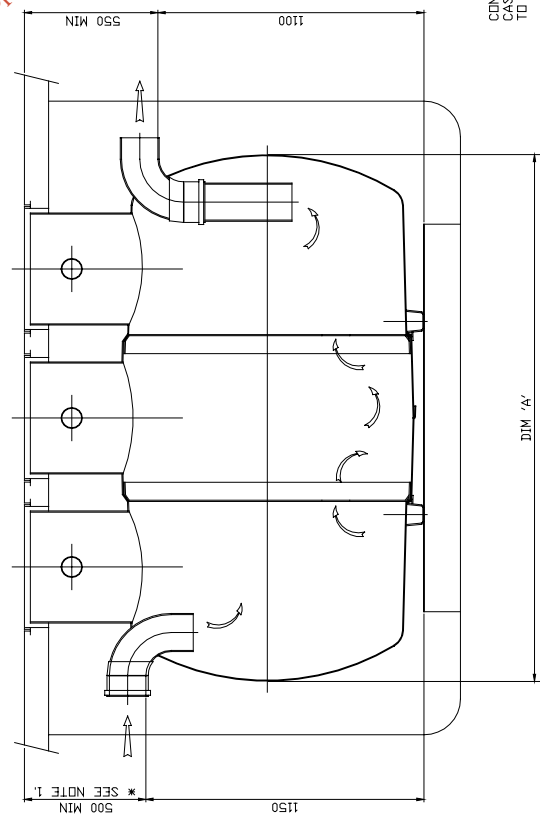
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UNIT	DIM 'A'	DIM 'B'	WORKING CAPACITY	APPROX. WEIGHT.		FALL ACROSS UNIT
				EMPTY	FULL	
W3/020	2210	625	2000 Litres	120 Kg	2220 Kg	50
W3/030	3060	1050	3000 Litres	150 Kg	3200 Kg	50
W3/040	3910	1475	4000 Litres	180 Kg	4180 Kg	50



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TITLE
WASH DOWN & SILT SEPARATORS
(W3/020-W3/040)
SALES DRAWING

SCALE 1:10 SHEET SIZE A1
DRAWING NO. 800884
ISSUE 5

ISSUE	DATE	DRAWN	BY	DESCRIPTION
1	26.01.96	B.S.		INITIAL ISSUE
2	29.10.01	A.L.		FOOTPAUS / DIMENSIONS / BORDER / NOTES. UPDATE
3	01.02.02	MRG		AMEND ARTICAL CODES
4	16.09.02	A.L.		FEET AMENDED
5	02.10.02	A.L.		DIMENSIONS AMENDED

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