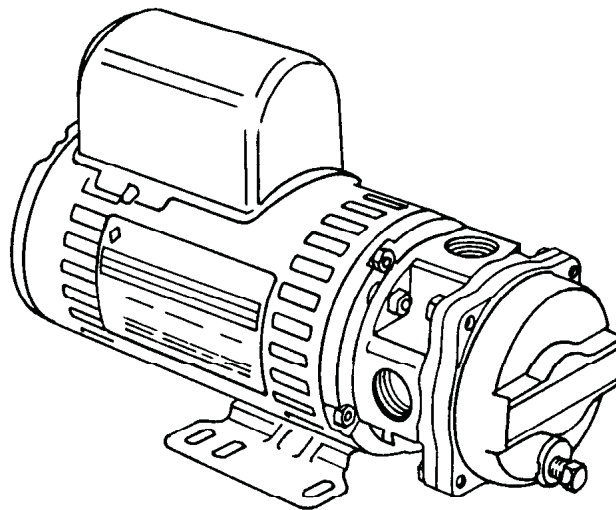


burks®

INSTALLATION AND OPERATION MANUAL

Close Coupled Turbine Pumps - Series: CR



WARNING!

BURKS Turbine Pumps are of the positive displacement type. When the pump is operating, liquid will be delivered to the discharge side of the pump. If the discharge line is blocked or closed, pressure will build up until the motor stalls, a pump part breaks or the piping bursts. To prevent the possibility of equipment damage or personal injury, a pressure relieving device of adequate size must be incorporated in the discharge side of the system.

IMPORTANT!

Read all instructions in this manual before operating pump.

DO NOT work on pump until you are sure pump and associated piping are totally depressurized, pump and motor have cooled down, and electricity to the motor has been shut off and locked out. 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

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Form No. F0911D-Rev. F

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

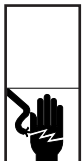


Rotating machinery Amputation or severe laceration can result.



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. Improper grounding voids warranty.



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



WARNING! Operation against a closed discharge valve will cause premature bearing and seal failure on any pump, and on end suction and self priming pump the heat build may cause the generation of steam with resulting dangerous pressures. It is recommended that a high case temperature switch or pressure relief valve be installed on the pump body.



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



WARNING! This pump is designed to handle materials which could cause illness or disease through direct exposure. Wear adequate protective clothing when working on the pump or piping.



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



WARNING! Do not wear loose clothing that may become entangled in 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. Secure the pump in its operating position so it can not tip over, fall or slide.



WARNING! 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.



WARNING! 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.



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.

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

1987, 2001, 2003, 1/2006, 9/06

Alteration Rights Reserved

GENERAL INFORMATION

To the Purchaser:

Congratulations! You are the owner of one of the finest pumps on the market today. Burks® Pumps are products engineered and manufactured of high quality components. Over eighty years of pump building experience along with a continuing quality assurance program combine to produce a pump which will stand up to the toughest pumping projects.

This manual will provide helpful information concerning installation, maintenance, and proper service guidelines.

Receiving:

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. If the manual is removed from the crating, do not lose or misplace.

Unless otherwise specifically agreed, all capacity, head and efficiency guarantees are based on shop test when handling clear, cold, fresh water at a temperature not over 85°F.

Storage:

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

Long Term - 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 water base, air dry enamel paint. All surfaces should then be sprayed with a rust-inhibiting oil.

Service Centers:

For the location of the nearest Burks Service Center, check your Burks representative or Crane Pumps & Systems, Inc., in Piqua, Ohio, telephone (937) 778-8947.

LOCATION OF PUMP

The unit should be mounted in a dry location where it is easily accessible for inspection and maintenance. Allow ample clearance around the unit for free air circulation. If a dry location is not available, mount it on a foundation well above the wet floor. In order to keep the suction line as short as possible, place the pump close to the source of supply. Where liquids at or near their boiling points are being handled, the supply must be located above the suction, so that the available NPSH will be greater than that required by the unit.

PIPING

DO NOT Use The Pump As A Piping Support.

It is very important that the pipe be independently supported near the pump so that no strains will be transmitted to the unit. External loads caused by the pipe cause misalignment with subsequent failure of bearings and internal parts. Suction and discharge sizes are selected for proper performance of the pumping unit and are not intended to determine the suction and discharge pipe sizes. Pipe sizes must be determined by the user based on the system requirements.

SUCTION PIPING

Suction piping should be short in length, as direct as possible, and never smaller in diameter than the pump suction opening. **The suction pipe should slope upward to the pump inlet.** A horizontal suction line must have a gradual rise to the pump. Any high point in the pipe will become filled with air and thus prevent proper operation of the pump.

Valves in Suction Piping - If the pump is operating under static suction lift conditions, a foot valve or check valve should be installed in the suction line to avoid the necessity of priming each time the pump is started. A strainer, approximately 20 mesh, should be installed on the suction side of the pump to prevent chips, scale or hard foreign particles from entering the pump and damaging the raceway and impeller.

The pump must never be throttled by the use of a valve on the suction side of the pump. Valves should be used only to isolate the pump for maintenance purposes, and should always be installed in positions to avoid air pockets.

WARNING! BURKS Turbine Pumps are of the positive displacement type. When the pump is operating, liquid will be delivered to the discharge side of the pump. If the discharge line is blocked or closed, pressure will build up until the motor stalls, a pump part breaks or the piping bursts. To prevent the possibility of equipment damage or personal injury, a pressure relieving device of adequate size must be incorporated in the discharge side of the system.



DISCHARGE PIPING

On long horizontal runs it is desirable to maintain as even a grade as possible. Avoid high spots, such as loops, which will collect air and throttle the system or lead to erratic pumping.

Valves in Discharge Piping - A check valve gate valve should be installed in the discharge. The check valve, placed between the pump and the gate valve, protects the pump from excessive pressure, and prevents liquid from running back through the pump in case of power failure. The gate valve is used when shutting the pump down.

GAUGES

Pressure Gauges - Properly sized pressure gauges should be installed in both the suction and discharge side of the pump. The gauges will enable the operator to easily observe the operation of the pump, and also determine if the pump is operating in conformance with the performance curve. If cavitation, vapor binding or other unstable operation should occur, widely fluctuating discharge pressure will be noted.

OPERATING



WARNING! Failure to connect the motor frame to the power supply equipment grounding conductor by using the grounding cord, green screw or green wire provided may result in serious electrical shock.

PRIMING

Before starting the pump it is necessary that both the casing and suction pipe be completely filled with liquid. This priming can be accomplished by any of the following methods.

- A. When the liquid supply level is above the center line of the pump, it is primed by opening the suction and discharge valves. The inflowing liquid will displace the air and fill the suction line, pump casing, and discharge line up to the level of supply.
- B. Where the pump is operating with suction lift and the suction line is equipped with a foot valve, the system is filled with liquid by filling through the discharge piping or priming plug if provided.

PRIOR TO STARTING

Before the pump is started initially, make the following inspections:

Check Rotation - Be sure that the pump operates in the direction indicated by the arrow on the pump casing or frame, as serious damage can result if the pump is operated with incorrect rotation. Make sure the shaft rotation is clockwise when looking at the motor end of the pump.

Check all connections to motor and starting device with wiring diagram. Check voltage, phase and frequency on motor nameplate with line circuit.

STARTING

Follow the steps below in the order indicated to start pump:

- Open gate valve in discharge line wide open.
- Open gate valve in suction line wide open.
- Turn on power to pump motor.

If the pump does not prime properly, loses its prime during start-up it should be shut-down and the condition corrected before the procedure is repeated.

If the motor runs, but no water is pumped, be sure pump is primed, that there are no air leaks in suction piping, that all gate valves are open and all check valves operate.



IMPORTANT ! - DO NOT operate pump at pressures above 100 P.S.I., operating above 100 P.S.I. will overload the motor and void the warranty.

OPERATING CHECKS

After initial start-up:

- Check the pump and piping to assure there are no leaks.
- Check and record pressure gauge readings for future reference.
- Check and record voltage, amperage per phase.



WARNING! - The shell of the motor may get very hot after prolonged full load operation. Avoid contact with bare skin to prevent serious burns. (NOTE: The motor has a class B insulation system and is designed to give long life at this elevated temperature.)

MAINTENANCE

LUBRICATION

No lubrication is required for the liquid end of the pump. Motors are equipped with ball bearings which are grease-packed and sealed at the factory. No additional lubrication is required.

DRAINING THE PUMP

To drain pump, remove 1/8" pipe plug from bottom of pump front cover. After pump has drained, start pump to discharge liquid from the impeller. Always protect the pump, piping, tank, etc., from freezing - or drain the system when there is a chance of freeze-up.

IMPELLER ADJUSTMENT

After years of service, it may be desirable to adjust the impeller to compensate for water wear. If this is necessary, because of reduced capacity or pressure, special instructions will be supplied by the factory upon request.

MOTOR

Keep motor clean and dry. This is an open ventilated motor. The windings must be protected from excess humidity and moisture. If motor fails to run, be sure power is on, all switches or electrical controls are closed, fuses are in order and all electrical connections are tight. (Motor must be repaired by Authorized Repair Station under terms of guarantee.)

SHAFT SEAL

The mechanical shaft seal should be replaced if there is any fluid leakage in the area between the pump end and motor.

1. Remove pump end cover (four cap screws).
2. Remove impeller nut. It will be necessary to stop rotation of impeller by using spanner wrench in puller holes, or gripping O.D. with large pump pliers, or a gentle bite with pipe wrench.

3. Remove four nuts from motor studs, Raceway and impeller may be removed with T-5332 Puller (if available) or by inserting a large screwdriver in the gap between raceway flange and motor, one on each side and prying Raceway, Seal and Impeller off of shaft as a unit.
4. Remove both rotating and stationary member of shaft seal. Clean seat area of raceway. Lubricate rubber parts of the seal with water to ease installation.
5. Insert new stationary seat in raceway with ceramic surface facing out. Remount raceway on motor and tighten four nuts on studs.
6. Slide rotating member of seal on shaft with hard carbon surface against ceramic seat. Note that spring end aligns on impeller hub.

7. Check to insure that impeller drive key is in shaft. Replace impeller. Tighten impeller lock nut.
8. With gasket in place, assemble cover to raceway with four cap screws.

FAILURE TO PUMP

If the motor runs, but no water is pumped, be sure pump is primed, that there are no air leaks in suction piping, that all gate valves are open and all check valves operate.

BARNES®



burks®

WEINMAN®

DEMING®

PROSSER®

Limited 24 Month 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 twenty-four (24) 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

PUMPS & SYSTEMS

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**IMPORTANT!
WARRANTY REGISTRATION**

Your product is covered by the enclosed Warranty.
To complete the Warranty Registration Form go to:

<http://www.cranepumps.com/ProductRegistration/>

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.**

