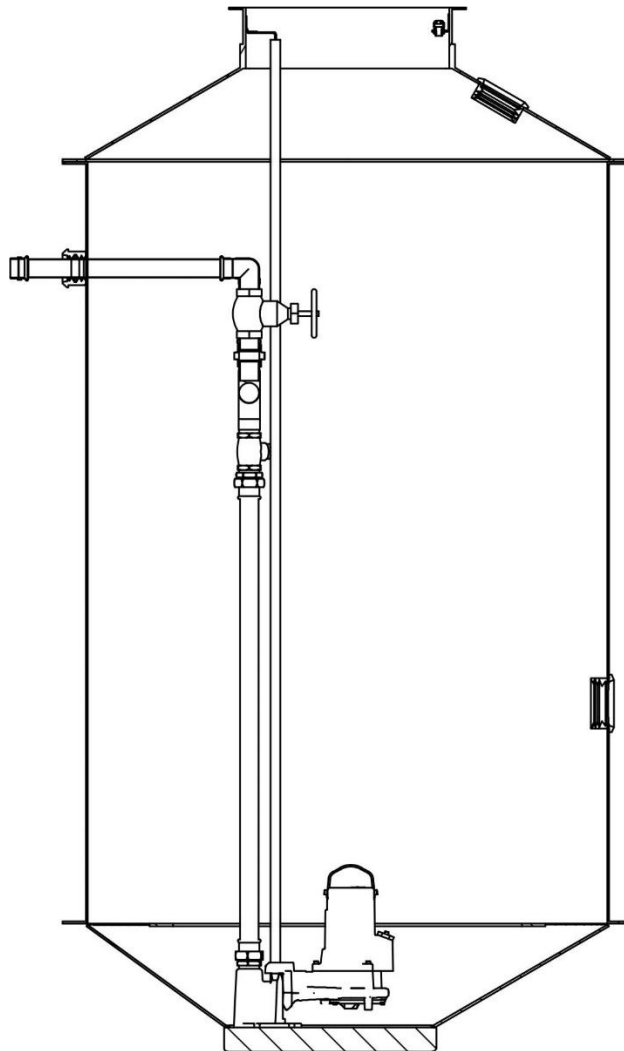




Submersible Pump Set Operating & Maintenance

Original Instructions
Dated: 15.10.2020 – Revision: 1



Ref: OM0005



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Operating & Maintenance

Submersible Pump Set

Table of Content:

1) Introduction	3
2) Warnings for the Safety of People & Property	3
3) Overview	4
4) Main Components	5
5) Handling	6
6) Operating Limits	6
7) Product Identification Code	7
8) Health & Safety	8
9) Block Prevention	9
10) Installation	9 – 12
11) Commissioning	13
12) Operation	13 – 14
13) Maintenance	15 – 16
14) General Fault-Finding Guidance	16
15) Ec Declaration of Conformity	18

1). Introduction:

The information contained within this manual is intended for the installer/user of this equipment to safely install & operate the products mentioned.

The products are to be installed by a competent person who is familiar with all the required and relevant regulations.

Failure to install/operate or maintain the equipment in accordance with these instructions could cause harm, injury to persons or damage to property.

Failure to install/operate/maintain the equipment according to the Operating & Maintenance instructions could invalidate the warranty as provided by KGN Pillinger.

No liability can be accepted for damage or operation disorders due to neglect, misuse, modification or use of equipment other than for its intended application.

This information should be read in conjunction with the manufacturers O&M.



QR Code:

The codes are scannable via a smart phone or tablets camera to retrieve specific product details in support of these instructions.

2). Warnings for the Safety of People & Equipment:



DANGER:

Failure to observe this caution may result in injury and/or damage to equipment.



ELECTRIC SHOCK:

Failure to observe this warning may result electric shock.

WARNING

WARNING:

Failure to observe this warning may cause damage/injury to property, environment or person(s).



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3). Overview:

KGN Pillinger's range of sewage/surface water underground pumping stations consists of a GRP chamber, within which is fitted 1 or 2 electric submersible pumps.

This is supplied complete with an electrical control panel, which should be mounted within an adjacent building or weatherproof kiosk.

The pumping stations are designed and manufactured to automatically collect the product and transfer it, via the pumps, under the dictates of float switches or level electrodes fitted within the chamber.

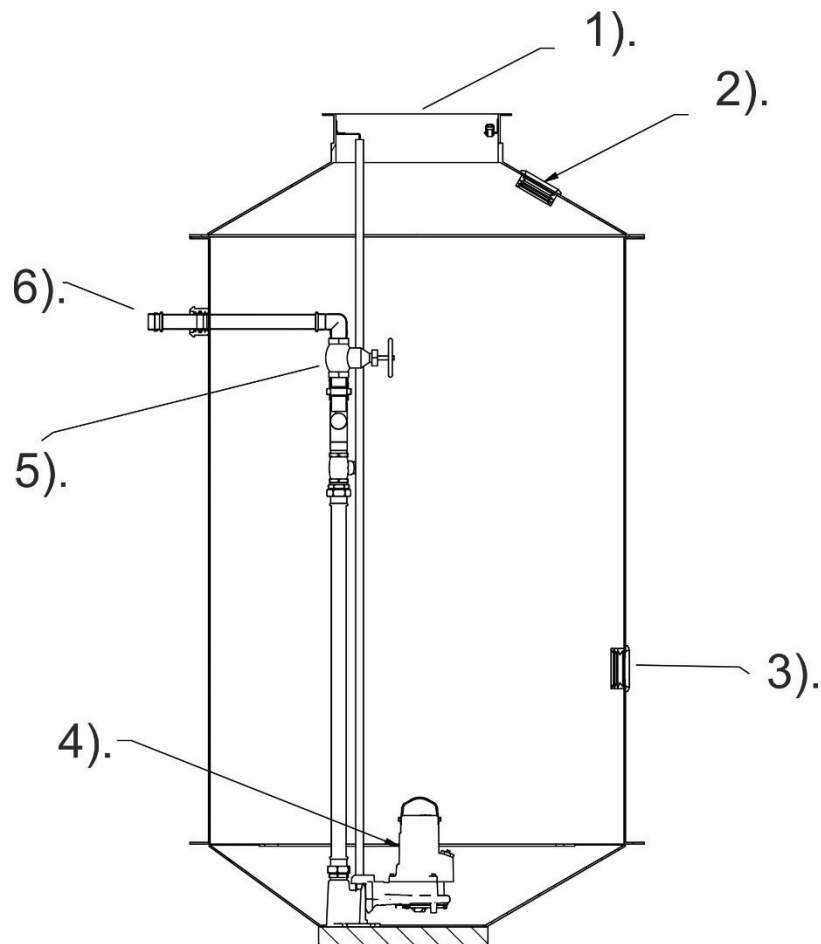
The installer/operator is responsible for following the instructions and complying with the safety requirements given in this operation manual.

Failures to install, operate, or maintain the equipment according to the 'Operating & Maintenance Instructions' could invalidate the warranty as provided by KGN Pillinger.

No liability can be accepted for damage or operation disorders that are the result of non-compliance with the operating instructions.

4). Main Component Listing - *UPOD underground plant room range.*

<u>Ref</u>	<u>Component</u>
1	Access Cover
2	Cable Duct
3	Inlet
4	Pump(s)
5	Isolator Valve
6	Discharge



5). Handling:



Assembled units are heavy. Failure to properly lift & support these sets can result in serious personal injury and/or equipment damage. The appropriate rated lifting devices and methods must be used for & during lifting operations.

- Delivery vehicles should be guided and supervised on site at all times by a competent banksman.
- If a crane is used, ensure that it is adequately sized, correctly stabilised, and supervised by a suitably qualified experienced banksman.
- Only qualified personnel should be involved in lifting or transporting this equipment.
- If unloading is to be carried out in a public area, the appropriate Personal Protective Equipment must be worn and local safety rules must be observed and obeyed.
- If the GRP Pump Chamber is to be further transported by vehicle, first remove the pumps and access cover. The GRP Pump Chamber should be secured to the vehicle around the chamber NOT around the inlet / outlet / cable duct(s).
- For off-loading use nylon slings, ensuring the GRP Pump Chamber is not subjected to any sharp impacts.

6). Operating Limits:

See product/pump specific operation & maintenance manual for further details.

Noise emissions:



Exposure to excessive noise can cause permanent hearing damage. It is the end users' responsibility to identify the required legal requirements, ensuring the appropriate safety equipment (PPE) is applied and noise control is in place.



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Operating & Maintenance

Submersible Pump Set

7). Product Identification Code(s).

All KGN Pillinger Submersible Pump Sets are identified by either of the below coding options:

- 'P' Number.
- Serial Number
- Site/job Reference.

For assistance e-mail service@kgnpillinger.com or telephone **0208 681 0097**



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8). Health & Safety

WARNING

It is the responsibility of the customer, and/or contractor to ensure: anyone working on the equipment is wearing all necessary PPE, aware of the appropriate health warnings and has read & understood the information in this manual.

- Foul water pumps will be handling raw sewage, which can lead to Leptospirosis (or Weils Disease), which can potentially be a life-threatening disease if it comes into contact with broken skin.
- Due to the nature of the surface water the pumping stations could contain unknown substances creating potential hazards ranging from chemicals within the water to harmful gasses within any pump chamber.
- Only those engineers trained and qualified to work with such hazards and in confined spaces should attempt any level of service or maintenance on these pumps.

WARNING

Sewage gases are explosive and toxic.

The equipment and the area immediately surrounding it should be subject to the following safety precautions:

- NO SMOKING.
- No naked flames or sparks.
- Only qualified people may carry out maintenance / service work.
- Nobody may enter the chamber until the atmosphere is checked for safety by means of a suitable portable gas detector.
- Nobody may enter the chamber until the equipment is switched off & isolated electrically with a lock out.
- Temporary barriers and warning signs must be erected around all open access covers.



9). Blockage Prevention

WARNING

Do not dispose of the following items through the drainage or pump system.:

- Disposable nappies - These are not designed to be flushed down the toilet, and will certainly block the pump if disposed of in this way.
- Sanitary towels - Due to changes in design and material used, these are no longer flushable and ought to be disposed of in a bin.
- Items made of cloth or plastic - These should not be flushed down the toilet, as again they do not break up in order to be pumped away. The more common items found in cases of blockages along these lines are cleaning cloths, condoms and cotton buds.
- Toilet cleaning wipes - These are becoming more commonly used and they cause problems for all pumps as they do not break up causing blockages.
- Cooking Fat - The build-up of fat in the sump is a common problem. If fat comes into contact with cold water it solidifies causing the start/stop float to jam, in which case the pump will either burn out or stop working.

These items will cause pump failure due to blockages, and any site attendance by our engineers will be fully chargeable and could prove very costly:

10). Installation

IMPORTANT - This GRP tank is a liner and must always be supported by a concrete base and concrete surround of adequate thickness and suitable for the ground conditions. This concrete surround should be a minimum of 200 mm.

- The depth of excavation needs to be at most 500 mm deeper than the overall tank depth (plus roof slab if applicable), to allow for the construction of a hard-core/concrete base.
- **NO WARRANTY CLAIM CAN BE ACCEPTED FOR FRACTURE FAILURES.**
- As the tank is hand made from GRP, the exact dimensions are not guaranteed to be exact to the size offered/supplied. It is the installer's responsibility to measure the tank supplied before sizing the excavation.
- The access cover and moulded feet (if fitted) may be additional to the nominal size of the tank. Installation must be carried out as per the following instructions:
- Select a suitable location for the tank. This will be normally in the ground lower than the properties that are being drained and allow for falls in site drainage.
- Check no other structure or special access is required over the selected spot.



Installation – Continued:

- Provision can always be made, if necessary, to place the tank beneath a roadway, provided that protective backfill is placed around it and a suitable duty manhole cover and frame is used over the opening.
- Check that no underground cables, pipes or service ducts lie beneath.
- Excavate the required opening in the ground to receive the tank and pipe work to be used.
- The sides of the excavation should be battened for safety and to prevent earth slippage.
- A sump should be left in one corner for dewatering. A dewatering pump may be required to control any ground water present.
- Some clean hard-core should be placed and consolidated in the base of excavation. Usually this will need to be about 200 mm thick, but in good ground should be a minimum of 50 mm.
- Lay concrete (minimum grade 25) to a minimum thickness of 150 mm, on top of hard-core and compact well down.
- Ensure correct orientation of the inlet/outlet pipes and other connections.
- Lower the tank onto the damp concrete base, allowing the base feet or mouldings to settle in.
- The tank must be settled fully in the correct position into manipulable, wet concrete base.
- If the inlet socket(s) is positioned less than 800 mm up from the base of the tank, make this connection at this point.
- Fill the tank with approximately 700 mm depth of water.
- Pour concrete surround in situ to a thickness of no less than 200 mm and to a height of 600 mm from the concrete base using minimum grade 25 concrete.
- The concrete must be evenly poured around the tank periphery and must NOT exceed the depth of water in the tank at any time.
- The concrete should be vibrated to leave no voids.
- Care must be taken to ensure that any pipes or other connections made are not damaged.
- The concrete will secure into position any pipes that have been connected.
- Ensure that the tank is vertical by use of a spirit level across the tanks opening.
- Additionally, ensure that the tank is at the correct depth level. Allow the concrete 'anchor' to set.
- **NOTE - DO NOT REMOVE THE WATER FROM THE TANK.**
- Make connections to the site pipework, cable duct and vent (if applicable).
- The water level should gradually be raised consistent with the increasing level of concrete poured and should remain 100 mm higher than the concrete backfill. It is essential that the tank remains level at all times.
- Leave the water in the tank until the concrete has fully set.
- If required, construct a concrete cover slab (with access opening) of maximum 200 mm thickness, ensuring that the slab is supported by consolidated backfill, or utilise engineering brick courses to the sides of the GRP opening/manway. These must be supported by consolidated backfill/concrete.
- The access cover/frame would have been supplied unattached to the tank. Set the frame into the concrete cover slab or a brick course (see figure 1).

Installation – Continued

- Construct a concrete plinth for the control panel kiosk (where applicable), as detailed on our kiosk base drawing (available on request).
- Empty the tank of water, whilst ensuring that any debris is removed.
- Partly refill the tank with clean water for testing the system upon commissioning and to facilitate a flush through of the discharge pipe prior to sewage/drainage pumping.
- Install the pumps, float-switches and interconnecting cables. If extensions are required, draw these electrical cables through the cable duct to the proposed position of the control panel.
- Position the control panel (and kiosk if applicable).
- Provide a suitable electrical supply, to be isolated and adjacent to the positioned control panel.
- Make the final electrical connections according to the 'Field Connections' instruction provided with the control panel. Always check the rotation direction of the pumps to ensure they have been correctly wired.

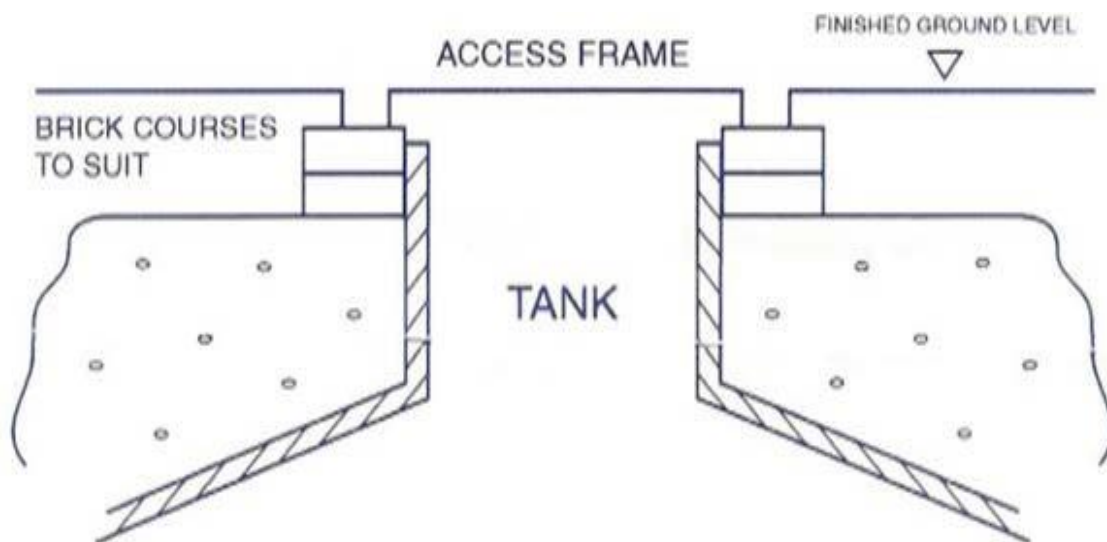


Figure 1

Electrical Connections



These instructions are in general and not specific to a particular pump set – refer to your quote/order details to confirm specific model.

- The incoming supply must be sized to carry the motor full load current of all pumps (as all can be in operation at any one time).
- All electrical connections are to be made against the relevant product wiring diagrams.
- All electrical connections should be sized, installed and protected in accordance with the requirements of the latest safety standards and any other current local rules and regulations.
- It is the responsibility of the installer to ensure that the cable and fuse/MCB protection is suitably rated to accommodate the pump set, and that the integrity of the main incoming supply is tested and certified prior to applying power to the set.
- **It's essential that this equipment is earth bonded to the building earth system.**

Pre-start up

- It is the responsibility of the engineer/operator to ensure that the pumps and motors are clear of obstructions and correctly located on their 'Duckfoot' auto coupling and that the pumps are always covered with water.
- The pump must not be allowed to run dry under any circumstances as overheating will rapidly damage the internal components of the pump.
- Pipework attached to the pump set must be suitably supported so that there are no forces acting upon the discharge pipes of the set.

The automatic coupling system allows for quick and efficient inspection operations. The coupling foot is fastened to the bottom of the sump together with the delivery pipe; two guiding tubes connect it to the anchoring bracket secured to the edge of the sump cover. The pump is lowered along the guiding tubes until reaches the exact coupling position; the seal will be tight thanks to the weight of the pump. This operation can be repeated any number of times and it makes checking and inspection operations easier; the pump is simply extracted from the sump by means of a chain (even if the system is flooded), checked or repaired and reassembled.

Please refer to the pump manufactures manual for specific details of equipment installed

11). Commissioning

If the pumping equipment is not installed, operated and maintained correctly it can lead to failure, void warranty and cost time and money.

The commissioning of the set assures all systems and components of the equipment supplied are installed, tested, operated and maintained according to the operational requirements of the system.

The commissioning process comprises of a set of engineering philosophies and procedures that inspect and test every operational component of the equipment, from individual functions such as instrumentation and control logic, through to the full operation of the system.

The main objective of commissioning is to provide the safe and orderly handover of the unit to the customer, guaranteeing its operability in terms of performance, reliability and safety.



We recommend the unit is commissioned and subsequently serviced biannually by a fully trained KGN Pillinger engineer.

12). Operation

Duty/Standby

These units are designed to operate on a Duty/Standby basis under the dictates of either:

1). Float Switches - 'Stop', 'Start' & 'High Level'.

2). Electrodes - 'Stop', 'Start', 'High Level' and 'Common'.

- The starters are interlocked so that only one pump may run at any time whether manual or auto control has been selected.
- In manual control each pump may be run on its own by operating the respective 'manual' switch mounted on the door.
- In auto control the pumps will run under level control by operating both 'auto' switches. As the fluid level rises the duty pump will become enabled via the relative float/electrode.
- This pump will continue to run until the level falls below the stop position of the float/electrode.
- The pump duty is now alternated so that the other pump becomes the duty unit next time they are called to run.



Operation – Continued:

- Should the duty pump be running and the level continues to rise to the high level float/electrode, the high level light will illuminate and the buzzer will sound. This may be muted by pressing ‘cancel alarm’. This alarm may be reset once the level is below the high level float switch.

Duty/Assist

These units are designed to operate from either:

- 1). Float switches - ‘Stop’, ‘Duty Start’, ‘Assist. Start’ and ‘High Level’.
 - 2). Electrodes - ‘Stop’, ‘Duty Start’, ‘Assist. Start’, ‘High Level’ and ‘Common’.
- In manual control each pump may be run on its own by operating the respective ‘manual’ switch mounted on the door.
 - In auto control the pump/s will run under level control by operating both ‘auto’ switches. As the fluid level rises the duty pump will become enabled via the relative float/electrode.
 - If the level continues to rise the Assist Pump will become enabled via the second float/electrode. The pump/s will continue to run until the level falls below the stop position of the float/electrode.
 - The pump duty is now alternated so that another pump becomes the duty unit next time they are called to run.
 - Should the duty pump be running and the level continues to rise to the high level float/electrode, the high level light will illuminate and the buzzer will sound. This may be muted by pressing ‘cancel alarm’. This alarm may be reset once the level is below the high level float switch.
 - Should the duty pump have stopped or failed to clear the sump water and the level has reached the high level float/electrode, the assist pump will start and run until the level falls below the stop float. Visual and audible indication of high level will also occur again at this point.
 - The remote beacon will be illuminated until the level falls below the high level float at which point pressing ‘cancel alarm’ will extinguish the beacon.

13). Maintenance



We suggest that routine maintenance visits are carried out on a twice yearly basis by a KGN engineer.

On each service we would carry out the following:

- Lift and clean the pumps.
- Top up the oil levels where necessary.
- Test the pump motors.
- Clean and check the operation of the electrodes, non-return and gate valves and all associated electrical connections.
- Test all electrical controls.
- The pits would be inspected, cleaned and cleared of any foreign matter, which could be detrimental to the smooth running of the equipment.
- Following each visit, we would send a separate report of our findings, together with an invoice for the service.
- Any minor faults found during the service visit would be rectified at the time following verbal instruction, although should we pick up on any more major faults, you would be notified in writing and the work would be carried out and invoiced separately on receipt of an order from yourselves.

The unit is constructed using low maintenance components throughout and should not require any day to day maintenance.

The following is the recommended frequency for various maintenance tasks.

- Other items, such as security of fixings, terminations, plant room mechanisms and accessories are not specified, but should be carried out as a matter of course, as on any other piece of equipment.



Monthly checks:

- Make a thorough visual check of the equipment, watching the operation through a complete cycle.
- If dirt or debris appears to be clinging to the high level float switch - or to the other float switches when fitted, clean them off by spraying with a water hose.
- Check that the high level float switch - and the other float switches when fitted - have not moved from their pre-set positions and that the pumps are operating correctly.

15). General Fault-Finding Guidance:

FAULT	POSSIBLE CAUSE	RECOMMENDED ACTION
<u>Pumps will not run:</u>	1). Power failure.	Check main isolator. Check that a power supply is available prior to the control panel – (e.g Distribution board)..
<u>Pump(s) start frequently:</u>	1). Start switching point set to low.	Reset the switching point higher
<u>Pump(s) run longer than normal operation:</u>	1). NRV not sealing properly. 2). Discharge pipe blockage.	Check. Check and remove any blockages.
<u>Pumping station 'flooded':</u>		Isolate electrical supply. Use a separate portable pump to pump out chamber as low as possible. Check for cause of flooding and repair.



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Disposal:

This product and its associated parts must be disposed of in accordance with local regulations, including all packaging.



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16). EC Declaration of Conformity



EC DECLARATION OF CONFORMITY

We hereby declare that the following KGN Pillinger (KG Norman Ltd)
manufactured products:

Type A, AV, EV, SE, FSA, CAT5 & UPOD

are produced in accordance with the below provisions laid down by the:

MACHINERY Directive (2006/42/EC)
LOW VOLTAGE Directive (2014/30/EU)
EMC Directive (2014/65/EU)

& conforms to the below technical standards:

EN ISO 12100:2010 - EN 809+A1:2009 – EN 61000-6-1:2007 – EN 61000-6-2:2005
EN 61000-6-3:2007+A1:2011 - EN 60204-1:2006+A1:2009

Christopher Norman
Director

For & on behalf of
KGN Pillinger
CROYDON
03/01/2020