Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Dayton™ Submersible Effluent Pumps

ENGLISH

ESPAÑOL

Description

Dayton submersible effluent pumps are self-contained and are especially designed to handle septic tank effluent. They will provide sufficient pressure to pump material through small diameter pipe to gravity interceptors, treatment plants, or remote leach fields. This pump is designed to pump effluent, nonexplosive and noncorrosive liquids, and shall **NOT** be installed in locations classified as hazardous in accordance with the United States National Electrical Code (NEC), ANSI/NFPA 70. Never install the pump in a trench, ditch, or hole with a dirt bottom; the legs will sink into the dirt and the suction will become plugged.

c SP® US
CSA 108
UL 778
LR16567

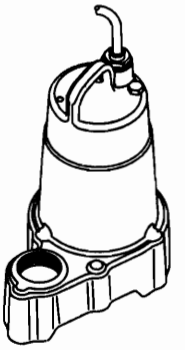

Figure 1

Specifications

TEMPERATURE..... 104°F (40°C) Continuous
IMPELLER ..... 10 Vane, vortex
SOLIDS HANDLING..... 3/4" (19mm) spherical
PAINT..... Air dry enamel
SEAL ..... Single mechanical
CABLE ENTRY ..... 20 ft. (6 m) quick disconnect cord w/plug on 120 & 240 volt, pressure grommet for sealing and strain relief
UPPER BEARING..... Single row, ball design oil lubrication, radial load
LOWER BEARING..... Single row, ball design, oil lubrication, radial & thrust load
MOTOR ..... Oil-filled, class B insulation
SINGLE PHASE..... Permanent Split Capacitor (PSC) Includes overload protection in motor
FLOAT (used on 4HU73 & 4HU74); Automatic Models Wide angle, PVC, mechanical, N/O 20 ft. (6 m), cable w/Piggy-back plug Pumping range 4.25" to 13.25" (108 to 337)

Models	Pump Material						
	Volute/ strainer	Motor Housing	Impeller	Shaft	O-rings	Hardware	Seal
4HU71	Plastic	Cast Iron	Cast Iron	416 SS	Buna-N	300 Series SS	Silicon Carbide/Buna-N
4HU72	Plastic	Cast Iron	Cast Iron	416 SS	Buna-N	300 Series SS	Silicon Carbide/Buna-N
4HU73	Plastic	Cast Iron	Cast Iron	416 SS	Buna-N	300 Series SS	Silicon Carbide/Buna-N
4HU74	Plastic	Cast Iron	Cast Iron	416 SS	Buna-N	300 Series SS	Silicon Carbide/Buna-N

Models	Hp	Volt	Ph	NEMA Start Code	Full Load Amps	Cord Size	Cord Type	Cord O.D. Inches (mm)	Winding Resistance Main -- Start
4HU71	1/2	120	1	D	9.4	14/3	SJTOW	0.375 (9.5)	2.1 -- 4.4
4HU72	1/2	240	1	D	4.3	14/3	SJTOW	0.375 (9.5)	7.5 -- 16.5
4HU73	1/2	120	1	D	9.4	14/3	SJTOW	0.375 (9.5)	2.1 -- 4.4
4HU74	1/2	240	1	D	4.3	14/3	SJTOW	0.375 (9.5)	7.5 -- 16.5

Winding Resistance ± 5%

Pump rated for operation at ± 10% voltage at motor

Form 5S5009

Printed in China
09701
0704/138/VCPVP

CRN011
06/04

Dayton™

Dayton™ Submersible Effluent Pumps

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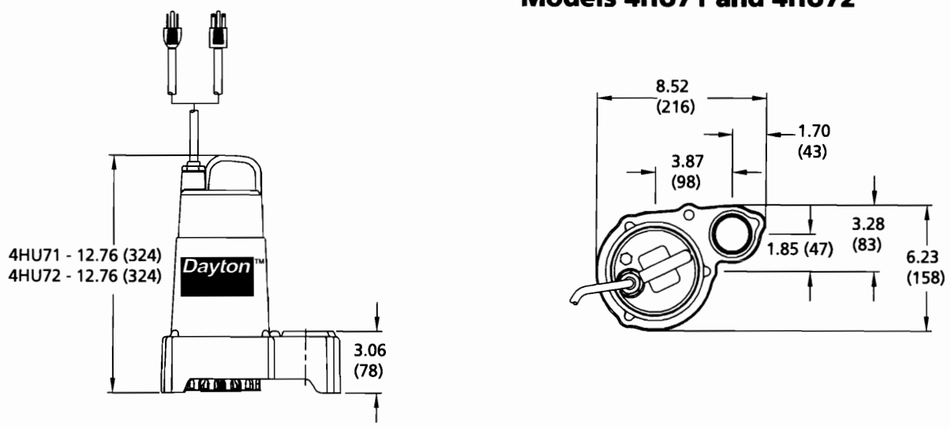
Performance

Models	Hp	Speed (Nominal)	Disch. NPT	Gal./Min @ Total Head in Feet 5 Ft	10 Ft	15 Ft	20 Ft	25 Ft	30 Ft	Shut Off
4HU71	1/2	3450 RPM	1½" (38mm)	90	78	65	52	35	10	31 Ft
4HU72	1/2	3450	1½" (38mm)	90	78	65	52	35	10	31
4HU73	1/2	3450	1½" (38mm)	90	78	65	52	35	10	31
4HU74	1/2	3450	1½" (38mm)	90	78	65	52	35	10	31

Dimensions

Models 4HU71 and 4HU72



Models 4HU73 and 4HU74

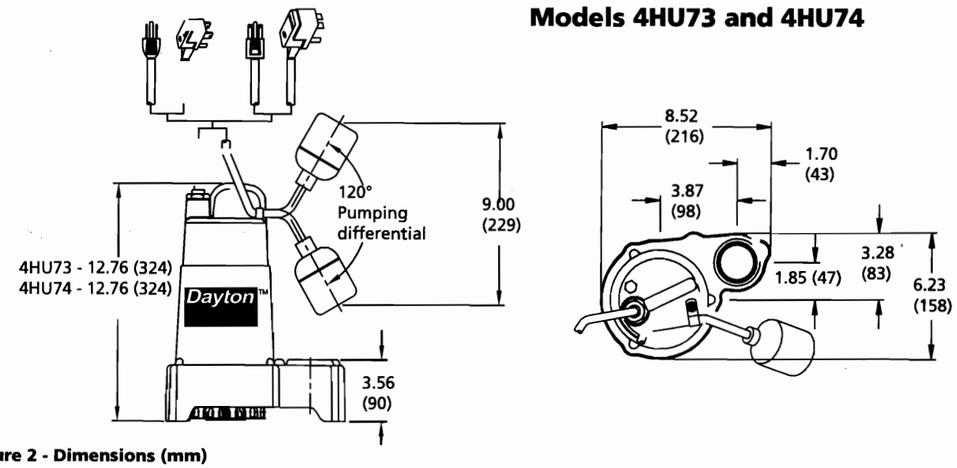


Figure 2 - Dimensions (mm)

Models 4HU71, 4HU72, 4HU73 and 4HU74

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General Safety Information

Please read this before installing or operating pump. this information is provided for SAFETY and to PREVENT EQUIPMENT PROBLEMS. To help recognize this information, observe the following symbols:

NOTE: Indicates special instructions which are important but not related to hazards.

IMPORTANT: Indicates factors concerned with assembly, installation, operation, or maintenance which could result in damage to the machine or equipment if ignored.

⚠ CAUTION ***Warns about hazards that will or can cause minor personal injury or property damage if ignored.***

⚠WARNING ***Warns about hazards that can cause severe personal injury, death, or major property damage if ignored.***

⚠ DANGER ***Warns about hazards that will cause serious personal injury, death, or major property damage if ignored.***

1. Most accidents can be avoided by using COMMON SENSE.

⚠ CAUTION ***Do not wear loose clothing that may become entangled in the impeller or other moving parts.***
Always wear appropriate safety gear, such as safety glasses, when working on the pump or piping.

⚠ CAUTION ***Pumps build up heat and pressure during operation. Allow time for pumps to cool before handling or servicing.***

2. Only qualified personnel should install, operate, and repair pump.

⚠ CAUTION ***Keep clear of suction and discharge openings. Do not insert fingers in pump with power connected.***

⚠ DANGER ***Do not pump hazardous materials (flammable, caustic,etc.) unless the pump is specifically designed and designated to handle them.***

3. Make sure lifting handles are securely fastened each time before lifting.
4. Do not lift pump by the power cord.
5. Do not exceed manufacturer's recommendation for maximum performance, as this could cause the motor to overheat.
6. Secure the pump in its operating position so it can not tip over, fall, or slide.
7. Keep hands and feet away from impeller when power is connected.

⚠ DANGER ***Submersible pumps are not approved for use in swimming pools, recreational water installations, decorative fountains, or any installation where human contact with the pumped fluid is common.***

8. Operation against a closed discharge valve will cause premature bearing and seal failure on any pump.

⚠WARNING ***To reduce risk of electrical shock, pump must be properly grounded in accordance with the United States National Electric Code (NEC), or the Canadian Electrical Code (CEC) and all applicable state, and local codes and ordinances.***

⚠WARNING ***To reduce risk of electrical shock, always disconnect the pump from the power source before handling or servicing.***

9. Any wiring of pumps should be performed by a qualified electrician.

⚠ CAUTION ***Never operate a pump with a power cord that has frayed or brittle insulation.***

10. Cable should be protected at all times to avoid punctures, cuts, bruises, and abrasions - inspect frequently.

⚠ CAUTION ***Never handle connected power cords with wet hands. Never operate a 120 volt pump with a plug-in type power cord without a ground fault circuit interrupter.***

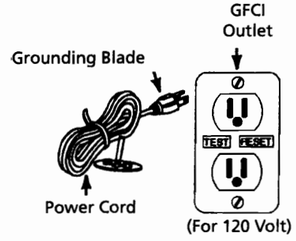

Figure 3

11. Do not remove cord and strain relief. Do not connect conduit to pump.

⚠WARNING ***To reduce risk of electrical shock, all wiring and junction connections should be made per the United States National Electric Code (NEC), or the Canadian Electrical Code (CEC) and applicable state or province and local codes. Requirements may vary depending on usage and location. See wiring diagrams in manual.***

Dayton Electric Mfg. Co. is not responsible for losses, injury, or death resulting from a failure to observe these safety precautions, misuse or abuse of pumps or equipment.

Dayton™ Submersible Effluent Pumps

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Unpacking

Upon receiving the pump, it should be inspected for damage or shortages. If damage has occurred, file a claim immediately with the carrier that delivered the pump. If the manual is removed from the packaging, do not lose or misplace.

Storage

Short Term- Pumps are manufactured for efficient performance following short inoperative periods in storage. For best results, pumps can be retained in storage, as factory assembled, in a dry atmosphere with constant temperatures for up to six (6) months.

Long Term- For storage of six (6) months, to twenty-four (24) months, the units should be stored in a temperature controlled area, a roofed-over walled enclosure that provides protection from the elements (rain, snow, wind-blown dust, etc.), and whose temperature can be maintained between +40° F and +120° F. If extended high humidity is expected to be a problem, all exposed parts should be inspected before storage and all surfaces that have the paint scratched, damaged, or worn should be recoated with a water base, air dry enamel paint. All surfaces should then be sprayed with a rust-inhibiting oil.

Pump should be stored in its original shipping container. On initial start up, rotate impeller by hand to assure seal and impeller rotate freely.

If it is required that the pump be installed and tested before the long term storage begins, such installation will be allowed provided:

1. The pump is not installed under water for more than one (1) month.
2. Immediately upon satisfactory completion of the test, the pump is removed, thoroughly dried, repacked in the original shipping container, and placed in a temperature controlled storage area.

Installation

SUBMERGENCE

It is recommended that the pump be operated in the submerged condition and the sump liquid level should never be less than "A" dimension in Figure 4.

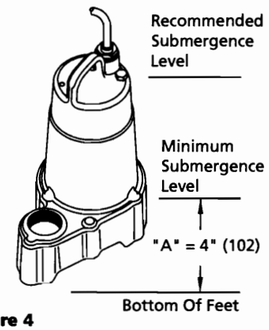

Figure 4

Provide proper sump diameter of approx. 18" (457mm) minimum and depth of approx. 20" (508mm) minimum to allow the pump and switch to operate without restriction. Make sure sump is free of string, cloth, nails, gravel, etc. before installing pump.

DISCHARGE

Discharge piping should be as short as possible. Both a check valve and a shut-off valve are recommended for each pump being used. The check valve is used to prevent backflow into the sump. Excessive backflow can cause flooding and/or damage to the pump. The shut-off valve is used to stop system flow during pump or check valve servicing.

LIQUID LEVEL CONTROL

Models 4HU73 & 4HU74

The level control is mounted to the pumps motor housing. The control level can be changed by adjusting the cord tether. The level control should not come in contact with side or bottom of sump. Be certain that the level control can not hang up or foul in it's swing and that the level control "Off" mode is above the recommended minimum submergence level. (See Figure 5). Reference dimension "A", in Figure 4.

Typical installation with Wide Angle level control

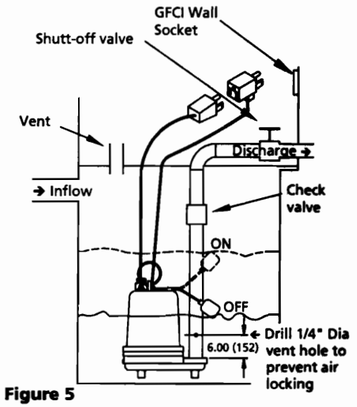

Figure 5

⚠WARNING ***Never work in the sump with the power ON.***

Figure 6 shows a typical connection for 1 phase 120 and 240 volt pumps with a piggy-back plug, for manual and automatic operations.

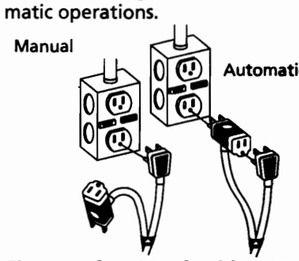

Figure 6 - for 120 volt with GFCI

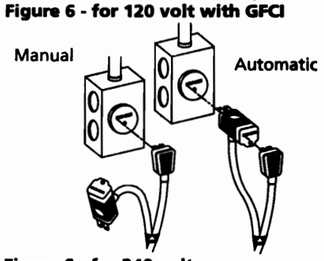

Figure 6 - for 240 volt

Automatic - Plug float cord into outlet, then plug pump cord into float cord.

Manual - Plug pump cord directly into outlet.

Models 4HU71, 4HU72, 4HU73 and 4HU74

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Installation (Continued)

ELECTRICAL CONNECTIONS

Power Cable –The cord assembly mounted to the pump must not be modified in any way. This pump comes complete with a 3 wire cord and 3 prong grounded plug that must be connected into a 3 wire grounded Ground Fault receptacle. **DO NOT** remove ground pin from electrical plug. It is **NOT** recommended to use an extension cord with these pumps.

OVERLOAD PROTECTION

Automatic thermal overload protects the sealed-in-oil motor. Running dry may overheat the motor and trip the overload. The type of in-winding overload protector used is referred to as an inherent overheating protector and operates on the combined effect of temperature and current. This means that the overload protector will trip out and shut the pump off if the windings become too hot, or the load current passing through them becomes too high.

It will then automatically reset and start the pump up after the motor cools to a safe temperature. In the event of an overload, the source of this condition should be determined and rectified immediately.

⚠ CAUTION ***Do not cycle or run pump if an overload condition occurs!***

Pre-operation

CHECK VOLTAGE AND PHASE

Before operating pump, check to make sure that the voltage and phase information stamped on the pump's identification plate matches the available power.

CHECK PUMP ROTATION

Before putting pump into service for the first time, the motor rotation must be checked.

Improper motor rotation can result in poor pump performance and can damage the motor and/or pump. To check the rotation, suspend the pump freely, momentarily apply power and observe the "kickback." "Kickback" should always be in a counter-clockwise direction as viewed from the top of the pump ("kickback" is always opposite to impeller rotation). "Rotation" and "kickback" direction is noted on the pump motor housing.

INCORRECT ROTATION

In the unlikely event that the rotation is incorrect for a single-phase pump, contact Repair and Service, tollfree at 1-866-632-9866.

IDENTIFICATION PLATE

Note the numbers on the pump's identification plate and record at the end of the manual for future reference.

PUMP-DOWN TEST

After the pump has been properly wired and lowered into the basin, sump, or lift station, it is advisable to check the system by filling with liquid and allowing the pump to operate through it's pumping cycle. The time needed to empty the system, or pump-down time, should be recorded.

Service and Repair

Refer to Figure 7.

⚠ DANGER ***Electrical power to the pump motor must be disconnected and locked out to prevent any dangerous electrical hazards or personnel danger before any service work is done to the pump.***

⚠ CAUTION ***Always wear eye protection when working on pumps.***

REPLACING OIL

Drain all oil from motor housing and dispose of properly. Refill with 16 ounces of new cooling oil as per Table 1. An air space must remain in the top of the motor housing to compensate for air expansion.

⚠ CAUTION ***Do not overfill oil. Overfilling of motor housing with oil can create excessive and dangerous hydraulic pressure which can destroy the pump and create a hazard. Overfilling oil voids warranty.***

Table 1 –Cooling Oil –Dielectric

Supplier	Grade
BP	Enerpar SE 100
Conoco	Pale Paraffin 22
Mobil	D.T.E. Oil Light
G & G Oil	Circulating 22
Texaco	Diala -Oil-AX
Woco	Primium 100

VOLUTE/STRAINER

Remove screws (Ref. No. 2), and volute/strainer (Ref. No. 1) . Clean and examine volute/strainer (Ref. No. 1) and replace if damaged. Clean impeller vanes if clogged. Replace volute/strainer (Ref. No. 1) and screws (Ref. No. 2)

CABLE SERVICE

To replace cable (Ref. No. 3) remove gland nut (Ref. No. 3a) and friction ring (Ref. No. 3b) from motor housing. Pull cord through opening and disconnect the motor wires from the terminals on cable (Ref. No. 3).

Dayton™ Submersible Effluent Pumps

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Troubleshooting Chart

⚠ CAUTION Always disconnect the pump from the electrical power source before handling. If the system fails to operate properly, carefully read instructions and perform maintenance recommendations. If operating problems persist, the following chart may be of assistance in identifying and correcting them.

NOTE: Not all problems and corrections will apply to each pump model.

Symptom	Possible Cause (s)	Corrective Action
Pump will not run	1. Poor electrical connection, blown fuse, tripped breaker, or other interruption of power; improper power supply	1. Check all electrical connections for security. Have electrician measure current in motor leads. If current is within ± 20% of locked rotor Amps, impeller is probably locked. If current is 0, overload may be tripped. Remove power, allow pump to cool, then recheck current
	2. Motor or switch inoperative	2. Go to manual operation of pump
	3. Float movement restricted	3. Reposition pump or clean basin as required to provide adequate clearance for float
	4. Switch will not activate pump or is defective	4. Disconnect level control. Set ohmmeter for a low range, such as 100 ohms full scale and connect to level control leads. Actuate level control manually and check to see that ohmmeter shows zero ohms for closed switch and full scale for open switch (Float Switch)
	5. Defective motor	5. Check winding insulation (Megger Test) and winding resistance. If check is outside of range, dry and recheck. If still defective, replace per service instructions
	6. Insufficient liquid level	6. Make sure liquid level is at least equal to suggested turn-on point
Pump will not turn off	1. Float movement restricted	1. Reposition pump or clean basin as required to provide adequate clearance for float
	2. Switch will not activate pump or is defective	2. Disconnect level control. Set ohmmeter for a low range, such as 100 ohms full scale and connect to level control leads. Actuate level control manually and check to see that ohmmeter shows zero ohms for closed switch and full scale for open switch (Float Switch)
	3. Excessive inflow or pump not properly sized for application	3. Recheck all sizing calculations to determine proper pump size
	4. Pump may be airlocked	4. Loosen union slightly to allow trapped air to escape. Verify that turn-off level of switch is set so that impeller cavity is always flooded. Clean vent hole
Pump hums but doesn't run	1. Incorrect voltage	1. Check all electrical connections for security. Have electrician measure current in motor leads. If current is within ± 20% of locked rotor Amps, impeller is probably locked. If current is 0, overload may be tripped. Remove power, allow pump to cool, then recheck current
	2. Impeller jammed or loose on shaft, worn, or damaged, impeller cavity or inlet plugged	2. Check impeller for freedom of operation, security, and condition. Clean impeller cavity and inlet of any obstruction
Pump cycles too frequently or runs periodically when fixtures are not in use	1. Check valve stuck closed or installed backwards	1. Remove and examine check valve for proper installation and freedom of operation
	2. Fixtures are leaking	2. Repair fixtures as required to eliminate leakage
	3. Ground water entering basin	3. Check for leaks around basin inlet and outlets

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Troubleshooting Chart (Continued)

Symptom	Possible Cause (s)	Corrective Action
Pump delivers insufficient capacity	1. Incorrect voltage	1. Check all electrical connections for security. Have electrician measure current in motor leads. If current is within ±20% of locked rotor Amps, impeller is probably locked. If current is 0, overload may be tripped. Remove power, allow pump to cool, then recheck current
	2. Excessive inflow or pump not properly sized for application	2. Recheck all sizing calculations to determine proper pump size
	3. Discharge restricted	3. Check discharge line for restrictions, including ice. If line passes through or into cold areas
	4. Check valve stuck closed or installed backwards	4. Remove and examine check valve for proper installation and freedom of operation
	5. Shut-off valve closed	5. Open valve
	6. Impeller jammed or loose on shaft, worn or damaged, impeller cavity or inlet plugged	6. Check impeller for freedom of operation, security, and condition. Clean impeller cavity and inlet of any obstruction
	7. Pump may be airlocked	7. Loosen union slightly to allow trapped air to escape. Verify that turn-off level of switch is set so that impeller cavity is always flooded. Clean vent hole
	8. Pump running backwards	8. Check rotation. If power supply is three phase, reverse any two of three power supply leads to ensure proper impeller rotation
Pump shuts off and turns on independent of switch (trips thermal overload protector) **⚠ CAUTION** ***Pump may start unexpectedly. Disconnect power supply*** NOTE: Some pumps do not have thermal load protection on the motor Check pump specifications to determine	1. Incorrect voltage	1. Check all electrical connections for security. Have electrician measure current in motor leads. If current is within ±20% of locked rotor Amps, impeller is probably locked. If current is 0, overload may be tripped. Remove power, allow pump to cool, then recheck current
	2. Excessive inflow or pump not properly sized for application	2. Recheck all sizing calculations to determine proper pump size
	3. Impeller jammed, loose on shaft, worn or damaged; impeller cavity or inlet plugged	3. Check impeller for freedom of operation, security, and condition. Clean impeller cavity and inlet of any obstruction
	4. Excessive water temperature (internal protection only)	4. Check pump temperature limits & fluid temperature
Pump operates noisily or vibrates excessively	1. Worn bearings, motor shaft bent	1. Check winding insulation (Megger Test) and winding resistance. If check is outside of range, dry and recheck. If still defective, replace per service instructions
	2. Debris in impeller cavity or broken impeller	2. Check impeller for freedom of operation, security, and condition. Clean impeller cavity and inlet of any obstruction
	3. Pump running backwards	3. Check rotation. If power supply is three phase, reverse any two of three power supply leads to ensure proper impeller rotation
	4. Piping attachments to building structure too rigid or too loose	4. Replace portion of discharge pipe with flexible connector

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For Repair Parts, call 1-800-323-0620

24 hours a day - 365 days a year

Please provide the following information:
-Model number
-Serial number (if any)
-Part description and number as shown in parts list

Address parts correspondence to:
Grainger Parts
P.O. Box 3074
1657 Shermer Road
Northbrook, IL 60065-3074 U.S.A.

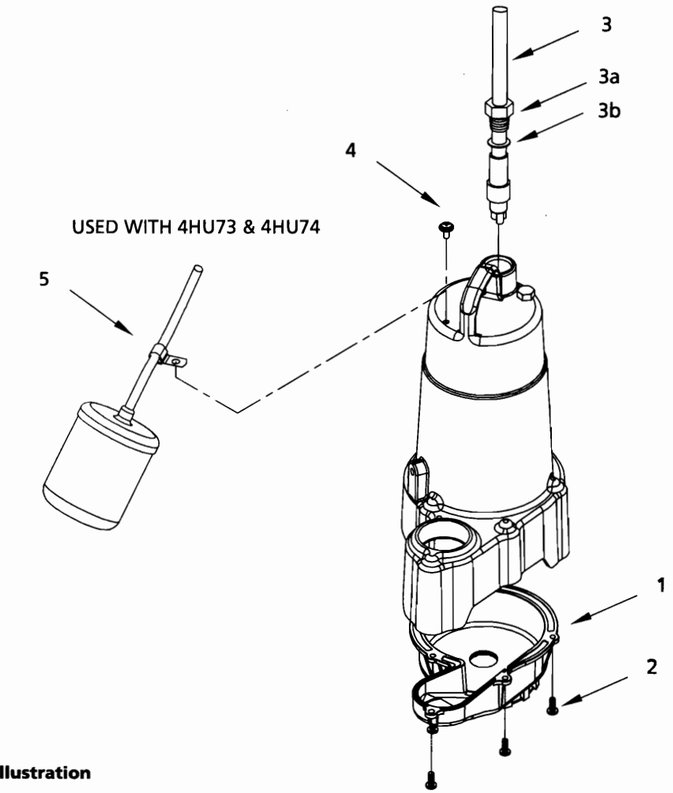

Figure 7 – Repair Parts Illustration

Repair Parts List

Ref. No.	Description	Part Number For Pump Models 4HU71	4HU72	4HU73	4HU74	Qty.
1	Volute/Strainer	118058	118058	118058	118058	1
2	10-32 x 1/2" SS screw	*	*	*	*	5
3	20 ft. (6 m) Power cable assy	099260XA	118078XA	099260XA	118078XA	1
3a †	Gland nut	----	----	----	----	1
3b †	Friction ring	----	----	----	----	1
4	10-32 x 3/8" SS screw	*	*	*	*	1
5	Float switch	----	----	115501A	115501XB	1

(†) Included with item #3
(*) Standard hardware item, available locally
(△) See Table 1 for replacement oil
---- Not available

For Repair and Service Call 1-866-632-9866

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Dayton™ Submersible Effluent Pumps

For Repair and Service, call 1-866-632-9866

LIMITED WARRANTY

DAYTON ONE YEAR LIMITED WARRANTY. *Dayton™ Submersible Effluent Pumps, Models covered in this manual, are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specific legal rights which vary from jurisdiction to jurisdiction.*

LIMITATION OF LIABILITY. *To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to and shall not exceed the purchase price paid.*

WARRANTY DISCLAIMER. *Dayton has made a diligent effort to provide information and illustrate the products in this literature accurately, however, such information and illustrations are for the sole purpose of identification, and do not express or imply a warranty that the products are MERCHANTABLE, or FIT FOR A PARTICULAR PURPOSE, or that the products will necessarily conform to the illustrations or descriptions.*

Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in the "LIMITED WARRANTY" above is made or authorized by Dayton.

PRODUCT SUITABILITY. *Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the products are installed or used. Before purchase and use of a product, review the product applications, and all applicable national and local codes and regulations, and be sure that the product, installation, and use will comply with them.*

Certain aspects of disclaimers are not applicable to consumer products: e.g., (a) some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you, (b) also, some jurisdictions do not allow a limitation on how long an implied warranty lasts, consequently the above limitation may not apply to you, and (c) by law, during the period of this Limited Warranty, any implied warranties of implied merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. *Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date, and number of dealer's invoice, describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.*

Manufactured for Dayton Electric Mfg. Co., 5959 W. Howard St., Niles, Illinois 60714 U.S.A.

Manufactured for Dayton Electric Mfg. Co.
Niles, Illinois 60714 U.S.A

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