



Submittal Review Response

Project Name: **Hilo WWTP Rehabilitation and Replacement Project Phase 1**
Submittal No.: **11334-001.0**
Date: **9/23/2025**

Client: County of Hawai'i Carollo Project No.: 203975
Contractor: Nan, Inc.
Submittal Name: INLINE GRINDER
Reviewed By: Francisco Martinez, Matheus Tolentino Lauar

SUBMITTAL REVIEW

Review is for general compliance with contract documents. No responsibility is assumed by Carollo for correctness of quantities, dimensions, and details. No deviation or variation is approved unless specifically addressed in these review comments. Refer to Section 01330 for additional requirements. The Contractor shall assume full responsibility for coordination with all other trades and deviations from contract requirements.

Approved	<input type="checkbox"/> No Exceptions
	<input type="checkbox"/> Make Corrections Noted - See Comments
	<input type="checkbox"/> Make Corrections Noted - Confirm
Not Approved	<input type="checkbox"/> Correct and Resubmit
	<input checked="" type="checkbox"/> Rejected - See Remarks
Receipt Acknowledged	<input type="checkbox"/> Filed for Record
	<input type="checkbox"/> With Comments - Resubmit

Review Comments:

1. Include equipment tags in the submittal to assist with review.
2. The Grinders that are to be installed at Sludge Blending are located within the classified envelope called out in specification section 16052 – 1.04.B.5. and should be rated to be located inside of the classified area. The submitted Grinders do not seem to be for installation in a classified area. Resubmit the following with Grinders that can be installed within the classified area:
 - a. 10-GRI-2111
 - b. 10-GRI-2112
 - c. 10-GRI-2211
1. 10-GRI-2221
2. Contractor to clarify if spare cutter cartridges already include spacers. Three spare spacers per grinder size are required, per paragraph 11334-2.07.B.5
3. Contractor to provide documentation for all grinder sizes to confirm the design criteria for minimum flowrate, maximum flowrate, and maximum pressure drop at maximum flowrate, as listed in paragraph 11334-2.03.A. Flowrate capacities are not listed for any of the equipment submitted.
4. Contractor to provide bill of materials for equipment. Submittal does not clearly indicate the materials for grinder housing, housing access port covers, cutters and spacers, grinder drive and drive shaft, as specified in paragraph

11334.2.04

5. Contractor to confirm that motors meet torque requirements, as specified in paragraph 11334-2.04.C.6

High Priority

CONTRACTOR SUBMITTAL TRANSMITTAL FORM REV. A

Owner: County of Hawaii
Contractor: Nan, Inc.
Project Name: Hilo WWTP Phase 1
Submittal Title:
TO:
From: Nan Inc.

Project No.: WW-4705R
Submittal Number:
For Information Only

Specification No. and Subject of Submittal / Equipment Supplier	
Spec:	Paragraph:
Authored By:	Date Submitted:

Submittal Certification		
Check Either (A) or (B):		
<input type="checkbox"/> (A)	We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings with <u>no exceptions</u> .	
<input type="checkbox"/> (B)	We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings <u>except</u> for the deviations listed.	
Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.		
General Contractor's Reviewer's Signature: <u>Nan</u>		
Printed Name and Title: In the event, Contractor believes the Submittal response does or will cause a change to the requirements of the Contract, Contractor shall immediately give written notice stating that Contractor considers the response to be a Change Order.		
Firm:	Signature:	Date Returned:

PM/CM Office Use	
Date Received GC to PM/CM:	
Date Received PM/CM to Reviewer:	
Date Received Reviewer to PM/CM:	
Date Sent PM/CM to GC:	

Nan, Inc

PROJECT: HILO WWTP REHABILITATION
AND REPLACEMENT PROJECT - PHASE 1

JOB NO. WW-4705R

THIS SUBMITTAL HAS BEEN CHECKED BY
THIS CONTRACTOR. IT IS CERTIFIED
CORRECT, COMPLETE, AND IN
COMPLIANCE WITH CONTRACT
DRAWINGS AND SPECIFICATIONS. ALL
AFFECTED CONTRACTORS AND
SUPPLIERS ARE AWARE OF, AND WILL
INTEGRATE THIS SUBMITTAL (UPON
APPROVAL) INTO THEIR OWN WORK.

DATE RECEIVED _____
SPECIFICATION SECTION # _____
SPECIFICATION _____
PARAGRAPH _____
DRAWING _____
SUBCONTRACTOR _____
SUPPLIER _____
MANUFACTURER _____

CERTIFIED BY CQCM or Designee : Nan

SECTION 11334

INLINE GRINDER

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes: In-line grinder including main housing, cutter-drive assembly, and vendor control panel.

1.02 REFERENCES

- A. American Iron and Steel Institute (AISI):
 - 1. 4130 - Heat Treated Alloy Steel.
 - 2. 4140 - Heat Treated Hexagon Steel.
- B. ASTM International (ASTM):
 - 1. A395 - Standard Specification for Ferritic Ductile Iron Pressure Retaining Castings.
 - 2. A536 - Standard Specification for Ductile Iron Castings.
- C. National Electrical Code (NEC).
- D. National Electrical Manufacturers Association (NEMA):
 - 1. 250 - Enclosures for Electrical Equipment (1000 V Maximum).
- E. Underwriters Laboratories, Inc. (UL):
 - 1. 508 - Standard for Industrial Control Equipment.
 - 2. 508A - Standard for Industrial Control Panels.
 - 3. 698A - Standard for Industrial Control Panels Relating to Hazardous (Classified) Locations.
 - 4. 1283 - Standard for Electromagnetic Interference Filters.
 - 5. 1449 - Surge Protective Devices.

1.03 SUBMITTALS

- A. Submit as specified in Section 01330 - Submittal Procedures and Section 15050 - Common Work Results for Mechanical Equipment.
- B. Product data.
- C. Shop drawings.
- D. Calculations.
- E. Commissioning submittals:
 - 1. Provide Manufacturer's Certificate of Source Testing as specified in Section 01756 - Commissioning.

2. Provide Manufacturer's Certificate of Installation and Functionality Compliance as specified in Section 01756 - Commissioning.
- F. Project closeout documents:
1. Final vendor operation and maintenance manual as specified in Section 01782 - Operation and Maintenance Manuals.

1.04 WARRANTY

- A. Provide warranty as specified in Section 01783 - Warranties and Bonds.

PART 2 PRODUCTS

2.01 GENERAL

- A. As specified in Section 15050 - Common Work Results for Mechanical Equipment.

2.02 MANUFACTURERS

- A. One of the following or equal:
1. JWC Environmental, 30004T Series Muffin Monster.
 2. Franklin Miller.

2.03 DESIGN AND PERFORMANCE CRITERIA

- A. Design requirements:

Criteria	BS Mixing Grinders	Thickener Feed Grinders	DSL Transfer Grinders	DSL Transfer Grinders ⁽¹⁾
Quantity	2	2	2	2
Maximum flow (gpm)	250	200	225	225
Tag Numbers	10-GRI-2111 10-GRI-2112	10-GRI-2211 10-GRI-2221	11-GRI-2405 11-GRI-2415	11-GRI-2425 11-GRI-2435
Minimum flow (gpm)	125	40	50	50
Maximum pressure drop (psi) at maximum flow rate	0.3	0.2	0.2	0.2
Inlet (inches)	4	4	6	6
Outlet (inches)	4	4	6	6
Motor size (horsepower)	5	5	5	5
Motor and grinder assembly area classification	Class 1 Division 2	Class 1 Division 2	Unclassified	Unclassified
<u>Notes:</u>				
1. Equipment is included as part of Additive Alternate No. 1 only.				

2.04 MATERIALS

A. General:

1. Sewage grinders shall consist of the following 3 main components:
 - a. Main housing.
 - b. Cutter cartridge and drive assembly.
 - c. Vendor control panel.
2. Cutter cartridge and drive assembly shall be 2-shaft design and be capable of continuous operation, processing wet or dry:
 - a. Single shaft devices utilizing a single rotating cutter bar with stationary cutters will not be acceptable.
3. Two-shaft design shall consist of parallel shafts alternately stacked with intermeshing cutters and spacers positioned on the shaft to form a helical pattern.
 - a. The shafts shall counter-rotate with the driven shaft operating at approximately 2/3 the speed of the drive shaft.

B. Main housing:

1. Main housing shall be a solid cast structure made of ASTM A395 or A536 ductile iron:
 - a. One-piece flanged body to be capable of remaining in-line if removal of the cutter cartridge and drive assembly is required for service.
2. Inside profile of the main housing shall be concave to follow the radial arc of the cutters:
 - a. To direct larger particles toward the cutters and ensure fineness of grind, the main housing must maintain a clearance not to exceed 5/16 inch between the major diameter of the cutter and the concave arc of the housing.
3. Main housing to be provided with a covered access port for equipment inspection. Access port covers to be ASTM A395 or A536 ductile iron.
4. Maintenance and service components:
 - a. Provide easy access opening at the top of the grinder for tightening the cutter stacks.
 - b. Stack compression to be accomplished by torquing the stack nuts on the top of the grinder.
 - c. The stack nuts shall be externally accessible.

C. Cutter cartridge and drive assembly:

1. Cutter cartridge and drive assembly to be removable from the housing as a complete segment without further disassembly. The components of that assembly include cutters, spacers, shafts, reducer, motor, bearings, and seals.
2. Cutters and spacers:
 - a. Inside configuration of both cutters and spacers shall be hexagonal so as to fit the shafts with a total clearance not to exceed 0.025 inch across the flats to ensure positive drive and increase the compressive strength of the spacers.
 - b. Cutters and spacers to be AISI 4130 Heat Treated Alloy Steel, surface ground for uniformity and through-hardened to a minimum 44-52 Rockwell C.

- c. Cutter configuration shall consist of 1 shaft with 11-tooth cutters and 1 shaft with 11-tooth cam cutters:
 - 1) To maintain particle size, the height of the tooth must not exceed 1/2 inch above the root diameter.
 - 2) Cutter root diameter overlap to be not less than 1/16-inch or greater than 1/4-inch to maintain the best possible cutting efficiency while incurring the least amount of frictional losses.
- d. The cutter shall exert a minimum force of 450 pounds per horsepower continuously and 1,430 pounds per horsepower at momentary load peaks at the tooth tip.
- 3. Grinder drive and driven shafts to be made of AISI 4140 Heat Treated Hexagon Steel with a tensile-strength rating of not less than 149,000 pounds per square inch:
 - a. Each shaft hex to be a minimum of 2 inches.
- 4. Reducer:
 - a. The gear speed reducer to be a grease-filled planetary type of reducer with "Heavy Shock" load classification:
 - 1) The reduction ratio to be 29:1.
 - 2) High-speed shaft of the grinder to be directly coupled with the reducer using a 2-piece coupling.
- 5. Motor: Provide motors as specified in Section 16222 - Low Voltage Motors up to 500 Horsepower and as specified in this Section.
 - a. At minimum, motor to be TEFC design, horsepower as scheduled in design criteria, 1,725 revolutions per minute, 208/230/460 volt, 60 hertz, 3 phase:
 - 1) Motor service factor to be 1.15, the efficiency factor not less than 81 percent at full load, and the power factor not less than 75 percent at full load.
 - b. Provide motors suitable for classification included in design criteria.
 - c. Motor accessories: As specified in Section 16222 - Low Voltage Motors up to 500 Horsepower and in this Section and as indicated on the Drawings.
- 6. Required running torque per horsepower:
 - a. Continuously: 1,000-inch pounds minimum.
 - b. At momentary load peaks: 3,300-inch pounds.
- 7. Cutter cartridge seal housing and cover to be cast of ASTM A395 or A536 ductile iron and designed to protect the seal labyrinth while guiding particles directly into the cutting chamber.
- 8. Bearings and seals:
 - a. Radial and axial loads of the shafts to be borne by 4 sealed oversize deep-groove ball bearings.
 - b. Bearings to be protected by a combination of a replaceable and independent tortuous path device and end face mechanical seals.
 - c. Face materials must be a minimum of tungsten carbide to tungsten carbide, not requiring an external flush or any type of lubrication.
 - d. The mechanical seal to be rated at 90 pounds per square inch continuous duty by the seal manufacturer.

- e. Bearings and seals to be housed in a replaceable cartridge that supports and aligns the bearings and seals, as well as protects the shafts and end housings. O-rings to be made of Buna-N elastomers.
- f. Products requiring continuous or occasional lubrication or flushing will not be accepted.

2.05 CONTROL SYSTEM

- A. Vendor control panel(s):
 - 1. General:
 - a. This Section summarizes key control system components for vendor control panels (VCP).
 - 1) Referenced sections can be obtained from the Contractor for complete control system requirements.
 - b. Conform with requirements of Section 17710 - Control Systems: Panels, Enclosures, and Panel Components
 - c. Provide instruments and other components performing similar functions of the same type, model, or class, and from one manufacturer.
 - 1) Coordinate with Contractor to align make and model with Contractor-furnished equipment.
 - d. Provide a separate control panel for each vendor packaged system such that control panels will have fully independent control of the functions and operations for their respective system.
 - e. VCP shall be completely preprogrammed, prewired, where possible and factory tested for proper operation prior to shipment.
 - 1) Additional testing requirements as specified in Section 17950 - Commissioning for Instrumentation and Controls.
 - f. Provide necessary control hardware, software, and components as required for a fully functional and operational installation.
 - g. Design and size panels.
 - 1) Design panels to fit in the space if indicated on the Drawings.
 - a) Panel Tags:
 - (1) 10-VCP-2111 - BS MIXING GRINDER 1.
 - (2) 10-VCP-2112 - BS MIXING GRINDER 2.
 - (3) 10-VCP-2211 - THICKENER FEED GRINDER 1.
 - (4) 10-VCP-2221 - THICKENER FEED GRINDER 2.
 - (5) 11-VCP-2405 - DSL TRANSFER GRINDER 1.
 - (6) 11-VCP-2415 - DSL TRANSFER GRINDER 2.
 - 2. Panel enclosure and components:
 - h. Enclosure manufacturers: One of the following or equal:
 - 1) nVent/Hoffman.
 - 2) Saginaw Control & Engineering.
 - i. Provide panels with dimensions as shown on the drawings, not to exceed 27" wide without Engineer approval.
 - j. Provide components and equipment with UL 508 listing.
 - k. Provide control panels with UL 508A labeled.
 - l. Provide fuses for equipment that is not UL listed or recognized.
 - m. Provide intrinsically safe circuits and equipment in accordance with UL 698A.

- n. Provide control panel power circuits in accordance with the panel power wiring diagram included with the contract documents.
 - 1) Design devices and instruments to fail in a safe condition.
- o. Accept single 480 VAC, 3-phase power source:
 - 1) Equipped with a UL 1449 rated SPD.
 - 2) Terminate incoming power feed on main circuit breaker as specified in Section 16412 - Low Voltage Molded Case Circuit Breakers.
 - a) Properly rated for the available fault current as calculated as specified in Section 16305 - Electrical System Studies.
 - 3) Control power transformer:
 - a) Provide a single power source.
 - b) Control power transformers as required:
 - (1) Primary voltage: 460 VAC, 3 phase, 60 hertz.
 - (2) Secondary voltages:
 - (a) 120 VAC for controls.
 - (b) Derive additional voltages as required by the application.
 - (c) Sized for all panel components plus 10 percent spare capacity.
 - (d) Primary and secondary fuses.
 - 4) Protective barriers and touch safe components for 480 VAC equipment.
 - 5) Provide a physical barrier to separate 480 VAC distribution and starters from controls section of cabinet.
 - p. Conform panel enclosure rating to the area classifications as specified in Section 16050 - Common Work Results for Electrical.
 - q. Panel shall be rated as follows, unless otherwise specified:
 - 1) Indoor panels:
 - a) Electrical/control rooms: NEMA 12, powder coated mild steel.
 - b) Process floor: NEMA 4X.
 - (1) Non-Corrosive Areas: Type 316 stainless steel.
 - (2) Corrosive Areas: Polycarbonate or fiberglass reinforced polyester (FRP).
 - 2) Outdoor panels: NEMA 4X, Type 316 stainless steel.
 - r. Provide each control panel door with a continuous steel hinge, 3-point latching mechanism and locking handle with rollers on the ends of the latch rods.
 - 1) Connect latch rods to a common door handle, hold doors securely, and form a compressed seal between door and gasket, at the top, side, and bottom.
 - s. Perform and submit thermal management calculations for each control panel.
 - 1) Provide heating, cooling, and dehumidifying devices in order to maintain instrumentation and control devices within their rated operational temperature range.
 - t. Pad lockable flange mounted disconnect switch to disconnect power from panel.
 - 1) Interlock with the panel door.

- u. Provide nonmetallic ducts for routing and organization of conductors and cables.
 - 1) Provide separate ducts for signal and low voltage wiring from power and 120 VAC control wiring.
 - v. Provide 120 VAC to 24 VDC (or other voltages as required) power supply arrangement that is configured with several modules to supply adequate power in the event of a single module failure in either a 1+1 or N+1 configuration as required:
 - 1) Provide automatic switchover upon module failure.
 - 2) Alarm contacts monitored by the PLC.
 - 3) Design power supply systems so either the primary or backup supply can be removed, repaired, and returned to service without disrupting the system operation.
 - w. Provide NEC Class 2 power to devices requiring NEC Class 2 or SELV supply power.
 - x. Provide UL 1449 rated SPD and UL 1283 rated EMI filter on 120 VAC panel power source.
 - y. Provide GFCI duplex 120 VAC convenience receptacle.
 - z. Factory-assemble and wire the control panel such that field wiring only requires connections to terminals.
 - aa. Panel instruments as shown on the Drawings, as specified in Section 17710 - Control Systems: Panels, Enclosures, and Panel Components, and as recommended by the equipment manufacturer to provide a fully operational system.
2. Pilot Devices:
- a. Mounted on outside face of panel door: Refer to Section 17710 - Control Systems: Panels, Enclosures, and Panel Components and as indicated on the Drawings.
 - b. Control Devices:
 - 1) HAND-OFF-REMOTE selector switch.
 - 2) RESET pushbutton to clear permissives that stop equipment.
 - 3) PANIC STOP pushbutton
 - c. Pilot Lights:
 - 1) Status:
 - a) Power On.
 - b) Running.
 - c) Jammed: Indicates jam condition/jam clearing sequence.
 - 2) Alarms:
 - a) Motor Fail.
 - b) Jam.
 - d. Monitoring and control:
 - 1) Dry contact rating: 120 VAC at 10 A.
 - 2) VCP Inputs:
 - a) Control:
 - (1) Start/Stop command.
 - 3) VCP Outputs:
 - a) Status:
 - (1) Running.
 - (2) REMOTE indication.
 - b) Alarms:
 - (1) Failed.

- e. Hardwired control functions:
- 1) Jam Clearing Sequence: Upon the grinder encountering a jam condition, the vendor control panel will stop the grinder and reverse its rotation to clear the obstruction. If the jam is cleared, the controller will return to normal operation. If the jam condition still exists, the controller will go through 2 additional reversing cycles within 30 seconds (3 times total) before signaling a grinder jam fail condition. Upon a grinder jam fail condition, the controller will stop and latch out the grinder and activate a Jam Fail contact.
 - 2) If a power failure occurs while the grinder is running, the grinder will resume running when power is restored. If the grinder is stopped due to an overload condition and a power failure occurs, the overload indicator will reactivate when power is restored.
 - 3) Starter to provide overcurrent protection. The overload relay to be adjustable so that the range selected includes the full load amps rating and service factor.
 - 4) The following will stop and latch out grinder and activate an alarm at the grinder panel.
 - a) Panic Stop button pressed.
 - b) Motor High Temperature.
 - c) Motor Overload.
 - d) High Current.
 - 5) If VCP HOR selector switch is in HAND, grinder will run. In REMOTE, VCP will accept a single Start/Stop input command from Area PLC/SCADA.

2.06 FINISHES

- A. As specified in Section 09960 - High-Performance Coatings.

2.07 SPARE PARTS

- A. As specified in Section 15050 - Common Work Results for Mechanical Equipment.
- B. Provide the following spare parts for each size grinder specified:
1. 3 fuses.
 2. 3 replacement long life indicator lamps.
 3. 1 complete gasket and o-rings set.
 4. 3 cutters.
 5. 3 spacers.
 6. 1 complete mechanical seal.

PART 3 EXECUTION

3.01 GENERAL

- A. As specified in Section 15050 - Common Work Results for Mechanical Equipment.

3.02 COMMISSIONING

- A. As specified in Section 01756 - Commissioning, Section 15958 - Mechanical Equipment Testing, and this Section.
- B. Manufacturer services:
 - 1. Provide certificates:
 - a. Manufacturer's Certificate of Source Testing.
 - b. Manufacturer's Certificate of Installation and Functionality Compliance.
 - 2. Manufacturer's Representative onsite requirements: Require manufacturer's representative to perform the following services as described below and as specified in Section 01756 - Commissioning. The specified durations are the minimum required time on the job site. Additional services and/or longer durations shall be provided as needed at no cost to the Owner to meet the required quality of work. Work to be done in a minimum of 4 trips:
 - a. Installation assistance: As required:
 - 1) Advise/observe the Contractor on the installation of the equipment.
 - 2) Provide additional assistance as required.
 - a. Installation inspection: 1 trip, 2-day minimum.
 - b. Functional Testing: 2 trips, 2-day minimum each trip.
 - 3. Training: As defined in Section 01756 - Commissioning and this Section:
 - a. Operations: 2-hour class, 2 sessions.
 - b. Mechanical Maintenance: 3-hour class, 1 session.
 - c. Combined Electrical and I&C Maintenance: 1-hour class, 1 session.
 - 2. Final acceptance checkout: 1 workday (trip may be combined with training).
- C. Source testing:
 - 1. Test as specified in Section 15958 - Mechanical Equipment Testing.
 - 2. Grinder:
 - a. Test witnessing: Not witnessed.
 - b. Conduct Level 1 General Equipment Performance Test.
 - c. Conduct Level 1 Vibration Test.
 - d. Conduct Level 1 Noise Test.
 - 3. Electrical Instrumentation and Controls:
 - a. Test witnessing: Not witnessed.
 - b. Conduct testing as specified in Section 17950 - Commissioning for Instrumentation and Controls.
- D. Functional testing:
 - 1. Grinder:
 - a. Conduct Level 2 General Equipment Performance Test.
 - b. Conduct Level 2 Vibration Test.
 - c. Conduct Level 2 Noise Test.
 - 2. Electrical Instrumentation and Controls:
 - a. Conduct testing as specified in Section 17950 - Commissioning for Instrumentation and Controls.

END OF SECTION



S U B M I T T A L

TASKMASTER TM8500 INLINE

Model: TM851206

SN: 12810AB

Contractor: Nan Inc

Job Name: Hilo, HI WWTP Phase 1 Grinders

GRINDERS | SHREDDERS | CRUSHERS | SCREENS

Experience the Difference

Submittal Data

by **Franklin Miller, Inc.**

Prepared For:

JASON KO
NAN INC
636 Laumaka St
HONOLULU HI 96819
Phone: 8088424929

Franklin Miller is pleased to provide the enclosed submittal data for your review and Approval.

Date	03/27/2025	Pages	50
Revision	00	Prepared By	Ashley Arias
Copies		Action	Approval
Purchase Order	24077-00046		
Installation	Hilo, HI WWTP Phase 1 Grinders		

Qty	Model	Serial Number	Weight (Lbs.)
2	TM851206	12810AB	

Review & Approval Required:		
Signed by :	✓	Check One:
Title:		Approved without change
Organization:		Approved as noted
Date:		Revise and resubmit

Once approved with signature and released for production, this submittal document will be considered a legal document and will override any other documents; unless otherwise specified in writing in this document. Franklin Miller will only be responsible for items mentioned herein. If any modifications are required, Franklin Miller will resubmit this document for final approval (without charge).

Please send back your approval and confirm / provide the following:

- Select voltage to control (230V) or (460V)
- Select O&M Manual should be digital PDFs or hard copies.

The returned data package may be transmitted via fax, mail, or email. **This machine can not be released for production without the above mentioned information and APPROVAL signature.**

Franklin Miller Inc.

60 Okner Parkway • Livingston, N.J. 07039 • Phone: (973)535-9200 • Fax: (973)535-6269

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Livingston, New Jersey.

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1 Unit Specification

FRANKLIN MILLER, INC.

UNIT SPECIFICATIONS

General Information

Order #:	110872
Serial #:	12810AB
Customer:	Nan Inc
Purchase Order #:	24077-00046
Machine Installation:	Hilo, HI WWTP Phase 1 Grinders
Machine Model:	TM851206
Quantity:	2

Motor

MANUFACTURER Baldor	POWER 5HP	ENCLOSURE TEFC
VOLTS 230/460	PHASE 3 phase	HERTZ 60

Reducer

MANUFACTURER Sumitomo	MODEL 6125	RATIO 29
---------------------------------	----------------------	--------------------

Enclosure

MODEL S25060	CONTROLLER NEMA 4X 316SS	
VOLTS 230/460	PHASE 3 phase	HERTZ 60



Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039 USA

Scope of Supply

Order No. 110872

Page 1 of 3

Sold To:

Nan Inc

636 Laumaka St
Honolulu, HI 96819 USA
Contact: Welina Bobiles
Phone: 8088424929

Rep:

JBI Water & Wastewater Eqt., Inc.

3386 Tartan Trail
El Dorado Hills, CA 95762 USA

Organization ID	P.O. #	Salesperson	Serial Number	Order Date
NAN002	24077-00046	Jacob Galanty	12808AB, 12809AB, 12810/	3/25/2025

Line No.	Quantity	Units	Description
----------	----------	-------	-------------

1 2.0 EA **TASKMASTER® GRINDER, Model TM851204 as follows:**

- Cutter Cartridge Technology: 11-Tooth Cam Cutters, 4140 H.T.
- Nom. 8" x 12" Cutting Chamber
- 4" ANSI Flange Housing- 150# Bolt Pattern
- Drop-In Design Housing For Fast & Easy Maintenance - D.I.
- Mechanical Seals: TC vs. TC 90 psi max.
- 2" Hexagonal Shafting, 4140 H.T.
- Painted 2 Coats Heavy Epoxy Coating - Osha Blue

No Cutter Stack Retightening Required - GUARANTEED

2 2.0 EA **MOTOR AND DRIVE INCLUDING:**

- 5HP TEFC Baldor C-Face Motor, 230/460V, 3PH, 60 HZ
- Gear Reducer - Cycloidal, Vertical Down
- Coupling: High Torque Jaw Style
- Reducer and Adapter constructed of Iron and Steel

3 2.0 EA **Automatic Reversing Controller, Model S260**

- Nema 4X 316 Stainless Steel Enclosure
- Allen Bradley Compact Logix PLC logic control
- IEC starters
- LED Indicators - for long life
- Current Sensing Auto-Reversing Program
- 30mm pilot devices
- Pad Lockable Flange Mount Disconnect Switch
- GFCI duplex 120 VAC convenience receptacle
- 120V Control Circuit
- 480V 3 Phase 60HZ

4 2.0 EA **TASKMASTER® GRINDER, Model TM851204 as follows:**

- Cutter Cartridge Technology: 11-Tooth Cam Cutters, 4140 H.T.
- Nom. 8" x 12" Cutting Chamber
- 4" ANSI Flange Housing- 150# Bolt Pattern
- Drop-In Design Housing For Fast & Easy Maintenance - D.I.
- Mechanical Seals: TC vs. TC 90 psi max.
- 2" Hexagonal Shafting, 4140 H.T.
- Painted 2 Coats Heavy Epoxy Coating - Osha Blue

No Cutter Stack Retightening Required - GUARANTEED



Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039 USA

Scope of Supply

Order No. 110872

Page 2 of 3

Sold To:

Nan Inc

636 Laumaka St
Honolulu, HI 96819 USA
Contact: Welina Bobiles
Phone: 8088424929

Rep:

JBI Water & Wastewater Eqt., Inc.

3386 Tartan Trail
El Dorado Hills, CA 95762 USA

Organization ID	P.O. #	Salesperson	Serial Number	Order Date
NAN002	24077-00046	Jacob Galanty	12808AB, 12809AB, 12810/	3/25/2025

Line No.	Quantity	Units	Description
----------	----------	-------	-------------

5 2.0 EA MOTOR AND DRIVE INCLUDING:

- 5HP TEFC C-Face Baldor Motor, 230/460V, 3PH, 60 HZ
- Gear Reducer - Cycloidal, Vertical Down
- Coupling: High Torque Jaw Style
- Reducer and Adapter constructed of Iron and Steel

6 2.0 EA Automatic Reversing Controller, Model S260

- Nema 4X 316 Stainless Steel Enclosure
- Allen Bradley Compact Logix PLC logic control
- IEC starters
- LED Indicators - for long life
- Current Sensing Auto-Reversing Program
- 30mm pilot devices
- Pad Lockable Flange Mount Disconnect Switch
- GFCI duplex 120 VAC convenience receptacle
- 120V Control Circuit
- 480V 3 Phase 60HZ

7 2.0 EA TASKMASTER® GRINDER, Model TM851206 as follows:

- Cutter Cartridge Technology: 11-Tooth Cam Cutters, 4140 H.T.
- Nom. 8" x 12" Cutting Chamber
- 6" Ansi (DIN 150) Flange Housing- 150# Bolt Pattern
- Drop-In Design Housing For Easy Maintenance. D.I.
- Mechanical Seals: TC vs. TC 90 psi max.
- 2" Hexagonal Shafting, 4140 H.T.
- Painted 2 Coats Heavy Epoxy Coating - Osha Blue

8 2.0 EA MOTOR AND DRIVE INCLUDING:

- 5HP TEFC C-Face Baldor Motor, 230/460V, 3PH, 60 HZ
- Gear Reducer - Cycloidal, Vertical Down
- Coupling: High Torque Jaw Style
- Reducer and Adapter constructed of Iron and Steel

9 2.0 EA Automatic Reversing Controller, Model S260



Franklin Miller Inc.
60 Oknay Parkway
Livingston, NJ 07039 USA

Scope of Supply

Order No. 110872

Page 3 of 3

Sold To:

Nan Inc

636 Laumaka St
Honolulu, HI 96819 USA
Contact: Welina Bobiles
Phone: 8088424929

Rep:

JBI Water & Wastewater Eqt., Inc.

3386 Tartan Trail
El Dorado Hills, CA 95762 USA

Organization ID	P.O. #	Salesperson	Serial Number	Order Date
NAN002	24077-00046	Jacob Galanty	12808AB, 12809AB, 12810F	3/25/2025

Line No.	Quantity	Units	Description
			<ul style="list-style-type: none">- Nema 4X 316 Stainless Steel Enclosure- Allen Bradley Compact Logix PLC logic control- IEC starters- LED Indicators - for long life- Current Sensing Auto-Reversing Program- 30mm pilot devices- Pad Lockable Flange Mount Disconnect Switch- GFCI duplex 120 VAC convenience receptacle- 120V Control Circuit- 480V 3 Phase 60HZ
10	2.0	EA	Spare Parts <ul style="list-style-type: none">- 3 fuses.- 3 replacement long life indicator lamps.- 1 complete gasket and o-rings set.- 3 cutters cartridges- 1 complete mechanical seal.
11	1.0	DY	Startup Services - (4 Trips) <ul style="list-style-type: none">- Installation Inspection- Warranty Certification- O&M instructions <p>If more than one day, Days are Consecutive. Normal Day Rate includes up to 8 hours,</p>
12	2.0	EA	Seismic Calcs
13	1.0	EA	Two Year Warranty

2

Paint Specification

PAINTING SPECIFICATIONS

(Franklin Miller Fabricated Parts)

All stainless steel parts, if used, will not be painted.

All steel surfaces shall be primed the same day as cleaned.

All steel parts which are exposed will be painted to the following procedures.

SURFACE PREPARATION

Surface preparation for steel will be defined by the Steel Structures Painting Council (SSPC) and is as follows:

SSPC-10-NEAR WHITE BLAST CLEANING

Near-white blast cleaning is a method of preparing metal surfaces for painting or coating by removing nearly all mill scale, rust scale, paint or foreign matter by the use of abrasives propelled through nozzles or by centrifugal wheels. A near-white blast cleaned surface finish is defined as one in which all oil, grease, dirt, mill scale, rust corrosion products, oxides, paint or other foreign matter have been completely removed from the surface except for very light shadows, very slight streaks or slight discolorations caused by rust stain, mill scale oxides, or slight, tight residues of paint or coating that may remain. At least 95% of each square inch of surface area shall be free of all visible residues, and the remainder shall be limited to the light discolored mentioned above.

COATING

DESCRIPTION:	Polyamide Epoxy
TYPICAL USE:	Coating structural steel, machinery and equipment.
COLOR:	Franklin Miller Blue
FINISH:	Satin
PRIMER:	One Coat
TOP:	One Coat
DRY FILM THICKNESS:	(As recommended by manufacturer): 3 to 5 mil per coat.

3 Warranty

FRANKLIN MILLER INC.
LIMITED WARRANTY
DOMESTIC

SELLER warrants the goods sold hereunder to be free from defects in material and workmanship under normal use and service not arising from misuse, negligence or accident, or unauthorized modification of the equipment, in connection with the use, installation, and transportation of the goods by BUYER, its agents, servants, employees or by carriers. SELLER's obligations under this warranty are limited to remedying any deficiencies in the goods at such place or places in the United States of America as may be designated by SELLER. This warranty shall pertain to any part or parts of any goods to which BUYER has, within (24) months after date of shipment, given written notice of a claimed defect to the SELLER. The BUYER shall be required to furnish SELLER with details of such defects and this warranty shall be effective as to such goods which upon SELLER's examination shall disclose to its satisfaction to have been defective and which at SELLER's option shall be repaired in place if required for a warranty repair. The BUYER at his expense shall make available in a suitable location for repair by SELLER or promptly thereafter be returned to SELLER, at BUYER's, or its nominees expense. If upon examination it is determined by the SELLER that the repair or replacement does not fall within the Warranty as set forth in this clause, an estimate for cost of repair will be provided to the BUYER. This warranty is expressly in lieu of all other warranties expressed or implied. In no event shall the SELLER be liable to the BUYER or to any other person for any loss or damage, direct or indirect, arising out of or caused by the use or operation of the goods, or for the loss of profits, business, or good will. Under no circumstance will SELLER be liable for any of the following: (1) third party claims against BUYER for losses or damages including liquidated damages; (2) loss of or damage to BUYER's records or data; or (3) economic consequential damages (including loss of profits or savings) or incidental damages even if SELLER is informed of their possibility. Excluded from the warranty herein are (a) defects in parts or components not manufactured directly by SELLER; Franklin Miller will, however, pass on the remaining balance of the purchased equipment manufacturer's warranty; (b) or not part of SELLER's standard design or are supplied pursuant to special BUYER's requirements; (c) certain parts which are subject to wear and tear from abrasive action or use thereof; and (d) any part that has been subjected to misuse. SELLER's liability is limited to furnishing or repairing at SELLER's option parts determined by SELLER to be defective. No express warranties and no implied warranties, whether of merchantability or fitness for any particular use, or otherwise (except as to title), other than those expressly set forth above which are made expressly in lieu of all other warranties, shall apply to products sold by us, and no waiver, alteration, or modification of the foregoing conditions shall be valid unless made in writing and signed by an executive officer of our corporation. If the buyer is in default of Clause 6 (Payment of Purchase Price) this warranty is null and void unless reinstated by SELLER.

4

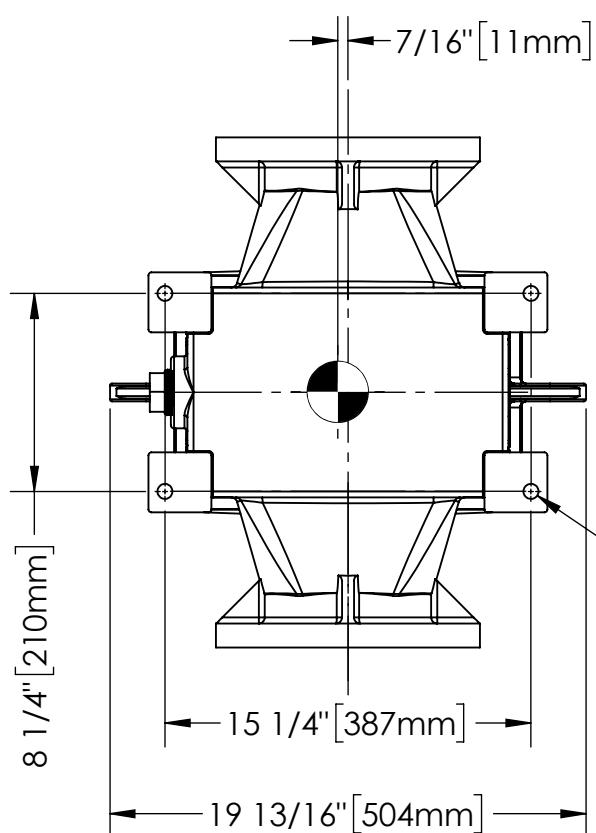
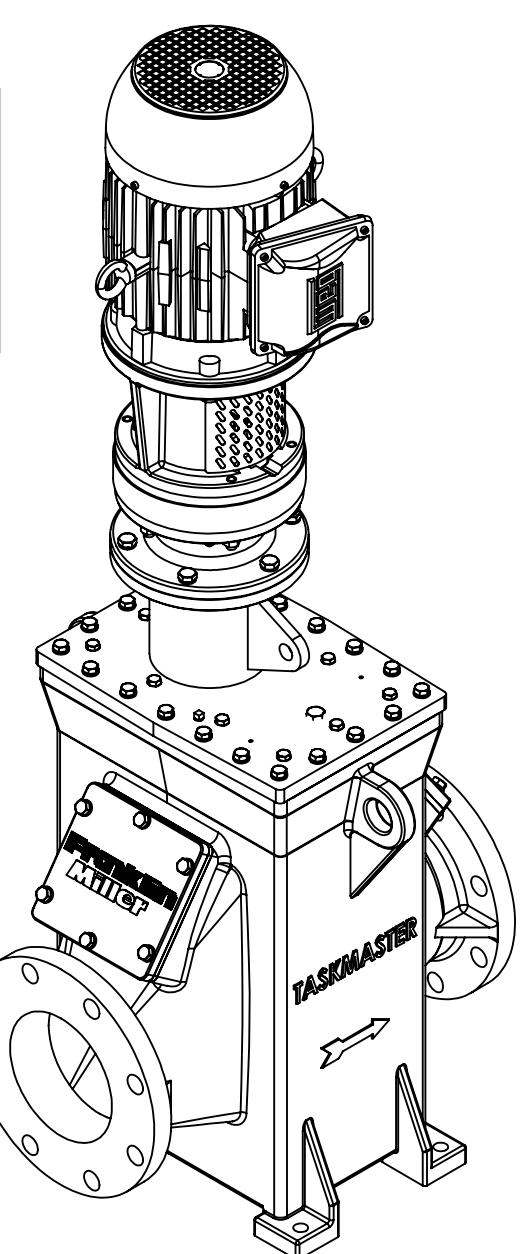
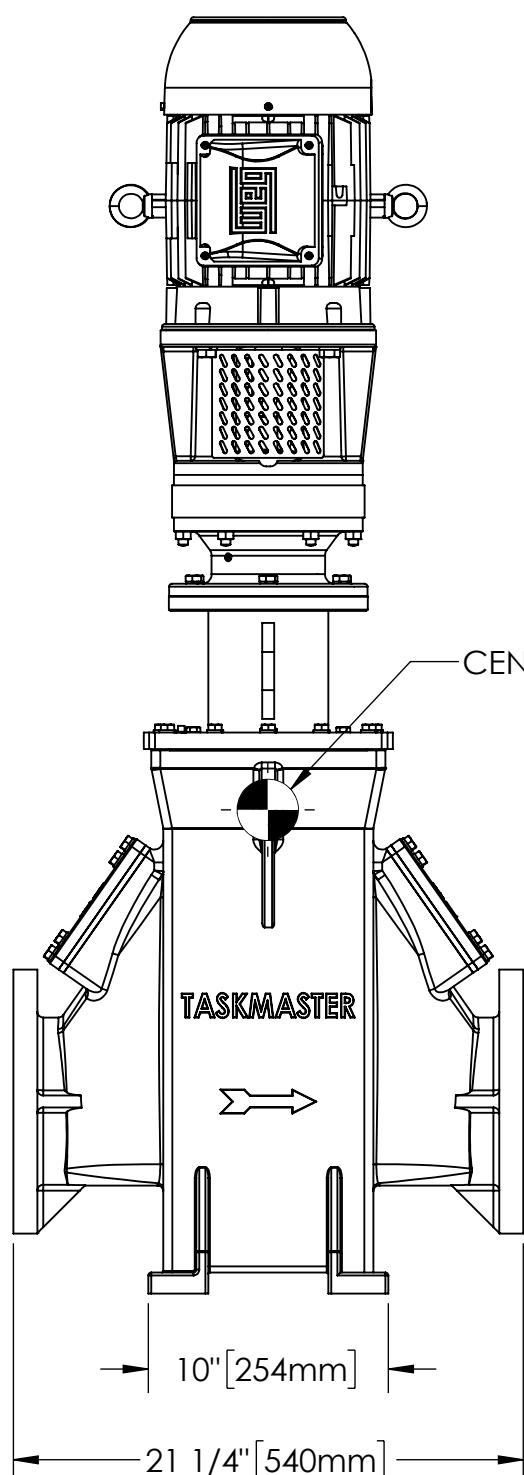
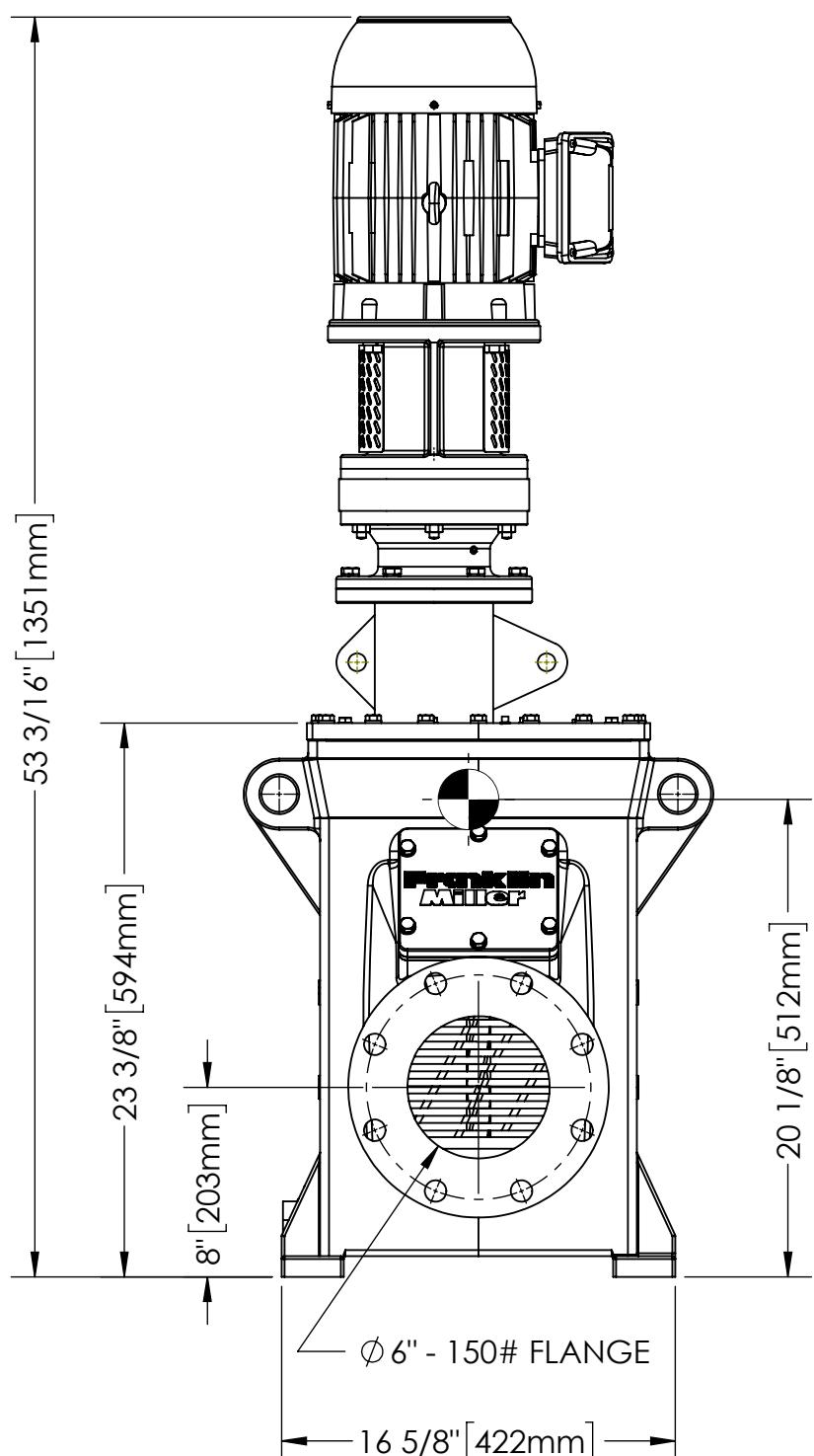
Drawings

BOM TABLE

ITEM NO.	DESCRIPTION
1	HOUSING ASSEMBLY, TM851206, DROP-IN
2	DRIVE ASSEMBLY, 5HP TEFC, TM8500, SUMI 6125

NOTE:

1. 11-TOOTH CAM CUTTERS



COMMENTS:

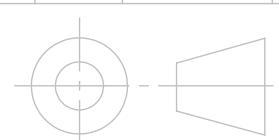
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MACHINE TOLERANCES UNLESS OTHERWISE NOTED

DECIMALS	FRACTIONS	± 1/32
.0	± .015	ANGLES ± .05°
.00	± .010	CHAMFER ANGLES ± 3°
.000	± .005	SURFACE TEXTURE 125/



THIRD ANGLE PROJECTION

DRAWN	NAME	DATE
	JB	3/26/25

CHECKED

ENG APPR.

MFG APPR.

Q.A.

MATERIAL SEE BOM

FINISH

**Franklin
Miller®**

TITLE: TASKMASTER®, TM851206 Drop-In, 5Hp Motor TEFC

SIZE DWG. NO. REV

B 12810ABTM851206 .

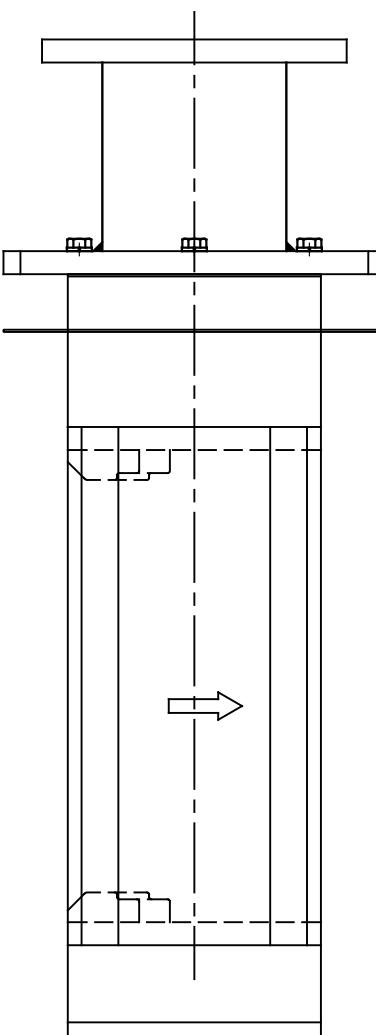
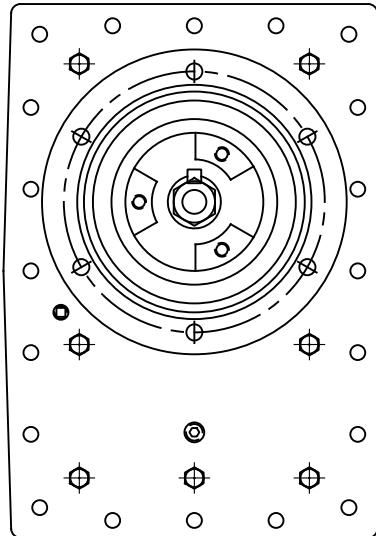
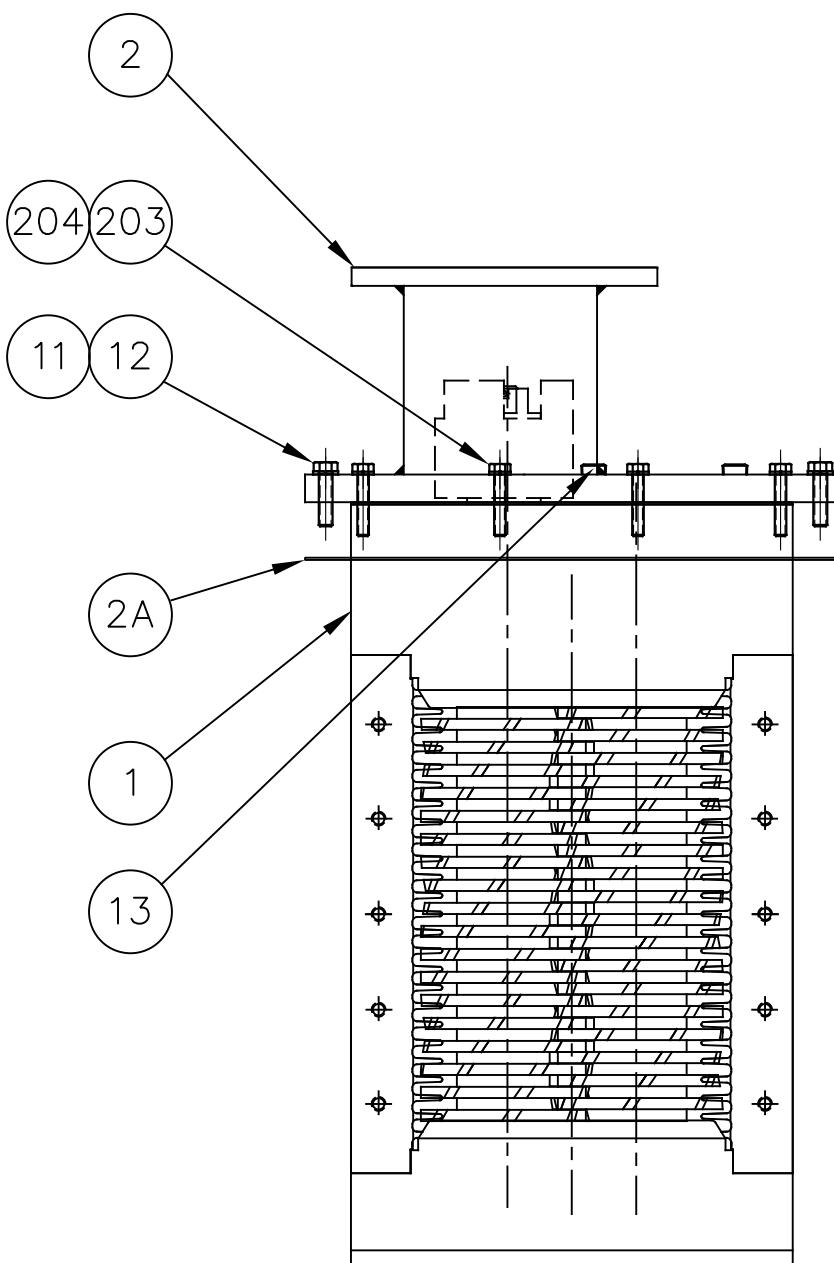
DO NOT SCALE DRAWING

SCALE: 1:8 WEIGHT: 780 lbs

Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039
Tel: 973-535-9200
www.franklinmiller.com

SHEET 1 OF 1

PARTS LIST				
ITEM	QTY	DESCRIPTION	PART/#	MATERIAL
1	1	TM851200 LESS DRIVE	TM851200	SEE DETAIL
2	1	ADAPTER, REDUCER	TM85634	CS
2A	1	GASKET, ADAPTER	TM85630B	BUNA
11	20	LOCKWASHER 3/8	LW06S	18-8
12	20	SCREW 3/8-16 x 1 1/2	HC061624S	18-8
13	1	PLUG, VENT	PP00060	BRASS
203	10	SCREW, 5/16-18 x 1 3/4, GRADE 8	HC051828HT	CS
204	10	LOCKWASHER 5/16, HI-STRENGTH	LW05HT	CS



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LIVINGSTON, NEW JERSEY.

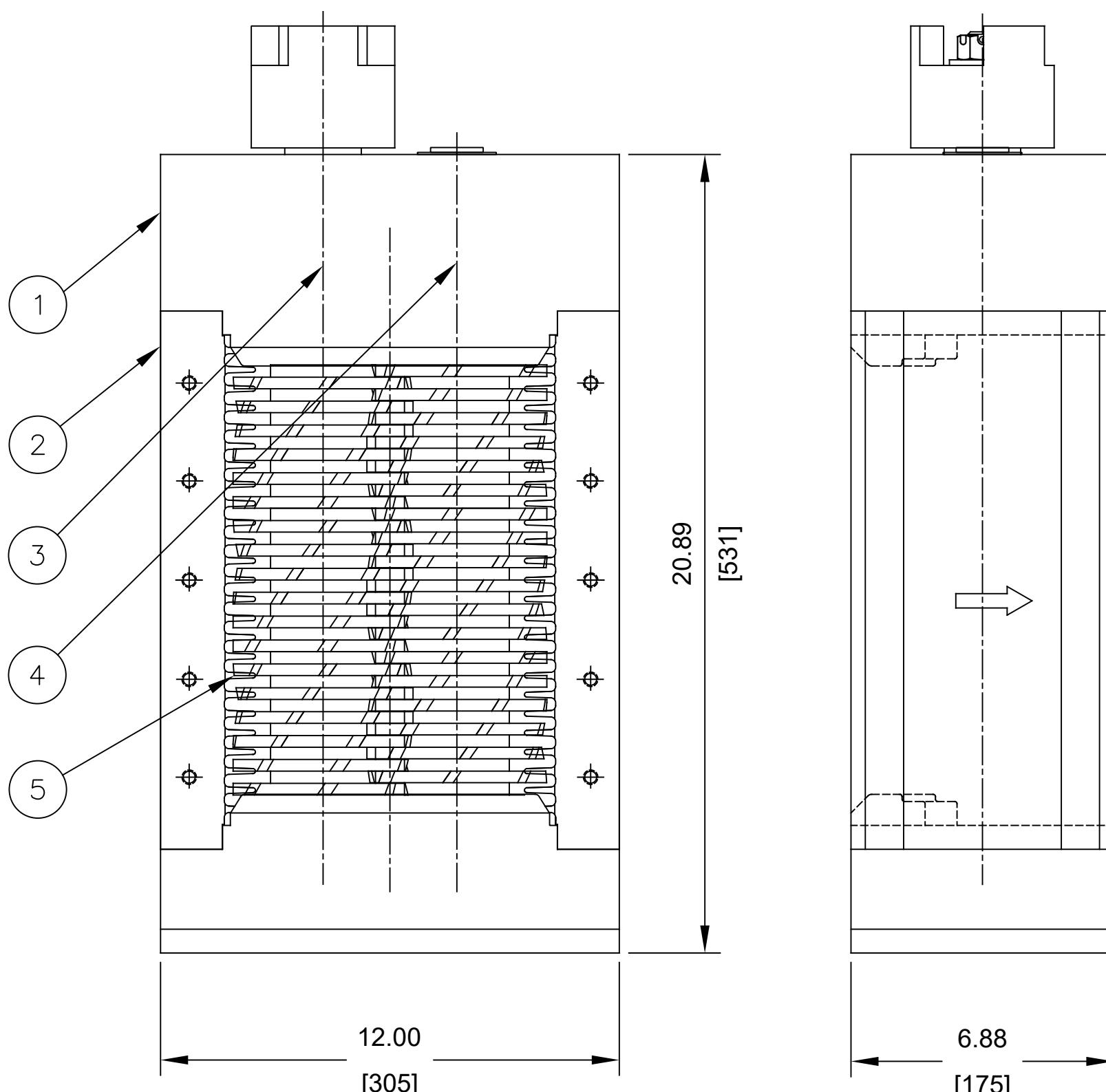
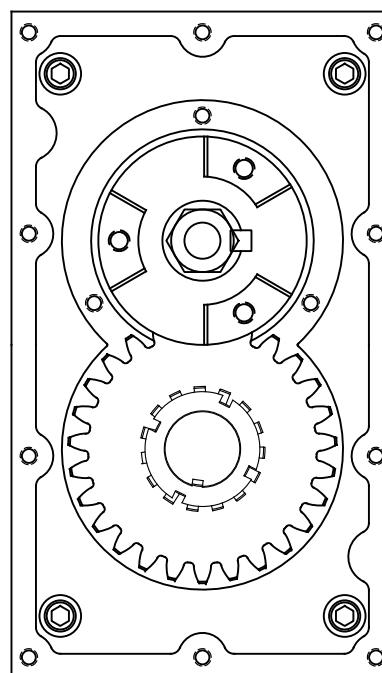
FRANKLIN MILLER INC.
60 OKNER PARKWAY, LIVINGSTON, N.J. 07039

TASKMASTER TM8512 DROP-IN LESS DRIVE & HOUSING

SCALE	DWN	DATE	CKD	DATE	DWG. NO.
1:5	AEW/AG	03/06/03	.	.	TM851203

BILL OF MATERIAL				MATERIAL STANDARD	WEIGHT
ITEM	QTY	DESCRIPTION	FMI P/#		
1	1	TM850000 COMMON PARTS	TM850000	SEE DETAIL	110.7 LBS
2	2	SIDE FRAME	TM85660	DUCT	28.5 LBS
3	1	DRIVE SHAFT	TM85373BH	4140 Rc28-32	16.5 LBS
4	1	DRIVEN SHAFT	TM8572BH	4140	15.5 LBS
5	6	CUTTER CARTRIDGE	TM8551A	4140	6.5 LBS

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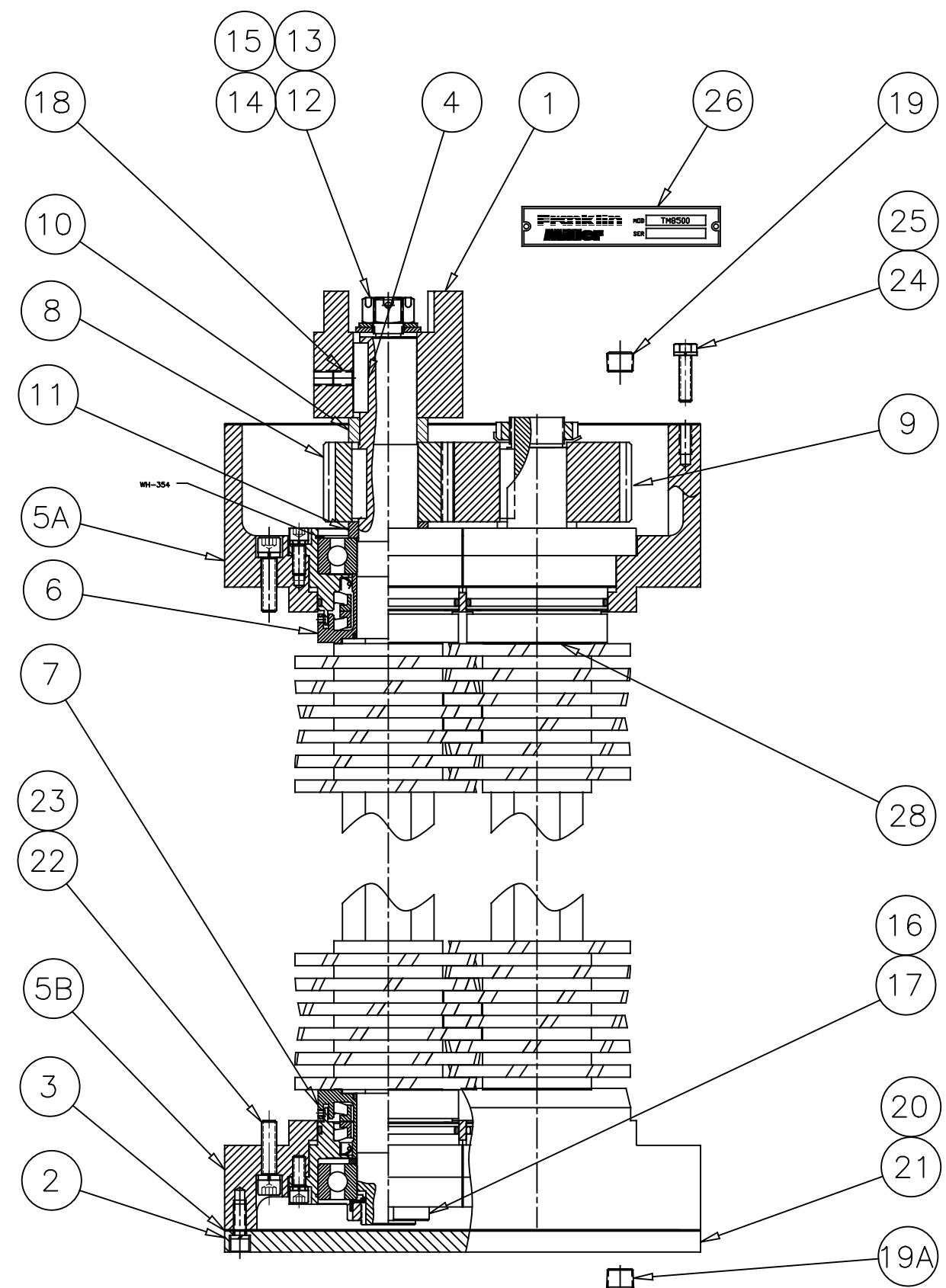
TM8512 LESS DRIVE

LTR P/N	MATERIAL	WEIGHT#	SCALE	DWN	DATE	CKD	DATE	DWG	REV
			1: 4	AEW	10/13/00	.	.	TM851200	

PARTS LIST		FMI PART/#			FMI PART/#			
ITEM	QTY	DESCRIPTION	TM850000	MATERIAL	WEIGHT	TM850000C	MATERIAL	WEIGHT
1	1	COUPLING HALF	FM00015AU	1018 C.S.	5.5 LBS	FM00015AU	1018 C.S.	5.5 LBS
2	1	COVER, BOTTOM	TM8510B	D.I. 65-45-12	13.5 LBS	TM8510C	316LSS	9 LBS
3	2	GASKET	TM8512A	BUNA	-	TM8512A	BUNA	-
4	3	KEY, 3/8 SQ x 1 3/4	KS0628	1090 C.S.	.125 LBS	KS0628	1090 C.S.	.125 LBS
5A	1	HOUSING, TOP	TM8546M	D.I. 65-45-12	39 LBS	TM85010	316LSS	41 LBS
5B	1	HOUSING, BOTTOM	TM85646M	D.I. 65-45-12	30 LBS	TM85011	316LSS	31 LBS
6	2	BEARING/SEAL CARTRIDGE, FIXED	TM85760 REV #5	SEE DETAIL	6 LBS	TM85760 REV #5	SEE DETAIL	6 LBS
7	2	BEARING/SEAL CARTRIDGE, EXPANSION	TM85990 REV #5	SEE DETAIL	5.9 LBS	TM85990 REV #5	SEE DETAIL	5.9 LBS
8	1	PINION GEAR, 18T	TM85125	4140 ALLOY STEEL	2.5 LBS	TM85125	4140	2.5 LBS
9	1	SPUR GEAR, 27T	TM85124	4140 ALLOY STEEL	7.5 LBS	TM85124	4140	7.5 LBS
10	1	SPACER, GEAR/COUPLING	TM85410	1018 C.S.	.25 LBS	TM85410	1018 C.S.	.25 LBS
11	2	SPACER, GEAR/BEARING	TM8596	1018 C.S.	.25 LBS	TM8596	1018 C.S.	.25 LBS
12	1	WASHER, PLAIN, WIDE 3/4	WPW12HT	CS	.125 LBS	WPW12HT	CS	.125 LBS
13	1	WASHER, BELLVILLE, 3/4 X .107 THK	WB12107	CS	.125 LBS	WB12107	CS	.125 LBS
14	1	COTTER PIN, 1/8 x 1 1/2	MM00120	18-8 S.S.	.125 LBS	MM00120	18-8 S.S.	.125 LBS
15	1	NUT, HEX, SLOTTED, 3/4-10	NHS1210	CS	.25 LBS	NHS1210	CS	.25 LBS
16	3	NUT, BEARING, N-07	BN07	1018 C.S.	.25 LBS	BN07	1018 C.S.	.25 LBS
17	3	LOCKWASHER, BEARING , W-07	BW07	1018 C.S.	.125 LBS	BW07	1018 C.S.	.125 LBS
18	2	SETSCREW, 3/8-16 x 1/2	SS061608S	18-8 S.S.	.125 LBS	SS061608S	18-8 S.S.	.125 LBS
19	1	PIPE PLUG 3/8 NPT	PP00027	GALV.	.25 LBS	PP00027	GALV.	.25 LBS
19A	1	PIPE PLUG 1/4 NPT	PP04	GALV.	.25 LBS	PP04	GALV.	.25 LBS
20	10	SCREW, 5/16-18 x 1"	SC051816S	18-8 S.S.	.125 LBS	HC051816S	18-8 S.S.	.125 LBS
21	10	LOCKWASHER, HI-COLLAR 5/16	LWH05S	18-8 S.S.	.125 LBS	LW05S	18-8 S.S.	.125 LBS
22	8	SCREW 3/8-16 x 1 1/2	SC061624S	18-8 S.S.	.125 LBS	SC061624S	18-8 S.S.	.125 LBS
23	8	WASHER BOLT SEALING 3/8	MM00153	18-8 S.S.	.125 LBS	MM00153	18-8 S.S.	.125 LBS
24	10	SCREW 5/16-18 x 1 1/4	HC051820S	18-8 S.S.	.125 LBS	HC051820S	18-8 S.S.	.125 LBS
25	10	LOCKWASHER 5/16	LW05S	18-8 S.S.	.125 LBS	LW05S	18-8 S.S.	.125 LBS
26	1	NAMEPLATE-S/N FMI	NP1000	18-8 S.S.	.25 LBS	NP1000	18-8 S.S.	.25 LBS
27	2oz	LUBRICANT, GREASE, GEAR	LU00003	LUBRICANT	.125 LBS	LU00003	LUBRICANT	.125 LBS
28	1	SHIM, .005"THK	FM00607	CS				

REV NO.	DESCRIPTION	DWN	DATE
1	UPDATED BEARING/SEAL CART'S & HARDWARE	AEW	08/24/0
2	CHANGED BOTTOM HOUSING TO LOW-PROFILE	AEW	12/21/0
3	ADDED ASTM MATERIAL REF.	JHT	03/25/0
4	CHANGED BALLOONING	JHT	06/20/0
5	CHANGED ITEM 41 FROM GREASE FITTING TO PLUG, DELETED QTY (6) OF ITEM 44, ADDED ITEM 17A	GWC	10/30/0
6	DELETED QTY (6) OF ITEMS 44 & 48	AG	01/30/0
7	PARTS LIST was updated	AG	05/23/0
8	ADDED COMPONENT WEIGHTS	JT	10/05/0
9	Item #5B was updated, Items #28, 29 were removed	AG	02/10/0
10	Items #2 & 3 were updated	AG	03/13/0
11	Item #3 was updated	AG	07/25/1
12	BEARING/SEAL CARTRIDGES were updated (REV #5)	AG	08/19/1

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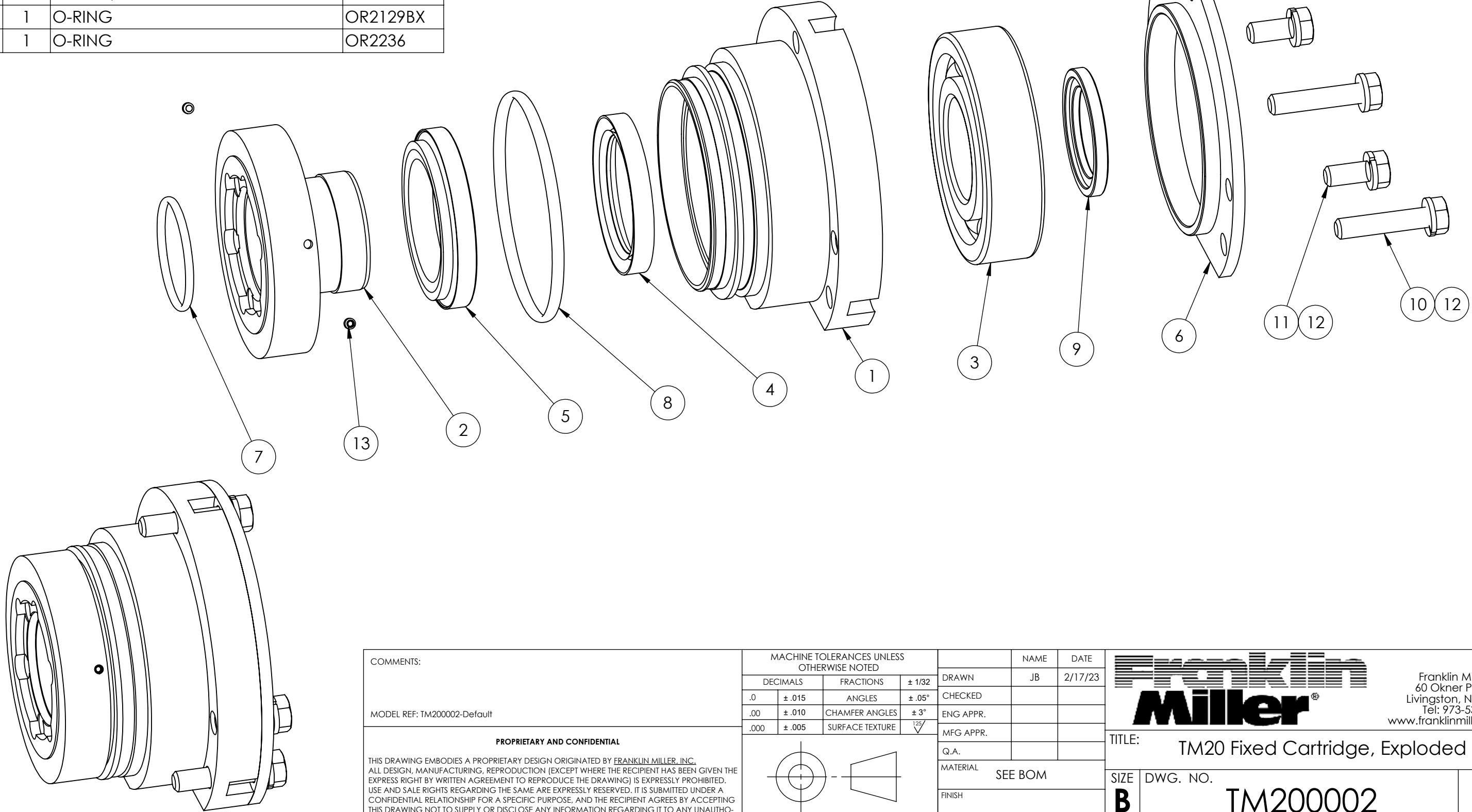
Franklin Miller INC.
60 OKNER PARKWAY, LIVINGSTON, N.J. 07039

M8500 COMMON PARTS

			 FETK in Miller INC. 60 OKNER PARKWAY, LIVINGSTON, N.J. 07039 TM8500 COMMON PARTS					
C	316LSS-BODY		SCALE	DWN	DATE	CKD	DATE	REV 12
-	SEE BOM		1:3	AEW	10/13/00	.	.	
R P/N	MATERIAL	WEIGHT#	DWG NO. TM850000					
THIRD ANGLE PROJECTION 			DIMENSIONS INCH [mm]					

8 7 6 5 4 3 2 1

ITEM NO.	QTY.	DESCRIPTION	PART NUMBER	ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
1	1	STATIONARY SEAL GLAND	TM8549C	9	1	SPACER, BOTTOM CARTRIDGE	TM20074
2	1	ROTARY SEAL GLAND	TM8594C	10	3	SCREW, 5/16-18 X 1 1/2"LG HHCS	HC051824S
3	1	BALL BEARING	BB245616	11	2	SCREW, 5/16-18 X 3/4"LG HHCS	HC051812S
4	1	LIP SEAL	SO293906	12	5	LOCKWASHER, 5/16"	LW05S
5	2	MECHANICAL SEAL	MS284415T	13	2	SET SCREW 8-32 X 1/8 LG	SS#83202
6	1	COVER, BEARING	TM8547 R2				
7	1	O-RING	OR2129BX				
8	1	O-RING	OR2236				



COMMENTS:

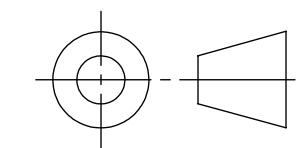
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MACHINE TOLERANCES UNLESS OTHERWISE NOTED

DECIMALS	FRACTIONS	± 1/32
.0	± .015	ANGLES ± .05°
.00	± .010	CHAMFER ANGLES ± 3°
.000	± .005	SURFACE TEXTURE 125/



THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

Franklin Miller

Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039
Tel: 973-535-9200
www.franklinmiller.com

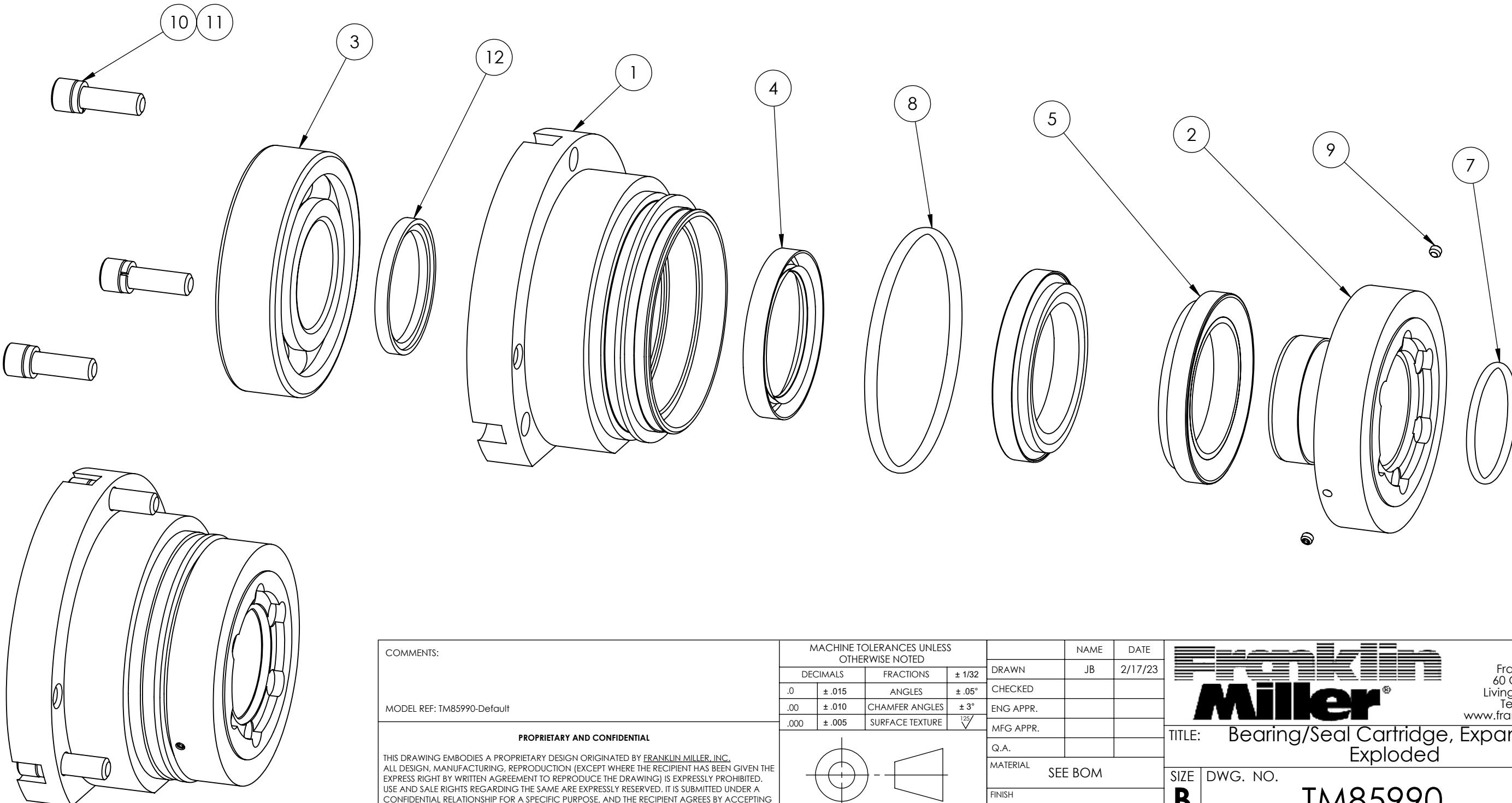
TITLE: TM20 Fixed Cartridge, Exploded

SIZE	DWG. NO.	REV
B	TM200002	1
SCALE: 2:3		WEIGHT:
		SHEET 1 OF 1

8 7 6 5 4 3 2 1

BOM TABLE			
ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
1	1	STATIONARY SEAL GLAND	TM8549C
2	1	ROTARY SEAL GLAND	TM8594C
3	1	BALL BEARING	BB245616
4	1	LIP SEAL	SO293906
5	2	MECHANICAL SEAL	MS284415T
6			

BOM TABLE			
ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
7	1	O-RING	OR2129
8	1	O-RING	OR2236
9	2	SET SCREW 8-32 X 1/8 LG	SS#83202
10	3	LOCKWASHER HI-COLLAR, 5/16	LWH05S
11	3	SOCKET HEAD CAP SCREW 5/16-18NC X 1 LG SS	SC051816S
12	1	SPACER, ROTARY GLAND	TM85484



COMMENTS:
MODEL REF: TM85990-Default

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DECIMALS	FRACTIONS	$\pm .05^\circ$
.0	$\pm .015$	ANGLES
.00	$\pm .010$	CHAMFER ANGLES
.000	$\pm .005$	SURFACE TEXTURE

 DRAWN: JB 2/17/23
 CHECKED: _____
 ENG APPR.: _____
 MFG APPR.: _____
 Q.A.: _____
 MATERIAL: SEE BOM
 FINISH: _____
 THIRD ANGLE PROJECTION
 DO NOT SCALE DRAWING
 SCALE: 2:3 WEIGHT: 7.00 SHEET 1 OF 1

Franklin Miller
Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039
Tel: 973-535-9200
www.franklinmiller.com

TITLE: Bearing/Seal Cartridge, Expansion, Exploded
SIZE DWG. NO. B TM85990 REV 5
SCALE: 2:3 WEIGHT: 7.00 SHEET 1 OF 1

5

Motor Data

BALDOR® • RELIANCE®

Customer information packet

CEM3615T

5HP, 1755RPM, 3PH, 60HZ, 184TC, 3642M, TEFC, F1

Class - None

Division - Not Applicable

Specifications

Enclosure	TEFC
Frame	184TC
Frame Material	Steel
Frequency	60.00 Hz
Haz Area Class and Group	None
Haz Area Division	Not Applicable
Motor Letter Type	Three Phase
Output @ Frequency	5.000 HP @ 60 HZ
Phase	3
Synchronous Speed @ Frequency	1800 RPM @ 60 HZ
Voltage @ Frequency	230.0 V @ 60 HZ 460.0 V @ 60 HZ
Agency Approvals	CSA EEV NEMA PREMIUM NEMA_PREMIUM UR
Ambient Temperature	40 °C
Auxillary Box	No Auxillary Box
Auxillary Box Lead Termination	None
Base Indicator	Rigid
Bearing Grease Type	Polyrex EM (-20F +300F)
Blower	None
Current @ Voltage	6.700 A @ 460.0 V 14.000 A @ 208.0 V 13.400 A @ 230.0 V
Design Code	B
Drip Cover	No Drip Cover
Duty Rating	CONT
Efficiency @ 100% Load	89.5 %
Electrically Isolated Bearing	Not Electrically Isolated
Feedback Device	NO FEEDBACK
Front Shaft Indicator	None

Part detail

Revision	D
Type	AC
Mech. spec.	36A002
Base	
Status	PRD/A
Elec. spec.	36WGQ032
Layout	36LYA002
Eff. date	10-02-2024
CD Diagram	CD0005
Poles	04
Leads	9#16
Proprietary	False
Created date	12-03-2020

Heater Indicator	No Heater
High Voltage Full Load Amps	6.7 a
Insulation Class	F
Inverter Code	Inverter Ready
KVA Code	J
Lifting Lugs	No Lifting Lugs
Locked Bearing Indicator	Locked Bearing
Motor Lead Quantity/Wire Size	9 @ 16 AWG
Motor Lead Termination	Flying Leads
Motor Standards	NEMA
Motor Type	3642M
Mounting Arrangement	F1
Number of Poles	4
Overall Length	18.05 IN
Power Factor	78
Product Family	General Purpose
Pulley End Bearing Type	Ball
Pulley Face Code	C-Face
Pulley Shaft Indicator	Standard
Rodent Screen	None
Service Factor	1.15
Shaft Diameter	1.125 IN
Shaft Ground Indicator	No Shaft Grounding
Shaft Rotation	Reversible
Shaft Slinger Indicator	No Slinger
Speed	1755 rpm
Speed Code	Single Speed
Starting Method	Direct on line
Thermal Device - Bearing	None
Thermal Device - Winding	None
Vibration Sensor Indicator	No Vibration Sensor
Winding Thermal 1	None
Winding Thermal 2	None

Nameplate

NP3441LUA

CAT.NO.	CEM3615T					
SPEC	36A002Q032G1					
HP	5					
VOLTS	230/460					
AMPS	13.4/6.7					
RPM	1755					
FRAME	184TC	HZ	60	PH	3	
SF	1.15	CODE	J	DES	B	CLASS
NEMA NOM. EFF	89.5	PF	78			F
RATING	40C AMB-CONT					
CC	010A					
ENCL	TEFC	SER				
DE	6206	ODE	6205			

VPWM INVERTER READY**CT6-60H(10:1)VT3-60H(20:1)**

50HZ 5HP 190/380V 15.6/7.8A

SF1.0

AC Induction Motor Performance Data

Record # 89917

Typical performance - not guaranteed values

Winding: 36WGQ032-R001**Type:** 3642M**Enclosure:** TEFC**Nameplate Data**

Rated Output (HP)	5
Volts	230/460
Full Load Amps	13.4/6.7
R.P.M.	1755
Hz	60 Phase
NEMA Design Code	B KVA Code
Service Factor (S.F.)	1.15
NEMA Nom. Eff.	89.5 Power Factor
Rating - Duty	40C AMB-CONT
S.F. Amps	

**460 V, 60 Hz:
High Voltage Connection**

Full Load Torque	15 LB-FT
Start Configuration	direct on line
Breakdown Torque	53.1 LB-FT
Pull-up Torque	23.4 LB-FT
Locked-rotor Torque	34.7 LB-FT
Starting Current	49.8 A
No-load Current	3.31 A
Line-line Res. @ 25°C	2.4 Ω
Temp. Rise @ Rated Load	71°C
Temp. Rise @ S.F. Load	86°C
Locked-rotor Power Factor	40.6635
Rotor inertia	0.391 lb-ft²

Load Characteristics 460 V, 60 Hz, 5 HP

% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor	38	60	72	79	82	84	81
Efficiency	83.8	88.9	89.8	89.5	88.4	86.8	88.8
Speed	1789	1778	1766	1753	1738	1722	1744
Line amperes	3.64	4.39	5.45	6.66	8.08	9.67	7.51

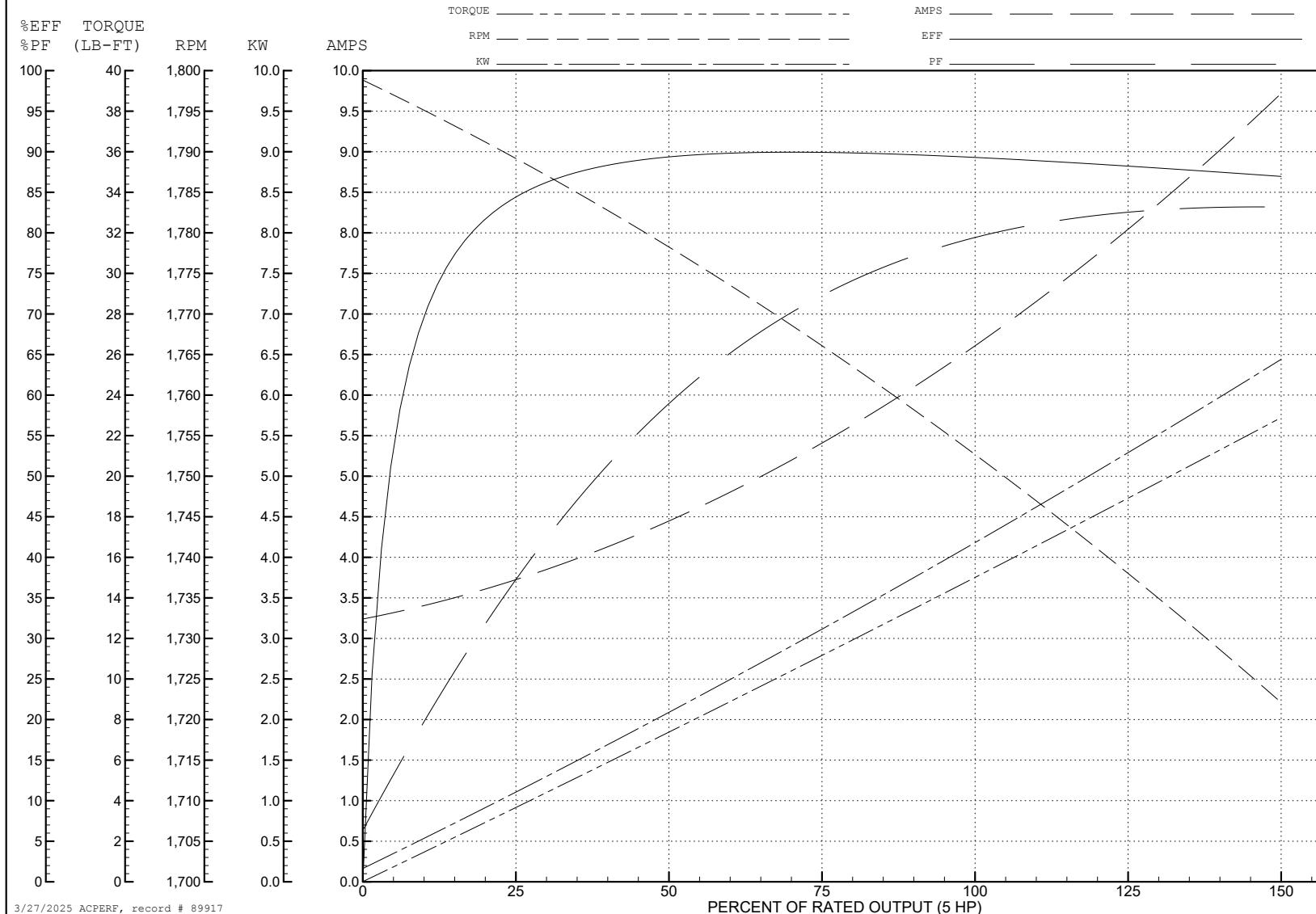
ABB Motors and Mechanical Inc.

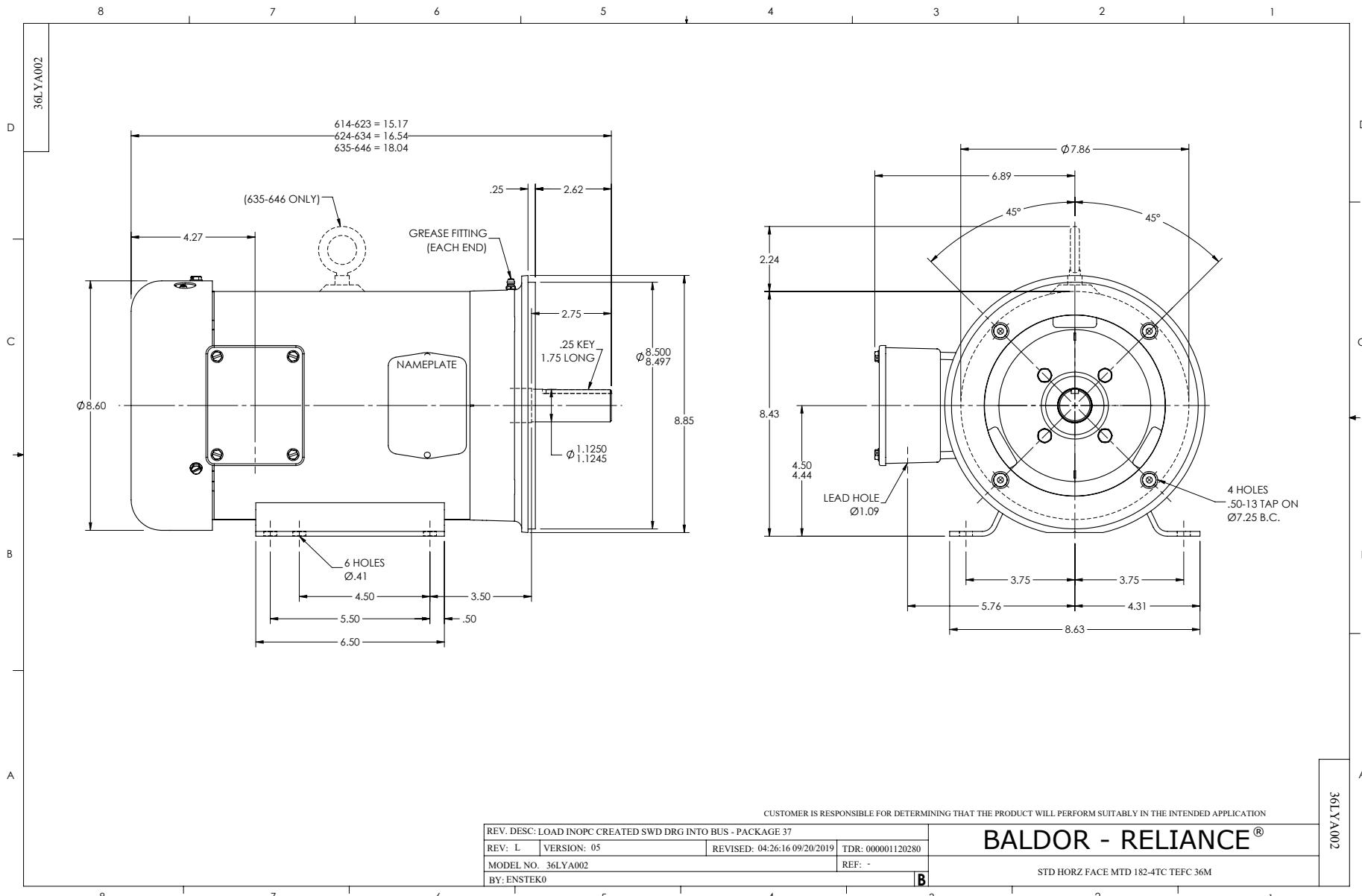
WINDING # 36WGQ032

Typical performance - not guaranteed values.

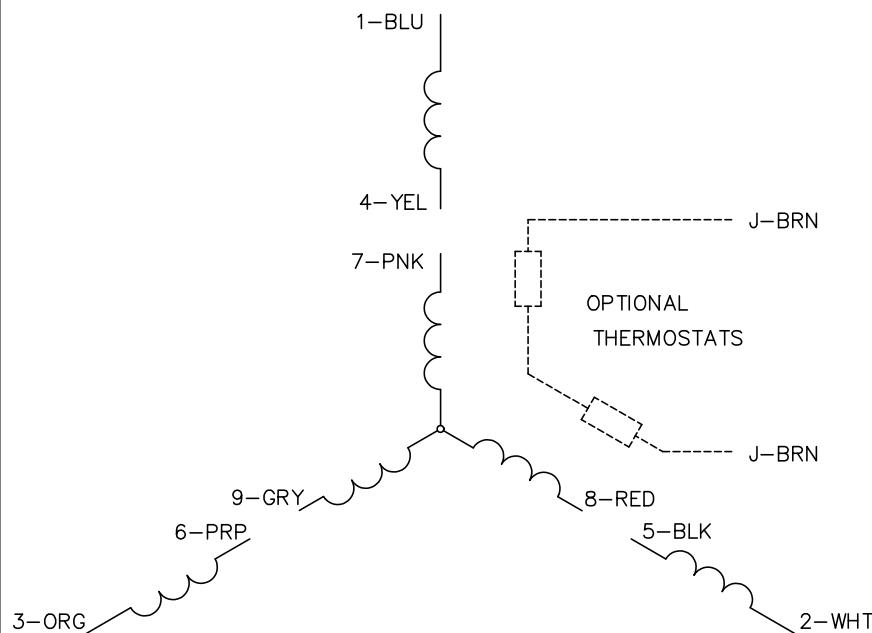
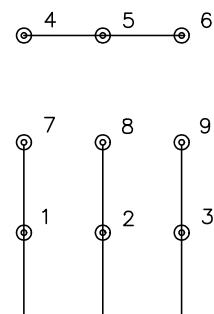
5 HP 3 PH 60 HZ 1755 RPM 460 V 3642M

TORQUES (LB-FT): PO=53.1 PU=23.4 LR=34.7 LRA=49.8

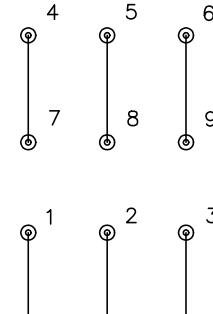




CD0005

LOW VOLTAGE
(2Y)

LINE

HIGH VOLTAGE
(1Y)

LINE

NOTES:

1. INTERCHANGE ANY TWO LINE LEADS TO REVERSE ROTATION.
2. OPTIONAL THERMOSTATS ARE PROVIDED WHEN SPECIFIED.
3. ACTUAL NUMBER OF INTERNAL PARALLEL CIRCUITS MAY BE A MULTIPLE OF THOSE SHOWN ABOVE.
4. LEAD COLORS ARE OPTIONAL. LEADS MUST ALWAYS BE NUMBERED AS SHOWN.

REV. DESC: REVISE TO SHOW OPTIONAL COLORS

REV. LTR: E BY: JLP REVISED: 01/19/99 10:15 TDR: 0171435

CD0005

BALDOR ELECTRIC Co.

FILE: AAA00005140

MDL: -

MTL: -

3PH, DV, 9 LEADS

CD0005

6

Reducer Data

Cyclo® 6000 Speed Reducers



Superior design, powerful performance

- Cyclo® 6000 boasts an expanded range of standard sizes and ratings. Use this chart to select a new Cyclo® 6000 when replacing Cyclo® series 3000 and 4000 models.

CYCLO® Frame Size Cross Reference

OLD 3000	4000	NEW 6000
3075	4075	6060
3085	4085	6065
		6070
		6075
		6080
		6085
3090	4090	6090
3095	4095	6095
3097	4097	6095
3100	4100	6100
3105	4105	6105
310H	410H	610H
		6110
		6115
3110	4110	6120
3115	4115	6125
311H	4125	612H
3140	4130	6130
3145	4135	6135
		6140
3155	4145	6145
315H	415H	614H
3160	4165	6165
3165	416H	616H
316H	4170	6170
3170	4175	6175
3175	4180	6180
3180	4170	6170
3185	4185	6185
3190	4190	6190
3195	4195	6195
3205	4205	6205
3215	4215	6215
3225	4225	6225
3235	4235	6235
3245	4245	6245
3255	4255	6255
3265	4265	6265
3275	4275	6275



- The Cyclo® 6000 is also available as an inline Gearmotor

To request a catalog, or for more information on any of our high quality products, please visit our Website:



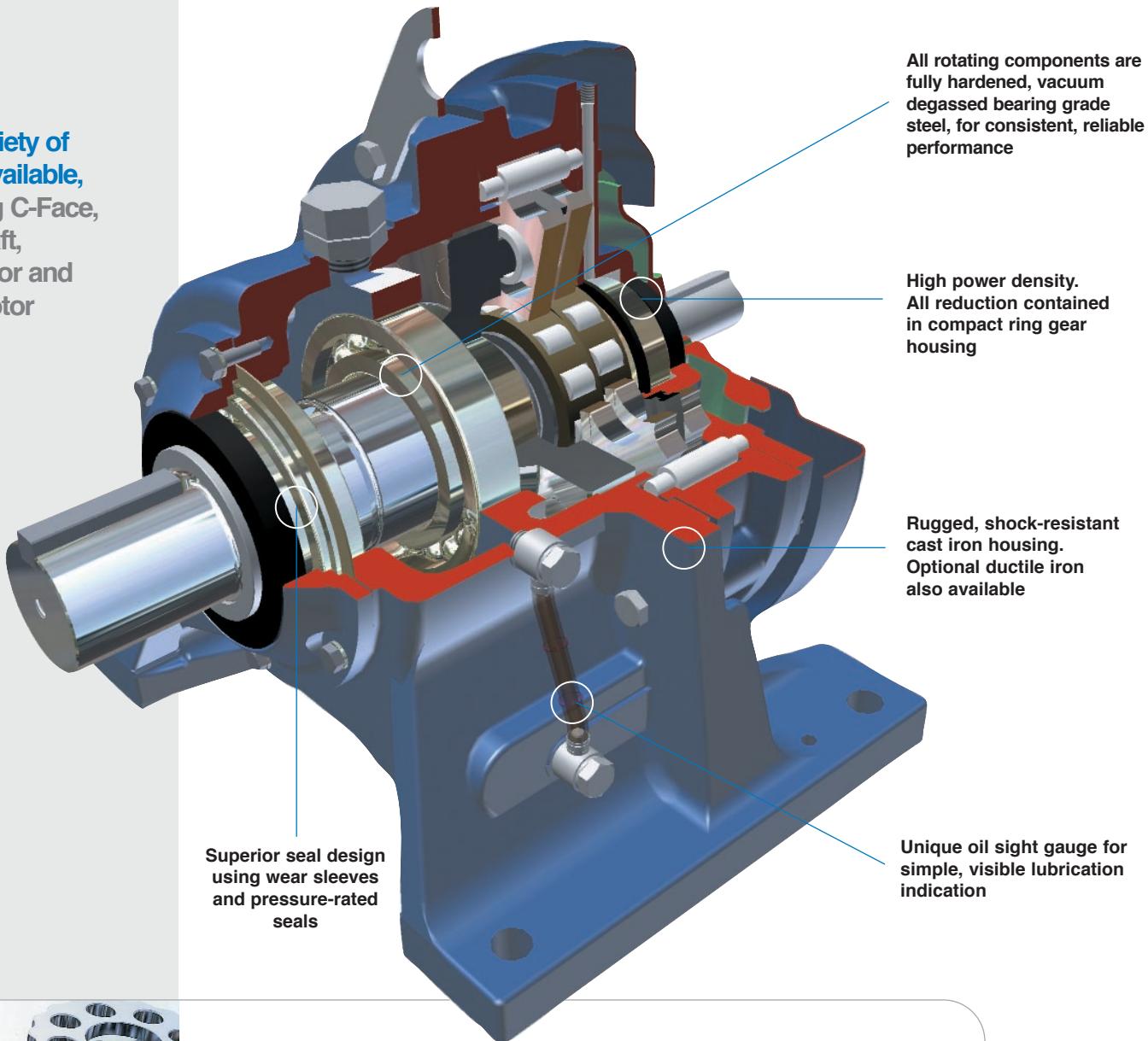
www.smcylo.com



Cyclo® 6000

High Torque Density, High Reliability Cycloidal Speed Reducers

- Wide variety of inputs available, including C-Face, Free-Shaft, Gearmotor and Brakemotor



Unmatched Reliability, Exceptional Performance

- Cyclo® speed reducers and gearmotors are designed to withstand shock loads exceeding 500% of their ratings



► Sumitomo's Cyclo® 6000 is extremely torque dense and is available as an inline speed reducer or gearmotor

Product Description

The Sumitomo Cyclo® drive is **unsurpassed by any other inline drive** available in the market today. Cyclo®'s unique **epicyclic-dial design** has advantages superior to speed reducers using common involute tooth gears. Cyclo® components operate in compression, not in shear. Unlike gear teeth with limited contact points, a Cyclo® has two thirds of its reduction components in contact at all times. Cyclo® speed reducers and gearmotors are **designed to withstand shock loads exceeding 500%** of their ratings, and provide exceptional performance, reliability and long life in the most severe applications.

Features & Benefits

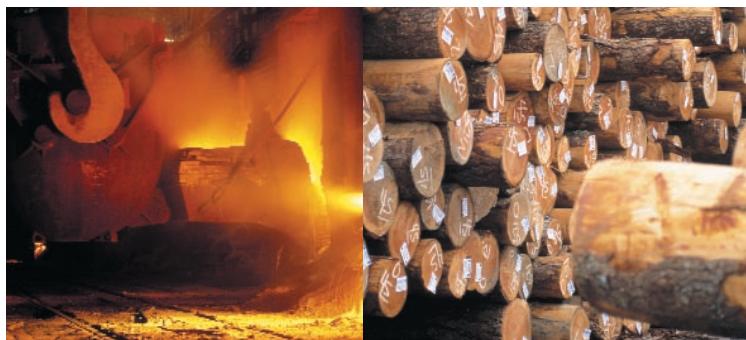
- **Highest overload capacity**, exceeding 500%
- **Exceptional life** with a 24 month warranty
- **High efficiency**, even at high reduction ratios
- **Remarkably versatile**, and available as inline speed reducer or gearmotor
- Ideal for **severe, high shock** applications
- Optional grease lubrication for **no maintenance**

Specifications

Sizes:	23 models (5 lbs to 5000 lbs)
Torque Rating:	210 to 603,000 lb in
HP Rating:	.10 to 232 HP
Ratio Range:	3 to 119 (single), 121 to 7569 (double), 8041 to 658,503 (triple)
Mounting:	Foot, Flange, Face Mount
Motor Standards:	NEMA, IEC, JIS, UL, CSA, CE



- **Simple, Compact Design**
- **Rugged Forged Output Shaft**
- **Many Mounting Styles**
- **C-Face, Shovel Base & Top Mount Options**



► Applications

- Conveyors
- Food Machinery
- Mixers
- Automotive Plants
- Recycling Machines
- Poultry Plants
- Sawmills and Wood Mills
- Wastewater Treatment
- Steel Mills
- Construction Equipment
- Paper Mills
- Processing Plants

FAQs

How do I select a Cyclo speed reducer or gearmotor?

Selection is based on the actual horsepower and/or torque requirements at the output shaft. The Cyclo speed reducer has particularly high efficiencies over a wide range of reduction ratios, which frequently permits the use of reduced input power requirements (smaller HP motor) without sacrificing output shaft torque. The selection procedures in this catalog will guide you in choosing the most efficient reducer for your application.

What information do I need to get started in the selection process?

To select the proper reducer for your application, you will need to know:

- Application: type of driven machine
- Hours of operation per day
- Motor horsepower (HP) and speed (RPM)
- Mounting position

If there are any special environmental factors or operation requirements, they must also be noted. This information will be important in determining the Service Factor of your application.

What are Service Factors and how are they used?

In general, reducers and gearmotors are rated for the specific conditions and operating requirements of the application by the use of AGMA-defined Service Factors. There are three AGMA load classifications for reducers: uniform (U), moderate shock (M) and heavy shock (H) (page 2.3) The Service Factors are used in the product selection process to adjust for the specific conditions and operating requirements of your application.

What do I do if my application has particularly severe operating conditions?

The standard ratings for Cyclo are based on 10-hour daily service under conditions of uniform loads (equivalent to AGMA service factor 1.0). By following the product selection process, you will determine and apply the Service Factors to compensate for the severe operating conditions.

How can I be sure that the reducer can withstand periodic excessive overloads?

Cyclo Speed Reducers provide 500% momentary intermittent shock load capacity. For applications with shock loads greater than 500%, consult an SMA Application Engineer.

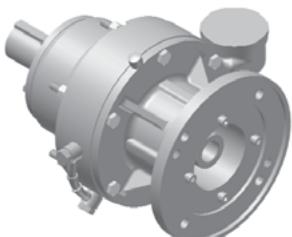
What are the standard input speeds?

In general terms, the speeds are 1750 and 1165 RPM. The selection tables in this catalog are based on 1750, 1165, 870, 580, and 50 RPM. When non-standard input speeds are used, the horsepower and torque ratings also vary.

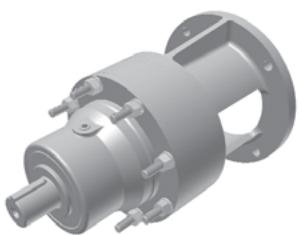
What thermal capacity limitations does the Cyclo have?

The Cyclo speed reducer, by virtue of its smooth, almost frictionless operation (unlike traditional helical gears), has a thermal rating that far exceeds its mechanical capacity and all but eliminates the conventional limitations due to heat.

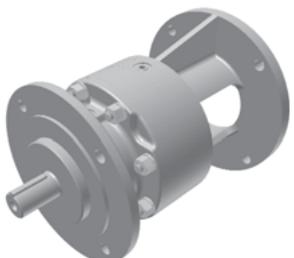
Common Configurations



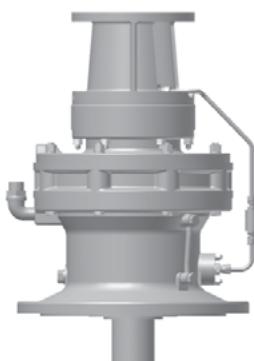
Single Reduction,
Horizontal Flange Mount
with Hollow Shaft Input



Single Reduction, Flange Mount
with C-Face Adapter



Single Reduction, V-Flange Mount
with C-Face Adapter



Double Reduction with
C-Face Adapter

Standard Specifications

Reducer	Reduction:	Internal planetary gear mechanism with trochoidal curved tooth profile.
	Lubrication:	Grease or oil lubricated models available.
	Seals:	Nitrile material, dual lipped, double output seals available.
	Material:	Rugged cast iron or ductile housings.
	Paint Color:	Blue, Muenter's color number 6.5PB 3.6/8.2

Ambient Conditions	Installation Location:	Indoors or Outdoors
	Ambient Temperature:	14°~104° F (-10° ~ 40° C)
	Ambient Humidity:	Under 85%
	Elevation:	Under 3,281 ft. (1000 meters)
	Atmosphere:	Well ventilated location, free of corrosive gases, explosive gases, vapors and dust.

Shaft Rotation

On single reduction Cyclo® speed reducers, ratios 3 through 119, the slow speed shaft rotates in a reverse direction to that of the high speed shaft.

On double reduction units, ratios 104 through 7569, both the high speed and the slow speed shaft rotate in the same direction.

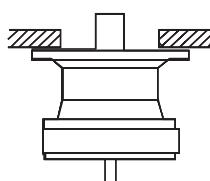
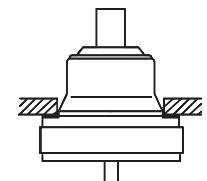
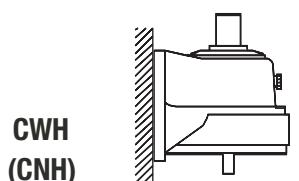
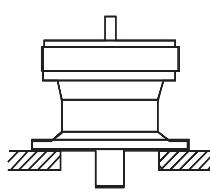
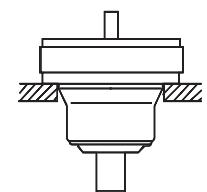
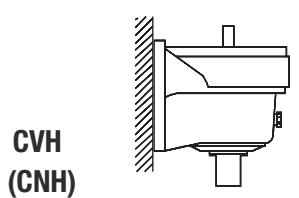
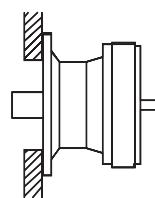
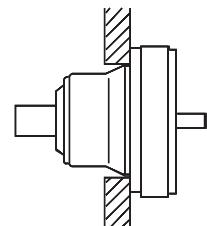
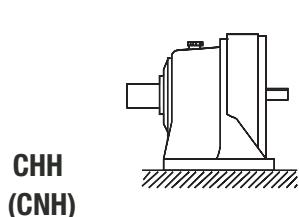
Input Speeds

In general terms, the standard input speeds of single reduction units are 1750, 1165, 875, 580, and 50 RPM. When non-standard input speeds are used, the horsepower and torque ratings will also vary.

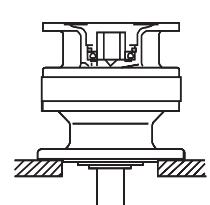
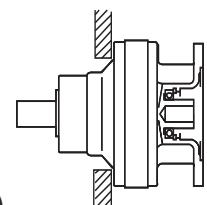
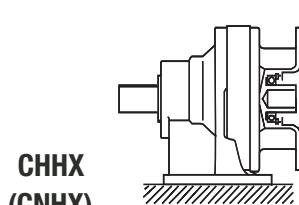
Thermal Capacity

The Cyclo® speed reducer's smooth, almost frictionless operation all but eliminates the conventional limitations due to heat. In all sizes, Cyclo® speed reducers have thermal ratings that exceed their mechanical capacity.

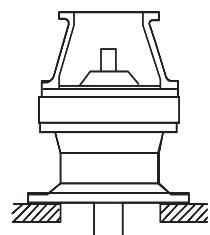
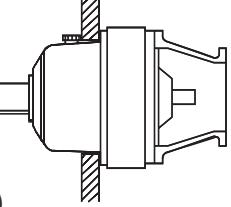
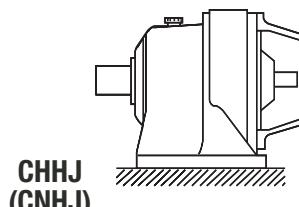
Housing Styles & Mounting Positions



Input Side Hollow Shaft



With Adaptor



Mounting
Positions

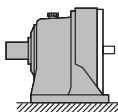
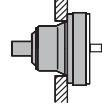
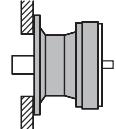
Configure a Model Number

Output Shaft Orientation

Type	Prefix
Horizontal	H
Vertical	V
Vertical Up (Solid Shaft)	W
Universal Direction	N

**H****V****W****Housing Style**

Type	Prefix
Foot	H
Flange	F
V-Flange	V

**H**
Foot**F**
Flange**V**
V Flange**Input Connection**

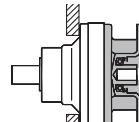
Input Connection	Prefix
None	-
C-Face Adaptor	J
Hollow Input Shaft	X

**No Symbol**

Reducers

**J**

With Adapter

**X**

Hollow Shaft

Modification (Special)

	Prefix
Special	S
Standard	-

Frame Size (from Selection Tables)

C H H - **6 1 1 5**

Input connection
Mounting style
Output shaft orientation

Frame size

Y - **29**

Modification (Special feature)
Ratio

Shaft specification

Shaft Specifications

Input Shaft	Suffix
Inch	Y
DIN	G
Metric DIN	-

Cyclo Speed Reducer product code (always "C")

The Service Factor table below presents both AGMA standard service factors and Cyclo® service factors. Cyclo® service factors are smaller than AGMA, based on the Cyclo® strength and performance experience.

If your application requires AGMA specified service factors, then the AGMA value should be used. Otherwise, the Cyclo® service factor should be used.

Service Factors

Prime Mover	Service Duration	Load Classifications					
		Uniform		Moderate Shock		Heavy Shock	
		AGMA	Cyclo®	AGMA	Cyclo®	AGMA	Cyclo®
Electric Motor	1/2 hr. per day (Occasional)	0.50	0.50	0.80	0.80	1.25	1.20
	3 hrs. per day (Intermittent)	0.80	0.80	1.00	1.00	1.50	1.35
	Up to 10 hrs. per day	1.00	1.00	1.25	1.20	1.75	1.50
	24 hrs. per day	1.25	1.20	1.50	1.35	2.00	1.60
Multi Cylinder Internal Combustion Engine	1/2 hr. per day (Occasional)	0.80	0.80	1.00	1.00	1.50	1.35
	3 hrs. per day (Intermittent)	1.00	1.00	1.25	1.20	1.75	1.50
	Up to 10 hrs. per day	1.25	1.20	1.50	1.35	2.00	1.60
	24 hrs. per day	1.50	1.35	1.75	1.50	2.25	1.70
Single Cylinder Internal Combustion Engine	1/2 hr. per day (Occasional)	1.00	1.00	1.25	1.20	1.75	1.50
	3 hrs. per day (Intermittent)	1.25	1.20	1.50	1.35	2.00	1.60
	Up to 10 hrs. per day	1.50	1.35	1.75	1.50	2.25	1.70
	24 hrs. per day	1.75	1.50	2.00	1.60	2.50	1.80

How to Select

Determine Selection Horsepower (HP)

Motor HP X Service Factor = Selection HP
--

Example: 10 Motor HP X 1.25 Service Factor = 12.5 Selection HP

Select a Frame Size

1 Match your OUTPUT RPM (or RATIO)...

Output RPM Ratio	583	350	292	219	159	135	117	103	83.3	FRAME SIZE
Input HP	20.2	20.2	20.3	20.3	20.3	20.3	20.3	16.1	14.8	6145
Output Torque in-lbs	2081	3469	5560	7650	9030	10300	9370	10500	10500	614H
Overhung Load (lbs)	1554	1843	2170	2430	2470	2580	2710	2890	2890	
Input HP	27.2	27.2	26.4	26.4	26.4	25.1	17.6	17.3	17.3	6160
Output Torque in-lbs	2798	4654	7230	9900	11800	12900	10200	12400	12400	
Overhung Load (lbs)	1702	2019	2090	2360	2400	2510	2640	2850	2850	
Input HP	32.3	32.3	26.4	26.4	26.4	25.1	17.6	17.3	17.3	6165
Output Torque in-lbs	3322	5530	7230	9900	11800	12900	10200	12400	12400	616H
Overhung Load (lbs)	1686	1998	2090	2360	2400	2510	2640	2850	2850	
Input HP	37.0	37.0	37.0	47.2	47.2	43.5	41.1	40.3	40.3	6170
Output Torque in-lbs	3798	6335	7230	9900	11800	12900	10200	12400	12400	
Overhung Load (lbs)	1906	2261	2400	2620	3020	3130	3240	3440	3680	
Input HP	40.4	40.4	40.4	47.2	47.2	43.5	41.1	40.3	40.3	6175
Output Torque in-lbs	4141	6914	8290	10800	12100	12300	12800	12900	12900	
Overhung Load (lbs)	1906	2261	2400	2620	3020	3130	3240	3440	3680	
Input HP	-	-	-	47.2	47.2	43.5	41.1	40.3	40.3	6180
Output Torque in-lbs	-	-	-	17800	21000	22300	23800	24900	24900	
Overhung Load (lbs)	-	-	-	4030	4210	4430	4670	5030	5030	
Input HP	-	-	-	52.3	52.3	52.3	52.3	52.3	52.3	6185
Output Torque in-lbs	-	-	-	19600	22300	26800	30500	37600	37600	

2 ...to your SELECTION HP...

3 ...to find your FRAME SIZE

If Overhung or Axial Load are present, any Overhung or Axial Load must be checked against the capacity of the selection.

For special circumstances in selecting a **Frame Size** such as:

- Overhung Load
- Axial Loads
- Shock Loading

Consult Technical Information, pages 5.6–5.13.

Nomenclature

Example

CNV – 6125Y – 29

C – Cyclo 6000
N – Universal
V – V-Flange

6125 – Frame Sizen
Y – Inch Shaft
29 – Ratio

Nomenclature

Ratio

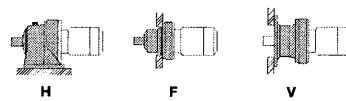
Ratio is found here in Selection Tables

Output RPM Ratio	540	360	210	219	108	135	117	100	83.3	FRAME SIZE
	3	5	6	8	11	13	15	17	21	
Input HP	20.2	20.2	20.3	20.3	20.3	20.3	20.3	18.1	18.1	
Output Torque in-lbs	3469	4179	5086	7000	9030	10000	10371	10500	10500	
Overhung Load (lb)	1044	1843	1965	2170	2430	2470	2500	2710	2860	
Input HP	27.2	27.2	27.2	26.4	26.4	26.4	25.1	17.6	17.6	
Output Torque in-lbs	4814	5580	7230	9900	11800	12900	13290	12400	12400	
Overhung Load (lb)	1702	2018	2150	2400	2890	2890	3000	3150	3250	
Input HP	32.3	32.3	32.3	32.3	36.3	36.3	35.2	21.6	21.6	
Output Torque in-lbs	5322	6100	6860	12200	13600	15000	14700	15500	15500	
Overhung Load (lb)	1486	1986	2130	2360	2470	2790	2950	3060	3210	
Input HP	37.8	37.8	37.8	37.8	37.8	36.8	34.2	26.4	26.2	
Output Torque in-lbs	6326	7600	10100	13900	16300	17500	15300	18700	18700	
Overhung Load (lb)	1906	2281	2400	2950	3040	3100	3290	3460	3750	
Input HP	40.4	40.4	40.4	40.4	40.4	40.4	32.3	22.3	22.3	
Output Torque in-lbs	6141	6914	8290	11000	15200	18000	20700	18700	23200	
Overhung Load (lb)	1806	2381	2400	2620	3020	3130	3290	3440	3880	
Input HP	-	-	-	-	47.2	47.2	43.5	41.1	40.2	
Output Torque in-lbs	-	-	-	-	17800	21000	23200	23800	28900	
Overhung Load (lb)	-	-	-	-	4000	4210	4420	4670	5030	
Input HP	-	-	-	-	52.3	52.3	52.3	52.3	52.3	

Nominal
Total Ratio

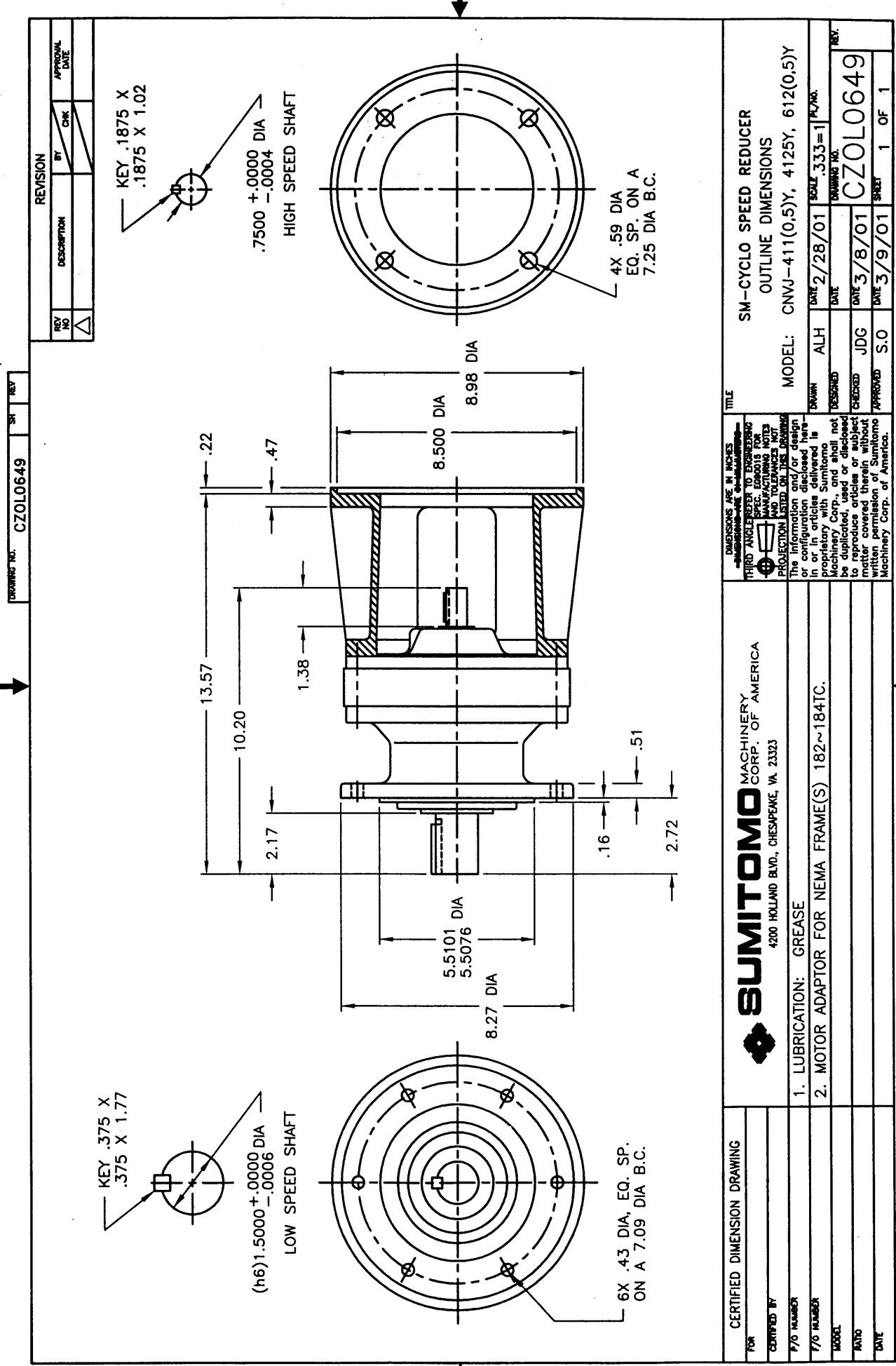
1750 RPM Frame Size Selection Tables

Dimensions:		Pages
Foot Mount (H)		4.2–4.15
F-Flange (F)		4.30–4.38
V-Flange (V)		4.48–4.64

Single Reduction, Ratios 25-119
H, F, V Housing Styles

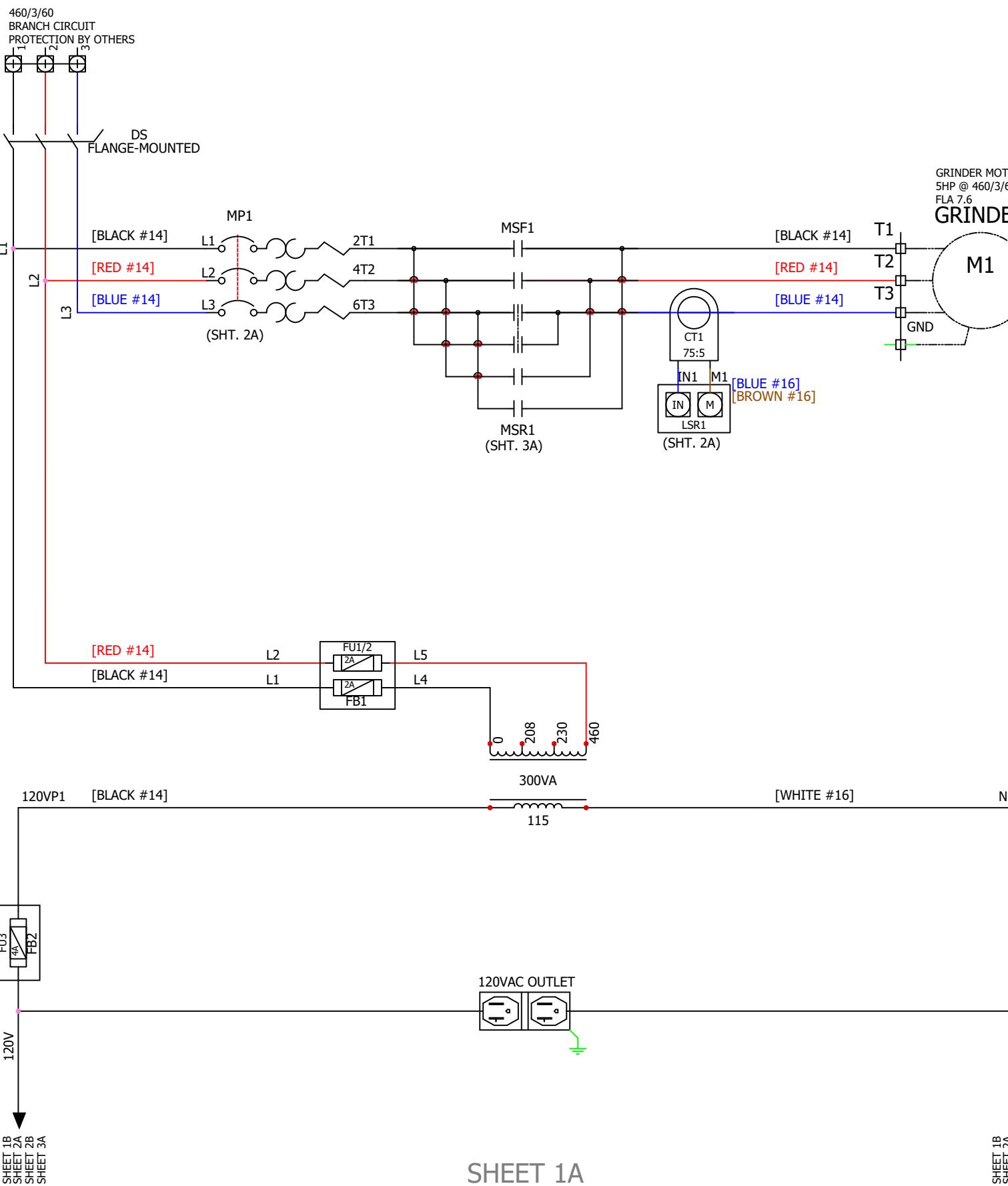
Output RPM Ratio	70.0	60.3	50.0	40.7	34.3	29.7	24.6	20.1	14.7	FRAME SIZE
25		29		35	43	51	59	71	87	119
Input HP	0.15	0.15	0.15	0.12	-	-	-	-	-	
Output Torque (in•lbs)	127	146	177	178	-	-	-	-	-	
Overhung Load (lbs)	265	265	265	265	-	-	-	-	-	6060
Input HP	0.22	0.22	0.19	0.15	-	-	-	-	-	
Output Torque in•lbs	190	220	230	223	-	-	-	-	-	
Overhung Load (lbs)	265	265	265	265	-	-	-	-	-	6065
Input HP	0.31	0.30	0.28	0.23	0.13	0.13	-	-	-	
Output Torque in•lbs	264	301	339	334	233	271	-	-	-	
Overhung Load (lbs)	397	397	397	397	397	397	-	-	-	6070
Input HP	0.40	0.38	0.37	0.30	0.19	0.18	-	-	-	
Output Torque in•lbs	337	380	448	446	335	367	-	-	-	
Overhung Load (lbs)	397	397	397	397	397	397	-	-	-	6075
Input HP	0.46	0.46	0.44	0.34	0.26	0.25	0.16	0.12	-	
Output Torque in•lbs	391	452	527	493	450	500	391	359	-	
Overhung Load (lbs)	569	575	575	575	575	575	575	575	-	6080
Input HP	0.64	0.63	0.49	0.40	0.32	0.31	0.25	0.16	-	
Output Torque in•lbs	544	621	595	580	563	632	609	484	-	
Overhung Load (lbs)	562	573	575	575	575	575	571	575	-	6085
Input HP	0.90	0.84	0.82	0.58	0.45	0.42	0.34	0.28	0.17	
Output Torque in•lbs	769	832	981	858	776	836	819	843	682	
Overhung Load (lbs)	750	750	750	750	750	750	750	750	750	6090
Input HP	1.16	1.05	1.02	0.81	0.57	0.50	0.40	0.40	0.20	
Output Torque in•lbs	990	1040	1220	1190	990	1010	981	1210	823	
Overhung Load (lbs)	750	750	745	750	750	750	750	750	750	6095
Input HP	1.70	1.62	1.31	1.05	0.75	0.69	0.59	0.58	0.28	
Output Torque in•lbs	1460	1610	1560	1540	1310	1400	1410	1730	1150	
Overhung Load (lbs)	1210	1210	1210	1210	1210	1210	1210	1210	1210	6100
Input HP	2.24	2.13	1.61	1.45	1.04	0.95	0.75	0.76	0.38	
Output Torque in•lbs	1920	2120	1920	2140	1810	1920	1830	2260	1560	
Overhung Load (lbs)	1210	1210	1210	1210	1210	1210	1210	1210	1210	6105
Input HP	2.56	2.55	2.01	1.74	1.27	1.15	0.90	0.89	-	
Output Torque in•lbs	2200	2530	2410	2570	2200	2330	2180	2640	-	
Overhung Load (lbs)	1500	1540	1650	1710	1710	1710	1710	1710	-	6110
Input HP	2.98	2.98	2.43	2.04	1.49	1.36	1.02	1.02	-	
Output Torque in•lbs	2550	2950	2900	2990	2600	2730	2470	3030	-	
Overhung Load (lbs)	1490	1530	1640	1710	1710	1710	1710	1710	-	6115
Input HP	4.15	4.01	3.34	2.56	2.31	1.74	1.28	1.27	-	
Output Torque in•lbs	3540	3980	4010	3780	4020	3530	3120	3770	-	
Overhung Load (lbs)	1790	1860	1980	2120	2200	2200	2200	2200	-	6120
Input HP	5.32	5.06	4.27	3.19	3.06	2.17	1.61	1.52	-	
Output Torque in•lbs	4540	5010	5100	4700	5330	4380	3910	4510	-	
Overhung Load (lbs)	1770	1840	1950	2100	2190	2200	2200	2200	-	6125
Input HP	6.93	6.01	4.98	4.01	3.41	2.94	2.46	1.91	-	
Output Torque in•lbs	5920	5960	5950	5910	5950	5920	5960	5660	-	
Overhung Load (lbs)	2050	2160	2290	2470	2580	2710	2890	3130	-	6130
Input HP	7.99	7.57	5.70	5.06	3.93	3.38	2.91	2.56	-	
Output Torque in•lbs	6820	7500	6820	7430	6860	6830	7070	7620	-	
Overhung Load (lbs)	2030	2130	2270	2430	2560	2690	2870	3110	-	6135
Input HP	9.25	7.99	6.99	5.29	4.60	3.97	3.26	2.66	-	
Output Torque in•lbs	7900	7920	8360	7780	8020	8010	7920	7900	-	
Overhung Load (lbs)	3090	3150	3400	3550	3590	3590	3590	3590	-	6140

Speed Reducers
Selection Tables



7

Electrical



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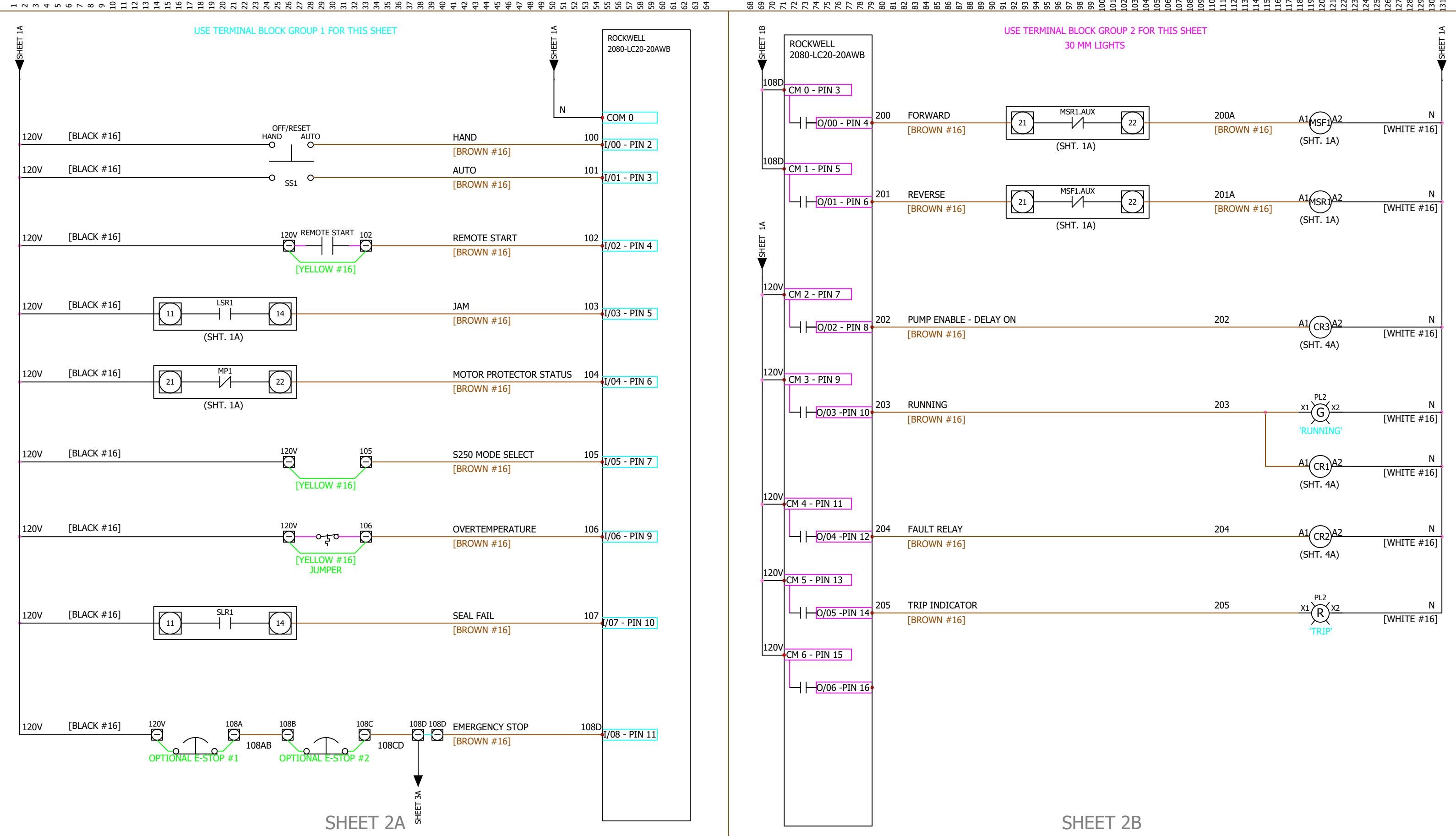
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* WIRE SIZE SHALL BE 16 AWG OR MAXIMUM ALLOWED AS RATED BY
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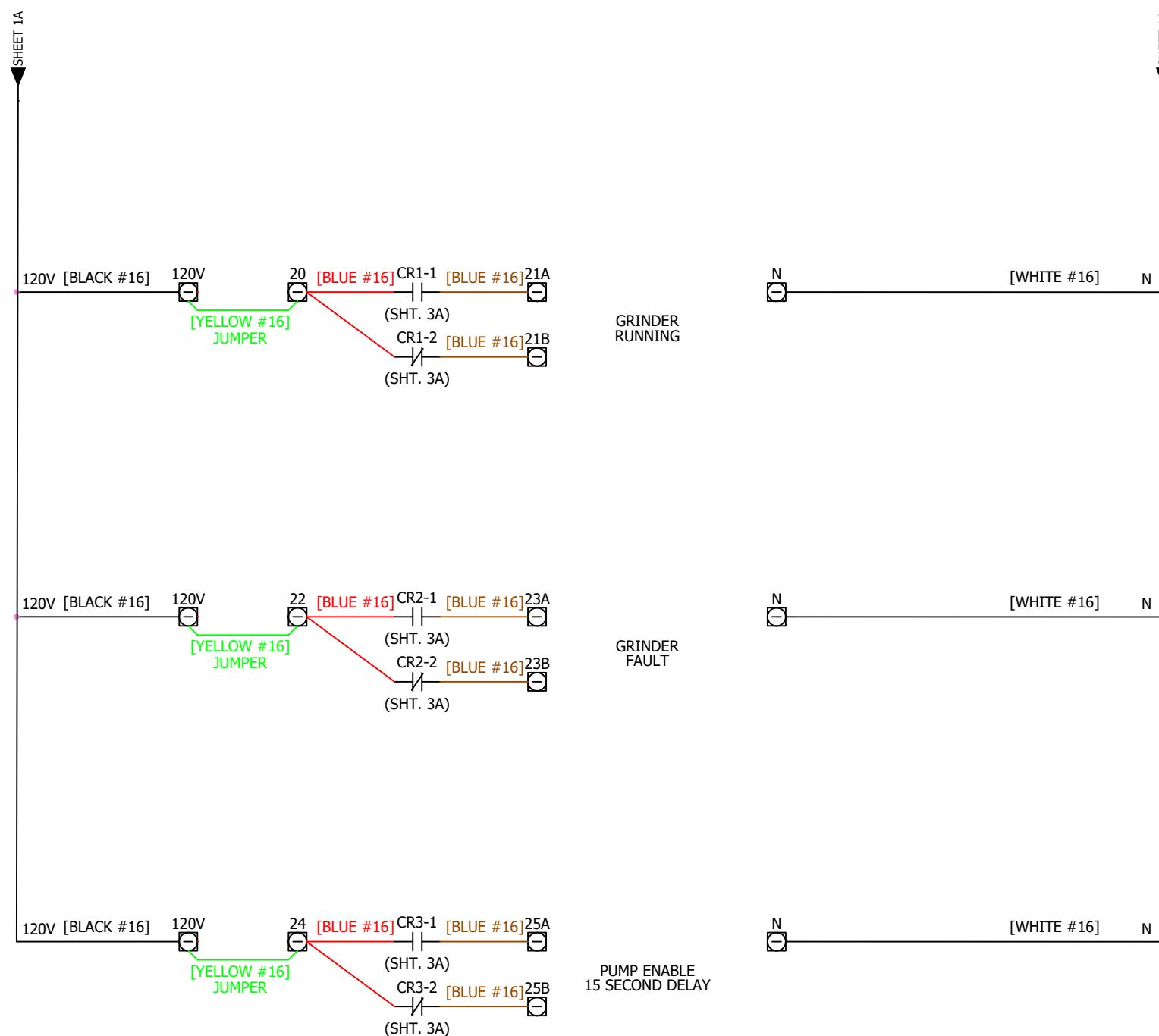
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-	IDS	2025-02-03		REV 0		



WIRE TYPE	SIZE*	COLOR	WIRE TYPE	SIZE*	COLOR
POWER	AS REQUIRED	BLACK	24 VDC	16 AWG	BLUE
120V CONTROL	16 AWG	RED	12 VDC	16 AWG	PURPLE
120V NEUTRAL	16 AWG	WHITE	EXT. POWER	16 AWG	YELLOW
24 VAC	16 AWG	ORANGE	SHIELDED	18 AWG	MULTI
LOW VAC	16 AWG	BROWN	GROUND	16 AWG	GREEN

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POWER	AS REQUIRED	BLACK	24 VDC	16 AWG	BLUE	
120V CONTROL	16 AWG	RED	12 VDC	16 AWG	PURPLE	
120V NEUTRAL	16 AWG	WHITE	EXT. POWER	16 AWG	YELLOW	
24 VAC	16 AWG	ORANGE	SHIELDED	18 AWG	MULTI	

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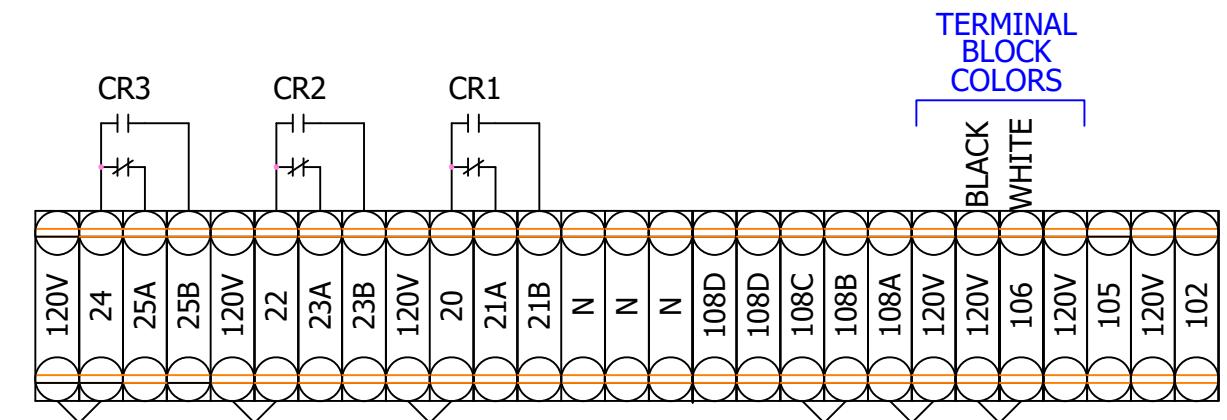
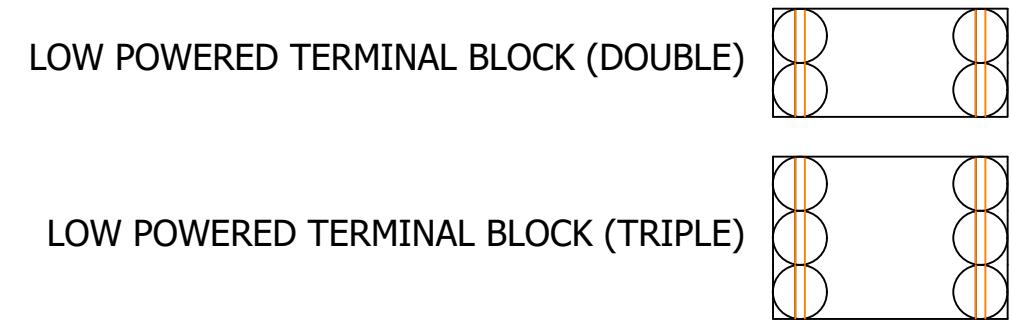
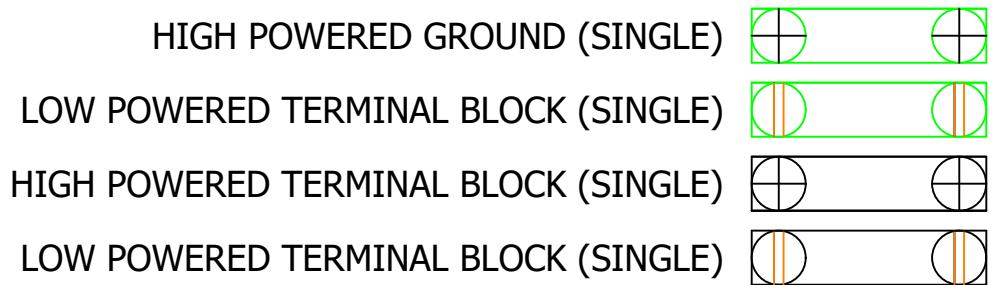
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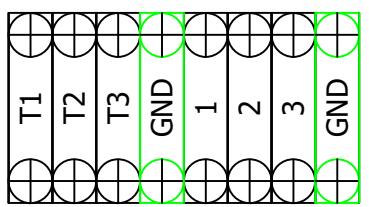
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PUMP ENABLE DELAY
GRINDER FAULT
GRINDER RUNNING

OPTIONAL E-STOP #2
OPTIONAL E-STOP #1
OVERTEMPERATURE
S250/S260 MODE SELECTION
REMOTE START



POWER IN
GRINDER #1 POWER

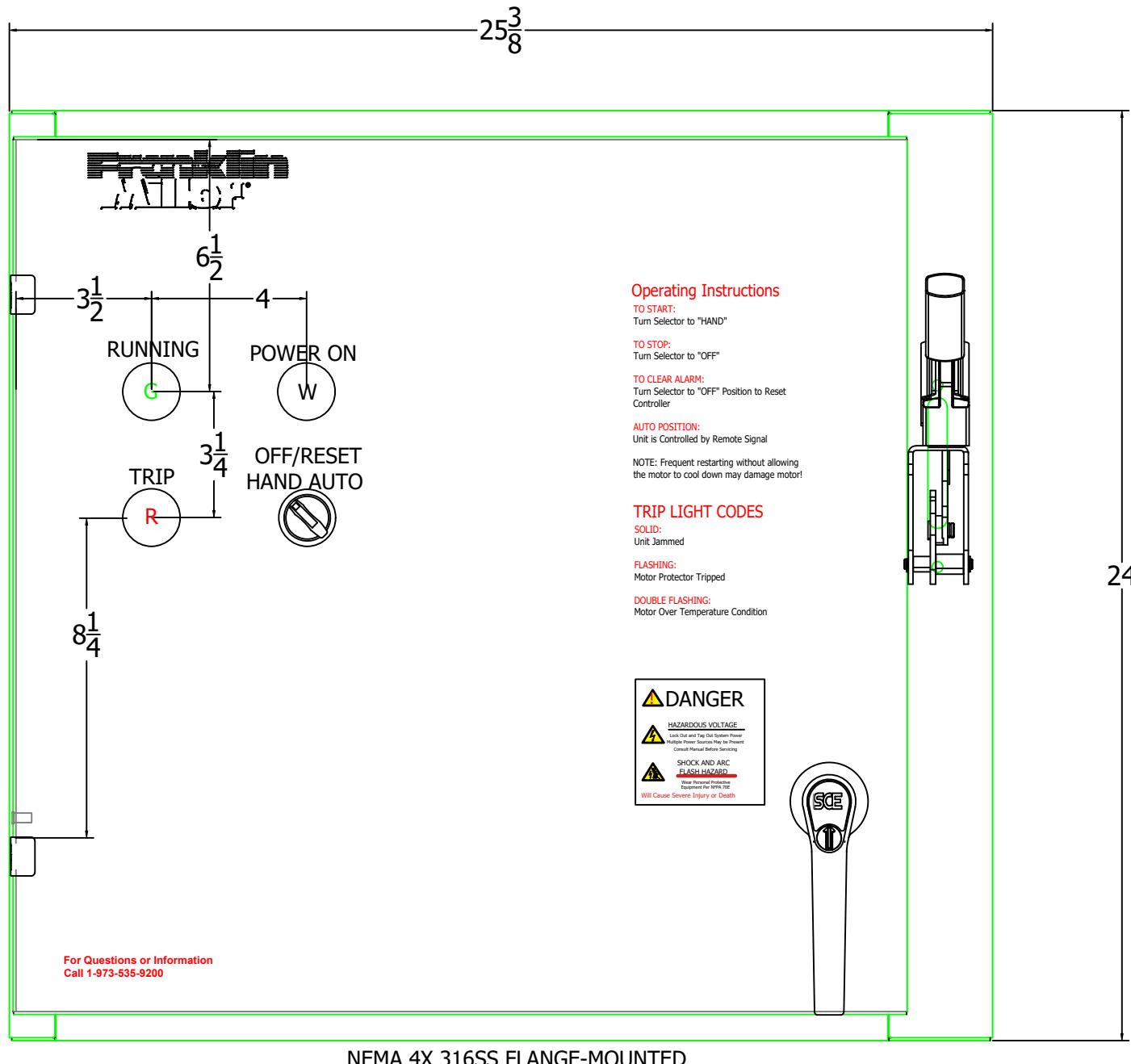
SHEET 4

WIRE TYPE	SIZE*	COLOR	WIRE TYPE	SIZE*	COLOR
POWER	AS REQUIRED	BLACK	24 VDC	16 AWG	BLUE
120V CONTROL	16 AWG	RED	12 VDC	16 AWG	PURPLE
120V NEUTRAL	16 AWG	WHITE	EXT. POWER	16 AWG	YELLOW
24 VAC	16 AWG	ORANGE	SHIELDED	18 AWG	MULTI
LOW VAC	16 AWG	BROWN	GROUND	16 AWG	GREEN

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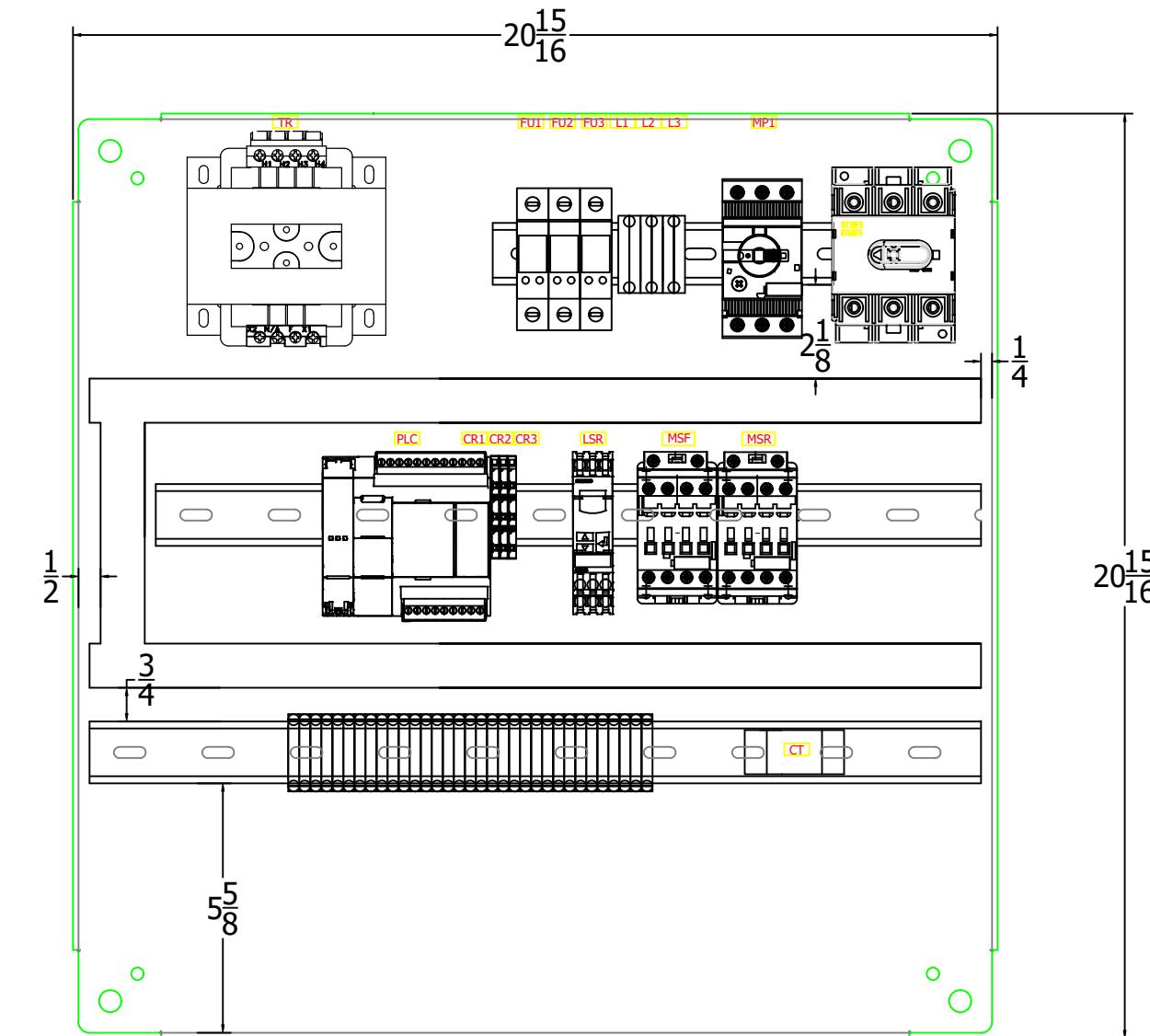


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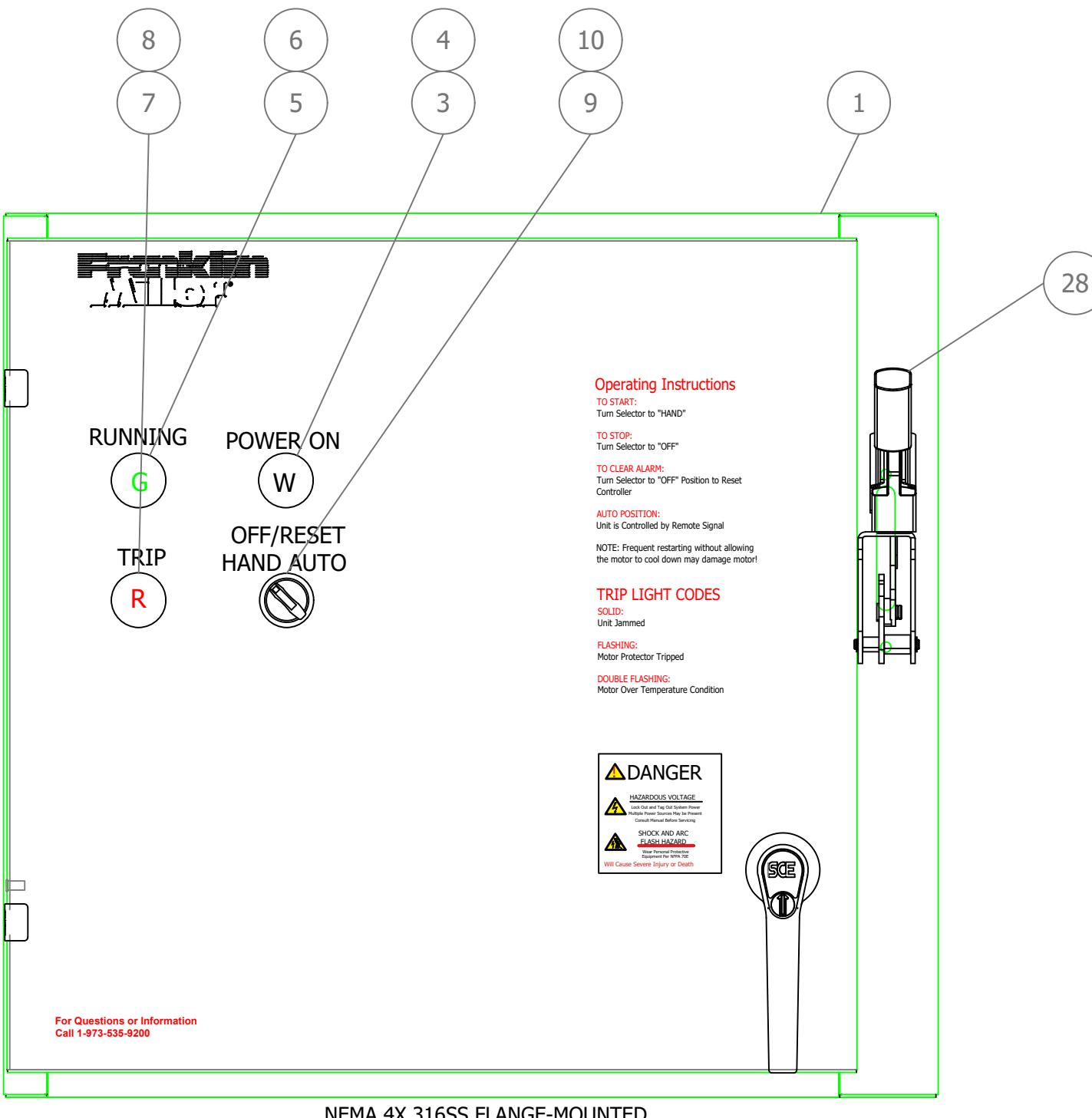
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BACKPANELS

SHEET 6A

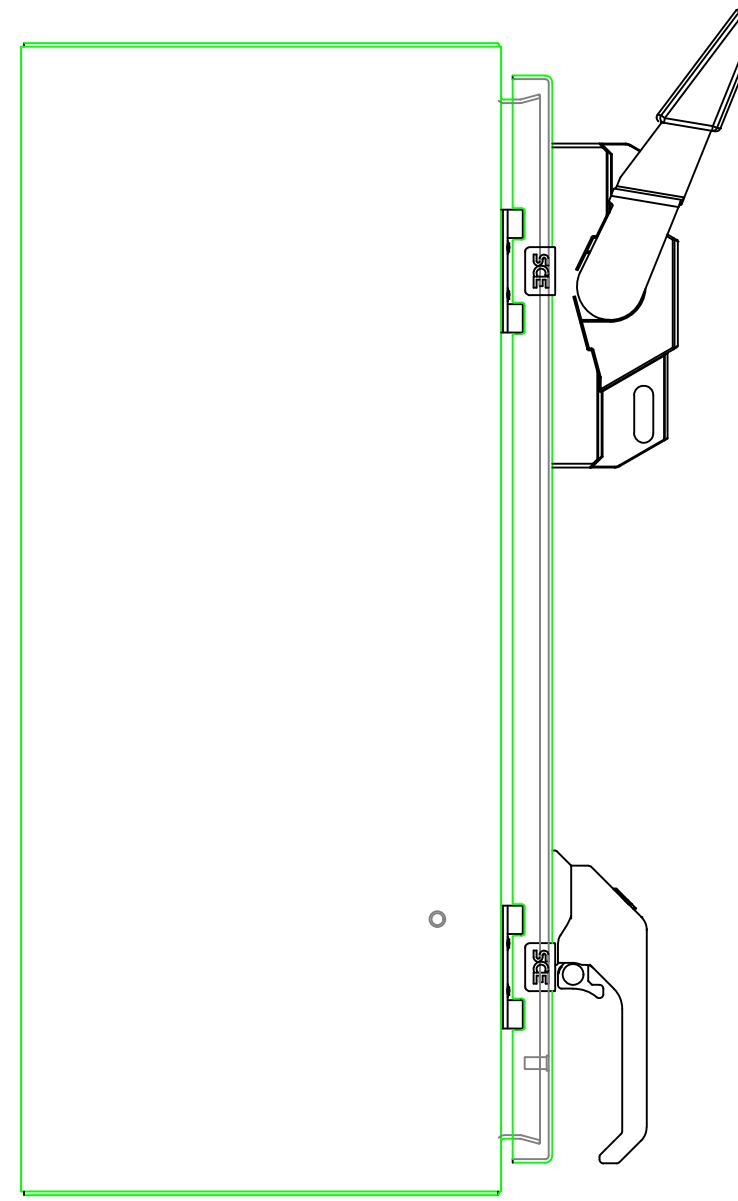
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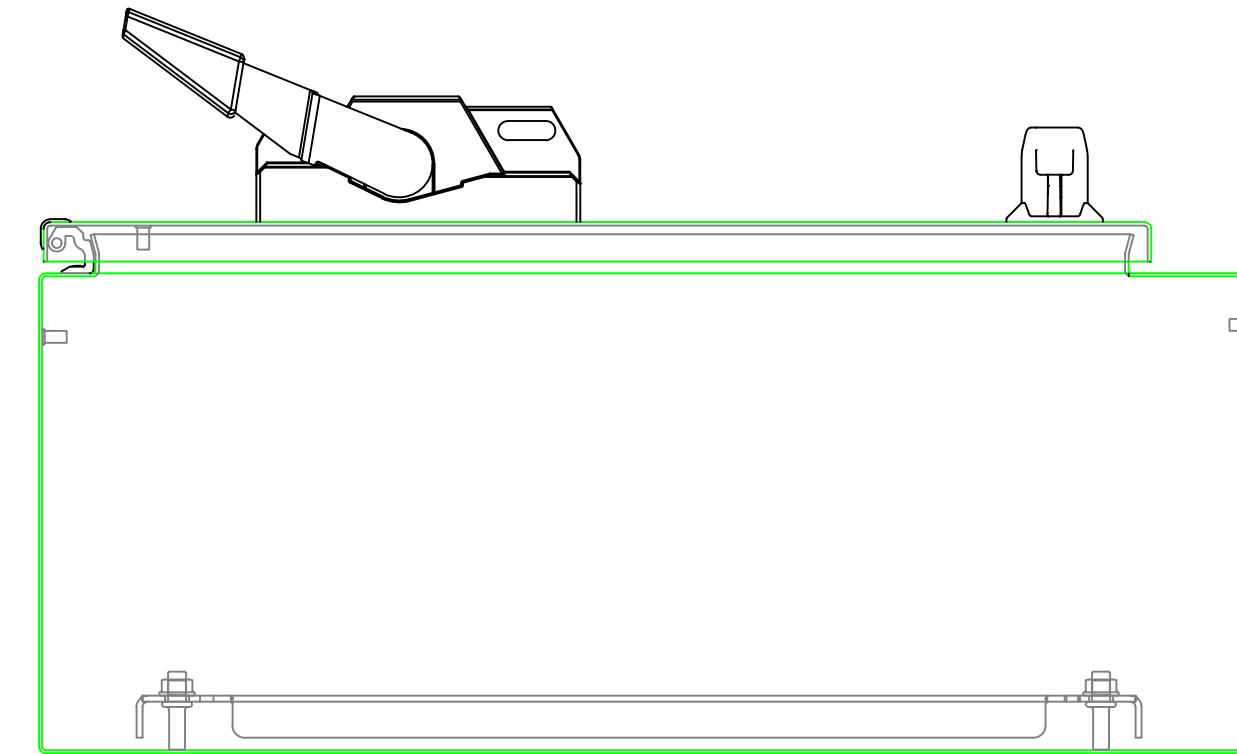
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LEFT SIDE VIEW

SHEET 7A



BOTTOM VIEW

SHEET 7B

LEFT SIDE

BOTTOM

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-	IDS	2025-02-03		EC12808	7

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HONOLULU HI 96819
Phone: 8088424929

Franklin Miller is pleased to provide the enclosed submittal data for your review and Approval.

Date	03/27/2025	Pages	50
Revision	00	Prepared By	Ashley Arias
Copies		Action	Approval
Purchase Order	24077-00046		
Installation	Hilo, HI WWTP Phase 1 Grinders		

Qty	Model	Serial Number	Weight (Lbs.)
2	TM851204	12809AB	

Review & Approval Required:		
Signed by :	✓	Check One:
Title:		Approved without change
Organization:		Approved as noted
Date:		Revise and resubmit

Once approved with signature and released for production, this submittal document will be considered a legal document and will override any other documents; unless otherwise specified in writing in this document. Franklin Miller will only be responsible for items mentioned herein. If any modifications are required, Franklin Miller will resubmit this document for final approval (without charge).

Please send back your approval and confirm / provide the following:

- Select voltage to control (230V) or (460V)
- Select O&M Manual should be digital PDFs or hard copies.

The returned data package may be transmitted via fax, mail, or email. **This machine can not be released for production without the above mentioned information and APPROVAL signature.**

Franklin Miller Inc.

60 Okner Parkway • Livingston, N.J. 07039 • Phone: (973)535-9200 • Fax: (973)535-6269

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Livingston, New Jersey.

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1 Unit Specification

FRANKLIN MILLER, INC.

UNIT SPECIFICATIONS

General Information

Order #:	110872
Serial #:	12809AB
Customer:	Nan Inc
Purchase Order #:	24077-00046
Machine Installation:	Hilo, HI WWTP Phase 1 Grinders
Machine Model:	TM851204
Quantity:	2

Motor

MANUFACTURER Baldor	POWER 5HP	ENCLOSURE TEFC
VOLTS 230/460	PHASE 3 phase	HERTZ 60

Reducer

MANUFACTURER Sumitomo	MODEL 6125	RATIO 29
---------------------------------	----------------------	--------------------

Enclosure

MODEL S25060	CONTROLLER NEMA 4X 316SS	
VOLTS 230/460	PHASE 3 phase	HERTZ 60



Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039 USA

Scope of Supply

Order No. 110872

Page 1 of 3

Sold To:

Nan Inc

636 Laumaka St
Honolulu, HI 96819 USA
Contact: Welina Bobiles
Phone: 8088424929

Rep:

JBI Water & Wastewater Eqt., Inc.

3386 Tartan Trail
El Dorado Hills, CA 95762 USA

Organization ID	P.O. #	Salesperson	Serial Number	Order Date
NAN002	24077-00046	Jacob Galanty	12808AB, 12809AB, 12810/	3/25/2025

Line No.	Quantity	Units	Description
----------	----------	-------	-------------

1 2.0 EA **TASKMASTER® GRINDER, Model TM851204 as follows:**

- Cutter Cartridge Technology: 11-Tooth Cam Cutters, 4140 H.T.
- Nom. 8" x 12" Cutting Chamber
- 4" ANSI Flange Housing- 150# Bolt Pattern
- Drop-In Design Housing For Fast & Easy Maintenance - D.I.
- Mechanical Seals: TC vs. TC 90 psi max.
- 2" Hexagonal Shafting, 4140 H.T.
- Painted 2 Coats Heavy Epoxy Coating - Osha Blue

No Cutter Stack Retightening Required - GUARANTEED

2 2.0 EA **MOTOR AND DRIVE INCLUDING:**

- 5HP TEFC Baldor C-Face Motor, 230/460V, 3PH, 60 HZ
- Gear Reducer - Cycloidal, Vertical Down
- Coupling: High Torque Jaw Style
- Reducer and Adapter constructed of Iron and Steel

3 2.0 EA **Automatic Reversing Controller, Model S260**

- Nema 4X 316 Stainless Steel Enclosure
- Allen Bradley Compact Logix PLC logic control
- IEC starters
- LED Indicators - for long life
- Current Sensing Auto-Reversing Program
- 30mm pilot devices
- Pad Lockable Flange Mount Disconnect Switch
- GFCI duplex 120 VAC convenience receptacle
- 120V Control Circuit
- 480V 3 Phase 60HZ

4 2.0 EA **TASKMASTER® GRINDER, Model TM851204 as follows:**

- Cutter Cartridge Technology: 11-Tooth Cam Cutters, 4140 H.T.
- Nom. 8" x 12" Cutting Chamber
- 4" ANSI Flange Housing- 150# Bolt Pattern
- Drop-In Design Housing For Fast & Easy Maintenance - D.I.
- Mechanical Seals: TC vs. TC 90 psi max.
- 2" Hexagonal Shafting, 4140 H.T.
- Painted 2 Coats Heavy Epoxy Coating - Osha Blue

No Cutter Stack Retightening Required - GUARANTEED



Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039 USA

Scope of Supply

Order No. 110872

Page 2 of 3

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NAN002	24077-00046	Jacob Galanty	12808AB, 12809AB, 12810/	3/25/2025

Line No.	Quantity	Units	Description
----------	----------	-------	-------------

5 2.0 EA MOTOR AND DRIVE INCLUDING:

- 5HP TEFC C-Face Baldor Motor, 230/460V, 3PH, 60 HZ
- Gear Reducer - Cycloidal, Vertical Down
- Coupling: High Torque Jaw Style
- Reducer and Adapter constructed of Iron and Steel

6 2.0 EA Automatic Reversing Controller, Model S260

- Nema 4X 316 Stainless Steel Enclosure
- Allen Bradley Compact Logix PLC logic control
- IEC starters
- LED Indicators - for long life
- Current Sensing Auto-Reversing Program
- 30mm pilot devices
- Pad Lockable Flange Mount Disconnect Switch
- GFCI duplex 120 VAC convenience receptacle
- 120V Control Circuit
- 480V 3 Phase 60HZ

7 2.0 EA TASKMASTER® GRINDER, Model TM851206 as follows:

- Cutter Cartridge Technology: 11-Tooth Cam Cutters, 4140 H.T.
- Nom. 8" x 12" Cutting Chamber
- 6" Ansi (DIN 150) Flange Housing- 150# Bolt Pattern
- Drop-In Design Housing For Easy Maintenance. D.I.
- Mechanical Seals: TC vs. TC 90 psi max.
- 2" Hexagonal Shafting, 4140 H.T.
- Painted 2 Coats Heavy Epoxy Coating - Osha Blue

8 2.0 EA MOTOR AND DRIVE INCLUDING:

- 5HP TEFC C-Face Baldor Motor, 230/460V, 3PH, 60 HZ
- Gear Reducer - Cycloidal, Vertical Down
- Coupling: High Torque Jaw Style
- Reducer and Adapter constructed of Iron and Steel

9 2.0 EA Automatic Reversing Controller, Model S260



Franklin Miller Inc.
60 Oknner Parkway
Livingston, NJ 07039 USA

Scope of Supply

Order No. 110872

Page 3 of 3

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JBI Water & Wastewater Eqt., Inc.

3386 Tartan Trail
El Dorado Hills, CA 95762 USA

Organization ID	P.O. #	Salesperson	Serial Number	Order Date
NAN002	24077-00046	Jacob Galanty	12808AB, 12809AB, 12810F	3/25/2025

Line No.	Quantity	Units	Description
			<ul style="list-style-type: none">- Nema 4X 316 Stainless Steel Enclosure- Allen Bradley Compact Logix PLC logic control- IEC starters- LED Indicators - for long life- Current Sensing Auto-Reversing Program- 30mm pilot devices- Pad Lockable Flange Mount Disconnect Switch- GFCI duplex 120 VAC convenience receptacle- 120V Control Circuit- 480V 3 Phase 60HZ
10	2.0	EA	Spare Parts <ul style="list-style-type: none">- 3 fuses.- 3 replacement long life indicator lamps.- 1 complete gasket and o-rings set.- 3 cutters cartridges- 1 complete mechanical seal.
11	1.0	DY	Startup Services - (4 Trips) <ul style="list-style-type: none">- Installation Inspection- Warranty Certification- O&M instructions <p>If more than one day, Days are Consecutive. Normal Day Rate includes up to 8 hours,</p>
12	2.0	EA	Seismic Calcs
13	1.0	EA	Two Year Warranty

2

Paint Specification

PAINTING SPECIFICATIONS

(Franklin Miller Fabricated Parts)

All stainless steel parts, if used, will not be painted.

All steel surfaces shall be primed the same day as cleaned.

All steel parts which are exposed will be painted to the following procedures.

SURFACE PREPARATION

Surface preparation for steel will be defined by the Steel Structures Painting Council (SSPC) and is as follows:

SSPC-10-NEAR WHITE BLAST CLEANING

Near-white blast cleaning is a method of preparing metal surfaces for painting or coating by removing nearly all mill scale, rust scale, paint or foreign matter by the use of abrasives propelled through nozzles or by centrifugal wheels. A near-white blast cleaned surface finish is defined as one in which all oil, grease, dirt, mill scale, rust corrosion products, oxides, paint or other foreign matter have been completely removed from the surface except for very light shadows, very slight streaks or slight discolorations caused by rust stain, mill scale oxides, or slight, tight residues of paint or coating that may remain. At least 95% of each square inch of surface area shall be free of all visible residues, and the remainder shall be limited to the light discolored mentioned above.

COATING

DESCRIPTION:	Polyamide Epoxy
TYPICAL USE:	Coating structural steel, machinery and equipment.
COLOR:	Franklin Miller Blue
FINISH:	Satin
PRIMER:	One Coat
TOP:	One Coat
DRY FILM THICKNESS:	(As recommended by manufacturer): 3 to 5 mil per coat.

3 Warranty

FRANKLIN MILLER INC.
LIMITED WARRANTY
DOMESTIC

SELLER warrants the goods sold hereunder to be free from defects in material and workmanship under normal use and service not arising from misuse, negligence or accident, or unauthorized modification of the equipment, in connection with the use, installation, and transportation of the goods by BUYER, its agents, servants, employees or by carriers. SELLER's obligations under this warranty are limited to remedying any deficiencies in the goods at such place or places in the United States of America as may be designated by SELLER. This warranty shall pertain to any part or parts of any goods to which BUYER has, within (24) months after date of shipment, given written notice of a claimed defect to the SELLER. The BUYER shall be required to furnish SELLER with details of such defects and this warranty shall be effective as to such goods which upon SELLER's examination shall disclose to its satisfaction to have been defective and which at SELLER's option shall be repaired in place if required for a warranty repair. The BUYER at his expense shall make available in a suitable location for repair by SELLER or promptly thereafter be returned to SELLER, at BUYER's, or its nominees expense. If upon examination it is determined by the SELLER that the repair or replacement does not fall within the Warranty as set forth in this clause, an estimate for cost of repair will be provided to the BUYER. This warranty is expressly in lieu of all other warranties expressed or implied. In no event shall the SELLER be liable to the BUYER or to any other person for any loss or damage, direct or indirect, arising out of or caused by the use or operation of the goods, or for the loss of profits, business, or good will. Under no circumstance will SELLER be liable for any of the following: (1) third party claims against BUYER for losses or damages including liquidated damages; (2) loss of or damage to BUYER's records or data; or (3) economic consequential damages (including loss of profits or savings) or incidental damages even if SELLER is informed of their possibility. Excluded from the warranty herein are (a) defects in parts or components not manufactured directly by SELLER; Franklin Miller will, however, pass on the remaining balance of the purchased equipment manufacturer's warranty; (b) or not part of SELLER's standard design or are supplied pursuant to special BUYER's requirements; (c) certain parts which are subject to wear and tear from abrasive action or use thereof; and (d) any part that has been subjected to misuse. SELLER's liability is limited to furnishing or repairing at SELLER's option parts determined by SELLER to be defective. No express warranties and no implied warranties, whether of merchantability or fitness for any particular use, or otherwise (except as to title), other than those expressly set forth above which are made expressly in lieu of all other warranties, shall apply to products sold by us, and no waiver, alteration, or modification of the foregoing conditions shall be valid unless made in writing and signed by an executive officer of our corporation. If the buyer is in default of Clause 6 (Payment of Purchase Price) this warranty is null and void unless reinstated by SELLER.

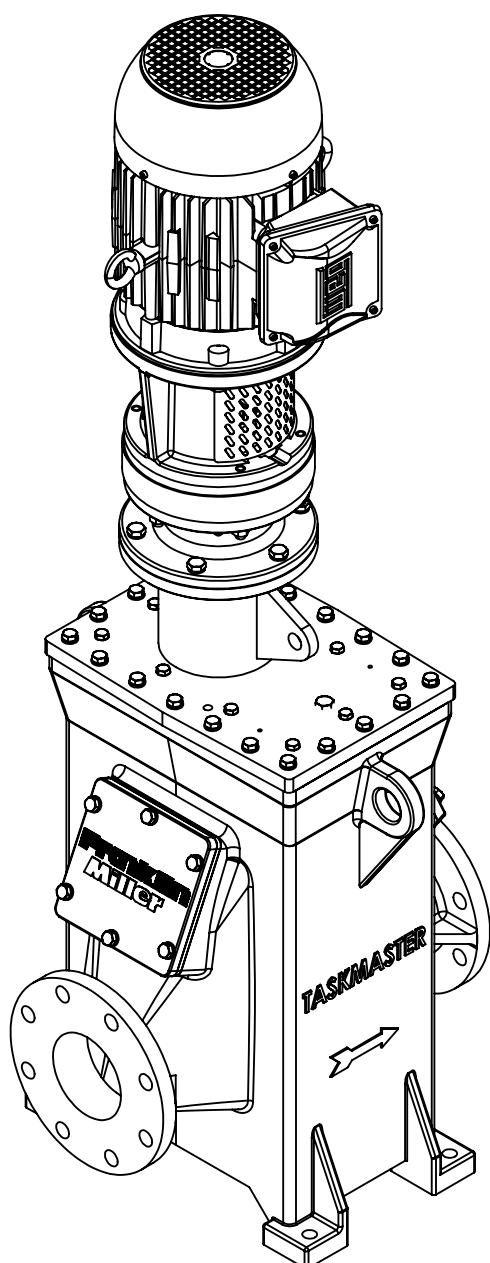
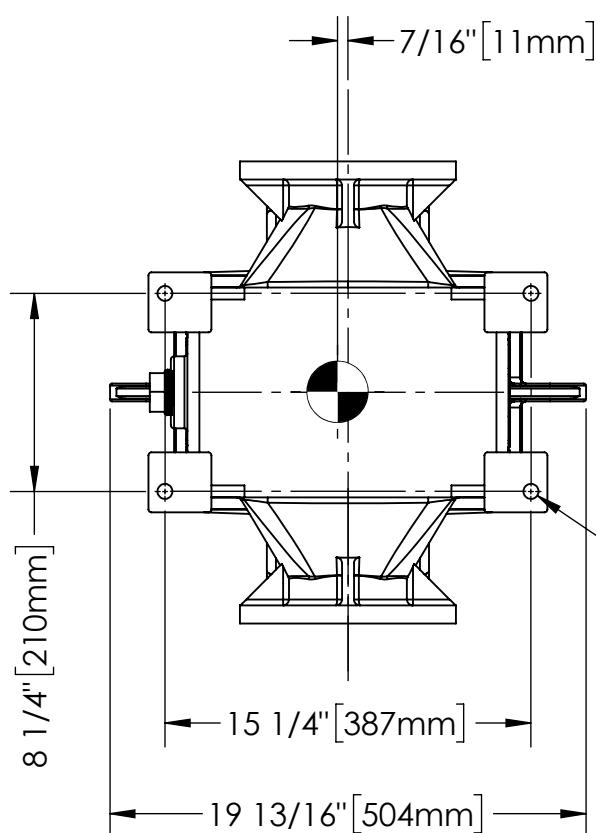
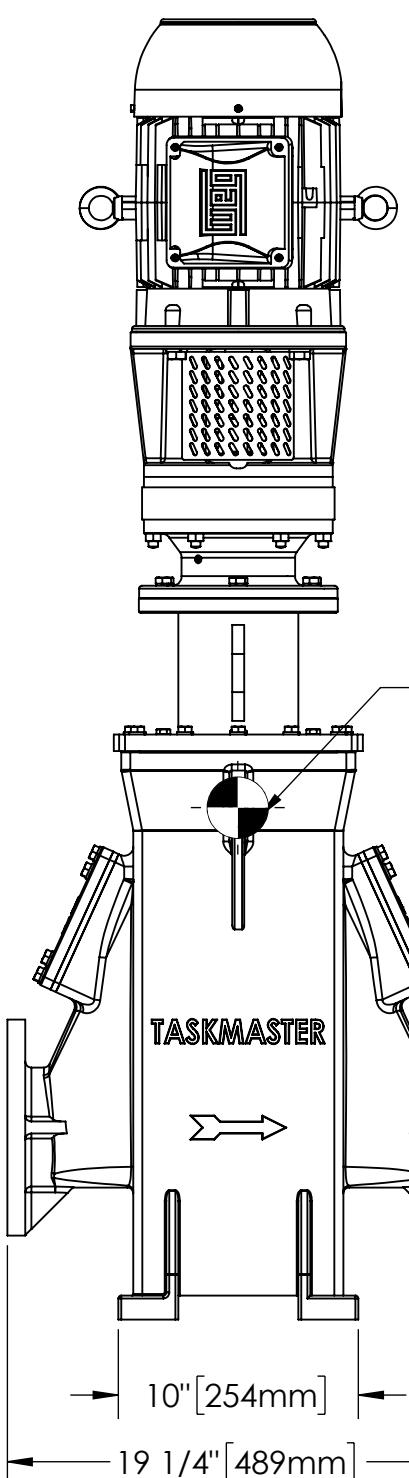
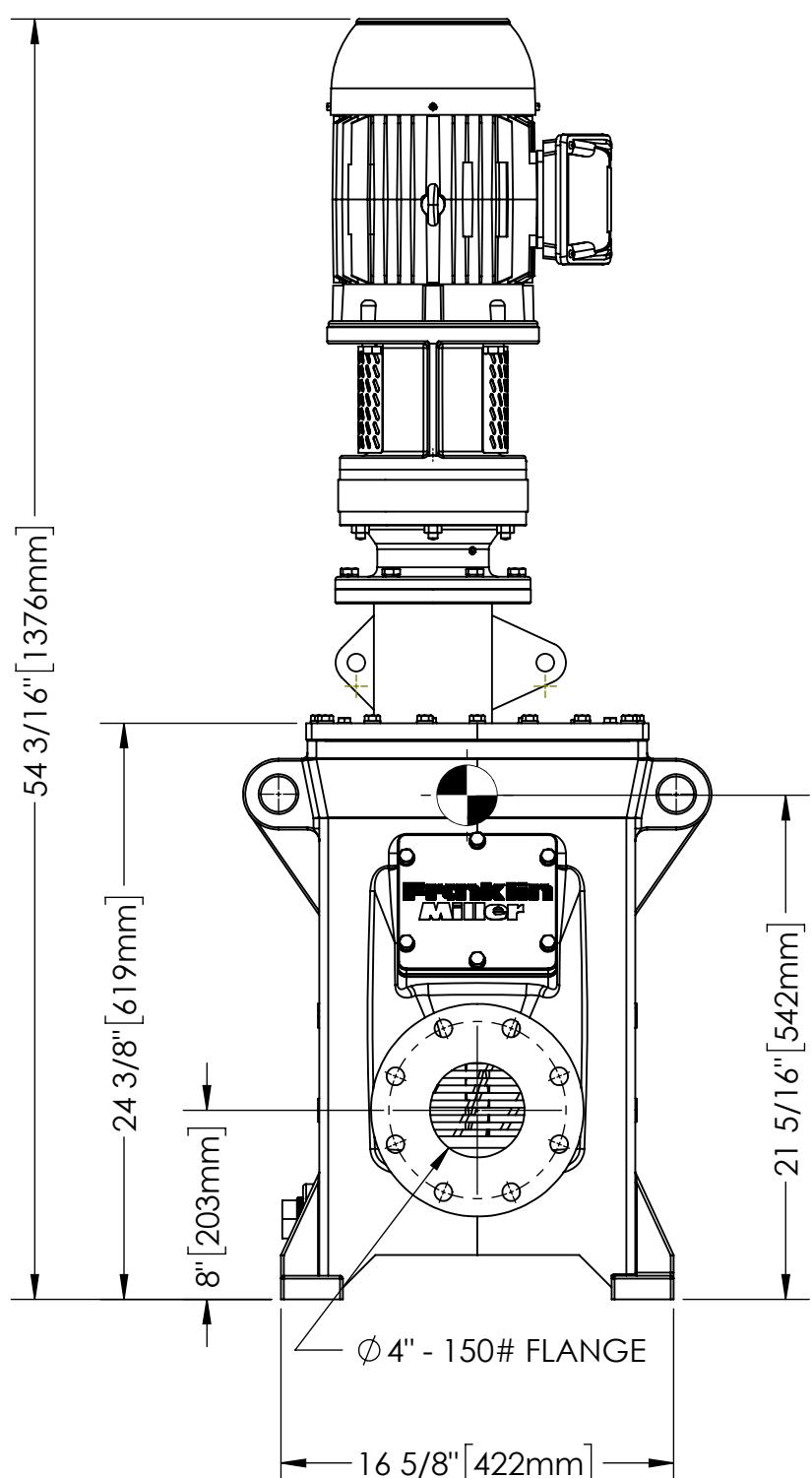
4

Drawings

BOM TABLE	
ITEM NO.	DESCRIPTION
1	HOUSING ASSEMBLY, TM851204, DROP-IN
2	DRIVE ASSEMBLY, 5HP TEFC, TM8500, SUMI 6125

NOTE:

1. 11-TOOTH CAM CUTTERS



COMMENTS:

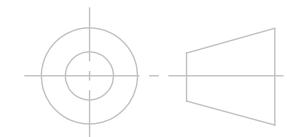
MODEL REF: 12809ABTM851204-Default

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MACHINE TOLERANCES UNLESS OTHERWISE NOTED

DECIMALS	FRACTIONS	± 1/32
.0	± .015	ANGLES ± .05°
.00	± .010	CHAMFER ANGLES ± 3°
.000	± .005	SURFACE TEXTURE 125/



DRAWN: JB 3/26/25

CHECKED:

ENG APPR.

MFG APPR.

Q.A.

MATERIAL SEE BOM

FINISH

**Franklin
Miller®**

TITLE: TASKMASTER®, TM851204 Drop-In, 5Hp Motor TEFC

SIZE DWG. NO. B 12809ABTM851204 REV .

DO NOT SCALE DRAWING

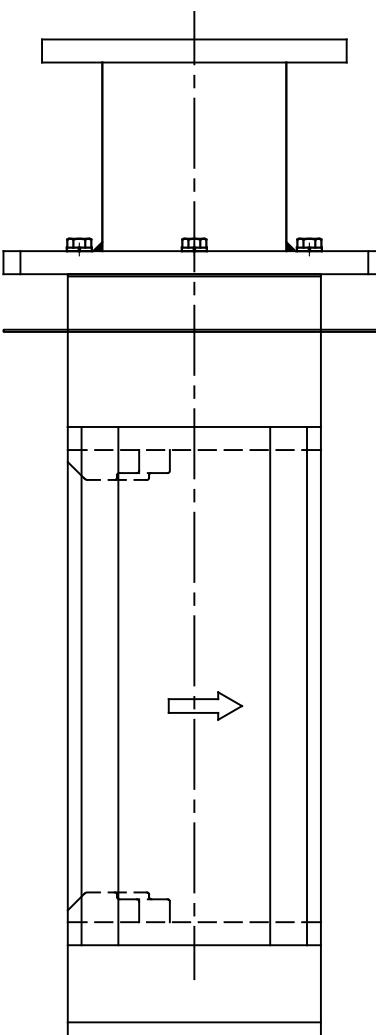
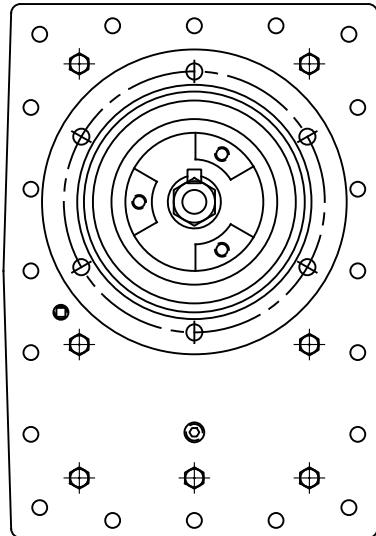
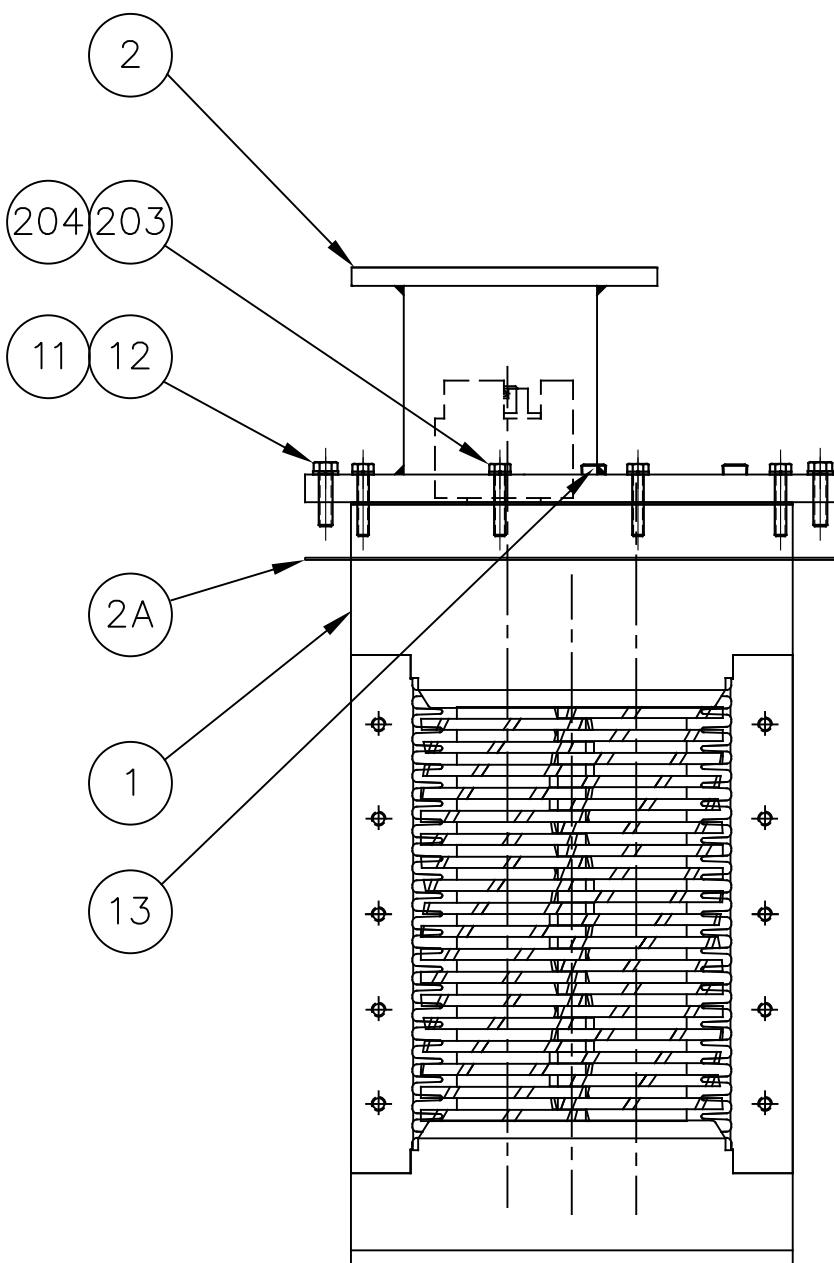
SCALE: 1:8

WEIGHT: 755 lbs

Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039
Tel: 973-535-9200
www.franklinmiller.com

SHEET 1 OF 1

PARTS LIST				
ITEM	QTY	DESCRIPTION	PART/#	MATERIAL
1	1	TM851200 LESS DRIVE	TM851200	SEE DETAIL
2	1	ADAPTER, REDUCER	TM85634	CS
2A	1	GASKET, ADAPTER	TM85630B	BUNA
11	20	LOCKWASHER 3/8	LW06S	18-8
12	20	SCREW 3/8-16 x 1 1/2	HC061624S	18-8
13	1	PLUG, VENT	PP00060	BRASS
203	10	SCREW, 5/16-18 x 1 3/4, GRADE 8	HC051828HT	CS
204	10	LOCKWASHER 5/16, HI-STRENGTH	LW05HT	CS



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LIVINGSTON, NEW JERSEY.

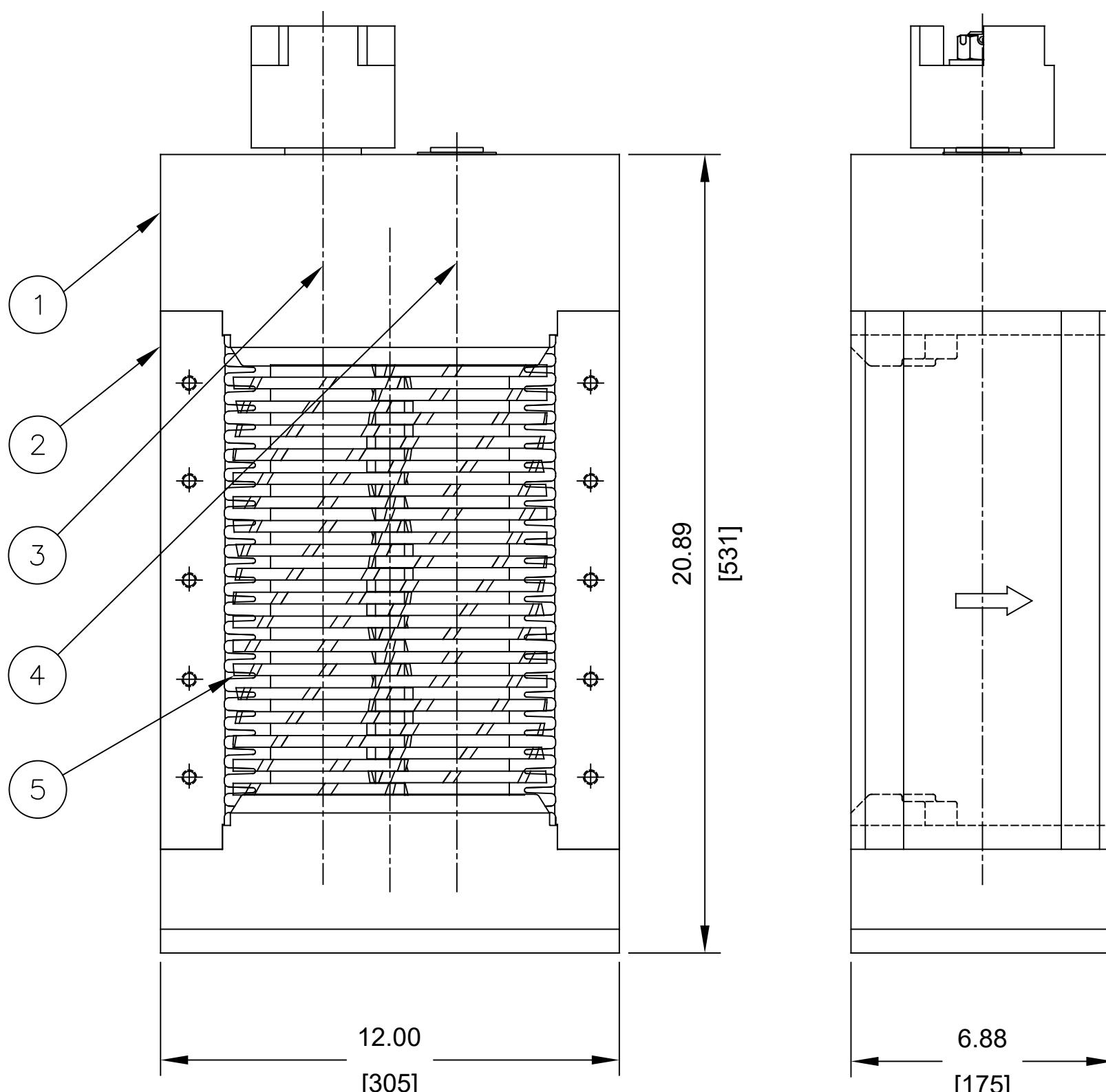
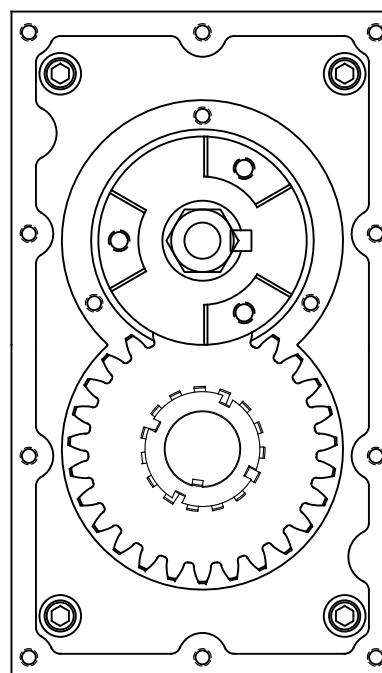
FRANKLIN MILLER INC.
60 OKNER PARKWAY, LIVINGSTON, N.J. 07039

TASKMASTER TM8512 DROP-IN LESS DRIVE & HOUSING

SCALE	DWN	DATE	CKD	DATE	DWG. NO.
1:5	AEW/AG	03/06/03	.	.	TM851203

BILL OF MATERIAL				MATERIAL STANDARD	WEIGHT
ITEM	QTY	DESCRIPTION	FMI P/#		
1	1	TM850000 COMMON PARTS	TM850000	SEE DETAIL	110.7 LBS
2	2	SIDE FRAME	TM85660	DUCT	28.5 LBS
3	1	DRIVE SHAFT	TM85373BH	4140 Rc28-32	16.5 LBS
4	1	DRIVEN SHAFT	TM8572BH	4140	15.5 LBS
5	6	CUTTER CARTRIDGE	TM8551A	4140	6.5 LBS

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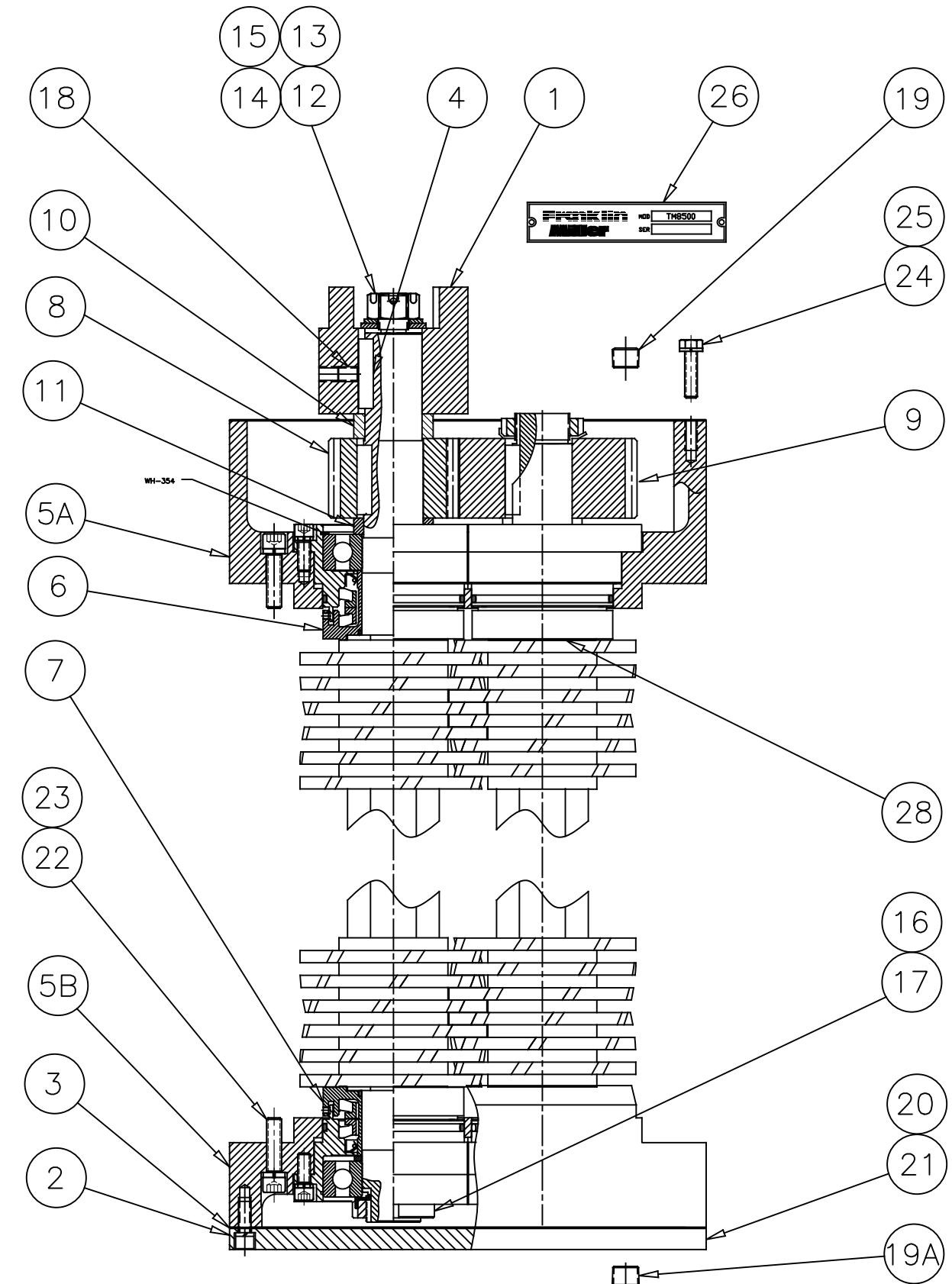


FRANKLIN Miller INC.
 60 OKNER PARKWAY, LIVINGSTON, N.J. 07039

TM8512 LESS DRIVE

LTR P/N	MATERIAL	WEIGHT#	SCALE	DWN	DATE	CKD	DATE	DWG	REV
			1: 4	AEW	10/13/00	.	.		
TM851200								TM851200	REV

PARTS LIST		FMI PART/#		FMI PART/#	
ITEM	QTY	DESCRIPTION	TM850000	MATERIAL	WEIGHT
1	1	COUPLING HALF	FM00015AU	1018 C.S.	5.5 LBS
2	1	COVER, BOTTOM	TM8510B	D.I. 65-45-12	13.5 LBS
3	2	GASKET	TM8512A	BUNA	-
4	3	KEY, 3/8 SQ x 1 3/4	KS0628	1090 C.S.	.125 LBS
5A	1	HOUSING, TOP	TM8546M	D.I. 65-45-12	39 LBS
5B	1	HOUSING, BOTTOM	TM85646M	D.I. 65-45-12	30 LBS
6	2	BEARING/SEAL CARTRIDGE, FIXED	TM85760 REV #5	SEE DETAIL	6 LBS
7	2	BEARING/SEAL CARTRIDGE, EXPANSION	TM85990 REV #5	SEE DETAIL	5.9 LBS
8	1	PINION GEAR, 18T	TM85125	4140 ALLOY STEEL	2.5 LBS
9	1	SPUR GEAR, 27T	TM85124	4140 ALLOY STEEL	7.5 LBS
10	1	SPACER, GEAR/COUPLING	TM85410	1018 C.S.	.25 LBS
11	2	SPACER, GEAR/BEARING	TM8596	1018 C.S.	.25 LBS
12	1	WASHER, PLAIN, WIDE 3/4	WPW12HT	CS	.125 LBS
13	1	WASHER, BELLVILLE, 3/4 X .107 THK	WB12107	CS	.125 LBS
14	1	COTTER PIN, 1/8 x 1 1/2	MM00120	18-8 S.S.	.125 LBS
15	1	NUT, HEX, SLOTTED, 3/4-10	NHS1210	CS	.25 LBS
16	3	NUT, BEARING, N-07	BN07	1018 C.S.	.25 LBS
17	3	LOCKWASHER, BEARING , W-07	BW07	1018 C.S.	.125 LBS
18	2	SETSCREW, 3/8-16 x 1/2	SS061608S	18-8 S.S.	.125 LBS
19	1	PIPE PLUG 3/8 NPT	PP00027	GALV.	.25 LBS
19A	1	PIPE PLUG 1/4 NPT	PP04	GALV.	.25 LBS
20	10	SCREW, 5/16-18 x 1"	SC051816S	18-8 S.S.	.125 LBS
21	10	LOCKWASHER, HI-COLLAR 5/16	LWH05S	18-8 S.S.	.125 LBS
22	8	SCREW 3/8-16 x 1 1/2	SC061624S	18-8 S.S.	.125 LBS
23	8	WASHER BOLT SEALING 3/8	MM00153	18-8 S.S.	.125 LBS
24	10	SCREW 5/16-18 x 1 1/4	HC051820S	18-8 S.S.	.125 LBS
25	10	LOCKWASHER 5/16	LW05S	18-8 S.S.	.125 LBS
26	1	NAMEPLATE-S/N FMI	NP1000	18-8 S.S.	.25 LBS
27	2oz	LUBRICANT, GREASE, GEAR	LU00003	LUBRICANT	.125 LBS
28	1	SHIM, .005"THK	FM00607	CS	



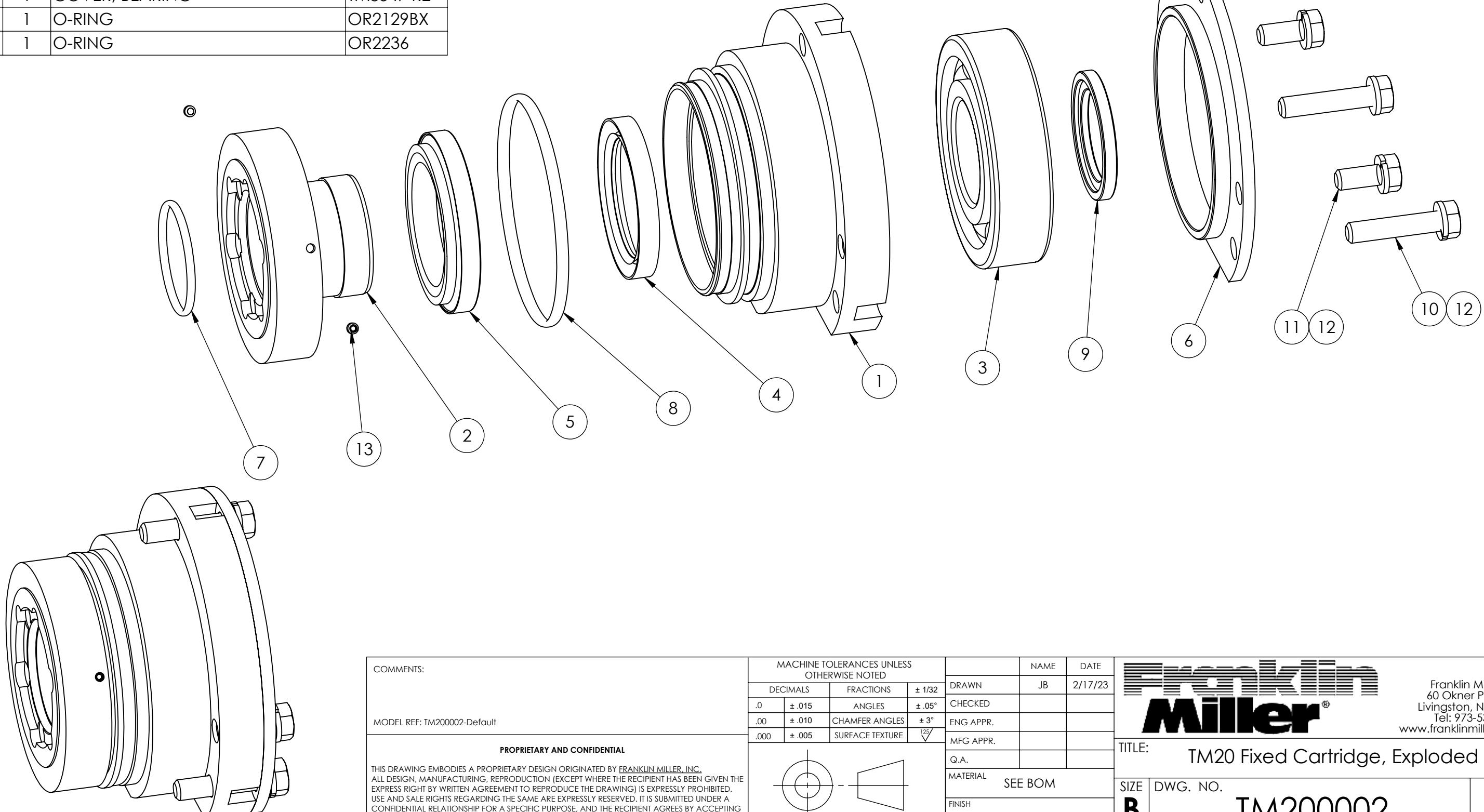
REV NO.	DESCRIPTION	DWN	DATE
1	UPDATED BEARING/SEAL CART'S & HARDWARE	AEW	08/24/01
2	CHANGED BOTTOM HOUSING TO LOW-PROFILE	AEW	12/21/01
3	ADDED ASTM MATERIAL REF.	JHT	03/25/02
4	CHANGED BALLOONING	JHT	06/20/02
5	CHANGED ITEM 41 FROM GREASE FITTING TO PLUG, DELETED QTY (6) OF ITEM 44, ADDED ITEM 17A	GWC	10/30/03
6	DELETED QTY (6) OF ITEMS 44 & 48	AG	01/30/04
7	PARTS LIST was updated	AG	05/23/05
8	ADDED COMPONENT WEIGHTS	JT	10/05/05
9	Item #5B was updated, Items #28, 29 were removed	AG	02/10/06
10	Items #2 & 3 were updated	AG	03/13/06
11	Item #3 was updated	AG	07/25/16
12	BEARING/SEAL CARTRIDGES were updated (REV #5)	AG	08/19/19

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C	316LSS-BODY	
-	SEE BOM	
LTR P/N	MATERIAL	WEIGHT#
THIRD ANGLE PROJECTION		DIMENSIONS INCH [mm]
1: 3	AEW	10/13/00 . .
DWG NO. TM850000		REV 12

8 7 6 5 4 3 2 1

ITEM NO.	QTY.	DESCRIPTION	PART NUMBER	ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
1	1	STATIONARY SEAL GLAND	TM8549C	9	1	SPACER, BOTTOM CARTRIDGE	TM20074
2	1	ROTARY SEAL GLAND	TM8594C	10	3	SCREW, 5/16-18 X 1 1/2"LG HHCS	HC051824S
3	1	BALL BEARING	BB245616	11	2	SCREW, 5/16-18 X 3/4"LG HHCS	HC051812S
4	1	LIP SEAL	SO293906	12	5	LOCKWASHER, 5/16"	LW05S
5	2	MECHANICAL SEAL	MS284415T	13	2	SET SCREW 8-32 X 1/8 LG	SS#83202
6	1	COVER, BEARING	TM8547 R2				
7	1	O-RING	OR2129BX				
8	1	O-RING	OR2236				



COMMENTS:

MODEL REF: TM200002-Default

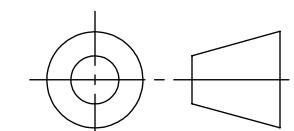
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MACHINE TOLERANCES UNLESS OTHERWISE NOTED

DECIMALS	FRACTIONS	± 1/32
.0	± .015	ANGLES ± .05°
.00	± .010	CHAMFER ANGLES ± 3°
.000	± .005	SURFACE TEXTURE 125/

✓



THIRD ANGLE PROJECTION

DRAWN

JB

2/17/23

CHECKED

ENG APPR.

MFG APPR.

Q.A.

MATERIAL

SEE BOM

FINISH

DO NOT SCALE DRAWING

SCALE: 2:3 WEIGHT: SHEET 1 OF 1

**Franklin
Miller**

Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039
Tel: 973-535-9200
www.franklinmiller.com

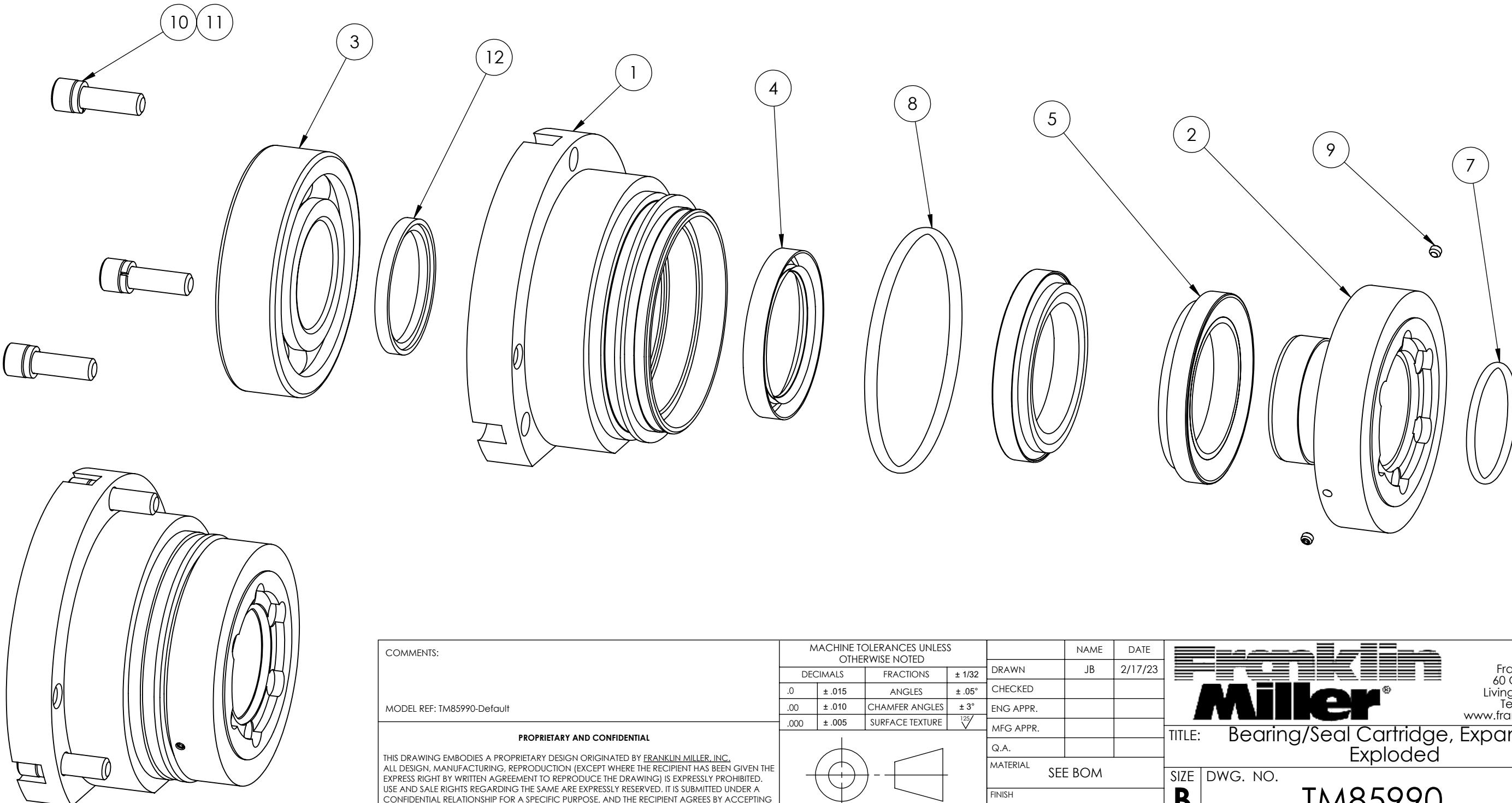
TITLE: TM20 Fixed Cartridge, Exploded

SIZE DWG. NO. REV
B TM200002 1

8 7 6 5 4 3 2 1

BOM TABLE			
ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
1	1	STATIONARY SEAL GLAND	TM8549C
2	1	ROTARY SEAL GLAND	TM8594C
3	1	BALL BEARING	BB245616
4	1	LIP SEAL	SO293906
5	2	MECHANICAL SEAL	MS284415T
6			

BOM TABLE			
ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
7	1	O-RING	OR2129
8	1	O-RING	OR2236
9	2	SET SCREW 8-32 X 1/8 LG	SS#83202
10	3	LOCKWASHER HI-COLLAR, 5/16	LWH05S
11	3	SOCKET HEAD CAP SCREW 5/16-18NC X 1 LG SS	SC051816S
12	1	SPACER, ROTARY GLAND	TM85484



COMMENTS:
MODEL REF: TM85990-Default

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MACHINE TOLERANCES UNLESS OTHERWISE NOTED

DECIMALS	FRACTIONS	± 1/32	
.0	± .015	ANGLES	± .05°
.00	± .010	CHAMFER ANGLES	± 3°
.000	± .005	SURFACE TEXTURE	125/

 THIRD ANGLE PROJECTION

DRAWN	NAME	DATE
JB	2/17/23	
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
MATERIAL		SEE BOM
FINISH		
DO NOT SCALE DRAWING		

Franklin Miller
Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039
Tel: 973-535-9200
www.franklinmiller.com

TITLE: Bearing/Seal Cartridge, Expansion, Exploded
SIZE DWG. NO. REV
B TM85990 5
SCALE: 2:3 WEIGHT: 7.00 SHEET 1 OF 1

5

Motor Data

BALDOR® • RELIANCE®

Customer information packet

CEM3615T

5HP, 1755RPM, 3PH, 60HZ, 184TC, 3642M, TEFC, F1

Class - None

Division - Not Applicable

Specifications

Enclosure	TEFC
Frame	184TC
Frame Material	Steel
Frequency	60.00 Hz
Haz Area Class and Group	None
Haz Area Division	Not Applicable
Motor Letter Type	Three Phase
Output @ Frequency	5.000 HP @ 60 HZ
Phase	3
Synchronous Speed @ Frequency	1800 RPM @ 60 HZ
Voltage @ Frequency	230.0 V @ 60 HZ 460.0 V @ 60 HZ
Agency Approvals	CSA EEV NEMA PREMIUM NEMA_PREMIUM UR
Ambient Temperature	40 °C
Auxillary Box	No Auxillary Box
Auxillary Box Lead Termination	None
Base Indicator	Rigid
Bearing Grease Type	Polyrex EM (-20F +300F)
Blower	None
Current @ Voltage	6.700 A @ 460.0 V 14.000 A @ 208.0 V 13.400 A @ 230.0 V
Design Code	B
Drip Cover	No Drip Cover
Duty Rating	CONT
Efficiency @ 100% Load	89.5 %
Electrically Isolated Bearing	Not Electrically Isolated
Feedback Device	NO FEEDBACK
Front Shaft Indicator	None

Part detail

Revision	D
Type	AC
Mech. spec.	36A002
Base	
Status	PRD/A
Elec. spec.	36WGQ032
Layout	36LYA002
Eff. date	10-02-2024
CD Diagram	CD0005
Poles	04
Leads	9#16
Proprietary	False
Created date	12-03-2020

Heater Indicator	No Heater
High Voltage Full Load Amps	6.7 a
Insulation Class	F
Inverter Code	Inverter Ready
KVA Code	J
Lifting Lugs	No Lifting Lugs
Locked Bearing Indicator	Locked Bearing
Motor Lead Quantity/Wire Size	9 @ 16 AWG
Motor Lead Termination	Flying Leads
Motor Standards	NEMA
Motor Type	3642M
Mounting Arrangement	F1
Number of Poles	4
Overall Length	18.05 IN
Power Factor	78
Product Family	General Purpose
Pulley End Bearing Type	Ball
Pulley Face Code	C-Face
Pulley Shaft Indicator	Standard
Rodent Screen	None
Service Factor	1.15
Shaft Diameter	1.125 IN
Shaft Ground Indicator	No Shaft Grounding
Shaft Rotation	Reversible
Shaft Slinger Indicator	No Slinger
Speed	1755 rpm
Speed Code	Single Speed
Starting Method	Direct on line
Thermal Device - Bearing	None
Thermal Device - Winding	None
Vibration Sensor Indicator	No Vibration Sensor
Winding Thermal 1	None
Winding Thermal 2	None

Nameplate

NP3441LUA

CAT.NO.	CEM3615T					
SPEC	36A002Q032G1					
HP	5					
VOLTS	230/460					
AMPS	13.4/6.7					
RPM	1755					
FRAME	184TC	HZ	60	PH	3	
SF	1.15	CODE	J	DES	B	CLASS
NEMA NOM. EFF	89.5	PF	78			F
RATING	40C AMB-CONT					
CC	010A					
ENCL	TEFC	SER				
DE	6206	ODE	6205			

VPWM INVERTER READY**CT6-60H(10:1)VT3-60H(20:1)**

50HZ 5HP 190/380V 15.6/7.8A

SF1.0

AC Induction Motor Performance Data

Record # 89917

Typical performance - not guaranteed values

Winding: 36WGQ032-R001**Type:** 3642M**Enclosure:** TEFC**Nameplate Data**

Rated Output (HP)	5
Volts	230/460
Full Load Amps	13.4/6.7
R.P.M.	1755
Hz	60 Phase
NEMA Design Code	B KVA Code
Service Factor (S.F.)	1.15
NEMA Nom. Eff.	89.5 Power Factor
Rating - Duty	40C AMB-CONT
S.F. Amps	

**460 V, 60 Hz:
High Voltage Connection**

Full Load Torque	15 LB-FT
Start Configuration	direct on line
Breakdown Torque	53.1 LB-FT
Pull-up Torque	23.4 LB-FT
Locked-rotor Torque	34.7 LB-FT
Starting Current	49.8 A
No-load Current	3.31 A
Line-line Res. @ 25°C	2.4 Ω
Temp. Rise @ Rated Load	71°C
Temp. Rise @ S.F. Load	86°C
Locked-rotor Power Factor	40.6635
Rotor inertia	0.391 lb-ft²

Load Characteristics 460 V, 60 Hz, 5 HP

% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor	38	60	72	79	82	84	81
Efficiency	83.8	88.9	89.8	89.5	88.4	86.8	88.8
Speed	1789	1778	1766	1753	1738	1722	1744
Line amperes	3.64	4.39	5.45	6.66	8.08	9.67	7.51

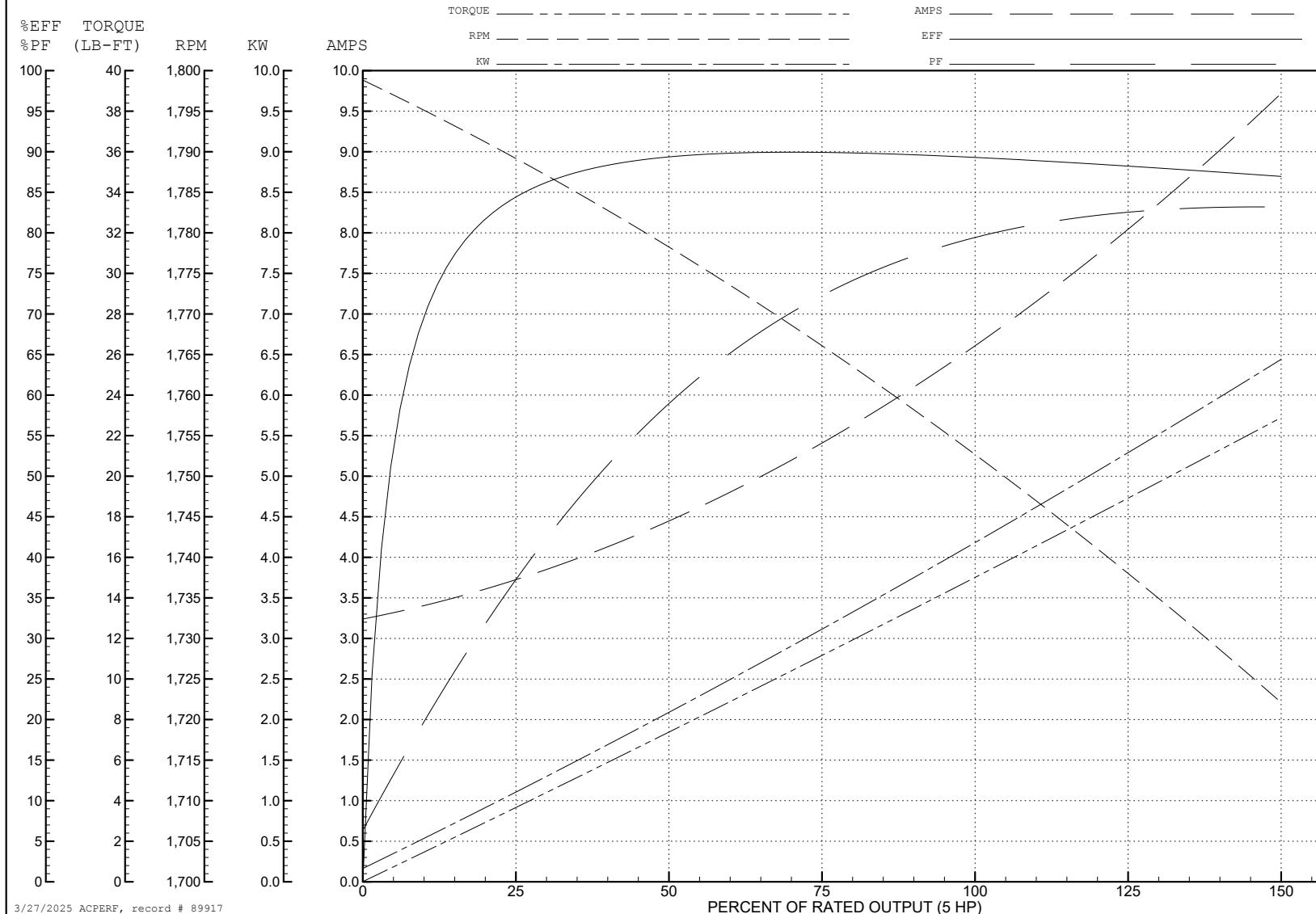
ABB Motors and Mechanical Inc.

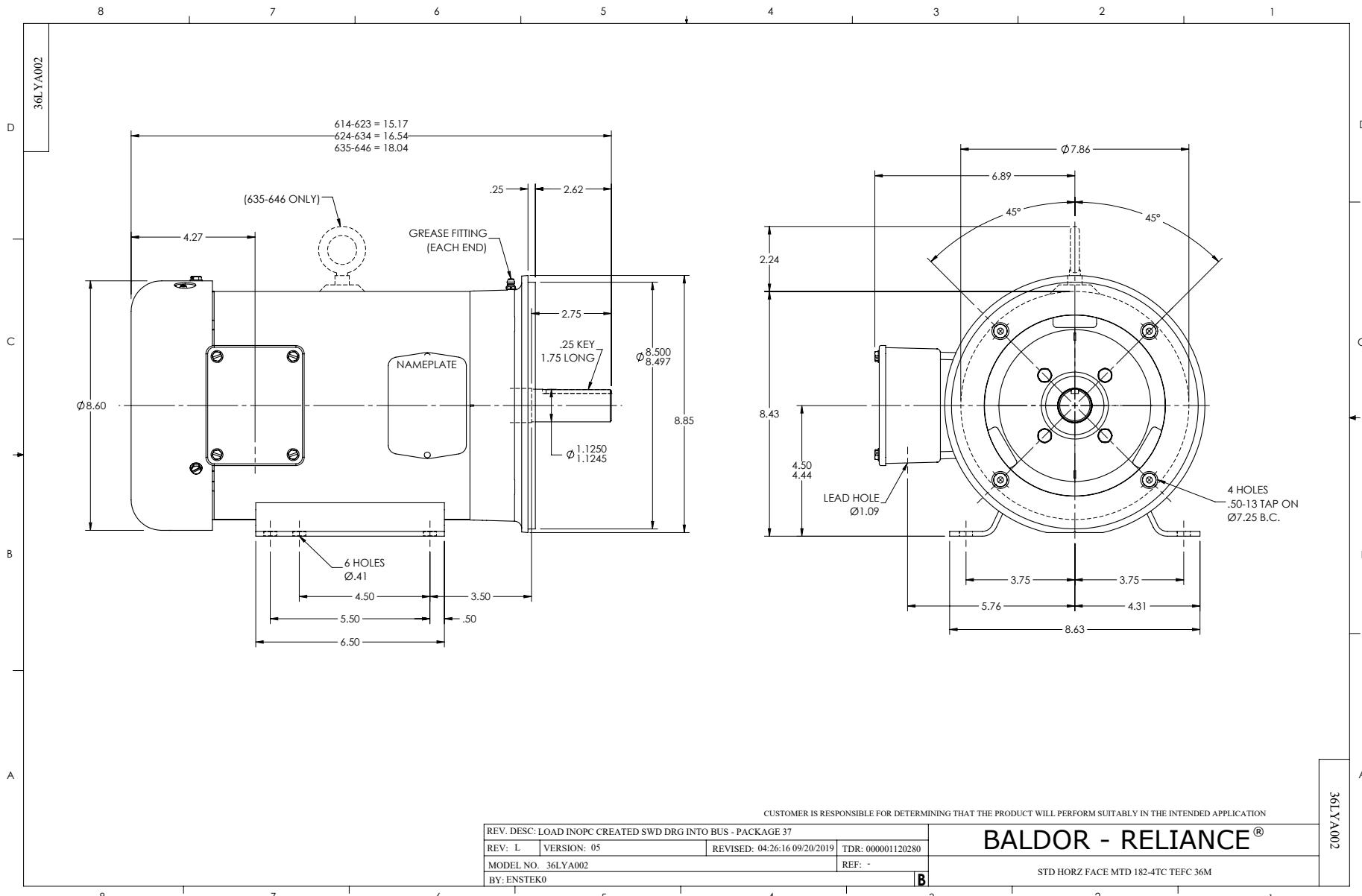
WINDING # 36WGQ032

Typical performance - not guaranteed values.

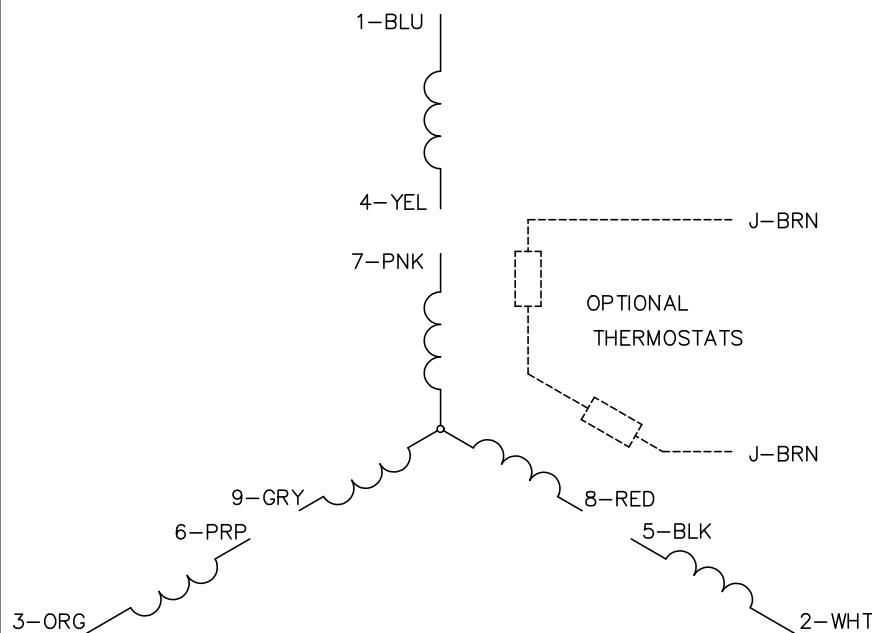
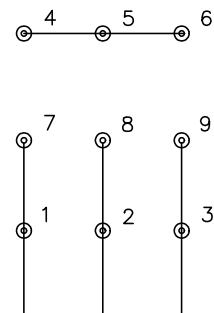
5 HP 3 PH 60 HZ 1755 RPM 460 V 3642M

TORQUES (LB-FT): PO=53.1 PU=23.4 LR=34.7 LRA=49.8

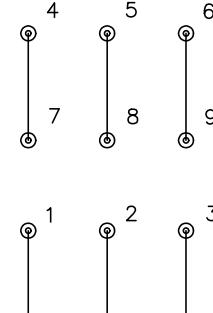




CD0005

LOW VOLTAGE
(2Y)

LINE

HIGH VOLTAGE
(1Y)

LINE

NOTES:

1. INTERCHANGE ANY TWO LINE LEADS TO REVERSE ROTATION.
2. OPTIONAL THERMOSTATS ARE PROVIDED WHEN SPECIFIED.
3. ACTUAL NUMBER OF INTERNAL PARALLEL CIRCUITS MAY BE A MULTIPLE OF THOSE SHOWN ABOVE.
4. LEAD COLORS ARE OPTIONAL. LEADS MUST ALWAYS BE NUMBERED AS SHOWN.

REV. DESC: REVISE TO SHOW OPTIONAL COLORS

REV. LTR: E BY: JLP REVISED: 01/19/99 10:15 TDR: 0171435

CD0005

FILE: AAA00005140

MDL: -

MTL: -

BALDOR ELECTRIC Co.

3PH, DV, 9 LEADS

CD0005

6

Reducer Data

Cyclo® 6000 Speed Reducers



Superior design, powerful performance

- Cyclo® 6000 boasts an expanded range of standard sizes and ratings. Use this chart to select a new Cyclo® 6000 when replacing Cyclo® series 3000 and 4000 models.

CYCLO® Frame Size Cross Reference

OLD 3000	4000	NEW 6000
3075	4075	6060
3085	4085	6065
		6070
		6075
		6080
		6085
3090	4090	6090
3095	4095	6095
3097	4097	6095
3100	4100	6100
3105	4105	6105
310H	410H	610H
		6110
		6115
3110	4110	6120
3115	4115	6125
311H	4125	612H
3140	4130	6130
3145	4135	6135
		6140
3155	4145	6145
315H	415H	614H
3160	4165	6165
3165	416H	616H
316H	4170	6170
3170	4175	6175
3175	4180	6180
3180	4170	6170
3185	4185	6185
3190	4190	6190
3195	4195	6195
3205	4205	6205
3215	4215	6215
3225	4225	6225
3235	4235	6235
3245	4245	6245
3255	4255	6255
3265	4265	6265
3275	4275	6275



- The Cyclo® 6000 is also available as an inline Gearmotor

To request a catalog, or for more information on any of our high quality products, please visit our Website:



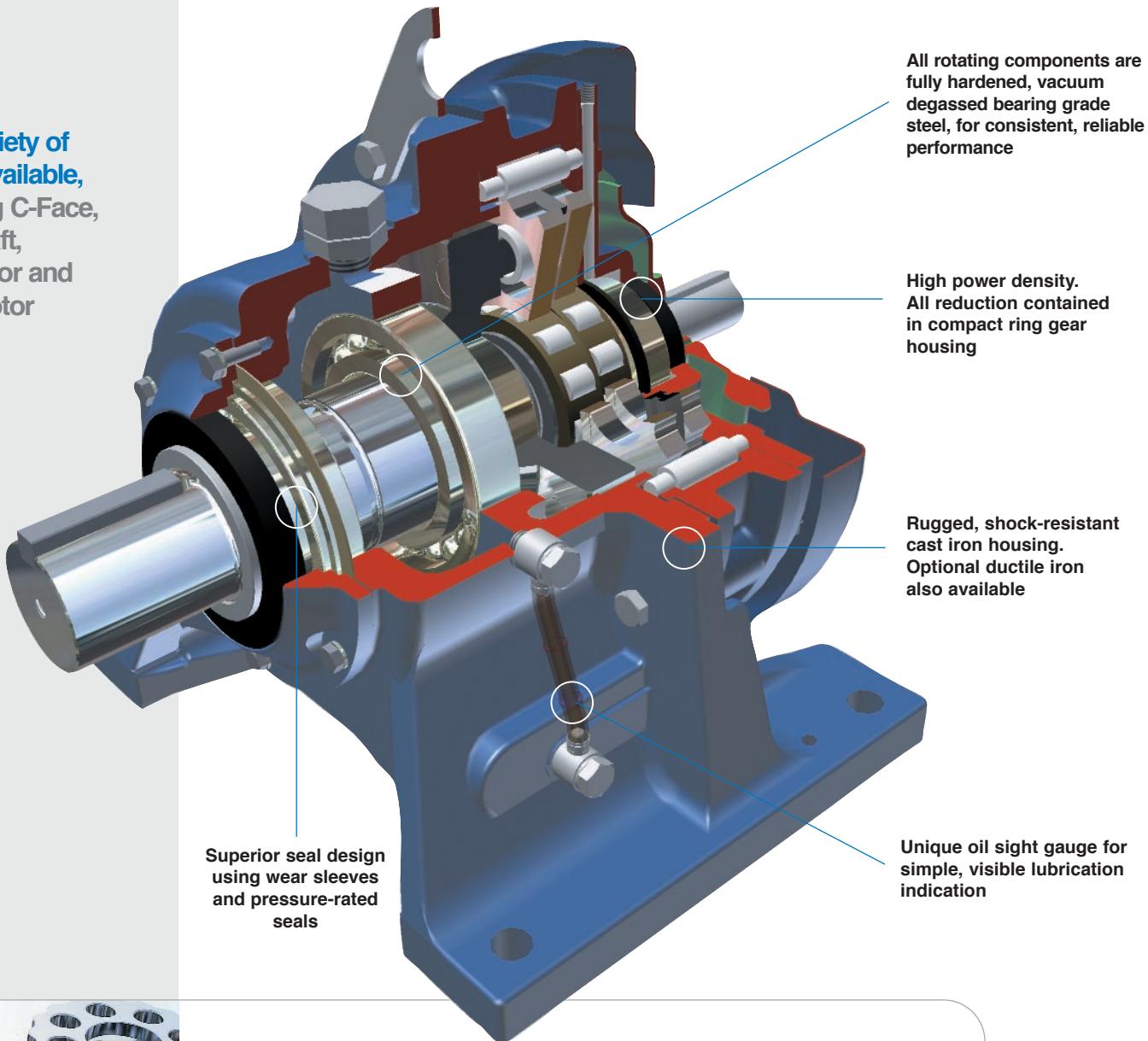
www.smcylo.com



Cyclo® 6000

High Torque Density, High Reliability Cycloidal Speed Reducers

- Wide variety of inputs available, including C-Face, Free-Shaft, Gearmotor and Brakemotor



Unmatched Reliability, Exceptional Performance

- Cyclo® speed reducers and gearmotors are designed to withstand shock loads exceeding 500% of their ratings



► Sumitomo's Cyclo® 6000 is extremely torque dense and is available as an inline speed reducer or gearmotor

Product Description

The Sumitomo Cyclo® drive is **unsurpassed by any other inline drive** available in the market today. Cyclo®'s unique **epicyclic-dial design** has advantages superior to speed reducers using common involute tooth gears. Cyclo® components operate in compression, not in shear. Unlike gear teeth with limited contact points, a Cyclo® has two thirds of its reduction components in contact at all times. Cyclo® speed reducers and gearmotors are **designed to withstand shock loads exceeding 500%** of their ratings, and provide exceptional performance, reliability and long life in the most severe applications.

Features & Benefits

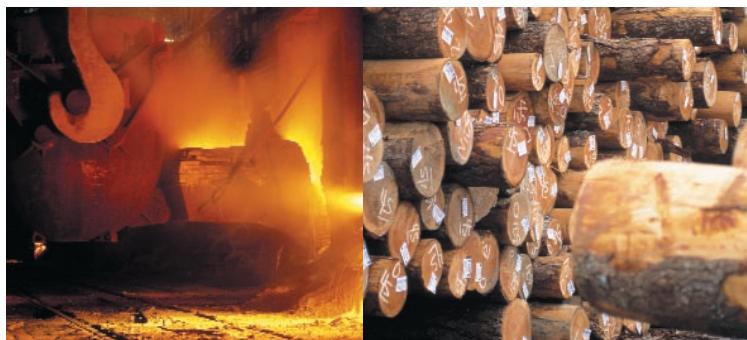
- **Highest overload capacity**, exceeding 500%
- **Exceptional life** with a 24 month warranty
- **High efficiency**, even at high reduction ratios
- **Remarkably versatile**, and available as inline speed reducer or gearmotor
- Ideal for **severe, high shock** applications
- Optional grease lubrication for **no maintenance**

Specifications

Sizes:	23 models (5 lbs to 5000 lbs)
Torque Rating:	210 to 603,000 lb in
HP Rating:	.10 to 232 HP
Ratio Range:	3 to 119 (single), 121 to 7569 (double), 8041 to 658,503 (triple)
Mounting:	Foot, Flange, Face Mount
Motor Standards:	NEMA, IEC, JIS, UL, CSA, CE



- **Simple, Compact Design**
- **Rugged Forged Output Shaft**
- **Many Mounting Styles**
- **C-Face, Shovel Base & Top Mount Options**



► Applications

- Conveyors
- Food Machinery
- Mixers
- Automotive Plants
- Recycling Machines
- Poultry Plants
- Sawmills and Wood Mills
- Wastewater Treatment
- Steel Mills
- Construction Equipment
- Paper Mills
- Processing Plants

FAQs

How do I select a Cyclo speed reducer or gearmotor?

Selection is based on the actual horsepower and/or torque requirements at the output shaft. The Cyclo speed reducer has particularly high efficiencies over a wide range of reduction ratios, which frequently permits the use of reduced input power requirements (smaller HP motor) without sacrificing output shaft torque. The selection procedures in this catalog will guide you in choosing the most efficient reducer for your application.

What information do I need to get started in the selection process?

To select the proper reducer for your application, you will need to know:

- Application: type of driven machine
- Hours of operation per day
- Motor horsepower (HP) and speed (RPM)
- Mounting position

If there are any special environmental factors or operation requirements, they must also be noted. This information will be important in determining the Service Factor of your application.

What are Service Factors and how are they used?

In general, reducers and gearmotors are rated for the specific conditions and operating requirements of the application by the use of AGMA-defined Service Factors. There are three AGMA load classifications for reducers: uniform (U), moderate shock (M) and heavy shock (H) (page 2.3) The Service Factors are used in the product selection process to adjust for the specific conditions and operating requirements of your application.

What do I do if my application has particularly severe operating conditions?

The standard ratings for Cyclo are based on 10-hour daily service under conditions of uniform loads (equivalent to AGMA service factor 1.0). By following the product selection process, you will determine and apply the Service Factors to compensate for the severe operating conditions.

How can I be sure that the reducer can withstand periodic excessive overloads?

Cyclo Speed Reducers provide 500% momentary intermittent shock load capacity. For applications with shock loads greater than 500%, consult an SMA Application Engineer.

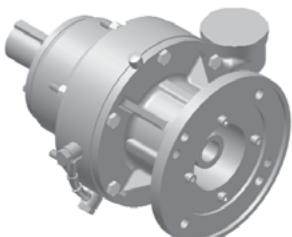
What are the standard input speeds?

In general terms, the speeds are 1750 and 1165 RPM. The selection tables in this catalog are based on 1750, 1165, 870, 580, and 50 RPM. When non-standard input speeds are used, the horsepower and torque ratings also vary.

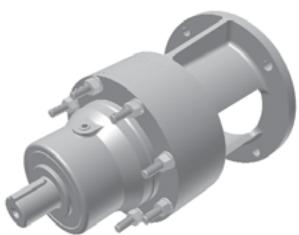
What thermal capacity limitations does the Cyclo have?

The Cyclo speed reducer, by virtue of its smooth, almost frictionless operation (unlike traditional helical gears), has a thermal rating that far exceeds its mechanical capacity and all but eliminates the conventional limitations due to heat.

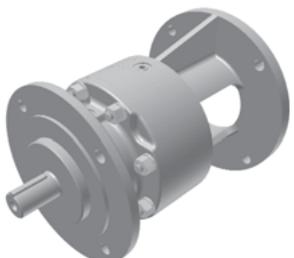
Common Configurations



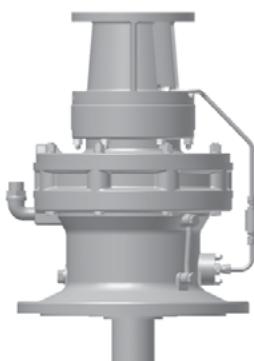
Single Reduction,
Horizontal Flange Mount
with Hollow Shaft Input



Single Reduction, Flange Mount
with C-Face Adapter



Single Reduction, V-Flange Mount
with C-Face Adapter



Double Reduction with
C-Face Adapter

Standard Specifications

Reducer	Reduction:	Internal planetary gear mechanism with trochoidal curved tooth profile.
	Lubrication:	Grease or oil lubricated models available.
	Seals:	Nitrile material, dual lipped, double output seals available.
	Material:	Rugged cast iron or ductile housings.
	Paint Color:	Blue, Muenter's color number 6.5PB 3.6/8.2

Ambient Conditions	Installation Location:	Indoors or Outdoors
	Ambient Temperature:	14°~104° F (-10° ~ 40° C)
	Ambient Humidity:	Under 85%
	Elevation:	Under 3,281 ft. (1000 meters)
	Atmosphere:	Well ventilated location, free of corrosive gases, explosive gases, vapors and dust.

Shaft Rotation

On single reduction Cyclo® speed reducers, ratios 3 through 119, the slow speed shaft rotates in a reverse direction to that of the high speed shaft.

On double reduction units, ratios 104 through 7569, both the high speed and the slow speed shaft rotate in the same direction.

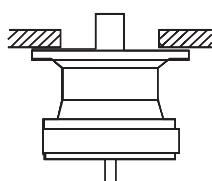
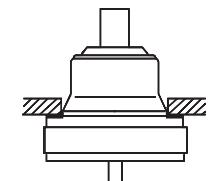
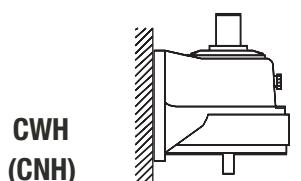
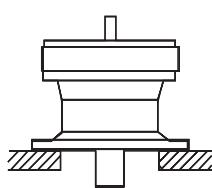
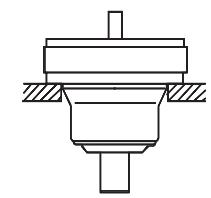
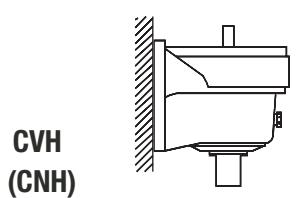
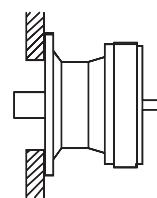
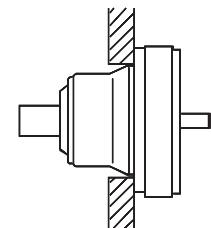
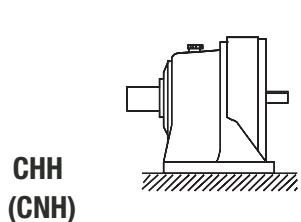
Input Speeds

In general terms, the standard input speeds of single reduction units are 1750, 1165, 875, 580, and 50 RPM. When non-standard input speeds are used, the horsepower and torque ratings will also vary.

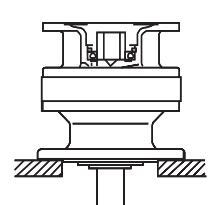
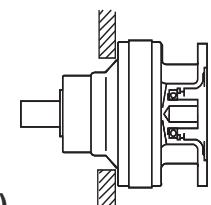
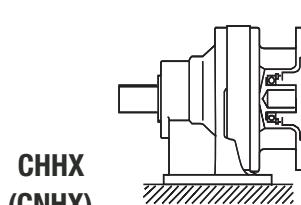
Thermal Capacity

The Cyclo® speed reducer's smooth, almost frictionless operation all but eliminates the conventional limitations due to heat. In all sizes, Cyclo® speed reducers have thermal ratings that exceed their mechanical capacity.

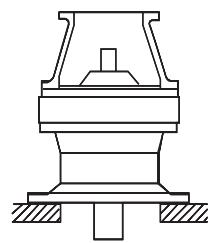
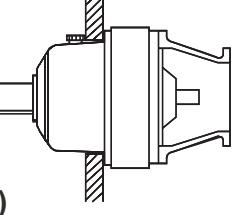
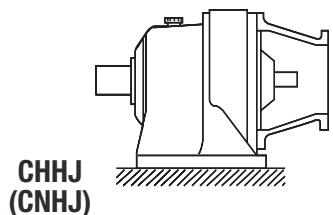
Housing Styles & Mounting Positions



Input Side Hollow Shaft



With Adaptor

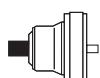


Mounting
Positions

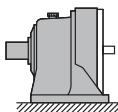
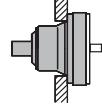
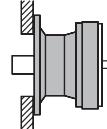
Configure a Model Number

Output Shaft Orientation

Type	Prefix
Horizontal	H
Vertical	V
Vertical Up (Solid Shaft)	W
Universal Direction	N

**H****V****W****Housing Style**

Type	Prefix
Foot	H
Flange	F
V-Flange	V

**H**
Foot**F**
Flange**V**
V Flange**Input Connection**

Input Connection	Prefix
None	-
C-Face Adaptor	J
Hollow Input Shaft	X

No Symbol

Reducers

With Adapter

Hollow Shaft

Modification (Special)

	Prefix
Special	S
Standard	-

Frame Size (from Selection Tables)**Shaft Specifications**

Input Shaft	Suffix
Inch	Y
DIN	G
Metric DIN	-

C H H - 6 1 1 5 Y - 29

Frame size

Modification (Special feature)

Input connection

Mounting style

Output shaft orientation

Shaft specification

Ratio

Cyclo Speed Reducer product code (always "C")

The Service Factor table below presents both AGMA standard service factors and Cyclo® service factors. Cyclo® service factors are smaller than AGMA, based on the Cyclo® strength and performance experience.

If your application requires AGMA specified service factors, then the AGMA value should be used. Otherwise, the Cyclo® service factor should be used.

Service Factors

Prime Mover	Service Duration	Load Classifications					
		Uniform		Moderate Shock		Heavy Shock	
		AGMA	Cyclo®	AGMA	Cyclo®	AGMA	Cyclo®
Electric Motor	1/2 hr. per day (Occasional)	0.50	0.50	0.80	0.80	1.25	1.20
	3 hrs. per day (Intermittent)	0.80	0.80	1.00	1.00	1.50	1.35
	Up to 10 hrs. per day	1.00	1.00	1.25	1.20	1.75	1.50
	24 hrs. per day	1.25	1.20	1.50	1.35	2.00	1.60
Multi Cylinder Internal Combustion Engine	1/2 hr. per day (Occasional)	0.80	0.80	1.00	1.00	1.50	1.35
	3 hrs. per day (Intermittent)	1.00	1.00	1.25	1.20	1.75	1.50
	Up to 10 hrs. per day	1.25	1.20	1.50	1.35	2.00	1.60
	24 hrs. per day	1.50	1.35	1.75	1.50	2.25	1.70
Single Cylinder Internal Combustion Engine	1/2 hr. per day (Occasional)	1.00	1.00	1.25	1.20	1.75	1.50
	3 hrs. per day (Intermittent)	1.25	1.20	1.50	1.35	2.00	1.60
	Up to 10 hrs. per day	1.50	1.35	1.75	1.50	2.25	1.70
	24 hrs. per day	1.75	1.50	2.00	1.60	2.50	1.80

How to Select

Determine Selection Horsepower (HP)

Motor HP X Service Factor = Selection HP
--

Example: 10 Motor HP X 1.25 Service Factor = 12.5 Selection HP

Select a Frame Size

1 Match your OUTPUT RPM (or RATIO)...

Output RPM Ratio	583	350	292	219	159	135	117	103	83.3	FRAME SIZE
Input HP	20.2	20.2	20.3	20.3	20.3	20.3	20.3	16.1	14.8	6145
Output Torque in-lbs	2081	3469	5560	7650	9030	10300	9370	10500	10500	614H
Overhung Load (lbs)	1554	1843	2170	2430	2470	2580	2710	2890	2890	
Input HP	27.2	27.2	26.4	26.4	26.4	25.1	17.6	17.3	17.3	6160
Output Torque in-lbs	2798	4654	7230	9900	11800	12900	10200	12400	12400	
Overhung Load (lbs)	1702	2019	2090	2360	2400	2510	2640	2850	2850	
Input HP	32.3	32.3	26.4	26.4	26.4	25.1	17.6	17.3	17.3	6165
Output Torque in-lbs	3322	5530	7230	9900	11800	12900	10200	12400	12400	616H
Overhung Load (lbs)	1686	1998	2090	2360	2400	2510	2640	2850	2850	
Input HP	37.0	37.0	37.0	47.2	47.2	43.5	41.1	40.3	40.3	6170
Output Torque in-lbs	3798	6335	7230	9900	11800	12900	10200	12400	12400	
Overhung Load (lbs)	1906	2261	2400	2620	3020	3130	3240	3440	3680	
Input HP	40.4	40.4	40.4	47.2	47.2	43.5	41.1	40.3	40.3	6175
Output Torque in-lbs	4141	6914	8290	10800	12100	12300	12800	12900	12900	
Overhung Load (lbs)	1906	2261	2400	2620	3020	3130	3240	3440	3680	
Input HP	-	-	-	47.2	47.2	43.5	41.1	40.3	40.3	6180
Output Torque in-lbs	-	-	-	17800	21000	22300	23800	24900	24900	
Overhung Load (lbs)	-	-	-	4030	4210	4430	4670	5030	5030	
Input HP	-	-	-	52.3	52.3	52.3	52.3	52.3	52.3	6185
Output Torque in-lbs	-	-	-	19600	22300	26800	30500	37600	37600	

2 ...to your SELECTION HP...

3 ...to find your FRAME SIZE

If Overhung or Axial Load are present, any Overhung or Axial Load must be checked against the capacity of the selection.

For special circumstances in selecting a **Frame Size** such as:

- Overhung Load
- Axial Loads
- Shock Loading

Consult Technical Information, pages 5.6–5.13.

Nomenclature

Example

CNV – 6125Y – 29

C – Cyclo 6000
N – Universal
V – V-Flange

6125 – Frame Sizen
Y – Inch Shaft
29 – Ratio

Nomenclature

Ratio

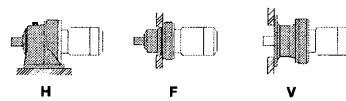
Ratio is found here in Selection Tables

Output RPM Ratio	540	360	210	219	108	135	117	100	83.3	FRAME SIZE
	3	5	6	8	11	13	15	17	21	
Input HP	20.2	20.2	20.3	20.3	20.3	20.3	20.3	18.1	18.1	
Output Torque in-lbs	3469	4179	5086	7000	9030	10000	10371	10500	10500	
Overhung Load (lb)	1044	1843	1965	2170	2430	2470	2500	2710	2860	
Input HP	27.2	27.2	27.2	26.4	26.4	26.4	25.1	17.6	17.6	
Output Torque in-lbs	4814	5580	7230	9900	11800	12900	13290	12400	12400	
Overhung Load (lb)	1702	2018	2150	2400	2890	2890	3000	3150	3250	
Input HP	32.3	32.3	32.3	32.3	36.3	36.3	35.2	21.6	21.6	
Output Torque in-lbs	5322	6100	6860	12200	13600	15000	14700	15500	15500	
Overhung Load (lb)	1486	1986	2130	2360	2470	2760	2950	3060	3210	
Input HP	37.8	37.8	37.8	37.8	37.8	36.8	34.2	26.4	26.2	
Output Torque in-lbs	6335	7600	10100	13900	16300	17500	15300	18700	18700	
Overhung Load (lb)	1906	2281	2400	2950	3040	3100	3290	3460	3750	
Input HP	45.4	45.4	45.4	45.4	45.4	45.4	45.4	32.3	32.3	
Output Torque in-lbs	6141	6914	8290	11000	15200	18000	20700	18700	23200	
Overhung Load (lb)	1906	2361	2400	2620	3020	3130	3290	3440	3880	
Input HP	-	-	-	-	47.2	47.2	43.5	45.1	45.2	
Output Torque in-lbs	-	-	-	-	17800	21000	23200	23800	28900	
Overhung Load (lb)	-	-	-	-	4000	4210	4420	4670	5030	
Input HP	-	-	-	-	52.3	52.3	52.3	52.3	52.3	

Nominal
Total Ratio

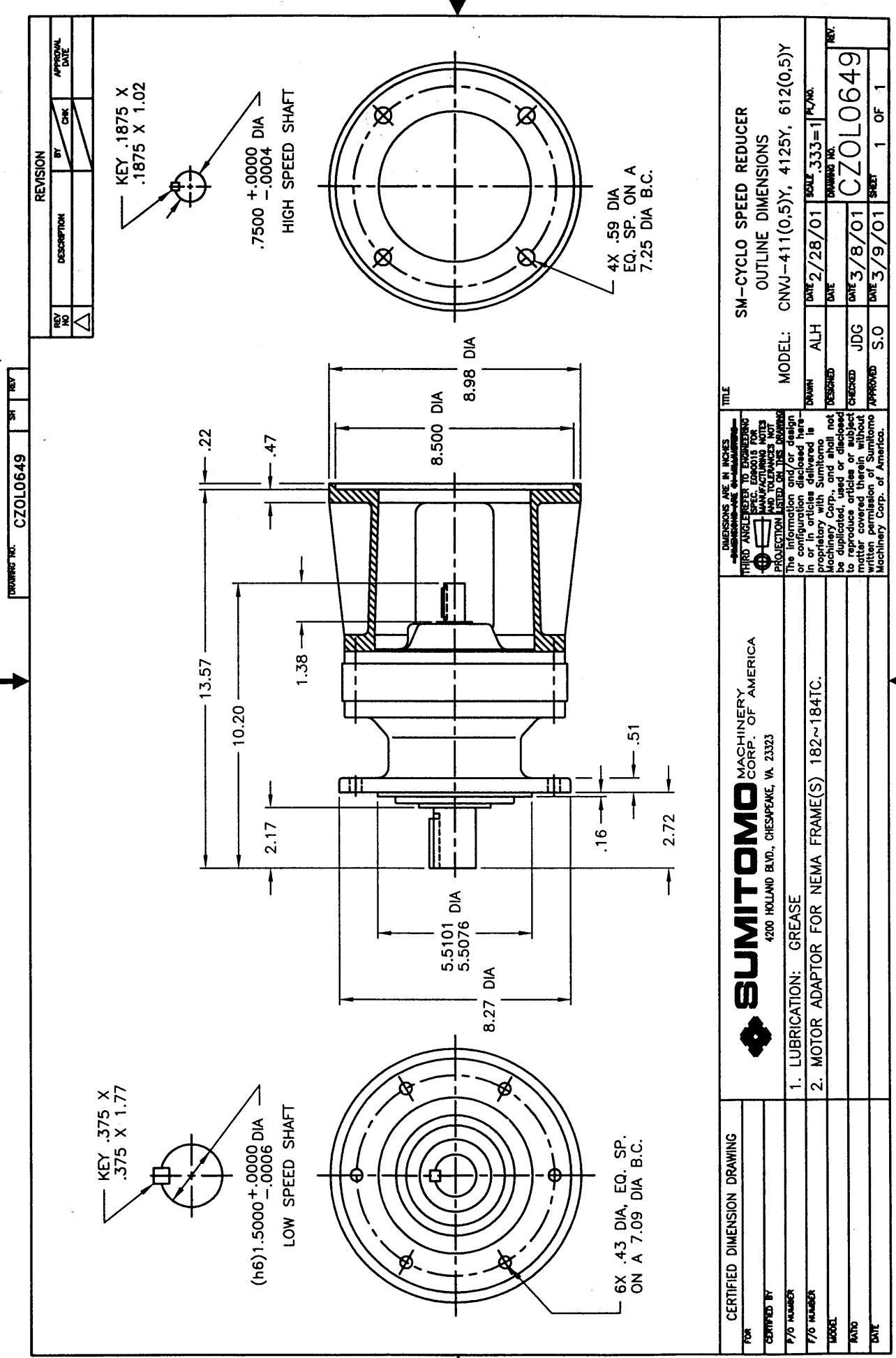
1750 RPM Frame Size Selection Tables

Dimensions:		Pages
Foot Mount (H)		4.2–4.15
F-Flange (F)		4.30–4.38
V-Flange (V)		4.48–4.64

Single Reduction, Ratios 25-119
H, F, V Housing Styles

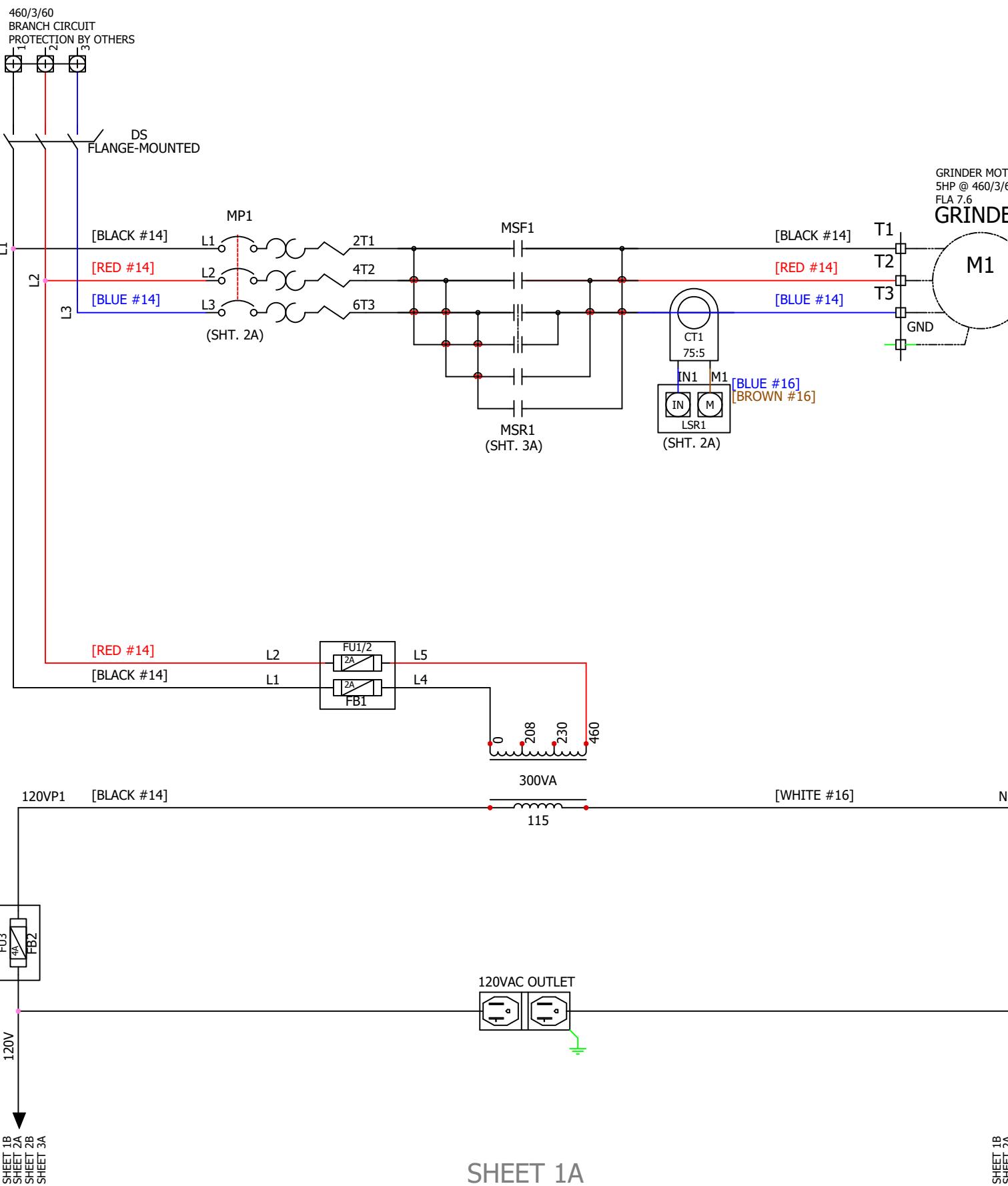
Output RPM Ratio	70.0	60.3	50.0	40.7	34.3	29.7	24.6	20.1	14.7	FRAME SIZE
25		29		35	43	51	59	71	87	119
Input HP	0.15	0.15	0.15	0.12	-	-	-	-	-	
Output Torque (in•lbs)	127	146	177	178	-	-	-	-	-	
Overhung Load (lbs)	265	265	265	265	-	-	-	-	-	6060
Input HP	0.22	0.22	0.19	0.15	-	-	-	-	-	
Output Torque in•lbs	190	220	230	223	-	-	-	-	-	
Overhung Load (lbs)	265	265	265	265	-	-	-	-	-	6065
Input HP	0.31	0.30	0.28	0.23	0.13	0.13	-	-	-	
Output Torque in•lbs	264	301	339	334	233	271	-	-	-	
Overhung Load (lbs)	397	397	397	397	397	397	-	-	-	6070
Input HP	0.40	0.38	0.37	0.30	0.19	0.18	-	-	-	
Output Torque in•lbs	337	380	448	446	335	367	-	-	-	
Overhung Load (lbs)	397	397	397	397	397	397	-	-	-	6075
Input HP	0.46	0.46	0.44	0.34	0.26	0.25	0.16	0.12	-	
Output Torque in•lbs	391	452	527	493	450	500	391	359	-	
Overhung Load (lbs)	569	575	575	575	575	575	575	575	-	6080
Input HP	0.64	0.63	0.49	0.40	0.32	0.31	0.25	0.16	-	
Output Torque in•lbs	544	621	595	580	563	632	609	484	-	
Overhung Load (lbs)	562	573	575	575	575	575	571	575	-	6085
Input HP	0.90	0.84	0.82	0.58	0.45	0.42	0.34	0.28	0.17	
Output Torque in•lbs	769	832	981	858	776	836	819	843	682	
Overhung Load (lbs)	750	750	750	750	750	750	750	750	750	6090
Input HP	1.16	1.05	1.02	0.81	0.57	0.50	0.40	0.40	0.20	
Output Torque in•lbs	990	1040	1220	1190	990	1010	981	1210	823	
Overhung Load (lbs)	750	750	745	750	750	750	750	750	750	6095
Input HP	1.70	1.62	1.31	1.05	0.75	0.69	0.59	0.58	0.28	
Output Torque in•lbs	1460	1610	1560	1540	1310	1400	1410	1730	1150	
Overhung Load (lbs)	1210	1210	1210	1210	1210	1210	1210	1210	1210	6100
Input HP	2.24	2.13	1.61	1.45	1.04	0.95	0.75	0.76	0.38	
Output Torque in•lbs	1920	2120	1920	2140	1810	1920	1830	2260	1560	
Overhung Load (lbs)	1210	1210	1210	1210	1210	1210	1210	1210	1210	6105
Input HP	2.56	2.55	2.01	1.74	1.27	1.15	0.90	0.89	-	
Output Torque in•lbs	2200	2530	2410	2570	2200	2330	2180	2640	-	
Overhung Load (lbs)	1500	1540	1650	1710	1710	1710	1710	1710	-	6110
Input HP	2.98	2.98	2.43	2.04	1.49	1.36	1.02	1.02	-	
Output Torque in•lbs	2550	2950	2900	2990	2600	2730	2470	3030	-	
Overhung Load (lbs)	1490	1530	1640	1710	1710	1710	1710	1710	-	6115
Input HP	4.15	4.01	3.34	2.56	2.31	1.74	1.28	1.27	-	
Output Torque in•lbs	3540	3980	4010	3780	4020	3530	3120	3770	-	
Overhung Load (lbs)	1790	1860	1980	2120	2200	2200	2200	2200	-	6120
Input HP	5.32	5.06	4.27	3.19	3.06	2.17	1.61	1.52	-	
Output Torque in•lbs	4540	5010	5100	4700	5330	4380	3910	4510	-	
Overhung Load (lbs)	1770	1840	1950	2100	2190	2200	2200	2200	-	6125
Input HP	6.93	6.01	4.98	4.01	3.41	2.94	2.46	1.91	-	
Output Torque in•lbs	5920	5960	5950	5910	5950	5920	5960	5660	-	
Overhung Load (lbs)	2050	2160	2290	2470	2580	2710	2890	3130	-	6130
Input HP	7.99	7.57	5.70	5.06	3.93	3.38	2.91	2.56	-	
Output Torque in•lbs	6820	7500	6820	7430	6860	6830	7070	7620	-	
Overhung Load (lbs)	2030	2130	2270	2430	2560	2690	2870	3110	-	6135
Input HP	9.25	7.99	6.99	5.29	4.60	3.97	3.26	2.66	-	
Output Torque in•lbs	7900	7920	8360	7780	8020	8010	7920	7900	-	
Overhung Load (lbs)	3090	3150	3400	3550	3590	3590	3590	3590	-	6140

Speed Reducers
Selection Tables

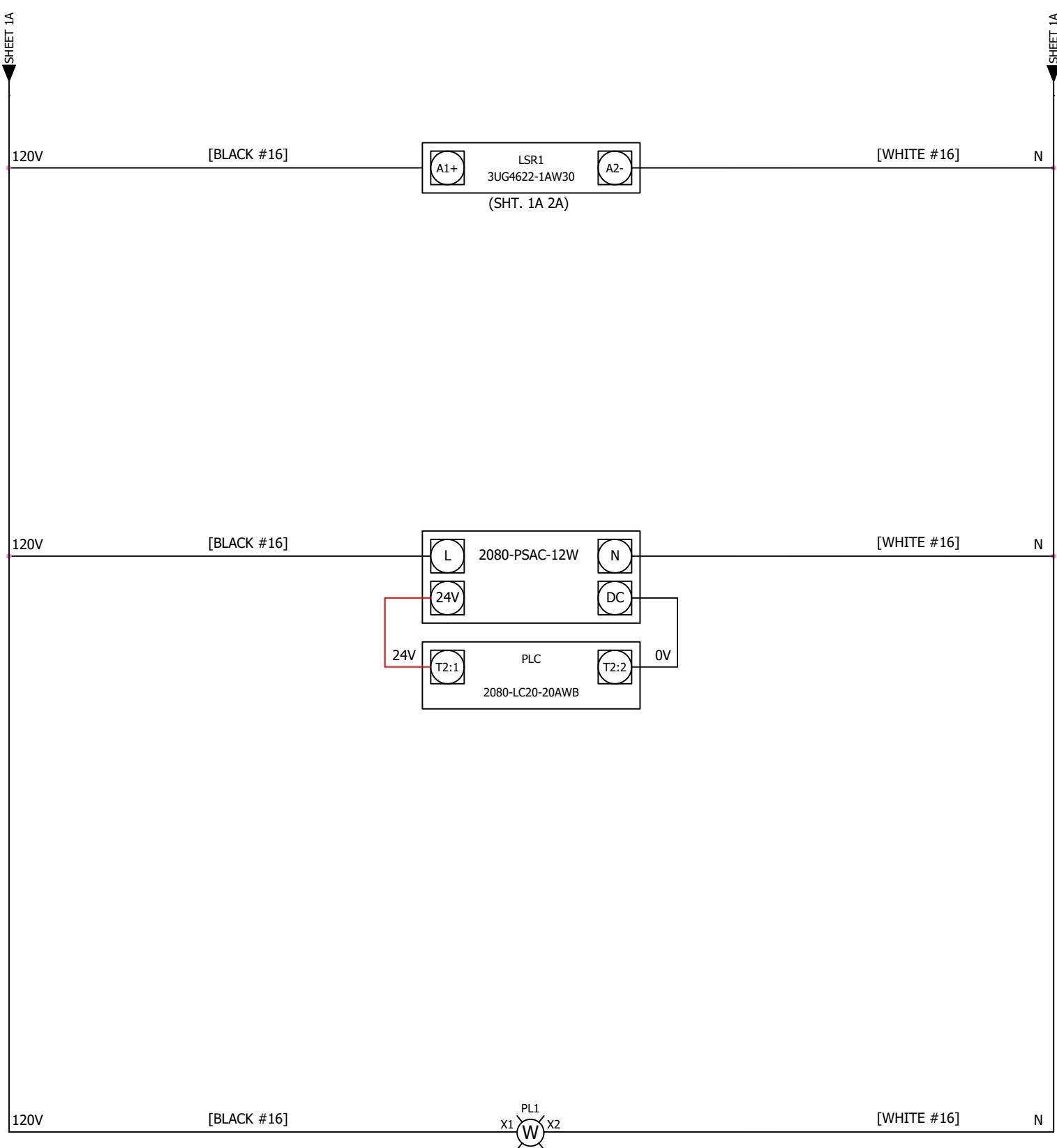


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Electrical



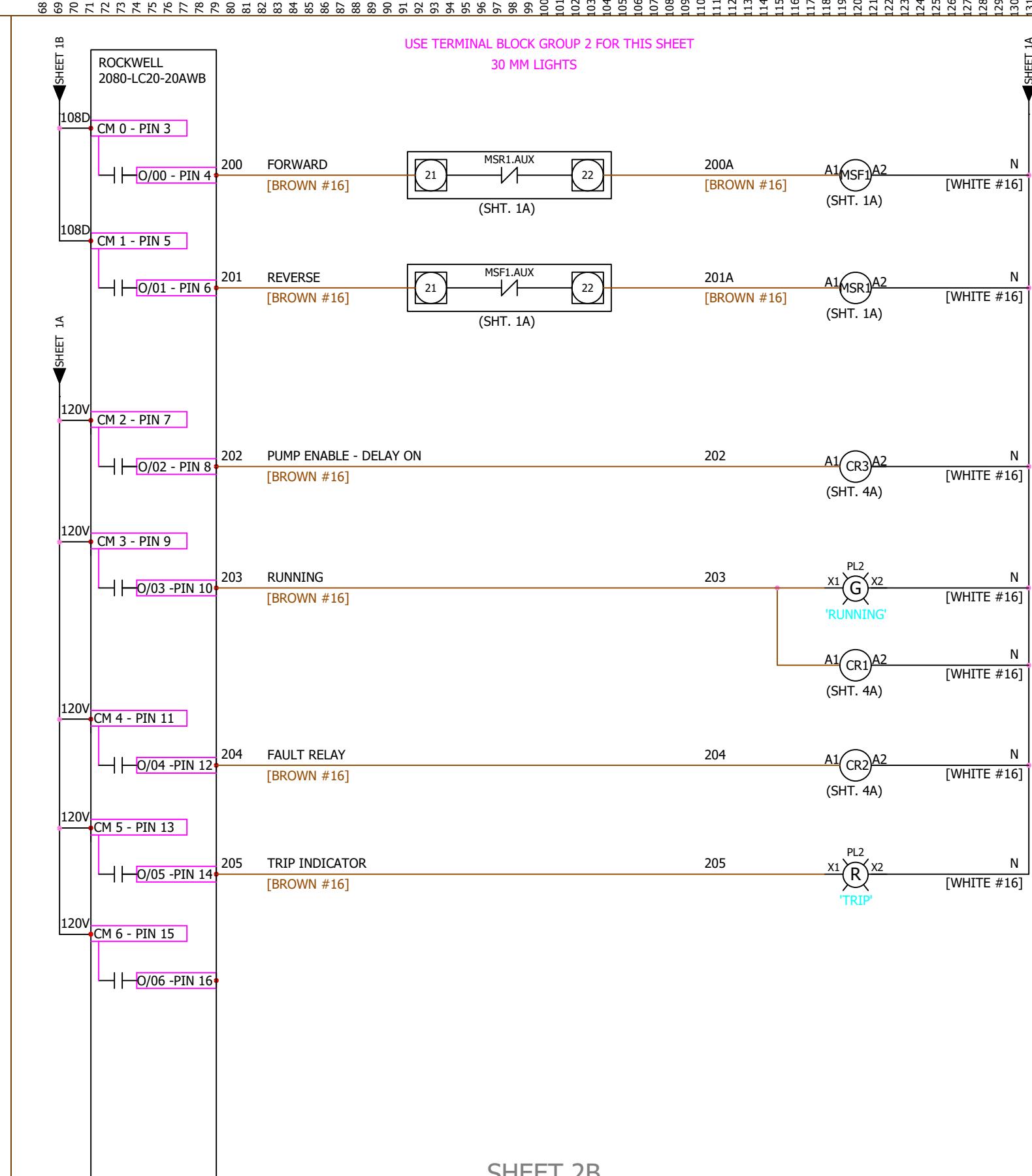
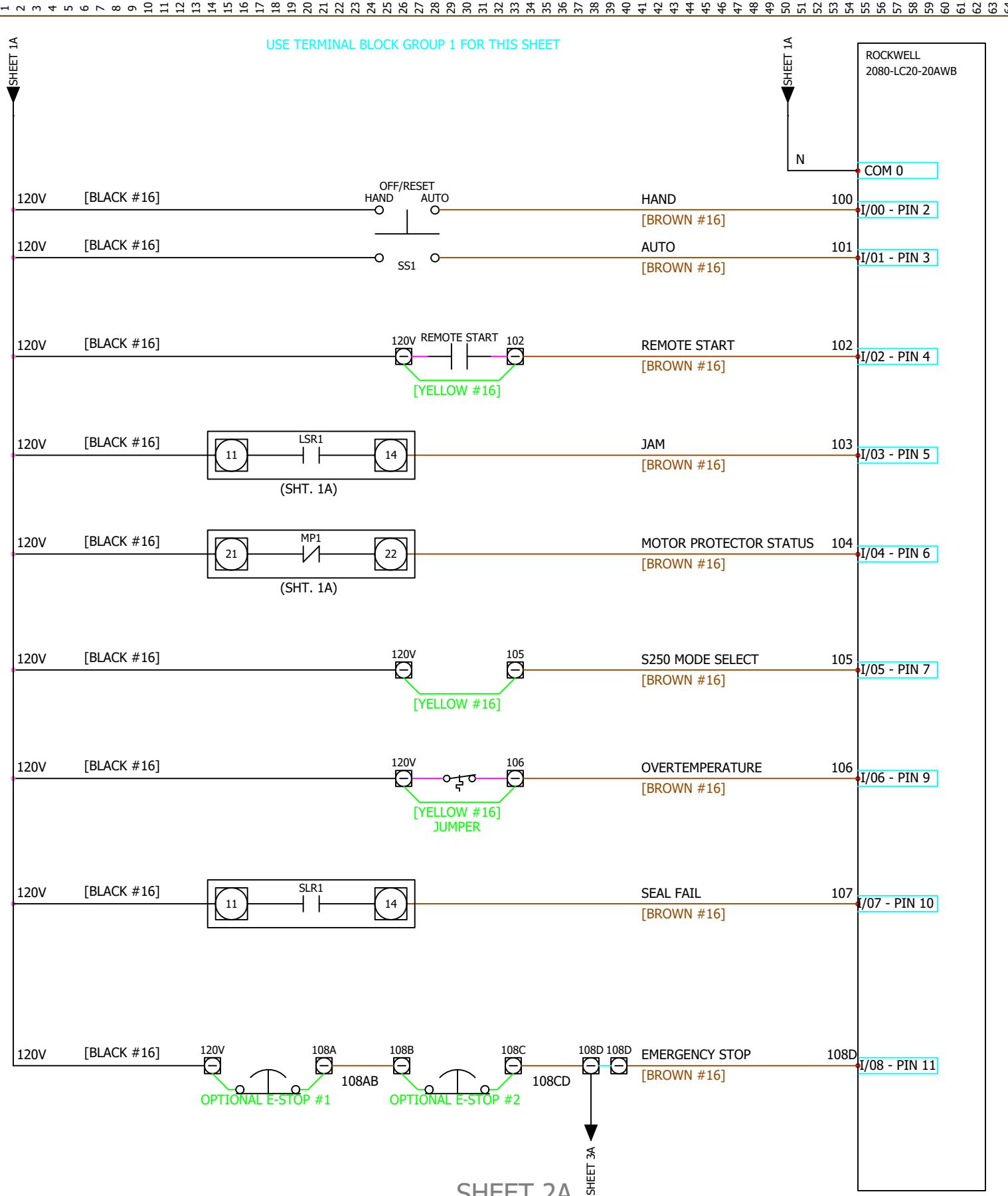
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WIRE TYPE	SIZE*	COLOR	WIRE TYPE	SIZE*	COLOR
POWER	AS REQUIRED	BLACK	24 VDC	16 AWG	BLUE
120V CONTROL	16 AWG	RED	12 VDC	16 AWG	PURPLE
120V NEUTRAL	16 AWG	WHITE	EXT. POWER	16 AWG	YELLOW
24 VAC	16 AWG	ORANGE	SHIELDED	18 AWG	MULTI
LOW VAC	16 AWG	BROWN	GROUND	16 AWG	GREEN

THIS COMPLETE ELECTRICAL ASSEMBLY WILL BE CONSTRUCTED AND
LABLED TO CONFORM TO THE REQUIREMENTS OF U.L. 508A PROCEDURES.

* WIRE SIZE SHALL BE 16 AWG OR MAXIMUM ALLOWED AS RATED BY
COMPONENT MANUFACTURER IF COMPONENT IS RATED FOR SMALLER THAN
16 AWG



WIRE TYPE	SIZE*	COLOR	WIRE TYPE	SIZE*	COLOR	THIS DRAWING EMBODIES A PROPRIETARY ALL DESIGN, MANUFACTURING, REPRODUC- TION AND SALE OF THIS DRAWING IS FOR RIGHT BY WRITTEN AGREEMENT TO REPRO- DUCE IT. NO PARTS OF THIS DRAWING REGARDING THE SAME ARE EXPRESSLY RES- ERVED. NO PARTS OF THIS DRAWING ARE SPECIFIC PURPOSE, AND THE RECIPIENT AG- REES NOT TO DISCLOSE OR USE ANY IN- FORMATION REGARDING IT TO ANY UNA- UTHORIZED PERSON. THE RECIPIENT AG- REES THAT IT IS THE PROPERTY OF THE FABRICATOR, AND THAT IT IS TO BE MAINTAINED AS CONFIDENTIAL INFORMATION. IT IS THE PROPERTY OF THE FABRICATOR AND IS TO BE RETURNED UPON REQUEST.
POWER	AS REQUIRED	BLACK	24 VDC	16 AWG	BLUE	
120V CONTROL	16 AWG	RED	12 VDC	16 AWG	PURPLE	
120V NEUTRAL	16 AWG	WHITE	EXT. POWER	16 AWG	YELLOW	
24 VAC	16 AWG	ORANGE	SHIELDED	18 AWG	MULTI	

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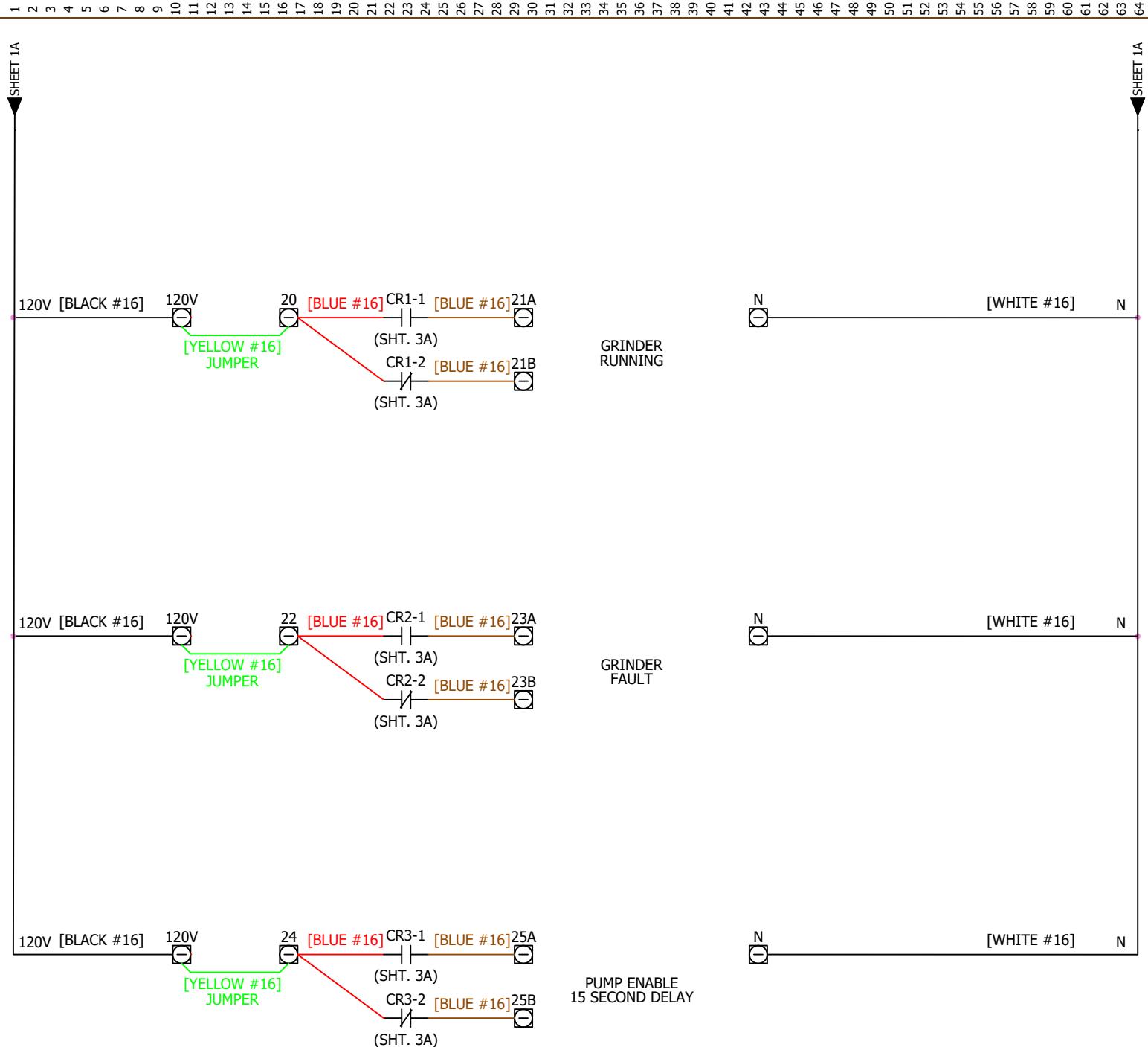
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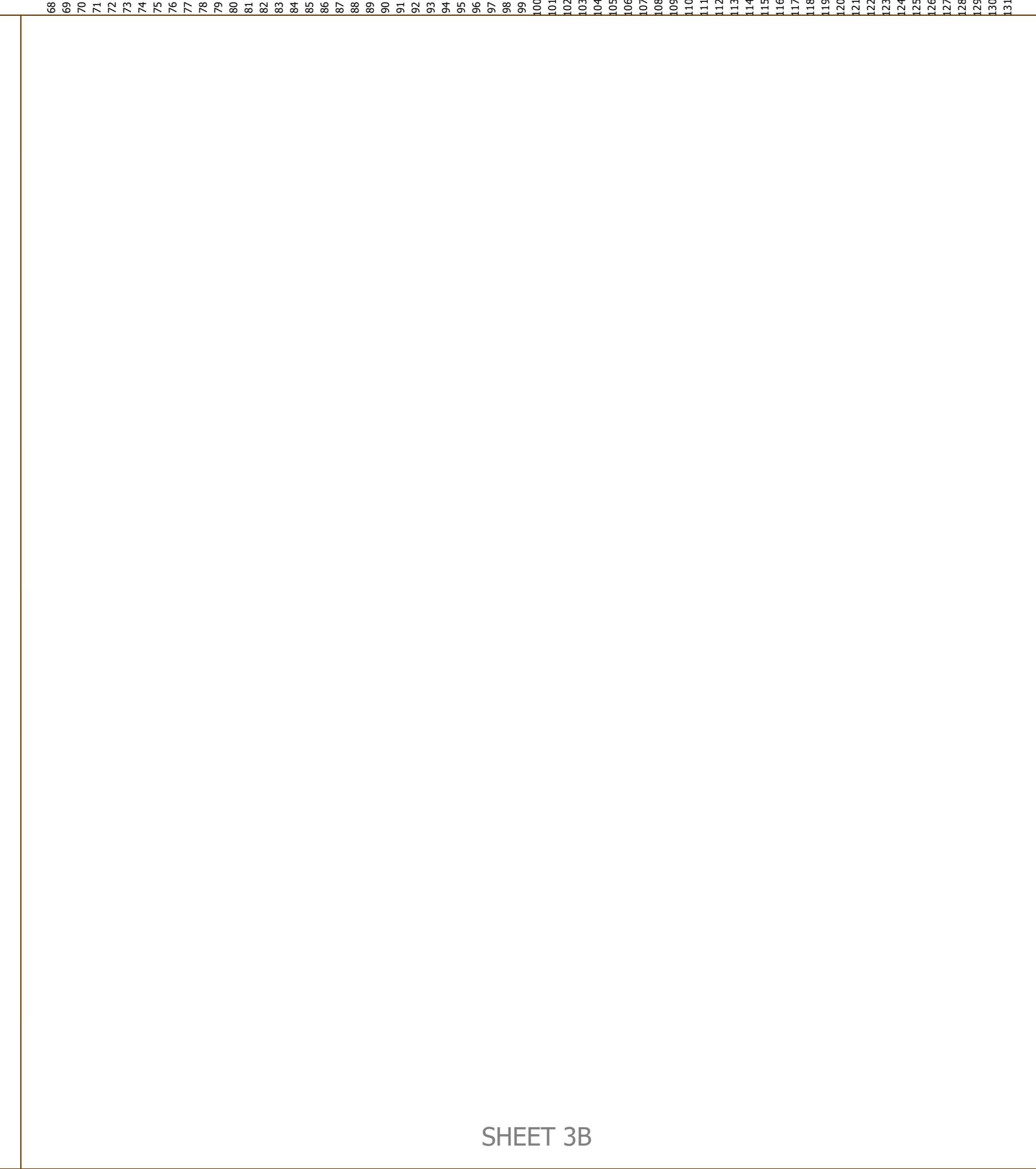
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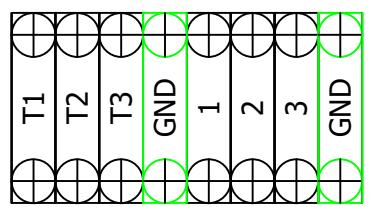
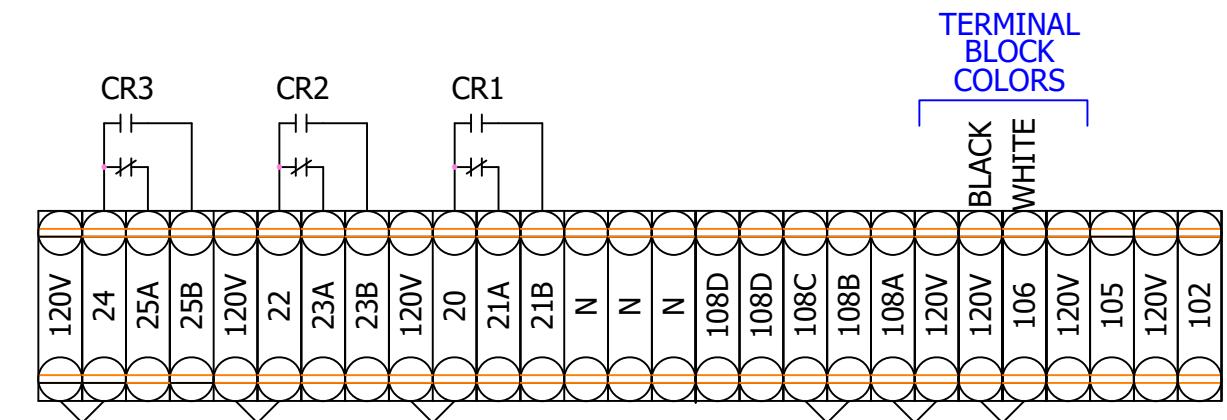
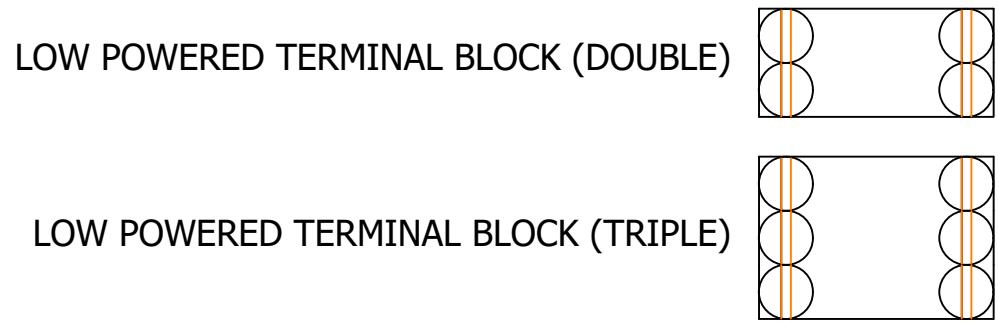
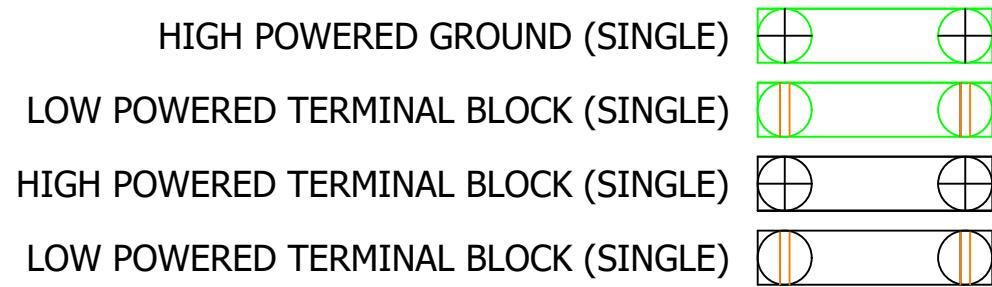


SHEET 3A



WIRE TYPE	SIZE*	COLOR	WIRE TYPE	SIZE*	COLOR	THIS DRAWING EMBODIES A PROPRIETARY DESIGN ORIGINATED BY FRANKLIN MILLER, INC.
POWER	AS REQUIRED	BLACK	24 VDC	16 AWG	BLUE	ALL DESIGN, MANUFACTURING, REPRODUCTION (EXCEPT WHERE THE RECIPIENT HAS BEEN GIVEN THE EXPRESS
120V CONTROL	16 AWG	RED	12 VDC	16 AWG	PURPLE	RIGHT BY WRITTEN AGREEMENT TO REPRODUCE THE DRAWING) IS EXPRESSLY PROHIBITED. USE AND SALE RIGHTS
120V NEUTRAL	16 AWG	WHITE	EXT. POWER	16 AWG	YELLOW	REGARDING THE SAME ARE EXPRESSLY RESERVED. IT IS SUBMITTED UNDER A CONFIDENTIAL RELATIONSHIP FOR A
24 VAC	16 AWG	ORANGE	SHIELDED	18 AWG	MULTI	SPECIFIC PURPOSE, AND THE RECIPIENT AGREES BY ACCEPTING THIS DRAWING NOT TO SUPPLY OR DISCLOSE ANY
LOW VAC	16 AWG	BROWN	GROUND	16 AWG	GREEN	INFORMATION REGARDING IT TO ANY UNAUTHORIZED PERSON OR TO INCORPORATE IN OTHER PROJECTS ANY
THIS COMPLETE ELECTRICAL ASSEMBLY WILL BE CONSTRUCTED AND LABELED TO CONFORM TO THE REQUIREMENTS OF U.L. 508A PROCEDURES.			* WIRE SIZE SHALL BE 16 AWG OR MAXIMUM ALLOWED AS RATED BY COMPONENT MANUFACTURER IF COMPONENT IS RATED FOR SMALLER THAN 16 AWG			

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 LIVINGSTON, NEW JERSEY.



PUMP ENABLE DELAY
GRINDER FAULT

OPTIONAL E-STOP #2

OPTIONAL E-STOP #1

OVERTEMPERATURE

S250/S260 MODE SELECTION

REMOTE START

SHEET 4

WIRE TYPE	SIZE*	COLOR	WIRE TYPE	SIZE*	COLOR
POWER	AS REQUIRED	BLACK	24 VDC	16 AWG	BLUE
120V CONTROL	16 AWG	RED	12 VDC	16 AWG	PURPLE
120V NEUTRAL	16 AWG	WHITE	EXT. POWER	16 AWG	YELLOW
24 VAC	16 AWG	ORANGE	SHIELDED	18 AWG	MULTI

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THIS COMPLETE ELECTRICAL ASSEMBLY WILL BE CONSTRUCTED AND

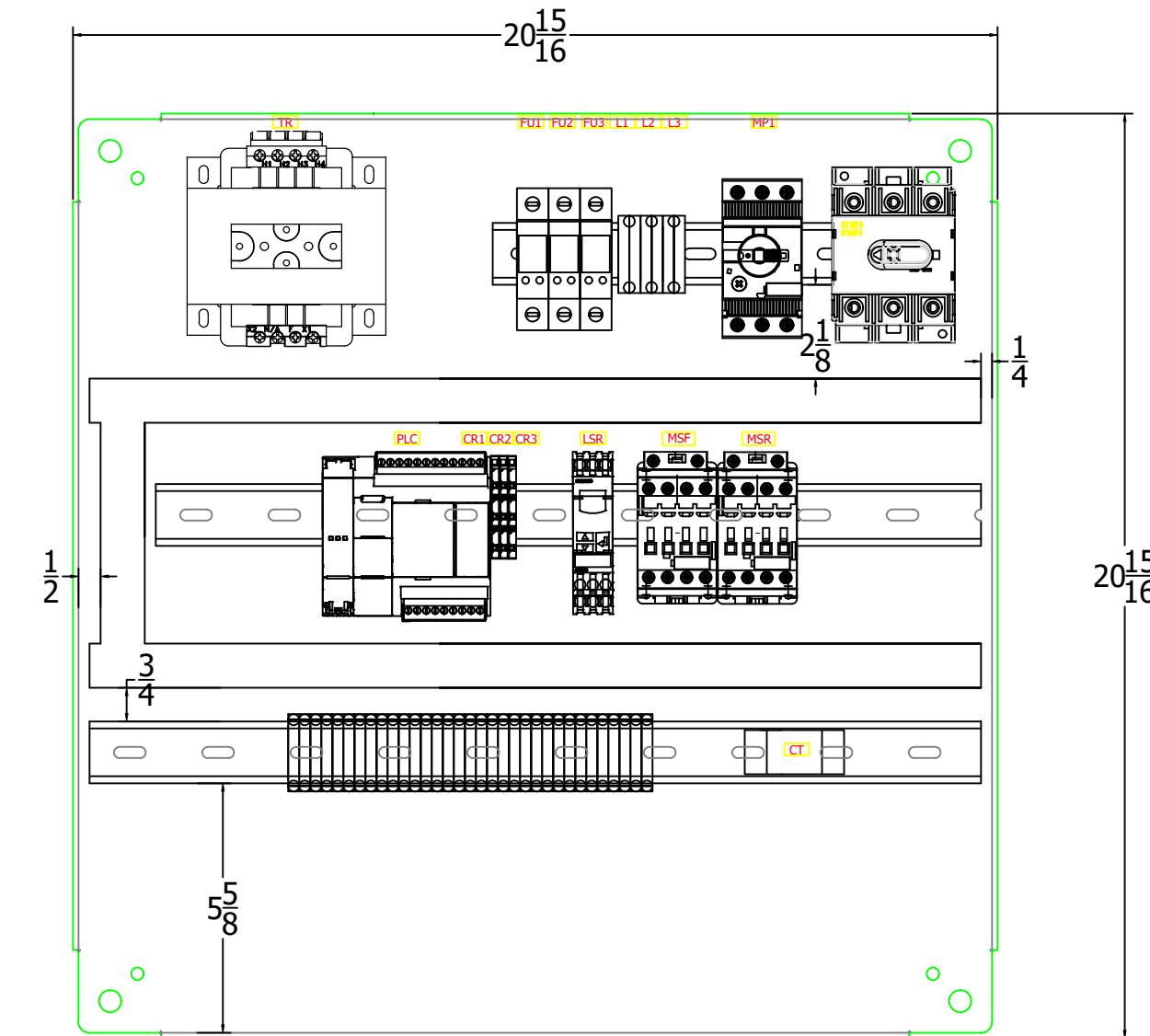
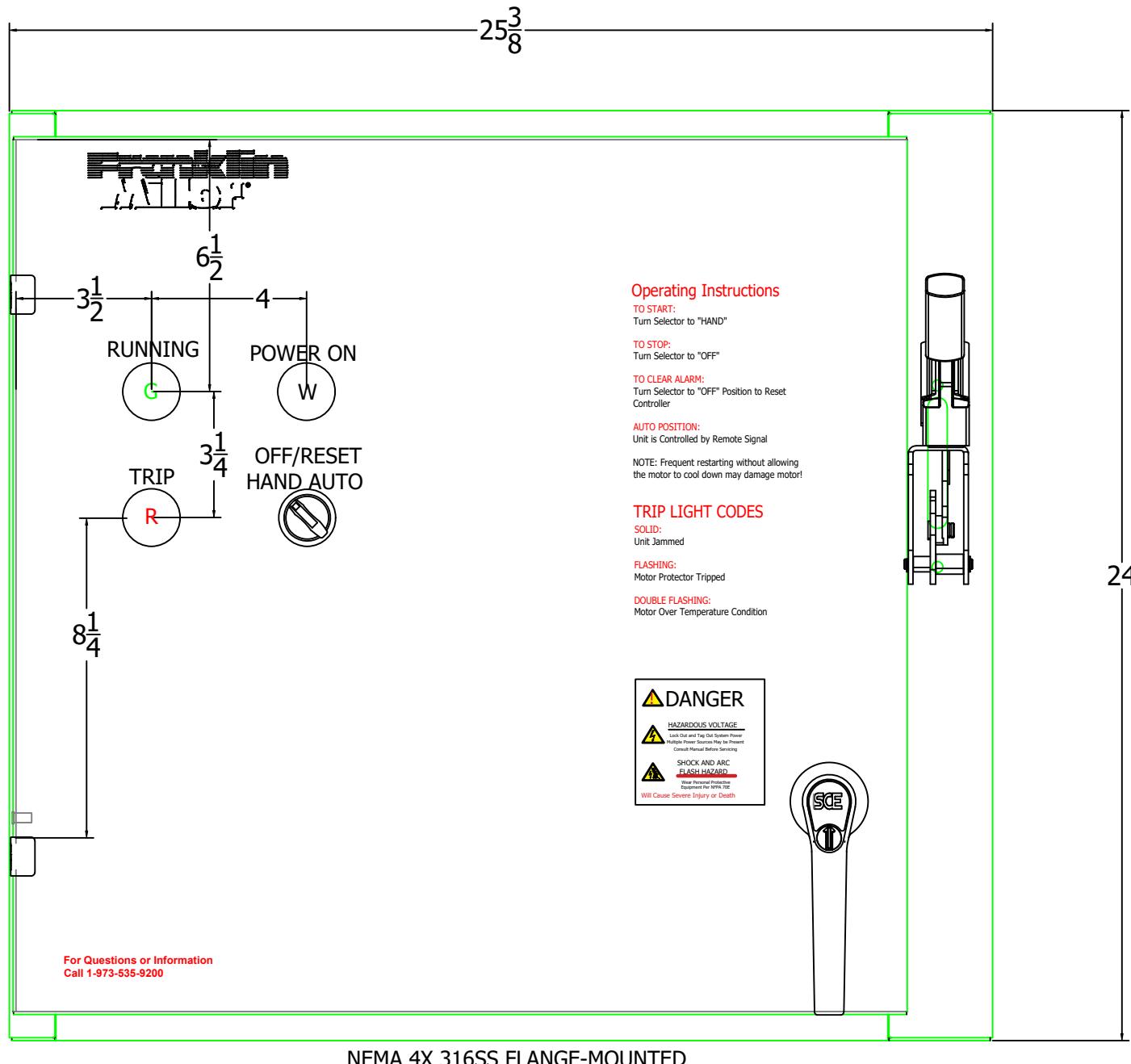
* WIRE SIZE SHALL BE 16 AWG OR MAXIMUM ALLOWED AS RATED BY
COMPONENT MANUFACTURER IF COMPONENT IS RATED FOR SMALLER TH



60 OKNER PARKWAY, LIVINGSTON, N.J. 07039

HTLQ WWTP

FILED WWTF
CALE DRAWN DATE DWG EC12808 4 REV
IDS 2025-02-03 0



SHEET 5A

FRONTPANEL

BACKPANELS

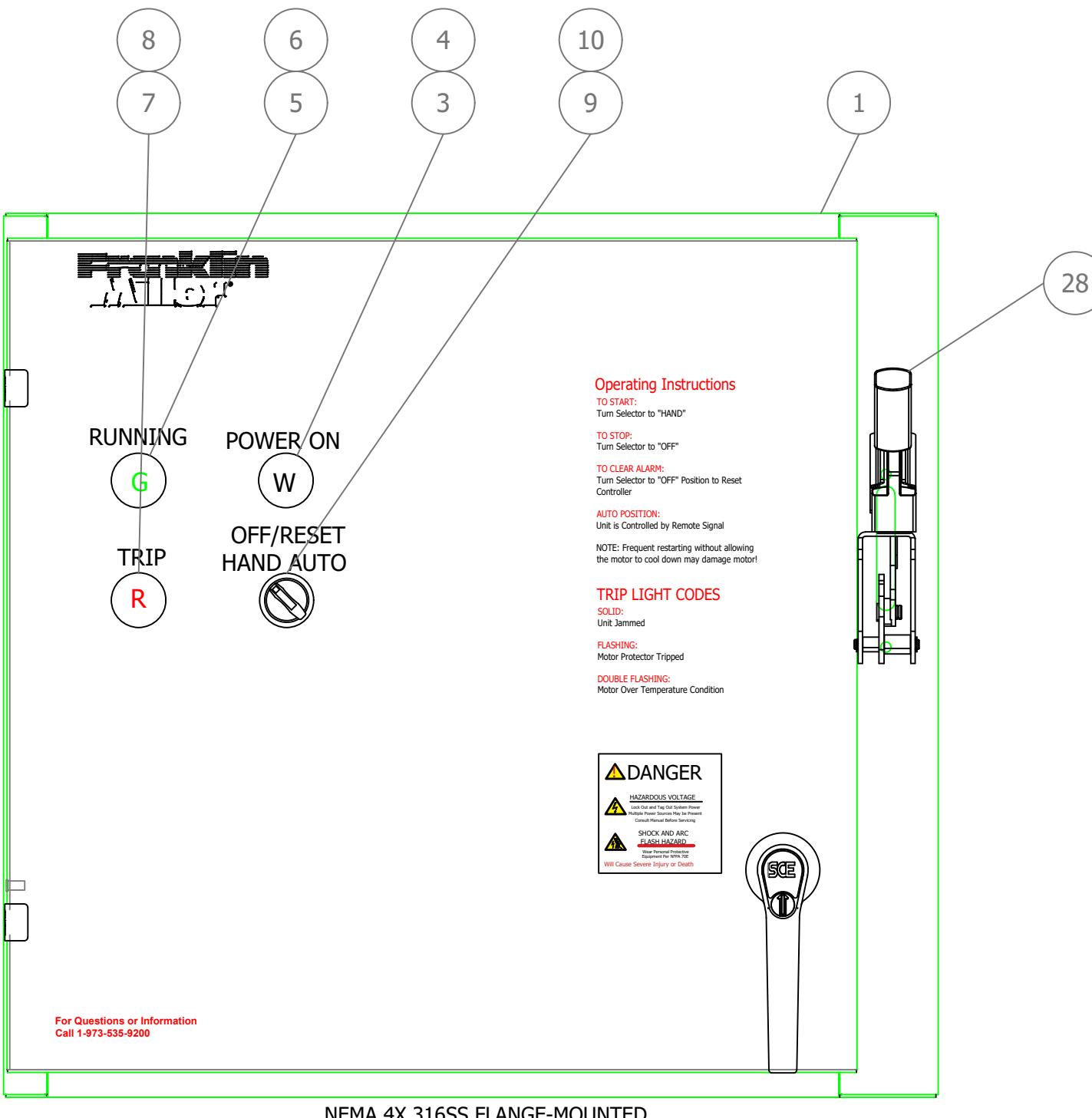
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SHEET 5B

FRANKLIN MILLER INC.
60 OKNER PARKWAY, LIVINGSTON, N.J. 07039

HILO WWTP

SCALE	DRAWN	DATE		DWG	EC12808	SHT 5
-	IDS	2025-02-03				REV 0



FRONTPANEL

BACKPANELS

SHEET 6A

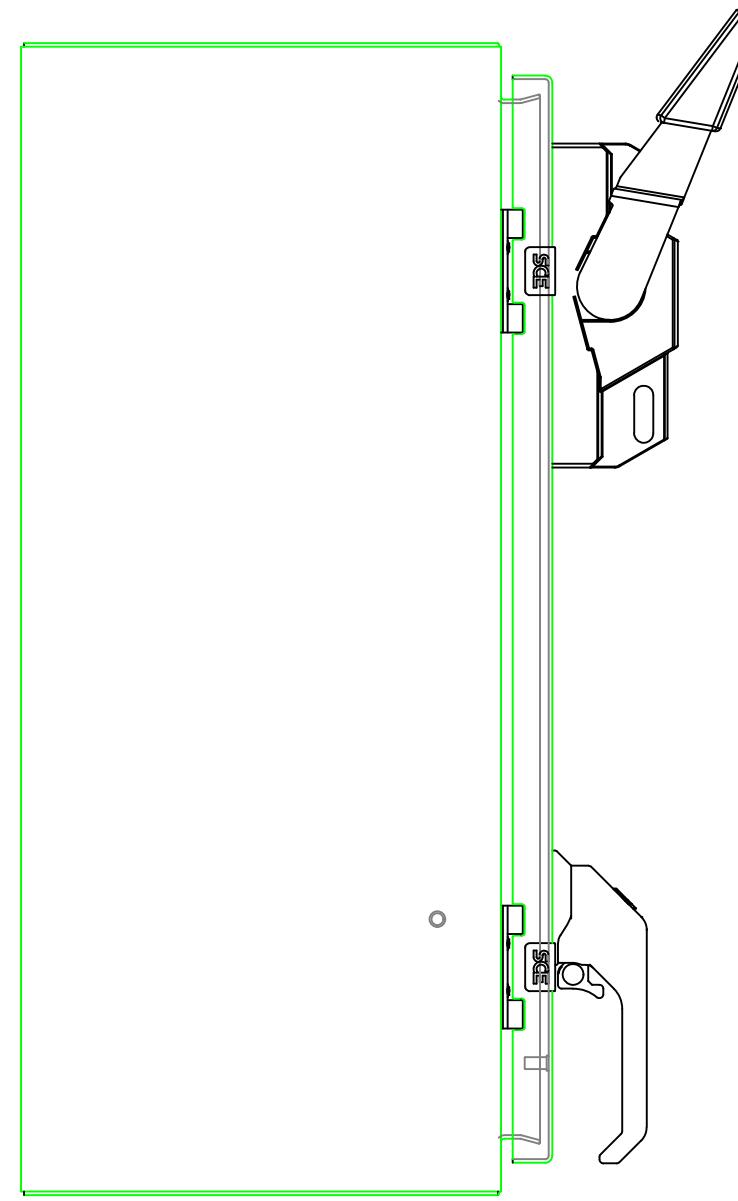
SHEET 6B

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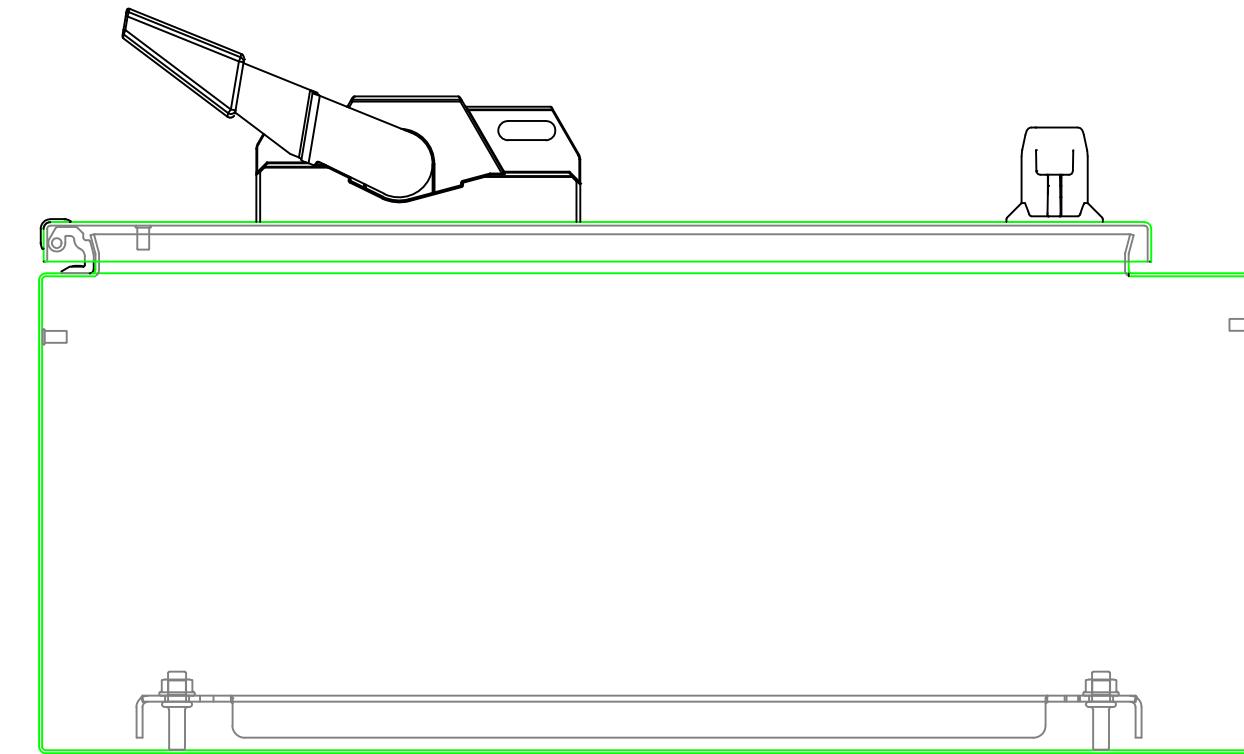
HILO WWTP

SCALE	DRAWN	DATE		DWG	SHT
-	IDS	2025-02-03		EC12808	6 REV 0



LEFT SIDE VIEW

SHEET 7A



BOTTOM VIEW

SHEET 7B

LEFT SIDE

BOTTOM

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HILO WWTP

SCALE	DRAWN	DATE		DWG	SHT
-	IDS	2025-02-03		EC12808	7

REV 0

TASKMASTER® GRINDERS

TASKMASTER® TITAN GRINDERS

DIMMINUTOR® COMMINUTORS

SUPER SHREDDER®

SPIRALIFT® SCREENS

SCREENMASTER® SCREENS

DELUMPER® CRUSHERS



See the difference...

Since 1918

60 Okner Parkway, Livingston, NJ 07039

P: (973) 535-9200 • F: (973) 535-6269

info@franklinmiller.com

www.franklinmiller.com



S U B M I T T A L

TASKMASTER TM8500 INLINE

Model: TM851204

SN: 12808AB

Contractor: Nan Inc

Job Name: Hilo, HI WWTP Phase 1 Grinders

GRINDERS | SHREDDERS | CRUSHERS | SCREENS

Experience the Difference

Submittal Data

by **Franklin Miller, Inc.**

Prepared For:

JASON KO
NAN INC
636 Laumaka St
HONOLULU HI 96819
Phone: 8088424929

Franklin Miller is pleased to provide the enclosed submittal data for your review and Approval.

Date	03/27/2025	Pages	50
Revision	00	Prepared By	Ashley Arias
Copies		Action	Approval
Purchase Order	24077-00046		
Installation	Hilo, HI WWTP Phase 1 Grinders		

Qty	Model	Serial Number	Weight (Lbs.)
2	TM851204	12808AB	

Review & Approval Required:		
Signed by :	✓	Check One:
Title:		Approved without change
Organization:		Approved as noted
Date:		Revise and resubmit

Once approved with signature and released for production, this submittal document will be considered a legal document and will override any other documents; unless otherwise specified in writing in this document. Franklin Miller will only be responsible for items mentioned herein. If any modifications are required, Franklin Miller will resubmit this document for final approval (without charge).

Please send back your approval and confirm / provide the following:

- Select voltage to control (230V) or (460V)
- Select O&M Manual should be digital PDFs or hard copies.

The returned data package may be transmitted via fax, mail, or email. **This machine can not be released for production without the above mentioned information and APPROVAL signature.**

Franklin Miller Inc.

60 Okner Parkway • Livingston, N.J. 07039 • Phone: (973)535-9200 • Fax: (973)535-6269

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Livingston, New Jersey.

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1 Unit Specification

FRANKLIN MILLER, INC.

UNIT SPECIFICATIONS

General Information

Order #:	110872
Serial #:	12808AB
Customer:	Nan Inc
Purchase Order #:	24077-00046
Machine Installation:	Hilo, HI WWTP Phase 1 Grinders
Machine Model:	TM851204
Quantity:	2

Motor

MANUFACTURER Baldor	POWER 5HP	ENCLOSURE TEFC
VOLTS 230/460	PHASE 3 phase	HERTZ 60

Reducer

MANUFACTURER Sumitomo	MODEL 6125	RATIO 29
---------------------------------	----------------------	--------------------

Enclosure

MODEL S25060	CONTROLLER NEMA 4X 316SS	
VOLTS 230/460	PHASE 3 phase	HERTZ 60



Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039 USA

Scope of Supply

Order No. 110872

Page 1 of 3

Sold To:

Nan Inc

636 Laumaka St
Honolulu, HI 96819 USA
Contact: Welina Bobiles
Phone: 8088424929

Rep:

JBI Water & Wastewater Eqt., Inc.

3386 Tartan Trail
El Dorado Hills, CA 95762 USA

Organization ID	P.O. #	Salesperson	Serial Number	Order Date
NAN002	24077-00046	Jacob Galanty	12808AB, 12809AB, 12810/	3/25/2025

Line No.	Quantity	Units	Description
1	2.0	EA	TASKMASTER® GRINDER, Model TM851204 as follows: <ul style="list-style-type: none">- Cutter Cartridge Technology: 11-Tooth Cam Cutters, 4140 H.T.- Nom. 8" x 12" Cutting Chamber- 4" ANSI Flange Housing- 150# Bolt Pattern- Drop-In Design Housing For Fast & Easy Maintenance - D.I.- Mechanical Seals: TC vs. TC 90 psi max.- 2" Hexagonal Shafting, 4140 H.T.- Painted 2 Coats Heavy Epoxy Coating - Osha Blue No Cutter Stack Retightening Required - GUARANTEED
2	2.0	EA	MOTOR AND DRIVE INCLUDING: <ul style="list-style-type: none">- 5HP TEFC Baldor C-Face Motor, 230/460V, 3PH, 60 HZ- Gear Reducer - Cycloidal, Vertical Down- Coupling: High Torque Jaw Style- Reducer and Adapter constructed of Iron and Steel
3	2.0	EA	Automatic Reversing Controller, Model S260 <ul style="list-style-type: none">- Nema 4X 316 Stainless Steel Enclosure- Allen Bradley Compact Logix PLC logic control- IEC starters- LED Indicators - for long life- Current Sensing Auto-Reversing Program- 30mm pilot devices- Pad Lockable Flange Mount Disconnect Switch- GFCI duplex 120 VAC convenience receptacle- 120V Control Circuit- 480V 3 Phase 60HZ
4	2.0	EA	TASKMASTER® GRINDER, Model TM851204 as follows: <ul style="list-style-type: none">- Cutter Cartridge Technology: 11-Tooth Cam Cutters, 4140 H.T.- Nom. 8" x 12" Cutting Chamber- 4" ANSI Flange Housing- 150# Bolt Pattern- Drop-In Design Housing For Fast & Easy Maintenance - D.I.- Mechanical Seals: TC vs. TC 90 psi max.- 2" Hexagonal Shafting, 4140 H.T.- Painted 2 Coats Heavy Epoxy Coating - Osha Blue No Cutter Stack Retightening Required - GUARANTEED



Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039 USA

Scope of Supply

Order No. 110872

Page 2 of 3

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Nan Inc

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Honolulu, HI 96819 USA
Contact: Welina Bobiles
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Rep:

JBI Water & Wastewater Eqt., Inc.

3386 Tartan Trail
El Dorado Hills, CA 95762 USA

Organization ID	P.O. #	Salesperson	Serial Number	Order Date
NAN002	24077-00046	Jacob Galanty	12808AB, 12809AB, 12810/	3/25/2025

Line No.	Quantity	Units	Description
----------	----------	-------	-------------

5 2.0 EA MOTOR AND DRIVE INCLUDING:

- 5HP TEFC C-Face Baldor Motor, 230/460V, 3PH, 60 HZ
- Gear Reducer - Cycloidal, Vertical Down
- Coupling: High Torque Jaw Style
- Reducer and Adapter constructed of Iron and Steel

6 2.0 EA Automatic Reversing Controller, Model S260

- Nema 4X 316 Stainless Steel Enclosure
- Allen Bradley Compact Logix PLC logic control
- IEC starters
- LED Indicators - for long life
- Current Sensing Auto-Reversing Program
- 30mm pilot devices
- Pad Lockable Flange Mount Disconnect Switch
- GFCI duplex 120 VAC convenience receptacle
- 120V Control Circuit
- 480V 3 Phase 60HZ

7 2.0 EA TASKMASTER® GRINDER, Model TM851206 as follows:

- Cutter Cartridge Technology: 11-Tooth Cam Cutters, 4140 H.T.
- Nom. 8" x 12" Cutting Chamber
- 6" Ansi (DIN 150) Flange Housing- 150# Bolt Pattern
- Drop-In Design Housing For Easy Maintenance. D.I.
- Mechanical Seals: TC vs. TC 90 psi max.
- 2" Hexagonal Shafting, 4140 H.T.
- Painted 2 Coats Heavy Epoxy Coating - Osha Blue

8 2.0 EA MOTOR AND DRIVE INCLUDING:

- 5HP TEFC C-Face Baldor Motor, 230/460V, 3PH, 60 HZ
- Gear Reducer - Cycloidal, Vertical Down
- Coupling: High Torque Jaw Style
- Reducer and Adapter constructed of Iron and Steel

9 2.0 EA Automatic Reversing Controller, Model S260



Franklin Miller Inc.
60 Oknay Parkway
Livingston, NJ 07039 USA

Scope of Supply

Order No. 110872

Page 3 of 3

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3386 Tartan Trail
El Dorado Hills, CA 95762 USA

Organization ID	P.O. #	Salesperson	Serial Number	Order Date
NAN002	24077-00046	Jacob Galanty	12808AB, 12809AB, 12810F	3/25/2025

Line No.	Quantity	Units	Description
			<ul style="list-style-type: none">- Nema 4X 316 Stainless Steel Enclosure- Allen Bradley Compact Logix PLC logic control- IEC starters- LED Indicators - for long life- Current Sensing Auto-Reversing Program- 30mm pilot devices- Pad Lockable Flange Mount Disconnect Switch- GFCI duplex 120 VAC convenience receptacle- 120V Control Circuit- 480V 3 Phase 60HZ
10	2.0	EA	Spare Parts <ul style="list-style-type: none">- 3 fuses.- 3 replacement long life indicator lamps.- 1 complete gasket and o-rings set.- 3 cutters cartridges- 1 complete mechanical seal.
11	1.0	DY	Startup Services - (4 Trips) <ul style="list-style-type: none">- Installation Inspection- Warranty Certification- O&M instructions <p>If more than one day, Days are Consecutive. Normal Day Rate includes up to 8 hours,</p>
12	2.0	EA	Seismic Calcs
13	1.0	EA	Two Year Warranty

2

Paint Specification

PAINTING SPECIFICATIONS

(Franklin Miller Fabricated Parts)

All stainless steel parts, if used, will not be painted.

All steel surfaces shall be primed the same day as cleaned.

All steel parts which are exposed will be painted to the following procedures.

SURFACE PREPARATION

Surface preparation for steel will be defined by the Steel Structures Painting Council (SSPC) and is as follows:

SSPC-10-NEAR WHITE BLAST CLEANING

Near-white blast cleaning is a method of preparing metal surfaces for painting or coating by removing nearly all mill scale, rust scale, paint or foreign matter by the use of abrasives propelled through nozzles or by centrifugal wheels. A near-white blast cleaned surface finish is defined as one in which all oil, grease, dirt, mill scale, rust corrosion products, oxides, paint or other foreign matter have been completely removed from the surface except for very light shadows, very slight streaks or slight discolorations caused by rust stain, mill scale oxides, or slight, tight residues of paint or coating that may remain. At least 95% of each square inch of surface area shall be free of all visible residues, and the remainder shall be limited to the light discolored mentioned above.

COATING

DESCRIPTION:	Polyamide Epoxy
TYPICAL USE:	Coating structural steel, machinery and equipment.
COLOR:	Franklin Miller Blue
FINISH:	Satin
PRIMER:	One Coat
TOP:	One Coat
DRY FILM THICKNESS:	(As recommended by manufacturer): 3 to 5 mil per coat.

3 Warranty

FRANKLIN MILLER INC.
LIMITED WARRANTY
DOMESTIC

SELLER warrants the goods sold hereunder to be free from defects in material and workmanship under normal use and service not arising from misuse, negligence or accident, or unauthorized modification of the equipment, in connection with the use, installation, and transportation of the goods by BUYER, its agents, servants, employees or by carriers. SELLER's obligations under this warranty are limited to remedying any deficiencies in the goods at such place or places in the United States of America as may be designated by SELLER. This warranty shall pertain to any part or parts of any goods to which BUYER has, within (24) months after date of shipment, given written notice of a claimed defect to the SELLER. The BUYER shall be required to furnish SELLER with details of such defects and this warranty shall be effective as to such goods which upon SELLER's examination shall disclose to its satisfaction to have been defective and which at SELLER's option shall be repaired in place if required for a warranty repair. The BUYER at his expense shall make available in a suitable location for repair by SELLER or promptly thereafter be returned to SELLER, at BUYER's, or its nominees expense. If upon examination it is determined by the SELLER that the repair or replacement does not fall within the Warranty as set forth in this clause, an estimate for cost of repair will be provided to the BUYER. This warranty is expressly in lieu of all other warranties expressed or implied. In no event shall the SELLER be liable to the BUYER or to any other person for any loss or damage, direct or indirect, arising out of or caused by the use or operation of the goods, or for the loss of profits, business, or good will. Under no circumstance will SELLER be liable for any of the following: (1) third party claims against BUYER for losses or damages including liquidated damages; (2) loss of or damage to BUYER's records or data; or (3) economic consequential damages (including loss of profits or savings) or incidental damages even if SELLER is informed of their possibility. Excluded from the warranty herein are (a) defects in parts or components not manufactured directly by SELLER; Franklin Miller will, however, pass on the remaining balance of the purchased equipment manufacturer's warranty; (b) or not part of SELLER's standard design or are supplied pursuant to special BUYER's requirements; (c) certain parts which are subject to wear and tear from abrasive action or use thereof; and (d) any part that has been subjected to misuse. SELLER's liability is limited to furnishing or repairing at SELLER's option parts determined by SELLER to be defective. No express warranties and no implied warranties, whether of merchantability or fitness for any particular use, or otherwise (except as to title), other than those expressly set forth above which are made expressly in lieu of all other warranties, shall apply to products sold by us, and no waiver, alteration, or modification of the foregoing conditions shall be valid unless made in writing and signed by an executive officer of our corporation. If the buyer is in default of Clause 6 (Payment of Purchase Price) this warranty is null and void unless reinstated by SELLER.

4

Drawings

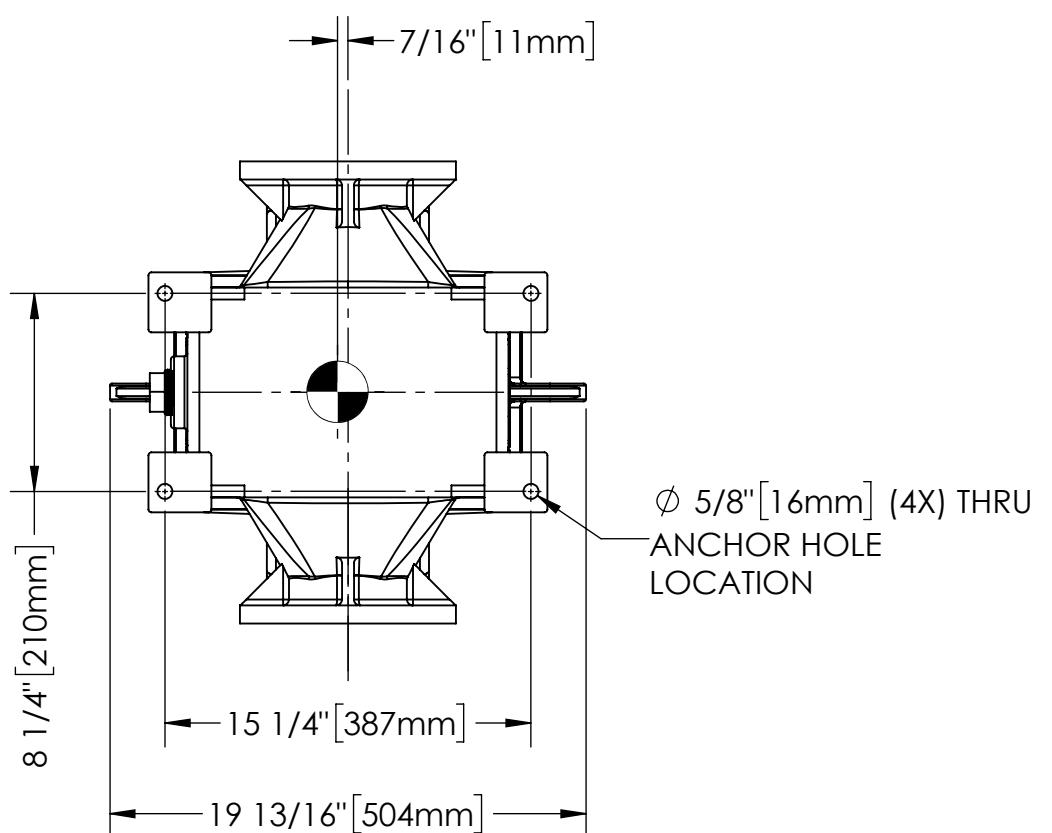
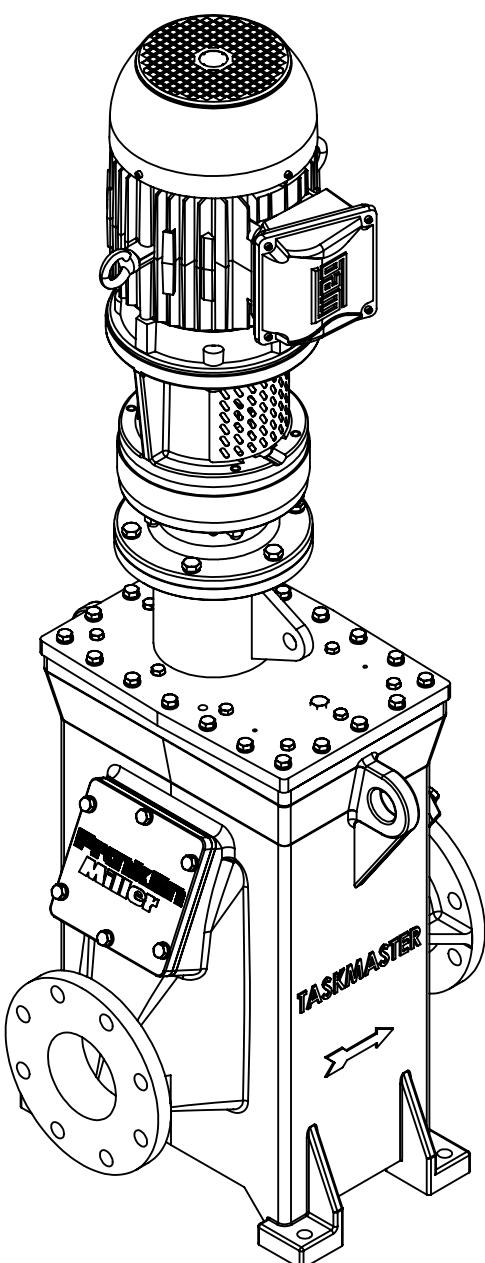
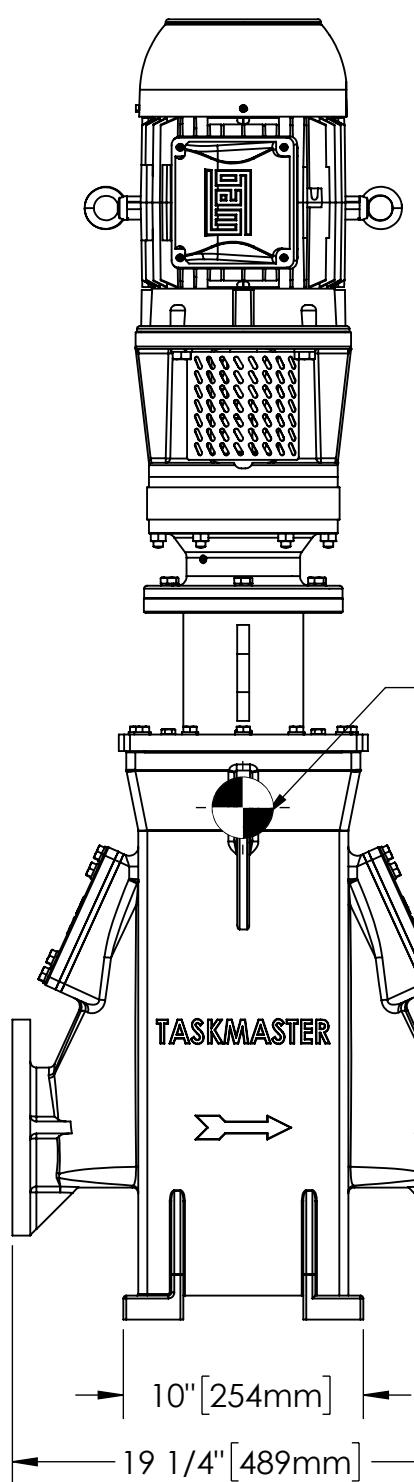
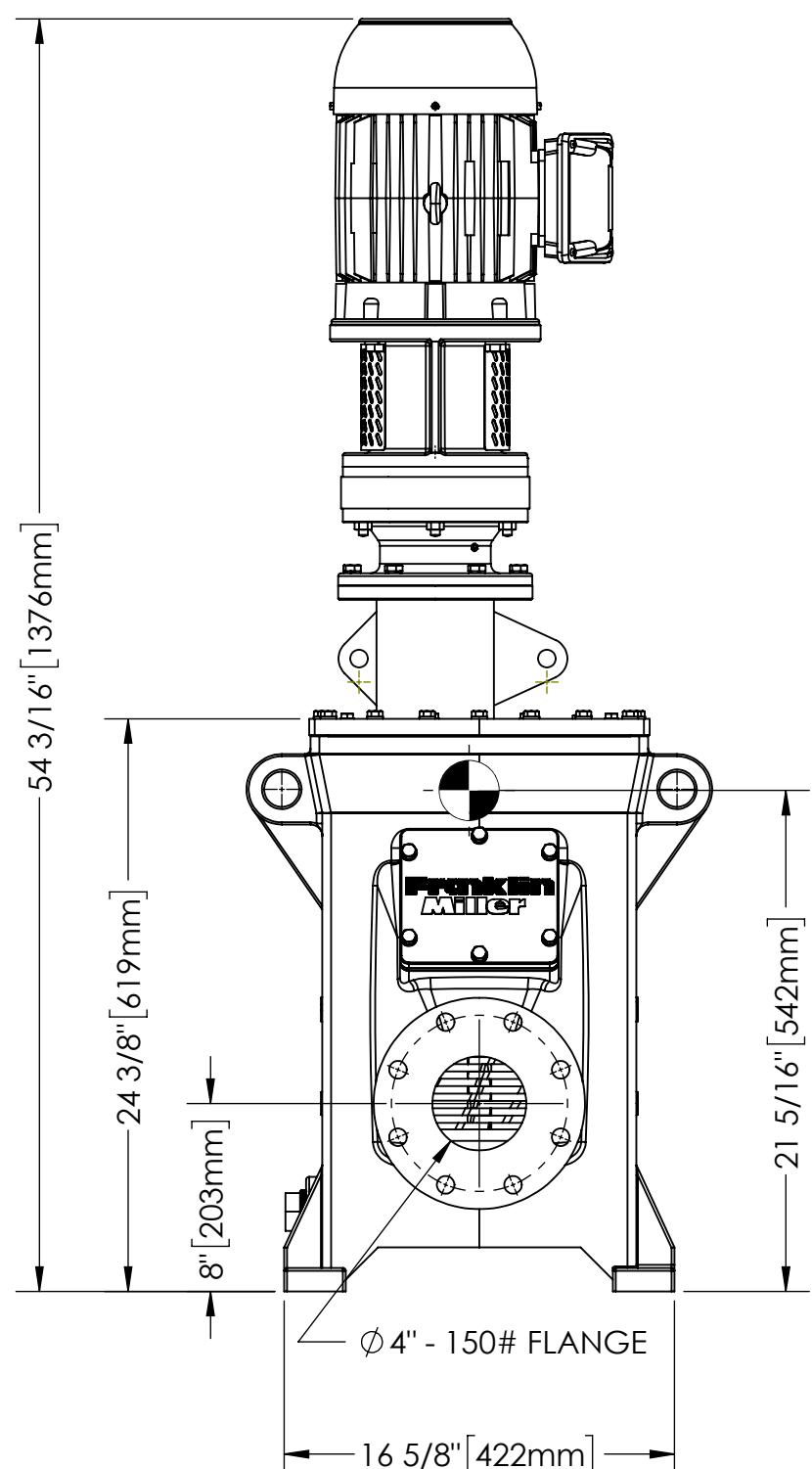
BOM TABLE

DESCRIPTION

ITEM NO.	DESCRIPTION
1	HOUSING ASSEMBLY, TM851204, DROP-IN
2	DRIVE ASSEMBLY, 5HP TEFC, TM8500, SUMI 6125

NOTE:

1. 11-TOOTH CAM CUTTERS



COMMENTS:

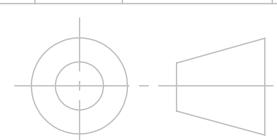
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MACHINE TOLERANCES UNLESS OTHERWISE NOTED

DECIMALS	FRACTIONS	± 1/32
.0	± .015	ANGLES ± .05°
.00	± .010	CHAMFER ANGLES ± 3°
.000	± .005	SURFACE TEXTURE 125/



THIRD ANGLE PROJECTION

DRAWN	NAME	DATE
	JB	3/26/25

CHECKED

ENG APPR.

MFG APPR.

Q.A.

MATERIAL SEE BOM

FINISH

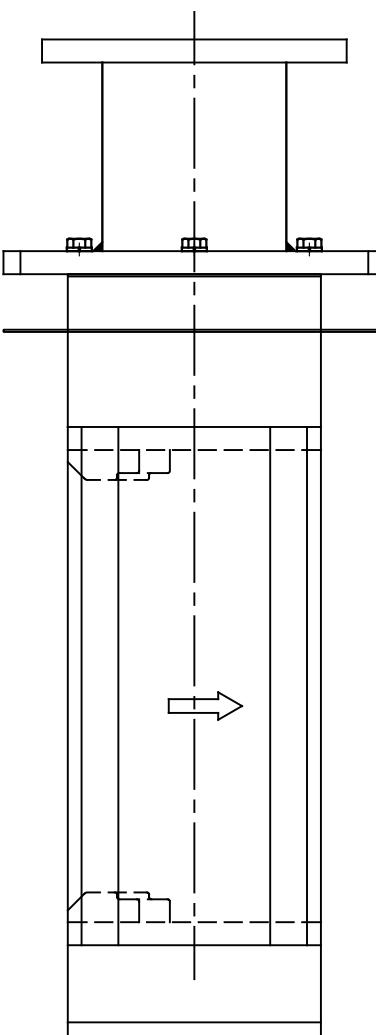
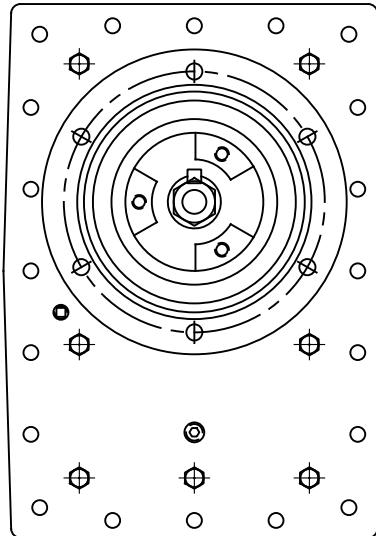
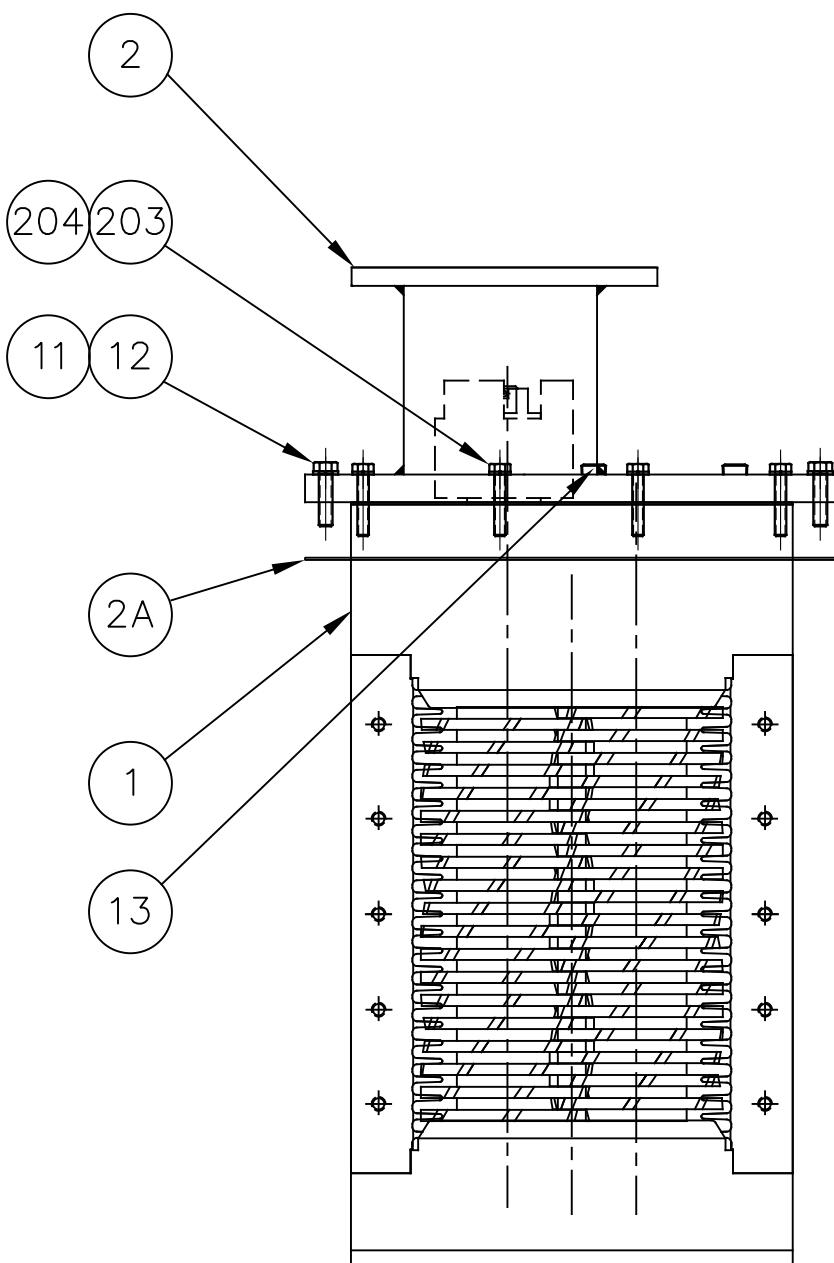
Franklin Miller
TASKMASTER®

TITLE: TASKMASTER®, TM851204 Drop-In, 5Hp Motor TEFC

SIZE DWG. NO. B 12808ABTM851204 REV .

DO NOT SCALE DRAWING SCALE: 1:8 WEIGHT: 755 lbs SHEET 1 OF 1

PARTS LIST				
ITEM	QTY	DESCRIPTION	PART/#	MATERIAL
1	1	TM851200 LESS DRIVE	TM851200	SEE DETAIL
2	1	ADAPTER, REDUCER	TM85634	CS
2A	1	GASKET, ADAPTER	TM85630B	BUNA
11	20	LOCKWASHER 3/8	LW06S	18-8
12	20	SCREW 3/8-16 x 1 1/2	HC061624S	18-8
13	1	PLUG, VENT	PP00060	BRASS
203	10	SCREW, 5/16-18 x 1 3/4, GRADE 8	HC051828HT	CS
204	10	LOCKWASHER 5/16, HI-STRENGTH	LW05HT	CS



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LIVINGSTON, NEW JERSEY.

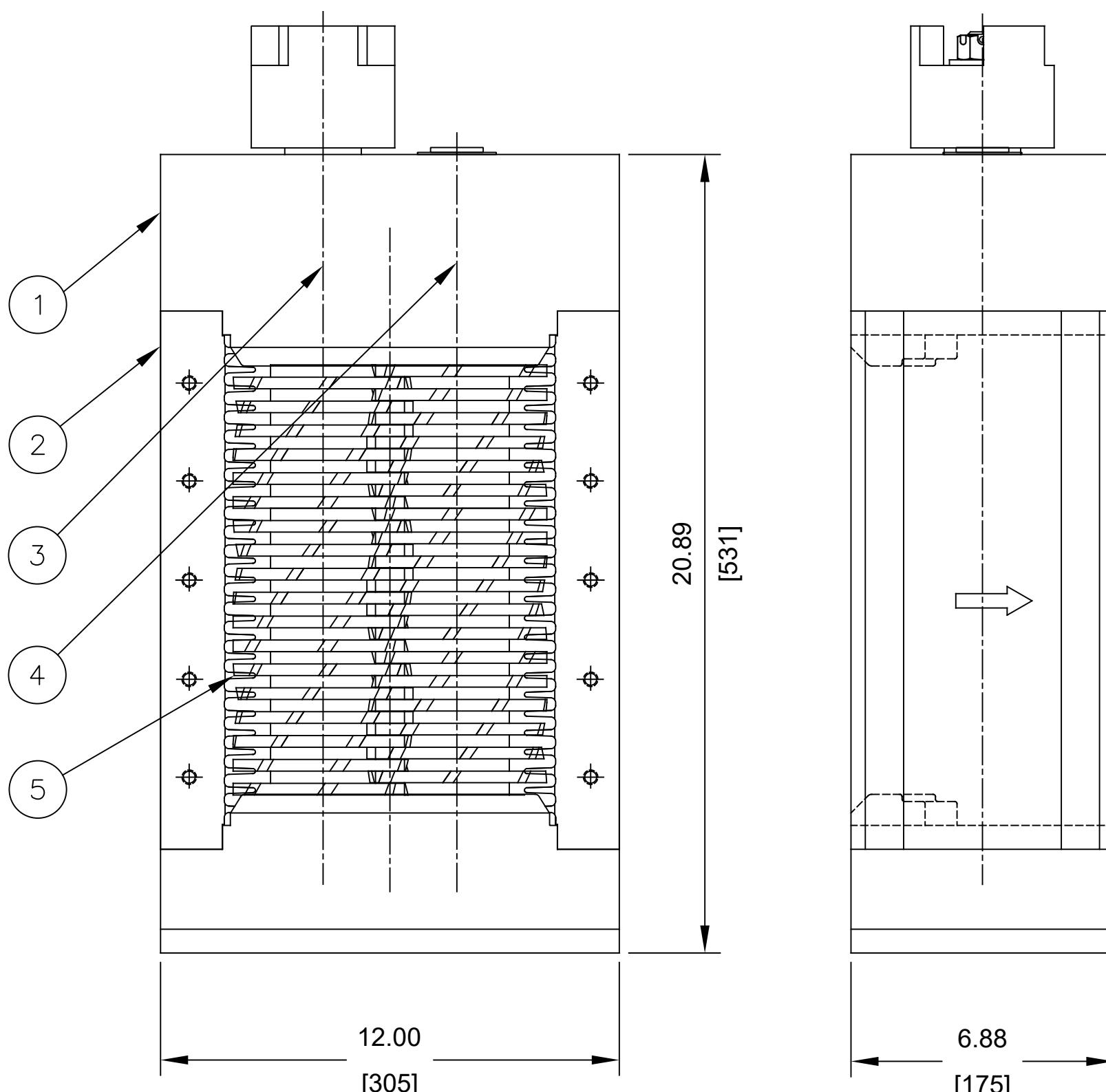
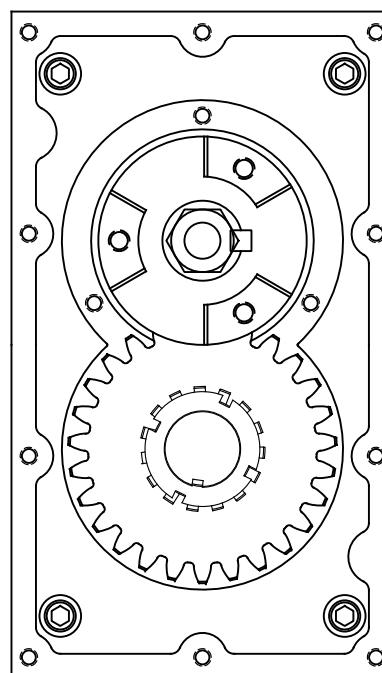
FRANKLIN MILLER INC.
60 OKNER PARKWAY, LIVINGSTON, N.J. 07039

TASKMASTER TM8512 DROP-IN LESS DRIVE & HOUSING

SCALE	DWN	DATE	CKD	DATE	DWG. NO.
1:5	AEW/AG	03/06/03	.	.	TM851203

BILL OF MATERIAL				MATERIAL STANDARD	WEIGHT
ITEM	QTY	DESCRIPTION	FMI P/#		
1	1	TM850000 COMMON PARTS	TM850000	SEE DETAIL	110.7 LBS
2	2	SIDE FRAME	TM85660	DUCT	28.5 LBS
3	1	DRIVE SHAFT	TM85373BH	4140 Rc28-32	16.5 LBS
4	1	DRIVEN SHAFT	TM8572BH	4140	15.5 LBS
5	6	CUTTER CARTRIDGE	TM8551A	4140	6.5 LBS

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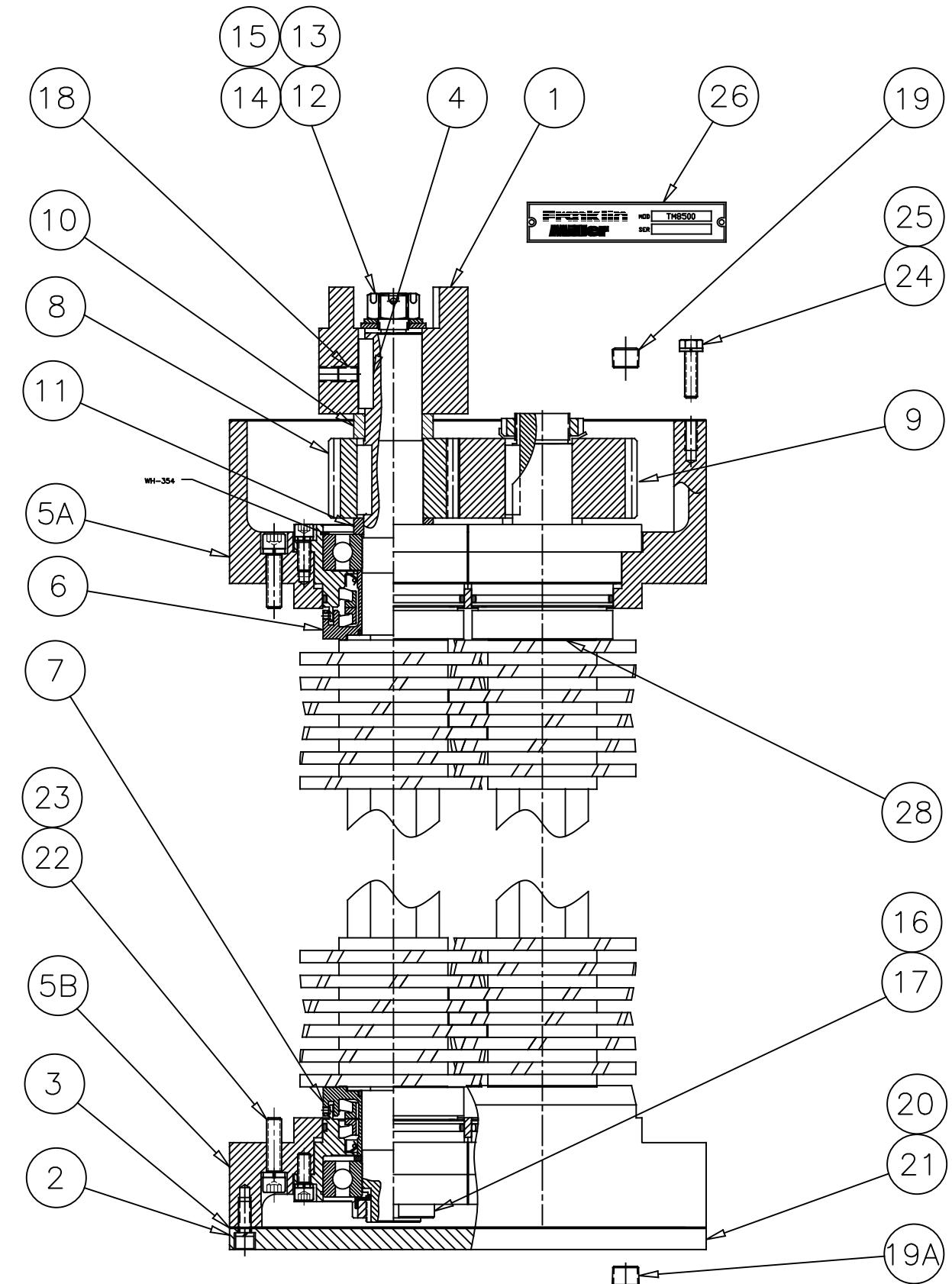


FRANKLIN Miller INC.
 60 OKNER PARKWAY, LIVINGSTON, N.J. 07039

TM8512 LESS DRIVE

LTR P/N	MATERIAL	WEIGHT#	SCALE	DWN	DATE	CKD	DATE	DWG	REV
			1: 4	AEW	10/13/00	.	.	TM851200	

PARTS LIST		FMI PART/#		FMI PART/#	
ITEM	QTY	DESCRIPTION	TM850000	MATERIAL	WEIGHT
1	1	COUPLING HALF	FM00015AU	1018 C.S.	5.5 LBS
2	1	COVER, BOTTOM	TM8510B	D.I. 65-45-12	13.5 LBS
3	2	GASKET	TM8512A	BUNA	-
4	3	KEY, 3/8 SQ x 1 3/4	KS0628	1090 C.S.	.125 LBS
5A	1	HOUSING, TOP	TM8546M	D.I. 65-45-12	39 LBS
5B	1	HOUSING, BOTTOM	TM85646M	D.I. 65-45-12	30 LBS
6	2	BEARING/SEAL CARTRIDGE, FIXED	TM85760 REV #5	SEE DETAIL	6 LBS
7	2	BEARING/SEAL CARTRIDGE, EXPANSION	TM85990 REV #5	SEE DETAIL	5.9 LBS
8	1	PINION GEAR, 18T	TM85125	4140 ALLOY STEEL	2.5 LBS
9	1	SPUR GEAR, 27T	TM85124	4140 ALLOY STEEL	7.5 LBS
10	1	SPACER, GEAR/COUPLING	TM85410	1018 C.S.	.25 LBS
11	2	SPACER, GEAR/BEARING	TM8596	1018 C.S.	.25 LBS
12	1	WASHER, PLAIN, WIDE 3/4	WPW12HT	CS	.125 LBS
13	1	WASHER, BELLVILLE, 3/4 X .107 THK	WB12107	CS	.125 LBS
14	1	COTTER PIN, 1/8 x 1 1/2	MM00120	18-8 S.S.	.125 LBS
15	1	NUT, HEX, SLOTTED, 3/4-10	NHS1210	CS	.25 LBS
16	3	NUT, BEARING, N-07	BN07	1018 C.S.	.25 LBS
17	3	LOCKWASHER, BEARING , W-07	BW07	1018 C.S.	.125 LBS
18	2	SETSCREW, 3/8-16 x 1/2	SS061608S	18-8 S.S.	.125 LBS
19	1	PIPE PLUG 3/8 NPT	PP00027	GALV.	.25 LBS
19A	1	PIPE PLUG 1/4 NPT	PP04	GALV.	.25 LBS
20	10	SCREW, 5/16-18 x 1"	SC051816S	18-8 S.S.	.125 LBS
21	10	LOCKWASHER, HI-COLLAR 5/16	LWH05S	18-8 S.S.	.125 LBS
22	8	SCREW 3/8-16 x 1 1/2	SC061624S	18-8 S.S.	.125 LBS
23	8	WASHER BOLT SEALING 3/8	MM00153	18-8 S.S.	.125 LBS
24	10	SCREW 5/16-18 x 1 1/4	HC051820S	18-8 S.S.	.125 LBS
25	10	LOCKWASHER 5/16	LW05S	18-8 S.S.	.125 LBS
26	1	NAMEPLATE-S/N FMI	NP1000	18-8 S.S.	.25 LBS
27	2oz	LUBRICANT, GREASE, GEAR	LU00003	LUBRICANT	.125 LBS
28	1	SHIM, .005"THK	FM00607	CS	



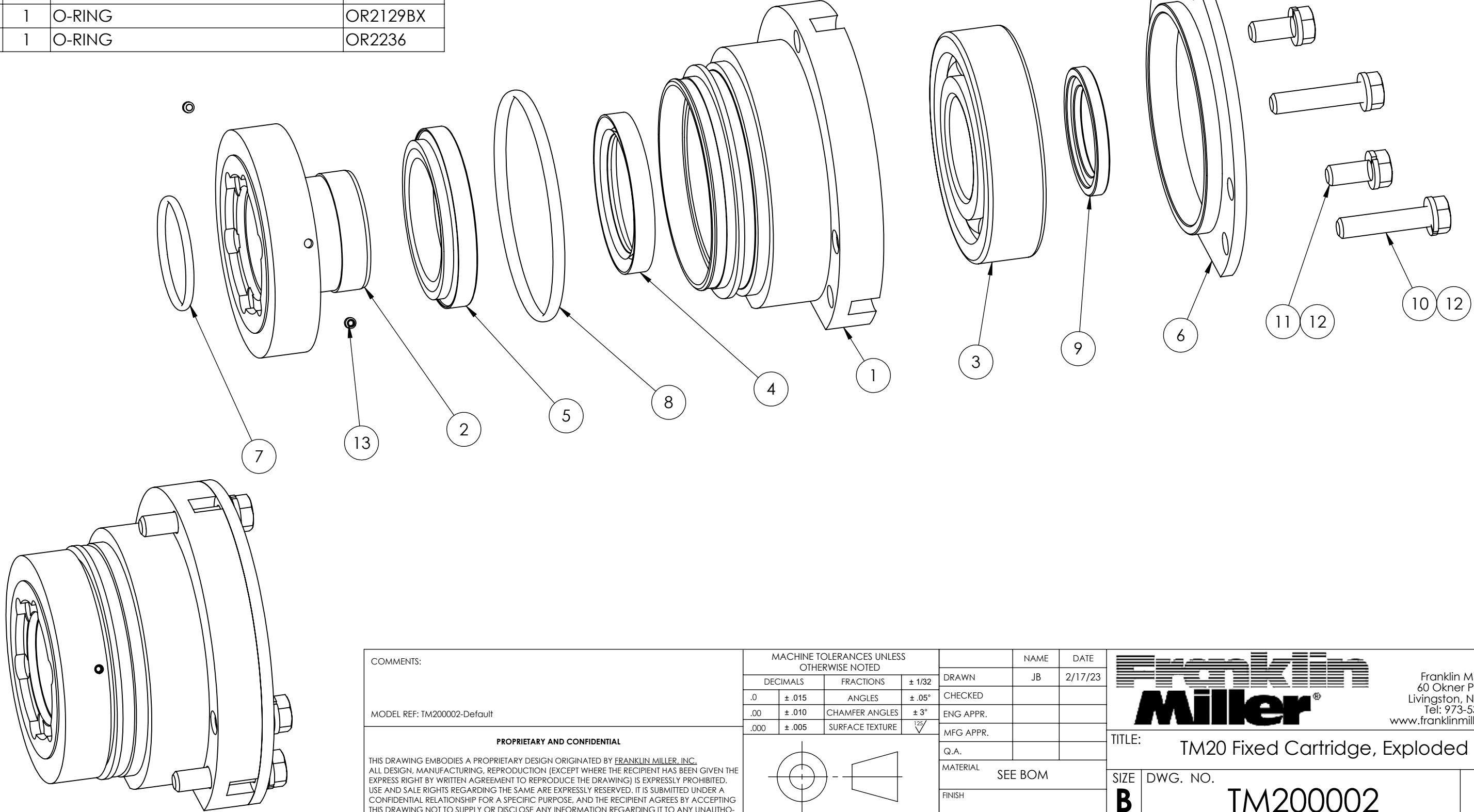
REV NO.	DESCRIPTION	DWN	DATE
1	UPDATED BEARING/SEAL CART'S & HARDWARE	AEW	08/24/01
2	CHANGED BOTTOM HOUSING TO LOW-PROFILE	AEW	12/21/01
3	ADDED ASTM MATERIAL REF.	JHT	03/25/02
4	CHANGED BALLOONING	JHT	06/20/02
5	CHANGED ITEM 41 FROM GREASE FITTING TO PLUG, DELETED QTY (6) OF ITEM 44, ADDED ITEM 17A	GWC	10/30/03
6	DELETED QTY (6) OF ITEMS 44 & 48	AG	01/30/04
7	PARTS LIST was updated	AG	05/23/05
8	ADDED COMPONENT WEIGHTS	JT	10/05/05
9	Item #5B was updated, Items #28, 29 were removed	AG	02/10/06
10	Items #2 & 3 were updated	AG	03/13/06
11	Item #3 was updated	AG	07/25/16
12	BEARING/SEAL CARTRIDGES were updated (REV #5)	AG	08/19/19

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LIVINGSTON, NEW JERSEY.

C	316LSS-BODY	
-	SEE BOM	
LTR P/N	MATERIAL	WEIGHT#
THIRD ANGLE PROJECTION		DIMENSIONS INCH [mm]
1: 3	AEW	10/13/00
	.	.
		DWG NO. TM850000
		REV 12

8 7 6 5 4 3 2 1

ITEM NO.	QTY.	DESCRIPTION	PART NUMBER	ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
1	1	STATIONARY SEAL GLAND	TM8549C	9	1	SPACER, BOTTOM CARTRIDGE	TM20074
2	1	ROTARY SEAL GLAND	TM8594C	10	3	SCREW, 5/16-18 X 1 1/2"LG HHCS	HC051824S
3	1	BALL BEARING	BB245616	11	2	SCREW, 5/16-18 X 3/4"LG HHCS	HC051812S
4	1	LIP SEAL	SO293906	12	5	LOCKWASHER, 5/16"	LW05S
5	2	MECHANICAL SEAL	MS284415T	13	2	SET SCREW 8-32 X 1/8 LG	SS#83202
6	1	COVER, BEARING	TM8547 R2				
7	1	O-RING	OR2129BX				
8	1	O-RING	OR2236				



COMMENTS:

MODEL REF: TM200002-Default

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MACHINE TOLERANCES UNLESS OTHERWISE NOTED

DECIMALS	FRACTIONS	± 1/32
.0	± .015	ANGLES
.00	± .010	CHAMFER ANGLES
.000	± .005	SURFACE TEXTURE

DECIMALS

FRACTIONS

± 1/32

ANGLES

CHAMFER ANGLES

± 3°

SURFACE TEXTURE

125/

V

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

DRAWN

CHECKED

ENG APPR.

MFG APPR.

Q.A.

MATERIAL

FINISH

SEE BOM

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

NAME

JB

DATE

2/17/23

CHECKED

ENG APPR.

MFG APPR.

Q.A.

MATERIAL

FINISH

SEE BOM

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

FINISH

SEE BOM

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

Franklin Miller

Franklin Miller Inc.
60 Okner Parkway
Livingston, NJ 07039
Tel: 973-535-9200
www.franklinmiller.com

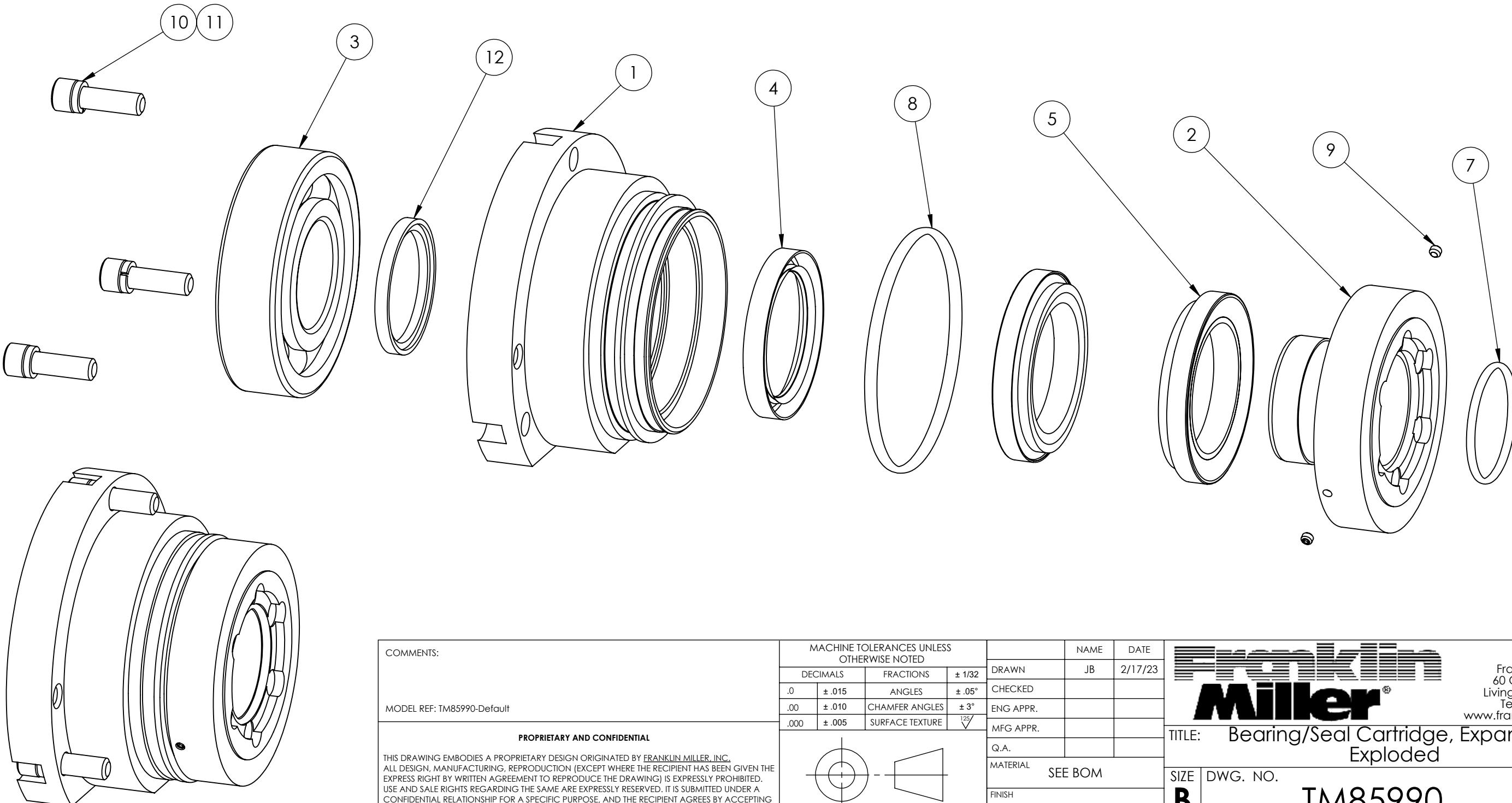
TITLE: TM20 Fixed Cartridge, Exploded

SIZE DWG. NO. REV
B TM200002 1
SCALE: 2:3 WEIGHT:
SHEET 1 OF 1

8 7 6 5 4 3 2 1

BOM TABLE			
ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
1	1	STATIONARY SEAL GLAND	TM8549C
2	1	ROTARY SEAL GLAND	TM8594C
3	1	BALL BEARING	BB245616
4	1	LIP SEAL	SO293906
5	2	MECHANICAL SEAL	MS284415T
6			

BOM TABLE			
ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
7	1	O-RING	OR2129
8	1	O-RING	OR2236
9	2	SET SCREW 8-32 X 1/8 LG	SS#83202
10	3	LOCKWASHER HI-COLLAR, 5/16	LWH05S
11	3	SOCKET HEAD CAP SCREW 5/16-18NC X 1 LG SS	SC051816S
12	1	SPACER, ROTARY GLAND	TM85484



COMMENTS:

MODEL REF: TM85990-Default

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MACHINE TOLERANCES UNLESS OTHERWISE NOTED

DECIMALS	FRACTIONS	± 1/32
.0	± .015	ANGLES
.00	± .010	CHAMFER ANGLES
.000	± .005	SURFACE TEXTURE

.05° ± 3° 125/V

ENG APPR.

MFG APPR.

Q.A.

MATERIAL

FINISH

DO NOT SCALE DRAWING

DRAWN

CHECKED

ENG APPR.

MFG APPR.

Q.A.

MATERIAL

FINISH

DO NOT SCALE DRAWING

NAME

JB

ENG APPR.

MFG APPR.

Q.A.

MATERIAL

FINISH

DO NOT SCALE DRAWING

DATE

2/17/23

ENG APPR.

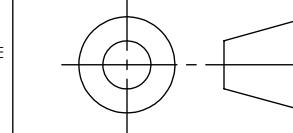
MFG APPR.

Q.A.

MATERIAL

FINISH

DO NOT SCALE DRAWING


Franklin Miller
 Franklin Miller Inc.
 60 Okner Parkway
 Livingston, NJ 07039
 Tel: 973-535-9200
www.franklinmiller.com

 TITLE: Bearing/Seal Cartridge, Expansion,
 Exploded

 SIZE DWG. NO. REV
B TM85990 5
 SCALE: 2:3 WEIGHT: 7.00 SHEET 1 OF 1

5

Motor Data

BALDOR® • RELIANCE®

Customer information packet

CEM3615T

5HP, 1755RPM, 3PH, 60HZ, 184TC, 3642M, TEFC, F1

Class - None

Division - Not Applicable

Specifications

Enclosure	TEFC
Frame	184TC
Frame Material	Steel
Frequency	60.00 Hz
Haz Area Class and Group	None
Haz Area Division	Not Applicable
Motor Letter Type	Three Phase
Output @ Frequency	5.000 HP @ 60 HZ
Phase	3
Synchronous Speed @ Frequency	1800 RPM @ 60 HZ
Voltage @ Frequency	230.0 V @ 60 HZ 460.0 V @ 60 HZ
Agency Approvals	CSA EEV NEMA PREMIUM NEMA_PREMIUM UR
Ambient Temperature	40 °C
Auxillary Box	No Auxillary Box
Auxillary Box Lead Termination	None
Base Indicator	Rigid
Bearing Grease Type	Polyrex EM (-20F +300F)
Blower	None
Current @ Voltage	6.700 A @ 460.0 V 14.000 A @ 208.0 V 13.400 A @ 230.0 V
Design Code	B
Drip Cover	No Drip Cover
Duty Rating	CONT
Efficiency @ 100% Load	89.5 %
Electrically Isolated Bearing	Not Electrically Isolated
Feedback Device	NO FEEDBACK
Front Shaft Indicator	None

Part detail

Revision	D
Type	AC
Mech. spec.	36A002
Base	
Status	PRD/A
Elec. spec.	36WGQ032
Layout	36LYA002
Eff. date	10-02-2024
CD Diagram	CD0005
Poles	04
Leads	9#16
Proprietary	False
Created date	12-03-2020

Heater Indicator	No Heater
High Voltage Full Load Amps	6.7 a
Insulation Class	F
Inverter Code	Inverter Ready
KVA Code	J
Lifting Lugs	No Lifting Lugs
Locked Bearing Indicator	Locked Bearing
Motor Lead Quantity/Wire Size	9 @ 16 AWG
Motor Lead Termination	Flying Leads
Motor Standards	NEMA
Motor Type	3642M
Mounting Arrangement	F1
Number of Poles	4
Overall Length	18.05 IN
Power Factor	78
Product Family	General Purpose
Pulley End Bearing Type	Ball
Pulley Face Code	C-Face
Pulley Shaft Indicator	Standard
Rodent Screen	None
Service Factor	1.15
Shaft Diameter	1.125 IN
Shaft Ground Indicator	No Shaft Grounding
Shaft Rotation	Reversible
Shaft Slinger Indicator	No Slinger
Speed	1755 rpm
Speed Code	Single Speed
Starting Method	Direct on line
Thermal Device - Bearing	None
Thermal Device - Winding	None
Vibration Sensor Indicator	No Vibration Sensor
Winding Thermal 1	None
Winding Thermal 2	None

Nameplate

NP3441LUA

CAT.NO.	CEM3615T					
SPEC	36A002Q032G1					
HP	5					
VOLTS	230/460					
AMPS	13.4/6.7					
RPM	1755					
FRAME	184TC	HZ	60	PH	3	
SF	1.15	CODE	J	DES	B	CLASS
NEMA NOM. EFF	89.5	PF	78			F
RATING	40C AMB-CONT					
CC	010A					
ENCL	TEFC	SER				
DE	6206	ODE	6205			

VPWM INVERTER READY**CT6-60H(10:1)VT3-60H(20:1)**

50HZ 5HP 190/380V 15.6/7.8A

SF1.0

AC Induction Motor Performance Data

Record # 89917

Typical performance - not guaranteed values

Winding: 36WGQ032-R001**Type:** 3642M**Enclosure:** TEFC**Nameplate Data**

Rated Output (HP)	5
Volts	230/460
Full Load Amps	13.4/6.7
R.P.M.	1755
Hz	60 Phase
NEMA Design Code	B KVA Code
Service Factor (S.F.)	1.15
NEMA Nom. Eff.	89.5 Power Factor
Rating - Duty	40C AMB-CONT
S.F. Amps	

**460 V, 60 Hz:
High Voltage Connection**

Full Load Torque	15 LB-FT
Start Configuration	direct on line
Breakdown Torque	53.1 LB-FT
Pull-up Torque	23.4 LB-FT
Locked-rotor Torque	34.7 LB-FT
Starting Current	49.8 A
No-load Current	3.31 A
Line-line Res. @ 25°C	2.4 Ω
Temp. Rise @ Rated Load	71°C
Temp. Rise @ S.F. Load	86°C
Locked-rotor Power Factor	40.6635
Rotor inertia	0.391 lb-ft²

Load Characteristics 460 V, 60 Hz, 5 HP

% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor	38	60	72	79	82	84	81
Efficiency	83.8	88.9	89.8	89.5	88.4	86.8	88.8
Speed	1789	1778	1766	1753	1738	1722	1744
Line amperes	3.64	4.39	5.45	6.66	8.08	9.67	7.51

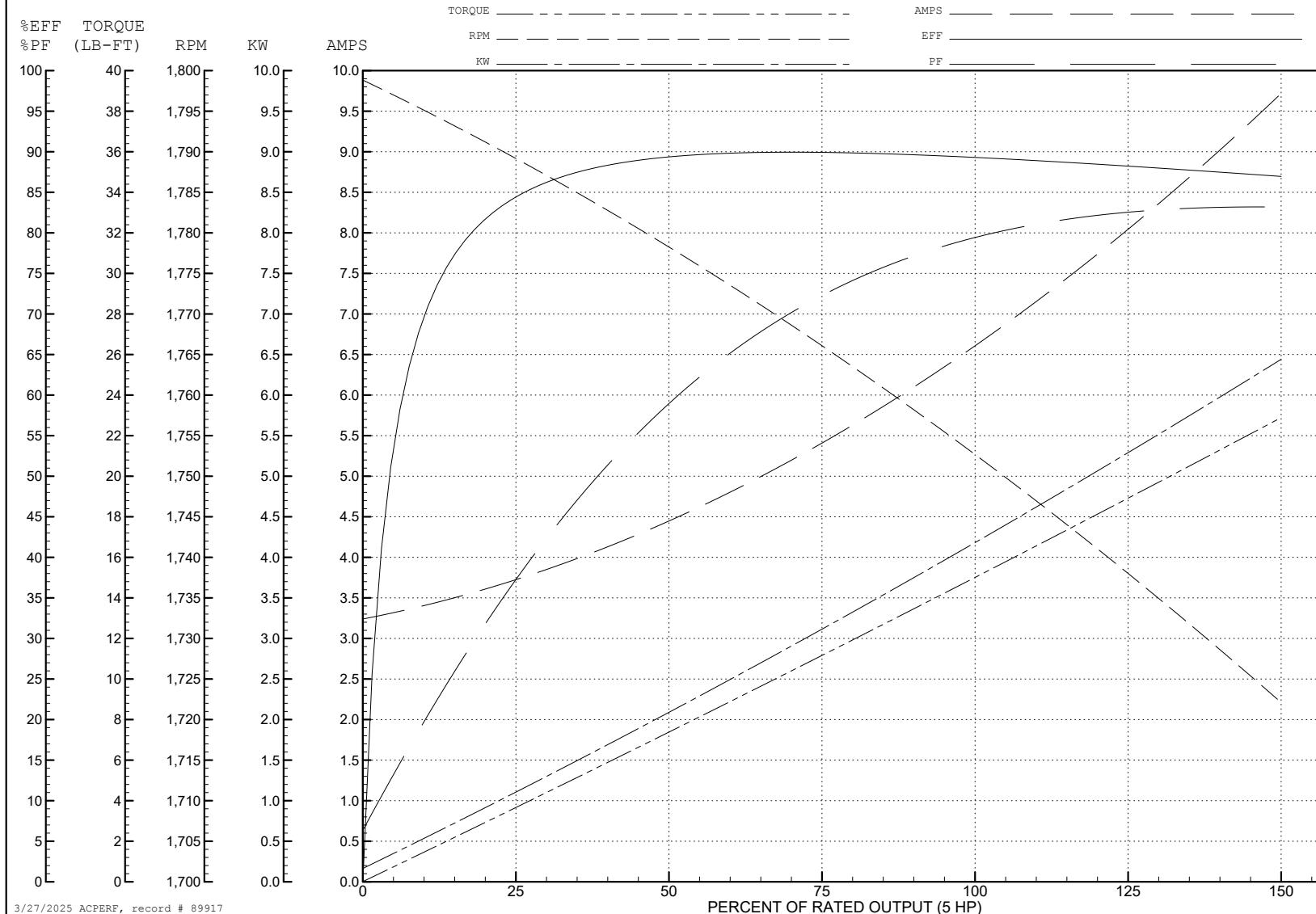
ABB Motors and Mechanical Inc.

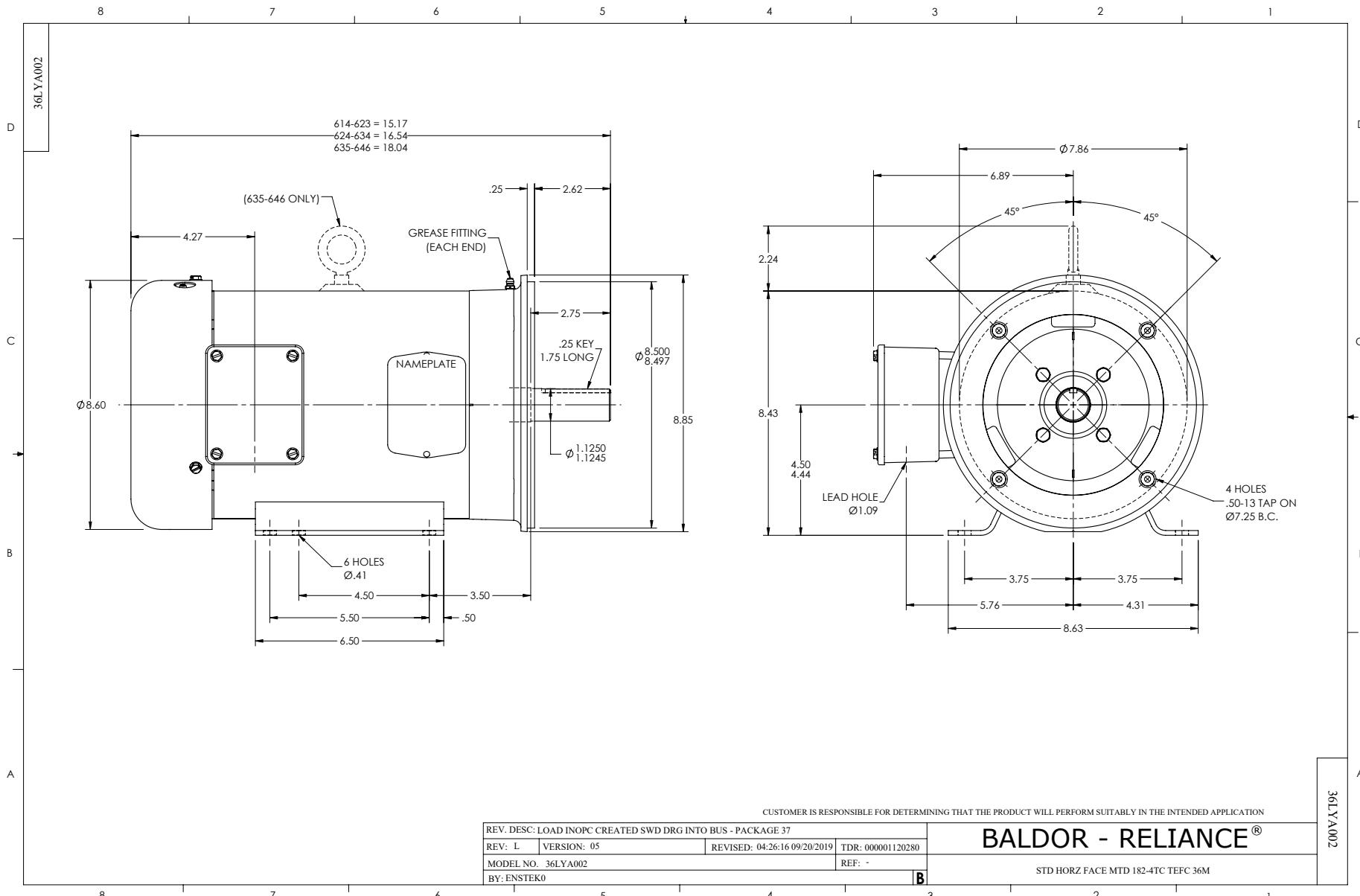
WINDING # 36WGQ032

Typical performance - not guaranteed values.

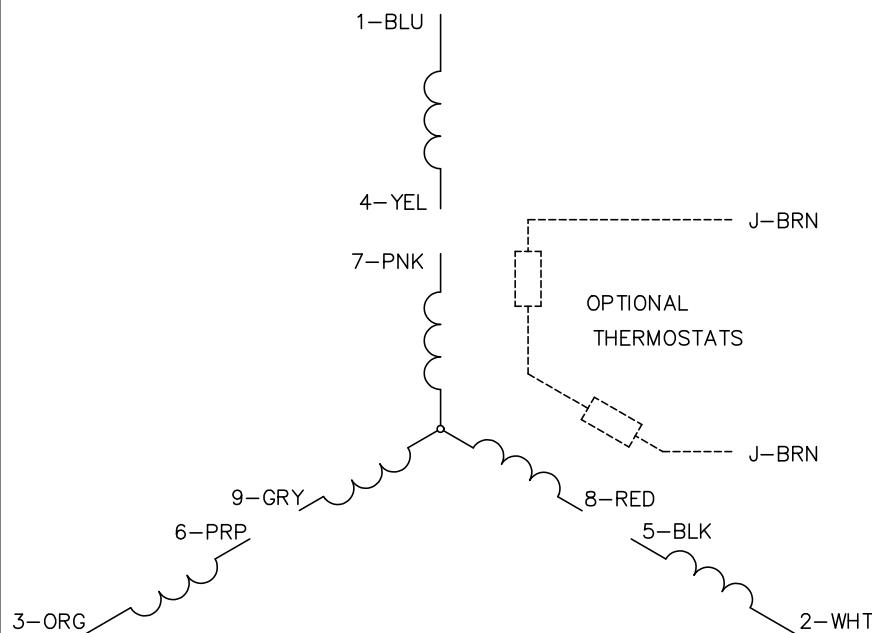
5 HP 3 PH 60 HZ 1755 RPM 460 V 3642M

TORQUES (LB-FT): PO=53.1 PU=23.4 LR=34.7 LRA=49.8

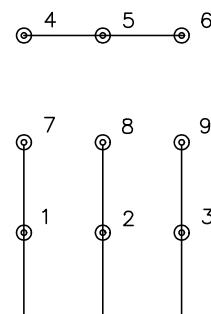




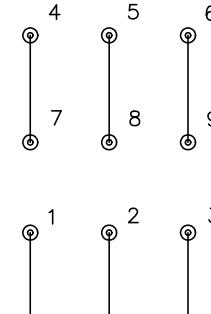
CD0005



LOW VOLTAGE (2Y)



HIGH VOLTAGE (1Y)



NOTES:

1. INTERCHANGE ANY TWO LINE LEADS TO REVERSE ROTATION.
2. OPTIONAL THERMOSTATS ARE PROVIDED WHEN SPECIFIED.
3. ACTUAL NUMBER OF INTERNAL PARALLEL CIRCUITS MAY BE A MULTIPLE OF THOSE SHOWN ABOVE.
4. LEAD COLORS ARE OPTIONAL. LEADS MUST ALWAYS BE NUMBERED AS SHOWN.

REV. DESC: REVISE TO SHOW OPTIONAL COLORS			
REV. LTR: E	BY: JLP	REVISED: 01/19/99 10:15	TDR: 0171435
CD0005	FILE: AAA00005140	MDL: -	MTL: -

BALDOR ELECTRIC Co.

3PH, DV, 9 LEADS

CD0005

6

Reducer Data

Cyclo® 6000 Speed Reducers



Superior design, powerful performance

- Cyclo® 6000 boasts an expanded range of standard sizes and ratings. Use this chart to select a new Cyclo® 6000 when replacing Cyclo® series 3000 and 4000 models.

CYCLO® Frame Size Cross Reference

OLD 3000	4000	NEW 6000
3075	4075	6060
3085	4085	6065
		6070
		6075
		6080
		6085
3090	4090	6090
3095	4095	6095
3097	4097	6095
3100	4100	6100
3105	4105	6105
310H	410H	610H
		6110
		6115
3110	4110	6120
3115	4115	6125
311H	4125	612H
3140	4130	6130
3145	4135	6135
		6140
3155	4145	6145
315H	415H	614H
3160	4165	6165
3165	416H	616H
316H	4170	6170
3170	4175	6175
3175	4180	6180
3180	4170	6170
3185	4185	6185
3190	4190	6190
3195	4195	6195
3205	4205	6205
3215	4215	6215
3225	4225	6225
3235	4235	6235
3245	4245	6245
3255	4255	6255
3265	4265	6265
3275	4275	6275



- The Cyclo® 6000 is also available as an inline Gearmotor

To request a catalog, or for more information on any of our high quality products, please visit our Website:



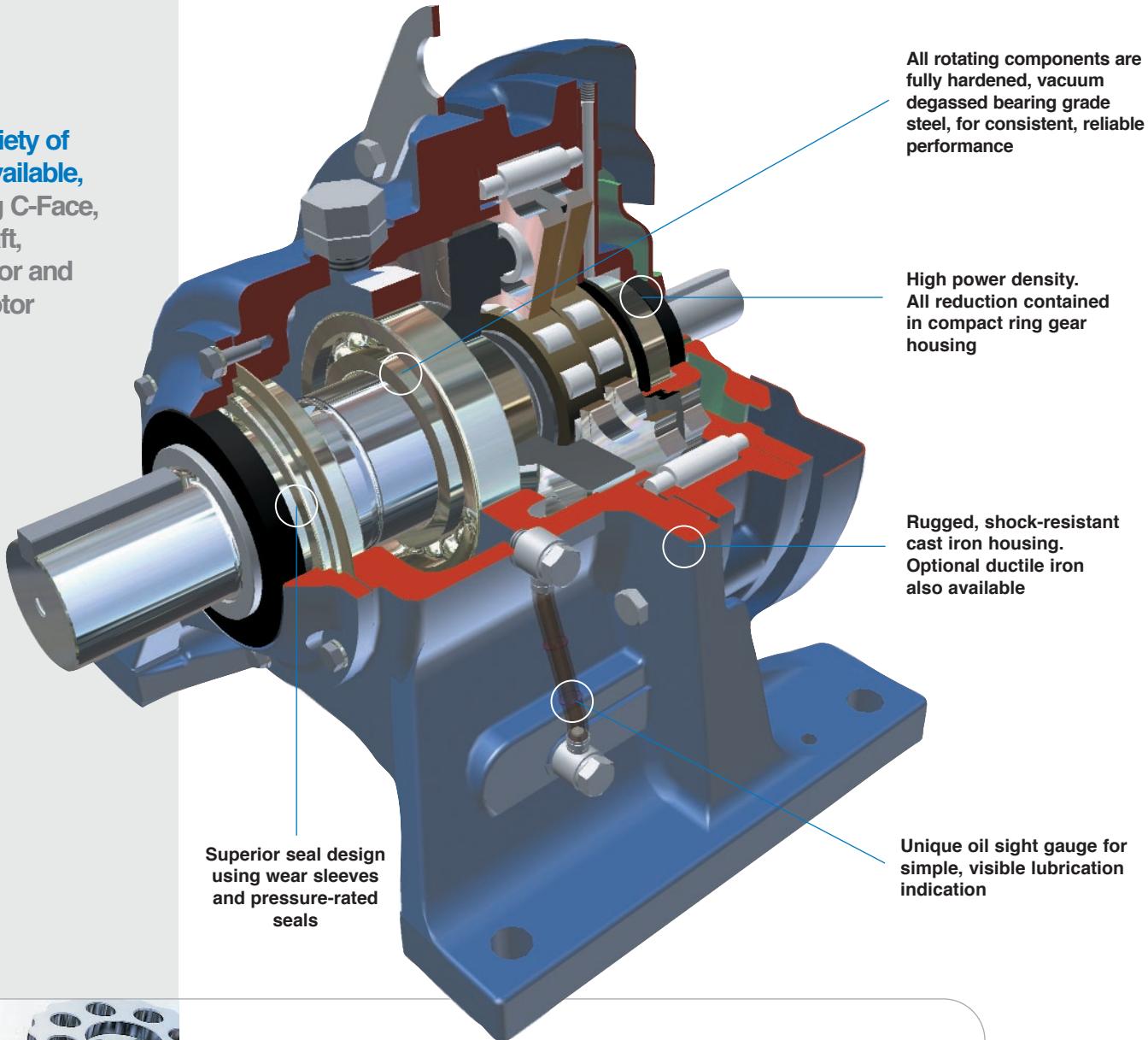
www.smcylo.com



Cyclo® 6000

High Torque Density, High Reliability Cycloidal Speed Reducers

- Wide variety of inputs available, including C-Face, Free-Shaft, Gearmotor and Brakemotor



Unmatched Reliability, Exceptional Performance

- Cyclo® speed reducers and gearmotors are designed to withstand shock loads exceeding 500% of their ratings



► Sumitomo's Cyclo® 6000 is extremely torque dense and is available as an inline speed reducer or gearmotor

Product Description

The Sumitomo Cyclo® drive is **unsurpassed by any other inline drive** available in the market today. Cyclo®'s unique **epicyclic-dial design** has advantages superior to speed reducers using common involute tooth gears. Cyclo® components operate in compression, not in shear. Unlike gear teeth with limited contact points, a Cyclo® has two thirds of its reduction components in contact at all times. Cyclo® speed reducers and gearmotors are **designed to withstand shock loads exceeding 500%** of their ratings, and provide exceptional performance, reliability and long life in the most severe applications.

Features & Benefits

- **Highest overload capacity**, exceeding 500%
- **Exceptional life** with a 24 month warranty
- **High efficiency**, even at high reduction ratios
- **Remarkably versatile**, and available as inline speed reducer or gearmotor
- Ideal for **severe, high shock** applications
- Optional grease lubrication for **no maintenance**

Specifications

Sizes:	23 models (5 lbs to 5000 lbs)
Torque Rating:	210 to 603,000 lb in
HP Rating:	.10 to 232 HP
Ratio Range:	3 to 119 (single), 121 to 7569 (double), 8041 to 658,503 (triple)
Mounting:	Foot, Flange, Face Mount
Motor Standards:	NEMA, IEC, JIS, UL, CSA, CE



- **Simple, Compact Design**
- **Rugged Forged Output Shaft**
- **Many Mounting Styles**
- **C-Face, Shovel Base & Top Mount Options**



► Applications

- Conveyors
- Food Machinery
- Mixers
- Automotive Plants
- Recycling Machines
- Poultry Plants
- Sawmills and Wood Mills
- Wastewater Treatment
- Steel Mills
- Construction Equipment
- Paper Mills
- Processing Plants

FAQs

How do I select a Cyclo speed reducer or gearmotor?

Selection is based on the actual horsepower and/or torque requirements at the output shaft. The Cyclo speed reducer has particularly high efficiencies over a wide range of reduction ratios, which frequently permits the use of reduced input power requirements (smaller HP motor) without sacrificing output shaft torque. The selection procedures in this catalog will guide you in choosing the most efficient reducer for your application.

What information do I need to get started in the selection process?

To select the proper reducer for your application, you will need to know:

- Application: type of driven machine
- Hours of operation per day
- Motor horsepower (HP) and speed (RPM)
- Mounting position

If there are any special environmental factors or operation requirements, they must also be noted. This information will be important in determining the Service Factor of your application.

What are Service Factors and how are they used?

In general, reducers and gearmotors are rated for the specific conditions and operating requirements of the application by the use of AGMA-defined Service Factors. There are three AGMA load classifications for reducers: uniform (U), moderate shock (M) and heavy shock (H) (page 2.3) The Service Factors are used in the product selection process to adjust for the specific conditions and operating requirements of your application.

What do I do if my application has particularly severe operating conditions?

The standard ratings for Cyclo are based on 10-hour daily service under conditions of uniform loads (equivalent to AGMA service factor 1.0). By following the product selection process, you will determine and apply the Service Factors to compensate for the severe operating conditions.

How can I be sure that the reducer can withstand periodic excessive overloads?

Cyclo Speed Reducers provide 500% momentary intermittent shock load capacity. For applications with shock loads greater than 500%, consult an SMA Application Engineer.

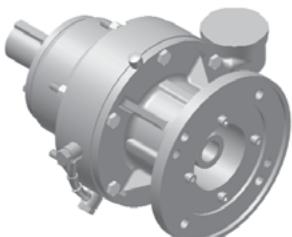
What are the standard input speeds?

In general terms, the speeds are 1750 and 1165 RPM. The selection tables in this catalog are based on 1750, 1165, 870, 580, and 50 RPM. When non-standard input speeds are used, the horsepower and torque ratings also vary.

What thermal capacity limitations does the Cyclo have?

The Cyclo speed reducer, by virtue of its smooth, almost frictionless operation (unlike traditional helical gears), has a thermal rating that far exceeds its mechanical capacity and all but eliminates the conventional limitations due to heat.

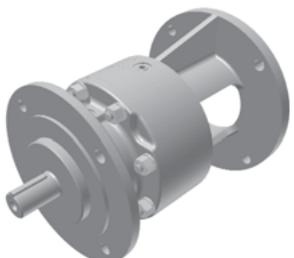
Common Configurations



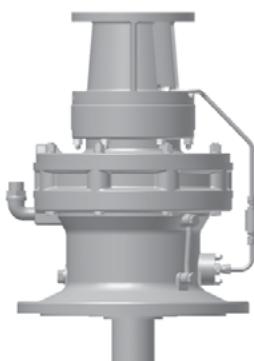
Single Reduction,
Horizontal Flange Mount
with Hollow Shaft Input



Single Reduction, Flange Mount
with C-Face Adapter



Single Reduction, V-Flange Mount
with C-Face Adapter



Double Reduction with
C-Face Adapter

Standard Specifications

Reducer	Reduction:	Internal planetary gear mechanism with trochoidal curved tooth profile.
	Lubrication:	Grease or oil lubricated models available.
	Seals:	Nitrile material, dual lipped, double output seals available.
	Material:	Rugged cast iron or ductile housings.
	Paint Color:	Blue, Muenter's color number 6.5PB 3.6/8.2

Ambient Conditions	Installation Location:	Indoors or Outdoors
	Ambient Temperature:	14°~104° F (-10° ~ 40° C)
	Ambient Humidity:	Under 85%
	Elevation:	Under 3,281 ft. (1000 meters)
	Atmosphere:	Well ventilated location, free of corrosive gases, explosive gases, vapors and dust.

Shaft Rotation

On single reduction Cyclo® speed reducers, ratios 3 through 119, the slow speed shaft rotates in a reverse direction to that of the high speed shaft.

On double reduction units, ratios 104 through 7569, both the high speed and the slow speed shaft rotate in the same direction.

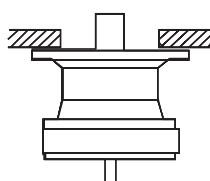
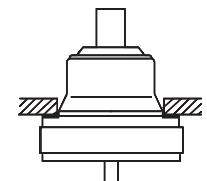
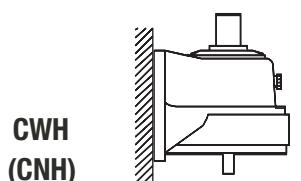
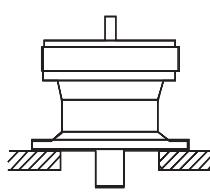
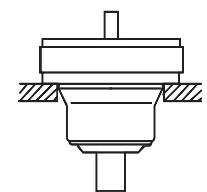
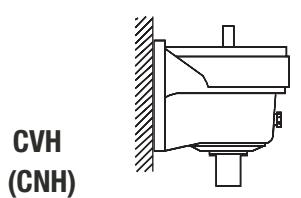
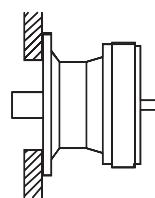
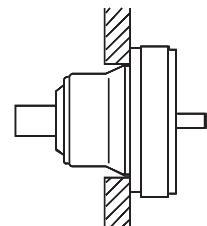
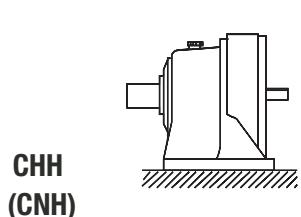
Input Speeds

In general terms, the standard input speeds of single reduction units are 1750, 1165, 875, 580, and 50 RPM. When non-standard input speeds are used, the horsepower and torque ratings will also vary.

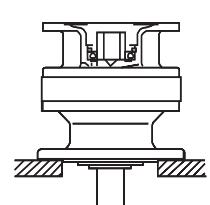
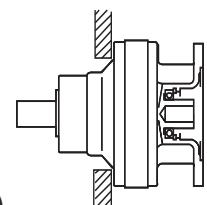
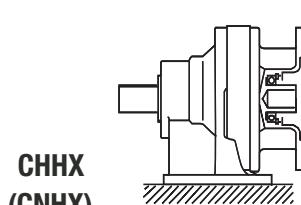
Thermal Capacity

The Cyclo® speed reducer's smooth, almost frictionless operation all but eliminates the conventional limitations due to heat. In all sizes, Cyclo® speed reducers have thermal ratings that exceed their mechanical capacity.

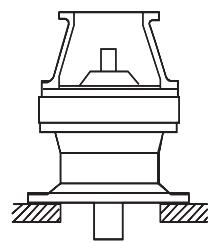
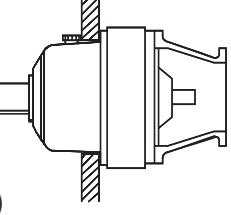
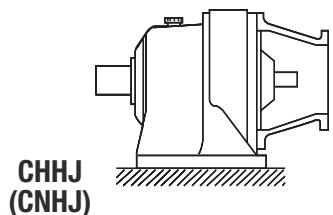
Housing Styles & Mounting Positions



Input Side Hollow Shaft



With Adaptor

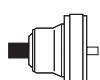


Mounting
Positions

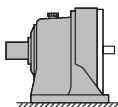
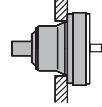
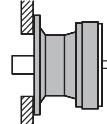
Configure a Model Number

Output Shaft Orientation

Type	Prefix
Horizontal	H
Vertical	V
Vertical Up (Solid Shaft)	W
Universal Direction	N

**H****V****W****Housing Style**

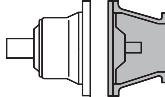
Type	Prefix
Foot	H
Flange	F
V-Flange	V

**H**
Foot**F**
Flange**V**
V Flange**Input Connection**

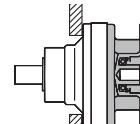
Input Connection	Prefix
None	-
C-Face Adaptor	J
Hollow Input Shaft	X

No Symbol

Reducers



With Adapter



Hollow Shaft

Modification (Special)

	Prefix
Special	S
Standard	-

Frame Size (from Selection Tables)**Shaft Specifications**

Input Shaft	Suffix
Inch	Y
DIN	G
Metric DIN	-

C H H - 6 1 1 5

Frame size

Y**29**

Shaft specification

Mounting style
Input connection
Output shaft orientation

Modification (Special feature)

Input connection

Ratio

Cyclo Speed Reducer product code (always "C")

The Service Factor table below presents both AGMA standard service factors and Cyclo® service factors. Cyclo® service factors are smaller than AGMA, based on the Cyclo® strength and performance experience.

If your application requires AGMA specified service factors, then the AGMA value should be used. Otherwise, the Cyclo® service factor should be used.

Service Factors

Prime Mover	Service Duration	Load Classifications					
		Uniform		Moderate Shock		Heavy Shock	
		AGMA	Cyclo®	AGMA	Cyclo®	AGMA	Cyclo®
Electric Motor	1/2 hr. per day (Occasional)	0.50	0.50	0.80	0.80	1.25	1.20
	3 hrs. per day (Intermittent)	0.80	0.80	1.00	1.00	1.50	1.35
	Up to 10 hrs. per day	1.00	1.00	1.25	1.20	1.75	1.50
	24 hrs. per day	1.25	1.20	1.50	1.35	2.00	1.60
Multi Cylinder Internal Combustion Engine	1/2 hr. per day (Occasional)	0.80	0.80	1.00	1.00	1.50	1.35
	3 hrs. per day (Intermittent)	1.00	1.00	1.25	1.20	1.75	1.50
	Up to 10 hrs. per day	1.25	1.20	1.50	1.35	2.00	1.60
	24 hrs. per day	1.50	1.35	1.75	1.50	2.25	1.70
Single Cylinder Internal Combustion Engine	1/2 hr. per day (Occasional)	1.00	1.00	1.25	1.20	1.75	1.50
	3 hrs. per day (Intermittent)	1.25	1.20	1.50	1.35	2.00	1.60
	Up to 10 hrs. per day	1.50	1.35	1.75	1.50	2.25	1.70
	24 hrs. per day	1.75	1.50	2.00	1.60	2.50	1.80

How to Select

Determine Selection Horsepower (HP)

Motor HP X Service Factor = Selection HP
--

Example: 10 Motor HP X 1.25 Service Factor = 12.5 Selection HP

Select a Frame Size

1 Match your OUTPUT RPM (or RATIO)...

Output RPM Ratio	583	350	292	219	159	135	117	103	83.3	FRAME SIZE
Input HP	20.2	20.2	20.3	20.3	20.3	20.3	20.3	16.1	14.8	6145
Output Torque in-lbs	2081	3469	5560	7650	9030	10300	9370	10500	10500	614H
Overhung Load (lbs)	1554	1843	2170	2430	2470	2580	2710	2890	2890	
Input HP	27.2	27.2	26.4	26.4	26.4	25.1	17.6	17.3	17.3	6160
Output Torque in-lbs	2798	4654	7230	9900	11800	12900	10200	12400	12400	
Overhung Load (lbs)	1702	2019	2090	2360	2400	2510	2640	2850	2850	
Input HP	32.3	32.3	26.4	26.4	26.4	25.1	17.6	17.3	17.3	6165
Output Torque in-lbs	3322	5530	7230	9900	11800	12900	10200	12400	12400	616H
Overhung Load (lbs)	1686	1998	2090	2360	2400	2510	2640	2850	2850	
Input HP	37.0	37.0	37.0	47.2	47.2	43.5	41.1	40.3	40.3	6170
Output Torque in-lbs	3798	6335	7230	9900	11800	12900	10200	12400	12400	
Overhung Load (lbs)	1906	2261	2400	2620	3020	3130	3240	3440	3680	
Input HP	40.4	40.4	40.4	47.2	47.2	43.5	41.1	40.3	40.3	6175
Output Torque in-lbs	4141	6914	8290	10800	12100	12300	12800	12900	12900	
Overhung Load (lbs)	1906	2261	2400	2620	3020	3130	3240	3440	3680	
Input HP	-	-	-	47.2	47.2	43.5	41.1	40.3	40.3	6180
Output Torque in-lbs	-	-	-	17800	21000	22300	23800	24900	24900	
Overhung Load (lbs)	-	-	-	4030	4210	4430	4670	5030	5030	
Input HP	-	-	-	52.3	52.3	52.3	52.3	52.3	52.3	6185
Output Torque in-lbs	-	-	-	19600	22300	26800	30500	37600	37600	

2 ...to your SELECTION HP...

3 ...to find your FRAME SIZE

If Overhung or Axial Load are present, any Overhung or Axial Load must be checked against the capacity of the selection.

For special circumstances in selecting a **Frame Size** such as:

- Overhung Load
- Axial Loads
- Shock Loading

Consult Technical Information, pages 5.6–5.13.

Nomenclature

Example

CNV – 6125Y – 29

C – Cyclo 6000
N – Universal
V – V-Flange

6125 – Frame Sizen
Y – Inch Shaft
29 – Ratio

Nomenclature

Ratio

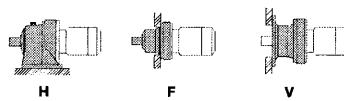
Ratio is found here in Selection Tables

Nominal Total Ratio

Output RPM Ratio	540	360	210	219	108	135	117	100	83.3	FRAME SIZE
	3	5	6	8	11	13	15	17	21	
Input HP	20.2	20.2	20.3	20.3	20.3	20.3	20.3	18.1	18.1	
Output Torque in-lbs	3469	4179	5086	7000	9030	10000	10371	10500	10500	
Overhung Load (lb)	1044	1843	1965	2170	2430	2470	2500	2710	2860	
Input HP	27.2	27.2	27.2	26.4	26.4	26.4	25.1	17.6	17.6	
Output Torque in-lbs	4814	5580	7230	9900	11800	12900	13290	12400	12400	
Overhung Load (lb)	1702	2018	2150	2400	2890	2890	3000	3150	3250	
Input HP	32.3	32.3	32.3	32.3	36.3	36.3	35.2	21.6	21.6	
Output Torque in-lbs	5322	6100	6860	12200	13600	15000	14700	15500	15500	
Overhung Load (lb)	1486	1986	2130	2360	2470	2760	2950	3060	3210	
Input HP	37.8	37.8	37.8	37.8	37.8	36.8	34.2	26.4	26.2	
Output Torque in-lbs	6335	7600	10100	13900	16300	17500	15300	18700	18700	
Overhung Load (lb)	1906	2281	2400	2950	3040	3100	3290	3460	3750	
Input HP	40.4	40.4	40.4	40.4	40.4	40.4	32.3	22.3	22.3	
Output Torque in-lbs	6141	6914	8290	11000	15200	18000	20700	18700	23200	
Overhung Load (lb)	1906	2361	2400	2620	3020	3130	3290	3440	3880	
Input HP	-	-	-	-	47.2	47.2	43.5	41.1	40.2	
Output Torque in-lbs	-	-	-	-	17800	21000	23200	23800	28900	
Overhung Load (lb)	-	-	-	-	4000	4210	4420	4670	5030	
Input HP	-	-	-	-	52.3	52.3	52.3	52.3	52.3	

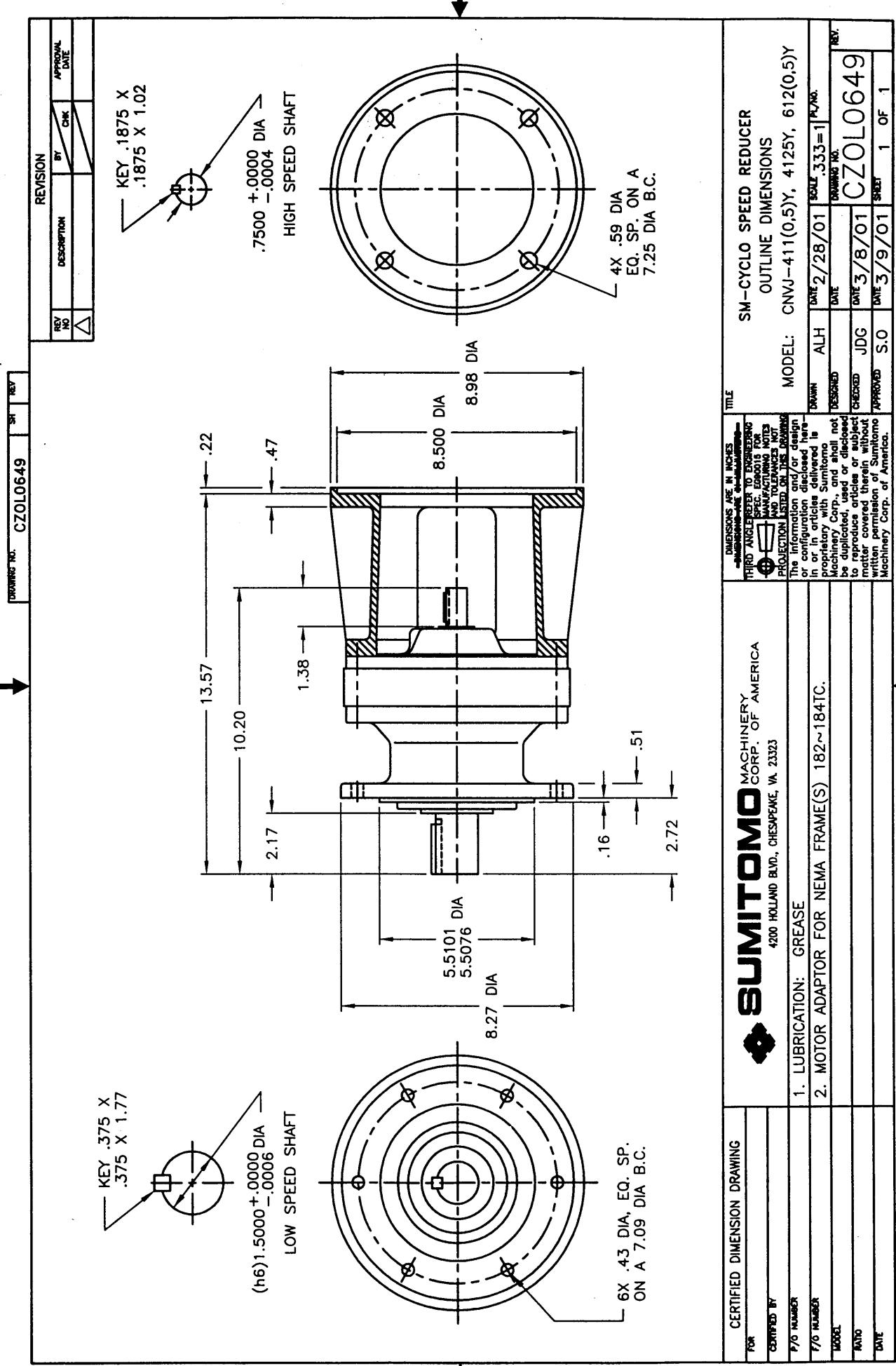
1750 RPM Frame Size Selection Tables

Dimensions:		Pages
Foot Mount (H)		4.2–4.15
F-Flange (F)		4.30–4.38
V-Flange (V)		4.48–4.64

Single Reduction, Ratios 25-119
H, F, V Housing Styles

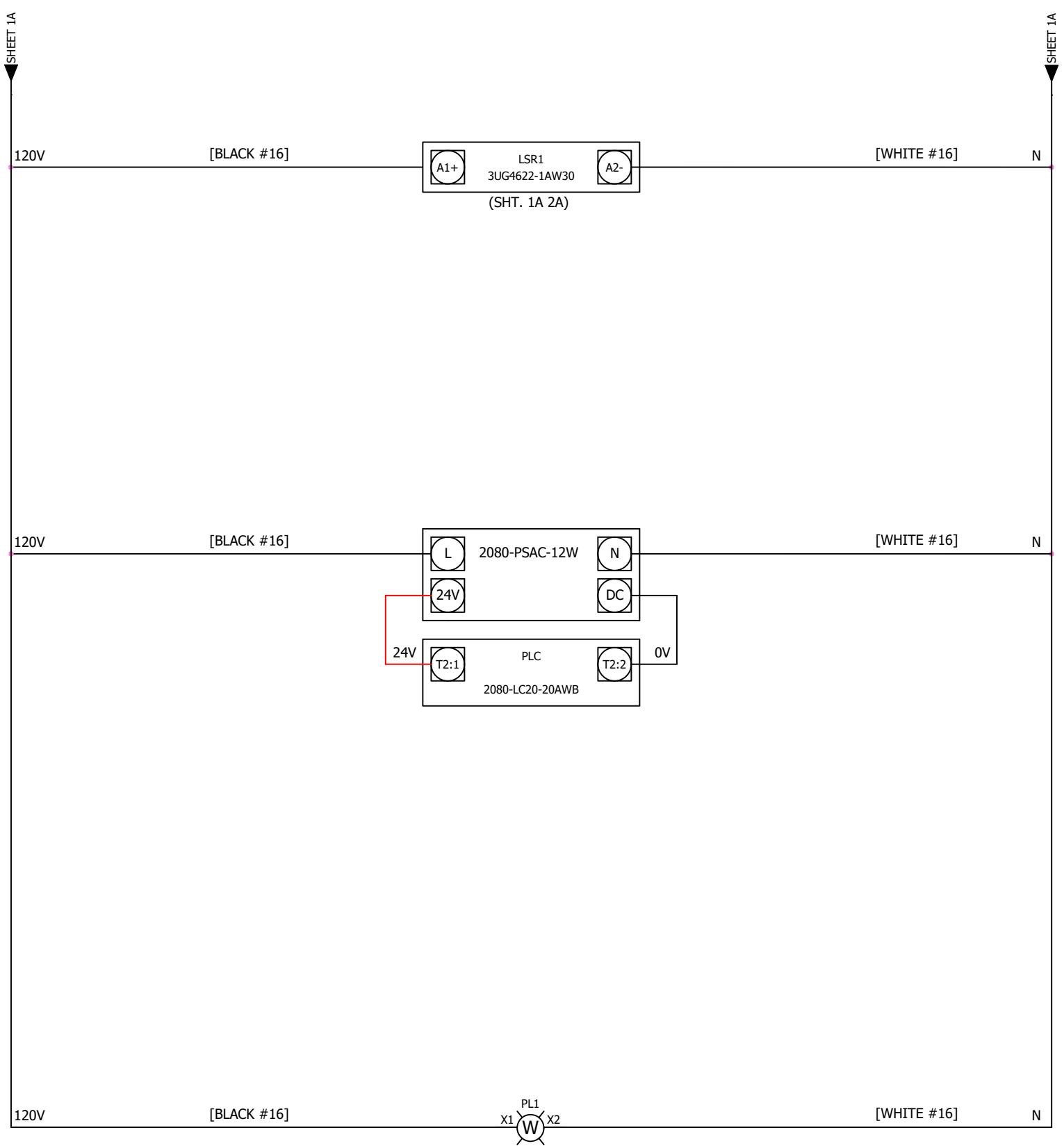
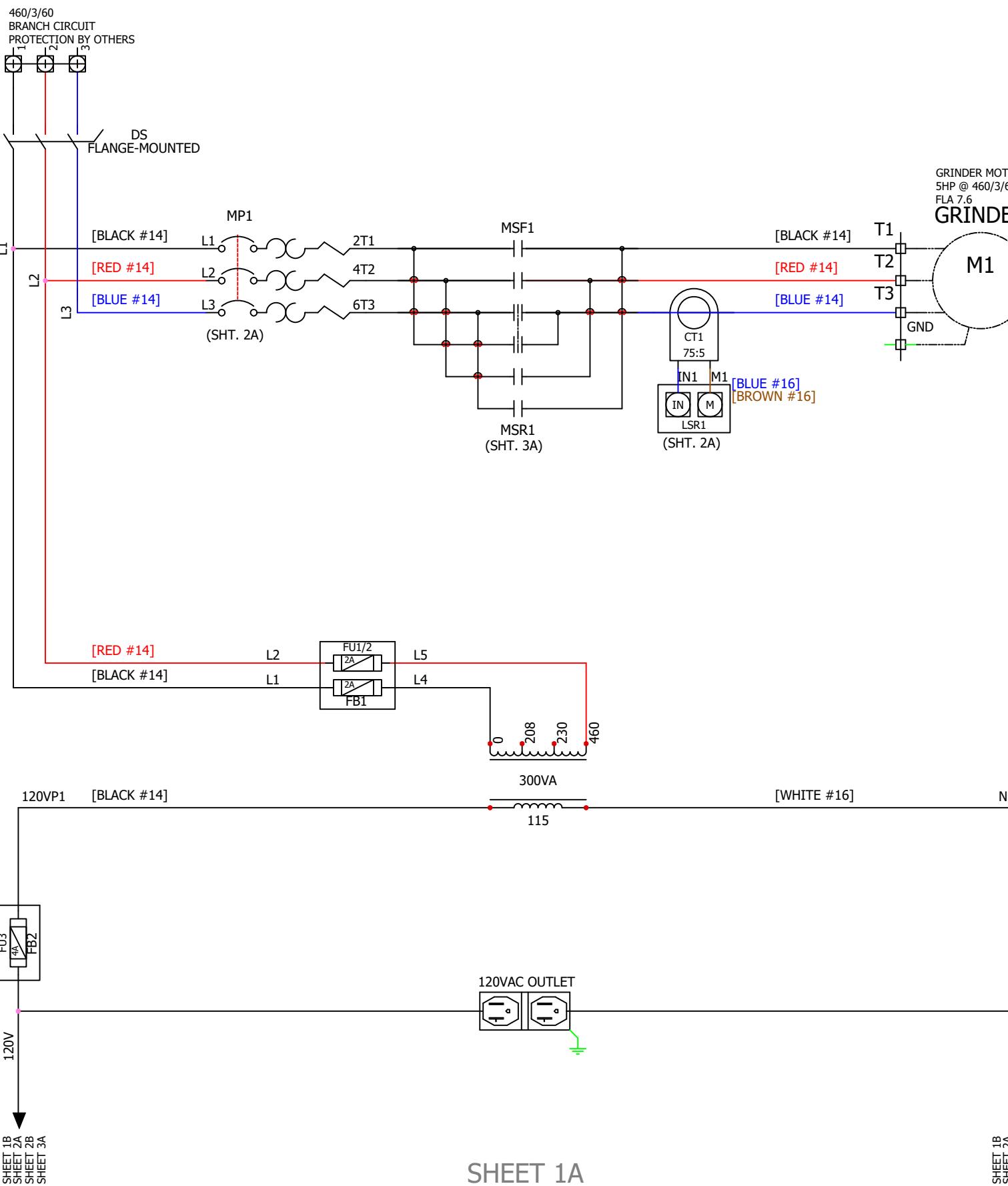
Output RPM Ratio	70.0	60.3	50.0	40.7	34.3	29.7	24.6	20.1	14.7	FRAME SIZE
25		29		35	43	51	59	71	87	119
Input HP	0.15	0.15	0.15	0.12	-	-	-	-	-	
Output Torque (in•lbs)	127	146	177	178	-	-	-	-	-	
Overhung Load (lbs)	265	265	265	265	-	-	-	-	-	6060
Input HP	0.22	0.22	0.19	0.15	-	-	-	-	-	
Output Torque in•lbs	190	220	230	223	-	-	-	-	-	
Overhung Load (lbs)	265	265	265	265	-	-	-	-	-	6065
Input HP	0.31	0.30	0.28	0.23	0.13	0.13	-	-	-	
Output Torque in•lbs	264	301	339	334	233	271	-	-	-	
Overhung Load (lbs)	397	397	397	397	397	397	-	-	-	6070
Input HP	0.40	0.38	0.37	0.30	0.19	0.18	-	-	-	
Output Torque in•lbs	337	380	448	446	335	367	-	-	-	
Overhung Load (lbs)	397	397	397	397	397	397	-	-	-	6075
Input HP	0.46	0.46	0.44	0.34	0.26	0.25	0.16	0.12	-	
Output Torque in•lbs	391	452	527	493	450	500	391	359	-	
Overhung Load (lbs)	569	575	575	575	575	575	575	575	-	6080
Input HP	0.64	0.63	0.49	0.40	0.32	0.31	0.25	0.16	-	
Output Torque in•lbs	544	621	595	580	563	632	609	484	-	
Overhung Load (lbs)	562	573	575	575	575	575	571	575	-	6085
Input HP	0.90	0.84	0.82	0.58	0.45	0.42	0.34	0.28	0.17	
Output Torque in•lbs	769	832	981	858	776	836	819	843	682	
Overhung Load (lbs)	750	750	750	750	750	750	750	750	750	6090
Input HP	1.16	1.05	1.02	0.81	0.57	0.50	0.40	0.40	0.20	
Output Torque in•lbs	990	1040	1220	1190	990	1010	981	1210	823	
Overhung Load (lbs)	750	750	745	750	750	750	750	750	750	6095
Input HP	1.70	1.62	1.31	1.05	0.75	0.69	0.59	0.58	0.28	
Output Torque in•lbs	1460	1610	1560	1540	1310	1400	1410	1730	1150	
Overhung Load (lbs)	1210	1210	1210	1210	1210	1210	1210	1210	1210	6100
Input HP	2.24	2.13	1.61	1.45	1.04	0.95	0.75	0.76	0.38	
Output Torque in•lbs	1920	2120	1920	2140	1810	1920	1830	2260	1560	
Overhung Load (lbs)	1210	1210	1210	1210	1210	1210	1210	1210	1210	6105
Input HP	2.56	2.55	2.01	1.74	1.27	1.15	0.90	0.89	-	
Output Torque in•lbs	2200	2530	2410	2570	2200	2330	2180	2640	-	
Overhung Load (lbs)	1500	1540	1650	1710	1710	1710	1710	1710	-	6110
Input HP	2.98	2.98	2.43	2.04	1.49	1.36	1.02	1.02	-	
Output Torque in•lbs	2550	2950	2900	2990	2600	2730	2470	3030	-	
Overhung Load (lbs)	1490	1530	1640	1710	1710	1710	1710	1710	-	6115
Input HP	4.15	4.01	3.34	2.56	2.31	1.74	1.28	1.27	-	
Output Torque in•lbs	3540	3980	4010	3780	4020	3530	3120	3770	-	
Overhung Load (lbs)	1790	1860	1980	2120	2200	2200	2200	2200	-	6120
Input HP	5.32	5.06	4.27	3.19	3.06	2.17	1.61	1.52	-	
Output Torque in•lbs	4540	5010	5100	4700	5330	4380	3910	4510	-	
Overhung Load (lbs)	1770	1840	1950	2100	2190	2200	2200	2200	-	6125
Input HP	6.93	6.01	4.98	4.01	3.41	2.94	2.46	1.91	-	
Output Torque in•lbs	5920	5960	5950	5910	5950	5920	5960	5660	-	
Overhung Load (lbs)	2050	2160	2290	2470	2580	2710	2890	3130	-	6130
Input HP	7.99	7.57	5.70	5.06	3.93	3.38	2.91	2.56	-	
Output Torque in•lbs	6820	7500	6820	7430	6860	6830	7070	7620	-	
Overhung Load (lbs)	2030	2130	2270	2430	2560	2690	2870	3110	-	6135
Input HP	9.25	7.99	6.99	5.29	4.60	3.97	3.26	2.66	-	
Output Torque in•lbs	7900	7920	8360	7780	8020	8010	7920	7900	-	
Overhung Load (lbs)	3090	3150	3400	3550	3590	3590	3590	3590	-	6140

Speed Reducers
Selection Tables



7

Electrical

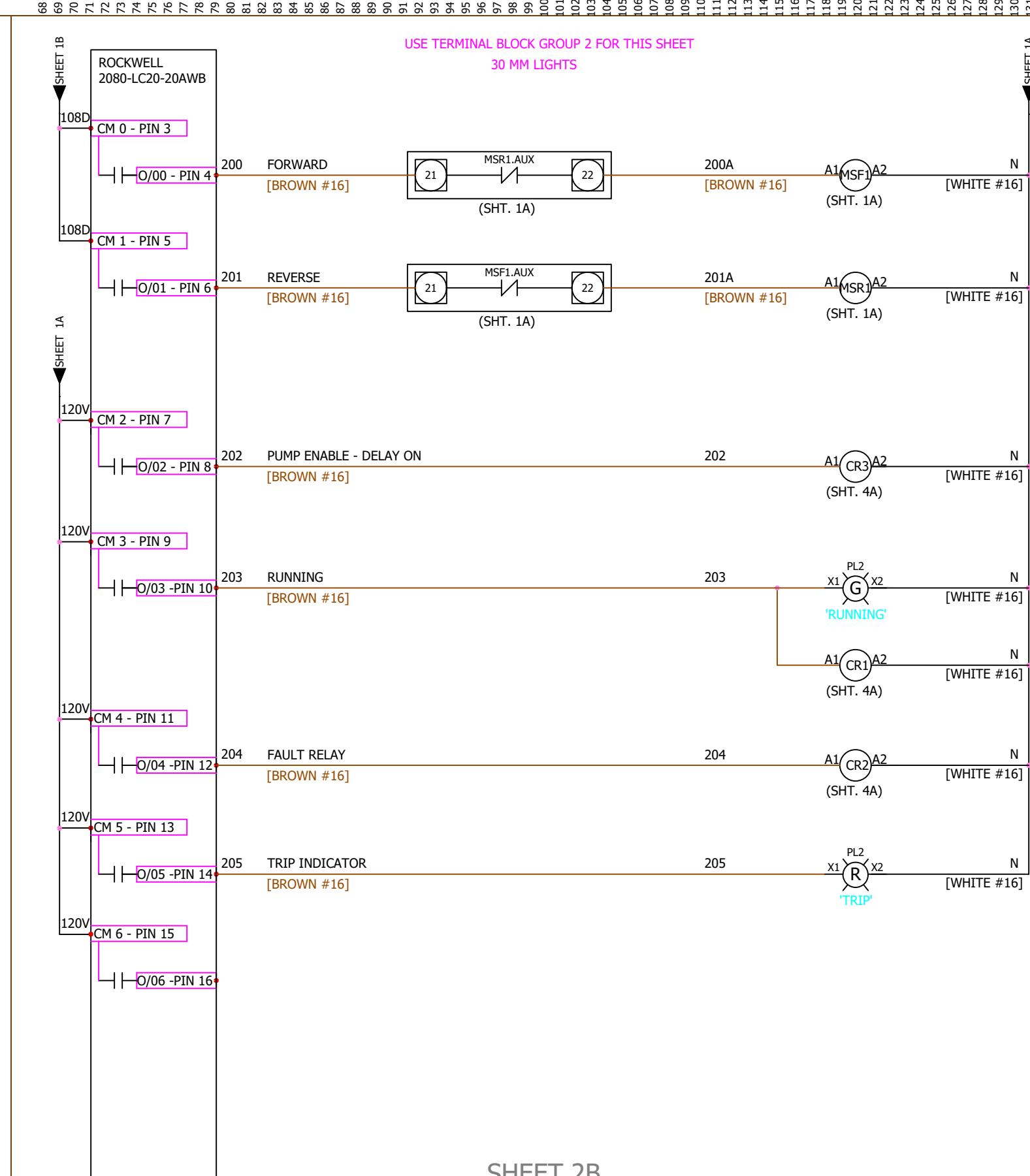
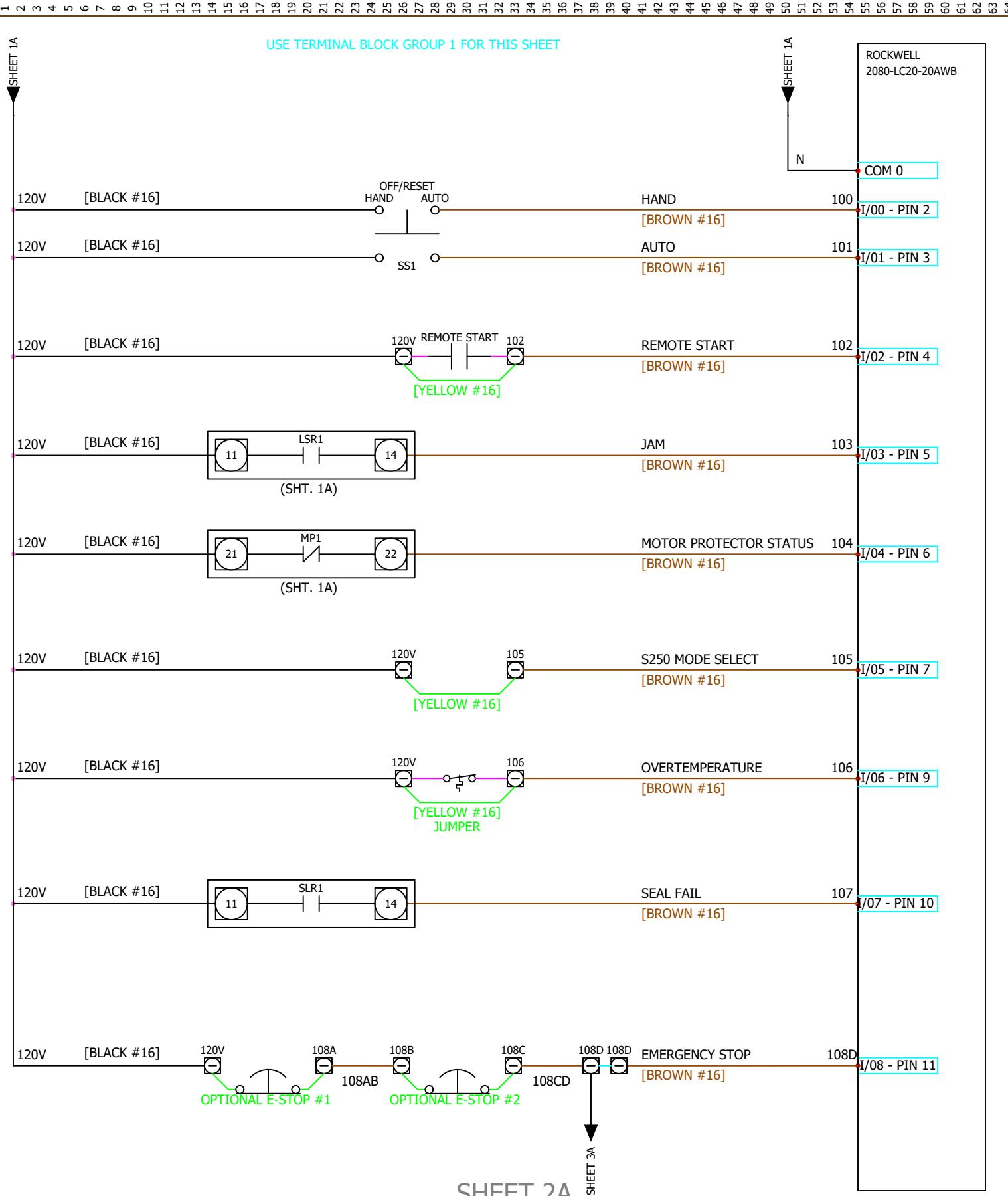


WIRE TYPE	SIZE*	COLOR	WIRE TYPE	SIZE*	COLOR
POWER	AS REQUIRED	BLACK	24 VDC	16 AWG	BLUE
120V CONTROL	16 AWG	RED	12 VDC	16 AWG	PURPLE
120V NEUTRAL	16 AWG	WHITE	EXT. POWER	16 AWG	YELLOW
24 VAC	16 AWG	ORANGE	SHIELDED	18 AWG	MULTI
LOW VAC	16 AWG	BROWN	GROUND	16 AWG	GREEN

THIS COMPLETE ELECTRICAL ASSEMBLY WILL BE CONSTRUCTED AND LABELED TO CONFORM TO THE REQUIREMENTS OF U.L. 508A PROCEDURES.

* WIRE SIZE SHALL BE 16 AWG OR MAXIMUM ALLOWED AS RATED BY COMPONENT MANUFACTURER IF COMPONENT IS RATED FOR SMALLER THAN 16 AWG

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WIRE TYPE	SIZE*	COLOR	WIRE TYPE	SIZE*	COLOR	THIS DRAWING EMBODIES A PROPRIETARY ALL DESIGN, MANUFACTURING, REPRODUC- TION AND SALE OF THIS DRAWING IS FOR RIGHT BY WRITTEN AGREEMENT TO REPRO- DUCE IT. NO PARTS OF THIS DRAWING REGARDING THE SAME ARE EXPRESSLY RES- ERVED. NO PARTS OF THIS DRAWING ARE SPECIFIC PURPOSE, AND THE RECIPIENT AG- REES NOT TO DISCLOSE OR USE ANY IN- FORMATION REGARDING IT TO ANY UNA- UTHORIZED PERSON. THE RECIPIENT AG- REES THAT IT IS THE PROPERTY OF THE FABRICATOR, AND THAT IT IS TO BE MAINTAINED AS A TRADE SECRET. THE FABRICATOR RESERVES THE RIGHT TO REPRODUCE THIS DRAWING IN WHOLE OR IN PART, OR TO DISCLOSE IT TO OTHERS, AS IT SEEKS TO EXPAND ITS BUSINESS.
POWER	AS REQUIRED	BLACK	24 VDC	16 AWG	BLUE	
120V CONTROL	16 AWG	RED	12 VDC	16 AWG	PURPLE	
120V NEUTRAL	16 AWG	WHITE	EXT. POWER	16 AWG	YELLOW	
24 VAC	16 AWG	ORANGE	SHIELDED	18 AWG	MULTI	

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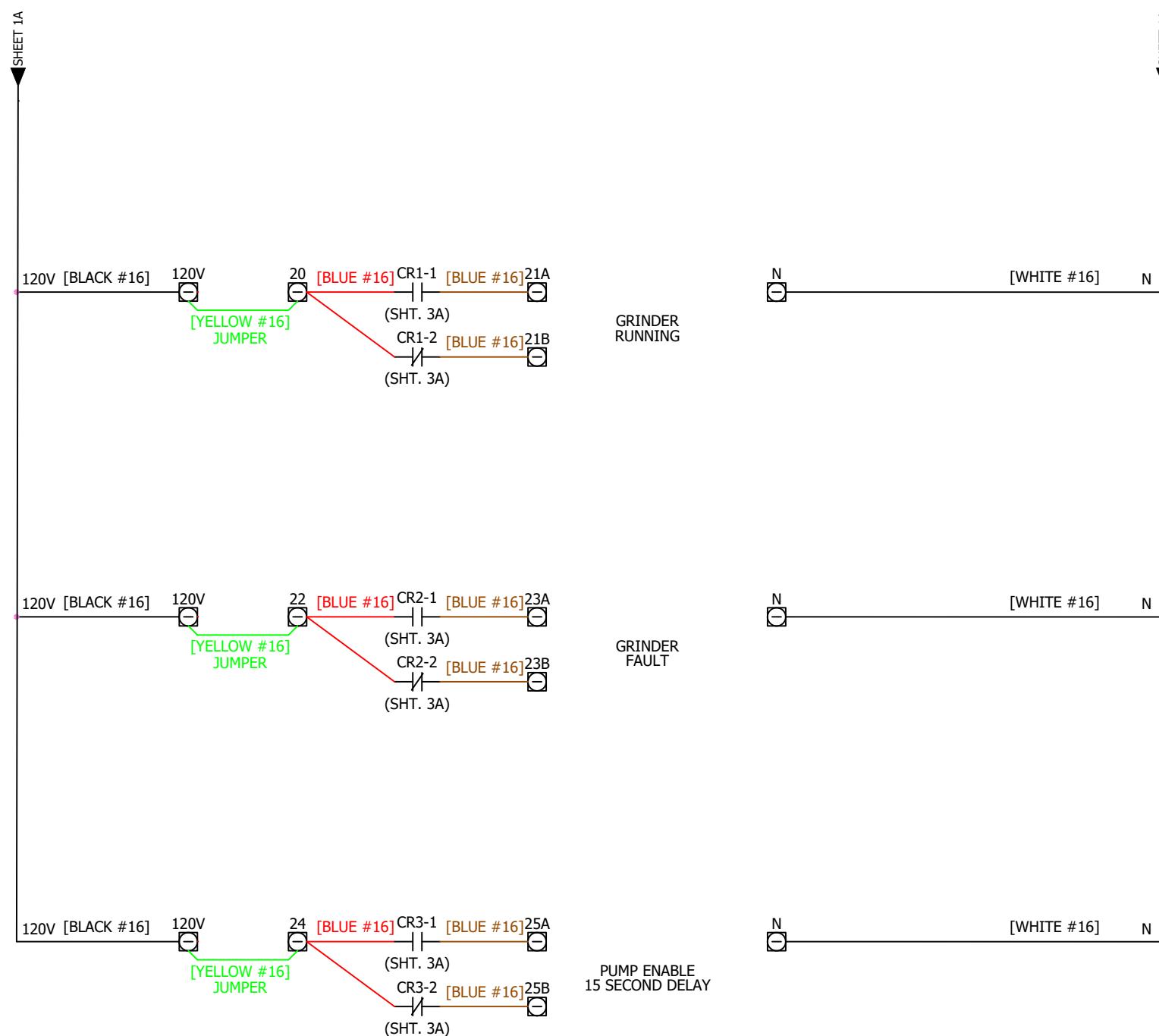
* WIRE SIZE SHALL BE 16 AWG OR MAXIMUM ALLOWED AS RATED BY COMPONENT MANUFACTURER IF COMPONENT IS RATED FOR SMALLER THAN



THOMAS MILLER INC.
100 PARKWAY, LIVINGSTON, N.J. 07039

HTL LOWATER

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SHEET 3

WIRE TYPE	SIZE*	COLOR	WIRE TYPE	SIZE*	COLOR	THIS DRAWING EMBODIES A PROPRIETARY ALL DESIGN, MANUFACTURING, REPRODUC- TION AND DISTRIBUTION RIGHTS OWNED BY THE RIGHT BY WRITTEN AGREEMENT TO REPRODUCE REGARDING THE SAME ARE EXPRESSLY RE- SERVED. THE DRAWINGS CONTAIN CERTAIN SPECIFIC PURPOSE, AND THE RECIPIENT AGREES INFORMATION REGARDING IT TO ANY UNAU- THORIZED PERSONS OR COMPANIES. FEATURES RELEVANT TO THIS DESIGN, AND NOTICE OF THE EXISTENCE OF THIS DRAWING IS NOT TO BE MADE EXCEPT AS AUTHORIZED BY THE OWNER.
POWER	AS REQUIRED	BLACK	24 VDC	16 AWG	BLUE	
120V CONTROL	16 AWG	RED	12 VDC	16 AWG	PURPLE	
120V NEUTRAL	16 AWG	WHITE	EXT. POWER	16 AWG	YELLOW	
24 VAC	16 AWG	ORANGE	SHIELDED	18 AWG	MULTI	

THIS COMPLETE ELECTRICAL ASSEMBLY WILL BE CONSTRUCTED AND TESTED TO CONFORM TO THE REQUIREMENTS OF MIL-STD-883C.

* WIRE SIZE SHALL BE 16 AWG OR MAXIMUM ALLOWED AS RATED BY
COMPONENT MANUFACTURER IF COMPONENT IS RATED FOR SMALLER

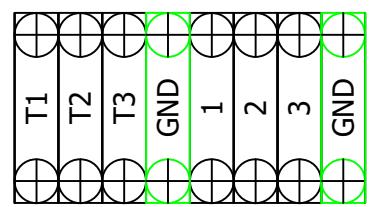
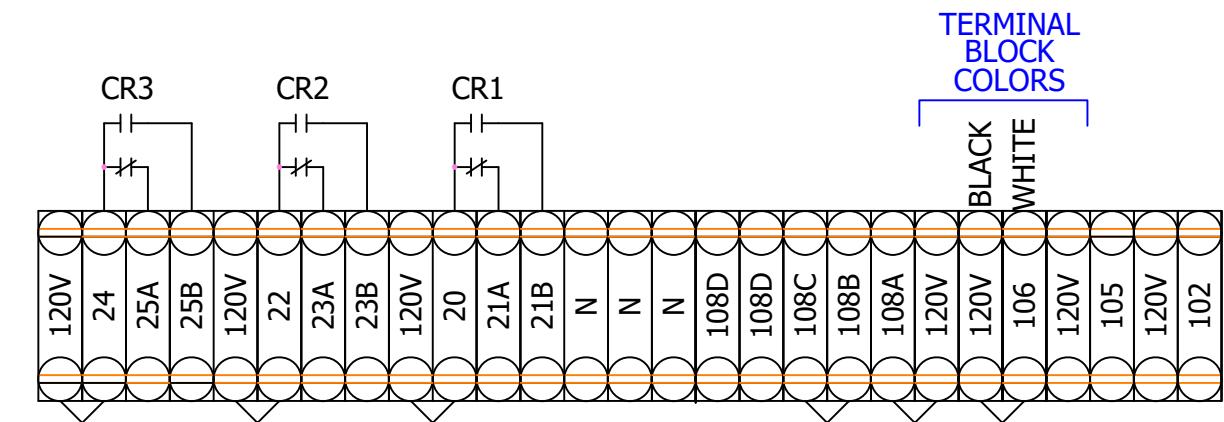
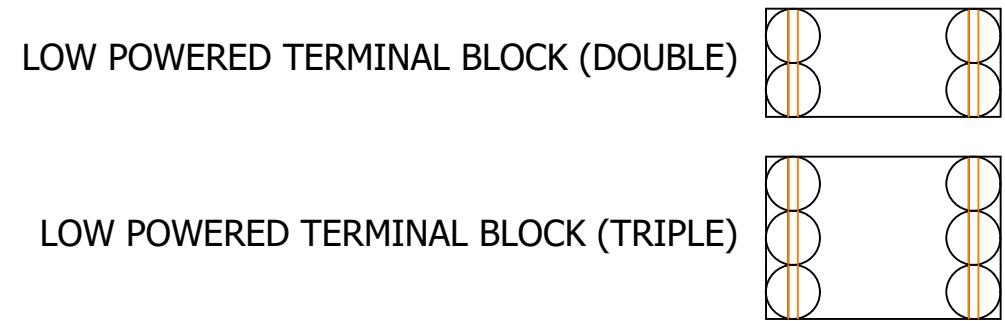
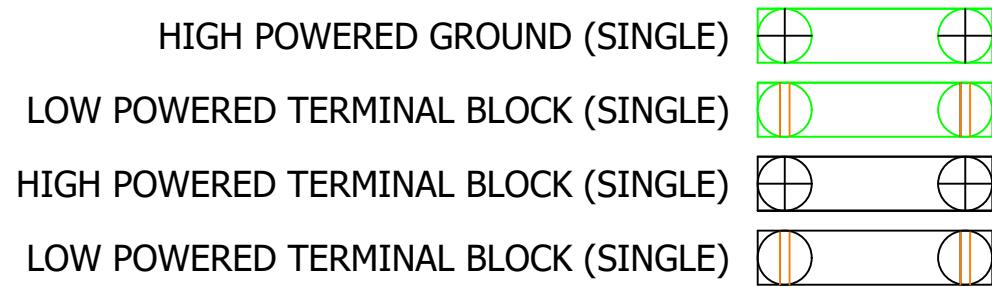
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SHEET 3B

The logo consists of a red graphic element on the left resembling a barcode or a series of vertical bars of varying heights, followed by the word "Miller" in a large, bold, black sans-serif font. A smaller ".com" is positioned at the bottom right corner of the logo.

IT LO WAITD

HILO WWTP



PUMP ENABLE DELAY
GRINDER FAULT

OPTIONAL E-STOP #2

OPTIONAL E-STOP #1

OVERTEMPERATURE

S250/S260 MODE SELECTION

REMOTE START

SHEET 4

WIRE TYPE	SIZE*	COLOR	WIRE TYPE	SIZE*	COLOR
POWER	AS REQUIRED	BLACK	24 VDC	16 AWG	BLUE
120V CONTROL	16 AWG	RED	12 VDC	16 AWG	PURPLE
120V NEUTRAL	16 AWG	WHITE	EXT. POWER	16 AWG	YELLOW
24 VAC	16 AWG	ORANGE	SHIELDED	18 AWG	MULTI

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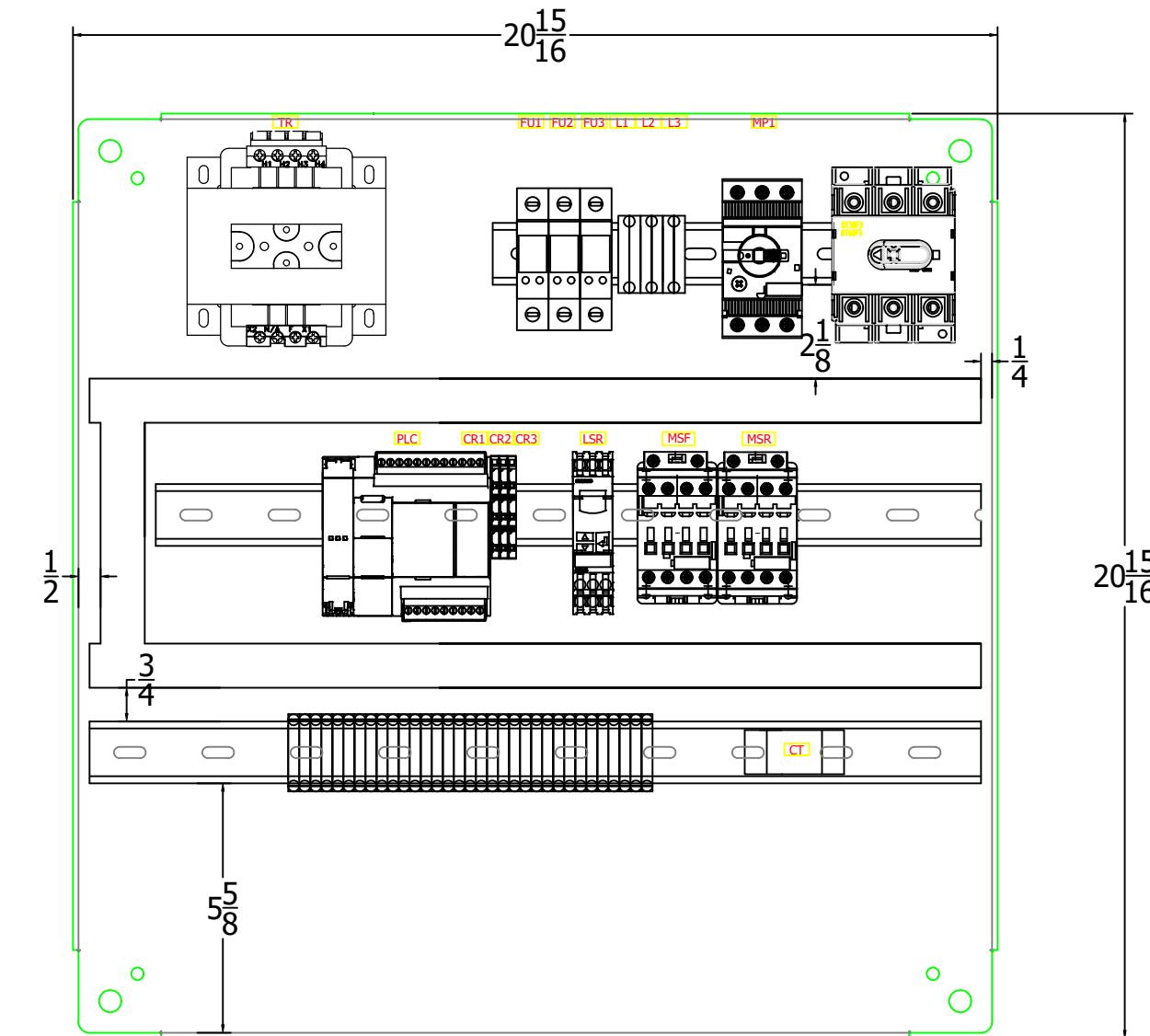
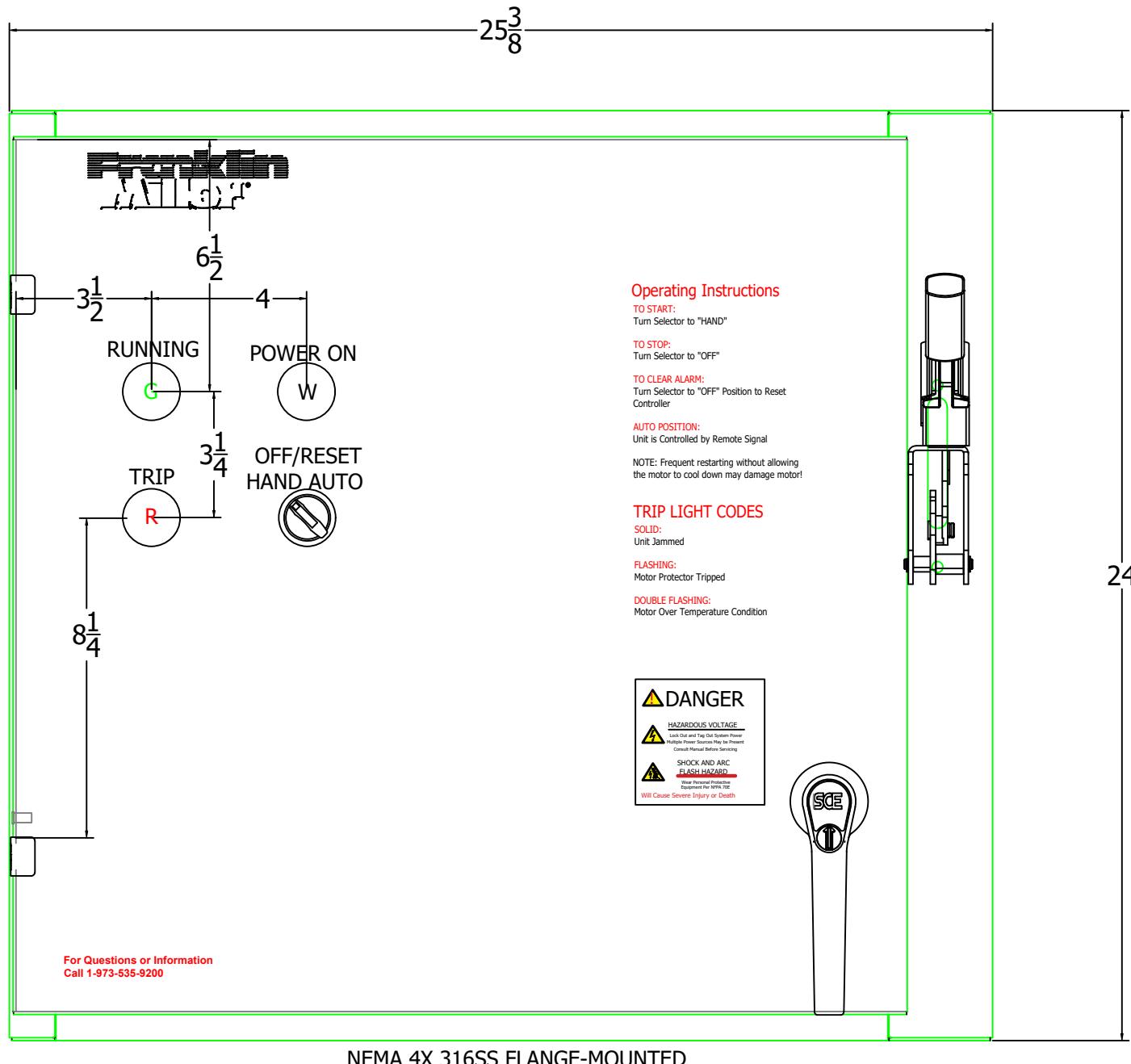
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SHEET 5A

FRONTPANEL

BACKPANELS

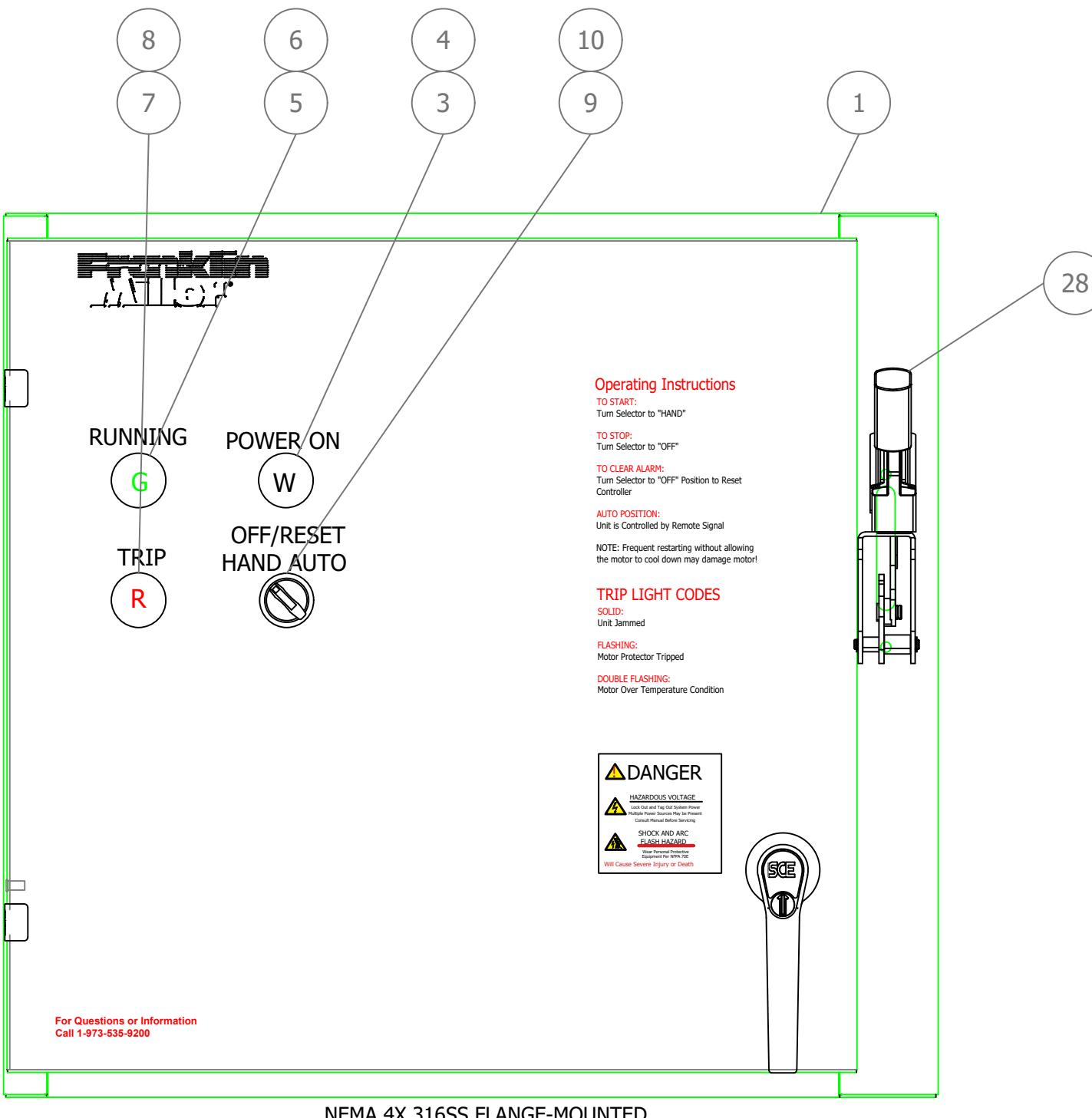
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SHEET 5B

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FRONTPANEL

BACKPANELS

SHEET 6A

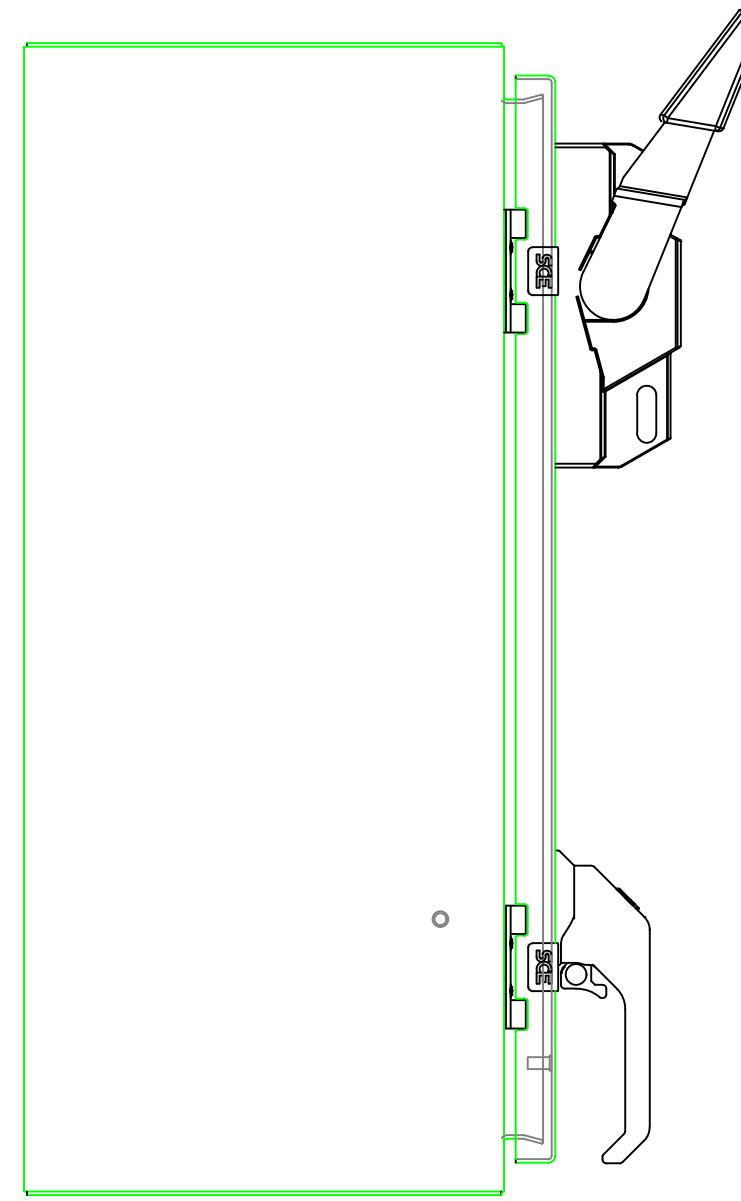
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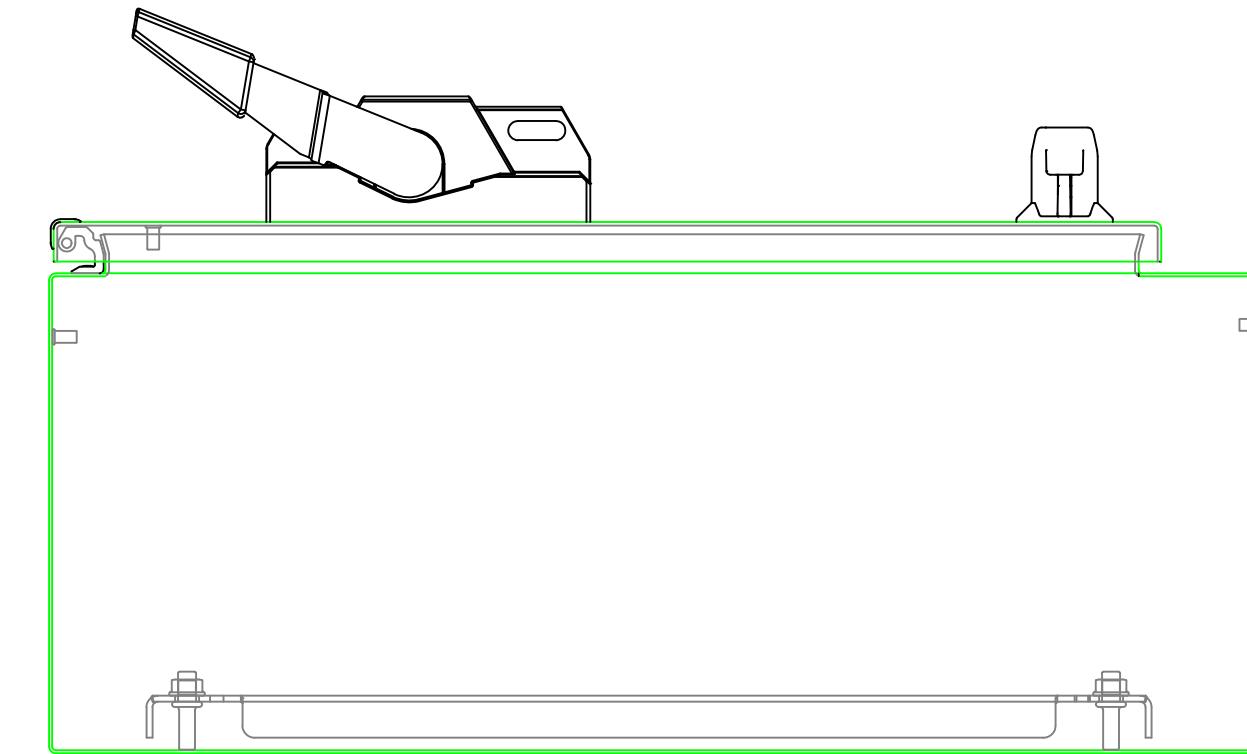
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LEFT SIDE VIEW

SHEET 7A



BOTTOM VIEW

SHEET 7B

LEFT SIDE

BOTTOM

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