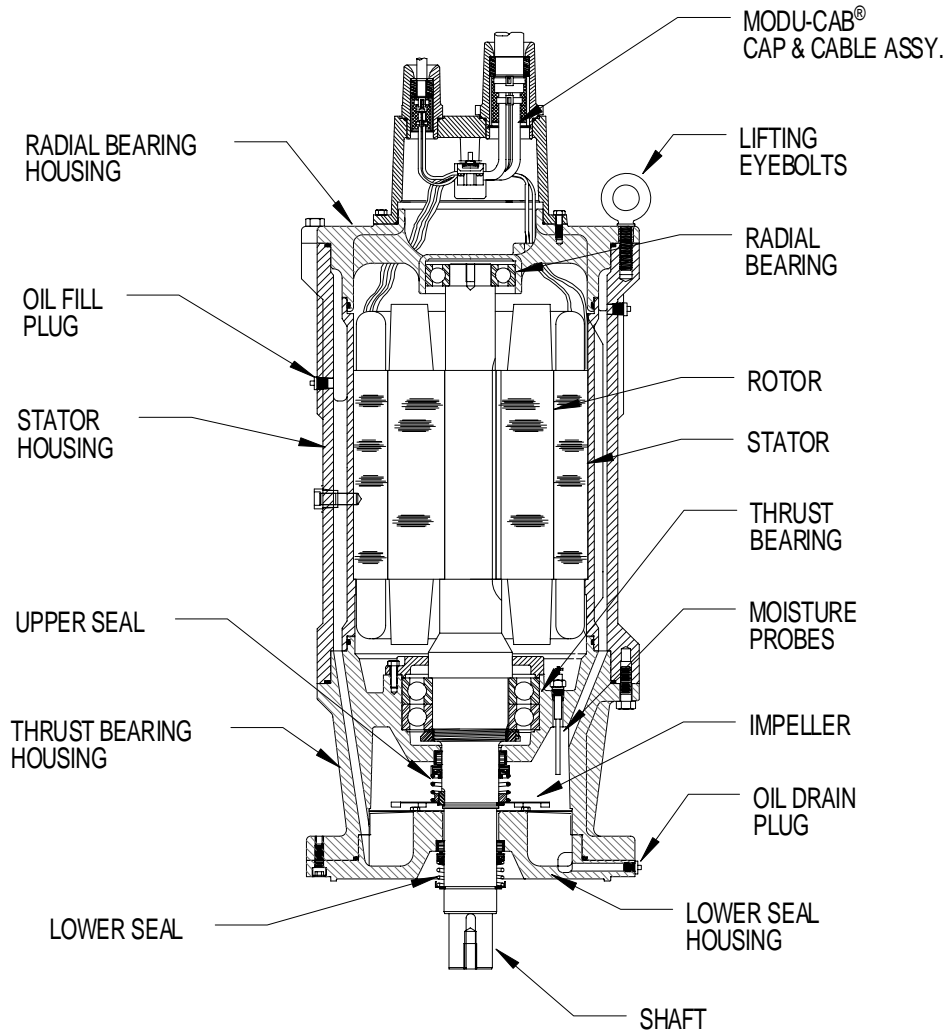


YCC DRY PIT SUBMERSIBLE CLC MOTOR

CLOSED LOOP COOLING
210 THRU 360 FRAMES

INSTALLATION, OPERATION AND MAINTENANCE MANUAL



TYPICAL MOTOR DETAIL



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ACCEPTANCE OF SHIPMENT

Thoroughly inspect this equipment before accepting shipment from the transportation company. If any of the goods called for in the bill of lading or express receipt are damaged or the quantity is short, do not accept them until the freight or express agent makes an appropriate notation on your freight bill or express receipt. If any concealed loss or damage is discovered later, notify your freight or express agent at once and request him to make an inspection. We will assist you in collecting claims for loss or damage in shipment; however, this willingness on our part does not remove the transportation company's responsibility in reimbursing you for collection of claims or replacement of material. Claims for loss or damage in shipment must not be deducted from the Yeomans Chicago Corporation (YCC) invoice, nor should payment of the YCC invoice be withheld awaiting adjustment of such claims, as the carrier guarantees safe delivery. If considerable damage has been incurred and the situation is urgent, contact the nearest YCC Representative or the factory for assistance. Please keep a written record of all such communications.

IMPORTANT

THOROUGHLY READ ALL INSTRUCTIONS BEFORE SERVICING YCC MOTORS. YCC cannot be responsible for any damage resulting from failure to comply with these instructions. This motor is not to be operated at conditions nor with liquids other than those stated in the original order acknowledgment without written permission from YCC. Keep this manual handy for ready reference.

CAUTION

Surface temperature of the motor enclosure may reach temperatures which can cause discomfort or injury to personnel making accidental contact. Protection should be provided by the user to prevent accidental contact with hot surfaces. Follow all lockout/tagout procedures before servicing.

WARNING

MOTOR MAY CONTAIN GAS UNDER PRESSURE DUE TO HIGH TEMPERATURES FROM ABNORMAL OPERATION. DISASSEMBLY MAY CAUSE BODILY INJURY. CONTACT YCC FOR ASSISTANCE.

GENERAL NOTES – YCC Dry Pit Submersible CLC Motors are totally enclosed non ventilated (TENV), internally cooled, tandem seal unit, with an oil chamber separate from the winding area. CLC is YCC's designation for submersible motors utilizing "Closed Loop Cooling". The CLC motors have cooling fluid, which is circulated within the motor frame. The lower seal housing is used as a heat sink to cool the fluid. The face of the lower seal housing must be in contact with the liquid being pumped at all times to meet nameplate rating. The CLC motor must be mounted vertical shaft down. To insure the integrity of sealing surfaces when servicing these motors, all parts should be handled with utmost care.

Wound Stators -YCC Dry pit submersible Motors utilize a wound stator, which has been pressed into the housing. The stator insulation system has been designed for the temperature and electrical ratings involved. If motor failure is analyzed to encompass a winding failure, it is required that a replacement wound stator be ordered from YCC.

MODU-CAB® Cap & Cable Assembly – The cap & cable assembly can be removed from the motor in order to perform normal inspection and repairs. Should the cap & cable assembly or individual cable modules be damaged or the integrity of the sealing components be in question, repair or replacement is required. Complete MODU-CAB® assemblies and individual cable units are available as replacement parts. Rebuild kits for field repair of the cable modules are also available as replacement parts.

Hardware - All hardware is stainless steel and, if necessary, should be replaced with the same type.

FIGURE 1
TYPICAL THERMAL PROTECTOR
WIRING DIAGRAM

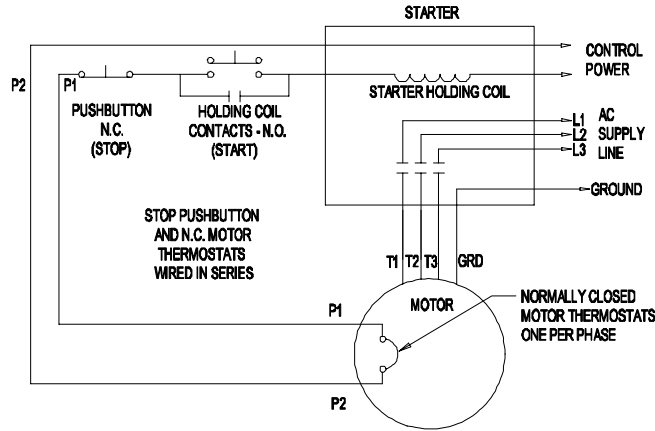


FIGURE 2
TYPICAL MOISTURE SENSING CIRCUIT
WIRING DIAGRAM

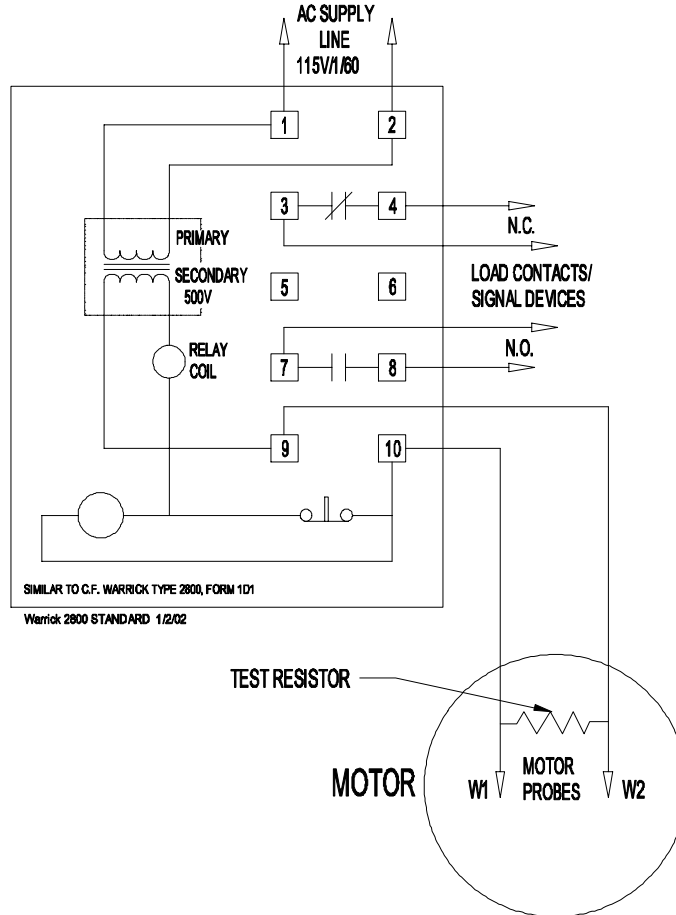


Table 1 - Lead Color Coding

		Black Lead	White Lead	Red Lead	Orange Lead	Green Lead
Power Cable	Polyphase	T1	T2	T3	-	Ground
Control Cable	All	P1	P2	W1	W2	-

LONG TERM STORAGE INSTRUCTIONS

The equipment is shipped from the factory with adequate protection for transportation in covered trucks, and for indoor storage at the job site for a limited time between receipt and installation. If the equipment is not put into service within 90 days, it should be stored in a cool, clean, and dry indoor location. The equipment should be removed from shipping packaging and inspected prior to storage. To help prevent rusting, any paint scratches or chips incurred during handling should be touched up prior to storage. Store the equipment in the vertical shaft down position.

Electrical cables must be properly supported and protected from moisture. The rotating assembly must be spun for approximately one (1) minute monthly to insure proper distribution of lubricant and to prevent damage to the shaft, bearings or seals.

INSTALLATION NOTES

Thermal Protectors (Leads marked P1 and P2) must be connected. See Figure 1 and Tables 1 & 2. If current through the thermostats exceeds the values listed in Table 2, an intermediate control circuit relay must be used to reduce the current or the thermostats will not work properly. Moisture probes (Leads marked W1 and W2) must be connected. See Figures 2 and 3 and Table 1. Check power supply against final nameplate connection voltage. When installing pump or other machine to motor shaft, care must be taken to properly fit shaft and key. If required, the impeller hub should be heated slightly before sliding it onto the shaft. **UNDER NO CIRCUMSTANCES SHOULD THE IMPELLER BE DRIVEN ON BY POUNDING. THIS WILL DAMAGE THE SEALS AND BEARINGS.** The key must be fit to shaft keyway to avoid impeller from riding on key. The fastener must employ locking means to prevent loosening. When fastener is removed, it is recommended fastener be replaced with a similar device available from YCC.

When a CLC motor ships from the factory it is ready for installation. No adjustment is required. Check that the fluid level is up to the oil fill plug (25) after motor is installed in shaft down position. The motor will operate successfully when applied within the specifications listed below.

All CLC motors will operate in either direction of rotation. To reverse the direction of a three-phase motor, interchange any two motors leads at the starter. Eyebolts are supplied for the purpose of installation and servicing the motor. **DO NOT USE THE MOTOR ELECTRICAL CABLES FOR LIFTING.**

Normal care should be exercised to prevent mechanical damage to the seal, frame and insulated electrical cable. One (1) extra nameplate is furnished. This should be retained in a safe place, preferably in the control panel where the power cable enters the enclosure.

Table 2
Maximum Current Capacity of
Motor Thermostats

Volts (VAC)	Continuous Amperes	Inrush Amperes
110~120	3.0	30
220~240	1.5	15
440~480	0.75	7.5
550_600	0.6	6.0

Check power supply against final nameplate connection voltage. This equipment is intended to operate using a supply of quality power with normally accepted characteristics of voltage unbalance, voltage variations, expected number of voltage sags/interruptions and harmonic distortion levels. The IEEE and the International Electrotechnical Commission (IEC) have developed standards to provide further guidance regarding these areas.

When the submersible motor leaves the factory it is ready for installation, however, during shipping and handling, fasteners may loosen. Verify tightness before installation. The motor will operate successfully when the following conditions are met:

- Voltage variation: 10% above or below nameplate data.
- Frequency variation: 5% above or below nameplate data.
- Voltage unbalance: 1% maximum between any two (2) incoming power legs.

Performance within these ranges will not necessarily be the same as the established performance at exact rated voltage and frequency..

MOISTURE DETECTION SYSTEM

IMPORTANT

***YCC Dry Pit Submersible CLC Motors are equipped with moisture detection devices.
Failure to properly connect or utilize this system voids the motor warranty.***

Moisture probes, leads marked W1 and W2, must be used in conjunction with an induction relay. This device will detect moisture entering the oil chamber or stator housing. When properly connected to a warning device, this system will provide notification of needed maintenance. Integrity of this system requires periodic testing.

CONTROLS AND SIGNAL DEVICES - A control and signal device (not supplied by YCC) must be installed at the installation site to complete the moisture detection system. Control leads should not be installed in the same conduit as power leads. Induced voltage can cause false moisture signals.

CONTACT OPERATION - Normally open load contacts close and normally closed load contacts open when the moisture probes detect the influx of moisture within the motor.

TEST PROCEDURE - A normally closed pushbutton and neon-indicating lamp may be provided as means of checking the moisture sensing components. When the pushbutton is depressed, the indicating lamp will be illuminated to indicate (A) power is supplied to the control, (B) the control is operative, and (C) wiring to the moisture probes in the motor is intact. This procedure should be performed periodically to confirm integrity of circuit.

If a test button is not supplied, the integrity of the circuit may be checked with an ohmmeter by first disconnecting W1 and W2 from the relay. To avoid inaccurate readings, it is important to measure the resistance across the leads to the moisture seal probe and NOT across the relay. Measured resistance should be 330,000 ohms (+/-10%). Measured resistance below this level could indicate a moisture breach. Measured resistance above this level could indicate an interruption in the circuit and/or wiring.

SIGNAL DEVICES - The signal device may be audible (bell, buzzer, horn or siren) or visible (incandescent or neon lamp) or both -a signal device of your choice may be obtained from your local electrical supply house.

SYSTEM OPERATION - It is recommended that upon indication (by warning light, etc.) of lower seal failure that the motor is removed from the installation and the fluid and lower seal is replaced as soon as possible. If reconditioning is not performed within a 30-day period it is recommended that the upper seal and thrust bearing be thoroughly inspected and replaced if required. Disregard of this warning and/or failure to perform this inspection may result in catastrophic failure and will void the warranty.

When ordering parts or reporting trouble please have complete motor nameplate data available.

DISASSEMBLY INSTRUCTIONS

WARNING

TO AVOID CONTACT WITH LIVE PARTS, DISCONNECT ALL POWER INCLUDING POWER TO THE MOISTURE CONTROL SYSTEM BEFORE PERFORMING ANY DISASSEMBLY OPERATIONS.

WARNING

MOTOR MAY CONTAIN GAS UNDER PRESSURE DUE TO HIGH TEMPERATURES FROM OPERATION. DISASSEMBLY MAY CAUSE BODILY INJURY.

Refer to cross-section Drawings Figure 5.a (210), Figure 5.b (250), Figure 5.c (320), and Figure 5.d (360)

ELECTRICAL REPAIRS

(250)

EXCEPT for replacement of the MODU-CAB[®] assembly, electrical repairs for the 250 CLC motor require the complete disassembly of the motor. Refer to Mechanical Repair (250 only) section for instructions.

(210, 320 and 360)

CAUTION

Follow all lockout/tagout procedures before servicing. Disconnect motor leads and control cable leads.

Electrical repairs such as stator repair and/or replacement or servicing of thermal protectors may be accomplished without disturbing the rotating assembly (i.e. Rotor and Thrust Bearing Housing).

Mount the motor in the vertical shaft down position.

Drain internal cooling fluid from the motor frame by first removing pipe plug (25) and then removing drain plug (40). Use caution in removing these plugs. Slowly unthread the plug until loose and the internal pressure is relieved. Use caution in the removal of this fluid to prevent spillage and dispose of properly. Uncontaminated fluid may be reused.

Loosen, but do not remove cap screws (26) securing the MODU-CAB[®] assembly (9). Back MODU-CAB[®] assembly slowly out of radial bearing housing (8) until loose and internal pressure is relieved. Remove all screws.

Disconnect the motor power leads (T1, T2 and T3), and ground screw (27) in the cap. Disconnect moisture probe leads (W1 and W2) and thermal protector leads (P1 and P2). Remove MODU-CAB[®] assembly .

Remove thrust bearing housing mounting screws (23) from the thrust bearing housing (5).

Using the eyebolts (38), carefully lift the stator/stator housing and radial bearing housing assembly up and off the thrust bearing housing assembly.

Make sure that moisture probe leads are free to be pulled through the opening in the radial bearing housing as these leads are connected to the thrust bearing housing.

If necessary, radial bearing housing (8) can be removed from stator/stator housing assembly (7) by removing cap screws (24) from the radial bearing housing.

MECHANICAL REPAIRS (210, 320 and 360)

CAUTION

Follow all lockout/tagout procedures before servicing. Disconnect motor leads and control cable leads.

To inspect Lower seal:

Place the motor in the shaft-up position.

NOTE: Attempted removal of the lower seal may require it to be replaced.
Remove lower seal snap ring (12).

Remove lower seal (13) rotating element.

Thoroughly clean the recess and visually inspect the seal.

To inspect the Upper seal:

Place the motor in the shaft-down position.

NOTE: Fluid will flow from the lower seal area if the seal is removed before draining fluid.

Remove frame pipe plug (25), drain fluid plug (40) and drain fluid. Remove lower seal as explained above.

Remove cap screws (22) from lower seal housing (4).

Remove lower seal housing (4).

To replace oil baffle, remove oil baffle (41) from lower seal housing (4) by removing screws (42).

Remove inner seal snap ring (15), fluid impeller (29) impeller key (36) and upper seal (16) rotating element.

Thoroughly clean the chamber and visually inspect seal.

Thrust Bearing Replacement:

Remove fluid, seals and lower seal housing as described above. Mount motor in vertical shaft down position and continue as follows.

Refer to Electrical Repairs for removal of stator/stator housing assembly from the thrust bearing housing.

Disconnect the moisture probe lead wires (32) at probes (21).

Remove cap screws (46) securing the thrust bearing cap (6) to the thrust bearing housing (5).

Place an eyebolt (not provided) in the threaded hole in upper end of the shaft (3) and lift the rotating assembly from the thrust bearing housing (5).

Remove thrust bearing locknut and lockwasher (45) 320 & 360 frames or thrust bearing snap ring (44) 210 frame, from shaft (3).

Using a suitable bearing puller, remove thrust bearing (10).

Remove thrust bearing cap (6) from shaft.

Total Disassembly:

Remove moisture probes (21) and resistor (37) if necessary.

Using a suitable bearing puller, remove radial bearing (11), if necessary.

MECHANICAL REPAIRS (250)

CAUTION

Follow all lockout/tagout procedures before servicing. Disconnect motor leads and control cable leads.

Place the motor in the shaft-down position.

Remove MODU-CAB[®] assembly (9) as described in Electrical Repair (210, 320 and 360) section.

If the cooling fluid cavity is to be opened, thoroughly drain fluid by removing pipe plug (25) and then removing drain plug (40). Use caution in removing these plugs. Slowly unthread the plug until loose and the internal pressure is relieved. Properly dispose of contaminated fluid. Uncontaminated fluid may be reused.

Rotate motor to the vertical shaft up position.

To inspect Lower seal:

NOTE: Attempted removal of the lower seal may require it to be replaced.

Remove lower seal snap ring (12).

Remove lower seal (13) rotating element.

Thoroughly clean the recess and visually inspect the seal.

To inspect the Upper seal:

Remove cap screws (22) from lower seal housing (4) and remove lower seal housing.

Remove upper seal snap ring (15), fluid impeller (29) impeller key (36) and upper seal (16) rotating element.

Thoroughly clean the chamber and visually inspect seal.

Stator / Stator Housing Removal:

Disassemble motor as described previously.

Thoroughly clean the fluid chamber and remove cap screws (23) from the thrust bearing housing (5).

Place a properly sized eyebolt (not provided) in the shaft (3) extension and carefully lift the rotating assembly from the stator/stator housing assembly. Make sure that moisture probe leads (32) are free to pull through the cored lead channel in the stator housing (7) and radial bearing housing (8).

Rotate the stator/stator housing and radial bearing housing (8) assembly to the shaft down position.

Remove cap screws (24) from the radial bearing housing (8).

Lift housing from the stator/stator housing assembly.

Thrust Bearing Replacement:

Remove rotating assembly as described previously and place horizontally on bench. Carefully block assembly so that it cannot roll. Disconnect the moisture probe lead wires (32) at probes (21).

Remove cap screws (46) securing the thrust bearing cap (6) to the thrust bearing housing (5) and remove bearing housing.

Remove thrust bearing snap ring (44) from shaft (3).

Using suitable bearing puller, remove thrust bearing (10).

Remove thrust bearing cap (6) from shaft.

Total Disassembly:

Remove moisture probes (21) and resistor (37) if necessary.

Using suitable bearing puller, remove radial bearing (11).

RE-ASSEMBLY INSTRUCTIONS (210, 320 and 360)

WARNING

SUITABLE PROTECTIVE CLOTHING (I.E. GLOVES) MUST BE WORN WHEN HANDLING HEATED COMPONENTS.

Thoroughly clean all parts prior to re-assembly. Special care must be taken with o-rings and o-ring fits. Place o-rings on all bracket fits and lightly coat fits with grease (not excessive).

CAUTION

When installing ball bearings, press only against inner races of bearings. Pressing outer races will damage rolling elements and damage the bearing. Press evenly on inner race, using extreme care not to score the shaft.

Rotating Assembly

It may be necessary to heat bearings to facilitate installation due to close tolerance fits. Bearings may be heated by either of the following methods:

OIL BATH: Accomplished by submerging bearing in a tank of oil having a high flash point. The bearing should be suspended so as not to be in contact with the heat source, for 20 to 30 minutes at a temperature of approximately 220°F. Oil temperature must not exceed 250°F.

INDUCTION HEATING: Accomplished by applying heat directly to the bearing (i.e., commercially available induction bearing heater). Extreme caution must be exercised to insure that bearing temperature does not exceed 200°F.

The bearings should be quickly installed and positioned squarely against mating face while it is still hot and secured with appropriate locknut or retaining ring.

Install radial bearing (11) on shaft. Pack the bearing 2/3 to 3/4 full with specified grease.

Assemble thrust bearing cap (6) and thrust bearing (10) to the rotor/shaft assembly. NOTE: 8222 *PumPac* bearings must be prelubricated and installed in accordance with instructions supplied with the bearings. Special care must be taken to position the directional "arrow" marks on the outer races of the bearings toward the output end of the shaft.

Secure the thrust bearing on the shaft with bearing lockwasher and locknut (45) – 320 & 360 or snap ring (44) -210. Tighten the locknut securely and engage the lockwasher locking tab after the bearing has cooled.

Thrust Bearing Housing Assembly

Coat moisture probe (21) pipe threads with sealant and screw into place making sure they are tight. Clean excessive sealant from the bearing housing.

Coat all machined surfaces of thrust bearing housing (5) with a thin coat of grease.

Prepack the thrust bearing (10) 2/3 to 3/4 full with specified grease after the bearing has cooled.

Lower the reassembled rotating assembly into thrust bearing housing (5). Secure the thrust bearing cap (6) to the bearing housing with cap screws (46).

Attach the moisture probe lead wires (32) marked W1 and W2 and resistor (37) to probes (21). Lower the stator housing (7) over rotating assembly, pulling W1 and W2 lead wires (32) through cored channel in the stator housing.

Bolt the thrust bearing housing (5) to the stator housing (7) with cap screws (23) making sure o-rings (18) and (19) are not damaged and are properly seated.

Radial Bearing Housing Assembly

Coat all machined surfaces of the radial bearing housing with a thin coat of grease.

Assemble radial bearing housing to stator housing (7) by lowering onto stator housing assembly while pulling all lead wires through cored openings in radial bearing housing (8). Make sure o-rings (18) & (19) are properly seated.

Secure radial bearing housing (8) to stator housing (7) with cap screws (24).

Lower Seal / Lower Seal Housing Assembly

Place the motor assembly in the vertical shaft up position. Thoroughly clean seal cavity and probes.

Lightly lubricate the upper seal (17) stationary seat rubber seal and the thrust bearing housing (5) seal seat with water or water-based seal installation lubricant such as P-80® Rubber Lubricant. *Do not use oil or grease as a seal lubricant.* Make sure that the lapped seal face is exposed. Carefully place the upper seal stationary seat (17) over shaft (3) and into the thrust bearing housing (5). Using a suitable pressing tool, press stationary seat until properly positioned.

Wipe lapped face clean with a clean towel or rag. Lightly lubricate rubber parts of upper seal (16) rotating element and shaft (3) with water or water-based seal installation lubricant such as P-80® Rubber Lubricant. *Do not use oil or grease as a seal lubricant.* Slide complete rotating element onto shaft.

Install upper seal spring and place fluid impeller (29) and impeller key (36) onto shaft and against the spring. Firmly push impeller into position and install upper seal snap ring (15) on shaft using a suitable tool. Turn shaft by hand to make sure seal is properly seated. Assemble oil baffle (41) to lower seal housing (4) using screws (42).

RECOMMENDED REPLACEMENT Cooling Fluid When checking the level or adding fluid, add the same type of fluid (do not mix).

UNITS SHIPPED PRIOR TO JANUARY, 2008:

Citgo Sentry 19, Mobil Mobiltherm 603 or Amoco Heat Transfer Oil No. 4199

UNITS SHIPPED AFTER JANUARY, 2008:

These units have a tag or sticker identifying the fluid as **Royal Purple Barrier Fluid FDA Grade 22**. All CLC motors can be upgraded to this product after draining all of the existing fluid.

TABLE 3
RECOMMENDED OIL QUANTITIES
(Royal Purple Barrier Fluid FDA Grade 22)

MOTOR FRAME	QUANTITY
210	12 quarts
250	16 quarts
320	24 quarts
360	32 quarts

Recommended Grease for Bearings: CITGO Lithium EP-2 or equivalent.

Assemble lower seal housing (4) to the thrust bearing housing (5) using cap screws (22). Make sure o-ring (28) is lubricated and properly seated before tightening. Thoroughly clean seal cavity.

Install lower seal (14) stationary and rotating elements and lower seal snap ring (12) following the procedure outlined above. When complete, turn shaft by hand to make sure seals are properly seated.

Rotate motor to the shaft down position. Replace lower pipe plug (40).

Remove pipe plugs (25) and (39) and fill with Royal Purple Barrier Fluid FDA Grade 22 fluid until fluid level reaches the pipe plug hole (25). For the approximate quantity of fluid required see Table 3. Do not use standard oil or the cooling capacity of the motor will be reduced and the motor may overheat prematurely.

MODU-CAB® assembly

Place o-ring (20) over fit and lightly coat with grease (not excessive).

Using suitable connectors, reconnect power leads to proper final voltage connection. Be sure to check lead wire marking and color coding prior to connecting. Refer to Table 1 for correct lead color-coding.

Reconnect control leads W1 to W1, W2 to W2, P1 to P1, P2 to P2.

Reconnect power cable ground wire to ground terminal in top of radial bearing housing (8) using screw (27).

Secure MODU-CAB® assembly (9) to radial bearing housing (8) using screws (26), making sure that the o-ring (20) is properly seated before tightening.

RE-ASSEMBLY INSTRUCTIONS (250)

Thoroughly clean all parts prior to re-assembly. Special care must be taken with o-rings and o-ring fits. Place o-rings on all bracket fits and lightly coat fits with grease (not excessive).

CAUTION

When installing ball bearings, press only against inner races of bearings. Pressing outer races will damage rolling elements and damage the bearing. Press evenly on bearing inner race, using extreme care not to score the shaft.

Rotating Assembly

It may be necessary to heat bearings to facilitate installation due to close tolerance fit. Bearings may be heated by either of the following methods:

OIL BATH: Accomplished by submerging bearing in a tank of oil having a high flash point. The bearing should be suspended so as not to be in contact with the heat source, for 20 to 30 minutes at a temperature of approximately 220 F. Oil temperature must not exceed 250 F.

INDUCTION HEATING: Accomplished by applying heat directly to the bearing (commercially available induction bearing heater). Extreme caution must be exercised to insure that bearing temperature does not exceed 200 F.

The bearings should be quickly installed and positioned squarely against mating face while it is still hot and secured with appropriate locknut or retaining ring.

WARNING

SUITABLE PROTECTIVE CLOTHING (GLOVES) MUST BE WORN WHEN HANDLING HEATED COMPONENTS.

Assemble radial bearing (11), thrust bearing cap (6) and thrust bearing (10) to the rotor/shaft assembly.

Secure the thrust bearing on the shaft with bearing snap ring (44).

Thrust bearing Housing Assembly

Coat moisture probe (21) pipe threads with sealant and screw into place, making sure they are tight. Clean excessive sealant from the bearing housing.

The thrust bearing must be packed 2/3 to 3/4 full with specified grease. Coat all machined surfaces of the thrust bearing housing with a thin coat of grease. Install thrust bearing housing (5) over thrust bearing (10). Secure inner bearing cap (6) to the bearing housing with cap screws (46).

Attach moisture probe lead wires (32) marked W1 and W2 and resistor (37) to probes (21). Install the thrust bearing housing / rotating assembly into the stator housing while pulling the moisture probe lead wires W1 and W2 through the cored passage in the stator housing.

Bolt the thrust bearing housing (5) to stator housing (7) with cap screws (23) making sure o-ring (18) is not damaged and is properly seated.

Radial bearing housing Assembly

Radial bearing (11) must be packed 2/3 to 3/4 full with specified grease. Coat all machined surfaces of the radial bearing housing with a thin coat of grease.

Mount motor assembly in the shaft down position and lower radial bearing housing (8) onto the motor assembly. Pull moisture probe leads W1 and W2, thermal protector leads P1 and P2, and motor power leads through cored cavities in the radial bearing housing (8).

Install cap screws (24) to secure the radial bearing housing (8) to the stator housing (7). Make sure that o-rings (19) are seated properly.

Lower Seal / Mounting Flange Assembly

Place the motor assembly in the vertical shaft up position. Thoroughly clean seal cavity and probes. Lightly lubricate the upper seal (17) stationary seat rubber seal and thrust bearing housing (5) seal seat with water or water-based seal installation lubricant such as P-80® Rubber Lubricant. Do not use oil or grease as a seal lubricant.

Make sure that the lapped seal face is exposed. Carefully place the upper seal (17) stationary seat over the shaft (3) and into the thrust bearing housing (5). Using a suitable pressing tool, press until properly positioned. Wipe lapped face clean with a clean towel or rag.

Lightly lubricate rubber parts of upper seal (16) rotating element and shaft (3) with water or water-based seal installation lubricant such as P-80® Rubber Lubricant. Do not use oil or grease as a seal lubricant. Slide complete upper seal rotating element onto shaft.

Install upper seal spring and place fluid impeller (29) and impeller key (36) onto shaft and up against the spring. Firmly push impeller into position and install upper seal snap ring (15) on shaft using a suitable tool. Turn shaft by hand to make sure seal is properly seated.

Assemble lower seal housing (4) to the stator housing using cap screws (22). Make sure o-ring (19) is lubricated and properly seated before tightening. Thoroughly clean seal cavity.

Install lower seal (14) stationary and rotating element and lower seal snap ring (12) following the procedure outlined above. When complete, turn shaft by hand to make sure seals are properly seated.

Rotate motor to the shaft down position.

Replace lower pipe plug (40).

Remove pipe plugs (25) and (39) and fill with Royal Purple Barrier Fluid FDA Grade 22 fluid until fluid level reaches the pipe plug hole (25). For the approximate quantity of fluid required see Table 3. Do not use standard oil or the cooling capacity of the motor will be reduced and the motor may overheat prematurely.

MODU-CAB® assembly

Place o-ring (20) over fit and lightly coat with grease (not excessive).

Using suitable connectors, reconnect power leads to proper final voltage connection. Be sure to check lead wire marking and color coding prior to connecting. Refer to Table 1 for correct lead color-coding.

Reconnect control leads W1 to W1, W2 to W2, P1 to P1, P2 to P2.

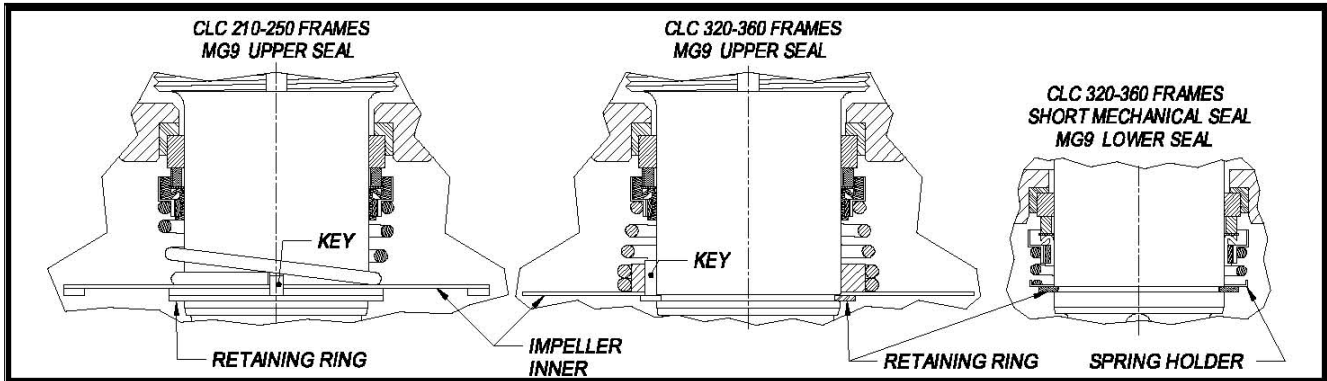
Reconnect power cable ground wire to ground terminal in top of radial bearing housing (8) using screw (27).

Secure MODU-CAB® assembly (9) to radial bearing housing (8) using screws (26), making sure that the o-ring (20) is properly seated before tightening.

ADDENDUM

MECHANICAL SEAL INSTRUCTION – CLC

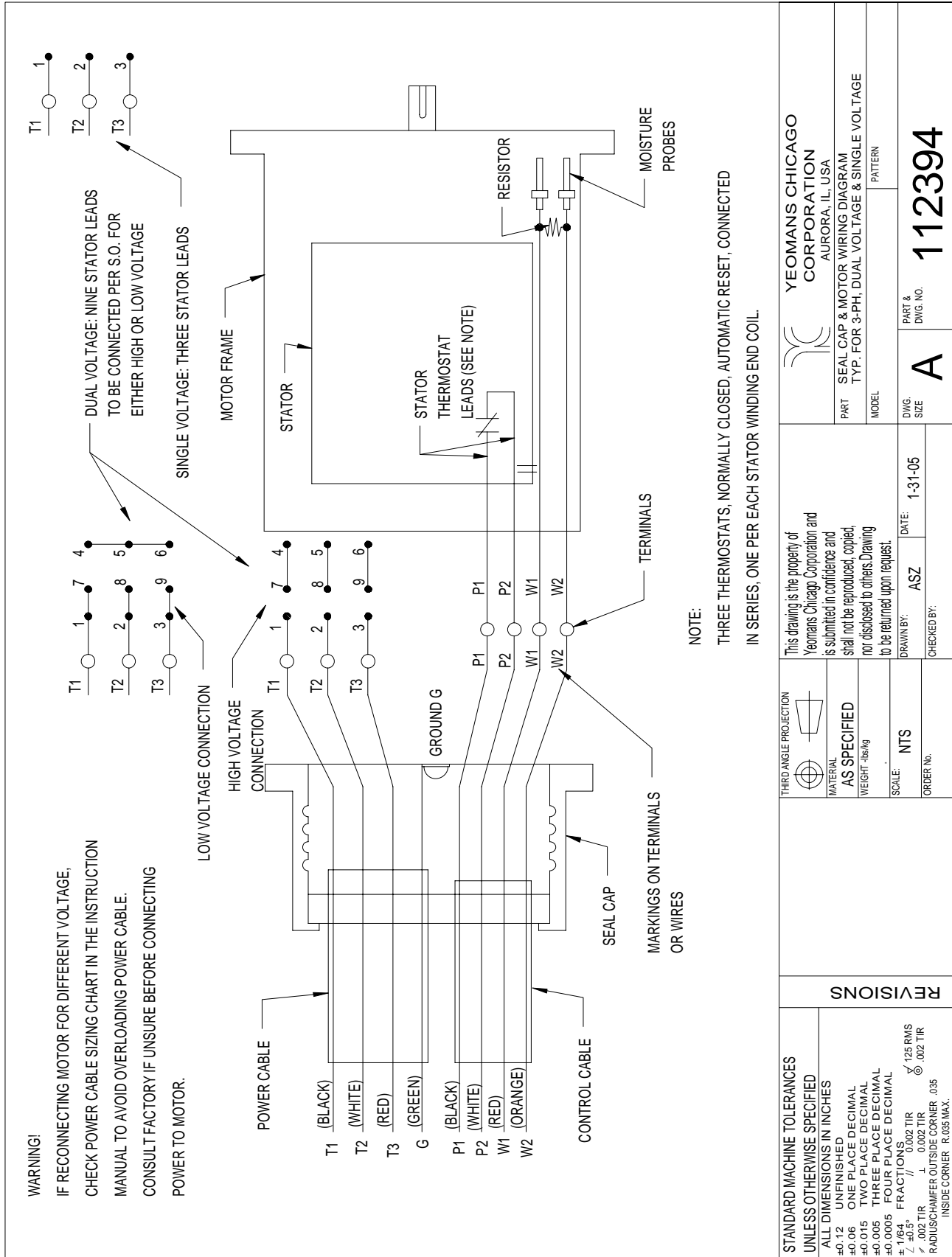
The mechanical seals used on motors manufactured by YCC are purchased commercially from various suppliers that make interchangeable seals. The most common types are called the John Crane Type 21, Pac-Seal/Flowserve Type 21-31, and the Burgmann MG9. These seals applied in YCC motors function interchangeably with some minor changes to the mounting details. Shown on this document are the variations and the details to correctly substitute seals. **DO NOT ASSUME A REPLACEMENT SEAL MOUNTS IDENTICALLY TO AN EXISTING SEAL.** The retainers for all seals have been updated to accommodate different seals and springs. Some seals use a spring holder which looks like a thin washer, some use a cup shaped spring holder, some use a retaining ring alone. The replacement seal should be installed with the correct retaining components. The diagrams below illustrate the differences. Note the conical springs and their orientations.



Note: Protect lapped seal faces from contamination or damage during handling and installation. Never use grease or oil as a seal installation lubricant. Oil, grease or dirt on the seal faces may cause leakage.

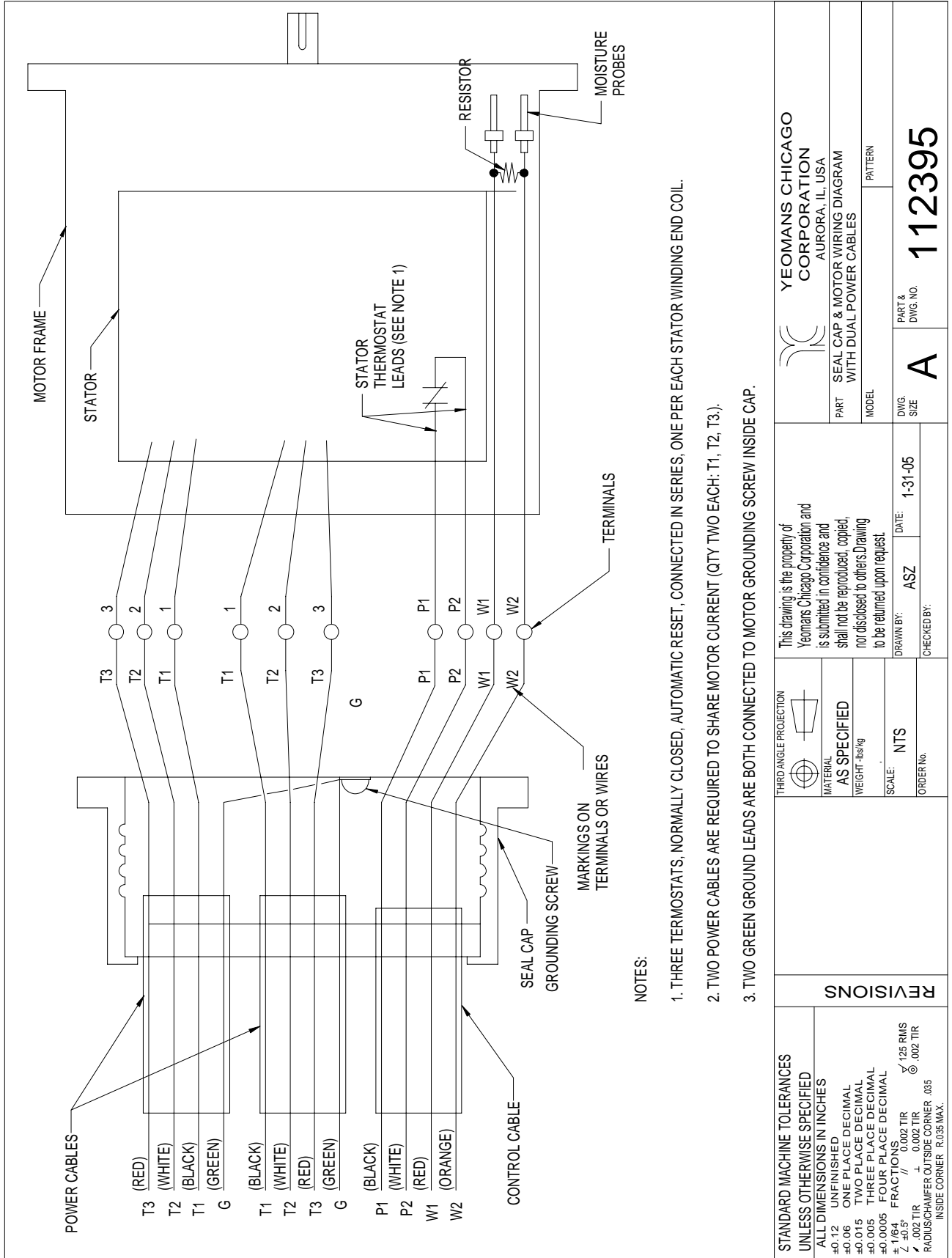
1. Disassemble pump to expose seal. Motor lower seal housing will need to be removed to service upper seal. Note assembly and mounting of existing seal. New seal should mount similar but may require additional components such as spacer or different retaining ring.
2. Carefully remove old seal rotary and stationary components taking care not to damage shaft or housing bore.
3. Clean shaft and housing bore with very fine emery cloth to remove rust and burrs, but avoid making flat spots or reducing the shaft diameter. Clean Shaft and housing bore with suitable solvent.
4. Lubricate the shaft and housing bore, and the seal's Viton elastomer components only with water or water-based seal installation lubricant such as P-80® Rubber Lubricant. *Do not use oil or grease as a seal lubricant.* Seal faces should not be lubricated.
5. Press stationary seal seat firmly into housing bore. Protect seal face with plastic or cardboard.
6. Check both seal faces for contamination by lubricant or particles. Slide rotary seal components by hand pressure along shaft to insure completely parallel contact with stationary seat. Make sure spring properly engages step on rotary seal and opposite end of spring either engages spring retainer or sits against the Impeller, Inner. Seal may be supplied with a spacer that is to be placed between the retaining ring and the seal spring on the lower seal on some models. See sketches above. Some seals sit on the Impeller, Inner and the impeller drive key must engage the seal spring next to the end turn to allow spring to sit flat against impeller.
7. Reassemble motor and pump replacing any components supplied in kit if applicable.
8. Some dry-pit submersible pumps are provided with a manual pump vent. When pump is started, the casing must be flooded and the trapped air must be vented to assure that the seal is properly cooled by the pumpage and the pump will remain primed. Never run pump dry.

FIGURE 3



<p>STANDARD MACHINE TOLERANCES UNLESS OTHERWISE SPECIFIED</p> <p>ALL DIMENSIONS IN INCHES</p> <p>±0.12 UNFINISHED ±0.06 ONE PLACE DECIMAL ±0.015 TWO PLACE DECIMAL ±0.005 THREE PLACE DECIMAL ±0.0005 FOUR PLACE DECIMAL ± 1/64 FRACTIONS ∠ .002 TIR // .002 TIR ∠ .002 TIR .002 TIR RADIUS CHAMFER OUTSIDE CORNER .035 INSIDE CORNER R .035 MAX.</p>	REVISIONS		<p>THIRD ANGLE PROJECTION</p> <p>MATERIAL AS SPECIFIED</p> <p>WEIGHT - lbs/kg</p> <p>SCALE: NTS</p> <p>ORDER No.</p>	<p>This drawing is the property of Yeomans Chicago Corporation and is submitted in confidence and shall not be reproduced, copied, or disclosed to others. Drawing to be returned upon request.</p> <p>DRAWN BY: ASZ DATE: 1-31-05</p> <p>CHECKED BY:</p>	<p>YEOMANS CHICAGO CORPORATION AURORA, IL, USA</p> <p>PART SEAL CAP & MOTOR WIRING DIAGRAM TYP. FOR 3-PH, DUAL VOLTAGE & SINGLE VOLTAGE</p> <p>MODEL PATTERN</p>	<p>PART & DWG. NO. A</p> <p>DWG. SIZE 112394</p>
	<p>YEOMANS CHICAGO CORPORATION</p>					

FIGURE 4



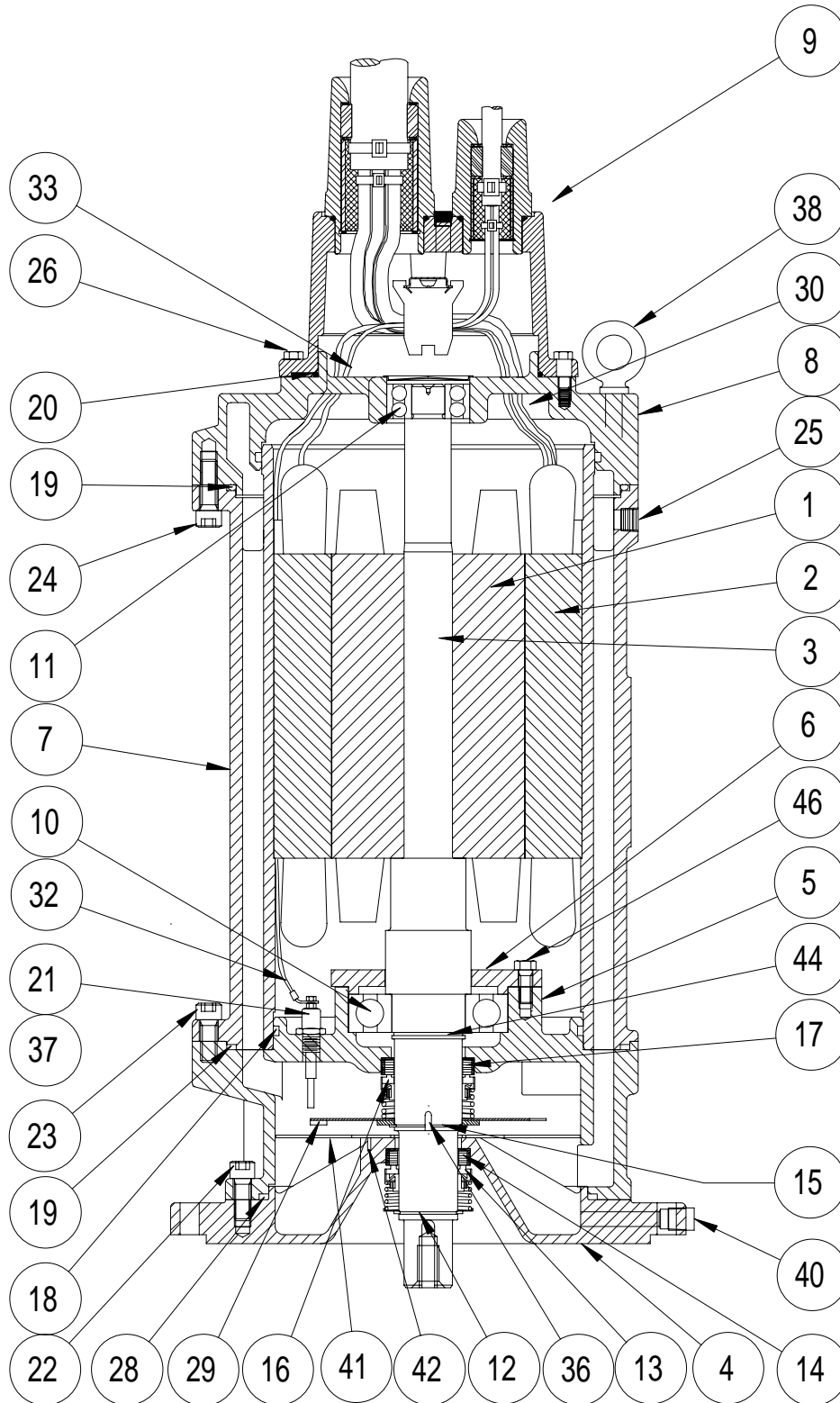
NOTES:

1. THREE THERMOSTATS, NORMALLY CLOSED, AUTOMATIC RESET, CONNECTED IN SERIES, ONE PER EACH STATOR WINDING END COIL.
2. TWO POWER CABLES ARE REQUIRED TO SHARE MOTOR CURRENT (QTY TWO EACH: T1, T2, T3).
3. TWO GREEN GROUND LEADS ARE BOTH CONNECTED TO MOTOR GROUNDING SCREW INSIDE CAP.

STANDARD MACHINE TOLERANCES UNLESS OTHERWISE SPECIFIED	REVISIONS		THIRD ANGLE PROJECTION MATERIAL AS SPECIFIED WEIGHT - lbs/kg SCALE: NTS ORDER NO.	This drawing is the property of Yeomans Chicago Corporation and is submitted in confidence and shall not be reproduced, copied, nor disclosed to others. Drawing to be returned upon request.	YEOMANS CHICAGO CORPORATION AURORA, IL, USA
	ALL DIMENSIONS IN INCHES ±0.12 UNFINISHED ±0.06 ONE PLACE DECIMAL ±0.015 TWO PLACE DECIMAL ±0.005 THREE PLACE DECIMAL ±0.0005 FOUR PLACE DECIMAL ± 1/64 FRACTIONS Z ±0.5° // 0.002 TIR ✓ 0.002 TIR RADIUS/CHAMFER OUTSIDE CORNER .035 INSIDE CORNER R.035 MAX.	DRAWN BY: ASZ DATE: 1-31-05			

FIGURE 5.a

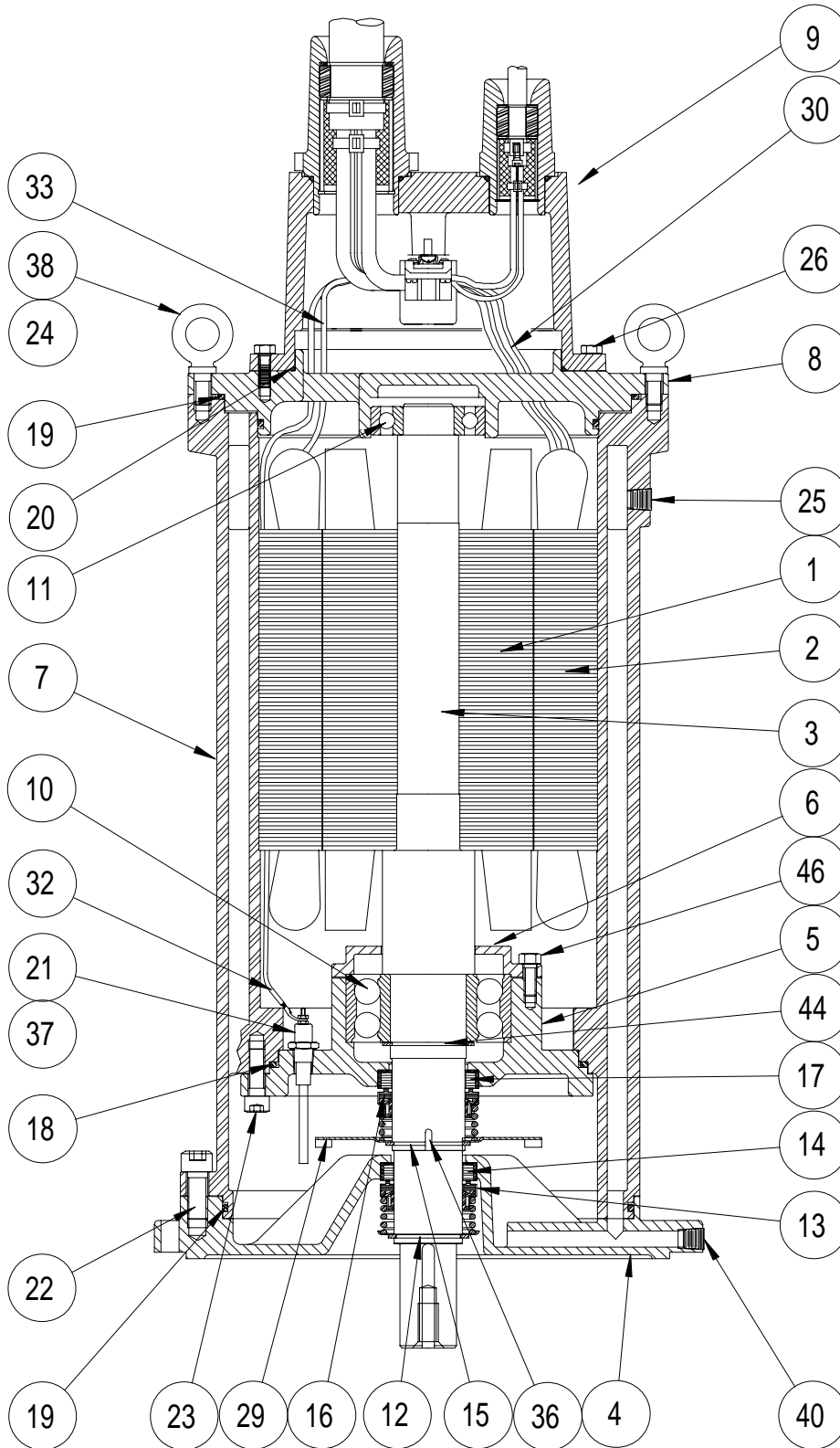
CROSS SECTION AND PARTS IDENTIFICATION DRAWING



TYPICAL 210 CLC FRAME

FIGURE 5.b

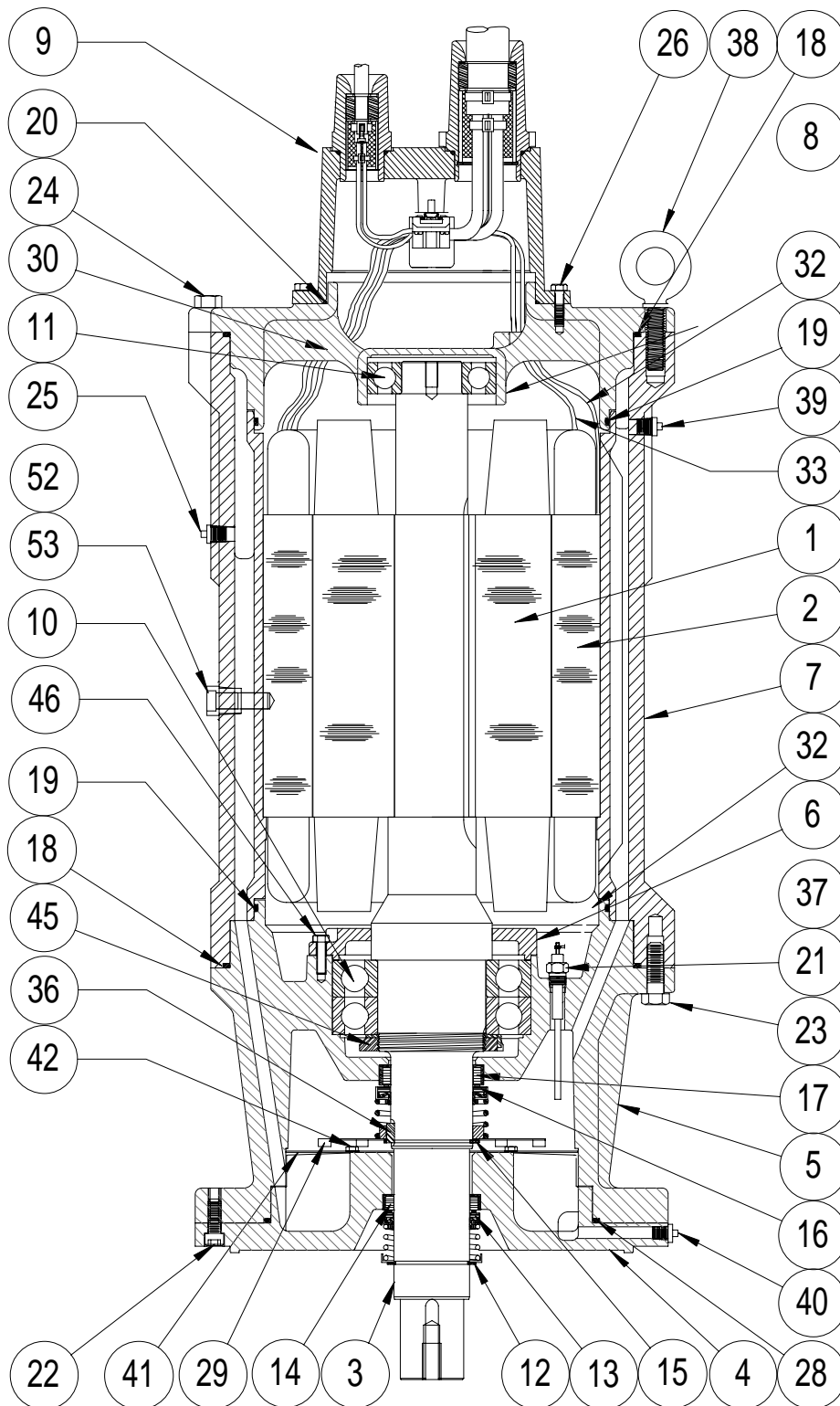
CROSS SECTION AND PARTS IDENTIFICATION DRAWING



TYPICAL 250 CLC FRAME

FIGURE 5.c

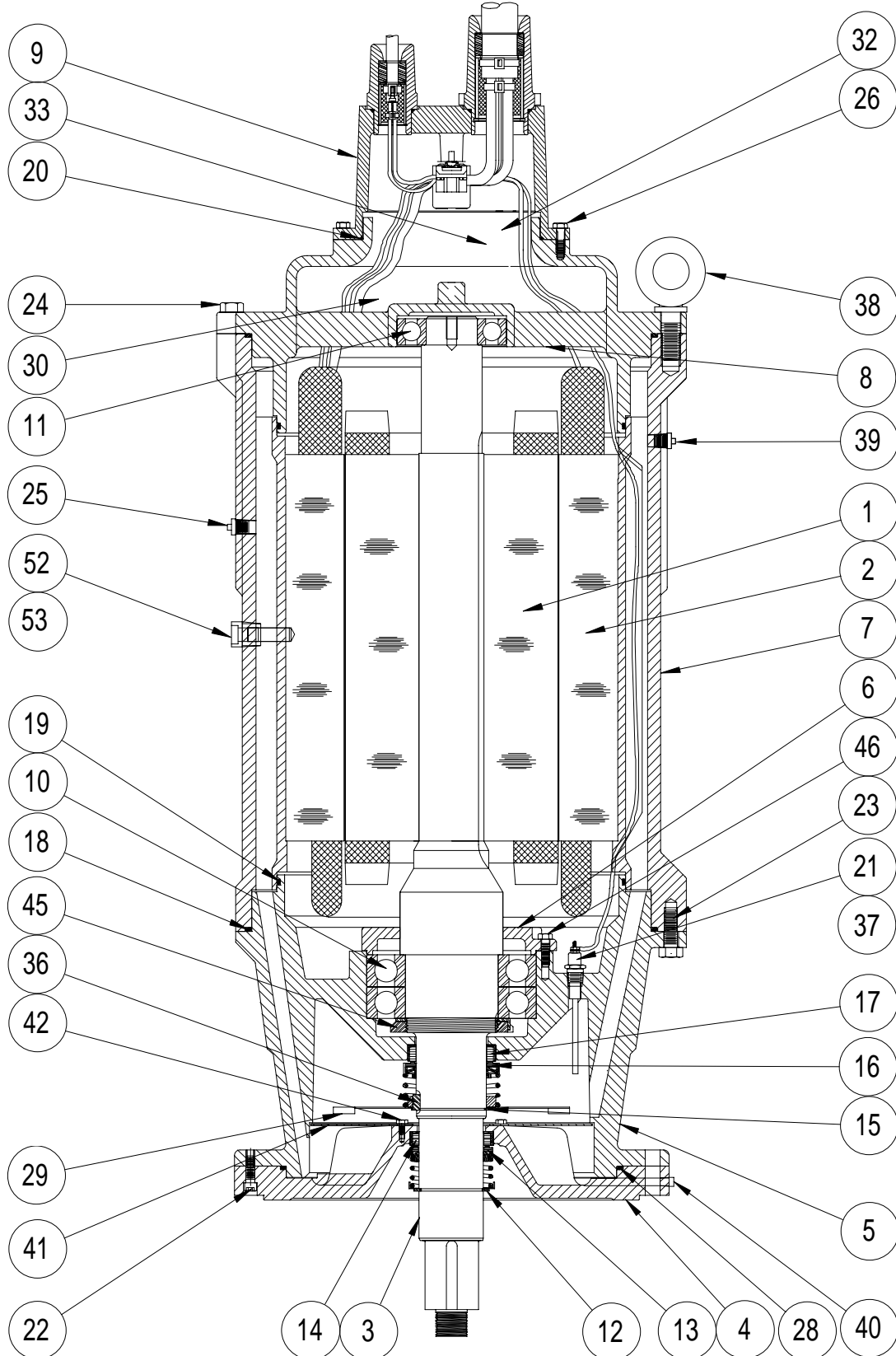
CROSS SECTION AND PARTS IDENTIFICATION DRAWING



TYPICAL 320 CLC FRAME

FIGURE 5.d

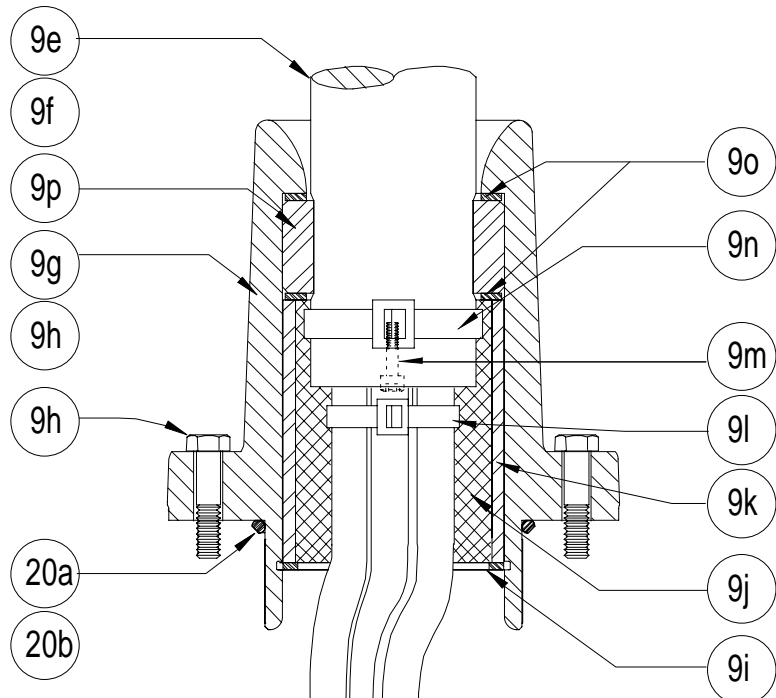
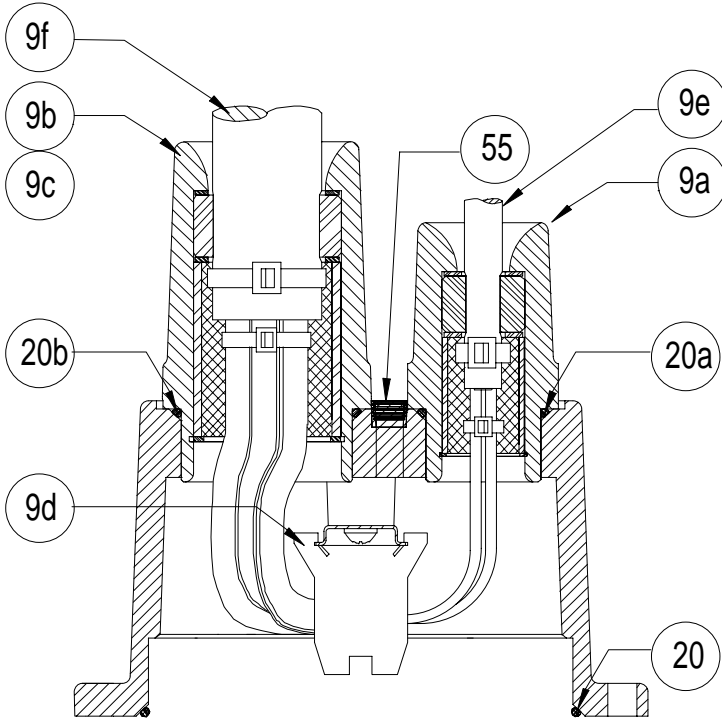
CROSS SECTION AND PARTS IDENTIFICATION DRAWING



TYPICAL 360 CLC FRAME

FIGURE 5.e

CROSS SECTION AND PARTS IDENTIFICATION DRAWING



TYPICAL MODU-CAB[®] ASSEMBLY

**TABLE 4
PARTS LIST FOR FIGURES 5.a ~ 5.e**

NO.	DESCRIPTION	NO.	DESCRIPTION
1	ROTOR	15	UPPER SEAL SNAP RING
2	STATOR	16	UPPER SEAL ROTATING ELEMENT
3	SHAFT	17	UPPER SEAL STATIONARY SEAT
4	LOWER SEAL HOUSING	18	O-RING, THRUST BEARING HOUSING
5	THRUST BEARING HOUSING	19	O-RING, STATOR HOUSING
6*	THRUST BEARING CAP	20	O-RING, MODU-CAB® TO RADIAL BRG. HSNQ.
7	STATOR HOUSING	20a	O-RING, CONTROL CABLE CONNECTOR
8	RADIAL BEARING HOUSING	20b	O-RING, POWER CABLE CONNECTOR
9	MODU-CAB® CAP & CABLE ASSEMBLY	21	MOISTURE PROBES
9a	CABLE CONNECTOR ASSEMBLY - CONTROL	22*	SOCKET HEAD CAP SCREW
9b	CABLE CONNECTOR ASSEMBLY - POWER 1	23*	HEX HEAD/SOCKET HEAD CAP SCREW
9c**	CABLE CONNECTOR ASSEMBLY - POWER 2	24	HEX HEAD CAP SCREW
9d	TERMINAL ASSEMBLY	25	PIPE PLUG
9e	CONTROL CABLE	26	HEX HEAD CAP SCREW
9f	POWER CABLE	28	O-RING, LOWER SEAL HOUSING
9g	CONNECTOR BODY - CONTROL	29	IMPELLER, FLUID
9h	CONNECTOR BODY - POWER	30	POWER WIRING LEADS
9i	RETAINING RING	32	PROBE WIRING LEADS
9j	SEALING COMPOUND	33	THERMAL PROTECTOR LEADS
9k	SLEEVE	37	RESISTOR (ACROSS PROBES 21)
9l	CABLE TIE	38	EYE BOLT
9m	CAP SCREW-NYLON	39*	PIPE PLUG
9n	CABLE TIE	40	DRAIN PLUG
9o	WASHER (2)	41*	OIL BAFFLE
9p	GROMMET	42*	HEX HEAD CAP SCREW
9q	CAP SCREW	44*	SNAP RING - THRUST BEARING
10*	THRUST BEARING	45*	LOCK NUT AND WASHER
11*	RADIAL BEARING	46*	HEX HD CAP SCREW
12	LOWER SEAL SNAP RING	52*	PIPE PLUG
13	LOWER SEAL ROTATING ELEMENT	53*	PIN
14	LOWER SEAL STATIONARYSEAT	55	PIPE PLUG

*NOTE: Not applicable to all Frames

YCC DRY-PIT SUBMERSIBLE MOTOR DATA – 4 POLE

H.P.	Full Load RPM	Frame Size	Nominal Eff % @ *			Nominal Power Factor % @			Amps @ 460V		KVA Code Letter	Full Load Torque (Ft-Lbs)	% Full Load Torque		S.F. @ 40° C Amb.	Power Cable	
			Full Load	3/4 Load	1/2 Load	Full Load	3/4 Load	1/2 Load	Full Load	Locked Rotor			Locked Rotor	Break-down		AWG Size	O.D. ** (in.)
0.75	1765	140	62.0	56.0	42.0	59.0	54.0	42.0	2.0	15.4	K	2.3	524	650	1.00	16	0.570+/- .030
1	1770	140	66.0	60.0	46.0	56.0	49.0	37.0	2.6	19.8	J	3.0	534	638	1.00	16	0.570+/- .030
1.5	1765	140	72.0	65.0	55.0	62.0	53.0	42.0	3.3	26.8	J	4.5	398	576	1.00	12	0.650+/- .030
2.0	1775	140	72.0	68.0	60.0	56.0	51.0	41.0	4.7	45.1	J	6.0	610	753	1.00	12	0.650+/- .030
3.0	1725	140	80.0	79.0	75.0	88.0	84.0	77.0	4.2	21.0	F	9.0	177	264	1.00	16	0.570+/- .030
5.0	1785	180	87.0	85.0	80.0	54.0	45.0	33.0	9.1	84.0	H	20.0	238	313	1.00	See Power Cable Size Chart	
	1770	210CLC	80.0	77.9	72.5	83.5	81.1	75.0	7.0	43.6	H	14.8	230	290	1.15		
7.5	1759	210CLC	76.0	73.7	67.9	84.7	82.9	78.6	10.9	60.2	H	22.2	216	263	1.15		
10	1771	210CLC	88.9	88.8	86.9	73.9	66.1	53.5	14.2	105.0	K	29.7	291	363	1.15		
15	1747	210CLC	86.7	88.6	88.6	81.4	76.4	66.1	19.9	104.8	F	45.1	192	239	1.15		
20	1741	210CLC	86.4	88.9	89.6	82.4	78.6	69.6	26.3	131.1	F	60.3	183	223	1.15		
25	1761	250CLC	88.8	90.3	90.2	83.8	80.6	72.2	31.4	172.1	F	74.6	192	236	1.15		
30	1765	250CLC	90.2	91.6	91.3	85.2	82.3	74.4	37.0	218.0	G	89.4	210	263	1.15		
40	1760	250CLC	89.5	91.0	91.0	84.8	81.2	72.3	49.0	298.0	G	119.3	212	265	1.15		
50	1771	320CLC	89.3	89.4	87.6	82.1	77.6	67.7	64.0	345.0	F	148.3	175	252	1.15		
60	1767	320CLC	90.3	90.9	90.0	87.9	86.8	82.1	71.0	378.0	F	178.3	167	229	1.15		
75	1775	320CLC	92.1	91.9	90.9	81.5	77.2	67.3	93.6	580.0	G	221.8	140	240	1.15		
100	1785	360CLC	92.4	92.6	91.0	86.9	85.2	79.5	117.0	777.2	G	294.4	197	238	1.15		
125	1782	360CLC	93.2	93.2	92.0	86.9	85.4	80.1	145.0	901.0	G	368.5	178	263	1.15		
150	1782	360CLC	95.0	94.7	93.6	84.0	80.3	71.3	176.0	1250.0	H	442.0	140	240	1.15		

Typical motor data for Submersible 3 phase, 60 hertz, NEMA design B, 40 °C ambient, normal torque motors. Amperes shown are for 460-volt connection. If other connections are available, the amperes will vary inversely with rated voltage. All values are nominal.

*Efficiencies include all mechanical losses including mechanical seals.

** Auxiliary control cord (separate cord) for all motors always 4 conductor, #14 AWG @ .590 ± .030 inches. Above cable data is for standard motors only, with cable length of 30 feet. Data is applicable through lengths of 100'. Control cables must be run in a separate conduit. Not certified for construction. Cable size and dimensions may vary. Confirm with factory before final design or construction.

YCC DRY-PIT SUBMERSIBLE MOTOR DATA – 6 POLE

H.P.	Full Load RPM	Frame Size	Nominal Eff % @ *			Nominal Power Factor % @			Amps @ 460V		KVA Code Letter	Full Load Torque (Ft-Lbs)	% Full Load Torque		S.F. @ 40° C Amb.	Power Cable	
			Full Load	3/4 Load	1/2 Load	Full Load	3/4 Load	1/2 Load	Full Load	Locked Rotor			Locked Rotor	Break-down		AWG Size	O.D. ** (in.)
0.75	1175	180	54.9	48.1	39.9	61.3	56.9	49.5	2.0	15.8	S	3.4	495	591	1.00	See Power Cable Size Chart	
1	1170	180	60.9	54.9	45.2	68.0	61.3	55.1	2.4	15.8	P	4.5	370	441	1.15		
1.5	1160	180	64.8	62.2	54.9	74.9	70.1	61.3	2.7	15.8	L	6.8	244	292	1.00		
2	1165	180	72.2	70.2	64.9	71.9	66.3	55.1	3.5	25.2	L	9.0	256	314	1.00		
3	1165	210CLC	87.5	86.6	82.7	61.5	53.2	41.6	5.2	43.3	N	13.3	371	466	1.15		
5	1145	210CLC	87.6	86.9	84.0	64.4	56.5	44.4	8.3	53.0	K	22.3	291	353	1.15		
7.5	1140	210CLC	86.5	87.7	86.9	73.2	67.4	56.5	11.1	53.1	G	33.9	192	232	1.15		
10	1156	210CLC	84.0	85.8	85.4	70.7	63.3	51.0	15.8	75.3	G	45.4	212	237	1.15		
15	1158	250CLC	85.8	87.5	87.2	77.6	71.1	58.9	21.1	89.1	E	68.0	150	210	1.15		
20	1164	250CLC	87.2	89.0	89.0	80.8	75.8	65.0	26.6	124.6	E	90.3	160	220	1.15		
25	1162	250CLC	87.7	89.6	89.8	80.8	76.1	65.8	33.0	152.8	E	113.0	162	217	1.15		
30	1173	320CLC	87.3	87.8	86.3	81.5	77.4	68.2	39.5	211.0	G	134.3	171	231	1.15		
40	1175	320CLC	88.7	89.6	88.7	83.9	80.9	73.2	50.3	293.7	G	178.8	186	238	1.15		
50	1186	320CLC	94.2	94.4	93.9	80.6	77.8	70.0	61.7	345.0	F	221.0	154	230	1.15		
60	1177	320CLC	91.2	91.2	90.9	80.7	76.7	66.9	76.3	466.0	G	238.1	150	275	1.15		
75	1178	360CLC	90.7	91.2	90.3	83.8	79.9	70.9	92.0	570.0	G	334.5	146	291	1.15		
100	1173	360CLC	90.6	91.7	91.3	84.8	81.7	73.7	122.0	681.0	F	447.6	133	260	1.15		
125	1177	360CLC	90.6	90.7	90.4	84.5	81.5	73.0	152.9	960.0	G	557.6	140	275	1.15		

Typical motor data for Submersible 3 phase, 60 hertz, NEMA design B, 40 °C ambient, normal torque motors. Amperes shown are for 460-volt connection. If other connections are available, the amperes will vary inversely with rated voltage. All values are nominal.

*Efficiencies include all mechanical losses including mechanical seals.

** Auxiliary control cord (separate cord) for all motors always 4 conductor, #14 AWG @ .590 ± .030 inches. Above cable data is for standard motors only, with cable length of 30 feet. Data is applicable through lengths of 100'. Control cables must be run in a separate conduit. Not certified for construction. Cable size and dimensions may vary. Confirm with factory before final design or construction.

YCC DRY-PIT SUBMERSIBLE MOTOR DATA – 8 POLE

Refer to Factory

YCC DRY-PIT SUBMERSIBLE MOTOR DATA POWER CABLE SIZING CHART

H.P.	Full Load RPM	Frame Size	Power Cable(s)														
			200V			230V			380V			460V			575V		
			FLA	AWG Size	O.D. (in.)	FLA	AWG Size	O.D. (in.)	FLA	AWG Size	O.D. (in.)	FLA	AWG Size	O.D. (in.)	FLA	AWG Size	O.D. (in.)
5.0	1770	210 CLC	16.1	14	0.58	14.0	14	0.58	8.5	14	0.58	7.0	14	0.58	5.7	16	0.42
7.5	1759	210 CLC	25.1	10	0.71	21.8	12	0.65	13.2	12	0.65	10.9	12	0.65	8.9	16	0.42
10	1771	210 CLC	32.7	8	0.99	28.4	10	0.71	17.2	10	0.71	14.2	10	0.71	11.6	16	0.42
15	1747	210 CLC	45.8	8	0.99	39.8	8	0.99	24.1	8	0.99	19.9	8	0.99	16.3	14	0.58
20	1741	210 CLC	60.5	6	1.10	52.6	6	1.10	31.8	6	1.10	26.3	6	1.10	21.5	12	0.65
25	1761	250 CLC	72.2	4	1.25	62.8	6	1.10	38.0	6	1.10	31.4	6	1.10	25.7	10	0.71
30	1765	250 CLC	85.1	4	1.25	74.0	4	1.25	44.8	4	1.25	37.0	4	1.25	30.2	8	0.99
40	1760	250 CLC	112.7	2	1.45	98.0	2	1.45	59.3	6	1.10	49.0	8	0.99	40.1	8	0.99
50	1771	320 CLC	Please Refer to Factory									64.0	6	1.10	52.3	6	1.10
60	1767	320 CLC										71.0	4	1.25	58.0	6	1.10
75	1775	320 CLC										93.6	2	1.45	76.5	4	1.25
100	1785	360 CLC										117.0	2	1.45	95.6	2	1.45
125	1782	360 CLC										145.0	2 x #4	1.25	118.5	2	1.45
150	1782	360 CLC										176.0	2 x #4	1.25	143.9	2 x #4	1.25

0.75	1175	180 CLC	4.6	16	0.42	4.0	16	0.42	2.4	16	0.42	2.0	16	0.42	1.6	16	0.42
1	1170	180 CLC	5.5	16	0.42	4.8	16	0.42	2.9	16	0.42	2.4	16	0.42	2.0	16	0.42
1.5	1160	180 CLC	6.2	16	0.42	5.4	16	0.42	3.3	16	0.42	2.7	16	0.42	2.2	16	0.42
2	1165	180 CLC	8.1	16	0.42	7.0	16	0.42	4.2	16	0.42	3.5	16	0.42	2.9	16	0.42
3	1165	210 CLC	12.0	16	0.42	10.4	16	0.42	6.3	16	0.42	5.2	16	0.42	4.3	16	0.42
5	1145	210 CLC	19.1	12	0.65	16.6	14	0.58	10.1	14	0.58	8.3	14	0.58	6.8	16	0.42
7.5	1140	210 CLC	25.5	10	0.71	22.2	12	0.65	13.4	12	0.65	11.1	12	0.65	9.1	16	0.42
10	1156	210 CLC	36.3	8	0.99	31.6	8	0.99	19.1	8	0.99	15.8	8	0.99	12.9	14	0.58
15	1158	250 CLC	48.5	8	0.99	42.2	8	0.99	25.6	8	0.99	21.1	8	0.99	17.2	14	0.58
20	1164	250 CLC	61.2	6	1.10	53.2	6	1.10	32.2	6	1.10	26.6	6	1.10	21.7	12	0.65
25	1162	250 CLC	75.9	4	1.25	66.0	6	1.10	40.0	6	1.10	33.0	6	1.10	27.0	10	0.71
30	1173	320 CLC	90.9	4	1.25	79.0	4	1.25	47.8	4	1.25	39.5	4	1.25	32.3	8	0.99
40	1175	320 CLC	115.7	2	1.45	100.6	2	1.45	60.9	6	1.10	50.3	8	0.99	41.1	8	0.99
50	1186	320 CLC	Please Refer to Factory									61.7	6	1.10	50.4	8	0.99
60	1177	320 CLC										76.3	4	1.25	62.4	6	1.10
75	1178	360 CLC										92.0	2	1.45	75.2	4	1.25
100	1173	360 CLC										122.0	2	1.45	99.7	2	1.45
125	1177	360 CLC										152.9	2 x #4	1.25	125.0	1	1.68

NOTES / CLARIFICATIONS:

- 1) Sizing is applicable for lengths through 75 feet. For other lengths, please refer to factory.
- 2) The designation "2 x" preceding the AWG number indicates that there are two (2) power cables of the listed size. Cable O.D. values are nominal and subject to variation.
- 3) Data is subject to change and is not certified for construction purposes. Please verify sizes with factory prior to construction or sizing of terminals and conduits.

RECOMMENDED CABLE TYPES & MANUFACTURERS

MANUFACTURER	CABLE	TYPE	MFR. CAT. NO.	YCC P/N	NOM. OD
COLEMAN	1x4	PPE	30265	C10-31-19	1.6800
	2x4	PPE	30264	C10-31-30	1.4800
	4x4	PPE	30262	C10-31-29	1.2700
	6x4	PPE	30261	C10-31-28	1.1000
	8x4	PPE	30260	C10-31-27	0.9900
	10x4	SEOOW	22429	C10-31-33	0.7100
	12x4	SEOOW	22428	C10-31-34	0.6450
	14x4 (power)	SEOOW	22427	C10-31-35	0.5750
	14x4 (control)	SEOOW	24236	C10-31-5	0.5750
	16x4	SEOOW	22426	C10-31-32	0.4150
GENERAL CABLE	1x4	W	81374.99.01	C10-31-19	1.6800
	2x4	W	81664.99.01	C10-31-30	1.4350
	4x4	W	81644.99.01	C10-31-29	1.2200
	6x4	W	81624.99.01	C10-31-28	1.0900
	8x4	W	81314.99.01	C10-31-27	0.9850
	10x4	SOOW	02727	C10-31-33	0.7150
	12x4	SOOW	02726	C10-31-34	0.6500
	14x4	SOOW	02768	C10-31-35	0.5750
	16x4	SOOW	02766	C10-31-32	0.4200
PRIORITY WIRE & CABLE	1x4	W	P26N2	C10-31-19	1.6800

NOTE - The above commercial cable types have been tested and approved by YCC. Use of other cable types or sizes is not recommended and may void the motor warranty. YCC assumes no liability for motor failure or other damage that might result from the use of cable types or sizes other than those shown.

MODU-CAB® REPLACEMENT PARTS & REBUILD KITS

Complete MODU-CAB® Assembly: Includes complete replacement cap and cable assembly, including 30' or 50' electrical cables. (Please refer to factory for other lengths.)

Sensor & Power Modules: Individual cable module assemblies, with connector body and 30' or 50' electrical cable. Includes o-ring for mounting the module to the cap. (Please refer to factory for other lengths.)

Rebuild Kits: Include the necessary grommets, washers, o-rings and other components for rebuilding a power or sensor module. *Rebuild Kits do not include electrical cable. Please refer to the chart "RECOMMENDED CABLE TYPES & MANUFACTURERS" for approved cable types.*

Please refer to factory for ratings / voltages not listed.

HP	Motor Speed	Voltage	Frame	Complete MODU-CAB® Assemblies		Sensor Modules		Power Modules		Rebuild Kits		AWG Size (Power)
				30'	50'	30'	50'	30'	50'	Sensor	Power	
0.75	6 POLE	200/230/380/460/575	180/210CLC	A-112346-004	A-112346-008	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	16
1	6 POLE	200/230/380/460/575	180/210CLC	A-112346-004	A-112346-008	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	16
1.5	6 POLE	200/230/380/460/575	180/210CLC	A-112346-004	A-112346-008	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	16
2	6 POLE	200/230/380/460/575	180/210CLC	A-112346-004	A-112346-008	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	16
3	6 POLE	200/230/380/460/575	180/210CLC	A-112346-004	A-112346-008	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	16
5	4 POLE	200/230	180/210CLC	A-112346-003	A-112346-007	A-112156-013	A-112156-027	A-112156-043	A-112156-044	A-112453-01	A-112453-01	14
		380/460/575	180/210CLC	A-112346-004	A-112346-008	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	16
	6 POLE	200	180/210CLC	A-112346-002	A-112346-006	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	12
		230 380/460/575	180/210CLC 180/210CLC	A-112346-003 A-112346-004	A-112346-007 A-112346-008	A-112156-013 A-112156-013	A-112156-027 A-112156-027	A-112156-043 A-112156-014	A-112156-044 A-112156-028	A-112453-01 A-112453-01	A-112453-01 A-112453-02	14 16
7.5	4 POLE	200	180/210CLC	A-112346-001	A-112346-005	A-112156-013	A-112156-027	A-112156-010	A-112156-024	A-112453-01	A-112453-03	10
		230	180/210CLC	A-112346-002	A-112346-006	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	12
		380	180/210CLC	A-112346-003	A-112346-007	A-112156-013	A-112156-027	A-112156-043	A-112156-044	A-112453-01	A-112453-01	14
		460/575	180/210CLC	A-112346-004	A-112346-008	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	16
	6 POLE	200	180/210CLC	A-112346-001	A-112346-005	A-112156-013	A-112156-027	A-112156-010	A-112156-024	A-112453-01	A-112453-03	10
		230	180/210CLC	A-112346-002	A-112346-006	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	12
		380	180/210CLC	A-112346-003	A-112346-007	A-112156-013	A-112156-027	A-112156-043	A-112156-044	A-112453-01	A-112453-01	14
		460/575	180/210CLC	A-112346-004	A-112346-008	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	16
10	4 POLE	200	180/210CLC	A-112208-002	A-112208-004	A-112156-013	A-112156-027	A-112156-009	A-112156-023	A-112453-01	A-112453-04	8
		230	180/210CLC	A-112346-001	A-112346-005	A-112156-013	A-112156-027	A-112156-010	A-112156-024	A-112453-01	A-112453-03	10
		380/460	180/210CLC	A-112346-003	A-112346-007	A-112156-013	A-112156-027	A-112156-043	A-112156-044	A-112453-01	A-112453-01	14
		575	180/210CLC	A-112346-004	A-112346-008	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	16
	6 POLE	200/230	180/210CLC	A-112208-002	A-112208-004	A-112156-013	A-112156-027	A-112156-009	A-112156-023	A-112453-01	A-112453-04	8
		380	180/210CLC	A-112346-002	A-112346-006	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	12
		460/575	180/210CLC	A-112346-003	A-112346-007	A-112156-013	A-112156-027	A-112156-043	A-112156-044	A-112453-01	A-112453-01	14
15	4 POLE	200/230	180/210CLC	A-112208-002	A-112208-004	A-112156-013	A-112156-027	A-112156-009	A-112156-023	A-112453-01	A-112453-04	8
		380	180/210CLC	A-112346-001	A-112346-005	A-112156-013	A-112156-027	A-112156-010	A-112156-024	A-112453-01	A-112453-03	10
		460	180/210CLC	A-112346-002	A-112346-006	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	12
		575	180/210CLC	A-112346-003	A-112346-007	A-112156-013	A-112156-027	A-112156-043	A-112156-044	A-112453-01	A-112453-01	14
	6 POLE	200/230	250CLC/360CLC	A-112365-004	A-112365-013	A-112156-013	A-112156-027	A-112156-009	A-112156-023	A-112453-01	A-112453-04	8
		380	250CLC/360CLC	A-112346-001	A-112346-005	A-112156-013	A-112156-027	A-112156-010	A-112156-024	A-112453-01	A-112453-03	10
		460	250CLC/360CLC	A-112365-006	A-112365-015	A-112156-013	A-112156-027	A-112156-011	A-112156-025	A-112453-01	A-112453-06	12
		575	250CLC/360CLC	A-112365-007	A-112365-016	A-112156-013	A-112156-027	A-112156-043	A-112156-044	A-112453-01	A-112453-01	14
20	4 POLE	200/230	180/210CLC	A-112208-001	A-112208-003	A-112156-013	A-112156-027	A-112156-008	A-112156-022	A-112453-01	A-112453-05	6
		380	180/210CLC	A-112208-002	A-112208-004	A-112156-013	A-112156-027	A-112156-009	A-112156-023	A-112453-01	A-112453-04	8
		460	180/210CLC	A-112346-001	A-112346-005	A-112156-013	A-112156-027	A-112156-010	A-112156-024	A-112453-01	A-112453-03	10
		575	180/210CLC	A-112346-002	A-112346-006	A-112156-013	A-112156-027	A-112156-014	A-112156-028	A-112453-01	A-112453-02	12
	6 POLE	380	250CLC/360CLC	A-112365-004	A-112365-013	A-112156-013	A-112156-027	A-112156-009	A-112156-023	A-112453-01	A-112453-04	8
		200/230	250CLC/360CLC	A-112365-003	A-112365-012	A-112156-013	A-112156-027	A-112156-008	A-112156-022	A-112453-01	A-112453-05	6
		460	250CLC/360CLC	A-112365-005	A-112365-014	A-112156-013	A-112156-027	A-112156-010	A-112156-024	A-112453-01	A-112453-03	10
		575	250CLC/360CLC	A-112365-006	A-112365-015	A-112156-013	A-112156-027	A-112156-011	A-112156-025	A-112453-01	A-112453-06	12
25	4 POLE	200	250CLC/360CLC	A-112365-002	A-112365-011	A-112156-013	A-112156-027	A-112156-007	A-112156-021	A-112453-01	A-112453-07	4
		230	250CLC/360CLC	A-112365-003	A-112365-012	A-112156-013	A-112156-027	A-112156-008	A-112156-022	A-112453-01	A-112453-05	6
		380/460	250CLC/360CLC	A-112365-004	A-112365-013	A-112156-013	A-112156-027	A-112156-009	A-112156-023	A-112453-01	A-112453-04	8
		575	250CLC/360CLC	A-112365-005	A-112365-014	A-112156-013	A-112156-027	A-112156-010	A-112156-024	A-112453-01	A-112453-03	10
	6 POLE	200	250CLC/360CLC	A-112365-002	A-112365-011	A-112156-013	A-112156-027	A-112156-007	A-112156-021	A-112453-01	A-112453-07	4
		230	250CLC/360CLC	A-112365-003	A-112365-012	A-112156-013	A-112156-027	A-112156-008	A-112156-022	A-112453-01	A-112453-05	6
		380/460	250CLC/360CLC	A-112365-004	A-112365-013	A-112156-013	A-112156-027	A-112156-009	A-112156-023	A-112453-01	A-112453-04	8
		575	250CLC/360CLC	A-112365-005	A-112365-014	A-112156-013	A-112156-027	A-112156-010	A-112156-024	A-112453-01	A-112453-03	10

(CONTINUED ON FOLLOWING PAGE)

MODU-CAB® REPLACEMENT PARTS & REBUILD KITS (CONTINUED FROM PREVIOUS PAGE)

HP	Motor Speed	Voltage	Frame	Complete MODU-CAB® Assemblies		Sensor Modules		Power Modules		Rebuild Kits		AWG Size (Power)
				30'	50'	30'	50'	30'	50'	Sensor	Power	
30	4 POLE	200/230	250CLC/360CLC	A-112365-002	A-112365-011	A-112156-013	A-112156-027	A-112156-007	A-112156-021	A-112453-01	A-112453-07	4
		380/460/575	250CLC/360CLC	A-112365-004	A-112365-013	A-112156-013	A-112156-027	A-112156-009	A-112156-023	A-112453-01	A-112453-04	8
30	6 POLE	200/230	250CLC/360CLC	A-112365-002	A-112365-011	A-112156-013	A-112156-027	A-112156-007	A-112156-021	A-112453-01	A-112453-07	4
		380/460/575	250CLC/360CLC	A-112365-004	A-112365-013	A-112156-013	A-112156-027	A-112156-009	A-112156-023	A-112453-01	A-112453-04	8
40	4 POLE	200/230	250CLC/360CLC	A-112365-001	A-112365-010	A-112156-013	A-112156-027	A-112156-005	A-112156-019	A-112453-01	A-112453-08	2
	4 POLE	380	250CLC/360CLC	A-112365-003	A-112365-012	A-112156-013	A-112156-027	A-112156-008	A-112156-022	A-112453-01	A-112453-05	6
	4 POLE	460/575	250CLC/360CLC	A-112365-004	A-112365-013	A-112156-013	A-112156-027	A-112156-009	A-112156-023	A-112453-01	A-112453-04	8
	6 POLE	200/230	250CLC/360CLC	A-112365-001	A-112365-010	A-112156-013	A-112156-027	A-112156-005	A-112156-019	A-112453-01	A-112453-08	2
	6 POLE	380	250CLC/360CLC	A-112365-003	A-112365-012	A-112156-013	A-112156-027	A-112156-008	A-112156-022	A-112453-01	A-112453-05	6
	6 POLE	460/575	250CLC/360CLC	A-112365-004	A-112365-013	A-112156-013	A-112156-027	A-112156-009	A-112156-023	A-112453-01	A-112453-04	8
50	4 POLE	460/575	250CLC/360CLC	A-112365-003	A-112365-012	A-112156-013	A-112156-027	A-112156-008	A-112156-022	A-112453-01	A-112453-05	6
	6 POLE	460	250CLC/360CLC	A-112365-003	A-112365-012	A-112156-013	A-112156-027	A-112156-008	A-112156-022	A-112453-01	A-112453-05	6
60	4 POLE	460	250CLC/360CLC	A-112365-002	A-112365-011	A-112156-013	A-112156-027	A-112156-007	A-112156-021	A-112453-01	A-112453-07	4
		575	250CLC/360CLC	A-112365-003	A-112365-012	A-112156-013	A-112156-027	A-112156-008	A-112156-022	A-112453-01	A-112453-05	6
60	6 POLE	460	250CLC/360CLC	A-112365-002	A-112365-011	A-112156-013	A-112156-027	A-112156-007	A-112156-021	A-112453-01	A-112453-07	4
		575	250CLC/360CLC	A-112365-003	A-112365-012	A-112156-013	A-112156-027	A-112156-008	A-112156-022	A-112453-01	A-112453-05	6
75	4 POLE	460	250CLC/360CLC	A-112365-002	A-112365-011	A-112156-013	A-112156-027	A-112156-007	A-112156-021	A-112453-01	A-112453-07	2
		575	250CLC/360CLC	A-112365-002	A-112365-011	A-112156-013	A-112156-027	A-112156-007	A-112156-021	A-112453-01	A-112453-07	4
	6 POLE	460	250CLC/360CLC	A-112365-001	A-112365-010	A-112156-013	A-112156-027	A-112156-005	A-112156-019	A-112453-01	A-112453-08	2
100	4 POLE	460/575	250CLC/360CLC	A-112365-001	A-112365-010	A-112156-013	A-112156-027	A-112156-005	A-112156-019	A-112453-01	A-112453-08	2
		6 POLE	460/575	250CLC/360CLC	A-112365-001	A-112365-010	A-112156-013	A-112156-027	A-112156-005	A-112156-019	A-112453-01	A-112453-08
125	4 POLE	480	250CLC/360CLC	A-112339-001	A-112339-002	A-112156-013	A-112156-027	A-112156-006	A-112156-020	A-112453-01	A-112453-07	4
		575	250CLC/360CLC	A-112365-001	A-112365-010	A-112156-013	A-112156-027	A-112156-005	A-112156-019	A-112453-01	A-112453-08	2
	6 POLE	480	250CLC/360CLC	A-112339-001	A-112339-002	A-112156-013	A-112156-027	A-112156-006	A-112156-020	A-112453-01	A-112453-07	4
150	4 POLE	480/575	250CLC/360CLC	A-112365-008	A-112365-009	A-112156-013	A-112156-027	A-112156-003	A-112156-017	A-112453-01	A-112453-09	1

MODU-CAB® CABLE CONNECTOR REBUILD PROCEDURES

Disassembly

To repair or rebuild a cable connector, the entire MODU-CAB® cap and cable assembly must be removed from the motor and all leads must be disconnected from both the terminal assembly and the power connection at the supply. Please refer to Cable Connector Assembly drawing (page 30) for illustration of referenced items.

- 1) Remove the cable connector assembly (Item 9a, 9b or 9c) from the MODU-CAB® cap and cable assembly by removing the fasteners (Item 9h) holding the cable connector body (Item 9g or 9h) to the cap.
- 2) Only the connector body (Item 9g or 9h) is to be reused and all other parts removed from the assembly are to be discarded. All components to make the repair are included in the repair kit except the electrical cable.
- 3) If any epoxy is present on the retaining ring (Item 9i), sleeve (Item 9k) or connector body (Item 9g or 9h) it must first be carefully scraped or chipped from the parts before removal. The retaining ring (item 9i) is to be removed from the connector body (Item 9g or 9h) with an appropriate tool, then the sleeve (Item 9k) can be forced out of the connector body (Item 9g or 9h). All washers (Item 9o) must be removed from the connector body (Item 9g or 9h) before continuing with reassembly.

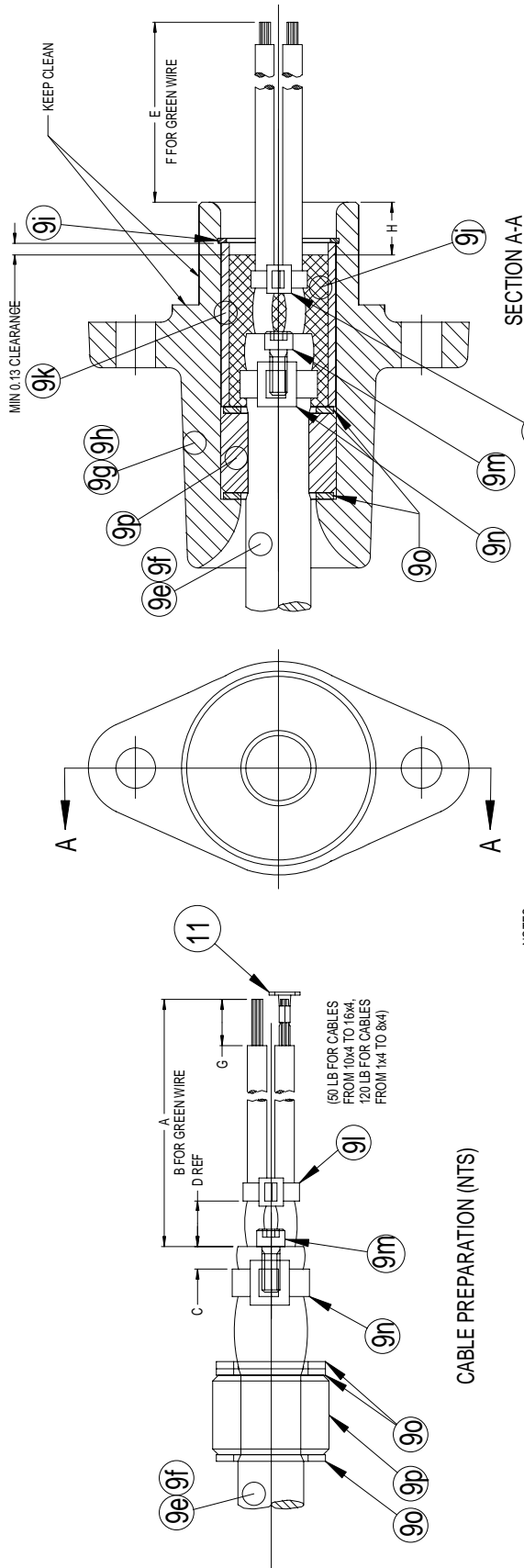
Assembly

- 1) Cut new cable (Item 9e or 9f) to the desired length. Do not exceed original cable length without consulting factory.
- 2) Thoroughly clean the connector body (Item 9g or 9h), washers (Item 9o) and sleeve (Item 9k) to remove all dirt, oil and epoxy residue. These parts must be completely clean and dry before assembly.
- 3) For specific assembly and specific cable size, strip jackets and if necessary, cut wires by dimensions shown on the table on Page 30. Strip insulation from each wire by dimensions shown on Page 30.
- 4) Clean inner surface of grommet (Item 9p) and first 24 inches of cable jacket (cable end in contact with connector body) with alcohol to remove oil and dirt.
- 5) Slide connector body (Item 9g or 9h), washer (Item 9o) grommet (Item 9p), second washer (Item 9o) and sleeve (Item 9k) over the cable jacket.
- 6) For specific assembly and specific cable size, strip jackets and if necessary, cut wires by dimensions shown on the table on Page 30. Install cable tie (Item 9l). If applicable, insert nylon screw (Item 9m). For assemblies with nylon screw, install second cable tie (Item 9n) as close to the end of nylon screw head as possible. For assemblies without nylon screw, install second cable tie (Item 9n) as close to the end of jacket as possible. All cable ties shall be tied by using cable tie tensioner with tying force set to 50 lb. or 120 lb., depending on the cable tie size used.
- 7) Place and hold connector body (Item 9g or 9h) in holding fixture (e.g. vise) with the side to be inserted cap up.
- 8) Insert washers (Item 9o), grommet (Item 9p) and sleeve (Item 9k) into the connector body. Pull down cable till cable rests on the washer.

- 9) Place retaining ring (Item 9i) and
 - 9.1 Mounting tool (reference Drawings M-112260 & M-112261) into the connector body. Place 3/8-16 screws and nuts.
 - or
 - 9.2 Retaining ring pusher (reference Drawings M-112349 & M-112350) into the connector body. Use arbor press. Apply pressure on the pusher till the pusher reaches the stop. Remove pusher.

Check if the retaining ring is sitting completely in the groove. If not, repeat steps above until the retaining ring is sitting completely in the groove.
- 10) Mix epoxy potting compound (resin) with catalyst (hardener) (Item 9j) per instructions.
- 11) Pour epoxy (Item 9j) to the level shown on Page 30. Do not allow epoxy to reach the retaining ring.
- 12) Allow epoxy to cure and dry for 24 hours.
- 13) Test cable connector assembly for short circuits and continuity.

CABLE CONNECTOR ASSEMBLY

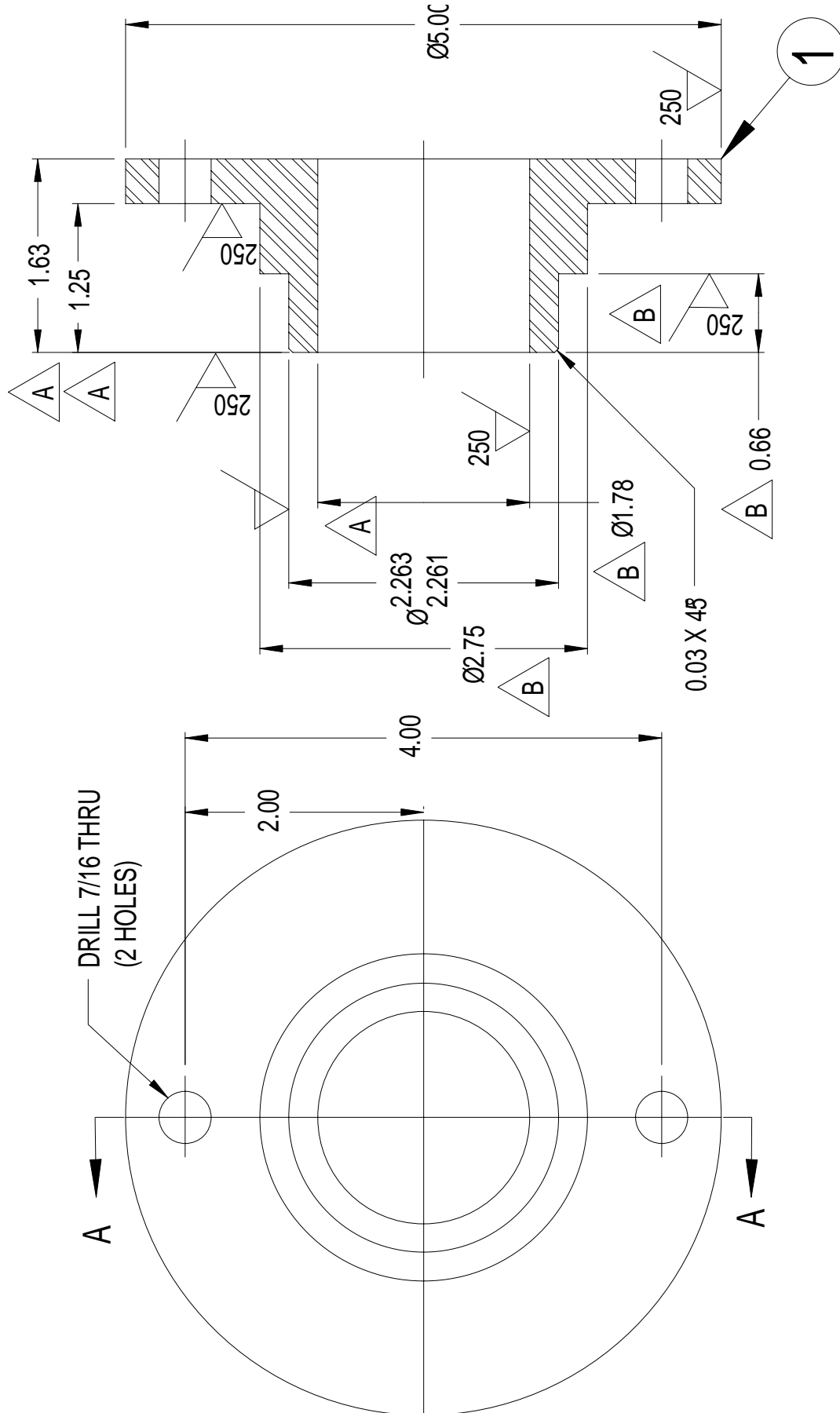


NOTES:
 1. ALL DIMENSIONS ARE IN INCHES
 2. FOR DASHING, 16. DIMENSIONS A & E SHALL BE DETERMINED DURING ASSEMBLY & REPORTED TO THE ENG. DEPT.

DASH NO.	DESCRIPTION	A	B	C	D	E	F	G	H
1	CABLE CONNECTOR ASSY FOR SPECIAL CABLE 1x4 WITH TERMINAL	19.50	15.00	0.50	0.25	17.00	12.50	0.63	0.88
2	CABLE CONNECTOR ASSY FOR CABLE 1x4 WITH TERMINAL	6.00	8.50	0.50	0.25	6.00	10.50	0.63	0.88
3	STD CABLE CONNECTOR ASSY FOR CABLE 1x4	6.75	6.75	0.50	0.25	6.00	6.00	0.63	0.88
4	CABLE CONNECTOR ASSY FOR CABLE 2x4 WITH TERMINAL	8.50	13.00	0.50	1.00	6.00	10.50	0.63	0.88
5	STD CABLE CONNECTOR ASSY FOR CABLE 2x4	8.50	8.50	0.50	1.00	6.00	6.00	0.63	0.88
6	CABLE CONNECTOR ASSY FOR CABLE 4x4 WITH TERMINAL	8.50	13.00	0.50	1.00	6.00	10.50	0.63	0.88
7	STD CABLE CONNECTOR ASSY FOR CABLE 4x4	8.50	8.50	0.50	1.00	6.00	6.00	0.63	0.88
8	STD CABLE CONNECTOR ASSY FOR CABLE 6x4	8.50	8.50	0.50	1.00	6.00	6.00	0.63	0.88
9	STD CABLE CONNECTOR ASSY FOR CABLE 8x4	8.50	8.50	0.50	1.00	6.00	6.00	0.63	0.88
10	STD CABLE CONNECTOR ASSY FOR CABLE 10x4	9.44	9.44	0.25	0.50	8.00	8.00	0.38	0.63
11	STD CABLE CONNECTOR ASSY FOR CABLE 12x4	9.44	9.44	0.25	0.50	8.00	8.00	0.38	0.63
12	CABLE CONNECTOR ASSY FOR SPECIAL CABLE 14x4	18.50	18.50	0.25	0.50	17.00	17.00	0.38	0.63
13	STD CABLE CONNECTOR ASSY FOR CABLE 14x4	9.44	9.44	0.25	0.50	8.00	8.00	0.38	0.63
14	STD CABLE CONNECTOR ASSY FOR CABLE 16x4	9.44	9.44	0.25	0.50	8.00	8.00	0.38	0.63
15	STD CABLE CONNECTOR ASSY FOR CABLE 16x8	9.44	9.44	0.25	0.50	8.00	8.00	0.38	0.63
16	CABLE CONNECTOR ASSY FOR SPECIAL CABLE 24x37	SEE NOTE	-	0.25	0.50	SEE NOTE	-	-	0.63

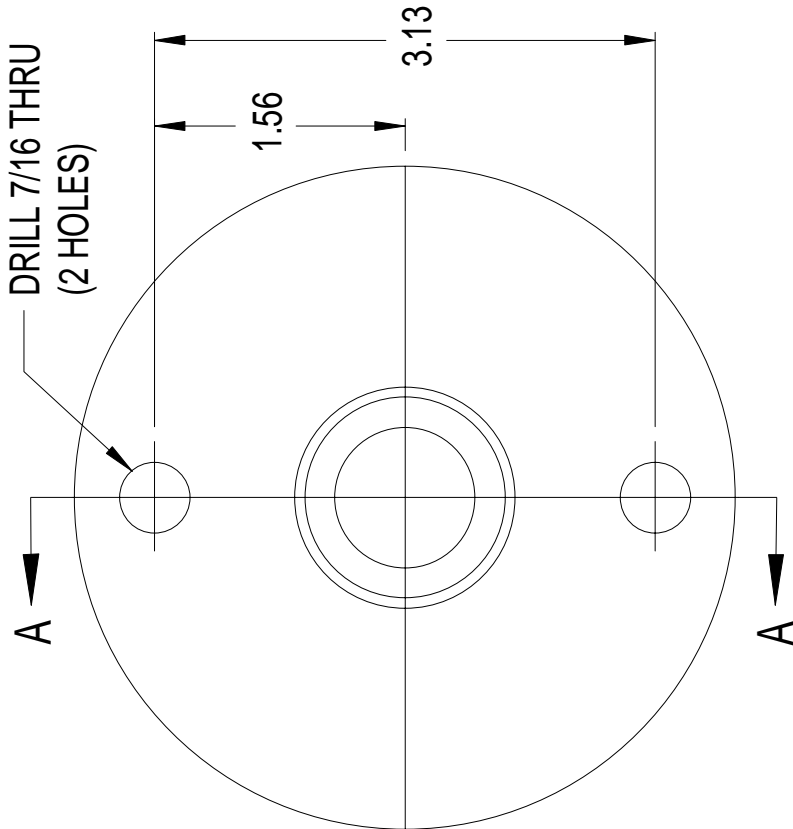
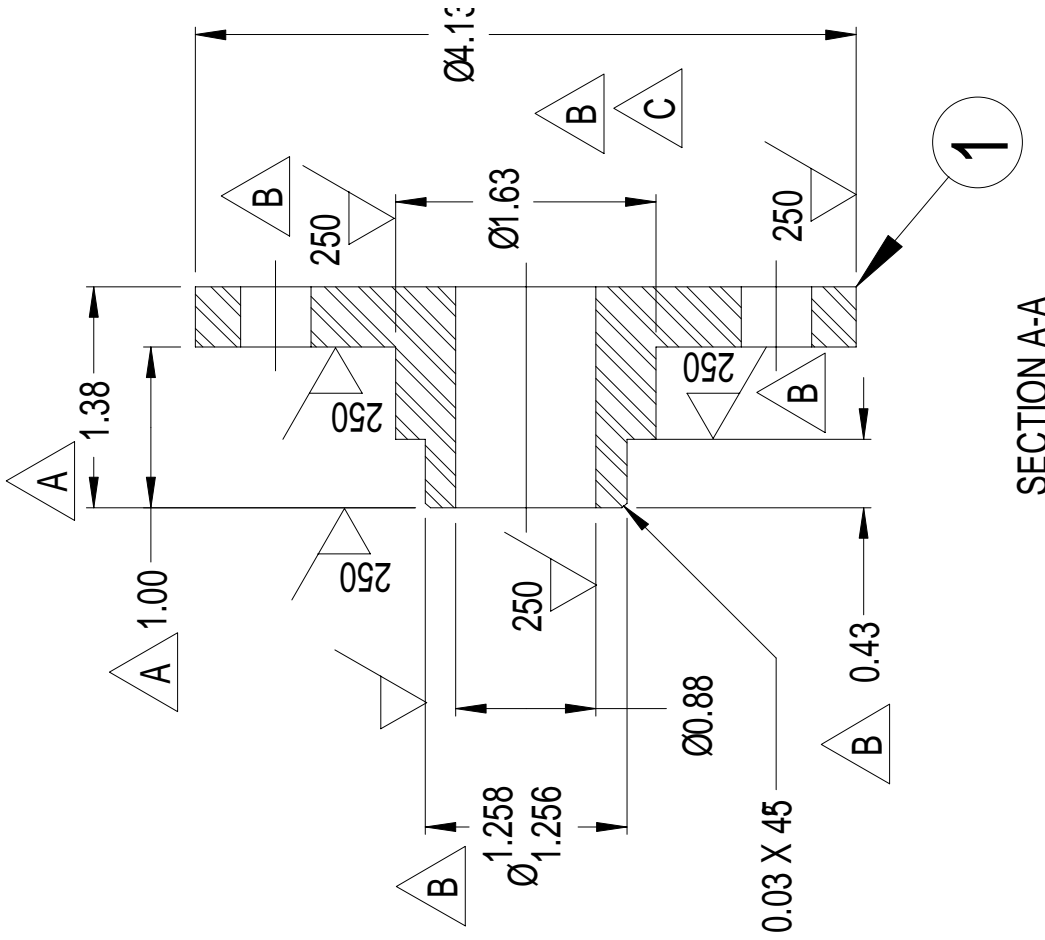
ITEM NO.	PART DESCRIPTION	QTY
9g or 9h	CONNECTOR BODY	1
9e or 9f	CABLE	1
9p	GROMMET	2
9o	WASHER	1
9k	SLEEVE	1
9i	RETAINING RING	1
9j	SEALING COMPOUND	1
9n	CABLE TIE, 120 LB.	1
9m	SHCS, NYLON 6/6	1
9l	CABLE TIE	1
11	RING TERMINAL FOR GROUNDING	1

MOUNTING TOOL – Dwg. A-112260, Rev. C, 1/4/05



ITEM 1: PL 1.63 x 5 OD x 1.78 ID

MOUNTING TOOL – Dwg. A-112261, Rev. C, 1/4/05



A ITEM 1: PL 1.38 x 4.13 OD x 0.88 ID