



English

Installation, Operation and Maintenance Instructions

EMS 1-80 Mono Sense
Pressure Sewer Systems

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Warranty

Warranty Statement

1. Pressure Sewage Systems manufactured by Mono Pumps are covered by warranty for a period not exceeding twelve months from purchase.
2. Mono Pumps will make good by repair, or at Mono's option, the replacement of faulty parts under warranty, providing always that:
 - (a) The equipment was correctly installed and properly used in accordance with Mono Pumps Installation, Operating & Maintenance Instruction and accepted codes of good engineering practice.
 - (b) The claim for goods under warranty arises solely from faulty design, material or workmanship.
 - (c) The repair is carried out in the Mono factory or by an authorised agent or distributor appointed by Mono Pumps.
 - (d) All freight costs to and from the factory or repair agent are to be paid by the purchaser.
3. In the case of equipment or components which are not of Mono manufacture, but supplied by them, the warranty is limited to that extended by the suppliers or manufacturers of such equipment.
4. Mono Pumps warranty does not cover any of the following:
 - (a) Claims for third party liability of damage caused by failure of any of the company's products.
 - (b) Damage caused by abnormal operating conditions, war, violence, storm cataclysm or any other force.
 - (c) Damage caused by the equipment being used for an application for which it is not recommended.
 - (d) Damage caused by sand or abrasive materials, corrosion due to salt water or electrolytic action.
5. The decision of Mono Pumps in relation to any claims or disputes over warranty is final.
6. The warranty is in lieu of all other warranties and conditions expressed or implied, written or oral, statutory or otherwise, which are hereby negated and excluded.

7. This express warranty does not exclude any conditions or warranty implied by the Trade Practices Act 1974 or separate State laws and in addition to any other right, that the original purchasers or any subsequent purchaser may have at law.

In case of claim please contact your Authorised Mono Dealer or contact Mono Pumps (Australia) Pty Ltd.

Introduction

Introduction

This manual will provide the user with essential information on the installation, operation and maintenance of the Mono Pressure Sewer System - PSS EMS 1-80.

It is important that the instructions and recommendations presented in this manual are followed during the installation, operation and maintenance of this system.

Throughout the manual there are various safety signs associated with certain tasks. These safety signs are to be used as a guide only and should never be used in place of a job safety risk assessment.

Intended Use

The PSS EMS 1-80 is designed to transport domestic sewage from the point of generation to a sewerage treatment plant, gravity carrier or larger pump station and rising main.

The PSS EMS 1-80 system is designed to handle domestic sewage only. It is not designed to handle commercial or industrial sewage applications. For these types of applications please consult Mono Pumps (Australia) Pty Ltd.

For each property, sewage created in the household flows by gravity into the PSS EMS 1-80 tank. When the level rises to a set point, the pump is automatically started. The self priming pump draws the sewerage into an integral macerator turning the solids into a slurry of small particles. This allows the sewage to be then discharged through small bore pipe (32 NB to 125 NB) into the pressurised reticulation network.

As the sewage is transported under pressure by the positive displacement pump and not by gravity, the PSS Eco 1-80 can be installed in various topography such as :

- Mountainous or hilly land.
- Flat land.
- Clay, rocky soil or areas of shallow top soil.
- Areas of significant environmental sensitivity.
- Built up areas.
- Areas of low population density.

The PSS EMS 1-80 system comprises of:

- 900, 1100 or 2200 litre tank with lid.
- Pump with inbuilt macerator.
- PSS Eco 1-80 controller.
- All internal tank pipework.
- Level transducer.
- Check valve and ball valve on pump's discharge.
- 20m of 240V electrical cable.

Basic Tools Required For Installation

- 121mm hole saw.
- Drill to suit hole saw.
- 13 and 15mm spanner.
- 6mm allen key.
- Pipe wrench to suit 85mm diameter barrel union.

Warnings



This pump is not to be operated in environments containing flammable or explosive substances.



All electrical connections must be carried out by a qualified electrician in accordance with local regulatory requirements.



All plumbing connections must be carried out by a qualified plumber in accordance with local regulatory requirements.



Never place hands into the inlet whilst pump is running as there are rotating cutters. Ensure the pump is fully isolated prior to any maintenance.



Duty, maximum pressure and flow must be taken into account when setting up pumping system.



The G80 pump is not designed to be operated partially or fully submerged. Ensure the dry well is kept free of water during installation, operation and maintenance.



The pump weighs 35kg. An assisted lift or multi person lift must be used when moving pump.



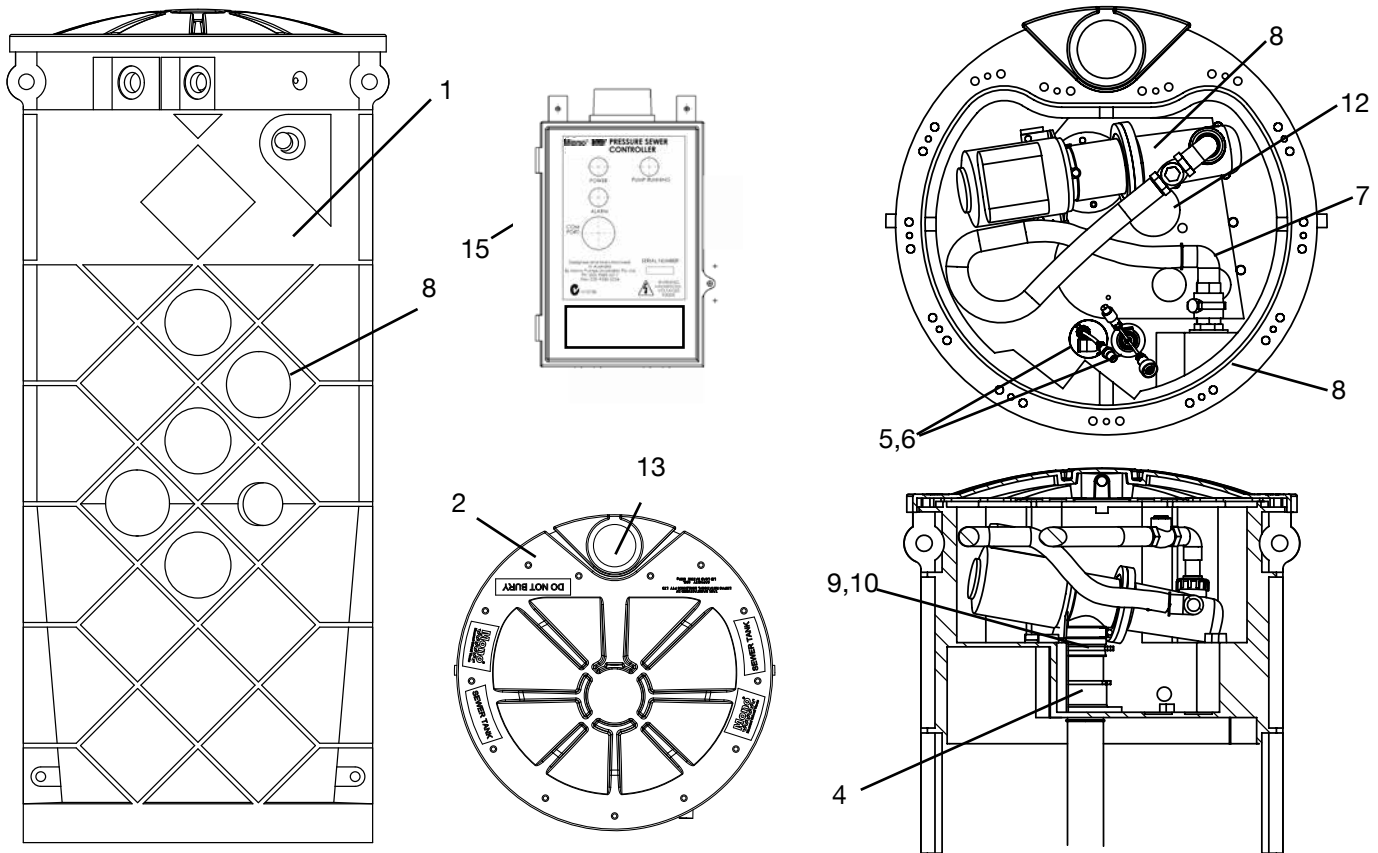
High surface temperature for pump motor. Motor may reach temperatures 80 deg C above ambient temperature.



Do not drop, roll or lay the tank on its side, as this will damage the unit.

Specifications

System Specification



ITEM	DESCRIPTION	QTY	PART NUMBER
1	Tank	1	CM9025XA (900L) CM9050XA (1200L)
2	Tank Lid	1	CM9045GC
3	Pump For PSS-EMS180	1	CG801R81PB
3	Pump For PSS-EMS180-RTRV	1	CG801R81PB/R
4	Pump Sliding Inlet Assembly	1	GRIF 310
5	Redundant Alarm Level Sensing Assembly	1	GRIF 288
6	Mono-Sense Level Sense	1	GRIF 250
7	Flexible Discharge Pump Assembly	1	GRIF 301
8	DWV Grommet Seal	1	AUX 6234
9	Pump Connection Hose Clamps	1	GRIF 218
10	Pump Connection Sleeve	1	GRIF 072
11	Electrical Connections (Not Shown) For PSS-EMS180	1	GRIF 287
11	Electrical Connections (Not Shown) For PSS-EMS180-RTRV	1	GRIF 116
12	2" Drain Plug	1	GRIF 053
13	110mm Inspection Port	1	GRIF 104
14	Lid Gasket	1	GRIF 140
15	Pressure Sewer Controller	1	PSS-CH1MS2

Specifications

G80 Pump Specification

Inlet:	3" Cast Iron Spigot to Suit Nitrile Sleeve
Outlet:	1 1/4" BSP Internal Thread
Weight:	35 Kg

Materials

Pump Body:	Cast iron
Stator and O Rings:	Nitrile rubber
Screws, Nuts & Washers:	316 stainless steel
Motor Shaft:	316 stainless steel
Cutters:	Hardened tool steel
Oil (in oil bath):	Shell Tellus Oil 100 anti wear hydraulic and circulating oil. Volume 130 mls
Gasket:	Aramid fibre and nitrile rubber binder

Environmental

Storage Temperature:	-10 to 60 deg C
Operating Temperature:	-5 to 40 deg C
IP Rating:	IP55
Humidity:	100% Max

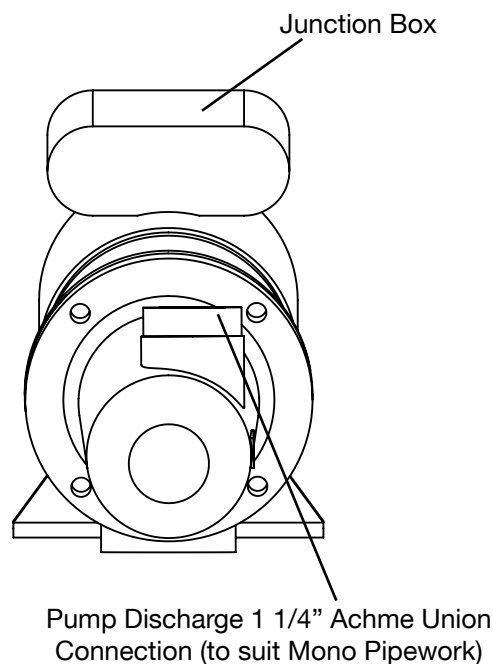
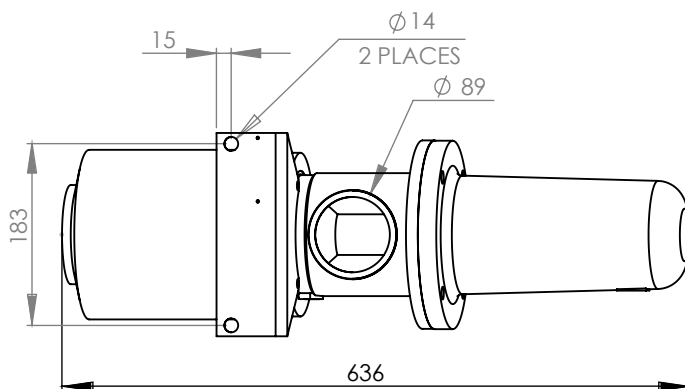
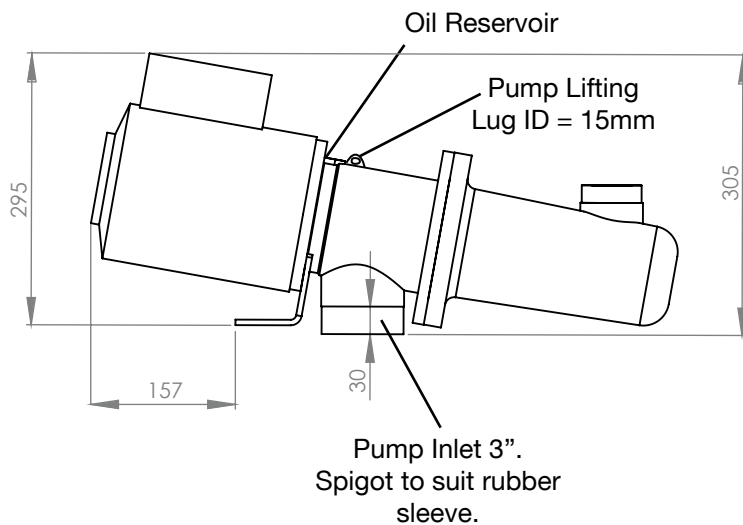
Electrical Characteristics

Max. Operating Voltage:	240 V +/- 5%, 50 Hz
Motor Duty:	Short time duty S2-30 minutes.
Max. Starts per hour:	10
Locked Rotor Current:	31.3 Amps
Full load Current:	7.5 Amps
Motor Power:	0.93 kW
Thermal Overload:	Automatic reset

Water Quality

Water Temperature:	10 - 30 deg C.
pH range:	6 - 10

G80 Pump Dimensions

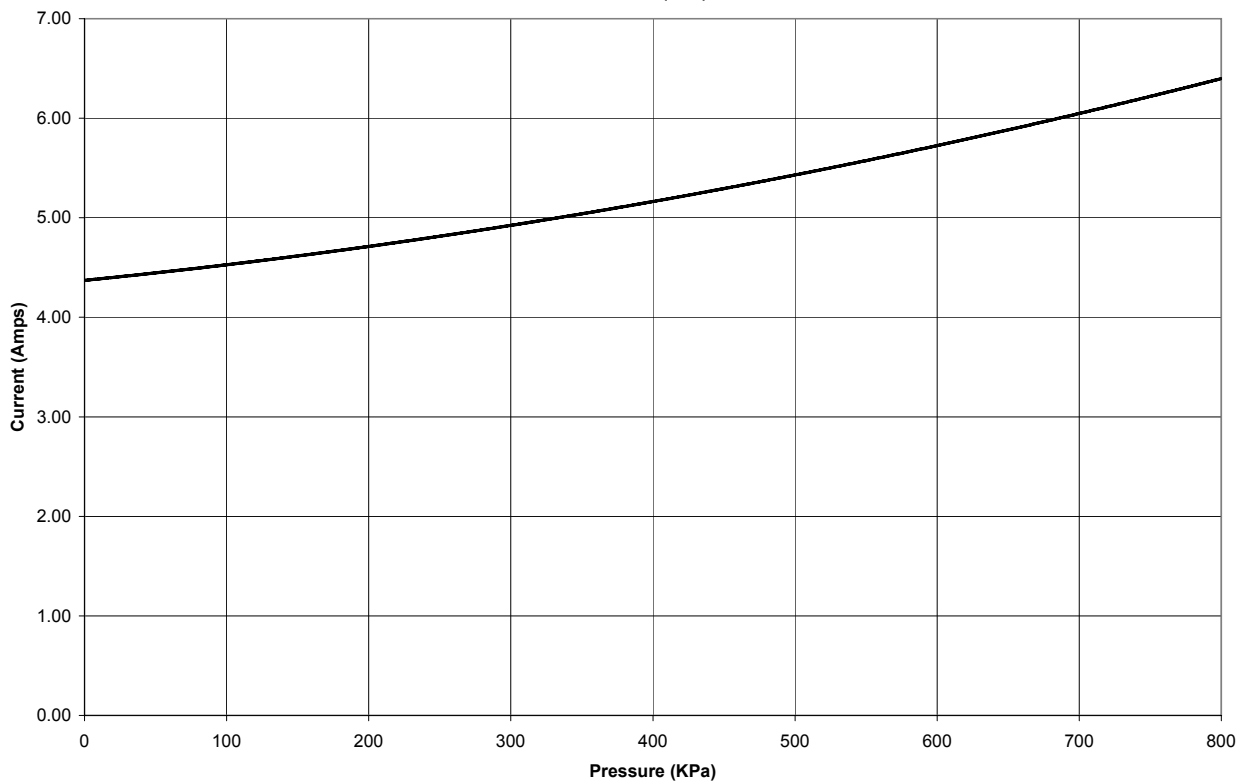
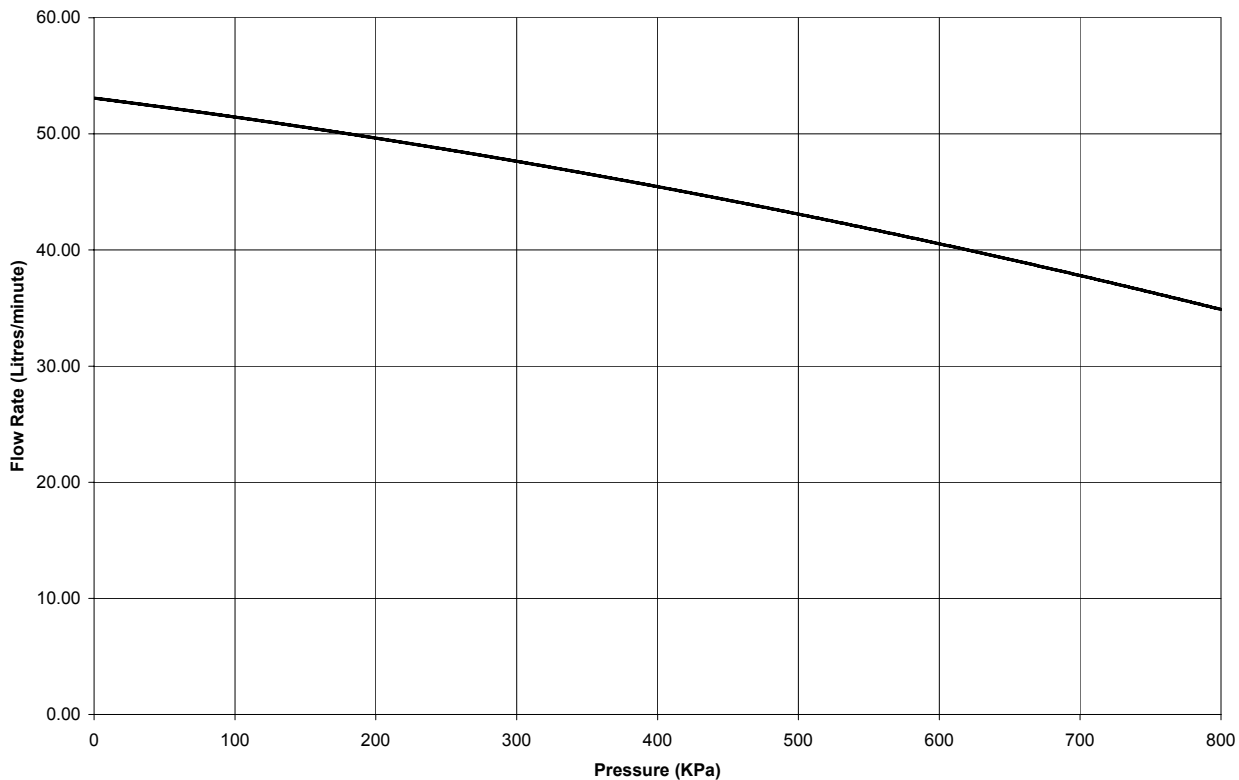


Specifications

Pump Performance

Maximum Suction Lift: 2 metres with 80mm diameter suction pipe.

The chart below indicates the performance characteristics of the pump.



Specifications

Pressure Sewer Controller Specification

Electrical

Controller Input Voltage:	240 +/-10 VAC
Max Current (Run) :	8 Amps
Max Current (Motor Start) :	20 Amps (Peak)
Circuit Breaker:	15 Amps
Control Circuit Fuse:	0.5 Amps

Outputs

Motor:	1.0 kW Max
	240 VAC
	Overcurrent Protection:9 Amps
Level Probes:	RS 232 (Standard Signal)
	Isolated 5 VDC

Com Connector

- RS232
- 9600 baud
- rts/cts

Environmental

Storage Temperature:	-10 to 60 deg C
Operating Temperature:	-10 to 50 deg C
IP Rating:	IP66
Humidity:	95% Max.

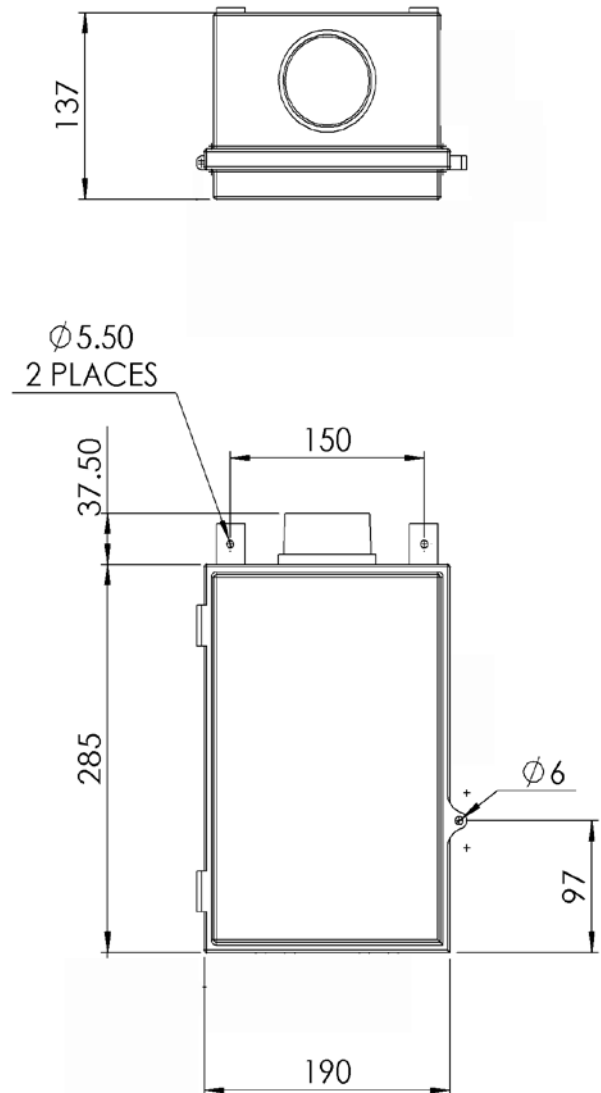
Dimensions & Weight

Dimensions (Carton):	390 x 275 x 290mm
Weight (in Carton):	3 Kg

Default Protection Settings

Pump Motor Current Trip (Over Pressure)	9 Amps
Pump Reset Time From Trip	5 minutes
Number of Current Trips Per Hour Till Alarm	10
Audible Alarm Run Time	5 minutes
Level Sensing Delay Time	2 seconds
Maximum Continuous Pump Run Time	15 minutes
Maximum Pump Starts Per Hour	10
Pump Cool Down Time	50 minutes

Dimensions of Pressure Sewer Controller



Specifications

PSS Tank Specification - 900 litre tank

Part Number: PSS-EMS180

Materials

Tank and Lid:	LDPE	
Gasket:	Nitrile	
Pump Inlet:	PVC, Nitrile	
Pump Discharge:	Check Valve:	Stainless Steel Swing Type
	Pipe Work	Reinforced Rubber hose

Approvals

Tank tested to AS/NZS AS1546.1 -2008

Under Licence: 20051 Viscount Rotational Moulding

Weight

Tank 900 Litre only:	120 Kg
Lid only:	8 Kg
Tank 900 Litre fully assembled:	175 Kg

Capacities - 900 Litre Tank

Maximum:	900 Litres
Low Level:	50 Litres
High Level:	170 Litres
Alarm Level:	330 Litres
Emergency Capacity	570 Litres

Environmental

Storage Temperature:	-10 to 60 deg C
Operating Temperature:	-10 to 50 deg C

Lid Loading

Maximum Loading: 500 Kg

Tank Discharge

1 1/4" BSP Male Thread

Tank Inlet

100mm inlet to be drilled on site using a 121mm holesaw to suit either:

- 100mm DWV Grommet Seal or
- 110mm Spigot

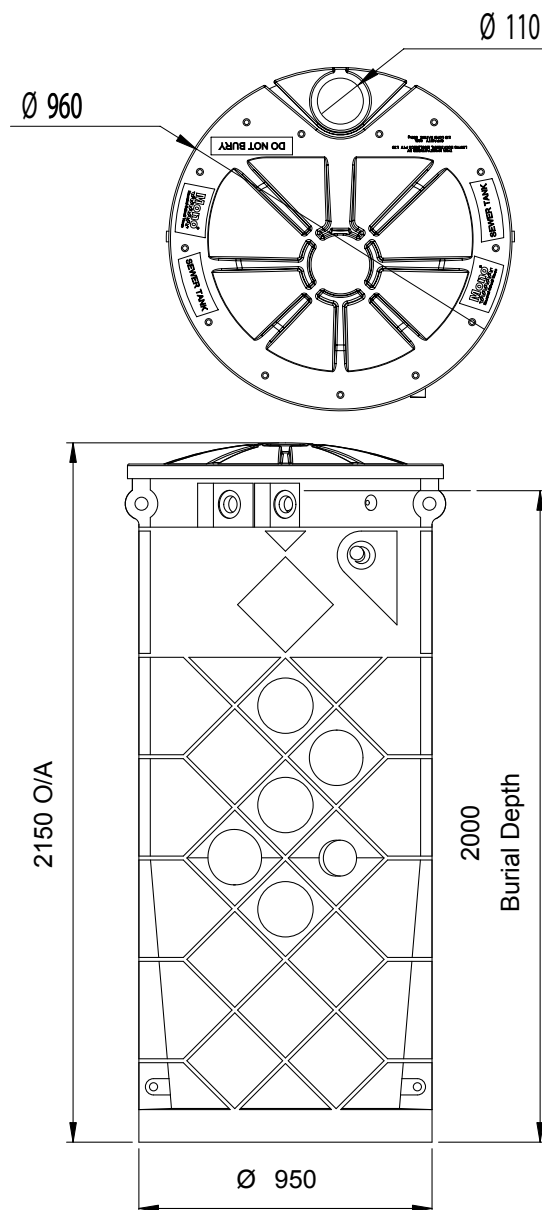
Noise Levels

55 dBA (Fast) @ 1 metre

Measured during operation of pump.

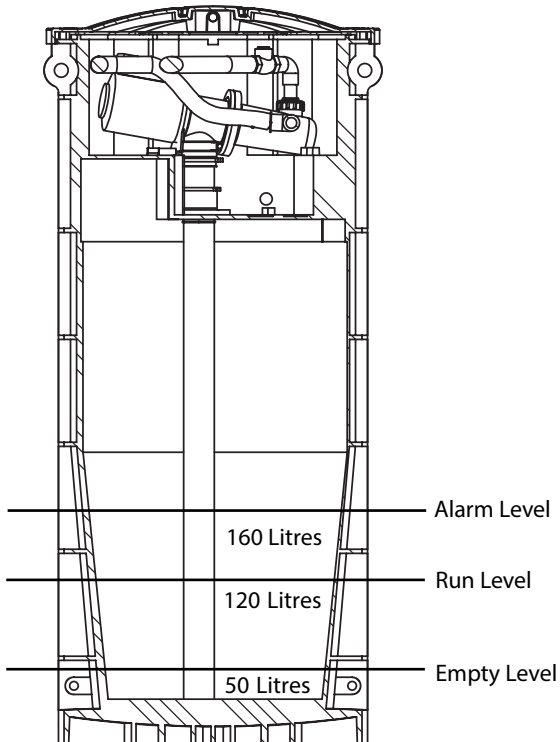
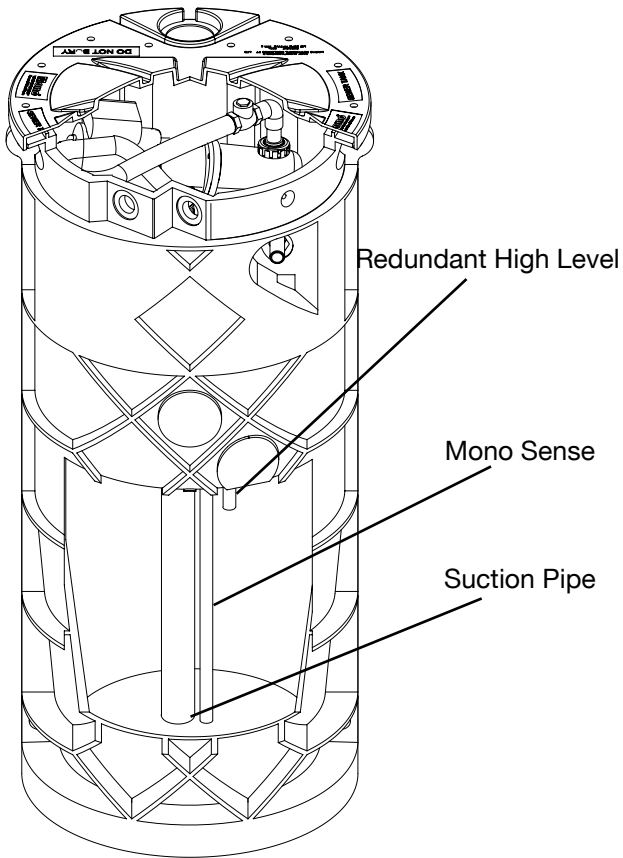
Measurement taken 1 metre directly above tank lid.

Dimensions of 900 Litre Tank (millimetres)

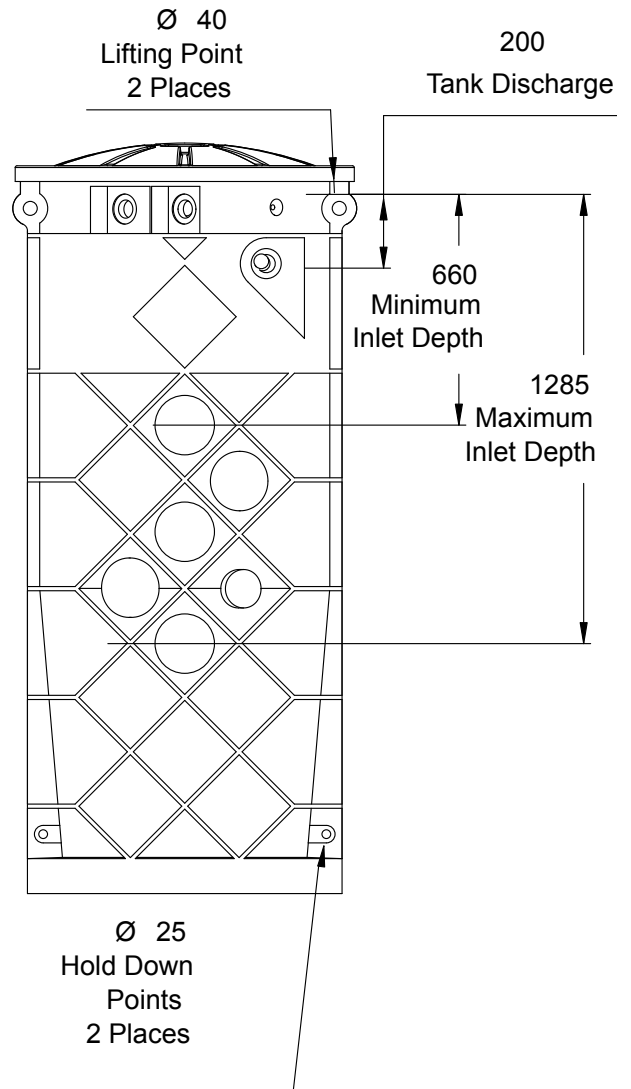


Specifications

Levels Within 900L Tank



Pipe Connection and Lifting Points on 900L Tank



Specifications

PSS Tank Specification - 2200 litre tank

Part Number: PSS-EMS180B

Materials

Tank and Lid:	LDPE	
Gasket:	Nitrile	
Pump Inlet:	PVC, Nitrile	
Pump Discharge:	Check Valve:	Stainless Steel Swing Type
	Ball Valve:	Stainless Steel
	Pipe work:	Reinforced Rubber hose

Approvals

Tank tested to AS/NZS 1546.1 -2008

Under Licence: 20051 Viscount Rotational Moulding

Weight

Tank 2200 Litre only:	285 Kg
Lid only:	8 Kg
Tank 900 Litre fully assembled:	348 Kg

Capacities - 2200 Litre Tank

Maximum:	2200 Litres
Low Level:	90 Litres
High Level:	440 Litres
Alarm Level:	820 Litres
Emergency Capacity	1380 Litres

Environmental

Storage Temperature:	-10 to 60 deg C
Operating Temperature:	-10 to 50 deg C

Lid Loading

Maximum Loading: 500 Kg

Tank Discharge

1 1/4" BSP Male Thread

Tank Inlet

100mm inlet to be drilled on site using a 121mm holesaw to suit either:

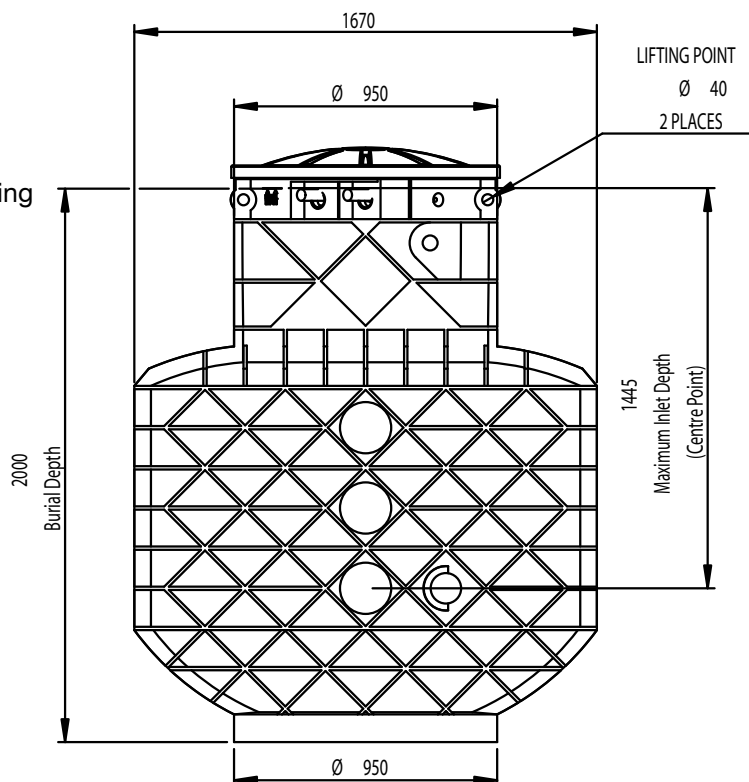
- 100mm DWV Grommet Seal or
- 110mm Spigot

Noise Levels

55 dBA (Fast) @ 1 metre

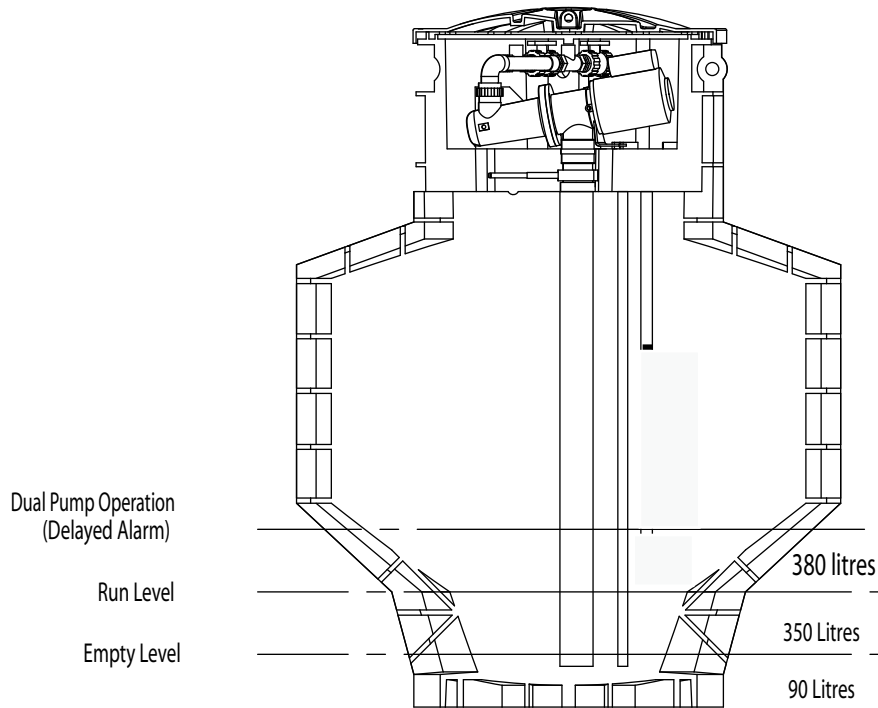
Measured during operation of pump.

Measurement taken 1 metre directly above tank lid.

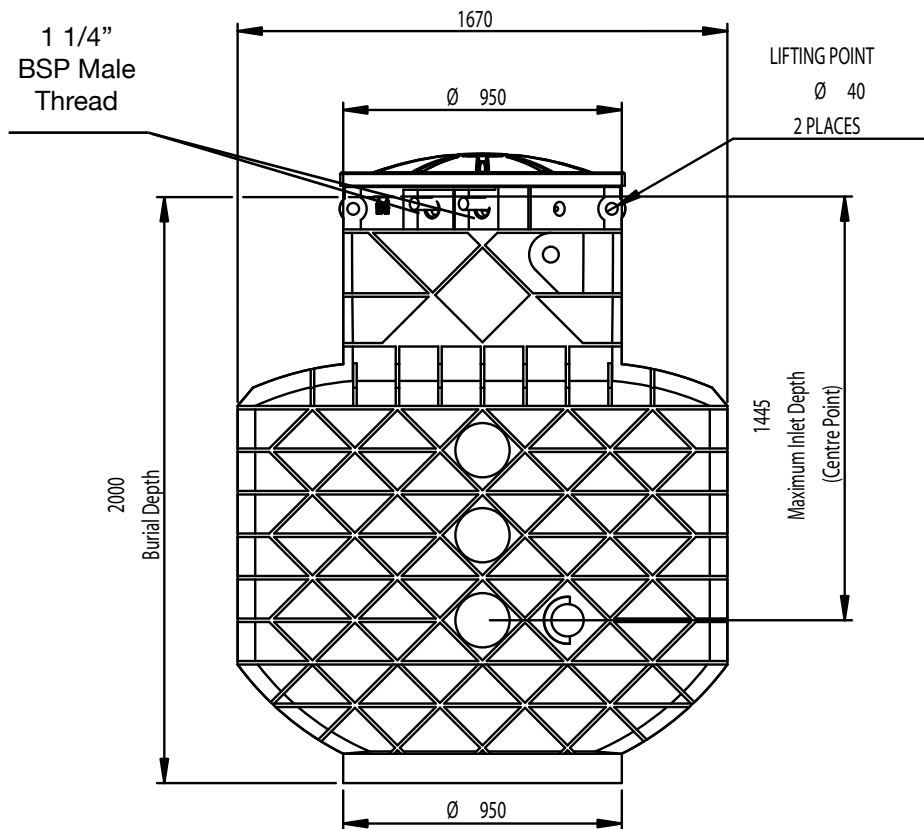


Specifications

Levels Within 2200L Tank



Pipe Connection and Lifting Points on 2200L Tank



Specifications

PSS Tank Specification - 2200 litre tank

Part Number: PSS-EMS180C

Materials

Tank and Lid:	LDPE	
Gasket:	Nitrile	
Pump Inlet:	PVC, Nitrile	
Pump Discharge:	Check Valve:	Stainless Steel Swing Type
	Ball Valve:	Stainless Steel
	Pipe work:	Reinforced Rubber hose

Approvals

Tank tested to AS/NZS 1546.1:2008
Under Licence: 20051 Linpac Rotational Moulding

Weight

Tank 1100 Litre fully assembled:	225 Kg
Lid only:	8 Kg

Capacities - 2200 Litre Tank

Maximum:	1100 Litres
Low Level:	50 Litres
High Level:	170 Litres
Alarm Level:	305 Litres
Emergency Capacity	795 Litres

Environmental

Storage Temperature:	-10 to 60 deg C
Operating Temperature:	-10 to 50 deg C

Lid Loading

Maximum Loading: 500 Kg

Tank Discharge

1 1/4" BSP Male Thread

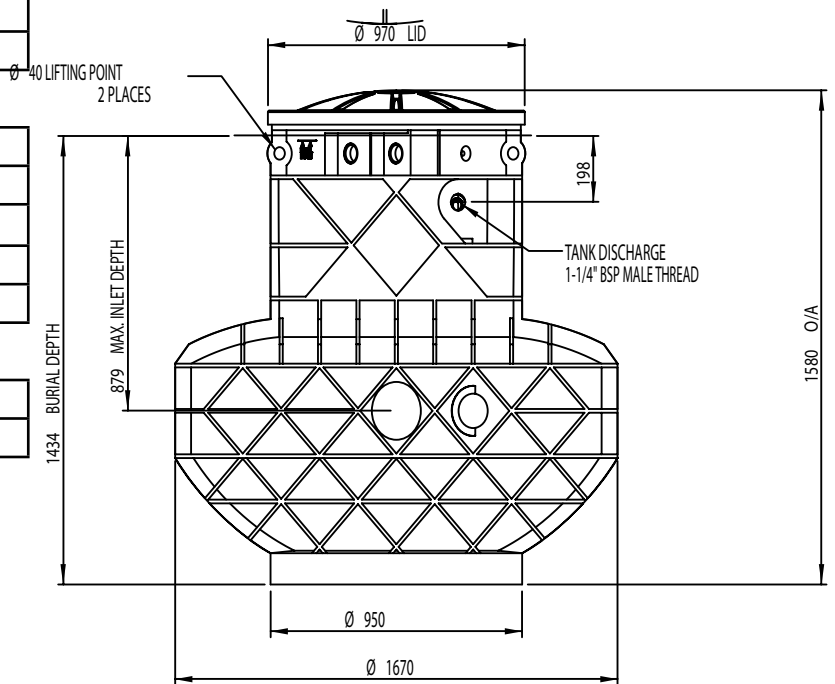
Tank Inlet

100mm inlet to be drilled on site using a 121mm holesaw to suit either:

- 100mm DWV Grommet Seal or
- 110mm Spigot

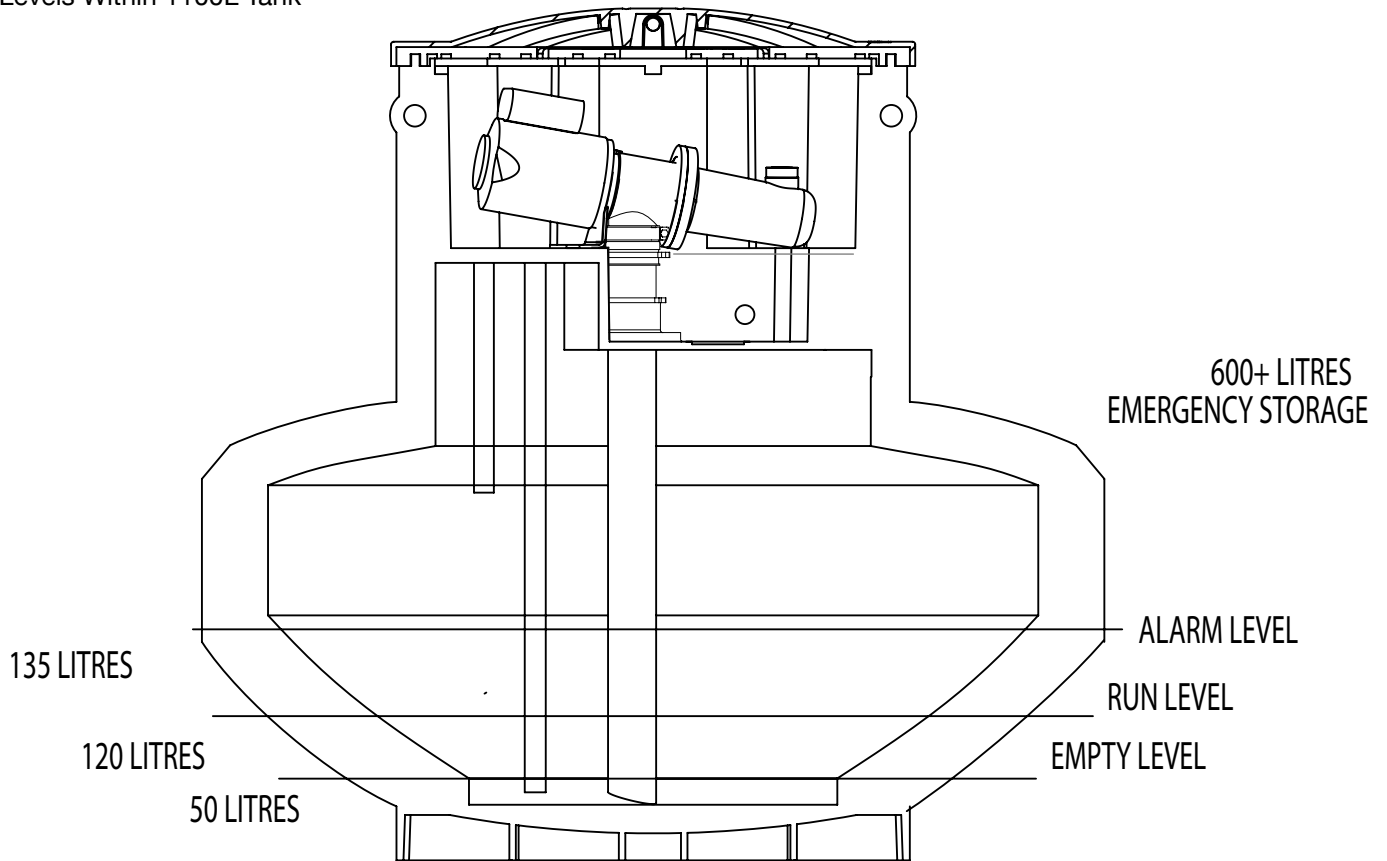
Noise Levels

55 dBA (Fast) @ 1 metre
Measured during operation of pump.
Measurement taken 1 metre directly above tank lid.

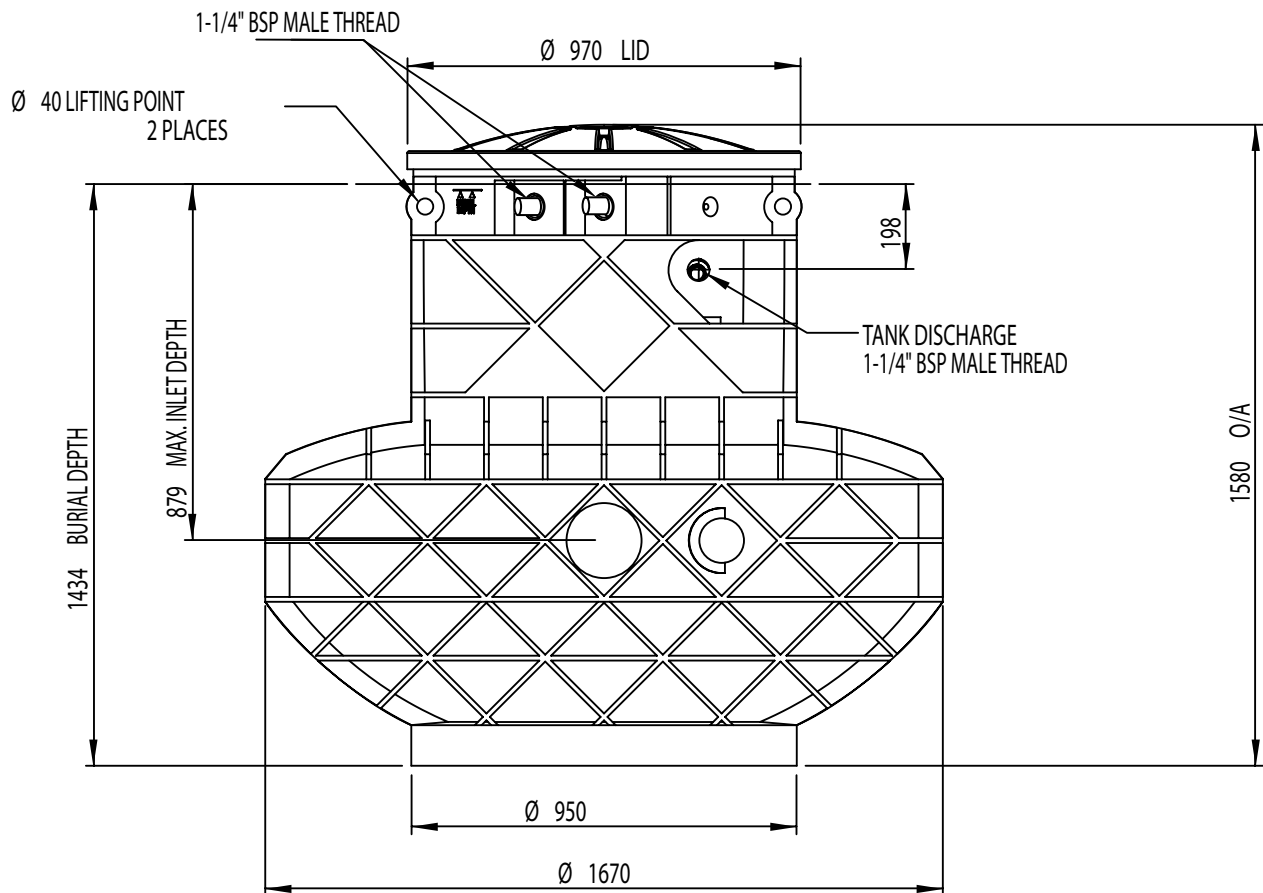


Specifications

Levels Within 1100L Tank

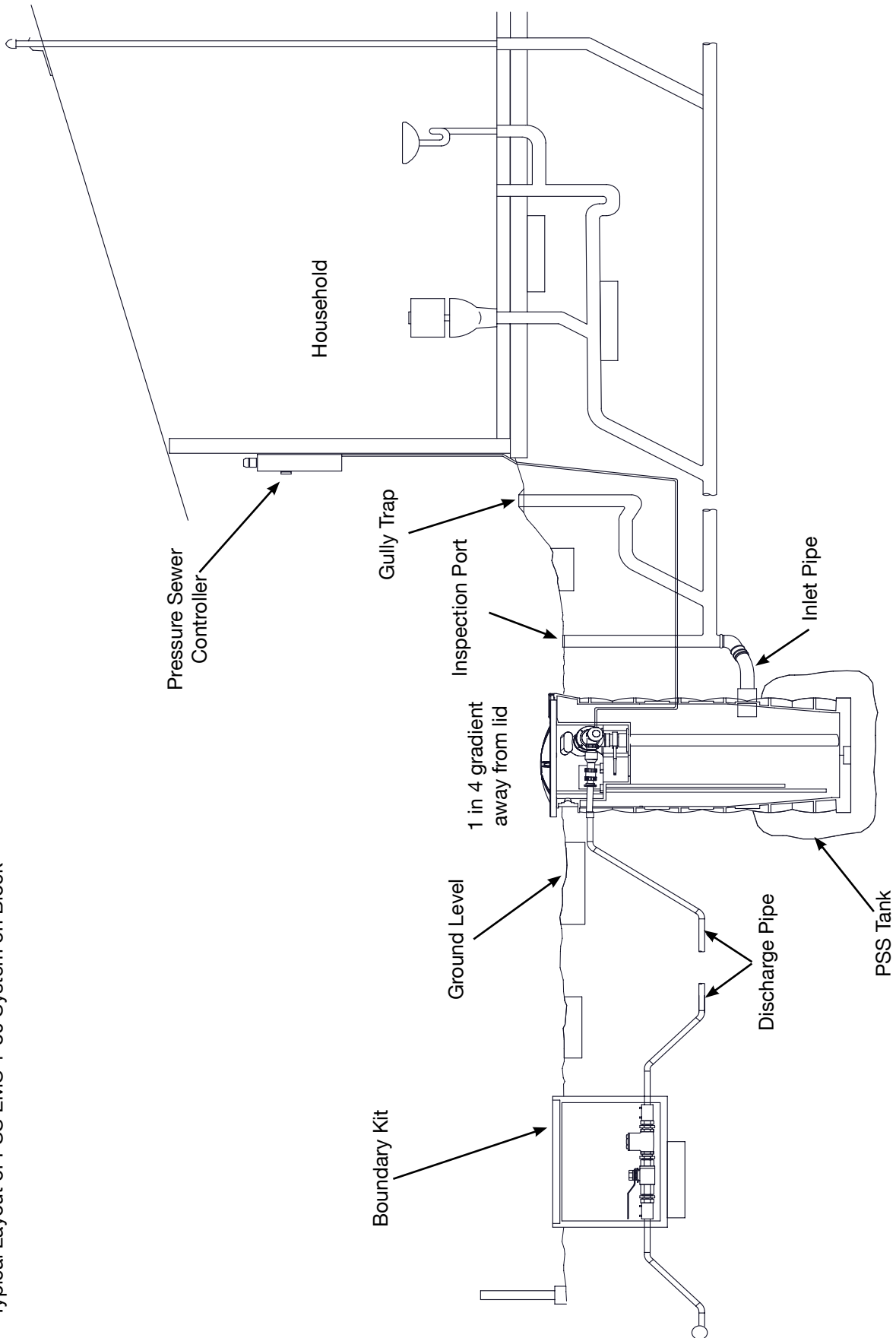


Pipe Connection and Lifting Points on 1100L Tank



Installation

Typical Layout of PSS EMS 1-80 System on Block



Installation

Installation Checklist



Caution: All plumbing and installation work is to be conducted by a qualified Plumber.



Caution: All electrical connections is to be conducted by a qualified Electrician.

Action	Checked	
BEFORE TANK INSTALLATION		
1	No damage has occurred during transit to tank, lid, pump, pipe work/valves or controller.	
2	PSS Eco 1-80 is been installed into an area where there will be no traffic within 1m around lid.	
3	PSS Eco 1-80 is been installed into an area 1.5m clear of all buildings.	
4	PSS Eco 1-80 is been installed with an 1 in 4 gradient away from the lid.	
5	Sewerage plumbing audit on property meets local regulations.	
6	Electrical audit on property meets local regulations.	
7	All installation work (except electrical work) is been conducted by a licensed plumber with drainage experience.	
8	All electrical work is been conducted by a licensed electrician.	
9	Slings, chains or shackles required to lift tank are to statutory regulations.	
10	A 20 amp type D circuit breaker is installed in the meter box.	
11	All trench depths for electrical cable are to local regulations.	
12	Property has been assessed for correct foundations.	
13	Hole for the PSS Eco 1-80 system is to local regulations.	
14	Inlet sewer pipe for PSS Eco 1-80 is no greater than 1285mm depth from ground level.	
DURING TANK INSTALLATION		
1	Tank is level in hole.	
2	Tank has approx. 250L of water in it, ensuring no floatation occurs during concrete pouring.	
3	Tank does not have the discharge inlet hole drilled in to it, before concrete pouring.	
4	Discharge pipe work has been installed as per pattern on page 18.	
5	All pipes are supported sufficiently for backfill.	
6	Once concrete has been poured, 121mm diameter hole for the inlet pipe has been drilled into tank.	
7	DWV grommet seal has been placed into inlet hole.	
8	Inlet and discharge pipe is connected.	
9	Backfill does not contain large particles (as these can effect tank wall loading).	
AFTER TANK INSTALLATION		
1	Remove the foam insert and do not reinstall the insert (this is used for protection during transport only)	
2	Prime pump by removing discharge union and filling with water, then re-tighten.	
3	Pressure sewer controller is wired in and powered.	
4	Level sensors have been wired correctly into the pressure sewer controller.	
5	All valves are in the open position.	
6	All Barrel Unions have been tightened.	
7	Pump has been tested through one complete operation cycle and is working as it should.	
8	Ensure that lid has been fully bolted down evenly.	

Installation

Foundations - PSS EMS 1-80



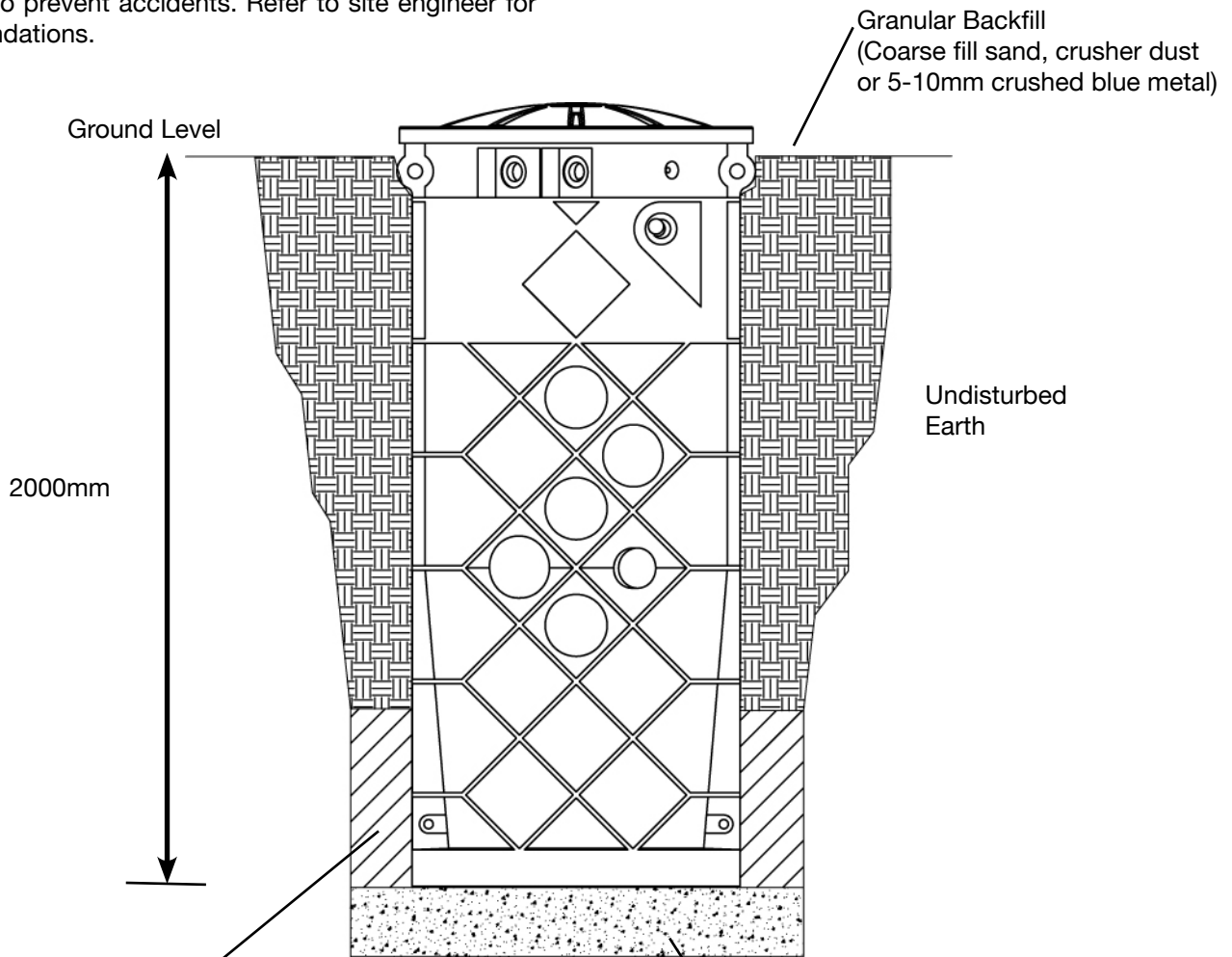
Caution: All plumbing and installation work is to be conducted by a qualified Plumber.

Caution: As sites vary and there are many potential site hazards, it is recommended that a Job Safety Analysis of each site is done prior to installation or any works.

Caution: Installation holes may require protection and supports to prevent accidents. Refer to site engineer for recommendations.

The illustration below provides a guide to the foundations required for the E 1-80 900 litre tank. This is to be used as a guide only, as installation is dependent on ground conditions and should be in accordance with the directions of the site engineer.

The Eco 1-80 Tank should be located in an area where there is good drainage of surface water away from the tank. There should be a 1 in 4 gradient away from the lid to help with drainage. It should be as close to the household as possible and in a non trafficable area.



Tank Size	Weight of Concrete	Volume of Concrete
900L	700Kg	0.35 Cubic Metre
1100L	1250Kg	0.55 Cubic Metre
2200L	1250Kg	0.55 Cubic Metre

(Suitable for water charge soil. Refer to site engineer for all other soil types.)

Level Gravel Bedding
150mm deep minimum
(10-20mm crushed blue metal)

Installation

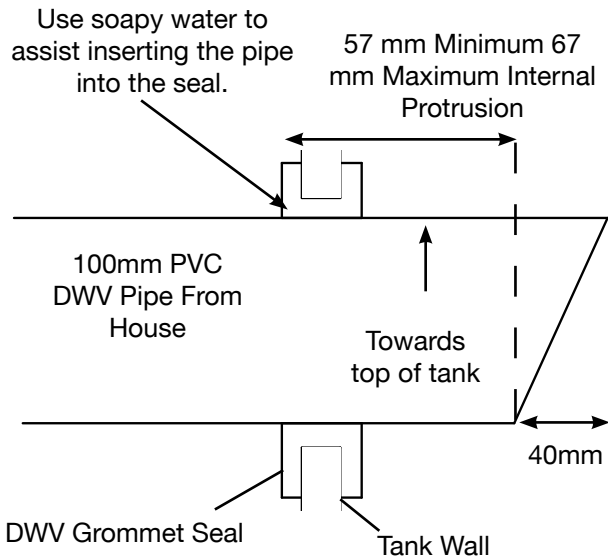
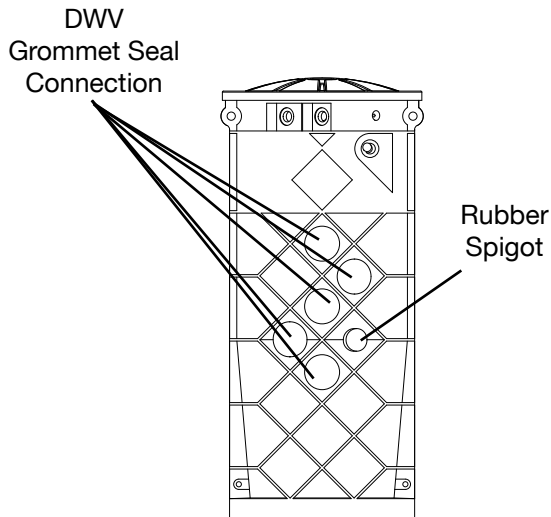
Pipework Connections - Inlet

The connection to the tank from the household is made using 100mm DWV PVC pipe and the grommet seal provided (loose).

Drill a hole (using a 121mm hole saw) at the correct depth using the flats provided. Ensure that hole is central to the flat. Place the DWV grommet seal in the hole with the label facing out. Push the pipe through. Soapy water may assist this process.

Alternatively, a rubber spigot connection can be used. The rubber spigot should have an internal diameter of 110mm.

The maximum depth of inlet from ground level is 1285mm. The minimum is 660mm.

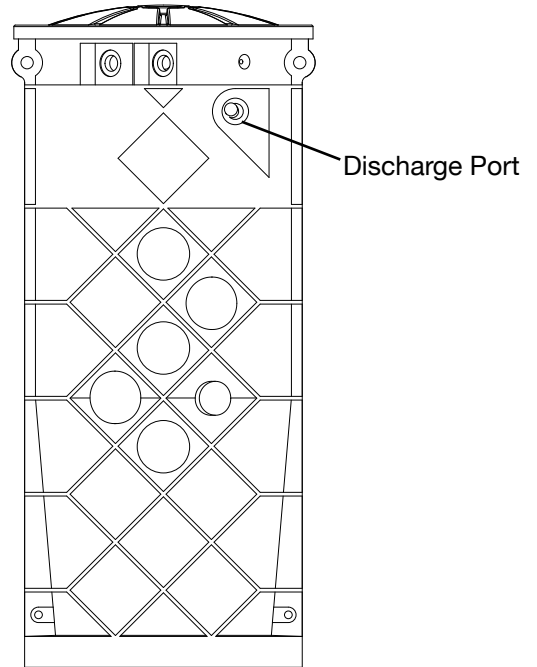


Pipework Connections - Outlet

1 1/4" BSP Stainless Steel with external thread is supplied for the outlet.

Ensure that discharge pipework leading away from the PSS EMS 1-80 tank, is in a pattern as per page 18 of this manual.

Ensure that discharge pipework leading from the tank is well supported for backfilling.



Installation

Electrical Connections



Warning: All electrical connections is to be conducted by a qualified Electrician.

Prior to installation, an electrical audit must be conducted on the property to ensure the installation will meet local regulations.

Electrical Installation Diagram.

Ensure all electrical connections are made in accordance with local regulations.

Connections at the Meter Box.

The power to the PSS Control box must come from the meter box and be wired in on its own circuit breaker. This should be a 20 Amp Type D circuit breaker.

Electrical Connections - At Tank

Run both the motor cable and the level sensing cable through sealed conduit. At the tank wall connect the conduit to the socket connection that is provided.

Ensure that the conduit is buried in accordance with local regulations.

Electrical Connections - Within Pressure Sewer Controller

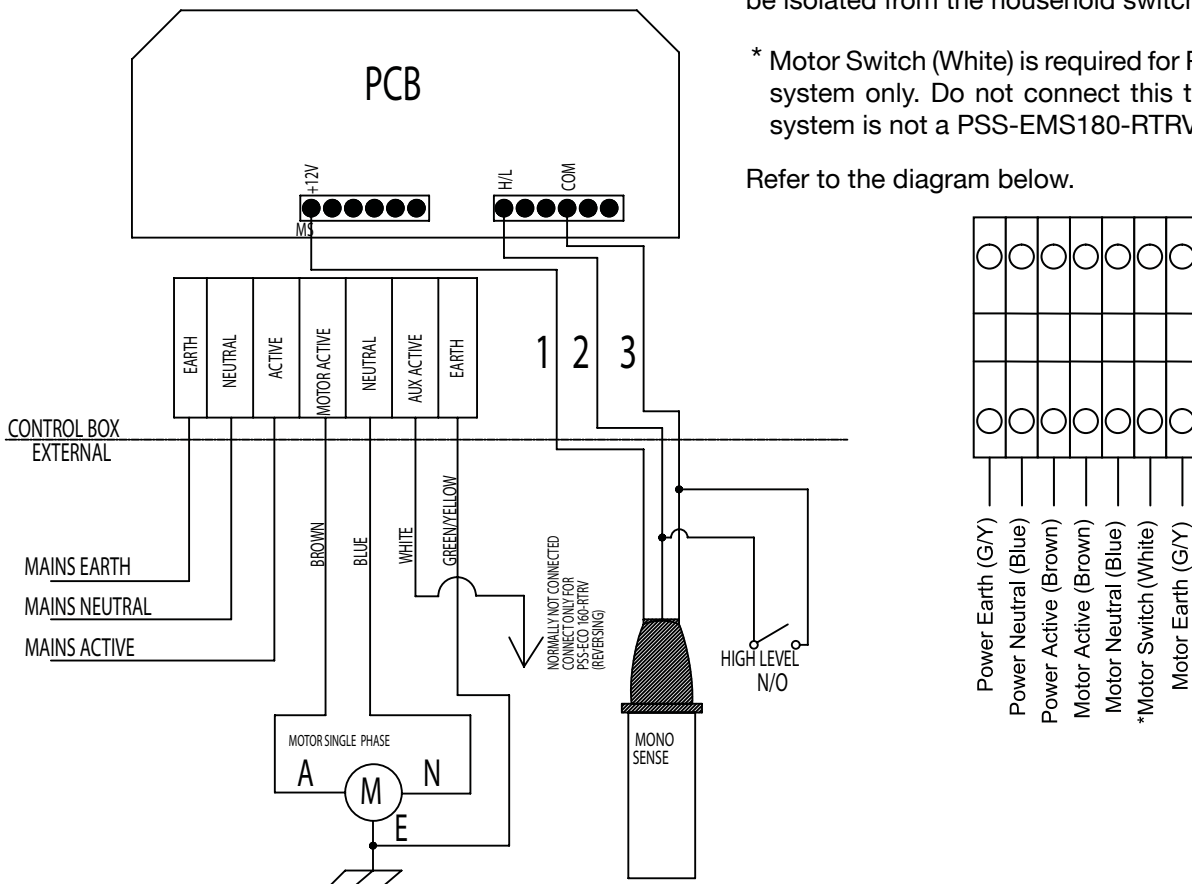
Ensure all cables are sealed through the cable glands/conduit at the base of the controller.

Connect the mains power and the pump leads to the Terminal block mounted on the DIN Rail.

There is no external isolator on the PSS controller. If required an isolation breaker can be added to the DIN rail by an electrician on installation. Typically the controller will be isolated from the household switch board.

* Motor Switch (White) is required for PSS-EMS180-RTRV system only. Do not connect this terminal block if the system is not a PSS-EMS180-RTRV.

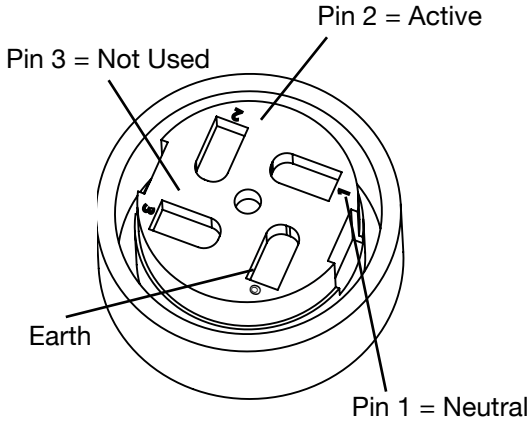
Refer to the diagram below.



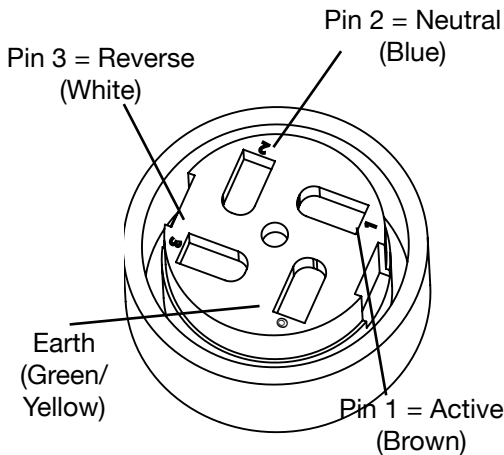
Installation

Electrical Connections - Motor Plug

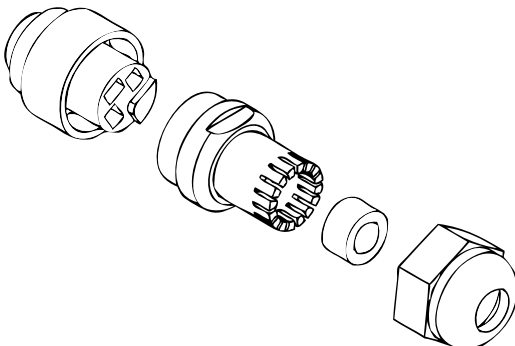
The motor connection plug for the PSS-EMS180 system is to be wired as below.



The motor connection plug for PSS-EMS180-RTRV system is to be wired as below.



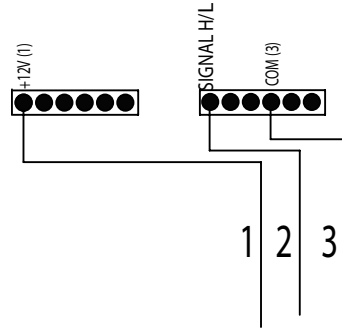
Assemble the remainder of the plug as shown below.



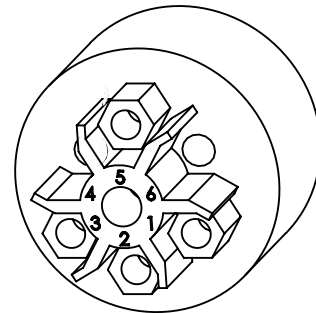
Electrical Connections - Level Sensors

Note: The Mono Sense transducer does both the run and alarm. The electromechanical sensor is a redundant backup.

The level sensors are connected directly into the terminal block on the PCB in the Pressure Sewer Controller. The connection ports are labelled.



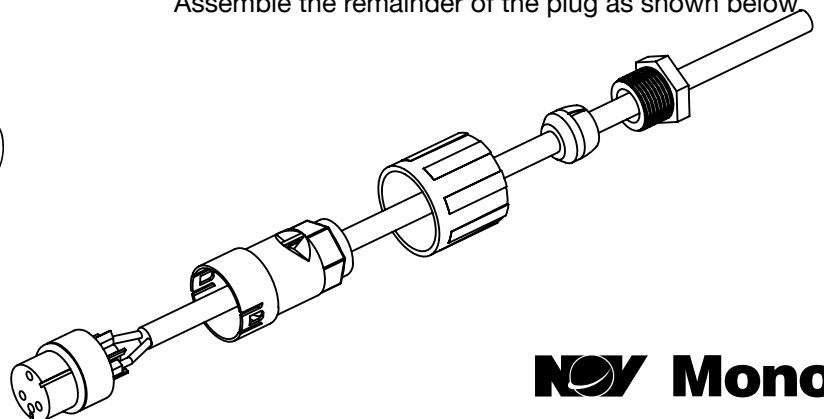
The above numbers corresponds to the connections numbers on the plug for the level box inside the tank. The wires in this cable are also referenced with the corresponding connection numbers. The plug is wired as below.



Level Switch Pin Connections

- Pin 1 is the +12 Volt connection
- Pin 2 is the Signal connection.
- Pin 3 is the common connection
- Earth Pin is not used.

Assemble the remainder of the plug as shown below.



Installation

Installation of Pump



Warning: Check that the mains power to the Pressure Sewer Controller is switched off prior to working on the pump.



Caution: Depending of the amount of water in the tank, if the controller is on, the pump may come on automatically.



Warning: The pump weighs 35kg. An assisted lift or multi person lift must be used when moving pump.

1. Remove cardboard or foam inserts from the dry well. These are required for support during transport only.
2. Fill the discharge chamber ports of the pump with water.
3. Ensure that there is a good seal on the 3" suction port by tightening up the hose clamp.
4. Connect the loose stainless steel end of the flexible discharge to the pump ensuring it is done up tight.
5. Ensure that the check valve inspection cap is facing up.
6. Ensure that the discharge valve is fully open.
7. Connect the IP68 plug for the pump.
8. Turn on controller
9. Fill tank with water through inspection port until pump switches on. Pump should prime with in 20 seconds.
10. Check that there are no leaks in the system. By applying back pressure using a partially closed ball valve.

Installation of Level Sensors

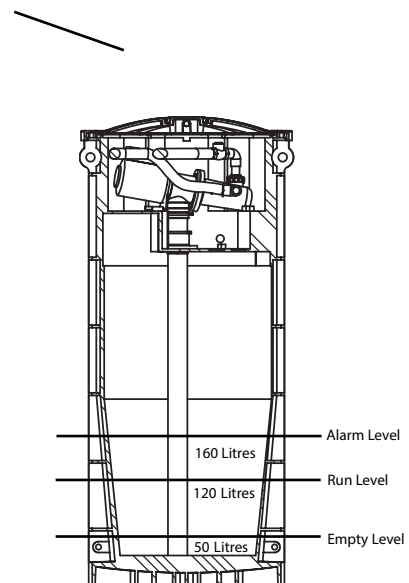


Caution: Ensure that you keep a watch on the water level in the tank as you perform this operation, so that the pump is not dry run.

1. Switch on power to the Pressure Sewer Controller. Pump should be activated.
2. Allow pump to pump out water to below the low level sensors. Once the water has fallen to below the low level sensor the pump will turn off.
3. If pump does not turn off, check Level Sensor wiring.
4. Refill the tank through the inspection port.
5. When the water level is high enough to cover the low level sensor the pump will turn on.
6. If pump does not turn on, check level sensor wiring.
7. Keep filling the tank up.
8. Once the tank reaches the high level sensor, the alarm will sound.
9. If the alarm does not sound, stop filling tank, turn off pump and check high level sensor wiring.
10. If level sensors are working as they should, turn off the water and pump the water out until the alarm turns off.
11. Turn off pump.

Firmly secure the lid. To secure the lid, place the lid on top of the tank and align the fasteners in the slots. Compress the lid at the fastener you are tightening until the bolt is just touching the lid, by standing on the lids edge. The fasteners only require a 1/4 turn in either direction to tighten. The closed position is indicated by the line on the hex head pointing out from the tank, as shown below.

The system will now work automatically as it fills with water.



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Operation

Operation of Pressure Sewer Controller

System Indicators

The Pressure Sewer Controller features various indicators which signify how the system is functioning. The functions of the indicators are as follows:

Power On

This indicates that mains power is connected to the unit.

Pump Running Indicator

This indicates when the pump is running.

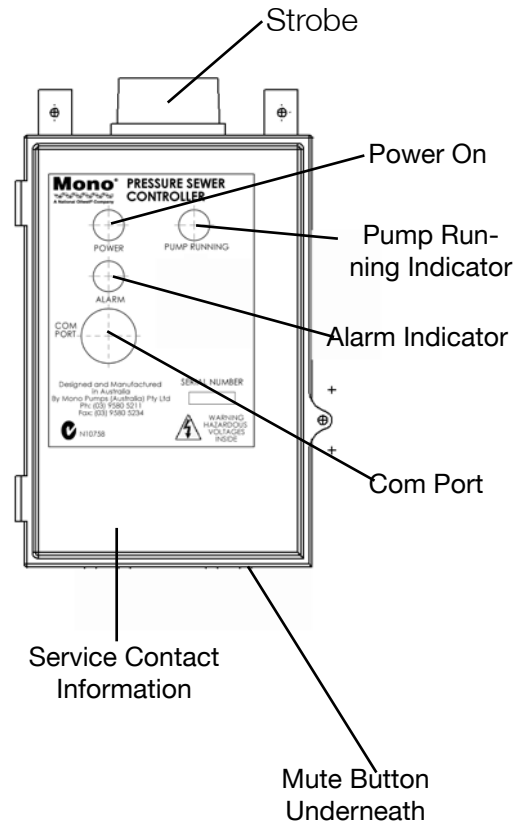
Alarm Indicator/ Strobe/ Siren

This indicates operational problems with the PSS Eco 1-80 system. When the alarm begins, limit the use of water (there is 570L emergency storage in tank). If the strobe light does not stop flashing after ten minutes, contact your service provider.

The table at the bottom of the page indicates the functions that the alarms will operate.

Mute Button

By pressing this button, the end user can switch off the audible alarm. This will not switch off the visual alarm. This button is located on the underside of the unit.



Operation of Protection Features

Function	Description	Reset	Pump Shutdown	Warning Light	Siren	Strobe
Over Current	Trips when current exceeds programmed maximum current level.	Via Trip Reset Timer	YES	YES	NO	NO
Max Current Trips	Trips when number of current trips exceed programmed value.	Automatic - if fault clears	NO	YES	YES	YES
Exceed max. run time	Trips when pump/motor has continuously run greater than the programmed maximum time	Via Motor Cool-Down Time	YES	YES	YES	YES
Exceed max. Starts/Hour	Trips when maximum starts per hour has been exceeded	Via Motor Cool-Down Time	YES	YES	NO	NO
High Level	Trip when high level probe is active	Via Low Level Probe	NO	YES	YES	YES
Sensor Fault	Triggered when Mono-Sense level sensor is not detected	Automatic when Sensor detected	YES	YES*	NO	NO

* Warning light only activated if sensor has previously been detected.

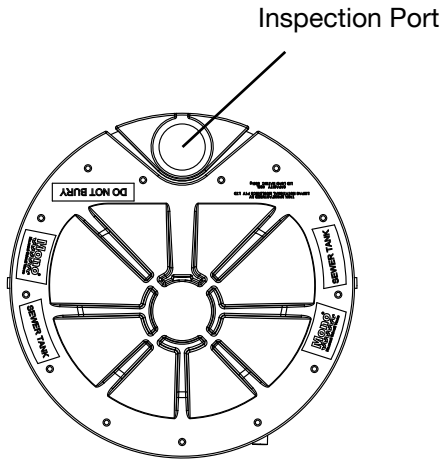
Maintenance

Desludging The PSS EMS 1-80 Tank

Over time, sewage sludge can build up in the bottom of the tank. The PSS EMS 1-80 tank has been designed so that desludging can occur without having to remove the lid of the tank.

Access to the wet well can be gained by the 110mm inspection port on top of the tank

This port enables a 100mm diameter suction pipe into the tank.



If additional access is required, there are an extra two access points in the dry well. The first access point is the 100mm port under the pump inlet assembly. The pump would need to be removed to access this port. The second access point is the 80mm drainage point for the dry well.

Removal of Sludge via Inspection Port



1. Isolate PSS system. Ensure that pump can not be turned on.
2. Unscrew the lid of the inspection port.
3. Place suction pipe down the hole and into the tank until it hits the bottom of the tank (approx. 2.2m).
4. Remove sludge from the bottom of tank.
5. Once completed, remove suction pipe from inspection port.
6. Fill tank with approximately 250 litres via the inspection port.
7. Re-prime pump as per Installation of Pump (pg 24).
8. Replace lid of inspection port.

Maintenance

Removal of Sludge via the Additional Access Points.



Caution: The pump weighs 35kg. An assisted lift or multi person lift must be used when moving pump.

The first access point is the 100mm port under the pump inlet assembly. The pump will need to be removed to access this port.

The second access point is the 80mm drainage point for the dry well.

1. Isolate PSS system at the boundary kit. Isolate the Pressure Sewer Controller and ensure that pump can not be turned on.
2. Unscrew bolts in lid and place underside up and away from dirt etc.
3. The pump will need to be removed to reach the first access point.
4. Unscrew the hose clamps and remove suction pipe and floor seal.
5. Unscrew the 80mm plug if access via the dry well drainage port is required.
6. Place a suction hose down either or both access points and into the tank until the hose hits the bottom of the tank (approx. 2.0m).
7. Remove sludge from the bottom of tank.
8. Once completed, remove suction hose.
9. For the first access point, replace pump and inlet assembly.
10. Fill tank with approx. 250 litres of water via the inspection port.
11. Re-prime pump as per Installation of Pump (pg 24).
12. If second access point has been used, replace the plug.
13. Clean up the dry well ensuring that it contains no liquids.
14. Check that the 50mm lip around the top of the tank

and that the lip on the underside of the lid is clean. This will ensure a good seal has occurred so that the dry well remains sealed.

15. Place the lid and bolts back onto the PSS tank. The lid is keyed, so that it can be only fitted one way.
16. Screw the bolts down in place, ensuring that a good seal of the dry well has occurred.
17. Turn PSS system at boundary kit back on.
18. Turn Pressure Sewer Controller back on.

Cleaning the Level Sensors

It is recommended when desludging the PSS Eco 1-80 tank, that the level sensors are cleaned.

1. Unscrew the level sensors from the barrel union. When replacing the level sensor in the barrel union add thread tape. There is no need to open the pressure sensor there are no servicable parts (unit is factory calibrated).
2. Lift up and out the level sensors and assembly.
3. Clean off any build up around the end of the tube.
4. Replace the level sensors back into the tank.
5. **THE MONO-SENSE LEVEL SENSOR IS VERY FRAGILE!** Never touch the sensor diaphragm with any object. Never direct high pressure water into the sensor.

Maintenance

Removing The PSS EMS 1-80 Pump.



PROTECTIVE CLOTHING
MUST BE WORN



HAND PROTECTION
MUST BE WORN



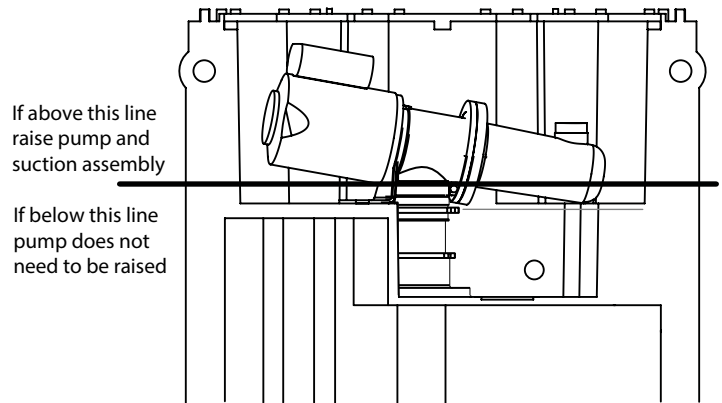
SWITCH OFF POWER
BEFORE WORKING
ON EQUIPMENT

Ensure the PSS System has been isolated, and ensure that the pump cannot be turned on.

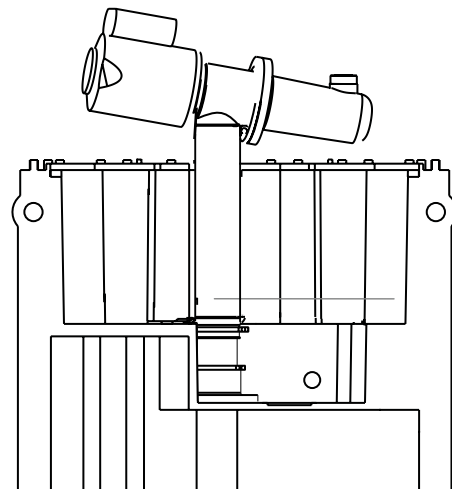
Removing of the pump will require the removal of the lid first. Please ensure the lid is removed in a similar way as per the instructions under installation on page 24.

After removing lid please follow the below instructions.

1. Check the level of sludge inside of the tank via the inspection port (as shown on page 27) by unscrewing the lid.
2. If level of the Sludge is below the line as per the drawing the pump does not need to be lifted, if the sludge is level with this line the pump will need to be lifted as per the drawing before any part of the pipework is removed to ensure spillage does not occur.
3. Once the pump is secure via the lifting lug, close the valve on the discharge pipework.
4. If raising the pump do now, if not proceed to the next step.
5. Unscrew the end of the discharge pipework that is attached to the pump.
6. Unplug the IP68 Plug that is connected to the pump.
7. Loosen clamps that attached pump to suction pipe.
8. Pump can now be removed.



Secure lifting device or PSS lifting Tripod (GRIF 340) to tank and attach to pump. Pump should be raised to about this height and secure before any further steps can be followed.



Maintenance

Maintenance Checklist



Caution: Isolate mains power before commencing any work on the PSS EMS 1-80 system.

	Action	Checked
1.	Ensure that household has discontinued use of water.	
2.	Pressure Sewer Controller is off.	
3.	Isolate the mains power (follow standard electrical lockout procedures).	
4.	Ensure that discharge valve in boundary kit is turned off.	
5.	Remove lid and ensure that underside of lid is not in dirt.	
6.	Disconnect pump plug from internal power supply.	
7.	Disconnect level sensor power plug from internal power supply	
8.	Ensure that discharge valve in tank has been closed.	
9.	Attach lifting device to pump refer to the lifting rod on page 28.	
10.	Unscrew clamp on rubber sleeve closest to suction side of pump.	
11.	Remove pump by lifting straight up.	
12.	Clean up any liquid in the dry well.	
13.	Ensure that lid has been replaced on tank and tightened to prevent water from entering into the dry well.	

Maintenance

Pump Disassembly



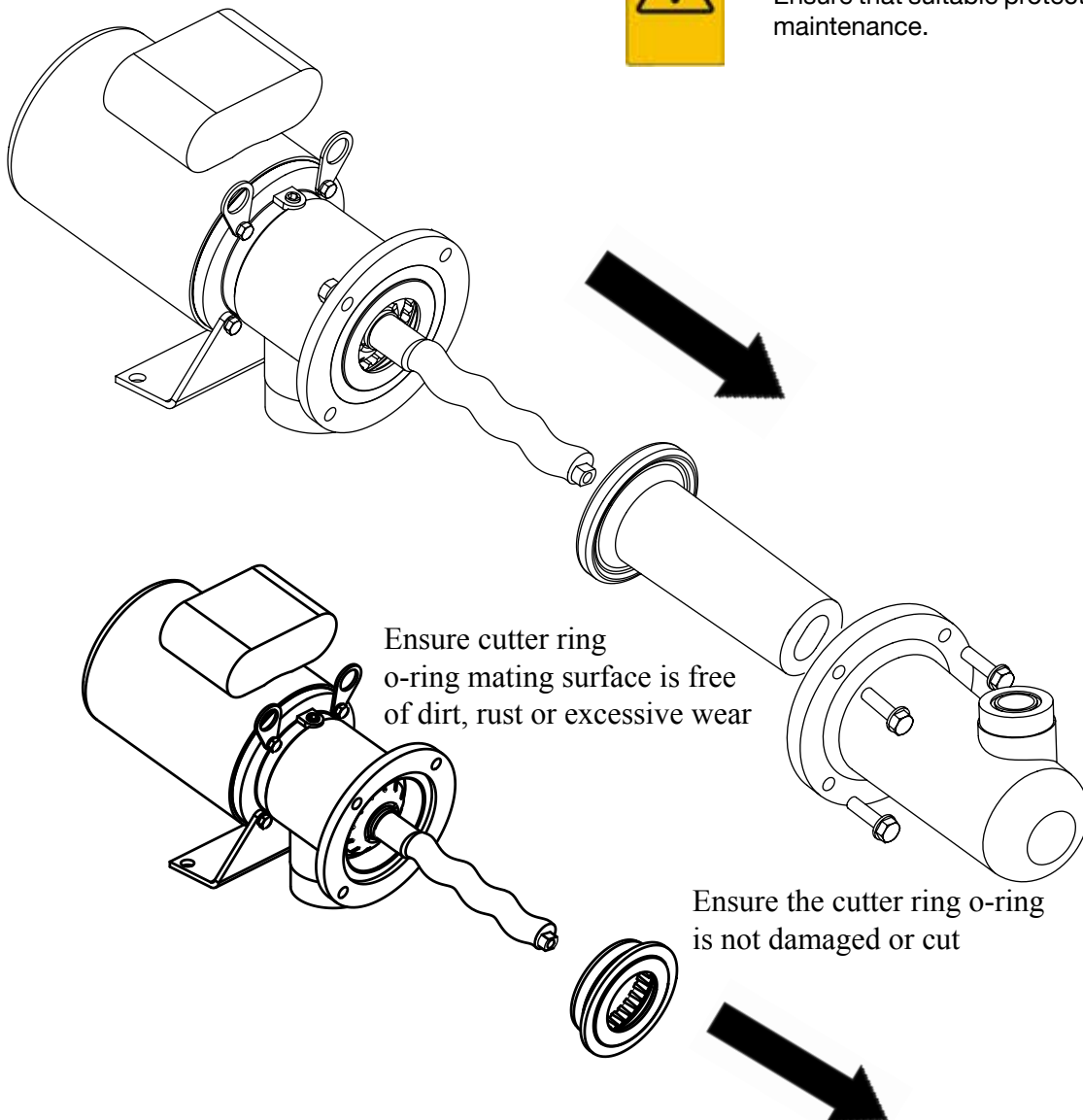
Caution: Ensure that motor has been disconnected from any power supply before commencing any work.



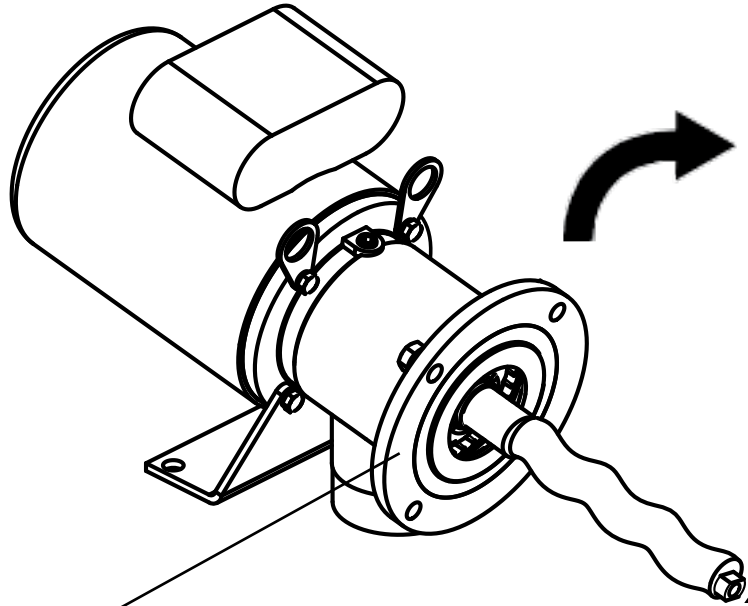
Caution: Pump may contain sharps ie: needles. Ensure that suitable protective gloves for sharps are worn while working on pump.



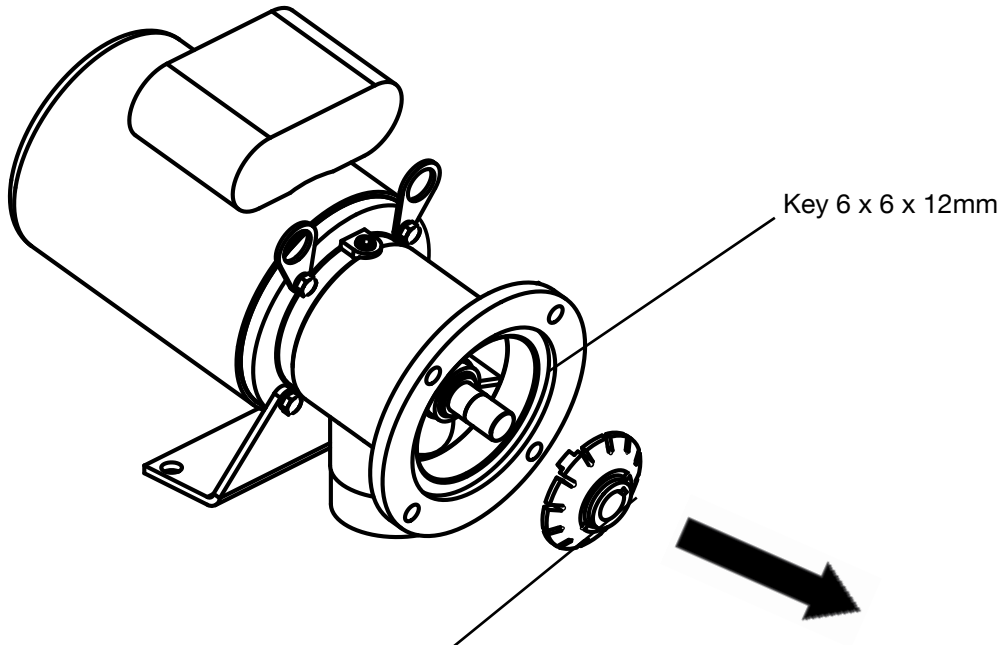
Caution: Pump may contain human effluent. Ensure that suitable protection is worn during maintenance.



Maintenance



Hold cutter to remove rotor.
Cutter can be held with screw driver
against the internal shroud.
Note: Left hand thread on rotor.

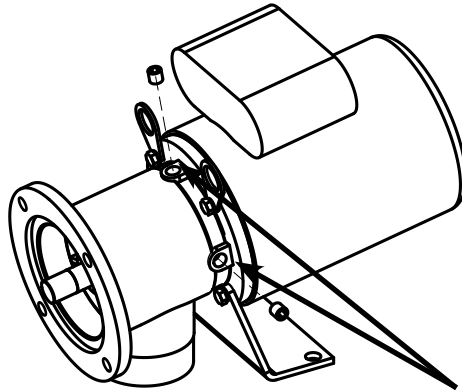


Use extraction bolts to
remove cutter impeller.

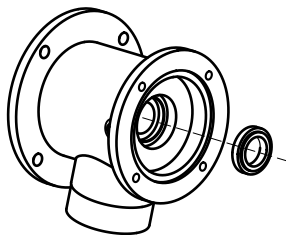
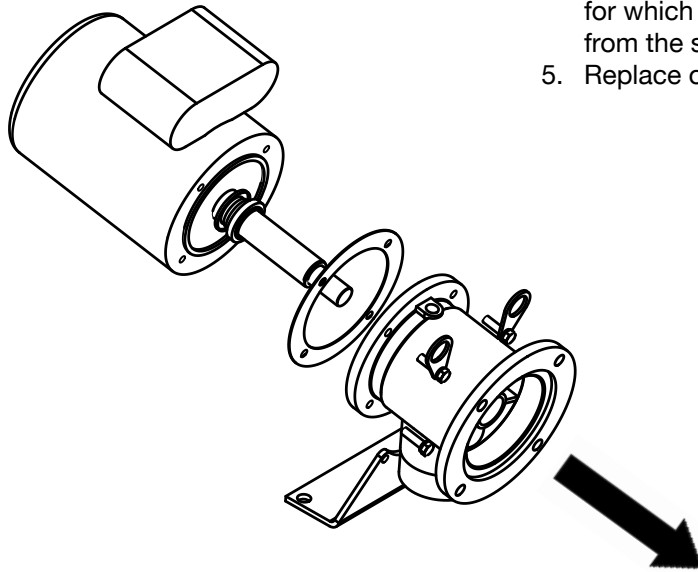
Maintenance



Caution: Mechanical seal is contained in an oil filled bath. Before suction chamber can be removed, the oil needs to be drained.

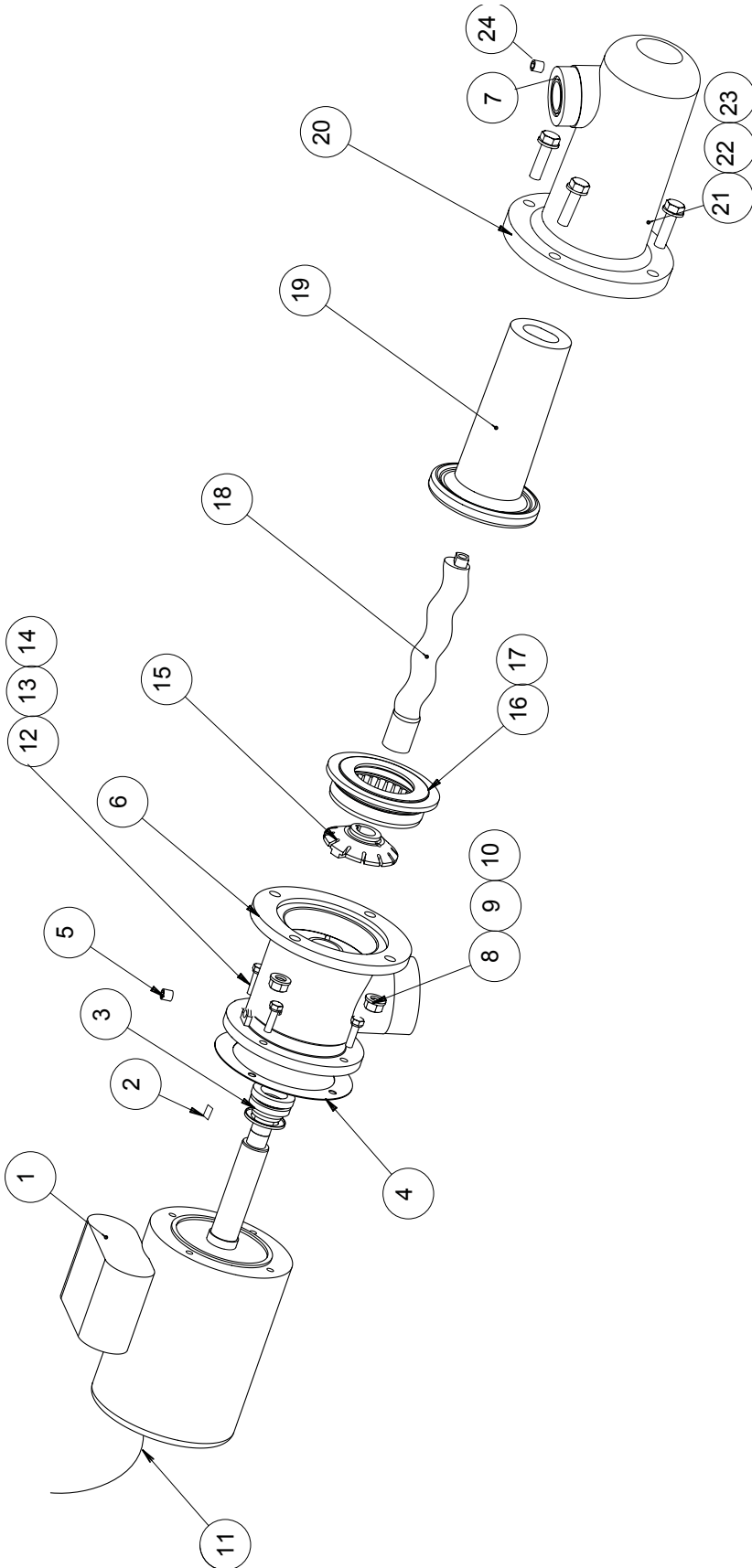


1. Remove oil fill plugs.
2. Turn pump on to its side to drain oil.
3. To refill, place pump upright.
4. Fill with oil (see Pump Specification for which type) until oil extrudes from the side holes (approx. 130ml).
5. Replace oil fill plugs.



Maintenance

Pump Spare Parts List



ITEM	DESCRIPTION	QTY	PART NUMBER
13	M8 S/S Bolt	4	K113260F
14	Spring Washer	4	W113251F
15	Cutter Impeller	1	LE GRIF 304
16	Cutter Ring	1	TC GRIF 306
17	O Ring	1	GRIF 029
18	Rotor HCP	1	SF G90 2530
19	Stator	1	RR G90 2200
20	Discharge Chamber	1	CD GRIF 075M
21	M12 Bolt	4	F115300F
22	Washer M12 S/S	4	W115050F
23	Spring Washer M12	4	W115251F
24	Plug 1/4"	1	P130210S

ITEM	DESCRIPTION	QTY	PART NUMBER
1	Motor 240V 1 Phase	1	GRIF-09301MTR
2	SQ KEY 6x5x14	1	K150614P
3	Mechanical Seal	1	OO CP800 1060
4	Gasket	1	GRIF 021
5	Plug 1/4"	2	P130210S
6	Suction Chamber	1	CD GRIF 171M
7	O-Ring	1	AUX 6252
8	Washer M12 S/S	4	W115050F
9	Nut M12 S/S	4	N115100F
10	Spring Washer M12	4	W115251F
11	Electrical Plug	1	SUN 23565-1
12	Washer M8 S/S	4	W113051F

Fault Finding

Fault Finding



Warning: Failure to respond to a flashing strobe/audible alarm, will result in damage to the PSS EMS 1-80 system.

It is recommended that a PSS handheld display unit is used to help the operator determine and repair settings for the PSS EMS 1-80 system.

SYMPTOM	CAUSE OF TROUBLE	CHECKING PROCEDURE	CORRECTIVE ACTION
Flashing strobe/audible alarm	High level probe has been activated.	Check the sewage level in the tank to ensure that the tank is not full. Check that the pump is able to handle the flow coming into the tank. If water level is not past the high level probe, check that the level sensors are working as per page 20 of this manual.	If tank is full, stop all water use. If tank is above high level sensor but is not full, minimise water usage as there is 570L emergency storage in tank. Rewire the level sensors as per pages 22 & 23 of this manual.
		Check that the pump is working and that there is sewage been discharged from pump.	Pull out the pump and replace or repair.
	Pump has exceeded maximum current trips. This is most likely due to over pressure in the discharge line.	Check to ensure that there is no closed valves on the pump's discharge line. Check to ensure that there is no closed valves in the network.	Open all closed valves.
		Check discharge line or network for blockages.	Clear any blockages in the discharge line or network.
		Check that the cutters in the pump are not jammed or blocked.	Pull out the pump and remove blockage.
		Check that the stator has not been run dry.	Pull out the pump and replace or repair.
		Check the setting in the controller for maximum number of current trip levels.	Return maximum number of current trip levels back to default factory settings.
	Pump has been running for too long.	Check that there is not too much water flowing into the tank.	If a large spa water is been dumped into the sewer system, then this can cause the pump to run too long. Install a flow restrictor at the spa.
		Check that the pump is turning and producing flow.	Pull out the pump and replace or repair.
	Failing to respond to the flashing strobe or audible alarm.	Check the complete system (all pipework, level sensors, pump etc) for any damage.	Replace or repair system.
Increased pump running time/pump runs at reduced capacity.	Partial blockage of inlet.	Check discharge line or network for blockages.	Clear any blockages in the discharge line or network.
	Stator has been damaged.	Check the condition of the stator.	Pull out the pump and replace or repair.
Pump run light is flashing.	Motor not connected, motor faulty OR faulty wiring.	Check to ensure motor is wired to controller correctly as per installation instructions and check for loose wiring in the controller.	If motor is wired to controller correctly and no loose wires re found and the PUMP RUN light continues to "flash" replace the motor.

Fault Finding

SYMPTOM	CAUSE OF TROUBLE	CHECKING PROCEDURE	CORRECTIVE ACTION
Warning light on controller is "ON".	Current exceeds maximum number of current trips setting.	Check to ensure that there is no closed valves on the pump's discharge line. Check to ensure that there is no closed valves in the network.	Open all closed valves.
		Check discharge line or network for blockages.	Clear any blockages in the discharge line or network.
		Check that the cutters in the pump are not jammed or blocked.	Pull out the pump and remove blockage.
		Check that the stator has not been run dry.	Pull out the pump and replace or repair.
		Check the setting in the controller for maximum number of current trip levels.	Return maximum number of current trip levels back to default factory settings.
		Check that there is not too much water flowing into the tank.	If a large spa water is being dumped into the sewer system, then this can cause the pump to run too long. Install a flow restrictor at the spa.
	Check that the pump is turning and producing flow.	Pull out the pump and replace or repair.	
Maximum number of starts per hour has been exceeded.	Check the setting in the controller for maximum number of starts per hour.	Return maximum number of starts per hour back to default factory settings.	
	Mono-Sense level sensor communication problems.	Check level sensor wiring.	Rewire level sensors, replace if fault persists.
Tank is full but pump does not turn on.	Level sensors are wired incorrectly.	Check the electrical connections of the level sensors as per pages 22 & 23 of this manual.	Rewire the level sensors as per pages 22 & 23 of this manual.
		Check that the level sensors are working as per page 24 of this manual.	Rewire the level sensors as per pages 22 & 23 of this manual.
	Blocked level sensors.	Check sludge level in bottom of tank.	Desludge the tank as per page 27 of this manual.
	Controller is not turned on.	Check that there is power to the controller.	Contact supply authority for correction.
	No power or incorrect voltage.	Voltage must be +/- 10% rated voltage.	Contact supply authority for correction and voltage symmetry.
	Defective wiring.	Check for loose or corroded connections.	Correct faulty wiring or connections.
Controller states that pump is running, but there is no discharge	Circuit breaker is in the "off" position.	Open controller and check circuit breaker.	Turn circuit breaker to the "on" position.
	Wiring of the motor plug or wiring of the motor is incorrect.	Check wiring of the motor plug as per pages 22 & 23 of the manual. If this	Correct faulty wiring or connections. If fault appears to be with the motor, contact your supply authority.
	Pump has dry run.	Pull the pump out and check the stator.	Replace the stator and clean up the rotor.
	Pump motor is turning but there is no discharge.	Pull the pump out and check the internal parts of the pump.	Pull out the pump and replace or repair.

Optional Accessories

PSS Handheld Display Unit

Part No.: PSS DISP UNIT



The PSS handheld display unit is an optional accessory that allows the operator to extract data and change software settings within the Pressure Sewer Controller.

The PSS handheld display unit is powered either from the Pressure Sewer Controller or a 9 volt battery. If the Pressure Sewer Controller is running the display unit takes power from the controller. If the Pressure Sewer Controller is not connected to power, the PSS handheld display unit will run off the internal battery, provided that the battery is not flat. Provided that there is battery power, the PSS handheld display unit will also power up the microprocessor on the Pressure Sewer Controller so that settings can be changed without the controller being connected to mains power.

The PSS handheld display unit has two sets of functions, primary and secondary. The primary functions will give actual information on the PSS EMS 1-80 system. The secondary functions allows the operator to change certain functions of the Pressure Sewer Controller software.

Primary Functions

To access the primary functions, press the number key then enter.

Number Key	Primary Function
1	Number of Starts
2	Hours Run (Pump)
3	Number of Power Resets
4	Number of Current Trips
5	Motor Amps
6	Number of Starts per Hour
7	Number of High Levels
8	Serial Number and Date of Manufacture of the Pressure Sewer Controller
9	Unit ID of the Pump Display Unit
20	Read tank level, measured from bottom of Mono-Sense level sensor (if installed)
21	Number of Mono-sense level sensor failures detected

Secondary Functions



Caution: Secondary functions should only be changed by an experienced operator, as changing the settings from the factory defaults could cause damage to the PSS Eco 1-80 system.

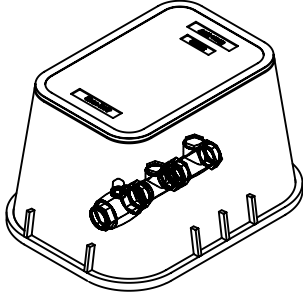
To access the secondary functions, press:

- * key
- Number key for the function to be changed.
- Enter
- New Value (that this function is to be changed too)
- Enter

Number Key	Secondary Function
1	Motor Trip Amps
2	Motor Trip Reset Time (minutes)
3	Motor Trip Maximum (No. of current trips allowed before alarm)
4	Audible Alarm Time (minutes)
5	Level Delay Time (seconds)
6	Maximum Run Time
7	Maximum Starts/Hour
8	Motor Cool Down Time
9	Set Defaults (1 = Return back to factory settings)

Optional Accessories

Boundary Kit



The boundary kit is an optional accessory, that allows an operator to isolate an individual property from the common sewerage network. The boundary kit contains a boundary kit box with a stainless steel lockable ball valve and check valve.

The boundary kit is installed between the main pressure network and the PSS EMS 1-80 system. When work is required on the PSS EMS 1-80 system and/or property, the lockable ball valve in the boundary kit can be turned into the off position preventing sewage from the common network flowing back into the PSS EMS 1-80 tank.

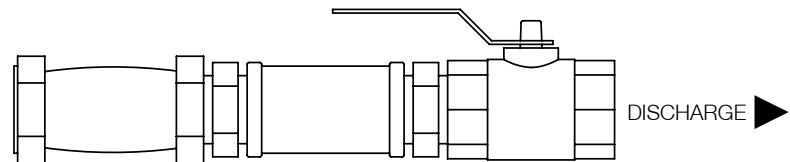
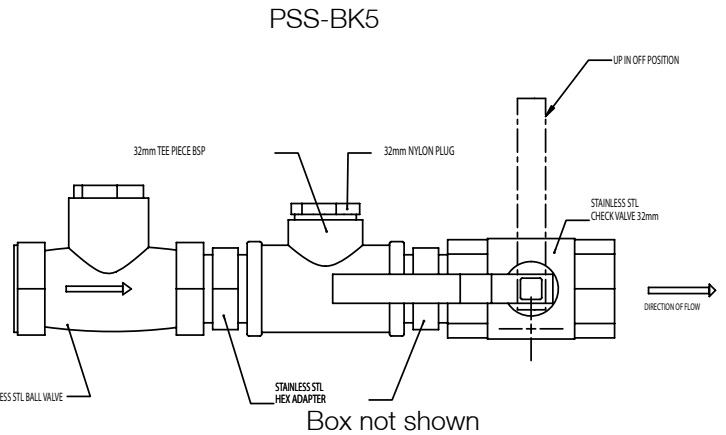
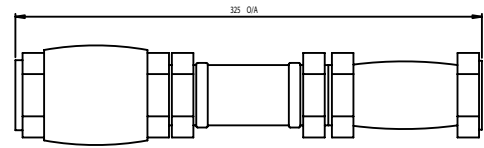
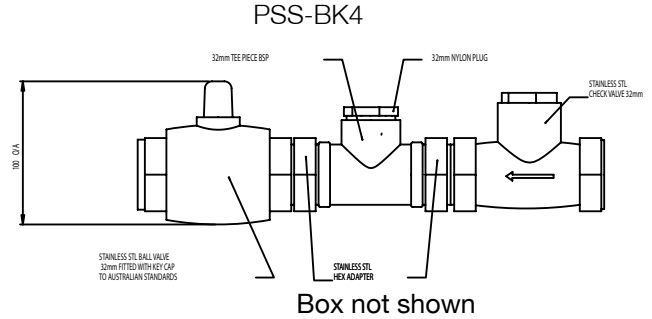
Materials

Boundary Kit Box:	Black LDPE
Lockable Ball Valve:	316 stainless steel
Hex Nipple:	316 stainless steel
Check Valve:	316 stainless steel

Environmental

Storage Temperature:	-10 to 60 deg C
Operating Temperature:	-10 to 50 deg C

Boundary Kit Dimensions



Optional Accessories

Telemetry Options



Mono Pumps has an extensive range of telemetry options that can be added to the standard PSS EMS 1-80 system. These telemetry options can be individually tailored to your requirements.

For all inquiries with regards to this option, please contact Mono Pumps.

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