

**TRANSMITTAL OF SUBMITTAL**

DATE: 8/16/23

**TO: Scott Miller**

CMG - City of Atlanta  
2528 Chattahoochee Circle  
Atlanta, GA 30318

New Submittal  Resubmittal

Project: East Area Water Quality Control Facility  
Improvements

Specification Section No. : 11134

Supplier/Vendor/Subcontractor: Heyward

Manufacturer: JWC Environmental

**FROM: LAKESHORE ENGINEERING**

1259 Ellsworth Drive


Atlanta, GA 30318

**The following items are hereby submitted:**

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Submittal number	Submittal Type	Contains Variation to Contract	
				No	Yes
Email	Sludge Grinders - O&M Manual	11134-67.01	O&M Manual	X	

**Comments/Variation:**

CONTRACTOR hereby certifies that (i) CONTRACTOR has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By:  \_\_\_\_\_  
Brandon Dow



## **OPERATION and MAINTENANCE MANUAL**

### **East Area Water Quality Control Facility**

<b>MODEL</b>	<b>S/N</b>	<b>TAG NO.</b>
30004T-1206	115412-1-1	82G3612
	115412-1-2	82G3614
PC2220	115412-2-1	
	115412-2-2	

#### **Contractor**

Lakeshore Engineering  
1259 Ellsworth Drive NW  
Atlanta, GA 30318-4105

#### **Manufacturer/Service**

JWC Environmental  
2600 South Garnsey Street  
Santa Ana, CA 92707  
Ph: 800-331-2277

#### **Local Representative**

Heyward, Inc.  
3590 Habersham at Northlake  
Tucker, GA 30084  
Ph: 770-496-9808



# **OVERALL TABLE OF CONTENTS**

## **East Area Water Quality Control Facility**

- Customer Order
- Warranty Certificate
- Monster Renew Program

### **TAB 1**

- Operation and Maintenance Manual, Grinder Model 30004T-1206
- Drawings

### **TAB 2**

- Operation and Maintenance Manual, Motor Controller PC2220
- Drawings





2850 S. Red Hill Ave., STE 125  
 Santa Ana, CA 92705  
 (949) 833-3888

**CUSTOMER ORDER**

Order Number: **115412**  
 Date: **10/6/2022**  
 Page: **1**

**Sold To**

Lakeshore Engineering  
 1259 Ellsworth Dr Nw  
 Atlanta, GA 30318-4105  
 US - UNITED STATES

**Ship To**

Lakeshore Engineering  
 1510 Key Road  
 Intrenchment Creek WPCP  
 Atlanta, GA 30318  
 US - UNITED STATES

CUSTOMER ID				CUSTOMER P.O.				PAYMENT TERMS				FREIGHT TERMS			
6013390				21091-11160				90% Net 45, 10% NTE 180				Freight Prepaid			
SALES REP ID				SHIPPING METHOD				F.O.B.				SHIP DATE			
Heyward GA				Bestway				Origin				10/11/2022			
QUANTITY								T							
LI #	ORD	SH	LOT	PART ID				DESCRIPTION				X			

Contact 48Hrs Prior  
 Wayne Owenby 678-524-4220

M-F, 8am - 3pm

Final Inspection Report (FIR) to be shipped with equipment

LIQUIDATED DAMAGES. LD's begin 12 weeks + 2 weeks grace period after release for Production and are capped at 15%.

1 2 0 1 30004T-1206  
 A30004T-12-CD REV D  
 A30004T-12-01 REV D

30004T-1206  
 Ship Date 10/11/2022  
 Model 30004T-1206 Muffin Monster grinder in a 6 inch dia. pipeline.  
 30004T-1206 grinder with 12 inch cutter stack using 11 tooth .310 thick cam cutters in alloy steel tungsten carbide mechanical seals with Buna-N elastomers rated for 90 psi, Cork & Rubber gaskets.

A34010-0143-29-3HP TEFC 208-230/460 182TC 1.15SF 60HZ

Primer: Tnemec N69, 1 coat, 4-6 dry mils, hunter green  
 Intermediate: Tnemec N69, 1 coat, 6 dry mils min, hunter green  
 Final: Tnemec 72 Endura-Shield, 2 coats, 2-3 dry mils min, hunter green

Surface prep: SSPC-SP6

SN: 115412-1-1, 115412-1-2

Tag# 82G3612, #82G3614



2850 S. Red Hill Ave., STE 125  
 Santa Ana, CA 92705  
 (949) 833-3888

**CUSTOMER ORDER**

Order Number: **115412**  
 Date: **10/6/2022**  
 Page: **2**

**Sold To**

Lakeshore Engineering  
 1259 Ellsworth Dr Nw  
 Atlanta, GA 30318-4105  
 US - UNITED STATES

**Ship To**

Lakeshore Engineering  
 1510 Key Road  
 Intrenchment Creek WPCP  
 Atlanta, GA 30318  
 US - UNITED STATES

CUSTOMER ID	CUSTOMER P.O.	PAYMENT TERMS	FREIGHT TERMS
6013390	21091-11160	90% Net 45, 10% NTE 180	Freight Prepaid
SALES REP ID	SHIPPING METHOD	F.O.B.	SHIP DATE
Heyward GA	Bestway	Origin	10/11/2022
QUANTITY			T
LI #	ORD	SHP	LOT
2	2	0	2

LI #	ORD	SHP	LOT	PART ID	DESCRIPTION	T	X
2	2	0	2	PC2220	PC2220-115412 Ship Date 10/11/2022 DWG# PC2220-115412-B 3HP Grinder Motor 460V / 3 Phase / 60Hz Main Circuit Breaker with Flanged disconnect switch Panasonic PLC Phase monitor relay Surge suppressor Allen-Bradley pilot light devices Local-Off/Reset-Remote selector switch Forward-Off-Reverse selector switch One set of spare fuses NEMA 4X 316 Stainless Steel Flanged Enclosure (24x25x8) Program #PC2220-115412  SN: 115412-2-1, 115412-2-2		
3	2	0		SUBMITTALS	Standard Submittals Ship Date 10/11/2022  For Approval: (1) PDF to jlaurion@lakeshoreengineering.com (1) PDF to Rep		
4	3	0		MANUALS	O&M MANUALS HARD COPY Ship Date 10/11/2022  (1) Hard Copy to Invoice (1) PDF to jlaurion@lakeshoreengineering.com (1) PDF to Rep		
6	1	0		Shipping	Shipping & Handling Ship Date 10/11/2022		
7	1	0		SU	Start Up Ship Date 10/11/2022		
8	1	0		EXT-WAR	Extended Warranty Ship Date 10/11/2022  4 year extended warranty		



2850 S. Red Hill Ave., STE 125  
 Santa Ana, CA 92705  
 (949) 833-3888

**CUSTOMER ORDER**

Order Number: 115412  
 Date: 10/6/2022  
 Page: 3

**Sold To**

Lakeshore Engineering  
 1259 Ellsworth Dr Nw  
 Atlanta, GA 30318-4105  
 US - UNITED STATES

**Ship To**

Lakeshore Engineering  
 1510 Key Road  
 Intrinchment Creek WPCP  
 Atlanta, GA 30318  
 US - UNITED STATES

CUSTOMER ID		CUSTOMER P.O.		PAYMENT TERMS		FREIGHT TERMS	
6013390		21091-11160		90% Net 45, 10% NTE 180		Freight Prepaid	
SALES REP ID			SHIPPING METHOD		F.O.B.		SHIP DATE
Heyward GA			Bestway		Origin		10/11/2022
QUANTITY							T
LI #	ORD	SHP	LOT	PART ID	DESCRIPTION		X

9 1 0 9 ENGLAB

Engineering Labor  
 Ship Date 10/11/2022





## WARRANTY CERTIFICATE

Date of Issue:	10/11/2022	Sales Order Number:	115412
Date of Startup:	TBD		

End User/Owner:	City of Atlanta
Project Name:	East Area Water Quality Control Facility Improvements
Project Location:	Atlanta, Georgia

Equipment Supplied	Muffin Monster Grinder   Motor Controller		
Model Number:	30004T-1206	PC2220	
Serial Number:	115412-1-1, 115412-1-2	115412-2-1, 115412-2-2	

Except for the following, the warranty procedures, provisions and terms stated in JWC Environmental Manufacturer's Standard Warranty, shall apply, copy attached.

- A. One year standard warranty in accordance with the project General Conditions against defective equipment and poor workmanship.
- B. An extended limited warranty for the grinders including the motors, controls and seals provided as part of Specification 11134 Section 1.5 with respect to the specified performance criteria. The warranty must be supplied to the Owner by the Contractor prior to start-up of the equipment and must be in a form acceptable to the Owner. The warranty shall be limited to all direct costs, including labor, and consequential costs relating to any required remedy, including replacement of the equipment, associated with failure of the equipment to perform as specified, consistent clogging and torque cutoff of the grinders, premature failure of the bearings, seals and / or cutting bars during the warranty period. The warranty shall cover the period during initial start-up and testing and from the date of expiration of the Contractor's standard one year warranty for a period of 1460 days to allow for evaluation of equipment life and structural integrity over a period of 5 years.

Item	Equipment No.
Sludge Feed Grinders	82G3612 & 82G3614



## **MANUFACTURER'S STANDARD WARRANTY**

Subject to the terms and conditions hereof, JWC Environmental (the "Company") warrants until one year after commissioning (written start-up date notification required) of the Product or until 18 months after delivery of such Product to Buyer, whichever is earlier, that each Product will be free of defects in materials and workmanship. If the Company receives written notification of such defect during the warranty period and the defective Product's use is discontinued promptly after the defect is discovered by the person who then owns the defective Product (the "Owner"), the Company will cause any Products whose defect is covered under this warranty to either be replaced or repaired at no cost to the Owner. The foregoing warranty does not cover repairs required due to repair or alteration other than by the Company's personnel, accident, neglect, misuse, wear whether ordinary or extraordinary, transportation or causes other than ordinary use and maintenance in accordance with the Company's instructions and specifications. Any replaced Products will become the property of the Company. Any replacement Products will be warranted only for the remaining term of the original limited warranty period and not beyond that term.



JWC Environmental Inc.  
2600 South Garnsey Street  
Santa Ana, California 92707  
866-485-1897  
jwce.com/service

## Monster Renew Program

### Boost the life of your existing unit

Get the performance of new factory-built cartridge sent straight to you

### One-year warranty

Standard 1-year warranty ensures unit is protected

### - HOW IT WORKS -

1. Receive renew monster cutter cartridge
2. Remove motor from existing cartridge assembly\*
3. Install existing motor on new Monster cutter cartridge
4. Install and START GRINDING!

\*no need to send back old cutter cartridge

### CONTACT

[www.jwce.com/service](http://www.jwce.com/service)

800-331-2277



# **JWC ENVIRONMENTAL INC.**

**CHANNEL MONSTER® / MACHO MONSTER® / MUFFIN MONSTER® /  
MINI MONSTER® / SLUDGE MONSTER®**

## **OPERATION AND MAINTENANCE MANUAL**

**This manual, and all the information contained herein, is the exclusive property of JWC Environmental Inc. It is fully protected by copyright and contains information of a proprietary nature. It is provided for the sole purpose of transmitting the information contained herein to the designated recipient.**

**This information is to be used only as specified in the JWC Environmental Inc. Terms and Conditions of the identified sales order and only for the operation and maintenance of the Products which it was designed for. It is not to be reproduced, copied in whole, or in part, nor is the information it contains to be disclosed in any manner without the written consent of JWC Environmental Inc. Its use for any other reason than that specified shall be in violation of the agreement with the recipient concerning the legal rights of JWC Environmental Inc.**

**JWC Environmental Inc. reserves the right to make changes which may obsolete certain parts of this manual.**

**© 2022 JWC Environmental Inc. ALL RIGHTS RESERVED**

**JWCE, JWC Environmental, Muffin Monster, Channel Monster, Mini Monster, Macho Monster, and Sludge Monster are registered trademarks of JWC Environmental Inc.**

**JWCE's Santa Ana and Costa Mesa California facilities are registered by UL to ISO9001:2008 #10001313 QM8. JWC International Congleton, UK is registered by QAS to ISO9001:2008 File #A13056. U.S. patents apply: 4,919,346; 5,060,872; 5,320,286; 5,333,801; 5,354,004; 5,478,020; 5,505,388; 5,593,100; 6,176,443; 6,332,984; 7,073,433; 7,080,650; 7,081,171; 7,086,405; 7,383,842; RE37,550E; RE37,349E; RE40,422; RE39,948E. Additional patents pending and international patents also apply.**

**Other product and company names herein may be the trademarks of their respective owners.**

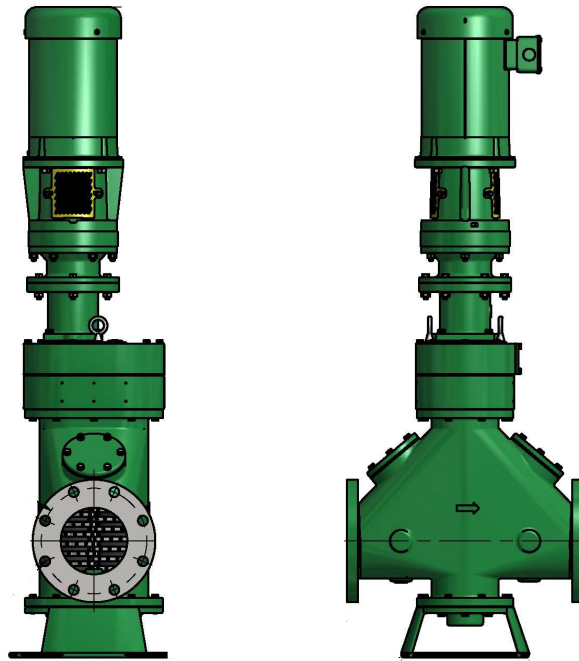
**No part of this document may be photocopied, reproduced, stored in a retrieval system, or transmitted, in any form or by any means whether, electronic, mechanical, or otherwise without the prior written permission of JWCE.**

**No warranty of accuracy is given concerning the contents of the information contained in this publication. To the extent permitted by law no liability (including liability to any person by reason of negligence) will be accepted by JWCE, its subsidiaries or employees for any direct or indirect loss or damage caused by omissions from or inaccuracies in this document.**

**JWCE reserves the right to change details in this publication without notice.**



## OPERATION and MAINTENANCE MANUAL 30004T MUFFIN MONSTER<sup>®</sup> IN-LINE GRINDER



Released October 2019

**JWC Environmental Inc.**  
**2600 S. Garnsey**  
**Santa Ana, CA 92707**

**[www.jwce.com](http://www.jwce.com)**



JWC Environmental Inc. shall not be liable for any commercial losses, loss of revenues or profits, loss of goodwill, inconvenience, or exemplary, special, incidental, indirect or consequential damages whatsoever, or claims of third parties, regardless of the form of any claim that may result from the use of this practice.





## TABLE OF CONTENTS

### SECTION 1 GENERAL INFORMATION

1.1 INTRODUCTION .....	1-1
1.2 DESCRIPTION .....	1-1
1.3 MECHANICAL SPECIFICATIONS .....	1-1
1.4 LIMITATION OF USE .....	1-1
1.5 DESIGN COMPLIANCE .....	1-1
1.6 REPAIRS AND RETURNS .....	1-2

### SECTION 2 SAFETY INSTRUCTIONS

2.1 INTRODUCTION .....	2-1
------------------------	-----

### SECTION 3 INSTALLATION AND CHECKOUT

3.1 INTRODUCTION .....	3-1
3.2 UNPACKING AND STORAGE .....	3-1
3.3 INSTALLATION .....	3-1
3.4 STARTUP .....	3-2
3.5 LONG TERM AND PERMANENT SHUTDOWNS .....	3-2
3.5.1 Permanent Shutdown .....	3-3

### SECTION 4 MAINTENANCE

4.1 INTRODUCTION .....	4-1
4.2 MAINTENANCE REQUIREMENTS .....	4-1
4.3 INSPECTION/MAINTENANCE .....	4-7
4.3.1 Visual .....	4-8
4.3.2 External Fasteners .....	4-8
4.3.3 Drive Assembly and Coupling .....	4-8
4.3.4 Cutter Stack .....	4-8
4.3.5 Seal Cartridge Assembly .....	4-8
4.3.6 Grinder Drive Gears .....	4-8
4.4 LUBRICATION .....	4-8
4.4.1 Grinder Drive Couplings .....	4-8
4.4.2 Drive Gears .....	4-8
4.4.3 Speed Reducer .....	4-8
4.5 PARTS INFORMATION .....	4-8

### SECTION 5 TROUBLESHOOTING

5.1 INTRODUCTION .....	5-1
------------------------	-----

### SECTION 6 REMOVAL AND REPLACEMENT

6.1 INTRODUCTION .....	6-1
6.2 GRINDER REMOVAL .....	6-1
6.3 GRINDER COMPONENT REMOVAL AND REPLACEMENT .....	6-2
6.3.1 Cutter Cartridge Removal .....	6-2
6.3.2 Cutter and Spacer Removal .....	6-3
6.3.3 End Housing Removal .....	6-4
6.3.4 Stacking Cutters and Spacers .....	6-4
6.3.5 Drive Gear, Driven Gear and Shaft Removal and Replacement .....	6-6
6.3.6 Seal Cartridge Removal and Inspection .....	6-6
6.4 GRIND TEST .....	6-7

### APPENDIX A ELECTRIC DRIVE ASSEMBLY MAINTENANCE INSTRUCTIONS

This page intentionally left blank

## LIST OF FIGURES

FIGURE 3-1	INSTALLATION CONFIGURATIONS .....	3-1
FIGURE 3-2	SUGGESTED CLEARANCE .....	3-2
FIGURE 3-3	GRINDER LIFT POINTS .....	3-2
FIGURE 6-1	CUTTER CARTRIDGE REMOVAL .....	6-2
FIGURE 6-2	MAINTENANCE FLANGE OPTIONS .....	6-3
FIGURE 6-3	CUTTER ORIENTATION .....	6-5
FIGURE 6-4	CUTTER STACKING .....	6-5

This page intentionally left blank

## LIST OF TABLES

TABLE 1-1	CONFIGURATION GRINDER SPECIFICATIONS .....	1-2
TABLE 1-2	STANDARD CONFIGURATION MATERIALS USED .....	1-2
TABLE 4-1	FIVE YEAR MAINTENANCE SCHEDULE .....	4-2
TABLE 4-2	RECOMMENDED LUBRICANTS and LUBRICATION SCHEDULE .....	4-7
TABLE 5-1	GRINDER TROUBLESHOOTING GUIDE .....	5-1
TABLE 5-2	GRINDER MOTOR TROUBLESHOOTING GUIDE .....	5-3

This page intentionally left blank

## SECTION 1 GENERAL INFORMATION

### 1.1 INTRODUCTION

SECTION 1 describes and defines the operation, specifications, options, and support information related to the 30004T In-Line Muffin Monster grinder and components. Details about the drive assembly are found in the Electric Drive Assembly Maintenance Instructions (Appendix A). Refer to the grinder configuration and assembly drawings for all grinder configurations and dimensions.

### 1.2 DESCRIPTION

The grinder is a two shafted in-line grinding system designed for installation on the suction side of pumps that pulverizes influent solids into a particle size acceptable to sewage type pumps. Solids reduction facilitates free flow and easy disposal of sludge eliminating the need for treatment plant bar screens, rakes, and other related equipment.

The other components of a typical grinding system are a motor drive mounted to the grinder which provides rotary power for the grinder shafts and a separate motor controller which provides operator and automatic controls for the grinder motor. Refer to the appropriate manual or instructions for details on other components.

Model number breakdown for the Muffin Monster 30004T-XXYY grinder is:

- 30004T - grinder model type.
- XX - cutting chamber height in inches.
- YY - flange diameter in inches.

### 1.3 MECHANICAL SPECIFICATIONS

The grinder inlet and outlet flanges can accommodate the following:

- American National Standards Institute Standards (ANSI) B16.42-1979 Class 150: 4, 6, 8 and 10 inch (102, 152, 202 and 252 mm) pipe-line.
- Australian Standard A100, A150, A200, A250.
- British Standard 4504, Section 3.1, 1989, Table 11, PN16: 150 mm nominal pipe diameter.
- British /International Standards Organization (ISO) B100, B150, B200, B250.
- International Standards Organization (ISO) 2084-1974 (E), Table 2, NP16: 150 mm nominal pipe diameter.
- Japanese Industrial Standards (JIS) B2210-1984, Nominal Pressure 10K: J100, J150, J200, J250 mm nominal pipe diameter.
- Japanese Water Authority (JWA) 7.5K: JWA100, JWA150, JWA200, JWA250 mm nominal pipe diameter.

Grinder specifications are shown in TABLE 1-1; TABLE 1-2 shows grinder materials.

### 1.4 LIMITATION OF USE

JWCE considers that the buyers and users of this equipment limit the use of the equipment to the purpose and intent defined at time of sale. Applications of the equipment must be in compliance with all applicable local, federal, and area safety rules, regulations, and guidelines.

### 1.5 DESIGN COMPLIANCE

JWCE considers the equipment described in this manual satisfies the design criteria for same and/or similar types of equipment. JWCE also considers that the buyers and users of this equipment comply and ensure compliance with the warnings, cautions and notes included in this manual to avoid the potential for injury and/or equipment damage.

## 1.6 REPAIRS AND RETURNS

Return Authorization must be made by calling JWCE if repairs are required. Be prepared to give the model number and serial number, located on the nameplate on the grinder top cover, to the JWCE representative. Returned item(s) must be securely packaged and shipped to JWCE.

Contact JWCE Customer Service or the local sales/service representative for answers to service questions.

**JWC Environmental**  
**2600 S. Garnsey St.**  
**Santa Ana, CA 92707**

**800-331-2277**  
**949-833-3888**  
**714-549-4007 (fax)**

**TABLE 1-1 CONFIGURATION GRINDER SPECIFICATIONS**

Horsepower	3 (2.2 kW)
Voltage	460 VAC
Frequency	60 Hz
Duty	Continuous
Temperature Rating	Operating 23°F (-5°C) to 105°F (40°C) Storage 40°F (5°C) to 105°F (40°C)
Speed Reducer Ratio	29:1
Shaft speed	60 rpm (drive shaft), 44 rpm (driven shaft)
Motor Service Factor	1.15

**TABLE 1-2 STANDARD CONFIGURATION MATERIALS USED**

<b>GRINDER COMPONENT</b>	<b>MATERIAL USED</b>
End Housings	ASTM A536-77 ductile iron
Top and Bottom Covers	ASTM A536-77 ductile iron
Cutters and Spacers	Alloy steel
Shafts	4140 alloy steel
Seal Faces	Tungsten Carbide




## SECTION 2 SAFETY INSTRUCTIONS


### 2.1 INTRODUCTION

Operations and maintenance personnel must read and understand the safety instructions listed in this section and throughout this manual before operating or maintaining the grinder. **WARNINGS** (double boxed, upper case), **Cautions** (single boxed, title case), and **NOTES** inform operations and maintenance personnel of safety concerns and important information crucial to the operation and maintenance of this equipment.


Safety instructions are based on properly trained personnel using good safety practices at all times. JWC Environmental shall not be held liable for any ignorance or disregard of applicable OSHA, federal, state, or local regulations. JWC Environmental shall not be held liable for any damages resulting from controller functions that are triggered as a result of wiring misconnections, wiring shielding errors, and/or other wiring errors not in compliance with OSHA, federal, state, or local regulations.




**DO NOT WEAR LOOSE FITTING CLOTHING NEAR GRINDER.**




**KEEP PERSONNEL AND UNAUTHORIZED MATERIAL CLEAR OF GRINDER CUTTING CHAMBER.**




**WEAR EYE AND EAR PROTECTION WHEN STEAM CLEANING COMPONENTS. COMPLY WITH ALL OSHA AND OTHER REGULATORY AGENCY SAFETY REQUIREMENTS.**



**DO NOT LIFT HEAVY EQUIPMENT OVERHEAD OF PERSONNEL. ENSURE THAT ADEQUATE ASSISTANCE IS AVAILABLE AND UTILIZED WHEN LIFTING AND TRANSPORTING EQUIPMENT, TOOLS, AND SUPPORT MATERIALS.**



**ELECTRICAL HAZARDS EXIST. DO NOT TAKE ELECTRICAL MEASUREMENTS ALONE. VERIFY AND ENSURE POWER TO THE MOTOR CONTROLLER IS REMOVED, LOCKED OUT, AND TAGGED BEFORE PERFORMING ANY INSTALLATION, SERVICE, OR MAINTENANCE TASK INCLUDING THE REMOVAL OR ATTEMPTING TO REMOVE ANY OBSTRUCTION(S) FROM THE GRINDER.**



**JWCE CONTROLLER PANEL CONTROLS DO NOT REMOVE POWER FROM THE CONTROLLER ENCLOSURE. DO NOT USE ANY START/STOP PUSHBUTTON AS A POWER DISCONNECT. SERVICE JWCE CONTROLLERS AND CONNECTED DEVICES ONLY WHEN POWER TO THE CONTROLLER HAS BEEN TURNED OFF, LOCKED OUT AND TAGGED.**



**DO NOT ATTEMPT ANY MAINTENANCE ON THE EQUIPMENT DURING A POWER LOSS. THE GRINDER MAY START, STOP, REVERSE, OR RESTART AUTOMATICALLY AFTER POWER LOSS AND RECOVERY. ELECTRICAL LOCKOUT PROCEDURES MUST BE PERFORMED PRIOR TO SERVICING ANY EQUIPMENT OR CONNECTED EQUIPMENT.**



**PERSONAL AND MECHANICAL HAZARDS EXIST DURING THE PERFORMANCE OF THE GRIND TEST.**



**PERFORM ALL SURFACE PREPARATION AND PAINTING IN A WELL VENTILATED NON-SMOKING AREA THAT IS IN COMPLIANCE WITH ALL APPLICABLE SAFETY REGULATIONS. AVOID PROLONGED EXPOSURE TO VAPORS. USE AN AIR RESPIRATOR/AIR MASK AND CHEMICAL SAFETY GOGGLES/FACE SHIELD.**



**Cutters And Spacers Are Sharp. Appropriate Gloves Must Be Worn When Installing Or Handling Cutters And Spacers To Prevent Injury During Handling.**

## SECTION 3 INSTALLATION AND CHECKOUT

### 3.1 INTRODUCTION

SECTION 3 describes the installation, checkout, and start-up procedure of the 30004T grinder. Review all safety instructions before installing the grinder.

No special equipment, tools, or test equipment is required for grinder installation (or maintenance). Make sure any lifting and handling devices are rated for a load capacity greater than the weight of the grinder. Refer to TABLE 1-3 for standard grinder weights (other factors, such as type of motor will impact the overall weight of the motor).

### 3.2 UNPACKING AND STORAGE

The grinder is carefully packaged for shipment to the installation site. Do not remove any components from the shipping crate/carton until an inventory is taken.

1. Inspect the shipping container. Report all shipping container damage immediately to the carrier and send a copy to the company representative.
2. Inspect the grinder for missing, loose, or damaged components. The grinder is shipped completely assembled and ready to install. Contact JWCE or local representative if parts are loose, missing, or damaged.
3. Inspect the grinder options included with the equipment as defined in the customer order. If parts are missing, loose, or damaged, contact JWCE.
4. Close and seal all shipping containers after inspection for shortages and damage. Store in the shipping containers until time of installation indoors in an environment between 40° F (5° C) and 105° F (40° C). Try not to re-open the storage container until installation. If it is necessary to store the equipment outdoors, make sure the crates are covered to protect from moisture.

The motor and speed reducer have been lubricated at the factory. Extended storage may cause grease to separate. A small amount of light lubricant may leak from greased areas. Unless leakage is excessive - more than one (1) tablespoon - it does not cause any problems. The grease homogenizes to its original consistency when the gears are run.

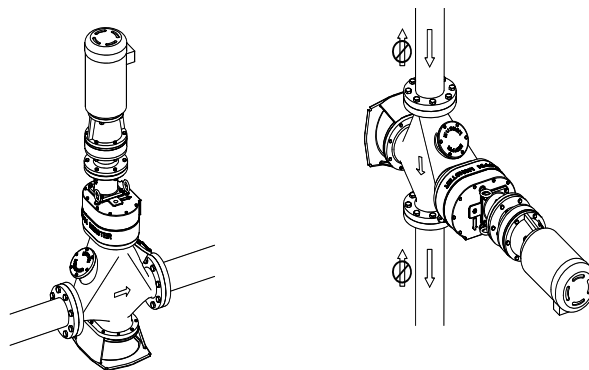
If possible, rotate the drive assembly at least 15 revolutions every 3 months, minimum, to redistribute bearing lubricant. A rust preventive coating to the cutter stack is factory-applied but should also be liberally reapplied after every 6 months of storage.

### 3.3 INSTALLATION

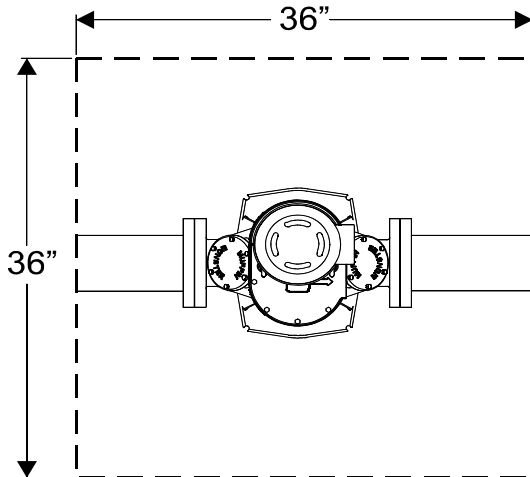
Perform the following procedure to install the grinder in line with the existing piping FIGURE 3-1 and FIGURE 3-2 show the 30004T installation configurations and suggested clearance. A minimum amount of civil work is required during installation. A minimum of five pipe diameters should be allowed between the grinder discharge and the pump suction if the grinder is installed upstream of a pump. Standard tools, a multimeter and lifting equipment with the proper load rating are required. All drive components are factory greased and ready for operation. For hydraulic powered grinders refer to the Hydraulic Power Pack manual.

Read and understand the associated motor controller manual before operating the grinder.

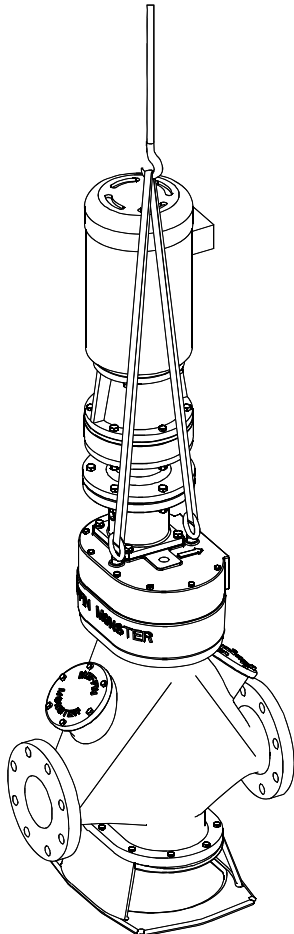
**FIGURE 3-1 INSTALLATION CONFIGURATIONS**



**FIGURE 3-2 SUGGESTED CLEARANCE**



**FIGURE 3-3 GRINDER LIFT POINTS**



1. Verify that electrical power to the grinder is shutoff and tagged out.
2. Locate the flow directional arrows found on top of the grinder gear housing and on the main housing. Arrows point in the direction of flow.
3. Attach lifting cables to both grinder lifting eyebolts or lugs as shown in FIGURE 3-3 to position the grinder into its installation site.
4. Install the flange gaskets and bolt the grinder flanges to their mating flanges in the piping. Bolts and gaskets are supplied by others.
5. Connect the electrical power from the grinder drive assembly to the motor controller panel. (Connect the grinder to the HPP for hydraulic grinders.) Refer to the motor controller wiring diagram and site installation drawing for more information.
6. Verify that all electrical and mechanical connections are connected and secure.
7. Complete any required customer/user inspection records and forms.

### 3.4 STARTUP

The motor controller controls grinder operation. Refer to the associated motor controller manual to perform grinder startup.

### 3.5 LONG TERM AND PERMANENT SHUTDOWNS

Perform the following if the grinder is to be removed from service either permanently or for an extended time. For shutdowns longer than one (1) year, contact JWCE Customer Service for instructions.

For a long term shutdown remove and lock out electrical power to the motor controller and isolate the grinder from both upstream and downstream flow.

## 30004T GRINDER INSTALLATION AND CHECKOUT



Perform the following procedure for shutdowns from six (6) months to twelve (12) months:

1. Remove the grinder from its installation site if possible.
2. Steam clean all parts (except the drive assembly) to clean and disinfect.
3. Clean the grinder using an appropriate solvent.
4. Completely fill the speed reducers with lubricant.
5. Rotate the grinder drive assembly for one (1) to five (5) minutes every three (3) months by hand if possible or for at least 15 revolutions. If the grinder cannot be operated manually, temporarily apply the appropriate power to the

grinder drive assembly for one (1) to five (5) minutes. Check for lubricant leakage.

### 3.5.1 Permanent Shutdown

The following guidelines should be followed when the grinder is being taken out of service and not scheduled to return to service.

For returns, clean and disinfect the grinder prior to return to JWCE.

For on-site disposal, clean and disinfect the grinder. Disassemble the grinder as described in SECTION 6. Clean and disinfect the grinder components. Dispose of the motor and components in accordance with local, federal, and national safety and disposal regulations and standards. Apply warning and safety labels to materials and containers.

This page intentionally left blank.

## SECTION 4 MAINTENANCE

### 4.1 INTRODUCTION

SECTION 4 defines maintenance guidelines and identifies the lubricants, parts, and drawings required to support the 30004T grinder. Review all safety instructions before performing maintenance of the grinder. Refer to SECTION 5 for troubleshooting guidelines. Refer to SECTION 6 for removal and replacement instructions, the grinder exploded view for parts location and the parts list. Refer to the associated motor controller manual and the Electric Drive Assembly Maintenance Instructions - Appendix A for drive assembly maintenance and troubleshooting. Contact JWCE Customer Service or local service representative for any maintenance information questions.

### 4.2 MAINTENANCE REQUIREMENTS

The following paragraphs describe the grinder scheduled maintenance activities. Recommended maintenance is required to make sure the grinder operates in peak condition. Refer to TABLE 4-1 for a five year summary of maintenance tasks and TABLE 4-2 for recommended lubricants and lubrication schedule. Refer to the Hydraulic Power Pack (HPP) manual for hydraulic fluid information.

Contact JWCE Customer Service or local service representative for questions on lubrication requirements, guidelines or recommended lubricants. Avoid mixing brands and/or types of lubricants.

Tasks are written for personnel experienced in same and/or similar equipment who are familiar with the basic operation, safety, emergency procedures, and use of plant tools/maintenance equipment. Time periods are based on normal operation usage and can be adjusted by the individual users depending on equipment usage and the operational environment. **More frequent inspections may be required for grinders operating in harsh, extreme hot or extreme cold environments or processing abrasive or corrosive material.**

**TABLE 4-1 FIVE YEAR MAINTENANCE SCHEDULE**
**Maintenance Schedule - One Year**

1 Year				
ITEM	3 Months	6 Months	9 Months	12 Months
Grinders				Inspect cutters
				Check stack tightness
				Inspect seal cartridges for leaks
				Tighten loose external fasteners
Electric Drive				Inspect motor
				Inspect speed reducer (Sumitomo)
				Inspect speed reducer (Nord)
				Inspect equipment coupling
<del>Hydraulic Drive</del>				<del>Inspect torque motor</del>
				<del>Inspect speed reducer (hi-torque models)</del>
				<del>Inspect equipment coupling</del>
Hydraulic Power Pack	Inspect oil quality	Inspect oil quality	Inspect oil quality	Replace hydraulic oil and filter every 12 mos. or 8000 service hours
	Clean suction strainer	Clean suction strainer	Clean suction strainer	Clean suction strainer



**Maintenance Schedule - Two Year**

2 Years				
ITEM	15 Months	18 Months	21 Months	24 Months
Grinders				Inspect cutters
				Check stack tightness
				Inspect seal cartridges for leaks
				Tighten loose external fasteners
Electric Drive				Inspect motor
				Inspect speed reducer (Sumitomo)
				Inspect speed reducer (Nord)
				Inspect equipment coupling
<del>Hydraulic Drive</del>				<del>Inspect torque motor</del>
				<del>Inspect speed reducer (hi-torque models)</del>
				<del>Inspect equipment coupling</del>
Hydraulic Power Pack	Inspect oil quality	Inspect oil quality	Inspect oil quality	Replace hydraulic oil and filter every 12 mos. or 8000 service hours
	Clean suction strainer	Clean suction strainer	Clean suction strainer	Clean suction strainer

**Maintenance Schedule - Three Year**

3 Years				
ITEM	27 Months	30 Months	33 Months	36 Months
Grinders				Inspect cutters
				Check stack tightness
				Inspect seal cartridges for leaks
				Tighten loose external fasteners
				Inspect gears/grease quality (int. operation)
Electric Drive				Inspect motor
				Inspect speed reducer (Sumitomo)
				Inspect speed reducer (Nord)
				Inspect equipment coupling
<del>Hydraulic Drive</del>				<del>Inspect torque motor</del>
				<del>Inspect speed reducer (hi-torque models)</del>
				<del>Inspect equipment coupling</del>
Hydraulic Power Pack	Inspect oil quality	Inspect oil quality	Inspect oil quality	Replace hydraulic oil and filter every 12 mos. or 8000 service hours
	Clean suction strainer	Clean suction strainer	Clean suction strainer	Clean suction strainer

**Maintenance Schedule - Four Year**

4 Year				
ITEM	39 Months	42 Months	45 Months	48 Months
Grinders				Inspect cutters
				Check stack tightness
				Inspect seal cartridges for leaks
				Tighten loose external fasteners
				Inspect gear grease quality if not changed at 36 mos.
Electric Drive				Inspect motor
				Inspect speed reducer (Sumitomo)
				Inspect speed reducer (Nord)
				Inspect equipment coupling
<del>Hydraulic Drive</del>				<del>Inspect torque motor</del>
				<del>Inspect speed reducer (hi-torque models)</del>
				<del>Inspect equipment coupling</del>
Hydraulic Power Pack	Inspect oil quality	Inspect oil quality	Inspect oil quality	Replace hydraulic oil and filter every 12 mos. or 8000 service hours
	Clean suction strainer	Clean suction strainer	Clean suction strainer	Clean suction strainer

**Maintenance Schedule - Fifth Year**


5 Year				
ITEM	51 Months	54 Months	57 Months	60 Months
Grinders				Inspect cutters
				Check stack tightness
				Inspect seal cartridges for leaks
				Tighten loose external fasteners
				Replace gear grease if not replaced earlier.
Electric Drive				Inspect motor
				Inspect speed reducer (Sumitomo)
				Inspect speed reducer (Nord)
				Inspect equipment coupling
<del>Hydraulic Drive</del>				<del>Inspect torque motor</del>
				<del>Inspect speed reducer (hi-torque models)</del>
				<del>Inspect equipment coupling</del>
Hydraulic Power Pack	Inspect oil quality	Inspect oil quality	Inspect oil quality	Replace hydraulic oil and filter every 12 mos. or 8000 service hours
	Clean suction strainer	Clean suction strainer	Clean suction strainer	Clean suction strainer

**TABLE 4-2 RECOMMENDED LUBRICANTS and LUBRICATION SCHEDULE**

TASK	TYPE	MANUFACTURER
Cutter stack lubrication	Zep 45 Aerosol Lubricant* WD-40 Aerosol Lubricant	Zep 45 Manufacturing WD-40 Corp.
O-ring and seal cartridge replacement	MPG All Purpose Super Grease*/ white lithium grease	Nichels Engineering
Greasing of couplings and drive gears	Mystic JT-6 Hi-Temp* Lubriplate 930-AA Mobil Temp No. 1, 2 or 78	Citgo Fiske Bros. Refining Mobil Oil
Intermediate support collars	Industrial Grease	Chevron-Texaco
Grinder long term service removal	LPS 3® Rust Inhibitor*	LPS Laboratories
Lubricate gears	Every 48 - 60 mos [Paragraph 4.4.2]	
*OEM recommended		



**4.3 INSPECTION/MAINTENANCE**

The following paragraphs describe the inspection guidelines, preparation for inspection, and the inspection/maintenance defined for the grinder. Refer to the motor controller manual for controller inspection guidelines and procedures. Refer to SECTION 6 for removal/replacement instructions, grinder exploded view and grinder parts list.




**KEEP PERSONNEL AND UNAUTHORIZED MATERIAL CLEAR OF GRINDER CUTTING CHAMBER.**

The following guidelines should be observed during maintenance.

**OPEN, LOCK OUT, AND TAG POWER TO THE CONTROLLER PER SAFETY PROCEDURES.**



**ISOLATE FLOW THROUGH THE PIPELINE AS REQUIRED TO AVOID INJURY AND/OR DAMAGE FROM FLOW PRESSURES AND/OR INFLUENT. RELIEVE PRESSURE BY CRACKING OPEN ONE OF THE GRINDER FLANGES.**

- Clean all gasket surfaces of all gasket material before installing a new gasket.
- Thoroughly clean end housing bores with suitable solvent. Replace housing if bores are scored, pitted, or other damage is identified.
- Avoid mixing brands and/or types of lubricants. If the lubricant identified does not meet the requirements identified in this manual, contact the factory.
- Rinse and steam sanitize the grinder parts except the drive assembly. Solvent clean the exterior of the drive assembly.
- Inspect all components for cracks, damages, or evidence of excessive wear. Replace as required.
- Complete all required customer/user inspection records and forms.

#### 4.3.1 Visual

Check grinder for leakage, vibration, noise, or solids buildup on cutters and side rails. Check grinder output for proper solids reduction.



#### 4.3.2 External Fasteners

Check grinder external fasteners - tighten if loose.

#### 4.3.3 Drive Assembly and Coupling

Check that the grinder drive is free of contaminants and there are no signs of damage, overheating or lubricant leakage. Check the hardware securing the drive to the grinder for tightness. Using the drive plug inspection port, check for excessive wear on the coupling halves or if a gap exists between the halves.

#### 4.3.4 Cutter Stack

Isolate flow from grinder. Check the grinder cutters for damage or wear. Damaged or worn cutters must be replaced if solids are not being properly reduced or if the grinder jams excessively.

Check cutter stack tightness by inserting a long screwdriver or similar tool in between adjacent cutters on each shaft and moving the tool up and down. Verify none of the cutters or spacers shift along the shaft axes when pushed. Cutters must be removed, cleaned, restacked and lubricated if any cutters or spacers shift along the shaft axes.

#### 4.3.5 Seal Cartridge Assembly

Remove the drive assembly and the cutter cartridge per SECTION 6. Then remove the top and bottom covers. Check inside of the end housings for contaminants and leakage around or through the seal cartridge assembly. Check for a damaged O-ring where the seal cartridge assembly contacts the end housing bore if any leakage is present. Replace the entire seal cartridge assembly if influent leakage or contaminants are noted.

Clean end housing bores with a suitable solvent. Replace the housing if bores are scored, pitted, or other damage is identified.

#### 4.3.6 Grinder Drive Gears

Remove the grinder top cover per SECTION 6. Check drive gears for cracks, broken teeth or excessive wear. Check the drive gear grease for contamination. Replace drive gear grease per Paragraph 4.4.2 if required.

### 4.4 LUBRICATION

Observe the following when lubricating the grinder:

- Set the motor controller switch to OFF. Open any controller circuit breaker or disconnect switch, then remove and tag out supply power before lubricating equipment.
- Avoid mixing brands and/or types of lubricants.

#### 4.4.1 Grinder Drive Couplings

Remove the drive per SECTION 6 instructions. Carefully remove old grease if necessary, and replace with new grease per Table 4-2.

#### 4.4.2 Drive Gears

Remove top cover per SECTION 6 instructions. Carefully remove the old grease and replace with new grease per Table 4-2. Apply grease in the recess between the coupling lobes. Replace the top cover.

#### 4.4.3 Speed Reducer

The speed reducer is filled with grease at the factory and is ready for installation and operation. JWCE uses maintenance-free, Cyclo-driven speed reducers.

### 4.5 PARTS INFORMATION

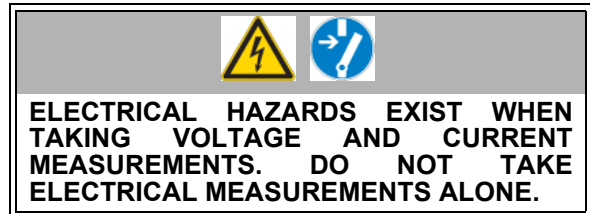
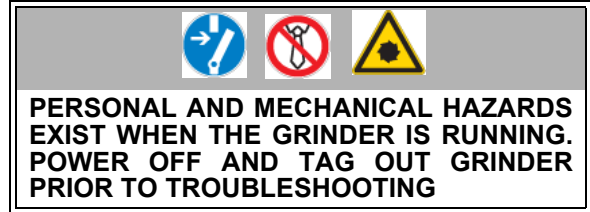
The parts lists included in SECTION 6 identify the parts for the standard configurations of the grinder. JWCE does not recommend stocking of parts as spares which may or may not be used.

## SECTION 5 TROUBLESHOOTING

### 5.1 INTRODUCTION

SECTION 5 describes 30004T grinder troubleshooting. Review all safety instructions before troubleshooting the grinder. TABLE 5-1 is a troubleshooting guide for the grinder. TABLE 5-2 is a troubleshooting guide for the grinder motor. Refer to SECTION 6 for the appropriate removal and replacement instructions based on troubleshooting results. Refer to the motor controller manual for causes and possible solutions not related to the grinder.

The grinder normally operates smoothly and quietly. Verify main power is available before troubleshooting. Power off and tag out main power to the motor controller if any excessive noise or temperature rise is observed and prior to grinder inspection.



**TABLE 5-1 GRINDER TROUBLESHOOTING GUIDE**

Symptom	Possible Cause	Solution
Grinder making noise.	Cutter stack loose.	Check stack tightness. If loose, remove, inspect, clean, and replace all cutters and spacers. Replace any damaged or worn cutters and spacers.
	Damaged cutter(s) or spacer(s).	Replace damaged cutter(s) or spacer(s).
	Seal or bearing failure.	Replace failed grinder seal cartridge.
	Drive gears not sufficiently greased.	Clean and re-grease gears (replace gears if damage or excessive gear wear has occurred).
Cutter drive shaft not rotating.	Broken drive shaft below drive gear.	Replace drive shaft and check for ancillary damage. Return part to JWCE.
Cutter driven shaft not rotating.	Driven gear key failure.	Replace key if broken or missing. Contact factory if gear or shaft keyway is damaged.
	Broken driven shaft.	Replace driven shaft and check for ancillary damage (return to factory).

**TABLE 5-1 GRINDER TROUBLESHOOTING GUIDE (Cont'd)**

Both cutter drive and driven shafts not rotating.	Drive coupling key failure.	Replace coupling key(s) if broken or missing. Contact JWCE if shaft keyways are damaged.
	Drive coupling failure, drive lugs worn.	Replace coupling assembly. Check coupling keys for damage or wear.
	Broken drive shaft.	Replace drive shaft and check for ancillary damage. Return part to JWCE.
	Grinder gear reducer failure.	Replace gear reducer.
	Grinder motor failure.	Refer to TABLE 5-2.
	Grinder motor coupling key failure.	Replace coupling key(s) if broken or missing. Contact JWCE if shaft keyways are damaged.
	Grinder motor coupling failure.	Replace coupling assembly. Check coupling keys for damage or wear.
Head drop across grinder excessive.	Downstream water conditions different from what was originally provided at application stage.	Refer to performance flow curve to determine required flow conditions. Contact JWCE for assistance.
Grinder reverses excessively, but continues to run.	Cutters are worn and cannot effectively grind material.	Replace cutters and spacers.
	Excessive solids loading or duty cycle.	Reduce solids loading or decrease duty cycle.
	Grinder current sensor reverse threshold set too low.	Contact JWCE for assistance.
	Excessive friction on components.	Refer to symptom: <i>Grinder making noise.</i>
Debris buildup on drive shaft spacers.	Cutters excessively worn.	Replace worn cutters.
Motor Controller indicates Grinder Overload.	Unusually large or troublesome solids entered grinder chamber.	Locate and remove troublesome solids from waste stream; reset controller and restart grinder per the controller O&M.
	Excessive solids loading or duty cycle.	Reduce solids loading or decrease duty cycle.
	Cutters excessively worn.	Replace worn cutters.
Motor Controller indicates Grinder Motor Overload. The grinder motor current draw exceeds the duration established by the controller.	Excessive solids loading or duty cycle.	Reduce solids loading or decrease duty cycle.
	Excessive friction on components.	Refer to symptom: <i>Grinder making noise.</i>



**TABLE 5-2 GRINDER MOTOR TROUBLESHOOTING GUIDE**

Symptom	Possible Cause	Solution
Motor does not start.	Line trouble such as single phasing at motor starter.	Check power source, overloads, fuses, controls, etc.
Hydraulic motor does not start.	Hydraulic Power Pack (HPP) not working.	Check HPP per appropriate manual.
	Loose, disconnected or blocked hose.	Check hydraulic hose connections to the grinder and HPP.
Excessive humming.	High voltage.	Check line connections.
	Eccentric air gap.	Contact factory to have motor serviced.
Hydraulic motor noisy or vibrating	Air in hydraulic fluid lines.	Check HPP per appropriate manual.
	Wrong type of hydraulic fluid used.	Verify the recommended hydraulic fluid was used to fill HPP.
Motor overheating.	Overloading of motor due to excessive friction or duty cycle.	Remove unwanted friction in motor; reduce the duty cycle of equipment.
	Single phasing or unbalanced voltage.	Verify the current for each motor leg. The current for each leg should be approximately equal, if not, isolate and correct.
	Improper ventilation.	Verify cooling fan is operating correctly; increase ventilation of motor; reduce ambient heat on motor.
	Rotor rubbing on stator.	Contact JWCE to have motor serviced.
	Over or under voltage.	Check input voltage on each leg.
	Open stator winding.	Check voltage on all legs.
	Grounded winding.	Perform dielectric test and repair as required.
	Improper connections.	Inspect all electrical connections for proper termination, clearance, mechanical strength, and electrical continuity. Refer to motor lead connections.


This page intentionally left blank.

## SECTION 6 REMOVAL AND REPLACEMENT



### 6.1 INTRODUCTION

SECTION 6 describes 30004T grinder assembly and component removal and replacement. Review all safety instructions before removing and replacing grinder assembly or components. Grinder components can be reused unless broken or worn. Contact JWCE for questions regarding grinder service.


The following guidelines must be observed when removing and reinstalling the grinder.



**ISOLATE THE GRINDER FROM FLOW THROUGH THE PIPELINE AND RELIEVE ANY REMAINING PRESSURE.**

**OPEN, LOCKOUT, AND TAG POWER AT THE DISCONNECT (OR CIRCUIT BREAKER) TO THE CONTROLLER BEFORE ANY DISASSEMBLY OR REASSEMBLY PROCEDURES.**




**WEAR EYE AND EAR PROTECTION WHEN STEAM CLEANING COMPONENTS. COMPLY WITH ALL OSHA AND OTHER REGULATORY AGENCY SAFETY REQUIREMENTS.**



**DO NOT WEAR LOOSE FITTING CLOTHING NEAR THE GRINDER.**




**USE EXTREME CARE WHEN USING ANY SOLVENT.**



**Cutters And Spacers Are Sharp. Appropriate Gloves Should Be Worn When Installing/Handling Cutters And Spacers To Prevent Injury During Handling.**

- Clean end housing bores thoroughly with suitable solvent.
- Verify that all parts/components being assembled are clean and free of excess lubricants and gasket material.
- Inspect drive and driven shaft top and bottom seal assemblies. Mating surfaces must be clean and polished.
- Inspect all parts for cracks, nicks, burrs, excessive wear, or obvious signs (or suspected areas) of damage. Replace all damaged/suspected parts. Sealed bearings cannot be re-greased.
- Complete all required customer/user inspection records and forms if required.

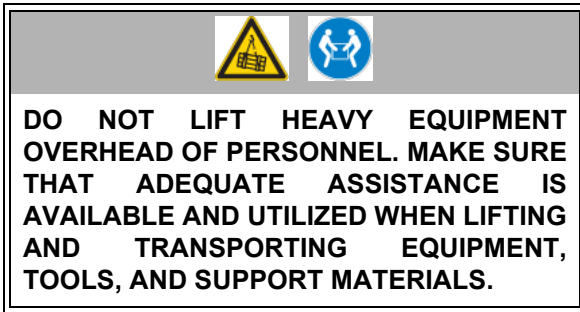
### 6.2 GRINDER REMOVAL

The grinder can be removed from the installation without any disassembly or component removal. The following procedure describes the removal of the grinder from the installation. Refer to the drawings at the back of this manual for part identification and location.



**Use Both Hoisting Rings/Lugs Mounted In The Grinder Top Cover To Lift The Grinder From The Installation.**

1. Verify that main power is removed from the motor controller. Disconnect any wiring to the grinder motor.
2. Attach lifting cables to the two hoisting rings or lugs on the top cover.
3. Maintain lifting tension and disconnect the grinder at the inlet and outlet flanges.



4. Lift the grinder. Place the grinder on the housing base on a level surface.

Replacing the grinder in the installation after assembly and/or maintenance is the same as the grinder installation instructions in SECTION 3.

### **6.3 GRINDER COMPONENT REMOVAL AND REPLACEMENT**

The following paragraphs contain procedures to remove grinder components. Replacement instructions are the reverse order of the removal instructions unless noted otherwise. Place removed components on a clean, flat, work surface to avoid damage and facilitate inspection.

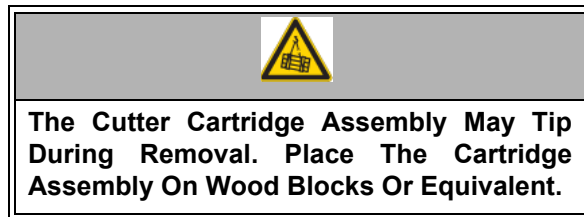
Make sure that all mating surfaces are clean during grinder component replacement. Clean any gasket residue and replace gasket if required.

#### **6.3.1 Cutter Cartridge Removal**

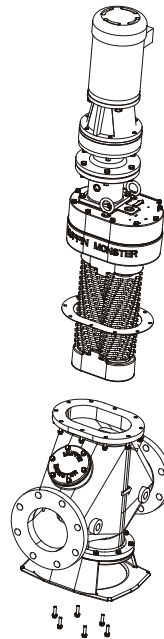
The cutter cartridge can be removed from the main housing as a complete assembly (refer to FIGURE 6-1).

If required, an optional maintenance flange with or without a bar screen can be installed in the main housing if flow is to be reestablished through the grinder housing during cutter cartridge maintenance (refer to FIGURE 6-2).

Remove the cutter stack by attaching lifting cables to both eyebolts/lugs. Remove the screws securing the cutter cartridge at the top of the unibody housing and at the bottom of the housing. Slowly and steadily lift the cutter cartridge assembly clear of the main housing.

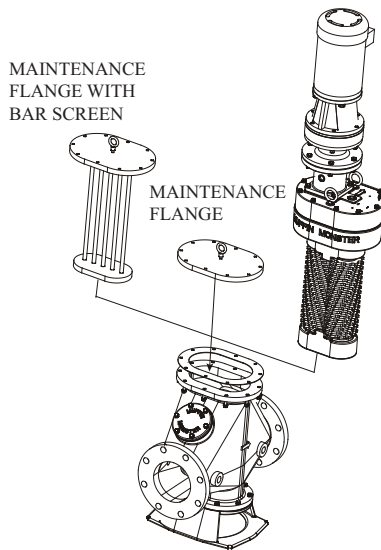


**FIGURE 6-1 CUTTER CARTRIDGE REMOVAL**



If the optional maintenance flange is being used, verify the base stand section is dry before installing a new main housing gasket on the main housing flange and a lower end housing gasket on the base stand.

**FIGURE 6-2 MAINTENANCE FLANGE OPTIONS**



**6.3.2 Cutter and Spacer Removal**

Perform the following procedure to remove and replace the cutters and spacers. Refer to Paragraph 6.3.4 for correct cutter and spacer stacking.



**Cutters And Spacers Are Sharp. Appropriate Gloves Must Be Worn When Installing Or Handling Cutters And Spacers To Prevent Injury During Handling.**

1. Remove the drive assembly following the directions in the Electric Drive Assembly Maintenance Instructions, Appendix A.
2. Remove the cutter cartridge assembly from the main housing per Paragraph 6.3.1.
3. Remove the drive coupling and its key from the drive shaft.

4. Stand the cutter assembly on the bottom end housing.
5. Remove the stack nut access cover.
6. Remove the shaft tightening access pipe plug.
7. Lock the drive shaft hex nut through the access port with a 2¼ inch wrench.
8. Loosen the socket headed cap screw.
9. Remove the top cover from the gear housing.
10. Remove the oil seal from the top cover.
11. Remove the hex nut from the drive shaft.
12. Remove the socket headed cap screw and stack washer from the driven shaft.
13. Remove the drive and driven gears followed by the bushing spacers located on each shaft.
14. Remove the gear keys from the drive and driven shafts.
15. Remove the gear housing from the upper end housing.
16. Remove the upper end housing.
17. Remove the compression disks from the drive and driven shafts.
18. Carefully note the spacer/cutter stacking configuration and the helical pattern of the cutter stack prior to disassembly to ease the restacking of the cutters and spacers.
19. Remove all cutters and spacers. For the 24 inch cutter stack, an intermediate shaft support assembly is installed in the center of the cutter stack to provide additional support.
20. Place the lower end housing with the drive and driven shafts still installed on its side using wood blocks to support the drive and driven shafts.
21. Remove the retaining rings.
22. Remove the gib key from the drive and driven shafts.

23. Remove the lower end housing from the two shafts and place on a clean, flat surface for inspection.
24. Remove the seal rings from both ends of the drive and driven shafts.
25. Remove the compression disk from the drive and driven shafts.
26. During replacement, the compression disc must be installed prior to installing the seal O-ring to prevent tearing the seal O-ring. Apply a light coat of grease (Nichels Engineering MPG All Purpose Super Grease or white lithium grease) on the seal ring.
27. Ensure the end housing bushing deflectors are at the influent (feed flow) side when replacing the upper end housing over the end of the drive and driven shafts.
28. Verify the flow arrow is pointed in the correct direction before lowering the main housing onto the standard base.

### 6.3.3 End Housing Removal

Disassembly of the top and bottom housing is the same (with the exception of the bearing spacers installed in the top housing) and performed as described in the following procedure. Replace the seal cartridge assembly if there is leakage, when bearing(s) do not rotate in the seal cartridge, or if resistance is encountered during bearing rotation.

1. Place the end housings on a clean, flat work surface.
2. Remove bearing spacer (top end housing only) and press the seal cartridge out of the housing bearing bore.
3. Check each seal cartridge for damage and for ease of rotation.
4. Remove the end housing O-rings.
5. Thoroughly clean housing bores with solvent. Inspect the end housing bores for signs of damage or wear. Contact JWCE or local representative if the bores are damaged, scored, pitted, or show signs of wearing, otherwise, store the end housing in a secure location to prevent damage until reassembled.

6. Coat the end housing bores with a thin film of grease (Nichels Engineering MPG All Purpose Super Grease or white lithium grease) when installing O-rings.
7. Lightly coat the seal cartridge assembly with grease during reassembly.
8. Make sure the seal cartridge notches line up with the dowel pins before pressing into the housing.

### 6.3.4 Stacking Cutters and Spacers

The meshed, helical stack of cutters is formed by alternately placing a cutter and a spacer on the grinder drive and driven shafts. An intermediate shaft support assembly is installed in the center of the 32 inch cutter stack to provide additional support for the shafts. The following procedure describes the installation of the cutters, spacers and intermediate shaft support assembly.

1. Clear and clean the work space around the assembled end housing.
2. Verify that the correct quantity of cutters and spacers for the grinder are on hand. Refer to the drawings at the back of this manual.
3. Verify all cutters and spacers are clean, free of cracks, signs of excessive wear, and/or other obvious signs of damage.
4. Verify the cutter drive and driven shafts are free of any burrs. File and clean off any burrs.

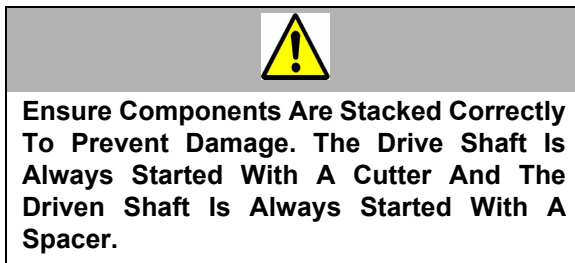


**Verify That Foreign Material Does Not Become Trapped Between the Stack Components. Trapped Material Can Affect Stack Height and Cutter Meshing Tolerance.**

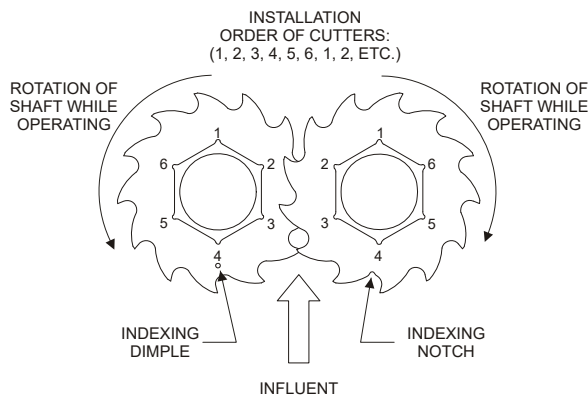
5. Install two dowel pins into the standard base and install a gasket on the standard base. Install the bottom end housing with the drive and driven shafts (shafts are vertical). The dowel pins will fit loosely in the bottom end housing.
6. Verify one cutter tooth on each cutter is marked with an indexing mark (dimple or

notch) used to properly assemble the cutters during stacking.

7. Refer to FIGURE 6-3 for orientation of the cutters on the drive and driven shafts. Ensure correct cutter installation by maintaining proper shaft orientation during the stacking process. The drive shaft is numbered clockwise and driven shaft is numbered counterclockwise.



**FIGURE 6-3 CUTTER ORIENTATION**

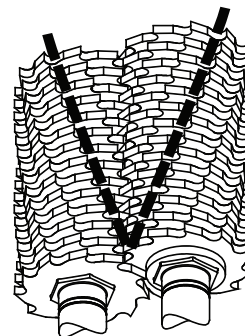


8. Install a cutter on the drive shaft with the index mark at position 1.
9. Install a spacer on the driven shaft and a spacer on the drive shaft.
10. Install a cutter on the driven shaft with the index mark at position 1.

11. Install the next cutter on the drive shaft with the index mark (dimple or notch) at position 2 and then install a spacer on the driven shaft.
12. Install a cutter on the driven shaft with the index mark (dimple or notch) at position 2 and then install a spacer on the drive shaft.
13. Repeat steps 8 through 12, rotating the index mark of the cutter one position at a time until the stack is complete. Verify the cutting stack ends with a spacer on the drive shaft and a cutter on the driven shaft and forms a helical pattern "V" shape. Refer to FIGURE 6-4.
14. Inspect stack for correct quantity or required cutters and spacers on the drive and drive shafts. Refer to the drawings at the back of this manual.
15. Install washers and apply Loctite adhesive to the drive and driven shaft stack screw threads. Install the drive and driven shaft stack screws. Torque the drive and driven stack screws to 135 ft. lbs. (184 Nm).

16. Verify cutter stack tightness. Refer to Paragraph 4.3.4.

**FIGURE 6-4 CUTTER STACKING**



### 6.3.5 Drive Gear, Driven Gear and Shaft Removal and Replacement

All cutters and spacers must be removed per Paragraph 6.3.2 before the bearings can be inspected or the drive gears removed and replaced.

1. Turn the assembly over and clamp the drive and driven shafts in a vise to prevent the shafts from dropping free during gear removal.
2. Remove the socket headed screws from the top cover.
3. Remove the top cover with the oil seal, outboard roller bearing outer race and end housing gasket.
4. Remove the end housing gasket material from the top cover and end housing mating surfaces.
5. Inspect the drive and driven outboard bearing outer races for evidence of wear or damage. JWCE does not recommend removal of the outboard roller bearing. Contact JWCE if the outboard roller is worn or damaged.
6. Verify that the drive and driven shafts are clamped (Step 1) and remove the snap ring retainers from the drive and driven shafts.
7. Slide the inner races off the shafts. Inspect the inner races for evidence of wear or damage. JWCE does not recommend removal of the outboard roller bearing. Contact JWCE if the outboard roller is worn or damaged.
8. Remove the gear spacers from the drive and driven shafts.
9. Remove the drive and driven gears and gear keys from the drive and driven shafts. Clean and inspect the gears. Replace the gear(s) if there are signs of wear, cracks, or if other obvious damage is noted.
10. Remove the gib key from the drive and driven shafts.
11. With a slow, even pull, remove the drive and driven shafts from the top end housing. Place

the shafts on a clean, flat work surface. Inspect the shafts for cracks, excessive wear, and/or other obvious signs of damage. Contact JWCE if shafts are damaged or if damage is suspected.

12. Inspect the drive and driven shaft O-rings. Replace O-rings if worn or damaged.

During replacement, support the top end housing and drive shafts to prevent damage to the shafts, O-rings and seal cartridge assembly when inserting the shaft into the top end housing seal cartridge assembly. Avoid damaging the O-rings when replacing the cutter assembly shafts into the housings. Apply grease (Nichels Engineering MPG All Purpose Super Grease or white lithium grease) to the O-ring. Replace the O-ring if it is damaged.

### 6.3.6 Seal Cartridge Removal and Inspection



**Do Not Attempt To Repair Or Grease The Seal Cartridge Assembly. Replace If Damaged Or If Wear Is Observed.**



**Handle End Housing With Care. Polished Seal Surfaces Can Be Damaged If The Housing Is Dropped Or Mishandled.**

Remove the seal support plate from the top end housing. Remove the seal cartridge assemblies from the top end housing. A hydraulic press may be needed to remove the seal cartridge assemblies.

Inspect the seal cartridge for excessive wear. Replace seal cartridges if damaged or if signs of wear are identified. Clean the top end housing cutter drive and driven shaft bearing bore(s) thoroughly with solvent before replacing the seal cartridge assembly. Replace the housing if the bores are scored, pitted, or damaged.



#### 6.4 GRIND TEST

Perform the grind test per the following procedure before installing the grinder if the cutter assembly or any cutters have been removed and replaced.



1. Temporarily connect the appropriate wiring from supply power to the grinder motor.
2. Apply power to the grinder. Verify the grinder is running with no excessive noise or vibration and that the cutters are rotating correctly.
3. Carefully insert a piece of wood into the grinder cutting chamber. Verify the wood is reduced by the cutters. Remove power.
4. Clean any debris left over from the grind test prior to installing the grinder as described in SECTION 3.

This page intentionally left blank.

## APPENDIX A

### ELECTRIC DRIVE ASSEMBLY MAINTENANCE INSTRUCTIONS

#### A. 1 GENERAL INFORMATION

This maintenance instruction describes the standard and immersible electric motor drive assembly that provides rotary power for JWC Environmental (JWCE) high flow waste management devices such as grinders and augers. The electric drive assembly consists of an electric motor, reducer, an optional extended shaft and adapter spool. Refer to the electric drive assembly drawing for parts location and parts list.

The following paragraphs define the specifications, support guidelines, and safety concerns for the drive assembly. Details for the controller and the applicable JWCE equipment are located in the corresponding operation and maintenance manuals. Dimensional information for the drive may be found on the associated equipment configuration drawing.

**Electric Drive** - The following specifications apply to the electric drive.

- NEMA Frame, TEFC/TEXP / Chemical Duty / Super-E for standard motors or TENV XP for immersible motors.
- Speed: 1725 rpm for 60Hz (typical); 1440 for 50 Hz.
- Horsepower Rating: 1 to 10 horsepower.
- Power Requirements: 208/230/380/460 volts AC  $\pm$  10%, three phase, 50/60 Hertz.
- Duty: Continuous, grounding is required.
- Temperature: Operating 23° F (-5° C) to 105° F (40° C). Motor winding heater required below 32° F (0° C).
- Storage 40° F (5° C) to 105° F (40° C).
- Optional extended shaft available in six inch increments from 12" up to 120".

**Speed Reducer** - The speed reducer assembly consists of a motor adapter and a reducer. The following general specifications apply to the speed reducer.

- Input: 10 HP (maximum), 1450 to 1800 RPM.

- Reduction Factor: 377:1 (1 HP), 29:1 (3-5 HP), 43:1 (5 to 10 HP).
- Service Factor: 1.15.
- C-Face Adapter: NEMA 56C or 143TC (1 HP), 145TC or 182TC (3-5 HP), 213 or 215TC (5-10 HP).
- International Electro-technical Commission (IEC) 112M (Standard).

The spool is a one piece assembly that provides adaptability from the motor to the cutter assembly end housing and houses the coupling which transitions the motor output to the equipment input drive shaft.

The drive assembly is designed to operate smoothly and quietly. If any excessive noise or temperature rise is noted, stop operation and inspect the drive.

#### A. 2 TROUBLESHOOTING

Motor does not start:

- Main power supply trouble - Check the main power and motor controller settings.
- Motor failure - Contact JWCE.

Motor hums excessively:


- Supply voltage exceeds motor rating - Check supply voltage and line connections.
- Motor failure - Contact JWCE.

Motor overheating:



- Improper ventilation - Standard motors: Verify air intake is not blocked and motor cooling fan is rotating. Increase ambient air flow and reduce ambient heat if possible. Immersible motors: Verify motor body heat fins are free of dirt, sludge or other contaminants.
- Main power line problems or bad connection - Check supply voltage and line connections.
- Motor failure - Contact JWCE Customer Support.

**A. 3 REMOVAL AND REPLACEMENT GUIDELINES**

Observe the following guidelines during removal and replacement of the motor, reducer, and spool. Review the safety requirements in the JWCE equipment manual. Removed parts can be used during replacement unless damaged, worn or otherwise noted. Contact JWCE if any of the parts inspected in the following paragraphs appear damaged or worn.



**Opening The J-Box On Immersible-type Motors Will Void The Warranty. Change Motor Rotation Via The Controller. Refer To The Motor & Cable Wiring Diagram For Connection Definition.**

**VERIFY SUPPLY POWER HAS BEEN REMOVED AND TAGGED OUT BEFORE REMOVING MOTOR**



**DO NOT LIFT HEAVY EQUIPMENT OVERHEAD OF PERSONNEL.**

- Replacement of the motor or speed reducer does not require removal of the JWCE equipment from the installation.
- Store removed parts in a safe location.
- Install the JWCE equipment and electrical hookup following good practices and in compliance with all OSHA, local, state, and federal codes and requirements.
- Do not steam clean and disinfect the motor. Clean outside surfaces of the motor with suitable solvent.
- Remove all gasket material from all mating surfaces.
- Inspect outside of each unit/component removed for signs of cracks, damage, or excessive wear. Replace if necessary.
- Complete all required customer/user inspection records and forms.

**A. 4 DRIVE ASSEMBLY REMOVAL/REPLACEMENT**

Perform the following to remove the drive assembly as a complete unit from the JWCE equipment.

1. Attach lifting cables/sling lift to the drive assembly. Maintain tension on the lifting cables/sling.
2. Remove hardware securing drive assembly to the JWCE equipment.
3. Remove wiring from motor or at motor controller for immersible motors.
4. Lift up the drive assembly with slow and steady pull. Place removed assembly on a clean level surface and remove lifting cables/sling.
5. Inspect top cover gasket; replace if required.

Perform the startup and grinder cutter rotation verification as defined in the motor controller manual after motor replacement.

**A. 5 MOTOR REMOVAL / REPLACEMENT**

Each motor is maintenance-free type and is covered by the motor manufacturer's service policy and limited warranty. JWCE advises do not disassemble motor. If service is required, JWCE recommends removal of the motor from the affected unit and returning the motor to an authorized repair center. Contact JWCE Customer Support for more information.

Perform motor removal per the following steps. Replace the motor in the reverse order of the removal steps.

1. Prepare JWCE equipment for motor removal as described in SECTION 6.
2. Disconnect power leads to the motor and any heater or thermostat wiring (if required).
3. Remove hardware securing the motor to the spool.
4. Attach lifting cables/sling lift to the motor.
5. Remove the coupling guards from the speed reducer assembly.
6. Remove hardware securing the motor to the speed reducer assembly.
7. Slowly lift the motor from the speed reducer assembly and place the motor on a clean, flat work surface.

8. Remove motor flexible coupling half and key from the motor output shaft. The coupling half should be easily removable from the motor output drive shaft. If the coupling cannot be removed by hand, a gear puller will be required.
9. Inspect coupling motor half and motor output shaft key for damage. Discard and replace damaged components as necessary. **Store motor shaft half of coupling and motor output shaft key in a safe location to prevent loss until the motor is replaced on the motor/reducer adapter spool.**

Perform startup and grinder cutter rotation verification after motor replacement.

#### A. 6 SPEED REDUCER AND SPOOL REMOVAL / REPLACEMENT

The reducer assembly consists of a motor adapter spool and a reducer. The reducer assembly and spool are considered a complete assembly. Component removal and/or replacement is not recommended. Replace the speed reducer and spool in the reverse order of the removal steps. Contact JWCE if a speed reducer or spool problem is detected or suspected.

Remove the speed reducer and spool per the following procedure. Replace discarded gasket when replacing the speed reducer.

1. Remove the electric motor.
2. Attach lifting cables/sling, lift from the speed reducer assembly if necessary.

3. Remove hardware securing the speed reducer assembly to the speed reducer/equipment adapter spool.
4. Slowly lift the speed reducer assembly from the adapter spool and place it on a clean, flat work surface.
5. Remove the lifting cables/sling lift from the speed reducer assembly.
6. Remove and discard the speed reducer assembly-to-spool gasket.
7. Remove speed reducer assembly half of interlock coupling and key from the speed reducer assembly output shaft. Each coupling half should be easily removable from the shafts. A gear puller may be required if the couplings cannot be removed by hand.
8. **Store interlocking coupling and key in a safe location until the speed reducer assembly is installed.** Proceed to the next step if removing the spool.
9. Remove hardware securing the equipment adapter spool to the equipment top cover.
10. Slowly lift the equipment adapter spool from the unit top cover and place it on a clean, flat work surface.
11. Remove and discard the spool-to-top cover gasket.

Perform startup and grinder cutter rotation verification after spool replacement.

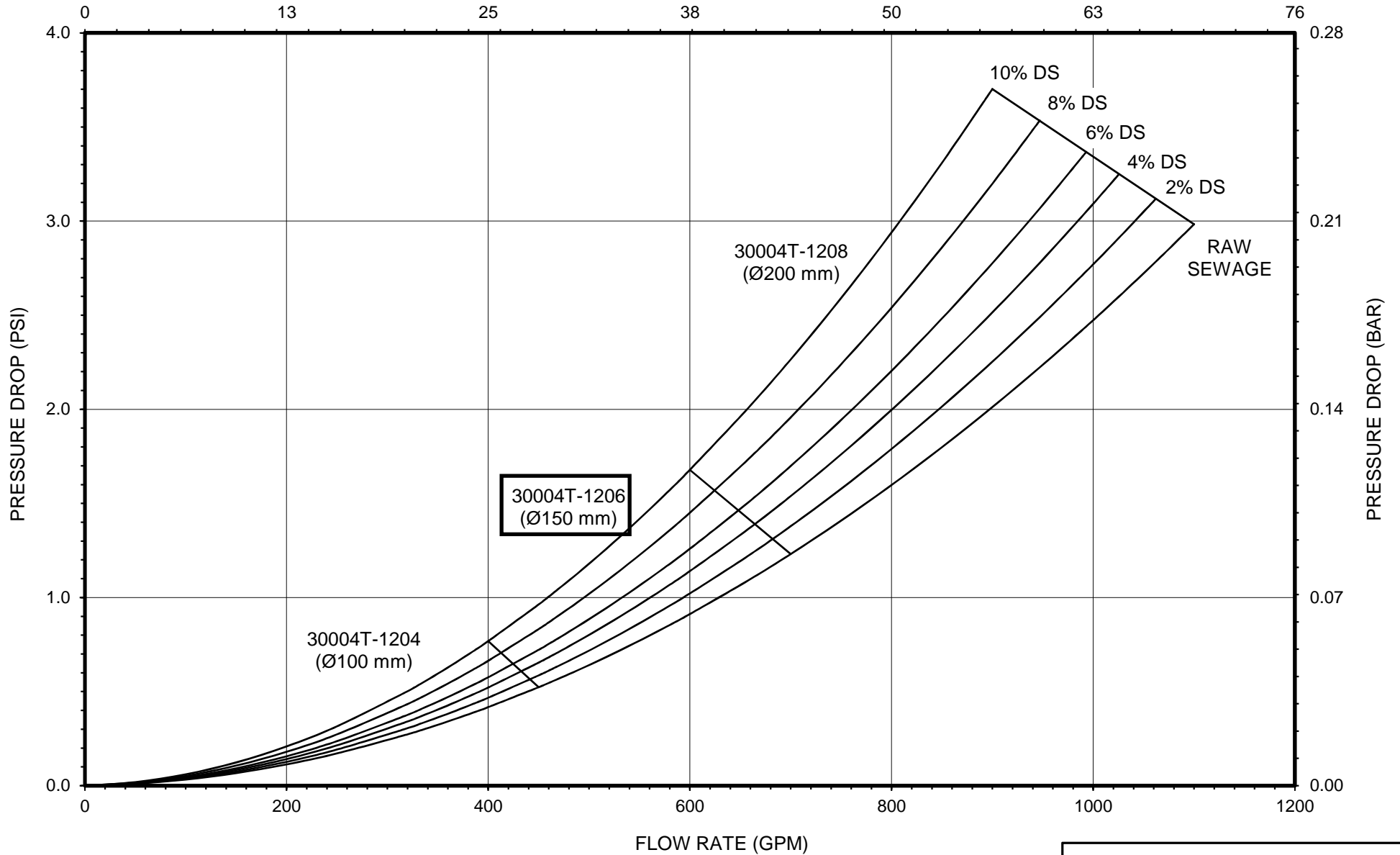
## IMMERSIBLE MOTOR & CABLE WIRING

LOW VOLTAGE	HIGH VOLTAGE										
<p style="text-align: center;"><b>MOTOR</b></p> <p style="text-align: center;"><b>T'STAT LEADS</b></p> <p style="text-align: center;"><b>LINE</b></p> <p style="text-align: center;"><b>T'STAT LEADS</b></p> <p style="text-align: center;"><b>CABLE</b>      <b>CABLE</b></p> <p style="text-align: center;">RED WHT BLK      BLU ORG</p>	<p style="text-align: center;"><b>MOTOR</b></p> <p style="text-align: center;"><b>T'STAT LEADS</b></p> <p style="text-align: center;"><b>LINE</b></p> <p style="text-align: center;"><b>T'STAT LEADS</b></p> <p style="text-align: center;"><b>CABLE</b>      <b>CABLE</b></p> <p style="text-align: center;">RED WHT BLK      BLU ORG</p>										
SINGLE VOLTAGE MOTORS	THERMOSTAT RATING										
<p style="text-align: center;"><b>LINE</b></p> <p style="text-align: center;"><b>T'STAT LEADS</b></p> <p style="text-align: center;"><b>CABLE</b>      <b>CABLE</b></p> <p style="text-align: center;">RED WHT BLK      BLU ORG</p>	<table style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th style="border-right: 1px solid black; padding: 5px;"><u>AMPS</u></th> <th style="padding: 5px;"><u>VOLTAGE</u></th> </tr> </thead> <tbody> <tr> <td style="border-right: 1px solid black; padding: 5px;">6.0</td> <td style="padding: 5px;">115</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">3.0</td> <td style="padding: 5px;">230</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">1.5</td> <td style="padding: 5px;">460</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">1.2</td> <td style="padding: 5px;">575</td> </tr> </tbody> </table>	<u>AMPS</u>	<u>VOLTAGE</u>	6.0	115	3.0	230	1.5	460	1.2	575
<u>AMPS</u>	<u>VOLTAGE</u>										
6.0	115										
3.0	230										
1.5	460										
1.2	575										

# MODEL 30004T-12

FLOW RATE (L/S)

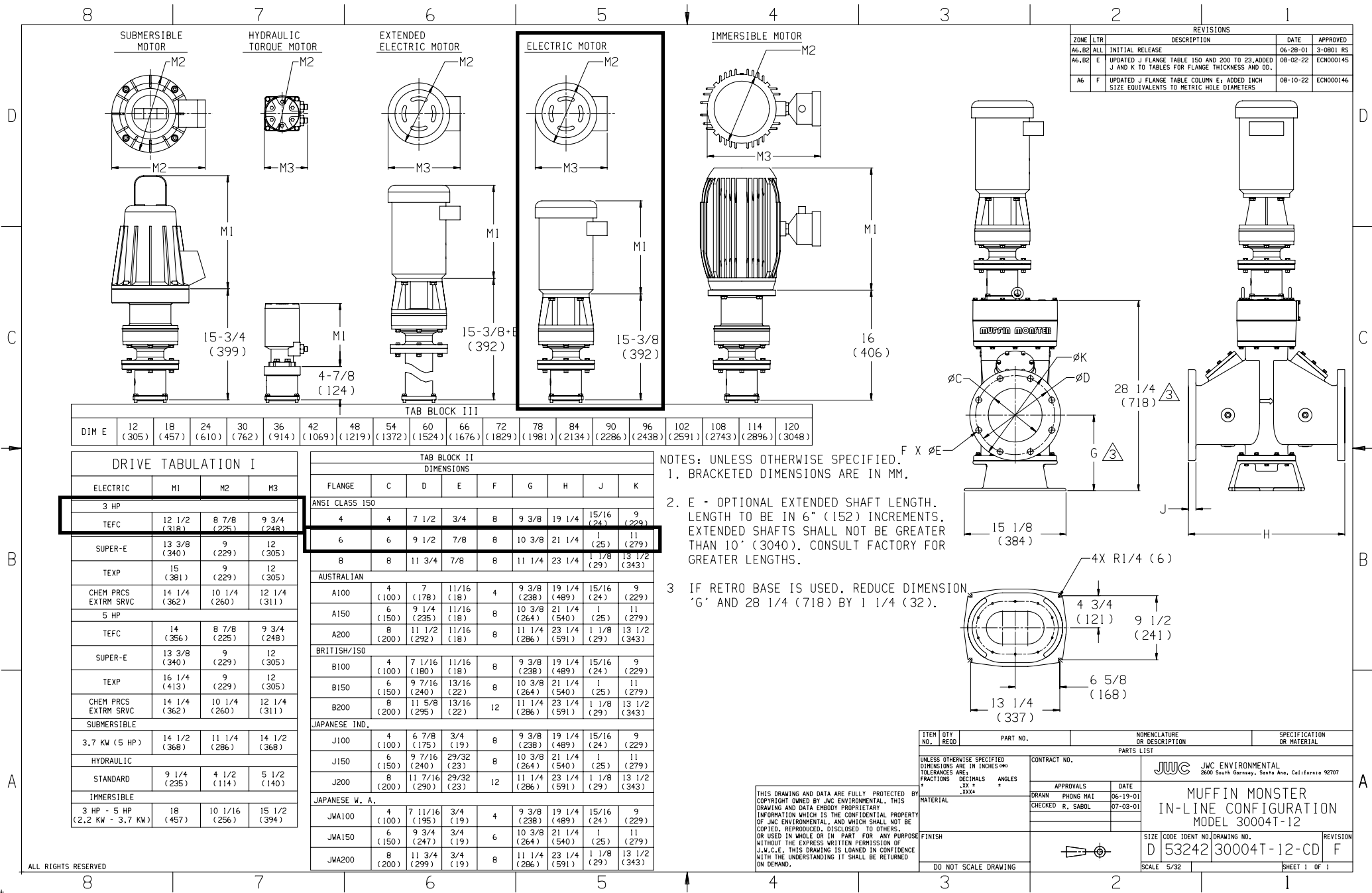
9-20-12







# UNCONTROLLED COPY



REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
A6, B2	ALL	INITIAL RELEASE	06-28-01	3-0801 RS
A6, B2	E	UPDATED J FLANGE TABLE 150 AND 200 TO 23, ADDED J AND K TO TABLES FOR FLANGE THICKNESS AND OD.	08-02-22	ECN000145
A6	F	UPDATED J FLANGE TABLE COLUMN E; ADDED INCH SIZE EQUIVALENTS TO METRIC HOLE DIAMETERS	08-10-22	ECN000146

DIM E	12 (305)	18 (457)	24 (610)	30 (762)	36 (914)	42 (1069)	48 (1219)	54 (1372)	60 (1524)	66 (1676)	72 (1829)	78 (1981)	84 (2134)	90 (2286)	96 (2438)	102 (2591)	108 (2743)	114 (2896)	120 (3048)
-------	----------	----------	----------	----------	----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------	------------	------------	------------	------------

DRIVE TABULATION I				
ELECTRIC	M1	M2	M3	
<b>3 HP</b>				
TEFC	12 1/2 (318)	8 7/8 (225)	9 3/4 (248)	
SUPER-E	13 3/8 (340)	9 (229)	12 (305)	
TEXP	15 (381)	9 (229)	12 (305)	
CHEM PRCS EXTRM SRVC	14 1/4 (362)	10 1/4 (260)	12 1/4 (311)	
<b>5 HP</b>				
TEFC	14 (356)	8 7/8 (225)	9 3/4 (248)	
SUPER-E	13 3/8 (340)	9 (229)	12 (305)	
TEXP	16 1/4 (413)	9 (229)	12 (305)	
CHEM PRCS EXTRM SRVC	14 1/4 (362)	10 1/4 (260)	12 1/4 (311)	
<b>SUBMERSIBLE</b>				
3.7 KW (5 HP)	14 1/2 (368)	11 1/4 (286)	14 1/2 (368)	
<b>HYDRAULIC</b>				
STANDARD	9 1/4 (235)	4 1/2 (114)	5 1/2 (140)	
<b>IMMERSIBLE</b>				
3 HP - 5 HP (2.2 KW - 3.7 KW)	18 (457)	10 1/16 (256)	15 1/2 (394)	

TAB BLOCK II DIMENSIONS										
FLANGE	C	D	E	F	G	H	J	K		
<b>ANSI CLASS 150</b>										
4	4	7 1/2	3/4	8	9 3/8	19 1/4	15/16 (24)	9 (229)		
6	6	9 1/2	7/8	8	10 3/8	21 1/4	1 (25)	11 (279)		
8	8	11 3/4	7/8	8	11 1/4	23 1/4	1 1/8 (29)	13 1/2 (343)		
<b>AUSTRALIAN</b>										
A100	4 (100)	7 (178)	11/16 (18)	4	9 3/8 (238)	19 1/4 (489)	15/16 (24)	9 (229)		
A150	6 (150)	9 1/4 (235)	11/16 (18)	8	10 3/8 (264)	21 1/4 (540)	1 (25)	11 (279)		
A200	8 (200)	11 1/2 (292)	11/16 (18)	8	11 1/4 (286)	23 1/4 (591)	1 1/8 (29)	13 1/2 (343)		
<b>BRITISH/150</b>										
B100	4 (100)	7 1/16 (180)	11/16 (18)	8	9 3/8 (238)	19 1/4 (489)	15/16 (24)	9 (229)		
B150	6 (150)	9 7/16 (240)	13/16 (22)	8	10 3/8 (264)	21 1/4 (540)	1 (25)	11 (279)		
B200	8 (200)	11 5/8 (295)	13/16 (22)	12	11 1/4 (286)	23 1/4 (591)	1 1/8 (29)	13 1/2 (343)		
<b>JAPANESE IND.</b>										
J100	4 (100)	6 7/8 (175)	3/4 (19)	8	9 3/8 (238)	19 1/4 (489)	15/16 (24)	9 (229)		
J150	6 (150)	9 7/16 (240)	29/32 (23)	8	10 3/8 (264)	21 1/4 (540)	1 (25)	11 (279)		
J200	8 (200)	11 7/16 (290)	29/32 (23)	12	11 1/4 (286)	23 1/4 (591)	1 1/8 (29)	13 1/2 (343)		
<b>JAPANESE W. A.</b>										
JWA100	4 (100)	7 11/16 (195)	3/4 (19)	4	9 3/8 (238)	19 1/4 (489)	15/16 (24)	9 (229)		
JWA150	6 (150)	9 3/4 (247)	3/4 (19)	6	10 3/8 (264)	21 1/4 (540)	1 (25)	11 (279)		
JWA200	8 (200)	11 3/4 (299)	3/4 (19)	8	11 1/4 (286)	23 1/4 (591)	1 1/8 (29)	13 1/2 (343)		

- NOTES: UNLESS OTHERWISE SPECIFIED.
1. BRACKETED DIMENSIONS ARE IN MM.
  2. E = OPTIONAL EXTENDED SHAFT LENGTH. LENGTH TO BE IN 6" (152) INCREMENTS. EXTENDED SHAFTS SHALL NOT BE GREATER THAN 10" (304). CONSULT FACTORY FOR GREATER LENGTHS.
  3. IF RETRO BASE IS USED, REDUCE DIMENSION 'G' AND 28 1/4 (718) BY 1 1/4 (32).

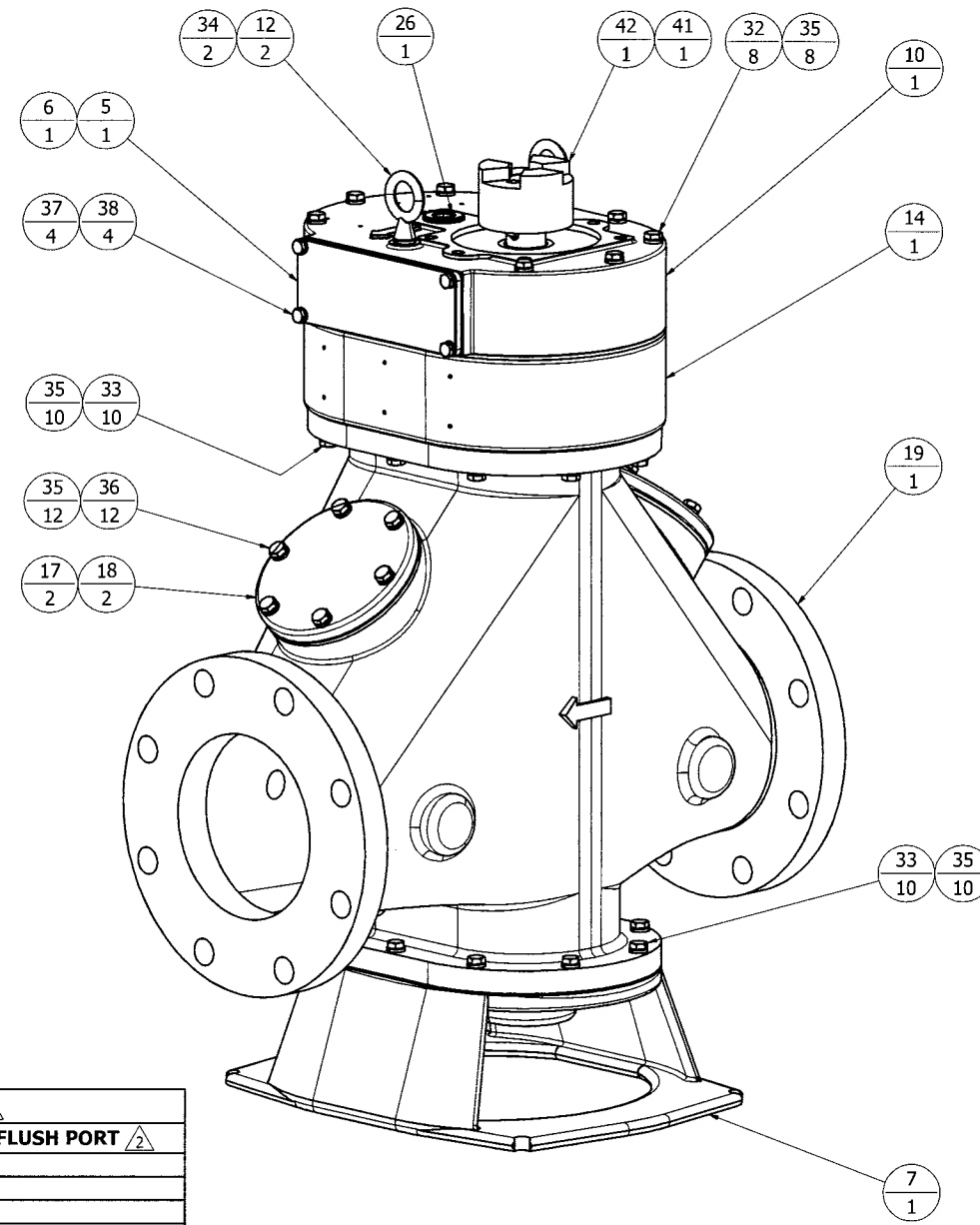
ITEM NO.	QTY	RECD	PART NO.	NOMENCLATURE OR DESCRIPTION	SPECIFICATION OR MATERIAL
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES-MM TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ° .XX ° .XXX °					
CONTRACT NO.			PARTS LIST		
DRAWN PHONG MAI 06-19-01			APPROVALS DATE		
CHECKED R. SABOL 07-03-01			JWC ENVIRONMENTAL 2600 South Garvey, Santa Ana, California 92707		
MATERIAL			MUFFIN MONSTER IN-LINE CONFIGURATION MODEL 30004T-12		
FINISH			SIZE CODE IDENT NO. DRAWING NO. REVISION		
DO NOT SCALE DRAWING			D 53242 30004T-12-CD F		
			SCALE 5/32 SHEET 1 OF 1		



NOTES UNLESS OTHERWISE SPECIFIED:

- 1 MODEL NUMBER: 30004T-AAAA  
AAAA = FLANGE DESIGNATION  
SEE TABLE 1 FOR MODEL NUMBERS AND CORRESPONDING UNIBODY HOUSING PART NUMBERS.
- 2 ADD F AFTER FLANGE DESCRIPTION TO DESIGNATE FLUSH PORT OPTION.
- 3 ADD -V SUFFIX TO DESIGNATE OPTIONAL VITON MATERIAL.
- 4 ADD -U SUFFIX TO DESIGNATE OPTIONAL 316 SST MATERIAL.
- 5 ADD SUFFIX FOR MATERIAL DESIGNATION.  
-TB = BUNA  
-TV = VITON
- 6 Z IN PART NUMBER DESIGNATES MATERIAL.  
B = BUNA  
V = VITON
- 7 B IN DRAWING NUMBER DESIGNATES CUTTER ASSEMBLY OPTION.  
2 = CAM CUTTERS  
4 = SERRATED CUTTERS
- 8. COAT COUPLING LUG FACES WITH LITHIUM GREASE.
- 9. COAT GEARS WITH HI-TEMP GREASE (MYSTIC JT-61).
- 10. TORQUE CUTTER STACKS TO 135 FT-LB.

REVISION HISTORY									
ZONE	REV	DESCRIPTION	ECO NO.	DATE	CHK	PE	MFG	QC	BB
1:A8	B	UNIBODY HOUSING WAS 34036-0006-DI/B, IS 34036-0008-DI/B. UNIBODY FLUSH PORT HOUSING WAS 34036-0006-DI, IS 34036-0008-DI. ADDED PIPELINE SIZE TO UNIBODY HOUSING OPTIONS TABLE	3-3234	05-06-15	KM	TN	N/A	N/A	
3C	C	DELETED STANDARD GEARSET OPTION. ITEM#40 QTY WAS 48 & ITEM#39 QTY WAS 8.	03-3262	03-01-16	RS	RS	-	-	
C3	D	ITEM 24; 34014-0002 GASKET QTY 2 WAS 1. RE-NUMBERED ITEMS IN PARTS LIST	03-3275	7/18/16	RS	RS	-	-	



ITEM	QTY	PART / ASSEMBLY NUMBER	DESCRIPTION	MATERIAL
46	4	03411-Z	O-RING -335	
45	4	03414-0002	WAVE SPRING, 5 WAVE	STL
44	1	20034	STACK WASHER	STL
43	2	30007-0017	KEY 3/8 SQ X 1-3/4	STL
42	1	30017-0011-001	INTERLOCKING COUPLING HALF	ALLOY STL
41	1	30045-0005	KEY, 5/16 SQ X 1-3/4	STL
40	8	30108	HHCS 5/16-18 X 1	SST
39	8	30111	DOWEL PIN, 3/8 X 1	STL
38	4	30114	HHCS 1/4-20 X 3/4	STL
37	4	30121	WASHER, LOCK 1/4	SST
36	18	30128	HHCS 5/16-18 X 1-1/4	SST
35	54	30130	WASHER, LOCK 5/16	SST
34	2	30140	WASHER, LOCK 3/8	SST
33	20	30143	HHCS 5/16-18 X 1-1/2	SST
32	8	30170	HHCS 5/16-18 X 3-1/2	SST
31	2	30287	RETAINING RING	STL
30	4	30307	GIB KEY	STL
29	1	30314	NUT 1-1/2" - 12 HEX	GRADE 8 STL
28	1	30315	SHCS, 3/4-10 X 1.0, GR 8	GRADE 5 STL
27	1	31087-0004	PIPE PLUG, 3/4 NPT	STL
26	1	31087-0006	PIPE PLUG, 1" NPT	SST
25	2	34014-0001	GASKET, MAIN HOUSING, MUFFIN MONSTER MODEL 30004	CORK AND RUBBER
24	2	34014-0002	GASKET, END HOUSING, MUFFIN MONSTER MODEL 30004	CORK AND RUBBER
23	1	34014-0003	GASKET, GEAR HOUSING, MUFFIN MONSTER 30004T	CORK AND RUBBER
22	1	34019-2901	GEAR 29 TEETH, DRIVE SHAFT	ALLOY STL
21	1	34021-3201	GEAR 32 TEETH, DRIVEN SHAFT	ALLOY STL
20	4	34034	COMPRESSION DISK	STL
19	1	34036-AAAA-DI	UNIBODY HOUSING, MUFFIN MONSTER 30004T	DUCTILE IRON
18	2	34043-DI	VIEW PORT COVER, MUFFIN MONSTER 30004	DUCTILE IRON
17	2	34044	VIEW PORT COVER GASKET, MUFFIN MONSTER 30004	CORK AND RUBBER
16	4	34046-Z7	SEAL RING #7-220	
15	2	34077-DI	END HOUSING, MUFFIN MONSTER 30004T	DUCTILE IRON
14	1	34078-DI	GEAR HOUSING, MUFFIN MONSTER 30004	DUCTILE IRON
13	2	34083	BEARING SPACER, MUFFIN MONSTER 30004	STL
12	2	34145	EYE BOLT 3/8-16 X 1-1/4	STL
11	6	34150	DOWEL PIN 5/16 X 1	STL
10	1	34705-DI	TOP COVER, MUFFIN MONSTER 30004T	DUCTILE IRON
9	1	34718-1201	DRIVE SHAFT - 2" HEX, MUFFIN MONSTER 30004T	ALLOY STL
8	1	34718-1202	DRIVEN SHAFT - 2" HEX, MUFFIN MONSTER 30004T	ALLOY STL
7	1	34727	STANDARD BASE, MUFFIN MONSTER 30004T	DUCTILE IRON
6	1	34741	GASKET, STACK NUT COVER, MUFFIN MONSTER 30004	CORK AND RUBBER
5	1	34742	STACK NUT COVER, MUFFIN MONSTER 30004T	DUCTILE IRON
4	2	34783	SPACER - GEAR/BUSHING, MUFFIN MONSTER 30004	STL
3	1	35048	OIL LIP SEAL	NITRILE
2	1	DWG# A3400B-0012	12" CUTTER STACK ASSEMBLY, MODEL 30004T	
1	4	DWG# A34320-3401	SEAL CARTRIDGE ASSEMBLY, MUFFIN MONSTER SERIES 30000	

PIPE SIZE	MODEL NO.	UNIBODY HOUSING	UNIBODY WITH FLUSH PORT
4" (100mm)	30004T-1204-DI	34036-0004-DI/B	34036-0004F-DI
	30004T-AS100-DI	34036-A100-DI	34036-A100F-DI
	30004T-B100-DI	34036-B100-DI	34036-B100F-DI
	30004T-J100-DI	34036-J100-DI	34036-J100F-DI
	30004T-JWA100-DI	34036-JWA100-DI	34036-JWA100F-DI
6" (150mm)	30004T-1206-DI	34036-0006-DI/B	34036-0006F-DI
	30004T-AS150-DI	34036-A150-DI	34036-A150F-DI
	30004T-B150-DI	34036-B150-DI	34036-B150F-DI
	30004T-J150-DI	34036-J150-DI	34036-J150F-DI
	30004T-JWA150-DI	34036-JWA150-DI	34036-JWA150F-DI
8" (200mm)	30004T-1208-DI	34036-0008-DI/B	34036-0008F-DI
	30004T-AS200-DI	34036-A200-DI	34036-A200F-DI
	30004T-B200-DI	34036-B200-DI	34036-B200F-DI
	30004T-J200-DI	34036-J200-DI	34036-J200F-DI
	30004T-JWA200-DI	34036-JWA200-DI	34036-JWA200F-DI

THIS DRAWING AND DATA ARE FULLY PROTECTED BY COPYRIGHT OWNED BY JWC ENVIRONMENTAL. THIS DRAWING AND DATA EMBODY PROPRIETARY INFORMATION WHICH IS THE CONFIDENTIAL PROPERTY OF JWC ENVIRONMENTAL AND SHALL NOT BE COPIED, REPRODUCED, DISCLOSED TO OTHERS, OR USED IN WHOLE OR IN PART FOR ANY PURPOSE WITHOUT THE EXPRESS WRITTEN PERMISSION FROM JWC. THIS DRAWING IS LOANED IN CONFIDENCE WITH THE UNDERSTANDING THAT IT SHALL BE RETURNED UPON DEMAND.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES [mm]  
FRACTIONS DECIMALS ANGLES  
± 1/16 .XX ± .03 ± 1/2°  
XXX ± .005

CONTRACT NO. APPROVALS DATE  
DRAWN K. S. MOIR 12/18/14  
CHECKED B. WEBER 01-19-15  
MANUF. V. QUINTANA 01-21-15  
Q.C. B. BAKER 01-21-15

MATERIAL SEE PARTS LIST

FINISH 250 (CAST) 125 (MACHINED) UNLESS OTHERWISE SPECIFIED

DO NOT SCALE DRAWING

**JWC ENVIRONMENTAL**  
290 PAULARINO AVE, COSTA MESA, CA 92626

**ASSEMBLY - MUFFIN MONSTER**  
IN LINE MODEL 30004T-12  
MUFFIN MONSTER SERIES 30000

SIZE **D** DRAWING NO. **A30004T-12-01** REV **D**

SCALE: NONE CAD MODEL: A30004T-1208-DI SHEET 1 OF 3

**CONTROLLED**

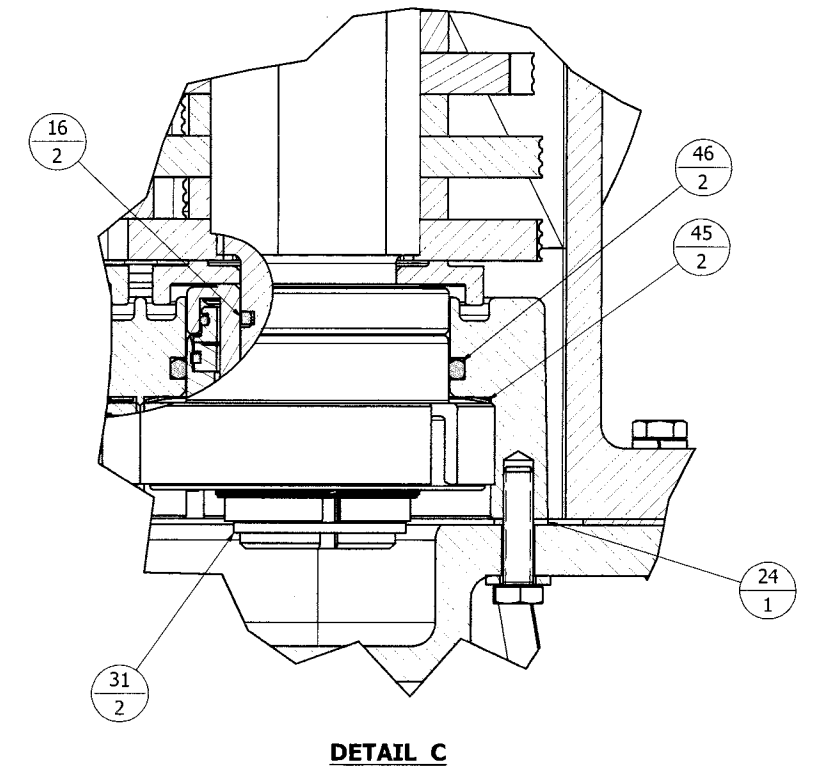
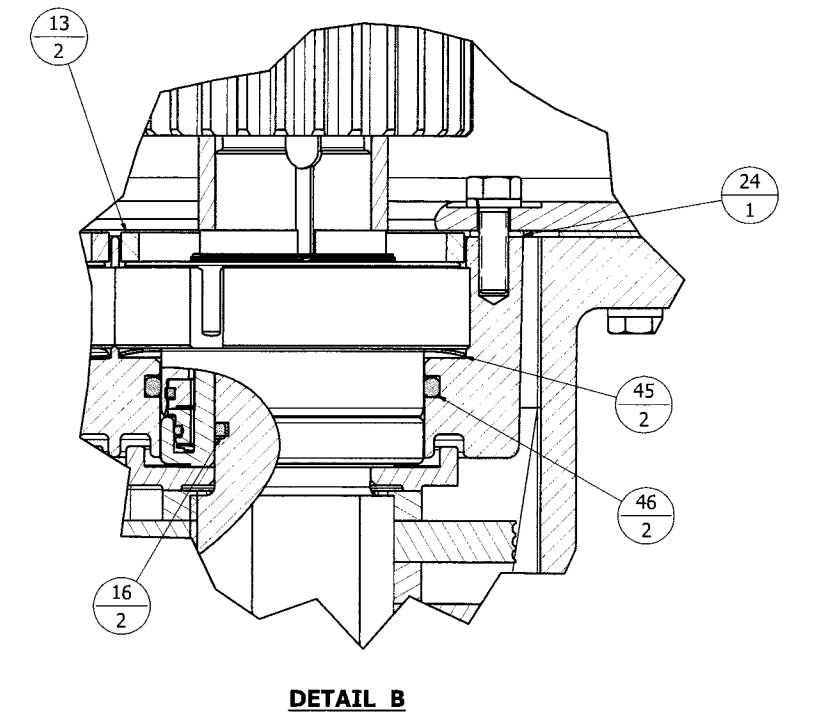
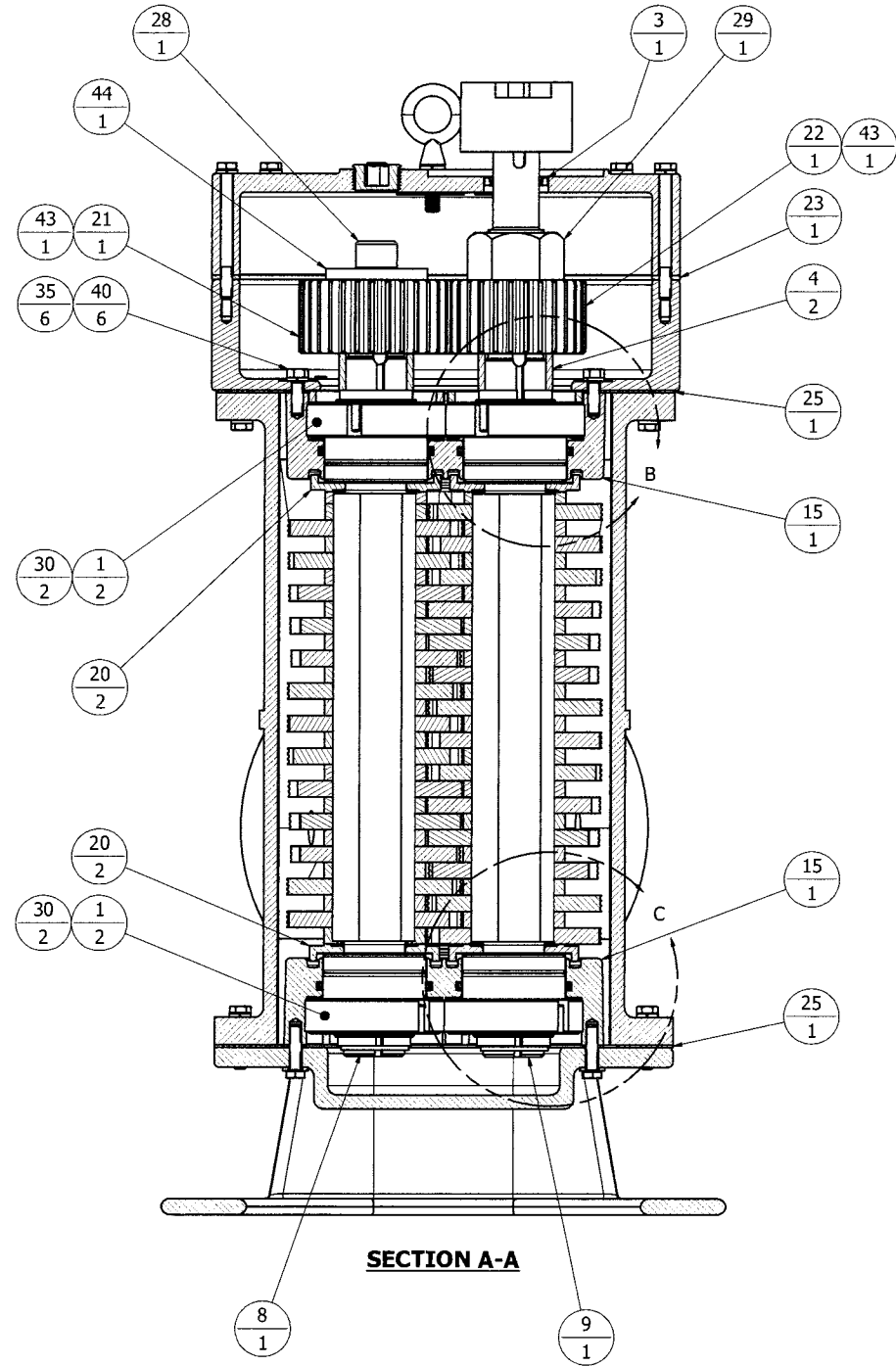
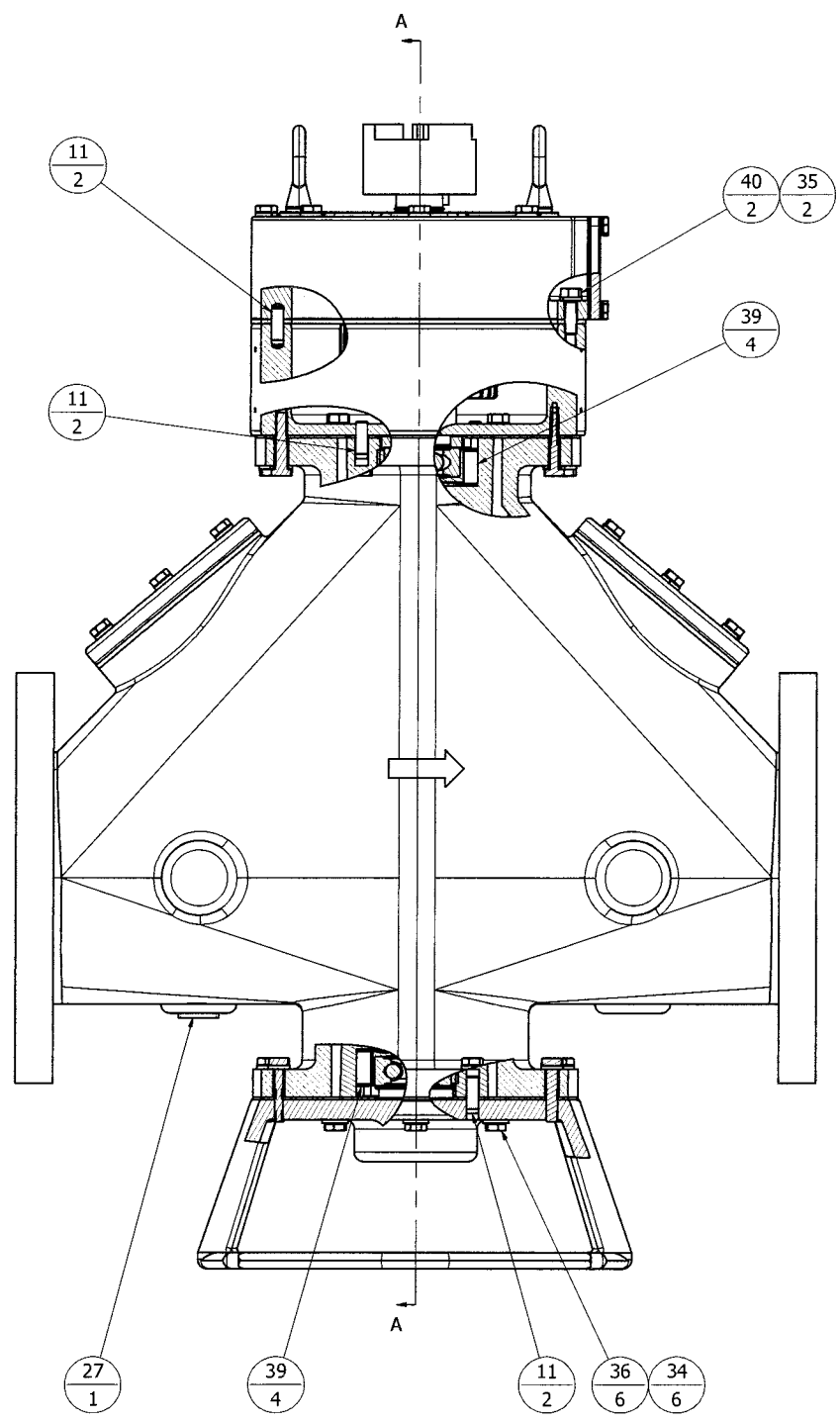


D

C

B

A



SECTION A-A

DETAIL B

DETAIL C

CONTROLLED

<p><b>JWC</b> JWC ENVIRONMENTAL          290 PAULARINO AVE, COSTA MESA, CA 92626</p>		
<p><b>ASSEMBLY - MUFFIN MONSTER</b>          IN LINE MODEL 30004T-12          MUFFIN MONSTER SERIES 30000</p>		
SIZE <b>D</b>	DRAWING NO. <b>A30004T-12-01</b>	REV <b>D</b>
SCALE: NONE	CAD MODEL: A30004T-1208-D1	SHEET 2 OF 3



D

C

B

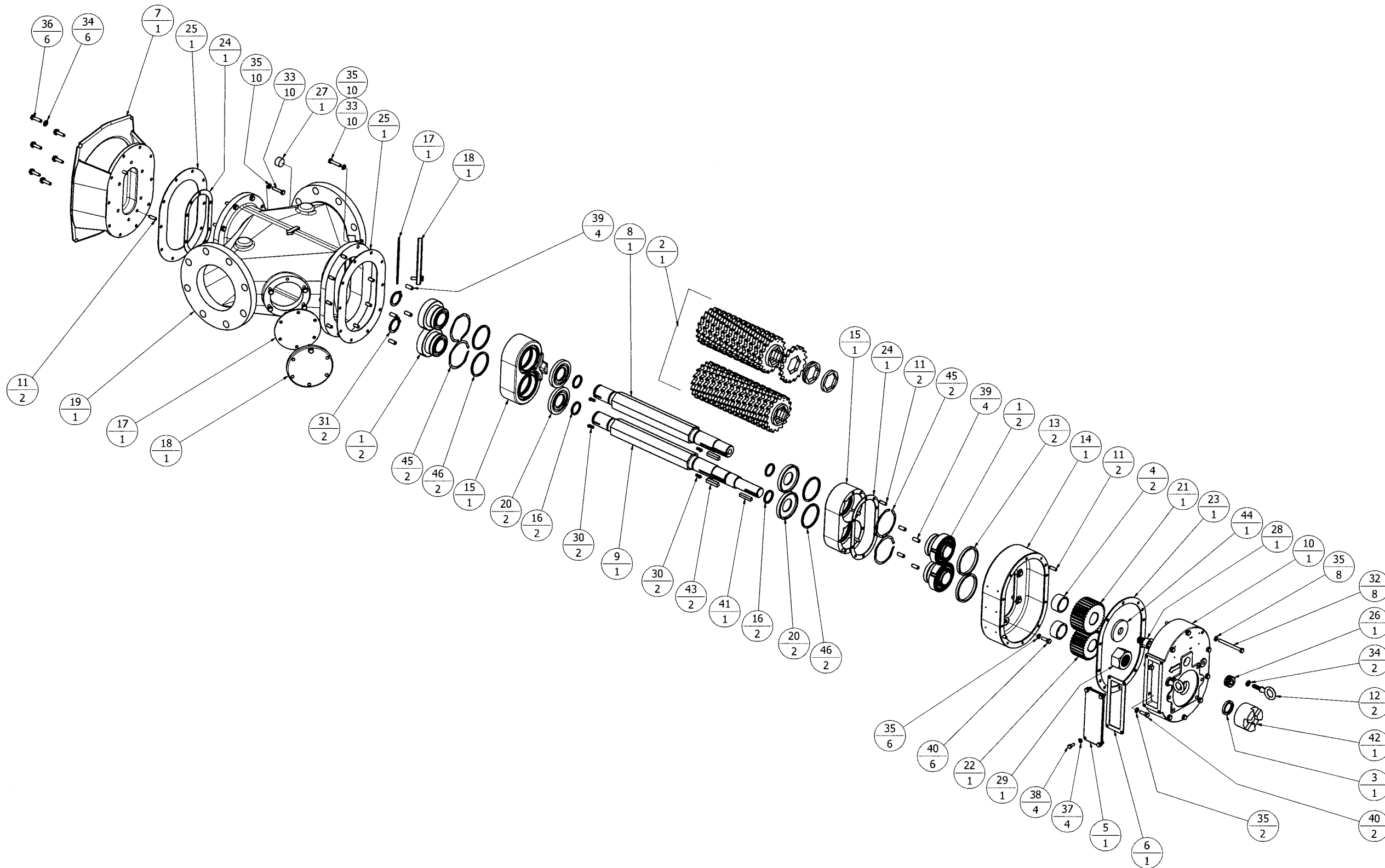
A

D

C

B

A



CONTROLLED

<b>JWC</b> JWC ENVIRONMENTAL 290 PAULARINO AVE, COSTA MESA, CA 92626		
<b>ASSEMBLY - MUFFIN MONSTER</b> IN LINE MODEL 30004T-12 MUFFIN MONSTER SERIES 30000		
SIZE <b>D</b>	DRAWING NO. <b>A30004T-12-01</b>	REV <b>D</b>
SCALE: NONE	CAD MODEL: A30004T-1208-DI	SHEET 3 OF 3



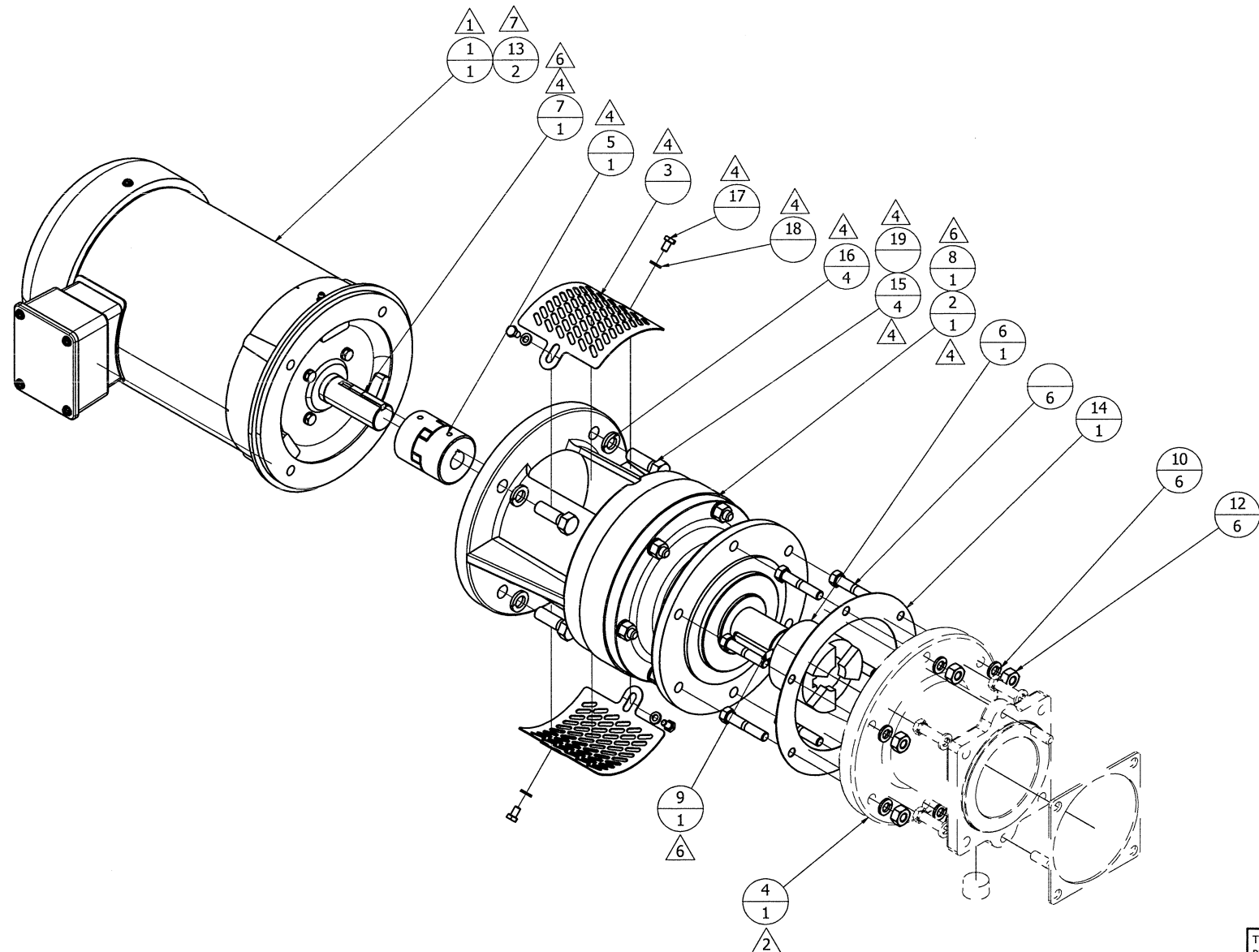


DRAWING NO. **A34010-E**

NOTES: (UNLESS OTHERWISE SPECIFIED)

- 1 MOTOR PART NUMBER WILL VARY BASED ON VOLTAGE, HP, AND FEATURES.
- 2 SPOOL ASSEMBLY/PARTS ARE FOR REFERENCE ONLY. REFER TO DWG K34013-E FOR ADDITIONAL SPOOL ASSEMBLY PARTS THAT ARE REQUIRED.
- 3. DRIVE ASSM. PART # IS A34010-XXXX-YY  
XXXX = JWC MOTOR PART #  
YY = REDUCER RATIO
- 4 SEE TABLE FOR PART OPTIONS.
- 5. SEAL ALL PIPE THREADS WITH TEFLON TAPE OR EQUIVALENT.
- 6 PART IS LISTED FOR REFERENCE ONLY.  
DRIVE KEYS ARE INCLUDED WITH MOTOR AND REDUCER.
- 7 FOR BALDOR TEFC MOTOR ONLY. OTHER MOTOR MAY NOT APPLIED.

REVISION HISTORY								
ZONE	REV	DESCRIPTION	ECO NO.	DATE	CHKD	PE	MFG	QC
ALL		INITIAL RELEASE	3-0752	03-13-00	RS			
ALL	A	ADDED NOTE	3-0785	05-02-01	RS			
ALL	B	ADDED ITEM B2, ITEM 20 WAS ITEM B6	3-0785	07-24-01	RS			
ALL	C	30023 WAS 31123	3-0785	11-27-02	CG			
ALL	D	REDRAWN AS SECTIONAL ASSY	3-0997	06-14-06	CG	RS	VQ	MC
ALL	E	ITEM 3 CPLG GUARD BOLT-ON DESIGN	3-1128	04-29-11	CG	RS	VQ	BW
B2	F	ADDED NOTE 7 TO ITEMS 8 & 9	03-3213	01-30-15	DM	RS	NA	NA
ALL	G	CONVERT TO INVERTOR DRAWING, ADD IEC AND 25:1 CONFIGURATION.	03-3313	6-11-18	PL	SA	JW	JD



CONTROLLED

ITEM	QTY	PART / ASSEMBLY NUMBER	DESCRIPTION	MATERIAL
19	1	SEE TABLE	LOCK WASHER, MOTOR	SST
18	1	SEE TABLE	FLAT WASHER, COUPLING GUARD	SST
17	1	SEE TABLE	HHCS M6-1 X 10MM, COUPLING GUARD	SST
16	4	SEE TABLE	LOCK WASHER, MOTOR	SST
15	4	SEE TABLE	HHCS, MOTOR	SST
14	1	30084-0003	GASKET, REDUCER/SPOOL	TAN FIBER
13	2	30197	SET SCREW 1/4-20 X 1/4	SST
12	6	30163	HEX NUT 3/8-16 HEAVY	SST
11	6	50101	HHCS 3/8-16 X 2	SST
10	6	30140	LOCK WASHER 3/8 SPLIT	SST
9	1	30007-0017	KEY 3/8 SQ X 1-3/4	ALLOY STL.
8	1	30007-0001	KEY 3/16 SQ. X 1	ALLOY STL.
7	1	SEE TABLE	KEY, MOTOR	ALLOY STL.
6	1	34017	COUPLING - INTERLOCKING	ALLOY STL.
5	1	SEE TABLE	MOTOR COUPLING	ALLOY STL.
4	1	DWG# K34013-E	ADAPTER SPOOL ASSM.	
3	1	SEE TABLE	COUPLING GUARD	SST
2	1	SEE TABLE	SPEED REDUCER	SUMITOMO
1	1	30010-XXXX	MOTOR	BALDOR/OTHER

THIS DRAWING AND DATA ARE FULLY PROTECTED BY COPYRIGHT OWNED BY JWC ENVIRONMENTAL. THIS DRAWING AND DATA EMBODY PROPRIETARY INFORMATION WHICH IS THE CONFIDENTIAL PROPERTY OF JWC ENVIRONMENTAL AND SHALL NOT BE COPIED, REPRODUCED, DISCLOSED TO OTHERS, OR USED IN WHOLE OR IN PART FOR ANY PURPOSE WITHOUT THE EXPRESS WRITTEN PERMISSION FROM JWC. THIS DRAWING IS LOANED IN CONFIDENCE WITH THE UNDERSTANDING THAT IT SHALL BE RETURNED UPON DEMAND.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES [mm]			CONTRACT NO.	
FRACTIONS	DECIMALS	ANGLES	APPROVALS	DATE
± 1/16	.XX ± .03 .XXX ± .005	± 1/2°	DRAWN R.SABOL	06-14-06
MATERIAL AS NOTED			CHECKED C.GLAUBERMAN	07-07-06
FINISH 250 / (CAST) 125 / (MACHINED) UNLESS OTHERWISE SPECIFIED			MANUF. V. QUINTANA	07-11-06
DO NOT SCALE DRAWING			Q.C. M.COCKRELL	07-12-06

**JWC** JWC ENVIRONMENTAL  
2850 S. RED HILL AVE, SUITE 125, SANTA ANA, CA 92705

**DRIVE ASSEMBLY**  
ELECTRIC  
3K4, 3K4T, CMD, CDD, 3-HYDRO-IX & 3-HYDRO-C

SIZE **D** DRAWING NO. **A34010-E** REV **G**

SCALE: NTS SHEET 1 OF 2



DRAWING NO. **A34010-E**

6

5

↓

4

3

2

1

ITEM 2 - SPEED REDUCER				
ASSEMBLY #	DESCRIPTION	P/N	DESCRIPTION	QTY
A34010-XXXX-29	60 HZ NEMA MOTOR, 145T-184C, 29:1	31313-0029-145T	REDUCER, 145TC, 29:1	1
A34010-XXXX-29	60 HZ NEMA MOTOR, 182T-215C, 29:1	31313-0029-182T	REDUCER, 182TC, 29:1	1
A34010-XXXX-25	50 HZ NEMA MOTOR, 182T-215C, 25:1	31313-0025-182T	REDUCER, 182TC, 25:1	1
A34010-XXXX-29-IECB5	60 HZ IEC MOTOR, 29:1 REDUCER	31313-0029-100L	REDUCER, IEC112-B5, 29:1	1
A34010-XXXX-25-IECB5	50 HZ IEC MOTOR, 25:1 REDUCER	31313-0025-100L	REDUCER, IEC112-B5, 25:1	1

ITEM 18 - FLAT WASHER, COUPLING GUARD				
ASSEMBLY #	DESCRIPTION	P/N	DESCRIPTION	QTY
A34010-XXXX-29	60 HZ NEMA MOTOR, 145T-184C, 29:1	30525	FLAT WASHER, M6	4
A34010-XXXX-29	60 HZ NEMA MOTOR, 182T-215C, 29:1	30525	FLAT WASHER, M6	4
A34010-XXXX-25	50 HZ NEMA MOTOR, 182T-215C, 25:1	30525	FLAT WASHER, M6	4
A34010-XXXX-29-IECB5	60 HZ IEC MOTOR, 29:1 REDUCER	N/A	N/A	0
A34010-XXXX-25-IECB5	50 HZ IEC MOTOR, 25:1 REDUCER	N/A	N/A	0

ITEM 3 - COUPLING GUARD				
ASSEMBLY #	DESCRIPTION	P/N	DESCRIPTION	QTY
A34010-XXXX-29	60 HZ NEMA MOTOR, 145T-184C, 29:1	31103-0145	COUPLING GUARD FOR 31313-145T	2
A34010-XXXX-29	60 HZ NEMA MOTOR, 182T-215C, 29:1	31103-0182	COUPLING GUARD FOR 31313-182T	2
A34010-XXXX-25	50 HZ NEMA MOTOR, 182T-215C, 25:1	31103-0182	COUPLING GUARD FOR 31313-182T	2
A34010-XXXX-29-IECB5	60 HZ IEC MOTOR, 29:1 REDUCER	N/A	N/A	0
A34010-XXXX-25-IECB5	50 HZ IEC MOTOR, 25:1 REDUCER	N/A	N/A	0

ITEM 19 - LOCK WASHER, MOTOR				
ASSEMBLY #	DESCRIPTION	P/N	DESCRIPTION	QTY
A34010-XXXX-29	60 HZ NEMA MOTOR, 145T-184C, 29:1	N/A	N/A	0
A34010-XXXX-29	60 HZ NEMA MOTOR, 182T-215C, 29:1	N/A	N/A	0
A34010-XXXX-25	50 HZ NEMA MOTOR, 182T-215C, 25:1	N/A	N/A	0
A34010-XXXX-29-IECB5	60 HZ IEC MOTOR, 29:1 REDUCER	50122	HEX NUT, 1/2-13	4
A34010-XXXX-25-IECB5	50 HZ IEC MOTOR, 25:1 REDUCER	50122	HEX NUT, 1/2-13	4

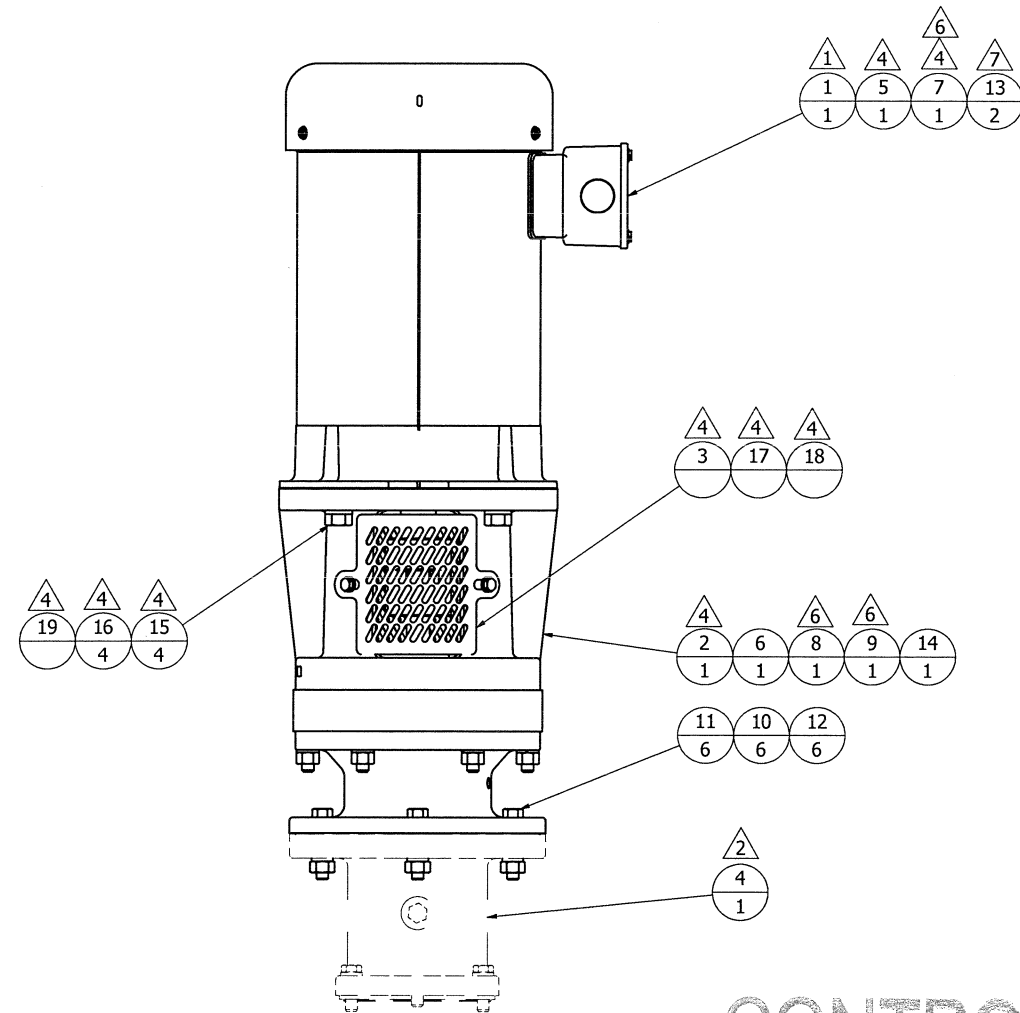
ITEM 5 - MOTOR COUPLING				
ASSEMBLY #	DESCRIPTION	P/N	DESCRIPTION	QTY
A34010-XXXX-29	60 HZ NEMA MOTOR, 145T-184C, 29:1	30016-0005	MOTOR COUPLING, 3/4, 3/16" KEY X 7/8, 3/16" KEY	1
A34010-XXXX-29	60 HZ NEMA MOTOR, 182T-215C, 29:1	30016-0002	MOTOR COUPLING, 1 1/8, 1/4" KEY X 3/4, 3/16" KEY	1
A34010-XXXX-25	50 HZ NEMA MOTOR, 182T-215C, 25:1	30016-0002	MOTOR COUPLING, 1 1/8, 1/4" KEY X 3/4, 3/16" KEY	1
A34010-XXXX-29-IECB5	60 HZ IEC MOTOR, 29:1 REDUCER	30016-0023	MOTOR COUPLING, 28MM, 8MM KEY X 7/8, 3/16" KEY	1
A34010-XXXX-25-IECB5	50 HZ IEC MOTOR, 25:1 REDUCER	30016-0023	MOTOR COUPLING, 28MM, 8MM KEY X 7/8, 3/16" KEY	1

ITEM 7 - KEY, MOTOR				
ASSEMBLY #	DESCRIPTION	P/N	DESCRIPTION	QTY
A34010-XXXX-29	60 HZ NEMA MOTOR, 145T-184C, 29:1	30007-0001	KEY, 3/16 SQ X 1	1
A34010-XXXX-29	60 HZ NEMA MOTOR, 182T-215C, 29:1	SPC0045-002	KEY, 1/4 SQ X 1-1/8	1
A34010-XXXX-25	50 HZ NEMA MOTOR, 182T-215C, 25:1	SPC0045-002	KEY, 1/4 SQ X 1-1/8	1
A34010-XXXX-29-IECB5	60 HZ IEC MOTOR, 29:1 REDUCER	30045-0009	KEY, 7 MM X 8 MM X 38MM	1
A34010-XXXX-25-IECB5	50 HZ IEC MOTOR, 25:1 REDUCER	30045-0009	KEY, 7 MM X 8 MM X 38MM	1

ITEM 15 - HHCS, MOTOR				
ASSEMBLY #	DESCRIPTION	P/N	DESCRIPTION	QTY
A34010-XXXX-29	60 HZ NEMA MOTOR, 145T-184C, 29:1	30131	HHCS 3/8-16 X 1-1/4" F/T	4
A34010-XXXX-29	60 HZ NEMA MOTOR, 182T-215C, 29:1	50115	HHCS 1/2-13 X 1-1/2" F/T	4
A34010-XXXX-25	50 HZ NEMA MOTOR, 182T-215C, 25:1	50115	HHCS 1/2-13 X 1-1/2" F/T	4
A34010-XXXX-29-IECB5	60 HZ IEC MOTOR, 29:1 REDUCER	50100	HHCS 1/2-13 X 1-3/4" F/T	4
A34010-XXXX-25-IECB5	50 HZ IEC MOTOR, 25:1 REDUCER	50100	HHCS 1/2-13 X 1-3/4" F/T	4

ITEM 16 - LOCK WASHER, MOTOR				
ASSEMBLY #	DESCRIPTION	P/N	DESCRIPTION	QTY
A34010-XXXX-29	60 HZ NEMA MOTOR, 145T-184C, 29:1	30140	LOCK WASHER, 3/8"	4
A34010-XXXX-29	60 HZ NEMA MOTOR, 182T-215C, 29:1	50120	LOCK WASHER, 1/2"	4
A34010-XXXX-25	50 HZ NEMA MOTOR, 182T-215C, 25:1	50120	LOCK WASHER, 1/2"	4
A34010-XXXX-29-IECB5	60 HZ IEC MOTOR, 29:1 REDUCER	50120	LOCK WASHER, 1/2"	4
A34010-XXXX-25-IECB5	50 HZ IEC MOTOR, 25:1 REDUCER	50120	LOCK WASHER, 1/2"	4

ITEM 17 - HHCS M6-1 X 10MM, COUPLING GUARD				
ASSEMBLY #	DESCRIPTION	P/N	DESCRIPTION	QTY
A34010-XXXX-29	60 HZ NEMA MOTOR, 145T-184C, 29:1	30661	HHCS M6-1 X 10MM	4
A34010-XXXX-29	60 HZ NEMA MOTOR, 182T-215C, 29:1	30661	HHCS M6-1 X 10MM	4
A34010-XXXX-25	50 HZ NEMA MOTOR, 182T-215C, 25:1	30661	HHCS M6-1 X 10MM	4
A34010-XXXX-29-IECB5	60 HZ IEC MOTOR, 29:1 REDUCER	N/A	N/A	0
A34010-XXXX-25-IECB5	50 HZ IEC MOTOR, 25:1 REDUCER	N/A	N/A	0



CONTROLLED

<b>JWC</b> JWC ENVIRONMENTAL 2850 S. RED HILL AVE, SUITE 125, SANTA ANA, CA 92705		
<b>DRIVE ASSEMBLY</b> ELECTRIC 3K4, 3K4T, CMD, CDD, 3-HYDRO-IX & 3-HYDRO-C		
SIZE <b>D</b>	DRAWING NO. <b>A34010-E</b>	REV <b>G</b>
SCALE: NTS	PL 50	SHEET 2 OF 2

8

7

6

5

↑

4

3

2

1



NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET DRAWING IN ACCORDANCE WITH ASME Y14.5M-1994 STANDARDS.

**2. MATERIAL OPTIONS:**

REPLACE -ZZ WITH -01 FOR THROUGH HARDENED ALLOY STEEL (AISI 4130, AISI 4140, AR500 OR INTERNATIONAL EQUIVALENT).

REPLACE -ZZ WITH -01T FOR THROUGH HARDENED ALLOY STEEL (AISI 4130).

NO EXCEPTION OR INTERNATIONAL EQUIVALENT ALLOWED IN SUPPLY.

REPLACE -ZZ WITH -02 FOR CASE HARDENED ALLOY STEEL (AISI 8620)

REPLACE -ZZ WITH -03 FOR THRU HARDENED STAINLESS STEEL (UNS S17400)

NOTE: USE -01 (4130 ALLOY STEEL) SPACERS WITH -02 (8620 ALLOY STEEL) CUTTERS.

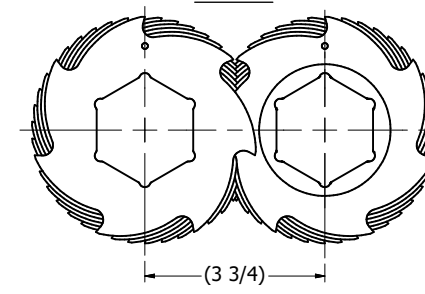
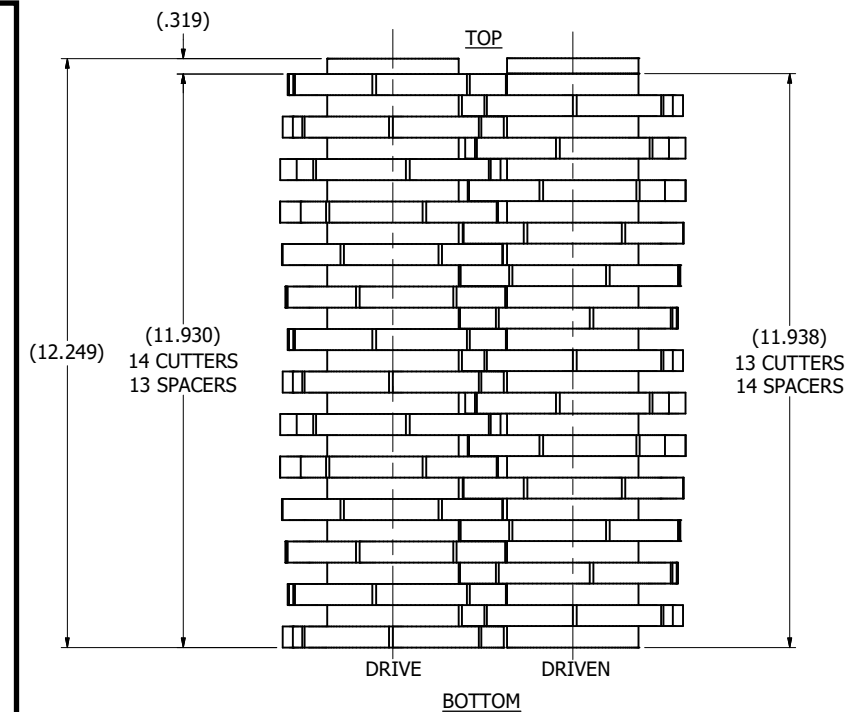
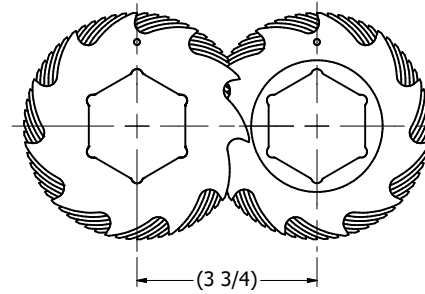
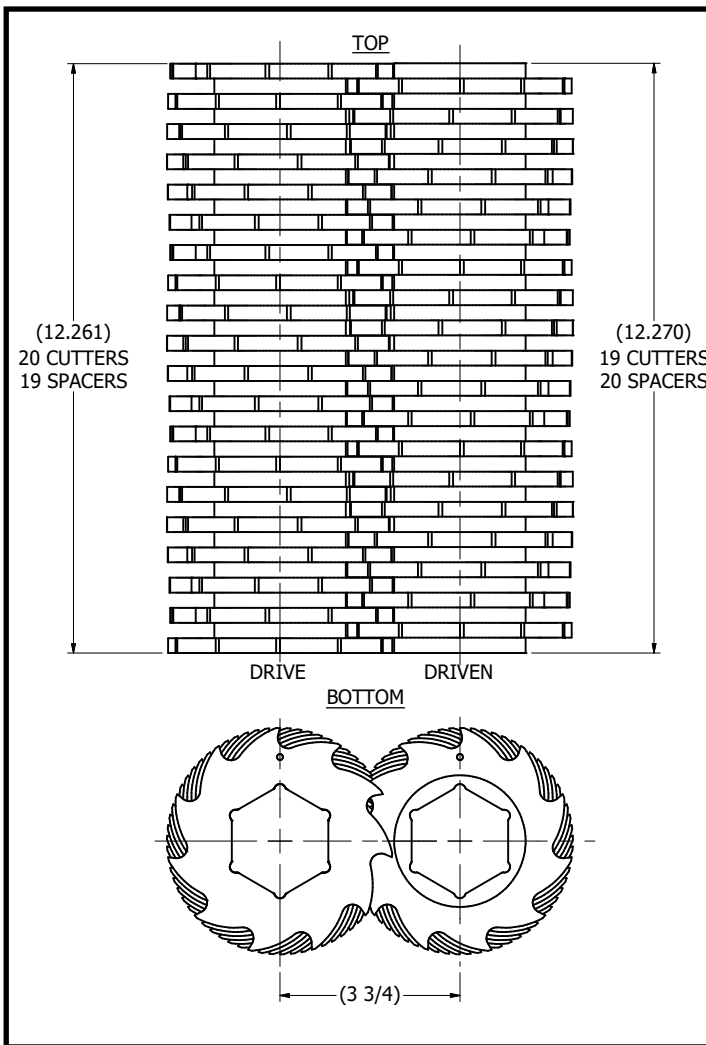
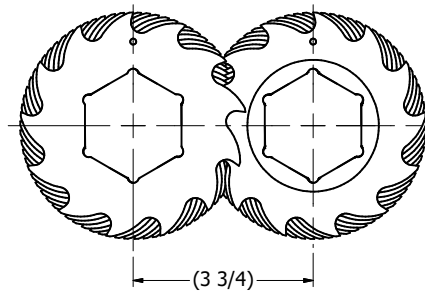
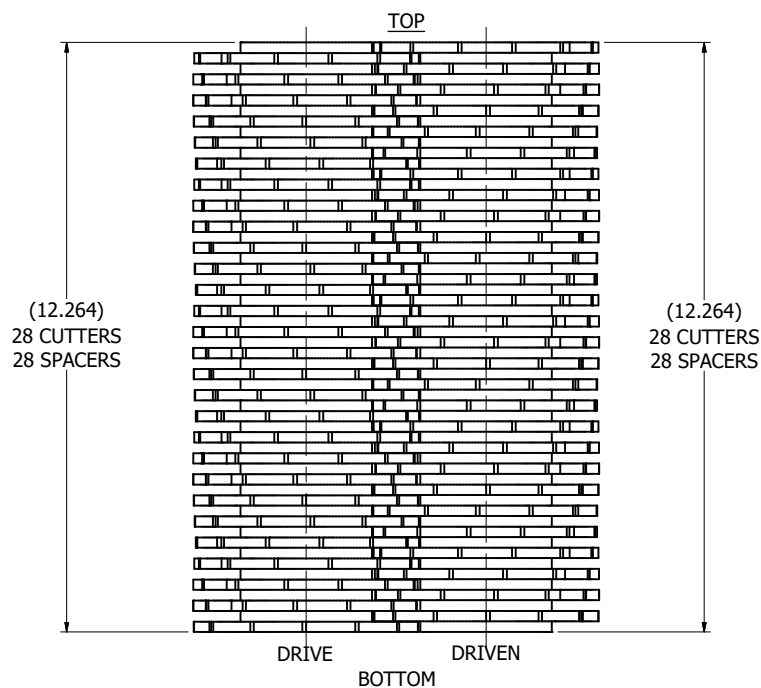
**3. ADDITIONAL MATERIAL OPTION ONLY AVAILABLE FOR 7T (.438 THICK) AND 11T CUTTERS (.310 THICK):**

REPLACE -ZZ WITH -05A FOR THRU HARDENED TOOL STEEL (MONSTER METAL)

4. FOR USE WITH 3-HYDRO-IX-0012 AND 30004T-12 SERIES GRINDERS.

5. SEE OPERATION AND MAINTENANCE MANUAL FOR HELICAL STACKING INSTRUCTIONS.

		REVISION HISTORY					
REV	ZONE	DESCRIPTION	ECO NO.	DATE	DRWN	CHKD	PE
A	ALL	INITIAL RELEASE	03-1126	5/18/10	CG	RS	RS
B	B6	ADDED A34017 ASSEMBLIES (4130)	03-3236	5/22/15	-	RS	RS
C	ALL	REDRAWN IN INVENTOR, REVISED CUTTER AND SPACER PART NUMBERS TO INCLUDE MATERIAL AND THICKNESS	03-3241	7/2/15	-	RS	RS
D	D6,8	ADDED NOTE TO USE 4130 SPACERS WITH 8620 CUTTERS	03-3258	1/27/16	-	RS	RS
E	A6	SPACER P/N 31016-0000-0319-ZZ WAS 31016-1100-0319-ZZ & 31016-0000-0223-ZZ WAS 31016-1300-0223-ZZ.	03-3317	3/13/18	-	RS	RS
F	D7,8	ADDED MONSTER METAL MATERIAL OPTION, NOTE 3.	03-3323	4/27/18	-	RS	CG
G	D7,8	UPDATED NOTE 3 MATERIAL OPTION, -05A WAS -04. ADDED -05A OPTION TO 7T (.438) & 11T (.310) CUTTERS	03-3388	2/20/20	-	JS	RS
H	D6,7,8	NOTE 3: "REPLACE -ZZ WITH -01 FOR THROUGH HARDENED ALLOY STEEL (AISI 4130, AISI 4140, AR500 OR INTERNATIONAL EQUIVALENT)." WAS "REPLACE -ZZ WITH -01 FOR THRU HARDENED ALLOY STEEL (AISI 4130)."; ADDED -01T MATERIAL DESIGNATION NOTE; REVISED DRAWING BORDER TO CURRENT STYLE	ECN000079	9/13/21	CG	JS	RS
J	D6,7,8	REVISED NOTE 2: REMOVED "ALL START AND SHIMS SPACERS IN -01T ASSEMBLIES SHALL BE -01 MATERIAL DESIGNATION" FROM -01T OPTION; REVISED NOTE 4: ADDED "3-HYDRO-IX-0012"; REVISED TITLE BLOCK.	ECN000100	1/13/22	IP	RS	CG



3 TOOTH CAM .310 THICK			
CUTTER ASSEMBLY	DRIVE	DRIVEN	SPACERS
A34017-0300-0310-ZZ-12	31017-0300-0310-ZZ 20	31017-0300-0310-ZZ 19	31016-0000-0319-ZZ 39

3. 7 TOOTH CAM .438 THICK				
CUTTER ASSEMBLY	DRIVE	DRIVEN	SPACERS	SHIMS
A34017-0700-0438-ZZ-12	31017-0700-0438-ZZ 14	31017-0700-0438-ZZ 13	31016-0000-0446-ZZ 27	31016-0000-0319-ZZ 2

3. 11 TOOTH CAM .310 THICK			
CUTTER ASSEMBLY	DRIVE	DRIVEN	SPACERS
A34017-1100-0310-ZZ-12	31017-1100-0310-ZZ 20	31017-1100-0310-ZZ 19	31016-0000-0319-ZZ 39

13 TOOTH CAM .215 THICK			
CUTTER ASSEMBLY	DRIVE	DRIVEN	SPACERS
A34017-1300-0215-ZZ-12	31017-1300-0215-ZZ 28	31017-1300-0215-ZZ 28	31016-0000-0223-ZZ 56

THIS DRAWING AND DATA ARE FULLY PROTECTED BY COPYRIGHT OWNED BY JWC ENVIRONMENTAL. THIS DRAWING AND DATA EMBODY PROPRIETARY INFORMATION WHICH IS THE CONFIDENTIAL PROPERTY OF JWC ENVIRONMENTAL AND SHALL NOT BE COPIED, REPRODUCED, DISCLOSED TO OTHERS, OR USED IN WHOLE OR IN PART FOR ANY PURPOSE WITHOUT THE EXPRESS WRITTEN PERMISSION FROM JWC. THIS DRAWING IS LOANED IN CONFIDENCE WITH THE UNDERSTANDING THAT IT SHALL BE RETURNED UPON DEMAND.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES [mm]			CONTRACT NO.	
FRACTIONS	DECIMALS	ANGLES	APPROVALS	DATE
± 1/16	.XX ± .03	± 1/2°	DRAWN C. GLAUBERMAN	5/18/10
	.XXX ± .005		CHECKED R. SABOL	7/11/10
			PROJ ENGR R. SABOL	7/18/10
			REVISED I. PINEDO	1/13/22

**JWC** JWC ENVIRONMENTAL  
2850 S. RED HILL AVE, SUITE 125, SANTA ANA, CA 92705

**12" CUTTER ASSEMBLY**  
SERIES 30004T & 3-HYDRO-IX - 2" HEX DRIVE  
MUNICIPAL WASTEWATER & INDUSTRIAL PROCESSING

SIZE **D** DRAWING NO. **A34002-0012** REV **J**

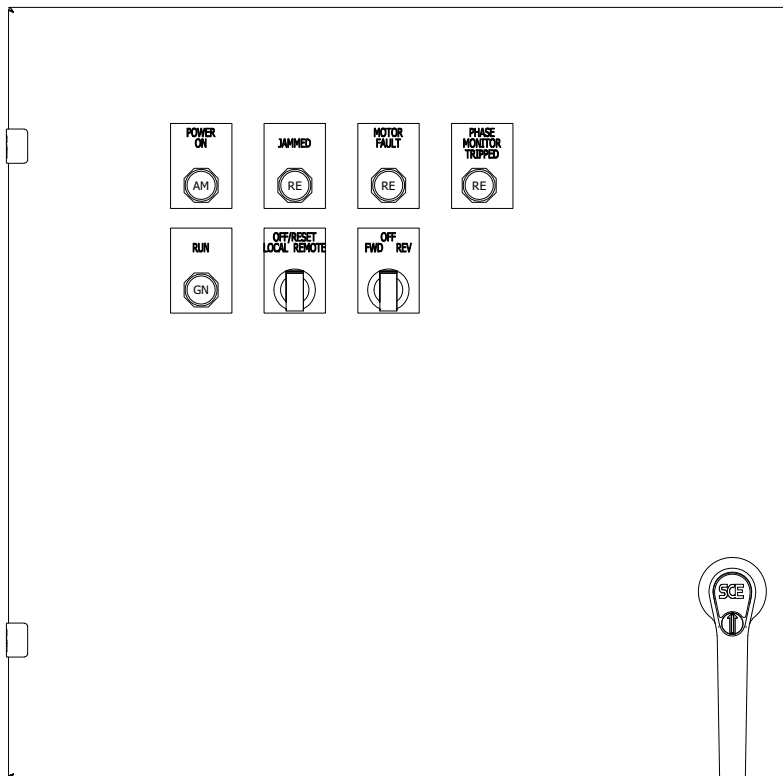
SCALE: 1/2 CAD MODEL: A34017-1300-0215-12 SHEET 1 OF 1







## OPERATION and MAINTENANCE MANUAL PC2220-115412 Motor Controller



Released October, 2022

**JWC Environmental Inc.**  
2600 S. Garnsey  
Santa Ana, CA 92707

[www.jwce.com](http://www.jwce.com)





## TABLE OF CONTENTS

### SECTION 1 GENERAL INFORMATION

1.1 INTRODUCTION.....	1-1
1.2 EQUIPMENT DESCRIPTION .....	1-1
1.3 LIMITATION OF USE.....	1-1
1.4 DESIGN COMPLIANCE.....	1-1
1.5 REPAIR RETURNS AND SERVICE QUESTIONS .....	1-1

### SECTION 2 SAFETY INSTRUCTIONS

### SECTION 3 INSTALLATION

3.1 INTRODUCTION.....	3-1
3.2 UNPACKING AND STORAGE.....	3-1
3.3 INSTALLATION.....	3-1

### SECTION 4 OPERATION

4.1 INTRODUCTION.....	4-1
4.2 GRINDER CONTROL .....	4-1
4.2.1 Reversal Sequence .....	4-1
4.2.2 Power Loss Recovery.....	4-1
4.2.3 Remote Contacts.....	4-1
4.3 OPERATING CONTROLS AND INDICATORS .....	4-1
4.3.1 Control Switch .....	4-1
4.3.2 Circuit Breaker.....	4-2
4.3.3 Indicators .....	4-2
4.4 SYSTEM OPERATION .....	4-3
4.4.1 Startup.....	4-3
4.4.2 Grinder Stop.....	4-3
4.4.3 Emergency Stop.....	4-3
4.4.4 Remote Operation .....	4-3
4.4.5 System Reset .....	4-3
4.4.6 Grinder Jam Simulation.....	4-4
4.5 PROGRAMMABLE LOGIC CONTROL (PLC) .....	4-4

### SECTION 5 MAINTENANCE / TROUBLESHOOTING

5.1 INTRODUCTION.....	5-1
5.2 MAINTENANCE .....	5-1
5.3 TROUBLESHOOTING .....	5-1

### SECTION 6 PARTS LIST

6.1 INTRODUCTION.....	6-1
-----------------------	-----

### LIST OF TABLES

TABLE 4-1 MOTOR CONTROLLER INDICATORS .....	4-2
TABLE 5-1 MAINTENANCE REQUIREMENTS .....	5-1
TABLE 5-2 MOTOR CONTROLLER TROUBLESHOOTING .....	5-2
TABLE 6-1 PARTS LIST - PC2220-115412 CONTROLLER.....	6-1

This page intentionally left blank

## SECTION 1 GENERAL INFORMATION

### 1.1 INTRODUCTION

SECTION 1 describes the PC2220-115412 motor controller. Refer to the motor controller drawing at the end of this document for the front panel controls and indicators. Refer to the enclosure dimension drawing also at the end of this document for outline and mounting dimensions.

### 1.2 EQUIPMENT DESCRIPTION

The motor controller is a logic controlled power panel designed to control and protect an electrically driven grinder. Refer to SECTION 4 for detailed information for each option.

The motor controller provide the following control and detection functions:

- Normal on/off mode operation.
- Current sensing to stop and reverse grinder cutter direction.
- Full load, jam and overload protection.
- Automatic re-start after loss of power in the ON mode.
- Remote Start/Stop control.
- One set each of Fail and Run contacts for customer auxiliary devices rated at 10A at 240 VAC resistive load.
- Main Circuit Breaker with Flanged disconnect switch Panasonic PLC.
- Phase monitor relay.
- Surge suppressor.
- Allen-Bradley pilot light devices.
- Local-Off/Reset-Remote selector switch.
- Forward-Off-Reverse selector switch.

The following specifications apply to all configurations of the motor controller. Noncompliance with conditions defined in this paragraph can invalidate warranties.

- Underwriters Laboratory (UL) listed.

- Power Requirements: factory wired for 460 VAC, three (3) phase, 60 Hz operation with fuse protected control circuitry.
- Internal humidity: 35% to 85% relative humidity (without condensation).
- Operating temperature range of 32° F (0° C) to 131° F (55° C), storage temperature range of 40° F (5° C) to 105° F (40° C).

### 1.3 LIMITATION OF USE

JWCE considers that the buyers and users of the grinder limit the use of the motor controller to the purpose and intent defined at the time of sale. Applications of the motor controller other than defined must be in compliance with all applicable local, federal, and area safety rules, regulations, and guidelines.

### 1.4 DESIGN COMPLIANCE

The motor controller satisfies the design criteria for same and/or similar types of equipment. JWCE considers that the buyers and users of the grinder comply and ensure compliance with the **WARNINGS, Cautions** and **NOTES** used in this manual to avoid the potential for personal injury and/or equipment damage.

### 1.5 REPAIR RETURNS AND SERVICE QUESTIONS

Return Authorization must be obtained by contacting JWCE if repairs are required. The motor controller model number and serial number listed on the nameplate located on the top cover must be given to the JWCE representative to assure timely processing of the Return Authorization. Item(s) to be returned should be properly packaged and shipped to JWCE.

Contact JWCE Sales Support at the following address or contact a local sales/service representative for answers to service questions.

**JWC Environmental**  
**2600 S. Garnsey St.**  
**Santa Ana, CA 92707**

**800-331-2277**  
**949-833-3888**  
**714-549-4007 (fax)**

This page intentionally left blank.


## SECTION 2 SAFETY INSTRUCTIONS

Operations and maintenance personnel must read and understand the safety instructions listed in this section and throughout this manual before operating or maintaining the grinder. **WARNINGS** (double boxed, upper case), **Cautions** (single boxed, title case), and **NOTES** inform operations and maintenance personnel of safety concerns and important information crucial to the operation and maintenance of this equipment.


Safety instructions are based on properly trained personnel using good safety practices at all times. JWC Environmental shall not be held liable for any ignorance or disregard of applicable OSHA, federal, state, or local regulations. JWC Environmental shall not be held liable for any damages resulting from controller functions that are triggered as a result of wiring misconnections, wiring shielding errors, and/or other wiring errors not in compliance with OSHA, federal, state, or local regulations.





**DO NOT WEAR LOOSE FITTING CLOTHING NEAR GRINDER.**





**KEEP PERSONNEL AND UNAUTHORIZED MATERIAL CLEAR OF CUTTING CHAMBER.**





**WEAR EYE AND EAR PROTECTION. COMPLY WITH ALL OSHA AND OTHER REGULATORY AGENCY SAFETY REQUIREMENTS.**


**DO NOT LIFT HEAVY EQUIPMENT OVERHEAD OF PERSONNEL. ENSURE THAT ADEQUATE ASSISTANCE IS AVAILABLE AND UTILIZED WHEN LIFTING AND/OR TRANSPORTING THE EQUIPMENT, TOOLS, AND SUPPORT EQUIPMENT/MATERIALS.**

**ELECTRICAL HAZARDS EXIST. ENSURE POWER TO THE MOTOR CONTROLLER IS REMOVED, LOCKED OUT, AND TAGGED BEFORE PERFORMING ANY INSTALLATION, SERVICE, OR MAINTENANCE TASK INCLUDING THE REMOVAL OR ATTEMPTING TO REMOVE ANY OBSTRUCTION(S) FROM THE GRINDER.**

**JWCE CONTROLLER PANEL CONTROLS DO NOT REMOVE POWER FROM THE CONTROLLER ENCLOSURE. DO NOT USE ANY START/STOP PUSHBUTTON AS A POWER DISCONNECT. SERVICE JWCE CONTROLLERS AND CONNECTED DEVICES ONLY WHEN POWER TO THE CONTROLLER HAS BEEN TURNED OFF, LOCKED OUT AND TAGGED.**



**DO NOT ATTEMPT ANY MAINTENANCE ON THE EQUIPMENT DURING A POWER LOSS. THE GRINDER MAY START, STOP, REVERSE, OR RESTART AUTOMATICALLY AFTER POWER LOSS AND RECOVERY. ELECTRICAL LOCKOUT PROCEDURES MUST BE PERFORMED PRIOR TO SERVICING ANY EQUIPMENT OR CONNECTED EQUIPMENT.**



**ELECTRICAL HAZARDS EXIST WHEN THE MOTOR CONTROLLER CABINET IS OPEN DURING TROUBLESHOOTING. AVOID TOUCHING MOTOR CONTROLLER COMPONENTS OR WIRING WHEN CHECKING MOTOR CONTROLLER VOLTAGES OR INTERNAL PLC INDICATORS. DO NOT TAKE ELECTRICAL MEASUREMENTS ALONE.**



**PERSONAL AND MECHANICAL HAZARDS EXIST DURING THE PERFORMANCE OF THE GRIND TEST.**



**PERFORM ALL SURFACE PREPARATION AND PAINTING IN A WELL VENTILATED NON-SMOKING AREA THAT IS IN COMPLIANCE WITH ALL APPLICABLE SAFETY REGULATIONS. AVOID PROLONGED EXPOSURE TO VAPORS. USE AN AIR RESPIRATOR/AIR MASK AND CHEMICAL SAFETY GOGGLES/FACE SHIELD.**



**Observe ESD Precautions When Touching Or Handling Controller Components.**



**Cutters And Spacers Are Sharp. Appropriate Gloves Must Be Worn When Installing Or Handling Cutters And Spacers To Prevent Injury During Handling.**

## SECTION 3 INSTALLATION

### 3.1 INTRODUCTION

No special equipment is required for motor controller installation. Ensure the lifting and handling devices rated for a load capacity greater than the weight of the motor controller. Review all safety instruction prior to installation. Refer to the motor controller drawing for wiring connections and the enclosure dimension drawing for motor controller dimensions.

Ensure all connections to the motor controller are as specified on the applicable drawings and in compliance with all local, state, and federal codes and standards. Damage to the motor controller as a result of misconnections is not covered by warranty. Contact JWCE with any installation questions.

### 3.2 UNPACKING AND STORAGE

The motor controller is carefully packaged for shipment to the installation site. Do not remove any components from the shipping crate/carton until an inventory is taken.

1. Inspect the shipping container. Report all damage to the shipping container immediately to the carrier and send a copy to the company representative.
2. Inspect the motor controller for missing, loose, or damaged components. Open the motor controller door and inspect for missing, loose or damaged parts. The grinder is shipped completely assembled and ready to install. Contact JWCE or a local representative if parts are missing, loose, or damaged.
3. Close all shipping containers after inspection for shortages and damage. Store in the shipping containers until time for installation indoors in an environment between 40° F (5° C) and 105° F (40° C). Do not open the storage container until installation.

### 3.3 INSTALLATION

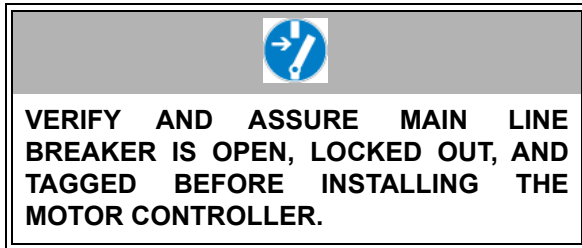
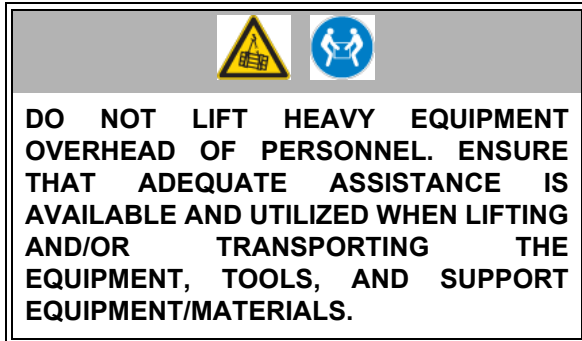
The following paragraphs describe the installation of the controller. Installation of any remote operating features may require installation and wiring of remote panel(s) supplied by others.

Observe the following guidelines during motor controller installation.

- Power supplied to the motor controller must be free of electrical noise and line voltage transients.
- Total system must be installed in compliance with all local, state, and federal codes and standards.
- Use wire size applicable to motor current and voltage requirements.
- All signal wires leading from the motor controller to any external devices must be pulled through an individual conduit to limit spurious electrical noise from triggering any of the motor controller functions. JWCE shall not be held liable for any damages resulting from a motor controller function or functions triggered by spurious electrical noise.
- Install a properly sized circuit breaker and/or fuses on the line side of the motor controller for short-circuit protection. Installation of the short-circuit protection including materials, installation, and wiring is considered a user option and is installed by the user and/or designated user representative.



Perform the following procedure to install the motor controller.



1. Verify main power line voltage and horsepower comply with data on the motor controller data label located on the inside of the motor controller.
2. Mount the motor controller in a vertical position using the clearance holes provided.
3. Open the motor controller front cover to expose the motor controller terminal board/strip.
4. Connect the input power lines, motor leads, and auxiliary connections defined for the motor controller installation. Keep all wire clippings and other foreign materials out of the motor controller enclosure.
5. Verify all mechanical and electrical connections are secure. Close the motor controller cover and secure the locking hardware.

## SECTION 4 OPERATION

### 4.1 INTRODUCTION

SECTION 4 describes the PC2220-115412 motor controller operating controls and indicators and the operational procedures to be followed when the motor controller is connected to the grinder. Review all safety instructions prior to operating the motor controller.

### 4.2 GRINDER CONTROL

At startup, power applied to the motor controller is routed to the grinder motor initiating grinder cutter rotation. The motor controller programmable logic controller (PLC) provides monitoring and logic control. The motor controller provides power to the grinder until a stop command is issued by the PLC when one of the following conditions occurs:

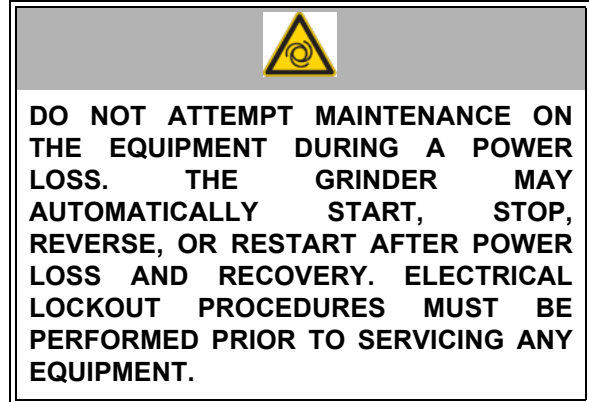
- Main input power is removed from the motor controller.
- The motor controller front panel LOCAL-OFF/RESET-REMOTE switch is set to OFF/RESET.
- The motor controller circuit breaker (CB1) is opened.
- A grinder jammed failure that cannot be cleared by the automatic reversal sequence.
- A motor overload failure.
- The phase monitor trips.
- The surge suppressor trips.
- The customer installed Remote On/Off contact is opened when the grinder control switch is set to remote.

#### 4.2.1 Reversal Sequence

The motor controller initiates a grinder reversal sequence when the grinder cutter stacks can no longer rotate. The motor controller PLC sends a reversal command to close the motor reverse contactor temporarily changing the phasing of the three phase power to the motor. Grinder reverse rotation starts and continues for approximately  $\frac{1}{4}$  turn. At the completion of the  $\frac{1}{4}$  turn cutter reversal, the PLC removes power from the motor reverse relay and the grinder cutters return to normal forward rotation. If the obstruction is not cleared, the PLC restarts the grinder reverse sequence. The PLC issues a stop command if two (2) more grinder reversals occur within 30 seconds of the first reversal. The cause of the grinder jam

must be cleared and the motor controller must be reset before the grinder can be restarted.

#### 4.2.2 Power Loss Recovery



The grinder starts immediately when main power is restored if main power is removed from the motor controller while the grinder is running or if the grinder control switch is set to REMOTE and the remote run permissive contact is closed by other.

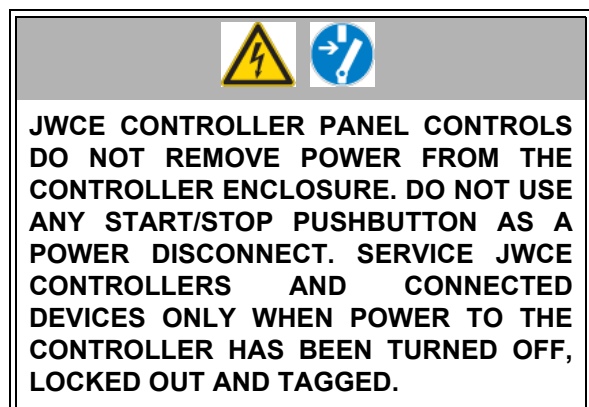
#### 4.2.3 Remote Contacts

Sets of Fail and Run relay contacts and connections for user defined Emergency Stop and/or Remote Start/Stop controls are included to provide the user with the capability of connecting user designated and installed options.

### 4.3 OPERATING CONTROLS AND INDICATORS

The following paragraphs describe the PC2220-115412 controller controls and indicators.

#### 4.3.1 Control Switch



The motor controller has a front panel mounted LOCAL-OFF/RESET-REMOTE three (3) position selector switch (SS1). The LOCAL-OFF/RESET-REMOTE switch allows the operator to control the application of power to the grinder motor or to place the grinder in REMOTE mode for control by a remote operator. The LOCAL position gives grinder control to the FWD-OFF-REV switch. The OFF/RESET position removes power from the grinder motor. In the event of a grinder failure, OFF/RESET resets the motor controller grinder control circuits and failure indicator(s). The REMOTE position provides remote mode starting and stopping and requires user installed connections to the motor controller AUTO/REMOTE input terminals.

#### 4.3.2 Circuit Breaker

The three-phase, 15A-rated circuit breaker provides overcurrent protection by opening the main power to the motor controller. A front panel handle allows the local operator to manually open the circuit breaker removing power to the motor controller components and the grinder motor.

#### 4.3.3 Indicators

Refer to TABLE 4-1 for a listing of the indicators on the motor controller front panel. Verify the operation of any remotely located indicators as the grinder is cycled through the startup in Paragraph 4.4.1.

**TABLE 4-1 MOTOR CONTROLLER INDICATORS**

INDICATOR	OPERATION
<b>POWER ON</b>	Amber indicator that indicates power is applied to the motor controller. Lights when main power is applied to the motor controller. Goes out when main power is removed from the motor controller.
<b>RUN</b>	<p>Green indicator that operates along with the LOCAL-OFF/RESET-REMOTE switch and the user installed Auto/Remote Control switch to indicate grinder run status.</p> <p>ON mode - Lights when the switch is set to ON. Power is applied to the grinder motor and grinder rotation starts. Goes out when the switch is set to OFF/RESET. Power is removed from the grinder motor and grinder rotation stops.</p> <p>REMOTE mode - Lights when the switch is set to REMOTE and the user installed Auto/Remote contact is closed. Power is applied to the grinder motor and grinder rotation starts. Goes out when the switch is set to OFF/RESET or the Auto/Remote contact is opened. Power is removed from the grinder motor and grinder rotation stops.</p> <p>Remains lit during grinder reversal sequence(s). Goes out when a stop command is sent to the motor controller.</p>
<b>JAMMED</b>	Red indicator that lights to indicate the grinder cutter stack can no longer rotate freely. The indicator stays lit until the fail condition is corrected and the control switch is set to OFF/RESET.
<b>MOTOR FAULT</b>	Red indicator that lights to indicate a sustained grinder motor supply power condition has occurred or the grinder motor overheated, opening the grinder motor thermostat. The indicator stays lit until the fail condition is corrected and the control switch is set to OFF/RESET.
<b>PHASE MONITOR TRIPPED</b>	Red indicator that lights when one of the power supply legs is lost causing the phase monitor relay to open. Power is then removed from the grinder motor. The indicator remains lit until power is restored on all legs..

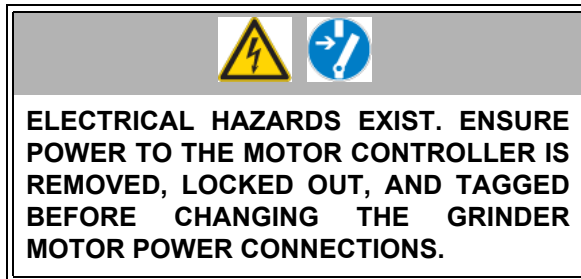
## 4.4 SYSTEM OPERATION

The following paragraphs describe using the motor controller for grinder operation. Troubleshoot the motor controller per SECTION 5 if unable to complete any of the procedures in this section.

### 4.4.1 Startup

Perform the following procedure to start the grinder.

1. Verify the LOCAL-OFF/RESET-REMOTE switch is in the OFF/RESET position. Apply power to the motor controller by closing the circuit breaker. Motor controller **POWER ON** indicator lights and remains lit during all phases of operation unless main power is removed.
2. Momentarily set the LOCAL-OFF/RESET-REMOTE switch from OFF/RESET to LOCAL and the FWD-OFF-REV to either FWD or REV, then back to OFF/RESET.
3. Verify **RUN** indicator lights when the LOCAL-OFF/RESET-REMOTE switch is set to LOCAL and goes out when the control switch is set to OFF/RESET.
4. Set the LOCAL-OFF/RESET-REMOTE switch from OFF/RESET to LOCAL. Verify grinder cutters are rotating towards each other in the direction of flow. Proceed to Step 10 if rotation is correct. If rotation is not correct, proceed to Step 5.
5. Set the LOCAL-OFF/RESET-REMOTE switch to OFF/RESET.



6. Open, lock out, and tag power to the motor controller.
7. Change the grinder motor primary power connections for phases A and B to reverse motor rotation per the connection diagram affixed to the motor or reverse the motor wiring at the motor controller input terminals.

8. Restore power to the motor controller and repeat Steps 4 and 5 to verify/confirm correct grinder cutter rotation.
9. Set the LOCAL-OFF/RESET-REMOTE switch to LOCAL and the FWD-OFF-REV switch to the FWD.
10. Check the grinder for excessive noise and/or vibration.
11. Open the circuit breaker using the front panel handle. Verify grinder cutter rotation stops and the **RUN** and **POWER ON** indicators go out.
12. Set the LOCAL-OFF/RESET-REMOTE switch to OFF/RESET.
13. Complete any required startup logs and forms. The grinder is considered operational.

### 4.4.2 Grinder Stop

Rotate the LOCAL-OFF/RESET-REMOTE switch to OFF/RESET or set the Remote/Auto control switch to Stop to power off the grinder. The motor controller **RUN** indicator goes out and grinder cutter rotation stops. The **POWER ON** indicator remains lit.

### 4.4.3 Emergency Stop

In an emergency, grinder cutter rotation is stopped by removing power to the grinder motor. Remove power with a user defined and installed main power circuit breaker or Emergency Stop switch, and/or Remote/Auto Control On/Off switch. The motor controller circuit breaker can be used to remove power from the grinder.

### 4.4.4 Remote Operation

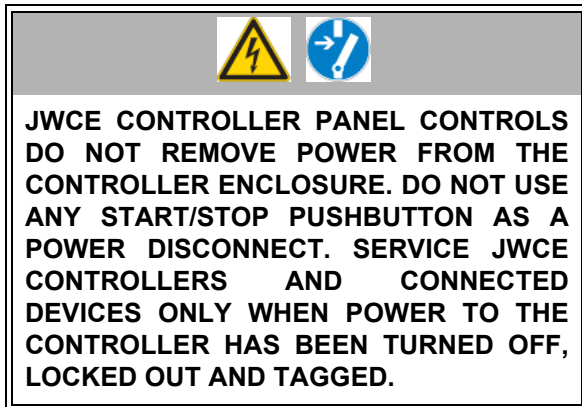
Remote operation is enabled by setting the grinder control switch to REMOTE position allowing the grinder to be controlled by a remote operator.

The motor controller cannot be reset by the remote operator if a grinder failure occurs in REMOTE mode. The grinder must be reset at the motor controller per Paragraph 4.4.5.

### 4.4.5 System Reset

The motor controller LOCAL-OFF/RESET-REMOTE switch resets the motor controller logic. If a fail/overload condition occurs, the motor controller cannot accept a new command until the fail/overload condition is corrected and the motor

controller is reset. Reset the system per the following procedure.



1. Set the LOCAL-OFF/RESET-REMOTE switch to OFF/RESET. Verify the particular fail indicator goes out, the **RUN** indicator remains off and the **POWER ON** indicator remains lit.
2. Open, lock out, and tag power to the motor controller. Open the motor controller circuit breaker.
3. Correct the fail/overload condition.
4. Restore main power to the motor controller and verify the **POWER ON** indicator is lit. Set LOCAL-OFF/RESET-REMOTE switch to LOCAL and the FWD-OFF-REV switch to the desired setting to start the grinder.

5. Verify the grinder is operating normally. If the grinder is operating properly, remote operation can be resumed by setting the LOCAL-OFF/RESET-REMOTE switch to REMOTE.

#### 4.4.6 Grinder Jam Simulation

Perform the following procedure to manually activate the grinder jam sequence.

1. Open the remote Start/Stop switch (if used).
2. Within three (3) seconds, rotate the LOCAL-OFF/RESET-REMOTE switch three (3) times from OFF/RESET to REMOTE, then from OFF/RESET to LOCAL.
3. Verify the grinder rotates in the forward direction for one (1) second, then begins three reversals. At the end of the three (3) reversals, the **JAMMED** indicator flashes steadily.
4. Place the LOCAL-OFF/RESET-REMOTE switch in the OFF/RESET position to reset the motor controller PLC and the indicator.

#### 4.5 PROGRAMMABLE LOGIC CONTROL (PLC)

The programmable logic control (PLC) provides automatic control for the motor controller. Refer to the motor controller drawing for the PLC inputs and outputs. The PLC **POWER** indicator must be lit and the PLC control switch must be in the RUN position for the PLC to control the motor controller.

## SECTION 5 MAINTENANCE / TROUBLESHOOTING

### 5.1 INTRODUCTION

SECTION 5 describes motor controller maintenance and troubleshooting information. Refer to the equipment manual for maintenance and parts information for the equipment being controlled. Contact JWCE Sales Support or a local representative for any maintenance questions.

### 5.2 MAINTENANCE

Perform the following procedure for motor controller maintenance tasks. Review all safety instructions before performing maintenance tasks. Refer to TABLE 5-1 for a summary and schedule of the maintenance tasks.

**TABLE 5-1 MAINTENANCE REQUIREMENTS**

Maintenance Operation	Frequency
Enclosure door fit	weekly
Moisture Inspection	3 months
Dust Inspection	3 months
Enclosure Seal Inspection	3 months
<p>Tasks require fifteen (15) minutes minimum/ thirty (30) minutes maximum. Maintenance tasks are based on personnel experienced in same or similar equipment and familiar with the basic operation, safety, emergency procedures, general plant safety, and use of plant tools/ maintenance equipment.</p> <p>Recommended intervals based on normal operation usage and should be adjusted by the individual user based on equipment usage and the operational environment. More frequent inspections are encouraged if the motor controller is operating in a harsh unprotected environment.</p>	



1. Inspect and verify a tight motor controller door-to-enclosure fit during operation. Continue to Step 2 if performing all scheduled tasks.
2. Verify main power to the motor controller is secured before opening the motor controller enclosure. Inspect the inside of the motor controller for moisture and signs of water leakage. If excessive moisture is found, use desiccant capsules to correct the problem. Inspect the motor controller seals and cable/ conduit entries and replace the seals as necessary if water or other contaminants are found inside the motor controller.

3. Inspect the motor controller interior for excessive dust. Check the enclosure seals if dust accumulation is found. Correct any problems found. Vacuum all dust from the motor controller enclosure, do not use forced air to remove (blow out) dust and dirt from the motor controller.
4. Inspect and verify that all conduit connections are sealed. Refer to the motor controller drawing for electrical, functional, and component location information.



### 5.3 TROUBLESHOOTING

TABLE 5-2 is a troubleshooting guide for the PC2220-115412 motor controller. Review all safety instructions prior to troubleshooting. Refer to the motor controller drawing for input voltage, component locations and wiring information. Refer to the grinder manual for grinder troubleshooting.

Troubleshooting involves opening the motor controller enclosure to check voltages, components and PLC indicators while main input power is being applied.

**ELECTRICAL HAZARDS EXIST. ENSURE POWER TO THE CONTROLLER IS REMOVED, LOCKED OUT, AND TAGGED BEFORE ATTEMPTING TO REMOVE ANY OBSTRUCTION(S) FROM THE GRINDER OR REMOVING AND/OR REPLACING CONTROLLER COMPONENTS.**

**ELECTRICAL HAZARDS EXIST WHEN THE CONTROLLER CABINET IS OPEN DURING TROUBLESHOOTING. AVOID TOUCHING MOTOR CONTROLLER COMPONENTS OR WIRING WHEN CHECKING MOTOR CONTROLLER VOLTAGES OR INTERNAL PLC INDICATORS. DO NOT TAKE ELECTRICAL MEASUREMENTS ALONE.**

**TABLE 5-2 MOTOR CONTROLLER TROUBLESHOOTING**

Potential Problem	Possible Solutions
Grinder does not start, <b>POWER ON</b> indicator not lit.	Verify that components are not burnt or damaged.
	Verify control voltage fuses FU1, FU2 and FU3 are good.
	Verify proper line voltage at terminals L1, L2, and L3.
	Verify transformer output voltage.
	Check that the surge suppressor is not shorted.
	Verify the motor controller circuit breaker is closed, operating properly.
Grinder does not start, <b>POWER ON</b> indicator lit.	Verify that components are not burnt or damaged.
	Verify motor controller grinder control switch is in REMOTE if starting from a Remote Stop/Start switch. Reset the control switch if necessary.
	ON Operation - Verify the grinder control switch (SS1) is set to ON and PLC input indicator X0 is lit. Check grinder control switch (SS1) and switch connections if indicator not lit.
	REMOTE Operation - Verify the grinder control switch (SS1) is set to REMOTE and PLC input indicator X1 is lit. Check the grinder control switch and switch connections if indicator not lit.
	Verify PLC input indicator X2 lights when the Auto-Run Permissive contact is closed. Check the Auto-Run Permissive contact and contact connections if indicator not lit.
	Verify PLC input indicator X4 is not lit. Check for a grinder overload condition if indicator is lit. Correct any overload condition, reset the motor controller and continue operation.
	Verify PLC output indicator Y4 is lit. Check motor forward starter contactor (MF) if indicator not lit.
Grinder does not Reverse	Verify PLC input indicator X3 lights momentarily when grinder jams. Check current (Grinder Jam) sensor (CT) if indicator does not light.
	Verify PLC output Y5 lights for approximately one (1) second and then goes out when the grinder is jammed. Check grinder motor reverse contactor (MR) and contactor connections if indicator does not light.
Motor controller does not reset an overload condition.	Verify PLC input indicators X0 and/or X1 are not lit after the grinder control switch is placed in the OFF/RESET position. Check the grinder control switch and switch connections if either or both indicators are lit.
	Verify that PLC input indicator X4 is not lit. Check motor overload relay (OL) if indicator lit.
Motor controller does not reset a grinder jammed condition after the grinder has been cleared.	Verify PLC inputs X0 and/or X1 are not lit after the grinder control switch is placed in the OFF/RESET position. Check the grinder control switch and switch connections if either or both indicators are lit.
	Verify that PLC input X3 is not lit. Check the current sensor (CT) if indicator is lit.

**TABLE 5-2 MOTOR CONTROLLER TROUBLESHOOTING (Cont'd)**

<b>Potential Problem</b>	<b>Possible Solutions</b>
Motor controller does not reset a grinder motor overtemp condition after the grinder motor has cooled.	Verify PLC inputs X0 and/or X1 are not lit after the grinder control switch is placed in the OFF/RESET position. Check the grinder control switch and switch connections if either or both indicators are lit.
Motor controller does not reset a phase monitor trip after all power legs are restored.	Verify PLC input X8 for the phase monitor relay is lit. Check the phase monitor and the wiring.

**NOTE: Additional troubleshooting efforts should always refer to the wiring diagram at the end of this document.**



This page intentionally left blank.

## SECTION 6 PARTS LIST

### 6.1 INTRODUCTION

TABLE 6-1 is the parts list for the PC2220-115412 motor controller. Refer to the PC2220-115412 assembly drawing for parts location.

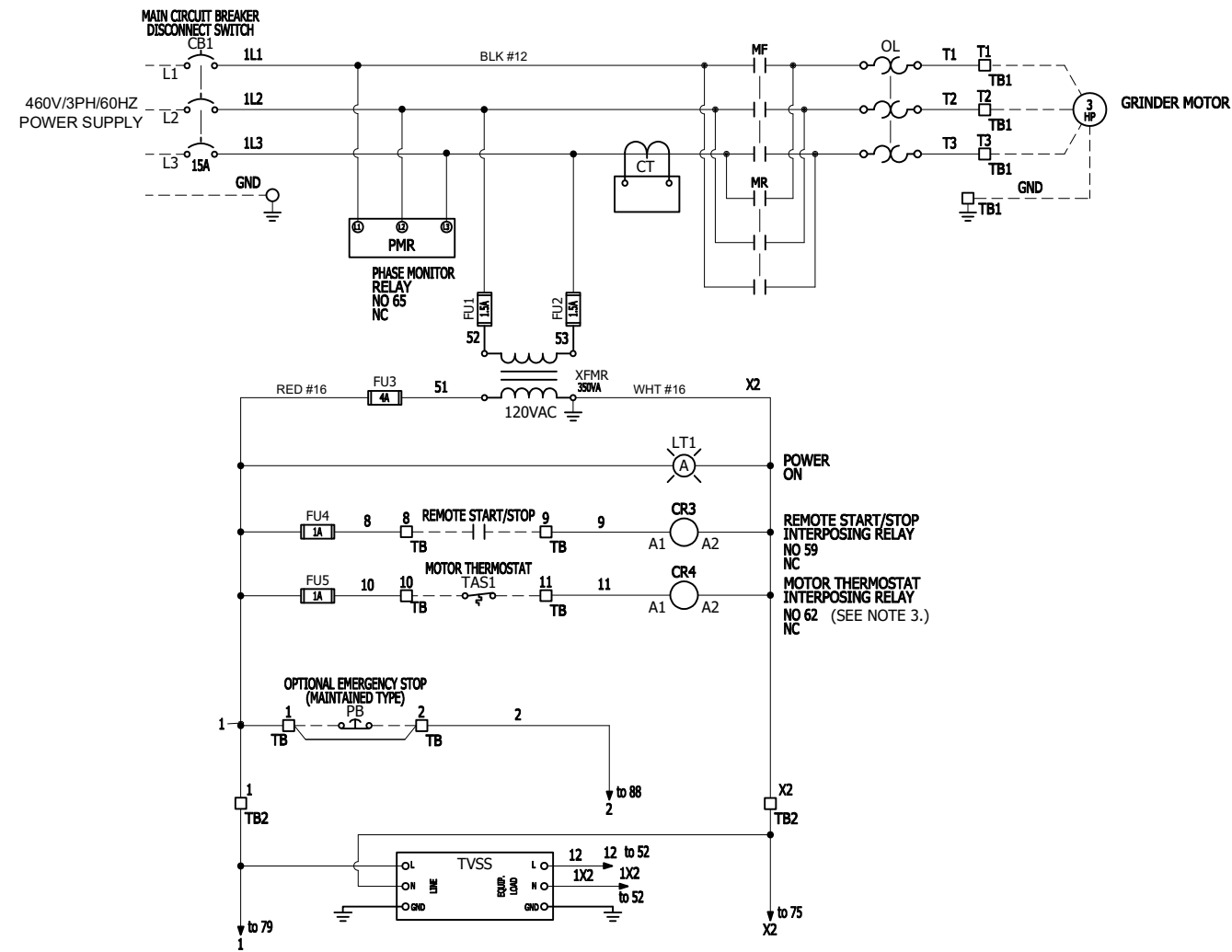
**TABLE 6-1 PARTS LIST - PC2220-115412 CONTROLLER**

Item	Part Number	Qty	Description
ENCL.	E01-012-001	1.00	ENCLOSURE, FLANGE-MOUNTED DISC TYPE, 316 SS 24X25X8
ENCL PANEL	E01-012-002	1.00	BACK PANEL, 21x21 POWDER COATED WHITE
ENCL MTG KIT	E01-012-003	1.00	MOUNTING FOOT KIT (4PC.), STAINLESS STEEL
FU4,FU5,SPARES	E06-160-0100	4.00	FUSE,1A GLASS TIMEDELAY 1 1/4inX1/4in
CR3,CR4	E05-004-015	2.00	RELAY, 6mm RV8H SERIES, 6A SPDT 120V LED
TB	E10-003-200	17.00	TERM. BLOCK,6mm GREY,35A 600V,22-10AW
LOAD TB1	E10-003-210	3.00	TERM. BLOCK,8mm GREY,50A 600V,20-8AWG
GND TB	E10-003-213	3.00	TERM BLOCK, GROUNDING 8mm 22-8AWG
TB2	E10-003-158	3.00	1492-J IEC TB, 4 CONNECTION POINTS, GRAY
TVSS	E12-025-006	1.00	SURGE SUPPRESSOR, 120V 3A
SS1	E08-001-410	1.00	SEL. SWITCH, 3-POS MAINTAINED 22mm
SS2	E08-001-411	1.00	SEL. SWITCH, 3-POS SPRING RETURN FROM RI
PLC	E19-007-077	1.00	PANASONIC PLC AFPX-C30R
LT5	E07-001-402	1.00	PILOT LIGHT, GRN LED 120V 22mm, N4X
LT3	E07-001-403	1.00	PILOT LIGHT, RED LED 120V 22mm, N4X
LT2	E07-001-403	1.00	PILOT LIGHT, RED LED 120V 22mm, N4X
LT4	E07-001-403	1.00	PILOT LIGHT, RED LED 120V 22mm, N4X
LT1	E07-001-404	1.00	PILOT LIGHT, AMB LED 120V 22mm, N4X
MF/MR	E02-020-101	1.00	CONTACTOR REV. 23A 3-POLE
OL	E02-020-242A	1.00	OVERLOAD RELAY 3.2-16.0A SOLID-STATE
CT	E04-007-001	1.00	CURRENT SENSOR, 1.0A@30V AC/DC OUTPUT
XFMR	E03-001-034	1.00	XFMR 350VA 240/480V:120V WITH 3-POLE FUS
FU1,FU2,SPARES	E06-110-0150	4.00	FUSE,1.5A,600V,TIME DLY
FU3,SPARE	E06-130-0400	2.00	FUSE,4A,250V,TIME DELAY

**TABLE 6-1 PARTS LIST - PC2220-115412 CONTROLLER (Cont'd)**

PMR	E05-026-031	1.00	VOLTAGE MONITOR RELAY , 230-630V
CB1	E09-038-039	1.00	CIRCUIT BREAKER 3-POLE 15A G-FRAME
CR1,CR2	E05-004-R6L	1.00	RLY MDGT DPDT 10A 120V

REV		ZONE		REVISION HISTORY				ECO NO.	DATE	DRWN	CHKD	PE
A		ALL		INITIAL RELEASE					10/28/21	KT	IF	KT
B		ALL		CHANGE ENCLOSURE MODEL DUE TO AVAILABILITY ISSUE					10/3/22	TT	IF	KT



### Control Philosophy

**Power On indicator lamp**

- illuminates when control power transformer is energized and fuses are good

**Grinder selector switch, LOCAL**

- Grinder will be controlled by FWD-OFF-REV selector switch
- FWD - energize grinder motor forward contactor, Run relay & Run indicator lamp
- OFF - de-energize grinder motor contactor, Run relay & Run indicator lamp
- REV - energize grinder motor reverse contactor, Run relay & Run indicator lamp

**Grinder selector switch, OFF/RESET**

- de-energize grinder motor contactor, Run relay & Run indicator lamp
- clear any alarm conditions

**Grinder selector switch, REMOTE**

- energize grinder motor forward contactor when Remote Run Permissive input to PLC is On; energize the Run relay & Run indicator lamp

**Jammed indicator lamp**

- illuminates when a jam condition is set by the PLC (see Grinder Jam Clearing Sequence below)

**Motor Fault indicator lamp**

- illuminates when either a motor overload fault, or a motor over-temperature fault occurs or fail-to-start

**Phase Monitor Tripped indicator lamp**

- illuminates when phase monitor relay status trips

**Fail Relay**

- energized when an alarm condition is set for any of the following: (i) grinder jam; (ii) grinder motor overload; (iii) grinder motor overtemp; (iv) phase monitor tripped, or; (v) fail-to-start

**Emergency stop switch, open, (Optional)**

- de-energizes control power to PLC outputs that drive the motor starter and Run indicator lamp

**Grinder Jam Clearing Sequence**

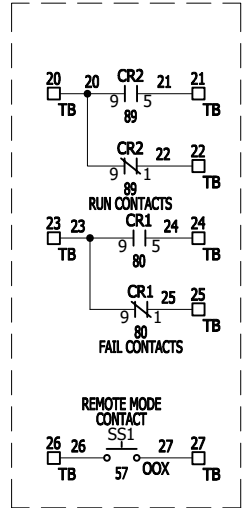
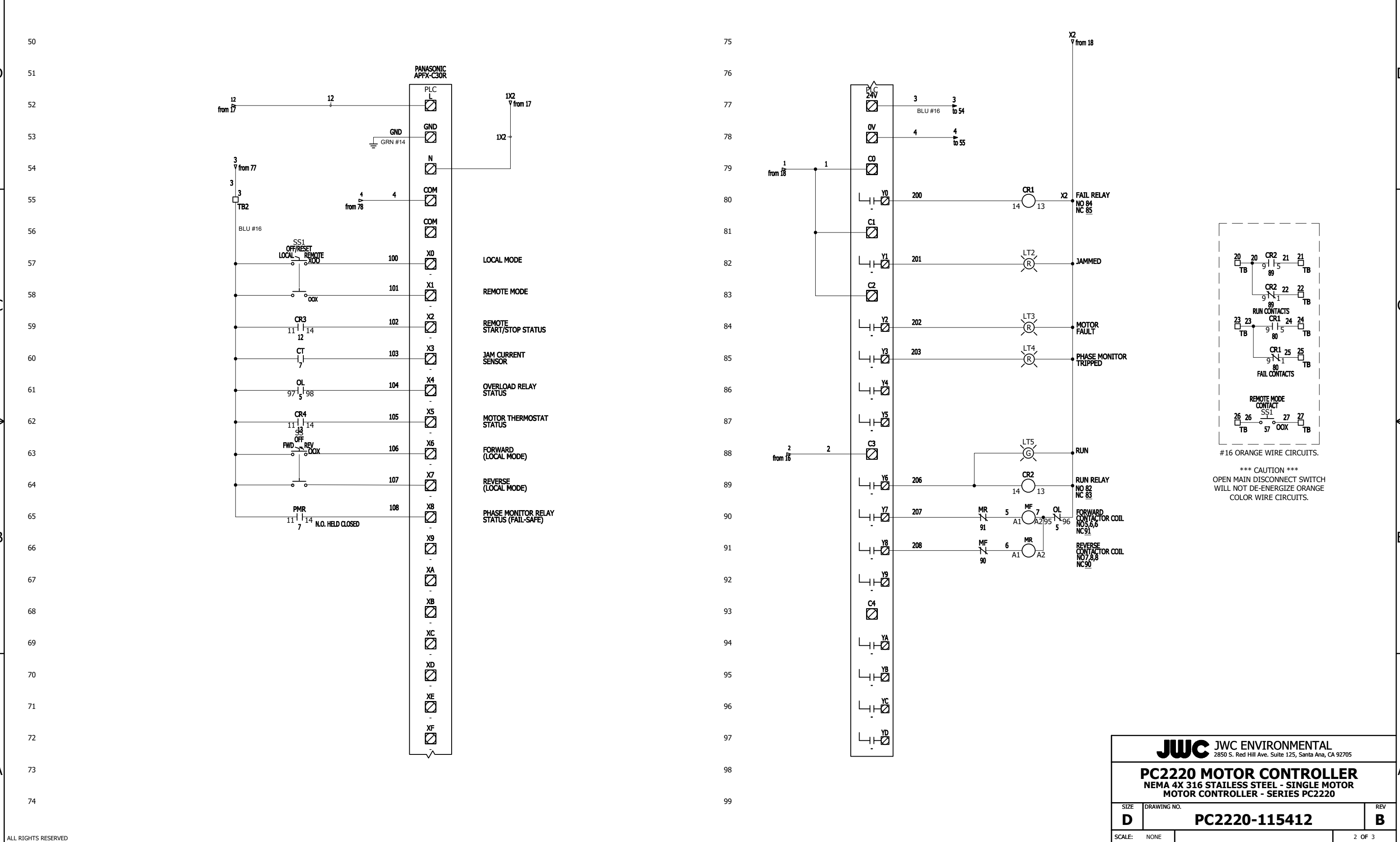
- when the current sensor detects a jam, the motor forward contactor will be momentarily de-energized
- the motor reverse contactor will be energized for a pre-determined period of time and de-energized
- the motor forward contactor will be re-energized
- this sequence is repeated, as required, to clear the jam for a total of no more than 3 reversals in a 30-second period
- if the jam is not cleared in accordance with this sequence, an alarm condition is set
- in order to avoid nuisance trips, the inrush current is ignored for a pre-defined period when the motor is energized

**NOTES: UNLESS OTHERWISE SPECIFIED**

- PROGRAM NUMBER: **PC2220-115412**.
- SHORT CIRCUIT CURRENT RATING (SCCR) FOR THE CONTROLLER IS 25kA.
- A WIRE JUMPER IS REQUIRED, IF THE MOTOR IS NOT EQUIPPED WITH THE THERMOSTAT.
- THE DEFAULT OVERLOAD RELAY SETPOINT IS BASED ON THE NEC TABLES 430-250, BUT IT MAY BE ADJUSTED TO THE MOTOR NAMEPLATE FULL LOAD AMPERES (FLA) DURING START-UP OR THEREAFTER.

THIS DRAWING AND DATA ARE FULLY PROTECTED BY COPYRIGHT OWNED BY JWC ENVIRONMENTAL. THIS DRAWING AND DATA EMBODY PROPRIETARY INFORMATION WHICH IS THE CONFIDENTIAL PROPERTY OF JWC ENVIRONMENTAL AND SHALL NOT BE COPIED, REPRODUCED, DISCLOSED TO OTHERS, OR USED IN WHOLE OR IN PART FOR ANY PURPOSE WITHOUT THE EXPRESS WRITTEN PERMISSION FROM JWC. THIS DRAWING IS LOANED IN CONFIDENCE WITH THE UNDERSTANDING THAT IT SHALL BE RETURNED UPON DEMAND.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		CONTRACT NO.			
	<b>FRACTIONS</b> ± 1/32	DECIMALS .XX ± .06 .XXX ± .005	ANGLES ± 1/2°	APPROVALS		
	MATERIAL			DRAWN		DATE
	FINISH 250 (CAST) 125 (MACHINED) UNLESS OTHERWISE SPECIFIED			CHECKED		DATE
DO NOT SCALE DRAWING			PROJ ENGR	DATE	<b>JWC ENVIRONMENTAL</b> 2850 S. Red Hill Ave. Suite 125, Santa Ana, CA 92705 <b>PC2220 MOTOR CONTROLLER</b> NEMA 4X 316 STAINLESS STEEL - SINGLE MOTOR MOTOR CONTROLLER - SERIES PC2220	
SCALE: NONE			REVISED	DATE		
SIZE <b>D</b>			DRAWING NO. <b>PC2220-115412</b>			
SCALE: NONE			REV <b>B</b>			



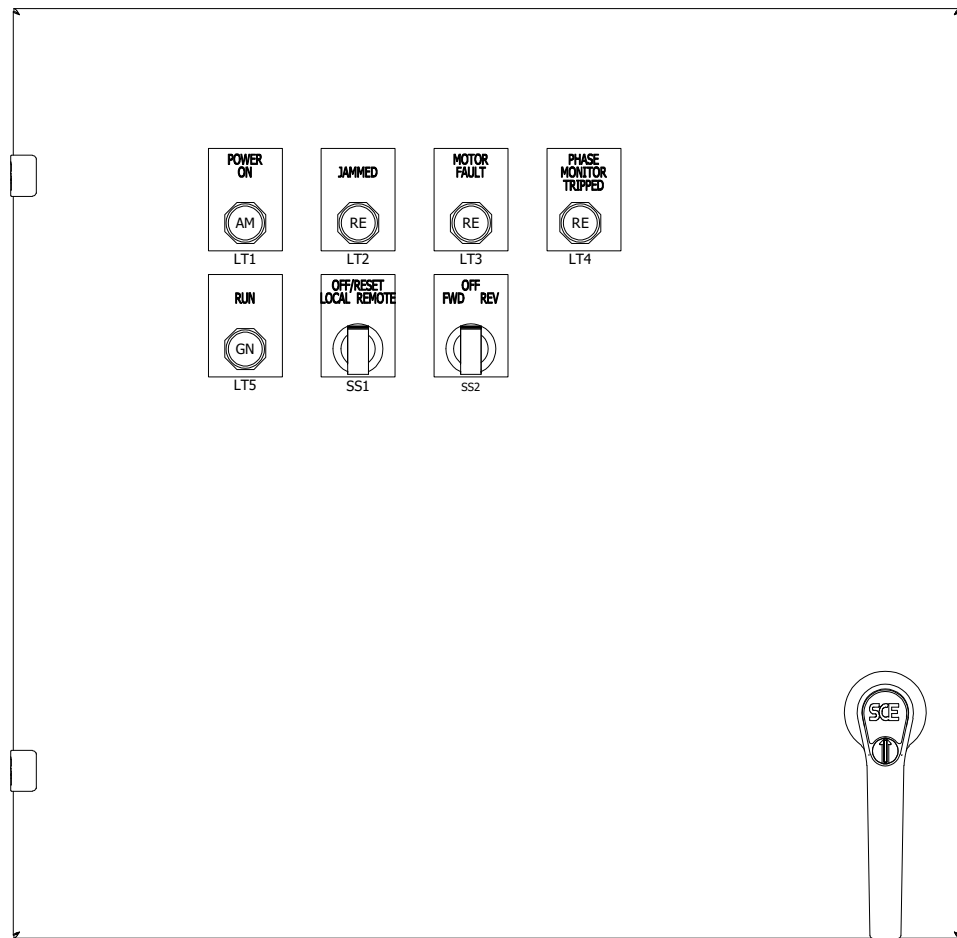


#16 ORANGE WIRE CIRCUITS.  
 \*\*\* CAUTION \*\*\*  
 OPEN MAIN DISCONNECT SWITCH  
 WILL NOT DE-ENERGIZE ORANGE  
 COLOR WIRE CIRCUITS.

<p><b>JWC</b> JWC ENVIRONMENTAL          2850 S. Red Hill Ave. Suite 125, Santa Ana, CA 92705</p>		
<p><b>PC2220 MOTOR CONTROLLER</b>          NEMA 4X 316 STAINLESS STEEL - SINGLE MOTOR          MOTOR CONTROLLER - SERIES PC2220</p>		
SIZE	DRAWING NO.	REV
<b>D</b>	<b>PC2220-115412</b>	<b>B</b>
SCALE:	NONE	2 OF 3



FRONT PANEL  
COMPONENT LOCATIONS

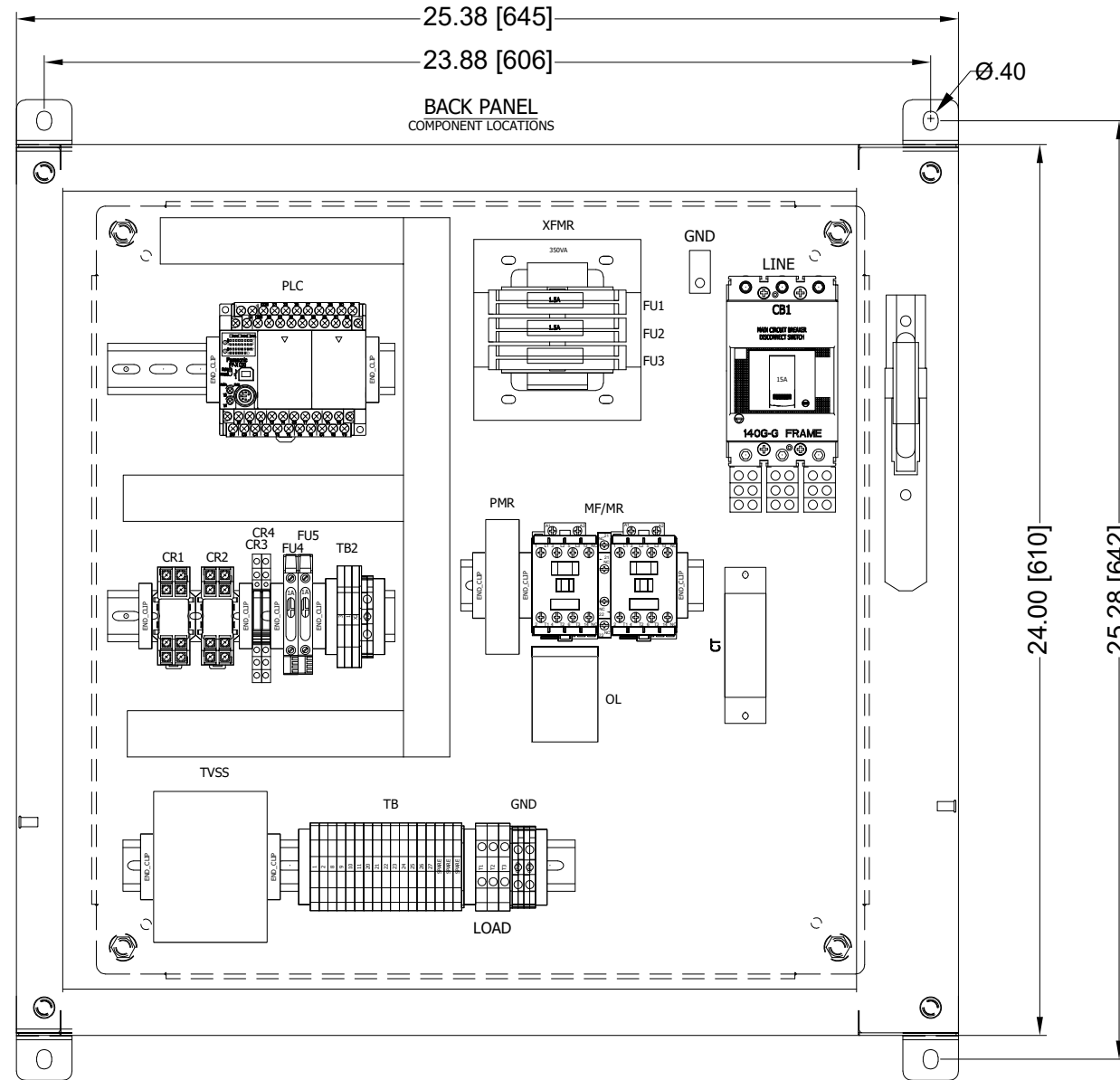


ENCLOSURE  
NEMA TYPE 4X, 316 STAINLESS STEEL, 24"H x 25"W x 8"D

25.38 [645]

23.88 [606]

BACK PANEL  
COMPONENT LOCATIONS

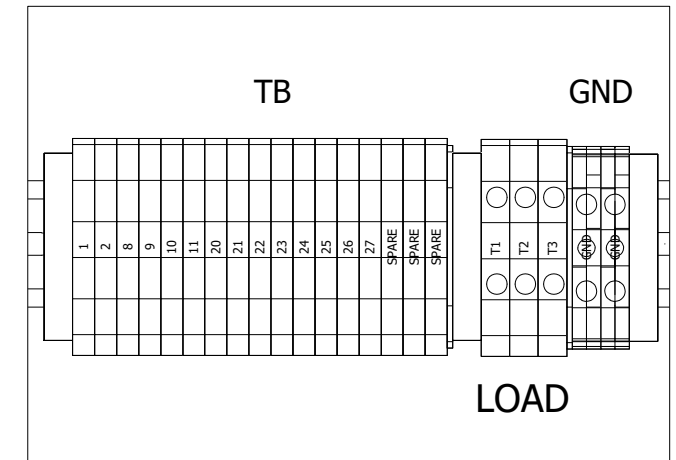


24.00 [610]

25.28 [642]

TB

GND



TERMINAL BLOCK LAYOUT

LOAD

**JWC** JWC ENVIRONMENTAL  
2850 S. Red Hill Ave. Suite 125, Santa Ana, CA 92705

**PC2220 MOTOR CONTROLLER**  
NEMA 4X 316 STAINLESS STEEL - SINGLE MOTOR  
MOTOR CONTROLLER - SERIES PC2220

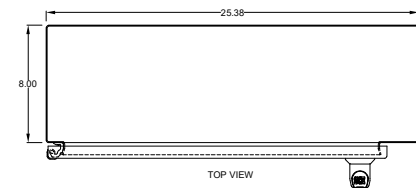
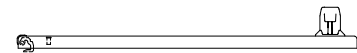
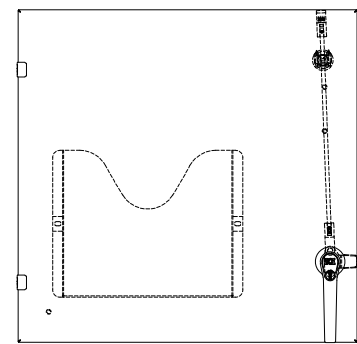
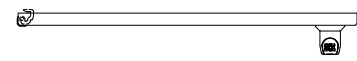
SIZE <b>D</b>	DRAWING NO. <b>PC2220-115412</b>	REV <b>B</b>
------------------	-------------------------------------	-----------------

SCALE: NONE 3 OF 3

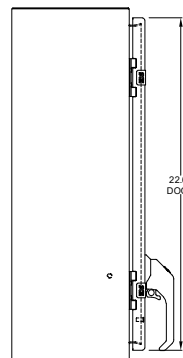




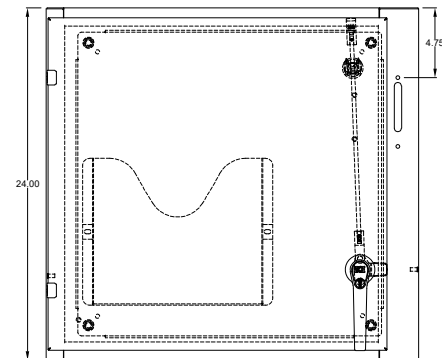
SAGINAW CONTROL & ENGINEERING  
SCE-24XEL2508SS6LP



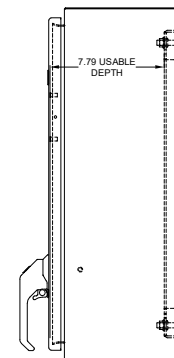
TOP VIEW



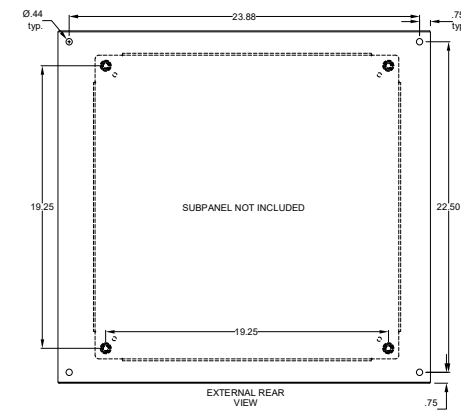
LEFT SIDE VIEW



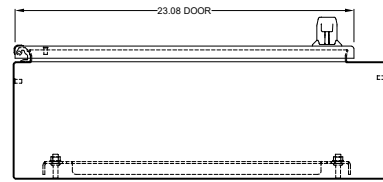
FRONT VIEW



RIGHT SIDE VIEW



EXTERNAL REAR VIEW



BOTTOM VIEW

DATA SUBJECT TO CHANGE WITHOUT NOTICE

SAGINAW CONTROL & ENGINEERING  
SCE-24P24

