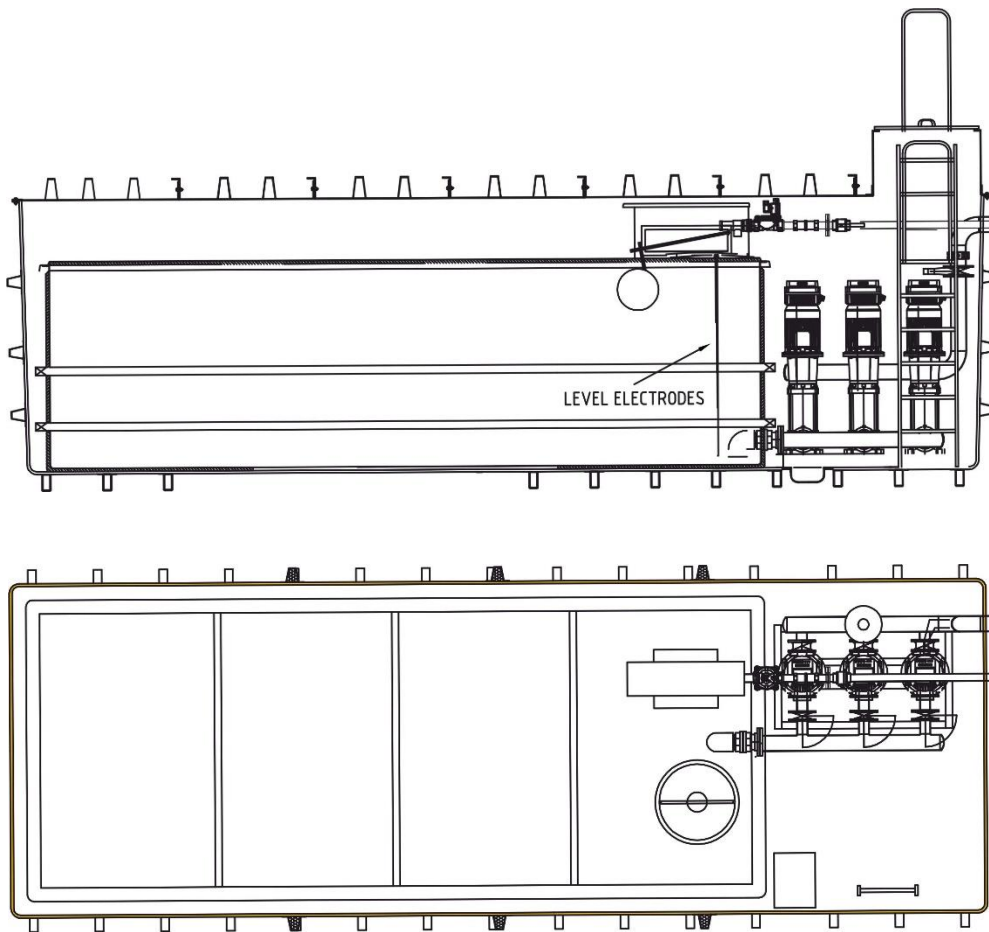




UPOD Underground Plant Room

Operating & Maintenance

Original Instructions
Dated: 30.09.2020 – Revision: 1



Ref: OM0004



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Operating & Maintenance

UPOD Underground Plant Room

Table of Content:

1) Introduction	3
2) Warnings for the Safety of People & Property	3
3) Overview	4
4) Main Components	5
5) Storage & Handling	6
6) Operating Limits	6
7) Product Identification Code	7
8) Guidance	8
9) Health & Safety	8
10) Installation	9 – 11
11) Commissioning	11
12) Operation	12 – 13
13) Product Specific Manuals	14
14) Maintenance	14 – 15
15) General Fault-Finding Guidance	16
16) Ec Declaration of Conformity	17

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 underground plant room pumping stations (UPOD) consists of an external GRP chamber, 1 or 2 internal GRP break tanks with 'type AB' air gap fitted with inlet ball valves fitted.

Also fitted into the inlet line are a double check valve and a normally closed – energised open safety solenoid valve, designed to shut off the water supply to the tank in the event of a power failure or excessive water being detected within the chamber.

The UPOD chamber is supplied with:

- A sump and sump pump. This pump is designed to operate upon detection of the accumulated water level in the sump, interfacing with a pre-set level sensor, and pumping the collected water externally to a drain point.
- A KGN Pillinger 'AV or EV Range' cold water booster set.
These sets will automatically control the pressure in the water distribution system, using pressure switches or variable speed drive invertors. The set is permanently connected to the system, delivering water at a pressure range within a pre-determined window, on a Duty/Assist or a Duty/Assist/Assist (or Standby) basis, depending on the number of pumps fitted, and the control logic required.
See product specific manuals on page 14 for further details
- An accumulator pressure vessel, or number of vessels, sized on the area and specific requirements of the system, is/are attached or included on the set, and will act as a hydraulic buffer between the booster set and the system.
- An electrical control panel on the equipment board within the chamber and a remote mimic panel, to be located above ground and in a location where the indicator lamps will enable an observer to monitor the status of the plant at any time.
- Pipe work and service ducts, these are extended and will terminate outside the chamber at one end, to enable the civil engineers to make the final connections, prior to the completion of the back fill, without the need to enter the confined space area.

* The following options may be included within the supply of the unit:

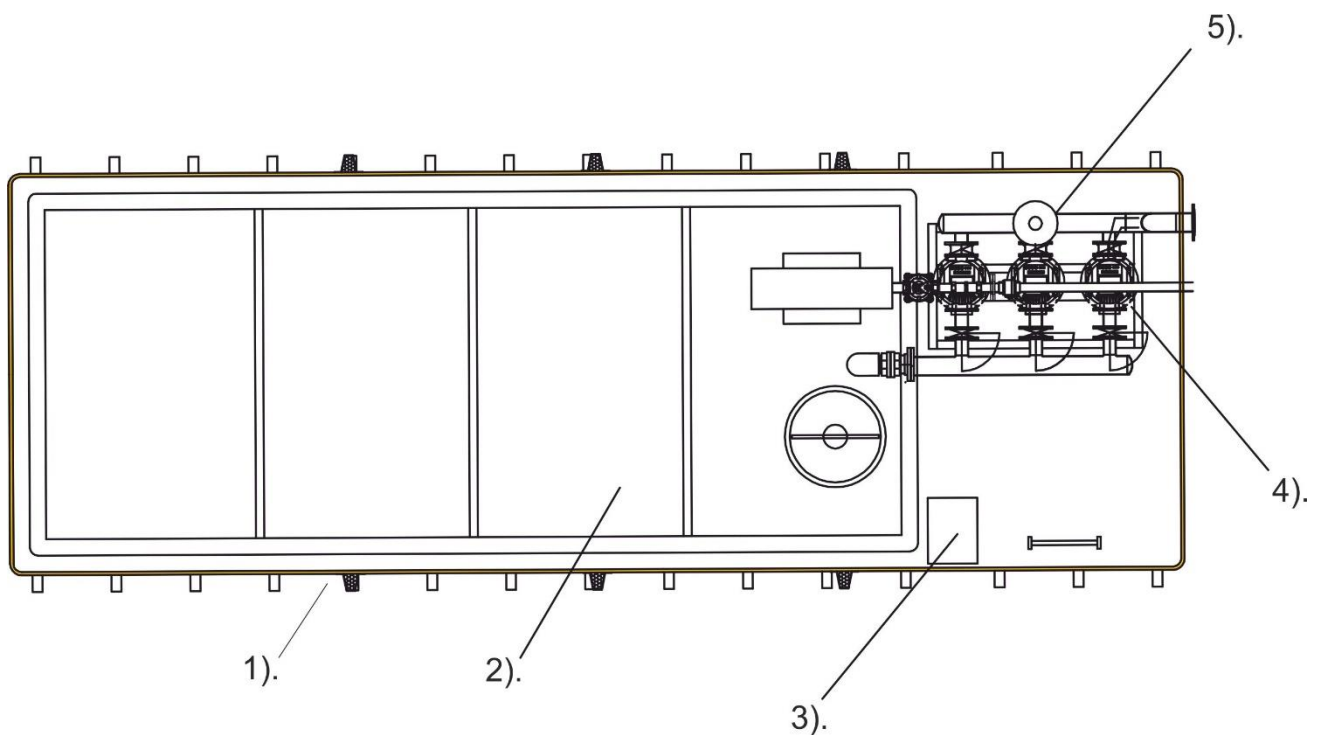
- Ventilation Fans (Inlet & Extract) c/w humidistat.
- Tubular Heater c/w Thermostat.
- Fluorescent Lighting (or Maintained Emergency Fluorescent Lighting) c/w waterproof switch.

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- 13 amps RCD protected switched socket outlet.

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

<u>Ref</u>	<u>Component</u>
1	Underground Chamber
2	Water Storage Tank with air gap
3	Sump Pump
4	Booster Set
5	Pressure Vessel



5). Storage & 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.

- Ensure the storage area has an adequate flat, clean, hard surface for the safe storage of the UPOD.
- The UPOD must remain level during lifting operations.
- At least two webbing slings should be run around the UPOD between the base steels by a trained and competent slinger.
- It is the responsibility of the slinger/crane operator to ensure that the UPOD is slung correctly and the centre of gravity is correct.
- Ensure the straps are clear of any external fittings.
- Lifting straps must be used when lowering into final position. Care should be taken to keep housing steady and upright.

WARNING

DO NOT Attach eyebolts, plate clamps, bull dog grips, chain blocks etc. to the UPOD.

6). Operating Limits:

See product/pump specific operation & maintenance manual.

Noise emissions:



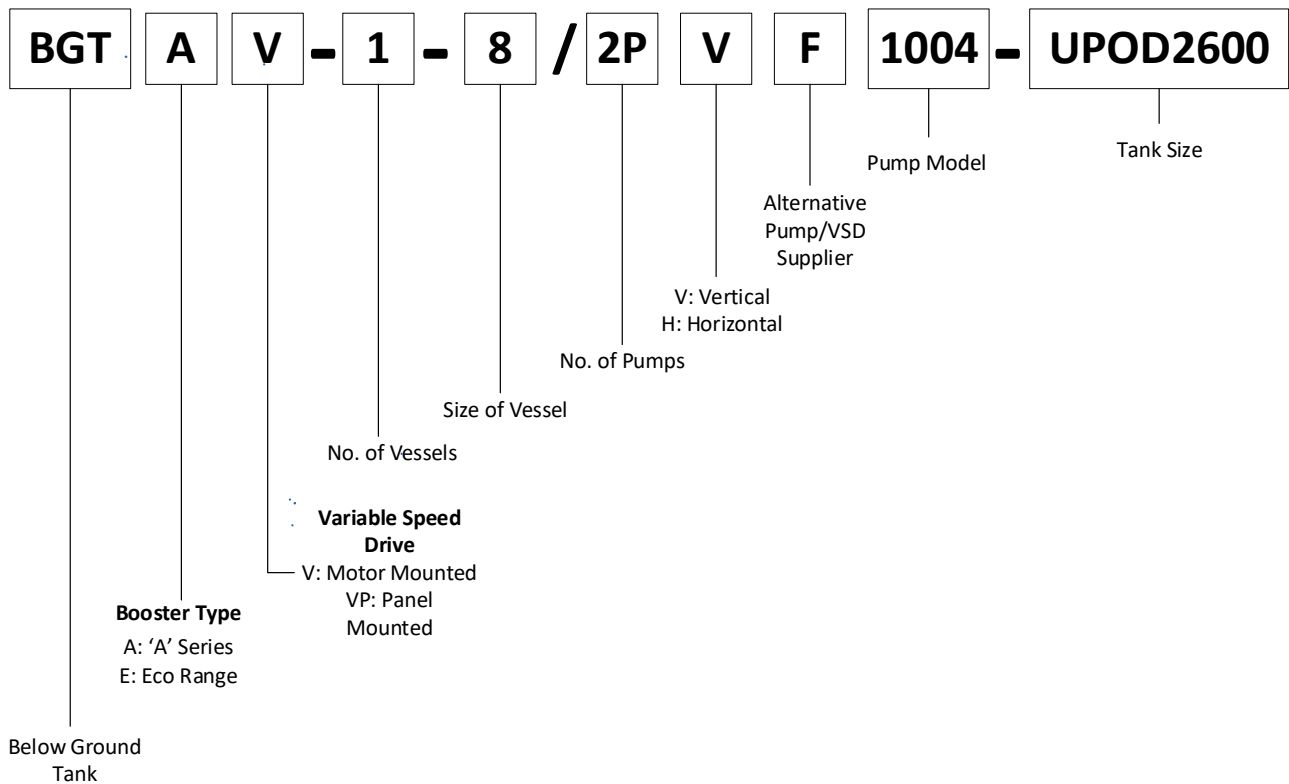
Exposure to excessive noise can cause permanent hearing damage. It is the end users' responsibility to identify the required legal requirements, ensuring the appropriate safety equipment (PPE) is applied and noise control is in place.



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7). Product Identification Code(s).

All KGN Pillinger UPOD underground plant rooms are identified by the below coding, each product will have this clearly affixed to the set:



8). Guidance

WARNING



IT IS ESSENTIAL THAT ONLY THOSE QUALIFIED AND AUTHORISED ARE ALLOWED TO WORK ON THIS EQUIPMENT.

PERSONNEL SHOULD ALWAYS ENSURE THAT ADEQUATE ELECTRICAL AND MECHANICAL ISOLATIONS ARE APPLIED WHEN WORKING ON THE PLANT.

CAUTION: THE PLANT CAN START AUTOMATICALLY AT ANY TIME WITHOUT WARNING

- Note: Power to the UPOD must be supplied at the earliest stage possible after installation in the ground. This is to ensure the sump pump is operational even if the booster set is not ready for commissioning.
- All connections should be blanked to prevent water ingress until they are connected up. The connections must be made to the external terminations as soon as possible.
- The fan ducts and sump pump pipework must be terminated above ground and above the flood level for the area; these need to be elbowed downwards with insect screens installed.
- It is the responsibility of the installer to ensure the UPOD is secure from any ingress of water during the installation period.
- A capped cable duct is fitted on the end of the UPOD (where all other terminations are made). Once on site and cables have been run through the duct, installers will need to fill with water and vermin proof foam. We would recommend something similar to 'Densoseal 16A'.

9). Health & Safety

WARNING

UNDERGROUND PLANT ROOMS ARE CLASSIFIED AS 'CONFINED SPACE AREAS' AND AS SUCH THERE IS A POTENTIAL RISK OF DEATH OR SERIOUS INJURY FROM HAZARDOUS SUBSTANCES OR DANGEROUS CONDITIONS (E.G. LACK OF OXYGEN).

- A Risk Assessment, Method Statement and Escape Plan must be put in place prior to entering the chamber or carrying out any works (under the Management of Health and Safety at Work Regulations 1999, regulation 3).
- The hatch must remain sealed at all times except when in use. No personnel may enter the chamber unless accompanied by a 'Top Man', who must remain in constant visual contact with the entrant at all times.



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Operating & Maintenance

UPOD Underground Plant Room

- Any operative working on or around equipment must wear suitable PPE clothing at all times.
- There is also the small likelihood of harmful gasses being present within the underground plant room and gas detection equipment must always be used prior to and during any entry to the plant room.
- Before entering the chamber, it is recommended that the hatch/access cover is lifted and a certified gas detector is lowered into the chamber for a minimum period of 5 minutes to ensure the chamber is safe to enter.

10). Installation

- Rot-proof, non-structural cores to structural rib profiles are all fully encapsulated with anchorages into concrete surround.
- Penetrations through the UPOD are minimised where possible to services connections only by use of bonded fixtures.

Note: This GRP chamber is a liner and must always be supported by a concrete base and concrete surround of adequate design and thickness for the ground conditions.

No warranty claim can be accepted for fracture failures.

- Do not cut, drill or grind any aspect of the UPOD.
- As the chamber is 'hand-made' from GRP, the dimensions cannot be guaranteed to be exactly to the nominal size offered.
- It is the responsibility of the Structural Engineer to specify and verify all load bearing structural details.
- The ground bearing slab should be minimum 200-250 mm thick, the walls 400-500 mm thick and the cover slab 20 mm thick.
- KGN Pillinger Underground Plant Rooms have been designed to be suitable for installation to a maximum depth of cover of 1000mm in fully saturated ground conditions.
- Depending upon the design of the concrete surround and slabs the UPOD can be situated under roadways or other highly loaded situations.
- The design of the temporary works should account for existing underground services, the stability of the excavation and dewatering during construction.
- Excavate the required opening in the ground to receive the tank and pipe work to be used. If a machine is used to remove the spoil, the sides of the excavation should be battened for stability and a sump left in one corner for dewatering purposes.

Excavation may require dewatering during the construction phase to prevent overload or floatation of the incomplete installation.

- The UPOD is supplied fully equipped and ready for installation.
- Do not remove any cover fixings - access into the UPOD is by the access hatch only.
- The concrete base is to be flat, dry and free from debris prior to the positioning of the UPOD.
- Lifting straps must be used when lowering into position and care should be taken to keep housing steady, upright and the correct way round.
- The UPOD must remain level during lifting operations.

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- At least two webbing slings should be run around the UPOD between the base steels by a trained and competent slinger. It is the responsibility of the slinger/crane operator to ensure that the UPOD is slung correctly and the centre of gravity is correct.
- Ensure the straps are clear of any external fittings.

Installation – Continued:

- Visually inspect the UPOD for any accidental damage and arrange repair by KGN Pillinger before installation.

WARNING

Do Not: Attach eyebolts, plate clamps, bull dog grips, chain blocks etc. to the UPOD..

- All connections to the UPOD should be made by suitably qualified personnel in accordance with any applicable regulations and with the approval of the Water Provider.
- The UPOD is suitable only for the maximum depth of cover shown on the drawings; depths in excess of this will overload this structure.
- Please ensure that the UPOD cover has been installed and fully sealed and bolted before positioning or backfilling is undertaken.
- The concrete backfill should be installed carefully and evenly placed to avoid imbalance or shock loading, maximum lift as specified; please refer to UPOD drawings.
- A concrete cover slab (with access opening) of maximum 210 mm thickness will need to be constructed, ensuring that the slab is supported by consolidated backfill, or by utilising engineering brick courses to the sides of the GRP opening/man way; again these must be supported by consolidated backfill and/or concrete. The cover slab cannot be placed until the concrete has achieved sufficient strength.
- The UPOD wall design relies upon the integrity of the dry lean concrete backfill and in particular it's anchorage through embedment of the side wall ribs and base bearers.
- The dry lean concrete must be placed to at least the level shown in drawings, filling of the void under the UPOD with dry lean concrete is not critical.

Whilst the equipment carries a full 12-month warranty from date of dispatch, normal maintenance must be carried out during this time to ensure that the warranty is not invalidated.

Electrical Connections



Power to the UPOD must be supplied at the earliest stage possible after installation in the ground. This is to ensure the sump pump is operational even if the booster set is not ready for commissioning.

- Connect incoming *electrical mains supply to the panel and low voltage connections to the low water cut off device.
- 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 See page 14 of this manual for further product specific details.
- 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.**

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.



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Pre-start up

Accumulator Pressure Vessel

The accumulator expansion pressure vessel is designed to act as a hydraulic buffer between the pumps and the system helping to reduce the number of starts per hour of the pumps.

During commissioning the pressure vessel/s will be pre-charged with either dry clean air or oxygen free nitrogen gas. This must be checked and adjusted if necessary, on a regular basis to maintain the correct operation of the system.

Pumps

Ensure the pump/s have been filled with liquid, primed and bled before operation and are running in the correct direction and rotation as indicated on the pump/s.

[See page 12](#) of this manual for further product specific details

12). Operation

Please refer to the booster set specific operation & installation manual for further details.

Variable Speed Drive Adjustment (VSD)

- If you need to modify the settings, refer to the designated manual QR code as laid out on [page 14](#) of this manual.

Slow Fill - Anti Surge (AV units only)

- In the event of a power failure or when starting the pump/s on an empty system, the pump/s can quickly run to full speed in order to meet the required pressure. This can cause a pressure shock wave to travel through the system.
- The Slow Fill system will manage an acceptable level of water to fill the system at a reduced pressure and the variable speed drive will operate the pump/s to achieve a set pressure before running at full capacity.
- The Slow Fill system is currently only available on boosters fitted with Hydrovar variable speed drives but can be designed and fitted to any new or existing system



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Level Electrodes

The electrodes fitted into the tank are the Omron PS - Multi-cluster type (see below).

Level Electrodes mounted in the supply tank will monitor the current level of the water available to the system.

If the level drops to the 'Low' level probe the pumps will be disabled and lock out, a warning light on the fascia of the control panel will illuminate, enabling a signal that can be monitored by the mimic panel and any Telemetry / SCADA System that may be available.

If the level in the tank reaches the 'High' Level probe the inlet solenoid will be disabled, preventing more water entering the tank, a warning light on the fascia of the control panel will illuminate, enabling a signal that can be monitored by the mimic panel and any Telemetry / SCADA System that may be available.

13). Product Specific Manuals

For further details please refer to the specific manufacturer product manual available via QR code(s) below or via <https://kgnpillinger.co.uk/download-centre/> . Manufacturers/ products are identifiable by their product name plates located on the individual product



KGN AV – EV Pressure Boosting Set

Scan the code with your smart device camera (or click the code) to be directed to the product specific operating manual for in-depth details.

Lowara Doc Submersible Pump

Scan the code with your smart device camera (or click the code) to be directed to the product specific operating manual for in-depth details.

Further 3rd Party Products

14). Maintenance



Do not touch any live parts for at least 8 minutes after switching off the power.

The electrical system must be isolated prior to carrying out any works.

WARNING

Failure to maintain the unit(s) may result in partial or complete failure and cause damage to property.

- 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.

We recommend the unit is inspected frequently and serviced biannually by a fully trained and qualified - KGN Pillinger engineer.

Monthly checks:

- Pumps for leakage and quiet running.
- Operation of set and test auto duty rotation.
- Pipework and installation for condition and leakage.
- Internal Inspection – Examine internal surfaces for signs of possible contamination & debris.

Six monthly checks (in addition to monthly schedule):

- Pre-charge pressure in the vessel and top up if necessary.
- Operating points of pressure switches and adjust if necessary.
- Exercise valves to prevent seizure.
- Control panel - test trips, check contactors, lamps etc.



Annual Check:

Entry/Escape Hatch & Ladder:

- Rubber seal for any signs of it being perished or damaged.
- Mounting screws and latches for any degradation for replacement or a requirement to tighten if loose.
- Hatch unit for any signs of damage.
- Extension ladder – for any visible cracks or damage to the fiberglass rungs.

15). General Fault-Finding Guidance:

FAULT	POSSIBLE CAUSE	RECOMMENDED ACTION
<u>No power, the set is off:</u>	1). Power supply disconnected. 2). Switch is in the off position.	Connect power supply. Switch set to on.
<u>Pump(s) fail to start:</u>	1). Power supply issue. 2). Low water level.	Reinstate incoming power supply. Reinstate incoming water supply.
<u>Pump leaks water:</u>	1). Defective mechanical seal. 2). Mechanical stress on pump.	Replace the seal. Support the pipe work.
<u>Pumps start frequently:</u>	1). If newly installed, air may still be present within pipework. 2). Vessel pre-charge is set incorrect.	The system requires bleeding to remove air. The vessels pre-charge requires adjustment to appropriate level.



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Operating & Maintenance

UPOD Underground Plant Room

Disposal:

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



K.G. Norman Ltd – t/a KGN Pillinger

Unit 3, 214 Purley Way, Croydon, CR0 4XG - UK

16). EC Declaration of Conformity

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Operating & Maintenance

UPOD Underground Plant Room



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