

# DTB Packaged Pump Pit Installation Manual

# Table of Contents

Table of Contents.....	2
INTRODUCTION.....	3
IMPORTANT .....	3
SAFETY PRECAUTIONS.....	3
INSTALLATION DRAWINGS .....	4
1. PLUMBING INSTALLATION DRAWING .....	4
2. PUMP PIT INSTALLATION DRAWING .....	5
3. EXCAVATION HOLE SIZE .....	6
4. ACCESS COVER INSTALLATION DRAWING.....	6
5. CONTROLLER INSTALLATION DRAWING .....	7
PRIOR TO INSTALLATION -                      INSTALLER’S CHECKLIST.....	8
PROCEDURE FOR PUMP PIT INSTALLATION .....	10
SAFETY PRECAUTIONS FOR SEWERAGE PUMP STATIONS .....	11
BREAKDOWN - SAFETY WHEN SERVICING .....	13
ELECTRICAL CONNECTION .....	14
SUPPLY:.....	14
CONTROL PANELS: .....	14
CONDUITS:.....	15
CABLES:.....	15
COMMISSIONING .....	16
GENERAL COMMISSIONING PROCEDURE .....	16
OPERATION .....	17
STORMWATER/SUBSOIL DRAINAGE PUMPS .....	17
SEWAGE PUMPS.....	17
TROUBLE-SHOOTING GUIDE.....	18
CARE AND MAINTENANCE.....	20
WARRANTY .....	21
WARRANTY FORM.....	22

# INTRODUCTION

Congratulations on your purchase of a DTB Packaged Pump Station. With proper care and by following a few simple guidelines your system will give you many years of dependable service.

## IMPORTANT

### **DO NOT ALLOW CABLE ENDS TO BE SUBMERSED!**

Only qualified personnel should install, operate and repair your pump station system. Any wiring of pumps should be performed by a qualified electrician.

Before installation local authorities must be consulted for all applicable codes and regulations.

## SAFETY PRECAUTIONS

1. Ensure installer is aware of “Confined Spaces” guidelines.
2. Make sure that there is sufficient oxygen and that there are no poisonous gases present.
3. Check the explosion risk before welding or using electric hand tools.
4. Do not ignore health hazards. Observe strict cleanliness.
5. Ensure that the lifting equipment (where required) is in good condition.
6. All personnel who are to work with sewage systems should be vaccinated against diseases that can occur.
7. Keep a first aid kit handy.

# INSTALLATION DRAWINGS

## 1. PLUMBING INSTALLATION DRAWING

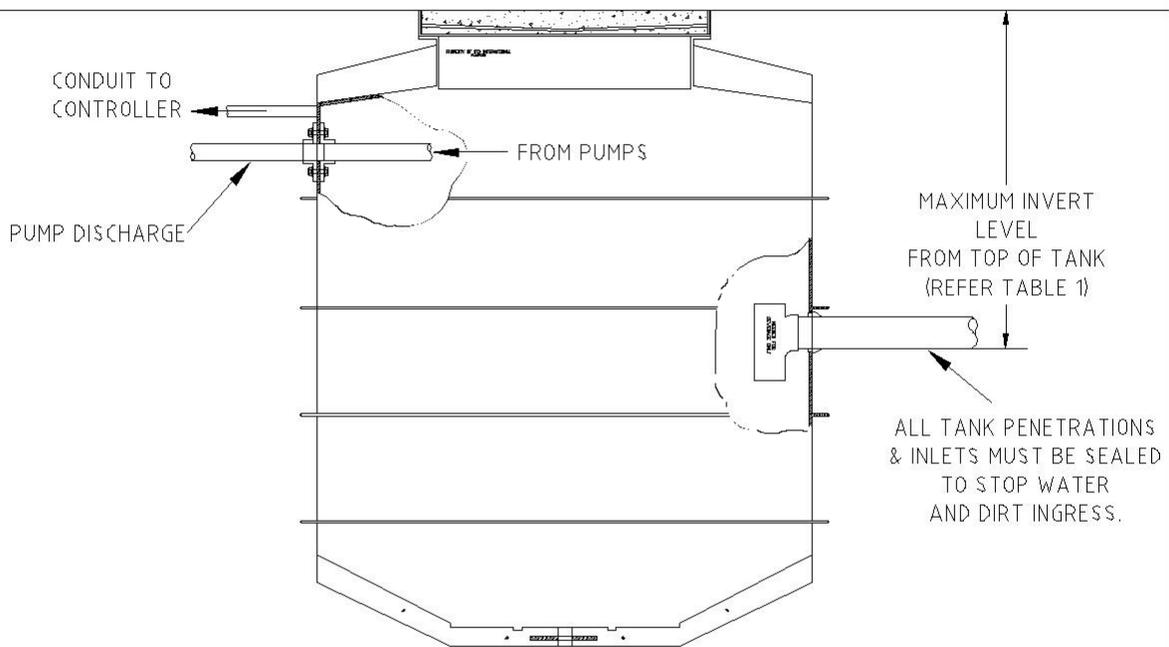
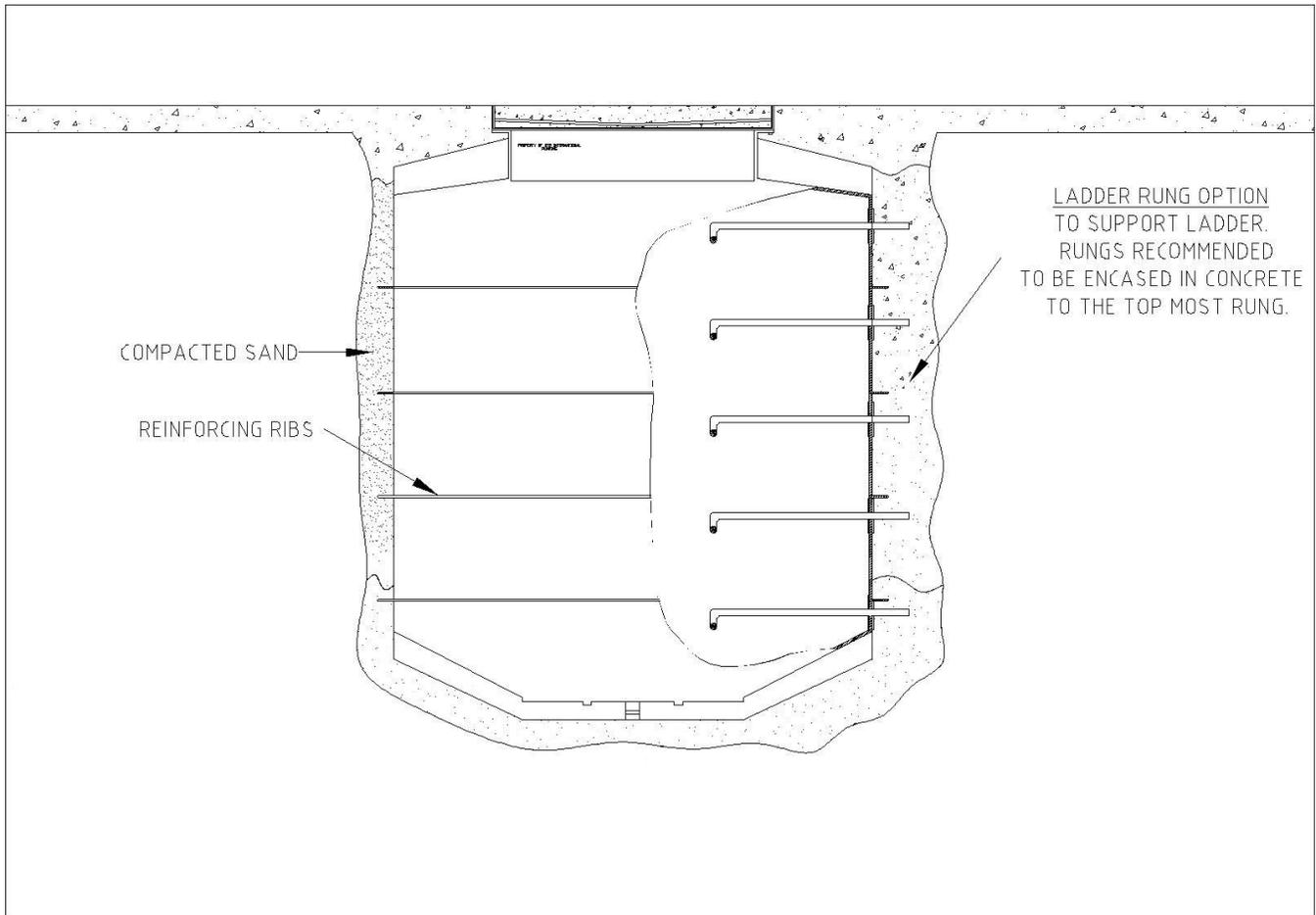


TABLE 1

PUMP PIT SIZE (Litres)	MAX. INVERT LEVEL (mm)
300	450
500	450
900	750
1200	900
1500	1400
2000	1700
3000	1600
5000+	2300

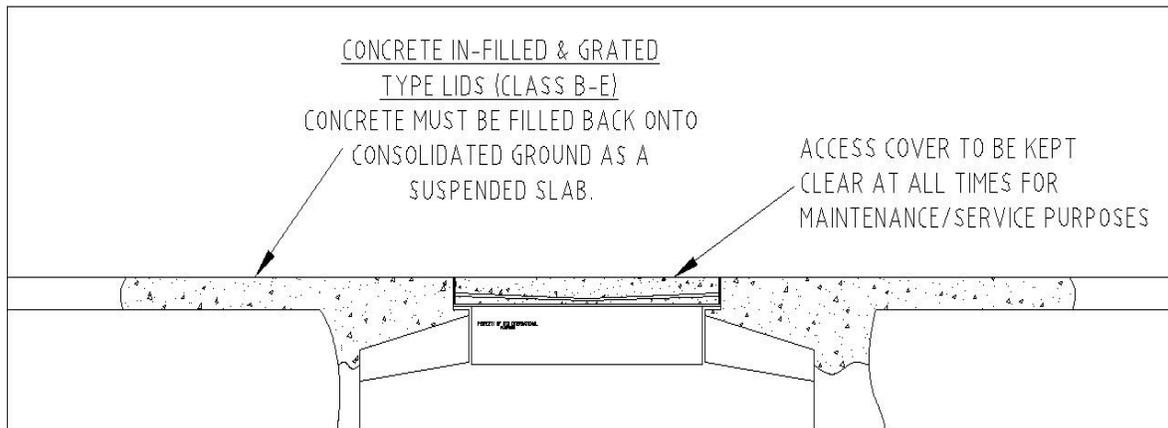
## 2. PUMP PIT INSTALLATION DRAWING



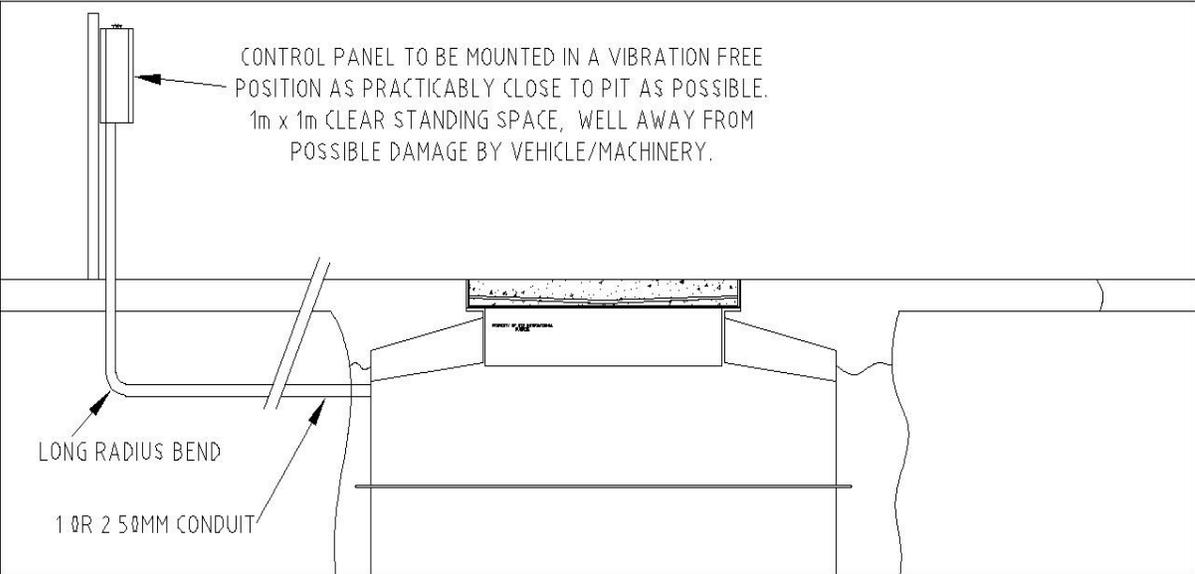
### 3. EXCAVATION HOLE SIZE

EXCAVATION PIT SIZE		
PIT SIZE (LITRES)	PIT DIMENSION (MM)	HOLE SIZE (MM)
300	600W X 600L X 900H	800W X 800L X 1000H
500	Ø1100 X 900H	Ø1300 X 1000H
900	Ø1100 X 1200H	Ø1300 X 1300H
1200	Ø1100 X 1700H	Ø1300 X 1800H
1500	Ø1100 X 2100H	Ø1300 X 2200H
2000	Ø1100 X 2400H	Ø1300 X 2500H
3000	Ø2300 X 2200H	Ø2500 X 2300H
5000+	Ø2300 X 3000H	Ø2500 X 3100H
LADDER OPTION	ALLOW EXTRA 100MM BEYOND EDGE OF LADDER RUNG	

### 4. ACCESS COVER INSTALLATION DRAWING



**5. CONTROLLER INSTALLATION DRAWING**



# PRIOR TO INSTALLATION – INSTALLER’S CHECKLIST

Before installing the pump station, check the depth of the inlet pipe as this will determine the tank depth. (“PLUMBING INSTALLATION DRAWING” P4)

## CAUTION:

- **DO NOT ALLOW CABLE ENDS TO BE SUBMERSED**
- Installation should be carried out by experienced and qualified tradesmen.
- Before digging, call any relevant local authorities to locate any underground lines or cables.
- The installation of a pump station requires the prior approval of local authorities. Questions relating to this should be directed to a responsible officer of local council and/or other relevant authority.

The following information must be regarded as a guide only.

- 1) (a) Determine the best location for your pump pit, and control panel (if applicable).
  - (1) DTB Packaged Pump Stations are generally supplied with 10m total length for pump power supply and float switch cables (Unless otherwise specified).
  - (2) Determine excavation hole size suitable for your “DTB Packaged Pump Station” (Refer “Excavation Hole Size” P6)
  - (3) The control panel should be located within 5-6 metres of the pump station as some length will be lost to depth of pit and cable installation to pump pit.
- (b) Correct appraisal of site conditions is essential before installation of sewage and stormwater pits. Installers must recognise that these pump pits when empty will float on approximately 50mm of water. The upward thrust at the base of the tank fully immersed in water could exceed 69 000 KPA.

Close attention to site conditions is therefore necessary.

(c) Consider.....

- **Drainage**, particularly at the tank base
- The **rise in water** due to
  - (i) tidal conditions
  - (ii) saturation of the ground during heavy rain
  - (iii) likelihood of flooding or run-off water from any source
- The quality of available **backfill**

(d) Where tanks are installed under adverse site conditions, the utmost care is required to prevent any chance of the vessel being forced out of the ground by upward pressure of the water. This can occur if the base is not properly drained.

2. Check for any damage to tanks. During transport and handling over rough ground, be careful to avoid "bruising". Contact with sharp stones or dropping of the tank may result in fractures, which must be repaired before installation to prevent leakage through the tank wall.
3. Plan your installation location carefully to ensure that the inlet pipe stays within the allowable inlet height.
4. Determine where the incoming power will be supplied from and if it can handle the rated load for your pump station.
5. Mount the control panel, when applicable, in accordance with electrical codes and where the alarm light can be easily seen. (See "Controller Installation Drawing" P7)
6. Make sure you have all the necessary equipment and supplies before starting your installation.
7. Determine the length of electrical cable required prior to manufacture of your packaged pump system as all joints in cables must be made by approved DTB technicians. Any cable extensions or jointing by a Non - DTB technician will void warranty on the packaged pump system.
8. Finish ground level in relation to tank access cover, as tank access cover risers are not normally recommended. Pump pit access covers must be accessible at all times. (See "Access Cover Installation Drawing" P6)

# PROCEDURE FOR PUMP PIT INSTALLATION

See "PUMP PIT INSTALLATION DRAWING" P5

1. The hole for the tank should be no greater than 250 to 300mm oversize to tank diameter, with due regard to the amount of backfill to be used under and around the tank. (Refer "Excavation Hole Size" P6)
2. Level and adjust tank to suit installation conditions.
3. Fill tank with water up to the first reinforcing rib or at least 300-400mm depth.
4. The pits are provided with reinforcing ribs. The purpose of these ribs is to create a bond between the pit and the backfill material to withstand the upward forces when the pump pit is empty.
5. Check local council and other authority's requirements concerning backfill levels.  
Ensure you have relevant inspector's approval before backfilling commences.
6. When backfilling use packing sand or clean fill only. At all times be careful that rocky or sharp objects are not used. Avoid use of heavy soils that do not consolidate.
7. Inlet pipes must be vented as according to "Plumbing Codes & Authorities.
8. Inlet pipes must be fitted with a "T" junction and dropper pipe on the inside of tank. (Sewerage Packaged Pump Stations Only)
9. All pipe connections to tanks must be sealed to stop water and dirt ingress.

# SAFETY PRECAUTIONS FOR SEWERAGE PUMP STATIONS

Your wastewater disposal service is part of a low pressure sewer system. The key element in this system is the DTB packaged pump station. The tank collects all wastewater: solids in the sewage/trade waste/effluent are then ground into a slurry, suitable for pumping. The pump generates sufficient pressure to pump this slurry to the discharge point.

Points to remember:

- Minimise the amount of cooking grease entering the system.
- Regulatory agencies advise that the following items should not be introduced into any sewer, either directly or through a pumping station:
  - Glass
  - Metal
  - Baby napkins
  - Socks, rags or cloth
  - Plastic objects (eg toys, utensils etc)
  - Sanitary napkins or tampons

In addition you must **NEVER** introduce into any sewer:

- Explosives
  - Flammable material
  - Lubricating oil and/or grease
  - Chemicals
  - Petrol or gasoline
- Do not leave pump cover off the tank except when servicing, to prevent the entrance of foreign materials such as rocks, metal, soil, animals or humans.
  - Prevent infiltration or direct flow of rain or run-off water into the pump basin to minimize pump cycling. This will prevent overloading the treatment facility and will facilitate swift transportation of waste/sewage/effluent.

- To reduce the risk of electrical shock, pumps and control panels must be properly earthed in the accordance with AS3000 wiring rules and all applicable state or local council ordinances.
- During power blackouts, minimize water consumption in the building to prevent sewage backing up.
- Always keep the shut-off valve completely open when system is in operation (unless advised otherwise by proper authorities). Before removing the pump from the station, be sure to close the shut-off valve. (This prevents backflow from the pressure sewer.)
- Keep the control panel (if installed) locked or confined to prevent unauthorized access.
- If the pump is idle for long periods of time, it is advisable to start the pump occasionally by adding water to the tank.

# BREAKDOWN – SAFETY WHEN SERVICING

- Be aware of “Confined Spaces” guidelines.
- To reduce the risk of electrical shock, always disconnect the pump from the power source before handling or servicing. Lock out power and tag.
- Do not wear loose clothing that may become entangled in the impeller or other moving parts.
- Keep clear of suction and discharge openings. DO NOT insert fingers in pump whilst power is connected.
- Always wear appropriate safety gear such as safety glasses when working on the pump or piping.
- Cable should be protected at all times to avoid punctures, cuts, bruises and abrasions. INSPECT FREQUENTLY.
- Never handle connected power cords with wet hands.
- To reduce the risk of electrical shock, all wiring and junction connections should be made in accordance with local codes and regulations.

# ELECTRICAL CONNECTION

**DO NOT ALLOW CABLE ENDS TO BE SUMBERSED!**

ELECTRICAL WORK MUST ONLY BE PERFORMED BY QUALIFIED AND COMPETENT PERSONNEL.

ELECTRICAL CONNECTION SHOULD BE CARRIED OUT IN ACCORDANCE WITH LOCAL REGULATIONS.

READ ALL WIRING DIAGRAMS AND INSTRUCTION SHEETS SUPPLIED BEFORE ATTEMPTING ELECTRICAL CONNECTION. IF IN DOUBT, CONTACT DTB FOR ADVICE AND COPIES OF WIRING DIAGRAMS OR INSTRUCTION SHEET.

**SUPPLY:** Ensure available power supply complies with electrical data on pump and control panel nameplates.

Power should be supplied via a main isolating switch. If the pump is not installed close to the switch it must be of a lockable type.

Three-phase pumps must be connected through a hand-resettable thermal overload (generally incorporated into standard DTB control panels).

It is advisable for single-phase pumps to also be supplied via a hand-resettable thermal overload.

All internally fitted thermal overloads and thermistors must be connected as per manufacturers' instructions

A clearly-marked dedicated circuit of an adequate capacity must be used. Pay careful attention to voltage drop regulations.

DO NOT install an "Earth Leakage Breaker or RCD" onto the circuit as this will shut down the whole pump system. As according to AS3000, control panels must be hard wired when an ELB or RCD is not installed.

**CONTROL PANELS:** Connection to control panels must be made as per instruction sheets and wiring diagrams supplied. Generally float switch cables supplied in conduit connector as a set are marked by tags on the end of the cable.

All unused wires are to be terminated in insulated connectors.

Mount control panels in a vibration-free position as close as practical to the pit. Allow at least 1m x 1m clear-standing space in front of control panel and position well away from possible damage by vehicles/machinery etc.

Thermal overloads fitted should be adjusted to full load amps noted on pump nameplate.

For three-phase pumps, check direction of rotation. Swap any two phases to change rotation. To visually inspect direction of impeller rotation, it may be necessary to remove pump from manifold via the barrel union.

**Keep clear of unprotected impeller.**

**CONDUITS:** All wiring from control panel to pit must be in an approved conduit or trunking.

Conduits from pit to control panel must be adequately sized with a minimum amount of bends to allow easy insertion/withdrawal of cables. Minimum 1 x 50mm conduit with long radius bends is standard procedure for dual systems to 1.5kW. Minimum 2 x 50mm conduit with long radius bends is recommended for dual pump systems greater than 1.5kW.

All conduits entering control panel must be sealed internally with silicon or similar to prevent ingress of moisture or fumes from pit.

**CABLES: DO NOT ALLOW CABLE ENDS TO BE SUBMERSED.**

Leave enough slack cable in pit to allow easy and complete removal of equipment from pit. Ensure that this loose cable is secured at the pit manhole to prevent float switch fouling or entry into pump impeller.

Any joints in cables or cable extension will void warranty of pumps unless made by and approved DTB Technician.

# COMMISSIONING

A Commissioning service is offered by DTB for systems installed in specified areas. This may or may not have been included in the price of the system. Please read your quotation carefully to determine this.

A **commissioning Application Form** must be filled out and returned to DTB three days prior to commissioning. Extra charges for commissioning will be made for installations not conforming to this booklet.

## GENERAL COMMISSIONING PROCEDURE

1. Double-check all aspects and details covered by this booklet.
2. Check all electrical connections are complete and correct.
3. Check adequacy of power supply. Switch on all isolating switches.
4. Double-check pump rotation (three-phase only).
5. Check amp draw of motors. Compare to pump nameplate details.
6. Ensure pit is clear of silt, mud, building debris and other foreign objects.
7. Double-check thermal overload setting.
8. Run through complete system operation ensuring that the pumps switch off before running dry or sucking air.
9. Return all selector switches to Auto position.

# OPERATION

In general, with correct control settings, your DTB submersible pump system should operate automatically.

Do not allow anything to enter the system pipework or pit which the pump is not designed to pump.

## **STORMWATER/SUBSOIL DRAINAGE PUMPS**

Warning, these pumps are only designed to pump drainage water with suspended solids not exceeding 15% in solids, selected pumps have maximum solid size capabilities (Refer to DTB for specifications) – large leaves, twigs, large quantities of mud, gravel or other foreign objects could jam pump. Depending on pump model these objects could damage/stop pump.

## **SEWAGE PUMPS**

These pumps are only designed to pump liquids and soft solids classified as normal sewage. Pump could become jammed should articles of clothing, sanitary items, rags or other foreign objects be allowed to enter the system pipework or pit.

*Make sure regular maintenance is carried out on the entire system.  
Regular maintenance intervals can be organised with DTB.*

# TROUBLE-SHOOTING GUIDE

## **A: Pump Motor does not run**

1. Water level in pit below off float level.
2. Power failure – check isolating switches and circuit breakers or fuses.
3. Thermal motor protection set too low – adjust and reset.
4. Loose terminal connection.
5. Float Switch movement obstructed.

## **B: Motor trips circuit breakers or thermal overload after short time of operation**

1. Temperature of pumped liquid too high.
2. Impeller jammed or partly jammed by foreign objects.
3. Phase failure.
4. Voltage too low.
5. Thermal overload set too low.
6. Impeller corroded to coverplate from lack of use or moisture entry during storage.

## **C: Pump runs but does not pump**

1. Gate valve closed.
2. Suction strainer or discharge line blocked.
3. Pump too small for applications.
4. Incorrect direction of rotation.
5. Air lock in pump – check that pump does not suck air before switching off. Check bleed hole, located at base of pipe work on pump line is not blocked.

**D: Pump will not switch off after emptying tank**

1. Pump float switch adjusted too low.
2. Incorrect wiring
3. Float switch fused.
4. Pump float switch movement obstructed.

**E: Tank continues emptying after pump switches off**

1. Discharge line syphoning - check that discharge point is not lower than pump.

# CARE AND MAINTENANCE

ONLY QUALIFIED AND COMPETENT PERSONNEL SHOULD ATTEMPT TO CARRY OUT MAINTENANCE WORKS ON YOUR SUBMERSIBLE PUMP SYSTEM.

Installation conditions will determine regularity of maintenance intervals. However, all installations should be serviced once every 12 months. More regular servicing is required for applications where there are abrasive particles in the water, excessive silt or debris entering the pit, or where the pumps are subject to heavy usage.

It is a good idea to keep a close eye on your newly-installed system until the time of the first maintenance service, to determine if more regular servicing is required.

Particular care should be taken to keep the pit clean while construction works are in progress.

**MAINTENANCE SCHEDULE:** Addition to any requirements in manufacturer's manual –

1. Be careful to avoid electric shock. Isolate pumps and controls before starting work.
2. Check external condition of pumps and control gear.
3. Check pumps for wear.
4. Check condition of electrical equipment.
5. Check pit for sludge build-up/presence of foreign objects – remove if necessary.
6. Check that pump cables are securely tied up and that float switch movement is not obstructed.
7. Check system operation.

# WARRANTY

DTB Submersible Pump Systems and its associated fittings and equipment supplied by DTB International Pumping are guaranteed to be free from defects in material or workmanship for a period of twelve months from the **purchase date**, as per our **Terms & Conditions of Sale**. This does not cover incorrect installation or application, or any other circumstances beyond the control of DTB. Nor are any consequential damages covered.

The DTB Warranty is only redeemable to the original purchaser of the equipment unless authorised otherwise by our service staff and covers only parts and labour associated with repair of the defective item in our workshop; i.e. labour or parts associated with travel to site or removal of pumps from pits is not covered. This is particularly applicable to units installed incorrectly.

Serial No. or Invoice No. must be supplied with all Warranty claims.

Freight and insurance for all goods returned for Warranty inspection must be pre-paid.

Installation, application or operation not in compliance with this booklet or any other information supplied, either verbally or in writing, immediately voids this **Warranty**.

DTB reserves the right to inspect any Warranty claim before authorising rectification work to be carried out under Warranty. Any item not directly manufactured or imported by DTB is subject to all warranty conditions of the respective manufacturer or importer and, in most cases, requires inspection by the manufacturer or importer.

Failure to carry out proper maintenance works at suitable regular intervals voids this **Warranty**.

This Warranty does not cover any pump installed in any situation for which it is not specified in writing unless the pump has been supplied to a written specification.

# WARRANTY FORM

DTB Packaged Pump Station manufactured by DTB International Pumping are guaranteed to be free from defects in material or workmanship for one (1) year from the date of shipment from factory in St Kilda, Victoria.

No claim will be recognized for any alleged defects in tanks that may have been apparent prior to installation, whether due to faults in manufacture or faults caused by transport and handling.

The obligation of this warranty, statutory or otherwise, is limited to replacement or repair at Victoria factory or at a point designated by DTB International Pumping, of such part as shall appear to us, upon inspection at such point, to have been defective in material or workmanship.

This warranty does not obligate DTB International Pumping to bear the cost of labour or transportation charges in connection with replacement or repair of defective parts; nor shall it apply to a pump upon which repairs or alterations have been made unless authorised by DTB International Pumping in writing.

No warranty is made in respect to pumps, motors or trade accessories, such being subject to warranties of their respective manufacturers.

No express, implied or statutory warranty, other than herein set forth is made or authorised to be made by DTB International Pumping.

In no event shall DTB International Pumping be liable for consequential damages or contingent liabilities for consequential damages or contingent liabilities arising out of the failure of any DTB International Pumping Packaged Pump Station or parts thereof to operate properly.

DTB International Pumping is not responsible for losses, injury, or death resulting from a failure to observe safety precautions set out herein, or misuse or abuse of pumps or related equipment.

A properly completed Warranty Registration form must be on file at the DTB office in order to activate your warranty.

If you have a claim under the provisions of the warranty, contact DTB.

When contacting your representative for service, please forward the following details.

Please fill and keep this information and return enclosed warranty card.

INVOICE NO \_\_\_\_\_ PUMP MODEL NO \_\_\_\_\_  
TANK MODEL NO \_\_\_\_\_ JOB NO \_\_\_\_\_