



# TYPE DL-1-110

*HEAVY DUTY SUBMERSIBLE PUMPS*

*INSTALLATION,  
OPERATION &  
MAINTENANCE  
INSTRUCTIONS*

**TOYO PUMPS NORTH AMERICA CORPORATION**

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## GENERAL TERMS & CONDITIONS OF SALE

### GENERAL TERMS & CONDITIONS OF SALE

The following terms and conditions shall apply to the purchase and sale of any products, materials, parts or other goods (collectively, "Goods") from Toyo Pumps North America Corp. ("TPNA"), Toyo Pumps North America, LLC. ("Toyo"), and Heavy Pumps Inc. ("Heavy" and, together with "Toyo" and "TPNA", the "Seller"), and the performance of any installation, repair, advisory, consulting or other services by Seller (collectively, the "Services"):

### TERMS & CONDITIONS OF SALE

**1. Acceptance of Purchase Order:** Formal acknowledgment of the purchase order by Seller by return to the purchasing party (the "Buyer") of the executed copy or Seller's commencement of such performance or acceptance of any payment shall constitute acceptance by Seller subject to having the Goods in stock and/or being willing to manufacture the Goods and perform the Services and these terms and conditions. If the Buyer submitted a purchase order to any company, partnership or other entity that directly or indirectly through one or more intermediaries controls, is controlled by or is under common control with Seller (in each case, an "affiliate"), including Toyo Pumps North America, L.L.C. ("TPNA LLC"), or to any field or business consultant, salesman or other contractor of Seller or their respective affiliates, then the Buyer acknowledges that such affiliate (including TPNA LLC), consultant, salesman or other contractor, as the case may be, does not have the authority to bind Seller and the purchase order will not be accepted until the earlier of receipt by the Buyer of an executed copy of the purchase order signed by an officer of Seller, Seller's commencement of performance under the purchase order or acceptance by Seller of any payment under the purchase order. Seller's acceptance of the purchase order is conditional upon the Buyer's agreement that the terms and conditions set out in this Agreement govern the relationship between the parties.

In the event of any conflict or inconsistency between the terms and conditions of sale herein and the terms and conditions contained in the Buyer's order or in any other form issued by the Buyer, whether or not any such form has been acknowledged or accepted by Seller, Seller's terms and conditions herein shall prevail. No waiver, alteration or modification of these terms and conditions shall be binding upon Seller unless made in writing and signed by a duly authorized representative of Seller.

**2. Materials and Compatibility with Buyer's System or Process:** Quotations and recommendations including, but not limited to, materials of construction and compatibility of the Goods with the Buyer's system and process are based on information supplied by the Buyer. The Buyer is responsible for final confirmation of the metallurgical suitability of the construction materials and compatibility of the Goods with the Buyer's system or process. By placing an order further to a quotation, the Buyer acknowledges and agrees that it has confirmed the metallurgical suitability of the construction materials and the compatibility of the Buyer's system and process with the Goods.

Seller expressly disclaims any warranty that the Goods will be compatible with the Buyer's operating system or process, and that the construction materials are metallurgically suitable for the Buyer's purposes. In the event that the Goods are not compatible with the Buyer's operating system or process, and/or that the construction materials are not metallurgically suitable, the Buyer shall be responsible for the cost of all changes in the Goods, and if the Buyer's order is cancelled, Seller shall be reimbursed for all costs and expenses incurred and reasonable profit for performance executed prior to the date of such termination.

**3. Taxes:** Any taxes, excise duties, levies or other assessments under any existing or future laws which Seller may be required to pay or collect in connection with the order, under any existing or future laws, including any taxes, excise duties, levies or other assessments levied on the sale, purchase, delivery, storage, processing, use or consumption of any other materials necessary for the completion of this order are not included in the purchase price and shall be for the account of the Buyer. The Buyer shall promptly pay the amount thereof to Seller upon demand, or in lieu thereof, furnish Seller with a tax exemption certificate acceptable to the taxing authorities. Without restricting the generality of the foregoing, HST or GST, if applicable, shall be added to the purchase price.

**4. Payments:** For orders of Goods having an aggregate purchase price of less than \$100,000 and orders for Services, Seller's regular terms are net 30 days subject to credit approval and at Seller's discretion. For orders of Goods having an aggregate purchase price equal to or greater than \$100,000, progress payments in accordance with the following milestones shall apply:

#### Milestone

Acceptance of Purchase Order	15%
Submittal of Approval Drawings	20%
Purchase of Major Components	20%
Goods ready to ship	25%
30 days after Shipment*	20%

\*(subject to credit approval and at Seller's discretion)

All milestone payments are due upon receipt of invoice, with the exception of the 30 days after Shipment milestone.

Interest will accrue at the annual rate of 24% per annum to be compounded monthly on the balance due and owing but will not exceed the maximum permitted by law.

Should the Buyer for any reason default in payments due under this Agreement, the Buyer agrees to pay all collection costs and indemnify Seller for all solicitors' fees arising from the default in payment.

**5. Shipping:** Unless shipping instructions accompany each order and are accepted by Seller, the manner of shipping is at the discretion of Seller. Seller's responsibility for the Goods ceases when they pass into the hands of the carrier at which time the Buyer assumes the risk for the Goods.

**6. Damaged Goods:** Seller's Goods are carefully inspected and checked for any damage prior to shipment. The Buyer assumes all responsibility for risk relating to loss or damage of Goods once the Goods pass into the hands of the carrier.

**7. Delayed Performance:** Seller shall not be responsible for delays in shipments or performance of the Services caused by (a) earthquake or explosion; (b) war, invasion, hostilities (whether war is declared or not), terrorist threats or acts, riot or other civil unrest; (c) requirements of law; (d) actions, embargoes, tariffs, or blockades in effect on or after the date of this Agreement; (e) action by any governmental authority; (f) national or regional emergency; and (g) strikes, labor stoppages or slowdowns or other industrial disturbances; (h) material shortages; (i) transportation delays; (j) accidents; (k) acts of God or other causes beyond Seller's reasonable control; or for delay caused by the acts or omissions of Seller, its servants, employees, contractors, subcontractors or agents. In any event, Seller shall not be responsible for the Buyer's lost profits or other consequential damages incurred by the Buyer for any delay or failure by Seller to make delivery of Goods or performance of Services under any order, it being agreed that Seller's sole liability shall be to refund any amounts prepaid by the Buyer to Seller on account of such delayed or non-delivered order.

**8. Warranties:** Seller makes no warranties expressed or implied, other than the following:

- Seller warrants its Goods to be free from defects in material and workmanship until the earlier of one year from the date of start of operation or use of the Goods or 18 months from the date of shipment to the original retail customer, provided no alteration has been made thereto after delivery.
- Any part or parts contained in the Goods which are proven defective after inspection by and to the satisfaction of Seller will be (at Seller's option) adjusted or repaired or replaced free of charge, on return of such defective part(s) by the Buyer. The Buyer shall assume all responsibility and expense for removal, reinstallation, freight and any related duties or taxes in connection with the foregoing.
- Seller shall not be liable and shall not have any obligation for fair wear and tear, seal failures, damage caused by vibration, failure to properly maintain, damage caused by operating without flow or adequate submersion, damage caused by corrosives, abrasives or foreign objects and other damage caused by the improper storage, handling, operation, or maintenance contrary to good practice or instructions in any manuals, or due to the fault, negligence, want of skill or wrongful acts of the Buyer, its employees, agents, contractors or suppliers.
- With respect to any equipment and materials which are included in the Goods furnished by Seller, but manufactured by others, the Buyer shall accept in lieu of any liability or guarantees on the part of Seller, the benefits of any guarantees (if any) that are obtained by Seller from such manufacturers or vendors.

- (e) Seller shall perform the Services in a workmanlike manner consistent with industry standards applicable at the time and place where such Services are performed.

The above warranties cease to be effective if the Goods are altered or repaired other than by persons authorized or approved by Seller to perform such work. Repairs or replacement deliveries do not interrupt or prolong the term of the warranty. The warranties above cease to be effective if the Buyer fails to operate and use the Goods sold hereunder in a safe and reasonable manner and in accordance with any written instructions from the manufacturer.

**9. Exclusivity of Warranties:** Seller expressly disclaims to the full extent permitted by law all express, implied, statutory and other warranties, guarantees or representations, including, without limitation, the warranties of merchantability, merchantable quality, durability or fitness for a particular purpose, and non-infringement of proprietary and intellectual property rights. For further clarity, the parties acknowledge and agree that, to the extent permitted by law, section 18 of the Sale of Goods Act, R.S.B.C. 1996, c. 410, and any similar legislation in other applicable jurisdictions, is excluded from and inapplicable to this Agreement.

**10. Limitation of Liability:** The liability of Seller and their respective affiliates, including but not limited to TPNA LLC, and their respective directors, officers, employees, contractors, subcontractors and agents ("Seller and Others") is limited to the repair, replacement or refund of the original purchase price actually paid by the Buyer for the particular Goods or Services which are the subject of the claim. Except as expressly provided in the foregoing, Seller and Others will not be liable for any loss, damage or expense including, but not limited to, the following: bodily harm to any individual, loss of profits, revenue, interest, loss by reason of shutdown or non-operation, increased expense of operation of the equipment, loss of power system, cost of purchase or replacement power, or claims of Buyer or customers of Buyer for service interruption, or any special, indirect, incidental or consequential damages arising out of this contract or any breach thereof, negligence of Seller and Others, the performance of the Services or defect in, failure of, or malfunction of the Goods furnished to the Buyer or the customers of the Buyer. Seller and Others will not be responsible for any special, indirect, consequential or incidental damages or expense of any kind or nature, regardless of the cause, even if Seller and Others have any knowledge regarding the probability of their occurrence.

**11. Cancellation or Modification:** The Buyer may cancel or modify a shipment of any part thereof only upon Seller receiving written notice seven (7) days prior to the cancellation or modification and upon payment to Seller of reasonable and proper cancellation or modification charges based upon expenses already incurred and commitments made by Seller, including, without limitation, any labour done, material purchased, Services performed and also including Seller's usual overhead and reasonable profit and cancellation charges from Seller's suppliers.

**12. Cancellation or Modifications due to Unusual Market Conditions:** The Seller will take all reasonable precautions to mitigate the risk related to Unusual Market and Supply Chain conditions related to commodities/ materials, economic tariffs, and sanctions. However, if, following the receipt and acceptance of a purchase order by Hevvy, the cost to Hevvy of the raw materials required to manufacture the Products ordered under such purchase order increases by a material amount, then notwithstanding Hevvy's prior acceptance of such purchase order, Hevvy may, in its sole discretion, either cancel such purchase order or increase the price for such Products by a corresponding amount by providing written notice to the Channel Partner, and upon receipt of such written notice the Channel Partner will have the option to either accept such increased price or cancel the purchase order; provided that if the Channel Partner fails to notify Hevvy that it wishes to cancel the purchase order within 10 days of the date of receipt of Hevvy's notice of the price increase, then the Channel Partner will be deemed to have accepted the price increase.

**13. Return of Goods:** No credit or refund will be permitted for Goods returned unless Seller's prior written permission has been obtained. If accepted, returned Goods may be subject to a handling or restocking charge.

**14. Back Orders:** The Buyer agrees that if it has ordered items which are unavailable at the time of the placement of the order, Seller will ship them as soon as they are available or at a later time.

**15. Arbitration:** If there is any disagreement, dispute or controversy (a "Dispute") between the parties with respect to any matter arising under this Agreement or the construction of this Agreement, then the Dispute shall be referred to and finally resolved by arbitration under the rules of the Arbitration Act, R.S.B.C. 1996, c. 55

by a sole arbitrator. The award of the arbitrator shall be final and binding upon each of the parties and shall not be subject to appeal or judicial review.

**16. Governing Law:** This Agreement shall be governed by and interpreted in accordance with the laws in effect in the Province of British Columbia, and, subject to Article 14, the parties attorn to the courts of the Province of British Columbia for the resolution of any disputes arising out of this Agreement. The United Nations Convention on Contracts for the International Sale of Goods will not apply to the supply of Goods or Services.

**17. Exclusion of Liability for Oral Representations:** The Buyer acknowledges that none of Seller, their respective affiliates or agents has made any oral or written representations, inducements, or promises that are not expressly contained in this Agreement. The Buyer acknowledges and agrees that ANY ORAL OR WRITTEN REPRESENTATIONS, INDUCEMENTS OR PROMISES MADE BY ANY FIELD OR BUSINESS CONSULTANT, SALESMAN OR OTHER CONTRACTOR OF SELLER OR THEIR RESPECTIVE AFFILIATES ARE EXPRESSION OF OPINION ONLY AND ARE NOT BINDING ON SELLER OR THEIR RESPECTIVE AFFILIATES UNLESS EXPRESSLY CONTAINED HEREIN. NEITHER SELLER NOR ANY OF THEIR RESPECTIVE AFFILIATES IS LIABLE FOR ANY ORAL OR WRITTEN REPRESENTATIONS, INDUCEMENTS OR PROMISES MADE BY ANY FIELD OR BUSINESS CONSULTANT, SALESMAN OR OTHER CONTRACTOR OF SELLER OR THEIR RESPECTIVE AFFILIATES UNLESS EXPRESSLY CONTAINED IN THIS AGREEMENT. This Agreement may be modified only in writing signed by the Buyer and an officer of either Seller. The Buyer acknowledges that any field or business consultant, salesman or other contractor of Seller or its affiliates is not authorized to modify or change any term of this Agreement.

**18. Intellectual Property:** Title to, ownership of and all intellectual property rights in, any facilities, designs, equipment, specifications, drawings, formulas, engineering notices, technical data, software, processes, documentation and information used in connection with Seller's supply of the Goods or Services (the "Goods Components") shall be and remain with Seller, or their suppliers or licensors. This Agreement does not grant to the Buyer any intellectual property or other rights or licenses in or to any Goods Components. Buyer shall not, and shall not knowingly permit a third party to, whether directly or indirectly, modify, reverse engineer or disassemble any Goods without the prior written consent of Seller.

**19. Severability:** If any provision of this Agreement is determined to be invalid, void or unenforceable, in whole or in part, such invalidity, voidance or unenforceability shall attach only to such provision or part thereof, and the remaining part of such provision and all other provisions thereof shall continue in full force and effect.

**20. Applicability:** This Agreement applies only to this order. Prospective orders may be subject to revised terms and conditions. It is the Buyer's responsibility to request and review Seller's current terms and conditions in respect of prospective orders.

**21. Entire Agreement Clause:** This Agreement constitutes the entire agreement between the parties, and is subject to no other oral or written proposals, agreements, implied terms, agreements through course of conduct, conditions precedent or understandings whatsoever.

End of General Terms & Conditions of Sale

## ***INTRODUCTION***

Thank you for selecting the Toyo submersible pump.

In order to ensure that you receive the maximum benefit of this equipment, it is required that this INSTRUCTION & SERVICE MANUAL be thoroughly read prior to use, and that all instruction be carefully followed.

### **WARNING!!**

This is not explosion-proof or spark-proof.  
It should not be operated in any area where flammable or explosive gases, vapors, liquids or particles are or may be present or where a spark could cause a danger or fire or explosion.

These ruggedly built, portable, electrically powered submersible pumps are designed for trouble-free operation in the removal of water from enclosed sumps, irrigation areas or serve a variety of general dewatering/pumping chores (applications).

The pumps feature an oil-filled chamber between the pump section and the electric motor section that has a high efficiency sealing system.

This sealing system prevents water from entering the motor and also permits extended dry running without the concern for seal damage.

These pumps are also equipped with induction-type motors that have built-in overload protection to guard against motor burn out due to over-current, over-heating or other mechanical over-load conditions.

Please fill in the information below and retain. These information will be necessary when requesting parts or service.

PUMP MODEL	DL -1-110
SERIAL NO.	
DATE OF PURCHASE	

## **TOYO SUBMERSIBLE PUMP MODEL DL-1-110**

### **OPERATING & MAINTENANCE INSTRUCTIONS**

#### ***PRIOR TO OPERATION***

##### **1) UNPACKING AND INSPECTION**

- a) Always lift the pump by the handle-not the cabtyre cable.  
If the pump must be suspended in a well or pit, a rope or chain should be attached to the pump handle.
- b) Check the nameplate information to ensure that the equipment received is that which was ordered.
- c) Carefully inspect the pump to be sure that shipping damage has not occurred.

##### **2) INSPECTION OF PUMP**

- a) Check to determine that the power circuit and/or receptacle are adequate to handle voltage/current rating of the motor-pump.
- b) Ensure that cabtyre cable/extension cord is free from damage and that grounding wire/circuit is operational.

CAUTION: Do not operate this pump unless it is connected to a properly wired grounding circuit since serious personal injury may result from electrical shock. Disconnect the cabtyre cable from the power source, before servicing this pump.  
Do not use this pump in the water where person(s) is (are).

#### ***INSTALLATION & OPERATION***

- a) Be certain that the pump is mounted on a solid, flat base or suspended by a rope or chain attached to the pump handle.

CAUTION: Do not use the electrical cable or discharge hose to suspended the pump.

Always attach suspension rope to the pump handle.

- b) Use the shortest possible length of discharge hose to assure you minimize friction losses and maximize your pump flow.
- c) Make certain that the cable and/or receptacle from which it draws power is protected and away from water or pump discharge hose to prevent accidental shock or electrical short circuiting.
- d) The pump model has a built-in overload protector which senses over-current, over-heating, or over-load conditions.  
The operation of this protector is such that should any of these conditions exists, the power supply will be interrupted until motor cooling has taken place. After cool-down has occurred, the pump will automatically re-start and continue to be protected in this way as long as the condition exists, but we request you to check and remove the cause.

Note: This is a protection device and is not intended to replace external controls.

- e) When cable extension is necessary, extended cable size must be adequate to avoid low voltage conditions, which may cause motor burn out. Select the proper gauge size and minimize length of the extension cable not to cause a large voltage drop. If you are not sure, it is recommended to consult with the Toyo representative office or Toyo suppliers nearest you. When extending the cable, be careful not to submerge the splice into the water to avoid the possibility of electrical shock.
- f) Connection to Power Source  
DL-110: Plug in or connect to one phase power source.

CAUTION: Be sure to provide an adequate grounding and to use a ground leakage circuit breaker.

## **AFTER OPERATION**

To keep the pump in good condition and maintain high pumping efficiency the following inspections should be carried out after each fifty (50) hours of operation. (See Fig.A6470)

- a) Remove Strainer-stand (item #23) and Pump Casing (#20). Clean out any solids and/or mud, sand, stones or other foreign material which may have collected in the Pump Casing.
- b) Check the Impeller (#21) for wear, obstruction or foreign material accumulation. If parts are extremely worn, replacement should be made at the first opportunity.
- c) After the inspections, clean the inside and outside of pump with clean water. When it is stored, keep it in a dried condition.

## **REGULAR INSPECTION**

### **1) LUBRICANT CHECK (See Fig.A6470)**

Check the mechanical seal by inspecting the condition of the lubricant in the oil chamber. You may readily determine the condition of the mechanical shaft seals based upon contamination level in the oil.

- a) Lay the pump on its side with Oil Plug (#35) facing upwards.  
After unscrewing the plug, turn the pump over so that the hole faces downward. Drain and collect the lubricant in a clean suitable container.
- b) If the lubricant is clear and clean (not milky appearing or no water present), the seals should be in a good condition.
- c) Refill the chamber with fresh lubricant, using a good multiviscosity grade lubricant (Turbine Oil ISO VG #32).
- d) Extreme discoloration (milky appearing or yellowish-gray) or free water in the lubricant requires immediate replacement of Mechanical Seal (#25) and V- Ring(#26).
- e) When inspection is complete, replace the oil plug and carefully tighten to prevent leakage.

Note: Replace Packing of the oil plug, if it is found to be defective.

Periodic inspection and replacement of the oil should be made as follows:

\*Inspection Cycle: Every 1,000 hours of running time

\*Replacement Cycle: Every 2,000 hours of running time

But we recommend inspection once a year even if running time is less than above.

Required lubricant volume is as follows and recommended lubricant is Turbine Oil ISO VG # 32. For your convenience, other lubricants equivalent to ISO VG # 32 are listed as follows.

If it is difficult to get these turbine oils, engine-oil (10W-30/40) can be used alternatively.

MODEL	Lubricant VOLUME			TYPE	BRAND NAME
	METRIC	OZ	US		
DL-1-110	0.147 (liter)	4.97 (oz)	0.31 (pint)	DTE Oil Light Victoria Oil 27 Energol THB 32 Paramount 32	Mobil Shell British Petroleum Gulf

## 2) **ELECTRICAL CHECK (MEGGER TEST)**

Whenever the pump is serviced, it is a good maintenance/safety practice to check the insulation strength of the motor and cabtyre cable in the following manner to prevent electrical shock accident(s).

- Disconnect the cabtyre cable from the power source.
- Using the 500 VDC Megger Tester, check the electrical insulation of each leg of the wiring circuit in combination with the ground lead (green or green/yellow).
- If any reading is less than one (1) meg-ohms (M<), it indicates damage to the cabtyre cable and/or the motor.
- Disconnect the cabtyre cable from the motor and Megger Test the insulation strength of the motor itself.
- Any reading more than ten (10) meg-ohms (M<) requires immediate replacement of the Cabtyre Cable.  
Any reading less than ten (10) meg-ohms (M<) indicates electrical leakage due to the presence of water or dampness in the motor in which case the motor must be dried thoroughly.  
If after drying, the condition still exists, there is a strong probability that the motor is in need of repair.

**CAUTION: It is absolutely imperative that appropriate corrective action/repair be performed before the pump is returned to service if it will not pass the Megger Test.**  
**Serious personal injury can result from electrical shock.**  
**The above maintenance inspection, if it is performed regularly, will result in greatly improved pumping efficiency and pump life.**

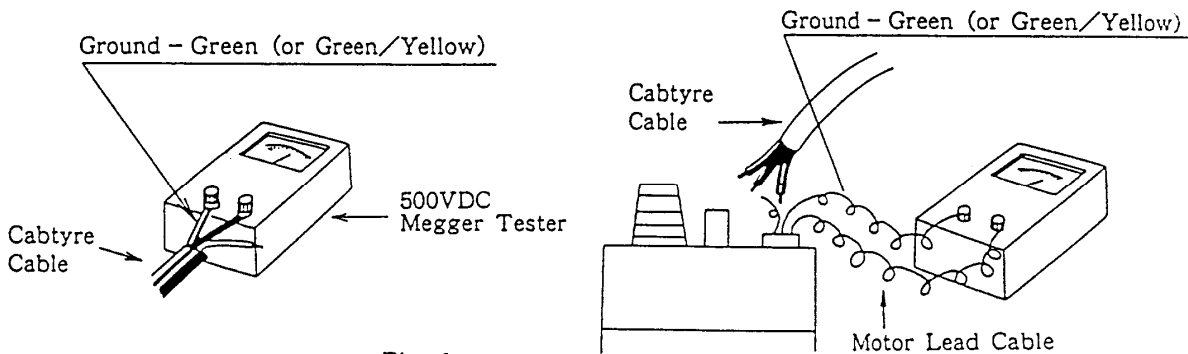


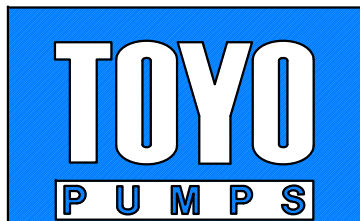
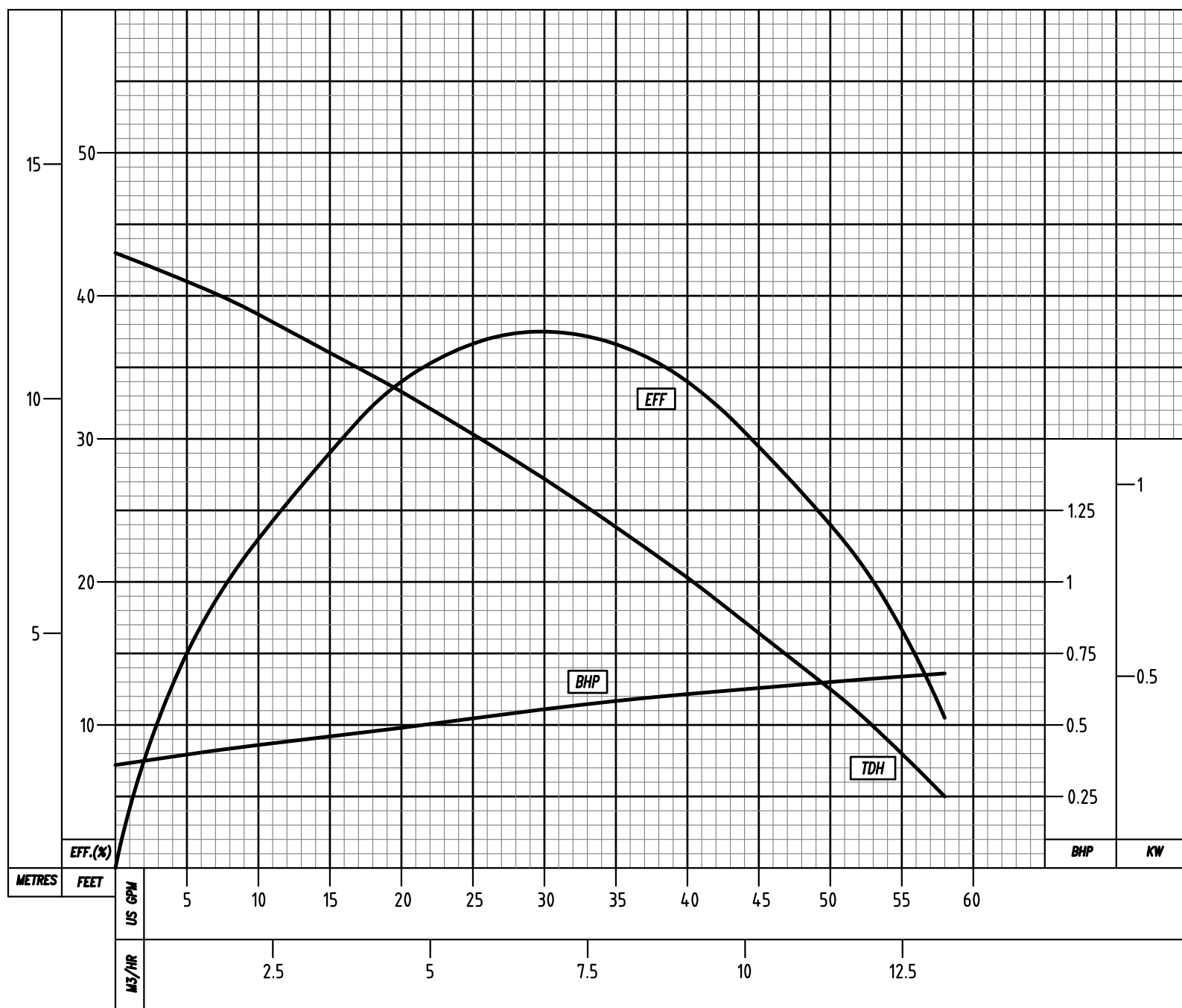
Fig. 1

## ***TROUBLE SHOOTING***

FAULT	POSSIBLE CAUSES	CORRECTION
Pump will not start.	1. No electric power. 2. Cable cut/broken. 3. Poor electric connection. 4. Low voltage. 5. Impeller obstructed. 6. Overload relay actuated.	Turn power on. Change cable. Clean connection. Check power source. Remove obstruction. Wait for motor to cool down.
Stop during operation.	1. Impeller obstructed. 2. Overload relay actuated. 3. Low voltage. 4. Liquid viscosity too high.	Remove obstruction. Wait for motor to cool down. Check power source. Reduce viscosity.
Reduction in Capacity	1. Discharge hose kinked or otherwise obstructed. 2. Impeller worn. 3. Strainer blocked.	Remove kink or obstructed.  Change worn parts. Remove obstruction.

**CAUTION:** Disconnect the cabtyre cable from the power source, before servicing pump.





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TEL : (604)298-1213 FAX : (604)298-7773

PUMP MODEL DL1

CURVE NUMBER A6468 REV. 1

EFFECTIVE DATE APR 29 2008

SUPERSEDES A6468 REV. 0

DISCHARGE INCHES 2

MM 50

SUCTION INCHES -

MM -

TEST NUMBER -

IMPELLER NBR 021-001-34

IMPELLER TYPE OPEN

IMP. DIAMETER INCHES 3.4

MM 85

MAX. PARTICLE INCHES 0.4

MM 10

VOLUTE NUMBER 020-000-40

MOTOR OUTPUT HP/KW 0.75/0.55

PHASE x VOLTAGE SINGLE X 110V

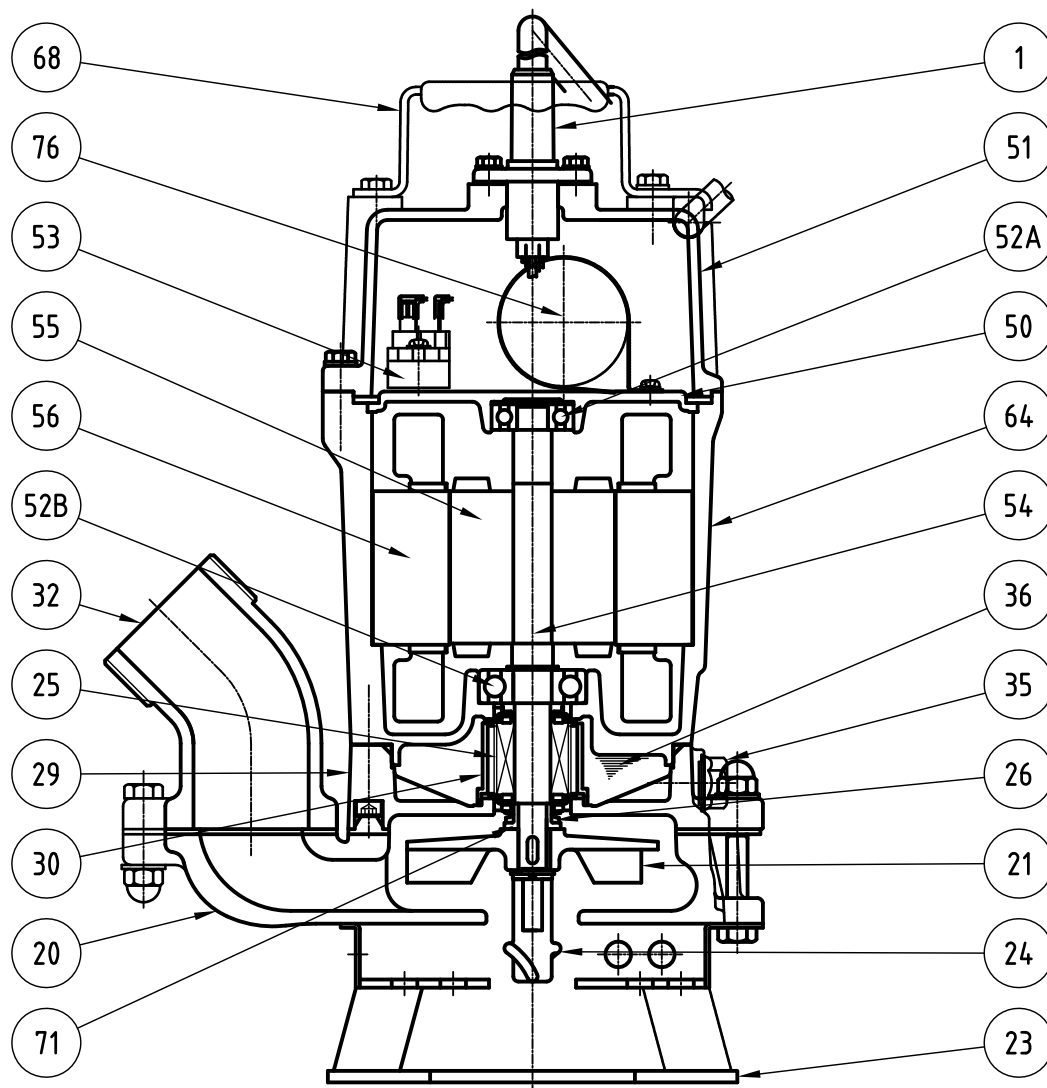
RATED CURRENT AMPS 7.6

WINDING INSULATION CLASS E

POLES/REVOLUTION 2 P / 3380 RPM

PERFORMANCE FOR WATER @ 68°F/20°C  
AND 1.0 S.G. CORRECT FOR OTHER  
CONDITIONS AND/OR SOLIDS EFFECT

# DL1 SERIES SEMI-VORTEX – DEWATERING PUMP



No.	DESCRIPTION	QTY	MATERIAL / NOTE	No.	DESCRIPTION	QTY	MATERIAL / NOTE
1	CABTYRE CABLE	1	PVC SHEATH AWG16/3-32ft	51	MOTOR HEAD COVER	1	B85, A383
20	PUMP CASING	1	A536 GRADE 100-70-03	52A	UPPER BEARING	1	6201ZZC3
21	IMPELLER	1	A532 CLASS III TYPE A	52B	LOWER BEARING	1	6302ZZC3
23	STRAINER STAND	1	STEEL	53	MOTOR PROTECTOR	1	
24	AGITATOR	1	A532 CLASS III TYPE A	54	SHAFT	1	AISI 403
25	MECHANICAL SEAL	1	SILICON CARBIDE / W-14VL	55	ROTOR	1	
26	V-RING	1	NBR	56	STATOR	1	
29	OIL CASING	1	CAST IRON	64	MOTOR HOUSING	1	B85, A383 (ALUMINUM ALLOY)
30	OIL LIFTER	1	ABS RESIN	68	HANDLE	1	A109 CLASS 91
32	DISCHARGE CONNECTION	1	CAST IRON 2" NPT	71	SHAFT SLEEVE	1	AISI 304
35	OIL PLUG	1	STAINLESS STEEL	76	CAPACITOR	1	
36	LUBRICANT		TURBINE OIL ISO VG32 OR SAE 10W/20W				
50	MOTOR BRACKET	1	ADC12				

**TOYO**  
PUMPS

TOYO PUMPS  
NORTH AMERICA CORPORATION

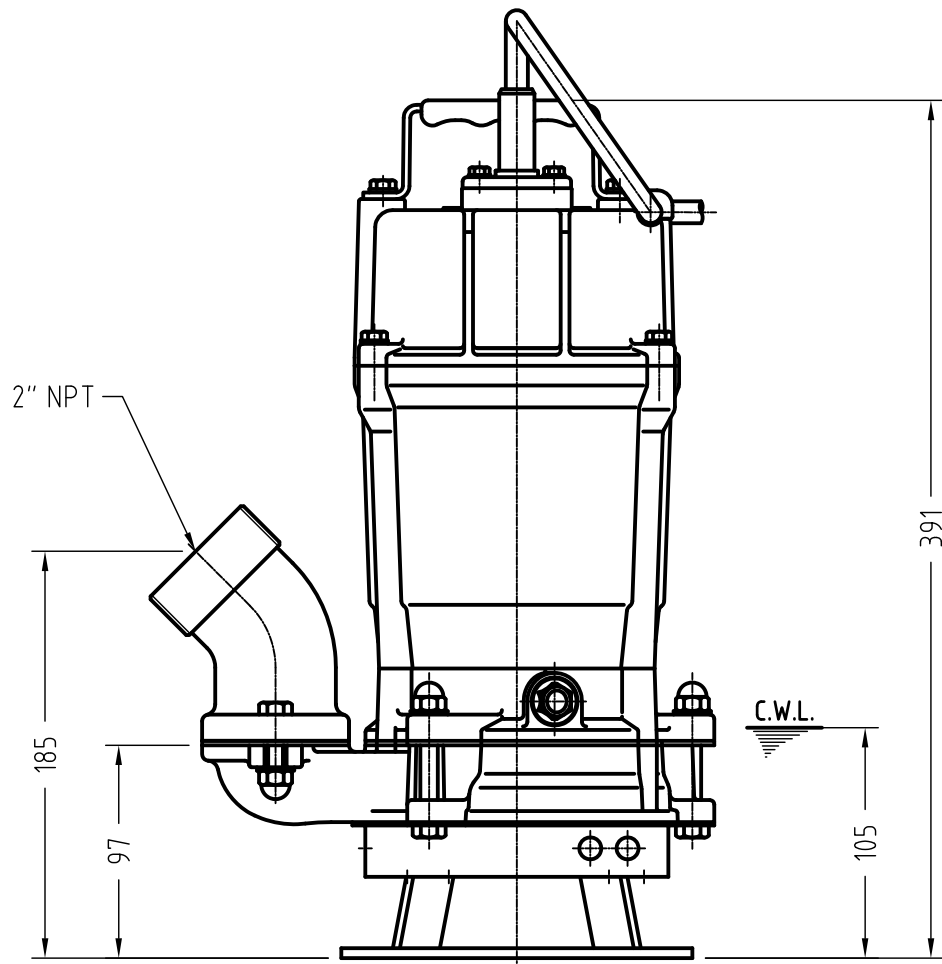
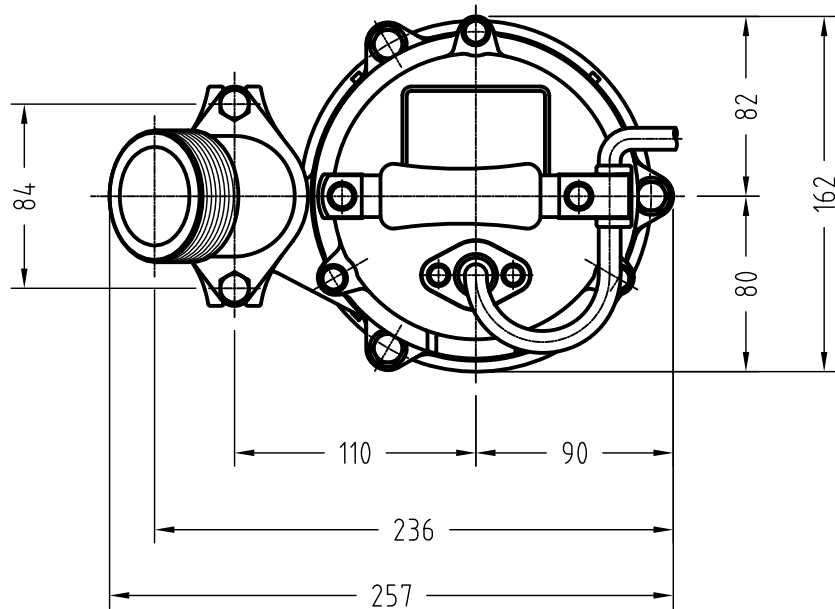
CROSS-SECTIONAL DRAWING  
DL1-110

DRAWING NO.  
A6470

REV.  
2

TOYO PUMPS RESERVES THE RIGHT TO CHANGE ANY OR ALL COMPONENTS WITHOUT NOTICE

# DL1 SERIES SEMI-VORTEX – DEWATERING PUMP



**TOYO**  
PUMPS

TOYO PUMPS  
NORTH AMERICA CORPORATION

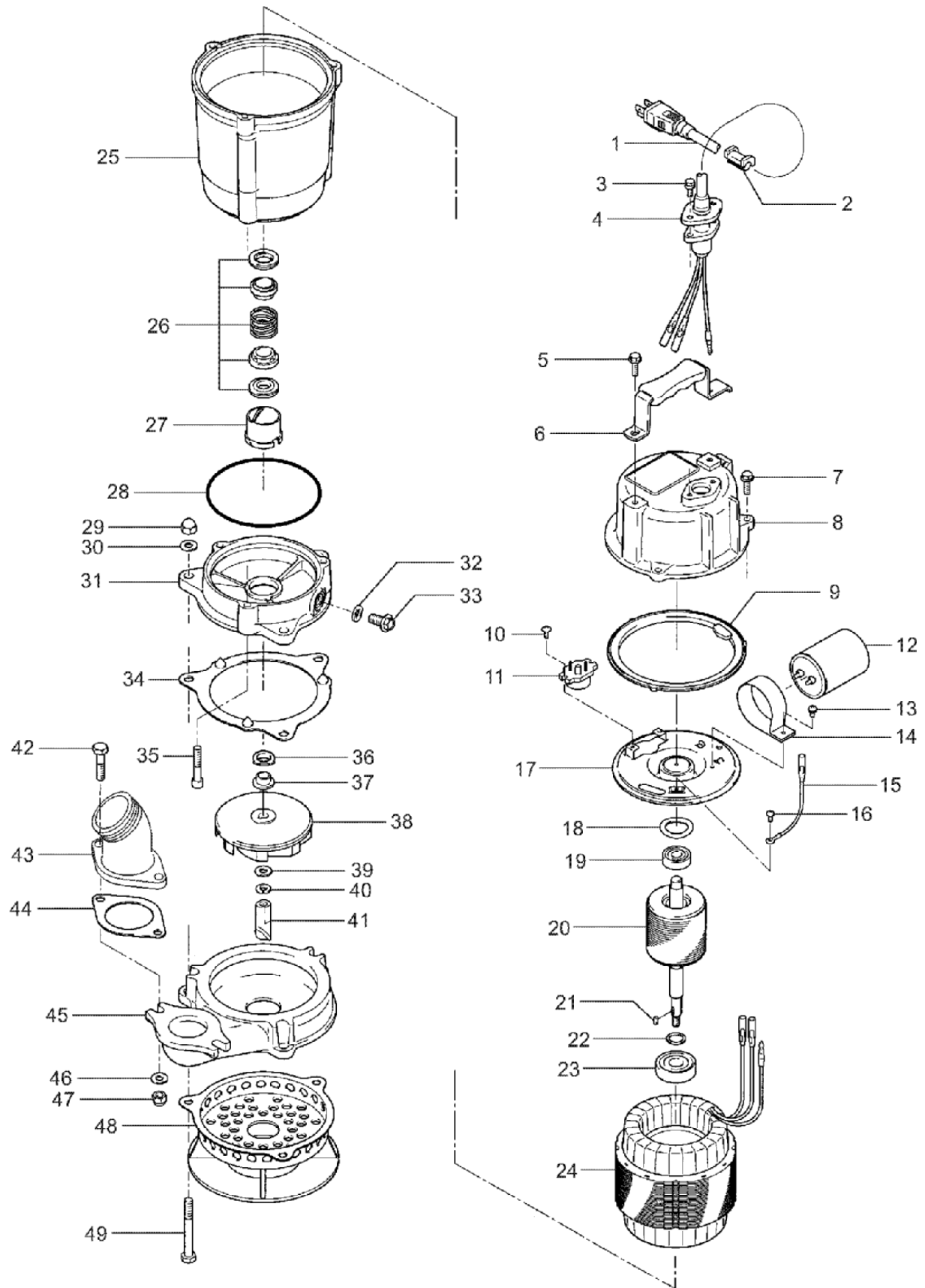
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DL1-110

DRAWING NO.  
A6469

REV.  
1

TOYO PUMPS RESERVES THE RIGHT TO CHANGE ANY OR ALL COMPONENTS WITHOUT NOTICE

# DL1 SERIES SEMI-VORTEX – DEWATERING PUMP



**TOYO**  
PUMPS

TOYO PUMPS  
NORTH AMERICA CORPORATION

EXPLODED VIEW  
DL1-110

DRAWING NO.  
A6763

REV.  
1



# TOYO PUMPS NORTH AMERICA CORPORATION

2853 Douglas Road  
Burnaby, BC V5C 6H2  
Tel: (604) 298-1213 Fax: (604) 298-1224

Kit ITEMS ARE INCLUDED IN GASKET KIT  
SR ITEMS ARE INCLUDED IN SEAL REPAIR KIT

## PARTS LIST - DL1-110

Ref. Dwg. No. A6763 Rev.1

TPSD-001 Rev.0

Please use the part number when ordering.

Effective: June 29, 2009

	REF #	PART #	DESCRIPTION	QTY
	1	001-943-23	Power Cable 32'	1
	2	010-163-16	Cable Clip Rubber	1
	3	040 415 00 08105	Bolt	2
	4	003-100-13	Gland	1
	5	040 415 00 13900	Bolt	2
	6	068-224-15	Handle	1
	7	140-396-16	Bolt	3
	8	051-000-10	Motor Head Cover	1
Kit	9	121-546-14	Gasket (H.Cover/M.Frame)	1
	10	143-136-15	Truss Screw	2
	11	053-000-63	Motor Protector 110/115/120V-60HZ	1
	12	076-000-18	Capacitor 110/115/120V-60HZ	1
	13	143-085-21	Pan Screw	1
	14	127-000-12	Retainer (Capacitor)	1
	15	009-000-44	Grounding Wire	1
	16	143-203-14	Pan Screw	1
	17	050-000-10	Motor Bracket	1
	18	142-192-16	Wave Washer	1
	19	052-100-15	Ball Bearing (Upper)	1
	20	055-000-92	Rotor and Shaft	1
	21	147-168-18	Key	1
	22	061-178-12	Bearing Collar	1
SR	23	052-152-12	Ball Bearing (Lower)	1
	24	056-002-03	Stator 110/115/120V-60HZ	1
	25	064-000-50	Motor Frame	1
SR	26	025-291-10	Mechanical Seal	1
SR	27	030-159-11	Oil Lifter	1
Kit	28	122-133-17	O-Ring (M.Frame/O.Casing)	1
	29	141-030-12	Acorn Nut	3
	30	142-143-12	Washer	3
	31	029-000-17	Oil Casing	1
Kit	32	121-246-11	Gasket (Oil Plug)	1
	33	035-125-13	Oil Plug	1
Kit	34	121-000-20	Gasket (O.Casing/P.Casing)	1
	35	140-256-13	Socket Bolt	3
SR	36	122-441-11	V-Ring	1



# TOYO PUMPS NORTH AMERICA CORPORATION

2853 Douglas Road  
Burnaby, BC V5C 6H2  
Tel: (604) 298-1213 Fax: (604) 298-1224

Kit ITEMS ARE INCLUDED IN GASKET KIT  
SR ITEMS ARE INCLUDED IN SEAL REPAIR KIT

## PARTS LIST - DL1-110

Ref. Dwg. No. A6763 Rev.1

TPSD-001 Rev.0

Please use the part number when ordering.

Effective: June 29, 2009

	REF #	PART #	DESCRIPTION	QTY
SR	37	071-292-14	Shaft Sleeve	1
	38	021-001-34	Impeller (60Hz)	1
	38	021-001-35	Impeller (50Hz)	1
	39	142-143-12	Washer	1
	40	040 417 00 02037	Spring Washer	1
	41	024-000-02	Agitator	1
	42	140-057-12	Bolt	2
	43	032-289-17	Hose Coupling NPT 2" (45 deg.) (STD.)	1
	43	032-144-19	Hose Coupling Barb 2"	1
Kit	44	121-138-19	Gasket (Discharge Fitting)	1
	45	020-000-40	Pump Casing	1
	46	142-143-12	Washer	2
	47	141-030-12	Acorn Nut	2
	48	023-00046	Strainer Stand	1
	49	140-062-10	Bolt	3
**	SR	952 200 09 11915	Seal Repair Kit (includes gasket kit)	1
SR	Kit	173-550-12	Gasket O-Ring Kit	1set