OPERATORS’ GUIDE

REL-SP SERIES
HYDRAULIC SUBMERSIBLE PUMP

The REL-SP SERIES Submersible Pumps are a light weight, efficient way to move large quantities of liquids FAST.

WARNING

All information found in this guide must be read and understood before use or testing of tool. Failure to read and understand warnings and safe handling instructions could result in severe personal injury and or death.

NOTICE

Sizes, weights and specifications listed in this manual are subject to change without notice. Please consult factory for information and updates.

REL-SP SERIES Manual 05-16
Obey all safety messages that follow this symbol to avoid possible injury or death. Safety of user and others may be in jeopardy if these instructions are not read and understood.

This Safety Alert and Signal Word indicate a imminently hazardous situation which if not avoided, will result in death or serious injury.

This Safety Alert and signal word indicate a imminently hazardous situation which if not avoided, could result in minor or moderate injury.

This Safety Alert and signal word indicate a imminently hazardous situation which if not avoided, may result in minor or moderate injury.

This Signal word indicate a imminently hazardous situation which if not avoided, may result in Property Damage.

This Signal Word indicate a imminently hazardous situation which if not avoided, will result in Damage to the Equipment.

This Signal word indicate a imminently hazardous situation which if not avoided, may result in Damage to the Equipment.

Always observe these warnings to avoid tool damage, serious injury or death.

The information in this manual is intended to guide the user in the use and application of this tool. It is not intended as a substitute for proper training and experience in safe work practices for this type of equipment. Consult your supervisor or safety personnel if you have any questions regarding the safe operation of this tool.
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### REGISTRATION

UPON RECEIPT OF THIS TOOL, COMPLETE THE REGISTRATION BELOW.

COMPANY ____________________________________________________________

ADDRESS ____________________________________________________________

______________________________________________________________________

PHONE ___________________  FAX ________________________________

SERIAL NUMBER ______________________________________________________

DATE OF PURCHASE _________________________________________________

DEALER NAME _______________________________________________________
REL-SP2
2 INCH SUBMERSIBLE HYDRAULIC PUMP

The REL-SP2 Submersible Pump is a light weight, efficient way to move large quantities of liquids FAST.

No priming required!
The REL-SP2 is also able to pump petroleum products.
The REL-SP2 is able to run all day without seal damage.

2” Compact, lightweight Submersible Pump
Operate on Open and closed center systems.
X-Long carry handle aids in placement.
High impact strainer housing.
Whip set and flush-face couplers included.
Can run dry without damage.

Specifications
Capacity: Up to 275 GPM
Flow Range: 5-8 GPM
Operating Pressure: 1200-2000 PSI
Intake Port: 1 15/16” (49mm)
Discharge Port: 2” NPFT (51mm)
Height: 14” (over handle)
Width: 8-1/2” x 9-1/2” diameter
Weight: 15 lbs.
The test above was conducted using a regulated hydraulic source and a fixed discharge assembly.

Results may vary under field conditions.

Contact your RELIABLE representative for literature about the REL-HPU-2000 2,000 psi hydraulic power unit and the REL-TP3 3 inch Hydraulic Trash Pump.
REL-SP3-500

3 INCH SUBMERSIBLE HYDRAULIC PUMP

The REL-SP3 Submersible Pump is a light weight, efficient way to move large quantities of liquids FAST.

No priming required!
The REL-SP3 is also able to pump petroleum products.
The REL-SP3 is able to run all day without seal damage.
3” Compact, lightweight Submersible Pump
Operate on Open and Closed Center systems.
X-Long carry handle aids in placement.
High impact strainer housing.
Whip set and flush-face couplers included.
Can run dry without damage.

Specifications

Capacity: Up to 500 GPM
Flow Range: 5-8 GPM
Operating Pressure: 1200-2000 PSI
Intake Port: 1 15/16” (49mm)
Discharge Port: 3” NPFT (51mm)
Height: 17” (over handle)
Width: 8-1/2” x 9-1/2” diameter
Weight: 17 lbs.
The test above was conducted using a regulated hydraulic source and a fixed discharge assembly.

Results may vary under field conditions.

Contact your RELIABLE representative for literature about the REL-HPU-2000 2,000 psi hydraulic power unit and the REL-TP3 3 inch Hydraulic Trash Pump.
BEFORE USING THIS TOOL, READ THE WARNINGS and the recommended practices described in this manual. Failure by the operator to read and fully understand these warnings will leave this person unqualified to use and operate this tool. Property damage, severe personal injury, and/or death could result by not following these warnings.

These warnings will appear in appropriate locations when they are pertinent to the particular subject being shown. Read each one carefully and follow them strictly.

**WARNING**

**Eye Protection**

Always wear eye protection to avoid injury from flying debris or hydraulic oil leaks. Failure to do so can result in serious personal injury.

**Skin Irritation**

Hydraulic oil may cause irritation. Use care to prevent contact with skin. In case of accidental contact, wash affected area immediately.

**Hard Hat**

Always wear a hard hat to avoid injury from falling debris. Failure to do so can result in serious personal injury.

**Foot Protection**

Always wear foot protection. Failure to do so can result in serious personal injury.

**Hearing Protection**

Always wear hearing protection, to avoid hearing loss due to long term exposure to high noise levels.

**Protective Gloves**

Always wear protective gloves & cloths. Failure to do so can result in serious personal injury.
SAFE OPERATION & CARE

USE THIS TOOL FOR ITS INTENDED PURPOSE ONLY
Any other use can result in injury or property damage.

INSPECT TOOL BEFORE USE. Replace any worn, damaged or missing parts. A damaged or improperly assembled tool may malfunction, injuring operator and/or nearby personnel.

INSPECT HYDRAULIC HOSES AND COUPLINGS before each use. Repair or replace if any cracking, leakage, wear or damage is found. Worn or damaged hoses may fail resulting in personal injury or property damage.

CLEAR WORK AREA of all bystanders and unnecessary personnel before operating this tool.

KEEP ALL PARTS OF THE BODY AWAY FROM MOVING PARTS. Failure to observe this warning could result in serious injury.

HYDRAULIC POWER SUPPLY

TURN HYDRAULIC SOURCE OFF before making any connection

DO NOT attempt to make any changes to any of the component parts or accessories when connected to the power source.

DO NOT adjust, inspect, or clean any tool while the tool is connected to the power source. The tool could accidentally start up and cause serious injury.

DO NOT lock the tool in the On Position. In an emergency, serious damage or injury could occur during the time required to stop the tool.

OIL INJECTION INJURY

Hydraulic oil or fluid under the skin is a serious injury. Oil under pressure can penetrate the skin and may cause dismemberment or loss of life. Seek medical assistance immediately if such an injury should occur.

Always wear safety gloves, eye protection and all required safety equipment when operating or handling this tool.

DO NOT use fingers or hands to attempt to locate a leak.

DO NOT handle hoses or couplers while system is pressurized.

NEVER open or service the system before depressurizing.
HOSES AND FITTINGS

There exists the potential for shock in using anything other than certified non-conductive hoses and hydraulic oil with dielectric properties, when using system components near energized electrical lines. Failure to recognize these conditions could cause electrocution.

Hoses and fittings used with this tool must comply with S.A.E. J1273 which covers recommended practice for selection, installation, and maintenance of hose and hose assemblies. The correct hoses and fittings are available from your supplier.

WARNING: Failure to comply with these warnings could result in severe bodily injury or death.

UNIT/HOSE CONNECTIONS

WARNING

ALWAYS DISCONNECT pump/power source and turn the key to the OFF position before connecting or disconnecting any components.

ALWAYS DEPRESSURIZE hydraulic system, before connecting or disconnecting any of the systems components.

ALWAYS TIGHTEN COUPLINGS COMPLETELY. Loose or improperly connected couplings may not allow fluid to pass through the hose creating a blockage in the supply or return line.

ALWAYS INSPECT HOSES AND CONNECTORS before connection to tool. Replace or repair if any leakage is evident. Leakage is a sign of deterioration in component parts.

Connect hoses and confirm proper flow direction to & from tool.

SERIOUS BURN HAZARD

WARNING

HOT SURFACES MAY CAUSE SERIOUS BURN INJURY

The hydraulic motor may be hot during and after operation.

CAUTION: HYDRAULIC FLUID MAY CAUSE SERIOUS BURNS

Never disconnect tool, hoses, or fittings while the hydraulic power source is running or if the hydraulic fluid is hot.

IF YOU HAVE ANY QUESTIONS REGARDING THE SAFE USE AND/OR OPERATION OF THIS TOOL, CONSULT YOUR AREA SUPERVISOR, OR CONTACT RELIABLE EQUIPMENT AT 800-966-3530
Use all appropriate and applicable personal safety equipment as required by the operating company.

Always inspect tool for wear or deterioration or damage every day. Worn or damaged parts may cause malfunction of tool or unsafe circumstance.

Keep all body parts away from moving parts of the pump.

Do not direct discharge towards any person, animal or vehicle.

Move outside danger zones before activating the pump.

Make sure there is no person in close proximity to you, the tool, or the discharge who could be injured by any operation being performed, tool malfunction or flying debris.

Do not overextend your position by overreaching or unbalancing the footing necessary to maintain physical control of your body.

Use this tool for the manufacturers’ intended purpose only.

Observe closely all safety rules for a particular job class.

Operation/safety methods may vary in accordance with the working guidelines established by each utility or contractor.

For your own safety, ensure that you fully comply with all safe operation guidelines required by your employer.

Consult your training or safety personnel or supervisor as needed.
HYDRAULIC SYSTEM REQUIREMENTS

Operating Pressure: 1200-2000 PSI (70-140 bar)
Max. Relief Setting: 2100 psi (145 bar)
Flow Range: 5-8 gpm REL-PS2  7-12 gpm (26-45 lpm) REL-PS3
Max. Backpressure: 250 psi (17 bar)
Cooling System: Required
Min. Filtration: 25 Micron
Sound Pressure <85 dBA @ 1m
Hydraulic Fluids: All hydraulic fluids that meet these listed specifications or listed HTMA specifications may be used for this tool.

S. U. S.
@ 100° F (38° C)............................................140 TO 225
@ 210° F (99° C)............................................ 40 minimum
FLASH POINT ..................... 340° F min. (170° C min.)
POUR POINT ...................... -30° F min. (-34° C min.)

Hydraulic Hoses: 2500 psi (175 bar) minimum working pressure (Ref. J517)
Hose assembly should include flush face quick disconnect couplers as recommended by the HTMA.
(Hydraulic Tool Manufacturers Association)

CAPACITY

Intake Port: 1 15/16 in. (49mm)  2 3/4 in. (70 mm)
Discharge Port: 2” NPFT (51mm)  3” NPT (76 mm)
Discharge Capacity: Up to 275 gpm  Up to 500 gpm (1,890 lpm)
(Illustration pg 5)  (Illustration pg 7)

WEIGHT & CLEARANCE

Weight: 15 lbs.  21 lbs. (9.5 kg)
Height: 14” (over handle)  17 in. (over handle)
Width: 8-1/2” x 9-1/2” diameter 10W x10.5L (25.4 x 26.7 cm)

Operation/Safety methods may vary in accordance with the working guidelines established by each utility or contractor.
For your own safety, ensure that you fully comply with all safe operation guidelines required by your employer.
Consult your training or safety personnel or supervisor as needed.
OPERATION

PRE-OPERATION

Do not use this tool under unsafe working conditions or locations.
Use this pump only for it’s intended purpose.
This pump is not designed for operation with a suction pipe inlet.
Read entire manual prior to operation of this tool.
(Refer to all safety recommendations and warnings)
Observe all safety precautions & procedures required by the operating company.
Check the Pump inlet screen and discharge for debris or obstruction.
Connect a compatible (2” SP2 or 3” SP3) discharge hose and securely tighten.
Ensure that hydraulic source is OFF and Control Valve is in the OFF position before making any connections.
Connect appropriate hydraulic hose to the tools’ return and pressure ports.
(Length may vary) Use a length of hose that will not restrict free movement, or pose any hazard to the operator or other personnel on the work site.

OPERATION

Observe ALL required safety guidelines established by the Utility or Contractor.
Lower the pump into the liquid, or position tool as required by the application.
Remove any kinks from discharge hose to ensure proper flow of discharge.
Position and direct the discharge hose in a manner that neither hose, or discharge will restrict free movement, or pose a hazard to the operator or other personnel.

WARNING  DO NOT direct discharge towards any person, animal or vehicle.
Turn ON hydraulic source and select an appropriate flow for the tool. (7 gpm)
COLDER WEATHER - Allow hydraulic fluid to warm for 3-5 minutes before operating.
NOTE: Do Not lift water with solids beyond 40 ft. if hydraulic flow is below 7 gpm
Move the Control Valve to the ON position.
Allow unit to run, watching for excessive solids and/or reduced discharge flow.
Possible Cause: The hydraulic flow/head ratio may be insufficient to carry excess solids. The pump may have settled into excessive solids beneath the liquid to be pumped.
Stop Pump to check & resolve.
Reduced flow may cause accumulation of solids in the volute, and increase pump wear.
Failure to resolve may result in reduced discharge capacity and/or pump damage.
Move the Control Valve to the OFF position.
Return the Flow Selector to the OFF position, and Turn KEY to the OFF position.
DAILY MAINTENANCE

**IMPORTANT:** The greatest cause of hydraulic system failure is dirt. Prevent the introduction of foreign matter into the pump via hydraulic fluid, dirty connections or accumulation of sediment in the hydraulic system.

The life, reliability, and safety of the tool is dependent on proper maintenance. Maintenance must be performed by authorized and trained personnel ONLY. Inspect pump for wear or damage. Worn or damaged parts may malfunction during operation. All parts must be replaced with new parts if signs of wear or damage are evident. Inspect the fittings, and hydraulic lines. (i.e. kinks, leaks, dirt, etc.) *Do Not use hands!*

Inspect Hoses. Worn or damaged and aged hoses may malfunction during operation. Clean and inspect pump before storage. Solids, fibers and sand may become attached to the volute screen, or trapped within the pump chamber and hose assembly.

Remove the volute by removing the two (2) hex head cap screws at the base of the handle. Lift the flange/motor assembly straight up, from the volute. (refer to Dwg # 1)

**CAUTION:** Impeller may be sharp.

Clean the inner screen, discharge and the impeller. *Impeller removal should not be necessary.* Visually Inspect the impeller for cracks, breakage, and excessive wear. *Replace as required.*

**NOTE:** A worn or damaged impeller may reduce pump performance.

If required the impeller may be removed by removing the center cap screw and lockwasher while holding the impeller. **CAUTION:** Impeller may be sharp.

Install or replace the impeller using the center cap screw and lockwasher.

Re-assemble the pump by replacing motor/flange assembly and securing the two (2) hex head cap screws and lockwashers to connect the handle, flange and volute.

**Clean and empty the discharge hose before storage.**

Inspect and clean hydraulic couplers before and after each use.

**NOTE:** Keep Label Set clean and legible. Replace decals when necessary.

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**CAUTION**

Operation and safety methods may vary in accordance with the guidelines established by each utility. For your safety, ensure that you fully comply with all safe operation guidelines established by your respective power utility.
### TROUBLESHOOTING TIPS AND FIELD SOLUTIONS

<table>
<thead>
<tr>
<th>Pump Will Not Start</th>
<th>Poor Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Hydraulic Flow or Pressure</td>
<td>Insufficient Hydraulic Flow</td>
</tr>
<tr>
<td>Impeller Jammed</td>
<td>Flow Reversed</td>
</tr>
<tr>
<td>Improper or Defective Coupling</td>
<td>Volute Screen Restricted</td>
</tr>
<tr>
<td></td>
<td>Discharge Kinked or Restricted</td>
</tr>
<tr>
<td></td>
<td>Impeller Worn or Damaged</td>
</tr>
<tr>
<td></td>
<td>Pump Not Matched to Application</td>
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<tr>
<td></td>
<td>Excessive Solids in Liquid</td>
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</tbody>
</table>

- Check Hydraulic Supply - Pressure and Flow
- Disconnect from Source - Ensure that Impeller Moves Freely by Turning the Center Cap Screw. Clean/Clear as required.
- Check Coupler Connections and Flow Direction
- Check Flow / Head (refer to illustration on pg. 5)
- Check Coupler Connections and Flow Direction
- Pump may have settled into solids. Raise Pump
- Volute Screen may be Obstructed. Clear Screen
- Straighten Discharge Hose & Clear Obstructions
- Check Impeller for Damage or Excessive Wear
- Replace Impeller as Required.
- Check Requirements - Adjust or Replace Pump.
- Reduce Solids
- Increasing Flow May Remove Excess Solids, but may result in wear or damage to the pump.

### IF THE ISSUE OR THE PROPER SOLUTION IS NOT FOUND ABOVE
CONTACT YOUR RELIABLE SERVICE REPRESENTATIVE

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WARNING: ALL tool repair and service must be performed by authorized and trained personnel ONLY. Improper maintenance or tampering could result in malfunction causing damage to equipment and/or injury to personnel.

Complete disassembly is not recommended. Return the unit to an authorized dealer for total disassembly and/or repair.

All maintenance or disassembly should take place on a flat, clean work surface covered with towels or wipers so as to have a clean space for the disassembled parts. Inspect each part during disassembly for wear, scratches, and cuts. Discard the worn or damaged parts and replace with new factory authorized parts.

O-rings are sensitive to sharp edges. Inspect closely for cuts or damage. A small cut will cause a leak. When assembling or disassembling O-rings, use hydraulic fluid as a lubricant to help disassembly or installation.
## REL-SP2

### MAJOR COMPONENT

<table>
<thead>
<tr>
<th>#</th>
<th>P/N</th>
<th>Description</th>
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<td>3</td>
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<td>SP204</td>
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<td>SP316</td>
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<td>R-SP2-H</td>
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*Diagram of REL-SP2 major component with parts labeled 1 to 16.*
# OPERATION RECORDS

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<thead>
<tr>
<th>Date</th>
<th>Hours</th>
<th>Liquid Type</th>
<th>Solid Type &amp; Concentration</th>
<th>Flow</th>
<th>Head</th>
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**REL-SP3**

**MAJOR COMPONENTS**

Motor assembly is sold as a complete unit only.

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### REL-SP3 PARTS LIST

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Handle NOT SHOWN
## OPERATION RECORDS

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If you have any questions regarding the information in this manual please contact RELIABLE EQUIPMENT at the address, phone or fax numbers shown below.

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