WEAVER CONSTRUCTION MANAGEMENT, INC.
3679 S. Huron St., Suite 404
Englewood, CO 80110
Phone: (303) 789-4111 FAX: (303) 789-4310

SUBMITTAL TRANSMITAL

September 22, 2011
WGC Submittal No: 14555-001

PROJECT: **Harold Thompson Regional WRF**
Birdsall Rd.
Fountain, CO 80817
Job No. 2908

ENGINEER: **GMS, Inc.**
611 No. Weber St., #300
Colorado Springs, CO 80903
719-475-2935 Roger Sams

OWNER: **Lower Fountain Metropolitan Sewage Disposal District**
901 S. Santa Fe Ave.
Fountain, CO 80817
719-382-5303 James Heckman

CONTRACTOR: **WesTech Engineering, Inc.**
3665 S West Temple
Salt Lake, UT 84115
801-265-1000

SUBJECT: WesTech Shaftless Spiral Conveyor

- Model CVH260 & Control Panel
  - Tag No. CV-1

SPEC SECTION: 14555 – Shaftless Screw Conveyor

PREVIOUS SUBMISSION DATES:

DEVIATIONS FROM SPEC: ___ YES _X_ NO

CONTRACTOR'S STAMP: This submittal has been reviewed by Weaver General Construction and approved with respect to the means, methods, techniques, & safety precautions & programs incidental thereto. Weaver General Construction also warrants that this submittal complies with contracted documents and comprises on deviations thereto:

Contractor's Stamp:	Engineer's Stamp:
Date: 9/22/11 Reviewed by: H.C. Myers (X) Reviewed Without Comments ( ) Reviewed With Comments ENGINEER'S COMMENTS:_____	

WESTECH AN EMPLOYEE OWNED COMPANY

SUBMITTAL FOR:
SECTION 14555 – SHAFTLESS SCREW CONVEYORS

HAROLD D THOMPSON WATER RECLAMATION FACILITY
FOUNTAIN, CO

EQUIPMENT:
ONE (1) SHAFTLESS SPIRAL CONVEYOR
MODEL: CVH260
& ONE (1) CONTROL PANELS

ENGINEER:
GMS, Inc.

REPRESENTED BY:
GOBLE SAMPSON ASSOCIATES
6805 N. BROADWAY
DENVER, CO 80221
CONTACT: JOSH QUEEN
PHONE: (303) 770-6418
FAX: (303) 770-7549
jqueen@goblesampson.com

FURNISHED BY:
WESTECH ENGINEERING, INC.
SALT LAKE CITY, UTAH

WESTECH JOB NUMBERS: 21393B

SEPTEMBER 2011

Std. Rev. 08/11/05

This page left intentionally blank.

WESTECH AN EMPLOYEE OWNED COMPANY

SUBMITTAL

This page left intentionally blank.

1 SUBMITTAL INTRODUCTION

This page left intentionally blank.

WESTECH AN EMPLOYEE OWNED COMPANY
SUBMITTAL

SUBMITTAL INTRODUCTION

This submittal is being furnished for the approval of the mechanical and electrical equipment (if applicable) as outlined under the specification section and drawings referred to in the Letter of Clarification.

Scope of Supply: A complete outline of materials to be supplied is listed herein. This submittal package represents WesTech's complete scope of supply. All other materials and services not specifically included on the drawings or within the body of this submittal are to be supplied by others.

A. **Operation and Maintenance Manuals**: Operation and Maintenance Manuals shall follow in a timely manner and with the content to satisfy the specifications. Final Operation and Maintenance Manuals will be supplied with the equipment. When applicable, "preliminary" Operation and Maintenance Manuals may be furnished prior to shipment of equipment when specifications require Engineer's approval. The manuals will include, but are not limited to, the following information:
   - A.1. Complete Bill of Materials for all equipment, including individual component weights
   - A.2. Recommended receiving and storage instructions.
   - A.3. Recommended installation.
   - A.4. Inspection, testing and start-up instructions.
   - A.5. Operation and maintenance instructions
   - A.6. Recommended spare parts list and pricing.
   - A.7. Emergency procedures and trouble-shooting guides.
   - A.8. Accessory equipment information.
   - A.9. "Approved", "Approved as Corrected" and/or "Revised" General Arrangement and Equipment Erection/Assembly drawings.

B. **Critical Dimensions**: Dimensions which are critical to the design of the equipment, but were not clear and/or not provided in the specifications or Engineer's drawings, appear on WesTech drawings in this submittal package with a cloud around them. **Approval to proceed will not be recognized by WesTech, and production will remain on hold, until all clouded dimensions (if applicable) are confirmed or supplied in writing by the Contractor/ Engineer**. Please note that the WesTech submittal drawings contain dimensions with ✱'s denoted to identify variance from contract documents and should be particularly noted. Please also note that all clouded dimensions on the WesTech submittal drawings require written verification from the Contractor before the equipment can be released by WesTech. Please include this written dimensional verification within the returned submittal package to WesTech.

C. **Re-submittals**: The enclosed information will not be duplicated in any future re-submittals, unless:
   - C.1. Items/sections have been commented on and need clarification or revision for the re-submittal.
   - C.2. Specifically requested by the Engineer or Contractor on the return Letter of Transmittal that: *"The entire re-submittal must be duplicated."*

This page left intentionally blank

Table of Contents

WESTECH

WARRANTY

WesTech equipment is backed by WesTech's reputation as a quality manufacturer, and by many years of experience in the design of reliable equipment.

Equipment manufactured or sold by WesTech Engineering, Inc., once paid for in full, is backed by the following warranty:

For the benefit of the original user, WesTech warrants all new equipment manufactured by WesTech Engineering, Inc. to be free from defects in material and workmanship, and will replace or repair, F.O.B. its factories or other location designated by it, any part or parts returned to it which WesTech's examination shall show to have failed under normal use and service by the original user within one (1) year following initial start-up, or eighteen (18) months from shipment to the purchaser, whichever occurs first. Such repair or replacement shall be free of charge for all items except for those items such as resin, filter media and the like that are consumable and normally replaced during maintenance, with respect to which, repair or replacement shall be subject to a pro-rata charge based upon WesTech's estimate of the percentage of normal service life realized from the part. WesTech's obligation under this warranty is conditioned upon its receiving prompt notice of claimed defects, which shall in no event be later than thirty (30) days following expiration of the warranty period, and is limited to repair or replacement as aforesaid.

THIS WARRANTY IS EXPRESSLY MADE BY WESTECH AND ACCEPTED BY PURCHASER IN LIEU OF ALL OTHER WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, WHETHER WRITTEN, ORAL, EXPRESS, IMPLIED, OR STATUTORY. WESTECH NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY WITH RESPECT TO ITS EQUIPMENT. WESTECH SHALL NOT BE LIABLE FOR NORMAL WEAR AND TEAR, CORROSION, OR ANY CONTINGENT, INCIDENTAL, OR CONSEQUENTIAL DAMAGE OR EXPENSE DUE TO PARTIAL OR COMPLETE INOPERABILITY OF ITS EQUIPMENT FOR ANY REASON WHATSOEVER.

This warranty shall not apply to equipment or parts thereof which have been altered or repaired outside of a WesTech factory, or damaged by improper installation, application, or maintenance, or subjected to misuse, abuse, neglect, accident, or incomplete adherence to all manufacturer's requirements, including, but not limited to, Operations & Maintenance Manual guidelines & procedures.

This warranty applies only to equipment made or sold by WesTech Engineering, Inc.

WesTech Engineering, Inc. makes no warranty with respect to parts, accessories, or components purchased by the customer from others. The warranties which apply to such items are those offered by their respective manufacturers.

Table of Contents

This page left intentionally blank

Table of Contents

WesTech Municipal Water Products

GROUNDWATER TREATMENT

Aeration

- Cascading Aerator
- Forced Draft Aerator
- Induced Draft Aerator

Sedimentation/Clarification

- Ballasted Flocculation
- ClariCell™ Package Treatment Plant
- Conventional Clarifier
- Flocculating Clarifier
- High Rate Clarifier
- solids CONTACT CLARIFIER™
- SuperSettler™ Inclined Plate Settler

Filtration

- AeraFilter™ Iron and Manganese Removal Plant
- AltaFilter™ Ultrafiltration Membrane System
- AltaPac™ Ultrafiltration Membrane System
- Circular and Rectangular Open Top Gravity Filter
- ClariCell-B™ Package Treatment Plant
- Horizontal and Vertical Pressure Filter
- ModTech™ Cluster Filter

Residuals Handling

- Backwash Water Clarifier
- Decant Mechanism
- Gravity Sludge Thickener
- SuperSettler™ Inclined Plate Settler
- Vacuum Drum Filter

Softening

- Cation Exchange Softener
- Solids CONTACT CLARIFIER™

SURFACE WATER TREATMENT

Flocculation

- Ducted Impeller Flocculator
- Horizontal Paddle Wheel Flocculator
- Vertical Paddle Wheel Flocculator

Sedimentation/Clarification

- ClariCell™ Package Treatment Plant
- Conventional Clarifier
- Flocculating Clarifier
- High Rate Clarifier
- Solids CONTACT CLARIFIER™
- SuperSettler™ Inclined Plate Settler

Filtration

- AltaFilter™ Ultrafiltration Membrane System
- AltaPac™ Ultrafiltration Membrane System
- Circular and Rectangular Open Top Gravity Filter
- ClariCell-B™ Package Treatment Plant
- Horizontal and Vertical Pressure Filter
- ModTech™ Cluster Filter
- PolyBloc™ Roughing Filter

Package Treatment Plants

- AltaFilter™ Ultrafiltration Membrane System
- AltaPac™ Ultrafiltration Membrane System
- ClariCell-B™ Package Treatment Plant

Ion Exchange

- Cation Exchange Softener
- GAC Contactor

Residuals Handling

- Backwash Water Clarifier
- Decant Mechanism
- Gravity Sludge Thickener
- SuperSettler™ Inclined Plate Settler
- Vacuum Drum Filter

Services

- Bench Scale Feasibility Testing
- Field Pilot Studies
- Full Scale Rental Equipment
- Installation and Erection Services
- Mechanical Evaluations
- Plant Process Audits

Tankage

- Supply and Erection

Tel: 801.265.1000
Fax: 801.265.1080
www.westech-inc.com

WESTECH
Process Equipment. Process Driven.

Table of Contents

WesTech Municipal Wastewater Products

Anaerobic Digestion Equipment
- Digester Cover - Radial Beam Style
- Digester Cover - Truss Style
- DuoSphere™ Dual-Membrane Gas Holder
  - Slab and Tank Mount
- Extreme Duty™ Mechanical Sludge Mixer
- Sludge Heating System

Biological Treatment
- Landox™ Oxidation Ditch
- OxyStream™ Advanced Oxidation Ditch Process
- Slow Speed Surface Aerators
- STM-Aerotor™ IFAS Systems
- ClearLogic™ MBR System
- HydroDoc™ Rotary Distributor
- BioDoc® Rotary Distributor

Clarifiers
- C.O.P.™ Clarifier Optimization Package
  - Spiral Blades
  - Sludge Ring
  - Dual Gate EDI
- Suction Header
- solids CONTACT CLARIFIER™
- Conventional Scraper Blade
- Suction Pipe

Combined Sewer Overflow
- CleanFlo™ ROMAG CSO Screens

Dissolved Air Flotation
- Pretreatment Clarifiers
- Sludge Thickeners
- Rectangular & Circular

Electrical Controls
- PLC Based Control Systems
- UL Listed Panels (UL508A/CSA)

Filters
- AltaFilter™ Ultrafiltration Membrane System
- SuperSand™ Continuous Backwash Filter
- Granular Media Gravity Filter
- Multi-Media Pressure Filter
- SuperDisc™ Cloth Media Disc Filter

Headworks
- CleanFlo™ Rotoscreen®
- CleanFlo™ Monoscreen®
- CleanFlo™ ALL-IN-ONE (Complete Plant)
- CleanFlo™ Element Continuous Belt Screen
- CleanFlo™ Perf Perforated Plate Belt Screen
- CleanFlo™ Shear (Internally Fed Drum Screen)
- CleanFlo™ SludgeScreen®
- CleanFlo™ Spiral Screen
- CleanWash™ Screenings Washer / Compactor
- Counter Pressure Screw
- CleanGrit™ Grit Washers
- Gritt Mitt™ Grit Classifiers
- Vortex Grit Separators

Laboratory & Pilot Plant Test Equipment
- Bench Scale Testing
- Pilot Plant Testing

Parts and Service Support
- 24 Hour Hot-Line
- Regional Service Technicians
- Full Service Parts Department

Rectangular Basin Skimming
- Helical Scum Skimmers
- Rotating Scum Pipes

Replacement Drives
- Adaptable to All Other Manufacturers
- Precision Bearing
- Grease Lubricated Option
- Clarifiers
- Thickeners

Septage Receiving Station
- Screening and Grit Removal Options
- Hauler Access Stations
- Customer Management / Billing Software

Tankage
- Material Supply
- Field Erection

Thickeners
- Center Feed
- Rake Lifting Devices
- Side Feed

WesTech

Tel: 801.265.1000
Fax: 801.2651080
www.westech-inc.com

Table of Contents

WesTech Mining and Metallurgical Products

Clarifiers
- Buoyant Media Clarifier
- Flocculating Clarifier
- Metallurgical Contact Clarifier
- Solids CONTACT Clarifier™
- SuperSettler™ Inclined Plate Settler

Clarifier / Thickener Drives
- Adaptable to All Other Manufacturers
- Bridge Supported Shaft Drive
- Column Supported Cage Drive
- Traction Drive

Granular Media Filtration
- Horizontal Pressure Filter
- Open Top Gravity Filter
  - Circular
  - Rectangular
- SuperSand™ Continuous Backwash Filter
- Vertical Pressure Filter

Magnetic Separators
- Permanent Magnet Belt Separator

Man Camp Potable Water Treatment
- AltaFilter™ Ultrafiltration Membrane System
- AltaPac™ Ultrafiltration Package System
- ClariCell-B™ Package Treatment Plant

Man Camp Wastewater Treatment
- ClearLogic™ MBR System
- STM-Aerotor™ IFAS Package System

Parts / Field Service / Training
- 24 Hour Hot-Line
- Full Service Parts Department
- Installation and Erection Services
- Mechanical Evaluations
- Operator Training
- Process Training
- Regional Service Technicians

Screens
- CIP / CIL Carbon Retention Screen
- Linear Screen

Services
- Bench Scale Feasibility Testing
- Field Pilot Studies
- Installation and Erection Services
- Mechanical Evaluations
- Plant Process Audits
- Pilot Rental Equipment
  - AltaFlo™ High Rate Thickener
  - AltaPac™ Ultrafiltration Package System
  - Buoyant Media Clarifier
  - High Rate Thickener
  - Horizontal Belt Filter
  - Linear Screen
  - Paste Thickener
  - Precoat Filter
  - Rotary Drum Filter
  - Solids Contact Clarifier

Tankage
- Anchor Channel Tank
- Elevated Tank
- Steel Bottom Tank
- Supply and / or Field Erection

Thickeners
- AltaFlo™ High Rate Thickener
- Conventional Thickener
- Deep Bed™ Paste Thickener
- HiDensity™ Paste Thickener
- HiFlo™ High Rate Thickener
- Swing Lift Thickener

Vacuum Filters
- Disc Filter
- Horizontal Belt Filter
- Precoat Drum Filter
- Rotary Drum Filter
  - Belt Discharge
  - Roll Discharge
  - Scraper Discharge

WESTECH
Process Equipment. Process Driven.

Tel: 801.265.1000
Fax: 801.265.1080
www.westech-inc.com

Table of Contents

WesTech Industrial Water and Wastewater Products

Aeration
Cascading Aerator
Forced / Induced Draft Aerator
Pressure Aerator

Barrier/Media Filtration
AeraFilter™ Iron / Manganese Removal
AltaFiler™ Ultrafiltration Membrane Systems
AltaPac™ Ultrafiltration Package Systems
AltaPak™ Ultrafiltration Systems
ClariCell-B™ Package Treatment
ModTech™ Cluster Filter
Open Top Gravity Filter (Circular or Rectangular)
PolyBloc™ Roughing Filter
Pressure Filter (Vertical or Horizontal)
Reverse Osmosis Systems
SuperSand™ Continuous Backwash Filter

Biological Treatment
BioDoc® Rotary Distributor
Biotreater
ClearLogic MBR Systems
DuoSphere™ Dual Membrane Gasholder (Slab or Tank Mount)
HydroDoc™ Rotary Distributor
Oxidation Ditches
Slow Speed Surface Aerators
Slow Speed Surface Aerators
STM Aerator™ IFAS Systems

Clarification/Sedimentation
Conventional Clarifier
COP™ Clarifier
Draft Tube™ Clarifier
Flocculating Clarifier
Metallurgical Contact Clarifier
Solids CONTACT Clarifier™
Suction Header
SuperSettler™ Incline Plate Settler

Clarifier / Thickener Drives
Adaptable to All Other Manufacturers
Precision Bearing

Dewatering
Belt Press
Horizontal Vacuum Belt Filter
Precoat Drum Filter
Recessed Plate Filter Press
Rotary Drum Vacuum Filter

Dissolved Gas Flotation
Circular
Rectangular
Sludge Thickener

Electrical Controls
PLC Based Control Systems
UL Listed Panels (UL508A / CSA)

Parts / Field Service /Training
24 Hour Hot-Line
Full Service Parts Department
Installation and Erection Services
Mechanical Evaluations
Operator Training
Process Training
Regional Service Technicians

Pilot Rental Equipment
AltaFilter™ Ultrafiltration Membrane Systems
AltaFlo™ High Rate Thickener
AltaPak™ Ultrafiltration Units
Buoyant Media Clarifier
High Rate Thickener
Horizontal Belt Filter
Linear Screen
Paste Thickener
Pilot Rental Equipment
Precoat Filter
Reverse Osmosis
Solids CONTACT Clarifier™
Vacuum Drum Filter

Oil / Water Separation
DAF Units (Circular or Rectangular)
DNF Units (Circular or Rectangular)
Oil / Water Separator (Circular or Rectangular)

Screens
CleanFlo™ Element Continuous Belt Screen
CleanFlo™ Monoscreen®
CleanFlo™ Rotoscreen®
CleanFlo™ Shear (Internally Fed Drum Screen)
CleanFlo™ Spiral Screen
CleanWash™ Screenings Washer / Compactor
Counter Pressure Screw
Gritt Mitt™ Grit Classifiers
Linear Screen

Softening
Cation Exchange Softener
Cold Lime Softening
Warm Lime Softening

Tankage
Anchor Channel Tank
Elevated Tank
Steel Bottom at Grade
Supply and / or Field Erection

Thickeners
AltaFlo™ High Rate Thickener
Conventional Thickener
Deep Bed™ Paste Thickener
HiDensity™ Paste Thickener
HiFlo™ High Rate Thickener

WesTech
Process Equipment. Process Driven.

Tel: 801.265.1000
Fax: 801.265.1080
www.westech-inc.com

This page left intentionally blank.

2 SCOPE OF SUPPLY

This page left intentionally blank.

WESTECH AN EMPLOYEE OWNED COMPANY

SUBMITTAL

SCOPE OF SUPPLY

WesTech is pleased to submit the enclosed information describing the Shaftless Spiral Conveyor, model CVH260. The equipment will be provided complete with the following features and components:

REFERENCE ENGINEER'S SPECIFICATION

SECTION: 14555, Shaftless Screw Conveyor
ADDENDA: 1, 2, 3, 4, 5

ITEM: "B" - One (1) Shaftless Spiral Conveyor Model No. CVH260

EACH UNIT FURNISHED COMPLETE BY WESTECH WITH THE FOLLOWING COMPONENTS:

APPLICATION DATA
- Transport of screenings.

SHAFTLESS SPIRAL CONVEYOR
- Horizontal orientation.
- Angle of inclination 0°.
- Pull configuration.
- Solids handling capacity; 50 cfh
- Two (2) side wall flanged inlets.
- Three (3) vertical outlets.
- Conveyor overall trough length approximately 16'.
- Shaftless spiral screw constructed from high strength carbon steel.
- Trough construction from 0.12" thick type 304stainless steel. Except for the inlet portion, the conveyor is provided with bolted 14ga thick type 304 stainless steel cover sections.
- Trough replaceable wear liner from UHMW-PE. Liner is held in place by clips along the length of the conveyor and supplied in 4' lengths.
- Drive unit with 1.5 Hp motor suitable for 460/3/60 electrical supply. The motor will be suitable for a Class1 Division 2 Group C&D location.

DISCHARGE CHUTE (TOTAL)
- Three (3) discharge chutes constructed from type 304 stainless steel.
- Two (2) south end chutes provided with manually operated slide gates from type 304 stainless steel.

CONVEYOR SUPPORTS
- Supports to equipment beams from type 304 stainless steel are supplied to support the shaftless screw conveyor unit as required.

HARDWARE
- Assembly fasteners and anchor rods from type 316 stainless steel.

CONTROLS AND ELECTRICAL DEVICES
- One (1) NEMA 4 main control panel suitable for 480/3/60 electrical supply. Control panel shall contain the following devices for operation of the conveyor:
    1. Step down control transformer disconnect with handle.
    2. Branch circuit protection.
    3. Drive motor starter.
    4. Emergency stop pushbutton.
    5. Conveyor H-O-A switch.
    6. Power monitor for overload protection.
    7. Hour meter for motor.
    8. Control power and run indicating lights.
    9. Alarm light indicating overcurrent and starter overload.
    10. Alarm reset pushbutton.
    11. Control relays and timers for screen control logic functions.
    12. Run and alarm auxiliary contacts.

- One (1) NEMA 7 local Emergency Stop pushbutton with lockout provisions for field mounting at the unit
- Two (2) NEMA 7 local Emergency Stop pull chord.
- One (1) Zero speed switch.

SPARE PARTS
- One (1) complete set of gaskets and seals
- One (1) complete set of trough liners.

FIELD SERVICE
- Included with the CleanWash Screw Wash Press scope of supply

WARRANTY
- WesTech standard warranty, one (1) year following initial start-up, or eighteen (18) months from shipment to the purchaser, whichever occurs first.

OPTIONAL ITEMS
- None.

NOTE: ANY ITEM NOT LISTED ABOVE TO BE FURNISHED BY OTHERS:

ITEMS NOT BY WESTECH: Electrical wiring, conduit or electrical equipment, piping, valves, or fittings, shimming material, lubricating oil or grease, shop or field painting, field welding, erection, hoist or lifting apparatus, detail shop fabrication drawings, performance testing, unloading, storage, concrete work, grating, platforms, stairs, handrailing, or field service (except as specifically noted).

3 LETTER OF CLARIFICATION

This page left intentionally blank.

WESTECH AN EMPLOYEE OWNED COMPANY

SUBMITTAL

LETTER OF CLARIFICATION

The purpose of the Letter of Clarification is to state any departure WesTech will take from the given specification. Each item is a clarification of specifications which might have multiple or vague interpretations or a statement of any departure WesTech will take from the given specification. If there are any questions, please call Jeff Watry at (801) 290-6450.

- Unit anchorage designed around RedHead A7 adhesive system. Adhesive and applicator by others.

1. CVH-260 is an Octagonal Shaped trough conveyor versus the traditional "U" trough with flat cover design. Additionally 14555.2.2A states conform to CEMA 350 dimensional tolerance standards – CEMA 350 is primarily for shafted screw conveyors and CEMA 300 contains dimensional standards. 2009 version added CEMA 300-34 for shaftless spiral dimension – covers spiral only.
2. CEMA 300-009 shows minimum trough thickness from 10 ga for 24" screw diameter to 16 ga for 6 in. The material thickness of this unit is in the 12 ga realm which is the mid-range specified for the standard for 9 inch diameter conveyors..
3. Since this is a shaftless conveyor and there is no non-drive end bearing, the non-drive end plates criteria does not apply.
4. The thickness specified would be what is supplied on our 14" and larger diameter shaftless spiral conveyors. This size conveyor has an 8 mm TIVAR 1000 UHMW-PE liner.
5. According to CEMA 300-34 until screw diameter is 12" or greater, the thickeness minimum is ¾". The 20 mm supplied is greater than the ¾" minimum for this diameter conveyor.
6. The Octagonal shaped cover design has a special retainer clip the is fastened to the flange portion of the lower body half. This design facilitates inspection, maintenance and replacement of liners.
7. Drawing HW-15/17: Drawings illustrate the discharge pipe discharging at the top of the conveyor. The WesTech discharge pipe will have a flanged end to match connect to the side wall of the WesTech shaftless conveyor so that the spiral of the conveyor can "shave off" pieces of the plug as it enters the conveyor.
8. The Octagonal design serves as a saddle , provide better trough rigidity and thus saddles are not required.
9. 14555. 2.3.F.2 states "See Section 13300 for additional control requirements" The Table of Contents for the Specification indicates no pages for the "Utility Control System". We base our submittal on Section 14555 Part 2.6 Controls.

- **The enclosed WesTech's submittal drawings contain dimensions marked with <u>clouds.</u> This indicates information that needs to be confirmed or corrected by the Engineer and/or the Contractor at the time this submittal is returned.**

This page left intentionally blank.

4 COMPONENT CATALOG INFORMATION

This page left intentionally blank.

WESTECH AN EMPLOYEE OWNED COMPANY

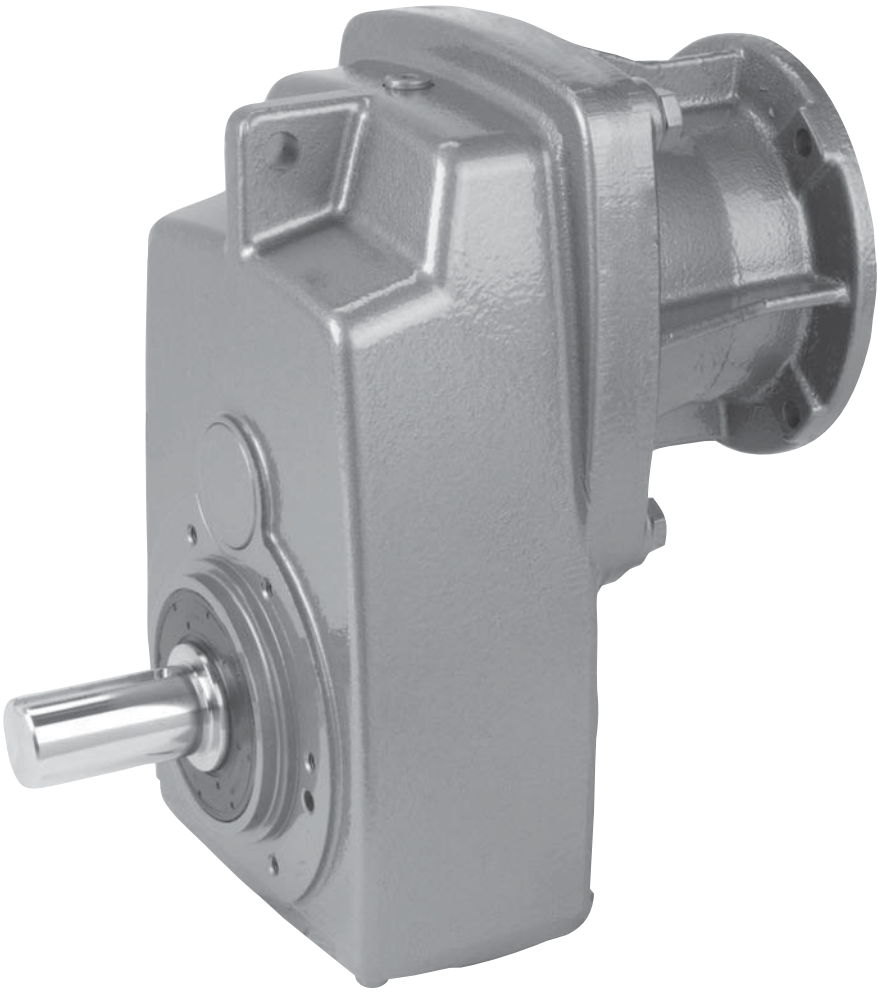
GEAR REDUCER

This page left intentionally blank.

Clincher™ Shaft Mount Reducers
Selection & Combinations

Selection

- SK 0182NB
- SK 0282NB
- SK 1382NB
- SK 1282/02
- SK 1282
- SK 2282
- SK 2382
- ~~SK 3282/02~~
- SK 3282
- ~~SK 3382~~
- SK 3282/12
- SK 4282
- SK 4382
- SK 4282/12
- SK 5282
- SK 5382
- SK 5282/12
- SK 6282
- SK 6382
- SK 6282/22
- SK 7282
- SK 7382
- SK 7382/22
- SK 7382/32
- SK 8282
- SK 8382
- SK 8382/32
- SK 8382/42
- SK 9282
- SK 9382
- SK 9382/42
- SK 9382/52
- SK 10282
- SK 10382
- SK 10382/52
- SK 11282
- SK 11382
- SK 11382/52
- SK 12382



NORD

www.nord.com

UNICASE™

odel Type	Gear Ratio i_{tot}	Output Speed n_2 1750 rpm [rpm]	Output Torque* $T_{2\,max.}$ [lb-in]	Maximum input p Solid input shafts typ Input Speed 1750 rpm [hp]	1150 rpm [hp]	875 rpm [hp]
SK 2282	4.51	388	1646	5.00	3.30	2.50
	5.72	306	1876	5.00	3.30	2.50
	6.43	272	2000	5.00	3.30	2.50
	7.48	234	2151	5.00	3.30	2.50
	8.37	209	2266	5.00	3.30	2.50
	9.03	194	2965	5.00	3.30	2.50
	10.15	172	3151	5.00	3.30	2.50
	11.81	148	3398	5.00	3.30	2.50
	13.23	132	3584	5.00	3.30	2.50
	16.53	106	4168	5.00	3.30	2.50
	18.51	95	4301	5.00	3.30	2.50
	21.90	80	4248	5.00	3.30	2.50
	23.96	73	3850	4.46	2.94	2.23
	24.97	70	4337	4.82	3.18	2.41
	26.83	65	3885	4.01	2.64	2.00
	29.65	59	4425	4.14	2.73	2.07
	31.23	56	3938	3.50	2.31	1.75
	36.54	48	4434	3.38	2.23	1.69
	37.18	47	4071	3.04	2.00	1.52
	43.71	40	4983	3.16	2.09	1.5

Selection Information

Gearbox Selection

A number of factors are considered when selecting a gear unit, including gearbox rating, service factor, speed and speed variation, horsepower, thermal capacity, ratio, physical size, ambient conditions and cost. Below are some guideline steps to help aid in the gear unit selection.

1. Determine the speed and/or gear ratio
2. Determine the required power or torque
3. Determine Service Factor
4. Select the basic gearbox type and input
5. Determine the required mounting position
6. Select options
7. Checks – overhung load, thrust load, NEMA motor weight, thermal considerations, and other application considerations

1. Speed and Gear Ratio

The first step in selecting a gear unit is determining the final output speed or speeds you need. This speed is normally described in revolutions per minute (rpm). This output speed or speeds is determined by the input speed to the gear unit divided by its gear ratio. Their relationship is described by the following formulas.

$$i\ (\text{gear ratio}) = \frac{\text{Input speed [rpm]}}{\text{Output speed [rpm]}}$$

$$\text{Output speed [rpm]} = \frac{\text{Input speed [rpm]}}{i\ (\text{gear ratio})}$$

To specify a gear unit, you can identify either gear ratio needed or the output speed (rpm) if the input speed is known.

2. Power and Torque

The second step for selecting a gear unit is the required power or torque needed to power the load. Torque in this catalog is normally expressed in pound-inches [lb-in].

$$\text{Power [hp]} = \frac{\text{Torque [lb-in]} \times \text{speed [rpm]}}{63025}$$

$$\text{Torque [lb-in]} = \frac{\text{Power [hp]} \times 63025}{\text{speed [rpm]}}$$

For a proper selection you must ensure that the motor or other prime mover can produce enough torque or power and that the gear unit has adequate torque or power capacity. You must also consider if the power or torque is specified at the input or output of the gear unit. The Helical-worm gear units have lower efficiency than in-line or bevel gear units, therefore helical-worm products efficiency may need to be considered in the selection.

To specify a gear unit you can identify either torque or power.

3. Service Factor or Service Class

In addition to power or torque, service factor must also be considered. A service factor is essentially the ratio of extra capacity in a gear unit compared to the power or torque that is needed to run that application. The goal of selecting a gear unit with extra capacity (service factor) is to provide adequate service life in operation.

One reason to apply a larger service factor is if a unit operates more hours per day. If a unit runs 24 hours per day it should normally have a higher service factor than a unit that runs 8 hours per day if you expect the same calendar life.

A second reason for applying a larger service factor is to cope with a more difficult application. Even if it takes the same power and speed to operate a rock crusher as a fan, the rock crusher needs a stronger gearbox (higher service factor) to give the same calendar operating life as the gear unit powering the fan.

The real question is how to determine the proper service factor for a gear unit in an application. Following are four possible methods.

Customer or User Specification

Many customers will have their own service factor guidelines or specifications.

AGMA Service Factoring

American Gear Manufacturers Association (AGMA) publishes lists of recommended service factors for different applications. These service factor recommendations have been determined form the experience of many gear manufactures and are in AGMA standard 6010. See page 68 for additional detail.

AGMA Service Classes

American Gear Manufactures Association (AGMA) has another method for selecting gear units service factors. AGMA standard 6009 lists many applications by a service class (I, II, III) with class I being the simplest applications and class III being the hardest. These application service classes are associated with a range of service factors by the following table.

AGMA Service Class	Service Factor
I	1.00 to 1.39
II	1.40 to 1.99
III	2.00 and above

In the gearmotors selection table each unit is also classified by an AGMA service class. See page 64 for additional detail.

Selection Information

NORD Mass Acceleration Service Factoring

NORD often uses a calculation based system to properly assign a service factor. This system considers hours of operation per day, the severity of the application and the number of times the equipment is cycled. See page 62 for additional detail.

4. Gearbox Type & Input

NORD gear drives are available in a number of mechanical configurations including:

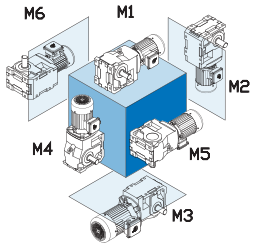
- Helical in-line
- Clincher™ shaft mount
- Right-angle helical-bevel
- Right-angle helical-worm

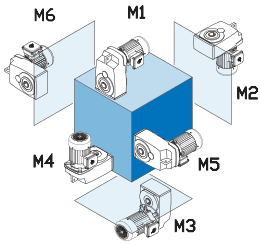
NORD's modular design allows for a number of different inputs to be added to NORD reducers including:

- Integral motor
- NEMA-C and IEC motor adapter
- Solid input shaft
- Servo motor adapter
- Sugar scoop mount
- Top motor mount platform
- NORDISC™ variable speed friction drives
- Titan™ variable speed belt boxes

5. Mounting Position

The gearbox mounting position is an important and often overlooked specification. The mounting position determines how much oil the gear reducer requires, in addition to determining the position of the oil drain, oil fill and vent on the gear drive. NORD offers six basic mounting positions. If your application requires a variation from the six basic mounting positions, please contact NORD.



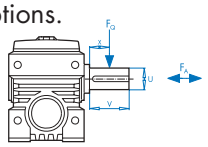


Many gearbox and motor options require a location designation. For example a right-angle helical-bevel unit with a single solid shaft extension requires a shaft extension side location. Please see page 18 for additional options that require location designation.

6. Options

NORD offers a number of mechanical, protective, paint and lubrication options for gear reducers and motors. Please see pages 19 for gear unit options and refer to the motor section (Section G) for motor options.

7. Checks



Overhung Load

An overhung or radial load exists when a force is applied at right-angles to a shaft beyond the shaft's outermost bearing. Pulleys, sheaves and sprockets will cause an overhung load when used as a power take-off. The amount of overhung load will vary, depending on the type of power take-off used and where it is located on the shaft.

Overhung load [FQ] can be found in the gearmotor rating tables and input shaft overhung load ratings [FQ1] can be found on pages 52 - 59. Overhung load capacities should not exceed the values in the table to ensure long bearing life. Overhung load capacities are to be applied at the midpoint of the shaft extension and without thrust loads.

To calculate overhung load see page 52.

Thrust Loads (Axial)

Loads that are directed towards or away from the gearbox along the axis of the shaft are called thrust or axial loads. Output shaft thrust capacity [FA] can be found in the gearmotor rating tables. Input shaft capacity [FA1] can be found on pages 52. Thrust load capacities should not exceed the values listed in the tables to ensure long bearing life. Thrust load capacities are listed for pure axial loads with no overhung load. Contact NORD for combination loads or a more exact examination of the application.

NEMA C-face Motor Weight Limits

When mounting a motor to a NORD NEMA C-face motor adapter it is important to consider the motor's weight. Following is a table that includes the maximum motor weight the NEMA adapter can support. If the motor exceeds the listed weight is must be externally supported. When a C-face mounted motor is externally supported care must be taken to ensure that the support system does not impose additional pre-loads on the NEMA motor adapter.

NEMA Weights

Motor FRAME	**56C**	**143TC**	**145TC**	**182TC**	**184TC**
Max Weight [lb]	66	88	110	130	175
Motor FRAME	**210TC**	**250TC**	**280TC**	**324TC**	**326TC**
Max Weight [lb]	220	450	550	770	1100
Motor FRAME	**365TC**				
Max Weight [lb]	1550				

Selection Information

General Warnings & Cautions

Applications with risk of personal injury should be reviewed together with NORD. Examples of these are hoist, lifts or other applications where people may be at risk.

Helical-worm

Efficiency

NORD worm gear units can reach efficiencies up to 92%.

Worm gears require a run-in period to reach their peak efficiency. Due to this the unit efficiency will be lower when the gear unit is new. The effect is greater at lower worm incline angles meaning with worms that have a low number of worm starts (or leads). Based on experience the following reduction in efficiency should be considered before the run-in is completed

Worm Starts (leads)	Reduction in efficiency
1	12%
2	6%
3	3%
6	2%

The number of worm starts is listed in the gear ratio tables in the helical-worm reducer ratings tables.

The run-in period is approximately 25 hours operating time at maximum load.

Following conditions must be met in order to reach the catalog efficiency values.

- Gear unit is fully run-in
- Gear unit has reached a constant temperature
- The required type of lubricant is used
- The required lubrication quantity is used
- The unit is operating at full rated torque

Vertical Mounting Position for Gear Units & Gear Motors

Observe thermal limit rating – see page 14. For motors which are mounted vertically upwards (Mounting position M4) and ratios < 24, we highly recommend oil expansion chambers in order to avoid leakage through the vent plug.

NEMA and IEC adapters use in hoist, lifts and other applications with danger of personal injury should be reviewed together with NORD.

NEMA/IEC adapter have additional shaft coupling and additional bearing seats compared to integral motors so there are higher no-load losses with NEMA or IEC adapters. We recommend mounting the motor directly, since it offers both technical and cost advantages.

External Installation, Tropical Use

Gearboxes installed outside, in damp rooms, or used in the tropics may require special seals and anti-corrosion options. Please contact NORD for application assistance.

Special conditions

If special environmental or other conditions exist in transit, storage or operation these need to be considered in the unit selection. Special conditions may include (but are not limited to) the following:

- Exposure to aggressive corrosive materials (contaminated air, gasses, acids, bases, salts, etc.)
- Very high relative humidity
- Direct contact between t he motor and liquid
- Material build- up on the gear unit or motor (dirt, dust, sand, etc.)
- High atmospheric pressure
- Radiation
- Extreme temperatures, high, low or large temp. changes
- High vibration, accelerations, shock or impacts
- Other abnormal conditions

Storage Before Installation

The gear units and motors should be stored in a dry area before they are to be installed. Special measures are required for longer storage. Please request long term storage instructions from NORD Gear or from the NORD web site.

Multi-stage Gear Units

With 4-, 5-, 6-stage multi-stage gear units, there are additional no-load loss due to the added rotating parts and the relatively small drive input power. Thus, a no-load loss of approximately 40 watts for 4-pole motors up to 1 HP (0.75 kW) is accounted for in the performance tables.

NEMA C-Face Adapter Capacity

The NEMA adapters are designed to handle the torques produced by the standard NEMA power assignment at 4 pole (1800 rpm) motor speeds. If a larger motor power is used than the power below NORD should be consulted. Also if a NEMA adapter is being used for other than an AC induction motor NORD should be consulted.

Adapter	Max Power [hp]	Adapter	Max Power [hp]
56C	1	250TC	20
140TC	2	280TC	30
180TC	5	320TC	50
210TC	10	360TC	75

Selection Information

Gear Reducer Ratings

The permissible continuous power limit of gear reducers is limited by both the mechanical rating and the thermal rating. The mechanical rating depends upon the material strength of the gear reducer's gears, bearings, housing, shafts, etc. The mechanical input power limit to the reducer is also a function of the mechanical power rating divided by the relevant reducer service factor.

The thermal rating or thermal limit depends upon the amount heat generated within the reducer and is influenced by a variety of factors including:

- Churning or splashing losses in the lubricant which depend upon reducer type, ratio, input style, mounting position or oil fill-level, and the circumferential travel velocities of the gear wheels.
- The actual speed and load conditions. These factors determine load-dependent losses in the gears and frictional losses in the gears, bearings and seal areas.
- Ambient Conditions:
  - Ambient Temperature.
  - Amount of free air circulation around the drive.
  - Possible near-by heat sources.
  - Heat dissipation or the ability of the reducer to transfer heat through the housing, shafts, and the mating substructure or mounting surface.

Observing the Reducer's Thermal Limit

When to Contact NORD

Through computer program analysis NORD can evaluate application conditions and the impact they have on a reducer's thermal capacity.

When applying helical in-line, Clincher™ shaft mount, and helical-bevel gear units of case sizes 6 and larger (SK62, SK6282 and SK9072.1 and larger), consult NORD if any two or more of the following conditions apply:

- Gear ratio, $i_{total} \leq 24{:}1$ or $\leq 48{:}1$ for helical-bevel units
- Input power, $P_1 \geq 60$ hp (45 kw)
- Input speed, $n_1 > 1800$
- Vertical positioning (mounting position M2 or M4)
- Input configuration: NEMA C-face, IEC, servo adapter or solid-shaft input (Type-W)
- Elevated ambient temperature ≥ 86° F (30 °C)

When applying helical-worm or worm gear units, please consult NORD if any one of the following conditions applies:

- Input speed, $n_1 > 1800$
- Vertical positioning (mounting position M2 or M4)
- Input configuration: NEMA C-face, IEC, servo adapter or solid-shaft input (Type-W)
- Elevated ambient temperature ≥ 86° F (30 °C)

Advise NORD of any special application considerations:

- Confined space or limited air circulation
- Exposure to other near-by radiant heat sources
- Dirty or dusty environments
- High altitude operation > 3,280 ft (1000 m) a.s.l.

Dangers of Reducer Overheating

The following problems may result when the reducer's thermal capacity or maximum oil sump temperatures are exceeded:

- Lubrication oxidation, breakdown and deterioration.
- A decrease in lubrication viscosity and film thickness.
- Loss of critical bearing and gear clearances required for proper lubrication.
- Increased contact pressures and increased operating temperatures in the critical load zones of the gearing and bearings.
- An increased possibility for metal-to-metal contact and premature component wear.
- A significant reduction in the lubricant's ability to prevent scuffing, pitting, and in extreme cases galling or welding.

Maximum Oil Sump Temperature Limit

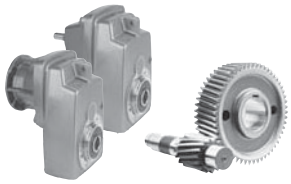
To prevent reducer overheating, the reducer's maximum oil sump temperature limit must not be exceeded for prolonged periods of operation (up to 3 hours continuous operation, depending upon reducer size).

Oil Type	Maximum Oil Temperature Limit	
	NORD	AGMA 9005-D94
Mineral	80-85 °C (176-185 °F)	95 °C (203 °F)
Synthetic	105 °C (220 ° F)	107 ° C (225 ° F)

Measures to Expand the Application Range

There are a variety of measures that may be taken in order to protect against thermal overload and expand the application range of the gear reducer. Common examples include the following:

- Recommending a change in lubrication viscosity and/or a specific synthetic lubricant type.
- Applying high-temperature seals.
- Increasing air flow around the gear unit.
- Shielding or protecting the reducer from high heat sources.
- Considering an integral motor instead of the bolt-on input assembly covers. In many cases the motor fan will substantially increase air-flow around the gear unit.
- Add an Oil Expansion/Overflow Chamber (Option "OA") or an Oil Reservoir (Option "OT").
- Oil Cooler (Option "OC").
- Water Cooling Cover (Option "WC")



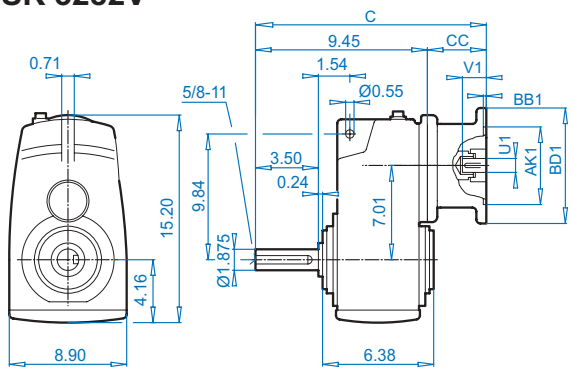
SK 3282
NEMA-C + W
Ratings & Combinations

Model Type	Gear Ratio	Output Speed	Output Torque*	Maximum input power◈ Solid input shafts type "W"				NEMA C-Face* Available Combinations							
				Input Speed											
	i_{tot}	n_2 1750 rpm	$T_{2\ max}$	1750 rpm	1150 rpm	875 rpm	580 rpm								
		[rpm]	[lb-in]	[hp]	[hp]	[hp]	[hp]	56C	140TC	180TC	210TC	250TC	280TC	320TC	360TC
SK 3282	4.48	391	4080	10.00	6.60	5.00	3.30	X	X	X	X				
	5.74	305	4964	10.00	6.60	5.00	3.30	X	X	X	X				
	6.70	261	5372	10.00	6.60	5.00	3.30	X	X	X	X				
	8.31	211	5983	10.00	6.60	5.00	3.30	X	X	X	X				
	9.80	179	7425	10.00	6.60	5.00	3.30	X	X	X	X				
	11.38	154	7266	10.00	6.60	5.00	3.30	X	X	X	X				
	14.11	124	7584	10.00	6.60	5.00	3.30	X	X	X	X				
	16.67	105	7443	10.00	6.60	5.00	3.30	X	X	X	X				
	20.18	87	7275	10.00	6.60	5.00	3.30	X	X	X	X				
	21.38	82	6390	8.31	5.49	4.16	2.74	X	X	X	X*				
	22.45	78	7080	8.76	5.78	4.38	2.89	X	X	X	X*				
	23.71	74	7124	8.36	5.52	4.18	2.76	X	X	X	X*				
	25.88	68	7487	8.08	5.33	4.04	2.67	X	X	X	X*				
	28.70	61	7700	7.45	4.92	3.73	2.46	X	X	X	X*				
	31.93	55	7761	6.77	4.47	3.39	2.24	X	X	X	X*				
	37.77	46	7390	5.39	3.56	2.70	1.78	X	X	X					
	38.62	45	5611	4.01	2.64	2.00	1.32	X	X	X*					
	42.02	42	8222	5.48	3.62	2.74	1.81	X	X	X*					
	44.85	39	6522	4.04	2.66	2.02	1.33	X	X	X*					
	48.04	36	4885	2.79	1.84	1.40	0.92	X	X						
	52.97	33	7478	3.92	2.58	1.96	1.29	X	X	X*					
	55.79	31	5682	2.79	1.84	1.40	0.92	X	X						
	64.12	27	8983	3.85	2.54	1.92	1.27	X	X	X*					
	65.89	27	6708	2.87	1.90	1.44	0.95	X	X						
	70.56	25	4991	1.98	1.31	0.99	0.65	X	X*						
	79.76	22	7523	2.63	1.73	1.31	0.87	X	X						
	88.74	20	8363	2.65	1.75	1.33	0.88	X	X						
	100.88	17	7142	1.93	1.27	0.96	0.64	X	X*						
	112.23	16	6815	1.73	1.14	0.86	0.57	X	X*						

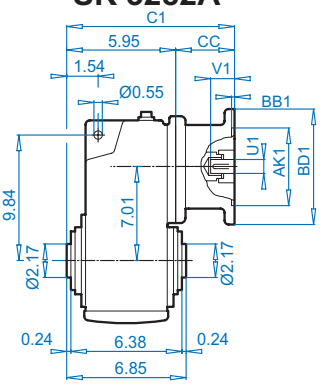
* Caution - The motor power may exceed the gear unit's mechanical torque capacity
◈ The mechanical power limit of the solid input shaft type "W" may limit the reducer rating.
All ratings are mechanical. See page 14 for thermal considerations.

lb	W	56C	140TC	180TC	210TC
SK 3282	110	106	115	123	143

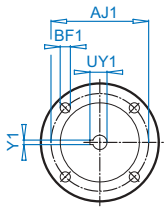
SK 3282V



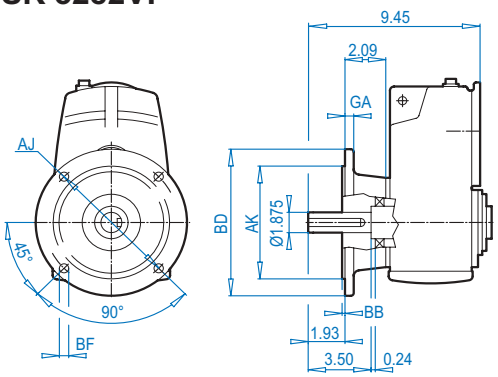
SK 3282A



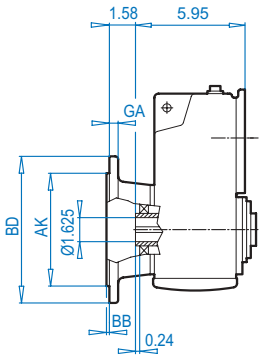
NEMA Input



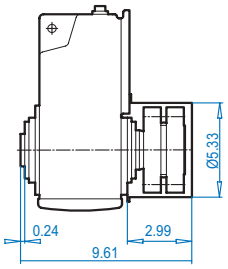
SK 3282VF



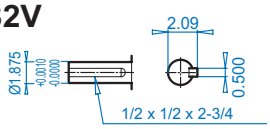
SK 3282AF



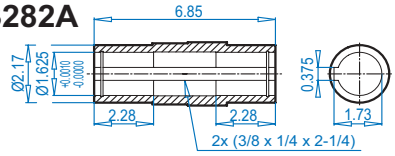
SK 3282ASH



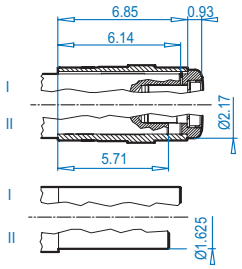
SK 3282V



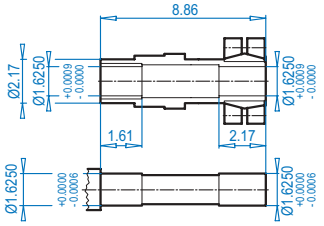
SK 3282A



SK 3282AB ⇨📖 394



SK 3282AS ⇨📖 72



ALTERNATE SHAFTS SEE PAGES 388 - 393

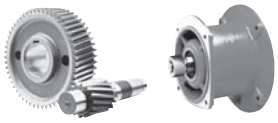
Mounting Flange

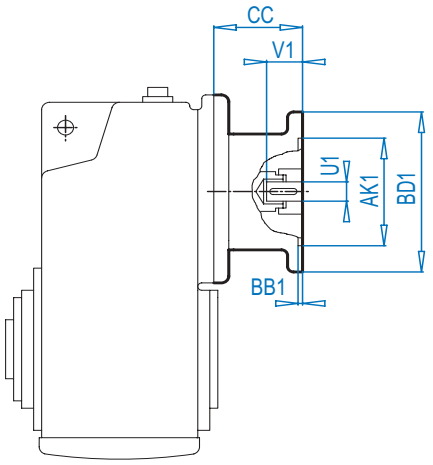
BD (mm)	AJ	AK	BB	BF	GA
9.84 (250)	8.46	7.09 +0.0006 -0.0005	0.16	0.55	0.63
11.81 (300)	10.43	9.06 +0.0000 -0.0013	0.16	0.55	0.79

NEMA Dimensions

Type	AJ1	AK1	BB1	BD1	BF1	U1	V1	UY1	Y1	C	C1	CC
56C	5.88	4.500	0.18	6.54	0.43	0.625	2.06	0.71	0.188	14.04	10.54	4.60
140TC	5.88	4.500	0.18	6.54	0.43	0.875	2.12	0.96	0.188	14.04	10.54	4.60
180TC	7.25	8.500	0.23	9.17	0.59	1.125	2.62	1.24	0.250	16.04	12.54	6.60
210TC	7.25	8.500	0.39	9.17	0.59	1.375	3.12	1.52	0.312	16.04	12.54	6.60

IEC Inputs





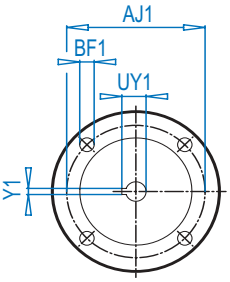


Figure 1
4 Bolt Flange

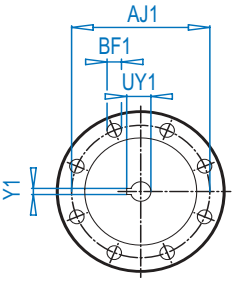


Figure 2
8 Bolt Flange
(For IEC 225-315)

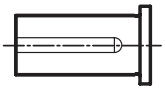
IEC Dimensions (mm)

Input	AJ1	AK1	BB1	BD1	BF1	U1	V1	UY1	Y1	Flange
IEC 63	115	95	3.5	140	M8	11	23	12.8	4	Fig. 1
IEC 71	130	110	4.0	160	M8	14	30	16.3	5	Fig. 1
IEC 80	165	130	4.0	200	M10	19	40	21.8	6	Fig. 1
IEC 90	165	130	4.0	200	M10	24	50	27.3	8	Fig. 1
IEC 100	215	180	5.0	250	M12	28	60	31.3	8	Fig. 1
IEC 112	215	180	5.0	250	M12	28	60	31.3	8	Fig. 1
IEC 132	265	230	5.0	300	M12	38	80	41.3	10	Fig. 1
IEC 160	300	250	6.0	350	M16	42	110	45.3	12	Fig. 1
IEC 180	300	250	6.0	350	M16	48	110	51.8	14	Fig. 1
IEC 200	350	300	6.0	400	M16	55	110	59.3	16	Fig. 1
IEC 225	400	350	6.0	450	M16	60	140	64.4	18	Fig. 2
IEC 250	500	450	6.0	550	M16	65	140	69.4	18	Fig. 2
IEC 280	500	450	6.0	550	M16	75	140	79.9	20	Fig. 2
IEC 315	600	550	7.0	660	M20	80	170	85.4	22	Fig. 2

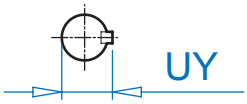
CC Dimensions

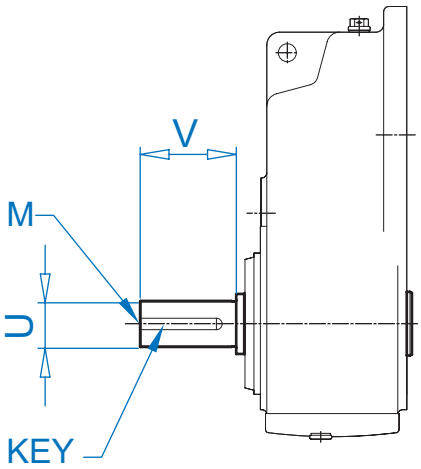
Unit	IEC63	IEC 71	IEC 80	IEC 90	IEC 100	IEC 112	IEC 132	IEC 160	IEC 180	IEC 200	IEC 225	IEC 250	IEC 280	IEC 315
SK 0182NB	3.35	3.35	4.06	4.06	4.96	4.96	–	–	–	–	–	–	–	–
SK 0282NB	3.35	3.35	4.06	4.06	4.96	4.96	–	–	–	–	–	–	–	–
SK 1382NB	3.35	3.35	4.06	4.06	4.96	4.96	–	–	–	–	–	–	–	–
SK 1282	3.35	3.50	4.13	4.13	5.12	5.12	–	–	–	–	–	–	–	–
SK 1282/02	3.35	3.50	4.13	4.13	5.12	5.12	–	–	–	–	–	–	–	–
SK 2282	–	3.46	4.25	4.25	4.92	4.92	6.14	–	–	–	–	–	–	–
SK 2282/02	3.35	3.50	4.13	4.13	5.12	5.12	–	–	–	–	–	–	–	–
SK 2382	3.35	3.50	4.13	4.13	5.12	5.12	–	–	–	–	–	–	–	–
SK 3282	–	3.46	4.25	4.25	4.92	4.92	6.14	–	–	–	–	–	–	–
SK 3282/12	3.35	3.50	4.13	4.13	5.12	5.12	–	–	–	–	–	–	–	–
SK 3382	3.35	3.50	4.13	4.13	5.12	5.12	–	–	–	–	–	–	–	–
SK 4282	–	–	–	4.29	5.24	5.24	7.48	7.64	7.64	–	–	–	–	–
SK 4282/12	3.35	3.50	4.13	4.13	5.12	5.12	–	–	–	–	–	–	–	–
SK 4382	–	3.46	4.25	4.25	4.92	4.92	6.14	–	–	–	–	–	–	–
SK 5282	–	–	–	4.29	5.24	5.24	7.48	7.64	7.64	–	–	–	–	–
SK 5282/12	3.35	3.50	4.13	4.13	5.12	5.12	–	–	–	–	–	–	–	–
SK 5382	–	3.46	4.25	4.25	4.92	4.92	6.14	–	–	–	–	–	–	–
SK 6282	–	–	–	–	5.00	5.00	6.97	10.47	10.47	9.02	11.93	11.93	11.93	–
SK 6382	–	–	–	4.29	5.24	5.24	7.48	7.64	7.64	–	–	–	–	–
SK 6382/22	–	3.46	4.25	4.25	4.92	4.92	6.14	–	–	–	–	–	–	–
SK 6382/32	–	3.46	4.25	4.25	4.92	4.92	6.14	–	–	–	–	–	–	–

Solid Shaft Dimensions

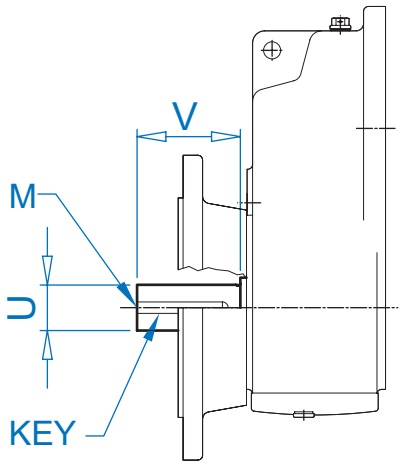


Solid Shaft Dimensions (VZ/VF)





VZ

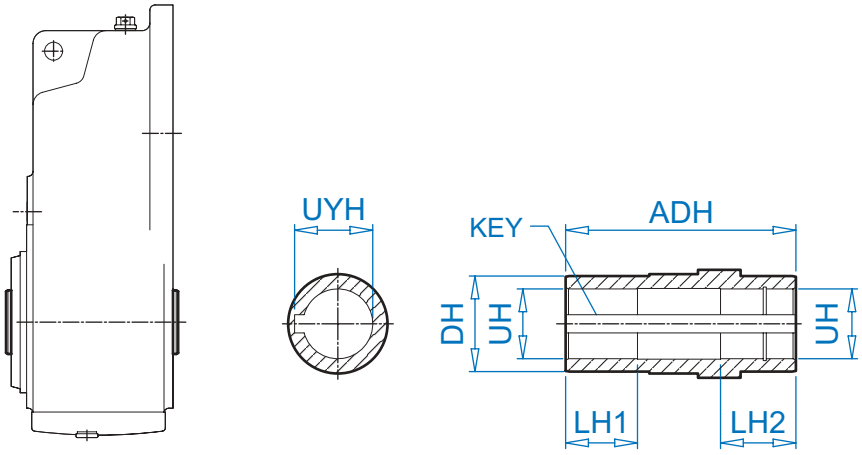


VF

UNIT	U	DIAMETER TOLERANCE	V	UY	KEY SIZE w x h x l	KEY QTY	DRILL & TAP M
SK 0182NB VZ/VF	0.750	+0.0000 / -0.0005	1.50	0.83	3/16 x 3/16 x 1-1/4	1	1/4-20
	25mm	+0.015 / +0.002mm	50mm	28.0mm	8 x 7 x 40mm	1	M10
SK 0282NB VZ/VF	1.000	+0.0000 / -0.0005	2.13	1.11	1/4 x 1/4 x 1-5/8	1	3/8-16
	25mm	+0.015 / +0.002mm	50mm	28.0mm	8 x 7 x 40mm	1	M10
SK 1382NB VZ/VF	1.250	+0.0000 / -0.0005	2.75	1.36	1/4 x 1/4 x 2-1/4	1	1/2-13
	30mm	+0.015 / +0.002mm	60mm	33.0mm	8 x 7 x 50mm	1	M10
SK 1282 VZ/VF	1.250	+0.0000 / -0.0005	2.75	1.36	1/4 x 1/4 x 2-1/4	1	1/2-13
SK 1382 VZ/VF	30mm	+0.015 / +0.002mm	60mm	33.0mm	8 x 7 x 50mm	1	M10
SK 2282 VZ/VF	1.375	+0.0000 / -0.0005	2.75	1.51	5/16 x 5/16 x 2-1/8	1	5/8-11
SK 2382 VZ/VF	35mm	+0.018 / +0.002mm	70mm	38.0mm	10 x 8 x 60mm	1	M12
SK 3282 VZ/VF	1.875	+0.0000 / -0.0010	3.50	2.09	1/2 x 1/2 x 2-3/4	1	5/8-11
SK 3382 VZ/VF	45mm	+0.018 / +0.002mm	90mm	48.5mm	14 x 9 x 80mm	1	M16
SK 4282 VZ/VF	2.250	+0.0000 / -0.0010	4.00	2.47	1/2 x 1/2 x 3-1/4	1	3/4-10
SK 4382 VZ/VF	55mm	+0.030 / +0.011mm	110mm	59.0mm	16 x 10 x 90mm	1	M20
SK 5282 VZ/VF	2.500	+0.0000 / -0.0010	5.00	2.77	5/8 x 5/8 x 4	1	3/4-10
SK 5382 VZ/VF	65mm	+0.030 / +0.011mm	130mm	69.0mm	18 x 11 x 100mm	1	M20
SK 6282 VZ/VF	3.000	+0.0000 / -0.0010	5.50	3.33	3/4 x 3/4 x 4-1/2	1	3/4-10
SK 6382 VZ/VF	75mm	+0.030 / +0.011mm	140mm	79.5mm	20 x 12 x 125mm	1	M20
SK 7282 VZ/VF	3.500	+0.0000 / -0.0010	6.75	3.88	7/8 x 7/8 x 5-1/2	1	3/4-10
SK 7382 VZ/VF	90mm	+0.035 / +0.013mm	170mm	95.0mm	25 x 14 x 140mm	1	M24
SK 8282 VZ/VF	4.250	+0.0000 / -0.0010	8.50	4.69	1 x 1 x 7-1/4	1	1-8
SK 8382 VZ/VF	110mm	+0.035 / +0.013mm	210mm	116mm	28 x 16 x 180mm	1	M24
SK 9282 VZ/VF	5.250	+0.0000 / -0.0010	9.84	5.80	1-1/4 x 1-1/4 x 8-3/8	1	1-8
SK 9382 VZ/VF	140mm	+0.040 / +0.015mm	250mm	148mm	36 x 20 x 200mm	1	M24
SK 10282 VZ/VF	6.250	+0.0000 / -0.0010	11.81	6.91	1-1/2 x 1-1/2 x 10	1	1-8
SK 10382 VZ/VF	160mm	+0.040 / +0.015mm	300mm	169mm	40 x 22 x 250mm	1	M24
SK 11282 VZ/VF	7.000	+0.0000 / -0.0010	11.81	7.77	1-3/4 x 1-3/4 x 10	1	1-8
SK 11382 VZ/VF	180mm	+0.040 / +0.015mm	300mm	190mm	45 x 25 x 250mm	1	M24
SK 12382 VZ/VF	7.000	+0.0000 / -0.0010	11.81	7.77	1-3/4 x 1-3/4 x 10	1	1-8
	180mm	+0.040 / +0.015mm	300mm	190mm	45 x 25 x 250mm	1	M24

- Dimensions are in inches unless otherwise noted.
- Metric Keys are captured in keyways.
- For shaft sizes not shown, consult NORD.

Hollow Shaft Dimensions (AZ-AF-AX)



Type	UH	DIAMETER TOLERANCE	ADH	LH1	LH2	DH	UYH	KEY SIZE w x h x l	KEY QTY
SK 0182 NB AZ/AF/AX	0.750*	+0.0010 / -0.0000	3.94	1.18	1.18	1.38	0.84	3/16 x 3/16 x 1-1/2	2
	0.500	+0.0010 / -0.0000	3.94	1.18	1.18	1.38	0.56	1/8 x 1/8 x 1-1/2	2
	25mm	+0.021 / -0.000 mm	100mm	30mm	30mm	35mm	28.3 mm	8 x7 x 40mm	2
SK 0282NB AZ/AF/AX	1.000*	+0.0010 / -0.0000	4.80	1.57	1.57	1.57	1.11	1/4 x 1/4 x 2-1/8	2
	1.1875	+0.0010 / -0.0000	4.80	1.57	1.57	1.57	1.30	1/4 x 1/4 x 2	2
	0.750	+0.0010 / -0.0000	4.80	1.57	1.57	1.57	0.84	3/16 x 3/16 x 1-1/2	2
	25mm	+0.021 / -0.000 mm	122mm	40mm	40mm	40mm	28.3 mm	8 x 7 x 40mm	2
	30mm	+0.021 / -0.000 mm	122mm	40mm	40mm	40mm	33.3 mm	8 x 7 x 40mm	2
SK 1382NB AZ/AF/AX	1.375*	+0.0010 / -0.0000	6.93	1.69	3.15	1.97	1.52	5/16 x 5/16 x 2-1/2	2
	1.4375	+0.0010 / -0.0000	6.93	2.36	2.36	1.97	1.61	3/8 x 3/8 x 2-1/2	2
	1.250	+0.0010 / -0.0000	6.93	2.36	3.15	1.97	1.37	1/4 x 1/4 x 2-1/4	2
	35mm	+0.025 / -0.000 mm	176mm	60mm	80mm	50mm	38.3 mm	10 x 8 x 60mm	2
SK 1282 AZ/AF/AX	1.1875*	+0.0010 / -0.0000	4.80	1.57	1.57	1.77	1.31	1/4 x 1/4 x 1-5/8	2
	1.250	+0.0010 / -0.0000	4.80	1.57	1.57	1.77	1.37	1/4 x 1/4 x 1-5/8	2
	1.000	+0.0010 / -0.0000	4.80	1.57	1.57	1.77	1.11	1/4 x 1/4 x 1-5/8	2
	0.750	+0.0010 / -0.0000	4.80	1.57	1.57	1.77	0.84	3/16 x 3/16 x 1-1/2	2
	30mm	+0.021 / -0.000 mm	122mm	40mm	40mm	45mm	33.3 mm	8 x 7 x 40mm	2
SK 2282 AZ/AF/AX	1.4375*	+0.0010 / -0.0000	5.47	1.97	1.97	1.97	1.61	3/8 x 3/8 x 2	2
SK 2382 AZ/AF/AX	1.500	+0.0010 / -0.0000	5.47	1.97	1.97	1.97	1.61	3/8 x 1/4 x 2	2
	1.375	+0.0010 / -0.0000	5.47	1.97	1.97	1.97	1.52	5/16 x 5/16 x 2	2
	1.250	+0.0010 / -0.0000	5.47	1.97	1.97	1.97	1.37	1/4 x 1/4 x 2-1/8	2
	35mm	+0.025 / -0.000 mm	139mm	50mm	50mm	50mm	38.3 mm	10 x 8 x 42mm	2
SK 3282 AZ/AF/AX	1.625*	+0.0010 / -0.0000	6.85	2.28	2.28	2.17	1.73	3/8 x 1/4 x 2-1/4	2
SK 3382 AZ/AF/AX	1.500	+0.0010 / -0.0000	6.85	2.28	2.28	2.17	1.61	3/8 x 1/4 x 2-1/4	2
	1.4375	+0.0010 / -0.0000	6.85	2.28	2.28	2.17	1.61	3/8 x 3/8 x 2-1/2	2
	40mm	+0.025 / -0.000 mm	174mm	58mm	58mm	55mm	43.3 mm	12 x 8 x 50mm	2
SK 4282 AZ/AF/AX	2.0625*	+0.0012 / -0.0000	7.68	2.56	2.56	2.76	2.22	1/2 x 3/8 x 2-5/8	2
SK 4382 AZ/AF/AX	1.9375	+0.0012 / -0.0000	7.68	2.56	2.56	2.76	2.16	1/2 x 1/2 x 2-3/4	2
	2.000	+0.0012 / -0.0000	7.68	2.56	2.56	2.76	2.22	1/2 x 1/2 x 2-3/4	2
	1.6875	+0.0012 / -0.0000	7.68	2.56	2.56	2.76	1.86	3/8 x 3/8 x 2-1/2	2
	50mm	+0.025 / -0.000 mm	195mm	65mm	65mm	70mm	53.8 mm	14 x 9 x 63mm	2

* standard size

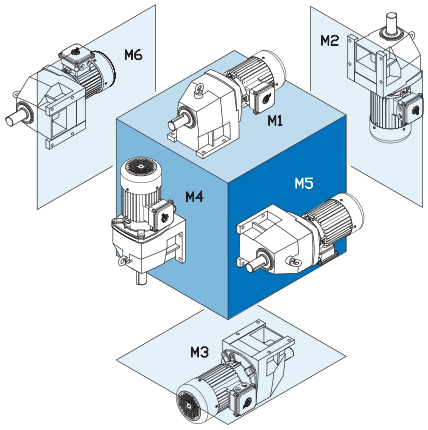
- Dimensions are in inches unless otherwise noted.
- For shaft sizes not shown, consult NORD.

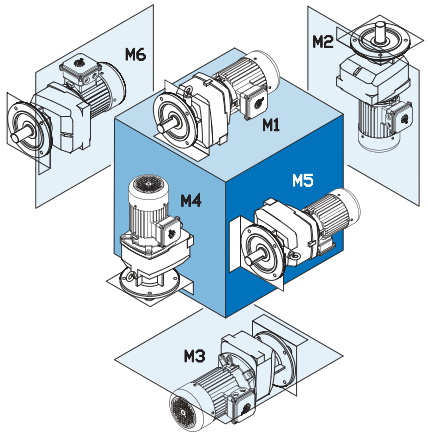
Mounting Positions

Mounting Positions

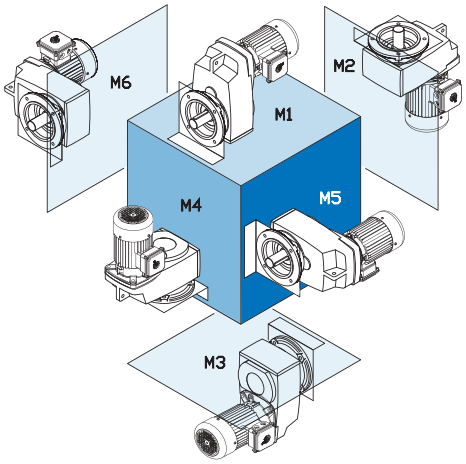
The reducer mounting position determines the approximate oil fill level and the appropriate vent location. In some cases mounting position may dictate possible variation in final reducer assembly. If considering any mounting positions that are not shown as catalog-standard options, it is critical that the customer consult with NORD prior to ordering.

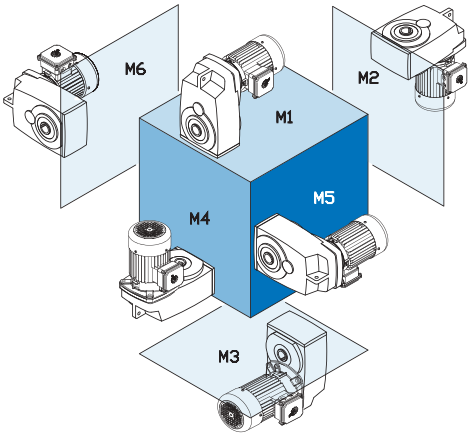
In-line



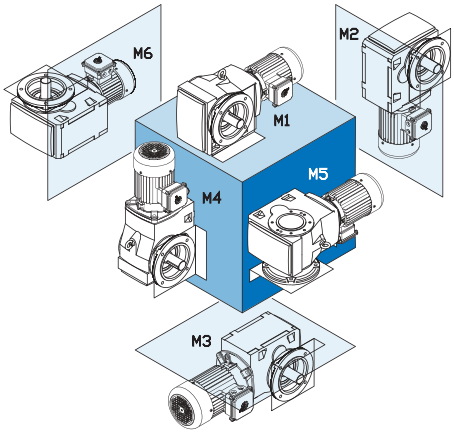


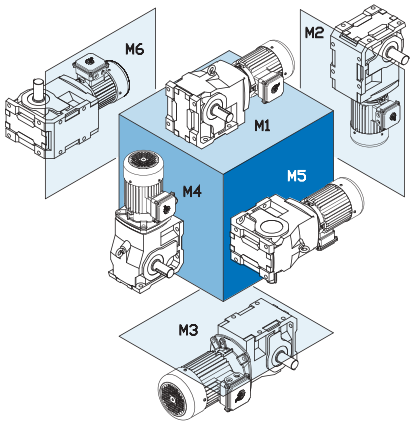
Clincher™





Right-Angle





Lubrication

Lubrication Types

Proper gearbox lubrication is essential in order to reduce friction, heat, and component wear. Lubricants reduce heat and wear by inserting a protective "fluid boundary" between mating parts and preventing direct metal to metal contact. Lubricants also help prevent corrosion and oxidation, minimize foam, improve heat transfer, optimize reducer efficiency, absorb shock loads and reduce noise.

Mounting position not only determines the proper fill-level but may also have some effect on final reducer assembly. If considering any mounting positions that are not shown as catalog-standard options, it is critical that the customer consult with NORD prior to ordering. Unless otherwise specified, NORD supplies most all gear units (*) factory-filled with the standard lubrication type and the appropriate amount of lubricating oil.

* Gear units SK10282, SK10382, SK11282, SK11382, SK12382, and SK9096.1 are supplied without oil.

Standard Oil Lubricants

Gear Unit Type	Ambient Temperature	Oil Type	ISO Viscosity	Manufacturer Brand / Type
Helical-Inline, Parallel-Shaft, & Helical-Bevel	-4 to 104 °F (-20 to 40 °C)	MIN-EP	VG 220	Shell / Omala 220 ♦
	-40 to 140 °F (-40 to 60 °C)	PAO	VG 220	Mobil SHC 630 ♦
	23 to 104 °F (-5 to 40 °C)	FG	VG 220	Shell / FM 220 ♦
Helical-Worm	-22 to 122 °F (-30 to 50 °C)	PAO	VG 680	Mobil SHC 636 ♦

Optional Oil Lubricants

Gear Unit Type	Ambient Temperature	Oil Type	ISO Viscosity	Manufacturer Brand / Type
Helical-Inline, Parallel-Shaft, & Helical-Bevel	-31 to 176 °F (-35 to 80 °C)	PAO	VG 460	Mobil SHC 634
	-40 to 77 °F (-40 to 25 °C)	PAO	VG 150	Mobil SHC 629
	-40 to 140 °F (-40 to 60 °C)	FG-PAO	VG 220	Shell / Cassida GL 220
Helical-Worm	-40 to 122 °F (-40 to 50 °C)	FG-PAO	VG 460	Shell / Cassida GL 460

Standard Bearing Grease Lubricants

Grease Type / Thickener	Ambient Temperature	NLGI Grade	Manufacturer Brand / Type
Standard (Li-Complex)	-22 to 140 °F (-30 to 60 °C)	NLGI 2	Shell Albida EP LC2 ♦
High Temp (Polyurea)	-13 to 176 °F (-25 to 80 °C)	NLGI 2	Mobil Polyrex EP 2 ♦
Food-Grade (Al-Complex)	-13 to 104 °F (-25 to 40 °C)	NLGI 2	Mobil Grease FM 222 ♦

♦ Stocked Lubricant

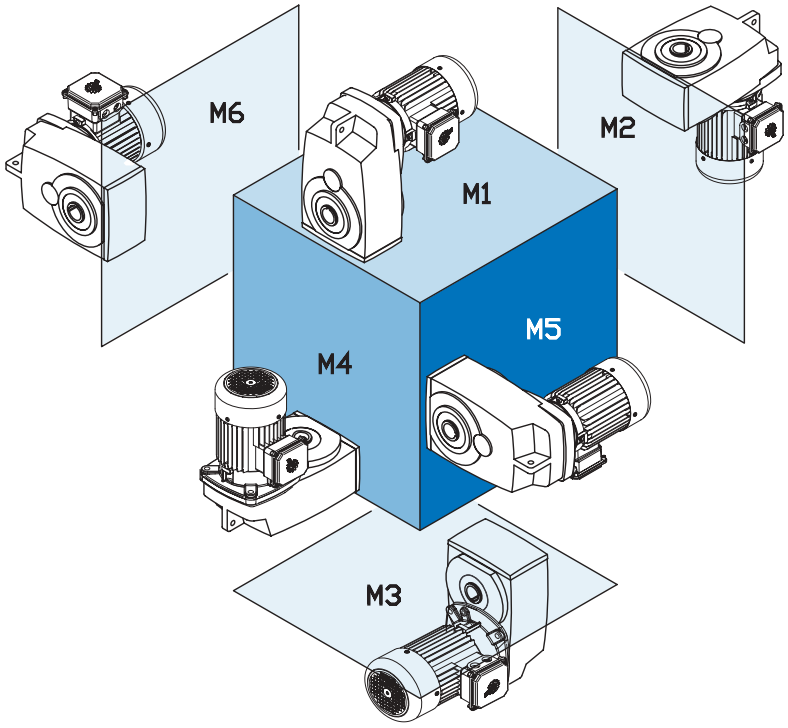
Oil Formulation Codes

MIN-EP	Mineral Oil with EP Additive
PAO	Synthetic Polyalphaolefin Oil
PG	Synthetic Polyglycol Oil
FG	Food-Grade Oil
FG-PAO	Food-Grade, Synthetic Polyalphaolefin Oil

Important Notes

- In worm gears avoid using (EP) gear oils that contain sulfur-phosphorous chemistries, as these additives can react adversely with bronze worm gears and accelerate wear.
- Food grade lubricants must be in compliance with FDA 212 CFR 178.3570 and qualify as a NSF-H1 lubricant. Please consult with lubrication manufacture for more information.
- When making a lubrication change, check with the lubrication supplier to assure compatibility and to obtain recommended cleaning or flushing procedures.
- Do not mix different oils with different additive packages or different base oil formulation types. Polyglycol (PG) oils are not miscible with other oil types and should never be mixed with mineral oil, or Polyalphaolefin (PAO) oil.
- Please Consult NORD if considering cold-temperature oils below an ISO Viscosity VG100 or lower.

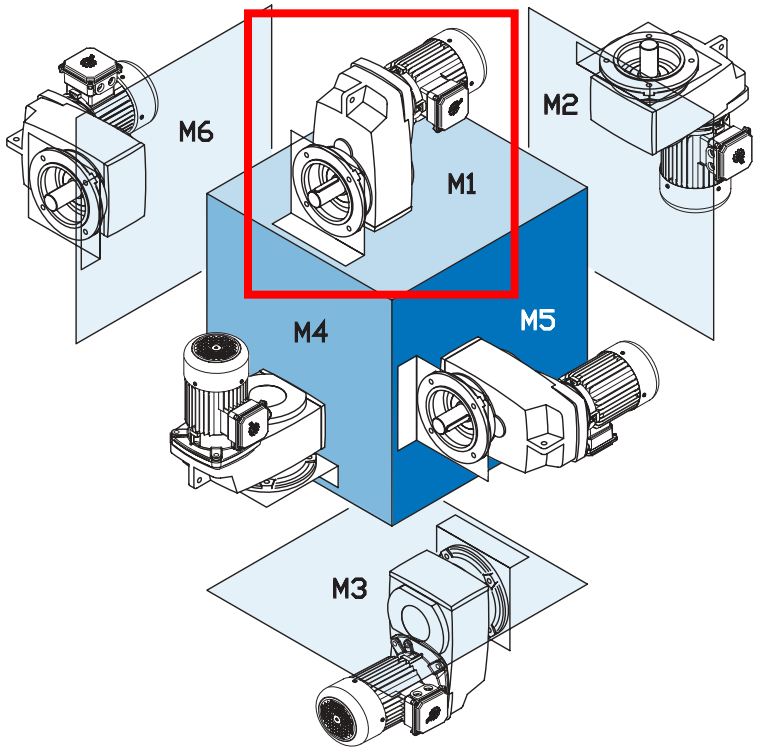
Clincher™ Shaft Mount Positions & Oil Fill Quantities



Mounting Position	M1		M2		M3		M4		M5		M6	
	Quarts	Liters	Quarts	Liters	Quarts	Liters	Quarts	Liters	Quarts	Liters	Quarts	Liters
SK0182NB	0.42	0.40	0.58	0.55	0.63	0.60	0.58	0.55	0.37	0.35	0.37	0.35
SK0282NB	0.74	0.70	1.06	1.00	0.85	0.80	1.16	1.10	0.95	0.90	0.95	0.90
SK1382NB	1.37	1.30	2.43	2.30	1.48	1.40	2.22	2.10	2.11	2.00	2.01	1.90
SK1282	0.95	0.90	1.37	1.30	0.95	0.90	1.27	1.20	1.00	0.95	1.00	0.95
SK2282	1.74	1.65	2.54	2.40	2.01	1.90	2.11	2.00	1.90	1.80	1.90	1.80
SK2382	1.80	1.70	2.75	2.60	2.01	1.90	3.28	3.10	1.59	1.50	1.59	1.50
SK3282	3.33	3.15	4.33	4.10	3.44	3.25	4.33	4.10	3.33	3.15	3.33	3.15
SK3382	4.33	4.10	5.18	4.90	3.49	3.30	5.92	5.60	3.49	3.30	3.49	3.30
SK4282	4.97	4.70	6.45	6.10	5.02	4.75	5.71	5.40	4.97	4.70	4.97	4.70
SK4382	6.24	5.90	7.19	6.80	5.18	4.90	8.77	8.30	5.18	4.90	5.18	4.90
SK5282	7.93	7.50	9.30	8.80	7.93	7.50	9.30	8.80	7.61	7.20	7.61	7.20
SK5382	13.2	12.5	12.7	12.0	7.08	6.70	14.8	14.0	8.77	8.30	8.77	8.30
SK6282	18.0	17.0	14.8	14.0	12.7	12.0	18.5	17.5	10.6	10.0	14.8	14.0
SK6382	17.4	16.5	13.7	13.0	10.1	9.60	19.0	18.0	14.8	14.0	13.2	12.5
SK7282	26.4	25.0	22.2	21.0	21.1	20.0	28.5	27.0	16.9	16.0	22.2	21.0
SK7382	23.3	22.0	21.1	20.0	16.9	16.0	26.4	25.0	24.3	23.0	20.1	19.0
SK8282	39.1	37.0	34.9	33.0	31.7	30.0	43.3	41.0	32.8	31.0	32.8	31.0
SK8382	35.9	34.0	33.8	32.0	26.4	25.0	40.2	38.0	37.0	35.0	31.7	30.0
SK9282	78.2	74.0	74.0	70.0	58.1	55.0	76.1	72.0	63.4	60.0	62.4	59.0
SK9382	77.2	73.0	74.0	70.0	47.6	45.0	78.2	74.0	68.7	65.0	63.4	60.0
SK10282*	95.1	90.0	95.1	90.0	42.3	40.0	95.1	90.0	63.4	60.0	86.7	82.0
SK10382*	89.8	85.0	106	100	77.2	73.0	106	100	84.6	80.0	84.6	80.0
SK11282*	174	165	169	160	153	145	206	195	106	100	148	140
SK11382*	169	160	164	155	148	140	222	210	164	155	143	135
SK12382*	169	160	164	155	148	140	222	210	164	155	143	135

* These units shipped without oil

Clincher™ Flange Mount Positions & Oil Fill Quantities



Mounting Position	M1		M2		M3		M4		M5		M6	
	Quarts	Liters	Quarts	Liters	Quarts	Liters	Quarts	Liters	Quarts	Liters	Quarts	Liters
SK0182NB	0.42	0.40	0.58	0.55	0.63	0.60	0.58	0.55	0.37	0.35	0.37	0.35
SK0282NB	0.74	0.70	1.06	1.00	0.85	0.80	1.16	1.10	0.95	0.90	0.95	0.90
SK1382NB	0.95	0.90	1.37	1.30	0.95	0.90	1.27	1.20	1.00	0.95	1.00	0.95
SK1282	1.37	1.30	2.43	2.30	1.48	1.40	2.22	2.10	2.11	2.00	2.01	1.90
SK2282	1.74	1.65	2.54	2.40	2.01	1.90	2.11	2.00	1.90	1.80	1.90	1.80
SK2382	1.80	1.70	2.75	2.60	2.01	1.90	3.28	3.10	1.59	1.50	1.59	1.50
SK3282	3.33	3.15	4.33	4.10	3.44	3.25	4.33	4.10	3.33	3.15	3.33	3.15
SK3382	4.33	4.10	5.18	4.90	3.49	3.30	5.92	5.60	3.49	3.30	3.49	3.30
SK4282	4.97	4.70	6.45	6.10	5.02	4.75	5.71	5.40	4.97	4.70	4.97	4.70
SK4382	6.24	5.90	7.19	6.80	5.18	4.90	8.77	8.30	5.18	4.90	5.18	4.90
SK5282	7.93	7.50	9.30	8.80	7.93	7.50	9.30	8.80	7.61	7.20	7.61	7.20
SK5382	13.2	12.5	12.7	12.0	7.08	6.70	14.8	14.0	8.77	8.30	8.77	8.30
SK6282	18.0	17.0	14.8	14.0	12.7	12.0	18.5	17.5	10.6	10.0	14.8	14.0
SK6382	17.4	16.5	13.7	13.0	10.1	9.60	19.0	18.0	14.8	14.0	13.2	12.5
SK7282	26.4	25.0	22.2	21.0	21.1	20.0	28.5	27.0	16.9	16.0	22.2	21.0
SK7382	23.3	22.0	21.1	20.0	16.9	16.0	26.4	25.0	24.3	23.0	20.1	19.0
SK8282	39.1	37.0	34.9	33.0	31.7	30.0	43.3	41.0	32.8	31.0	32.8	31.0
SK8382	35.9	34.0	33.8	32.0	26.4	25.0	40.2	38.0	37.0	35.0	31.7	30.0
SK9282	78.2	74.0	74.0	70.0	58.1	55.0	76.1	72.0	63.4	60.0	62.4	59.0
SK9382	77.2	73.0	74.0	70.0	47.6	45.0	78.2	74.0	68.7	65.0	63.4	60.0
SK10282*	95.1	90.0	95.1	90.0	42.3	40.0	95.1	90.0	63.4	60.0	86.7	82.0
SK10382*	89.8	85.0	106	100	77.2	73.0	106	100	84.6	80.0	84.6	80.0
SK11282*	174	165	169	160	153	145	206	195	106	100	148	140
SK11382*	169	160	164	155	148	140	222	210	164	155	143	135
SK12382*	169	160	164	155	148	140	222	210	164	155	143	135

* These units shipped without oil

MOTOR

This page left intentionally blank.

BALDOR
A MEMBER OF THE ABB GROUP

BALDOR • RELIANCE

Product Information Packet

VECP3584T

1.5HP,1760RPM,3PH,60HZ,145TC,0530M,TEFC

Part Detail

Revision:	E	**Status:**	PRD/A	**Change #:**		**Proprietary:**	No
Type:	AC	**Prod. Type:**	0530M	**Elec. Spec:**	05WGX008	**CD Diagram:**	
Enclosure:	TEFC	**Mfg Plant:**		**Mech. Spec:**	05F006	**Layout:**	
Frame:	145TC	**Mounting:**	F1	**Poles:**	04	**Created Date:**	03-06-2008
Base:	N	**Rotation:**	R	**Insulation:**	F	**Eff. Date:**	04-21-2010
Leads:	9#18	**Literature:**		**Elec. Diagram:**		**Replaced By:**	

Nameplate NP2069E

CAT.NO.	VECP3584T					
SPEC.	05F006X008G1					
HP	1.5					
VOLTS	208-230/460					
AMP	4.6-4.2/2.1					
RPM	1760					
FRAME	145TC	**HZ**	60	**PH**	3	
SER.F.	1.15	**CODE**	L	**DES**	B	**CL** F
NEMA-NOM-EFF	88.5	**PF**	76			
RATING	40C AMB-CONT					
CC	010A	**USABLE AT 208V**				
DE	6205	**ODE**	6205			
ENCL	TEFC	**SN**				

Parts List

Part Number	Description	Quantity
SA169125	SA 05F006X008G1	1.000 EA
RA157408	RA 05F006X008G1	1.000 EA
34FN3002B01	EXTERNAL FAN, PLASTIC, .637/.639 HUB W/	1.000 EA
S/P107-000-001	SUPER E PROC'S-FS & WS PLTS-POLYREX EM G	1.000 EA
06CB1000A02G	CONDUIT BOX, MACH GRAY	1.000 EA
RM1016	LEAD SEPARATOR GASKET - 305/306 C.P.MOTO	1.000 EA
51XW2520A12	.25-20 X .75, TAPTITE II, HEX WSHR SLTD	2.000 EA
11XW1032G06	10-32 X .38, TAPTITE II, HEX WSHR SLTD U	1.000 EA
HW3001B01	003SS CUP WASHER, FOR #8 SCREW	1.000 EA
10XN2520S06	1/4 20X3/8 HX HD CAP S.S.	1.000 EA
WD1000B16	LUGSDIRECT WIRE LUG, CAT # S4	1.000 EA
35EP1102B03G	FREP TEFC 205 BRG,GRSR,RLF,.125 NPT DRAI	1.000 EA
HW4500A19	1/4-28X1/4 SLOTTED PLUG F/S	1.000 EA
HW4500A17	317400 ALEMITE GREASE RELIEF	1.000 EA
HA4001A01SP	DRAIN PLUG, PLASTIC (MICRO PLAS)	1.000 EA
HW5100A05	WVY WSHR F/205 & 304 BRGS	1.000 EA
35EP1329A16G	PUEP ENCL 143-5TC 205 BRG,GRSR,RLF,NPT D	1.000 EA
HW4500A19	1/4-28X1/4 SLOTTED PLUG F/S	1.000 EA
HW4500A17	317400 ALEMITE GREASE RELIEF	1.000 EA
HA4001A01SP	DRAIN PLUG, PLASTIC (MICRO PLAS)	1.000 EA
51XN1032A20	10-32 X 1 1/4 HX WS SL SR	2.000 EA
06CB1502A01G	LIPPED CONDUIT BOX LID, MACH GRAY EPOXY	1.000 EA
HA3100A28	THRUBOLT 10-32 X 8.187	4.000 EA
51XB1214A16	12-14X1.00 HXWSSLD SERTYB	1.000 EA

Parts List (continued)

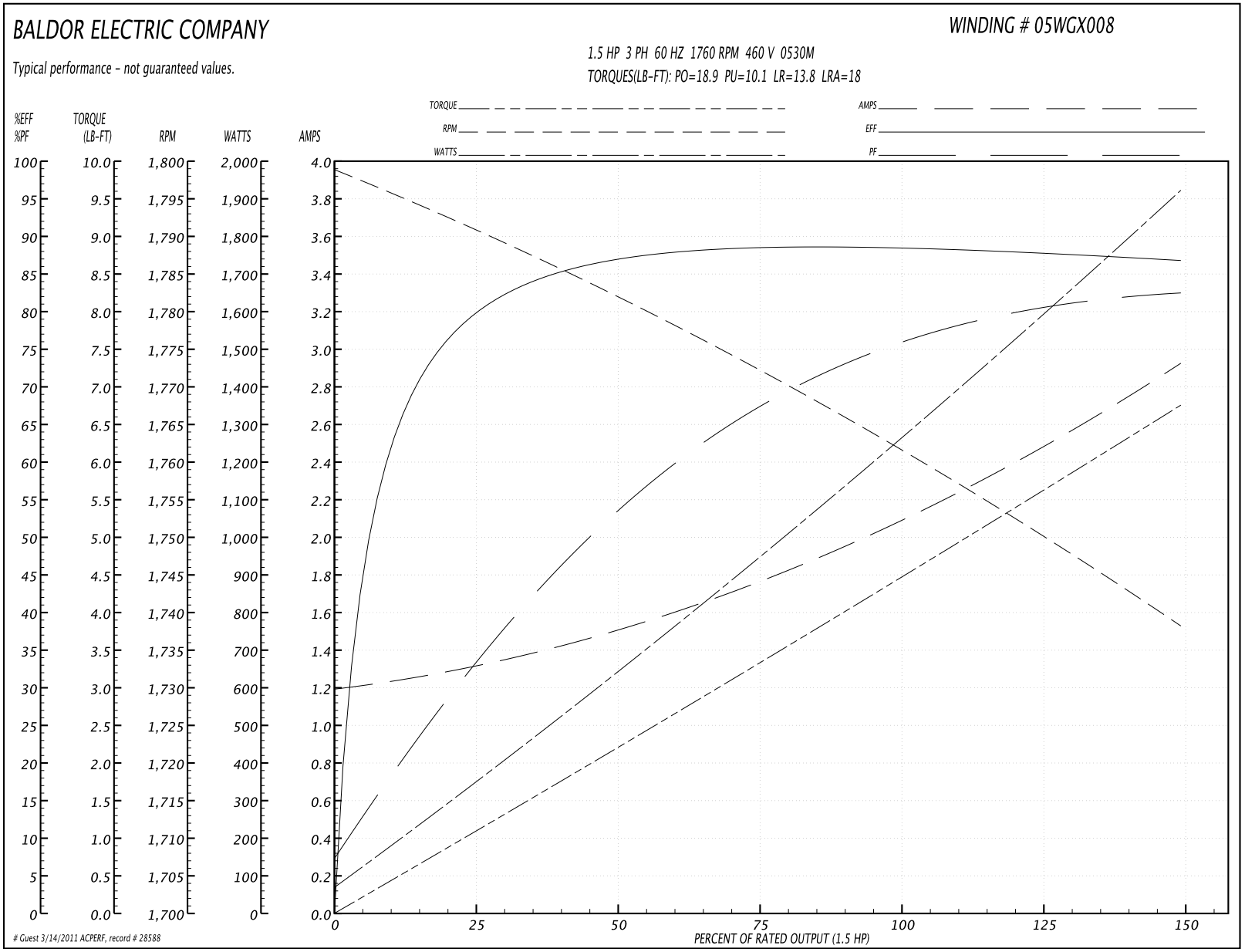
Part Number	Description	Quantity
35FH1000A04G	SPL FAN COVER MODEL 35 (GRAY)	1.000 EA
10XN2520A16	1/4-20 X 1 HEX HEAD CAP SCR, ZINC PLATED	3.000 EA
HW1001A25	LOCKWASHER 1/4, ZINC PLT .493 OD, .255 I	3.000 EA
WD4100A03	DE-750 HEYCO PLUG 62MP0750 MICRO PLASTIC	1.000 EA
35FH4500A11	DRIPCOVER(W/ AUTOPHERETIC PRIMER)	1.000 EA
HA2001A13	35-10103 SPACER WELKER	3.000 EA
51XN1032A20	10-32 X 1 1/4 HX WS SL SR	3.000 EA
06GS1003	GASKET, KOBX LID, 1/8" THICK BLACK NEOPR	1.000 EA
10XN2520A12	O1/4-20X 3/4 HEX HEAD CAP	2.000 EA
HW1001A25	LOCKWASHER 1/4, ZINC PLT .493 OD, .255 I	2.000 EA
HW4600B32SP	V-RING SLINGER 1.000 X 1.540 X 0.240	1.000 EA
HA1005A03SP	SLINGER, OD 1.750, ID .938, 205 BRG	1.000 EA
HW2501D13SP	KEY, 3/16 SQ X 1.375	1.000 EA
HA7000A01	KEY RETAINER 7/8" DIA SHAFT	1.000 EA
MJ5001A01	46-665 RED SEALER	0.001 QT
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	2.000 EA
LB1002	LABEL,MARINE DUTY (ON ROLLS)	1.000 EA
MJ1000A75	GREASE, POLYREX EM EXXON	0.050 LB
MG1025N19	PAINT, 778.50 WILKO, RELIANCE ELEC GREEN	0.022 GA
LB1125C02	SUPER-E (STOCK CTN LABEL SUPER-E WITH FL	1.000 EA
LC0005E01	CONN.DIA./WARNING LABEL (LC0005/LB1119)	1.000 EA
LB1357	ENERGY GUIDE LABEL (BOX LABEL)	1.000 SH
NP2069E	CP, SUPER-E, SS, UL CSA, (REV MTG) EMBOS	1.000 EA
36PA1000	PACK GROUP W/LB5001	1.000 EA

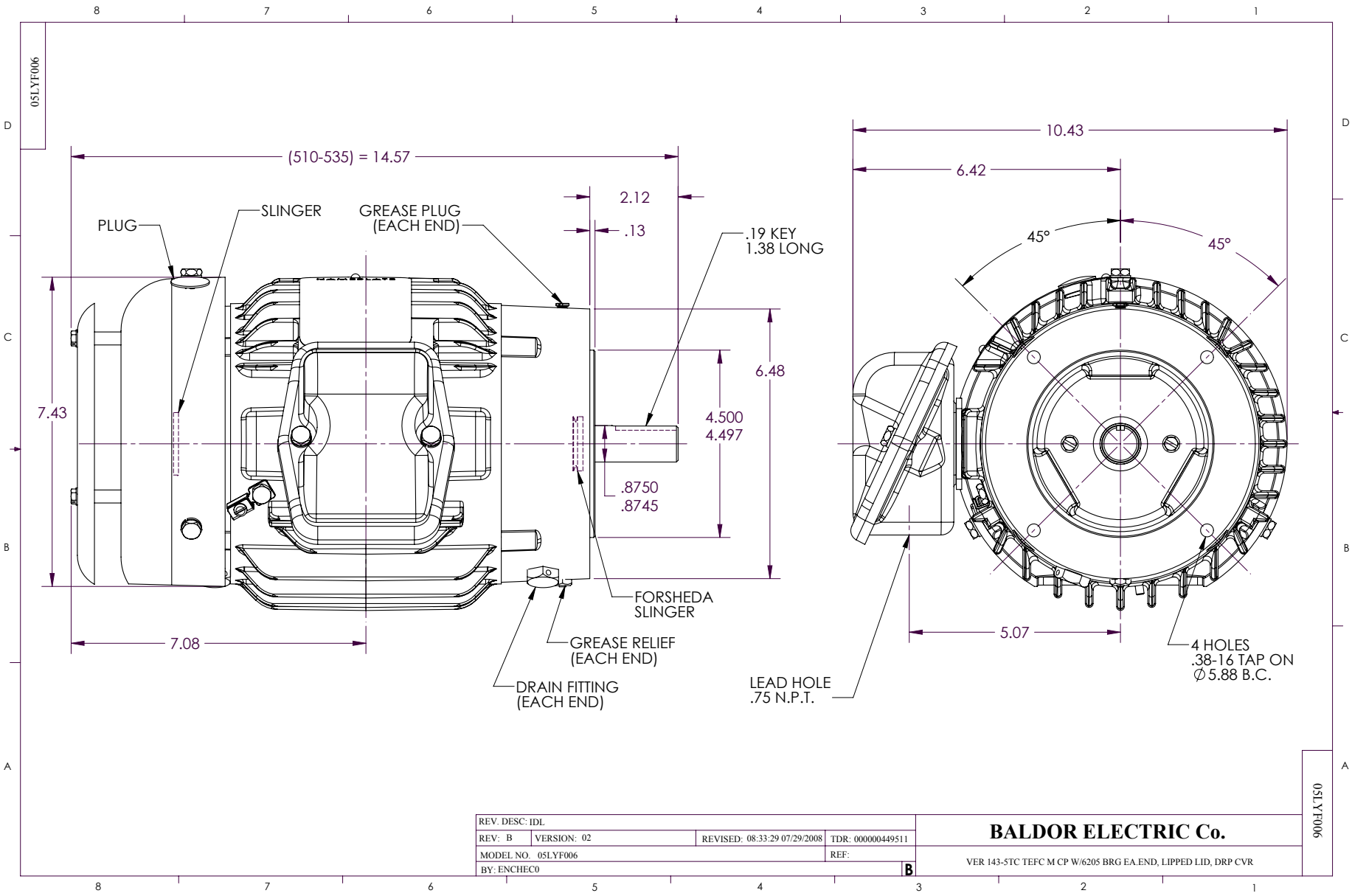
Parts List (continued)

Part Number	Description	Quantity
PK3082	STYROFOAM CRADLE	2.000 EA

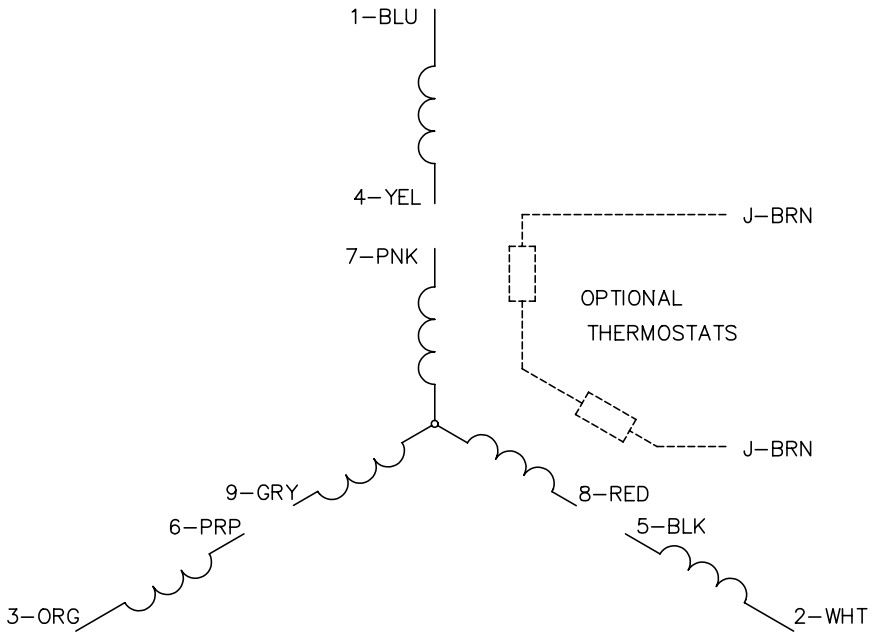
Performance Data at 460V, 60Hz, 1.5HP (Typical performance - Not guaranteed values)							
General Characteristics							
Full Load Torque:	4.49 LB-FT			**Start Configuration:**		DOL	
No-Load Current:	1.21 Amps			**Break-Down Torque:**		18.9 LB-FT	
Line-line Res. @ 25°C.:	9.6 Ohms A Ph / 0.0 Ohms B Ph			**Pull-Up Torque:**		10.1 LB-FT	
Temp. Rise @ Rated Load:	30 C			**Locked-Rotor Torque:**		13.8 LB-FT	
Temp. Rise @ S.F. Load:	38 C			**Starting Current:**		18.0 Amps	
Load Characteristics							
% of Rated Load	**25**	**50**	**75**	**100**	**125**	**150**	**S.F.**
Power Factor:	33.0	54.0	67.0	76.0	80.0	83.0	78.0
Efficiency:	79.3	86.8	88.4	88.6	87.9	86.8	88.2
Speed:	1791.0	1782.0	1773.0	1761.0	1751.0	1738.0	1755.0
Line Amperes:	1.29	1.49	1.76	2.1	2.49	2.91	2.33

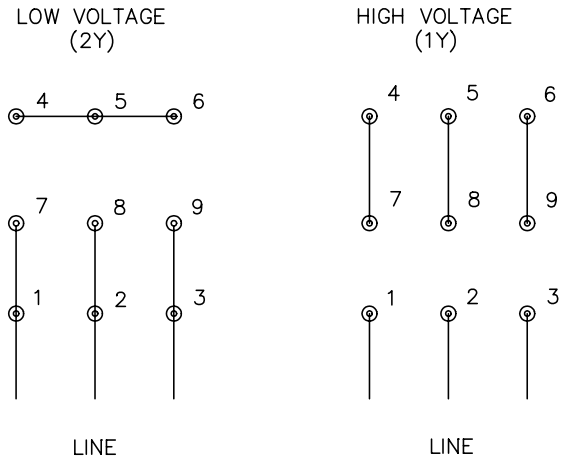
Performance Graph at 460V, 60Hz, 1.5HP Typical performance - Not guaranteed values




05LYF006
(510-535) = 14.57
2.12
.13
PLUG
SLINGER
GREASE PLUG
(EACH END)
.19 KEY
1.38 LONG
7.43
6.48
4.500
4.497
.8750
.8745
FORSHEDA
SLINGER
7.08
GREASE RELIEF
(EACH END)
DRAIN FITTING
(EACH END)
10.43
6.42
45°
45°
5.07
4 HOLES
.38-16 TAP ON
∅5.88 B.C.
LEAD HOLE
.75 N.P.T.
REV. DESC: IDL
REV: B
VERSION: 02
REVISED: 08:33:29 07/29/2008
TDR: 000000449511
MODEL NO. 05LYF006
REF:
BY: ENCHEC0
B
BALDOR ELECTRIC Co.
VER 143-5TC TEFC M CP W/6205 BRG EA.END, LIPPED LID, DRP CVR
05LYF006

CD0005





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.

CD0005

REV. DESC: REVISE TO SHOW OPTIONAL COLORS			BALDOR ELECTRIC Co.
REV. LTR: E	BY: JLP	REVISED: 01/19/99 10:15	TDR: 0171435
CD0005		FILE: AAA00005140	MDL: –
		MTL: –	3PH, DV, 9 LEADS

This page left intentionally blank.

WESTECH AN EMPLOYEE OWNED COMPANY

MOTION SENSOR

This page left intentionally blank.

Overview

MFA 4p motion failure alarm controller is a highly sensitive single setpoint motion sensor system, used with Milltronics MSP and XPP probes.

Benefits

- Up to 100 mm (4") gap between target and probe
- Switch selectable overspeed or underspeed detection
- Setpoint adjustment 2 to 3000 PPM (pulses/minute)
- Adjustable start-up time delay
- Visual indication of probe operation and relay status
- General purpose, suitable for majority of industrial applications; rugged probe designs provide unmatched reliability

Application

The MFA 4p detects changes in the motion and speed of rotating, reciprocating or conveying equipment. It warns of equipment malfunction and signals through contacts to shut down machinery in case of a slowdown or failure. Its reliability makes it a cost-effective way to protect valuable process equipment.

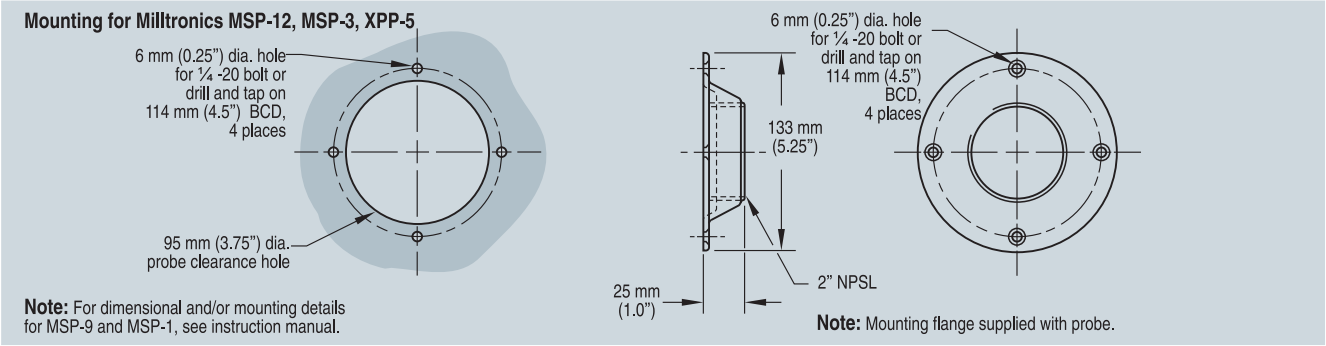
The single setpoint system suits most industrial applications. This versatile unit can be used on tail pulley shafts, driven pulleys, motor shaft sensing, belt or drag conveyors, screw conveyor flights, bucket elevators, fans and pumps.

A special feature is the adjustable 0 to 60 second time delay, allowing the monitored device to accelerate to normal running speed before monitoring begins. A wide range of probes are available to suit specific needs, including high temperatures, corrosive, and Class I, II and III installations. The CE approval allows the MFA 4p to consistently meet the needs of the mining aggregate, cement and other primary and secondary industries.

- Key Applications: tail pulleys, motor shaft sensing, screw conveyor flights, bucket elevators

Design

Mounting



MSP-12, MSP-3; XPP-5 mounting

8

Milltronics MFA 4p

Probes

Standard Milltronics MSP-12
- Heavy-duty general purpose motion probe
- Long lasting phenolic body with internal pre-amp
- Convenient mounting flange and locknut for fast installation and setup
- Temperature rating: -40 to 60 °C (-40 to 140 °F)

High temperature Milltronics MSP-3
- Heavy-duty, high temperature aluminum probe designed to withstand operating temperatures to 260 °C (500 °F)
- Cast aluminum probe with convenient mounting flange and locknut
- 1.5 m (5 ft) of high temperature PTFE cable provided. Up to 30 m (100 ft) may be used.
- Pre-amp remote mounted in painted cast aluminum NEMA 4 enclosure 140 mm x 140 mm x 100 mm (5.5" x 5.5" x 4"), ½" NPT conduit entry
- Pre-amp temperature rating -40 to 60 °C (-40 to 140 °F)

Stainless high temperature Milltronics MSP-9
- Heavy-duty, high temperature 304 stainless steel probe
- Special construction allows operation of probe in environment up to 260°C (500°F)
- 1.5 m (5 ft) special high temperature PTFE cable provided. Up to 30 m (100 ft) may be used.
- Pre-amp remote mounted in enamel painted steel (optional stainless steel) enclosure 150 mm x 150 mm x 100 mm (6" x 6" x 4")

Miniature Milltronics MSP-1
- Miniature probe for installations with limited mounting space
- CPVC probe body complete with locknuts
- 1.8 m (6 ft) cable provided. Up to 30 m (100 ft) may be used.
- Pre-amp remote mounted in painted cast aluminum NEMA 4 enclosure 140 mm x 140 mm x 100 mm (5.5" x 5.5" x 4"), ½" NPT conduit entry
- Due to smaller size, probe sensitivity is reduced, gap max. 13 mm (0.5")
- Temperature rating: -40 to 80 °C (-40 to 180 °F)

Milltronics XPP-5
- CSA hazardous approval (Class I, Div. 1, Groups A, B, C & D; Class II, Div. 1, Groups E, F & G; Class III)
- Phenolic / aluminum body that is fully potted
- Convenient mounting flange and locknut
- 3/4" NPT male hub connection
- Operating temperature from -40 to 60 °C (-40 to 140 °F)

MFA 4p motion probes

Technical specifications

Mode of operation	
Measuring principle	Motion monitor and alarm
Typical application	Monitoring loss of motion in tail pulley, screw flights, bucket elevators
Features	• Switch selectable overspeed or underspeed detection • Setpoint adjustment: 2 to 3000 PPM • Adjustable start-up time delay: 0 to 60 seconds • Visual indication of probe operation and relay status
Output	2 relays working in unison, each providing 1 SPDT Form C relay contact, rated 8 A @ 250 V AC resistive
Performance	
Repeatability	± 1 %
Dead band	± 0.25 %
Dynamic Range	0 ... 7200 PPM
Ambient Temperature Range	-20 ... +50 °C (-5 ... +122 °F)
Design	
Enclosure rating	Type 4X/NEMA 4X/IP65 (standard and optional stainless steel) Type 4/NEMA 4/IP65 (optional mild steel)
Enclosure dimensions	160 mm x 240 mm x 82 mm (6.3" x 9.5" x 3.2")
Enclosure material	Polycarbonate [optional: mild steel or stainless steel, 203 mm x 254 mm x 102 mm (8" x 10" x 4")]
Power Supply	100/115/200/230 V AC switch selectable, 50/60 Hz, 15 VA ± 10 % of rated voltage
Certificates and approvals	CE, $CSA_{US/C}$, FM

Selection and Ordering data		Order No.
MFA 4P Motion Failure Alarm Controller	C)	**7MH7144-**
A highly sensitive single setpoint motion sensor system, used with MSP and XPP probes.		■■■■
Enclosure		
NEMA 4X, polycarbonate enclosure		**1**
NEMA 4, painted mild steel enclosure		**2**
NEMA 4X, stainless steel enclosure		**3**
Input Voltage		
100/115/200/230 V AC, 50/60 Hz, switch selectable		**A**
Speed detection version		
Standard, underspeed (U/S) or overspeed (O/S), switch selectable		**A**
Slow speed (S/S), U/S or O/S detection, switch selectable		**B**
Approvals		
CE, CSA$_{US/C}$, FM		**2**
Instruction manual		
English	C)	**7ML1998-5FM01**
French	C)	**7ML1998-5FM11**
Spanish	C)	**7ML1998-5FM21**
German	C)	**7ML1998-5FM31**
Note: The instruction manual should be ordered as a separate item on the order.		
This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.		
Spare parts		
Relay		**7MH7723-1DW**
Transformer		**7MH7723-1DX**
Circuit Card, standard	C)	**7MH7723-1DU**
Circuit Card, Slow speed	C)	**7MH7723-1DV**

C) Subject to export regulations AL: N, ECCN: EAR99

Selection and Ordering data		Order No.
Milltronics RMA Remote Mounted Amplifier	C)	**7MH7145-**
Remote mounted amplifier for Milltronics MSP-1, MSP-3 and MSP-9 motion sensing probes.		**0**■
Enclosure		
Aluminum enclosure, 1/2" NPT entry		**A**
Painted steel, NEMA 4 rating		**C**
Stainless steel enclosure, NEMA 4X rating		**D**
Instruction manual		
English	C)	**7ML1998-5FM01**
French	C)	**7ML1998-5FM11**
Spanish	C)	**7ML1998-5FM21**
German	C)	**7ML1998-5FM31**
Note: The instruction manual should be ordered as a separate item on the order.		
Spare parts		
Card, RMA	C)	**7MH7723-1DT**

C) Subject to export regulations AL: N, ECCN: EAR99

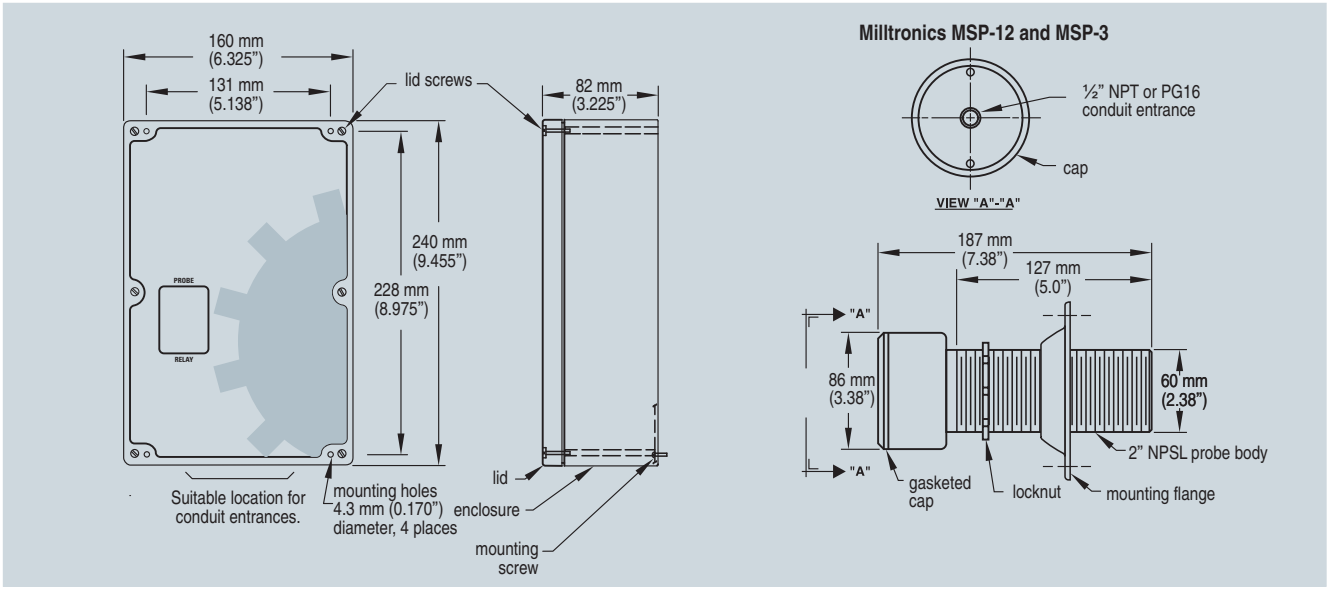
Selection and Ordering data		Order No.
Milltronics Motion Sensing Probes	C)	**7MH7146-**
A series of motion sensing probes used with the MFA 4p.		**0**■■
Milltronics MSP-1: miniature motion sensing probe Milltronics MSP-3: heavy-duty, high temperature aluminum Milltronics MSP-9: heavy-duty, high temperature stainless steel Milltronics MSP-12: heavy-duty, general purpose Milltronics XPP-5: hazardous rate Note: Milltronics MSP-1, MSP-3 and MSP-9 probes require the use of Milltronics RMA (amplifier)		
Model		
MSP-1 with 1.8 m (6 ft) of cable		**A**
MSP-3, 1/2" NPT cable inlet with 1.5 m (5 ft) high temperature cable		**B**
MSP-9 with 1.5 m (5 ft) high temperature cable		**D**
MSP-12, 1/2" NPT cable inlet		**E**
XPP-5, with 1.5 m (5 ft) cable, (CSA Class I, Group A, B, C and D; Class II Group E, F and G)		**G**
XPP-5, with 10 m (32.8 ft) cable, (CSA Class I, Group A, B, C and D; Class II Group E, F and G)		**H**
XPP-5, with 15 m (49.2 ft) cable, (CSA Class I, Group A, B, C and D; Class II Group E, F and G)		**J**
Approvals		
CE		**A**
Instruction manual		
English	C)	**7ML1998-5FM01**
French	C)	**7ML1998-5FM11**
Spanish	C)	**7ML1998-5FM21**
German	C)	**7ML1998-5FM31**
Note: The instruction manual should be ordered as a separate item on the order.		
Spare parts		
Locknut, for MSP-1	F)	**7MH7723-1CQ**
Locknut, for MSP-3, MSP-4, MSP-12, XPP-5	F)	**7MH7723-1CR**
Mounting flange, for MSP-3, MSP-4, MSP-12, XPP-5	F)	**7MH7723-1CS**
Mounting bracket for MSP-9	F)	**7MH7723-1CT**
Lid, 1/2" NPT cable inlet, for MSP-3, MSP-12	F)	**7MH7723-1CU**
Lid for MSP-9	F)	**7MH7723-1CV**
Lid gasket, for MSP-3, MSP-9	F)	**7MH7723-1CW**
Lid gasket, for MSP-12	F)	**7MH7723-1CX**

C) Subject to export regulations AL: N, ECCN: EAR99
F) Subject to export regulations AL: N, ECCN: N

8

Milltronics MFA 4p

Dimensional drawings



MFA 4p dimensions

8

CAPACITY CALCULATION

MACHINE	SPIRAL Ø	SPIRAL PITCH	SPIRAL SPEED	FILL RATE	CONVEYOR EFFICIENCY	ANGLE	CAPACITY
Pos B	0,23	0,255	16	0,3	0,7	0	2,13

POWER CALCULATION

MACHINE	M^3/HR	SG	CONVEYOR LENGTH	ANGLE	FRICTION FACTOR		POWER
Pos B	2,13	1,00	5,00	0	5,00		0,35

Recommended Motor Power					Choosen drive units		
Calculated Power		Motor selection (kW)	Approx Torque (Nm)		TYPE	kW / rpm	Torque
0,35	0,60	1,1	657	Pos B	**SK3282**	**1,1/16**	**657Nm**

Spiral Strength Calculation

Input Main Spiral		Value
Outer Diameter	mm	**230**
Pitch	mm	**255**
Height	mm	**50**
Width	mm	**20**
Number of	pcs	**1**

Output / Results		Value
Axiel Force, Pushing	N	7578
Torque, Pushing	Nm	**1512**
Axiel Force, Pulling	N	5999
Torque, Pulling	Nm	**1197**

This page left intentionally blank

5 ENCLOSURES

This page left intentionally blank

ASSEMBLY: 21393B-D101 REV: DWG #: 21393AB-D101

PART DESCRIPTION: GENERAL ARRANGEMENT DWG REV:

WRITTEN BY: MWB CHKD BY: PCH APP: JPW

DATE: 9/8/2011 DATE: 9/8/2011 DATE: 9/8/2011

ITEM	SP	PART NUMBER	DRAWING NUMBER	DWG REV	MATL CODE	PART DESCRIPTION	QTY	B/M	B/M REV
101	W	21393B-D102	21393AB-D101	0	304SS	MAIN ASSY, CVH260	1	Y	0
-	-	-	-	-	-	BUILD PER APPROVED DRAWING	-	-	-
-	-	-	-	-	-	LICENSOR MODEL: XC260	-	-	-
-	-	-	-	-	-	UNIT MATERIAL: 304 SS	-	-	-
-	-	-	-	-	-	SPIRAL MATERIAL: CARBON STEEL	-	-	-
-	-	-	-	-	-	UNIT LENGTH: 5610 mm	-	-	-
-	-	-	-	-	-	INSTALLATION ANGLE: 0 DEGREES	-	-	-
-	-	-	-	-	-	REDUCER:NORD, SK3282-AZ-BH-N140TC, RATIO 112.23	-	-	-
102	W	21393B-D103	21393B-D103		304SS	SUPPORT, CONVEYOR	2	N	
103	W	BHH-050C0200	-	-	304SS	CAPSCREW HH 1/2"-13 X 2" LG	16	N	-
104	W	WFL-050	-	-	304SS	WASHER, FLAT, 1/2"	16	N	-
105	W	WLO-050	-	-	304SS	WASHER, LOCK, 1/2"	16	N	-
106	W	NFI-050	-	-	304SS	NUT, HEX, 1/2"-13	16	N	-

Revision:

This page left intentionally blank

NOTES:

1. ALL 304 STAINLESS STEEL CONSTRUCTION EXCEPT FOR MOTOR, REDUCER, SPIRAL, DRIVE SHAFT, AND ELECTRICAL ITEMS.

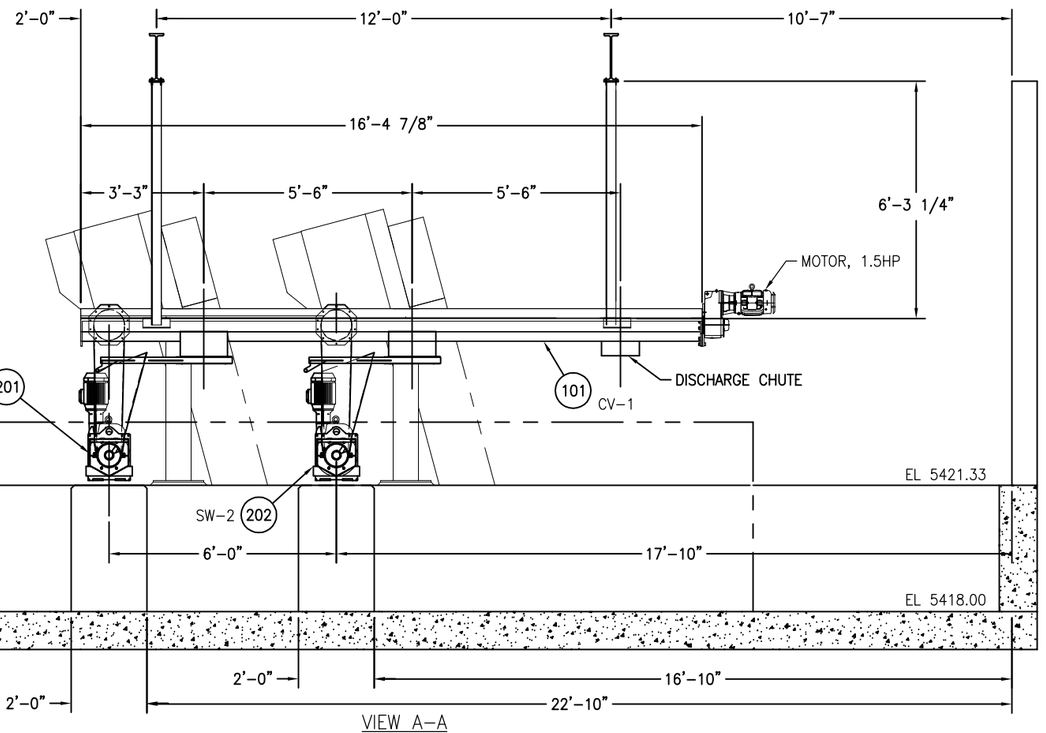
2. DRIVE SYSTEM
   SCREW WASH PRESSES:
   A. MOTOR: 5 HP, 1800 RPM, 230/460 V, 3 PH, 60 HZ, TEFC.
   B. REDUCER: HELICAL WORM GEAR COUPLED TO DRIVE SHAFT.
   CONVEYOR:
   C. MOTOR: 1.5 HP, 1800 RPM, 230/460V, 3PH, 60HZ, TEFC
   D. REDUCER: HELICAL WORM GEAR COUPLED TO DRIVE SHAFT.

3. SPIRAL SPEED: 18 RPM

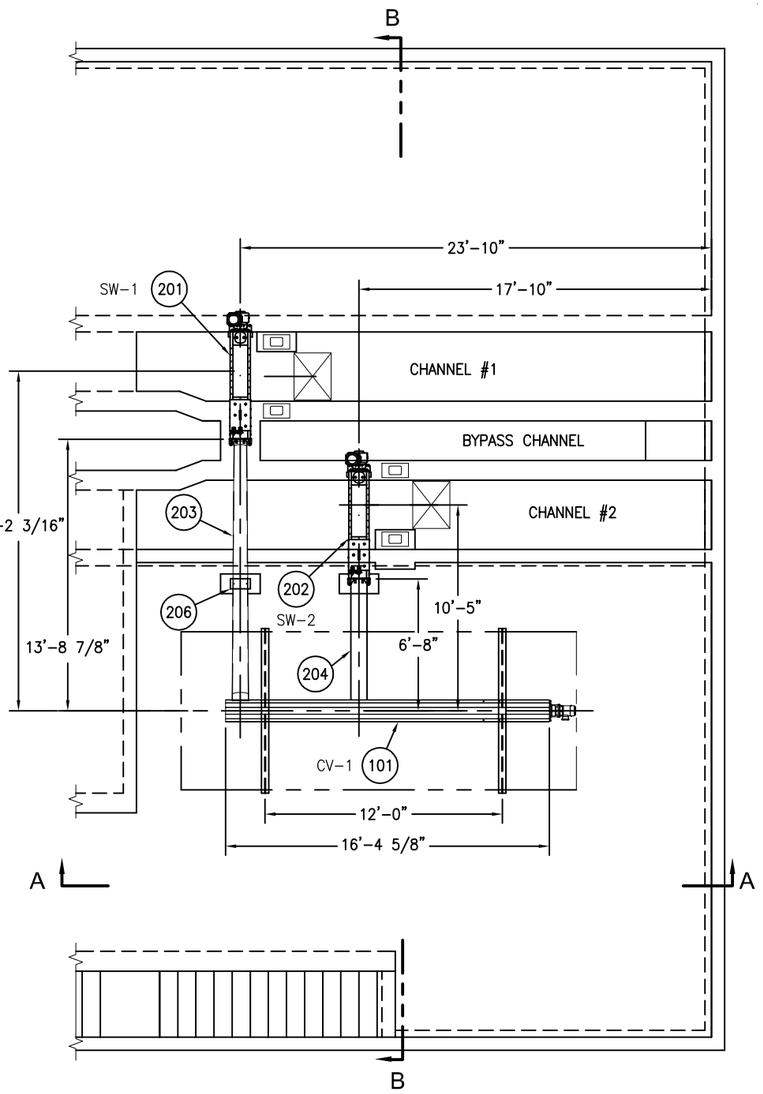
4. RECOMMENDED CLEARANCE TO BE 36.00 AROUND AND ABOVE UNIT.

5. ALL INTERCONNECTING WIRING, CONDUIT, AND PIPING FROM UNIT MOUNTED DEVICES WILL BE SUPPLIED BY OTHERS. SUPPORT ALL EXTERNAL PIPING INDEPENDENTLY OF SCREW WASH PRESS UNIT.

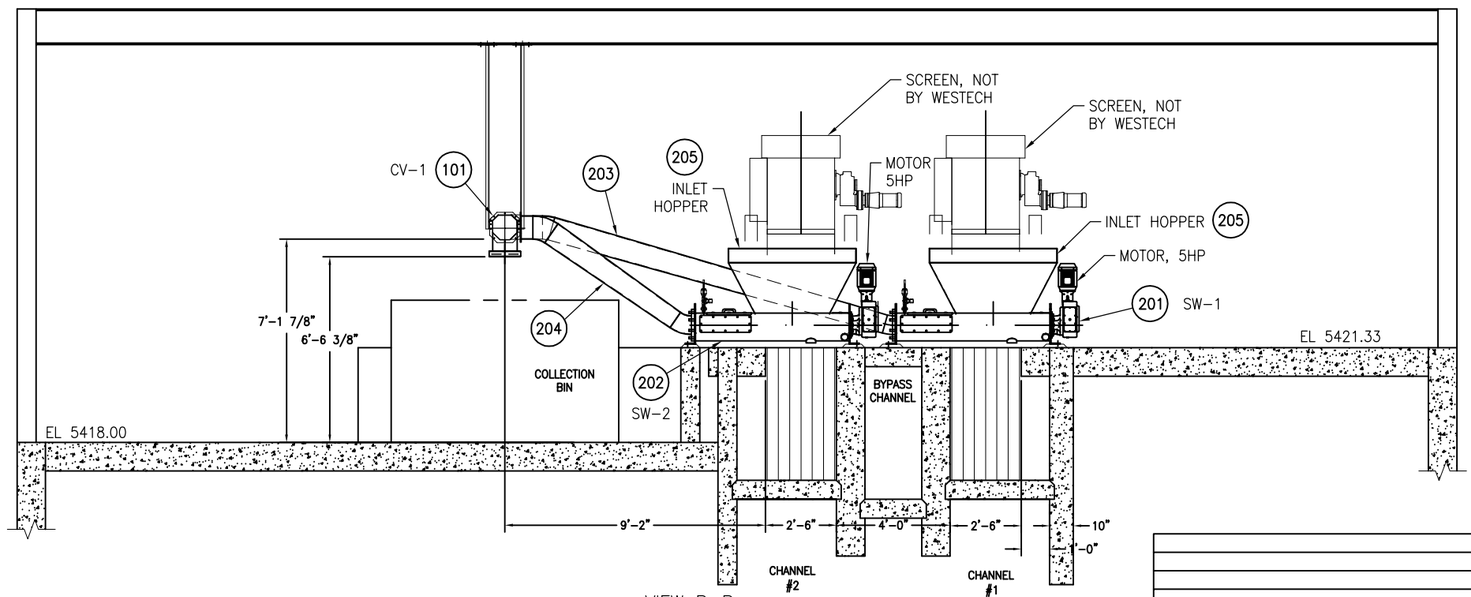
6. WEIGHTS:
   A. SCREW WASH PRESS – 620 LBS EXCLUDING HOPPER & PIPE.
   B. CONVEYOR: 1150 LBS



VIEW A–A



PLAN



VIEW B–B

SHEET 1 OF 4

PREPARED FOR: HAROLD D THOMPSON WRF
FOUNTAIN, CO
ENGINEER: GMS, INC.
COLORADO SPRINGS, CO
CONTRACTOR: WEAVER CONSTRUCTION MANAGEMENT, INC.
ENGLEWOOD, CO
PROJECT ORDER NO.: 9103 / 11360

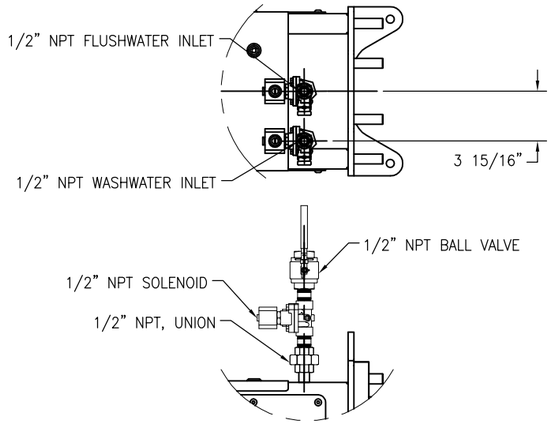
GENERAL ARRANGEMENT – (2) SCREW WASH PRESS / (1) CONVEYOR
DESCRIPTION

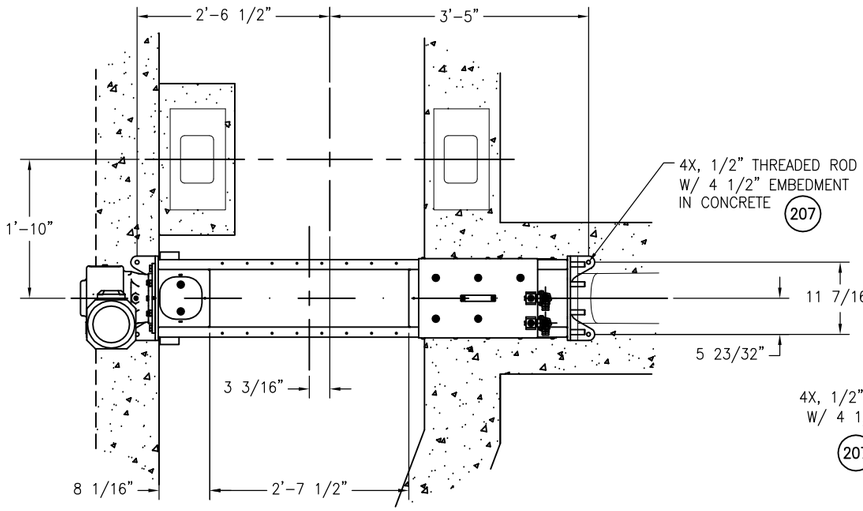
SWP20–80 / CVH260–5000								
TYPE				SIZE				
				NONE	09–11	MWB	PCH	JPW
DATE	STD. BY	STD.CHKD.	STD.APPVD	SCALE	DATE	PROJ. BY	PROJ.CHKD.	PROJ.APPVD

ALL COMPONENTS MUST BE FABRICATED AND MACHINED ACCORDING TO WESTECH STANDARD SPECIFICATION (DRAWNG P24Z–024A), UNLESS SPECIFICALLY NOTED ON THIS DRAWING.

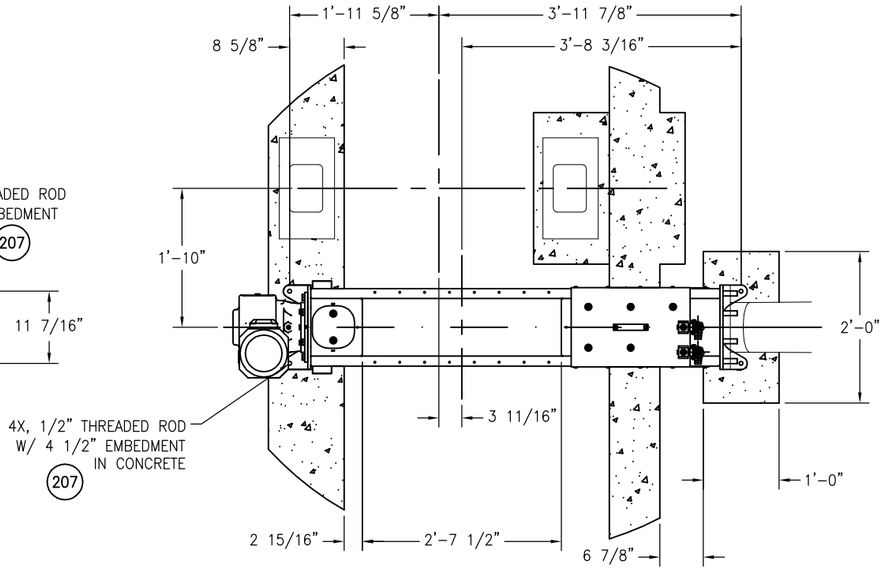
REVISION	BY	CHKD	DATE	LTR
				4
				3
				2
				1
				0

WESTECH | DRAWING NUMBER 21393AB–D101 | PROJECT NUMBER 21393AB | REV. 0

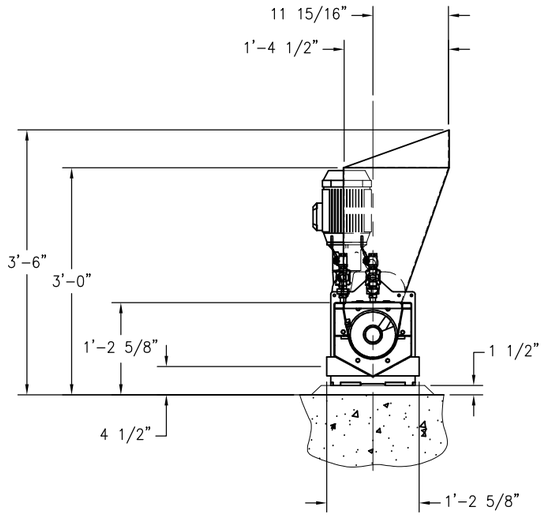




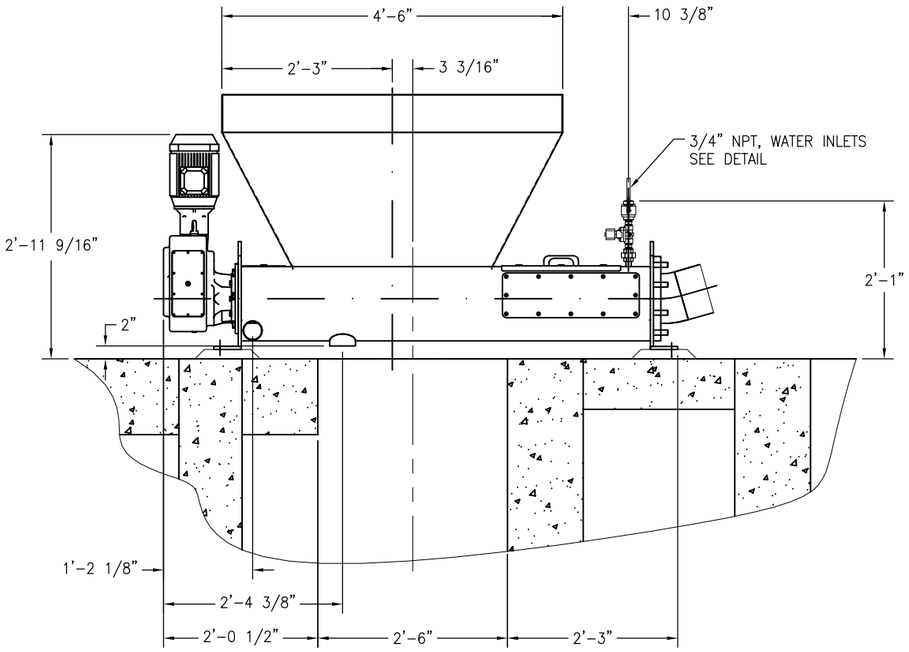
SCREW WASH PRESSS – PLAN
CHANNEL 1



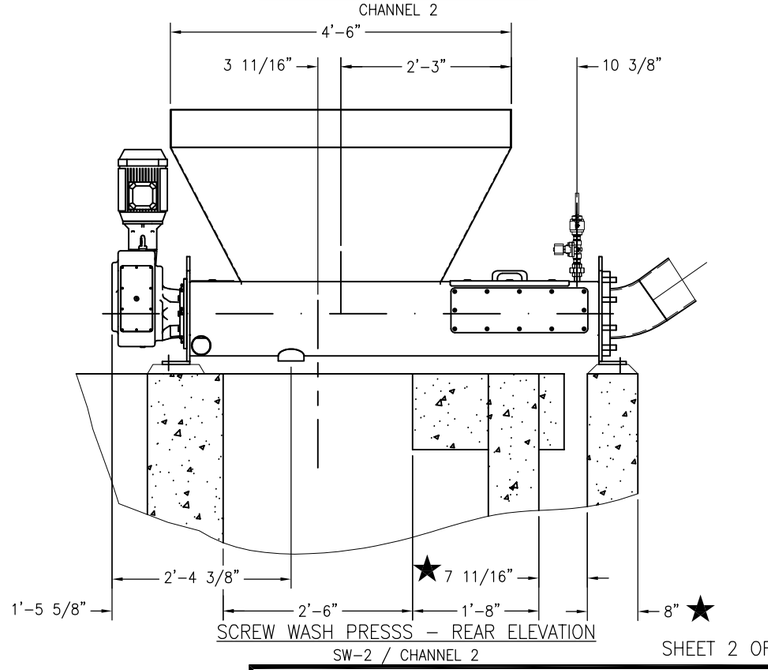
SCREW WASH PRESSS – PLAN
CHANNEL 2



SCREW WASH PRESSS – ELEVATION
TYP CHANNELS 1 & 2



SCREW WASH PRESSS – REAR ELEVATION
SW-1 / CHANNEL 1



SCREW WASH PRESSS – REAR ELEVATION
SW-2 / CHANNEL 2

REVISION	BY	CHKD	DATE	LTR
				4
				3
				2
				1

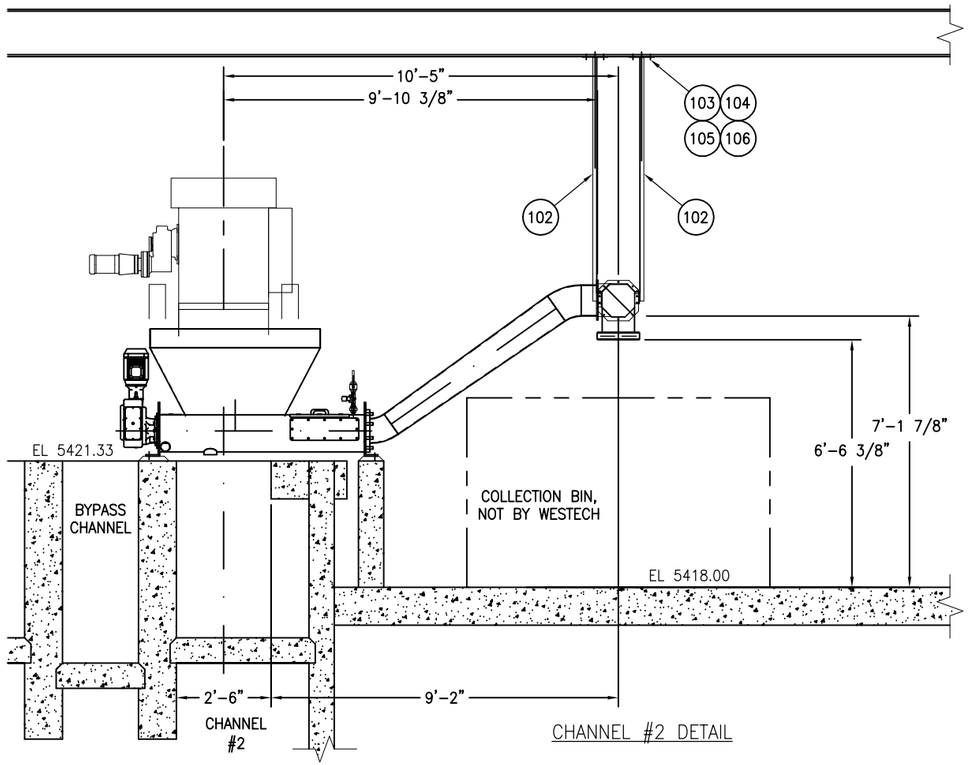
GENERAL ARRANGEMENT – (2) SCREW WASH PRESS / (1) CONVEYOR

DESCRIPTION								
SWP20-80 / CVH260-5000								
TYPE				SIZE				
				NONE	09-11	MWB	PCH	JPW
DATE	STD. BY	STD.CHKD.	STD.APPVD	SCALE	DATE	PROJ. BY	PROJ.CHKD.	PROJ.APPVD

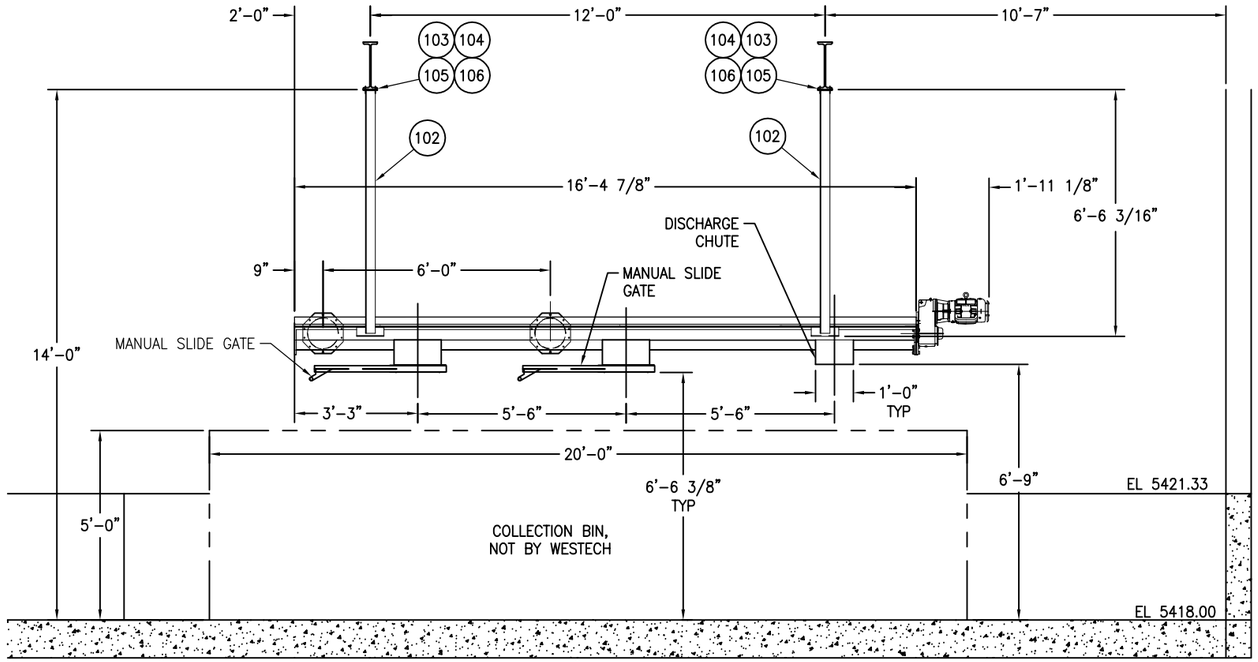
ALL COMPONENTS MUST BE FABRICATED AND MACHINED ACCORDING TO WESTECH STANDARD SPECIFICATION (DRAWING P24Z-024A), UNLESS SPECIFICALLY NOTED ON THIS DRAWING.

WESTECH

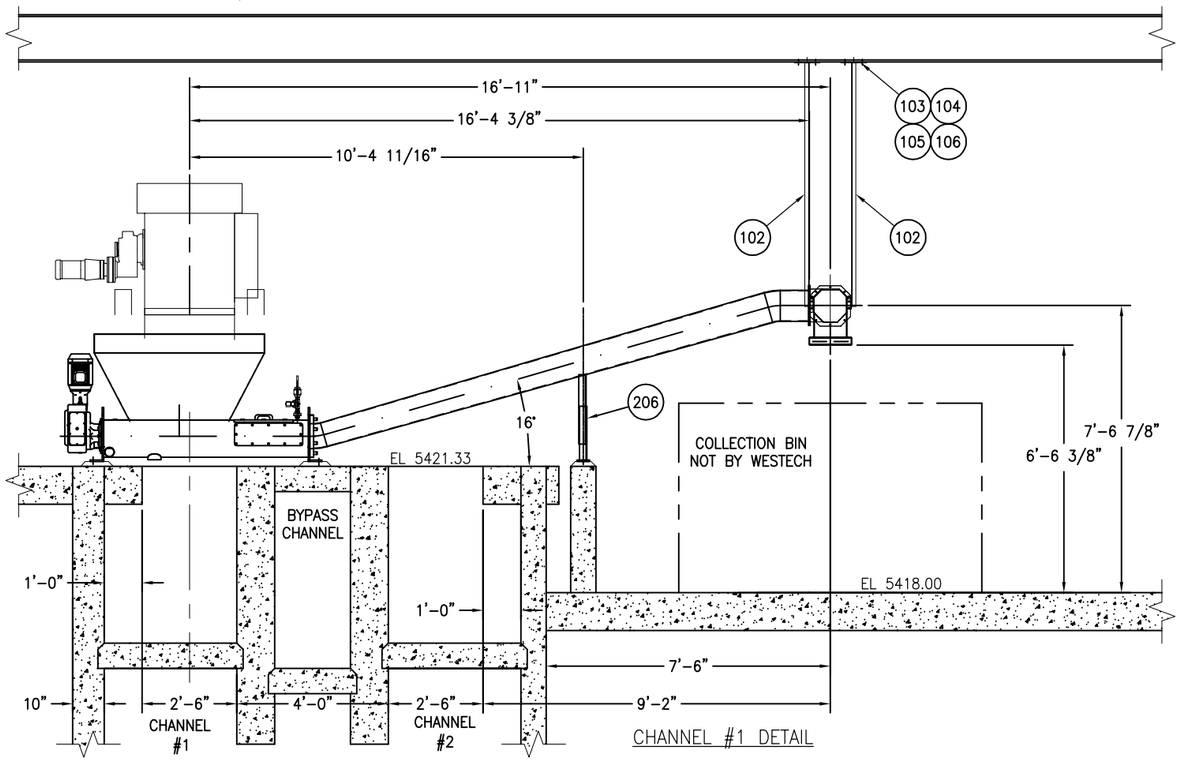
DRAWING NUMBER	PROJECT NUMBER	REV.
21393AB-D101	21393AB	0



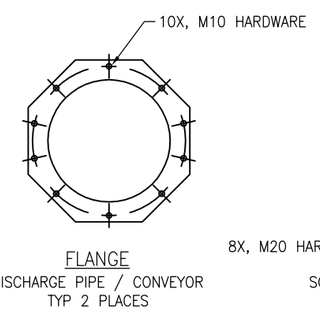
CHANNEL #2 DETAIL



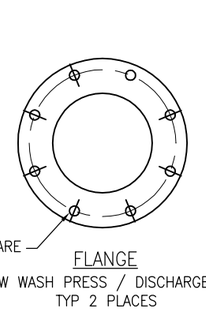
CONVEYOR DETAIL



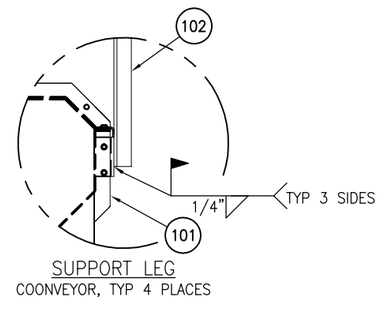
CHANNEL #1 DETAIL



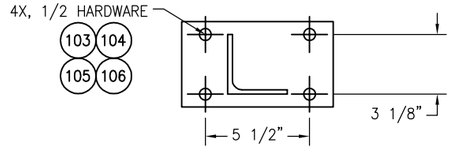
FLANGE
DISCHARGE PIPE / CONVEYOR
TYP 2 PLACES



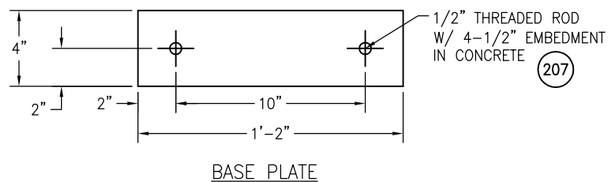
FLANGE
SCREW WASH PRESS / DISCHARGE PIPE
TYP 2 PLACES



SUPPORT LEG
COONVEYOR, TYP 4 PLACES



BASE PLATE
CONVEYOR, TYP 4 PLACES



BASE PLATE
SUPPORT PIPE, IT #206

REVISION	BY	CHKD	DATE	LTR
				1
				2
				3
				4
				5

GENERAL ARRANGEMENT – (2) SCREW WASH PRESS / (1) CONVEYOR

DESCRIPTION

SWP20-80 / CVH260-5000

TYPE

SIZE

DATE	STD. BY	STD.CHKD.	STD.APPVD	SCALE	DATE	PROJ. BY	PROJ.CHKD.	PROJ.APPVD
				NONE	09-11	MWB	PCH	JPW

ALL COMPONENTS MUST BE FABRICATED AND MACHINED ACCORDING TO WESTECH STANDARD SPECIFICATION (DRAWING P24Z-024A), UNLESS SPECIFICALLY NOTED ON THIS DRAWING.

WESTECH

DRAWING NUMBER	PROJECT NUMBER	REV.
21393AB-D101	21393AB	0

1. A STAR DENOTES VARIANCE FROM CONTRACT DOCUMENTS AND SHOULD BE PARTICULARLY NOTED. ★

2. CONTRACTOR TO VERIFY OR SUPPLY ON APPROVAL ALL DIMENSIONS SHOWN IN CLOUD.

3. THE FOLLOWING DEFINES THE RESPONSIBILITY OF WESTECH ENGINEERING INC. WITH REGARD TO THE INFORMATION AND DIMENSIONS SHOWN ON THE DRAWINGS.

   (A) THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR INSTALLATION PURPOSES UNTIL IT BEARS THE APPROVAL OF THE OWNER, THE ENGINEER OR THEIR DULY AUTHORIZED REPRESENTATIVE.

   (B) DIMENSIONS, LOADS, AND OTHER INFORMATION ARE PROVIDED TO ACCOMMODATE THE EQUIPMENT TO THE STRUCTURE AS SHOWN.

   (C) WESTECH IS NOT RESPONSIBLE FOR CONCRETE DESIGN. THE CUSTOMER IS TO PROVIDE REINFORCING STEEL AND DETERMINE SIZES TO SUIT LOCAL REQUIREMENTS.

   (D) WESTECH IS NOT RESPONSIBLE FOR DAMAGE, INJURY OR LOSS RESULTING FROM INCORPORATION OR USE OF THIS EQUIPMENT.

   (E) CHARGES FOR MODIFICATIONS, ADDITIONS OR CORRECTIONS TO THE EQUIPMENT WILL NOT BE ACCEPTED BY WESTECH, UNLESS PRIOR APPROVAL IS OBTAINED IN WRITING FROM AN AUTHORIZED WESTECH REPRESENTATIVE.

4. WESTECH DOES NOT FURNISH CONCRETE, GROUT, CONCRETE REINFORCING, PIPING, VALVES, PIPE SUPPORTS OR FITTINGS, WALL BRACKETS, ELECTRICAL WIRING, CONDUIT, OR ELECTRICAL EQUIPMENT, ERECTION, FIELD PAINTING OR PAINT, FIELD WELDING OR WELD ROD, WATER FOR TESTING, GREASE, OR LUBRICATING OIL, EXCEPT AS SPECIFICALLY NOTED.

5. DRIVE SHALL BE FINISHED WITH MANUFACTURER'S STANDARD PAINT.

6. SURFACE PREPARATION TO CONSIST OF:
   STAINLESS STEEL: SOLVENT CLEANED
   STEEL SCREW: SSPC–SP10 NEAR WHITE METAL BLAST

7. SHOP PAINTING TO CONSIST OF:
   STAINLESS STEEL: NONE
   STEEL SCREWS: ONE (1) COAT OF EPOXY PRIMER (3–6 MILS)

8. ANCHORS:
   UNIT ANCHORAGE DESIGNED AROUND RED HEAD A7 ADHESIVE SYSTEM.
   ANCHOR BOLT DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.
   USE BASE PLATES & BRACKETS AS TEMPLATES TO LOCATE ANCHOR BOLTS.

9. ALL ASSEMBLY FASTENERS TO BE: 18–8 SS

REVISION	BY	CHKD	DATE	LTR
				⚠
				⚠
				⚠
				⚠

GENERAL NOTES – (2) SCREW WASH PRESS / (1) CONVEYOR

DESCRIPTION

SWP20–80 / CVH260–5000

TYPE

SIZE

DATE	STD. BY	STD.CHKD.	STD.APPVD	SCALE	DATE	PROJ. BY	PROJ.CHKD.	PROJ.APPVD
				NONE	09–11	MWB	PCH	JPW

ALL COMPONENTS MUST BE FABRICATED AND MACHINED ACCORDING TO WESTECH STANDARD SPECIFICATION (DRAWING P24Z–024A), UNLESS SPECIFICALLY NOTED ON THIS DRAWING.

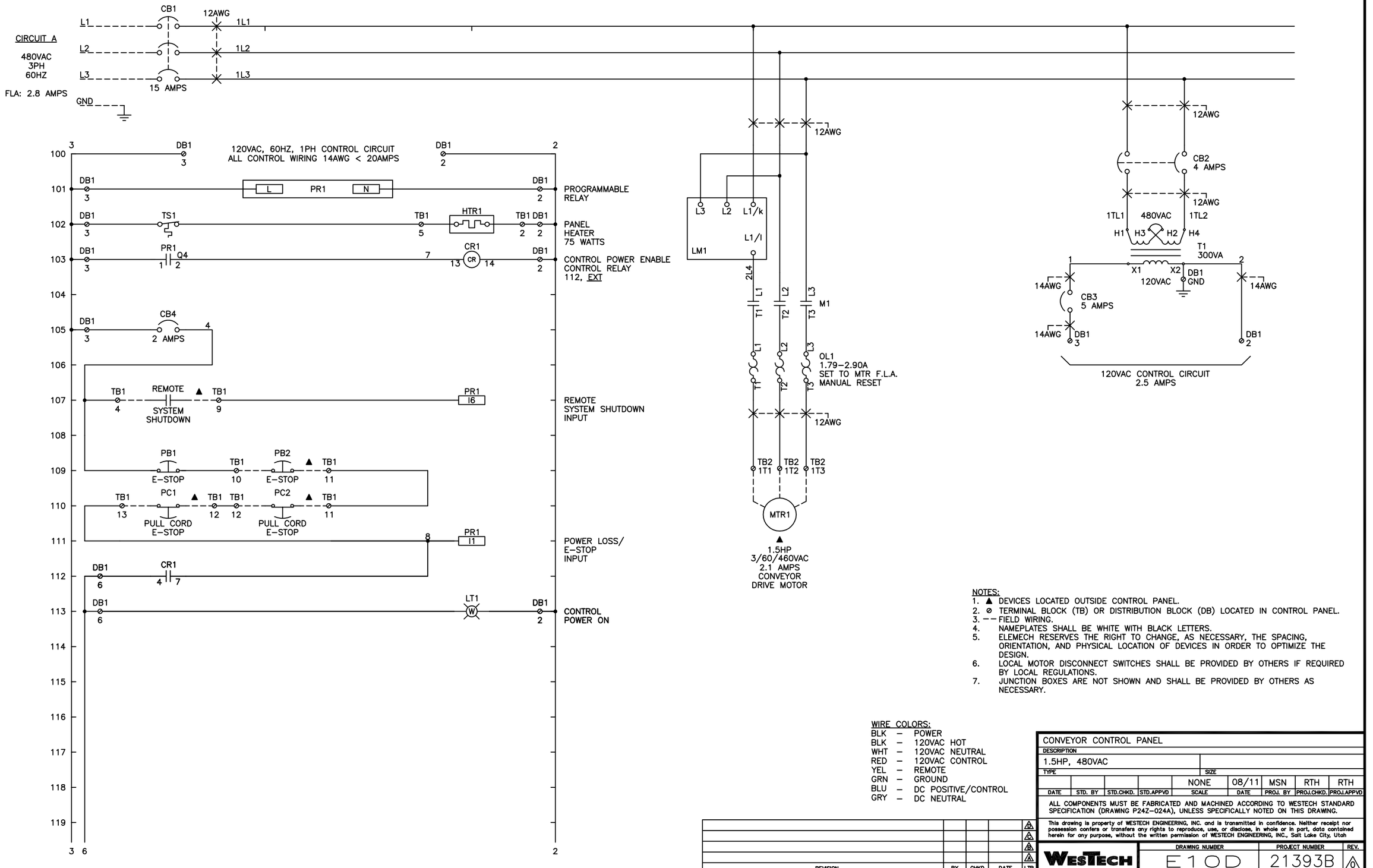
WESTECH

DRAWING NUMBER	PROJECT NUMBER	REV.
21393AB–D101	21393AB	⚠0

Item No	Component	Description	Manufacturer Part Number	QTY	Device
Conveyor Control Panel (Quantity: 1)					
1	00-000-000	Wire, Hardware, Wire labels, etc.	EleMech: Miscellaneous	1	
2	10-069-000	Wireway Duct Cover, 1.5"W, 6 Ft. Section, w/Panduit F Series	Panduit: C1.5WH6	3	
3	10-069-001	Wireway Duct Cover, 1"W, 6 Ft. Section, w/Panduit F Series	Panduit: C1WH6	3	
4	10-069-005	Wireway Duct, 1.5"Wx3"H, 6 Foot Section	Panduit: F1.5X3WH6	3	
5	10-069-007	Wireway Duct, 1"Wx3"H, 6 Foot Section	Panduit: F1X3WH6	3	
6	25-000-A001	Legendplate Assembly, Yellow E-Stop, Standard Encl.	EleMech: 25-000-A001 Assembly	1	
7	25-000-A002	Legendplate Assembly, White, Black Text, Standard Encl.	EleMech: 25-000-A002 Assembly	7	
8	25-000-A019	Nameplate Assembly, White: Power Supply - 3/60/480VAC	EleMech: 25-000-A019 Assembly	1	
9	42-063-007	Terminal Block, Din Rail, 35MM Wide, 15 High, 2 Meters Long	Wieland: 98.370.1000	1	
10	52-000-000	Label, Underwriters Laboratories 508A, w/Decal Set	EleMech: 508A	1	
11	03-001-A008	Circuit Breaker Assembly, 3 Pole, 480VAC, 15A, T1, 8" Depth	ABB: T1N015TL Assembly	1	CB1
12	03-056-024	Circuit Breaker, 1 Pole, 240VAC, 2A, 14kA, UL489, Type C	Siemens: 5SJ4102-7HG40	1	CB4
13	06-058-011	Control Relay, 3PDT,120VAC, 11Pin Spade, Indicator, Operator	Square D: RXM3AB2F7	3	CR1-3
14	06-058-012	Control Relay, Bus Jumper, 2-Pole, w/Telemec. RXM Relay	Square D: RXZ S2	2	CR1-3
15	38-058-003	Socket, 11 Pin Spade, Din, Screw Term., 3Tier, 250V w/3-Pole	Square D: RXZE2S111M	3	CR1-3
16	07-063-000	Distribution Block, End Cover, 4 Pole, 300V,10A, w/WK4E\V\VB	Wieland: 07.311.4053.1	1	DB1
17	07-063-001	Distribution Block, Jumper, 4 Pole, 300V,10A, w/WK4E\V\VB	Wieland: Z7.210.3427	3	DB1
18	07-063-002	Distribution Block, Single Pole, 10A, 300V, WK4E\V\VB	Wieland: 57.404.6955.1	7	DB1
19	42-063-004	Terminal Block, Ground, 30A, 600V, 6MM Wide, w/WK4/U	Wieland: 57.504.9053.0	2	DB1,TB1
20	11-035-027	Enclosure, NEMA 4, Painted Steel, 24"Hx24"Wx8"D, C. Hinge	Hoffman: A-24H24BLP	1	EN1
21	11-035-133	Sub-Panel, Painted Steel, w/24"Hx24"W C. Hinge Encl	Hoffman: A-24P24	1	EN1
22	15-011-000	Ground Lug	Blackburn: L70	2	GND
23	16-052-005	Elapsed Time Meter, 6 Digit, Round, 3-Hole, NEMA 4X	Redington: 722-0004	1	HM1
24	16-052-006	Elapsed Time Meter, Gasket, NEMA 4X (Use w/722-0004)	Redington: 5003-011	1	HM1
25	17-062-001	Heater, Silicone Rubber, Flat, 120VAC, 75 Watts, w/12" Leads	Watlow: 030050C1-A001B	1	HTR1
26	52-137-003	Label, Caution: Heater Element, 1.5"Wx0.75"H, White/Red	Nameplate Tech: 52-137-003	1	HTR1
27	52-137-002	Label, Multiple Supply Sources, Warning, 2.5"Wx1.5"H, Yellow	Nameplate Tech: 52-137-002	1	LBL1
28	52-137-000	Label, High Voltage, Danger, 2.25"Wx4.0"H, White/Black/Red	Nameplate Tech: 52-137-000	1	LBL2
29	34-001-002	PM, 1/3PH, 110-500VAC, 0.5-5A, 2)SPDT, 120VAC	ABB: 1SVR 450 330 R0000	1	LM1
30	32-005-046	Lens, Pilot Light, White, NEMA 4X, Standard, w/A-B 800H	Allen-Bradley: 800T-N26W	1	LT1
31	32-005-048	Pilot light, NEMA 4X, 120VAC, Transformer, No Lens	Allen-Bradley: 800H-PR16	5	LT1-5
32	32-005-044	Lens, Pilot Light, Green, NEMA 4X, Standard, w/A-B 800H	Allen-Bradley: 800T-N26G	1	LT2

Item No	Component	Description	Manufacturer Part Number	QTY	Device
33	32-005-045	Lens, Pilot Light, Red, NEMA 4X, Standard, w/A-B 800H	Allen-Bradley: 800T-N26R	3	LT3-5
34	22-018-000	Motor Starter, Non-Rev., NEMA 0, 1 NO Aux, 120VAC Coil, w/OL	Cutler-Hammer: AN16BNOAC	1	M1
35	22-018-006	Aux. Contact, Top mounted, 4NO, w/C-H Freedom	Cutler-Hammer: C320KGT13	1	M1
36	25-000-A010	Nameplate Assembly, White, Black Text, 1"Hx3"W	EleMech: 25-000-A010 Assembly	2	NP1,2
37	28-018-005	Overload Relay Heater Pack, 3PH, 1.79-2.90A, w/Freedom, C20	Cutler-Hammer: H2006B-3	1	OL1
38	29-005-010	Pushbutton E-Stop, NEMA 4X, Oper+1NCLB, Twist Rel. Red Head	Allen-Bradley: 800H-FRXT6D4	1	PB1
39	02-005-000	Contact Block, 1NO/1NC, w/A-B 800 Series	Allen-Bradley: 800T-XA	1	PB3
40	29-005-037	Pushbutton, NEMA 4X, Oper+1NC, Flush Head, Black	Allen-Bradley: 800H-AR2D2	1	PB3
41	33-183-010	PR, Zelio, 120VAC, 8)120VAC In, 4)Relay Out	Telemecanique: SR2B121FU	1	PR1
42	WES-52-P004	Program, PR, Zelio SR2B121FU, Standard	EleMech: WES-52-P004	1	PR1
43	13-000-A000	Spare Parts Box Assembly, Din Rail Mount	EleMech: 13-000-A000 Assembly	1	SP1
44	39-005-009	Selector Switch, NEMA 4X, 3 Pos. Maintained, 1NO-1NC	Allen-Bradley: 800H-JR2A	1	SS1
45	41-018-A026	Control Transformer Assembly, 480-120VAC, 300VA, w/C-Breaker	Cutler-Hammer: C0300E2A Assembly	1	T1,CB2,3
46	42-063-009	Terminal Block, End Clamp, w/WKN10/U	Wieland: Z5.522.8553	5	TB,DB
47	42-063-008	Terminal Block, Labels, Blank, w/WK4/U	Wieland: Z4.242.6353	22	TB1
48	42-063-015	Terminal Block, Jumper, w/WK4/U, 02 pole, Insulated	Wieland: Z7.281.1227	2	TB1
49	42-063-033	Terminal Block, Single Pole, 30A, 600V, WKF4/U, Spring Clamp	Wieland: 56.704.0055	33	TB1,2
50	42-063-034	Terminal Block, End Plate, Beige, w/WKFN 4/U	Wieland: 07.312.9255	2	TB1,2
51	42-063-000	Terminal Block, Labels, Custom Printed, w/WK4/U	Wieland: 04.242.6353-CUSTOM	62	TB1,2,DB1
52	46-034-000	Thermostat, for heater control, N.C.contact, 6 amp,30-140 F.	Stego: 01140.9-00	1	TS1
Zero Motion Assembly, Milltronics MFA-4P, Nema 4X FRP (Quantity: 1)					
53	11-035-126	Sub-Panel, Painted Steel, w/12"Hx10"W Junction Box	Hoffman: A-12P10	1	EN
54	11-035-176	Enclosure Mounting Feet, Fiberglass, J box	Hoffman: A-50MFKR	1	EN
55	11-035-273	Enclosure, Nema 4X, Fiberglass, 13.53"Hx10"Wx7"D, w/Window	Hoffman: A-14107JFGQRPWR	1	EN
56	25-000-A010	Nameplate Assembly, White, Black Text, 1"Hx3"W	EleMech: 25-000-A010 Assembly	1	NP
57	65-043-001	Zero Motion Sensor, 120VAC, 2-SPDT Relays, 4X, Probe Req'd	Milltronics: MFA-4P	1	ZSC
LCS, 1 Hole, Nema 4/7/9, E-Stop (Quantity: 1)					
58	25-000-A005	Legendplate Assembly, Yellow E-Stop, LCS Encl.	EleMech: 25-000-A005 Assembly	1	
59	53-053-003	Conduit, Lockwasher, 3/4", Use w/3/4" Nipple	Steel City: LN102	1	
60	11-004-004	Local Control Station, NEMA 4/7/9, 1 Hole, 3/4"NPT Holes	Akron Electric: CXI-333-X1-N4-N5-2RP	1	LCS1
61	29-005-009	Pushbutton E-Stop, NEMA 7/9, Oper+1NCLB, Push-Pull Red Head	Allen-Bradley: 800H-FPX6D4	1	PB2
62	29-005-063	Pushbutton, Padlocking Cover, w/ 800T/H 30.5mm only	Allen-Bradley: 800H-N140	1	PB2
Safety Switch, Left/Right, NEMA 7/9, w/fitting, cable, plug (Quantity: 2)					

Item No	Component	Description	Manufacturer Part Number	QTY	Device
63	92-295-000	Safety Switch, Left/Right, NEMA7/9, 3/4"NPT, Flag Arm	Control Components Company: RS-1X	1	PC1
64	92-295-001	Safety Cable, Vinyl Coated, 3/16" O.D., Orange, per ft.	Control Components Company: RS-25	60	PC1
65	92-295-002	Safety Cable, End Fitting	Control Components Company: RS-28	2	PC1
66	92-295-003	Safety Switch, Conduit Plug, 3/4"	Control Components Company: RS-29	1	PC1
Spare Parts / Ship Loose (Total Quantity Provided)					
67	65-043-002	Zero Motion Sensor, Probe, Class 1, Div 1, 10M CBL w/ MFA-4P	Milltronics: XPP-5	1	ZSC



NOTES:
1. ▲ DEVICES LOCATED OUTSIDE CONTROL PANEL.
2. ⊘ TERMINAL BLOCK (TB) OR DISTRIBUTION BLOCK (DB) LOCATED IN CONTROL PANEL.
3. – – FIELD WIRING.
4. NAMEPLATES SHALL BE WHITE WITH BLACK LETTERS.
5. ELEMECH RESERVES THE RIGHT TO CHANGE, AS NECESSARY, THE SPACING, ORIENTATION, AND PHYSICAL LOCATION OF DEVICES IN ORDER TO OPTIMIZE THE DESIGN.
6. LOCAL MOTOR DISCONNECT SWITCHES SHALL BE PROVIDED BY OTHERS IF REQUIRED BY LOCAL REGULATIONS.
7. JUNCTION BOXES ARE NOT SHOWN AND SHALL BE PROVIDED BY OTHERS AS NECESSARY.

WIRE COLORS:
BLK – POWER
BLK – 120VAC HOT
WHT – 120VAC NEUTRAL
RED – 120VAC CONTROL
YEL – REMOTE
GRN – GROUND
BLU – DC POSITIVE/CONTROL
GRY – DC NEUTRAL

REVISION	BY	CHKD	DATE	LTR
				0
				0
				0
				0

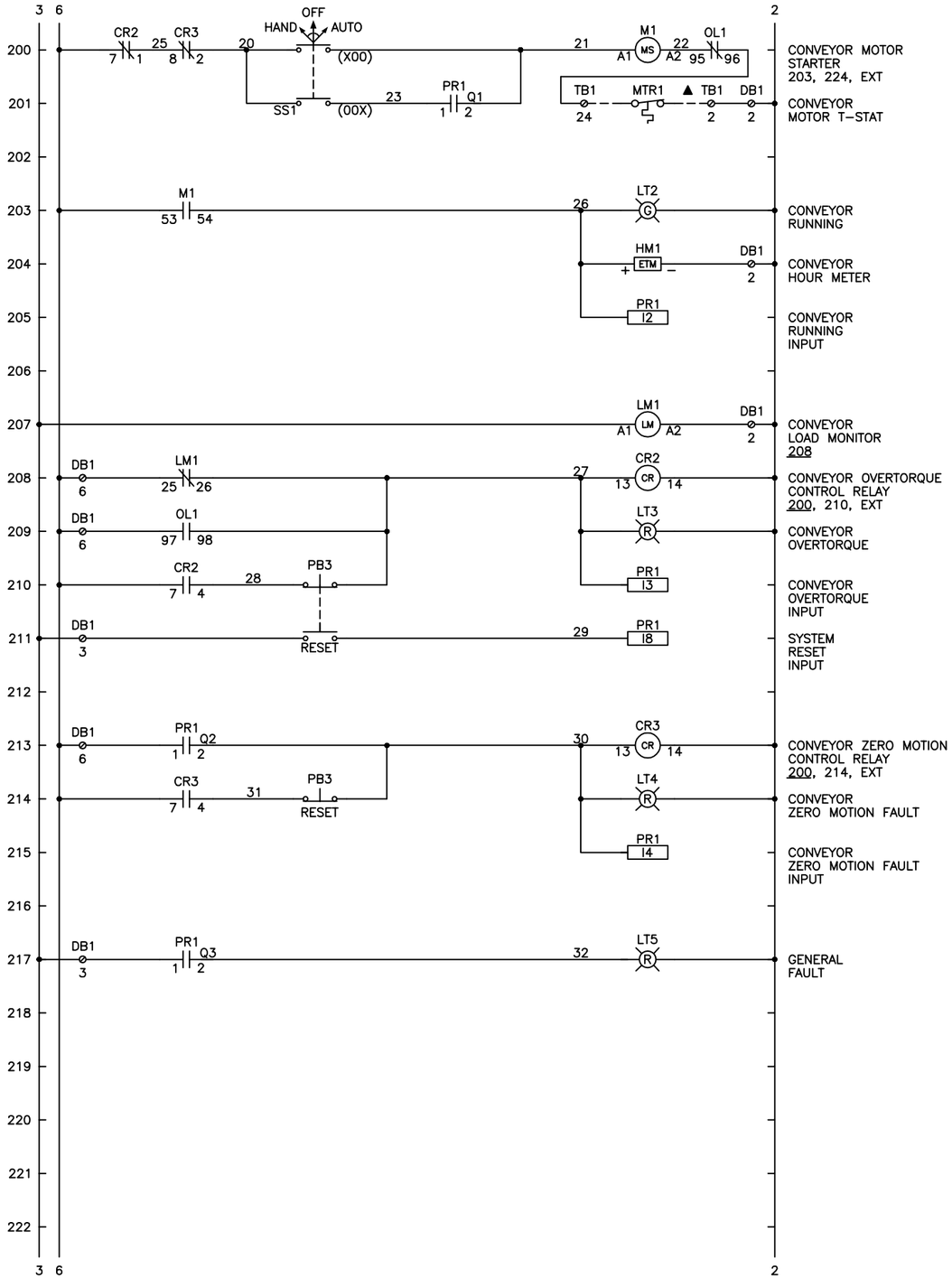
CONVEYOR CONTROL PANEL

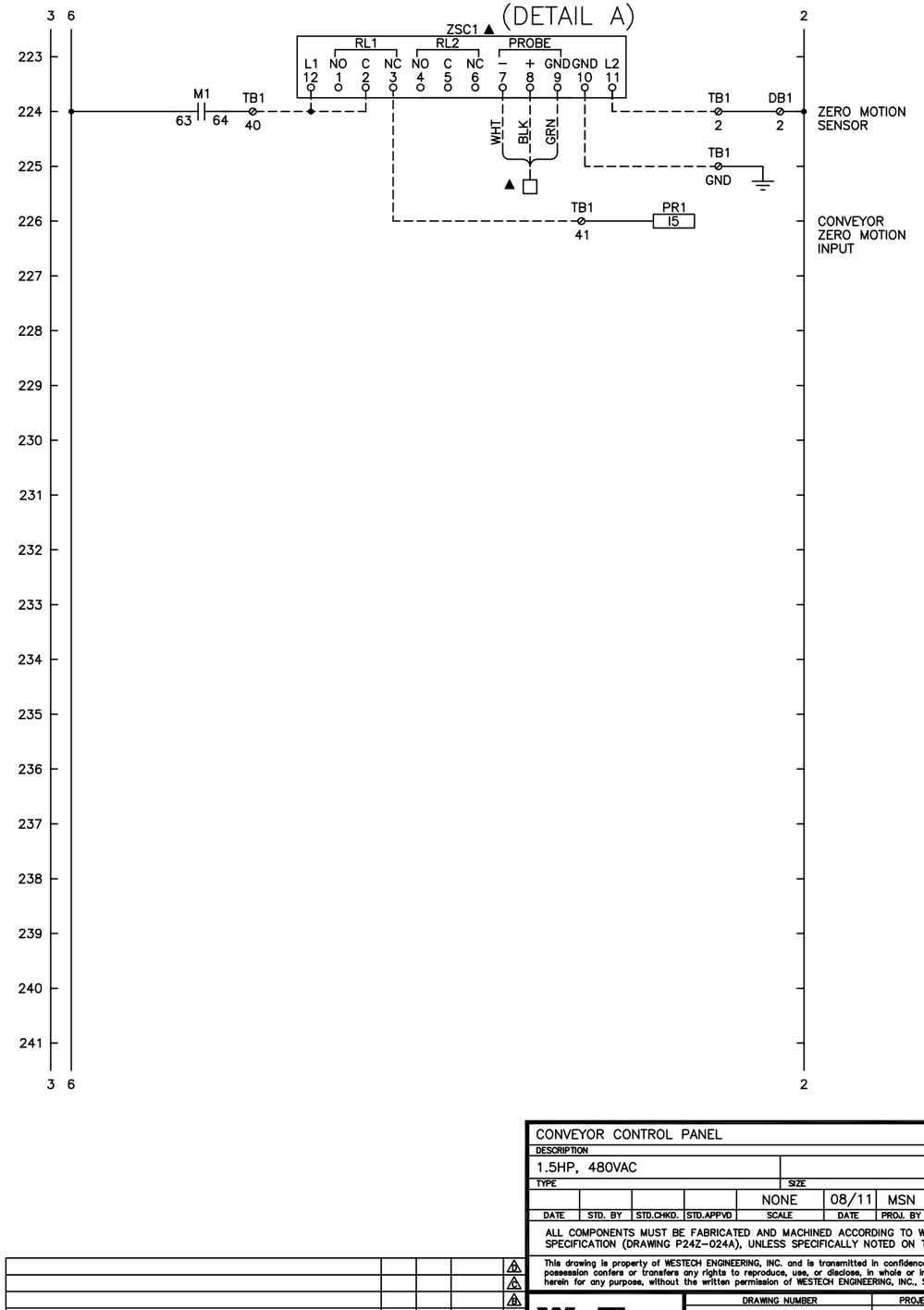
DESCRIPTION								
1.5HP, 480VAC								
TYPE				SIZE				
				NONE	08/11	MSN	RTH	RTH
DATE	STD. BY	STD.CHKD.	STD.APPVD	SCALE	DATE	PROJ. BY	PROJ.CHKD.	PROJ.APPVD

ALL COMPONENTS MUST BE FABRICATED AND MACHINED ACCORDING TO WESTECH STANDARD SPECIFICATION (DRAWING P24Z-024A), UNLESS SPECIFICALLY NOTED ON THIS DRAWING.

WESTECH

DRAWING NUMBER	PROJECT NUMBER	REV.
E10D	21393B	0





REVISION	BY	CHKD	DATE	LTR
				4
				3
				2
				1

CONVEYOR CONTROL PANEL

DESCRIPTION: 1.5HP, 480VAC

TYPE: NONE | SIZE

DATE	STD. BY	STD.CHKD.	STD.APPVD	SCALE	DATE	PROJ. BY	PROJ.CHKD.	PROJ.APPVD
				NONE	08/11	MSN	RTH	RTH

ALL COMPONENTS MUST BE FABRICATED AND MACHINED ACCORDING TO WESTECH STANDARD SPECIFICATION (DRAWING P24Z-024A), UNLESS SPECIFICALLY NOTED ON THIS DRAWING.

WESTECH | DRAWING NUMBER: E10D | PROJECT NUMBER: 21393B | REV.: 0

SEQUENCE OF OPERATION

CONTROL POWER ON–DELAY:
EACH TIME THE CONTROL PANEL POWER SUPPLY IS CYCLED, THE PROGRAMMABLE RELAY WILL ALLOW ALL SOLID STATE DEVICES TO BECOME FULLY ENERGIZED BEFORE ENABLING THE CONTROL POWER CIRCUIT.

CONVEYOR MODES OF OPERATION:
HAND: WHEN THE CONVEYOR SELECTOR IS IN THE HAND POSITION, THE CONVEYOR WILL RUN CONTINUOUSLY.
AUTO: WHEN THE CONVEYOR SELECTOR IS IN THE AUTO POSITION, THE CONVEYOR WILL CYCLE OFF AND ON, OFF TIME FIRST, PER THE CONVEYOR REPEAT CYCLE TIMERS SET IN THE PROGRAMMABLE RELAY.

NOTE: ANY RUN OF THE CONVEYOR WILL RESET THE CONVEYORS REPEAT CYCLE OFF TIMER.

EMERGENCY STOP:
THE CONVEYOR WILL STOP IMMEDIATELY, THE CONTROL POWER ON LIGHT WILL DE–ENERGIZE, AND THE GENERAL FAULT LIGHT WILL ENERGIZE, IF ANY OF THE E–STOP PUSHBUTTONS ARE PRESSED OR E–STOP PULL CORDS ARE ENGAGED. TO RESET, ENSURE ALL THE E–STOPS ARE ENABLED AND PRESS THE SYSTEM RESET PUSHBUTTON.

REMOTE SYSTEM SHUTDOWN:
WHEN THE REMOTE SYSTEM SHUTDOWN SIGNAL IS RECEIVED THE CONVEYOR WILL STOP IMMEDIATELY, THE CONTROL POWER ON LIGHT WILL DE–ENERGIZE, AND THE PRESS GENERAL FAULT LIGHT WILL ENERGIZE. THE SYSTEM WILL RESET WHEN THE REMOTE SYSTEM SHUTDOWN SIGNAL IS REMOVED. A MANUAL RESET WILL NOT BE REQUIRED.

FAULTS:
1. A FAULT OCCURS WHEN THE CONVEYOR LOAD MONITOR IS TRIPPED.
2. A FAULT OCCURS WHEN THE CONVEYOR MOTOR STARTER THERMAL OVERLOAD IS TRIPPED.
3. A FAULT OCCURS WHEN THE CONVEYOR IS CALLED TO RUN AND ZERO MOTION IS DETECTED FOR THE TIME SET IN THE CONVEYOR ZERO MOTION FAULT DELAY TIME.
4. A FAULT OCCURS WHEN THE CONVEYOR MOTOR THERMOSTAT IS TRIPPED.

– WHEN FAULTS 1 OR 2 OCCUR, THE CONVEYOR WILL STOP IMMEDIATELY, THE GENERAL FAULT LIGHT WILL BE ENERGIZED, AND THE CONVEYOR OVERTORQUE LIGHT WILL BE ENERGIZED.
– WHEN FAULT 3 OCCURS, THE CONVEYOR WILL STOP IMMEDIATELY, THE GENERAL FAULT LIGHT WILL BE ENERGIZED, AND THE CONVEYOR ZERO MOTION LIGHT WILL BE ENERGIZED.
– WHEN FAULT 4 OCCURS, THE PRESS WILL STOP IMMEDIATELY.
– FAULT 1 AND 3 CAN BE RESET BY PRESSING THE SYSTEM RESET PUSHBUTTON.
– FAULT 2 CAN BE RESET BY PRESSING THE RESET BUTTON LOCATED ON THE MOTOR STARTER THERMAL OVERLOAD.
– FAULT 4 WILL AUTOMATICALLY RESET.

NOTE: THE GENERAL FAULT CONTACT WILL CLOSE DUE TO ANY OF THE FOLLOWING CONDITIONS:
- FAULTS 1, 2, OR 3 OCCUR
- ANY OF THE E–STOP PUSHBUTTONS ARE PRESSED
- ANY OF THE E–STOP PULL CORDS ARE ENGAGED
- THE REMOTE SHUTDOWN SIGNAL IS RECEIVED.
- INPUT POWER IS LOST

DEVICE SETTINGS

LM1 – MOTOR LOAD MONITOR

DIAL	SETTING
COS MAX	MIN
COS MIN	MIN
TIME S	MIN
TIME R	MIN

NOTES:
1. THE LOAD MONITOR DIAL SHALL BE SET TO MINIMUM FROM THE FACTORY.
2. FIELD CONFIGURATION SHALL BE PERFORMED BY THE STARTUP TECHNICIAN PER THE APPROPRIATE TECHNICAL DOCUMENT.

HTR1

HEATER ON/OFF	40 °F

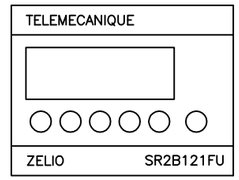
ZSC1 – ZERO SPEED CONTROLLER

PARAMETER	FACTORY SETTING	FIELD SETTING
VOLTAGE (S1)	115V	
MODE (S3)	UNDERSPEED	
PULSES (P1)	3	
PULSE MULTIPLIER (SW2)	X1	
START DELAY (P2)	10 SEC.	

NOTES:
1. RELAYS CHANGE STATE ON POWER–UP.

DEVICE SETTINGS

PR1 – I/O



PR INPUTS

I1	– POWER LOSS/E–STOP
I2	– CONVEYOR RUNNING
I3	– CONVEYOR OVERTORQUE
I4	– ZERO MOTION FAULT
I5	– CONVEYOR ZERO MOTION
I6	– REMOTE SYSTEM SHUTDOWN
I7	– SPARE
I8	– SYSTEM RESET

PR OUTPUTS

Q1	– CONVEYOR CALL TO RUN
Q2	– ZERO MOTION FAULT
Q3	– GENERAL FAULT
Q4	– CONTROL POWER ENABLE

PR1 – SETTINGS

BIT REF.	DESCRIPTION	TIMER RESOLUTION	FACTORY SETTINGS
TT–1t	CONVEYOR REPEAT CYCLE OFF TIME	HR:MIN	00:30
TT–2t	CONVEYOR REPEAT CYCLE ON TIME	MIN:SEC	01:00
TT–3t	CONVEYOR ZERO MOTION FAULT DELAY TIME	MIN:SEC	00:05

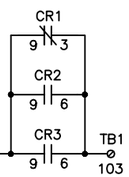
NOTES:
1. ABOVE IS A LISTING OF ALL THE FIELD SELECTABLE SETTINGS IN THE CONTROLLER.

PR1 – SETPOINT CHANGE INSTRUCTIONS

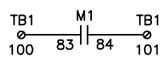
TO ALTER THE VALUE OF A TIMER OR COUNTER:

1. PRESS THE GREEN "MENU/OK", PRESS ARROW DOWN TO "PARAMETER". PRESS "MENU/OK"
2. TO ACCESS THE REQUIRED TIMER PRESS THE "UP" ARROW KEY UNTIL THE DESIRED TIMER IS DISPLAYED.
3. PRESS THE "RIGHT" ARROW UNTIL TIME VALUE FLASHES.
4. MODIFY THE TIME VALUE USING THE "UP" OR "DOWN" ARROW KEYS.
5. VALIDATE THE CHANGES BY PRESSING THE "MENU/OK", PRESS "MENU/OK" AGAIN WHEN ASKED TO CONFIRM CHANGES.
6. PRESS "MENU/OK" TO RETURN TO MAIN SCREEN.

CIRCUIT C



CIRCUIT B



CONVEYOR RUNNING

GENERAL FAULT

MAX. CONTROLLED LOAD: 10A @ 120VAC

NOTE: BRANCH CIRCUIT PROTECTION PROVIDED BY OTHERS PER N.E.C.

REVISION	BY	CHKD	DATE	LTR
				1
				2
				3
				4

CONVEYOR CONTROL PANEL

DESCRIPTION

1.5HP, 480VAC

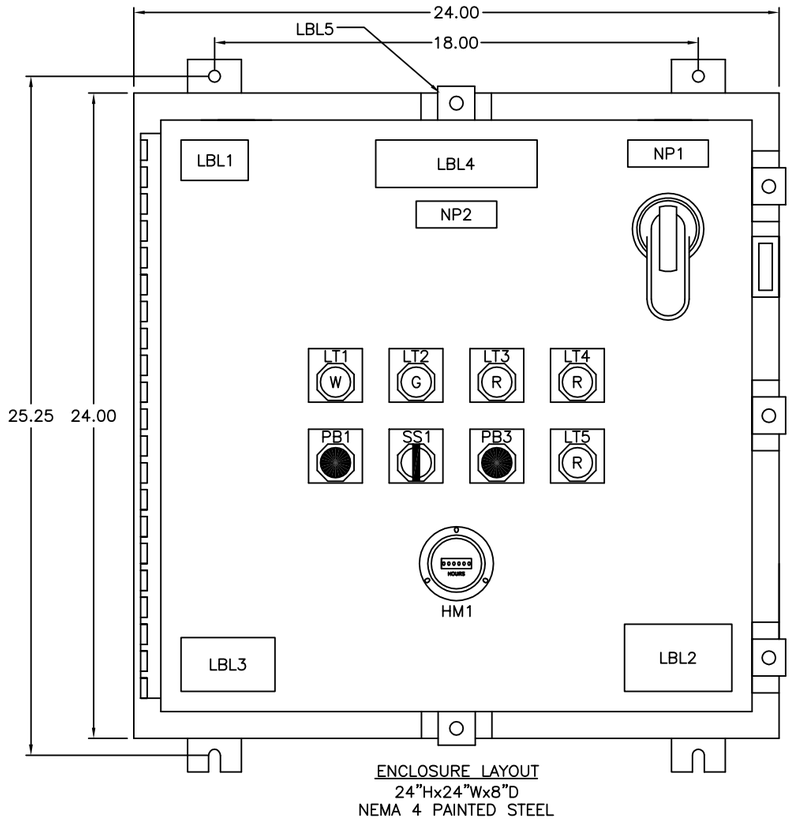
TYPE

SIZE

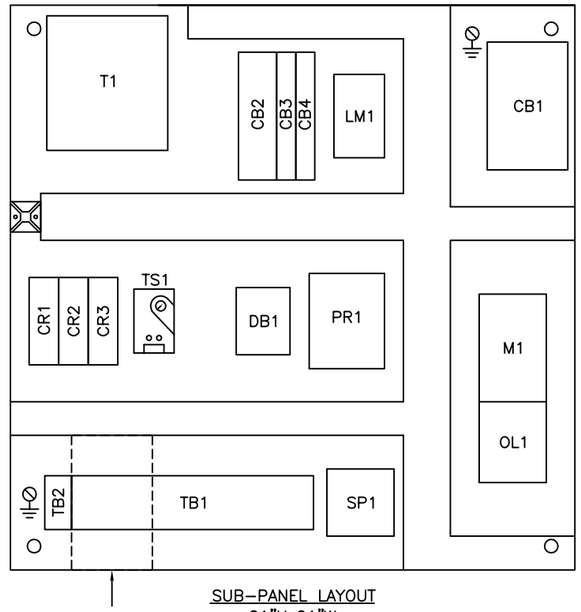
DATE	STD. BY	STD.CHKD.	STD.APPVD	SCALE	DATE	PROJ. BY	PROJ.CHKD.	PROJ.APPVD
				NONE	08/11	MSN	RTH	RTH

ALL COMPONENTS MUST BE FABRICATED AND MACHINED ACCORDING TO WESTECH STANDARD SPECIFICATION (DRAWING P24Z–024A), UNLESS SPECIFICALLY NOTED ON THIS DRAWING.

WESTECH | DRAWING NUMBER: E10D | PROJECT NUMBER: 21393B | REV.: 0



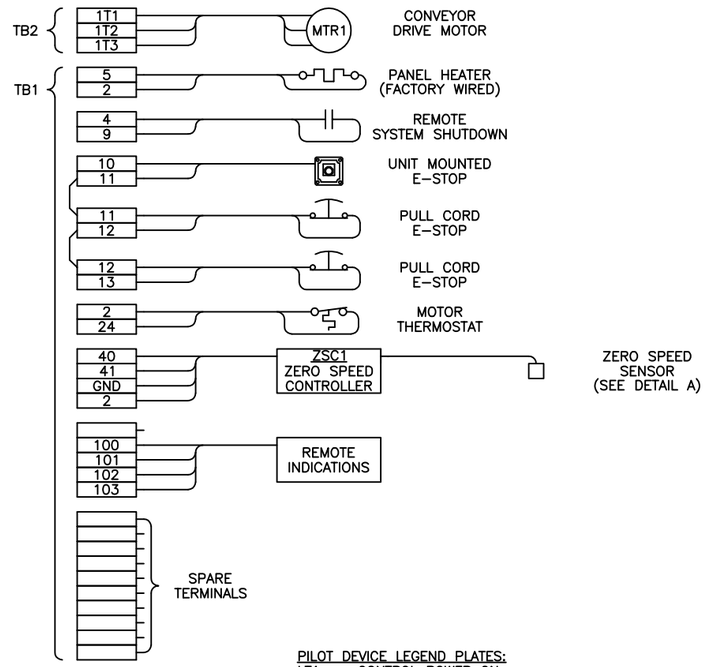
ENCLOSURE LAYOUT
24"Hx24"Wx8"D
NEMA 4 PAINTED STEEL



HTR1 MTD.
BEHIND
SUB–PANEL

SUB–PANEL LAYOUT
21"Hx21"W

FIELD WIRING DIAGRAM

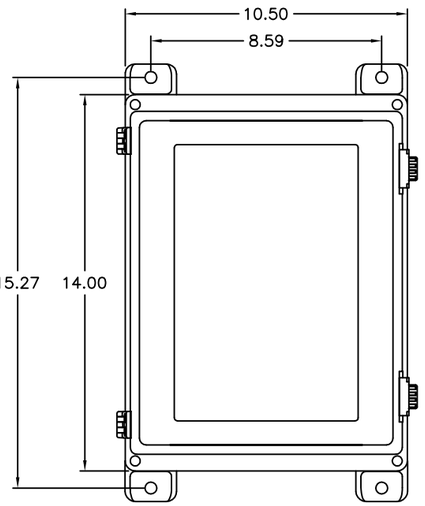


PILOT DEVICE LEGEND PLATES:
LT1 – CONTROL POWER ON
LT2 – CONVEYOR RUNNING
LT3 – CONVEYOR OVERTORQUE
LT4 – CONVEYOR ZERO MOTION
LT5 – GENERAL FAULT
PB1 – EMERGENCY STOP
PB2 – EMERGENCY STOP
PB3 – SYSTEM RESET
SS1 – CONVEYOR HAND–OFF–AUTO

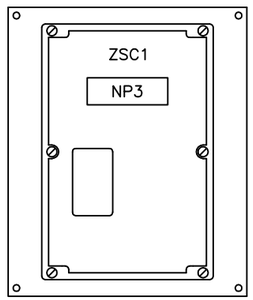
NAMEPLATES:
NP1 – 480VAC–3PH–60HZ
NP2 – LCP CV–1
NP3 – ZERO MOTION CONTROLLER

LABEL DESCRIPTION:
LBL1 – WARNING: MULTIPLE SUPPLY SOURCES
OPEN ALL DISCONNECTS BEFORE SERVICING
EQUIPMENT OR OTHER UNIT WIRING.
LBL2 – DANGER HIGH VOLTAGE
ENTRY BY QUALIFIED PERSON ONLY
LBL3 – ELEMECH ELECTRICAL CONTROL SYSTEMS
LBL4 – WESTECH
LBL5 – NOTICE:
– PENETRATIONS TO CONTROL CABINETS MUST BE FITTED WITH TYPE 4 FITTINGS, MYERS BRAND OR EQUAL
– ALL INTERIOR DEVICES MUST BE PROTECTED FROM INSTALLATION DEBRIS

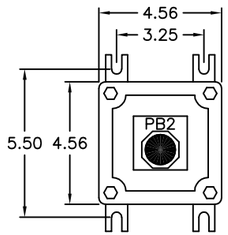
FAILURE TO ADHERE TO INSTRUCTIONS WILL VOID WARRANTY



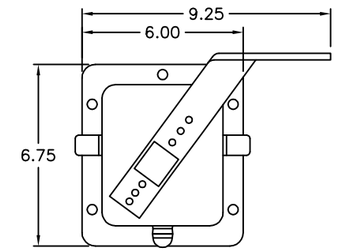
ENCLOSURE LAYOUT
14"Hx12.5"Wx7"D
NEMA 4X FIBERGLASS
10.28"Hx6.84"W WINDOW



SUB–PANEL LAYOUT
10.75"Hx8.88"W

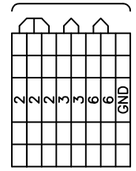


LCS1
NEMA 4/7/9
LOCAL CONTROL STATION
PUSHBUTTON LOCKABLE
IN DEPRESSED POSITION



PC1/2 – PULL CORD SAFETY SWITCH
6–3/4"Hx6"Wx8–7/16"D
NEMA 7/9 EXPOSION PROOF
CAST ALUMINUM

DB1 DETAIL



REVISION	BY	CHKD	DATE	LTR
				4
				3
				2
				1
				0

CONVEYOR CONTROL PANEL
DESCRIPTION
1.5HP, 480VAC
TYPE
SIZE

DATE	STD. BY	STD.CHKD.	STD.APPVD	SCALE	DATE	PROJ. BY	PROJ.CHKD.	PROJ.APPVD
				NONE	08/11	MSN	RTH	RTH

ALL COMPONENTS MUST BE FABRICATED AND MACHINED ACCORDING TO WESTECH STANDARD SPECIFICATION (DRAWING P24Z–024A), UNLESS SPECIFICALLY NOTED ON THIS DRAWING.

WESTECH

DRAWING NUMBER	PROJECT NUMBER	REV.
E10D	21393B	0