



**INSTRUCTION MANUAL  
AND  
PARTS LIST  
FOR  
110 / 210H CANNED MOTOR PUMPS**




**WARNING**


This Special Instruction Manual and General Instructions Manual, CA-1, should be read thoroughly prior to pump installation, operation or maintenance.

**SRM00073 | Rev. 0 (02-0037) | January 31, 2002**



## READ THIS ENTIRE PAGE BEFORE PROCEEDING

FOR THE SAFETY OF PERSONNEL AND TO PREVENT DAMAGE TO THE EQUIPMENT, THE FOLLOWING NOMENCLATURE HAS BEEN USED IN THIS MANUAL:

	<b>DANGER</b>	
Failure to observe the precautions noted in this box can result in severe bodily injury or loss of life.		

	<b>WARNING</b>	
Failure to observe the precautions noted in this box can cause injury to personnel by accidental contact with the equipment or liquids. Protection should be provided by the user to prevent accidental contact.		

	<b>CAUTION</b>	<b>ATTENTION</b>
Failure to observe the precautions noted in this box can cause damage or failure of the equipment.		

Non compliance of safety instructions identified by the following symbol could affect safety for persons:  	Safety instructions where electrical safety is involved are identified by:  	Safety instructions which shall be considered for reasons of safe operation of the pump and/or protection of the pump itself are marked by the sign:  <div style="text-align: center;"><b>ATTENTION</b></div>
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<b>ATTENTION</b>
<b><i>If operation of this pump is critical to your business, we strongly recommend you keep a spare pump or major repair kit in stock at all times. As a minimum, a minor repair kit (o-rings, gaskets, shaft seal and bearings) should be kept in stock so pump refurbishment after internal inspection can be accomplished.</i></b>

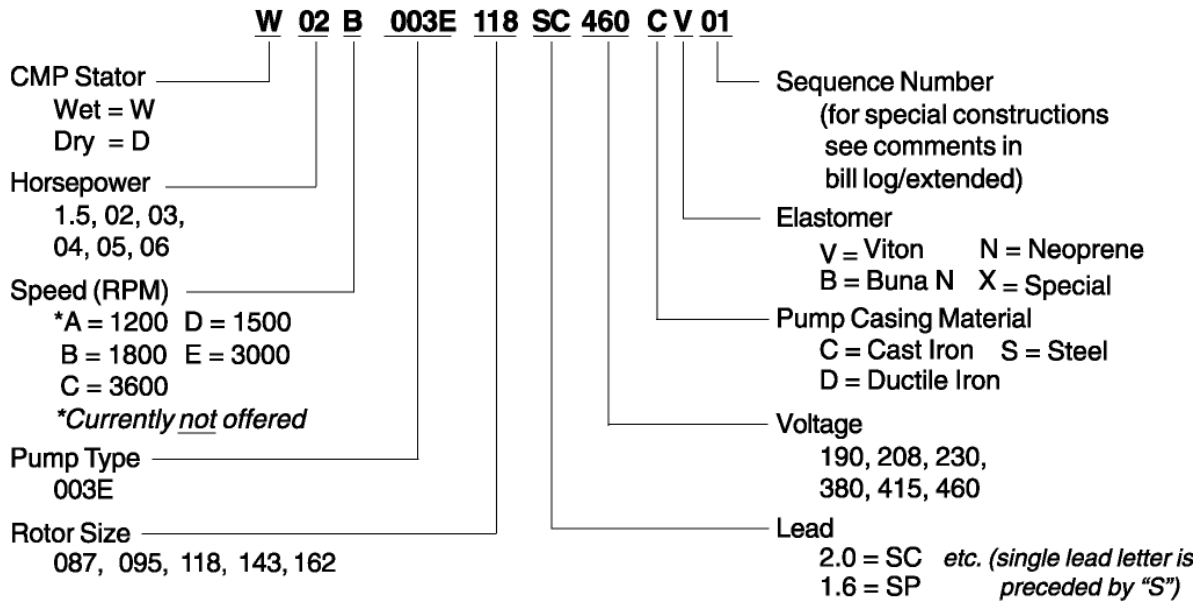
## GENERAL INSTRUCTIONS

**NOTE:** Individual contracts may have specific provisions that vary from this manual. Should any questions arise which may not be answered by these instructions, refer to General Instructions Manual, CA-1, provided with your order. For further detailed information and technical assistance please refer to Imo Pump, Technical Service Department at (704) 289-6511.

This manual cannot possibly cover every situation connected with installation, operation, inspection and maintenance of equipment supplied. Every effort was made to prepare text of manual so that engineering and design data is transformed into most easily understood wording. Imo Pump must assume personnel assigned to operate and maintain supplied equipment and apply this instruction manual have sufficient technical knowledge and are experienced to apply sound safety and operational practices which may not be otherwise covered by this manual.

In applications where equipment furnished by Imo Pump is to be integrated with a process or other machinery, these instructions should be thoroughly reviewed to determine proper integration of the equipment into overall plant operational procedures.

**This instruction manual covers the Series 110H and 210H Canned Motor Pumps. The model numbers of a particular pump may be found on nameplate. Refer to Figures 1 and 4 and Tables 1 and 2 for instructional keys when using this manual.**



**Figure 1 – Model Designation**

<b>IMO</b>		<b>CANNED MOTOR PUMP</b>	
Imo Pump		Imo Pump    Monroe NC USA	
TYPE	<input type="text"/>	DATE	<input type="text"/>
SERIAL	<input type="text"/>	TIME RATING	<input type="text"/>
HP	<input type="text"/>	RPM	<input type="text"/>
CODE	<input type="text"/>		
VOLTS	<input type="text"/>	HERTZ	<input type="text"/>
PH	<input type="text"/>		
INSUL CLASS	<input type="text"/>	AMPS	<input type="text"/>
AMB	<input type="text"/> °C		

**Figure 2 – Nameplate Data**

### Ordering Instructions

All correspondence pertaining to renewal parts for equipment must refer to instruction book and should be addressed to the nearest Imo Pump representative or sales office.

Handling of renewal orders will be greatly facilitated if following directions are carefully observed:

1. Give number of instruction book.
2. Give serial number of machine for which part is desired. Number appears on nameplate
3. Give name and part number from parts list or assembly drawing

## INSTALLATION



### WARNING

This Equipment is limited to handling fluids compatible with motor windings and insulation. Provide suitable safety and emergency systems to protect personnel and property from injury due to pump malfunction, If pump handles hazardous fluids, provide for safety in event of pump leakage or malfunction.

### CAUTION

### ATTENTION

Piping to pump **MUST** be independently supported and not allowed to impose strains on case. Piping connections should be flexible whenever possible and make provision for expansion and contraction due to temperature change. Piping connections must not impose more than 1 times "API" forces and moments on inlet and outlet.

### Inlet Position

The pump inlet flange may be positioned in increments of 90° from position shown on assembly drawing. To change position of flange, remove socket head cap screws (203) and lock washers (207). Rotate housing (201) and inlet head (202) as a unit taking care not to damage O-ring (409). Replace socket head cap screws with lock washers and torque to value on assembly drawing depending on pump type. Care must be taken to not disengage pump shaft (311) from motor shaft. If this occurs, ensure key (213) is in place and properly related before re-engaging shafts.

### Suction Line

The suction line should be as short as possible. A suction line one size larger than pump inlet is recommended. All joints in suction line must be tight and sealed. This prevents air from being drawn into a pump with negative suction pressure or leaks from pump or line with positive pressure.

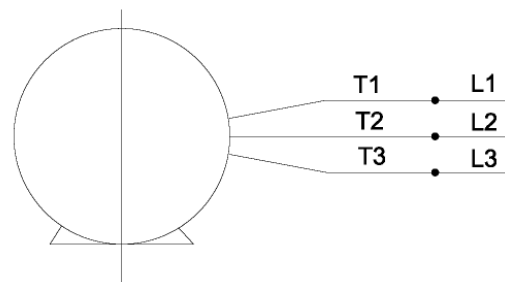
### Suction Strainer

A suction strainer of at least 100 mesh with a flow capacity of 30 - 50 gpm and a pressure drop not exceeding 0.5 psi (when newly installed) should be used. (Inlet strainer shall be sized to insure that pressure at inlet port of pump will not, under any circumstances, exceed 10 inches of mercury vacuum.) Maintenance instructions shall provide for periodic cleaning or replacement of inlet strainer.

### Electrical Connections

A label giving the electrical wiring connections for canned motor pump is located under conduit box cover and in Figure 3. Note that extended reverse rotation can cause pump damage.

3 Phase-Single Voltage



To reverse direction of rotation, interchange any two leads

Figure 3 – Motor Wiring Connections

### Rotation

Before attempting to operate pump, rotation must be verified. It is suggested that this can best be accomplished with a Phase and Motor Rotation Tester such as AVO Biddle Instruments Catalogue No. 560060 / 560400 (510 Township Line Road, Blue Bell, PA 19422 USA). Follow instrument manufacture's instructions to determine proper motor/pump rotation.

## OPERATION

### Structural Limits

Operating conditions, such as speed, fluid viscosity, inlet pressure, discharge pressure, temperature, filtration, duty cycle, mounting etc. are interrelated. Due to these variable conditions, specific application limitation may be different from structural limitations. This equipment must not be operated without verification that operating requirements are within its capabilities.

<b>CAUTION</b>		<b>ATTENTION</b>
Under no circumstances are the following structural limitations to be exceeded:		

Maximum Inlet Pressure ..... 50 PSIG  
 Maximum Discharge Pressure:  
     Series 110 ..... 400 PSI (1500 SSU max., 40 SSU min. viscosity at pumping temp.)  
     Series 210 ..... 400 PSI (1500 SSU max., 40 SSU min. viscosity at pumping temp.)  
 Maximum Fluid Temperature ..... 240°F


### INSPECTION AND PARTS LIST

Intervals for inspection and replacement of wear parts will vary greatly with the properties of pumped fluid and can only be determined by experience. All internal parts of unit are lubricated and cooled by pumped fluid. Fluid that contains abrasive materials or is corrosive will significantly reduce service life and require shorter service intervals. Wear in pump will normally show as vibration, noise, and loss of capacity or reduction in flow or pressure.

**Table 1 – Pump Parts List**

IDP	DESCRIPTION	QTY
118	Orifice	1
201	Housing	1
202	Inlet	1
203	Hex Bolt	4
204	Outlet	1
205	Hex Bolt	4
207	Lock Washer	4
208	Balance Piston Bushing	1
213	Key	1
216	Bearing	1
217	Truarc Ring	2
222	Retainer	1
223	Cap Screw	4
311	Power Rotor	1
314	Idler Rotor Assembly	2
409	O Ring	2
432	O-Ring	1

### MAINTENANCE

	<b>WARNING</b>
BEFORE working on equipment, make sure all power to the equipment is disconnected.	

**GENERAL:** To perform maintenance on canned motor pump, the following initial conditions shall be completed prior to maintenance action. Close inlet and outlet valves and tag “Out of Service”. De-energize pump drive motor and vent all pressure from pump. Remove drain plug (105) and drain fluid from pump and motor.

**NOTE:** Part numbers contained within parenthesis such as (103) refer to the balloon numbers as shown on Figure 3 and the IDP numbers in Table 1.

## Tools

Standard shop tools are required for the procedures given in this manual. An accurate torque wrench must be used to tighten all hex bolts and cap screws

## CANNED MOTOR PUMP DISASSEMBLY AND ASSEMBLY INSTRUCTIONS

**NOTE:** The below disassembly procedure applies to the pump only. The motor is not field repairable and must be returned to the factory for repair or replacement.

### PUMP REMOVAL AND DISASSEMBLY (See Figure 4)

1. Separate pump from canned motor by removing bolts (205) and O-ring (432).
2. Remove key (213) from power rotor (311).
3. Remove four hex bolts (203) with lock washers (207).
4. Remove inlet head (202).
5. Remove idler rotors (314) with thrust shoes by screwing them out of rotor housing (201).
6. Remove rotor housing (201) with O-ring (409).
7. Remove O-rings (409) from rotor housing (201).
8. Remove four cap screws (223) and ball bearing retainer (222).
9. Remove power rotor assembly (311) from inboard cover (204)
10. Remove truarc rings (217) and bearing (216) from power rotor (311).

### PUMP REASSEMBLY AND INSTALLATION (SEE FIGURE 4)

**NOTE:** Imo Pump recommends replacement of O-rings when these parts are disturbed from their original installed positions.

**NOTE:** Prior to pump re-assembly, check each part and remove any burrs then wipe all parts with lubricating oil. Rotate power rotor frequently during assembly to assure rotational clearances.

1. Clean all parts prior to assembly.
2. Install bearing (216) on power rotor (311) with truarc rings (217). Be sure to press only on inner race when installing bearing.
3. Install power rotor assembly (311) in inboard cover (204).
4. Install ball bearing retainer (222) and four cap screws (223). Torque Cap Screws (223) to value on assembly.
5. Lubricate the housing (201) pilots with a light oil or hydraulic fluid and install new O-ring (409) against shoulders of housing (201).
6. Lubricate the thread section of the power rotor (311) and install housing (201) on inboard cover (204).
7. Lubricate idler rotors (314) with light oil or hydraulic fluid and screw into housing (201).
8. Install inlet head (202) using cap screws (203) and lock washers (207). Torque cap screws (203) to value shown on assembly drawing.
9. Turn power rotor (311) by hand. Rotor should turn freely.
10. Install key (213) in rotor keyway.
11. Install O-Ring (432) on motor front cover.
12. Install pump into motor with hex bolts (205). Be sure key (213) in pump shaft engages keyway in motor shaft. Torque bolts per values on assembly drawing (Figure 4).



#### WARNING

After Assembly and prior to testing, reinstalling or operating unit, perform a High Potential test per NEMA MG1-1993 Section 1, Part 3.

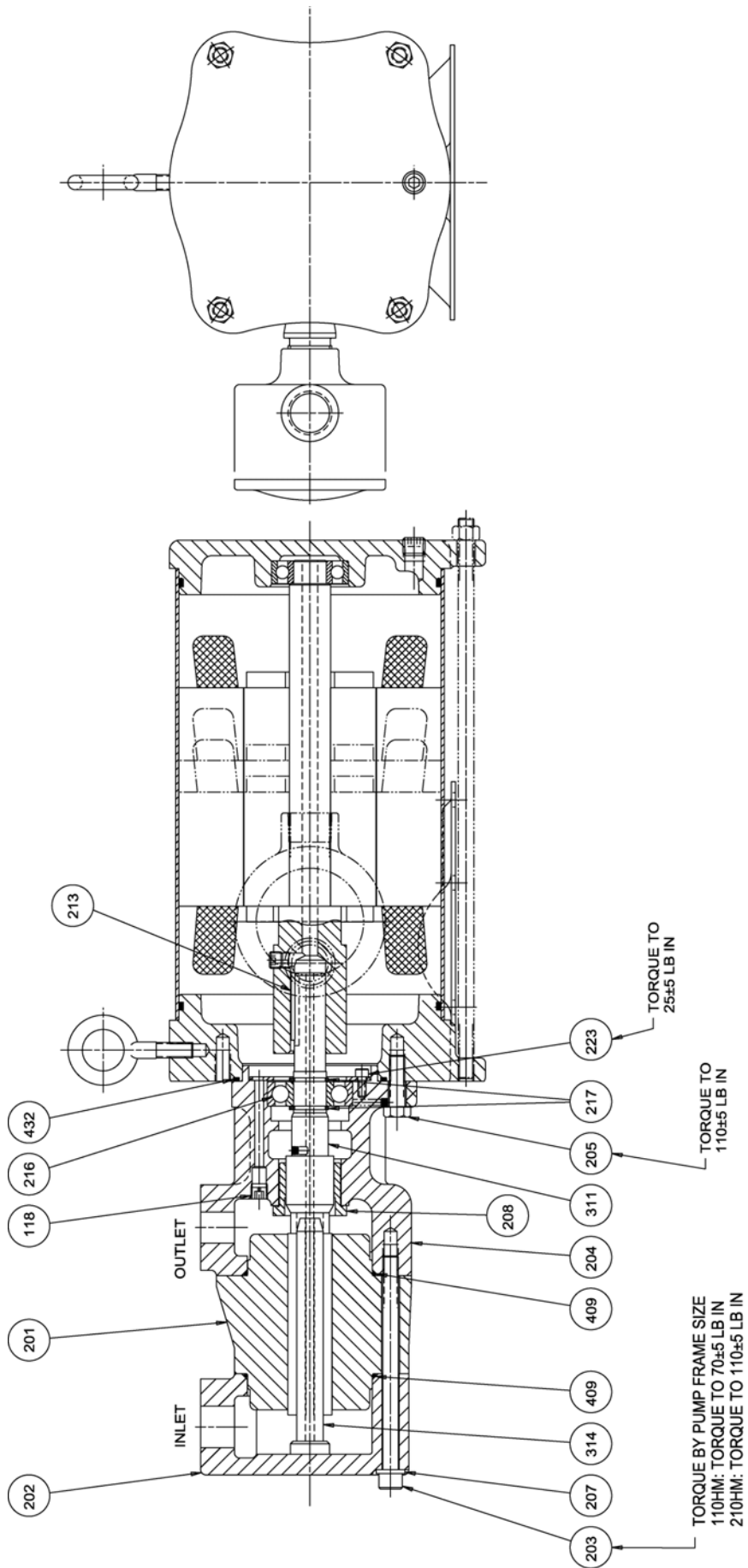


Figure 4



ALLWEILER



HOUTTUIN



IMO PUMP



WARREN



A MEMBER OF THE  
COLFAX PUMP GROUP

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