

**Notice to installing contractor: Instructions must remain with installation.**

SECTION: 6.10.001

*"QUALITY PUMPS SINCE 1939"*



FM0447

Rev. A

1009

Supersedes

0809

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

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**NOTICE: VENT HOLE FOR CHECK VALVE SEE #3 IN CAUTION SECTION BELOW AND #4 ON PAGE 3**

# INSTALLATION INSTRUCTIONS RECOMMENDED MODELS

DATE INSTALLED:

5/26/15

MODEL NUMBER:

M35

EFFLUENT*/SUMP/DEWATERING	SEWAGE
49, 50 Series, 70 Series, 98 Series	211 Series, 264 Series
130 Series, 140/4140, 145/4145 Series, 150 Series, 160/4160 Series	260 Series, 270/4270 Series
180/4180 Series, 191, 371, 372, 373	280/4280 Series, 290/4290 Series

P/N 006355

\*Effluent systems should specify that pumps should not handle solids exceeding three fourths inch (¾") in order to prevent large solids from entering leaching fields, mound systems etc. (Model 49 and 70 Series have 3/8" solids capability, 50, 90, 140, 145/4145, 151, 371 and 372 Series have ½", 130 Series has 5/8", 152,153, and 160/4160/180/4180, 373 Series have ¾"). Where codes permit, sewage pumps can be used for effluent systems. Nonautomatic pump(s) with external level control recommended for septic tank effluent applications.

## PREINSTALLATION CHECKLIST - ALL INSTALLATIONS

1. **Inspect your pump.** Occasionally, products are damaged during shipment. If the unit is damaged, contact your dealer before using. **DO NOT** remove the test plugs in the cover nor the motor housing.
2. **Carefully read the literature** provided to familiarize yourself with specific details regarding installation and use. These materials should be retained for future reference.

<div style="border: 1px solid black; padding: 5px;"> <h3 style="margin: 0;">WARNING</h3> <p style="margin: 0;">SEE BELOW FOR LIST OF WARNINGS</p> </div> <ol style="list-style-type: none"> <li>1. Make certain that the receptacle is within the reach of the pump's power supply cord. <b>DO NOT USE AN EXTENSION CORD.</b> Extension cords that are too long or too light do not deliver sufficient voltage to the pump motor. But, more important, they could present a safety hazard if the insulation were to become damaged or the connection end were to fall into the sump.</li> <li>2. <b>Make sure the pump electrical supply circuit is equipped with fuses or circuit breakers of proper capacity.</b> A separate branch circuit is recommended, sized according to the "National Electrical Code" for the current shown on the pump nameplate.</li> <li>3. <b>Testing for ground.</b> As a safety measure, each electrical outlet should be checked for ground using an Underwriters Laboratory Listed circuit analyzer which will indicate if the power, neutral and ground wires are correctly connected to your outlet. If they are not, call a qualified licensed electrician.</li> <li>4. <b>For Added Safety.</b> Pumping and other equipment with a 3-prong grounded plug must be connected to a 3-prong grounded receptacle. For added safety the receptacle may be protected with a ground-fault circuit interrupter. When a pump needs to be connected in a watertight junction box, the plug can be removed and spliced to the supply cable with proper grounding. For added safety this circuit may be protected by a ground-fault circuit interrupter. The complete installation must comply with the National Electrical Code and all applicable local codes and ordinances.</li> <li>5. <b>FOR YOUR PROTECTION, ALWAYS DISCONNECT PUMP FROM ITS POWER SOURCE BEFORE HANDLING.</b> Single phase pumps are supplied with a 3-prong grounded plug to help protect you against the possibility of electrical shock. <b>DO NOT UNDER ANY CIRCUMSTANCES REMOVE THE GROUND PIN.</b> The 3-prong plug must be inserted into a mating 3-prong grounded receptacle. If the installation does not have such a receptacle, it must be changed to the proper type, wired and grounded in accordance with the National Electrical Code and all applicable local codes and ordinances. Three phase pumps require motor starting devices with motor overload protection. See FM0486 for duplex installations.</li> <li>6. The tank is to be vented in accordance with local plumbing code. Pumps must be installed in accordance with the National Electrical Code and all applicable local codes and ordinances. Pumps are not to be installed in locations classified as hazardous in accordance with National Electrical Code, ANSI/NFPA 70.</li> <li>7. <b>"Risk of electrical shock"</b> Do not remove power supply cord and strain relief or connect conduit directly to the pump.</li> <li>8. Installation and servicing of electrical circuits and hardware should be performed by a qualified licensed electrician.</li> <li>9. Pump installation and servicing should be performed by a qualified person.</li> <li>10. Risk of electric shock - These pumps have not been investigated for use in swimming pool and marine areas.</li> <li>11. According to the state of California (Prop 65), this product contains chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.</li> </ol>	<div style="border: 1px solid black; padding: 5px;"> <h3 style="margin: 0;">CAUTION</h3> <p style="margin: 0;">SEE BELOW FOR LIST OF CAUTIONS</p> </div> <ol style="list-style-type: none"> <li>1. Check to be sure your power source is capable of handling the voltage requirements of the motor, as indicated on the pump name plate.</li> <li>2. The installation of automatic pumps with variable level float switches or nonautomatic pumps using auxiliary variable level float switches is the responsibility of the installing party and care should be taken that the tethered float switch will not hang up on the pump apparatus or pit peculiarities and is secured so that the pump will shut off. It is recommended to use rigid piping and fittings and the pit be 18" or larger in diameter.</li> <li>3. <b>Information - vent hole purpose.</b> It is necessary that all submersible sump, effluent, and sewage pumps capable of handling various sizes of solid waste be of the bottom intake design to reduce clogging and seal failures. If a check valve is incorporated in the installation, a vent hole (approx. 3/16") must be drilled in the discharge pipe below the check valve and pit cover to purge the unit of trapped air. Trapped air is caused by agitation and/or a dry basin. Vent hole should be checked periodically for clogging. The 50 or 90 Series pumps have a vent located in the pump housing opposite the float, adjacent to a housing lug, but an additional vent hole is recommended. The vent hole on a High Head application may cause too much turbulence. You may not want to drill one. If you choose not to drill a vent hole, be sure the pump case and impeller is covered with liquid before connecting the pipe to the check valve and no inlet carries air to the pump intake. <b>NOTE: THE HOLE MUST ALSO BE BELOW THE BASIN COVER AND CLEANED PERIODICALLY.</b> Water stream will be visible from this hole during pump run periods.</li> <li>4. Pump should be checked frequently for debris and/or build up which may interfere with the float "on" or "off" position. Repair and service should be performed by Zoeller Pump Company Authorized Service Station only.</li> <li>5. Dewatering and effluent sump pumps are not designed for use in pits handling raw sewage.</li> <li>6. Maximum operating temperature for standard model pumps must not exceed 130°F (54°C). Model 49 max. temperature must not exceed 104°F (40°C). The 70 and 211 Series max. temperature must not exceed 110°F (43°C).</li> <li>7. Pump models 188/4188, 189/4189, and 295/4295 nonautomatic pump must run totally submerged and CSA certified pumps must be operated submerged with "off - on" level controls.</li> <li>8. Pump models 266, 267, 268, 137 and 139 must be operated in an upright position. Do not attempt to start pump when tilted or laying on its side.</li> <li>9. Do not operate a pump in an application where the Total Dynamic Head is less than the minimum Total Dynamic Head listed on the Pump Performance Curves.</li> <li>10. Model 49 is for indoor use only.</li> </ol> <p>NOTE: Pumps with the "UL" mark and pumps with the "US" mark are tested to UL Standard UL778. CSA Certified pumps are certified to CSA Standard C22.2 No. 108.</p>
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REFER TO WARRANTY ON PAGE 2.

## Limited Warranty

Manufacturer warrants, to the purchaser and subsequent owner during the warranty period, every new product to be free from defects in material and workmanship under normal use and service, when properly used and maintained, for a period of one year from date of purchase by the end user, or 18 months from date of original manufacture of the product, whichever comes first. Parts that fail within the warranty period, one year from date of purchase by the end user, or 18 months from the date of original manufacture of the product, whichever comes first, that inspections determine to be defective in material or workmanship, will be repaired, replaced or remanufactured at Manufacturer's option, provided however, that by so doing we will not be obligated to replace an entire assembly, the entire mechanism or the complete unit. No allowance will be made for shipping charges, damages, labor or other charges that may occur due to product failure, repair or replacement.

This warranty does not apply to and there shall be no warranty for any material or product that has been disassembled without prior approval of Manufacturer, subjected to misuse, misapplication, neglect, alteration, accident or act of God; that has not been installed, operated or maintained in accordance with Manufacturer's installation instructions; that has been exposed to outside substances including but not limited to the following: sand, gravel, cement, mud, tar, hydrocarbons, hydrocarbon derivatives (oil, gasoline, solvents, etc.), or other abrasive or corrosive substances, wash towels or feminine sanitary products, etc. in all pumping applications. The warranty set out

in the paragraph above is in lieu of all other warranties expressed or implied; and we do not authorize any representative or other person to assume for us any other liability in connection with our products.

Contact Manufacturer at, 3649 Cane Run Road, Louisville, Kentucky 40211, Attention: Customer Service Department to obtain any needed repair or replacement of part(s) or additional information pertaining to our warranty.

**MANUFACTURER EXPRESSLY DISCLAIMS LIABILITY FOR SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES OR BREACH OF EXPRESSED OR IMPLIED WARRANTY; AND ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND OF MERCHANTABILITY SHALL BE LIMITED TO THE DURATION OF THE EXPRESSED WARRANTY.**

Some states do not allow limitations on the duration of an implied warranty, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

**In those instances where damages are incurred as a result of an alleged pump failure, the Homeowner must retain possession of the pump for investigation purposes.**

## EASY DO'S & DON'T'S FOR INSTALLING A SUMP PUMP

1. **DO** read thoroughly all installation material provided with the pump.
2. **DO** inspect pump for any visible damage caused by shipping. Contact dealer if pump appears to be damaged.
3. **DO** clean all debris from the sump. Be sure that the pump will have a hard, flat surface beneath it. **DO NOT** install on sand, gravel or dirt.
4. **DO** be sure that the sump is large enough to allow proper clearance for the level control switch(es) to operate properly.
5. **DO Always Disconnect Pump From Power Source Before Handling.**  
**DO** always connect to a separately protected and properly grounded circuit.  
**DO NOT** ever cut, splice, or damage power cord (Only splice in a watertight junction box).  
**DO NOT** carry or lift pump by its power cord.  
**DO NOT** use an extension cord with a sump pump.
6. **DO** install a check valve and a union in the discharge line.  
**DO NOT** use a discharge pipe smaller than the pump discharge.
7. **DO NOT** use a sump pump as a trench or excavation pump, or for pumping sewage, gasoline, or other hazardous liquids.
8. **DO** test pump immediately after installation to be sure that the system is working properly.
9. **DO** cover sump with an adequate sump cover.
10. **DO** review all applicable local and national codes and verify that the installation conforms to each of them.
11. **DO** consult manufacturer for clarifications or questions.
12. **DO** consider a two pump system with an alarm where an installation may become overloaded or primary pump failure would result in property damages.
13. **DO** consider a D.C. Backup System where a sump or dewatering pump is necessary for the prevention of property damages from flooding due to A.C. power disruptions, mechanical or electrical problems or system overloading.
14. **DO** inspect and test system for proper operations at least every three months.

## SERVICE CHECKLIST



**▲ WARNING** **ELECTRICAL PRECAUTIONS-** Before servicing a pump, always shut off the main power breaker and then unplug the pump - making sure you are wearing insulated protective sole shoes and not standing in water. Under flooded conditions, contact your local electric company or a qualified licensed electrician for disconnecting electrical service prior to pump removal.

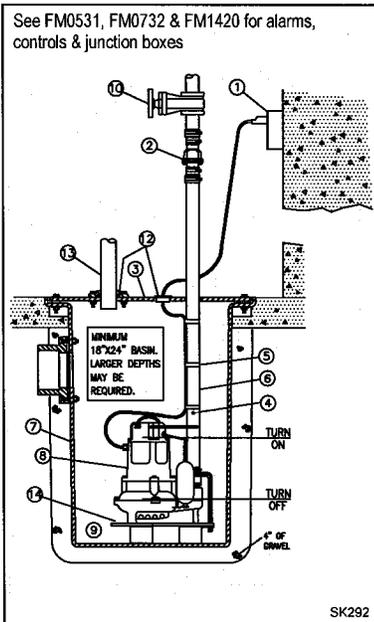
**▲ WARNING** Submersible pumps contain oils which becomes pressurized and hot under operating conditions - allow 2½ hours after disconnecting before attempting service.

CONDITION	COMMON CAUSES
<b>A. Pump will not start or run.</b>	Check fuse, low voltage, overload open, open or incorrect wiring, open switch, impeller or seal bound mechanically, defective capacitor or relay when used, motor or wiring shorted. Float assembly held down. Switch defective, damaged, or out of adjustment.
<b>B. Motor overheats and trips overload or blows fuse.</b>	Incorrect voltage, negative head (discharge open lower than normal) impeller or seal bound mechanically, defective capacitor or relay, motor shorted.
<b>C. Pump starts and stops too often.</b>	Float tight on rod, check valve stuck or none installed in long distance line, overload open, level switch(s) defective, sump pit too small.
<b>D. Pump will not shut off.</b>	Debris under float assembly, float or float rod bound by pit sides or other, switch defective, damaged or out of adjustment.
<b>E. Pump operates but delivers little or no water.</b>	Check strainer housing, discharge pipe, or if check valve is used vent hole must be clear. Discharge head exceeds pump capacity. Low or incorrect voltage. Incorrect motor rotation. Capacitor defective. Incoming water containing air or causing air to enter pumping chamber.
<b>F. Drop in head and/or capacity after a period of use.</b>	Increased pipe friction, clogged line or check valve. Abrasive material and adverse chemicals could possibly deteriorate impeller and pump housing. Check line. Remove base and inspect.

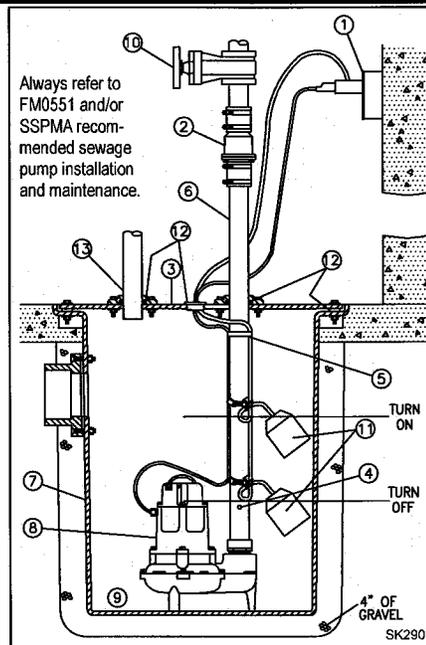
If the above checklist does not uncover the problem, consult the factory - Do not attempt to service or otherwise disassemble pump. Service must be performed by Zoeller Authorized Service Stations. Go to [www.zoeller.com/zcopump/TechSupport/authsslisting.htm](http://www.zoeller.com/zcopump/TechSupport/authsslisting.htm) to find the Authorized Service Station in your area.

# RECOMMENDED INSTALLATION FOR ALL APPLICATIONS

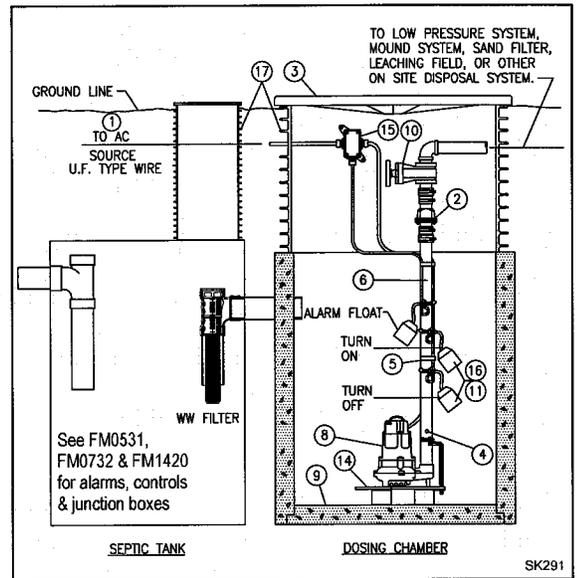
- (1) Electrical wiring and protection must be in accordance with National Electrical Code and any other applicable state and local electrical requirements.
  - (2) Install proper Zoeller unichek (combination union and check valve), preferably just above the basin to allow easy removal of the pump for cleaning or repair. On sewage, effluent or dewatering, if high head or below cover installation is required use 30-0164 on 1½" pipe, 30-0152 on 2" pipe and 30-0160 on 3" pipe. See (4) below.
  - (3) All installations require a basin cover to prevent debris from falling into the basin and to prevent accidental injury.
  - (4) When a Unichek is installed, drill a 3/16" dia. hole in the discharge pipe even with the top of the pump. **NOTE: THE HOLE MUST ALSO BE BELOW THE BASIN COVER AND CLEANED PERIODICALLY.** (High Head unit see #3 under "Caution" on front page). Water stream will be visible from this hole during pump run periods.
  - (5) Securely tape or clamp power cord to discharge pipe, clear of the float mechanism(s).
  - (6) Use full-size discharge pipe.
  - (7) Basin must be in accordance with applicable codes and specifications.
  - (8) Pump must be level and float mechanism(s) clear of sides of basin before starting pump.
  - (9) Basin must be clean and free of debris after installation.
  - (10) Gate Valve or Ball Valve to be supplied by installer and installed according to any and all codes.
  - (11) Locate float switches as shown in sketches. The best place for the "off" point is above the motor housing and positioned 180° from the inlet. Never put "off" point below discharge on pump (Sewage & Effluent only). **NOTE: FOR AUTOMATIC PUMPS, USE DEWATERING INSTALLATION SKETCH.**
  - (12) Gas tight seals required to contain gases and odors.
  - (13) Vent gases and odors to the atmosphere through vent pipe (Sewage & Dewatering only).
  - (14) Install Zoeller Pump Stand (Model 10-2421) under pump to provide a settling basin. (Effluent & Dewatering only).
- For Effluent Only:**
- (15) Wire pump to power through a Zoeller watertight junction box or watertight splice. **NOTE: Watertight enclosure is a must in damp areas. See No. 8 on front page of FM0732.**
  - (16) Refer to SSPMA Effluent Sizing Manual for determining "on" - "off" switches.
  - (17) Septic tank risers must be used for easy pump and filter access.
- NOTE: Double seal pumps offer extra protection from damage caused by seal failure.**



TYPICAL DEWATERING INSTALLATION



TYPICAL SEWAGE INSTALLATION



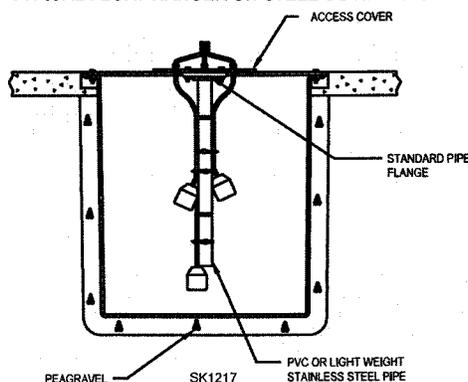
TYPICAL EFFLUENT INSTALLATION

All installations must comply with all applicable electrical and plumbing codes, including, but not limited to, National Electrical Code, local, regional, and/or state plumbing codes, etc. Not intended for use in hazardous locations.

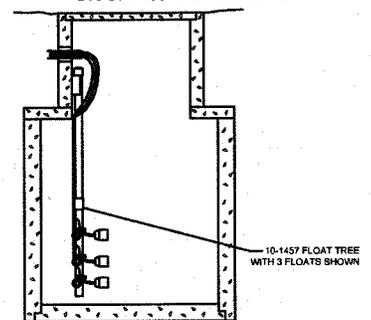
# SUGGESTED METHODS OF FLOAT INSTALLATION

On some installations it may be desirable to install an independent hanger for the level control switches to avoid possible hang ups on the pumps, piping, valves, etc. Float hangers are available from Zoeller Company on Catalog Sheet FM0526 or can be fabricated from standard pipe and fittings.

TYPICAL FLOAT HANGER ON STEEL COVER PITS



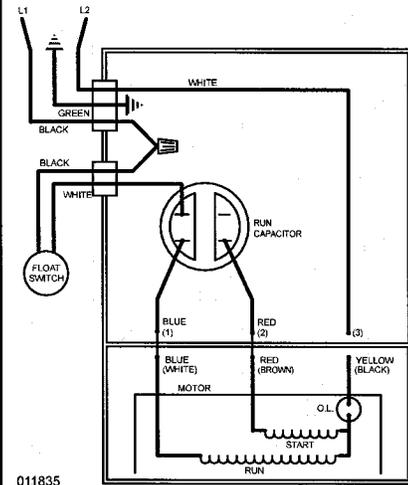
TYPICAL FLOAT HANGER ON CONCRETE PITS OR SEPTIC TANK RISERS



TYPICAL FLOAT HANGER ON CONCRETE PITS OR SEPTIC TANK RISERS

SK1218

# WD & WH MODEL INSTALLATION



011835

## WIRING DIAGRAM FOR MODELS

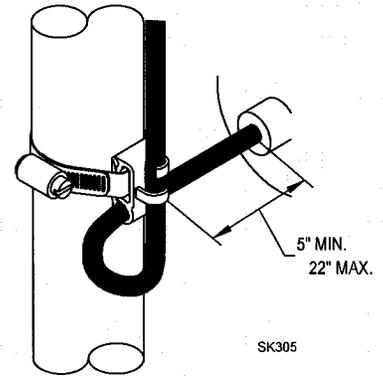
WD - 230V, 1 Ph, 60 Hz.  
WH - 200/208V, 1 Ph, 60 Hz.

### Determining Pumping Range in Inches (1 inch - 2.5 cm)

Tether Length	5	10	15	20	22
		min.			max.
Pumping Range	9	13.5	18	22	24

Use only as a guide. Due to weight of cable, pumping range above horizontal is not equal to pumping range below horizontal. Ranges are based on testing in nonturbulent conditions. Range may vary due to water temperature and cord shape. As tether length increases, so does the variance of the pumping range.

Models WD & WH are fully automatic. A float switch is included and factory wired in the pump circuit to provide automatic operation once the float switch is secured properly to the outlet pipe. Use the diagram above to secure the float switch properly and obtain the proper tether to customize the on-off cycle to each application.



20 AMP SWITCH (WD & WH MODELS)

Note: Failure to keep within proper tether limits may prevent reliable switch operation.

Note: Cable must be mounted in horizontal position.

## SINGLE PHASE WIRING INSTRUCTIONS



**WARNING** FOR YOUR PROTECTION, ALWAYS DISCONNECT PUMP FROM ITS POWER SOURCE BEFORE HANDLING. Single phase pumps are supplied with a 3-prong grounded plug to help protect you against the possibility of electrical shock. **DO NOT UNDER ANY CIRCUMSTANCES REMOVE THE GROUND PIN.** The 3-prong plug must be inserted into a mating 3-prong grounded receptacle. If the installation does not have such a receptacle, it must be changed to the proper type, wired and grounded in accordance with the National Electrical Code and all applicable local codes and ordinances.



**WARNING** "Risk of electrical shock" Do not remove power supply cord and strain relief or connect conduit directly to the pump.  
**WARNING** Installation and checking of electrical circuits and hardware should be performed by a qualified licensed electrician.  
**WARNING** Units supplied without a plug (single and three phase) and single phase nonautomatic units with a 20 amp plug must have a motor control and liquid level control provided at time of installation. The control device should have suitable voltage, ampere, frequency, grounding and horsepower rating for the pump to which it is connected.

## THREE PHASE WIRING INSTRUCTIONS



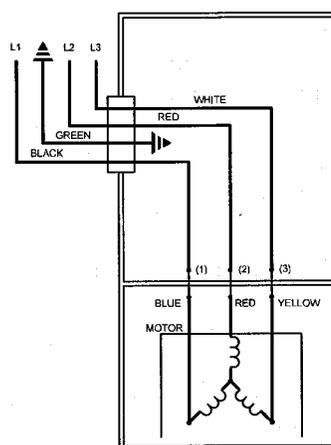
**WARNING** FOR YOUR PROTECTION, ALWAYS DISCONNECT PUMP FROM ITS POWER SOURCE BEFORE HANDLING.

To automatically operate a nonautomatic three phase pump, a control panel is required. Follow the instructions provided with the panel to wire the system. For automatic three phase pumps see automatic 3 phase wiring diagram located to the far right.

Before installing a pump, check the pump rotation to ensure that wiring has been connected properly to power source, and that the green lead of power cord (See wiring diagram), is connected to a valid ground. Momentarily energize the pump, observing the directions of kick back due to starting torque. Rotation is correct if kick back is in the opposite direction of rotation arrow on the pump casing. If rotation is not correct, switching of any two power leads other than ground, should provide the proper rotation.

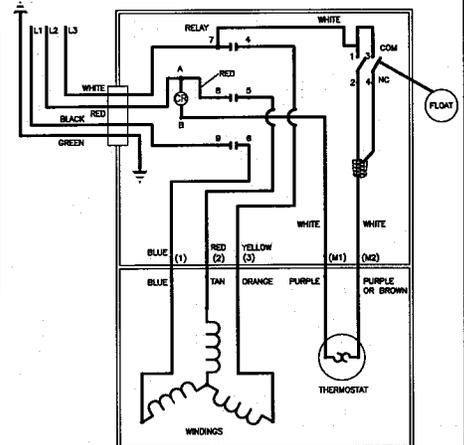
All three phase pumps require motor starting devices with motor overload protection. See FM0486 for duplex installations. Pumps **must** be installed in accordance with the National Electrical Code and all applicable local codes and ordinances. Pumps are not to be installed in locations classified as hazardous in accordance with National Electrical Code, ANSI/NFPA 70.

### NONAUTOMATIC 3 PHASE



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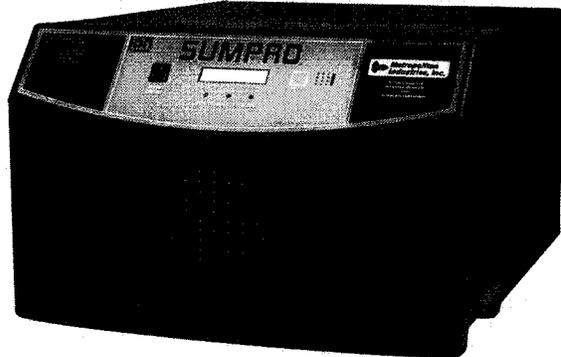
### AUTOMATIC 3 PHASE



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**IMPORTANT NOTICE:** Some insurance policies, both commercial and residential, extend coverage for damages incurred by product failure. You will need to have possession of the product to support your claim in most cases. Zoeller Pump Co. will exchange the unit or refund the original purchase price once the claim is settled with the insurer in the case where you need to retain possession of the product to support a damage claim you submit to your insurance company.

Take Control.  
**ION**  
Sumpro.



### INTRODUCTION

Reasonable care and safe methods should be practiced. Check local codes and requirements before installation. This manual contains important information for the safe use of this product. Read this manual completely before using this product and refer to it often for continued safe product use.

**Note:** This manual covers the installation of the inverter, regardless of what pump, switch or controller combination is included in the system you purchased. For more detailed installation information and troubleshooting regarding the pump, switch or controller, please refer to their individual manuals.

**DO NOT THROW AWAY OR LOSE THIS MANUAL.** Keep it in a safe place so that you may refer to it when needed.

### WARNING



**WARNING:** Always disconnect the Unit from the receptacle power source and battery before handling or making any adjustments to the system.

#### Battery Backup Warning:

1. Risk of electrical shock this Unit has not been investigated for use in outdoor areas.

2. Risk of electrical shock. Connect only to a properly grounded, three pronged grounding type receptacle. Under any circumstances, do not remove the grounding prong from the power cord.
3. Do not smoke, use sparkable electrical devices or open flame when working on this unit!
4. Do not install Unit in locations classified as hazardous per N.E.C., ANSI/NFPA 70 - 2014.



**FAILURE TO HEED ABOVE CAUTIONS  
COULD RESULT IN INJURY OR DEATH.**

The SUMPRO® is designed to operate a load up to 12 Amps. If operating more than one pump, the combined FLA cannot exceed 12 Amps.

### IMPORTANT SAFETY INSTRUCTIONS

Before proceeding further, please review the safety instructions carefully.

#### General Precautions:

- Before using the inverter read all instructions and caution markings on the inverter, the batteries & all appropriate sections of this instruction manual.
- Do not expose the inverter to any type of chemicals. The inverter is designed for interior use only.
- Do not disassemble the inverter; contact Metropolitan Industries Wholesale Customer Support at (800) 323-1665 when service or repair is required. Opening by unqualified personnel can lead to electrical shock or fire hazard and void the warranty.
- To reduce risk of electric shock, disconnect all wiring before cleaning.



**WARNING:** Avoid exposing the inverter or batteries to any type of explosive gases, as batteries generate explosive gases during normal operation. Install the batteries in a well ventilated area.

To reduce the risk of battery explosion, follow all the instructions of the battery supplier or any equipment you intend to use in the vicinity of batteries.

- Use the correct insulated tools to make AC/DC wiring connections.
- Do not install this inverter on or near flammable materials (plywood, chemicals, gas line etc.)

**CAUTION:****Personal Precautions:**

- Someone should be within the range of your voice to come to your aid when you work near batteries.
- Have plenty of fresh water and soap nearby in the event that battery acid contacts skin, clothing or eyes.
- Wear complete eye, skin and clothing protection.
- Avoid touching eyes while working near batteries. Wash your hands when done.
- If battery acid comes in contact with skin or clothing, wash immediately with soap and water.

**KNOWING YOUR INVERTER**

In its most basic form, an Inverter transforms Direct Current (DC) to Alternating Current (AC). The battery pack acts as reserve power to ensure continuous supply of power whenever electrical supply from utility power is not available. The inverter is used to charge the batteries when normal utility power is available and converts the battery's DC to AC voltage to run the pump when utility power is lost.

**BATTERY SAFETY**

**CAUTION:** Do not dispose of batteries in a fire. The battery may explode.



**CAUTION:** A battery can present a risk of severe burn and injury from high short circuit current. The following precautions should be observed when working on batteries.



**CAUTION:** Do not open or mutilate the battery. Released electrolyte is harmful to the skin and eyes. It may be toxic.



**CAUTION:** The electrolyte is a dilute sulfuric acid that is harmful to the skin and eyes. It is electrically conductive and corrosive. The following procedures should be observed:

- If electrolyte contacts the skin, wash it off immediately.
- If electrolyte contacts the eyes, flush thoroughly and immediately with water. Seek medical attention.
- Spilled electrolyte should be washed down with a suitable acid neutralizing agent. A common practice is to use a solution of approximately one pound (500 grams) bicarbonate of soda to approximately one gallon (4 liters) of water. The bicarbonate of soda solution should be added until the evidence of reaction (foaming) has ceased. The resulting liquid should be flushed with water and the area dried.



**CAUTION:** Do not reverse the battery connections, as it will blow the battery fuse. A power cord has been provided to connect the inverter to incoming AC wall outlet.

**BATTERY REQUIREMENTS**

Your Unit operates on 24 volt DC battery power when in the power fail mode. Two UL recognized deep cycle marine batteries should be used. There are two principal types of batteries: starting and deep cycle. There are several different types of battery constitutions including liquid lead acid, nickel iron, nickel cadmium, alkaline and maintenance free. Batteries are sealed or vented.

**NOTE:** All batteries must be the same make, model, and age for the inverter to function properly.

**Starting Batteries (NOT RECOMMENDED)**

Starting batteries are designed for high cranking power but not deep cycling. **DO NOT** use them with your inverter. They do not affect the inverter, but they will simply not last long in a deep cycle application. They use a lot of thin plates to maximize the surface area of the battery. This allows very high starting current but less run time when the battery is cycled.

### Deep Cycle Batteries (RECOMMENDED)

Deep Cycle batteries, also known as marine batteries, are best suited for use with the inverter. They are designed to have the majority of their capacity used before recharge. Available in many sizes and types, be sure to use at least a 100 AH battery.

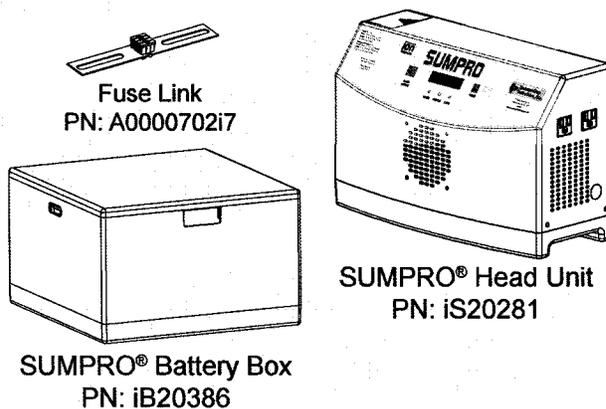
### BATTERIES NOT INCLUDED

#### TOOLS NEEDED

An insulated adjustable wrench will be needed.

#### INSTALLATION

The SUMPRO® unit is packaged in two separate cartons containing one complete unit and a fuse link. Below are the contents.



See accompanying unit assembly drawings.

#### 1. Unpack The SUMPRO®

Your SUMPRO® auxiliary power supply should be in two separate containers. Remove the contents from the containers. They should include the head unit, the battery box and the fuse link (located inside the battery box).

Open the lid on the battery enclosure and remove the fuse link from inside.

#### 2. Location

Find a suitable place to set the unit (when it is assembled). Keep in mind that the unit should be placed in an area where water and moisture will not splash or drip on the unit, the fan inlet on the front of the head unit will not be obstructed, and where a

properly grounded three prong receptacle is within reach of the power cord. When fully assembled, the head unit with batteries weighs approximately 200 lbs. It is recommended to use the optional SUMPRO® stand to keep the unit off the floor. A dedicated 15A receptacle circuit is recommended.

#### 3. Assembly

Set the battery box in place, making sure that the openings will be facing the back of the head unit. Once in place, place the head unit in front of the battery box feeding the battery leads through the large holes in the front of the battery box.

#### 4. Battery Installation

Now that the unit has been properly assembled and in its permanent location the batteries can be installed.



#### CAUTION: Important Safety Instructions

A battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed when working on batteries.

1. Remove watches, rings, or other metal objects.
2. Use tools with insulated handles.
3. Do not lay tools or metal objects on top of batteries.
4. Wear safety goggles and a face shield.

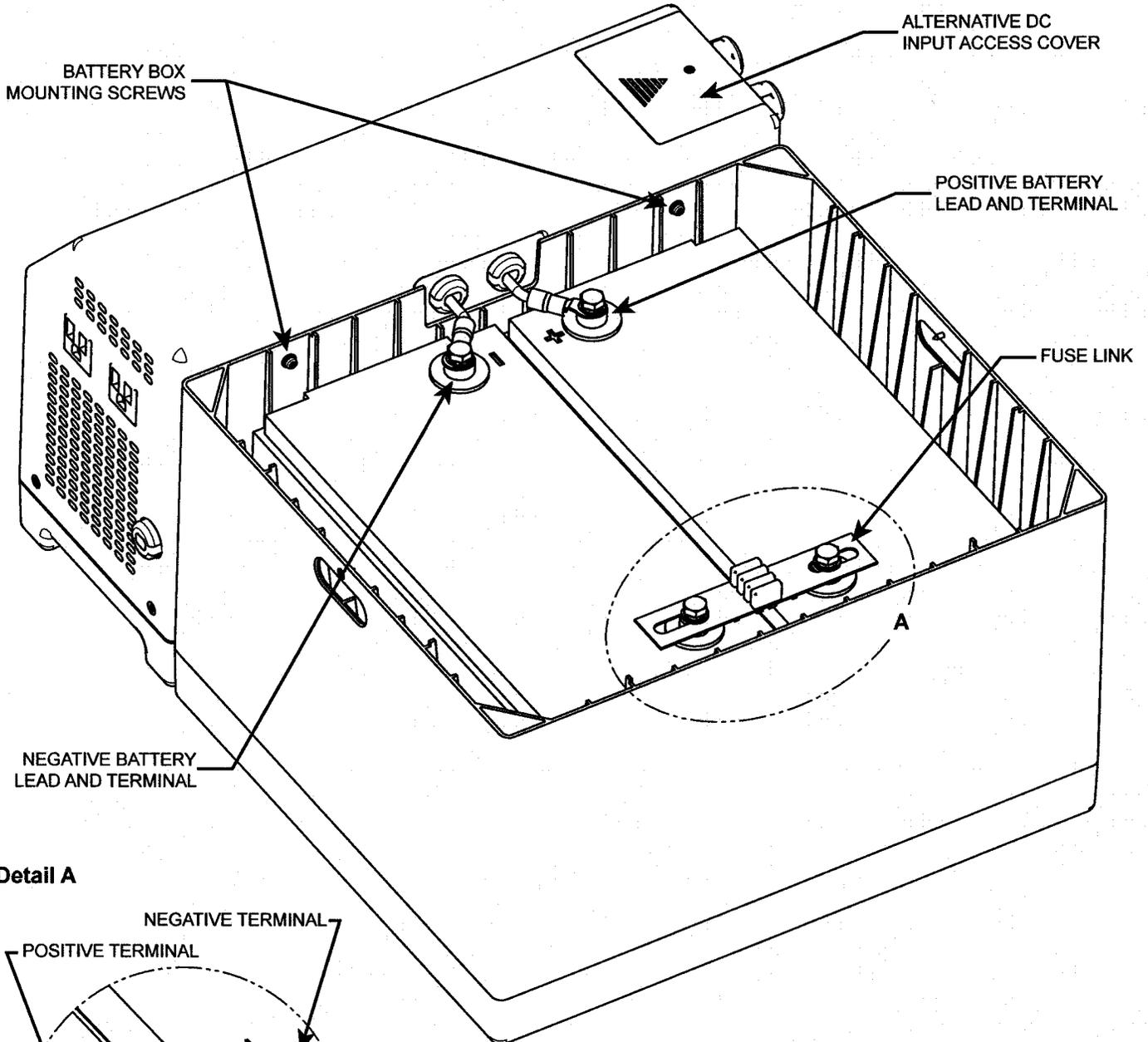
After taking the above precautions, secure the battery box to the head unit using the screws provided. Lower the two 12V batteries into the battery box with the terminals facing each other. At this time check the polarity of your batteries. Facing the front of the SUMPRO® unit, the left battery terminal should be positive, and the right negative (**See Page 4, Figure A**). If this is not the case, **DO NOT** continue until the proper batteries can be obtained.

#### 5. CONNECTING BATTERIES

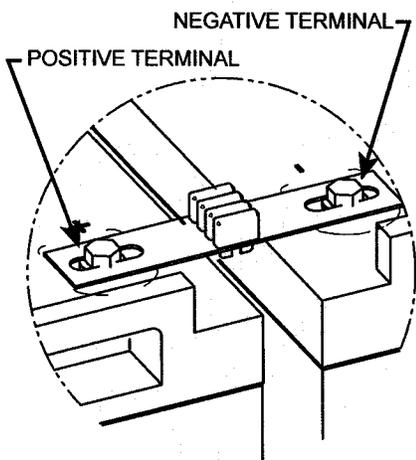
Now that the batteries have been installed, and the polarity conforms to the SUMPRO®, connect the fuse link across the back battery terminals (**See Page 4, Detail A**). Remove the protective cover from the negative (-) battery lead (black) then connect it to the negative (-) post of the battery. Screw down bolt tightly.

Plug the SUMPRO® unit into the designated 115V AC outlet.

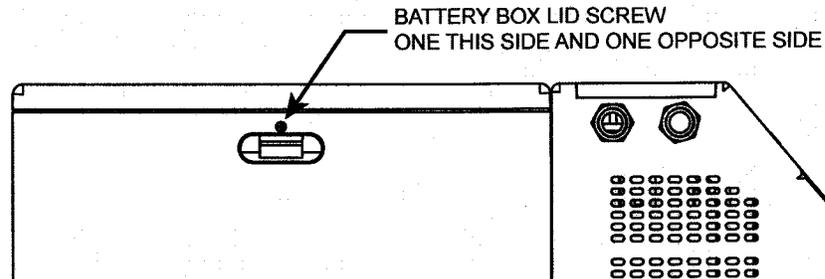
**Figure A**



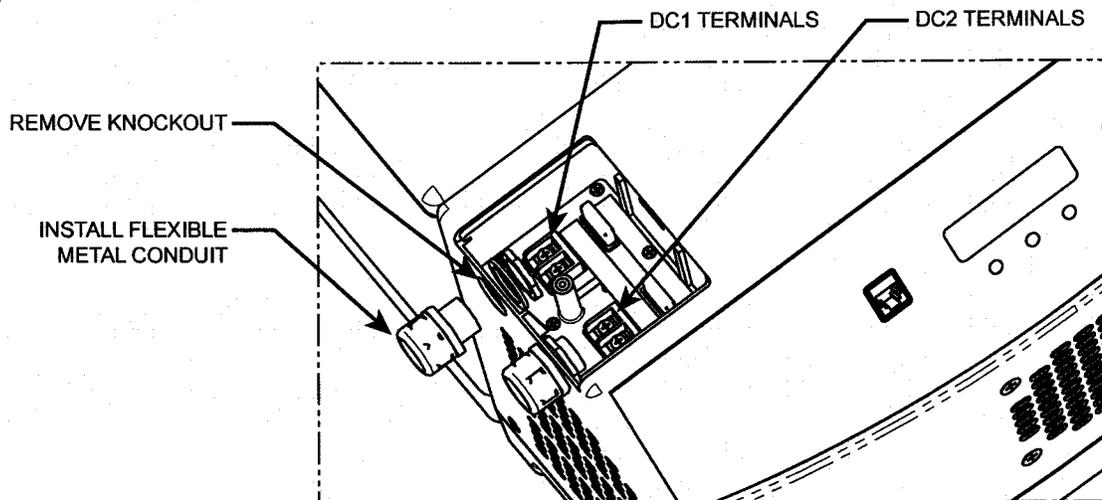
**Detail A**



**Figure B**



**Figure C**



**6. Within 30 seconds**, remove the protective cover from the positive (+) red battery lead then connect it to the positive (+) post.

**Note:** Make sure all battery connections are properly tightened to 75 pound inches.

**7. Close Unit**

Close and secure the battery enclosure lid using the screws provided, so that children cannot tamper with the unit (**See Page 5, Figure B**).

**8. Plug In The Pump**

At this time you may plug your 115V pump into your SUMPRO® unit, not exceeding the load limit of 12 amps or 1440 watts at any one time.

**Note:** If connecting a pump controller, such as the Ion Genesis or Ion Endeavor, follow the installation instructions in the controller manual. The controller will be plugged into the SUMPRO® instead of the wall outlet.

**ALTERNATIVE DC INPUT CONNECTIONS**

The alternative DC inputs provide an alternate means of charging the batteries via power source(s), not included. When an alternative DC source is connected to the Sumpro, it will charge the batteries if the generated power is greater than the battery voltage, whether or not AC power is available. If two alternative DC power sources are connected at the same time, the Sumpro utilizes the one generating the most power.

Please read the following instructions carefully before attempting to connect an alternative DC source.

1. There are two sets of alternative DC input terminals located on the top left side of the Sumpro, DC1 and DC2. Open access cover and remove the conduit knockout that corresponds to the terminals you are going to connect to (**See Page 5, Figure C**).

## SUMPRO®

Battery Back-Up

## OPERATION MANUAL

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2. Connect conduit to the head unit (**See Page 5, Figure C**). Check local codes for conduit requirements.
3. Run the wires from the alternative DC source and connect the positive (+) wire to the positive (+) DC terminal and the negative (-) wire to the negative (-) DC terminal.

NOTE: It doesn't matter which DC input is utilized, but insure that the positive (+) and negative (-) wires from the alternative DC source are connected to the same set of DC terminals, i.e., if using DC2 terminals, the positive and negative wires from the alternative DC source must be connected to the positive and negative terminals of DC2.

4. Put access cover back on the head unit.

### LIGHT AND RELAY FUNCTIONS

After you have your SUMPRO® unit in operation, you can check its status by looking at the system lights. They should tell you everything you need to know about the status of the unit.

1. Power – Green LED
  - a. Solid when AC Line In Voltage is deemed present.
  - b. Off when AC Line In fault occurs.
2. Inverter – Red LED
  - a. Blinks when unit is running off inverter and silence has NOT been pressed.
  - b. Solid when unit is running off inverter and silence has been pressed.
  - c. Off when unit is operating off of AC Line
3. Alarm – Red LED
  - a. Blinks when alarm condition occurs and silence has NOT been pressed
  - b. Solid when alarm condition occurs and silence has been pressed
  - c. Off when no alarm condition is present
  - d. Alarm Contact – NC dry contact

- i. Opens when either the Inverter LED or Alarm LED are blinking

4. LCD Display - Displays all info that pertains to current operating condition of the unit

### TESTING THE SYSTEM

To test the SUMPRO®, simply unplug it from the 115V AC power to run your pump on battery power for a short time. You can repeat this if you wish, but it is not necessary. If your SUMPRO® unit works the first time it is sure to work time and time again. **Be sure that you remember to plug the unit back into the receptacle after you have completed the test.**

**Note:** New batteries are rarely fully charged. Depending on the charge condition of the batteries and the voltage from the utility company, it may take up to 7 days for the batteries to be fully charged.

### SUMPRO® MAINTENANCE

Your SUMPRO® unit has been designed to be virtually maintenance free. Just make sure it is kept clean and dry and that the unit is periodically tested in the auxiliary mode.

### BATTERY MAINTENANCE

If you are using AGM maintenance free batteries, you should visually inspect the batteries every six months for swelling or leakage. For all other batteries, refer to the manufacturer recommended battery maintenance section of the battery being used.

Maintenance or replacement of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions.

### REPLACING BATTERIES

Wear full eye protection and protective clothing.

When replacing the batteries, use the same type and size batteries. See battery requirements (Page 2).



**CAUTION:** The electrolyte is a dilute sulfuric acid that is harmful to the skin and eyes. It is electrically conductive and corrosive. The following procedures should be observed:

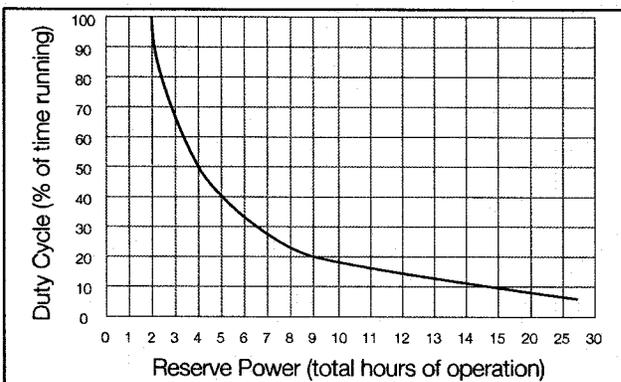
- Do not lay tools or metal objects on top of the

batteries

- Use tools with insulated handles
  1. Unplug the unit from the wall.
  2. Follow the Installation Instructions found on page 3 of this manual, starting with step 8 and working back to step 1.
  3. Remove and safely dispose of old batteries.
  4. Install new batteries per the installation instructions on page 3.

**TECHNICAL SPECIFICATIONS**

Model	100
A.C. Lower Voltage Limit	98 VAC $\pm$ 5V
Output Voltage with Full Load	85-135V $\pm$ 10V
Maximum Output Current	12 FLA
Battery Lower Voltage Limit	18.5V $\pm$ 0.3V
Main Output Frequency	60 Hz
Overload	125 $\pm$ 3% (With Auto Reset Function)
Alarm Contact	RJ11 Connection, Normally Closed Dry Contact
Alternative DC Inputs	24VDC, 20A max



Performance curve results using a 3/4 HP pump with a 7.5 FLA and (2) Metropolitan Power Plus model 31P-36 batteries.

**WARRANTY IS VOID IF...**

1. Power cord has been cut or the grounding prong has been removed.
2. Unit has been used in an outdoor application.
3. Batteries not meeting the above specifications have been used.
4. Unit has been submerged in water.
5. Unit has been tampered with in any manner not described in the above instructions.
6. Unit has been disassembled by the customer.
7. Unit has been applied to products exceeding the maximum capacity of the Unit, i.e., a pump other than the one supplied with the unit or more than one pump.
8. Unit has been applied to the wrong voltage.
9. Any labels or cord tags have been removed.

**TROUBLESHOOTING**

Please read the following before calling in for technical support as these are the most common, and easiest to rectify, issues that may occur with your SUMPRO® unit.

**System says that the batteries are too low**

1. Check the age of the batteries.
  - a. We recommend that batteries be replaced every 3 years to insure optimum performance
  - b. Batteries must be the same age, make and model in order for the SUMPRO® to function properly.
2. If using a wet battery, check water levels.

3. Clean all battery connections and leads with a wire brush or sand paper. Even new batteries could have a slight coating on the connections that could cause issues. Ensure that battery terminal screws are tightened to 75 pound inches.

4. Check fuse link for blown fuses.

**The system is stuck in a fault that won't clear**

1. Reboot the system
  - a. While in AC mode, disconnect the positive (+) red wire from the battery terminal
  - b. Unplug the SUMPRO® from the wall outlet
  - c. Wait a few minutes and plug the SUMPRO® back into the wall outlet
  - d. Within 30 seconds, reconnect the positive (+) red wire to the battery terminal

**NORMAL OPERATION LCD DISPLAYS**

	LCD Display	Description	Remedy
1	Sumpro Status NORMAL	The unit is operating off of AC Line power and is functioning normally.	Normal
2	Sumpro Status BATTERY BACKUP	The unit is in DC mode and running off of power provided by attached batteries.	Normal
3	Sumpro Status BATTERY CHARGING	The unit is charging the batteries.	Normal
4	Input Voltage 120V	The input voltage when running off of AC power from the utility.	Normal
5	Battery Current 15.0 A	Current going to the batteries during charging.	Normal
6	Output Current 5.0 A	Current going to the connected load while in DC mode.	Normal

	LCD Display	Description	Remedy
7	Battery Voltage 26.7 V	Battery voltage when batteries are deemed present.	Normal
8	Battery Capacity 91%	Battery capacity when batteries are deemed present. Capacity is calculated based on battery voltage alone. While inverting, the battery capacity can drop 15-20% when load is connected and running.	Normal

### ALARM & FAULT CODE LCD DISPLAYS

Below are the most common alarms and faults. For a complete list of LCD display alarms and faults, please refer to the separate SUMPRO® Troubleshooting Guide on our web site.

	LCD Display	Description	Remedy
1	Batteries Not Installed	The unit will detect that batteries are not connected by installing fully charged batteries or if it draws sufficient current while charging.	Install batteries of the same age, make and model. Once the unit detects that batteries are present, the unit will always assume batteries are connected unless the unit is completely powered off.
2	AC Input Voltage LOST	The unit has detected a loss of AC power from the utility and has switched to DC mode.	The unit must detect good AC voltage before switching back to AC mode.
3	AC Input Voltage UNDERVOLTAGE	The unit has detected an undervoltage condition and has switched to DC mode.	The unit must detect good AC voltage before switching back to AC mode.
4	AC Input Voltage OVERVOLTAGE	The unit has detected an overvoltage condition and has switched to DC mode.	The unit must detect good AC voltage before switching back to AC mode.
5	Invert Lock OFF: 10 S	The unit has suspended DC mode because of a fault condition. The display shows time left before DC mode will resume.	DC mode will resume after the time expires.
6	Charge Lock OFF: 10 S	The unit has suspended battery charging because of a fault condition. The display shows time left before charging start timer can begin.	Battery charging will resume after the timer expires.

**SUMPRO®**

Battery Back-Up

**OPERATION MANUAL**

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	LCD Display	Description	Remedy
7	Cool Lock OFF: 10 S	The unit has suspended battery charging because it needs to cool off for a period of time. The display shows time left before charging start timer can begin.	Battery charging will resume after the timer expires.
8	Fault Lock OFF: 10 S	The unit has entered into a fault condition and has suspended all operations. The display shows time left before operations can begin again.	Normal operation will resume after the timer expires.
9	Sumpro Status INVERT SUSPENDED	The unit has stopped DC mode due to a fault condition. Subsequent screens will state info regarding suspension.	The underlying fault condition must clear and the related lock timer must elapse.
10	Sumpro Status FAULTED	The unit has detected a fault condition and has stopped all operations until condition clears and/or necessary time has elapsed since fault.	The underlying fault condition must clear and the related lock timer must elapse.

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Battery Back-Up

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**WARRANTY REGISTRATION CARD**

Please fill out and send back to: Metropolitan Ind. Warranty Department P.O. Box 7266 Romeoville, IL 60446. Or to register online, go to [www.ionproducts.net](http://www.ionproducts.net)

**SUMPRO® Warranty Registration Card**

To register your purchase, please fill in the following information:

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Address: \_\_\_\_\_

City \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Purchased From: \_\_\_\_\_

Serial Number\*: \_\_\_\_\_

Installed By: \_\_\_\_\_ Phone: \_\_\_\_\_

\* The serial number is located next to the auxiliary inputs.



### Ion|StormPro 3 Year Residential Warranty

1. Coverage and Term. Metropolitan Industries, Inc. ("Metropolitan") warrants to the original purchaser (the "Buyer") of each Ion|StormPro product (the "product"), that any part thereof which proves to be defective in material or workmanship within three (3) years from date of manufacture, will be replaced at no charge with a new or remanufactured part, F.O.B. factory. Buyer shall be responsible for all freight charges and all costs of field labor or other charges incurred in the removal and/or reinstallation of any product, part or component thereof.
2. Exclusions. **THE WARRANTY IS SUBJECT TO THE FOLLOWING CONDITIONS AND EXCLUSIONS:**
  - (a) The Warranty excludes products or workmanship which becomes defective as a result of: (i) earthquake, fire, storms, the elements or any other acts of God; (ii) normal wear and tear from use; (iii) accident, misuse, abuse or neglect; (iv) modifications made by Buyer or any third party, other than **Metropolitan**; and (v) Buyer's failure to properly install, maintain, service and/or operate the product under normal conditions and according to manufacturer's instructions.
  - (b) **Metropolitan** shall not be responsible for, and the Warranty shall not cover, extended damage which occurs because of Buyer's failure to notify **Metropolitan** promptly in writing of apparent defects.
  - (c) Any part or component designated as manufactured by anyone other than **Metropolitan** shall be covered only by the express warranty of the manufacturer thereof.
  - (d) The Warranty shall lapse upon Buyer's failure to fully comply with the terms and conditions of its contract with **Metropolitan**, including Buyer's failure to pay the purchase price for the product or any portion thereof. Buyer's subsequent compliance with the terms and conditions of any such contract, will not cause the term of the Warranty to extend beyond the time period set forth above.
  - (e) No actions taken by **Metropolitan** to correct a defect in a product shall extend the Warranty beyond the period set forth above. **Metropolitan** shall not be obligated to remedy any defect, where otherwise required pursuant to the Warranty unless and until Buyer notifies **Metropolitan** in writing of the defect and then only if such notification is made prior to the expiration of the period set forth above.
3. Process of Claims and Repairs. **Metropolitan** agrees that if the product or any part or component thereof shall fail to conform to the terms of this Warranty, **Metropolitan** shall replace such nonconforming product, part or component at the original point of delivery and furnish instruction for its disposition. Any transportation charges involved in such disposition and all costs of field labor or other charges incurred in the removal and/or reinstallation of any product, part or component thereof shall be the responsibility of Buyer.
4. Limitation on Liability. Notwithstanding any provision to the contrary, **Metropolitan's** entire liability under this Warranty shall not in the aggregate exceed, and Buyer's exclusive and sole remedies are, to the extent permitted by law, shall be to secure replacement of the defective product. **UNDER NO CIRCUMSTANCES SHALL METROPOLITAN BE LIABLE UNDER THE WARRANTY FOR ANY INDIRECT, PUNITIVE, SPECIAL, EXEMPLARY, CONSEQUENTIAL OR INCIDENTAL DAMAGES (INCLUDING LOST PROFITS, REVENUE, USE OR ECONOMIC ADVANTAGE).**
5. Express Waiver of Any Other Warranties. **THE EXPRESS WARRANTY SET FORTH IN THIS WRITTEN WARRANTY IS THE ONLY WARRANTY MADE BY METROPOLITAN, OR ANY OTHER PARTY, IN CONNECTION WITH ANY PRODUCT PURCHASED FROM METROPOLITAN. NEITHER METROPOLITAN, NOR ANY OTHER PARTY, MAKES ANY OTHER EXPRESS OR IMPLIED WARRANTY WHICH IS NOT SET FORTH HEREIN, AND METROPOLITAN HEREBY DISCLAIMS AND BUYER HEREBY WAIVES ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**
6. Not Transferable. The Warranty may not be transferred and shall be void on the sale or other transfer of the product.
7. Products and Warranty Subject to Change. **Metropolitan** reserves the right to make revisions to its products and their specifications, and to revise this Warranty and related information without notice.

Your Peace of Mind is Our Top Priority®

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.



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**ALL NEW  
DESIGN!**

## FEATURES

- Alternates two automatic pumps up to ½ HP, 12 amps each, 115V single phase
- Extends pump life
- Compact design easily mounts in confined spaces and is equipped with cutting-edge electronics
- Circuit fault protection
- Specially designed for humid areas like basements
- Universal connection for alarm switch replacement
- Auxiliary output contacts (normally open) for remote alarm connection
- Built-in, rechargeable battery
- 9' power cord

## ALARMS

- Multiple alarm modes will alert user to potential problems and protect property by switching to the other pump when necessary.
  - High water alarm operation
  - Loss of power alarm operation
  - Continuous pump run alarm operation
  - Breaker tripped alarm operation
  - Pump failure alarm operation
- Built-in rechargeable battery will operate the alarm and LED lights for a limited time during power outage.
- Button for Silence and Reset

## INDICATOR LIGHTS

- Solid green LED lights for Pump 1, Pump 2 and Power
- Flashing red LED lights for alarm conditions

# SMART-PAK PLUS

## RESIDENTIAL ALTERNATOR SYSTEM



Part Number: 10-0804  
Shipping Weight: 5 lbs.

## INSTALLATION

1. Unpack unit and inspect for damage.
2. Review Figure 1 for a typical installation.
3. Follow instructions included with each pump for proper pump installation. Test pump on and off cycle several times to ensure proper pump cycling.
4. Mount unit on wall within reach of pumps' cords.
5. Mount the alarm switch on one of the discharge pipes a couple inches above the on level of the pumps. If possible, this should be below the inlet to the pit.
6. Connect the alarm float switch cord to the High Water connection on the side of the Smart-Pak Plus.
7. Plug the power cord into a properly grounded outlet.
8. Check system for proper operation as outlined below.



**WARNING** All installations must be in accordance with the National Electric Code, and any other applicable state and local electrical requirements.



**WARNING** Do not remove ground pin. Severe electrical shock could occur.

## NORMAL OPERATION

Upon first plugging the Smart-Pak Plus into AC power, the four LED lights will illuminate briefly in red, then green. The LED lights will turn off, then the Pump 1 and Power LED lights will illuminate green. When water rises to the level that both pumps' switches are on, the unit will send power to Pump 1 until its switch turns off. The Pump 2 LED will then illuminate indicating that power will be provided to Pump 2 once both pumps' switches are once again on. The control unit will continue to alternate between pumps 1 and 2, in this manner, until an alarm is detected. The Power LED remains green as long as AC power is available.

## ALARM OPERATION

There are five modes of alarm operation, as follows:

### 1. High Water Alarm Operation

If the sump's water level reaches the level of the high-water float switch, the alarm will sound, dry contacts will close and the unit will automatically alternate power to the other pump. Once the water level drops below the off level of the high-water float switch, the alarm will continue to sound and the light will flash red. Pressing the Silence/Reset button on the front of the unit will quiet the alarm and leave the LED illuminated. Once the alarm event has ended, pressing the Silence/Reset button for five seconds or longer will reset the alarm and the light will no longer be illuminated. If power is out and a high-water condition is present, the Power LED flashes red and the alarm chirps every three seconds. (The pump will not run while unit is on battery power.)

### 2. Loss of Power Alarm Operation

If AC power is lost, the alarm and LED lights operate until internal battery is dead or AC power is restored. The Power LED flashes red and alarm chirps every 12 seconds, and the dry contacts close. The red LED and alarm will clear themselves if power is restored.

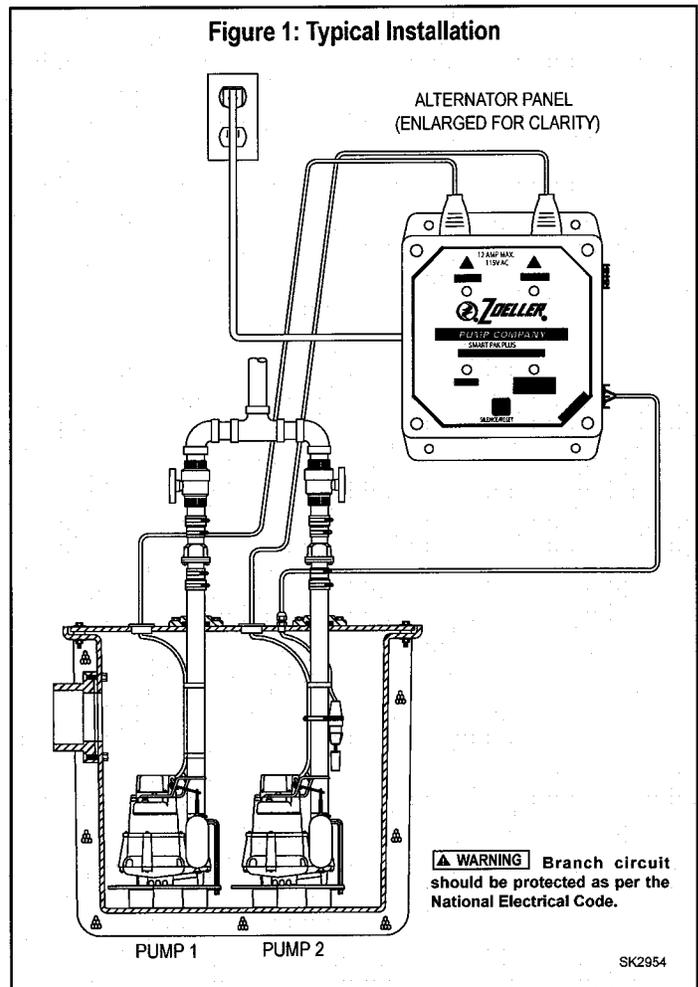
### 3. Continuous Pump Run Alarm Operation

If either pump runs continuous for over 300 seconds, the Smart-Pak Plus will alternate to the other pump, the LED for the pump flashes red, the audible alarm will sound, and dry contacts close. The red LED and alarm will clear themselves if the condition is remedied. After five consecutive faults, the alarm will remain on until it is manually reset.

## NOTES:

- Use of a working high-water alarm switch, properly connected to the Smart-Pak Plus, is required in order to allow for emergency pump alternation.
- The Smart-Pak Plus does not provide power to AC pumps during a power loss.
- Almost any standard, normally open pump switch can be substituted for the included high-water alarm float switch.
- The Smart-Pak Plus will not operate the pumps at the same time.
- The Smart-Pak Plus is a pump alternating device. It is not intended to bypass or augment the pumps' switches. Working switches are required for proper pump operation.

Figure 1: Typical Installation



### 4. Breaker Tripped Alarm Operation

If the active pump draws more than 14 amps continuously the alternator will switch to the other pump. After five consecutive cycles where a pump draws more than 14 amps, the alternator will disable that pump. If the active pump has an instantaneous current draw of more than 30 amps for two consecutive cycles the alternator disables the pump. Either condition will cause the red LED to flash for the failed pump, sound the alarm, and the dry contacts close. The Smart-Pak Plus will not attempt to use the problematic pump again until the alarm is reset.

### 5. Pump Failure Alarm Operation

If the Smart-Pak Plus detects that one of the pumps does not run, after five consecutive cycles of the high-water alarm tripping, that pump's LED flashes red, the alarm sounds and the dry contacts close.

## SILENCE/RESET BUTTON

Pressing the Silence/Reset button silences the audible alarm. Additional alarm conditions will sound the alarm again. Pressing and holding the Silence/Reset button for five seconds will reset any faults.

## BATTERY

The Smart-Pak Plus has a rechargeable nickel-metal-hydrate battery installed in the unit. The charging circuit "exercises" the battery to extend the life of the battery and reduce power consumption. Battery is not replaceable in the field.