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TECHNOLOGY GROUP

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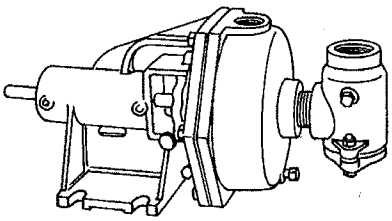
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Find the *Crane / Burks 320CS7M-AB-01* at our website: *Click HERE*

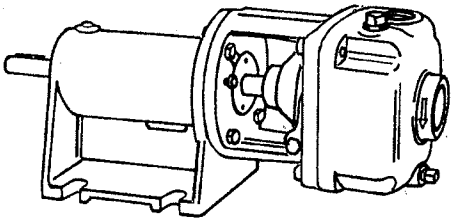
burks®

INSTALLATION AND OPERATION MANUAL

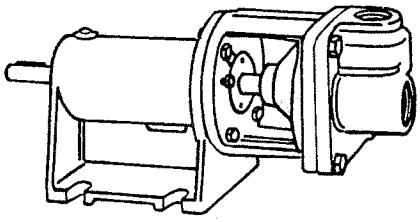
Turbine Pumps



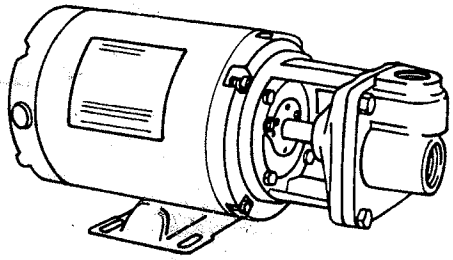
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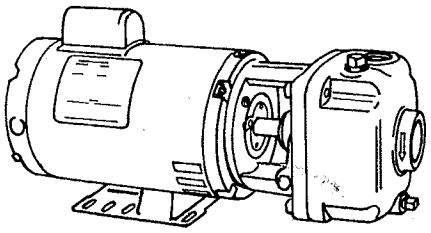
SERIES: ES



SERIES: ET



SERIES: CT



SERIES: CS

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. 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

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Form No. F0807D-Rev. E

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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 orIndicates 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, burnes or death could result.


Extremely hot - Severe burnes 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 desease 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.



Always wear eye protection when working on pumps.



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.

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



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.

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.



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.

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These instructions are intended as a guide to good installation practice. A correct installation, combined with regularly scheduled maintenance will generally insure a longer and more trouble-free pump service life.

The tables below are for your convenience in maintaining these records.

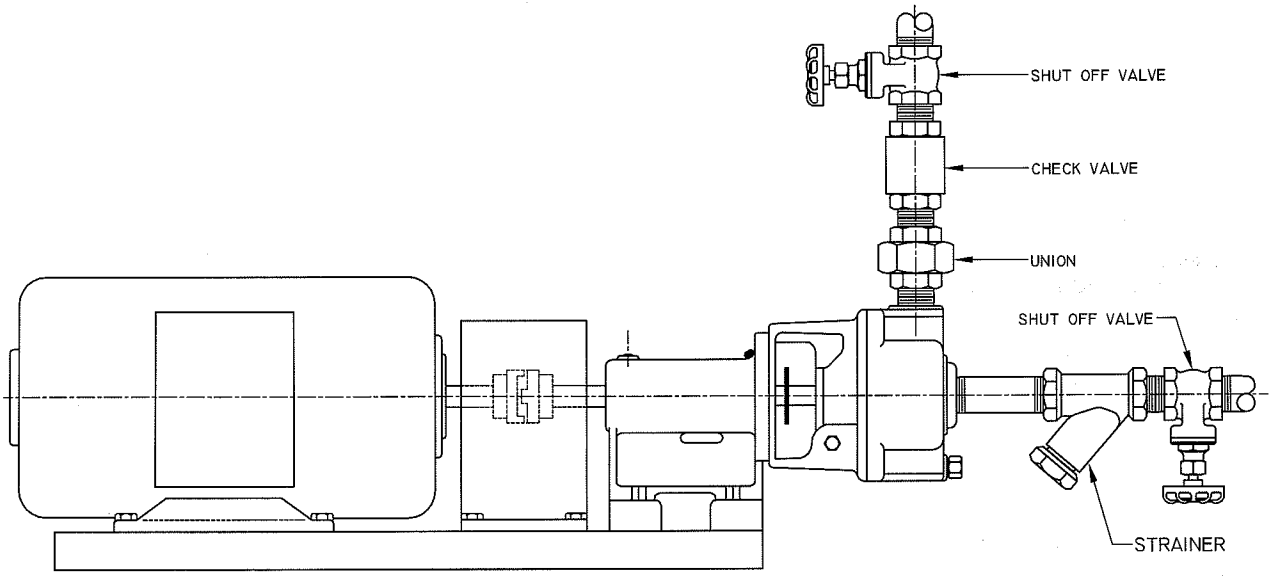
PUMP INSTALLATION AND PERFORMANCE RECORD

Pump Catalog No._____
Pump Serial No._____
Date Installed_____
Capacity_____ GPM _____
Total Head_____ Feet_____
Suction (±) _____Head Feet
Suction Piping: Length_____Feet
Diameter_____Inches
Voltage-Pump Operating: _____

Discharge Gauge, Reading _____ Head Feet
Discharge Piping: Length _____ Feet
Diameter _____ Inches
Liquid:_____
Temperature_____°F. _____
Specific Gravity_____
Viscosity_____ @ _____ °F. _____

Amperage: Line-1 _____ Line-2 _____ Line-3_____

INSPECTION AND REPAIRS					
INSPECTED		OUT-OF	BACK-IN	REPAIRES	COST
DATE	BY	SERVICE	SERVICE		



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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. Normally after being primed the pump can lift liquid from a supply 25 feet below the center line of the suction. However, 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.

ALIGNMENT

If the pump is driven by a flexible coupling, the angular, vertical and horizontal alignment must be checked. A straightedge across the coupling must rest evenly on both rims of the coupling at the top, bottom and sides. Alignment should be rechecked shortly after the initial start-up. Factory assembled units must be realigned at the job site due to the possibility of distortion in shipment. Final coupling alignment should be made with the system at operating temperature.

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. When reducing the piping to the suction opening diameter use an eccentric reducer with the eccentric side down to avoid air pockets. **Never use a straight taper reducer in a horizontal suction line, as it tends to form an air pocket in the top of the reducer and the pipe.**

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.

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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.

JACKETED SEAL CAVITY PIPING

The cooling fluid must enter the lower pipe connection to the cooling cavity and leave the upper pipe connection to insure that the cooling cavity is always full of fluid. Cooling fluid must be turned on when pump is running. The cooling fluid cavity must not be under pressure. The fluid leaving the cavity should flow to a drain. Cooling fluid should run for a brief period after shutdown to prevent "Heat Soaking".

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.



IMPORTANT ! - All pumps with 3 phase motors MUST be installed with a magnetic starter which provides 3 leg protection for motor. Failure to use correct starter will void warranty.

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 those shown for a given horsepower in the performance and selection tables, operating above maximum recommended pressure 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.

MAINTENANCE

LUBRICATION

No lubrication is required for the liquid end of any BURKS Turbine pump. Motors are equipped with ball bearings which are grease-packed and sealed at the factory. No additional lubrication is required. Base-mounted pumps have ball bearings in the Power Frame Assembly which are grease-packed at the factory and have provisions for re-lubrication as required. Use Chevron SR1 grease, or equal. For continuous operation, lubricate annually. For intermittent operation, lubricate every two years. **DO NOT over-lubricate.**

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FOLD HERE AND TAPE, DO NOT STAPLE

PLACE
STAMP
HERE

CRANE PUMPS & SYSTEMS, INC.
WARRANTY SERVICE GROUP
420 THIRD STREET
PIQUA, OHIO
45356 - U.S.A.

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