



RANDOLPH AUSTIN COMPANY

www.RandolphAustin.com

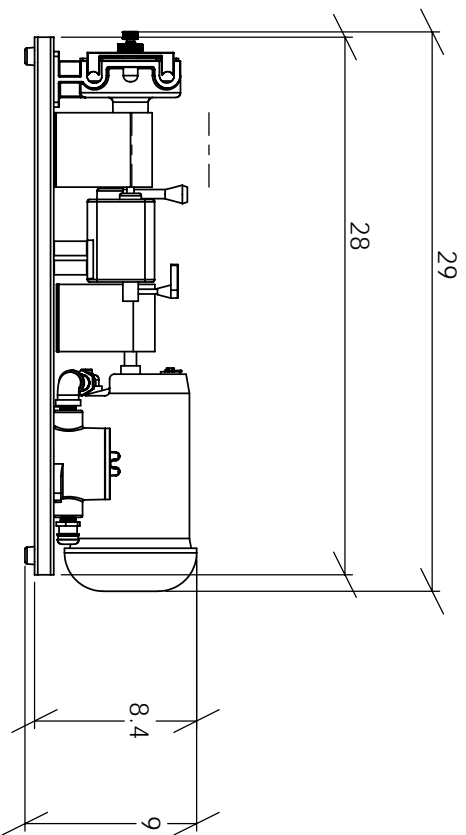
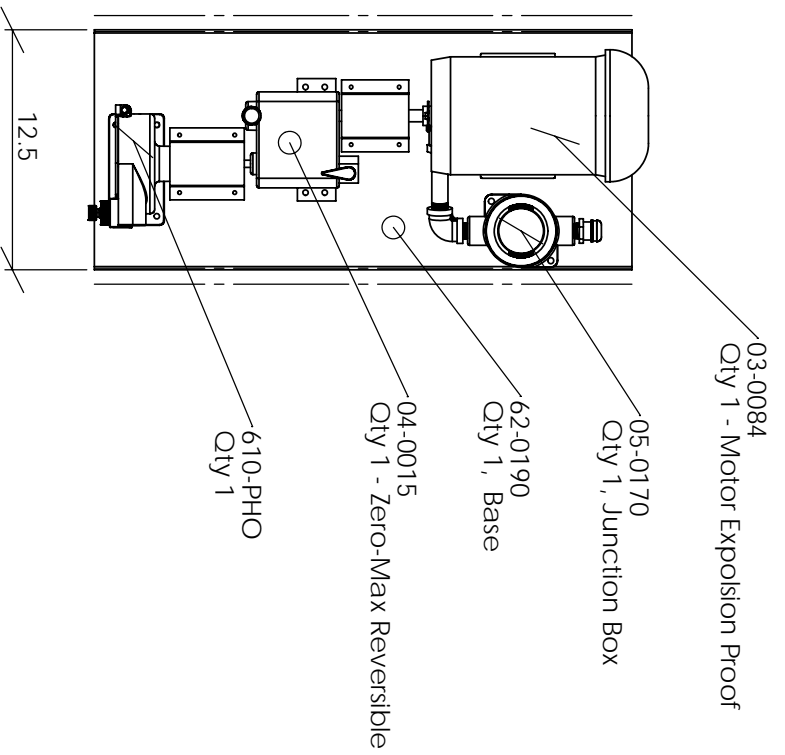
Operations Manual

Pump Series: 610

Model #610-203

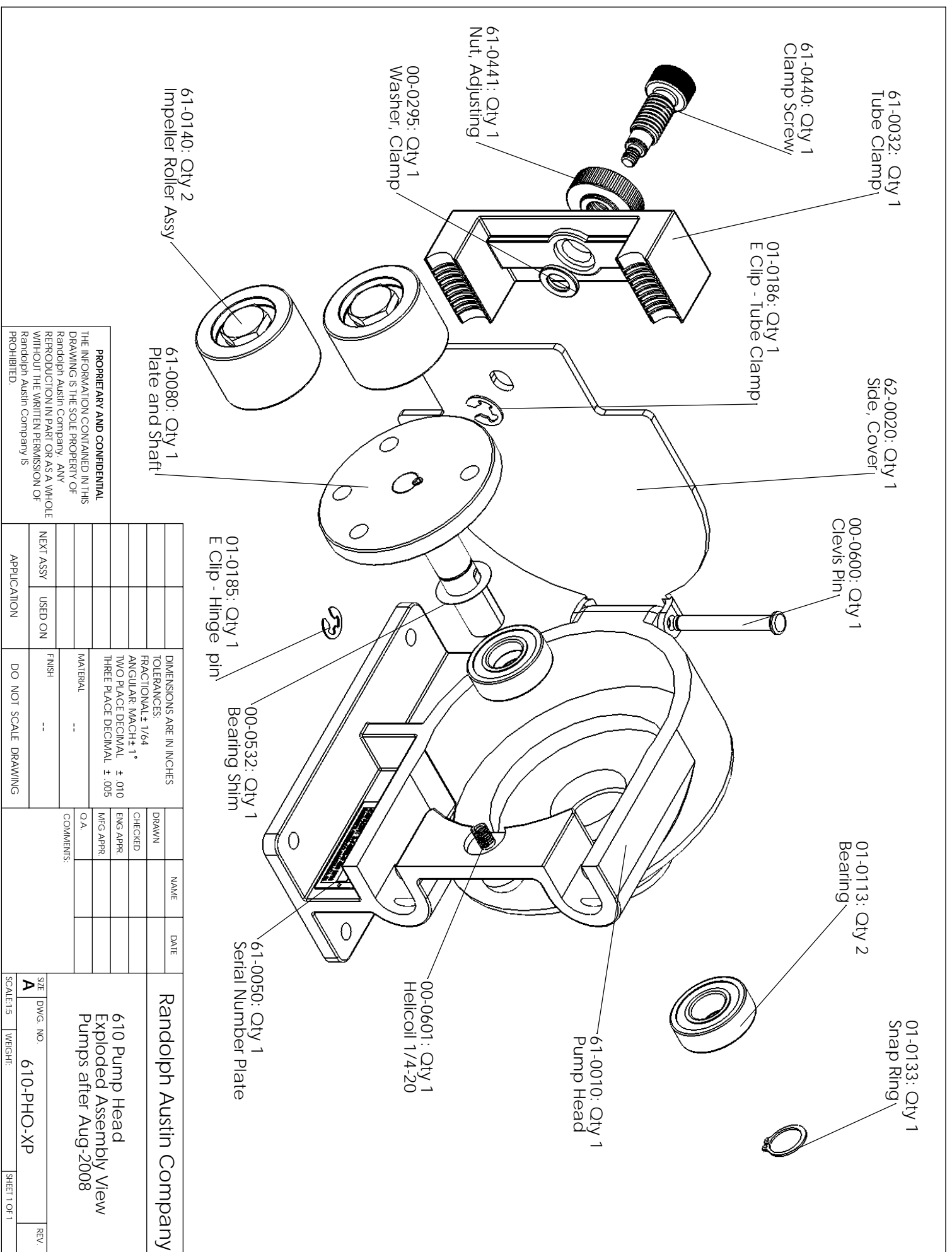
- 610 Pump Head
- Explosion Proof Motor Assembly
- Reversible Mechanical Speed Reducer
- Class 1, Group D, 1/3 Hp, 1ph, 115/208-230VAC

Randolph Austin Company
2119 FM 1626
Manchaca, Texas 78652
(512) 282-1590



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| | | | | | | | | | |
|-------------|---------|----------------------------|--------------------------|----------|----------|---|-------------------------|------|--|
| APPLICATION | | DIMENSIONS ARE IN INCHES | | DRAWN | | NAME | | DATE | |
| NEXT ASSY | USED ON | TOLERANCES: | FRAC TIONAL ± 1/64 | CHECKED | ENG APPR | COMMENTS: | Randolph Austin Company | | |
| | | ANGULAR: MACH ± 1° | TWO PLACE DECIMAL ± .010 | MFG APPR | | 610 Explosion Proof, Reversible speed control | | | |
| | | THREE PLACE DECIMAL ± .005 | | Q.A. | | SIZE DWG. NO. 610-203 | | | |
| | | MATERIAL | | | | SCALE: 1:10 WEIGHT: SHEET 1 OF 1 | | | |
| | | FINISH | -- | | | REV. | | | |
| | | DO NOT SCALE DRAWING | | | | | | | |

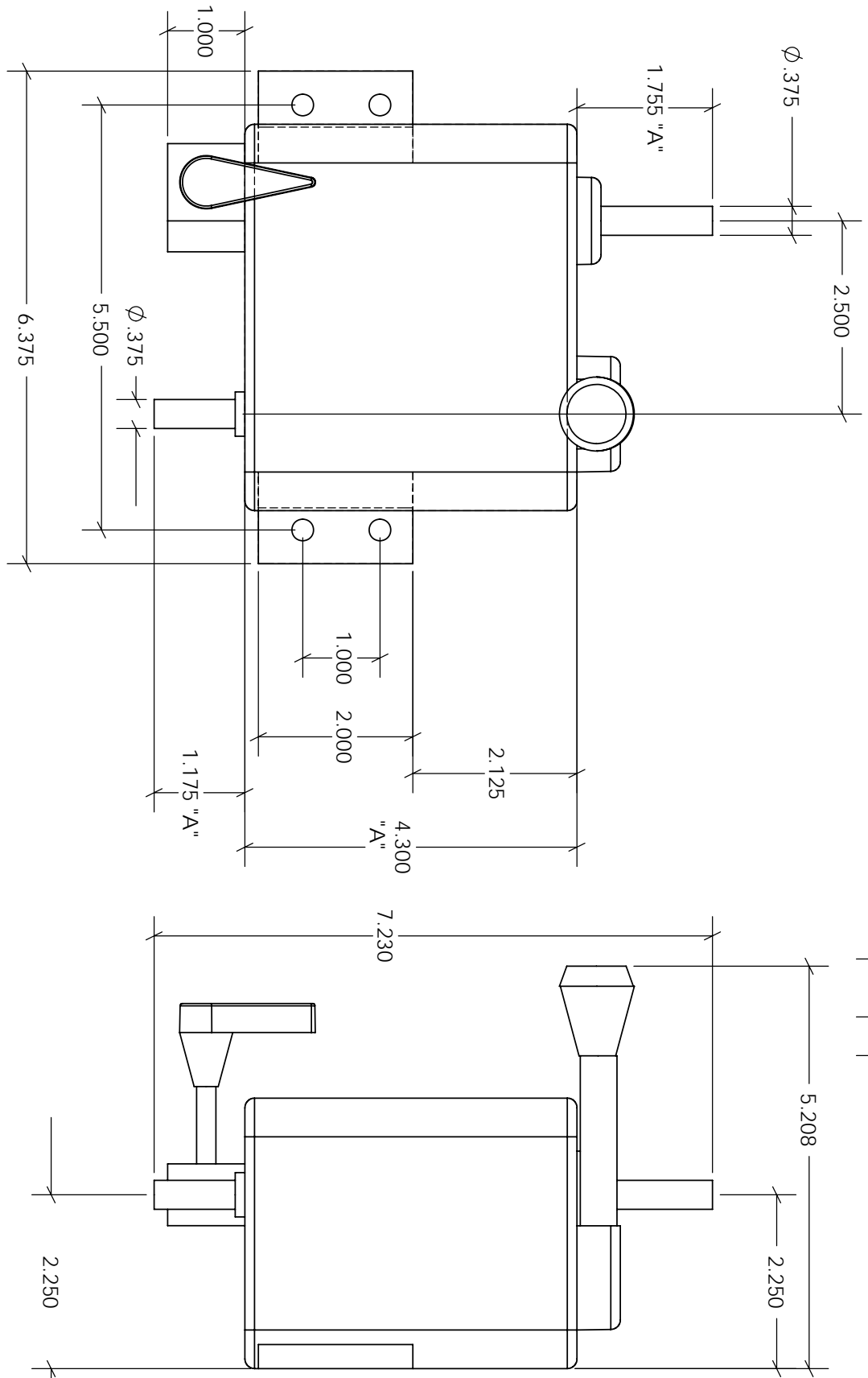


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| | | | | |
|--------------------------|----------------------------|-----------|------|------|
| DIMENSIONS ARE IN INCHES | | DRAWN | NAME | DATE |
| TOLERANCES: | FRACTIONAL ± 1/64 | CHECKED | | |
| | ANGULAR MACH ± 1° | ENG APPR | | |
| | TWO PLACE DECIMAL ± .010 | MFG APPR | | |
| | THREE PLACE DECIMAL ± .005 | O.A. | | |
| MATERIAL | | COMMENTS: | | |
| FINISH | | | | |
| NEXT ASSY | USED ON | | | |
| APPLICATION | | | | |
| DO NOT SCALE DRAWING | | | | |

| | | | |
|---|--------------|--------|------|
| Randolph Austin Company | | | |
| 610 Pump Head Exploded Assembly View Pumps after Aug-2008 | | | |
| SIZE | DWG. NO. | WEIGHT | REV. |
| A | 610-PHO-XP | | |
| SCALE: 1:15 | SHEET 1 OF 1 | | |

| REVISIONS | | DATE | APPROVED |
|-----------|------|-------------|----------|
| ZONE | REV. | DESCRIPTION | |
| | | | |
| | | | |



Dimensions "A" on model vary from data sheet. The dimensions are based on measured values.

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| | | | | | | | |
|--|--|-----------|--|--------------|--|---------|--|
| DIMENSIONS ARE IN INCHES | | DRAWN | | NAME | | DATE | |
| TOLERANCES: | | CHECKED | | | | | |
| FRACTIONAL ± 1/64 | | ENG APPR | | | | | |
| ANGULAR MACH ± 1 | | MFG APPR | | | | | |
| TWO PLACE DECIMAL ± .01 | | Q/A | | | | | |
| THREE PLACE DECIMAL ± .005 | | COMMENTS: | | | | | |
| MATERIAL | | | | | | | |
| FINISH | | | | | | | |
| -- | | | | | | | |
| NEXT ASSY | | | | | | | |
| USED ON | | | | | | | |
| APPLICATION | | | | | | | |
| DO NOT SCALE DRAWING | | | | | | | |
| <p>Randolph Austin Co JK-3, Reversible, Model for dimension</p> | | | | SIZE | | REV. | |
| | | | | A | | | |
| | | | | DWG. NO. | | 04-0015 | |
| | | | | SCALE: 1:2 | | WEIGHT: | |
| | | | | SHEET 1 OF 1 | | | |

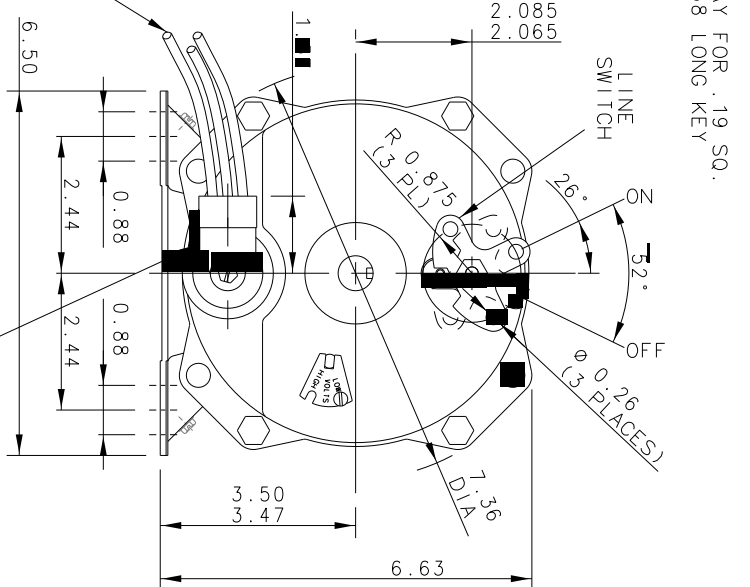
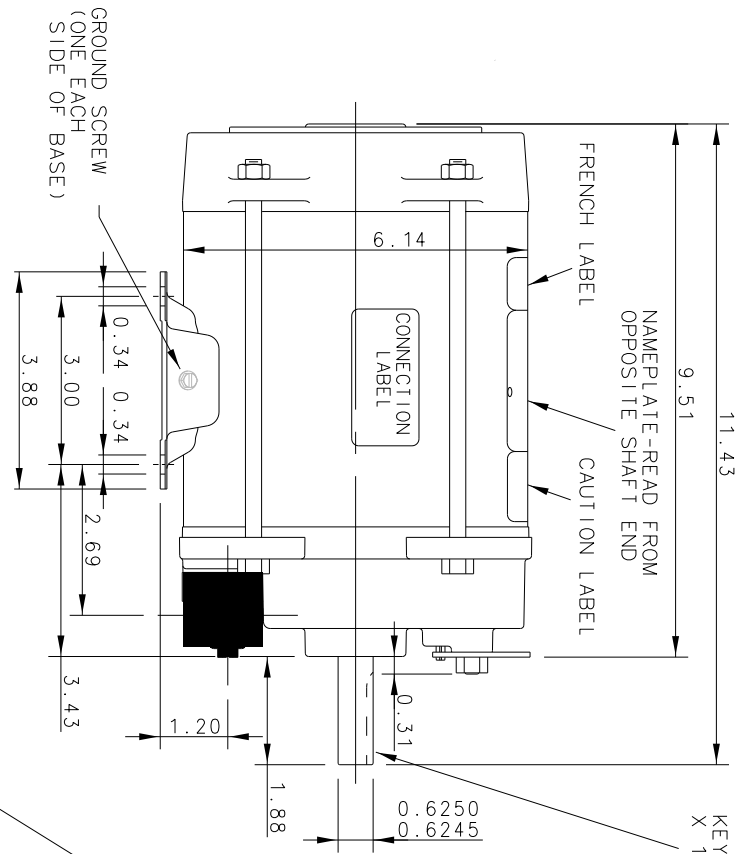
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1121007434

UNLESS OTHERWISE SPECIFIED DIMENSIONS WITHOUT TOLERANCES ARE REFERENCE ONLY

NOTES

- MOTOR LISTED FOR HAZARDOUS LOCATION - CLASS I, GROUP D.

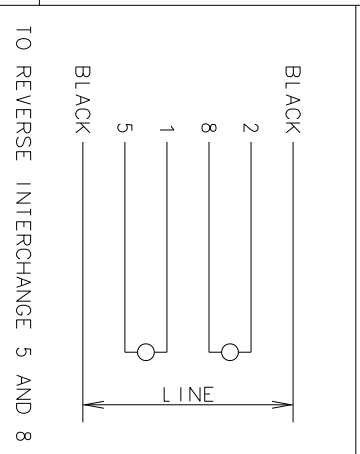


SIX LINE LEADS TO EXTEND 48" ± 2" - 0 FROM END OF CONDUIT BOSS WITH .44 STRIPPING. LEAD MATERIAL NO. 14 AWG WITH CROSS-LINKED POLYETHYLENE INSULATION, 600V, 125°C GASOLINE AND OIL RESISTANT, U.L. & CSA APPROVED.

MOTOR DATA

| | | | | | | |
|-----------|-----------------|-------------------------|--------------|-----------------------|-------------------|-----|
| TYPE | CSIR | ENCLOSURE | TENV X-PROOF | VIEWING LEAD END | MOTOR ROTATION | REV |
| HP | 1/3 | BEARINGS | BALL | ASSEMBLY END | ASSEMBLY ROTATION | REV |
| PH | 1 | PAINT | F.E. BLUE | ASSEMBLY VOLTAGE | LOW | |
| RPM | 1725/1425 | MOUNTING POSITION | HORIZONTAL | THERMALLY PROTECTED | LOW | |
| VOLTS | 115/208-230 | END CAP | N/R | WINDING AND TEST SPEC | 338144 | |
| F.L. AMPS | 5.0/2.5-6.0/3.0 | ENVIRONMENTAL CONDITION | NORMAL | CUSTOMER NAME | FE STANDARD | |
| S.F. AMPS | . | SHAFT MATERIAL | | CUSTOMER PART NO. | 51009 | |
| FRAME | 56 | TEMP CODE | T2A | DRAWN | LKW 12/31/97 | |
| TIME RATE | 30 MIN. | MAX.AMB. | 40°C | APPROVED | | |
| KVA CODE | M | INS. CLASS | B | RELEASED | 12/31/97 | |

| | |
|----------------------|---------------|
| LEADS | SEE LEAD NOTE |
| EXTERNAL CONNECTIONS | |
| BLACK | 2 |
| | 8 |
| 1 | 5 |
| BLACK | |



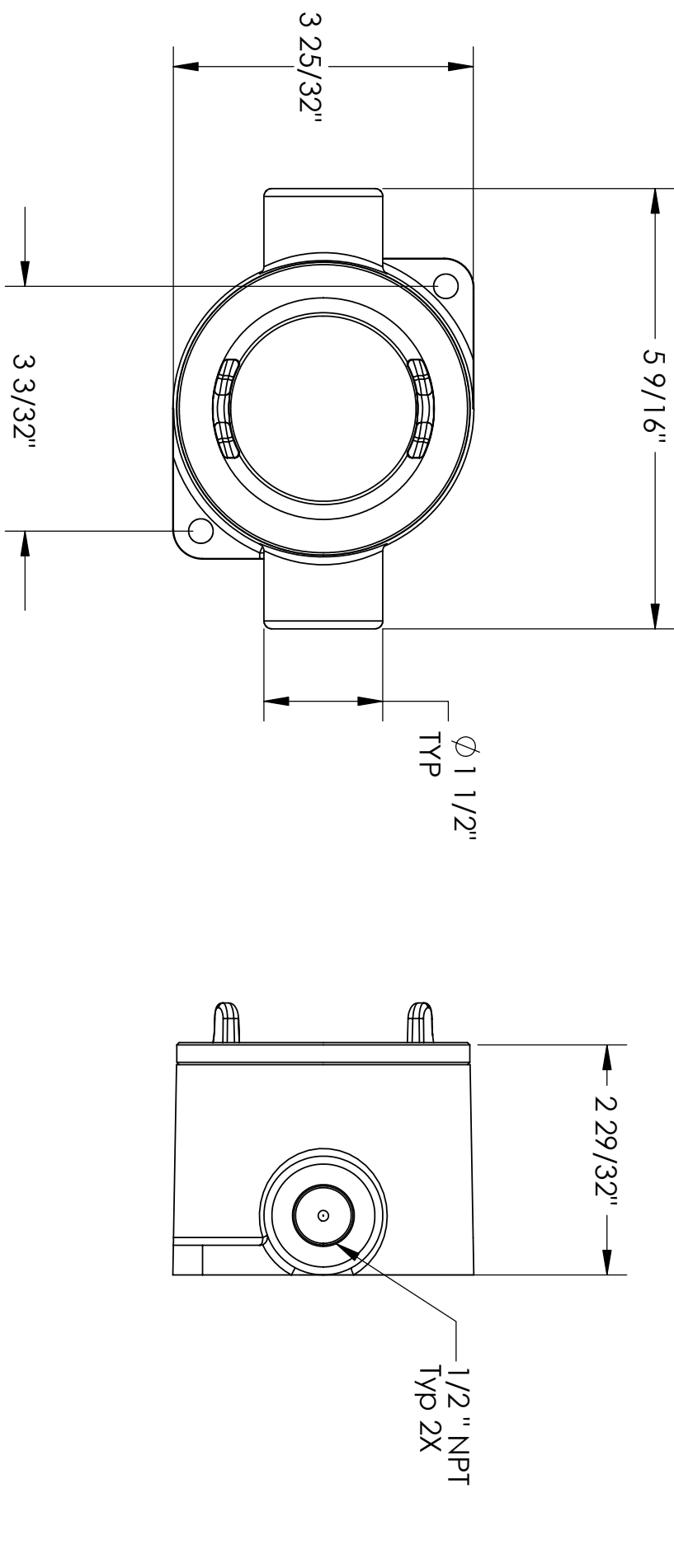
TO REVERSE INTERCHANGE 5 AND 8

Bluffton, Indiana 46714

MODEL OUTLINE

1121007434

| REVISIONS | | | | |
|-----------|------|-------------|------|----------|
| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
| | | | | |
| | | | | |
| | | | | |



Crouse Hines
EABC 1 6 - 1/2" NPT

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| APPLICATION | | DIMENSIONS ARE IN INCHES | | DRAWN | NAME | DATE | Randolph Austin Co Conduit Box - 610-201 |
|-------------|---------|----------------------------|--|-----------|------|------|--|
| NEXT ASSY | USED ON | TOLERANCES: | | CHECKED | | | |
| | | FRACTIONAL: 1/64 | | ENG APPR. | | | |
| | | ANGULAR: MACH ± 1 | | MFG APPR. | | | |
| | | TWO PLACE DECIMAL ± .01 | | Q.A. | | | |
| | | THREE PLACE DECIMAL ± .005 | | COMMENTS: | | | |
| | | MATERIAL | | | | | |
| | | FINISH | | | | | |
| | | | | | | | |
| | | DO NOT SCALE DRAWING | | | | | |
| | | | | | | | |

SIZE: **A** DWG. NO.: **05-0170** REV.:

SCALE: 1:2 WEIGHT: SHEET 1 OF 1

CES and CESD Arktite Receptacles

CESD – Cl. I, Div. 1 & 2, Group D*
 CES – Cl. I, Div. 1 & 2, Groups C,D
 Explosionproof
 Wet Locations
 Factory Sealed

2P

**Delayed Action
 Circuit Breaking
 CPH Plugs**

Application:

CES and CESD receptacles with CPH plugs are used:

- with portable electrically operated devices such as motor-generator sets, compressors, conveyors, portable tools, lighting systems and similar equipment
- in locations which are hazardous due to the presence of flammable vapors or gases
- in damp or corrosive locations
- at petroleum refineries, chemical and petrochemical plants, and other process industry facilities where similar hazards exist

Features:

- CES and CESD receptacles are equipped with a delayed action rotating sleeve which prevents complete withdrawal of the CPH plug in one continuous movement
- The delayed action feature permits the plug to be used as an emergency push-pull switch
- Details of operation are illustrated and described below:



Fig. 1

Fig. 2

Figure 1 above shows a CES receptacle assembly with CPH plug fully engaged. Figure 2 shows the plug withdrawn until it is stopped by the delayed action sleeve. In this position the circuit has been broken and the arc has been snuffed in the contact chambers.

Figure 3 shows the delayed action receptacle sleeve rotated approximately 45° to allow withdrawal of plug from receptacle.



Fig. 3

Fig. 4

Figure 4 shows the plug completely withdrawn. To accomplish this, the delayed action sleeve must be rotated counterclockwise. The time required to actuate the mechanism permits dissipation of the arc-generated heat before contacts and arcing chambers are opened to the atmosphere.

When inserting the plug, the reverse procedure is followed.

- Receptacles are factory sealed to simplify installation and wiring. External seals are not required
- The 30 ampere receptacles are provided with pressure terminals for field connection. The 60 ampere receptacles have flexible leads. Plugs are equipped with solder terminals.
- Two arrangements are provided for the 3/4" and 1 1/4" conduit hubs, as shown in the listings and dimensions on page 1012.

Grounding:

- NEC article 501 and CEC Part 1 Section 18 require that metal frames or exposed non-current-carrying metal parts of portable devices used in hazardous locations be grounded through an extra conductor in the portable cord.

Options:

- The following special options are available from factory by adding suffix to Cat. No.:

Description

Special polarity – for use where two or more receptacles of the same ampere rating, style and number of poles are to be installed in the same area for use on different voltages. Available as follows:

Receptacle interior rotated 22½ degrees clockwise when viewed from face and plug changed to match S4

- CES and CESD receptacles and CPH plugs are provided with an extra grounding pole for attachment of the grounding wire. In the plugs, provision is made for attachment of the grounding wire to the grounding pole. In addition, direct connection is provided between plug and receptacle housings and the ground pole. In the receptacles, grounding is accomplished through the conduit system.

Interchangeability of Plugs with Non-Hazardous Location Receptacles:

- CPH plugs can also be used with standard AR and NR receptacles of the same ampere rating, style and number of poles, thus permitting portable devices which are suitable for use in hazardous locations to be connected to receptacles in both hazardous and non-hazardous areas
- Portable devices for non-hazardous areas equipped with APJ and NPJ Arktite plugs *cannot* be used with CES and CESD receptacles

Standard Materials:

- Back boxes – Feraloy® iron alloy
- Receptacle housings – 30 ampere – copper-free aluminum; 60 ampere – Feraloy® iron alloy
- Plug bodies – copper-free aluminum
- Insulation – Krydon® fiberglass – reinforced polyester
- Contacts – brass or hard-drawn copper

Standard Finishes:

- Feraloy – electrogalvanized and aluminum acrylic paint
- Copper-free aluminum – natural
- Krydon material – red
- Brass and copper – natural

Electrical Rating Ranges:

- 30 and 60 amperes

Certifications and Compliances:

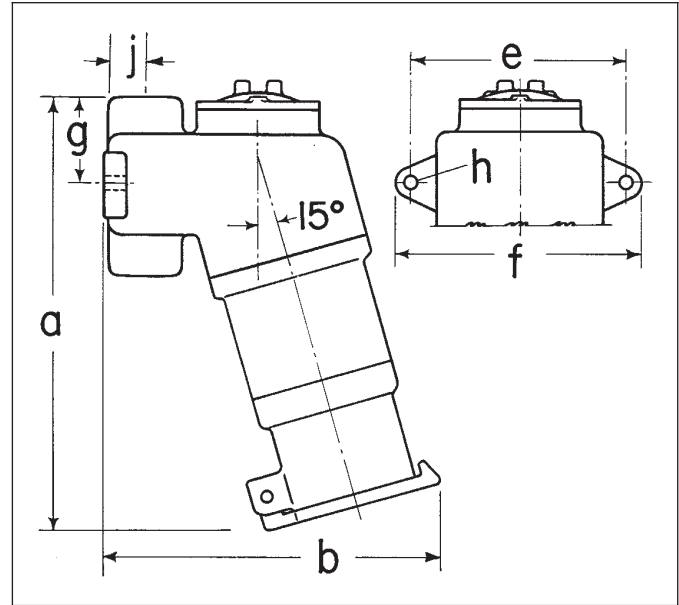
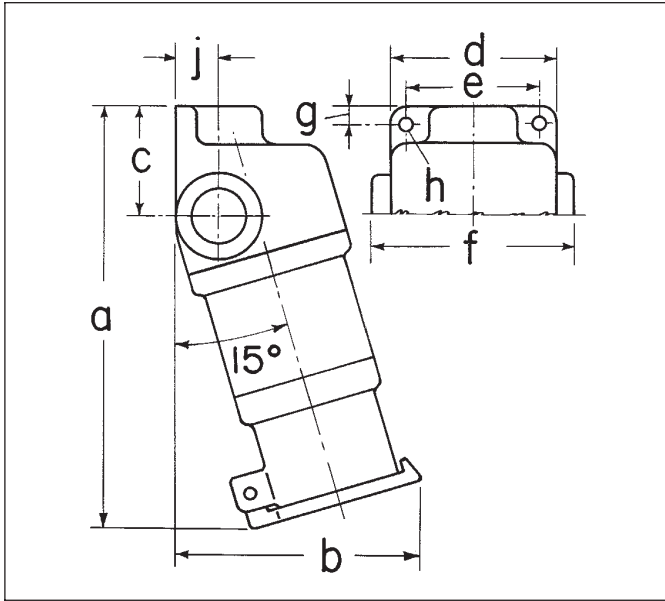
- NEC/CEC:
 CES – Class I, Division 1 and 2, Groups C,D;
 CESD – Class I, Division 1 and 2, Group D*
- ANSI/UL Standard: 1010
- CSA Standard C22.2 No. 182.1

* For U.S. CESD are also suitable for Class I, Group C when used with immediately adjacent seals.

CES and CESD Arktite Receptacles

**Circuit Breaking
Delayed Action, CPH Plugs
Dimensions**

CESD – Cl. I, Div. 1 and 2, Group D*
CES – Cl. I, Div. 1 and 2, Groups C,D
Explosionproof
Wet Locations
Factory Sealed

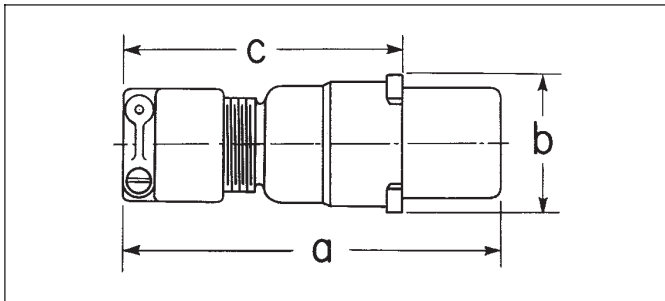


CES

| Cat. # | a | b | c | d | e | f | g | h | j |
|---------|--------------------------------|-------------------------------|--------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|
| CES2213 | | | | | | | | | |
| CES2214 | 7 ⁷ / ₁₆ | 4 ⁵ / ₈ | 2 ³ / ₁₆ | 3 ³ / ₈ | 2 ³ / ₄ | 4 ¹ / ₈ | 5 ¹ / ₁₆ | 1 ¹ / ₃₂ | 7 ⁷ / ₈ |
| CES4233 | | | | | | | | | |
| CES4234 | 12 | 7 | 2 ⁷ / ₈ | 5 ¹ / ₄ | 4 ³ / ₈ | 6 ¹ / ₈ | 7 ¹ / ₁₆ | 1 ⁹ / ₃₂ | 1 ¹ / ₈ |

CESD

| Cat. # | a | b | e | f | g | h | j |
|----------|--------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------------|
| CESD2213 | | | | | | | |
| CESD2214 | 7 ⁵ / ₈ | 6 ³ / ₈ | 4 ¹ / ₄ | 5 | 1 ⁷ / ₈ | 1 ¹ / ₃₂ | 1 ³ / ₁₆ |
| CESD4233 | | | | | | | |
| CESD4234 | 13 ¹ / ₂ | 9 ⁵ / ₈ | 6 ¹ / ₄ | 7 ¹ / ₄ | 3 | 1 ⁹ / ₃₂ | 1 ³ / ₁₆ |



CPH

| Cat. # | a | b | c |
|---------|--------------------------------|--------------------------------|--------------------------------|
| CPH7713 | 6 | 2 ³ / ₈ | 4 ⁵ / ₁₆ |
| CPH7913 | 6 ⁷ / ₁₆ | 2 ³ / ₈ | 4 ³ / ₄ |
| CPH7714 | 6 | 2 ³ / ₈ | 4 ⁵ / ₁₆ |
| CPH7914 | 6 ⁷ / ₁₆ | 2 ³ / ₈ | 4 ³ / ₄ |
| CPH7733 | 7 ³ / ₄ | 2 ³ / ₄ | 5 |
| CPH7933 | 8 ¹ / ₈ | 2 ³ / ₄ | 5 ³ / ₈ |
| CPH7734 | 7 ³ / ₄ | 3 ¹ / ₁₆ | 5 |
| CPH7934 | 8 ¹ / ₈ | 3 ¹ / ₁₆ | 5 ³ / ₈ |

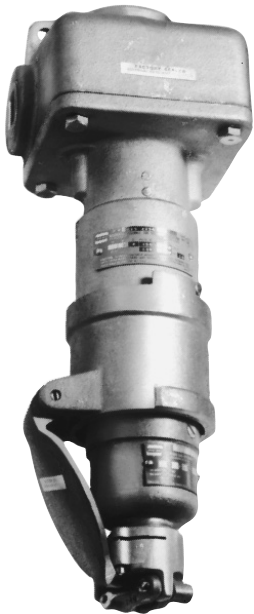
* In U.S. CESD are also suitable for Class I, Group C when used with immediately adjacent seals.

CES and CESD Arktite® Receptacles

Delayed Action
Circuit Breaking
CPH Plugs

CESD – Cl. I, Div. 1 & 2, Group D*
CES – Cl. I, Div. 1 & 2, Groups C,D
Explosionproof
Wet Locations
Factory Sealed

2P



CES Receptacles with three hubs – one on each side and one at top – and two pipe plugs with CPH plug fully engaged



CESD Receptacles with vertical through feed hubs and one pipe plug. Removable threaded cover at top to facilitate pulling wires

CES/CESD Receptacles

| Hub Size | Circuit | Phase | Max. HP | Max. Amps | Volts at 60 Cycles AC | CES Cat. # | CESD Cat. # |
|----------|----------------|-------|---------|-----------|-----------------------|------------|-------------|
| 3/4 | 2-wire, 3-pole | 1 | 1/2 | 7 | 480 [Ⓛ] | CES2213 | CESD2213 |
| | | | 1 1/2 | 30 | 120 to 240 | | |
| 3/4 | 3-wire, 4-pole | 3 | 1 | 7 | 480 [Ⓛ] | CES2214 | CESD2214 |
| | | | 3 | 30 | 120 to 240 | | |
| 1 1/4 | 2-wire, 3-pole | 1 | 3 | 30 | 480 [Ⓛ] | CES4233 | CESD4233 |
| 1 1/4 | 3-wire, 4-pole | 3 | 5 | 30 | 480 [Ⓛ] | CES4234 | CESD4234 |



CPH Plugs with mechanical cable grip and Neoprene bushing

CPH Plugs

| Circuit | Phases | Max. HP | Max. Amps | Volts at 60 Cycles AC |
|----------------|--------|---------|------------|-----------------------|
| 2-wire, 3-pole | 1 | 1/2 | 7 | 480 [Ⓛ] |
| | | 1 1/2 | 30 | 120 to 240 |
| 3-wire, 4-pole | 3 | 1 | 7 | 480 [Ⓛ] |
| | | 3 | 30 | 120 to 240 |
| 2-wire, 3-pole | 1 | 3 | 30 | 480 [Ⓛ] |
| | | 60 | 120 to 240 | |
| 3-wire, 4-pole | 3 | 5 | 30 | 480 [Ⓛ] |
| | | 60 | 120 to 240 | |

CABLE DIA.

| Cable Dia. Range | CPH Part # | CPH Part # |
|------------------|------------|------------|
| .375 to .875 | CPH7713 | CPH7913 |
| .500 to .875 | CPH7714 | CPH7914 |
| | CPH7733 | CPH7933 |
| | CPH7734 | CPH7934 |

* In U.S. CESD are also suitable for Class I, Group C when used with immediately adjacent seals.
Ⓛ CSA certified units are rated at 600 volts.

HOW TUBING IS INSERTED IN THE PUMP

1. Turn power off. Open the cover plate and tube clamp. Remove existing tubing by manually turning rollers while gently tugging on the tubing.
2. Clean any debris from pump race way and tube clamp with a clean rag or paper towel. A light detergent spray can be used as well. Avoid the use of solvents such as acetone as they will have an adverse effect on the paint.
3. Thread tubing back into pump. Start at the top of the pump and manually move the rollers so that they start occluding the tubing. Care should be taken to avoid pinching fingers with rollers. Align the tubing so that is in the center of the raceway.
4. Add lubricant. Close pump cover. Tighten tubing clamp to ensure the tubing is not fed through the pump.

| Pump Series | Tubing Size |
|--------------------|--|
| 250 | .062" (1/16") ID X .187" (3/16") OD |
| 250 | .125" (1/8") ID X .250" (1/4") OD |
| 300 | .250" (1/4") ID X .437" (7/16") OD |
| 400 | .250" (1/4") ID X .437" (7/16") OD |
| 500 | .187" (3/16") ID X .375" (3/8") OD |
| 500 | .250" (1/4") ID X .437" (7/16") OD |
| 610,615,620, & 630 | .375" (3/8") ID X .625" (5/8") OD |
| 610,615,620, & 630 | .500" (1/2") ID x .750" (3/4") OD |
| 750 | .625" (5/8") ID X .937" (15/16") OD |
| 750 | .750" (3/4") ID X 1.062" (1 1/16") OD |
| 780 | .750" (3/4") ID X 1.062" (1 1/16") OD |
| 880 | .750" (3/4") ID X 1.25" (1 1/4") OD |
| 880 | 1.00" (1.00") X 1.50" (1 1/2") OD |

General Characteristics of Randolph Austin Tubing Materials

Cilran™ is made from a thermoplastic elastomer that possesses exceptional chemical resistance to acids and bases. **Cilran™** has low gas permeability; good flex fatigue resistance and meets USP Class VI specifications. Ideal for use in many laboratory applications, it may be used in place of silicone for some applications. **Cilran™** is translucent white in color.

Povinal™ is a polyvinyl alcohol based tubing which is excellent for use in applications with aliphatic, aromatic and chlorinated hydrocarbon solvents. **Povinal™** has good flex fatigue resistance and is suitable for many industrial applications. It may be used as a substitute for fluoroelastomer polymers in some applications. Not recommended for use with water or solutions containing concentrations of water. Pump tubing is teal in color. Transfer tubing is amber.

Vytex™ is a clear flexible polyvinyl tubing ideal for general-purpose usage in applications with dilute aqueous solutions (both acids and alkali's), and for food and beverage usage. Strong acid solutions may be used with **Vytex™** for short intervals, but should be flushed with water after use. The smooth surface allows for easy flushing and cleanup for food and beverage applications. **Vytex™** is a durable, high flex tubing with a Shore "A" durometer of 60 allowing a long life expectancy for continuous flexing where peristaltic pumps are used.

Prothane II™ is transparent, aqua blue, polyester polyurethane tubing that exhibits excellent abrasion resistance, has good low temperature properties and is resistant to ozone and oxidation. **Prothane II™** exhibits an excellent resilience to continuous flexing and impacting experienced in peristaltic pumps. Along with these exceptional features **Prothane II™** exhibits good hydrolic stability, good oil and fuel resistance, and high tensile and tear strength. **Prothane II™** is resistant to diesel fuel, kerosene, motor oil, mild solvents, aromatic hydrocarbons, gasoline, and concentrated acid and alkaline solutions.

E-D Plex™ is multi-purpose tubing that is ideally suited for applications that range from transferring paint, ink, acids, and bases. Some oil and hydrocarbons will work with **E-D Plex™**, but should be tested before use. Combining the environmental resistance of EPDM with the chemical resistance of chloroprene, **E-D Plex™** possesses similar elastomeric performance found in more expensive vulcanized rubber, while still maintaining high flex fatigue resistance. **E-D Plex™** has been proven very successful in peristaltic pump applications where continuous flexing is required.