

BARNES[®]

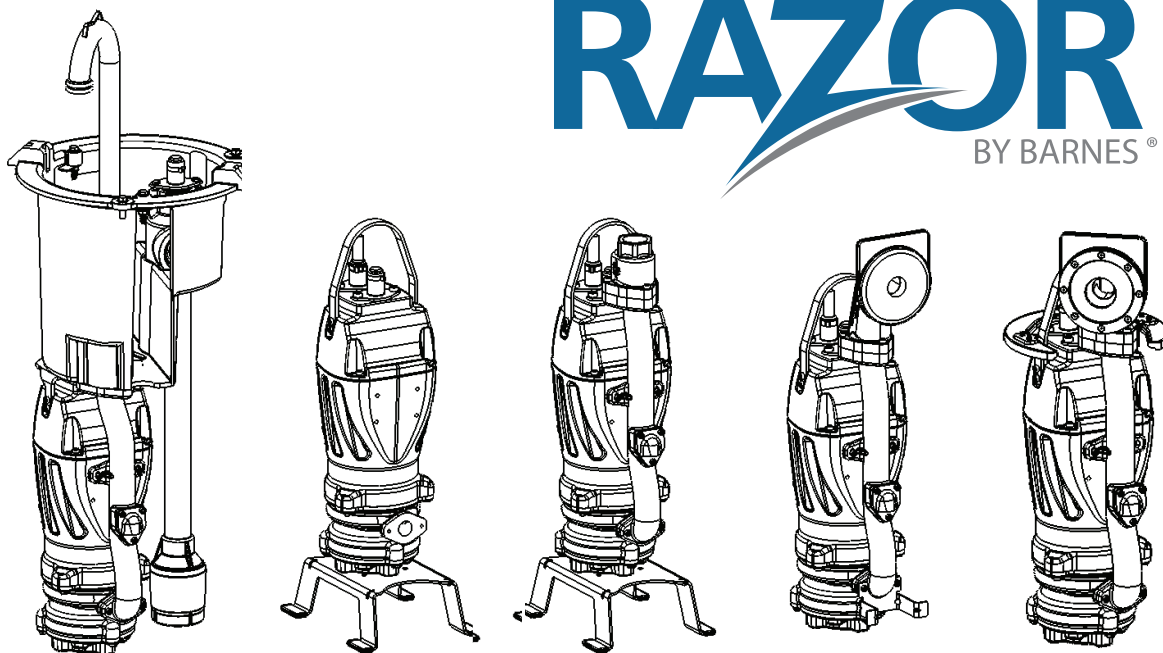
INSTALLATION MANUAL

Submersible Two-Stage Grinder Pump

Series: ZOGP

RAZOR

BY BARNES[®]



This product may be covered by one or more of the following patents and other patent(s) pending: Patent Pending

IMPORTANT!

*Read all instructions in this manual before operating pump.
As a result of Crane Pumps & Systems, Inc., constant product improvement program,
product changes may occur. As such Crane Pumps & Systems reserves the right to
change product without prior written notification.*

CRANE[®]

A Crane Co. Company

PUMPS & SYSTEMS

420 Third Street
Piqua, Ohio 45356
Phone: (937) 778-8947
Fax: (937) 773-7157
www.cranepumps.com

83 West Drive, Brampton
Ontario, Canada L6T 2J6
Phone: (905) 457-6223
Fax: (905) 457-2650



Form No. 145629-Rev. E

SAFETY FIRST!

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:



IMPORTANT! Warns about hazards that can result in personal injury or 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 can or will cause minor personal injury or property damage if ignored. Used with symbols below.

WARNING ! Warns about hazards that can or will cause serious personal injury, death, or major property damage if ignored. Used with symbols below.



Hazardous fluids can cause fire or explosions, burns or death could result.



Extremely hot - Severe burns can occur on contact.



Biohazard can cause serious personal injury.



Hazardous fluids can cause hazardous pressure, eruptions or explosions could cause personal injury or property damage.



Rotating machinery Amputation or severe laceration can result.



Hazardous voltage can shock, burn or cause death.

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



WARNING ! - To reduce risk of electrical shock, pumps and control panels must be properly grounded in accordance with the National Electric Code (NEC) or the Canadian Electrical Code (CEC) and all applicable state, province, local codes and ordinances.

WARNING! - To reduce risk of electrical shock, always disconnect the pump from the power source before handling or servicing. Lock out power and tag.

Prevent large articles of clothing, large amounts of chemicals, other materials or substances such as are uncommon in domestic sewage from entering the system.

During power black-outs, minimize water consumption at the home(s) to prevent sewage from backing up into the house.

Always keep the shut-off valve completely open when system is in operation (unless advised otherwise by the proper authorities). Before removing the pump from the basin, be sure to close the shut-off valve. (This prevents backflow from the pressure sewer.)

Keep the control panel locked or confined to prevent unauthorized access to it.

If the pump is idle for long periods of time, it is advisable to start the pump occasionally by adding water to the basin.



CAUTION! Pumps build up heat and pressure during operation-allow time for pumps to cool before handling or servicing.



WARNING! - **DO NOT** pump hazardous materials (flammable, caustic, etc.) unless the pump is specifically designed and designated to handle them.

Do not block or restrict discharge hose, as discharge hose may whip under pressure.



WARNING! - **DO NOT** wear loose clothing that may become entangled in the impeller or other moving parts.

WARNING! - Keep clear of suction and discharge openings. **DO NOT** insert fingers in pump with power connected.

Make sure lifting handles are securely fastened each time before lifting. Do not operate pump without safety devices in place. Always replace safety devices that have been removed during service or repair.

Do not exceed manufacturers recommendation for maximum performance, as this could cause the motor to overheat.

Secure the pump in its operating position so it can not tip over, fall or slide.

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



Never handle connected power cords with wet hands.



To reduce risk of electrical shock, all wiring and junction connections should be made per the NEC or CEC and applicable state or province and local codes. Requirements may vary depending on usage and location.



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.

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

Products Returned Must Be Cleaned, Sanitized, Or Decontaminated As Necessary Prior To Shipment, To Insure That Employees Will Not Be Exposed To Health Hazards In Handling Said Material. All Applicable Laws And Regulations Shall Apply.



Bronze/brass and bronze/brass fitted pumps may contain lead levels higher than considered safe for potable water systems. Lead is known to cause cancer and birth defects or other reproductive harm. Various government agencies have determined that leaded copper alloys should not be used in potable water applications. For non-leaded copper alloy materials of construction, please contact factory.



IMPORTANT! - Crane Pumps & Systems, Inc. is not responsible for losses, injury, or death resulting from a failure to observe these safety precautions, misuse or abuse of pumps or equipment.

Other brand and product names are trademarks or registered trademarks of their respective holders.

® Barnes is a registered trademark of Crane Pumps & Systems Inc.

4/07

Alteration Rights Reserved

USER GUIDE

USER GUIDE

Congratulations on your purchase of a Barnes Razor grinder pump system. With proper care and by following a few simple guidelines your grinder pump will give you many years of dependable service.

Use and Care

The Razor grinder pump station is designed to handle routine, domestic sewage. Solid waste materials should be thrown in the trash. While your station is capable of accepting and pumping a wide range of materials, regulatory agencies advise that the following items should not be introduced into any sewer either directly or through a kitchen waste disposal:

- Glass
- Metal
- Diapers
- Socks, rags or cloth
- Plastic objects (e.g., toys, utensils, etc.)
- Sanitary napkins or tampons

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

- Explosives
- Flammable Material
- Lubricating Oil and/or Grease
- Strong Chemicals
- Gasoline

General Information

Your home wastewater disposal service is part of a low pressure sewer system. The key element in this system is the Barnes Razor grinder pump station. The basin collects all wastewater from the house. The solids in the sewage are then ground to a small size suitable for pumping in the slurry.

The grinder pump generates sufficient pressure to pump this slurry from your home to the wastewater plant.

Power Failure

Your grinder pump cannot dispose of wastewater or provide an alarm signal without electrical power. If electrical power service is interrupted, keep water usage to a minimum.

Warranty

Your grinder pump is furnished with a warranty against defects in material or workmanship. A properly completed

Start-Up/Warranty Registration form must be on file at the Barnes factory in order to activate your warranty. In addition your pump must be installed in accordance with the installation instructions.

If you have a claim under the provisions of the warranty, contact your local Barnes Distributor.

When contacting your representative for service, please include your station serial number, pump model number, and pump serial number.

For future reference, record the following information:

Station Serial No: _____

Pump Model No: _____

Pump Serial No: _____

Local Distributor: _____

Distributor Telephone: _____

PUMP SPECIFICATIONS:

DISCHARGE	1 1/4"
LIQUID TEMPERATURE	104°F (40°C) Continuous
MOTOR HOUSING	Cast Iron ASTM A-48, Class 30
VOLUTE	Cast Iron ASTM A-48, Class 30
SEAL PLATE	Cast Iron ASTM A-48, Class 30
IMPELLERS	
<i>Design</i>	12 vane, Splitter-Type, vortex, with pump out vanes on back side. Dynamically balanced, ISO G6.3
<i>Material</i>	85-5-5-5 Bronze
CUTTER PLATE	Hardened 440C Stainless Steel Rockwell® C-55
CUTTER	Hardened 440C Stainless Steel Rockwell® C-55
SHAFT	416 Stainless Steel
O-RING	Buna-N
HARDWARE	300 Series Stainless Steel
PAINT	Powder Coat
SEAL	
<i>Design</i>	Single Mechanical, oil filled reservoir
<i>Material</i>	Rotating Faces - Silicon-Carbide Stationary Faces - Silicon-Carbide Elastomer - Buna-N Hardware - 300 series stainless steel
CORD ENTRY	Custom Molded, Quick Connected for sealing and strain relief
CORD	CSA/UL Approved 12/5 Type SOW
SPEED	3450 RPM, 60Hz 2875 RPM, 50Hz

UPPER BEARING:

Design..... Single Row, Ball

Lubrication Oil

Load..... Radial & Thrust

LOWER BEARING

Design..... Single Row, Ball

Lubrication Oil

Load..... Radial & Thrust

MOTOR

Design..... NEMA L, Oil Filled,
Squirrel Cage Induction

Insulation Class F

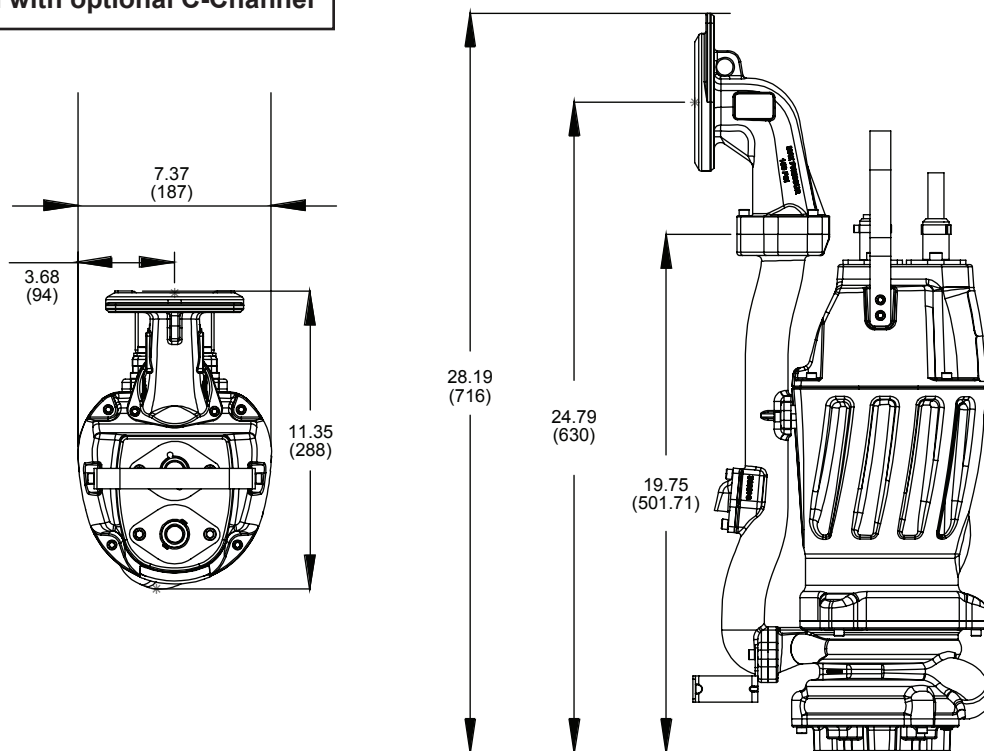
SINGLE PHASE..... Capacitor start/capacitor run

LEVEL CONTROLS: **SOLD SEPARATELY**, Model
ESPS-150™, Environmentally
sealed pressure switch with CPVC
housing, HNBR diaphragm, Custom
Molded Quick Connect for Sealing
and Strain Relief

OPTIONAL EQUIPMENT.... Additional Cord, Automatic to Manual
Adapter Plug Kit, BSP Check Valve
Kit, C-Channel Rail Check Valve Kit,
NPT Check Valve Kit, Base Kit

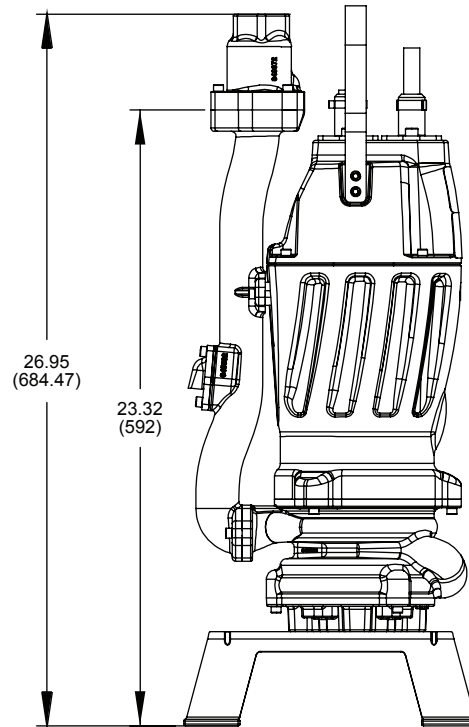
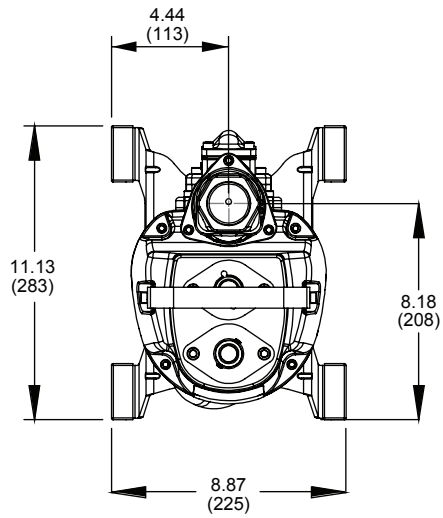
ZOGP20__CC - For "C" Channel
Shown with optional C-Channel

inches
(mm)



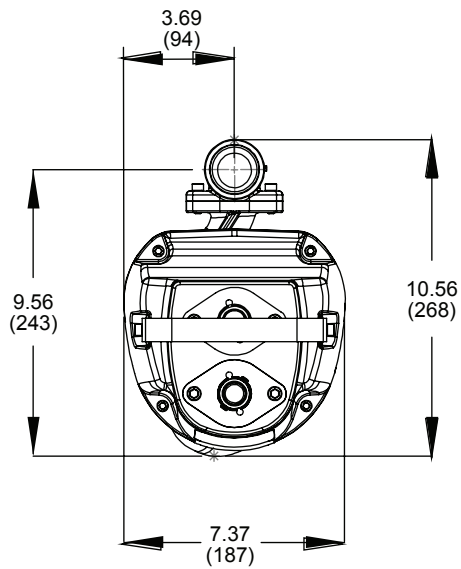
ZOGP20__CT - Threaded
Shown with optional NPT-BSP
Threaded

inches
(mm)

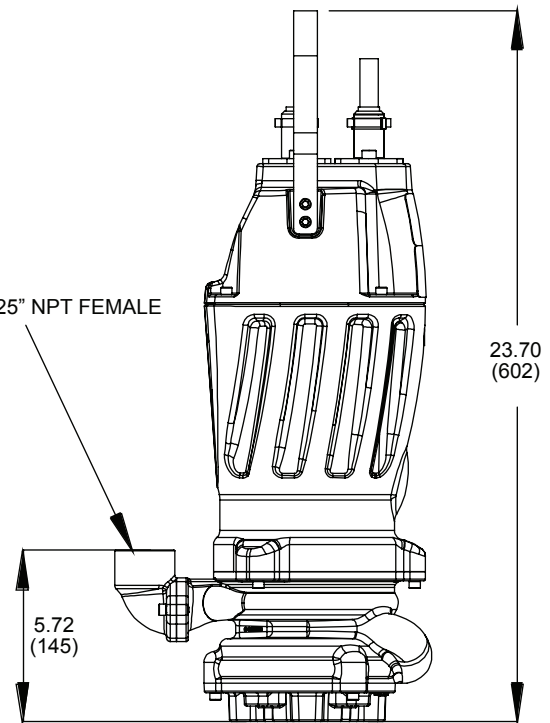


ZOGP20__L

inches
(mm)



1.25" NPT FEMALE



Shown without Discharge Valve - ESPS Level Control Sold Separately

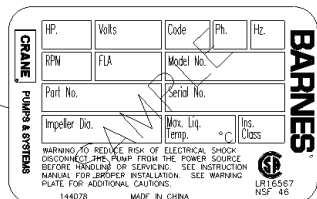
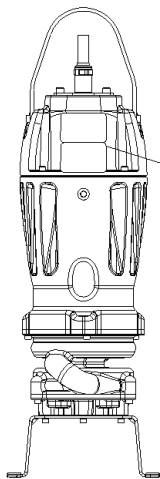
MODEL NO	HP	VOLT	PH	FRE-QUEN-CY	NEMA START CODE	FULL LOAD AMPS	LOCKED ROTOR AMPS	CORD SIZE	CORD O.D. ± .02 (.5) in (mm)	WINDING RESIS-TANCE MAIN -- START	RECOM-MENDED BREAKER SIZE
ZOGP2072__	2	208-240	1	60	H	17.5-15.0	53.8	12/3 12/5	.61 (15.5) .71 (18)	1.2--3.2	25 AMP
ZOGP2092__	2	208-240	3	60	J	8.5-8.2	43.9	12/4	.67 (17.0)	1.6	15 AMP
ZOGP2042__	2	480	3	60	J	4.6	22.0	12/4	.67 (17.0)	6.4	10 AMP
ZOGP20X2__	2	230	1	50	H	17	65.0	12/3 12/5	.61 (15.5) .71 (18)	1.7--5.5	25 AMP
ZOGP20Y2__	2	220	3	50	J	9	43.9	12/4	.67 (17.0)	5.1	15 AMP
ZOGP20Z2__	2	380	3	50	J	5.2	26.3	12/4	.67 (17.0)	10.2	10 AMP

Winding Resistance ± 5%, measured from terminal block.

Pump rated for operation at ± 10% voltage at motor.

For 3 Phase Models: Temperature Sensor Cord is 14/3 SOW. .55 (14mm) ± .02 (.51mm) OD

Recommended Breaker Sizes					
Pump Model	HP	Phase	Volts	Frequency	Breaker Size
ZOGP2072__	2	1	208-240	60	25
ZOGP2092__	2	3	208-240	60	15
ZOGP2042__	2	3	480	60	10
ZOGP20X2__	2	1	230	50	25
ZOGP20Y2__	2	3	220	50	15
ZOGP20Z2__	2	3	380	50	10



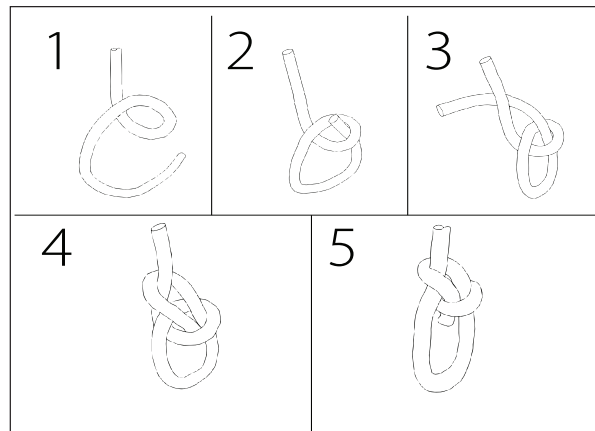
NAMEPLATE

The nameplate is located on the side of the pump. This contains the pumps part number, horsepower voltage, phase, and serial number, as well as other information. The start-up form located in the back of this manual contains a place to record this data. The information should be recorded now so the pump does not have to be pulled again later. The start-up form can be left in the control panel until station start-up is completed later.

Tie the bowline knot where shown per the directions provided (Steps 1 through 5).

On the CC series, tie one bowline knot on the moveable fitting and one bowline knot in the handle on the pump (See Fig 1).

On the CT (Not Shown) series tie bowline knot on the handle.



RECEIVING/UNPACKING:

Upon receiving the pump, it should be inspected for damage or shortages. If damage has occurred, file a claim immediately with the company that delivered the pump. Unpack pump and record pump serial and model number before installing. If the manual is removed from the packaging, do not lose or misplace.

STORAGE:

Short Term- 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- Any length of time exceeding six (6) months, but not more than 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 deg. F and +120 deg. 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 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.
- 3.) Before placing pump into service, pump should be brought to operational temperature range. Excessive or direct heating or cooling should NOT be used.

OPERATION TEMPERATURE RANGE: +35°F (2°C) to 104°F (40°C).

SERVICE CENTERS:

For the location of the nearest Barnes Service Center, check your Barnes representative or Crane Pumps & Systems, Inc. Service Department in Piqua, Ohio, telephone (937) 778-8947 or in Brampton, Ontario, Canada (905) 457-6223.

INSTALLATION:

Location - The pump is designed to fit into your basin either by sliding down the rail assembly, or by being mounted on a pump base. **THIS PUMP MUST BE INSTALLED WITH A MINIMUM OF 3 INCHES AND A MAXIMUM OF 4.5 INCHES OF CLEARANCE UNDER THE PUMP FOR THE ENTRANCE OF SEWAGE SOLIDS.**

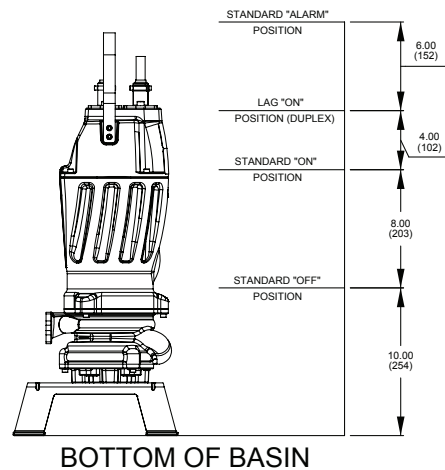


FIGURE 1 - Normal Operating Points

Discharge - Assemble discharge piping or hose assembly (whichever is required by your application), to the pump. Discharge piping should be as short as possible. Both a check valve and a shut-off valve are required 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. An anti-siphon valve is also required.

Package Systems- Refer to manual supplied with basin package system.

ELECTRICAL CONNECTIONS:

Pump Cables - The cord assembly mounted to the pump must **NOT** be modified in any way except for shortening to a specific application. Any splice between the pump and the control panel must be made in accordance with the National Electric Code or the Canadian Electric Code and all applicable state, province and local electric codes. It is recommended that a junction box, be mounted outside the sump or be of at least Nema 4 (EEMAC-4) construction if located within the wet well. **DO NOT USE THE POWER OR CONTROL CABLES TO LIFT PUMP!**

Overload Protection - For single phase, 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 becomes too high. It will then automatically reset and start the pump 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. **DO NOT LET THE PUMP CYCLE OR RUN IF AN OVERLOAD CONDITION OCCURS !**

Wire Size - If additional cable is required consult a qualified electrician for proper wire size.

CABLE CONNECTIONS:

Power/Control Cable- Insert female end of cable plug into housing bore aligning alignment mark with hole in terminal block see Figures 4 & 5. Tighten bolts on compression flange until flush with motor housing.

Pump Power - Large Pin (furthest from discharge)

Level Control - Small Pin (closest from discharge)

Level control cord has molded fitting at both ends of the cord. Install one end to the Pump and the other end to the Level Control.

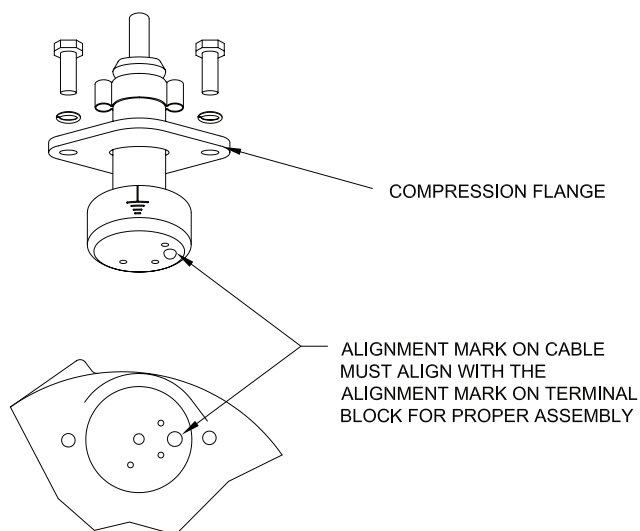
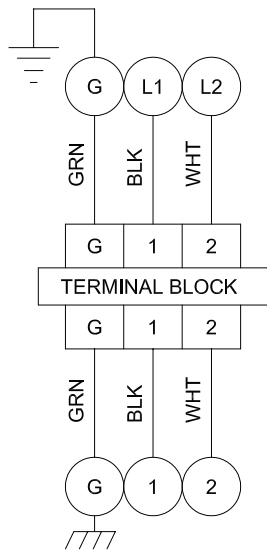
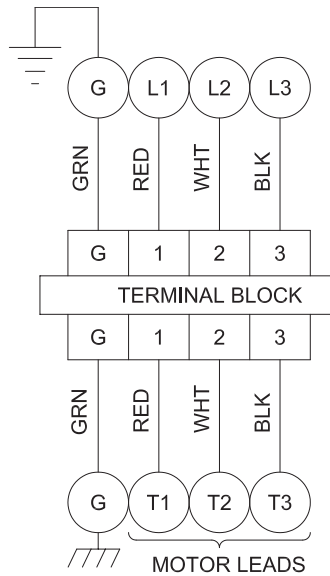


FIGURE 4



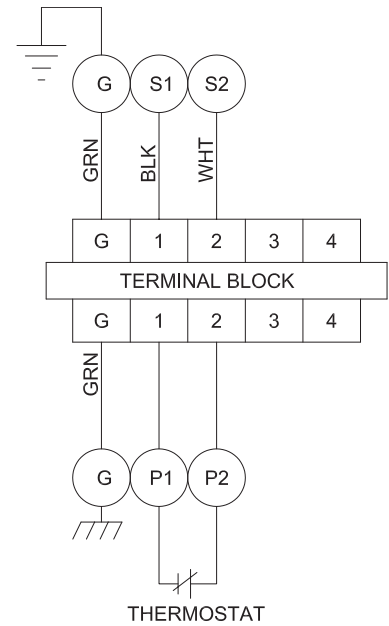
Single phase 240 Volt AC, 60Hz
"L" Series, 12/3 SOW

FIGURE 6



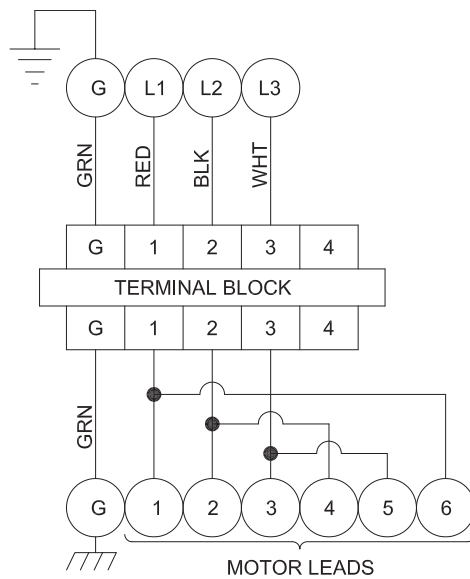
Single phase 240 Volt AC,
External Capacitor

FIGURE 6a



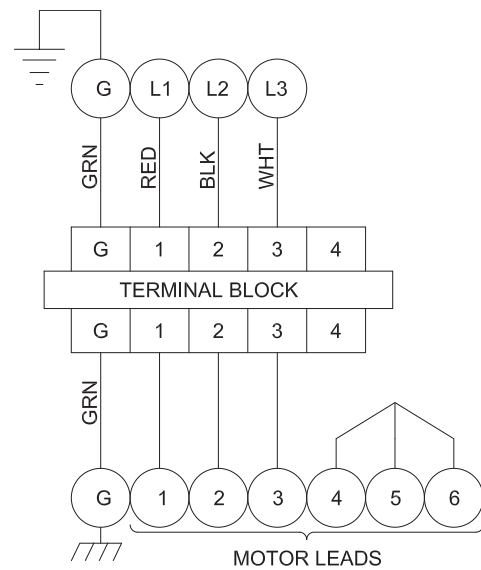
Temperature Sensors

FIGURE 6b



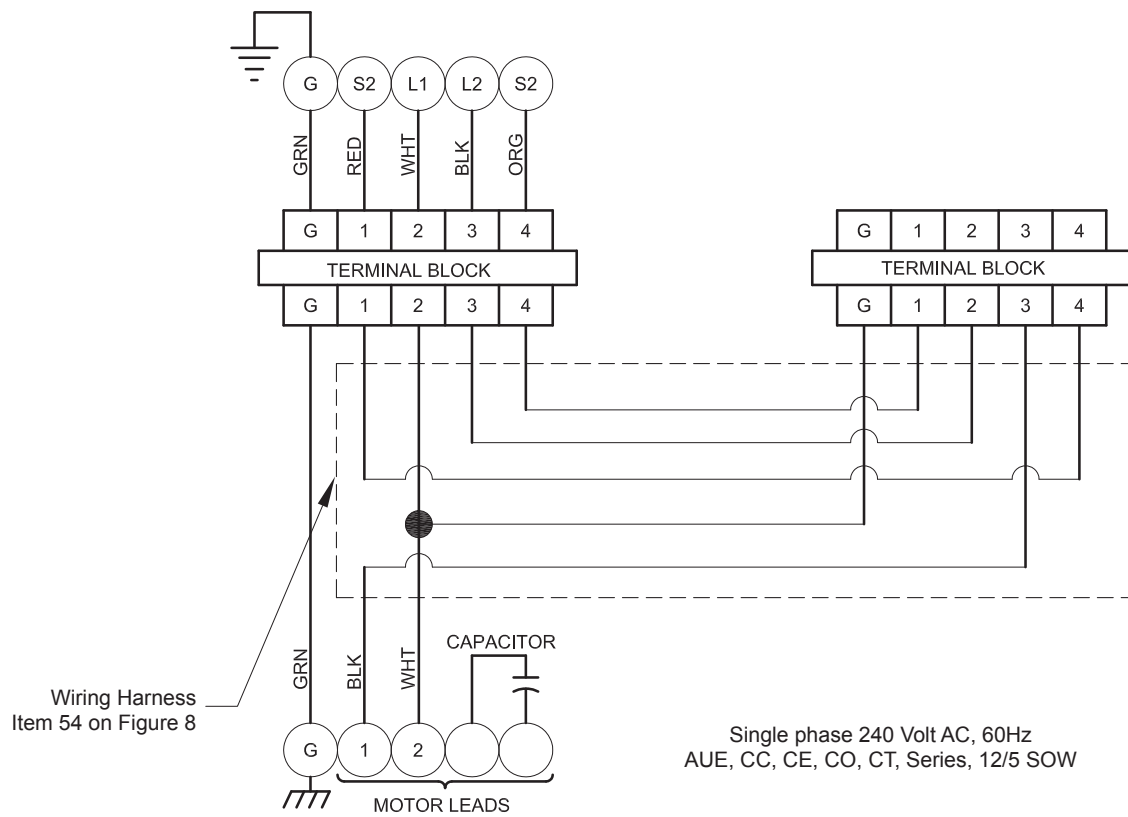
Three Phase, 200-240 Volt AC

FIGURE 6c



Three Phase, 460 Volt AC

FIGURE 6d

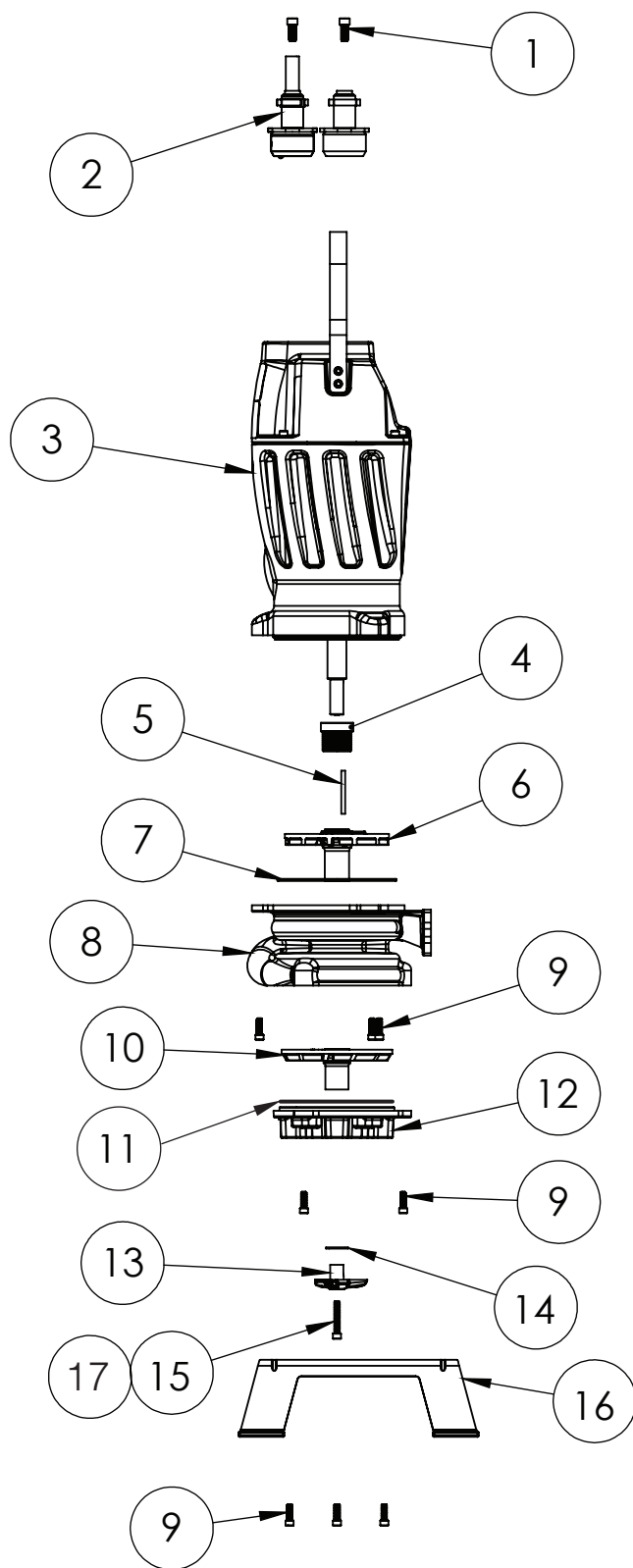


TROUBLE SHOOTING

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:
MATCH "CAUSE" NUMBER WITH CORRELATING "CORRECTION" NUMBER.

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

PROBLEM	CAUSE	CORRECTION
Pump will not run	<ol style="list-style-type: none"> 1. Poor electrical connection, blown fuse, tripped breaker or other interruption of power, improper power supply. 2. Motor or switch inoperative (to isolate cause, go to manual operation of pump). 2a. Float movement restricted. 2b. Switch will not activate pump or is defective. 3a. Insufficient liquid level. 3b. Switch is unable to activate 	<ol style="list-style-type: none"> 1. Check all electrical connections for security. Have electrician measure current in motor leads, if current is within $\pm 20\%$ 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. 2a. Reposition pump or clean basin as required to provide adequate clearance for float.
Pump will not turn off	<ol style="list-style-type: none"> 2a. Float movement restricted. 2b. Switch will not activate pump or is defective. 4. Excessive inflow or pump not properly sized for application. 9. Pump may be airlocked. 14. H-O-A switch on panel is in "HAND" position 	<ol style="list-style-type: none"> 2b. 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). 3a. Make sure liquid level is at least equal to suggested turn-on point. 3b. Rotate ESPS level control in horizontal position.
Pump hums but does not run	<ol style="list-style-type: none"> 1. Incorrect voltage 8. Cutter jammed or loose on shaft, worn or damaged, inlet plugged. 	<ol style="list-style-type: none"> 4. Recheck all sizing calculations to determine proper pump size.
Pump delivers insufficient capacity	<ol style="list-style-type: none"> 1. Incorrect voltage. 4. Excessive inflow or pump not properly sized for application. 5. Discharge restricted. 6. Check valve stuck closed or installed backwards. 7. Shut-off valve closed. 8. Cutter jammed or loose on shaft, worn or damaged, inlet plugged. 9. Pump may be airlocked. 10. Pump stator damaged/torn. 	<ol style="list-style-type: none"> 5. Check discharge line for restrictions, including ice if line passes through or into cold areas. 6. Remove and examine check valve for proper installation and freedom of operation. 7. Open valve. 8. Check cutter for freedom of operation, security and condition. Clean cutter and inlet of any obstruction. 9. Loosen union slightly to allow trapped air to escape. Verify that turn-off level of switch is set so that the suction is always flooded. Clean vent hole.
Pump cycles too frequently or runs periodically when fixtures are not in use	<ol style="list-style-type: none"> 6. Check valve stuck closed or installed backwards. 11. Fixtures are leaking. 15. Ground water entering basin. 	<ol style="list-style-type: none"> 10. Remove & examine for damage. Replace pump stator if required. 11. Repair fixtures as required to eliminate leakage.
Pump shuts off and turns on independent of switch, (trips thermal overload protector). CAUTION! Pump may start unexpectedly. Disconnect power supply.	<ol style="list-style-type: none"> 1. Incorrect voltage. 4. Excessive inflow or pump not properly sized for application. 8. Cutter jammed, loose on shaft, worn or damaged, inlet plugged. 12. Excessive water temperature. 	<ol style="list-style-type: none"> 12. Check pump temperature limits & fluid temperature. 13. Replace portion of discharge pipe with flexible connector. 14. Turn to automatic position.
Pump operates noisily or vibrates excessively	<ol style="list-style-type: none"> 4. Operating at too high a pressure. 5. Discharge restricted. 8. Cutter broken. 13. Piping attachments to building structure too rigid or too loose. 	<ol style="list-style-type: none"> 15. Check for leaks around basin inlet and outlets.



Torque all 1/4-20 bolts to 79 in-lb

FIGURE 8

PARTS LIST

ITEM	QTY	PART NO.	DESCRIPTION
1	4	11-44-1	SCREW,SKHD,5/16-18,.75" 18-8SS
2	1	109498XC	CORD,SET,12/3,SOW,30'
3	1	143451	ASSY,DRIVER,RAZOR (manual) 2HP,60HZ,208- 240V,1PH
3	1	143452	ASSY,DRIVER,RAZOR (auto) 2HP,60HZ,208-240V,1PH
3	1	145247	ASSY,DRIVER,RAZOR 2HP,60HZ,208-240V,3PH
3	1	145248	ASSY,DRIVER,RAZOR 2HP,60HZ,460V,3PH
4	1	111131SD	SEAL,MECH,.875",SC/SC/B
5	1	141704	KEY,3/16SQ,2.00LG
6	1	141656	IMP,OGP,2ND-STG,60HZ
7	1	2-31003-162	O-RING,-160,BUNA,5.237ID
8	1	141646	VOLUTE,OGP,60HZ
9	10	11-30-1	SCREW,SKHD,1/4-20,.750 18-8SS
10	1	141658	IMP,OGP,1ST-STG,60HZ
11	1	2-31001-160	O-RING,-160,BUNA,5.237ID
12	1	145173	ASSY,COVER,CUTTER,LF
13	1	141653	CUTTER,AXIAL,440C
14	A/R	143567-005 143567-015 143567-030 143567-060	Shims
15	1	11-34-1	SCREW,SKHD,1/4-20,1.50
16	1	145549	BASE,PUMP,SS
17	A/R	30237	LOCTITE™ RC609
18	NOT SHOWN	145400	CAP,START,300V,250MF
19	NOT SHOWN	145401	CAP,RUN,370V,30MF
20	NOT SHOWN	139741	SWITCH,START,MOTOR
50Hz Coming Soon			

Contact your local Distributor or the Factory for other cord lengths and other optional equipment.

(*) Automatic - ESPS Level Control

PARTS KITS

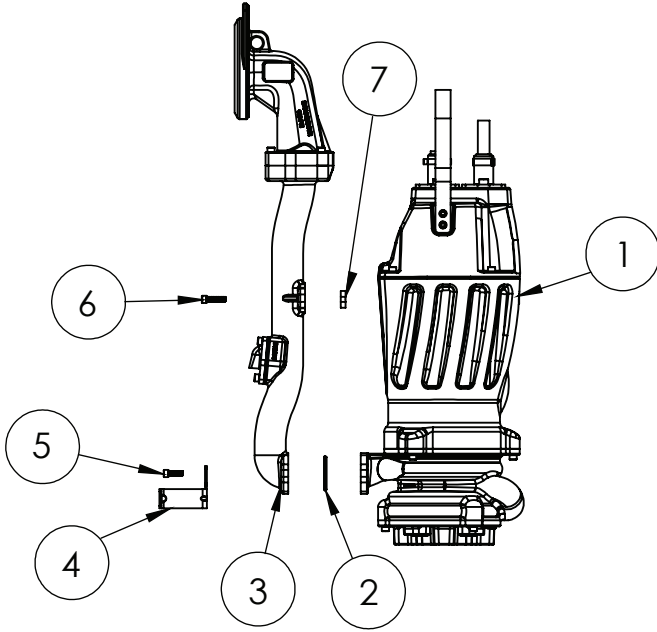
C-Channel KitP/N: 141707CA-KIT Item #'s: 2, 3, 4, 5, 6, 7

C-Channel Kit SS.....P/N: 141707CA-SS-KIT

NPT Check Valve Kit. P/N: 141707NA-KIT Item #'s: 2, 3A, 4, 5, 6

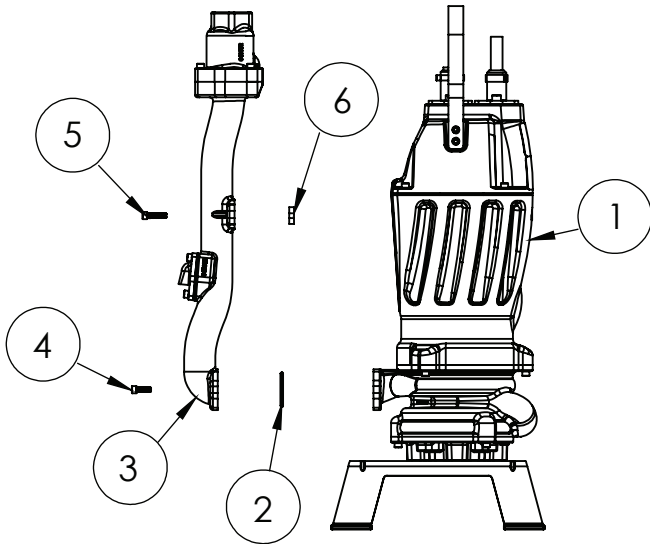
BSP Check Valve Kit..P/N: 141707BA-KIT Item #'s: 2, 3B, 4, 5, 6

C-Channel Discharge



ITEM	QTY	PART NO.	DESCRIPTION
1	1	See Page 13	ASSY, DRIVER, RAZOR
2	1	2-31003-222	O-RING, -222, BUNA, 1.484ID
3	1	141707C	ASSY, DISCHARGE, C-CHANNEL
4	4	143993	BRACKET, DISCHARGE
5	1	11-30-1	SCREW, SKHD, 1/4-20, .750, 18-8SS
6	1	11-32-1	SCREW, SKHD, 1/4-20, .875", 18-8SS
7	1	143577	SPACER, DISCHARGE, BUNA

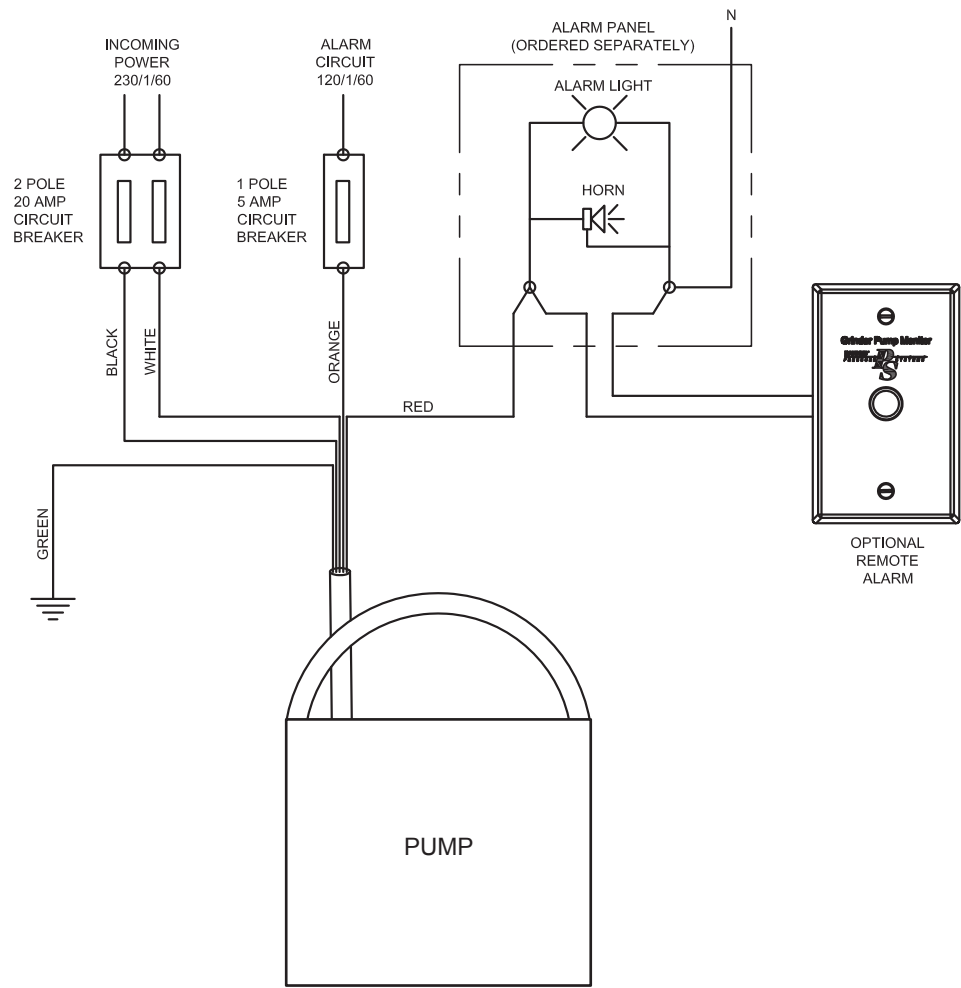
BSP/NPT Discharge

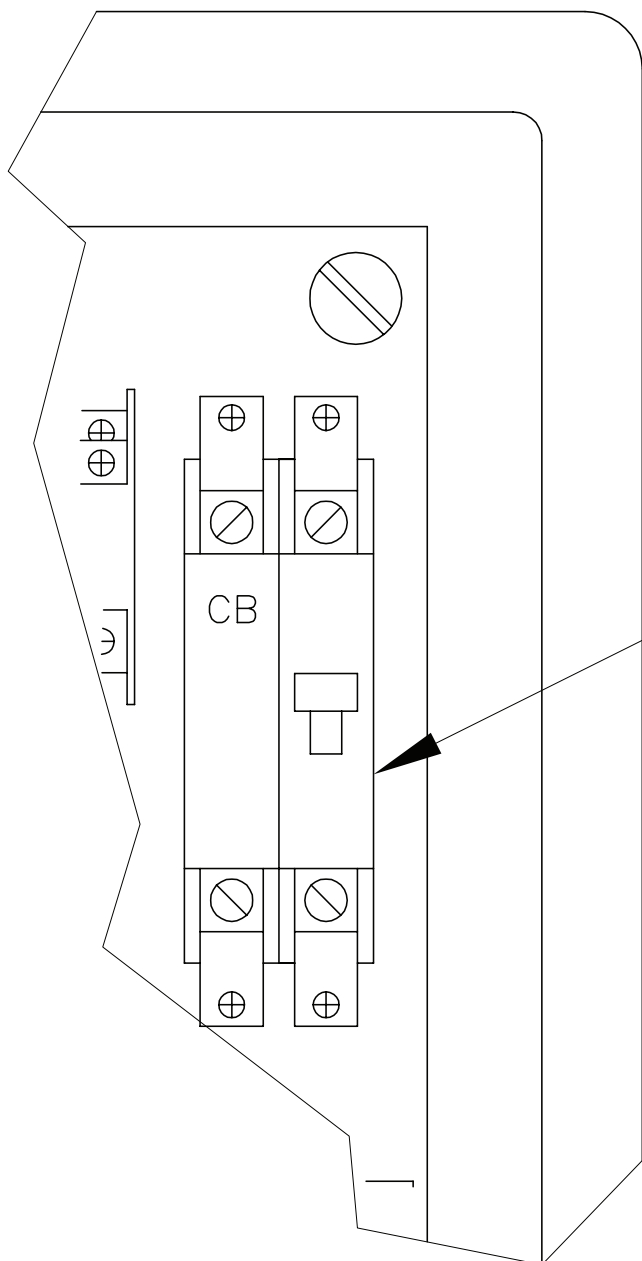


ITEM	QTY	PART NO.	DESCRIPTION
1	1	See Page 13	ASSY, DRIVER, RAZOR
2	1	2-31003-222	O-RING, -222, BUNA, 1.484ID
3a	1	141707TN	DISCHARGE, RAZOR, VLV, NPT
3b	1	141707TB	DISCHARGE, RAZOR, VLV, BSP
4	2	11-30-1	SCREW, SKHD, 1/4-20, .750 18-8SS
5	2	11-32-1	SCREW, SKHD, 1/4-20, 1.000" SS
6	1	143577	SPACER, DISCHARGE, BUNA

FIGURE 11

Typical Wiring Diagram (Generic)





CIRCUIT
BREAKER

Optional Circuit Breakers - Ordered Separately

PART NO.	DESCRIPTION
113291B	20 AMP, GE THQP Snap in Breaker
105476	20 AMP, DIN Rail Breaker

STEPS & TIPS:

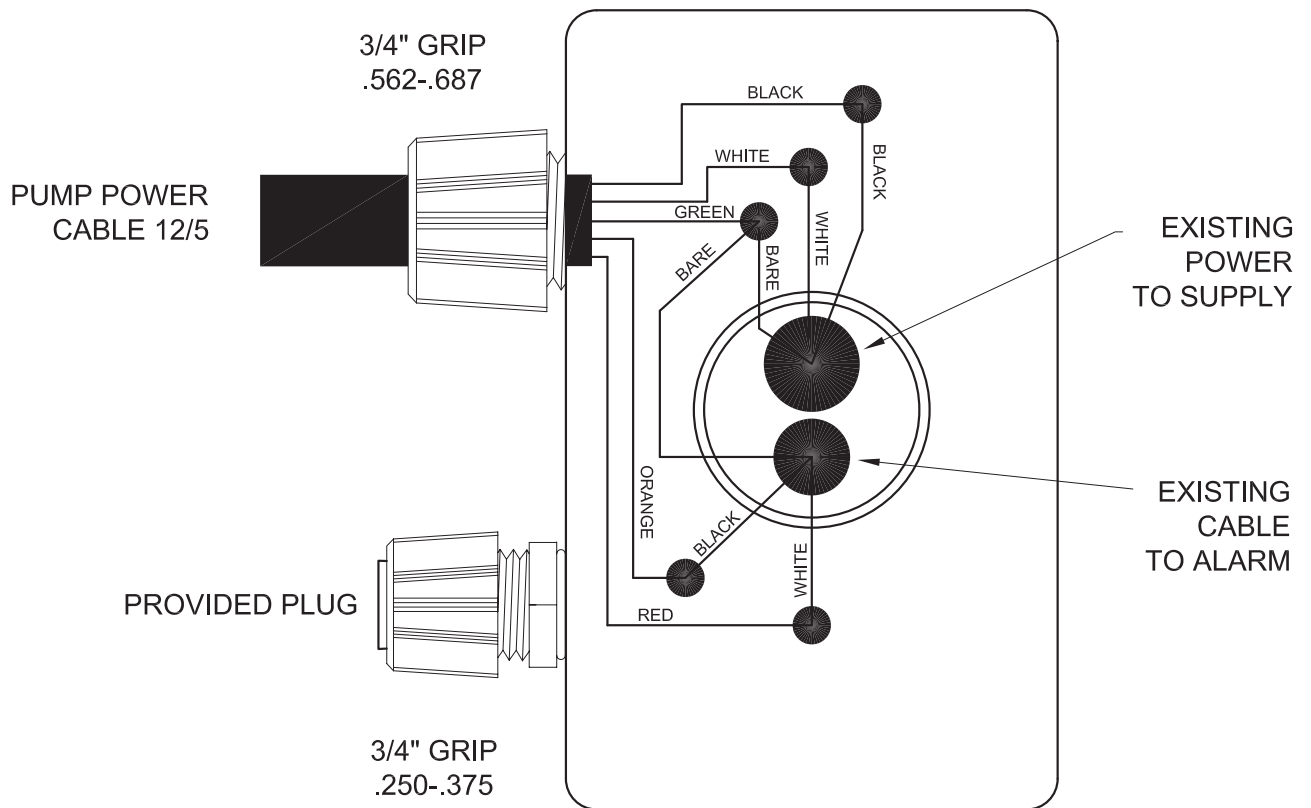
- Disconnect all power supplied to panel prior to servicing.
- Remove existing circuit breaker from control panel if rating is less than 20 AMPS.
- Install new circuit breaker to control panel (2 Pole 20 AMP) (Ordered Separately).
- Rewire existing power supplied to control panel if required.

WIRE FEEDING THE PANEL NEEDS TO BE AT LEAST 12 GAUGE. (MAY NEED TO BE LARGER DEPENDING UPON LENGTH OF RUN. CONSULT QUALIFIED ELECTRICIAN FOR PROPER APPLICATION.)

FIGURE 6

EONE 200 SERIES PACKAGE WIRING

	INCOMING 12 GA. CABLE	PUMP CABLE
	WHITE	WHITE
	BLACK	BLACK
*	BARE	GREEN
	INCOMING 14 GA. CABLE	
	BLACK	ORANGE
	WHITE	RED
*	BARE	GREEN



NOTE: DETERMINE IF THE PACKAGE CONTAINS AN EQD (QUICK DISCONNECT) IF SO GO TO PAGES 14, FIGURE 8.

*TIE BOTH BARE GROUND WIRES W/ GREEN PUMP GROUND.

FIGURE 7

2000 SERIES STATION WIRING

WIRING FOR UNITS NOT SUPPLIED WITH FACTORY WIRED EQD

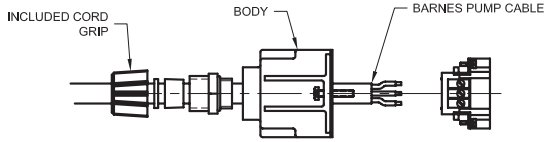
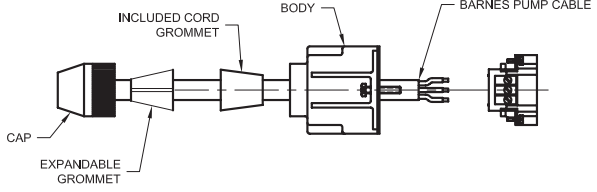
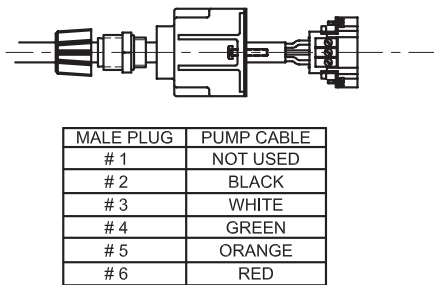
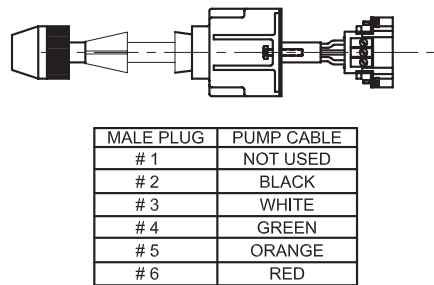
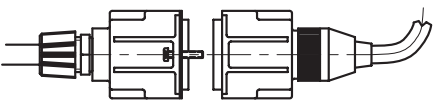
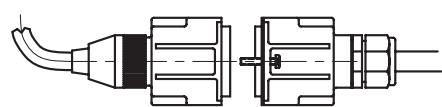
<div style="text-align: center;">1</div> <div style="text-align: center;">FEMALE CORD</div>  <p>PLACE INCLUDED CORD GRIP OVER BARNES PUMP CORD. REPLACE THE BODY OVER CABLE.</p>	<div style="text-align: center;">MALE CORD</div>  <p>REPLACE CAP AND EXPANDABLE GROMMET OVER BARNES PUMP CORD. PLACE INCLUDED CORD GROMMET OVER CABLE. (INSIDE SUPPLIED CORD GRIP)</p>																												
<div style="text-align: center;">2</div>  <table border="1" data-bbox="316 961 581 1123"> <thead> <tr> <th>MALE PLUG</th> <th>PUMP CABLE</th> </tr> </thead> <tbody> <tr><td># 1</td><td>NOT USED</td></tr> <tr><td># 2</td><td>BLACK</td></tr> <tr><td># 3</td><td>WHITE</td></tr> <tr><td># 4</td><td>GREEN</td></tr> <tr><td># 5</td><td>ORANGE</td></tr> <tr><td># 6</td><td>RED</td></tr> </tbody> </table> <p>WIRE CABLE INTO MALE PLUG.</p>	MALE PLUG	PUMP CABLE	# 1	NOT USED	# 2	BLACK	# 3	WHITE	# 4	GREEN	# 5	ORANGE	# 6	RED	 <table border="1" data-bbox="954 961 1219 1123"> <thead> <tr> <th>MALE PLUG</th> <th>PUMP CABLE</th> </tr> </thead> <tbody> <tr><td># 1</td><td>NOT USED</td></tr> <tr><td># 2</td><td>BLACK</td></tr> <tr><td># 3</td><td>WHITE</td></tr> <tr><td># 4</td><td>GREEN</td></tr> <tr><td># 5</td><td>ORANGE</td></tr> <tr><td># 6</td><td>RED</td></tr> </tbody> </table> <p>WIRE CABLE INTO MALE PLUG.</p>	MALE PLUG	PUMP CABLE	# 1	NOT USED	# 2	BLACK	# 3	WHITE	# 4	GREEN	# 5	ORANGE	# 6	RED
MALE PLUG	PUMP CABLE																												
# 1	NOT USED																												
# 2	BLACK																												
# 3	WHITE																												
# 4	GREEN																												
# 5	ORANGE																												
# 6	RED																												
MALE PLUG	PUMP CABLE																												
# 1	NOT USED																												
# 2	BLACK																												
# 3	WHITE																												
# 4	GREEN																												
# 5	ORANGE																												
# 6	RED																												
<div style="text-align: center;">3</div>  <p>TIGHTEN INTERNAL SCREWS AND CORD GRIP. PLUG PUMP CABLE INTO IN-COMING POWER AND TIGHTEN EXTERNAL SCREWS.</p>	 <p>TIGHTEN INTERNAL SCREWS AND CORD GRIP. PLUG PUMP CABLE INTO IN-COMING POWER AND TIGHTEN EXTERNAL SCREWS.</p>																												

FIGURE 8

BARNES®**burks®****WEINMAN®****DEMING®****PROSSER®**

Limited 3 Year Warranty

Crane Pumps & Systems warrants that products of our manufacture will be free of defects in material and workmanship under normal use and service for thirty-six (36) months after manufacture date, when installed and maintained in accordance with our instructions. This warranty gives you specific legal rights, and there may also be other rights which vary from state to state. In the event the product is covered by the Federal Consumer Product Warranties Law (1) the duration of any implied warranties associated with the product by virtue of said law is limited to the same duration as stated herein, (2) this warranty is a LIMITED WARRANTY, and (3) no claims of any nature whatsoever shall be made against us, until the ultimate consumer, his successor, or assigns, notifies us in writing of the defect, and delivers the product and/or defective part(s) freight prepaid to our factory or nearest authorized service station. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply. **THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY AND ALL WARRANTIES WITH RESPECT TO ANY PRODUCT SHALL BE TO REPLACE OR REPAIR AT OUR ELECTION, F.O.B. POINT OF MANUFACTURE OR AUTHORIZED REPAIR STATION, SUCH PRODUCTS AND/OR PARTS AS PROVEN DEFECTIVE. THERE SHALL BE NO FURTHER LIABILITY, WHETHER BASED ON WARRANTY, NEGLIGENCE OR OTHERWISE.** Unless expressly stated otherwise, guarantees in the nature of performance specifications furnished in addition to the foregoing material and workmanship warranties on a product manufactured by us, if any, are subject to laboratory tests corrected for field performance. Any additional guarantees, in the nature of performance specifications must be in writing and such writing must be signed by our authorized representative. Due to inaccuracies in field testing if a conflict arises between the results of field testing conducted by or for user, and laboratory tests corrected for field performance, the latter shall control. **RECOMMENDATIONS FOR SPECIAL APPLICATIONS OR THOSE RESULTING FROM SYSTEMS ANALYSES AND EVALUATIONS WE CONDUCT WILL BE BASED ON OUR BEST AVAILABLE EXPERIENCE AND PUBLISHED INDUSTRY INFORMATION. SUCH RECOMMENDATIONS DO NOT CONSTITUTE A WARRANTY OF SATISFACTORY PERFORMANCE AND NO SUCH WARRANTY IS GIVEN.**

This warranty shall not apply when damage is caused by (a) improper installation, (b) improper voltage (c) lightning (d) excessive sand or other abrasive material (e) scale or corrosion build-up due to excessive chemical content. Any modification of the original equipment will also void the warranty. We will not be responsible for loss, damage or labor cost due to interruption of service caused by defective parts. Neither will we accept charges incurred by others without our prior written approval.

This warranty is void if our inspection reveals the product was used in a manner inconsistent with normal industry practice and/or our specific recommendations. The purchaser is responsible for communication of all necessary information regarding the application and use of the product. **UNDER NO CIRCUMSTANCES WILL WE BE RESPONSIBLE FOR ANY OTHER DIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO TRAVEL EXPENSES, RENTED EQUIPMENT, OUTSIDE CONTRACTOR FEES, UNAUTHORIZED REPAIR SHOP EXPENSES, LOST PROFITS, LOST INCOME, LABOR CHARGES, DELAYS IN PRODUCTION, IDLE PRODUCTION, WHICH DAMAGES ARE CAUSED BY ANY DEFECTS IN MATERIAL AND/OR WORKMANSHIP AND/OR DAMAGE OR DELAYS IN SHIPMENT. THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

No rights extended under this warranty shall be assigned to any other person, whether by operation of law or otherwise, without our prior written approval.

CRANE®

A Crane Co. Company

PUMPS & SYSTEMS

420 Third Street
Piqua, Ohio 45356
(937) 778-8947
Fax (937) 773-7157
www.cranepumps.com

83 West Drive
Brampton, Ont. Canada L6T 2J6
(905) 457-6223
Fax (905) 457-2650

IMPORTANT!
WARRANTY REGISTRATION

Your product is covered by the enclosed Warranty.

If you have a claim under the provision of the warranty, contact your local
Crane Pumps & Systems, Inc. Distributor.

RETURNED GOODS

**RETURN OF MERCHANDISE REQUIRES A "RETURNED GOODS AUTHORIZATION".
CONTACT YOUR LOCAL CRANE PUMPS & SYSTEMS, INC. DISTRIBUTOR.**



**Products Returned Must Be Cleaned, Sanitized,
Or Decontaminated As Necessary Prior To Shipment,
To Insure That Employees Will Not Be Exposed To Health
Hazards In Handling Said Material. All Applicable Laws
And Regulations Shall Apply.**



A Crane Co. Company

PUMPS & SYSTEMS

START-UP REPORT

General Information

Pump Owner's Name: _____
Address: _____
Location of Installation: _____
Contact Person: _____ Phone: _____
Purchased From: _____

Nameplate Data

Pump Model #: _____ Serial #: _____
Part #: _____ Impeller Diameter: _____
Voltage: _____ Phase: _____ Ø Hertz: _____ Horsepower: _____
Full Load Amps: _____ Service Factor Amps: _____
Motor Manufacturer: _____

Controls

Control panel manufacturer: _____
Model/Part number: _____
Number of pumps operated by control panel: _____
Short circuit protection? YES___ NO___ Type: _____
Number and size of short circuit device(s): _____ Amp rating: _____
Overload Type: _____ Size: _____ Amp rating: _____
Do protection devices comply with pump and motor Amp rating? YES___ NO___
Are all electrical and panel entry connections tight? YES___ NO___
Is the interior of the panel dry? YES___ NO___
Liquid level Control Brand and Model: _____

Pre-Startup

All Pumps

Type of equipment: NEW___ REBUILT___ USED___
Condition of equipment at Start-Up: DRY___ WET___ MUDDY___
Was Equipment Stored? YES___ NO___ Length of Storage: _____
Liquid being pumped: _____ Liquid Temperature: _____
Supply Voltage/Phase/Frequency matches nameplate? YES___ NO___
Shaft turns freely? YES___ NO___
Direction of rotation verified for 3Ø motors? YES___ NO___
Debris in piping or wet well? YES___ NO___
Debris removed in your presence? YES___ NO___
Pump case/wet well filled with liquid before startup? YES___ NO___
Is piping properly supported? YES___ NO___

Non-Submersible Pumps

Is base plate properly installed / grouted? YES___ NO___ N/A___
Coupling Alignment Verified per I&O Manual? YES___ NO___ N/A___
Grease Cup/Oil Reservoir Level checked? YES___ NO___ N/A___

Submersible Pumps

Resistance of cable and pump motor (measured at pump control):

Red-Black: _____ Ohms(Ω) Red-White: _____ Ohms(Ω) White-Black: _____ Ohms(Ω)

Resistance of Ground Circuit between Control Panel and outside of pump: _____ Ohms(Ω)

MEG Ohms check of insulation:

Red to Ground: _____ White to Ground: _____ Black to Ground: _____

Operational Checks

Is there noise or vibration present? YES___ NO___ Source of noise/vibration: _____

Does check valve operate properly? YES___ NO___ N/A___

Is system free of leaks? YES___ NO___ Leaks at: _____

Does system appear to operate at design flow rate? YES___ NO___

Nominal Voltage: _____ Phase: 1Ø 3Ø (select one)

Voltage Reading at panel connection, Pump OFF: L1, L2 _____ L2, L3 _____ L1, L3 _____

Voltage Reading at panel connection, Pump ON: L1, L2 _____ L2, L3 _____ L1, L3 _____

Amperage Draw, Pump ON: L1 _____ L2 _____ L3 _____

Submersible Pumps

Are BAF and guide rails level / plumb? YES___ NO___

Is pump seated on discharge properly? YES___ NO___

Are level controls installed away from turbulence? YES___ NO___

Is level control operating properly? YES___ NO___

Is pump fully submerged during operation? YES___ NO___

Follow up/Corrective Action Required

YES___ NO___

Additional Comments:

Startup performed by: _____ Date: _____

Present at Start-Up

() Engineer: _____ () Operator: _____

() Contractor: _____ () Other: _____

All parties should retain a copy of this report for future trouble shooting/reference

CRANE
®

A Crane Co. Company

PUMPS & SYSTEMS

420 Third Street
Piqua, Ohio 45356
(937) 778-8947
Fax (937) 773-7157
www.cranepumps.com

83 West Drive
Brampton, Ont. Canada L6T 2J6
(905) 457-6223
Fax (905) 457-2650

Notes

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.