UltraGRIND™ CONTROL PANELS
INSTALLATION & OPERATION MANUAL

Series: 100 - Simplex
UGP, UGP-P, UCP & UCP-P

Series: 200 - Duplex
UGP & UCP

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

DISCONTINUED
Parts may NOT be available

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Congratulations on your purchase of a Barnes UltraGRIND™ 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 UltraGRIND 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 UltraGRIND 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.

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: _____________________
SAFETY FIRST!
PLEASE READ THIS BEFORE INSTALLING OR OPERATING PUMP.

**GENERAL**

1. Most accidents can be avoided by using **COMMON SENSE**.
2. Read this operation and maintenance instruction manual.
3. Do not wear loose clothing that may become entangled in the impeller or other moving parts.
4. Always wear appropriate safety gear, such as safety glasses, when working on the pump or piping.
5. Bronze/brass and bronze/brass fitted pumps may contain lead levels higher than considered safe for potable water systems. 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.
6. Minimize the amount of cooking grease entering the system.
7. Do Not leave pump cover off the basin, except while servicing, to prevent entrance of foreign materials such as rocks, metal, soil, animals or humans.
8. Prevent large articles of clothing, large amounts of chemicals, other materials or substances such as are uncommon in domestic sewage from entering the system.
9. During power black-outs, discontinue water consumption at the home(s) to prevent sewage from backing up into the house.
10. Prevent infiltration or direct flow of rain or run-off water into the pump basin to minimize pump cycling. This will prevent overloading the treatment facility, and will facilitate swift transportation of sewage.
11. Always keep the shut-off valve completely open when system is in operation (unless advised otherwise by the proper authorities).
12. Keep the control panel locked or confined to prevent unauthorized access to it.
13. If the pump is idle for long periods of time, it is advisable to start the pump occasionally by adding water to the basin.
14. Before removing the pump from the basin, be sure to close the shut-off valve. (This prevents backflow from the pressure sewer.)
15. Make sure level controls are provided at time of installation.

**PUMPS**

16. Recommended no more than 10 starts per hour.
17. Pumps build up heat and pressure during operation-allow time for pumps to cool before handling or servicing.
18. Only qualified personnel should install, operate and repair pump.
19. Keep clear of suction and discharge openings. **DO NOT** insert fingers in pump with power connected.
20. Do not pump hazardous materials (flammable, caustic, etc.) unless the pump is specifically designed and designated to handle them.
21. Do not block or restrict discharge hose, as discharge hose may whip under pressure.
22. Make sure lifting handles are securely fastened each time before lifting.
23. Do not lift pump by the power cord.
24. Do not exceed manufacturers recommendation for maximum performance, as this could cause the motor to overheat.
25. Secure the pump in its operating position so it can not tip over, fall or slide.
26. Keep hands and feet away from impeller when power is connected.
27. 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.
28. Do not operate pump without safety devices in place.
29. Always replace safety devices that have been removed during service or repair.

**ELECTRICAL**

30. To reduce risk of electrical shock, pump must be properly grounded in accordance with the National Electric Code (NEC) and all applicable state and local codes and ordinances.
31. To reduce risk of electrical shock, always disconnect the pump from the power source before handling or servicing. Lock out power and tag.
32. Any wiring of pumps should be performed by a qualified electrician.
33. Never operate a pump with a power cord that has frayed or brittle insulation.
34. Cable should be protected at all times to avoid punctures, cut, bruises and abrasions - inspect frequently.
35. Never handle connected power cords with wet hands.
36. Do not remove cord and strain relief. Do not connect conduit to pump.
37. To reduce risk of electrical shock, all wiring and junction connections should be made per the NEC and applicable state and local codes. Requirements may vary depending on usage and location. See wiring diagrams in manual.
38. Do Not operate the pump in the "HAND" control position and leave the pump unattended.

**IMPORTANT!** BARNES® PUMPS, 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.
Standard UGP & UCP UltraGRIND Control Panels

Standard Features:
- NEMA 4X Fiberglass enclosure.
- Pump circuit breaker.
- UGP - IEC rated motor starter with ambient compensated overload relay. UCP - Pumps have motor overload intragal in pump motor windings.
- Motor Start pushbutton.
- Separate circuit fuses for Control and Alarm circuits.
- 25 watt high level alarm light.
- UGP - Pre-installed start capacitor kit.
- UCP - SGPC pumps have capacitor internal to pump.
- Terminal strip and ground lug for all incoming connections.

Optional Features:
- 90 db alarm horn with 10 amp Silence control relay and NEMA 4X Silence pushbutton.
- 7 digit elapsed time meter with meter running indicator.
- 30 amp Automatic Transfer Switch with easy access 30 amp reverse pin portable generator receptacle and weatherproof cover.
- Seal Leak Indication with 120 volt indicator lamp and terminals for 2 leak probe wires (UGP Only).

UGP Panels used with SGV Grinder Pumps.
UCP Panels used with SGPC Grinder Pumps.

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<td>UCP-105</td>
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<td>UGP-208</td>
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<td>UGP-209</td>
<td>UCP-109</td>
<td>UCP-209</td>
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<td>UGP-210</td>
<td>UCP-110</td>
<td>UCP-210</td>
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<td>UCP-113</td>
<td>UCP-213</td>
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</tr>
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<td>UGP-214</td>
<td>UCP-114</td>
<td>UCP-214</td>
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<td>UGP-215</td>
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<td>UGP-216</td>
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</tr>
</tbody>
</table>

IMPORTANT: Control panel sizes and options will vary depending on contract specifications.
Standard Features:
- NEMA 4X Fiberglass enclosure.
- Pump circuit breaker.
- UGP - IEC rated motor starter with ambient compensated overload relay. UCP - Pumps have motor overload intragal in pump motor windings.
- Motor Start pushbutton.
- Separate circuit fuses for Control and Alarm circuits.
- 25 watt high level alarm light.
- UGP - Pre-installed start capacitor kit. UCP - SGPC pumps have capacitor internal to pump.
- Terminal strip and ground lug for all incoming connections.

Optional Features:
- 90 db alarm horn with 10 amp Silence control relay and NEMA 4X Silence pushbutton.
- 7 digit elapsed time meter with meter running indicator.
- 30 amp Automatic Transfer Switch with easy access 30 amp reverse pin portable generator receptacle and weatherproof cover.
- Seal Leak Indication with 120 volt indicator lamp and terminals for 2 leak probe wires.

UGP Panels used with SGV Grinder Pumps.
UCP Panels used with SGPC Grinder Pumps.
-P panels used with CONVERTIBLE Cover.

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<tr>
<th>UGP-P SIMPLEX</th>
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<td>UGP-101/2-P</td>
<td>UCP-101/2-P</td>
<td>NEMA 4X Fiberglass Enclosure, Operating Controls &amp; Remote Alarm Light.</td>
</tr>
<tr>
<td>UGP-101/2-P</td>
<td>UCP-101/2-P</td>
<td>NEMA 4X Fiberglass Enclosure, Operating Controls, with Remote Audio Alarm w/Push Button Silence &amp; Alarm Light.</td>
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<td>UGP-103/4-P</td>
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<td>UGP-103/4-P</td>
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</tr>
<tr>
<td>UGP-109/10-P</td>
<td>UCP-109/10-P</td>
<td>NEMA 4X Fiberglass Enclosure, Operating Controls, Elapsed Time Meter, Remote Alarm Light.</td>
</tr>
<tr>
<td>UGP-109/10-P</td>
<td>UCP-109/10-P</td>
<td>NEMA 4X Fiberglass Enclosure, Operating Controls, Elapsed Time Meter, Remote Audio Alarm w/Push Button Silence &amp; Alarm Light.</td>
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<td>UGP-111/12-P</td>
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</tr>
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**IMPORTANT:** Control panel sizes and options will vary depending on contract specifications.

PUMP SERIES:
UGP = UltraGRIND
UCP = UltraCAV

PANEL MODEL:
101 thru 116, Simplex
201 thru 216, Duplex

HORSEPOWER:
1 = 1HP
2 = 2HP
3 = 3HP
5 = 5HP
7.5 = 7.5HP

VOLTAGE:
0 = 200 VOLT, 1 PHASE, 60HZ
1 = 115 VOLT, 1 PHASE, 60HZ
2 = 230 VOLT, 1 PHASE, 60HZ
3 = 230 VOLT, 3 PHASE, 60HZ
4 = 460 VOLT, 3 PHASE, 60HZ
5 = 575 VOLT, 3 PHASE, 60HZ
6 = 200 VOLT, 3 PHASE, 60HZ

MOUNTING:
* = WALL MOUNT (STD).
P = POLY INSERT MOUNT
* Left Blank
**SECTION A: GENERAL INFORMATION**

**A-1) RECEIVING:**
Upon receiving the Control Panel, it should be inspected for damage or shortages. If damage has occurred, file a claim immediately with the company that delivered the basin package.

**A-2) STORAGE:**
For best results, control panels should be stored in a temperature controlled area that provides protection from the elements and humidity.

**A-3) SERVICE CENTERS:**
For the location of the nearest Barnes® Pumps Service Center, check your catalog, your Barnes Pumps, Inc. representative or Barnes Pumps, Inc. Service Department in Piqua, Ohio, telephone (937) 778-8947.

**A-4) LOCATION:**
Any alterations from the standard must be in accordance with local codes. These control panels are not to be installed in locations that would be classified as a HAZARDOUS location in accordance with NEC ANSI/NFPA 70.

**SECTION B: PRODUCT OVERVIEW**

The UGP & UCP Series Panels were developed to support the Barnes UltraGRIND low pressure sewer grinder packages. The electrical hardware has been designed to function with the Barnes SGV & SGPC Series Grinder Pumps. A detailed wiring diagram is enclosed in each control panel, and should be referred to during installation and package start-up.

**B-1) GENERAL COMPONENTS DESCRIPTION:**
The control panel is the brain of the pressure sewer basin package. It receives water level or pump temperature signals through the wiring from the basin package system. The panel will turn the pump “ON” or “OFF” depending on the signals received. A typical control wiring diagram can be seen on pages 13, 14, 15 & 18, 19. The following are descriptions of each component and their operation.

**Circuit Breaker (CB)** - The circuit breaker serves two purposes. First it is a main disconnect for the simplex UGP and UCP panels and pump power disconnect for duplex panels. When servicing the pump or control panel, this circuit breaker should be turned off and fuses pulled (duplex only). For stations with panels mounted in the cover, this DOES NOT disconnect the incoming power passing through the alarm box. The second function of the circuit breaker is protection against short circuit conditions. The circuit breaker will open or break a power circuit under a catastrophic failure such as a motor winding or cable short. The purpose of this action is to prevent fire and wire damage.

**Motor Start Contactor (MS)** - The motor starter is a device made up of two main components; the motor contacts and electromagnetic coil. When the coil is energized by a 120 volt control voltage, the armature closes the “double break” starter contacts applying 115 or 230 volt power to the motor depending on pump voltage. Terminal "T1" & "T2" are the pump connection points for the SGPC pumps.

**Control Circuit Fuses (FU1, FU2)** - These fuses offer overload protection to the control and alarm circuits. They are down stream of the breaker (simplex). These fuses are sized to protect the control circuit from a short and connected directly to incoming power on duplex.

**Overload (OL) (UGP Panels Only)** - The overload relay is installed attached to the motor starter. The purpose of the overload relay is to protect the motor and turn it off when an overload condition is sensed. The overload relay has three “heaters” inside along with control contacts for use in the control. When the operating current of the motor exceeds the current set on the overload relay, the normally closed contact in the control circuit will open and stop the motor. The overload relay will need to be manually reset if it has been tripped due to an overload situation.

**Start & Run Capacitor (SC, RC) (UGP Panels Only)** - On single phase pumps, a capacitor is placed in series with the start windings and in series with the run windings. These are commonly referred to as the start and run capacitors. The start capacitor improves the starting torque of the pump. The run capacitor is designed to improve the motor efficiency during operation.

**Start Relay (SR) (UGP Panels Only)** - The start relay is installed in conjunction with the start and run capacitors on a single phase motor. This device allows the motor to start and accelerate up to speed under a load. When the motor contactor is initially closed, the start capacitor boosts voltage to the motor. The start relay monitors this voltage and disconnects the start capacitor when the voltage reaches the designed value, corresponding to a desired motor speed. The run capacitor remains attached to the start winding at all times.

**Alarm Light** - A red indicator light located on the top of wall mounted panels, or on the alarm box for panels located in the cover. It is designed to be turned on when the fluid level in the basin is above the normal pump "ON" point. When the Alarm Light is lit, it either indicates a severe inflow of fluid, or a failure of the pump to turn on. Service of the basin in a timely manner will generally be required.

**Audible Alarm Horn** - An option on the UGP and UCP series panels is to have an Audible Alarm Horn sound when the Alarm Light is activated. The audible alarm can then be manually silenced by pressing the silence button on the wall mounted panels which de-energizes the alarm horn relay, or by turning the manual On/Off switch located on the alarm box, to “Off” for panels mounted in the cover. Remember to reset the Alarm Horn once the problem has been corrected for units with the manual switch.
**Seal Leak Indicator (UGP Only)** - This is an optional feature on the UGP panel. A separate circuit in the UGP panel can be wired to a SGV Grinder pump with seal probes, and if the outer seal on the pump has failed allowing pumping fluid into the chamber, a indicator light will be lit. The pump then can be pulled for evaluation and service.

**Terminal Strip** - This is the connection point for all signal wires going to and from the control panel. Connection are made here for level controls, thermal sensors, optional moisture probes, pump connections (UGP Only), and remote alarm (panel in cover Only).

**Start Button** - The Start Button allows for the manual operation of the pump by bypassing the level control circuit. With the "OFF" switch closed, the Start Button can be pushed and the pump will start. The pump will turn off once the "OFF" switch has opened the control circuit. If the fluid level is below the off switch, the Start Button will need to be held in to keep the pump "ON".

**Alternator (ALT)** - This is an electromechanical device that is used in the Duplex panels to alternate which pump runs when the "ON" float is closed. This device is designed to keep the amount of time each pump run equal. At the beginning of each cycle, the unit alternates and energizes the motor starter coil for the lead pump in that cycle.

**B-2) PRINCIPLES OF OPERATION - SIMPLEX:**

The 115 volt control ladder circuit is made up of a power line (L1) and a separate neutral feed.

The alarm circuit and control circuit are split and are fused separately. The fuse FU1 is for the alarm circuit, and the fuse FU2 is for the control circuit.

For UGP panels LS1 is the "OFF" level control switch and is connected between nodes one and two of the control circuit. For UCP panels LS1 is the "REDUNDANT OFF" and LS2 is "NORMAL OFF" and is connected between nodes one and two of the control circuit.

LS2 for UGP panels and LS3 for UCP panels is the "ON" level control switch and is connected between nodes three (3) and four (4).

Contactor MS forms a latch around the "ON" switch that will hold this portion of the circuit closed until the MS coil has been denergized by the opening of the "OFF" level control switch.

In UGP panels, the thermal sensor (TS) and motor overload (OL) are wired in series with the control circuit and when open will energize the pump.

The alarm circuit is energized by LS3 on UGP panels and LS4 on UCP panels. In wall mounted panels, this initiates the lighting of the Alarm Light and closing of the relay CR which actuates the Audible Alarm Horn. Pressing the "Silence" button will de-energize the CR coil and open the CR contact, thus turning the Audible Alarm Horn off.

In cover mounted panels, this energizes the alarm signal line going back to the alarm box, thus turning on both the alarm light and audible horn. The horn can be silenced by switching the manual silence switch on the alarm junction box from the "On" to the "Off" position. NOTE: Remember to turn the audible alarm switch back to the "On" position once the alarm condition has been corrected.

**B-3) PRINCIPLES OF OPERATION - DUPLEX:**

The 115 volt control ladder circuit is made up of a power line (L1) and a separate neutral feed.

The alarm circuit and the control circuit are split and are fused separately.

The fuse FU2 is for the alarm circuit, and the FU1 is for the control circuit.

For UGP panels LS1 is the "OFF" level control switch and is connected between nodes one and two of the control circuit. For UCP panels LS1 is the "REDUNDANT OFF" and LS2 is "NORMAL OFF" and is connected between nodes one and two of the control circuit.

LS2 for UGP panels and LS3 for UCP panels is the "ON" level control switch and is connected between nodes three (3) and four (4).

The LS2 level control is in series with a mechanical alternator (ALT) that will alternated from MS1 to MS2 at the beginning of each pump cycle. This alternation defines which pump is the lead and which pump is the lag pump for each cycle.

The contactor (MS1 or MS2) forms a latch around the "ON" switch that will hold this portion of the circuit closed until the MS coil has been denergized by the opening of the "OFF" level control switch.

If an exceptional amount of flow has entered the basin, and the fluid level raises, the LS3 float for UGP panels or LS4 for UCP panels will close, energizing the lag motor contactor (MS1 or MS2), and turning the lag pump on. Once the "OFF" level control opens, the control circuit is denergized and all pumps are turned off.

In UGP Panels, the thermal sensor (TS) and motor overload (OL) are wired in series with the control circuit and when open, will energize the pump with the thermal or overload condition.

The alarm circuit is energized by the closing of LS4 for UGP panels and LS5 for UCP panels. This initiates the lighting of the Alarm Light and closing of the relay CR coil and open the CR contact, thus silencing the Audible Alarm Horn.

⚠️ **WARNING !**

ELECTRICAL POWER TO THE PUMP MOTORS MUST BE DISCONNECTED AND LOCKED OUT TO PREVENT ANY DANGEROUS ELECTRICAL HAZARDS OR PERSONNEL DANGER BEFORE ANY SERVICE WORK IS DONE TO THE PUMP.
Figure 1

CONDUIT TO 18” BELOW GRADE

POST MOUNTED

HOUSE MOUNTED

Figure 1

INSIDE OF CONTROL PANEL

LAYER OF SEALING CAULK
SPRAY FOAM BACKING

SEALING OF CONDUIT ENTERING ELECTRICAL ENCLOSURE.

Figure 2
Figure 3

ALARM BOX

CONDUIT TO BE A MINIMUM OF 18" BELOW GRADE

CONTROL PANEL

SDY = 10/5 DIRECT BURIAL CABLE ALL UNITS
SGDC = 12/5 DIRECT BURIAL CABLE 230 V UNITS
(10/4 CABLE FOR 115V UNITS)
SECTION: C - INSTALLATION

CAUTION!
ALL MODEL PUMPS AND CONTROL PANELS MUST BE PROPERLY CONNECTED AND PROPERLY GROUNDED PER THE NATIONAL ELECTRICAL CODE, STATE, AND LOCAL CODES. IMPROPER GROUNDING VOIDS WARRANTY.

IMPORTANT
CHECK TO BE CERTAIN THAT ALL POWER IS OFF

C-1 INSTALLATION OF WALL MOUNT PANELS:
1. Verify that the proper panel has been selected. Make sure that the panel will support the Grinder HP and Voltage required, as well as have the desired features.

2. Select the desired mounting location. The UGP & UCP panel can be mounted on the side of a building, or on a post located near the basin (see Figure 1). The panel should be located so that easy access can be made for servicing. **NOTE:** The enclosure needs to be mounted on a flat surface to avoid damage due to stress. All panel alarm indicator lights and horns should be visible/audible from the chosen location.

3. The electrical enclosure will come with either a flange on the exterior or a set of mounting holes found under the front cover. The proper size fasteners should be used to mount the panel. Care should be taken to insure that the panel is mounted flat. A back plate may be required.

4. The panels use a NEMA 4X enclosure. Approved electrical conduit should be used to connect the wiring from the service panel in the home or separate electrical feed to the panel. Conduit should also be used to connect the panel to the basin. When using direct burial cable, the conduit should be run to 18" below grade then only cable need be run to the basin. The basin installation manual should be consulted to determine the number and size of direct burial wires required.

5. The terminal connection points are noted on the electrical wiring diagram that is enclosed in each panel. Care should be taken to insure that all wires are connected to the proper terminals. Note that each panel requires a separate neutral wire for the 115 volt control circuitry. Be sure that a separate neutral wire is pulled from the power source to the panel. Each terminal should be torqued to the value noted in the electrical wiring diagram.

6. The wires entering through the conduit into the panel must be sealed to prevent condensation from building in the enclosure. A sprayable urethane foam should be used as a backing material in each conduit. A sealing caulk should be placed in front of the foam for a final sealing (see Figure 2).

7. The Start-Up manual should be consulted for proper test and operations procedures of the control panel.

C-2 INSTALLATION OF PANELS IN BASIN COVER:
1. Verify that the proper panel has been selected. Make sure that the panel will support the Grinder HP and Voltage required, as well as have the desired features.

2. Select the desired mounting location for the Alarm Box. The box can be mounted on the side of a building or on a post located near the basin (See Fig. 1). The alarm box should be located so that easy access can be made for servicing. The location should also insure that all alarm lights and horns can be recognized in event a problem should arise. The control panel is already mounted in its proper orientation in the UltraCAP insert.

3. The alarm box has four tabs with mounting holes. Care should be taken to insure that the box is mounted flat using appropriate hardware. A back plate may be required.

4. The panel and alarm box use a NEMA 4X enclosure. Approved electrical conduit should be used to connect the wiring from the service panel in the home or separate electrical feed to the Alarm box. Conduit should also be used to connect the alarm box to the basin. When using direct burial cable, the conduit should be run 18" below grade or per NEC and local codes. Then only cable needs to be run to the basin. The Basin Installation Manual should be consulted to determine the number, size and type of direct burial cable required.
5. The direct burial, pump, and level control wires should be run through the appropriate cord grips in the bottom of the insert and then through the appropriate cord grips in the panel making sure that each cord grip is tightened securely (see Fig. 4).

The connection points are noted on the electrical wiring diagram in each panel and alarm box. Care should be taken to insure that all wires are connected in accordance with the diagram. Note that each system requires a separate neutral wire for the 115 volt circuitry. Be sure that a separate neutral wire is pulled from the power source to the system. Each terminal and connection should be torqued to the value noted in the electrical wiring diagram.

6. The wires entering through the conduit into the alarm box must be sealed to prevent condensation from building in the enclosure. A sprayable urethane foam should be used as a backing material in each conduit. A sealing caulk should be placed in front of the foam for a final sealing (see Figure 2).

7. The Start-Up manual should be consulted for proper test and operations procedures of the control panel.

SECTION: D REPLACEMENT PARTS

D-1 ORDERING REPLACEMENT PARTS:
When ordering replacement parts, ALWAYS furnish the following information:

1. Model number or Project. (D-3)
2. Part number.(D-2)
3. Part description.
4. Item part number.
5. Quantity required.

D-2 PART NUMBER:
The part number consists of a six (6) digit number, which appears in the catalog. A one or two letter suffix may follow this number to designate the design configuration. This number is used for ordering and obtaining information.

D-3 MODEL NUMBER:
This designation consists of numbers and letters which represent the features supplied on the panel. The Project name may also be used here. This number is used for ordering and obtaining information.

Reference the Part number and Project or Model Number when referring to the product.
TYPICAL SIMPLEX UGP PANEL
(Wall Mount)

NOTES:
1. PANEL GROUND TERMINAL MUST BE CONNECTED TO EARTH GROUND.
2. FACTORY WIRING IS SHOWN — FIELD WIRING IS SHOWN
3. RECOMMENDED TIGHTENING TORQUES FOR TERMINALS:
   Volt Power:
4. (TS) DENOTES THERMAL SWITCH.
TYPICAL SIMPLEX UGP-P PANEL
(Cover Mounted)

TYPICAL UGP-P WITH ALARM BOX

10/5 DIRECT BURIAL CABLE (230V)
ALARM BOX
(ON HOUSE)

LIGHT
SILENCE
HORN

CONTROL PANEL
TERMINAL STRIP (FLOATS)

CONTROL PANEL
TERMINAL STRIP (ULTRASWITCH)

NOTES:
1. PANEL GROUND TERMINAL MUST BE CONNECTED TO EARTH GROUND.
2. FACTORY WIRING IS SHOWN.
   FIELD WIRING IS SHOWN __________________________
3. RECOMMENDED TIGHTENING TORQUES FOR TERMINALS:
   VOLT POWER
   30 POUND INCHES, 115 VOLT POWER, CONTROL & LOW VOLTAGE
   20 POUND INCHES.
4. (*) DENOTES THERMAL SWITCH.
TYPICAL DUPLEX UGP PANEL
(Wall Mount)

NOTES:
1. PANEL GROUND TERMINAL MUST BE CONNECTED TO EARTH GROUND.
2. FACTORY WIRING IS SHOWN — FIELD WIRING IS SHOWN —
3. INSTALLER MUST PROVIDE A MAIN DISCONNECTING DEVICE WITH SHORT CIRCUIT PROTECTION FOR THIS ELECTRICAL ASSEMBLY.
4. RECOMMENDED TIGHTENING TORQUES FOR TERMINALS 230 VOLT POWER 30 POUND INCHES, 115 VOLT POWER, CONTROL & LOW VOLTAGE = 20 POUND INCHES.
5. THE CIRCUIT DIAGRAM IS DRAWN WITH NO ELECTRICAL POWER, THAT IS, WITH ALL COMPONENTS IN DE-ENERGIZED STATE.
6. ALL LEVEL SENSING SWITCHES ARE SHOWN WITH NO LIQUID IN TANK OR WELL.
7. DESIGNATION (TS) DENOTES THERMAL SENSING SWITCH(es) IN PUMP MOTOR WINDINGS.
8. WARNING LABEL TO BE PLACED ON SIDE OF THE ENCLOSURE DOOR NOTING THAT THE POWER MUST BE DISCONNECTED PRIOR TO SERVICING THE PANEL.
REPLACEMENT PARTS - 2HP

<table>
<thead>
<tr>
<th>PART No.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>099198</td>
<td>Start Capacitor - Single Phase   (SC)</td>
</tr>
<tr>
<td>099199</td>
<td>Run Capacitor - Single Phase     (RC)</td>
</tr>
<tr>
<td>099200</td>
<td>Start Relay - Single Phase       (START)</td>
</tr>
<tr>
<td>099201</td>
<td>Control Fuse                     (FU1 &amp; FU2)</td>
</tr>
<tr>
<td>099202</td>
<td>Overload Relay                   (OL)</td>
</tr>
<tr>
<td>099203</td>
<td>Motor Starter                    (MS)</td>
</tr>
<tr>
<td>100195</td>
<td>Control Relay                    (CR)</td>
</tr>
<tr>
<td>100199</td>
<td>Circuit Breaker                  (CB)</td>
</tr>
<tr>
<td>100190</td>
<td>Alarm Light Lens</td>
</tr>
<tr>
<td>096698</td>
<td>Alarm Horn Assy.</td>
</tr>
<tr>
<td>100184</td>
<td>Alarm Light Gasket</td>
</tr>
<tr>
<td>100201</td>
<td>Alarm Bulb</td>
</tr>
</tbody>
</table>

NOTE: Panels designed for a special project may have different components. Consult replacement parts list in project documentation.
TYPICAL DUPLEX UGP PANEL
(Wall Mount)

REPLACEMENT PARTS - 2HP

<table>
<thead>
<tr>
<th>PART No.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>099198</td>
<td>Start Capacitor - Single Phase</td>
</tr>
<tr>
<td>099199</td>
<td>Run Capacitor - Single Phase</td>
</tr>
<tr>
<td>099200</td>
<td>Start Relay - Single Phase</td>
</tr>
<tr>
<td>099201</td>
<td>Control Fuse (FU1 &amp; FU2)</td>
</tr>
<tr>
<td>099202</td>
<td>Overload Relay (OL)</td>
</tr>
<tr>
<td>099203</td>
<td>Motor Starter (MS)</td>
</tr>
<tr>
<td>100195</td>
<td>Control Relay (CR)</td>
</tr>
<tr>
<td>Contact Factory</td>
<td>Circuit Breaker (CB)</td>
</tr>
<tr>
<td>100190</td>
<td>Alarm Light Lens</td>
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<td>100184</td>
<td>Alarm Light Gasket</td>
</tr>
<tr>
<td>100201</td>
<td>Alarm Bulb</td>
</tr>
<tr>
<td>104408</td>
<td>Alternator</td>
</tr>
</tbody>
</table>

NOTE: Panels designed for a special project may have different components. Consult replacement parts list in project documentations.
TYPICAL SIMPLEX UCP PANEL
(Wall Mounted)

115/230 VOLT
1 PHASE

CB 20 AMP

ULTRACAV PUMP
1 HP F.L.A.
(230 VOLT)

FU1- 3 AMP
FU2- 3 AMP

LS1 1
LS2 2
LS3 3
LS4 4

START

ALARM LIGHT

ALARM HORN

SILENCE

TERMIONAL STRIP (FLOATS)

TERMINAL STRIP (ULTRASWITCH)

SYM  QTY  DESCRIPTION
PB  1  PUSHBUTTON
PB  1  N.O. CONTACT
CR  1  AUDIO ALARM
CR  1  RELAY BASE
CR  1  120 VAC RELAY
1  ALARM BULB SOCKET
1  NEMA 4X ALARM LENS
1  ALARM LIGHT BRACKET
1  LIGHT BULB, 25W
1  GROUND LUG
1  12 PT TERMINAL STRIP
1  ALUM. BACKPANEL
1  NEMA 4X ENCLOSURE
PB  1  START PUSH BUTTON
2  FUSE BLOCK
FU1-2 2  FUSE
MS  1  MOTOR STARTER
CB  1  CIRCUIT BREAKER

NOTES:
1. PANEL GROUND TERMINAL MUST BE CONNECTED TO EARTH GROUND.
2. FACTORY WIRING IS SHOWN
FIELD WIRING IS SHOWN
3. RECOMMENDED TIGHTENING TORQUES FOR TERMINALS 230 VOLT POWER
30 POUND INCHES. 115 VOLT POWER, CONTROL & LOW VOLTAGE
20 POUND INCHES.
NOTES:
1. PANEL GROUND TERMINAL MUST BE CONNECTED TO EARTH GROUND.
2. FACTORY WIRING IS SHOWN ———— FIELD WIRING IS SHOWN ————
3. RECOMMENDED TIGHTENING TORQUES FOR TERMINALS  VOLT POWER
   30 POUND INCHES. 115 VOLT POWER, CONTROL & LOW VOLTAGE —
   20 POUND INCHES.
4. (TS) DENOTES THERMAL SWITCH.
TYPICAL SIMPLEX UCP-P PANEL
(Cover Mounted)

TYPICAL UCP-P WITH ALARM BOX

NOTES:
1. PANEL GROUND TERMINAL MUST BE CONNECTED TO EARTH GROUND.
2. FACTORY WIRING IS SHOWN.
   FIELD WIRING IS SHOWN.
3. RECOMMENDED TIGHTENING TORQUES FOR TERMINALS VOLT POWER
   30 POUND INCHES. 115 VOLT POWER, CONTROL & LOW VOLTAGE –
   20 POUND INCHES.
4. (15) DENOTES THERMAL SWITCH.
# Typical Simplex UCP Panel (Wall Mount)

## Replacement Parts - 1HP

<table>
<thead>
<tr>
<th>PART No.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>099200</td>
<td>Start Relay - Single Phase</td>
</tr>
<tr>
<td>099201</td>
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<tr>
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</tr>
<tr>
<td>100184</td>
<td>Alarm Light Gasket</td>
</tr>
<tr>
<td>100201</td>
<td>Alarm Bulb</td>
</tr>
</tbody>
</table>

**NOTE:** Panels designed for a special project may have different components. Consult replacement parts list in project documentations.
TYPICAL DUPLEX UCP PANEL
(Wall Mount)

REPLACEMENT PARTS - 1HP

<table>
<thead>
<tr>
<th>PART No.</th>
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</tr>
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<tr>
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<td>100195</td>
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<tr>
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</tr>
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<td>100190</td>
<td>Alarm Light Lens</td>
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<tr>
<td>096688</td>
<td>Alarm Horn Assy.</td>
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<tr>
<td>100184</td>
<td>Alarm Light Gasket</td>
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<tr>
<td>100201</td>
<td>Alarm Bulb</td>
</tr>
<tr>
<td>104408</td>
<td>Alternator</td>
</tr>
</tbody>
</table>

NOTE: Panels designed for a special project may have different components. Consult replacement parts list in project documentations.
**RECOMMENDED BREAKER & HEATER SIZES:**

<table>
<thead>
<tr>
<th>Pump Model</th>
<th>HP</th>
<th>Phase</th>
<th>Volts</th>
<th>Breaker Size</th>
<th>Voltage Relay</th>
<th>Start Capacitor</th>
<th>Run Capacitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGV2002L</td>
<td>2</td>
<td>1</td>
<td>200</td>
<td>30 AMP</td>
<td>*MARS 68</td>
<td>143mfd - 220v</td>
<td>20mfd - 370v</td>
</tr>
<tr>
<td>SGV2022L</td>
<td>2</td>
<td>1</td>
<td>230</td>
<td>30 AMP</td>
<td>*MARS 68</td>
<td>143mfd - 220v</td>
<td>20mfd - 370v</td>
</tr>
<tr>
<td>SGV2062L</td>
<td>2</td>
<td>3</td>
<td>200</td>
<td>20 AMP</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
</tr>
<tr>
<td>SGV2032L</td>
<td>2</td>
<td>3</td>
<td>230</td>
<td>20 AMP</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
</tr>
<tr>
<td>SGV2042L</td>
<td>2</td>
<td>3</td>
<td>460</td>
<td>15 AMP</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
</tr>
<tr>
<td>SGV2052L</td>
<td>2</td>
<td>3</td>
<td>575</td>
<td>15 AMP</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
</tr>
<tr>
<td>SGPC1024L</td>
<td>1</td>
<td>1</td>
<td>230</td>
<td>20 AMP</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
</tr>
<tr>
<td>SGPC1014L</td>
<td>1</td>
<td>1</td>
<td>115</td>
<td>30 AMP</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
</tr>
</tbody>
</table>

N/R = Not Required.

* MARS68 or MARS16104 or GE3ARR3J3G3 part numbers can be used.

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>HP</th>
<th>VOLTS</th>
<th>PH</th>
<th>RPM (Nom)</th>
<th>NEMA START CODE</th>
<th>FULL LOAD AMPS</th>
<th>LOCKED ROTOR AMPS</th>
<th>CORD SIZE</th>
<th>CORD TYPE</th>
<th>CORD O.D.</th>
<th>EMERSON WINDING RESISTANCE MAIN−START</th>
<th>GE WINDING RESISTANCE MAIN−START</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGV2002L</td>
<td>2.0</td>
<td>200</td>
<td>1</td>
<td>3450</td>
<td>F</td>
<td>17.0</td>
<td>53.0</td>
<td>10/4</td>
<td>SO</td>
<td>0.745</td>
<td>0.98 − 7.29</td>
<td>————</td>
</tr>
<tr>
<td>SGV2022L</td>
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<td>230</td>
<td>1</td>
<td>3450</td>
<td>F</td>
<td>16.0</td>
<td>46.0</td>
<td>10/4</td>
<td>SO</td>
<td>0.745</td>
<td>1.44 − 6.87</td>
<td>1.50 − 7.60</td>
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<tr>
<td>SGV2062L</td>
<td>2.0</td>
<td>200</td>
<td>3</td>
<td>3450</td>
<td>J</td>
<td>11.0</td>
<td>42.0</td>
<td>10/4</td>
<td>SO</td>
<td>0.745</td>
<td>2.57</td>
<td>2.40</td>
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<tr>
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<td>230</td>
<td>3</td>
<td>3450</td>
<td>H</td>
<td>9.0</td>
<td>36.0</td>
<td>10/4</td>
<td>SO</td>
<td>0.745</td>
<td>3.09</td>
<td>3.13</td>
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<tr>
<td>SGV2042L</td>
<td>2.0</td>
<td>460</td>
<td>3</td>
<td>3450</td>
<td>H</td>
<td>4.0</td>
<td>18.0</td>
<td>10/4</td>
<td>SO</td>
<td>0.745</td>
<td>12.36</td>
<td>12.49</td>
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<tr>
<td>SGV2052L</td>
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<td>575</td>
<td>3</td>
<td>3450</td>
<td>H</td>
<td>3.2</td>
<td>14.4</td>
<td>10/4</td>
<td>SO</td>
<td>0.745</td>
<td>16.10</td>
<td>————</td>
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<tr>
<td>SGPC1014L</td>
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<td>115</td>
<td>1</td>
<td>1750</td>
<td>D</td>
<td>18.4</td>
<td>38.0</td>
<td>10/3</td>
<td>SOW</td>
<td>0.690</td>
<td>0.69 − 6.22</td>
<td>————</td>
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<td>SGPC1024L</td>
<td>1.0</td>
<td>230</td>
<td>1</td>
<td>1750</td>
<td>D</td>
<td>9.2</td>
<td>17.5</td>
<td>10/3</td>
<td>SOW</td>
<td>0.690</td>
<td>2.29 − 10.16</td>
<td>2.36 − 9.33</td>
</tr>
</tbody>
</table>

Winding Resistance ± 5%
Pump Rated For Operation at ± 10% Voltage at Motor.
IMPORTANT!
WARRANTY REGISTRATION

Your product is covered by the enclosed Warranty. This warranty is ONLY effective provided the warranty registration is completed and returned to the Barnes Pumps, Inc. Service Department. See "Start-up/Trouble Shooting" Manual For Start-up/Warranty Registration Form.

IMPORTANT! If you have a claim under the provision of the warranty, contact your local Barnes Pumps, 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.
Limited 1 Year Warranty

We warrant that products of our manufacture will be free of defects in material and workmanship under normal use and service for twelve (12) months after notice of owner’s acceptance, but no greater than twenty-four (24) months after receipt of shipment, 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 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.
IMPORTANT!
WARRANTY REGISTRATION

Your product is covered by the enclosed Warranty. This warranty is ONLY effective provided the warranty registration is completed and returned to the Barnes Pumps, Inc. Service Department. See "Start-up/Trouble Shooting" Manual For Start-up/Warranty Registration Form.

IMPORTANT! If you have a claim under the provision of the warranty, contact your local Barnes Pumps, Inc. Distributor.