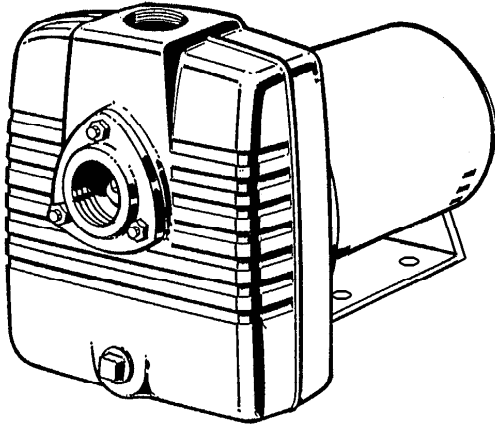


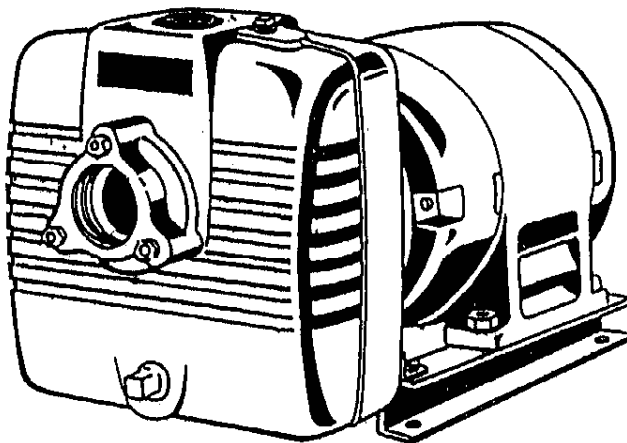
BARNES®

INSTALLATION and OPERATION MANUAL Self-Priming Centrifugal Pumps



Electric Drive Models:

3CCE, 3CCE-1
4CCE, 4CCE-1
5CCE, 5CCE-1
10CCE, 10CCE-1
15CCE
20CCE
25CCE



IMPORTANT!

Read all instructions in this manual before operating pump.

As a result of Crane Pumps & Systems, Inc., constant product improvement program, product changes may occur. As such Crane Pumps & Systems reserves the right to change product without prior written notification.

CRANE

A Crane Co. Company

PUMPS & SYSTEMS

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Form No. 022567-Rev. V

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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 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.



Toxic Fumes - Breathing can cause nausea, fainting or death



Eye protection required

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



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



WARNING! - DO NOT wear loose clothing that may become entangled in the impeller or other moving parts. Always wear appropriate safety gear, such as safety glasses, when working on the pump or piping.



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! Cable should be protected at all times to avoid punctures, cut, bruises and abrasions - inspect frequently. Never handle connected power cords with wet hands.



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.



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

SECTION: A - PUMP SPECIFICATIONS: 3CCE, 4CCE, 5CCE

DISCHARGE 1½" (38mm) x 1½ (38mm) NPT , Female

LIQUID TEMPERATURE 160°F (71°C) Continuous

INTERMEDIATE Cast Iron ASTM A-48, Class 30

VOLUTE Cast Iron ASTM A-48, Class 30

BODY Cast Iron ASTM A-48, Class 30

PEDESTAL Cast Iron ASTM A-48, Class 30

IMPELLER *Design* Semi-Open
Material Cast Iron ASTM A-48, Class 30
Dynamically Balanced, ISO G6.3

SHAFT Stainless Steel

SQUARE RINGS Buna-N

HARDWARE 300 Series Stainless Steel

PAINT Air dry enamel

SEAL *Design* Mechanical
Lubrication Self-Lubrication
Material Rotating Faces - Carbon
Stationary Faces - Ceramic
Elastomer - Buna-N
Hardware - 300 series stainless steel

CHECK VALVE:

Material Valve Flap - Neoprene
Weight - Cast Iron ASTM A-48, Class 30

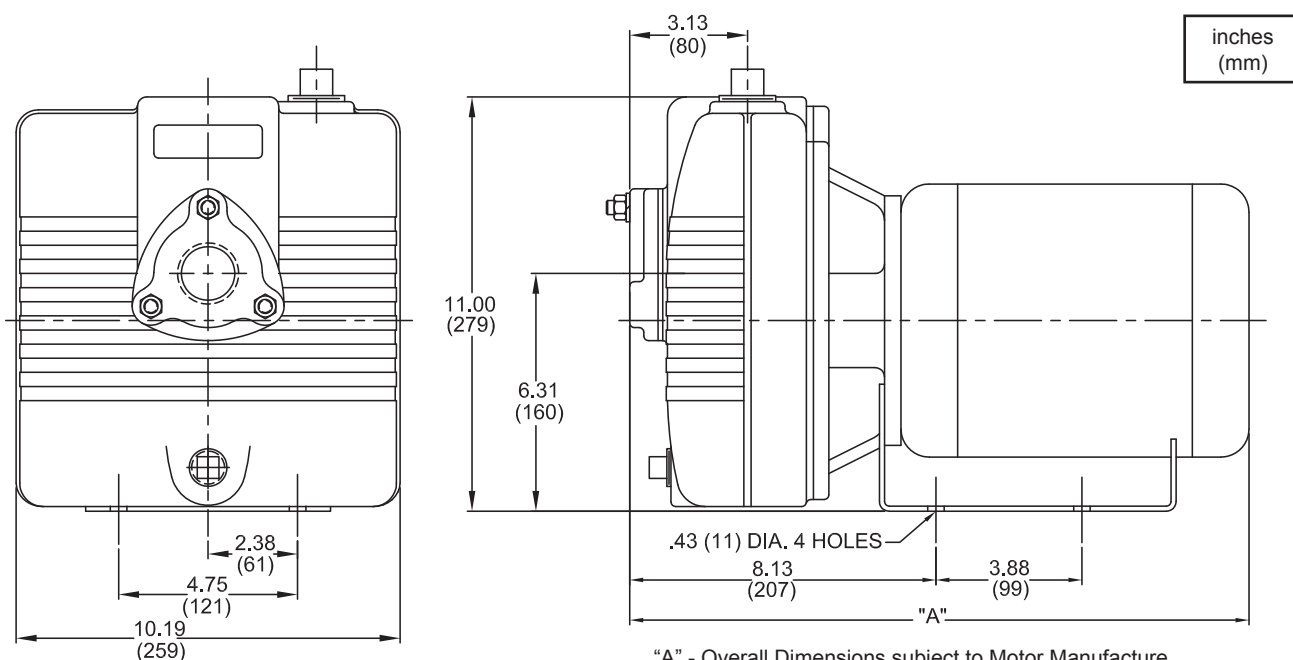
MOTOR: *Design* ODP, NEMA L, Single phase,
NEMA B, Three Phase Torque Curve,
C-Face, Footed, Squirrel Cage
Induction

Insulation Class B

SINGLE PHASE Dual Voltage 115/230, capacitor start

THREE PHASE 200-240/480 is Tri voltage motor.

OPTIONAL EQUIPMENT: Seal Material, TEFC motors



"A" - Overall Dimensions subject to Motor Manufacture

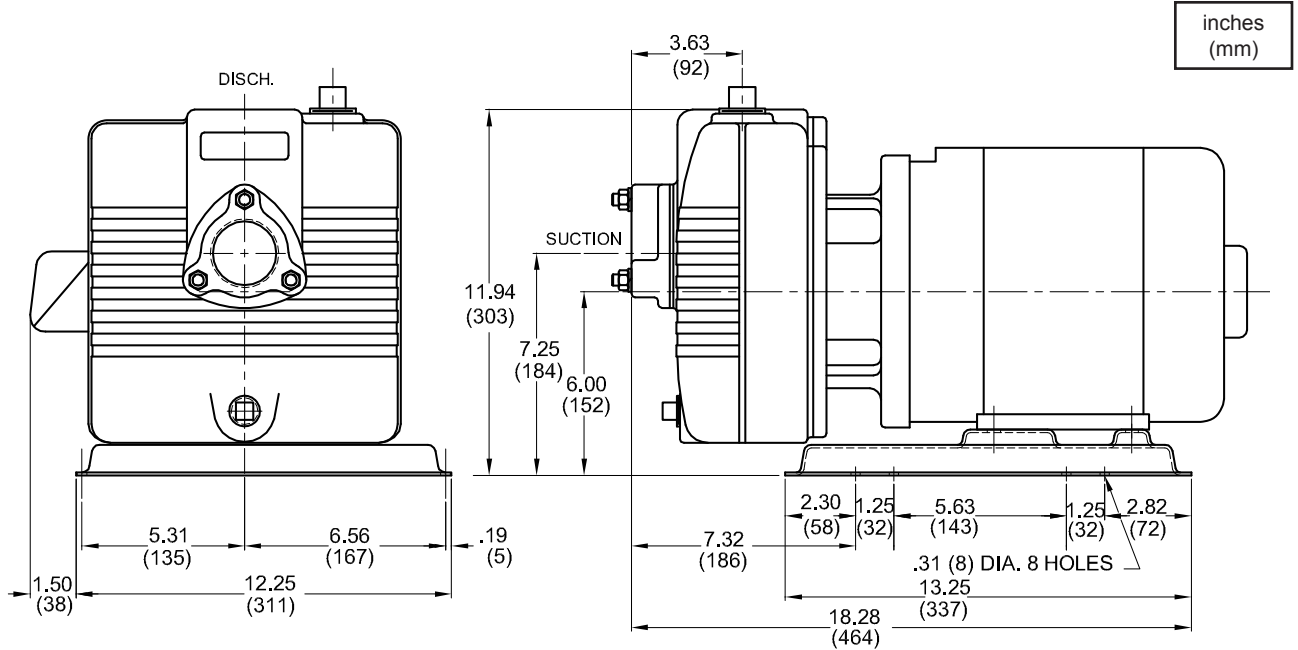
| MODEL NO. | HP | VOLTS | PH | RPM (Nom) | ODP MOTOR DESIGN | | | | TEFC MOTOR DESIGN | | |
|-----------|-----|-------------|----|-----------|------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|
| | | | | | * A DIM | FULL LOAD AMPS | LOCKED ROTOR AMPS | WEIGHT NET LBS | * A DIM | FULL LOAD AMPS | LOCKED ROTOR AMPS |
| 3CCE | 1.5 | 200-230/460 | 3 | 3450 | 17.88 (454) | 6.0/3.0 | 40/20 | 84 | 20.00 (508) | 5-4.6/2.3 | 36/18 |
| 3CCE-1 | 1.5 | 115/230 | 1 | 3450 | 18.44 (468) | 4.5/2.3 | 12/60 | 84 | 21.00 (534) | 16.6/8.3 | 84/42 |
| 4CCE | 2.0 | 200-230/460 | 3 | 3450 | 18.44 (468) | 6.8/3.4 | 50/25 | 92 | 21.00 (534) | 7-5.4/2.7 | 46/23 |
| 4CCE-1 | 2.0 | 115/230 | 1 | 3450 | 18.44 (468) | 5.9/3.0 | 144/72 | 92 | 21.92 (557) | 23/11.5 | 156/78 |
| 5CCE | 3.0 | 200-230/460 | 3 | 3450 | 18.44 (468) | 9.6/4.8 | 64/32 | 94 | 21.92 (557) | 8.1-7.6/3.8 | 66/33 |
| 5CCE-1 | 3.0 | 115/230 | 1 | 3450 | 19.69 (500) | 8.3/4.2 | 204/102 | 94 | 25.36 (644) | 29/14.5 | 172/86 |

IMPORTANT!

- 1.) **DO NOT** USE FOR PUMPING FLUIDS WITH A FLASH POINT OF LESS THAN 100°F.
- 2.) MAKE CERTAIN THAT PUMP AND/OR MOTOR ASSEMBLY AND CONTROLS HAVE THE APPROPRIATE RATINGS FOR THE GIVEN APPLICATION AREA CLASSIFICATION (ie DIVISION I, AGENCY LISTING ETC.)

SECTION: A - PUMP SPECIFICATIONS: 10CCE, 10CCE-1

| | |
|---|---|
| DISCHARGE 2" (51mm) x 2" (51mm) NPT , Female | SHAFT SLEEVE Bronze |
| LIQUID TEMPERATURE 160°F (71°C) Continuous | CHECK VALVE: <i>Material</i> Valve Flap - Neoprene Weight - Cast Iron ASTM A-48, Class 30 |
| INTERMEDIATE Cast Iron ASTM A-48, Class 30 | MOTOR: <i>Design</i> ODP, NEMA L, Single phase, NEMA B, Three Phase Torque Curve, C-Face, Footed, Squirrel Cage Induction, Marine Duty per USCG259 and AIEEE-45, 50°C Ambient |
| VOLUTE Cast Iron ASTM A-48, Class 30 | <i>Insulation</i> Class B |
| BODY Cast Iron ASTM A-48, Class 30 | SINGLE PHASE Single Voltage 230, |
| PEDESTAL Cast Iron ASTM A-48, Class 30 | THREE PHASE 200-240/480 is Tri voltage motor. |
| IMPELLER <i>Design</i> Semi-Open <i>Material</i> Cast Iron ASTM A-48, Class 30 Dynamically Balanced, ISO G6.3 | OPTIONAL EQUIPMENT: Seal Material, TEFC motors |
| SHAFT Stainless Steel | |
| SQUARE RINGS Buna-N | |
| HARDWARE 300 Series Stainless Steel | |
| PAINT Air dry enamel | |
| SEAL <i>Design</i> Mechanical <i>Lubrication</i> Self-Lubrication <i>Material</i> Rotating Faces - Carbon Stationary Faces - Ni-Resist Elastomer - Buna-N Hardware - 300 series stainless steel | |



| MODEL NO. | HP | VOLTS | PH | RPM (NOM) | ODP MOTOR DESIGN | | | TEFC MOTOR DESIGN | |
|-----------|-----|-------------|----|-----------|------------------|-------------------|----------------|-------------------|-------------------|
| | | | | | FULL LOAD AMPS | LOCKED ROTOR AMPS | WEIGHT NET LBS | FULL LOAD AMPS | LOCKED ROTOR AMPS |
| 10CCE | 5.0 | 200-230/460 | 3 | 3450 | 15.2/7.6 | 92/46 | 164 | 6 @ 460 | 47 @ 460 |
| 10CCE-1 | 5.0 | 230 | 1 | 3450 | 23 | 125 | 164 | 23 | 170 |

IMPORTANT!

- DO NOT USE FOR PUMPING FLUIDS WITH A FLASH POINT OF LESS THAN 100°F.
- MAKE CERTAIN THAT PUMP AND/OR MOTOR ASSEMBLY AND CONTROLS HAVE THE APPROPRIATE RATINGS FOR THE GIVEN APPLICATION AREA CLASSIFICATION (ie DIVISION I, AGENCY LISTING ETC.)

SECTION: A - PUMP SPECIFICATIONS: 15CCE

DISCHARGE 3" (76mm) x 3" (76mm) NPT ,
Female

LIQUID TEMPERATURE 160°F (71°C) Continuous

INTERMEDIATE Cast Iron ASTM A-48, Class 30

VOLUTE Cast Iron ASTM A-48, Class 30

BODY Cast Iron ASTM A-48, Class 30

PEDESTAL Cast Iron ASTM A-48, Class 30

IMPELLER *Design* Semi-Open
Material Cast Iron ASTM A-48, Class 30
Dynamically Balanced, ISO G6.3

SHAFT Stainless Steel

SQUARE RINGS Buna-N

HARDWARE 300 Series Stainless Steel

PAINT Air dry enamel

SEAL *Design* Mechanical
Lubrication Self-Lubrication
Material Rotating Faces - Carbon
Stationary Faces - Ni-Resist
Elastomer - Buna-N
Hardware - 300 series stainless steel

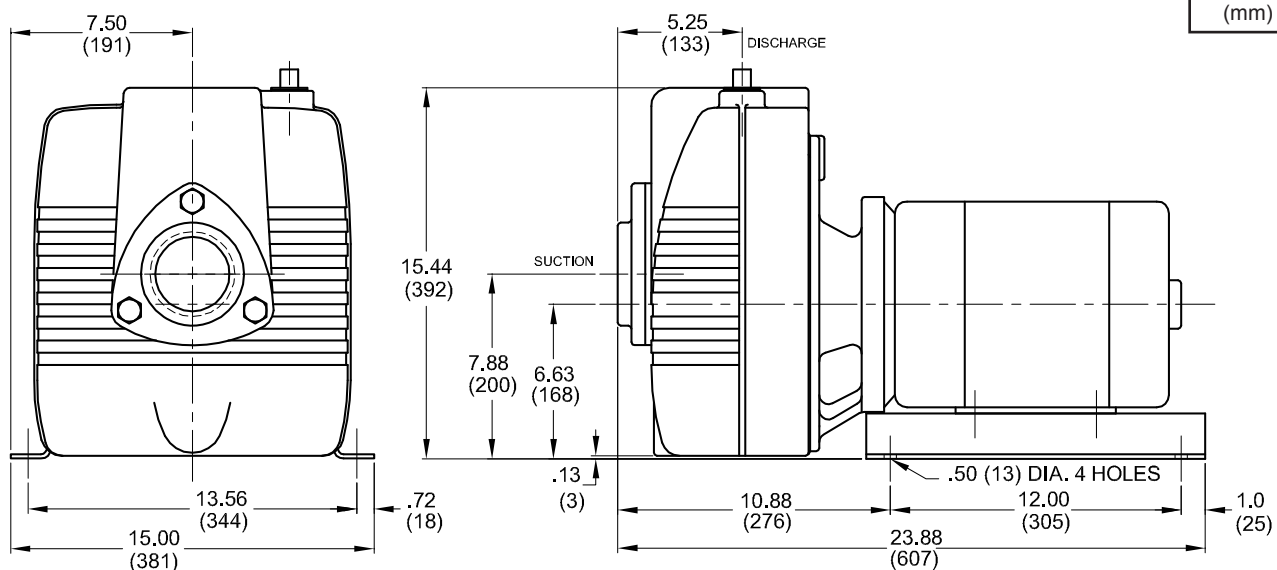
SHAFT SLEEVE Bronze

CHECK VALVE:
Material Valve Flap - Neoprene
Weight - Cast Iron ASTM A-48, Class 30

MOTOR: *Design* ODP, NEMA B, three phase,
Torque Curve, C-Face, Footed,
Squirrel Cage Induction
Marine Duty per USCG259 and
AIEEE-45, 50°C Ambient
Insulation Class B

THREE PHASE 200-240/480 is Tri voltage motor.

OPTIONAL EQUIPMENT: Seal Material, TEFC motors



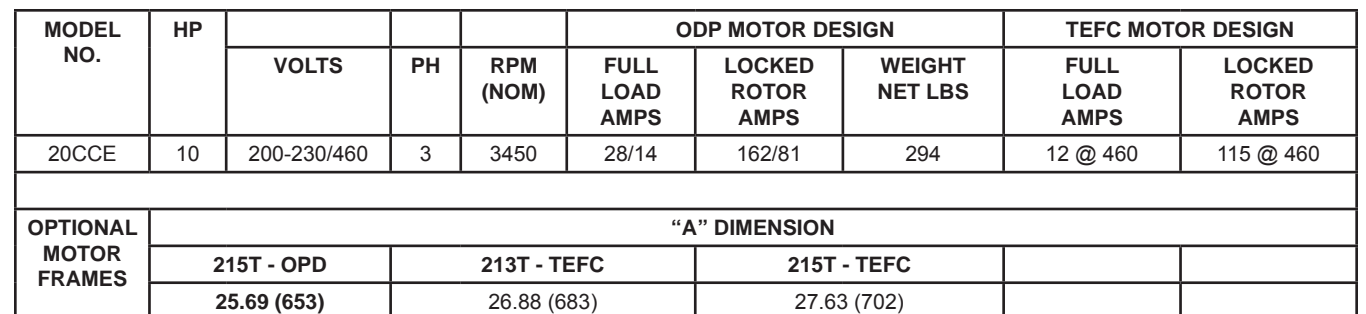
| MODEL NO. | HP | VOLTS | PH | RPM (NOM) | ODP MOTOR DESIGN | | | TEFC MOTOR DESIGN | |
|-----------|-----|-------------|----|-----------|------------------|-------------------|----------------|-------------------|-------------------|
| | | | | | FULL LOAD AMPS | LOCKED ROTOR AMPS | WEIGHT NET LBS | FULL LOAD AMPS | LOCKED ROTOR AMPS |
| 15CCE | 7.5 | 200-230/460 | 3 | 3450 | 22/11 | 127/63.5 | 248 | 20-19.2/9.6 | |

IMPORTANT!

- DO NOT USE FOR PUMPING FLUIDS WITH A FLASH POINT OF LESS THAN 100°F.
- MAKE CERTAIN THAT PUMP AND/OR MOTOR ASSEMBLY AND CONTROLS HAVE THE APPROPRIATE RATINGS FOR THE GIVEN APPLICATION AREA CLASSIFICATION (ie DIVISION I, AGENCY LISTING ETC.)

| | |
|-------------------------------------|---------------------------------------|
| DISCHARGE | 3" (76mm) x 3" (76mm) NPT , Female |
| LIQUID TEMPERATURE | 160°F (71°C) Continuous |
| INTERMEDIATE | Cast Iron ASTM A-48, Class 30 |
| VOLUTE | Cast Iron ASTM A-48, Class 30 |
| BODY | Cast Iron ASTM A-48, Class 30 |
| PEDESTAL | Cast Iron ASTM A-48, Class 30 |
| IMPELLER <i>Design</i> | Semi-Open |
| | <i>Material</i> |
| | Cast Iron ASTM A-48, Class 30 |
| | Dynamically Balanced, ISO G6.3 |
| SHAFT | Stainless Steel |
| SQUARE RINGS | Buna-N |
| HARDWARE | 300 Series Stainless Steel |
| PAINT | Air dry enamel |
| SEAL | <i>Design</i> |
| | Mechanical |
| | <i>Lubrication</i> |
| | Self-Lubrication |
| | <i>Material</i> |
| | Rotating Faces - Carbon |
| | Stationary Faces - Ni-Resist |
| | Elastomer - Buna-N |
| | Hardware - 300 series stainless steel |

| | |
|----------------------------|--|
| SHAFT SLEEVE | Bronze |
| CHECK VALVE: | |
| | <i>Material</i> |
| | Valve Flap - Neoprene |
| | Weight - Cast Iron ASTM A-48, Class 30 |
| MOTOR: | <i>Design</i> |
| | ODP, NEMA B, Three phase, |
| | Torque Curve, C-Face, Footed, |
| | Squirrel Cage Induction, Marine |
| | Duty per USCG259 and AIEEE-45, |
| | 50°C Ambient |
| | <i>Insulation</i> |
| | Class B |
| THREE PHASE | 200-240/480 is Tri voltage motor. |
| OPTIONAL EQUIPMENT: | Seal Material, TEFC motors |



- 1.) **DO NOT** USE FOR PUMPING FLUIDS WITH A FLASH POINT OF LESS THAN 100°F.
- 2.) MAKE CERTAIN THAT PUMP AND/OR MOTOR ASSEMBLY AND CONTROLS HAVE THE APPROPRIATE RATINGS FOR THE GIVEN APPLICATION AREA CLASSIFICATION (ie DIVISION I, AGENCY LISTING ETC.)

SECTION: A - PUMP SPECIFICATIONS: 25CCE

DISCHARGE 3" (76mm) x 3" (76mm) NPT ,
Female

LIQUID TEMPERATURE 160°F (71°C) Continuous

INTERMEDIATE Cast Iron ASTM A-48, Class 30

VOLUTE Cast Iron ASTM A-48, Class 30

BODY Cast Iron ASTM A-48, Class 30

PEDESTAL Cast Iron ASTM A-48, Class 30

IMPELLER *Design* Semi-Open
Material Cast Iron ASTM A-48, Class 30
Dynamically Balanced, ISO G6.3

SHAFT Stainless Steel

SQUARE RINGS Buna-N

HARDWARE 300 Series Stainless Steel

PAINT Air dry enamel

SEAL *Design* Mechanical
Lubrication Self-Lubrication
Material Rotating Faces - Carbon
Stationary Faces - Ni-Resist
Elastomer - Buna-N
Hardware - 300 series stainless steel

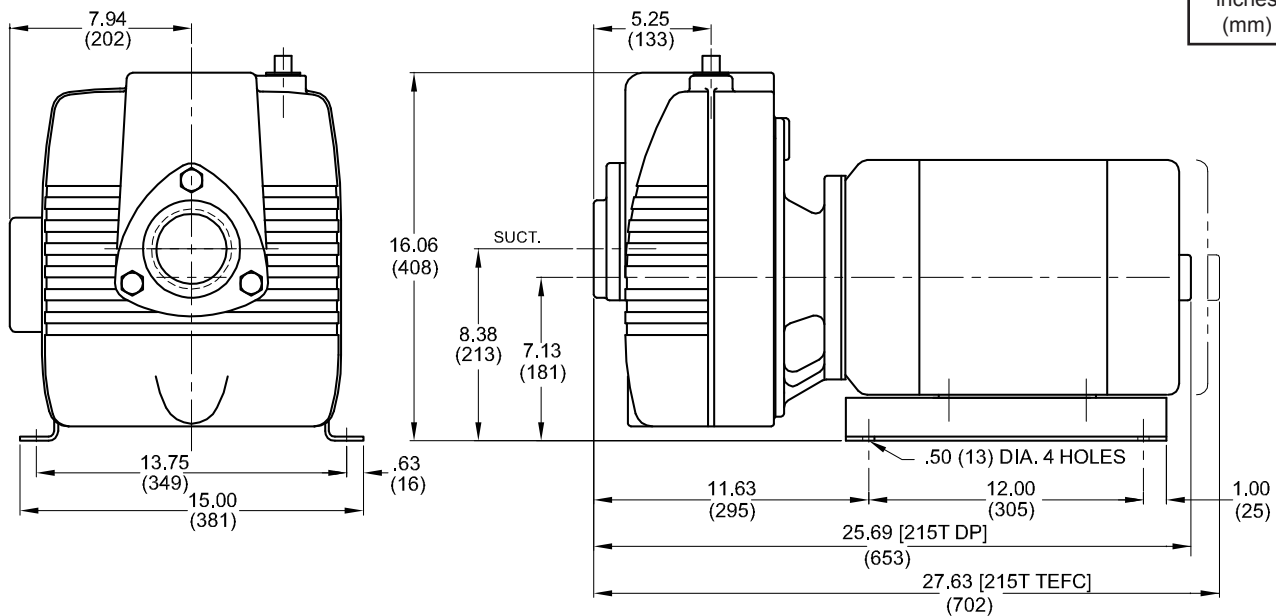
SHAFT SLEEVE Bronze

CHECK VALVE:
Material Valve Flap - Neoprene
Weight - Cast Iron ASTM A-48, Class 30

MOTOR: *Design* ODP, NEMA B, three phase,
Torque Curve, C-Face, Footed,
Squirrel Cage Induction
Marine Duty per USCG259 and
AIEEE-45, 50°C Ambient
Insulation Class B

THREE PHASE 200-240/480 is Tri voltage motor.

OPTIONAL EQUIPMENT: Seal Material, TEFC motors



| MODEL NO. | HP | VOLTS | PH | RPM (NOM) | ODP MOTOR DESIGN | | | TEFC MOTOR DESIGN | |
|-----------|----|-------------|----|-----------|------------------|-------------------|----------------|-------------------|-------------------|
| | | | | | FULL LOAD AMPS | LOCKED ROTOR AMPS | WEIGHT NET LBS | FULL LOAD AMPS | LOCKED ROTOR AMPS |
| 25CCE | 15 | 200-230/460 | 3 | 3450 | 42/21 | 232/116 | 322 | 18.5 @ 460 | 125 @ 460 |

IMPORTANT!

- 1.) **DO NOT** USE FOR PUMPING FLUIDS WITH A FLASH POINT OF LESS THAN 100°F.
- 2.) MAKE CERTAIN THAT PUMP AND/OR MOTOR ASSEMBLY AND CONTROLS HAVE THE APPROPRIATE RATINGS FOR THE GIVEN APPLICATION AREA CLASSIFICATION (ie DIVISION I, AGENCY LISTING ETC.)

SECTION B: GENERAL INFORMATION

B-1) To the Purchaser:

Congratulations! You are the owner of one of the finest pumps on the market today. Barnes products are engineered and manufactured of high quality components. Over one hundred years of pump building experience along with a continuing quality assurance program combine to produce a pump which will stand up to the toughest applications. This manual will provide helpful information concerning installation, maintenance, and proper service guidelines.

B-2) 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 packaging, do not lose or misplace.

B-3) Storage:

Short Term- Barnes pump's are manufactured for efficient performance following short 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.

Pump should be stored in its original shipping container and on initial start up, rotate impeller by hand to assure seal and impeller rotate freely.

B-4) SERVICE CENTERS:

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

SECTION C: INSTALLATION:

C-1) Location:

The pump should be located as near as possible to the liquid to be pumped and in no case should the pump be more than 25 feet above the surface of the liquid supply. The pump should always be as level as possible.

C-2) Rotation:

Check rotation of pump to be sure that it agrees with direction indicated on the "ROTATION PLATE". If rotation is incorrect, change as follows; 3 phase, interchange any two incoming wire leads. 1 phase, follow connection name plate on motor. All pump units rotate clockwise when looking from the driven end of the pump. Locate the pump on a firm footing to make sure the pump will not move due to vibration. The pumps should be level to provide favorable operating conditions.

C-3) Suction System:

It is advisable to use a suction line of the same size as the pump port size. All horizontal suction lines should slope up to the pump to avoid trapped air pockets. An adjustable stand, pipe clamp or floor flange must be installed to support the weight of the suction line. Using a smaller suction line than the pump port size can cause internal damage to the pump. The suction line must not have holes, even small holes. The smallest air leak in the suction line may prevent the pump from priming. Coat all threaded connections in the suction line with pipe thread compound to insure an air tight joint. In addition, suction flanges should be pulled up tight to prevent air leaks.



CAUTION! - This pump should not be operated without a strainer on the end of the suction line to prevent sticks, stones, rags and other foreign matter from being drawn into the impeller. The strainer should be cleaned regularly to insure full flow.

C-4) Discharge System:

Connect discharge hose or pipe to the side outlet on the discharge tee or to the discharge elbow.

C-5) Electric Motor & Connections:

Read Motor Manufacturer's Instructions or connection diagram located on the motor name plate or inside the cover on conduit box. Wiring of motor and control, overload protection and grounding should be in accordance with State, Province, Local and National Electrical Code (NEC) or Canadian Electrical Code (CEC). Be sure the following guidelines are met:

1. AC power is within $\pm 10\%$ of rated voltage with rated frequency. (See motor name plate for rating).

OR

2. AC power is within $\pm 5\%$ of rated frequency with rated voltage.

OR

3. A combined variation in voltage and frequency of $\pm 10\%$ (sum of absolute values) of rated values, provided the frequency variation does not exceed $\pm 5\%$ of rated frequency.

C-6) Pump Lubrication:

The pump requires no lubrication. The impeller and seal are the only moving parts of the pump and these parts are water lubricated and need no attention.



CAUTION! - DO NOT operate pump without liquid in pump body as operating dry will result in damage to the seal.

SECTION D: OPERATION:

D-1) Priming:

Remove the priming plug in the top of the discharge tee or in top of pump body, and fill the pump body completely with liquid as free of solids as possible. In freezing weather, the pump should be primed with warm water, if possible, to prevent any damage that may be caused by ice films within the pump.

D-2) Starting:

After completion of procedures outlined in Section C and D-1, the pump is then ready for operation. Start pump by applying power to motor as outlined in the Motor Instructions.

D-3) Shutdown:

Operation may be discontinued by disconnecting electric power. When the pump has been operating in freezing weather or in liquid containing a considerable amount of solids, it is advisable to drain the pump body by removing drain plug (26) and flushing the solids out of the body. Replace the drain plug.

D-4) Restart:

At each subsequent start, particularly if the pump has been drained, the priming liquid level should be checked since the pump is self-priming only when the body is full of liquid.

SECTION E: PUMP SERVICE AND REPAIR:

E-1) Check Valve Service:

To clean out or repair check valve, disconnect suction piping. Remove cap screws (24) and suction flange (23). **DO NOT PRY ON FLANGE** but rather bump off with a block of wood and a hammer. Pull off gasket (22C) together with weights (22A) and (22B), round head screw (22E) and lockwasher (22D). Examine and replace any parts showing wear or damage.

When replacing gasket and weight assembly onto pump body make sure that HINGE section of gasket (22C) is at TOP and that LARGE weight is on PUMP SIDE of gasket.

E-2) Body, Volute and Impeller Service:

To clean out or repair the body (18), volute (15) or impeller (12), disconnect suction and discharge piping. Remove hex nuts (21) and lockwashers (20) and pull body (18) from intermediate coupling (2). This will expose O-ring (4), impeller (12), impeller locking screw (13), volute (15) and volute gasket (17). Examine and replace any part showing undue wear or damage.

When impeller (12) needs replaced, pull volute (15) from intermediate coupling (2), remove set screw (13 on 3CCE - 5CCE) or cap screws (13) and washers (14) on 10CCE - 25CCEs, and unscrew the impeller from the motor shaft. The impeller is screwed onto the shaft with right hand thread and to break loose use a block of wood against a vane and strike with a hammer. At reassembly, be sure to use the required number of shims (10) and (11) to result in an impeller-to-volute clearance of not more than .015".

E-3) Shaft Seal Service:

To examine or replace shaft seal, remove body (18) and impeller (12) as outlined in Paragraph E-2. Remove impeller shims (10) and (11). Remove rotating member of shaft seal (9) from motor shaft. All of the components of the shaft seal are now exposed for examination. If any part shows wear or damage, replace entire shaft seal assembly. When stationary member needs replacing, pry used stationary member from intermediate coupling (2).



CAUTION! - handle seal parts with extreme care. DO NOT scratch or mar lapped faces.

Lightly oil ring and press stationary member over motor shaft and into intermediate coupling (2). Lightly oil motor shaft and inner surface of bellows of rotating member. With lapped surface facing intermediate coupling, slide rotating member onto shaft until lapped faces of rotating member and stationary member are together. Reassemble remainder of pump.

E-4) Motor Service:

To remove or replace motor (1), disassemble pump as outlined in Paragraphs E-2 and E-3.

Remove cap screws (5), lockwashers (6) to remove motor (1), and base (7) (On 3CCE - 5CCE's). To remove motor (1) from base (7) on 10CCE - 25CCE's, remove cap screws (28) on hex nuts (27).

SECTION: F REPLACEMENT PARTS

F-1 ORDERING REPLACEMENT PARTS:

When ordering replacement parts, ALWAYS furnish the following information:

1. Pump serial number and date code. (F-4)
2. Pump model number. (F-3)
3. Pump part number. (F-2)
4. Part description.
5. Item part number.
6. Quantity required.
7. Shipping instructions.
8. Billing instructions.

| | |
|----------------------|-----------------------|
| BARNES® | |
| Model No. (2) | Serial No. (1) |
| Part No. (3) | |
| Impeller Dia. | |

036352

F-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.

F-3 MODEL NUMBER:

This designation consists of numbers and letters which represent the discharge size, series horsepower, motor phase and voltage, speed and pump design. This number is used for ordering and obtaining information.

F-4 SERIAL NUMBER:

The serial number block will consist of a six digit number, which is specific to each pump and may be preceded by a alpha character, which indicates the plant location. This number will also be suffixed with a four digit number, which indicates the date the unit was built (Date Code). EXAMPLE: A012345 0490.

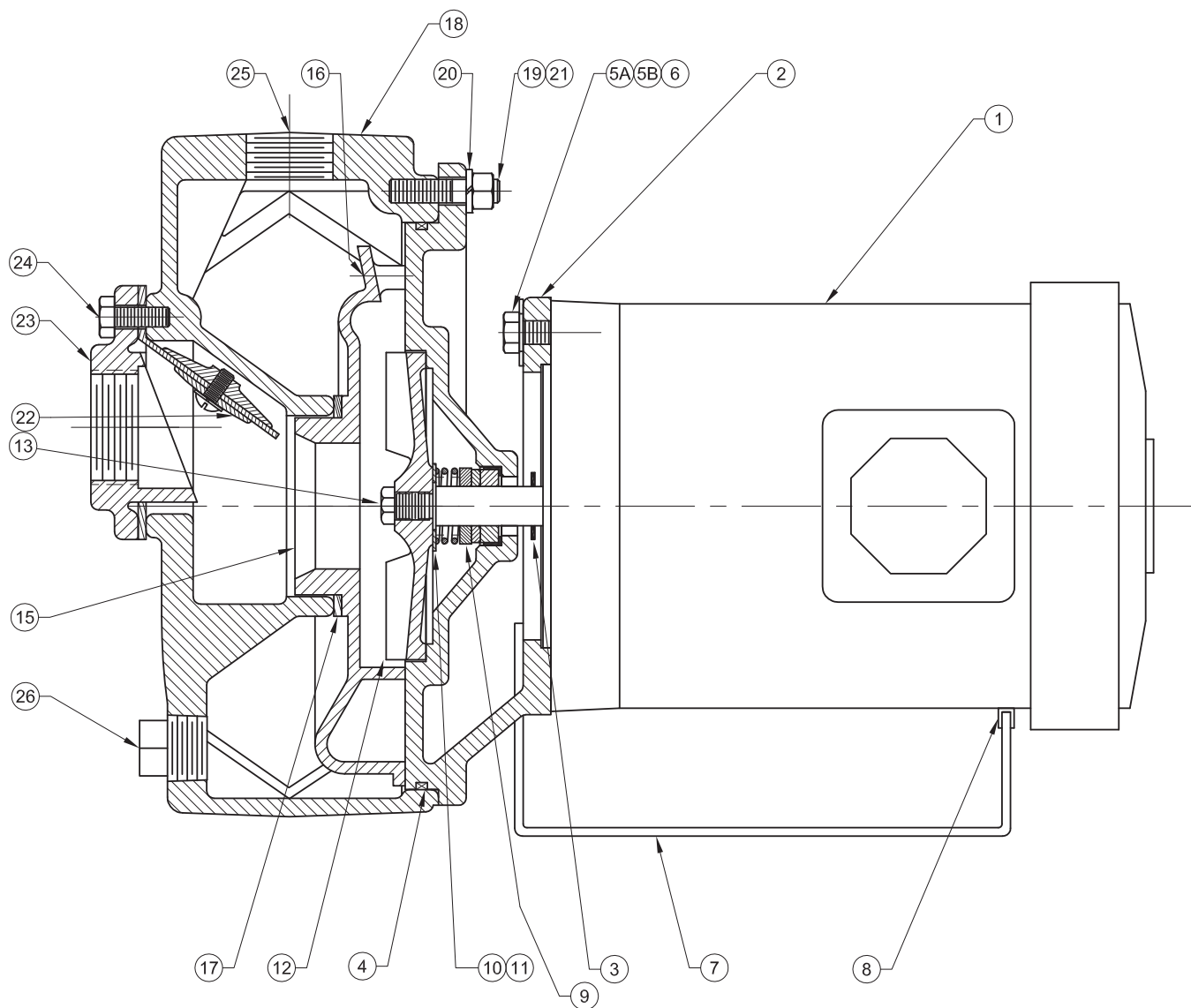
Reference the six digit portion (Serial Number) of this number when referring to the product.

TROUBLE SHOOTING

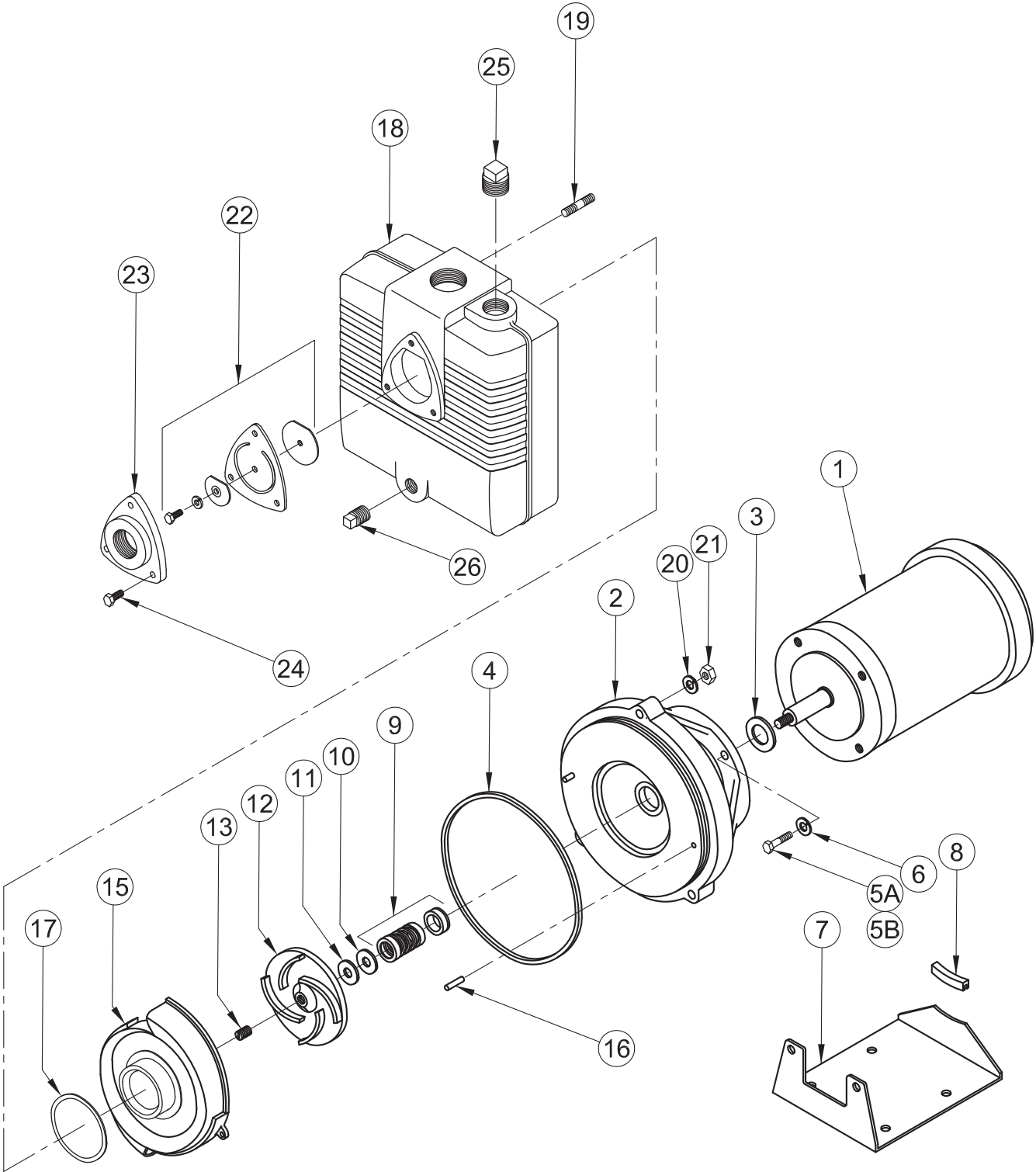
CAUTION ! Always disconnect the pump from the electrical power source before handling.
If the system fails to operate properly, carefully read instructions and perform maintenance recommendations.

| SYMPTOM | POSSIBLE CAUSE(S) | |
|--|--|--|
| Little or no discharge and unit will not prime | <ol style="list-style-type: none"> 1. Casing not filled with water 2. Total head too high 3. Suction head higher than pump designed for 4. Impeller partially or completely plugged 5. Hole or leak in suction line 6. Foot-valve too small 7. Impeller damaged 8. Foot-valve or suction line not submerged deep enough in water; pulling air 9. Insufficient inlet pressure or suction head 10. Suction piping too small 11. Casing gasket leaking 12. Suction or discharge line valves closed 13. Piping is fouled or damaged 14. Clogged strainer or foot-valve | <ol style="list-style-type: none"> 1. Fill pump casing. Using a foot-valve will extend pump life and facilitate immediate priming 2. Shorten suction head 3. Lower suction head, install foot-valve and prime. 4. Disassemble pump and clean out impeller 5. Repair or replace suction line 6. Match foot-valve to piping or install one size larger foot-valve 7. Disassemble pump and replace impeller 8. Submerge lower in water 9. Increase inlet pressure by adding more water to tank or increasing back pressure by turning gate valve on discharge line partially closed position 10. Increase pipe size to pump inlet size or larger 11. Replace 12. Open 13. Clean or replace 14. Clean or replace |
| Loss of suction after satisfactory operation | <ol style="list-style-type: none"> 1. Air leak in suction line 2. When unit was last turned off, water siphoned out of pump casing 3. Suction head higher than pump designed for 4. Insufficient inlet pressure or suction head 5. Clogged foot-valve, strainer, or pump 6. Defective wearplate(s) | <ol style="list-style-type: none"> 1. Repair or replace suction line 2. Refill (reprime) pump casing before restarting 3. Lower suction head, install foot-valve and primer 4. Increase inlet pressure by adding more water to tank or increasing back pressure by turning gate valve on discharge line to partially closed position. 5. Unclog, clear or replace as necessary. 6. Replace. |
| Pump overloads driver | <ol style="list-style-type: none"> 1. Total head lower than pump rating, unit delivering too much water 2. Specific gravity and viscosity of liquid being pumped different than the pump rating | <ol style="list-style-type: none"> 1. Increase back pressure on pump by turning gate valve on discharge line to partially closed position that will not overload motor. 2. Consult factory. |
| Pump vibrates and/or makes excessive noise | <ol style="list-style-type: none"> 1. Mounting plate or foundation not rigid enough 2. Foreign material in pump causing unbalance 3. Impeller bent 4. Cavitation present 5. Piping not supported to relieve any strain on pump assembly | <ol style="list-style-type: none"> 1. Reinforce. 2. Disassemble pump and remove. 3. Replace impeller. 4. Check suction line for proper size and check valve in suction line if completely open, remove any sharp bends before pump and shorten suction line. 5. Make necessary adjustments. |
| Pump runs but no fluid | <ol style="list-style-type: none"> 1. Faulty suction piping (air leak) 2. Pump located too far from fluid source 3. Gate valve closed 4. Clogged strainer 5. Fouled foot-valve 6. Discharge height too great 7. Fouled impeller 8. Faulty mechanical seal | <ol style="list-style-type: none"> 1. Replace 2. Replace 3. Open 4. Clean or replace 5. Clean or replace 6. Lower the height 7. Clean or replace. 8. Replace |
| Pump leaks at shaft | <ol style="list-style-type: none"> 1. Worn mechanical seal 2. Replacement seal not installed properly | <ol style="list-style-type: none"> 1. Replace 2. Follow Maintenance instructions carefully |

SERIES: 3CCE, 3CCE-1, 4CCE, 4CCE-1, 5CCE, 5CCE-1



SERIES: 3CCE, 3CCE-1, 4CCE, 4CCE-1, 5CCE, 5CCE-1



SERIES: 3CCE, 3CCE-1, 4CCE, 4CCE-1, 5CCE, 5CCE-1

PARTS KIT

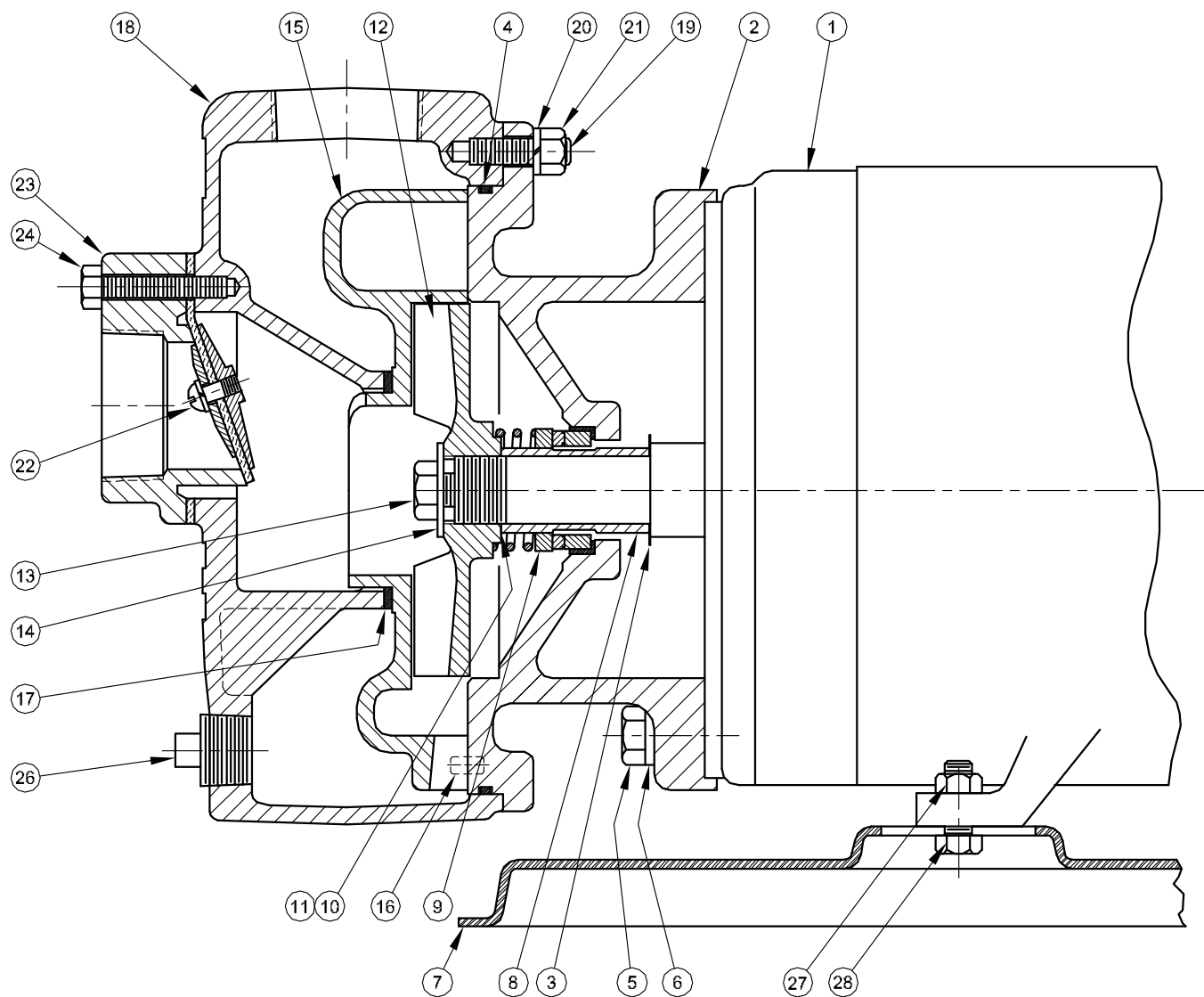
Seal Kit P/N: 021814 (±) 3,4,9,10,11,16,17,22C

4CCE Parts Kit...P/N: 083862 (▲) 2, 3, 4, 5, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26

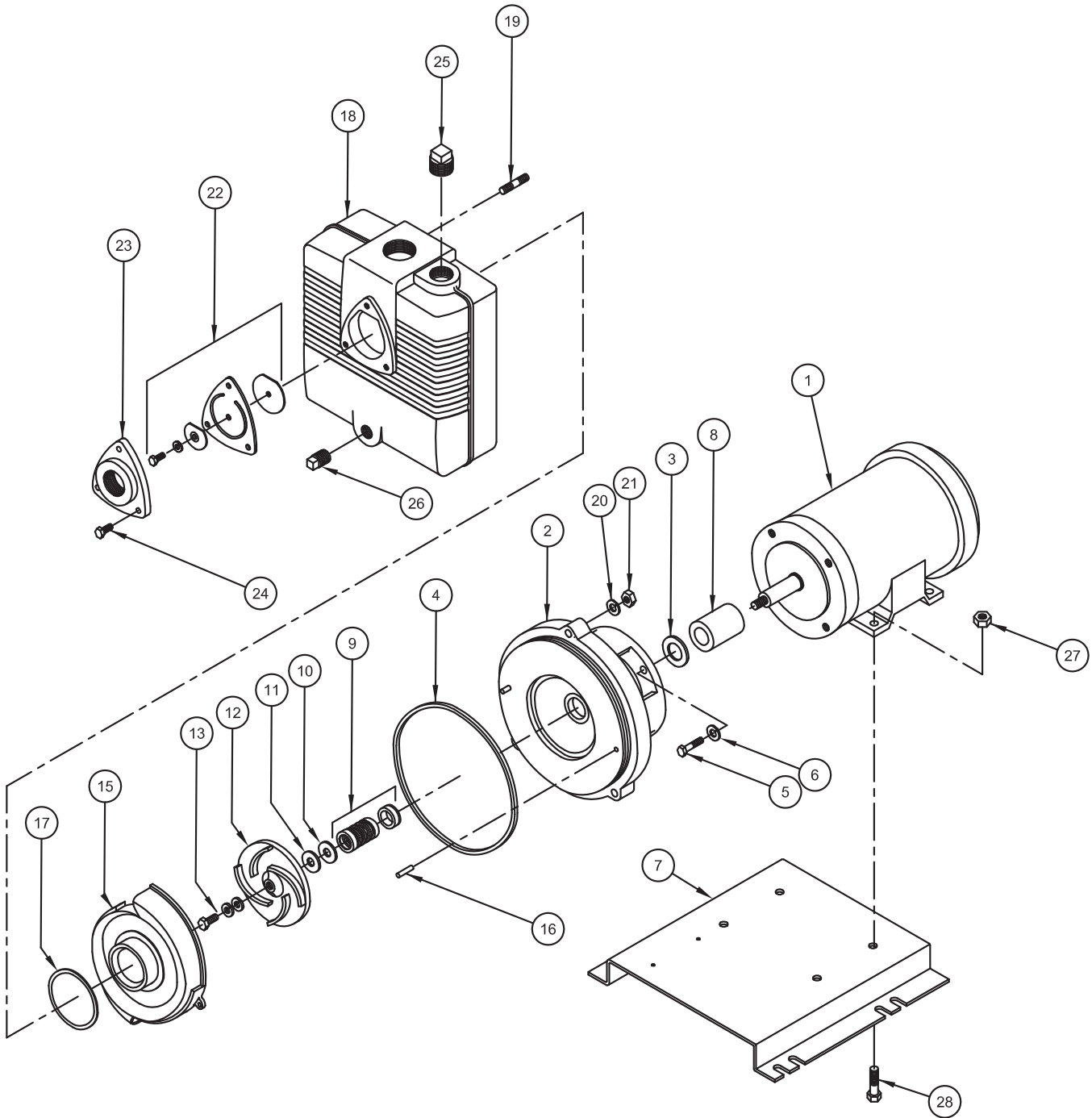
PARTS LIST

| ITEM | QTY. | PART No. | DESCRIPTION |
|------|------|----------------|---|
| 1 | 1 | 015-230-371-02 | Motor - 3CCE 230/460, ODP |
| | | 012256 | Motor - 3CCE-1 115/230, ODP |
| | | 022433 | Motor - 4CCE 200-230/460, ODP |
| | | 022432 | Motor - 4CCE-1 115/230, ODP |
| | | 027455 | Motor - 5CCE 200-230/460, ODP |
| | | 027456 | Motor - 5CCE-1 115/230, ODP |
| | | 031203 | Motor - 3CCE 200-230/460, TEFC |
| | | 031473 | Motor - 3CCE-1 115/230, TEFC |
| | | 031474 | Motor - 4CCE 200-230/460, TEFC |
| | | 031475 | Motor - 4CCE-1 115/230, TEFC |
| | | 037646 | Motor - 5CCE 200-230/460, TEFC |
| | | 106434 | Motor - 5CCE-1 115/230, TEFC |
| 2 | 1 | 025469 ▲ | Intermediate Coupling |
| 3 | 1 | 08105 ±▲ | Slinger |
| 4 | 1 | 017713 ±▲ | O-Ring |
| 5A | 2 | Q15-57-E26 | Cap Screw, 3CCE, 4CCE, 5CCE 3/8-16 x 1.125" Lg, Steel (Top Bolts) |
| 5B | 2 | 002235 | Cap Screw, 3CCE, 4CCE, 5CCE 3/8-16 x 1.25" Lg, Steel (Bottom Bolts) |
| | 4 | 002234 ▲ | Cap Screw, 4CCE-1 3/8-16 x 1.00" Lg, Stainless |
| 6 | 4 | 028408 | Lock Washer 3/8" Steel |
| 7 | 1 | 017432 | Base |
| 8 | 1 | 017362 | Pad |
| 9 | 1 | 012703 ±▲ | Shaft Seal, TP/CE/B |
| 10 | A/R | 026707 ±▲ | Shim, .010 |
| 11 | A/R | 026706 ±▲ | Shim, .005 |
| 12 | 1 | 026153 | Impeller 3CCE |
| | | 026213 ▲ | 4CCE |
| | | 026154 | 5CCE |
| 13 | 1 | 026155 | Set Screw, 3CCE 7/16-20 |
| | 1 | 028153 ▲ | Hex Nut, 4CCE, 5CCE 7/16-20, Stainless |
| 15 | 1 | 018095 ▲ | Volute |
| 16 | 2 | 017715 ±▲ | Pin, Volute |
| 17 | 1 | 017714 ±▲ | Gasket, Volute |
| 18 | 1 | 018097 ▲ | Body |
| 19 | 3 | 016569 ▲ | Stud 3/8-16 x 1.75" Lg, Steel |
| 20 | 3 | 028408 ▲ | Lock Washer 3/8", Steel |
| 21 | 3 | 15-23-6 ▲ | Hex Nut 3/8-16, Zp |
| 22 | 1 | 017718 ▲ | Check Valve Assy. |
| 22a | 1 | 001338 | Weight 2.25" O.D., CI |
| 22b | 1 | 001339 | Weight 1.56" O.D., CI |
| 22c | 1 | 017712 ± | Gasket Neoprene |
| 22d | 1 | 20-13-1 | Lock Washer 1/4", Stainless |
| 22e | 1 | 023469 | Round Hd Screw 1/4-20 x 625" Lg, Stainless |
| 23 | 1 | 018099 ▲ | Suction Flange |
| 24 | 3 | 002218 ▲ | Cap Screw 5/16-18 x .875" Lg, Steel |
| 25 | 1 | 003206 ▲ | Pipe Plug 1.25 NPT |
| 26 | 1 | 003204 ▲ | Pipe Plug .75 NPT |

SERIES: 10CCE, 10CCE-1



SERIES: 10CCE, 10CCE-1



SERIES: 10CCE, 10CCE-1

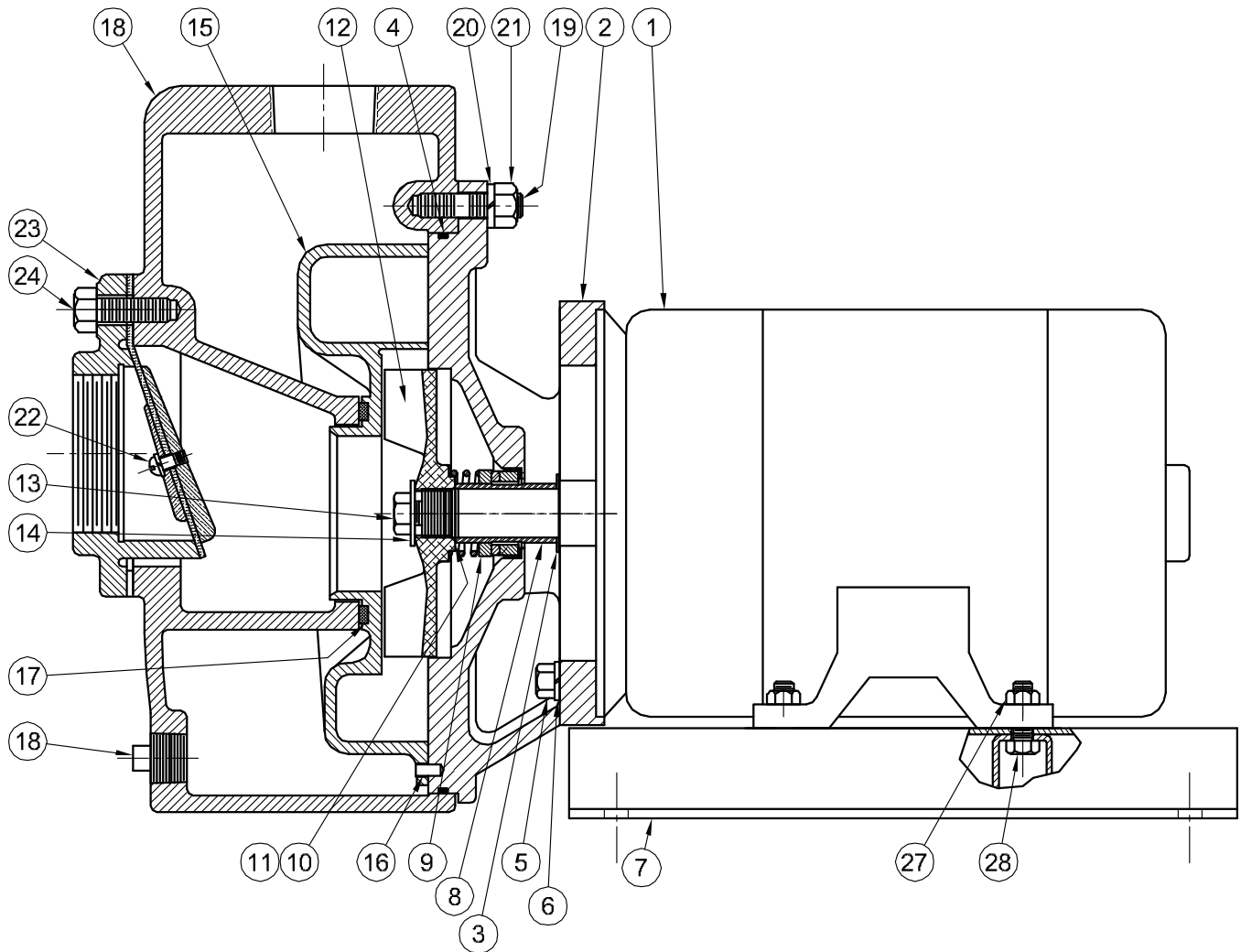
PARTS KIT

Seal KitP/N: 072920 (‡) 3,4,8,9,10,11,16,17,22C

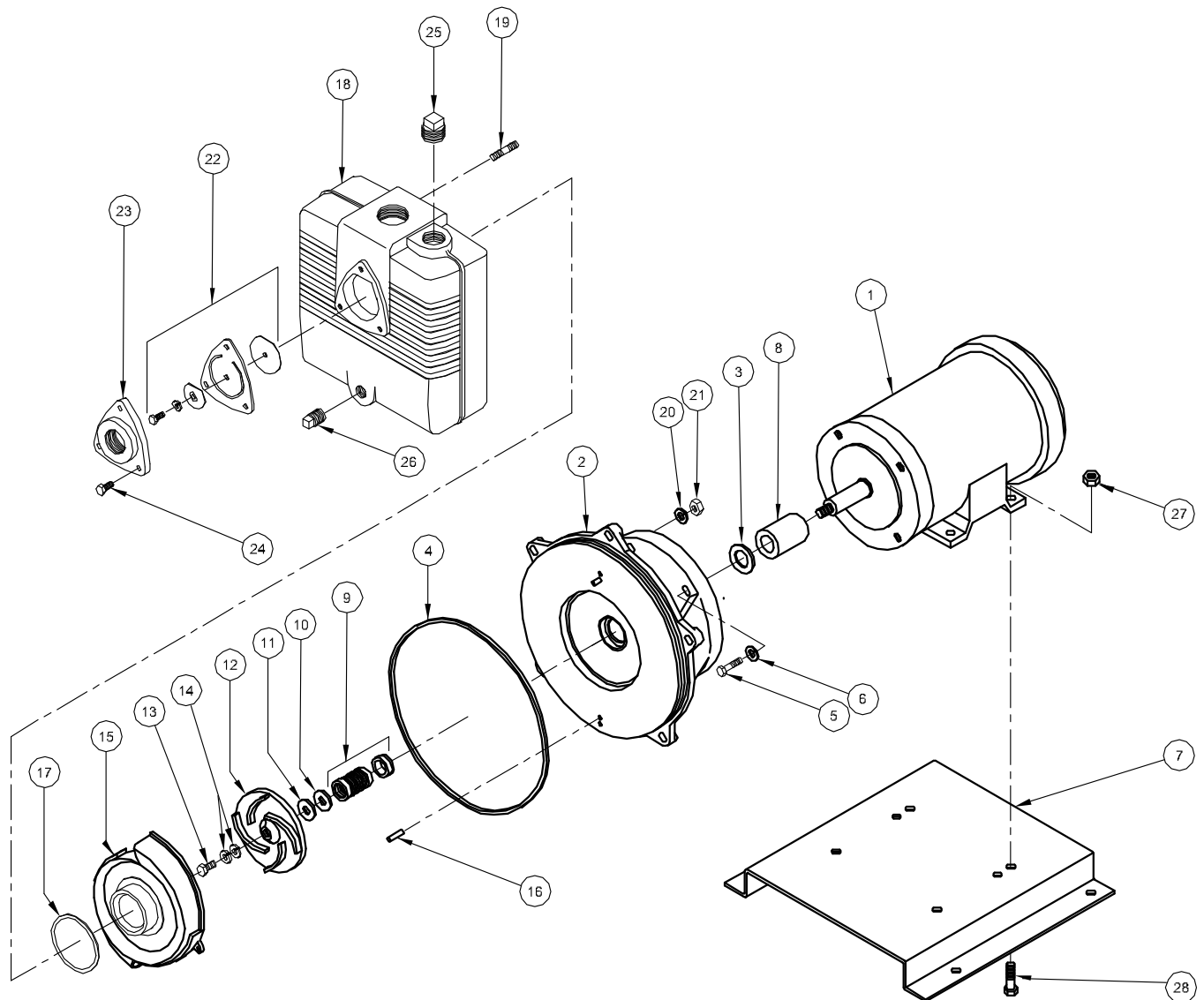
PARTS LIST

| ITEM | QTY. | PART No. | DESCRIPTION |
|------|------|----------|--|
| 1 | 1 | 028495 | Motor - 10CCE 200-230/460, ODP |
| | 1 | 028494 | Motor - 10CCE-1 230, ODP |
| | 1 | 036770 | Motor - 10CCE 200-230/460, TEFC |
| | 1 | 028494F | Motor - 10CCE-1 230, TEFC |
| 2 | 1 | 019537 | Intermediate Coupling |
| 3 | 1 | 005163 ‡ | Slinger |
| 4 | 1 | 017713 ‡ | O-Ring |
| 5 | 4 | 002266 | Cap Screw 1/2-13 x 1.50" Lg, Steel |
| 6 | 4 | 002608 | Lock Washer 1/2" Steel |
| 7 | 1 | 137242 | Base, 10CCE |
| | | 137242 | Base, 10CCE-1 |
| 8 | 1 | 018071 ‡ | Shaft Sleeve |
| 9 | 1 | 019146 ‡ | Shaft Seal C/NR/B |
| 10 | A/R | 001349 ‡ | Shim, .010 |
| 11 | A/R | 001348 ‡ | Shim, .031 |
| 12 | 1 | 019775 | Impeller |
| 13 | 1 | 019802 | Hex Hd Screw 1/2-20 x 1.00" Lg, Stainless |
| 14 | 2 | 019803 | Washer, Shakeproof 1/2, Stainless |
| 15 | 1 | 019069 | Volute |
| 16 | 2 | 017715 ‡ | Pin, Volute |
| 17 | 1 | 019245 ‡ | Gasket, Volute |
| 18 | 1 | 019135 | Body |
| 19 | 3 | 016569 | Stud 3/8-16 x 1.75" Lg, Steel |
| 20 | 7 | 028408 | Lock Washer 3/8", Steel |
| 21 | 3 | 15-23-6 | Hex Nut 3/8-16, Zp |
| 22 | 1 | 017718 | Check Valve Assy. |
| 22a | 1 | 001338 | Weight 2.25" O.D., CI |
| 22b | 1 | 001339 | Weight 1.56" O.D., CI |
| 22c | 1 | 017712 ‡ | Gasket Neoprene |
| 22d | 1 | 20-13-1 | Lock Washer 1/4", Stainless |
| 22e | 1 | 023469 | Round Hd Screw 1/4-20 x 625" Lg, Stainless |
| 23 | 1 | 018100 | Suction Flange |
| 24 | 3 | 002222 | Cap Screw 5/16-18 x 1.75" Lg, Steel |
| 25 | 1 | 003206 | Pipe Plug 1.25 NPT |
| 26 | 1 | 003204 | Pipe Plug .75 NPT |
| 27 | 4 | 15-23-6 | Hex Nut 3/8-16 Zp |
| 28 | 4 | 002234 | Hex Hd Screw 3/8-16 x 1.00"Lg, Stainless |

SERIES: 15CCE, 20CCE, 25CCE



SERIES: 15CCE, 20CCE, 25CCE



SERIES: 15CCE, 20CCE, 25CCE

PARTS KIT

Seal Kit P/N: 072918 (±) 3, 4, 8, 9, 10, 11, 16, 17, 22C

PARTS LIST

| ITEM | QTY. | PART No. | DESCRIPTION |
|------|------|-----------|---|
| 1 | 1 | 028496 | Motor - 15CCE 200-230/460, ODP |
| | 1 | 028497 | Motor - 20CCE 200-230/460, ODP |
| | 1 | 028498 | Motor - 25CCE 200-230/460, ODP |
| | 1 | 035185 | Motor - 15CCE 200-230/460, TEFC |
| | 1 | 028497F | Motor - 20CCE 200-230/460, TEFC |
| | 1 | 028498D | Motor - 25CCE 200-230/460, TEFC |
| 2 | 1 | 019553 | Intermediate Coupling |
| 3 | 1 | 005163 ± | Slinger |
| 4 | 1 | 018386 ± | O-Ring |
| 5 | 4 | 002266 | Cap Screw 1/2-13 x 1.50" Lg, Steel |
| 6 | 4 | 002608 | Lock Washer 1/2" Steel |
| 7 | 1 | 027174 | Base, 15CCE |
| | | 027352 | Base, 20CCE, 25CCE |
| 8 | 1 | 018071 ± | Shaft Sleeve |
| 9 | 1 | 019146 ± | Shaft Seal C/NR/B |
| 10 | A/R | 001349 ± | Shim, .010 |
| 11 | A/R | 001348 ± | Shim, .031 |
| 12 | 1 | 090053TB | Impeller, 15CCE |
| | 1 | 090050TB | Impeller, 20CCE |
| | 1 | 051102 | Impeller, 25CCE |
| 13 | 1 | 019802 | Hex Hd Screw 1/2-20 x 1.00" Lg, Stainless |
| 14 | 2 | 019803 | Washer, Shakeproof 1/2, Stainless |
| | 1 | 070089 | Washer, 25CCE Only |
| 15 | 1 | 018883 | Volute, 15CCE, 20CCE |
| | 1 | 019102 | Volute, 25CCE |
| 16 | 2 | 017715 ± | Pin, Volute |
| 17 | 1 | 018388 ± | Gasket, Volute |
| 18 | 1 | 019042 | Body |
| 19 | 5 | 016409 | Stud 1/2-13 x 2" Lg, Steel |
| 20 | 7 | 002608 | Lock Washer 1/2", Steel |
| 21 | 3 | 15-6-6 | Hex Nut 1/2-13, Zp |
| 22 | 1 | 018387 | Check Valve Assy. |
| 22a | 1 | 001588 | Weight 2.75" O.D., Steel |
| 22b | 1 | 067500 | Weight 4" O.D., Steel |
| 22c | 1 | 018008 ± | Gasket Neoprene |
| 22d | 1 | 022333 | Lock Washer 1/4", Stainless |
| 22e | 1 | 1-7-1 | Hex Hd Screw 1/4-20 x 1.00" Lg, Stainless |
| 22f | 1 | 15-5-1 | Hex Nut 1/4-20, Stainless |
| 23 | 1 | 018884 | Suction Flange, 15CCE |
| 24 | 3 | Q15-1-E26 | Cap Screw 1/2-13 x 1.25" Lg, Steel |
| 25 | 1 | 003205 | Pipe Plug 1.00 NPT |
| 26 | 1 | 003205 | Pipe Plug 1.00 NPT |
| 27 | 4 | 15-23-6 | Hex Nut 3/8-16 Zp |
| 28 | 4 | 002234 | Hex Hd Screw 3/8-16 x 1.00"Lg, Stainless |

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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.

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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.

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Fax (905) 457-2650

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.**