

**SUBMITTAL REVIEW**

RE: St. Lucie West Services District WWTF Expansion Project
St. Lucie West Services District, Project No. SLW075
Baskerville-Donovan, Inc., Project No. 107411.02
Wharton-Smith, Inc., Project No. 13-066

SUBMITTAL CLARIFICATIONS / EXCEPTIONS:

Please see the attached proposed Mechanical Fine Screen & Screenings Washer. Please confirm acceptable.

CONTRACTOR REVIEW STAMP:**ENGINEER REVIEW STAMP:**

SUBMITTAL NO.: 11330-001
DESCRIPTION: Mechanical Fine Screen & Screenings Washer
SUPPLIER: WesTech Engineering, Inc.
SPECIFICATION: 11330
DRAWING NO.: M-200, M-205
W/S FILE NO.: 11330-001 Mechanical Fine Screen & Screenings Washer

**BASKERVILLE-
DONOVAN, INC.****DOCUMENT REVIEW**

These documents have been reviewed for conformance with the design concept and general compliance with the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, fabrication and construction methods, and coordinating the work with all other trades.

☐ **APPROVED**
☐ **FURNISH AS CORRECTED** **DATE:** _____
☐ **REVISE & RESUBMIT**
☐ **REJECTED** **BY:** _____
☐ **SUBMIT SPECIFIC ITEM**

☒ **Certification Statement:** By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all **CONTRACTOR** requirements.

Date: 3/6/2014 **By:** Driss Benchekroun

PRODUCT SUBMITTAL

Specification Section: 11330 Mechanical Fine Screen and Screenings Washer

FOR:

**ST LUCIE WEST SERVICES DISTRICT
WASTEWATER TREATMENT FACILITY
PORT ST LUCIE, FL**

EQUIPMENT:

ONE CLEANFLO™ ROTOSCREEN® DS

Model: RSDS25-80-6

ONE CLEANWASH™ SCREW WASH PRESS

Model: SWP20-80

CONTRACTOR:

WHARTON-SMITH, INC.
Palm City, FL

ENGINEER:

BASKERVILLE-DONOVAN, INC.
Pensacola, FL

WESTECH AGENT:

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**WESTECH JOB NUMBER: 22218A / 22218B
February 2014**

COVER PAGE

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1 SUBMITTAL INTRODUCTION

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1. This submittal is being furnished for the approval of the mechanical and electrical equipment (if applicable) as outlined under the specification section referred to in the Letter of Clarification.
2. A complete outline of materials to be supplied are listed herein. The General Arrangement drawings enclosed represent our complete scope of supply. All other materials not specifically included on the drawings, or the body of this submittal, are to be supplied by other than WestTech Engineering, Inc.
3. Document and data requirements (i.e. Operation and Maintenance Manuals) covered elsewhere in the specifications shall follow in a timely manner and with the content to satisfy the specifications.
4. A copy of all “approved/approved as corrected” and/or “revised” General Arrangement Drawings (Shop Drawings) and Equipment Erection/Assembly Drawings will be included in the Installation, Operation & Maintenance Manuals.
5. Approval to proceed will not be recognized by WestTech until clouded dimensions (if applicable) are confirmed or supplied.
6. RE-SUBMITTALS: The enclosed information will not be duplicated in any future re-submittals, unless:
 - A. Items/sections have been commented on and need clarification or revision for the re-submittal.
 - B. Specifically requested by the Engineer or Contractor on the return Letter of Transmittal that the entire submittal must be duplicated.
7. In order to be environmentally aware, this submittal may utilize double side printing to conserve paper.

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2 LETTER OF CLARIFICATION

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The purpose of this Letter of Clarification is to state any departure WesTech will take from the given specifications. This letter of clarification includes specification section 11330, updated per addenda 1-6 and associated contract drawings. The right side of the page is a copy of the specification section with any departures from the given specifications noted on the left side of the page. Any exceptions to the contract drawings are noted on the drawings as text boxes. All items with no marks or comments should be considered as "No Exceptions Taken". This review is also used by WesTech to clarify specifications which might have multiple or vague interpretations.

The enclosed WesTech General Arrangement Drawings contain clouded dimensions. This indicates information to be confirmed and/or corrected by the Engineer and/or the Contractor at the time this submittal is returned. Submittal will not be considered as approved until all clouded dimensions have been confirmed and/or corrected.

All items not specifically noted in the enclosed General Arrangement drawings as being supplied by WesTech are by others.

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SECTION 11330 – MECHANICAL FINE SCREEN AND SCREENINGS WASHER

PART 1 - GENERAL

1.1 DEFINITIONS

- A. **CONTRACTOR** –The person, partnership, corporation, association, or affiliation as specifically defined in the contract general conditions paraphrased to be the entity with whom the OWNER shall execute an agreement for the installation of the system supplied by the SUPPLIER.
- B. **ENGINEER** – The person, partnership, corporation, association, or affiliation as specifically defined in the contract general conditions paraphrased to be the engineering firm contracted by the OWNER to design the project.
- C. **OWNER** – As specifically defined in the contract general conditions, the OWNER refers to the entity contracting the work being completed.
- D. **SUPPLIER/MANUFACTURER** – The person, partnership, corporation, association, or affiliation with whom the OWNER executes an agreement for supplying the SYSTEM equipment under this contract.
- E. **SYSTEM** – The complete influent screen, washer, compactor, and conveyance system, which shall include all equipment, controls, and instrumentation as necessary to remove solids from the raw sewage, clean, and deposit the solids into a dumpster for removal, as herein specified.

1.2 SCOPE

One of each type units will be
supplied per agreement



- A. Contractor shall furnish all labor, equipment, materials, tools, and incidental items required to install and place into proper operation two (2) stair type bar screens and two (2) washer/compactors provided by the same manufacturer. All equipment shall be installed as shown on the plans, as recommended by the supplier, and in compliance with all OSHA, local, state, and federal codes and regulations.
- B. The self-cleaning stair screen units will consist of shaft-mounted gearbox with motor, direct drive linkage, both in-place alternate stationary and moveable step assemblies, frame and covers and appurtenances specified or otherwise required for a complete and properly operating installation. The influent stream to be screened will be introduced via a channel with the solids being retained on the stepping surfaces of the stationary step assembly. The solids will then be conveyed up to the discharge point.
- C. Each washer/compactor shall be furnished complete with motor, inlet hopper, discharge pipe, drop chute, screenings “endless” bagger assembly, supports, and accessories for the washing and compaction of municipal sewage screenings, and all accessories and

one (1) complete and operable system



appurtenances specified or otherwise required for a complete and properly operating installation.

- D. Contractor shall be responsible for coordination of all related parts of work. Contractor shall verify all structures, piping, wiring, and components are compatible. Contractor shall be responsible for all structural and other alterations required to accommodate equipment differing in dimensions or other characteristics from these specifications and drawings as required to render two (2) complete and operable systems.
- E. The screen/washer/compactor controls shall enable each screen to be operated based on the water levels upstream of each screen. Ultrasonic level detectors shall be located upstream of the step screens to monitor water level in the channel and initiate an operating cycle through the PLC. High level float sensors shall be located upstream of the step screens to indicate a high water level alarm.
- F. The screen/washer/compactor controls shall operate each component as an integrated system with all control functions included in the panel for each screen.
- G. All equipment to be installed in the facility headworks and shall be rated for Class I, Division 1, Hazardous locations. Equipment control panel shall be elevated at least 18" above the top of wall such that it is located in a non-classified area.

1.3 SUMMARY

- A. The Contractor shall supply all components and appurtenances that will be required to produce a complete and workable installation as shown on the drawings.
- B. All supplied equipment is to be new per this specification.
- C. The equipment specifications detail the new equipment to be supplied and installed.

1.4 RELATED SECTIONS

- A. Division 1
- B. Division 3
- C. Division 5
- D. Division 16

1.5 SUBMITTALS

- A. Provide shop drawings and product data in accordance with section 01300 for the equipment being furnished, to include at minimum the following:

1. Certified shop drawings showing the details of construction, dimensions and anchor bolt requirements.
2. Complete wiring diagrams detailing all required field connections.
3. Descriptive literature, brochures, and/or catalogs of submitted equipment.
4. Calculations showing the structural capability of the screen framework to withstand the maximum possible water level with a safety factor of 2.
5. Complete bill of materials for the equipment.
6. List of Manufacturer's recommended spare parts.
7. Operation and maintenance manuals in accordance with the requirements of section 01730.
8. Installation reference list.
9. Equipment weights and lifting points.
10. Short and long term storage requirements.
11. Manufacturer's installation instructions.
12. A copy of Manufacturer's warranty.

1.6 REFERENCE STANDARDS

- A. American Iron and Steel Institute (AISI).
- B. American National Standards Institute (ANSI).
- C. American Society for Testing Materials (ASTM).
- D. American Bearing Manufacturers Association (ABMA).
- E. American Gear Manufacturers Association (AGMA).
- F. National Electrical Manufacturers Association (NEMA).
- G. Underwriters Laboratory (UL).

1.7 QUALITY ASSURANCE

- A. Qualifications: Qualified Manufacturers shall have a minimum 15 years experience, with no fewer than 10 operating installations of the type specified herein located in North America. Manufacturer shall provide a list of contact names, contact phone numbers, screen model number, design flow rate, and dates of installations for verification by the Engineer or Owner's Representative.
- B. A single manufacturer shall provide all components including but not limited to the screen, washer/compactor, motors, gear reducers, controls, and control panels as a complete integrated package to ensure proper coordination, compatibility, and operation of the system.
- C. Screen and washer/compactor shall be Manufacturer's standard product and only modified as necessary to comply with the drawings, specifications, and specified service conditions.
- D. All welding is performed in accordance with American Welding Society (AWS) D1.1 Structural Welding Code.
- E. Screen and washer/compactor shall undergo a passivation process to ensure maximum resistance to corrosion. All stainless steel surfaces shall be thoroughly cleaned and glass bead-blasted to a minimum SSPC-SP-6 finish.
- F. Contractor shall guarantee all equipment against faulty or inadequate design, improper assembly or installation, defective workmanship or materials, and breakage or other failure. Materials shall be suitable for service conditions.
- G. All equipment shall be designed, fabricated, and assembled in accordance with recognized and acceptable engineering and shop practices. Individual parts shall be manufactured to standard sizes and thicknesses so that repair parts can be installed in the field. Like parts of duplicate units shall be interchangeable. Equipment shall not have been in service prior to delivery, except as required for testing.
- H. All structural members of the equipment shall be designed for shock and vibratory loads. Additionally, the screen shall be designed to withstand the forces generated by maximum operating head without damage to the screen or its structure.
- I. Each screen and washer/compactor shall have the Manufacturer's name, address, and product identification information on a corrosion resistant nameplate securely affixed to the equipment.
- J. Screen and washer/compactor manufacturer shall be ISO 9001 certified and provide the Engineer with a copy of a valid certificate of registration.

1.8 WARRANTY

- A. The equipment shall be warranted by the manufacturer for a period of one (1) year from the date of the start of beneficial use to be free from defects in workmanship, design, or material. If the equipment should fail during the warranty period due to a defective part(s), it shall be repaired, or replaced.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Shipping

1. Ship equipment, material, and spare parts complete except where partial disassembly is required by transportation regulations or for protection of components.
2. Pack spare parts in containers bearing labels clearly designating contents and equipment for which they are intended.

B. Receiving and Storage:

1. Store and safeguard equipment, material, and spare parts. All spare parts must be stored in accordance with manufacturer's recommendations.

1.10 OPERATION AND MAINTENANCE MANUALS

- A. The manufacturer shall furnish operation and maintenance manuals in accordance with the requirements of section 01730 – Operating and Maintenance Data.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS/EQUIPMENT

- A. This specification and the project drawings are based upon the use of a Waste-Tech, Kusters Water Finescreen Stair Screen and TP200 Screenings Washer as herein specified.
- B. The following manufacturer's listed models are identified as pre-approved equals to the named units.

1. WesTech Cleanflo Rotoscreen Filter Step Screen and Cleanwash Screw Wash Press
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2. CleanTek Water Solutions/Conpura ConStep 40 Step Screen and ConWashPress Washer/Press Model 1822

- 2.2 Other Alternate Suppliers or systems may be accepted by the Owner only as herein specified. Equipment of Alternate Suppliers shall be compliant with the equipment specification
- 2.3 Alternate manufacturers shall be successful in the experience of manufacture, installation, operation, and servicing of equipment of the type, size, quality, performance, and reliability equal to that specified. The manufacturer shall submit evidence of experience having supplied at least ten (10) installations of similar type and size in the past five (5) years.
- 2.4 The Contractor shall select between the named manufacturer's as the equipment to be supplied and shall indicate his selection within the bid form.

2.5 SYSTEM DESIGN CRITERIA

A. Step Screen

Peak Flow Rate per Screen:	4.26 MGD (design flow)
Channel Width:	3'-0"
Channel Depth:	5'-7"
Max. differential between upstream and downstream water levels at design flow:	26" differential with a 10" downstream tailwater
Screen Incline from Horizontal:	45 degrees min, 75 degrees max
Screen Motor Horsepower:	As required, minimum 2 HP
Motor Rating:	IP65
Lamella Spacing:	6mm (1/4")
Linkage material:	316 Stainless Steel
Bar Material:	316 Stainless Steel
Minimum Bar Thickness:	2 mm
Operational Environment:	Class I, Div I, Group C & D

B. Washer/Compactor

Maximum cubic feet of screenings per hour, continuous:	35
Volume reduction, min. percent:	75
Minimum Motor Horsepower:	2.0
Obtained solids content, after compaction, min. percent:	35%
Operational Environment:	Class 1, Div. 1
Screenings Wash Water Supply	10 – 25 gpm @ 40 – 60 psig
Dewatering Zone Wash Water Supply	5 – 10 gpm. @ 40 – 60 psig

2.6 STEP SCREEN COMPONENT DESIGN REQUIREMENTS

A. FRAME ASSEMBLY

1. The frame assembly will be of all welded construction suitably braced to resist the loads imposed by the motion of the moving step assembly. The frame will have mounting legs suitable for attaching the step screen to the operating floor. The legs of the frame will be designed to allow the screen to pivot up for maintenance. The frame assembly, including side frames and base plate, will have a minimum thickness of 0.2". The mounting legs will have a minimum thickness of 0.16" 316 stainless steel.

B. SCREEN SURFACE

1. The step screen will consist of a moving step assembly and a stationary step assembly having parallel blades with stepped edges turned towards the flow of water. The meshing of both assemblies will then form a screen surface that will extend the width of the channel and comprise a combined sieve and transport device. The stepped edges on the blades will be inclined to retain the solids resting upon the blades. The moving step assembly will perform a circular movement in relation to the stationary step assembly. The movement will be self-cleaning and will transport collected screenings to the discharge point. Clear horizontal spacing between the stationary and moving step assemblies will be 1/4" (6 mm). The design of the screenings discharge will demonstrate effective release of the screenings and prevent carryover of screenings onto the floor behind the screen.
 - a. Stationary Step Assembly: The stationary step assembly will be supported at the top and bottom along its width by bolt-in-place step cradles. Both step cradles will be bolted to side plates on either side of the frame, which contain the blade assemblies. Each blade will be accurately cut from type stainless steel. Each stationary blade will have replaceable plastic or stainless steel spacers at the toe end and discharge end and along the length to maintain spacing between the stationary and moving step assemblies to prevent metal-to-metal contact during operation and to resist grit wear.
 - b. Moving Step Assembly: Bolt-in-place step cradles will support the moving step assembly. Each blade will be accurately cut from type stainless steel. A saw tooth or half-moon shaped pattern will be at the toe end of each moving blade. The step cradles will allow for proper alignment and interfacing of the moving step assembly with the stationary step assembly. The moving blades will be designed to convey the solids to the point of discharge.
 - c. Step Cradle: Each step cradle will be slotted to maintain spacing of the step assemblies. A neoprene or equal wedge will clamp the blades within the step cradle to positively lock the blades in place. Blades will be capable of removal from each respective assembly without total disassembly of the screen.
 - d. Side Seals: Neoprene side seals will be bolted to the front vertical side plates of the frame to direct flow to the screen surface. Side seals shall be designed so that under maximum upstream head conditions the seals cannot be compromised, allowing unscreened raw wastewater to pass.

- e. Covers: The step screen unit will be equipped with stainless steel safety/odor control covers. The covers will enclose the reducer and home position switch and terminate at or just below the top of the channel. The covers will have a minimum thickness of 0.06". Attachment hardware shall consist of flush mounted, quarter turn latches.
- f. Grit Flap or Directing Plate: A double acting grit flap or directing plate will be located at the toe of the screen. The grit flap or directing plate will be designed to prevent grit build-up or allow obstructions up to 4" in diameter to accumulate at the toe. The grit flap or directing plate shall direct heavier material such as grit and gravel, onto the top shelf of the bottom row of steps on the lamellas to prevent a build up of material in front of the screen. The grit flap or directing plate shall be removable and shall not interfere with the pivoting action of the screen.
- g. Hydraulic flushing assemblies will not be acceptable

C. DRIVE SYSTEM

- 1. The step screen drive system will consist of a motor, gear reducer, transmission shafts, sprockets, bearings, and drive chains over torque overload protection
 - a. Motor: The step screen motor shall be a synchronous maximum of 1,800 rpm, 3 phase, 60 Hz, 460 V, 1.15 S.F. unit with a minimum horsepower of 2.0. The motor will be a TEFC NEMA Design B with Class B insulation and temperature rise. The motor shall be certified for use in all Class 1, Division 1, Groups C and D installations.
 - b. Reducer: The reducer will be a shaft mounted helical worm type as manufactured by Nord, Eurodrive, Flender or equal.
 - c. Transmission Shafts: The drive shaft will be inserted through the hollow shaft reducer and attached to a sprocket on either side of the frame. The idler shaft will be inserted through a spacer tube and attached to a sprocket on either side of the frame. Each shaft will be suitably machined for the mounting of the sprockets.

D. ANCHOR BOLTS

- 1. The screen manufacturer will furnish four (4) 1/2-inch-13UNC by 5-1/2 inches long stainless steel expansion anchor bolts per screen.

E. FINISHES

- 1. The screen will be fabricated from passivated or electro-polished type 316 stainless steel with the exception of the motor, reducer, bearings, chains, and sprockets, which will be standard manufacturer's finish. The sprockets, bearings and drive shaft will be epoxy painted carbon steel. The motor and gear reducer shall be painted the same color.

F. ELECTRICAL DEVICES AND CONTROLS

- 1. Electrical Devices: In addition to the drive motor, the following electrical devices will be furnished per unit.

Overload Protection is provided by Emotron True Power Monitors supplied in the the control panel as recommended for step screens of this design - specific setup and instructions are provided in this submittal and O&M Manuals



- a. Emergency stop/local push button station. A NEMA 4X, explosion proof, emergency stop push button will be mounted to the support stand and will have a 1/2 inch NPT conduit connection.
 - b. Torque Overload Protection: The screen will be equipped with a limit switch to detect any torque overload conditions. The limit switch will sense movement of the gearmotor. The switch will be suitable for 115 V AC, single-phase current. Additionally, an over-current sensor will be provided to detect high motor amperage due to excessive loads.
 - c. Home Position Proximity Switch: After each initiation of the screen, the screen will continue to rotate until the home position limit switch stops the screen in the reset position. The switch will be suitable for 115 V AC, single-phase current.
 - d. Float Level Switch: One (1) float level switch that will sense upstream water level will be provided.
2. Controls (typical of two):
- a. As indicated in the drawings and specified herein provide NEMA 4X, Stainless Steel, 230/460 V control panels in enclosure suitable for field mounting. Panel shall be compliant with the requirements of Division 16 and shall contain the following devices for proper operation of the equipment:
 - 1) Process controller complete with LCD operator interface panel providing field settable/adjustable/access to process parameters.
 - 2) Emergency Stop pushbutton.
 - 3) Hand-Off-Auto selector switch for the screen and compactor.
 - 4) Control power and run indicating lights.
 - 5) Motor current monitor and hour meter (PLC Function)
 - 6) Overload Alarm
 - 7) Fault fault reset push button.
 - 8) Screen Torque over load indication light.
 - 9) Screen Motor overload light.
 - 10) Additional components as required for the Washer/Compactor as specified herein.
 - b. Sequence Of Operation:

- 1) Hand Operation: When HAND mode is selected, the unit will run continuously. Placing the selector switch in the off position will stop the screen when the moving blade returns to the home position.
- 2) Automatic Operation: When the AUTO mode is selected, the unit will run via timer and/or the water level sensor until the level falls below the start level. Upon loss of high level, the moving blades will continue to rotate until the home position is reached.
- 3) Fault Conditions: A motor O.L. or a high motor torque condition will stop the motor and indicate a fault by respective indicating lights.
- 4) The washer/compactor shall be energized in tandem with its associated screen as indicated herein.

2.7 SCREENINGS WASHER/COMPACTOR COMPONENT DESIGN REQUIREMENTS

A. GENERAL DESIGN REQUIREMENTS

1. The screenings washer/compactor system shall be designed to wash, compress and transport screenings from the bar screens to the screenings bin. The equipment shall be of the latest design and shall be fabricated of materials and in a fashion that will fully perform the functions described below.
2. Wet screening shall enter the screenings washer through an enclosed connecting chute from the discharge of the screen. The screened solids shall be washed and agitated to liquefy fecal matter and to facilitate its return to the influent channel. The connecting chute between the screen and the screenings washer shall provide a completely closed system to protect operating personnel from exposure to wastes.
3. Wet screenings with a minimum dry solids content of 5–10 percent shall enter the washer/compactor through the inlet trough. Excess liquid shall exit through the perforated drainage holes. Drainage of free flowing liquid shall be provided through the integral overflow outlet located beneath the trough. The rolling action provided by the Archimedean screw and the spray header shall provide additional cleaning of the screenings before the compaction stage and an integral wiper attached to the screw shall continuously clean the trough perforations. The screw shall transport all collected washed, compacted screenings into the discharge pipe for conveyance to the drop off point.

B. MATERIALS OF CONSTRUCTION

1. Inlet hopper: 316 stainless steel.
2. Inlet and outlet flanges: 316 stainless steel.
3. Housing and supports: 316 stainless steel.
4. Discharge pipe: 316 stainless steel

5. Screw: High tensile, abrasion resistant steel, minimum Brinnell hardness of 200 with Hardox reinforcement of the last flight.
6. Anti-rotation/wear bars: High tensile, abrasion resistant steel, minimum Brinnell hardness of 200
7. All fastener hardware shall be 316 stainless steel.

C. WASHER/COMPACTOR

1. Inlet Hopper
 - a. Each washer/compactor shall be equipped with an inlet hopper to receive screenings directly from a mechanical screen as shown on the Drawings.
 - b. The hopper shall be flanged, gasketed, and bolted to the washer/compactor housing to provide a watertight connection.
 - c. The hopper shall be equipped with a stainless steel spray bar with nozzles to provide wash water to the walls of the inlet hopper and trough. The spray bar shall include a ball valve to regulate the wash water flow from the wash zone solenoid valve.
2. Screw Housing
 - a. The screw housing and associated components shall be constructed of 316 stainless steel. The outlet flange shall incorporate a pipe bolt pattern for connection to the discharge pipe.
 - b. The compaction section shall incorporate a dewatering zone to allow the removal of the filtrate during compaction. Wash water inlets shall be provided on the top of the washing zone and on the top of the dewatering zone for automatic periodic flushing.
 - c. To prevent wear, the washing zone and compaction zone shall be fitted with a minimum of four (4) anti-rotation/wear bars to provide the washboard/friction contact points for the screenings and to prevent screw contact with the cylindrical wall. Each anti-rotation/wear bar shall be secured to the cylindrical housing with M10-316 stainless steel hex head cap screws and shall be replaceable without removing the screw from the compactor. Each anti-rotation/wear bar shall be made from High tensile, abrasion resistant steel, with a minimum Brinnell hardness of 200.
 - d. The removable cover for the dewatering section shall be held in place by a latching system to allow easy removal. A resilient seal shall be mounted to the cover to form a watertight seal with the screw housing. Designs where the cover is not removable are not acceptable.

- e. The bottom of the housing below the inlet hopper shall contain a 316 stainless steel perforated section for drainage. The perforated section shall have 5 mm round openings on staggered centers. Slotted holes or wedge wire sections in the drainage area are not acceptable as an alternate.
- f. The washing/compaction zone shall include 5 mm diameter perforations on staggered centers to drain the excess wash water and filtrate water pressed from the screenings to the drain pan. Slotted holes or wedge wire sections in the washing/compaction zone are not acceptable as an alternate.
- g. A drain pan shall be mounted to the bottom of the screw housing along the full length of the housing. The drain pan shall incorporate a minimum 2-1/2" plain ended drain pipe located beneath the trough at the drive end of the housing to return the wash water and liquefied fecal matter to the influent channel.

3. Wash Water System

- a. A minimum of two spray systems shall be provided; one for cleaning the screenings and one for flushing the dewatering section. Each spray wash system shall be furnished with a control solenoid valve, flow adjustment ball valve, stainless steel piping and fittings. Piping, fittings and valves shall be 1/2-inch diameter, minimum. A plant water strainer shall be provided for the incoming plant water supply. The wash water flow and minimum pressure requirements shall be as noted in Table 2.3 B.
- b. The screenings wash system shall be provided to continuously clean the screenings during operation. Wash water will be introduced into washing zone to dissolve and remove organic material.
- c. The dewatering chamber flush water system shall periodically clean the compaction and dewatering zone via a stainless steel flush water header located in the compaction/dewatering chamber. The header design shall be oriented to completely wash the full surface of the dewatering zone drainage area.
- d. Solenoid valves shall be 1/2-inch, minimum, bronze body suitable for 120 VAC operation with an explosion-proof rating. Solenoid valves shall be normally closed and rated for up to 100 psig. Solenoid valves shall be slow close type to minimize water hammer.
- e. Ball valves shall be 1/2-inch, minimum, bronze body with stainless steel ball and stem and Teflon seats.
- f. A bronze body Y-strainer with replaceable stainless steel internals shall be provided for the incoming plant water supply.

WesTech has found that because slow closing valves are designed to operate based on a pressure differential across the valve, these types do not always work properly with our system and we recommend supplying a water hammer arrestor to address this concern



4. Screw

- a. The screw shall be constructed of high strength low alloy steel and it shall have a minimum outside diameter of 7 inches. Shafted or shaftless conveyors shall be acceptable.
- b. The flights shall be cold formed from alloy steel. After fabrication the screw shall be precision machined to ensure that it is concentric along its length. The distance between the flights shall be arranged to allow transportation into the washing zone and compaction in the dewatering zone.
- c. A stainless steel reinforced wiper shall be attached to the solid shaft screw in the drainage area to help prevent debris from blinding the drain.

5. Thrust Bearing

- a. An independent thrust bearing shall be mounted between the drive and the washer/compactor body to fully support the screw and handle the load created during compaction and reversal of the screw.
- b. The thrust bearing shall have a substantial fabricated stainless steel housing and shall utilize tapered roller bearings located between two double lip seals. The screw will be cantilevered off of the thrust bearing to prevent the screw from resting inside the screw housing.
- c. Units submitted without an axial thrust bearing to fully support the cantilevered screw will not be accepted.

6. Support Structures

- a. The support legs shall be integral to the main body of the unit and shall be made of 316 stainless steel.

7. Discharge Pipe

- a. For each conveyor the discharge pipe shall be mounted to the pipe flange on the washer/compactor body and designed to transport the washed, dewatered and compacted screenings to the drop chute. The discharge pipe shall be constructed of minimum schedule 10, 316 stainless steel pipe and shall be of the configuration as shown on the Contract Drawings.
- b. The discharge pipes shall have a minimum inside diameter of 8 inches and expand to a minimum of 12 inches.

8. Discharge Drop Chute

WesTech supplied Screw Wash Press has an axial thrust bearing that is greaseable located in the output shaft housing. Item 18 of the reducer exploded view.



Addendum 5, replace references to 316 stainless steel to read 304 stainless steel



Addendum 5, replace references to 316 stainless steel to read 304 stainless steel



- a. For each conveyor, a drop chute as indicated in the drawings shall accept discharge from the discharge pipe to transport the washed, dewatered and compacted screenings to the appropriate receiving device. The drop chute shall include a head box, drop tube and chute supports as indicated in the drawings or required to provide a complete and functional system for each unit.
 - b. The drop chute head box shall be constructed of minimum schedule 10, 316 stainless steel pipe and shall be of the configuration as shown on the Contract Drawings with external angle reinforcing to provide a suitable transition from the discharge pipe to the drop chute.
 - c. The head box shall include a hinged lid with quarter turn t-handle lock to provide direct drop chute access from above.
 - d. The drop tube shall be of FRP construction and shall have a minimum inside diameter of 14 inches. It shall be of adequate thickness and reinforcing with adequate wall supports to withstand design wind speeds as indicated by Drawing S-001
 - e. The FRP drop chute shall be supplied with an “endless” bagging device to contain and encase dewatered screenings.
 - f. The entire chute assembly shall be self-supporting so that it may be disassembled from the discharge pipe and unsupported from the bottom.
 - g. The FRP drop chutes shall be designed with sufficient length so that the bagged screenings are directly deposited into the dumpster without possibility of screenings deposition outside of the designated dumpster location, with or without the use of a screenings bagger.
 - h. The screenings bagger shall be designed to be fitted with replaceable magazine of plastic hose, minimum 20” in diameter by 200’ in length, 1.5mm thick.
9. Drive Assembly
- a. The washer/compactor shall be complete with an integrated drive assembly consisting of a Class 1, Division 1, Group D, explosion-proof electric reversing motor close-coupled to a gear reducer.
 - b. The motor shall be a minimum 2.0 horsepower, 460 volt, 3 phase, 60 Hertz with a service factor of 1.15. The motors shall be rated at 40°C ambient with Class F insulation and shall have a Class B temperature rise at full load. The nominal motor speed shall be 1800 rpm.
 - c. The gear reducer shall be a parallel helical gear reducer. The reducer shall have a cast iron housing with a minimum service factor of 1.2.

- d. Gear reducers shall have ball or roller bearings throughout with all moving parts immersed in oil. Gears shall be of alloy steel with threads precision ground and polished after casehardening. Shafts shall be of high strength alloy steel ground to required tolerances.

D. ANCHOR BOLTS

1. Furnish all anchor bolts of ample size and strength required to securely anchor each item of equipment.
2. Material: 316 stainless steel unless noted otherwise.
3. Anchor bolts shall be set by the Contractor. Equipment shall be placed on the foundations, leveled, shimmed, bolted down, and grouted with a non-shrinking grout.

E. CONTROLS AND INSTRUMENTATION

1. GENERAL
 - a. Provide all controls necessary for the fully automatic operation of the washer/compactor as an integral component of the associated screen control panel with a local pushbutton panel as indicated in the drawings.
 - b. The washer/compactor shall be cycled on and off by control signals from the main control panel. The washer/compactor shall be started by a screen cycle counter generated from the bar screen.
2. Control Panel: Each screen control panel shall, in addition to the components necessary for the screen control , include the following items:
 - a. Washer/Compactor Reversing starter.
 - b. Compactor running forward and running reverse pilot lights.
 - c. Compactor Fail pilot light.
 - d. Compactor Over Torque pilot light
3. Local Control Station: Each compactor shall be furnished with a local control station in a NEMA 7 enclosure suitable for mounting as shown on the Drawings. It shall contain the following items:
 - a. Compactor hand-off-auto switch.
 - b. Compactor forward-off-reverse switch.
 - c. Screenings wash system hand-off-auto switch.

d. Dewatering wash system hand-off-auto switch.

e. Mushroom head E-Stop pushbutton

F. OPERATION

1. Washer/compactor Hand Operation: When the control station HOA selector switch is in the Hand position, the washer/compactor will run continuously. Turning the HOA selector switch to Off will stop the unit.
2. Washer/compactor Automatic Operation: When the washer/compactor selector switch is in the Auto position, the washer/compactor will cycle on after an adjustable time delay when a start signal is received from the screen. The screenings wash water will turn on and the screw shall run in an on/off cycle. The washer compactor shall continue operate after the screen is deactivated in accordance with an adjustable Off delay timer.
3. Screenings Wash System Hand Operation: When the screenings wash selector switch is in the Hand position, the spray wash will run continuously. Turning the selector switch to Off will stop the spray wash.
4. Screenings Wash System Auto Operation: When the screenings wash selector switch is in the Auto position, the spray wash will run whenever the washer/compactor is running.
5. Dewatering Zone Wash Hand Operation: When the dewatering chamber spray selector switch is in the Hand position, the spray wash will run continuously. Turning the selector switch to Off will stop the spray wash.
6. Dewatering Zone Wash Auto Operation: When the dewatering chamber spray selector switch is in the Auto position, the spray wash will cycle on and off per the settings of the spray wash repeat cycle timer when the washer/compactor is running.

G. SAFETY FEATURES

1. When a jam condition occurs in the Auto mode the controller shall stop the motor and activate the Clearing mode. Once the clearing mode is activated the washer/compactor will operate in reverse for a short duration then revert back to normal operation. If the washer compactor is unable to clear the jam after several attempts, the compactor Fail alarm will activate and lock out the washer/compactor.
2. If the washer/compactor experiences an over torque condition during reverse operation of a Clearing mode, the fail alarm will activate, and shut down the washer/compactor.
3. If a power failure occurs while the washer/compactor is running, operation shall resume when power is restored.
4. If a power failure occurs while the washer/compactor is in a fail condition, the fail indicator shall reactivate when power is restored.
5. Control reset shall be from the main control panel only.

H. SPARE PARTS

Automatic jam reversal is not part of the SWP logic. Controls do have manual control reversing provision. WesTech's position on these units is, it is safer to check for the obstruction and then reverse if needed to clear a jam.



1. The following spare parts shall be provided:
 - a. One (1) Wiper assembly with hardware
 - b. One (1) Set of Anti rotation/wear bars with hardware

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Contractor shall verify all dimensions in the field to ensure compliance of equipment dimensions with the drawings. Contractor shall notify Engineer of significant deviations.
- B. Installation of the equipment shall be in strict accordance with the contract documents and the manufacturer's instructions and shop drawings. CONTRACTOR shall supply anchor bolts for the equipment. CONTRACTOR shall install the anchor bolts in accordance with the manufacturer's recommendations
- C. CONTRACTOR shall furnish the services of a factory-trained Service Engineer for one trip including three (3) days to inspect the installation, observe start up, and provide operator training.
 1. Equipment shall not be energized, or "bumped" to check the electrical connection for motor rotation without the Service Engineer present.
 2. The Service Engineer shall make all necessary adjustments and settings to the controls. In particular, Service Engineer shall verify the measurement relay setting and the initial high water level setting for the step screen.
 3. The Service Engineer shall demonstrate proper and sequential operation of step screen and screenings washer. The step screen shall operate automatically based on the water level. The screenings washer shall operate automatically after a certain number of screen cycles, the number being determined by the Service Engineer.

3.2 OPERATING INSTRUCTIONS:

- A. Start-Up: Provide one (1) day of Start-up and O&M hands-on training and system optimization to Owner and Engineer on the day of system/equipment start-up and on-line operation.
- B. CONTRACTOR shall furnish the services of factory-trained Service Engineers for the screens and washers for one trip including two (2) days to inspect the installation, observe start up, and provide operator training.
 1. Equipment shall not be energized, or "bumped" to check the electrical connection for motor rotation without the Service Engineers present.
 2. The Service Engineers shall make all necessary adjustments and settings to the controls.

3. The Service Engineers shall demonstrate proper and sequential operation of equipment. The equipment shall operate automatically as per the manufacturer's recommendations.
4. Service Engineers shall provide classroom and/or field training on the Operation and Maintenance of the equipment to operator personnel. These instructions may include the use of slides, videos, literature, and/or oral presentations.

3.3 FIELD QUALITY CONTROL

A. Field Testing:

1. After the installation of the equipment, controls and appurtenances, and when construction of other units of the installation will permit, each complete system shall be subject to field tests as specified herein under actual operating conditions.
2. Conduct field tests under the direct supervision of the original unit suppliers, and in the presence of, and as directed by, Engineer.
3. Field tests to check each system for the following:
 - a) Has not been damaged by transportation or installation.
 - b) Has been properly installed.
 - c) Has no mechanical defects and is in proper alignment.
 - d) Has been properly connected.
 - e) Is free of overheating of any parts or any objectionable vibration or noise.
 - f) Is free of overloading of any parts.
 - g) Operates in accordance with manufacture's recommendations

END OF SECTION 11330

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SCOPE OF SUPPLY

Reference Engineer's Specification

Section: 11330 Mechanical Fine Screen and Screenings Washer

Addenda: 1, 2, 3, 4, 5, 6

Each unit furnished complete by WesTech with the following components:

One (1) CleanFlo™ Rotoscreen® DS, Model No. RSDS25-80-6

Basis of Design

- Refer to General Arrangement drawing - Process Information for details.

Fine Screen

- Frame constructed from type 316 stainless steel.
- Spring loaded, self-relieving grit flap from type 316 stainless steel directs material onto first step profile preventing material from passing under the screen.
- Movable and stationary lamella blades 3mm thick with step profile from Duplex stainless steel. All blades shall be supplied with serrations on the downstream side. Movable lamella blades are supplied with a saw-tooth pattern at their base. Stationary lamella blades are supplied with UHMW caps at the top and bottom of the plate, and intermittent spacers to maintain the filtration spacing between adjacent plates.
- Drive unit with 3 HP motor suitable for 460/3/60 electrical supply. The motor will be suitable for a Class 1, Division 1, and Group C & D location.
- Drive transmission system without the use of submerged bearings or chain and sprocket systems.
- Screen enclosures above the top of channel from type 316 stainless steel.
- Mechanical shaft mounted backstop (if required).
- Central lubrication system routes lubrication lines from drive shaft bearings to a common point on each side of the screen.
- Legs from type 316 stainless steel are supplied to support the fine screen unit above the top of channel elevation. Supports shall allow the screen to be pivoted from the channel.

Hardware

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

Controls and Electrical Devices

- One (1) NEMA 4X 316 stainless steel wall mount powder coated main control panel suitable for 480/3/60 electrical supply.
- One (1) NEMA 7 Local control station containing an Emergency stop pushbutton.
- One (1) NAMUR home position switch mounted at the screen drive assembly.
- One (1) Milltronics HydroRanger 200 ultrasonic level controller supplied in a windowed NEMA 4X polycarbonate enclosure including handheld programmer. Installed near screen control panel.
- One (1) Milltronics ultrasonic level transducer with type 316 stainless steel mounting bracket and integral 10 m cable. Suitable for installation in a Class 1, Division 1, Group C&D location.
- One (1) mercury-free type float switch with stainless steel mounting bracket.
- Please provide IP addresses for the PLC and OIU
- Dry contacts have been provided for monitoring equipment running and common fault status. See sheet 9 of 11 of controls drawing Network Communication.

Spare Parts

- None

One (1) CleanWash™ Screw Wash Press, Model No. SWP20-80**Basis of Design**

- Refer to General Arrangement drawing - Process Information for details.

Screenings Washer

- Washer body constructed from type 316 stainless steel.
- Inlet, washing and compaction zones provided with 5mm countersunk perforations to provide maximum drainage.
- Removable access panels allow for inspection and maintenance.
- Screw constructed from high strength carbon steel with protective primer coating.
- UHMW scrapers at the inlet/washing zone transition.
- Replaceable Hardox wear strips in the dewatering zone.
- High intensity spray wash system.
- Drive unit with 5 HP TEFC motor suitable for 460/3/60 electrical supply, Class 1, Division 1, Group C & D.
- Inlet hopper from type 316 stainless steel.
- Two (2) 1/2" brass body ball valves.
- One (1) 1" bronze body Y-strainer.

Discharge Pipe

- Discharge pipe extension constructed from type 304 stainless steel.
- Discharge pipe head-box with hinged access cover from type 304 stainless steel.
- Drop chute from FRP with wall supports from type 304 stainless steel.
- Continuous bagger assembly to collect dewatered screenings at discharge with refillable bag cassette.

Hardware

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

Controls and Electrical Devices

- Control devices will be added to the screen control panel for operation of the screenings washer unit.
- One (1) NEMA 7 local control station.
- Two (2) NEMA 7 120V bronze body solenoid valves to control water spray functions.

SPARE PARTS

- One (1) wiper assembly with hardware.
- One (1) set of wear bars with hardware.

3 MANUFACTURER INFORMATION

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One Year 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.

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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

Landex™ 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
Suction Pipe
solids CONTACT CLARIFIER™
Conventional Scraper Blade
RapiSand™ Ballasted Flocculation
Zickert Shark™

Combined Sewer Overflow

ROMAG CSO Screens
WWETCO FlexFilter™
WWETCO FlexFlo™ Control Valve

Dissolved Air Flotation

Pretreatment Clarifiers
Sludge Thickeners
Rectangular & Circular
Algae Removal

Electrical Controls

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

Filters

SuperSand™ Continuous Backwash Filter
SuperDisc™ Cloth Media Disc Filter
WWETCO FlexFilter™
CenTROL® LP Cluster Filter
MULTIWASH® Filtration Process
Trident® Package Plant

Headworks

CleanFlo™ Rotoscreen®
CleanFlo™ Monoscreen®
CleanFlo™ ALL-IN-ONE (Complete Plant)
CleanFlo™ Element Continuous Belt Screen
CleanFlo™ Shear (Internally Fed Drum Screen)
CleanFlo™ Spiral Screen (Inclined and Vertical)
CleanWash™ Screenings Washer / Compactor
Counter Pressure Screw
CleanGrit™ Grit Washers
Gritt Mitt™ Grit Classifiers
Vortex Grit Separators
Zickert Shark™ Grit and Grease Removal

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
Zickert Skimmer

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
DAF Thickening

WesTech Municipal Water Products

Aeration

Cascade Aerator
Forced Draft Aerator
Induced Draft Aerator
ATOMERATOR™

Sedimentation/Clarification

Conventional Clarifier
solids CONTACT CLARIFIER™
CONTRAFLO® Solids Contact Clarifier
CONTRAFAST® High Rate Clarifier/Thickener
SuperSettler™ Inclined Plate Settler
Zickert Shark™ Sludge Removal
Adsorption Clarifier®
Trident® HSC Multi-Barrier Clarifier
Tricon™ Adsorption Clarifier/Filter
SPIRACONE™ Clarifier
Sludge Sucker™ Sludge Siphon Clarifier
Flocculating Clarifier
RapiSand™ Ballasted Flocculation

Filtration

AERALATOR® Iron and Manganese Removal Plant
AltaFilter™ Ultrafiltration Membrane System
AltaPac™ Ultrafiltration Membrane System
Circular and Rectangular Open Top Gravity Filter
Multi-Tech™ Multiple Barrier Filtration System
Vertical Pressure Filter MULTICELL® Horizontal
Pressure Filter
ANTHRA/SAND™ Manganese Removal Media
CentROL® LP Cluster Filter
ESSD™ Filter Trough
MULTIWASH® Filtration Process
MULTIBLOCK® Underdrain
MULTICRETE™ II Underdrain
Multi-Tech™ Multiple Barrier Filtration System

Residuals Handling

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

Softening

solids CONTACT CLARIFIER™
CONTRAFLO® Solids Contact Clarifier
CONTRAFAST® High Rate Clarifier/Thickener
Cation Exchange Softener

Flocculation

Horizontal Paddle Wheel Flocculator
Vertical Paddle Wheel Flocculator

Package Treatment Plants

AltaFilter™ Ultrafiltration Membrane System
AltaPac™ Ultrafiltration Membrane System
ClariCell™ Package Conventional Treatment Plant
Tri-Mite™ & Trident® Package Plant
Trident® HS Package Plant
Water Boy™ & Aquarius™ Package Plant
Adsorption Clarifier®

Adsorption

Cation Exchange Softener
Granular Activated Carbon (GAC) Contactor
Adsorption Clarifier®

Tankage

Anchor Channel Tank
Flat Bottom Tank
Elevated Tank

Covers

Zickert Retractable Membrane Cover

Services

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

Electrical Controls

PLC Based Control System
UL Listed Panels (UL508A/CSA)

WesTech Industrial

Mining and Metallurgical Products

Clarifiers

Buoyant Media Clarifier
Flocculating Clarifier
Metallurgical Contact Clarifier
RapiSand™ Ballasted Flocculation
Solids CONTACT CLARIFIER™
CONTRAFast® High Rate Clarifier/Thickener
SuperSettler™ Inclined Plate Settler

Clarifier / Thickener Drives

Bridge Supported Shaft Drive
Column Supported Cage Drive
Replacement Options for All Manufacturers
Traction Drive

Granular Media Filtration

MULTICELL® Horizontal Pressure Filter
Vertical Pressure Filter
Circular & Rectangular Top Gravity Filter
Multi-Tech™ Multiple Barrier Filtration System
SuperSand™ Continuous Backwash Filter
WWETCO FlexFilter™
CentROL® LP Cluster Filter
MULTIWASH® Filtration Process

Magnetic Separators

Permanent Magnet Belt Separator

Man Camp Potable Water Treatment

AltaFilter™ Ultrafiltration Membrane System
AltaPac™ Ultrafiltration Package System
Tri-Mite™ & Trident® Package Plant
Water Boy™ & Aquarius™ Package Plant

Man Camp Wastewater Treatment

BioTreater
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 / Audits
Operator Training
Process Training
Regional Service Technicians

Screens

CIP / CIL Media Retention Screen
Linear Screen
Screw Classifiers

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
TOP™ Thickener Package

Vacuum Filters

Disc Filter
Horizontal Belt Filter
Precoat Drum Filter
Rotary Drum Filter
Belt Discharge
Roll Discharge
Scraper Discharge

WesTech Industrial

Water and Wastewater Products

Aeration

Cascade Aerator
Forced / Induced Draft Aerator

Barrier / Media Filtration

Iron / Manganese Removal
AltaFilter™ Ultrafiltration Membrane Systems
AltaPac™ Ultrafiltration Package Systems
Tri-Mite™ & Trident® Package Treatment
CentROL® LP Cluster Filter
Circular or Rectangular Top Gravity Filter
Pressure Filter (Vertical or Horizontal)
Reverse Osmosis Systems
SuperSand™ Continuous Backwash Filter
WWETCO FlexFilter™
Trident® HS Package Plant
Water Boy™ & Aquarius™ Package Plant
Multi-Tech™ Multiple Barrier Filtration System
MULTIWASH® Filtration Process
GAC Contactors
Cation Exchange Softeners

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
STM Aerotor™ IFAS Systems

Clarification / Sedimentation

Backwash Clarifier
Conventional Clarifier
Cooling Tower Slip Stream Treatment
COP™ Clarifier
Draft Tube™ Clarifier
CONTRAFast® High Rate Clarifier/Thickener
Filter Backwash Clarifier
Flocculating Clarifier
Metallurgical Contact Clarifier
Rapisand™ Ballasted Flocculation
Rim Drive Clarifiers
solids CONTACT CLARIFIER™
Suction Header
SuperSettler™ Inclined Plate Settler
Zickert Shark™ Sludge Removal
SPIRACONE™ Clarifier

Clarifier / Thickener Drives

Replacement Options For All Manufacturers
Precision Bearing
Steel Housing

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)

Lab Testing

Bench Scale Feasibility Testing
Field Pilot Testing / Studies
Plant Process Audits

Parts / Field Service / Training

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

Pilot Rental Equipment

AltaFilter™ Ultrafiltration Membrane Systems
AltaFlo™ High Rate Thickener
Buoyant Media Clarifier
High Rate Thickener
Horizontal Belt Filter
Linear Screen
Paste Thickener
Precoat Filter
Reverse Osmosis
solids CONTACT CLARIFIER™
Vacuum Drum Filter
CONTRAFast®
Pressure & Gravity Filter
Trident®, Trident® HS
Forced Draft Aerator

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
Resin Media Retention Screen

Softening

Cation Exchange Softener
Cold Lime Softener
Warm Lime Softener

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
Traction Drive Thickener
TOP™ Thickener Package

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"We Guarantee Peace of Mind!"



ISO 9001:2008 Certification

Certificate US95/0255.00

**The most responsive supplier of products and services
for liquid-solid separation and the treatment of water and wastewater.**

WesTech Engineering, Inc. is certified to the ISO 9001:2008 standard with SGS Systems & Services Certification. SGS is an independent ISO registrar, who conducts regular audits of clients' management processes.

ISO 9001:2008 ensures the consistency of quality practices and requires continuous improvement of WesTech's entire management system. Certification therefore assures customers that:

- 1) WesTech's products and services will consistently meet or exceed an internationally agreed-upon level of quality, and
- 2) Proactive management practices will enable it to anticipate and address customers' future needs, while paying careful attention to existing installations.

Founded in 1973, WesTech has attained preferred-supplier status with an overwhelming majority of its worldwide customers. As a leading innovator in the development of equipment that lowers overall costs by improving efficiency, reliability, and performance, the firm has been approved by virtually all major consultants for their projects.

WesTech is an employee-owned company. Since the Employee Stock Ownership Plan holds a majority of the stock, design and support personnel are naturally committed to the success of their projects and customers. Attitudes, behaviors, and decisions are further shaped by WesTech's six core values, which are:

- | | |
|--|--|
| • Exhibit honesty and integrity | • Take pride in our products |
| • Always do the right thing the first time | • Achieve productivity through hard work |
| • Value our people and their families | • Provide superior service |

The net result of WesTech's continuing ISO certification, combined with its distinctive ownership culture, is that customers can expect to be taken care of by exceptionally responsive associates who consistently deliver superior solutions. The company's stunning multi-year Customer Satisfaction rating of 95% is evidence of the power and effectiveness of this combination.

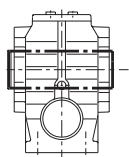
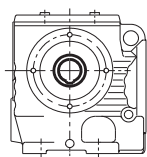
We invite you to learn more about our company, capabilities, and products - and then continually put us to the test. Find out for yourself why we say, "We not only guarantee our equipment, we guarantee peace of mind!"

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4 ACCESSORY EQUIPMENT

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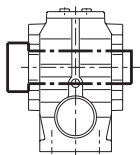
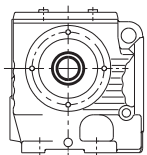
GEAR REDUCER – SCREEN



SA..

Helical-worm gear unit with hollow shaft

02453AXX



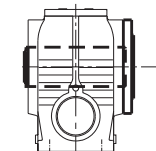
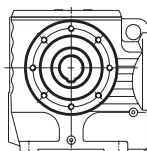
SH..

Helical-worm gear unit with keyless hollow shaft and shrink disk

ST..

Helical-worm gear unit for keyless hollow shaft mounting with the use of interchangeable tapered bushings

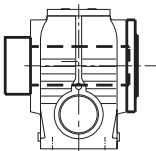
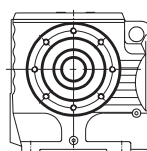
02454AXX



SAZ..

Helical-worm gear unit in B14 flange-mounted version with hollow shaft

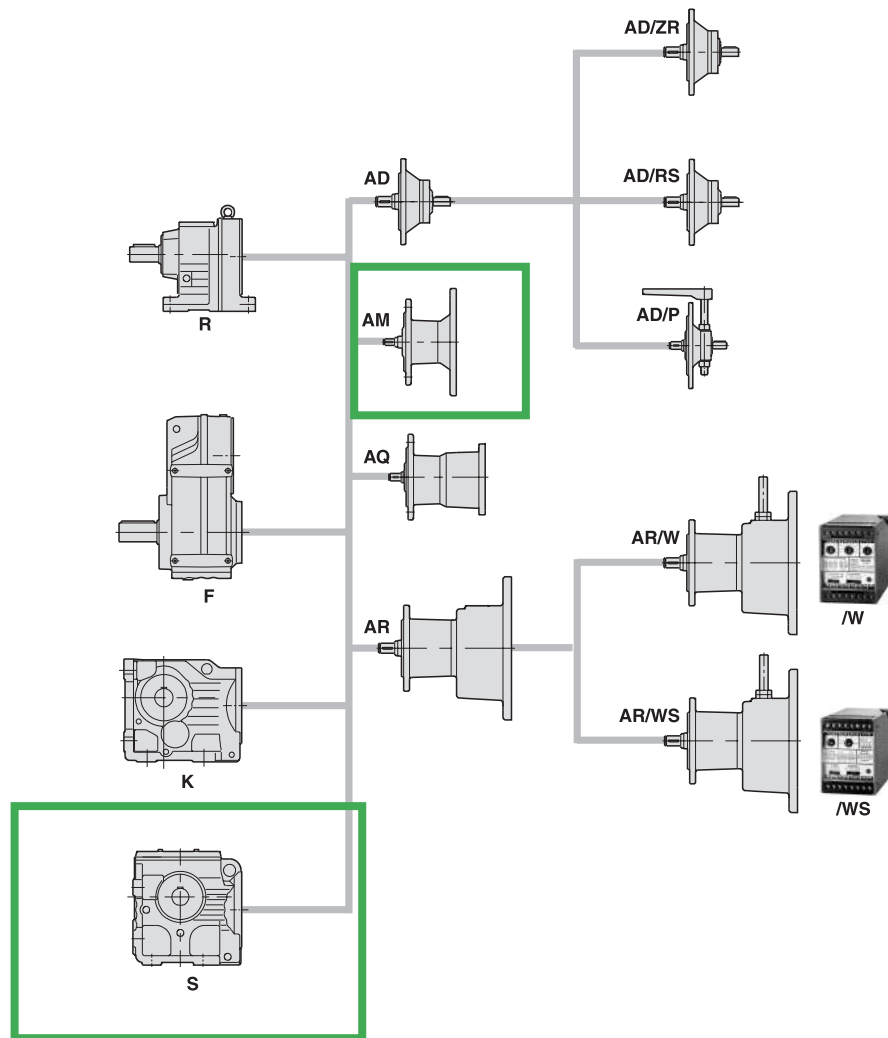
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SHZ..

Helical-worm gear unit in B14 flange-mounted version with hollow shaft and shrink disk

02456AXX

Components on the input side**Overview of components on the input side**

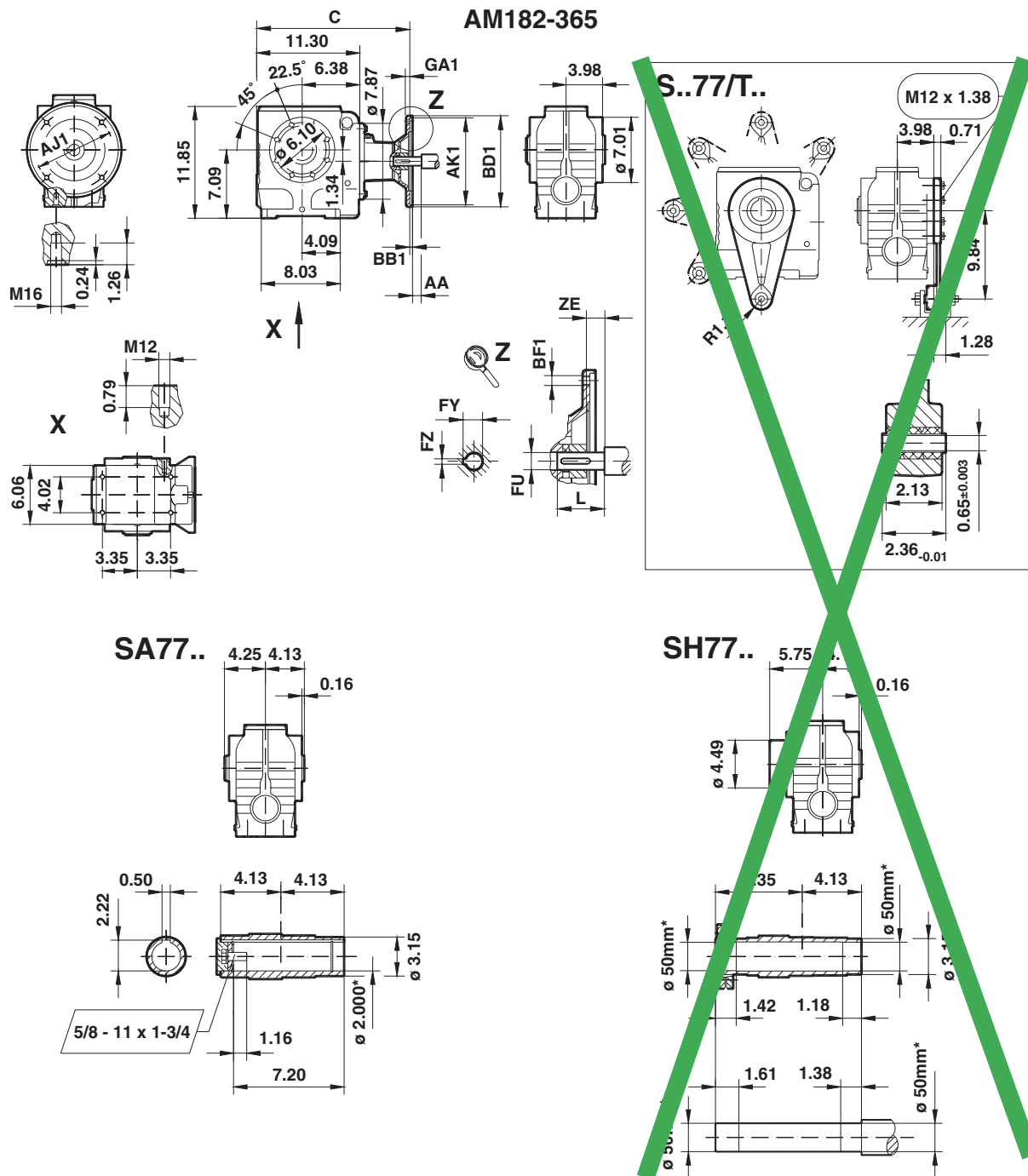
AD	Input Shaft Assembly	AR	Adapter with torque limiting coupling
AD/ZR	Input shaft assembly with centering shoulder	AR/W	Adapter with torque limiting coupling and speed monitoring
AD/RS	Input shaft assembly with backstop	AR/WS¹⁾	Adapter with torque limiting coupling and slip monitor
AD/P	Input shaft assembly with motor mounting platform	/W	Speed monitor
AM	Adapter for mounting IEC/NEMA motors	/WS	Slip monitor
AQ	Adapter for mounting servomotors		

¹⁾ Only in conjunction with VARIGEAR® variable speed gear unit

S77						AM56			AM143			AM145		
Ratio <i>i</i>	Output Speed <i>n</i> _a rpm	Input Power <i>P</i> _{emax} HP	Output Torque <i>T</i> _{amax} lb-in	Stages		Input Power <i>P</i> _e HP	Output Torque <i>T</i> _a lb-in	Output OHL <i>F</i> _{Ra} lb	Input Power <i>P</i> _e HP	Output Torque <i>T</i> _a lb-in	Output OHL <i>F</i> _{Ra} lb	Input Power <i>P</i> _e HP	Output Torque <i>T</i> _a lb-in	Output OHL <i>F</i> _{Ra} lb
256.47	6.80	1.86	11200	2	-	0.75	4160	3600	1	5750	3490	-	-	-
225.26	7.80	2.13	11200	2	-	0.75	3630	3600	1	5040	3560	2	10600	2770
214.00	8.20	2.26	11200	2	-	0.75	3450	3600	1	4780	3580	2	10100	2880
189.09	9.20	2.39	11000	2	-	0.75	3010	3600	1	4250	3600	2	9030	3080
161.60	11	2.79	10800	2	-	0.75	2520	3600	1	3580	3600	2	7700	3260
148.15	12	2.93	10600	2	-	0.75	2300	3600	1	3270	3600	2	7080	3350
130.00	13	3.19	10400	2	-	0.75	1990	3600	1	2830	3600	2	6240	3440
123.20	14	3.33	10200	2	-	0.75	1860	3600	1	2660	3600	2	5890	3490
107.83	16	3.59	9820	2	-	0.75	1580	3600	1	2300	3600	2	5130	3560
97.14	18	3.99	9650	2	-	-	-	-	1	2040	3600	2	4650	3470
85.22	21	4.26	9290	2	-	-	-	-	1	1760	3600	2	4070	3350
75.09	23	4.26	9740	2	-	0.75	1500	3470	1	2080	3380	2	4380	3080
71.33	25	4.52	9740	2	-	0.75	1420	3400	1	1990	3330	2	4160	3060
66.67	26	5.05	8580	2	-	-	-	-	-	-	-	2	3140	3170
63.03	28	5.05	9740	2	-	0.75	1240	3290	1	1730	3220	2	3670	2970
56.92	31	5.45	8140	2	-	-	-	-	-	-	-	2	2660	3040
53.87	32	5.99	9740	2	-	0.75	1040	3130	1	1460	3080	2	3140	2860
49.38	35	6.38	9740	2	-	0.75	930	3060	1	1320	3020	2	2880	2810
43.33	40	7.32	9740	2	-	0.75	795	2950	1	1140	2900	2	2520	2720
41.07	43	7.71	9740	2	-	0.75	745	2880	1	1070	2860	2	2350	2680
35.94	49	8.38	9380	2	-	0.75	630	2770	1	920	2750	2	2040	2590
32.38	54	9.18	9200	2	-	-	-	-	1	810	2660	2	1860	2520
28.41	62	9.84	8760	2	-	-	-	-	1	700	2540	2	1600	2430
25.07	70	10.77	8500	2	-	-	-	-	-	-	-	2	1400	2360
22.89	76	8.38	6240	2	-	0.75	460	2360	1	655	2340	2	1410	2200
20.99	83	9.18	6240	2	-	0.75	415	2320	1	595	2270	2	1280	2150
18.42	95	10.51	6280	2	-	0.75	355	2220	1	515	2190	2	1120	2080
17.45	100	11.04	6280	2	-	0.75	335	2180	1	480	2160	2	1060	2050
15.28	115	12.77	6370	2	-	0.75	285	2100	1	405	2070	2	920	1980
13.76	127	14.10	6370	2	-	-	-	-	1	365	2010	2	820	1930
12.07	145	16.09	6420	2	-	-	-	-	1	310	1930	2	715	1860
10.65	164	18.22	6420	2	-	-	-	-	-	-	-	2	620	1790
9.44	185	18.62	5800	2	-	-	-	-	-	-	-	2	550	1730
8.06	217	19.02	5090	2	-	-	-	-	-	-	-	2	460	1650

S77						AM182			AM184			AM213			AM215		
Ratio <i>i</i>	Output Speed <i>n</i> _a rpm	Input Power <i>P</i> _{emax} HP	Output Torque <i>T</i> _{amax} lb-in	Stages		Input Power <i>P</i> _e HP	Output Torque <i>T</i> _a lb-in	Output OHL <i>F</i> _{Ra} lb	Input Power <i>P</i> _e HP	Output Torque <i>T</i> _a lb-in	Output OHL <i>F</i> _{Ra} lb	Input Power <i>P</i> _e HP	Output Torque <i>T</i> _a lb-in	Output OHL <i>F</i> _{Ra} lb	Input Power <i>P</i> _e HP	Output Torque <i>T</i> _a lb-in	Output OHL <i>F</i> _{Ra} lb
189.09	9.20	2.39	11000	2	-	2.39	11000	2700	-	-	-	-	-	-	-	-	-
161.60	11	2.79	10800	2	-	2.79	10800	2750	2.79	10800	2750	-	-	-	-	-	-
148.15	12	2.93	10600	2	-	-	10600	2770	2.93	10600	2770	-	-	-	-	-	-
130.00	13	3.19	10400	2	-	3	9380	3020	3.19	10400	2840	3.19	10400	2840	3.19	10400	2840
123.20	14	3.33	10200	2	-	3	9840	3140	3.33	10200	2860	3.33	10200	2860	3.33	10200	2860
107.83	16	3.59	9820	2	-	3	7790	3260	3.59	9820	2930	3.59	9820	2930	3.59	9820	2930
97.14	18	3.99	9650	2	-	3	7040	3200	3.99	9650	2900	3.99	9650	2900	3.99	9650	2900
85.22	21	4.26	9290	2	-	3	6200	3130	4.26	9290	2790	4.26	9290	2790	4.26	9290	2790
75.09	23	4.66	8940	2	-	3	5440	3060	4.66	8940	2680	4.66	8940	2680	4.66	8940	2680
66.67	26	5.05	8580	2	-	3	4820	2970	5	8500	2590	5.05	8580	2570	5.05	8580	2570
63.03	28	5.05	9740	2	-	3	5490	2750	-	-	-	-	-	-	-	-	-
56.92	31	5.45	8140	2	-	3	4120	2880	5	7260	2540	5.45	8140	2430	5.45	8140	2430
53.87	32	5.99	9740	2	-	3	4690	2660	5	8050	2240	-	-	-	-	-	-
49.38	35	6.38	9740	2	-	3	4290	2630	5	7430	2230	-	-	-	-	-	-
43.33	40	7.32	9740	2	-	3	3760	2570	5	6500	2210	7.32	9740	1800	7.32	9740	1800
41.07	43	7.71	9740	2	-	3	3580	2520	5	6150	2200	7.50	9470	1780	7.71	9740	1740
35.94	49	8.38	9380	2	-	3	3100	2450	5	5400	2170	7.50	8230	1800	8.38	9380	1660
32.38	54	9.18	9200	2	-	3	2790	2410	5	4870	2140	7.50	7430	1810	9.18	9200	1580
28.41	62	9.84	8760	2	-	3	2430	2340	5	4250	2100	7.50	6550	1810	9.84	8760	1520
25.07	70	10.77	8500	2	-	3	2170	2250	5	3760	2060	7.50	5800	1800	10	7790	1540
22.89	76	8.38	6240	2	-	3	2120	2070	5	3630	1800	-	-	-	-	-	-
22.22	79	11.70	8140	2	-	-	-	-	-	-	-	7.50	5130	1780	10	6950	1550
20.99	83	9.18	6240	2	-	3	1950	2030	5	3320	1780	-	-	-	-	-	-
18.97	92	12.77	7610	2	-	-	-	-	-	-	-	7.50	4380	1750	10	5930	1560
18.42	95	10.51	6280	2	-	3	1690	1980	5	2920	1760	7.50	4470	1470	10	5970	830
17.45	100	11.04	6280	2	-	3	1590	1960	5	2740	1740	7.50	4200	1480	10	5660	900
15.28	115	12.77	6370	2	-	3	1390	1890	5	2390	1710	7.50	3670	1480	10	4960	1070
13.76	127	14.10	6370	2	-	3	1250	1850	5	2170	1680	7.50	3320	1470	10	4470	1170
12.07	145	16.09	6420	2	-	3	1090	1790	5	1900	1640	7.50	2920	1460	10	3940	1270
10.65	164	18.22	6420	2	-	3	960	1730	5	1660	1600	7.50	2570	1440	10	3450	1280
9.44	185	18.62	5800	2	-	3	840	1680	5	1470	1560	7.50	2260	1420	10	3050	1270
8.06	217	19.02	5090	2	-	3	710	1610	5	1250	1510	7.50	1950	1390	10	2610	1260

Please consult your SEW-Eurodrive Assembly Center for additional speed (RPM) selections and dimension pages not listed.



		AK1	GA1	AJ1	BB1	BD1	C	AA	BF1	ZC	ZE	FU	L	FY	FZ
SA77 SH77	AM182	8.50	0.39	7.250	0.20	8.98	16.79	0.12	0.59	5.49	0.65	1.125	2.72	1.24	0.250
	AM184	8.50	0.39	7.250	0.20	8.98	16.79	0.12	0.59	5.49	0.65	1.125	2.72	1.24	0.250
	AM213/215	8.50	0.43	7.250	0.20	8.98	18.72	0.25	0.59	7.42	0.62	1.375	3.35	1.52	0.312

***Refer to page 101 for tolerance information**
Dimensions subject to change without notice

Refer to page 94 for Alternate Shafts
See page 99 for Compound Reducer Information



Lubricant table

01 805 09 92US

	5) °C -50 0 +50 +100	DIN (ISO)	ISO, NLGI	ExxonMobil	Shell	AGIP	ARAL	bp	Tribol	TEMACO	Optimol	FUCHS	TOTAL
R...		CLP (CC)	VG 220	Mobilgear 600XP 220	Shell Omala 220	Klubersynth GEM 1-220 N	Aral Degol BG 220	BP Energol GR-XP 220	Tribol 1100/220	Meropa 220	Optigear BM 220	Renolin CLP 220	Carter EP 220
K... (HK...)	-25 -40 4)	CLP PG	VG 220	Mobil Glygoyle 30	Shell Tivela S 220	Klubersynth GH 6-220	Aral Degol GS 220	BP Energol SG-XP 220			Optiflex A 220		Carter SY 220
F...	-40 -20 +10 +25 4)	CLP HC	VG 220	Mobil SHC 630	Shell Omala HD 220	Klubersynth GEM 4-220 N	Aral Degol PAS 220				Optigear Synthetic A 220	Renolin Unisyn CLP 220	
	-40 -20 +10 +25 4)	CLP (CC)	VG 150	Mobil SHC 629	Shell Omala HD 150	Klubersynth GEM 4-150 N							Carter SH 150
	-20 -30 +10 +25 4)	CLP (CC)	VG 100	Mobilgear 600XP 100	Shell Omala 100	Kluberoil GEM 1-150 N	Aral Degol BG 100	BP Energol GR-XP 100			Optigear BM 100	Renolin CLP 150	Carter EP 100
	-30 -40 +10 +25 4)	HLP (HM)	VG 68-46	Mobil D.T.E. 13M	Shell Tellus T 32	Kluberoil GEM 1-68 N	Aral Degol BG 46				Optigear 32	Renolin B 46 HVI	Equivalis ZS 46
	-40 -20 +10 +25 4)	CLP HC	VG 32	Mobil SHC 624	Shell Tellus T 46	Klubersynth HySyn FG-32							Dacnis SH 32
	-40 -20 +10 +25 4)	HLP (HM)	VG 22	Mobil D.T.E. 44M	Shell Tellus T 46	Isotex MT 20 POT		BP Energol ULD UM 46		Rando UDZ 46			Equivalis ZS 15
S... (HS...)	-20 -30 -40 +10 +25 4)	CLP (CC)	VG 680	Mobilgear 600XP 680	Shell Omala 680	Kluberoil GEM 1-680 N	Aral Degol BG 680	BP Energol GR-XP 680	Tribol 1100/680	Meropa 680	Optigear BM 680	Renolin CLP 680	Carter EP 680
	-20 -30 -40 +10 +25 4)	CLP PG	VG 680 ¹⁾		Shell Tivela S 680	Klubersynth GH 6-680		BP Energol SG-XP 680	Tribol 800/680	Synlube CLP 680			
	-20 -30 -40 +10 +25 4)	CLP HC	VG 460	Mobil SHC 634	Shell Omala HD 460	Klubersynth GEM 4-460 N				Pinnacle EP 460			
	-20 -30 -40 +10 +25 4)	CLP (CC)	VG 150	Mobil SHC 629	Shell Omala HD 150	Klubersynth GEM 4-150 N				Pinnacle EP 150			Carter SH 150
	-20 -30 -40 +10 +25 4)	CLP (CC)	VG 150	Mobilgear 600XP 100	Shell Omala 100	Kluberoil GEM 1-150 N	Aral Degol BG 100	BP Energol GR-XP 100	Tribol 1100/100	Meropa 150	Optigear BM 100	Renolin CLP 150	Carter EP 100
	-25 -40 +10 +25 4)	CLP PG	VG 220 ¹⁾	Mobil Glygoyle 30	Shell Tivela S 220	Klubersynth GH 6-220	Aral Degol GS 220	BP Energol SG-XP 220	Tribol 800/220	Synlube CLP 220	Optiflex A 220		Carter SY 220
	-40 -20 +10 +25 4)	CLP HC	VG 32	Mobil SHC 624	Shell Tellus T 46	Klubersynth HySyn FG-32				Cetus PAO 46			Dacnis SH 32
R... K... (HK...)	-20 -30 -40 +10 +25 4)	CLP PG	VG 460 ¹⁾			Klubersynth UH1 6-460							
F... S... (HS...)	-20 -30 -40 +10 +25 4)	HCE	VG 460		Shell Cassida Fluid GL 460	Kluberoil 4UH1-460 N	Aral Eural Gear 460				Optileb GT 460		
	-20 -30 -40 +10 +25 4)	E	VG 460			Kluberbio CA2-460	Aral Degol BAB 460				Optisynth BS 460		
W... (HW...)	-20 -30 -40 +10 +25 4)	SEW PG	VG 460 ²⁾			Klubersynth HT-460-5							
	-20 -30 -40 +10 +25 4)	API GL5	SAE 75W90 (-VG 100)	Mobilube SHC 75 W90-LS									
	-20 -30 -40 +10 +25 4)	CLP PG	VG 460 ³⁾			Klubersynth UH1 6-460							

Fill Quantity for
 Rotoscreen
 SA77 Gearbox
 1 gallon [3.8 l],

MOTOR – SCREEN

BALDOR® • RELIANCE

Product Information Packet

CEM7042T-I

3//2HP,1760//1460RPM,3PH,60//50HZ,182TC

Part Detail									
Revision:	C	Status:	PRD/A	Change #:		Proprietary:	No		
Type:	AC	Prod. Type:	3631M	Elec. Spec:	36WGS266	CD Diagram:			
Enclosure:	XPFC	Mfg Plant:		Mech. Spec:	36N864	Layout:			
Frame:	182TC	Mounting:	F1	Poles:	04	Created Date:	01-15-2013		
Base:	RG	Rotation:	R	Insulation:	F	Eff. Date:	02-15-2013		
Leads:	9#16	Literature:		Elec. Diagram:		Replaced By:			
Nameplate NP0977XPSL									
NO.				CC	010A				
SER.				TEMP CODE	T3C				
SPEC.	36N864S266G1								
CAT.NO.	CEM7042T-I								
HP	3//2								
VOLTS	230/460//190/380								
AMPS	8.4/4.2//7.2/3.6								
RPM	1760//1460			MOTOR WEIGHT	116 LBS				
HERTZ	60//50			PH	3	CL	F	DE BRG	6206
SER.F.	1.15			DES	B	CODE	K	ODE BRG	6205
FRAME	182TC			GREASE	POLYREX EM				
RATING	40C AMB-CONT								
USABLE AT 208V	9			NEMA-NOM-EFF	89.5	PF	75		
		55C @ 1.0 SF / 75C RISE							

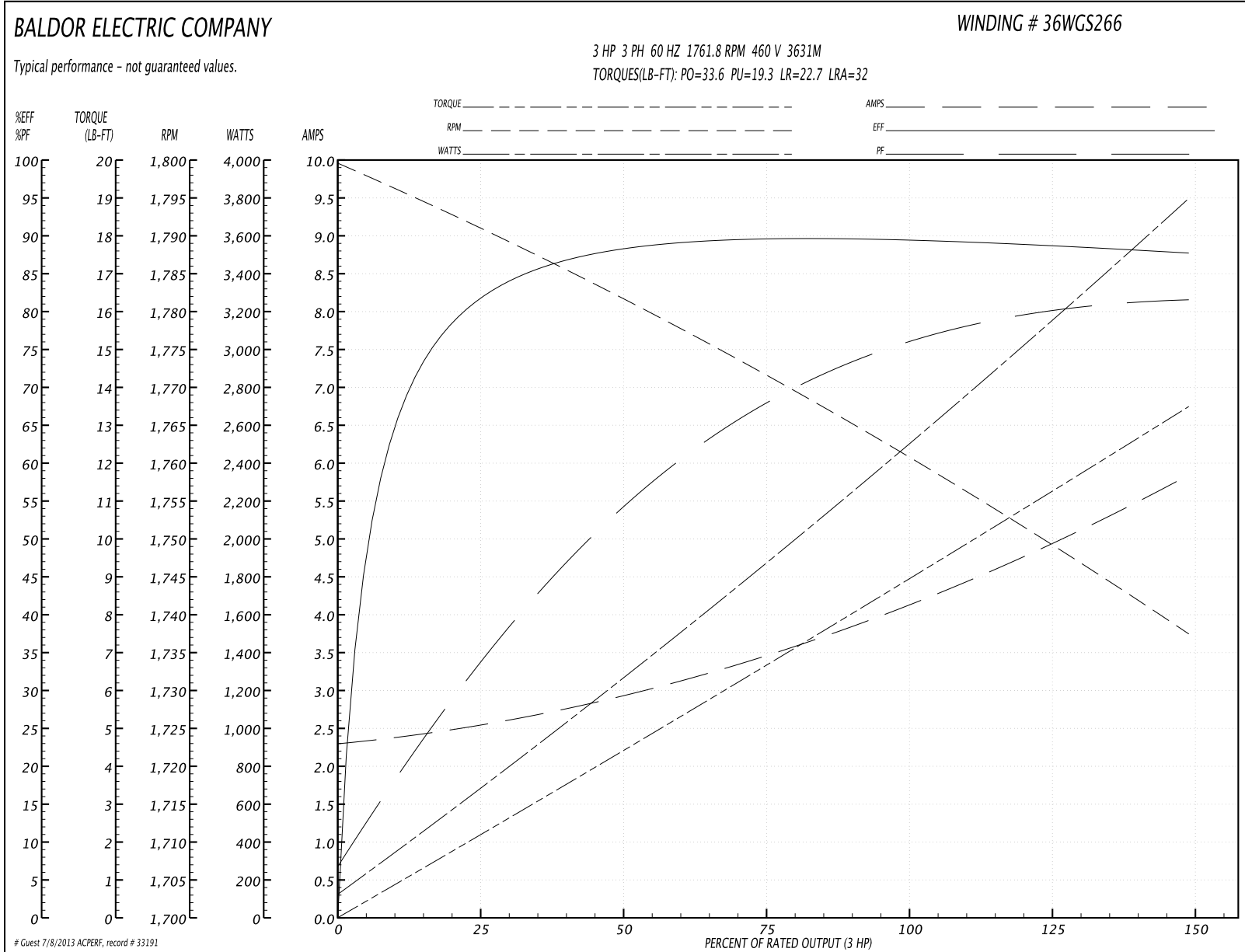
Parts List		
Part Number	Description	Quantity
SA257160	SA 36N864S266G1	1.000 EA
RA243948	RA 36N864S266G1	1.000 EA
36FN3000C01SP	EXFN, PLASTIC, 5.25 OD, .912 ID	1.000 EA
35CB1005A01	CONDUIT BOX,MACH - GROUP "C" MTRS	1.000 EA
06EP1709A05	FRONT XPFC 205 BRG GRP C W/ DRAIN (HW450	1.000 EA
HW4506A02	BREATHER/DRAIN-EXP PROOF-.125-27 NPTF AI	1.000 EA
HW3022E05	.125 DIA X .500 ROLLED SPRING PIN	1.000 EA
HW4500A19	1/4-28X1/4 SLOTTED PLUG F/S	2.000 EA
HW5100A05	WVY WSHR F/205 & 304 BRGS	1.000 EA
36EP1703A17	PUEP - GROUP C & E, DRAIN (HW4506A02)	1.000 EA
HA2009A81	SLINGER FOR GROUP E MTRS - 06 BRG.	1.000 EA
HW4506A02	BREATHER/DRAIN-EXP PROOF-.125-27 NPTF AI	1.000 EA
HW3022E05	.125 DIA X .500 ROLLED SPRING PIN	1.000 EA
HW4001A01	1/4 HX SOC PIPE PLG (F/S) ALLOY STEEL W/	2.000 EA
60XN1032A07	10-32 X 1/2 TRUSS HEAD, TORX SERRATED ZN	2.000 EA
51XN1032A20	10-32 X 1 1/4 HX WS SL SR	2.000 EA
36FH2000A05	FAN COVER, MACH W/(2) GRSR HOLES	1.000 EA
12XF1032A08	10-32X1/2 TY F HEX X	4.000 EA
35CB1501A01	CONDUIT BOX LID, MACH. - GROUP "C" MTRS	1.000 EA
RM1020A41	O-RING, -150 BUNA-N, .103 CS X 2.862 ID	1.000 EA
HW2501E16	3KEY, 1/4 SQ X 1.750	1.000 EA
HA7000A02	KEY RETAINER RING, 1 1/8 DIA, 1 3/8 DIA	1.000 EA
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	6.000 EA
LB1359	ALUM XP CAUTION LABEL	1.000 EA

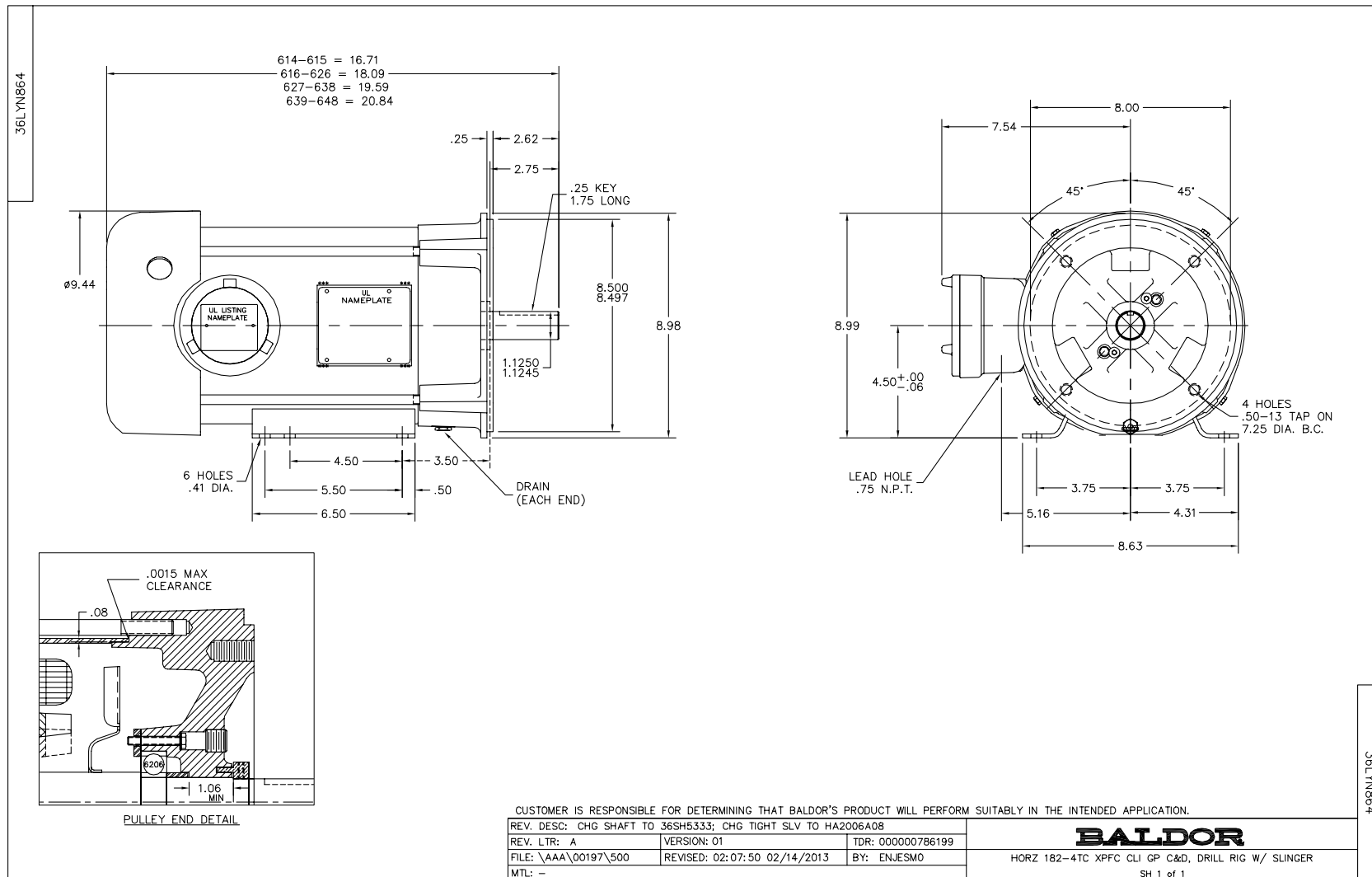
Parts List (continued)		
Part Number	Description	Quantity
LB9002A50	CMC-5000 BRADY WIRE MARK	1.000 EA
MJ1000A75	GREASE, POLYREX EM EXXON	0.050 LB
51XB1214A16	12-14X1.00 HXWSSLD SERTYB	1.000 EA
MG1025Z20	ACTIVATOR WILKOFAS 060.32	0.010 GA
MG1025G29	PAINT 789.205 DARK GRAY METALLIC (USE W/	0.022 GA
HA3105A09	THRUBOLT 3/8-16 X 12.000	4.000 EA
LB1119	WARNING LABEL	1.000 EA
LB1125C02	SUPER-E (STOCK CTN LABEL SUPER-E WITH FL	1.000 EA
LC0145B01	CONNECTION LABEL	1.000 EA
NP0977XPSL	SS XP UL CSA CC CL-I GP-C&D	1.000 EA
37PA1043	PACKAGING GROUP, STD -E (37XL)	1.000 EA

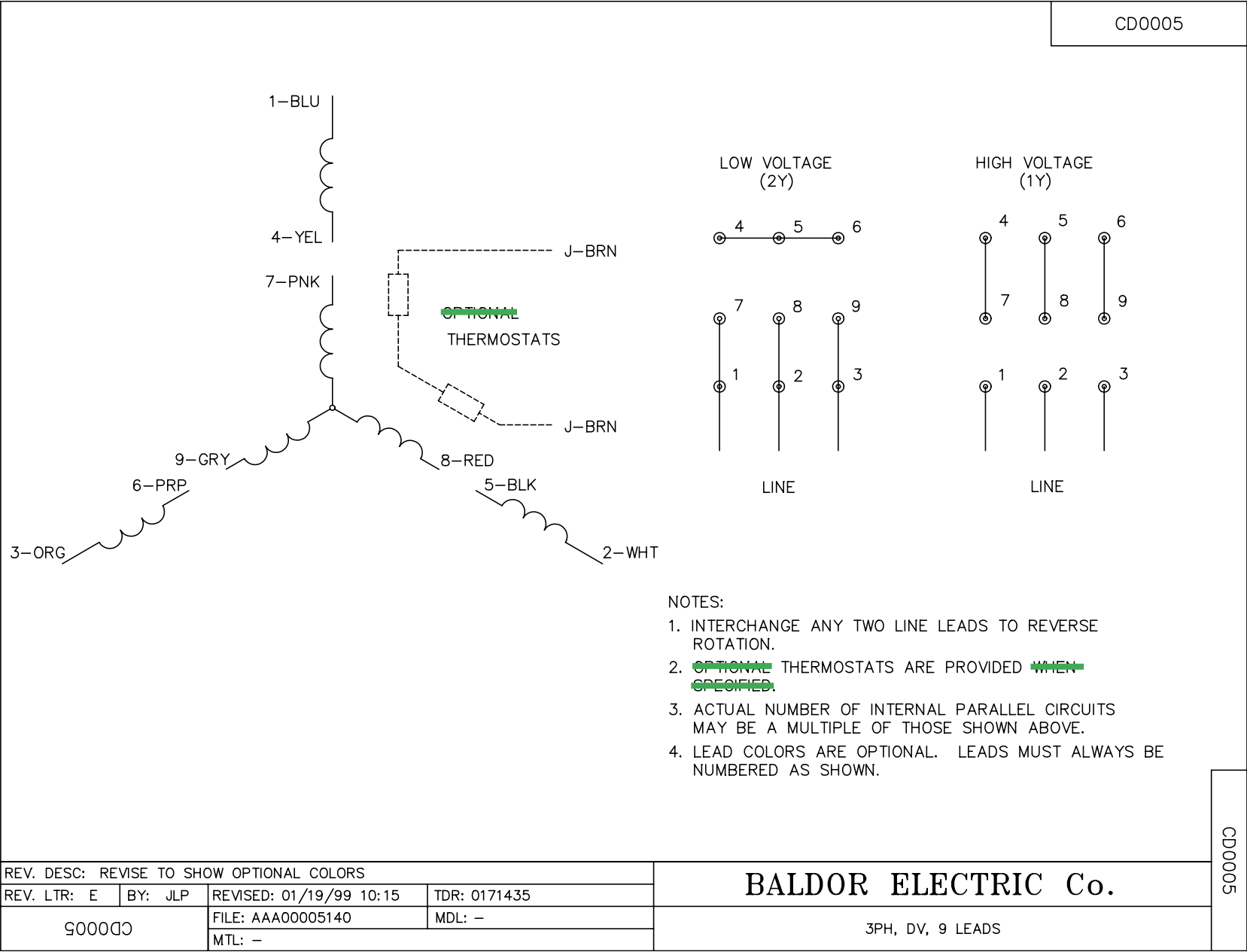
Performance Data at 460V, 60Hz, 3.0HP (Typical performance - Not guaranteed values)

General Characteristics							
Full Load Torque:		8.88 LB-FT		Start Configuration:		DOL	
No-Load Current:		2.33 Amps		Break-Down Torque:		33.6 LB-FT	
Line-line Res. @ 25°C.:		4.01 Ohms A Ph / 0.0 Ohms B Ph		Pull-Up Torque:		19.3 LB-FT	
Temp. Rise @ Rated Load:		40 C		Locked-Rotor Torque:		22.7 LB-FT	
Temp. Rise @ S.F. Load:		48 C		Starting Current:		32.0 Amps	
Load Characteristics							
% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor:	34.0	54.0	68.0	75.0	79.0	82.0	77.0
Efficiency:	80.9	87.8	89.5	89.6	88.9	88.0	89.2
Speed:	1791.0	1781.8	1771.6	1761.8	1749.6	1737.2	1754.0
Line Amperes:	2.5	2.89	3.43	4.15	4.95	5.81	4.63

Performance Graph at 460V, 60Hz, 3.0HP Typical performance - Not guaranteed values

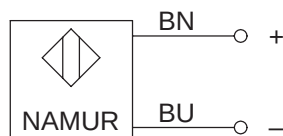




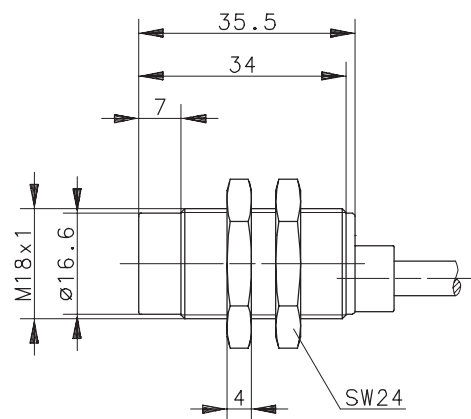
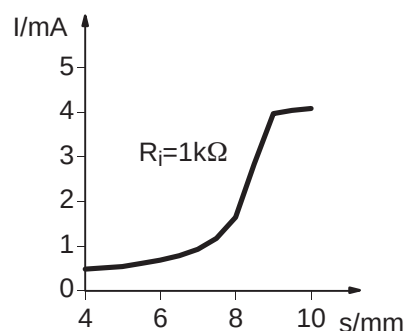


PROXIMITY SENSOR – SCREEN

Wiring Diagram



Current Characteristics



Technical Data according to DIN EN 50227/06.1998

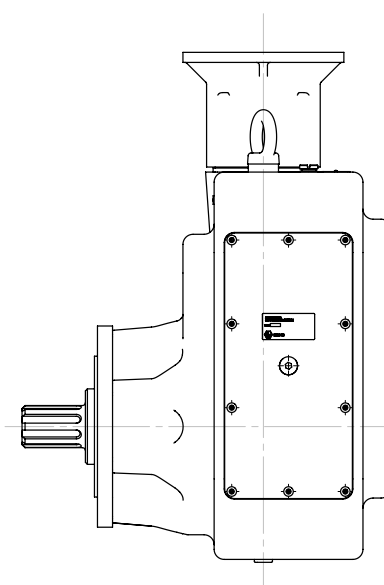
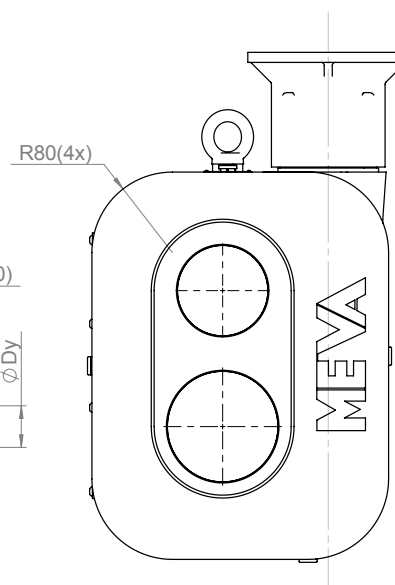
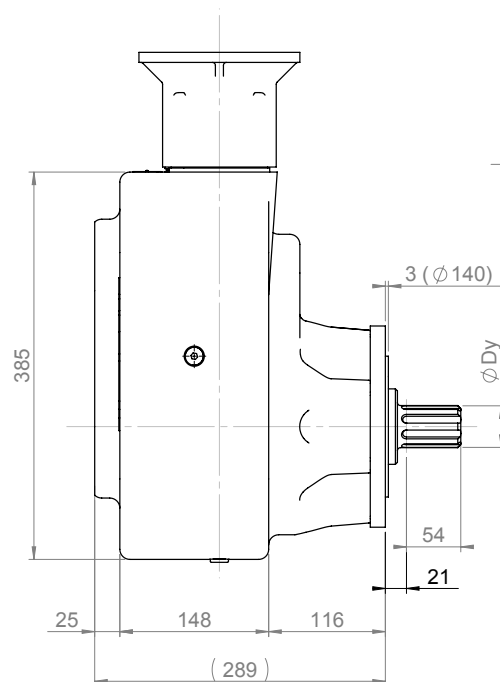
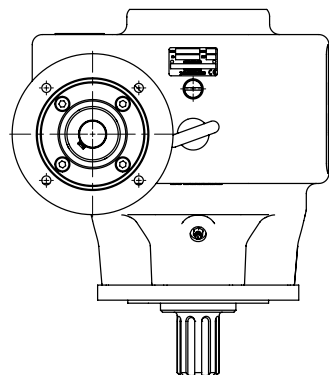
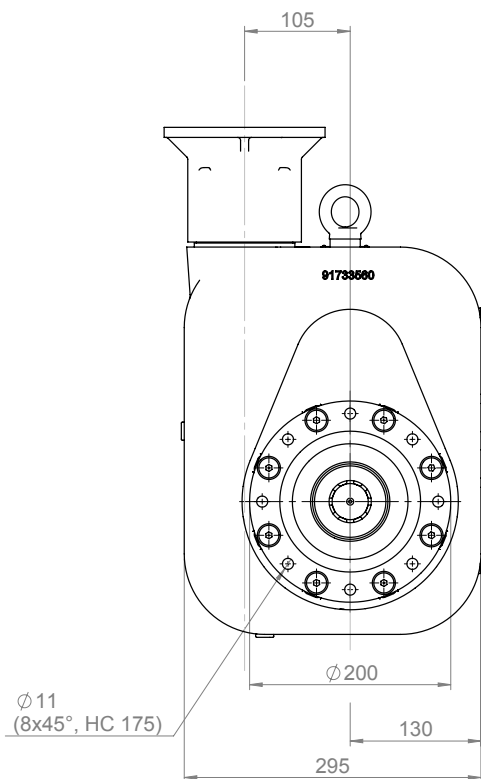
Elektrical Data

Mounting	non flush	
rated operating distance	s_n	8mm (switching point 1,5mA @ $U_n = 8V$ and $R_i = 1k\Omega$)
Repeat accuracy	R	< 5%
Standard target	24 x 24 x 1mm (length x width x thickness), Fe	
Rated voltage	U_n	DC 8 V
Rated operational voltage	U_e	DC 5 ... 25V
Ripple	≤ 5%	
current input	I	> 3mA ($U_n = 8V$ and $R_i = 1k\Omega$) sensing face free < 1mA ($U_n = 8V$ and $R_i = 1k\Omega$) sensing face damping
Frequency of operating cycles	f	≤ 200Hz
Self-inductance	L_i	60μH
Self-capacitance	C_i	55nF
Certified	TÜV 98 ATEX 1293	
Approvale no.	II 2 G EEx ib IIC T6	

Mechanical Data

Ambient air temperature	-25°C ... +70°C
Type of protection	IP 67
vibratory stresses	10 – 55Hz, a = 1mm
schock resistance	30g, $t_{stoß} = 11ms$
Front cap	PA 6.6, blue
Housing	brass, nickel plated
End cap	PA 12, blue
Termination type	cable 2 x 0,5mm ² x 2m; PVC-Outer jacket, blue
For attachment	2 x hexagon nut

GEAR REDUCER – WASH PRESS



DATATABELL / DATATABLE	
4 VÅXEL TYP / GEAR TYPE	240
CENTER DISTANCE C-C	105
UTVÅXLING / RATIO	SE STYCKLISTA / SEE ITEM LIST
SMÖRJMEDEL / LUBRICATION	MOBIL GLYGOYLE HE 460
OLJEMÅNGD / OIL VOLUME	
DISP 1XX	2.9 L
DISP 2XX	4.9L
DISP 3XX	7.0L
ÅTDRAGNINGSMOMENT TIGHTENING TORQUE	ENL. INS 127, OM INTE ANNAT ANGES. ACCORDING TO INS 127, IF NOT OTHERWISE STATED
VIKT UTAN OLJA / WEIGHT WITHOUT OIL	CA: 70Kg

Ritad NLN	Kontr	Godk	Skala 1:5	Ersätter 91733119	Ersatt av	Blad 1 / 3	Dat. 070206
SWEDRIVE AB S-340 14 LAGAN, SWEDEN TEL. 0372-265 00 TELEFAX 0372-265 49						Ext. Ref.	Vikt kg
SNÄCKVÅXEL MEVA 240						Nr. 91733123	Utg. 4.a

A3

ORIGINAL
FORMAT
UR-
SPRUNGS
FORMAT

DENNA
RITNING
ÄR
SWEDRIVE
AB'S
EGENDOM.
DEN FÄR
INTE
ANVÄNDAS
TILL SKADA
FÖR FÖRE-
TAGETS
INTERESSEN.

THIS
DRAWING
IS THE
PROPERTY
OF
SWEDRIVE
AB AND IS
NOT TO BE
USED
AGAINST
THE
INTEREST
OF THIS
COMPANY.

DIESE
ZEICHNUNG
IST DAS
EIGENTUM
DER
SWEDRIVE
AB UND
DARF NICHT
ZUM
SCHADEN
DIESER
GESELL-
SCHAFT
VER-
WENDET
WERDEN.

VYPLACERINGS
METOD
1:ST ANGLE
PROJECTION



SENASTE ÄNDRING
4 071024 NLN

YTFINIHET DÄR EJ ANNAT ANGES:
SURFACE FINISH EXCEPT AS STATED:

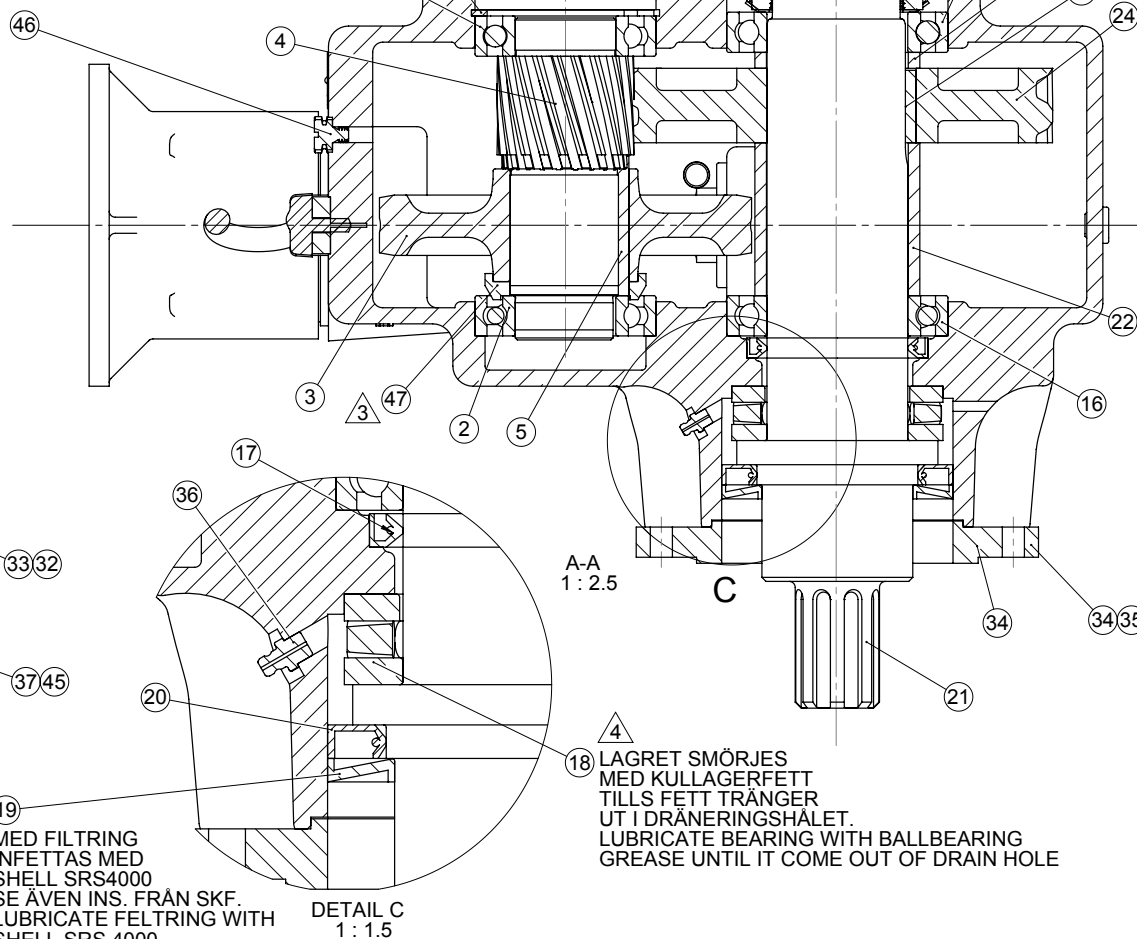
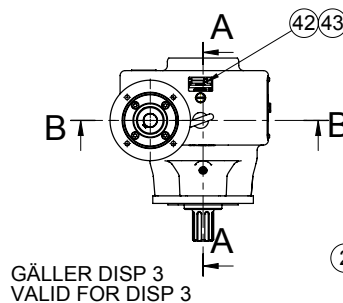
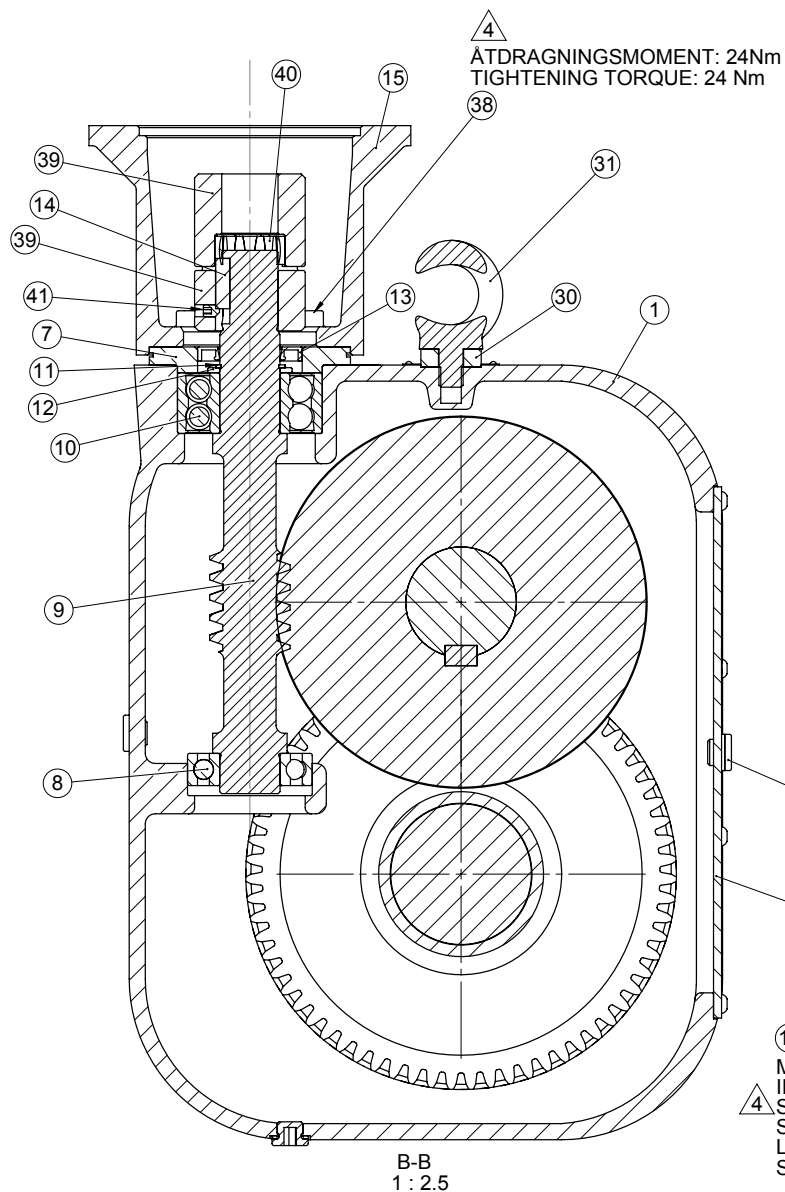
Ra 6,3

TOLERANSER DÄR EJ ANNAT ANGES:
TOLERANCES EXCEPT AS STATED:

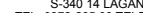
ISO 2768-m

GÄNGSLÄPPNINGAR ENL. INS 135
DUBBHÅL ENL. INS 141

SUPLSLÄPPNINGAR ENL. INS 101
SKARPA KANTER BRYTES



Ritad	NLN	Kontr	Godk	Skala	1:10	Ersätter	91733119	Ersatt av		Blad	2 / 3	Dat.	070206
SWEDRIVE AB				SNÄCKVÄXEL MEVA 240				Ext. Ref.		Vikt kg		Nr.	
S-340 14 LAGAN, SWEDEN TEL. 0372-265 00 TELEFAX 0372-265 49								91733123		4.a		Utg.	

Ritad	NLN	Kontr	Godk	Skala	1:3	Ersätter	91733119	Ersatt av	Blad	3 / 3	Dat.	070206
 SWEDRIVE AB S-340 14 LAGAN, SWEDEN TEL. 0372-265 00 TELEFAX 0372-265 49				SNÄCKVÄXEL MEVA 240				Ext. Ref.		Vikt kg		
								Nr.		Utg.		
								91733123		4.a		

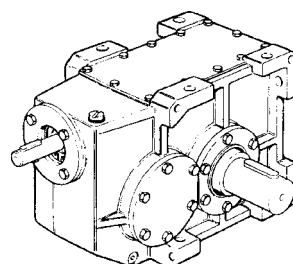


F240 DATA TABLE/DATENTABELLEN

Ratio code Übers Code	Input speed Antr. Drehz. 1/min	Max input power Max Antr. leistung kW	Max output torque Max Ausg. moment Nm	Efficiency Wirk. grad ca %	Ord. no. gear Best.Nr. Getriebe	Output speed Ausg. drehz. 1/min	Motor power Motor leistung kW	Recommended motor/Output torque Empfahle motoren Ausgangs moment Nm	Motor & flange Motor & Flansch
28** A0	2800	8,7	685	83	F240A0	100	4,0	315	112A-2F130
	1400	5,9	910	81		50	4,0	617	112A-4F130
	900	4,3	975	79		32	2,2	499	112A-6F130
	700	3,8	1130	78		25	1,5	446	112A-8F130
38** B0	2800	6,9	730	82	F240B0	74	4,0	423	112A-2F130
	1400	4,5	920	79		37	4,0	818	112A-4F130
	900	3,4	1020	77		24	2,2	660	112A-6F130
	700	2,9	1145	76		18	1,5	592	112A-8F130
48 C0	2800	8,7	1190	83	F240C0	58	4,0	547	112A-2F130
	1400	5,4	1440	81		29	4,0	1067	112A-4F130
	900	3,6	1440	79		19	2,2	880	112A-6F130
	700	2,7	1440	78		14	1,5	800	112A-8F130
65 D0	2800	6,9	1270	82	F240D0	43	4,0	736	112A-2F130
	1400	4,0	1440	79		21	4,0	1440	112A-4F130
	900	2,8	1440	77		14	2,2	1131	112A-6F130
	700	2,0	1440	76		10	1,5	1080	112A-8F130
82 E0	2800	5,8	1315	80	F240E0	34	4,0	907	112A-2F130
	1400	3,3	1440	77		17	3,0	1309	100B-4F130
	900	2,2	1440	75		11	2,2	1440	112A-6F130
	700	1,7	1440	74		8,5	1,5	1271	112A-8F130
97 F0	2800	5,1	1350	78	F240F0	28	4,0	1059	112A-2F130
	1400	2,8	1440	76		14	3,0*	1543*	100B-4F130
	900	1,9	1440	74		9,3	2,2*	1667*	112A-6F130
	700	1,5	1440	72		7,2	1,5	1440	112A-8F130
118 G0	2800	3,9	1210	77	F240G0	24	4,0*	1241*	112A-2F130
	1400	2,4	1440	75		12	2,2	1320	100A-4F130
	900	1,6	1440	72		7,6	1,5	1350	100B-6F130
	700	1,3	1440	70		5,9	1,1	1218	100B-8F130
164 H0	2800	3,5	1440	73	F240H0	17	3,0	1234	100B-2F130
	1400	1,9	1440	68		8,5	2,2*	1667*	100A-4F130
	900	1,3	1440	65		5,5	1,1	1218	90A-6F115
	700	1,1	1440	62		4,3	1,1	1440	100B-8F130
194 I0	2800	3,0	1440	71	F240I0	14	3,0	1440	100B-2F130
	1400	1,7	1440	66		7,2	1,5	1271	90B-4F115
	900	1,1	1440	62		4,6	1,1	1440	90B-6F115
	700	0,9	1440	60		3,6	0,75	1200	100A-8F130
302 K0	2800	1,8	1330	66	F240K0	9,3	1,5	1108	90A-2F115
	1400	1,2	1440	60		4,6	1,1	1320	90A-4F115
	900	0,8	1440	56		3,0	0,75	1350	90A-6F115
	700	0,65	1440	54		2,3	0,55	1218	90B-8F115
341 L0	2800	1,6	1210	63	F240L0	8,2	1,5	1134	90A-2F115
	1400	1,1	1440	57		4,1	1,1	1440	90A-4F115
	900	0,75	1440	53		2,6	0,75	1440	90A-6F115
	700	0,6	1440	51		2,1	0,55	1320	90B-8F115
392 M0	2800	1,4	1100	58	F240M0	7,2	1,5*	1179*	90A-2F115
	1400	1,0	1390	52		3,6	1,1	1529	90A-4F115
	900	0,75	1440	48		2,3	0,75	1440	90A-6F115
	700	0,6	1440	45		1,8	0,55	1320	90B-8F115

*With some motors the duty factor is below 1,0. See "Selecting the worm gear", Page 10.

*Bei einigen Motoren liegt der Betriebsfaktor unter 1,0. Siehe "Getriebeauswahl", Seite 10.



ORDER SPECIFICATIONS – SEE PAGE 36

MOTOR – WASH PRESS

BALDOR® • RELIANCE

Product Information Packet

CEM7044T-I

5//3HP,1750//1450RPM,3PH,60//50HZ,182TC

Part Detail									
Revision:	C	Status:	PRD/A	Change #:		Proprietary:	No		
Type:	AC	Prod. Type:	3643M	Elec. Spec:	36WGT031	CD Diagram:			
Enclosure:	XPFC	Mfg Plant:		Mech. Spec:	36N864	Layout:			
Frame:	184TC	Mounting:	F1	Poles:	04	Created Date:	01-15-2013		
Base:	RG	Rotation:	R	Insulation:	F	Eff. Date:	04-09-2013		
Leads:	9#16	Literature:		Elec. Diagram:		Replaced By:			
Nameplate NP0977XPSL									
NO.		CC	010A						
SER.		TEMP CODE	T3C						
SPEC.	36N864T031G1								
CAT.NO.	CEM7044T-I								
HP	5//3								
VOLTS	230/460//190/380								
AMPS	13/6.5//10.4/5.2								
RPM	1750//1450	MOTOR WEIGHT	136LBS						
HERTZ	60//50	PH	3	CL	F	DE BRG	6206		
SER.F.	1.15	DES	B	CODE	K	ODE BRG	6205		
FRAME	184TC	GREASE	POLYREX EM						
RATING	40C AMB-CONT								
USABLE AT 208V	13.6	NEMA-NOM-EFF	89.5	PF	80				
	55C AMB @ 1.0 SF								

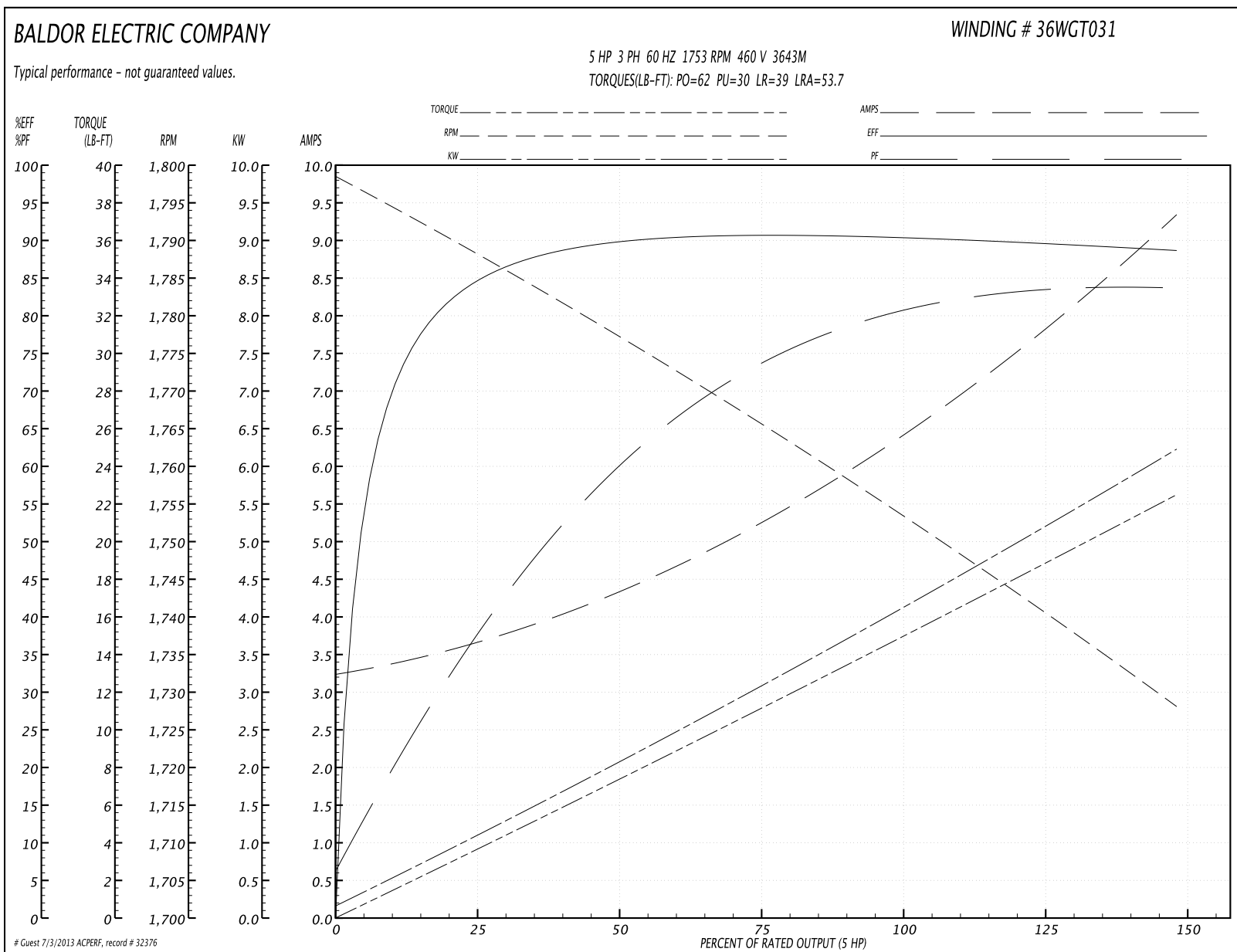
Parts List		
Part Number	Description	Quantity
SA257161	SA 36N864T031G1	1.000 EA
RA243949	RA 36N864T031G1	1.000 EA
35CB1005A01	CONDUIT BOX,MACH - GROUP "C" MTRS	1.000 EA
06EP1709A05	FRONT XPFC 205 BRG GRP C W/ DRAIN (HW450	1.000 EA
HW4506A02	BREATHER/DRAIN-EXP PROOF-.125-27 NPTF AI	1.000 EA
HW3022E05	.125 DIA X .500 ROLLED SPRING PIN	1.000 EA
HW4500A19	1/4-28X1/4 SLOTTED PLUG F/S	2.000 EA
HW5100A05	WVY WSHR F/205 & 304 BRGS	1.000 EA
36EP1703A17	PUEP - GROUP C & E, DRAIN (HW4506A02)	1.000 EA
HA2009A81	SLINGER FOR GROUP E MTRS - 06 BRG.	1.000 EA
HW4506A02	BREATHER/DRAIN-EXP PROOF-.125-27 NPTF AI	1.000 EA
HW3022E05	.125 DIA X .500 ROLLED SPRING PIN	1.000 EA
HW4001A01	1/4 HX SOC PIPE PLG (F/S) ALLOY STEEL W/	2.000 EA
60XN1032A07	10-32 X 1/2 TRUSS HEAD, TORX SERRATED ZN	2.000 EA
51XN1032A20	10-32 X 1 1/4 HX WS SL SR	2.000 EA
36FH2000A05	FAN COVER, MACH W/(2) GRSR HOLES	1.000 EA
12XF1032A08	10-32X1/2 TY F HEX X	4.000 EA
35CB1501A01	CONDUIT BOX LID, MACH. - GROUP "C" MTRS	1.000 EA
RM1020A41	O-RING, -150 BUNA-N, .103 CS X 2.862 ID	1.000 EA
HW2501E16	3KEY, 1/4 SQ X 1.750	1.000 EA
HA7000A02	KEY RETAINER RING, 1 1/8 DIA, 1 3/8 DIA	1.000 EA
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	6.000 EA
LB1359	ALUM XP CAUTION LABEL	1.000 EA
LB9002A50	CMC-5000 BRADY WIRE MARK	1.000 EA

Parts List (continued)		
Part Number	Description	Quantity
MJ1000A75	GREASE, POLYREX EM EXXON	0.050 LB
36FN3000A01SP	EXFN, PLASTIC, 7.00 OD, .912 ID	1.000 EA
51XB1214A16	12-14X1.00 HXWSSLD SERTYB	1.000 EA
MG1025Z20	ACTIVATOR WILKOFAS 060.32	0.010 GA
MG1025G29	PAINT 789.205 DARK GRAY METALLIC (USE W/	0.022 GA
HA3105A18	THRUBOLT- 3/8-16 X 13.375 X	4.000 EA
LB1119	WARNING LABEL	1.000 EA
LB1172A01	CUSTOM MTR CARTON LABEL LASER PRINTER	1.000 EA
LC0145B01	CONNECTION LABEL	1.000 EA
NP0977XPSL	SS XP UL CSA CC CL-I GP-C&D	1.000 EA
37PA1043	PACKAGING GROUP, STD -E (37XL)	1.000 EA

Performance Data at 460V, 60Hz, 5.0HP (Typical performance - Not guaranteed values)

General Characteristics							
Full Load Torque:		15.0 LB-FT		Start Configuration:		DOL	
No-Load Current:		3.3 Amps		Break-Down Torque:		62.0 LB-FT	
Line-line Res. @ 25°C.:		2.13 Ohms A Ph / 0.0 Ohms B Ph		Pull-Up Torque:		30.0 LB-FT	
Temp. Rise @ Rated Load:		60 C		Locked-Rotor Torque:		39.0 LB-FT	
Temp. Rise @ S.F. Load:		72 C		Starting Current:		53.7 Amps	
Load Characteristics							
% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor:	40.0	62.0	74.0	80.0	84.0	86.0	82.0
Efficiency:	84.7	89.7	90.7	90.4	89.7	88.6	90.0
Speed:	1787.0	1777.0	1766.0	1753.0	1741.0	1728.0	1746.0
Line Amperes:	3.6	4.3	5.3	6.5	7.8	9.3	7.3

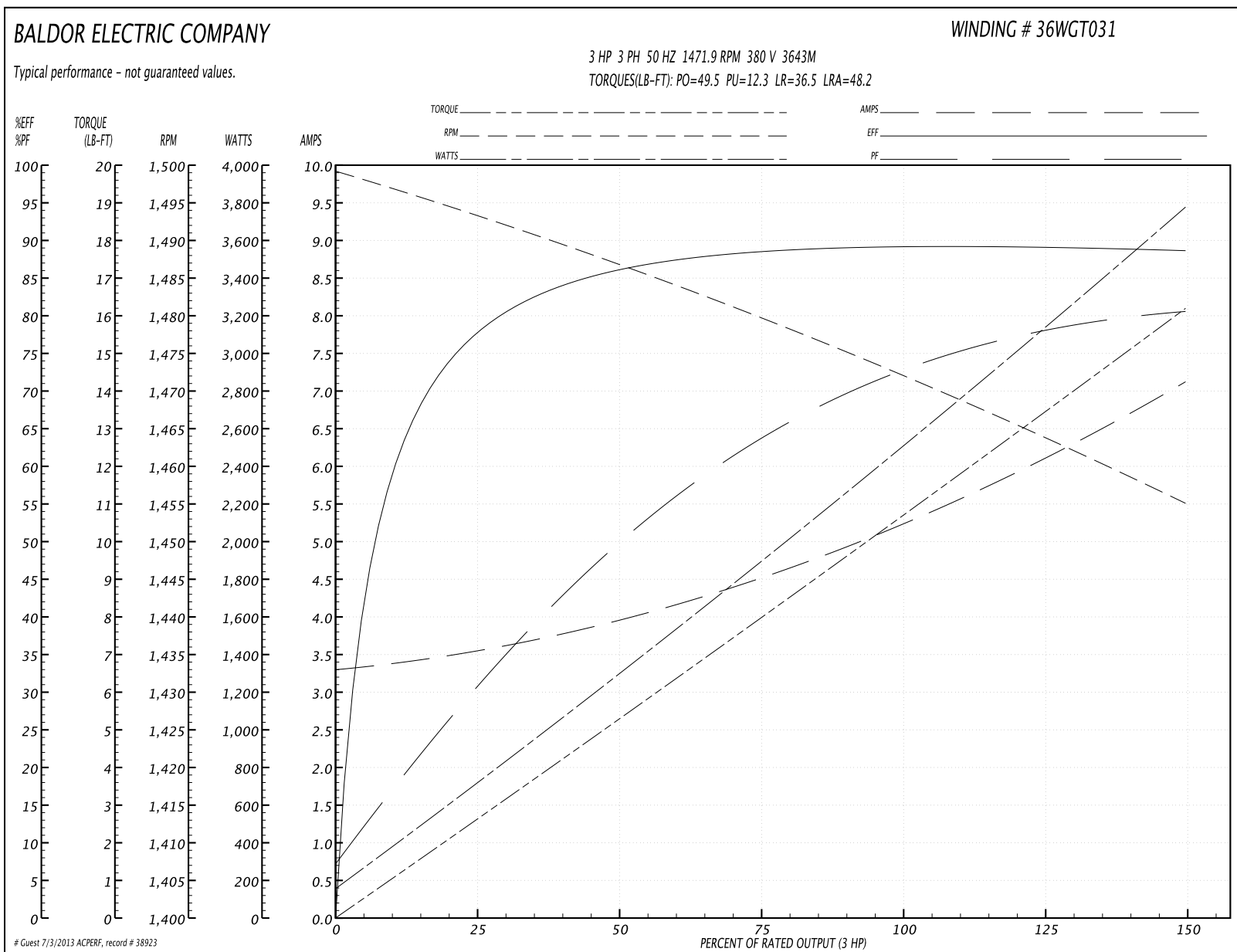
Performance Graph at 460V, 60Hz, 5.0HP Typical performance - Not guaranteed values

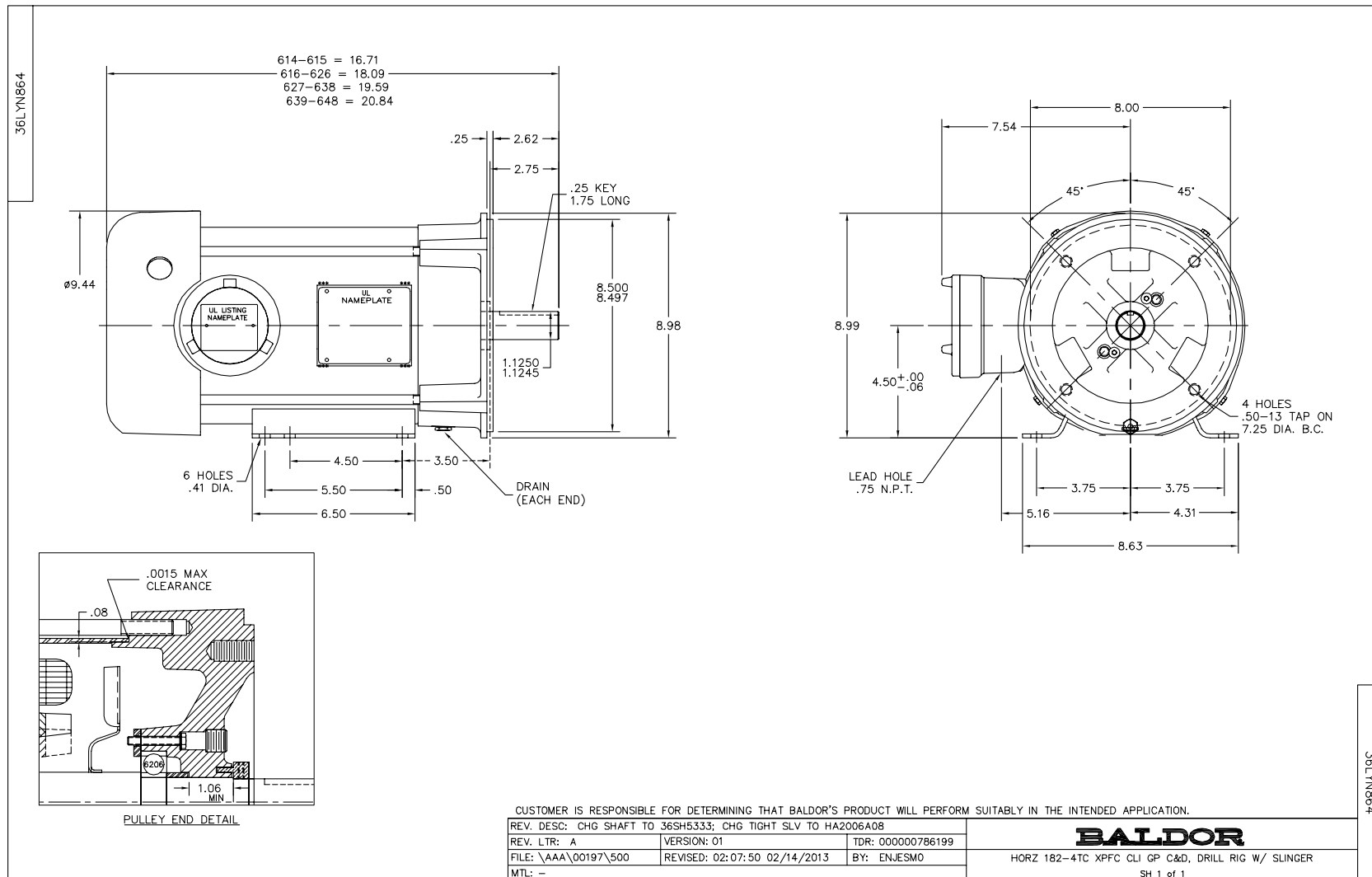


Performance Data at 380V, 50Hz, 3.0HP (Typical performance - Not guaranteed values)

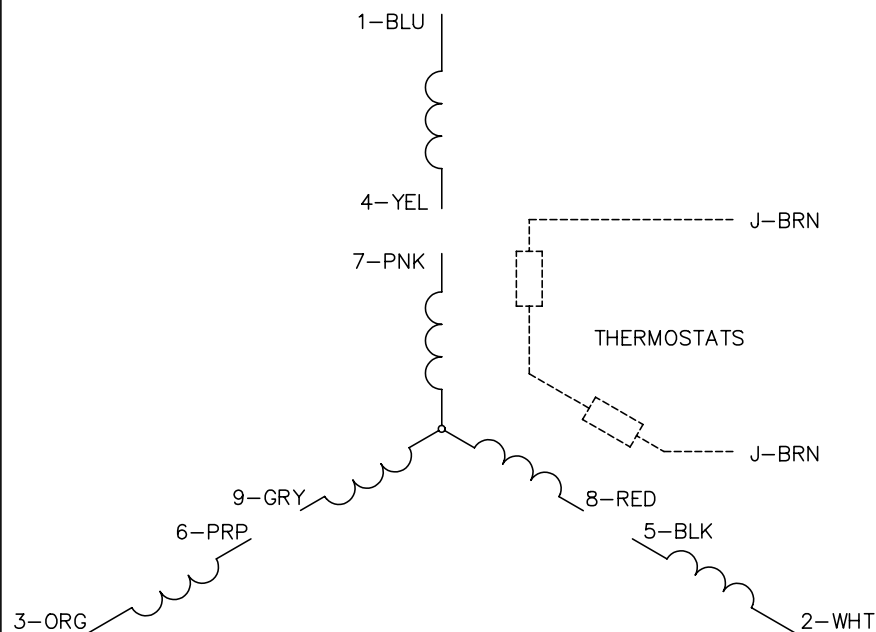
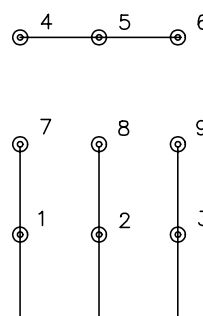
General Characteristics							
Full Load Torque:		10.7 LB-FT		Start Configuration:		DOL	
No-Load Current:		3.34 Amps		Break-Down Torque:		49.5 LB-FT	
Line-line Res. @ 25°C.:		2.2945 Ohms A Ph / 0.0 Ohms B Ph		Pull-Up Torque:		12.3 LB-FT	
Temp. Rise @ Rated Load:		39 C		Locked-Rotor Torque:		36.5 LB-FT	
Temp. Rise @ S.F. Load:		45 C		Starting Current:		48.2 Amps	
Load Characteristics							
% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor:	32.0	51.0	63.0	72.0	78.0	81.0	76.0
Efficiency:	77.9	86.0	88.5	89.2	89.2	88.7	89.2
Speed:	1493.7	1486.7	1479.6	1471.9	1463.6	1455.2	1467.0
Line Amperes:	3.51	3.92	4.53	5.28	6.15	7.09	5.8

Performance Graph at 380V, 50Hz, 3.0HP Typical performance - Not guaranteed values

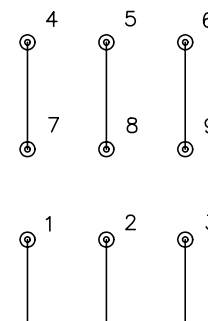




CD0005

LOW VOLTAGE
(2Y)

LINE

HIGH VOLTAGE
(1Y)

LINE

NOTES:

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

REV. DESC: REVISE TO SHOW OPTIONAL COLORS

REV. LTR: E

BY: JLP

REVISED: 01/19/99 10:15

TDR: 0171435

9000D0

FILE: AAA00005140

MDL: -

MTL: -

BALDOR ELECTRIC Co.

3PH, DV, 9 LEADS

CD0005

SOLENOID VALVE - WASH PRESS

Features

- Wide range of pressure ratings, sizes, and resilient materials provide long service life and low internal leakage
- High Flow Valves for liquid, corrosive, and air/inert gas service
- Industrial applications include:
 - Car wash
 - Laundry equipment
 - Air compressors
 - Industrial water control
 - Pumps

Construction

Valve Parts in Contact with Fluids		
Body	Brass	304 Stainless Steel
Seals and Discs	NBR or PTFE	
Disc-Holder	PA	
Core Tube	305 Stainless Steel	
Core and Plugnut	430F Stainless Steel	
Springs	302 Stainless Steel	
Shading Coil	Copper	Silver

Electrical

Standard Coil and Class of Insulation	Watt Rating and Power Consumption				Spare Coil Part Number			
	DC Watts	AC			General Purpose		Explosionproof	
		Watts	VA Holding	VA Inrush	AC	DC	AC	DC
F	-	6.1	16	40	238210	-	238214	-
F	11.6	10.1	25	70			238614	
F	16.8	16.1	35	180	272610	97617	272614	97617
F	-	17.1	40	93	238610	-	238614	-
F	-	20	43	240	99257	-	99257	-
F	-	20.1	48	240	272610	-	272614	-
H	30.6	-	-	-	-	74073	-	74073
H	40.6	-	-	-	-	238910	-	238914

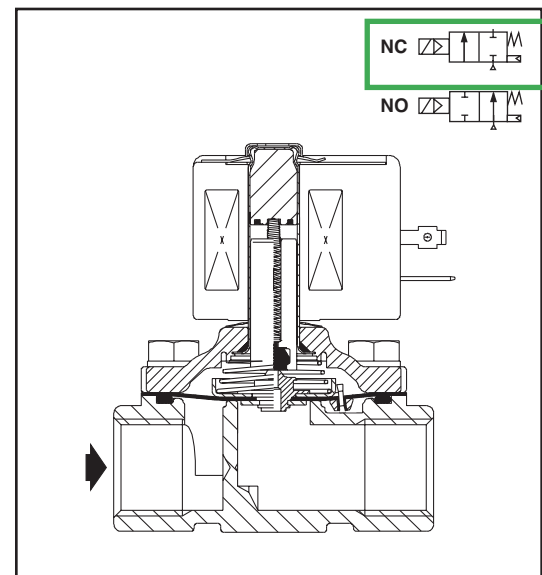
Standard Voltages: 24, 120, 240, 480 volts AC, 60 Hz or 110, 220 volts AC, 50 Hz. 6, 12, 24, 120, 240 volts DC. Must be specified when ordering.
Other voltages available when required.

Solenoid Enclosures

Standard: RedHat II - Watertight, Types 1, 2, 3, 3S, 4, and 4X; RedHat - Type I.

Optional: RedHat II - Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9; Red-Hat - Explosionproof and Watertight, Types 3, 4, 4X, 7, and 9.

(To order, add prefix "EF" to catalog number, except Catalog Numbers 8210B057, 8210B058, and 8210B059, which are not available with Explosionproof enclosures.)
See *Optional Features Section* for other available options.



Nominal Ambient Temp. Ranges

RedHat II/
RedHat AC: 32°F to 125°F (0°C to 52°C)

RedHat II DC: 32°F to 104°F (0°C to 40°C)

RedHat DC: 32°F to 77°F (0°C to 25°C)
(104°F/40°C occasionally)

Refer to *Engineering Section* for details.

Approvals

UL listed as indicated. CSA certified.
RedHat II meets applicable CE directives.
Refer to *Engineering Section* for details.

Specifications (English units)

Pipe Size (ins.)	Orifice Size (ins.)	Cv Flow Factor	Operating Pressure Differential (psi)							Max. Fluid Temp. °F		Brass Body			Stainless Steel Body			Watt Rating/Class of Coil Insulation ⑦	
			Min.	Max. AC		Max. DC			AC	DC	Catalog Number	Constr. Ref. No. ④	UL ⑤ Listing	Catalog Number	Constr. Ref. No. ④	UL ⑤ Listing	AC	DC	
				Air-Inert Gas	Water	Light Oil @ 300 SSU	Air-Inert Gas	Water											Light Oil @ 300 SSU
NORMALLY CLOSED (Closed when de-energized), NBR or PTFE ② Seating																			
3/8	3/8	1.5	①	150	125	-	40	40	-	180	150	8210G73 ③	1P	●	8210G36 ③	1P	●	6.1/F	11.6/F
3/8	5/8	3	0	150	150	-	40	40	-	180	150	8210G80	3D	○	-	-	-	10.1/F	11.6/F
3/8	5/8	3	5	200	150	135	125	100	100	180	150	8210G1	6D	○	-	-	-	6.1/F	11.6/F
3/8	5/8	2	0	300	300	300	-	-	-	175	-	8210G6	5D	○	-	-	-	17.1/F	-
1/2	7/16	2.2	①	150	125	-	40	40	-	180	150	8210G15 ③	2P	●	8210G37 ③	2P	●	6.1/F	11.6/F
1/2	5/8	4	0	150	150	-	40	40	-	180	150	EF 8210G94	5D	○	-	-	-	10.1/F	11.6/F
1/2	5/8	4	0	150	150	125	40	40	-	175	150	-	-	-	8210G87	7D	●	17.1/F	11.6/F
1/2	5/8	4	5	200	150	135	125	100	100	180	150	8210G2	6D	○	-	-	-	6.1/F	11.6/F
1/2	5/8	4	5	300	300	300	-	-	-	175	-	8210G7	5D	○	-	-	-	17.1/F	-
1/2	5/8	4	5	300	300	-	300	300	-	180	125	8210G227	5D	○	-	-	-	17.1/F	40.6/H
3/4	3/8	4.5	0	150	150	125	40	40	-	175	150	-	-	-	8210G88	7D	●	17.1/F	11.6/F
3/4	3/4	5	5	125	125	125	100	90	75	180	150	8210G9	9D	○	-	-	-	6.1/F	11.6/F
3/4	3/4	5	0	150	150	-	40	40	-	180	150	8210G95	8D	○	-	-	-	10.1/F	11.6/F
3/4	3/4	6.5	5	250	150	100	125	125	125	180	150	8210G3	11D	○	-	-	-	6.1/F	11.6/F
3/4	3/4	6	0	-	-	-	200	180	180	-	77	8210B26 ② ‡	10P	-	-	-	-	-	30.6/H
3/4	3/4	6	0	350	300	200	-	-	-	200	-	8210G26 ② ‡	40P	●	-	-	-	16.1F	-
1	1	13	0	-	-	-	100	100	80	-	77	8210B54 ‡	31D	-	8210D59	15D	-	-	30.6/H
1	1	13	0	150	125	125	-	-	-	180	-	8210G54	41D	●	8210G89	45D	●	16.1/F	-
1	1	13	5	150	150	100	125	125	125	180	150	8210G4	12D	○	-	-	-	6.1/F	11.6/F
1	1	13.5	0	300	225	115	-	-	-	200	-	8210G27 ‡	42P	●	-	-	-	20.1/F	-
1	1	13.5	10	300	300	300	-	-	-	175	-	8210G78 ②	13P	-	-	-	-	17.1/F	-
1 1/4	1 1/8	15	0	-	-	-	100	100	80	-	77	8210B55 ‡	32D	-	-	-	-	-	30.6/H
1 1/4	1 1/8	15	0	150	125	125	-	-	-	180	-	8210G55	13D	●	-	-	-	16.1/F	-
1 1/4	1 1/8	15	5	150	150	100	125	125	125	180	150	8210G8	16D	○	-	-	-	6.1/F	11.6/F
1 1/2	1 1/4	22.5	0	-	-	-	100	100	80	-	77	8210B56 ‡	33D	-	-	-	-	-	30.6/H
1 1/2	1 1/4	22.5	0	150	125	125	-	-	-	180	-	8210G56 ‡	44D	●	-	-	-	16.1/F	-
1 1/2	1 1/4	22.5	5	150	150	100	125	125	125	180	150	8210G22	18D	●	-	-	-	6.1/F	11.6/F
2	1 3/4	43	5	150	125	90	50	50	50	180	150	8210G100	20P	●	-	-	-	6.1/F	11.6/F
2 1/2	1 3/4	45	5	150	125	90	50	50	50	180	150	8210G101	21P	●	-	-	-	6.1/F	11.6/F
NORMALLY OPEN (Open when de-energized), NBR Seating (PA Disc-Holder, except as noted)																			
3/8	5/8	3	0	150	150	125	125	125	80	180	150	8210G33	23D	●	-	-	-	10.1/F	11.6/F
3/8	5/8	3	5	250	200	200	250	200	200	180	180	8210G11 ⑧ ⑨	39D	●	-	-	-	10.1/F	11.6/F
1/2	5/8	4	0	150	150	125	125	125	80	180	150	8210G34	23D	●	-	-	-	10.1/F	11.6/F
1/2	5/8	3	0	150	150	100	125	125	80	180	150	-	-	-	8210G30	37D	●	10.1/F	11.6/F
1/2	5/8	4	5	250	200	200	250	200	200	180	180	8210G12 ⑧ ⑨	39D	●	-	-	-	10.1/F	11.6/F
3/4	3/4	5.5	0	150	150	125	125	125	80	180	150	8210G35	25D	●	-	-	-	10.1/F	11.6/F
3/4	5/8	3	0	150	150	100	125	125	80	180	150	-	-	-	8210G38	38D	●	10.1/F	11.6/F
3/4	3/4	6.5	5	-	-	-	250	200	200	-	180	8210C13	24D	●	-	-	-	-	16.8/F
3/4	3/4	6.5	5	250	200	200	-	-	-	180	-	8210G13	46D	●	-	-	-	16.1/F	-
1	1	13	0	125	125	125	-	-	-	180	-	8210B57 ⑥ ⑩	34D	●	-	-	-	20/F	-
1	1	13	5	-	-	-	125	125	125	-	180	8210D14	26D	●	-	-	-	-	16.8/F
1	1	13	5	150	150	125	-	-	-	180	-	8210G14	47D	●	-	-	-	16.1/F	-
1 1/4	1 1/8	15	0	125	125	125	-	-	-	180	-	8210B58 ⑥ ⑩	35D	●	-	-	-	20/F	-
1 1/4	1 1/8	15	5	-	-	-	125	125	125	-	180	8210D18	28D	●	-	-	-	-	16.8/F
1 1/4	1 1/8	15	5	150	150	125	-	-	-	180	-	8210G18	48D	●	-	-	-	16.1/F	-
1 1/2	1 1/4	22.5	0	125	125	125	-	-	-	180	-	8210B59 ⑥ ⑩	36D	●	-	-	-	20/F	-
1 1/2	1 1/4	22.5	5	-	-	-	125	125	125	-	180	8210D32	29D	●	-	-	-	-	16.8/F
1 1/2	1 1/4	22.5	5	150	150	125	-	-	-	180	-	8210G32	49D	●	-	-	-	16.1/F	-
2	1 3/4	43	5	-	-	-	125	125	125	-	150	8210I03	30P	●	-	-	-	-	16.8/F
2	1 3/4	43	5	125	125	125	-	-	-	180	-	8210G103	50P	●	-	-	-	16.1/F	-
2 1/2	1 3/4	45	5	-	-	-	125	125	125	-	150	8210I04	27P	●	-	-	-	-	16.8/F
2 1/2	1 3/4	45	5	125	125	125	-	-	-	180	-	8210G104	51P	●	-	-	-	16.1/F	-

Notes: ① 5 psi on Air; 1 psi on Water.
 ② Valve provided with PTFE main disc.
 ③ Valve includes Ultem (G.E. trademark) piston.
 ④ Letter "D" denotes diaphragm construction; "P" denotes piston construction.
 ⑤ ○ Safety Shutoff Valve; ● General Purpose Valve.
 Refer to Engineering Section (Approvals) for details.

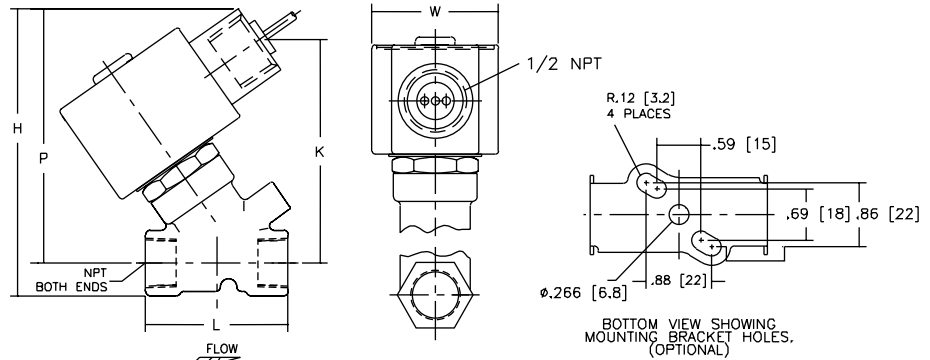
⑥ Valves not available with Explosionproof enclosures.
 ⑦ On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts.
 ⑧ AC construction also has PA seating.
 ⑨ No disc-holder.
 ⑩ Stainless Steel disc-holder.
 ‡ Must have solenoid mounted vertical and upright.

Dimensions: inches (mm)

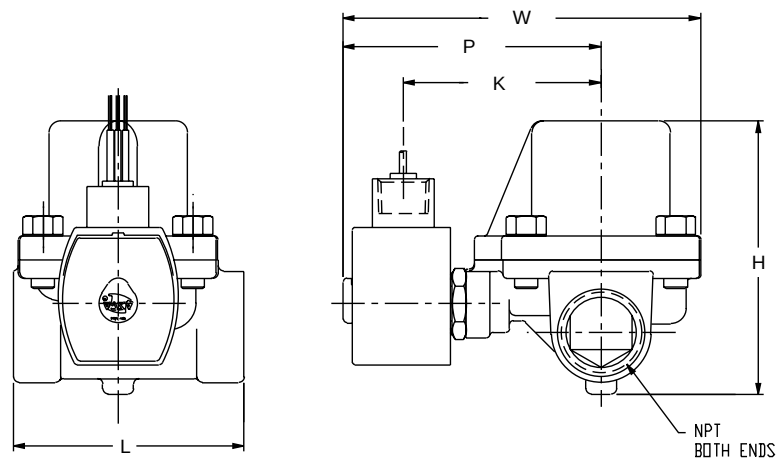
Constr. Ref. No.		H	K	L	P	W
1*	ins.	3.85	3.00	1.91	3.41	1.69
	mm	98	76	49	87	43
2*	ins.	4.17	3.25	2.28	3.63	1.69
	mm	106	83	58	92	43
13	ins.	4.44	3.22	3.75	4.19	5.81
	mm	113	82	95	106	147
5	ins.	3.84	2.31	2.75	3.28	2.28
	mm	98	59	70	83	58
6	ins.	3.85	1.94	2.75	2.86	2.28
	mm	98	49	70	71	58
7	ins.	4.19	2.50	2.81	3.47	2.39
	mm	106	64	71	88	61
8	ins.	4.13	2.47	2.81	3.44	2.29
	mm	105	63	71	87	58
9*	ins.	3.66	2.10	2.81	2.96	2.28
	mm	93	53	71	75	58
10*①	ins.	5.25	X	2.81	4.59	2.31
	mm	133	X	71	117	59
11*	ins.	4.16	2.66	3.84	3.52	2.75
	mm	106	68	98	89	70
12	ins.	5.64	3.15	3.75	4.01	3.36
	mm	143	80	95	102	85
15*	ins.	5.34	X	3.75	4.47	3.84
	mm	136	X	95	114	98
16	ins.	5.64	3.15	3.66	4.01	3.56
	mm	143	80	93	102	90
18	ins.	6.11	3.30	4.38	4.16	3.92
	mm	155	84	111	106	100
20*	ins.	7.33	3.71	5.06	4.57	4.87
	mm	186	94	129	116	124
21*	ins.	7.33	3.71	5.50	4.57	4.87
	mm	186	94	140	116	124
23	ins.	4.35	2.65	2.75	3.79	2.28
	mm	110	67	70	96	58
24	ins.	5.06	X	3.78	4.44	2.75
	mm	129	X	96	113	70
25	ins.	4.64	2.81	2.81	3.94	2.28
	mm	118	71	71	100	58
26	ins.	6.53	X	3.75	4.91	3.19
	mm	166	X	95	125	81
27	ins.	8.22	X	5.50	5.47	4.87
	mm	208	X	140	140	124
28	ins.	6.53	X	3.66	4.91	3.19
	mm	166	X	93	125	81
29	ins.	7.03	X	4.38	5.06	4.40
	mm	179	X	111	129	112

① Values must be mounted with solenoid vertical and upright.
* DC dimensions slightly larger.

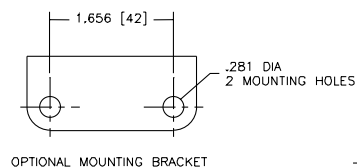
Constr. Refs. 1, 2



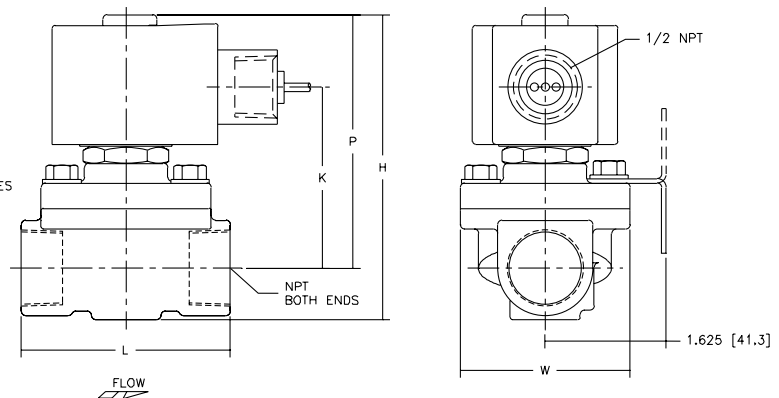
Constr. Ref. 13



Constr. Refs. 5-9, 11, 20, 21, 23, 25, 37, 38



OPTIONAL MOUNTING BRACKET



ULTRASONIC LEVEL SENSOR

SITRANS L Level instruments

Continuous measurement - Ultrasonic controllers

HydroRanger 200

Overview



HydroRanger 200 is an ultrasonic level controller for up to six pumps and provides control, differential control and open channel flow monitoring.

Benefits

- Monitors wet wells, weirs and flumes
- Digital communications with built-in Modbus RTU via RS-485
- Compatible with SmartLinX system and SIMATIC PDM configuration software
- Single or dual point level monitoring
- 6 relays standard
- Auto False-Echo Suppression for fixed obstruction avoidance
- Anti-grease ring/tide mark buildup
- Differential amplifier transceiver for common mode noise rejection and improved signal-to-noise ratio
- Wall and panel mounting options

Application

For water authorities, municipal water and wastewater plants, HydroRanger 200 is an economical, low-maintenance solution delivering control efficiency and productivity needed to meet to-day's exacting standards. It offers single- or dual-point monitoring with 6 relays standard, as well as digital communications with built-in Modbus RTU via RS-485.

HydroRanger 200 will monitor open channel flow and features more advanced relay alarming and pump control functions as well as volume conversion. It is compatible with SIMATIC PDM, allowing for PC configuration and setup. Sonic Intelligence[®] advanced echo-processing software provides increased reading reliability.

HydroRanger 200 uses proven continuous ultrasonic echo ranging technology to monitor water and wastewater of any consistency up to 15 m (50 ft) in depth. Achievable resolution is 0.1% with accuracy to 0.25% of range. Unlike contacting devices, HydroRanger 200 is immune to problems caused by suspended solids, harsh corrosives, grease or silt in the effluent, reducing downtime.

The HydroRanger 200 is available in wall or panel mounting versions.

- Key Applications: wet wells, flumes/weirs, bar screen control

Technical specifications

Mode of Operation

Measuring principle	Ultrasonic level measurement
Measuring range	0.3 to 15 m (1 to 50 ft)

Input

Analogue	0 to 20 mA or 4 to 20 mA, from alternate device, scaleable
Discrete	10 to 50 V DC switching level Logical 0 = < 0.5 V DC Logical 1 = 10 to 50 V DC Max. 3 mA

Output

Echomax [®] Transducer	44 kHz
Ultrasonic transducer	Compatible transducers: ST-H and Echomax series XPS-10/10F, XPS 15/15F, XCT-8, XCT-12 and XRS-5
Relays	6 relays, rating 5 A at 250 V AC, non-inductive 4 SPST Form A / 2 SPDT Form C
mA output	0 to 20 mA or 4 to 20 mA
• Max. load	750 Ω , isolated
• Resolution	0.1% of range

Accuracy

Error in measurement	0.25% of range or 6 mm (0.24"), whichever is greater
Resolution	0.1% of measuring range ¹⁾ or 2 mm (0.08"), whichever is greater
Temperature compensation	• -50 to +150 °C (-58 to +302 °F) • Integral temperature sensor in transducer • External TS-3 temperature sensor (optional) • Programmable fixed temperature values

Rated operating conditions

Installation conditions

Location	Indoor/outdoor
Installation category	II
Pollution degree	4

Ambient conditions

Ambient temperature (enclosure)	-20 to +50 °C (-4 to +122 °F)
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Design

Weight

• Wall mount	1.37 kg (3.02 lbs)
• Panel mount	1.50 kg (3.31 lbs)

Material (enclosure)	Polycarbonate
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Degree of protection (enclosure)

• Wall mount	IP65/Type 4X/NEMA 4X
• Panel mount	IP54/Type 3/NEMA 3

Cable

Transducer and mA output signal	2-core copper conductor, twisted, shielded, 0.5 to 0.75 mm ² (22 to 18 AWG), Belden [®] 8760 or equivalent is acceptable
Max. separation between transducer and transceiver	365 m (1200 ft)

SITRANS L Level instruments

Continuous measurement - Ultrasonic controllers

HydroRanger 200

Displays and controls	100 x 40 mm (4 x 1.5") multi-block LCD with backlighting
Programming	Programming using handheld programmer or via PC with SIMATIC PDM software

Power supply

AC version	100 to 230 V AC $\pm$ 15%, 50/60 Hz, 36 VA (17 W)
DC version	12 to 30 V DC (20 W)

Certificates and approvals

- CE²⁾
- Lloyd's Register of Shipping
- ABS Type Approval
- FM, CSA_{NRTL/C}, UL listed
- CSA Class I, Div. 2, Groups A, B, C and D, Class II, Div. 2, Groups F and G, Class III (wall mount only)
- MCERTS Class 1 approved for Open Channel Flow

Communication

- RS-232 with Modbus RTU or ASCII via RJ-11 connector
- RS-485 with Modbus RTU or ASCII via terminal strips
- Optional: SmartLinX[®] cards for
 - PROFIBUS DP
 - DeviceNet[™]
 - Allen-Bradley[®] Remote I/O

¹⁾ Program range is defined as the empty distance to the face of the transducer plus any range extension.

²⁾ EMC performance available upon request.

SITRANS L Level instruments

Continuous measurement - Ultrasonic controllers

HydroRanger 200

5

Selection and Ordering data	Order No.
Milltronics HydroRanger 200 Ultrasonic level controller for up to six pumps that provides control, differential control and open channel flow monitoring	C) 7ML1034-
Mounting Wall mount, standard enclosure Wall mount, 4 entries, 4 M20 cable glands included Panel mount	1 2 3
Power supply 100 to 230 V AC 12 to 30 V DC	A B
Communication (SmartLinX) Without module SmartLinX® Allen-Bradley® Remote I/O module SmartLinX PROFIBUS DP module SmartLinX DeviceNet™ module See SmartLinX product page on page 5/179 for more information.	A B C D
Approvals General Purpose CE, FM, CSAus/c, UL listed CSA Class I, Div. 2, Groups A, B, C and D; Class II, Div 2, Groups F and G; Class III (for wall mount applications only)	1 2
Number of measurement points Single point version Dual point version	1 2
Further designs Please add "-Z" to Order No. and specify Order code(s).	Order code
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text	Y15
Instruction manual English French German Note: The instruction manual should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.	C) 7ML1998-1FC04 C) 7ML1998-1FC14 C) 7ML1998-1FC34
Other instruction manuals SmartLinX Allen-Bradley Remote I/O, English SmartLinX PROFIBUS DP, English SmartLinX PROFIBUS DP, German SmartLinX PROFIBUS DP, French SmartLinX DeviceNet, English Note: The appropriate SmartLinX instruction manual should be ordered as a separate line on the order.	C) 7ML1998-1AP03 C) 7ML1998-1AQ03 C) 7ML1998-1AQ32 C) 7ML1998-1AQ12 C) 7ML1998-1BH02
Accessories Handheld programmer Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosure TS-3 Temperature Sensor - see TS-3 on page 5/119	7ML1830-2AK 7ML1930-1AC
Spare parts Power Supply Board (100 to 230 V AC) Power Supply Board (12 to 30 V DC) Display Board See SmartLinX product page on page 5/179 for more information.	C) 7ML1830-1MD C) 7ML1830-1ME C) 7ML1830-1MF

®Modbus is a registered trademark of Schneider Electric.
 ®Belden is a registered trademark of Belden Wire and Cable Company.
 ®Allen-Bradley is a registered trademark of Rockwell Automation.
 ™DeviceNet is a trademark of Open DeviceNet Vendor Association (ODVA)
 C) Subject to export regulations AL: N, ECCN: EAR99

Selection and Ordering data	Order No.
Siemens HydroRanger 200 Ultrasonic level controller for up to six pumps that provides control, differential control and open channel flow monitoring	C) 7ML5034-
Mounting Wall mount, standard enclosure Wall mount, 4 entries, 4 M20 cable glands included Panel mount	1 2 3
Power supply 100 to 230 V AC 12 to 30 V DC	A B
Number of measurement points Single point version Dual point version	A B
Communication (SmartLinX) Without module SmartLinX® Allen-Bradley® Remote I/O module SmartLinX PROFIBUS DP module SmartLinX DeviceNet™ module See SmartLinX product page on page 5/179 for more information.	0 1 2 3
Approvals General Purpose CE, FM, CSAus/c, UL listed CSA Class I, Div. 2, Groups A, B, C and D; Class II, Div 2, Groups F and G; Class III (for wall mount applications only)	1 2
Further designs Please add "-Z" to Order No. and specify Order code(s).	Order code
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text	Y15
Instruction manual English French German Note: The instruction manual should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.	C) 7ML1998-5FC01 C) 7ML1998-5FC11 C) 7ML1998-5FC31
Other instruction manuals SmartLinX Allen-Bradley Remote I/O, English SmartLinX PROFIBUS DP, English SmartLinX PROFIBUS DP, German SmartLinX PROFIBUS DP, French SmartLinX DeviceNet, English Note: The appropriate SmartLinX instruction manual should be ordered as a separate line on the order.	C) 7ML1998-1AP03 C) 7ML1998-1AQ03 C) 7ML1998-1AQ32 C) 7ML1998-1AQ12 C) 7ML1998-1BH02
Accessories Handheld programmer Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosure TS-3 Temperature Sensor - see TS-3 on page 5/119	7ML1830-2AK 7ML1930-1AC
Spare parts Power Supply Board (100 to 230 V AC) Power Supply Board (12 to 30 V DC) Display Board See SmartLinX product page on page 5/179 for more information.	C) 7ML1830-1MD C) 7ML1830-1ME C) 7ML1830-1MF

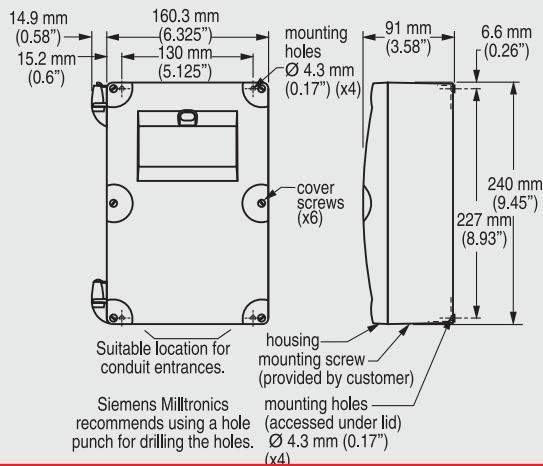
SITRANS L Level instruments

Continuous measurement - Ultrasonic controllers

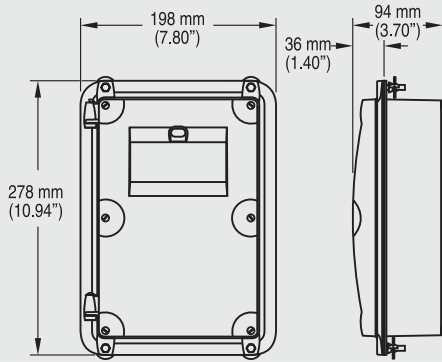
HydroRanger 200

Dimensional drawings

Wall Mount Version

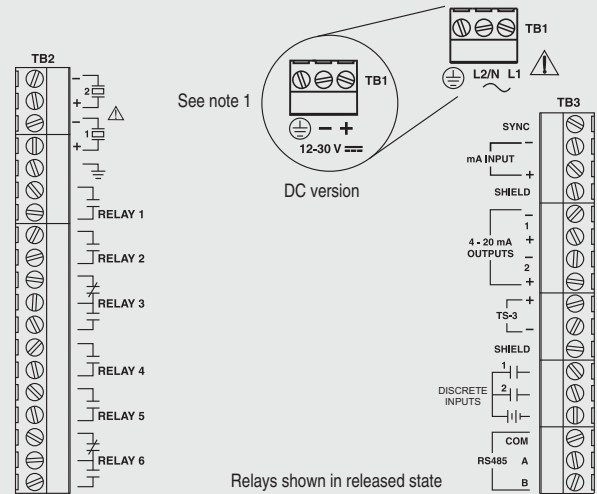


Panel Mount Version



HydroRanger 200 dimensions

Schematics



Notes

1. Use 2-core copper wire, twisted, with shield, for expansion up to 365 m (1200 ft.). Route cable in grounded metal conduit, separate from other cables.
2. Verify that all system components are installed in accordance with instructions.
3. Connect all cable shields to the HydroRanger 200 Shield Connections. Avoid differential ground potentials by not connecting cable shields to ground (earth) anywhere else.
4. Keep exposed conductors on shielded cables as short as possible to reduce noise on the line caused by stray transmissions and noise pickup.

HydroRanger 200 connections

Level Measurement

Continuous level measurement - Ultrasonic transducers

ST-H

Overview



ST-H transducers use ultrasonic technology to measure level in chemical storage and liquid tanks.

Benefits

- Can be mounted on a 2" (50.8 mm) standpipe
- Immune to corrosive and harsh environments
- Integral temperature sensor

Application

The narrow design of the ST-H allows the transducer to be mounted on a 2" (50.8 mm) standpipe. When mounted correctly, it is completely protected from the process and can even be used in harsh, corrosive environments.

During operation, the ultrasonic transducer emits acoustic pulses in a narrow beam perpendicular to the transducer face. The level transceiver measures the propagation time between pulse emission and reception of the echo to calculate the distance from the transducer to the material. Variations in sound velocity due to changes in temperature within the permissible range are automatically compensated by the integral temperature sensor.

- Key Applications: chemical storage, liquid tanks

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic transducer
Input	
Measuring range	0.3 ... 10 m (1 ... 33 ft)
Output	
Frequency	44 kHz
Beam angle	12°
Accuracy	
Temperature compensation	Compensated by integral temperature sensor
Rated operating conditions	
Pressure	Normal atmospheric pressure
Ambient conditions	
• Ambient temperature	-20 ... +60 °C (-5 ... +140 °F) (ATEX approved model) -40 ... +73 °C (-40 ... +163 °F) (CSA/FM approved model)
Design	
Weight ¹⁾	1.4 kg (3 lbs)
Material (enclosure)	Base and lid made of ETFE or PVDF (epoxy fitted joint) ²⁾
Process connection	2" NPT [(Taper), ANSI/ASME B1.20.1], R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]
Degree of protection	IP68
Cable connection	2-core shielded/twisted, 0.519 mm ² (20 AWG), PVC sheath
Cable (max. length)	365 m (1200 ft) with RG 62 A/U coaxial cable
Options	
Flange adapter	3" Universal (fits DN 65, PN 10 and 3" ASME)
Submergence coupling	For maintaining high level readings while the transducer is submerged
Certificates and approvals	
CE ³⁾ , CSA Class I, II, III, Div. 1, Gr. A, B, C, D, E, F, G T3 (ETFE only), FM Class I, II, Div. 1, Gr. C, D, E, F, G T4A, ATEX II 2G EEx m IIC T5, C-TICK, INMETRO: Br-Ex m II T5	

¹⁾ Approximate shipping weight of transducer with standard cable length

²⁾ When measuring chemicals, check compatibility of ETFE or PVDF and epoxy, or mount joint external to process.

³⁾ EMC certificate available on request

Level Measurement

Continuous level measurement - Ultrasonic transducers

ST-H

Selection and Ordering data

Echomax® ST-H ultrasonic transducer

Level measurement in chemical storage and liquid tanks. The narrow design of the ST-H allows the transducer to be mounted on a 2" standpipe. Measuring range: min. 0.3 m (1 ft), max. 10 m (33 ft).

Process connection

ETFE, 2" NPT [(Taper), ANSI/ASME B1.20.1]

PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1]

Cable length

5 m (16.40 ft)

10 m (32.81 ft)

30 m (98.43 ft)

50 m (164.04 ft)

100 m (328.08 ft)

Approvals

FM Class I, II, Div. 1, C-TICK

Operating Instructions

Quick Start Manual, multi-language

Applications Guidelines, multi-language

Note: The Applications Guidelines should be ordered as a separate line item on the order.

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.

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

Order No.

7ML1100-

A 0

0

3

B

C

D

E

2

Selection and Ordering data

Further designs

Please add "-Z" to Order No. and specify Order code(s).

Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75")]: Measuring-point number/identification (max. 16 characters) specify in plain text

Accessories

Universal box bracket, mounting kit

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE flange adapter for 2" NPT

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE flange adapter for 2" BSPT

Easy Aimer 2, NPT with ¾" x 1" PVC coupling

Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings

Easy Aimer 304, with stainless steel coupling

Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 SS couplings

Order code

Y17

Order No.

7ML1830-1BK

7ML1830-1BT

7ML1830-1BU

7ML1830-1AQ

7ML1830-1AX

7ML1830-1AU

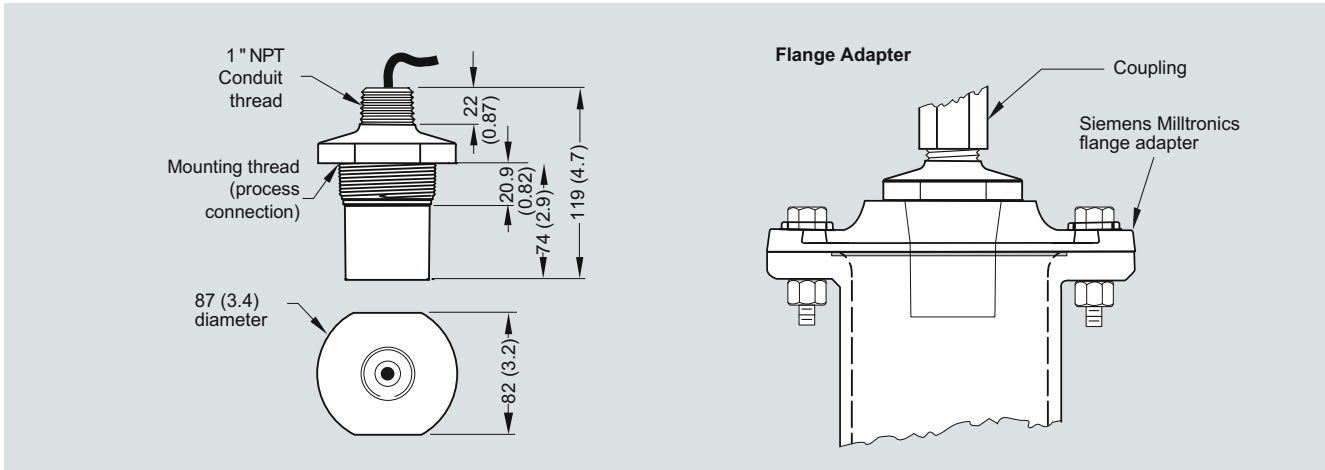
7ML1830-1GN

Level Measurement

Continuous level measurement - Ultrasonic transducers

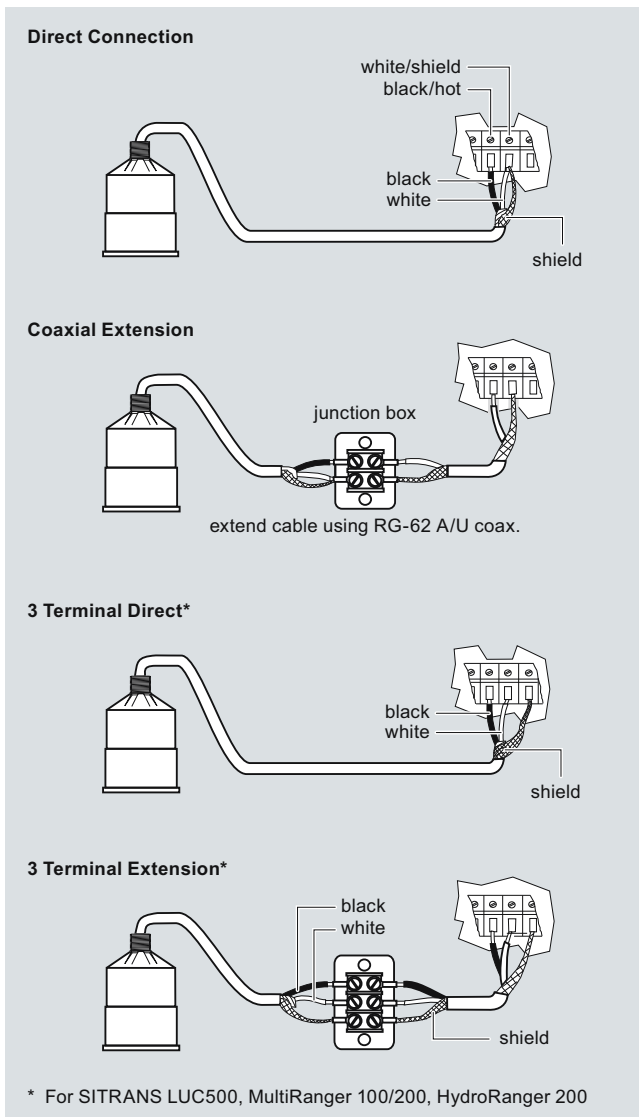
ST-H

Dimensional drawings



ST-H ultrasonic transducer, dimensions in mm (inch)

Schematics



ST-H ultrasonic transducer connections

APPLICABLE TO CANADIAN INSTALLATIONS IN HAZARDOUS LOCATIONS ONLY.

CONFIDENTIAL IMPORTANT NOTICE

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NON - HAZARDOUS LOCATION
(SAFE)

HAZARDOUS LOCATION

CLASS I GROUPS A,B,C,D
CLASS II GROUPS E,F,G

MILLTRONICS
CONTROLLER

METAL CONDUIT

CERTIFIED
CONDUIT
SEAL
FITTING



TRANSDUCER
MUST BE MOUNTED
USING 2" THREAD FOR
CORROSIVE/CHEMICAL
APPLICATIONS

CERTIFIED
CONDUIT
SEAL
FITTING

ST-H
TRANSDUCER

MILLTRONICS
CONTROLLER

JUNCTION BOX
CLASS I & II

METAL CONDUIT

CERTIFIED
CONDUIT
SEAL
FITTING



TRANSDUCER
MUST BE MOUNTED
USING 2" THREAD FOR
CORROSIVE/CHEMICAL
APPLICATIONS

CERTIFIED
CONDUIT
SEAL
FITTING

ST-H
TRANSDUCER

NOTES :

- 1) THE TRANSDUCER CABLE MUST BE TERMINATED IN AN AREA EXTERNAL TO HAZARDOUS LOCATIONS, CLASS I & II GR. A,B,C,D,E,F,G
- 2) A SEAL SHALL BE INSTALLED WITHIN 50 mm OF THE TRANSDUCER CONDUIT HUB.
- 3) THE MAX. TIGHTENING TORQUE AT THE CONDUIT HUB OF THE TRANSDUCER SHALL NOT EXCEED 22 N•m. INSTALLATION SHALL BE DONE IN ACCORDANCE WITH CEC PART 1 REQUIREMENTS.

3	ADDED MOUNTING NOTE PER ECN #97-887-0-0009	BG	AC	AUG 14/97
2	ADDED CANADIAN USE TITLE ECN #97-887-0-M006	BG	AC	MAR 05/97
1	CHANGED TITLE & REVISED FOR APP'LS PER ECN #96-887-0-E000	TJTD	SN	APR 01/96
0	FOR CONSTRUCTION	DLM	IVZ	JUN 14/93
No.	REVISION DESCRIPTION	DWG BY	APPRO.	DATE

DRAWING SCALE NONE	TOLERANCES UNLESS OTHERWISE NOTED 1 PLACE DECIMAL ±0.030" 2 PLACE DECIMAL ±0.010" 3 PLACE DECIMAL ±0.002"	FRACTIONS ±0.030" ANGLES ±0.5°	THIRD ANGLE PROJECTION
DRAWN BY D. McCONNEL	TITLE ST-H TRANSDUCER INTERCONNECTION DIAGRAM		
CHECKED BY TIEN VU			
APPROVED BY IAN VAN ZYL			



PETERBOROUGH, ONTARIO, CANADA.

FILE No. 10196203	DRAWING No. 1-9470004Z-DX-A	REV 3
PLOT AT 1:1	SHEET 1 OF 1	

FLOAT SWITCH

FT-300 Mechanically Activated, Narrow Angle Float Switch



FT-300

Mechanically Activated, Narrow Angle Float Switch

- Passed NSF Standard 61 protocol by an approved Water Quality Association laboratory
- Mechanically activated, snap action contacts
- High impact, corrosion resistant, polypropylene float housing
- Not sensitive to rotation
- Control differential of 1.5 in. (4 cm) above or below horizontal

The FT series cable suspended floats are designed for high or low level indication. The FT series is a miniature switch actuated design ideally suited to operate pumps, valves and similar equipment used in municipal wastewater treatment facilities.

Standard cable lengths are 20 ft. (6 m), and are available up to 30 ft. (9 m). The switch operating levels are easily adjustable by altering the height of the cable fixing point.

■ Operational Description

This narrow angle sensing device is used to accurately monitor liquid levels in potable water, water and sewage applications.

The FT-300 is not sensitive to rotation.

Normally Open Model (high level)

The control switch turns on (closes) when the float tips slightly above horizontal, signaling a high level. It turns off (opens) when the float drops slightly below horizontal.

Normally Closed Model (low level)

The control switch turns on (closes) when the float drops slightly below horizontal, signaling a low level. It turns off (opens) when the float tips slightly above horizontal.



File No. LR54245 Listed 83N2

Automation Products Group, Inc.

1025 West 1700 North
Logan, UT 84321 USA

Tel. 1/888/525-7300
Fax 1/435/753-7490

■ Specifications

Cable: Flexible 18 gauge, 2 conductor
(UL, CSA) SJOW, water resistant (CPE)

Float: 2.74 in. dia. x 4.83 in. long
(7.0 cm x 12.3 cm), high impact, corrosion
resistant, polypropylene housing for use in
sewage and water up to 140°F (60°C)

Maximum Water Depth: 30 ft. (9 m),
13 psi (90 kPa)

Electrical

125 VAC:

Maximum Electrical Load: 0.1 A

Minimum Electrical Load: 0.160 mA

30 VDC:

Maximum Electrical Load: 0.1 A

Minimum Electrical Load: 0.160 mA

5 VDC:

Minimum Electrical Load: 1 mA

Note: This switch can be used in hazardous
locations provided they are operated in
conjunction with appropriately rated and
installed intrinsically safe barriers.

Specifications are subject to change without
notice.

■ Ordering Information

Configuration

A (NO) Normally Open

B (NC) Normally Closed

Cable Length

(null) 6 m

L m (Optional cable length designation)

FT-300 -

ANCHOR BOLTS

A7 Adhesive



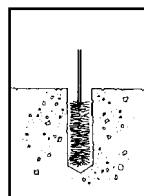
Fast Dispensing, Fast Curing Acrylic Adhesive

The acrylic resin and hardening agent are completely mixed as they are simultaneously dispensed from the dual cartridge through a static mixing nozzle, directly into the anchor hole. A7 can be used with threaded rod or rebar (for fastening to hollow base materials, see pages 29 and 32).

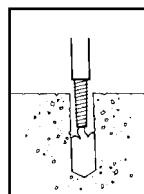
ADVANTAGES

- All weather formula, down to 0°F and below
- No drip, no sag, easy clean up
- Fast & easy dispensing, even 28-oz. cartridges can be hand dispensed
- Fast curing time, 35 minutes at 60°F
- Not mix ratio sensitive
- Rods are easier to insert into the hole with A7 compared with other adhesives
- Works in damp holes and underwater applications
- Requires less adhesive—can be used in 1/16" oversized or 1/8" oversized holes
- **One formula** for both hollow and solid base materials

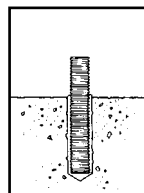
INSTALLATION STEPS



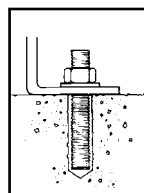
1. Drill proper sized hole. Clean out hole from bottom with forced air. Complete hole preparation with use of a brush and repeat cleaning with forced air (leave no dust or slurry).



2. When starting new cartridge or nozzle, dispense and discard enough adhesive until uniform dark grey color is achieved. Insert the nozzle into the bottom of the hole and fill to 1/2 the hole depth.



3. Insert the selected rod slowly by hand into the bottom of the hole with a slow twisting motion. This insures the adhesive fills voids and crevices uniformly.



4. See A7 Cure Time Charts for set-up time. After the recommended cure time is met, install and tighten fixture into place.

Curing Times and Dispensing Speeds

TEMPERATURE (F°/C°)	WORKING TIME	FULL CURE TIME
100° / 38°	5 minutes	25 minutes
80° / 27°	5.5 minutes	30 minutes
60° / 16°	7 minutes	35 minutes
40° / 4°	15 minutes	75 minutes
20° / -7°	35 minutes	6 hours
0° / -18°	4 hours	24 hours

APPROVALS/LISTINGS

ASTM Type IV, Grade 3, Class A, B, C
(exceptions - A7 gels faster than ASTM requirements and does not contain any epoxy)

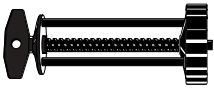
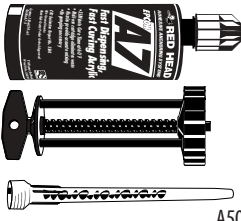
ICBO Evaluation Service, Inc. – #ER-5560

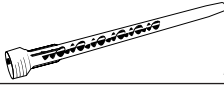
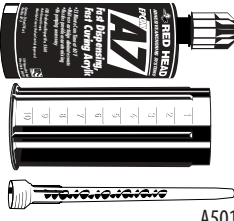
Metro-Dade County – #01-0501.01

City of Los Angeles – RR#25379

DOT Approvals

A7—5 oz. Ordering Information

PART NUMBER	DESCRIPTION	BOX QTY
 A7-5	5 Fluid Ounce Cartridge A7	12
 A500	Reusable Plastic Dispenser	12
 A500 Kit	Convenient Dispensing Kit Packaged in a Solid Plastic Shell with (1) A500 Plastic Dispenser (1) A7-5 Cartridge and (1) A24 Nozzle	8

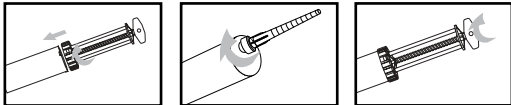
PART NUMBER	DESCRIPTION	BOX QTY
 A24	Mixing Nozzle	24
 A501	Reusable Caulking Gun Adaptor	12
 A501 Kit	Convenient Dispensing Kit Packaged in a Solid Plastic Shell with (1) A501 Caulking Gun Adaptor (1) A7-5 Cartridge and (1) A24 Nozzle	8

A500 PLASTIC DISPENSER

Attaches directly to cartridge allowing for easy hand dispensing.
No extra tools are required.



Simple Assembly and Dispensing



1. Twist-lock dispenser onto cartridge.
2. Thread nozzle onto cartridge.
3. Turn lever in order to dispense adhesive.



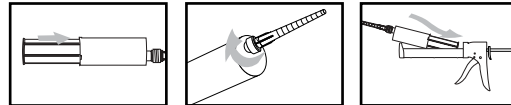
A500 Kit

A501 CAULKING GUN ADAPTOR

Allows cartridge to work with most standard caulking guns (caulking gun supplied by contractor).



Simple Assembly and Dispensing



1. Push adaptor tightly against back of cartridge.
2. Thread nozzle onto cartridge.
3. Place assembly in caulking gun and dispense adhesive.



A501 Kit

ESTIMATING TABLES

A7 Number of Anchoring Installations per Cartridge* Using Reinforcing 5 Fluid Ounce Cartridge Bar and Threaded Rod with A7 Adhesive in Solid Concrete

REBAR	DRILL HOLE DIA. INCHES	EMBEDMENT DEPTH IN INCHES (mm)			
		2 (50.8)	4 (101.6)	6 (152.4)	8 (203.2)
# 3	7/16	60	30	20	15
# 4	5/8	34	17	11	8
# 5	3/4	26	13	9	6
# 6	7/8	21	10	7	5
# 7	1	19	10	6	5
# 8	1-1/8	16	8	5	4

ROD In (mm)	DRILL HOLE DIA. INCHES	EMBEDMENT DEPTH IN INCHES (mm)			
		2 (50.8)	4 (101.6)	6 (152.4)	8 (203.2)
3/8 (9.5)	7/16	48	24	16	12
1/2 (12.7)	9/16	35	17	12	9
5/8 (15.9)	11/16	25	12	8	6
	3/4	18	9	6	4
3/4 (19.1)	13/16	18	9	6	4
	7/8	14	7	5	4
7/8 (22.2)	15/16	17	8	6	4
	1	12	6	4	3
1 (25.4)	1-1/16	14	7	5	4
	1-1/8	10	5	3	2

* The number of anchoring installations is based upon calculations of hole volumes using ANSI tolerance carbide tipped drill bits, the nominal areas of the reinforcing bars and the stress areas of the threaded rods. These estimates do not account for waste.

PERFORMANCE TABLE

A7 Acrylic Adhesive

Average Ultimate Tension and Shear Loads^{1,2,3} for Threaded Rod Installed in Solid Concrete

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	SETTING TORQUE Ft.-Lbs. (Nm)	EMBEDMENT IN CONCRETE In. (mm)	2000 PSI (13.8 MPa) CONCRETE		4000 PSI (27.6 MPa) CONCRETE	
				ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)	ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)
3/8 (9.5)	7/16 (11.1)	13 - 18 (17-24)	1-1/2 (38.1) 3-3/8 (85.7) 4-1/2 (114.3)	--- --- 5,852 (26.0) 7,729 (34.4)	--- --- 5,220 (23.2) 5,220 (23.2)	3,734 (16.6) 10,977 (48.8) 11,661 (51.9)	4,126 (18.3) 5,220 (23.2) 5,220 (23.2)
1/2 (12.7)	9/16 (14.3)	22 - 25 (29-33)	2 (50.8) 4-1/2 (114.3) 6 (152.4)	--- --- 10,798 (48.0) 14,210 (63.2)	--- --- 8,029 (35.7) 8,029 (35.7)	6,022 (26.8) 17,162 (76.3) 17,372 (77.3)	8,029 (35.7) 8,029 (35.7) 8,029 (35.7)
5/8 (15.9)	11/16 (17.5) or 3/4 (19.1)	55 - 80 (74-108)	2-1/2 (63.5) 5-5/8 (142.9) 7-1/2 (190.5)	--- --- 16,417 (73.0) 18,747 (83.4)	--- --- 15,967 (71.0) 15,967 (71.0)	7,330 (32.6) 26,504 (117.9) 29,381 (130.7)	11,256 (50.1) 15,967 (71.0) 15,967 (71.0)
3/4 (19.1)	13/16 (20.6) or 7/8 (22.2)	106 - 160 (143-216)	3 (76.2) 6-3/4 (171.5) 9 (228.6)	--- --- 18,618 (82.8) 23,934 (106.5)	--- --- 20,126 (89.5) 20,126 (89.5)	8,634 (38.4) 29,727 (132.2) 37,728 (167.8)	20,126 (89.5) 20,126 (89.5) 20,126 (89.5)
7/8 (22.2)	15/16 (23.8) or 1 (25.4)	185 - 250 (250-338)	3-1/2 (88.9) 7-7/8 (200.0) 10-1/2 (266.7)	--- --- --- --- 36,881 (164.1)	--- --- 29,866 (132.9) 29,866 (132.9)	13,650 (60.7) 44,915 (199.8) 48,321 (215.0)	20,920 (92.9) 29,866 (132.9) 29,866 (132.9)
1 (25.4)	1-1/16 (27.0) or 1-1/8 (28.6)	276 - 330 (374-447)	4 (101.6) 9 (228.6) 12 (304.8)	--- --- 32,215 (143.3) 46,064 (143.3)	--- --- 37,538 (167.0) 37,538 (167.0)	16,266 (72.2) 48,209 (214.5) 63,950 (284.5)	33,152 (147.5) 37,538 (167.0) 37,538 (167.0)
1-1/4 (31.8)	1-5/16 (33.3) or 1-3/8 (34.9)	370 - 660 (501-894)	5 (127.0) 11-1/4 (285.8) 15 (381.0)	--- --- 45,962 (204.5) 62,208 (276.7)	--- --- 58,412 (259.8) 58,412 (259.8)	21,838 (97.1) 56,715 (252.3) 84,385 (375.4)	33,152 (147.5) 58,412 (259.8) 58,412 (259.8)

1 Allowable working loads for the single installations under static loading should not exceed 25% capacity or the allowable load of the anchor rod.

2 Ultimate load values in 2000 and 4000 psi stone aggregate concrete. Ultimate loads are indicated for the embedment shown in the Embedment in Concrete column. Performance values are based on the use of high strength threaded rod (ASTM A193 Gr. B7). The use of lower strength rods will result in lower ultimate tension and shear loads.

3 Linear interpolation may be used for intermediate spacing and edge distances (see pages 14-15).

PERFORMANCE TABLE

A7 Allowable Tension Loads¹ for Threaded Rod Installed in Acrylic Adhesive Solid Concrete

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	MIN. EMBEDMENT DEPTH In. (mm)	ALLOWABLE TENSION LOAD BASED ON ADHESIVE BOND STRENGTH		ALLOWABLE TENSION LOAD BASED ON STEEL STRENGTH		
			2000 PSI (13.8 MPa) CONCRETE Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE Lbs. (kN)	ASTM A307 (SAE 1018) Lbs. (kN)	ASTM A193 GR. B7 (SAE 4140) Lbs. (kN)	316 AISI 304 SS Lbs. (kN)
3/8 (9.5)	7/16 (11.1)	1-1/2 (38.1)	---	934 (4.2)	2,080 (9.3)	4,340 (19.3)	3,995 (17.8)
		3-3/8 (85.7)	1,460 (6.5)	2,740 (12.2)	2,080 (9.3)	4,340 (19.3)	3,995 (17.8)
		4-1/2 (114.3)	1,930 (8.6)	2,915 (13.0)	2,080 (9.3)	4,340 (19.3)	3,995 (17.8)
1/2 (12.7)	9/16 (14.3)	2 (50.8)	---	1,505 (6.7)	3,730 (16.6)	7,780 (34.6)	7,155 (31.8)
		4-1/2 (114.3)	2,700 (12.0)	4,290 (19.1)	3,730 (16.6)	7,780 (34.6)	7,155 (31.8)
		6 (152.4)	3,550 (15.8)	4,340 (19.3)	3,730 (16.6)	7,780 (34.6)	7,155 (31.8)
5/8 (15.9)	11/16 (17.5) or 3/4 (19.1)	2-1/2 (63.5)	---	1,832 (8.2)	5,870 (26.1)	12,230 (54.4)	11,250 (50.0)
		5-5/8 (142.9)	4,100 (18.3)	6,625 (29.5)	5,870 (26.1)	12,230 (54.4)	11,250 (50.0)
		7-1/2 (190.5)	4,685 (20.8)	7,345 (32.7)	5,870 (26.1)	12,230 (54.4)	11,250 (50.0)
3/4 (19.1)	13/16 (20.6) or 7/8 (22.2)	3 (76.2)	---	2,158 (9.6)	8,490 (37.8)	17,690 (78.7)	14,860 (66.1)
		6-3/4 (171.5)	4,655 (20.7)	7,430 (33.1)	8,490 (37.8)	17,690 (78.7)	14,860 (66.1)
		9 (228.6)	5,980 (26.6)	9,430 (42.0)	8,490 (37.8)	17,690 (78.7)	14,860 (66.1)
7/8 (22.2)	15/16 (23.8) or 1 (25.4)	3-1/2 (88.9)	---	3,413 (15.2)	11,600 (51.6)	25,510 (113.5)	20,835 (92.7)
		7-7/8 (200.0)	---	11,230 (49.9)	11,600 (51.6)	25,510 (113.5)	20,835 (92.7)
		10-1/2 (266.7)	9,220 (41.0)	12,080 (53.7)	11,600 (51.6)	25,510 (113.5)	20,834 (92.7)
1 (25.4)	1-1/16 (27.0) or 1-1/8 (28.6)	4 (101.6)	---	4,067 (18.1)	15,180 (67.5)	31,620 (140.7)	26,560 (118.1)
		9 (228.6)	8,050 (35.8)	12,050 (53.6)	15,180 (67.5)	31,620 (140.7)	26,560 (118.1)
		12 (304.8)	11,515 (51.2)	15,985 (71.1)	15,180 (67.5)	31,620 (140.7)	26,560 (118.1)
1-1/4 (31.8)	1-5/16 (33.3) or 1-3/8 (34.9)	5 (127.0)	---	5,460 (24.3)	23,800 (105.9)	49,580 (220.6)	34,670 (154.2)
		11-1/4 (285.8)	11,490 (51.1)	14,175 (63.1)	23,800 (105.9)	49,580 (220.6)	34,670 (154.2)
		15 (381.0)	15,550 (69.2)	21,095 (93.8)	23,800 (105.9)	49,580 (220.6)	34,670 (154.2)

¹ Use lower value of either bond or steel strength for allowable tensile load.

PERFORMANCE TABLE

 DRILL HOLE DIAMETERS
 PROVIDED ON PAGES 6-8

A7 Acrylic Adhesive

Allowable Shear Loads^{1,2} for Threaded Rod Installed in Solid Concrete

THREADED ROD DIA In. (mm)	DRILL HOLE DIAMETER In. (mm)	MIN. EMBEDMENT DEPTH In. (mm)	ALLOWABLE SHEAR LOAD BASED ON CONCRETE STRENGTH		ALLOWABLE SHEAR LOAD BASED ON STEEL STRENGTH		
			2000 PSI (13.8 MPa) CONCRETE Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE Lbs. (kN)	ASTM A307 (SAE 1018) Lbs. (kN)	ASTM A193 GR. B7 (SAE 4140) Lbs. (kN)	316 AISI-304 SS Lbs. (kN)
3/8 (9.5)	7/16 (11.1)	1-1/2 (38.1) 3-3/8 (85.7)	--- --- 1,305 (5.8)	1,031 (4.6) 1,305 (5.8)	1,040 (4.6) 1,040 (4.6)	2,170 (9.7) 2,170 (9.7)	1,995 (8.9) 1,995 (8.9)
1/2 (12.7)	9/16 (14.3)	2 (50.8) 4-1/2 (114.3)	--- --- 2,005 (8.9)	2,005 (8.9) 2,005 (8.9)	1,870 (8.3) 1,870 (8.3)	3,895 (17.3) 3,895 (17.3)	3,585 (15.9) 3,585 (15.9)
5/8 (15.9)	11/16 (17.5) or 3/4 (19.1)	2-1/2 (63.5) 5-5/8 (142.9)	--- --- 3,990 (17.8)	2,814 (12.5) 3,990 (17.8)	2,940 (13.1) 2,940 (13.1)	6,125 (27.2) 6,125 (27.2)	5,635 (25.1) 5,635 (25.1)
3/4 (19.1)	13/16 (20.6) or 7/8 (22.2)	3 (76.2) 6-3/4 (171.5)	--- --- 5,030 (22.4)	5,030 (22.4) 5,030 (22.4)	4,250 (18.9) 4,250 (18.9)	8,855 (39.4) 8,855 (39.4)	7,440 (33.1) 7,440 (33.1)
7/8 (22.2)	15/16 (23.8) or 1 (25.4)	3-1/2 (88.9) 7-7/8 (200.0)	--- --- 7,465 (33.2)	5,232 (23.3) 7,465 (33.2)	5,800 (25.8) 5,800 (25.8)	12,760 (56.8) 12,760 (56.8)	10,730 (47.7) 10,730 (47.7)
1 (25.4)	1-1/16 (27.0) or 1-1/8 (28.6)	4 (101.6) 9 (228.6)	--- --- 9,385 (41.7)	8,288 (36.9) 9,385 (41.7)	7,590 (33.8) 7,590 (33.8)	15,810 (70.3) 15,810 (70.3)	13,285 (59.1) 13,285 (59.1)
1-1/4 (31.8)	1-5/16 (33.3) or 1-3/8 (34.9)	5 (127.0) 11-1/4 (285.8)	--- --- 14,600 (64.9)	8,288 (36.9) 14,600 (64.9)	11,900 (52.9) 11,900 (52.9)	24,790 (100.3) 24,790 (100.3)	18,840 (83.8) 18,840 (83.8)

1 Use lower value of either concrete or steel strength for allowable shear load.

2. Allowable loads taken from ICBO Evaluation Report #5560.

PERFORMANCE TABLE

A7 Acrylic Adhesive

Average Ultimate Tension and Shear Loads^{1,2} for Threaded Rod Installed in Grout Filled Concrete Block

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	ANCHOR LOCATION	ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)
1/2 (12.7)	5/8 (15.9)	4-1/4 (108.0)	GROUTED CELL	5,170 (23.0)	8,500 (37.8)
5/8 (15.9)	3/4 (19.1)	5 (127.0)	GROUTED CELL	6,320 (28.1)	10,850 (48.3)
3/4 (19.1)	7/8 (22.2)	6-5/8 (168.3)	GROUTED CELL	10,910 (48.5)	17,075 (76.0)

1 Allowable working loads for the single installations should not exceed 25% (an industry standard) capacity or the allowable load of the anchor rod. Loads based upon testing with ASTM A193, Grade B7 rods.

2 The tabulated values are for anchors installed at minimum 12 inch edge distance and minimum 8 inch spacing.

PERFORMANCE TABLE

A7 Acrylic Adhesive

Average Ultimate Tension and Shear Loads¹ for Threaded Rod Installed in Grouted² Brick Masonry Constructed of Solid Red Brick Units

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	ANCHOR LOCATION	ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)
1/4 (6.4)	3/8 (9.5)	3-1/2 (88.9) 6 (152.4)	CENTER OF BRICK FACE	2,130 (9.5) 3,575 (15.9)	1,165 (5.2) 1,550 (6.9)
3/8 (9.5)	1/2 (12.7)	3-1/2 (88.9) 6 (152.4)	CENTER OF BRICK FACE	2,130 (9.5) 8,875 (39.5)	1,150 (18.5) 6,950 (30.9)
1/2 (12.7)	5/8 (15.9)	3-1/2 (88.9) 6 (152.4)	CENTER OF BRICK FACE	2,130 (9.5) 12,155 (54.1)	3,090 (13.7) 7,910 (35.2)

1 Allowable working loads for the single installations should not exceed 25% (an industry standard) capacity or the allowable load of the anchor rod. Loads based upon testing with ASTM A193, Grade B7 rods.

2 Void between brick wythes was grouted solid; therefore the use of screens was not necessary.

PERFORMANCE TABLE

 DRILL HOLE DIAMETERS
 PROVIDED ON PAGES 6-8

A7 Acrylic Adhesive

Average Ultimate Tension Loads^{1,2} for Reinforcing Bar Installed in Solid Concrete

REINFORCING BAR DIA. In. (mm)	EMBEDMENT IN CONCRETE In. (mm)	2000 PSI (13.8 MPa) CONCRETE ULTIMATE TENSION Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE ULTIMATE TENSION Lbs. (kN)	ULTIMATE TENSILE AND YIELD STRENGTH GRADE 60 REBAR	
				MINIMUM YIELD STRENGTH Lbs. (kN)	MINIMUM ULTIMATE TENSILE STRENGTH Lbs. (kN)
# 3 (9.5)	3-3/8 (85.7)	6,180 (27.5)	8,324 (37.0)	6,600 (29.4)	9,900 (44.0)
	4-1/2 (114.3)	7,508 (33.6)	11,418 (50.8)	6,600 (29.4)	9,900 (44.0)
# 4 (12.7)	4-1/2 (114.3)	9,949 (44.3)	16,657 (74.1)	12,000 (53.4)	18,000 (80.1)
	6 (152.4)	15,038 (66.9)	17,828 (79.3)	12,000 (53.4)	18,000 (80.1)
# 5 (15.9)	5-5/8 (142.9)	14,012 (62.3)	20,896 (93.0)	18,600 (82.7)	27,900 (124.1)
	7-1/2 (190.5)	16,718 (74.4)	26,072 (116.0)	18,600 (82.7)	27,900 (124.1)
# 6 (19.1)	6-3/4 (171.5)	21,247 (94.5)	26,691 (118.7)	26,400 (117.4)	39,600 (176.2)
	9 (228.6)	32,325 (148.2)	37,425 (166.5)	26,400 (117.4)	39,600 (176.2)
# 7 (22.2)	7-7/8 (200.0)	-- --	40,374 (179.6)	36,000 (160.1)	54,000 (240.2)
	10-1/2 (266.7)	38,975 (173.4)	46,050 (204.8)	36,000 (160.1)	54,000 (240.2)
# 8 (25.4)	9 (228.6)	35,600 (158.4)	47,311 (210.5)	47,400 (210.9)	71,100 (316.3)
	12 (304.8)	41,010 (182.4)	66,140 (294.2)	47,400 (210.9)	71,100 (316.3)
# 9 (28.6)	10-1/8 (257.2)	-- --	57,221 (254.5)	60,000 (266.9)	90,000 (400.4)
	13-1/2 (342.9)	-- --	79,966 (355.7)	60,000 (266.9)	90,000 (400.4)
# 10 (31.8)	11-1/4 (285.8)	49,045 (218.2)	73,091 (325.1)	76,200 (339.0)	114,300 (508.5)
	15 (381.0)	69,079 (307.3)	83,295 (370.5)	76,200 (339.0)	114,300 (508.5)
# 11 (34.9)	12-3/8 (314.3)	63,397 (282.0)	75,047 (333.8)	93,600 (416.4)	140,400 (624.6)
	16-1/2 (419.1)	81,707 (363.5)	91,989 (409.2)	93,600 (416.4)	140,400 (624.6)

1 Allowable working loads for the single installations under static loading should not exceed 25% capacity or the allowable load of the anchor rod.

2 Ultimate load values in 2000 and 4000 psi stone aggregate concrete. Ultimate loads are indicated for the embedment shown in the Embedment in Concrete column. Performance values are based on the use of minimum Grade 60 reinforcing bar. The use of lower strength rods will result in lower ultimate tension loads.

PERFORMANCE TABLE

A7 Acrylic Adhesive

Recommended Edge Distance Requirements for Shear Loads

ANCHOR DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	CRITICAL EDGE DISTANCE In. (mm) (100% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (80% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (50% LOAD CAPACITY)	MINIMUM EDGE DISTANCE In. (mm) (10% LOAD CAPACITY)
3/8 (9.5)	3-3/8 (85.7)	4-3/16 (106.4)	3-7/16 (87.3)	2-5/16 (58.7)	13/16 (20.6)
1/2 (12.7)	4-1/2 (114.3)	5-5/8 (142.9)	4-5/8 (117.5)	3-1/8 (79.4)	1-1/8 (28.6)
5/8 (15.9)	5-5/8 (142.9)	7 (177.8)	5-3/4 (146.1)	3-1/8 (79.4)	1-3/8 (34.9)
3/4 (19.1)	6-3/4 (171.5)	8-7/16 (214.2)	6-15/16 (176.2)	4-5/8 (117.5)	1-5/8 (41.3)
1 (25.4)	9 (228.6)	11-1/4 (285.8)	9-1/4 (235.0)	6-1/4 (158.8)	2-1/4 (57.2)
1-1/4 (31.8)	11-1/4 (285.8)	14-1/16 (357.2)	11-5/8 (295.3)	7-7/8 (200.0)	2-7/8 (73.0)

Combined Shear and Tension Loading—for A7 Adhesive Anchors

Allowable loads for anchors under tension and shear loading at the same time (combined loading) will be lower than the allowable loads for anchors subjected to 100% tension or 100% shear. Use the following equation to evaluate anchors in combined loading conditions:

$$\left(\frac{Na}{Ns}\right)^{5/3} + \left(\frac{Va}{Vs}\right)^{5/3} \leq 1$$

Na = Applied Service Tension Load

Ns = Allowable Tension Load

Va = Applied Service Shear Load

Vs = Allowable Shear Load

PERFORMANCE TABLE

A7 Acrylic Adhesive Recommended Edge Distance Requirements for Tension Loads

ANCHOR DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	CRITICAL EDGE DISTANCE In. (mm) (100% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (90% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (80% LOAD CAPACITY)	MINIMUM EDGE DISTANCE In. (mm) (70% LOAD CAPACITY)
3/8 (9.5)	3-3/8 (85.7) 4-1/2 (114.3)	2-1/2 (63.5) 3-3/8 (85.7)	1-15/16 (49.2) 2-5/8 (66.7)	1-3/8 (34.9) 1-7/8 (47.6)	13/16 (26.2) 1-1/8 (28.6)
1/2 (12.7)	4-1/2 (114.3) 6 (152.4)	3-3/8 (85.7) 4-1/2 (114.3)	2-5/8 (66.7) 3-1/2 (88.9)	1-7/8 (47.6) 2-1/2 (63.5)	1-1/8 (28.6) 1-1/2 (38.1)
5/8 (15.9)	5-5/8 (142.9) 7-1/2 (190.5)	4-3/16 (106.4) 5-5/8 (142.9)	3-1/4 (82.6) 4-3/8 (111.1)	2-5/16 (58.7) 3-1/8 (79.4)	1-3/8 (34.9) 1-7/8 (47.6)
3/4 (19.1)	6-3/4 (171.5) 9 (228.6)	5-1/16 (128.6) 6-3/4 (171.5)	3-15/16 (100.0) 5-1/4 (133.4)	2-13/16 (71.4) 3-3/4 (95.3)	1-5/8 (15.9) 2-1/4 (57.2)
1 (25.4)	9 (228.6) 12 (304.8)	6-3/4 (171.5) 9 (228.6)	5-1/4 (133.4) 7 (177.8)	3-3/4 (95.3) 5 (127.0)	2-1/4 (57.2) 3 (76.2)
1-1/4 (31.8)	11-1/4 (285.8) 15 (381.0)	8-7/16 (214.3) 11-1/4 (285.8)	6-9/16 (166.7) 8-3/4 (222.2)	4-3/4 (120.7) 6-1/4 (158.8)	2-7/8 (73.0) 3-3/4 (95.3)

PERFORMANCE TABLE

A7 Acrylic Adhesive Recommended Spacing Requirements for Tension Loads

ANCHOR DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	CRITICAL SPACING In. (mm) (100% LOAD CAPACITY)	INTERPOLATED SPACING In. (mm) (90% LOAD CAPACITY)	MINIMUM SPACING In. (mm) (80% LOAD CAPACITY)
3/8 (9.5)	3-3/8 (85.7) 4-1/2 (114.3)	4-3/16 (106.4) 5-5/8 (142.9)	2-1/2 (63.5) 3-3/8 (85.7)	13/16 (20.6) 1-1/8 (28.6)
1/2 (12.7)	4-1/2 (114.3) 6 (152.4)	5-5/8 (142.9) 7-1/2 (190.5)	3-3/8 (85.7) 4-1/2 (114.3)	1-1/8 (28.6) 1-1/2 (38.1)
5/8 (15.9)	5-5/8 (142.9) 7-1/2 (190.5)	7 (177.8) 9-3/8 (238.1)	4-3/16 (106.4) 5-5/8 (142.9)	1-3/8 (34.9) 1-7/8 (47.6)
3/4 (19.1)	6-3/4 (171.5) 9 (228.6)	8-7/16 (214.3) 11-1/4 (285.8)	5 (127.0) 6-3/4 (171.5)	1-5/8 (41.3) 2-1/4 (57.2)
1 (25.4)	9 (228.6) 12 (304.8)	11-1/4 (285.8) 15 (381.0)	6-3/4 (171.5) 9 (228.6)	2-1/4 (57.2) 3 (76.2)
1-1/4 (31.8)	11-1/4 (285.8) 15 (381.0)	14-1/16 (357.2) 18-3/4 (476.3)	8-1/2 (215.9) 11-1/4 (285.8)	2-7/8 (73.0) 3-3/4 (95.5)

A7 Adhesive Anchoring System Spacing/Edge Distance Load Factor Summary¹

LOAD FACTOR

Critical Edge Distance—Tension

100% Tension Load

DISTANCE FROM EDGE OF CONCRETE

0.75 x Anchor Embedment (or greater)

Minimum Edge Distance—Tension

70% Tension Load

0.25 x Anchor Embedment

Critical Edge Distance—Shear

100% Shear Load

1.25 x Anchor Embedment (or greater)

Minimum Edge Distance—Shear

10% Shear Load

0.25 x Anchor Embedment

LOAD FACTOR

Critical Spacing—Tension

100% Tension Load

DISTANCE FROM ANOTHER ANCHOR

1.25 x Anchor Embedment (or greater)

Minimum Spacing—Tension

80% Tension Load

0.25 x Anchor Embedment

¹ Use linear interpolation for load factors at edge distances or spacing distances between critical and minimum.

A7 Chemical Resistance

A7 Chemical Resistance

	HIGH Anchors installed with A7 could be submerged in these materials.	MEDIUM Intermittent exposure or temporary submersion due to splash or spill.	LOW Exposure of A7 should be limited to splash and spill exposure followed by immediate cleanup.
Fresh Water	✓		
Salt Water	✓		
Brine	✓		
Urine	✓		
Humus	✓		
20% Caustic (NaOH)		✓	
Gasoline		✓	
10% Sulfuric Acid (H ₂ SO ₄)		✓	
3.5% Hydrochloric Acid (HCl)		✓	
9% Phosphoric Acid (H ₃ PO ₄)		✓	
10% Nitric Acid		✓	
8.5% Ammonium Hydroxide		✓	
Bleach		✓	
Ammonia		✓	
Xylene			✓
Toluene			✓
Acetone			✓
Glacial Acetic Acid			✓
Methanol			✓
Methylene Chloride			✓

Important Note: This chemical resistance table above applies only when A7 adhesive is used for installing anchors into concrete in a conventional manner with recommended hole sizes. Installation of the anchor must always be done in a drilled hole which is completely cleaned of all concrete dust. Exposure to solvents and chemicals, as listed above should occur only after the A7 adhesive has fully cured.

5 ENCLOSURES

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22218A PARTS LIST
CLEANFLO ROTOSCREEN DS
PORT ST LUCIE, FL

ASSEMBLY: 22218A					REV: -	DWG #: 22218AB-1000				
PART DESCRIPTION: ST LUCIE, RSDS25-80-6					DWG REV: A					
WRITTEN BY: BE14			CHKD BY: BE00			APP: WA108				
DATE: 1/27/2014			DATE: 1/27/2014			DATE: 2/17/2014				
ITEM	SP	PART NUMBER	DRAWING NUMBER	DWG REV	MATL CODE	PART DESCRIPTION	QTY	B/M	B/M REV	
101	W	22218A-1001	-	-	316SS	MAIN ASSY, RSDS25-80-6	1	N	-	
-	-	-	-	-	-	UNIT MATERIAL: 316 SS	-	-	-	
-	-	-	-	-	-	OPENING: 6mm	-	-	-	
-	-	-	-	-	-	REDUCER: SEW SA77AM182TC-KS, 130:1	-	-	-	
-	-	-	-	-	-	RATIO	-	-	-	
-	-	-	-	-	-	PROXIMITY SWITCH (X-PROOF): NAMUR KIN-	-	-	-	
-	-	-	-	-	-	M18EA/008-2G	-	-	-	
-	-	-	-	-	-	EQUIPMENT CRATING	-	-	-	
102	W	22218A-1002	-	-	316SS	SUPPORT LEG PAIR. RSDS	1	N	-	
103	W	EPO316-050C0750	-	-	316SS	EPOXY ANCHOR, 1/2" X 7 1/2", 316 SST W/2	8	N	-	
						NUTS & 2 WASHERS				
104	W	3002-006-007/M	-	-	M	MOTOR, EX-PROOF, 3 HP, 1750 RPM	1	N	-	
105	W	BHH316-050C0125	-	-	316SS	CAPSCREW HH 1/2"-13 X 1 1/4" LG	4	N	-	
106	W	1002-001-006/6	1002-001-006	A	316SS	BRACKET, LEVEL SENSOR	2	N	-	
107	W	PIPPVCSE0250	-	-	PVC	PIPE, PVC, SCH 40, 2 1/2" DIA X 1/2" LG	2	N	-	
108	W	COUPVCSE200	-	-	PVC	COUPLING, PVC, 2" NPT, SCH 40	2	N	-	
109	W	EPO316-037C0375	-	-	316SS	EPOXY ANCHOR, 3/8" X 3 3/4", 316 SST W/2	4	N	-	
						NUTS & 2 WASHERS				
110	W	1002-001-005/6	1002-001-005	0	316SS	BRACKET, LEVEL SENSOR	1	N	-	
111	W	8896T126	-	-	304SS	U-BOLT, 1" W/NUTS W/O MOUNTING	1	N	-	
						BRACKET				
112	W	22218A-1003	22218A-1003	-	304SS	NAMEPLATE	1	N	-	
113	W	22218AB-E100	22218AB-E100	-	316SS	CONTROL PANEL, NEMA 4X, 480/3/60	1	N	-	

Revision:

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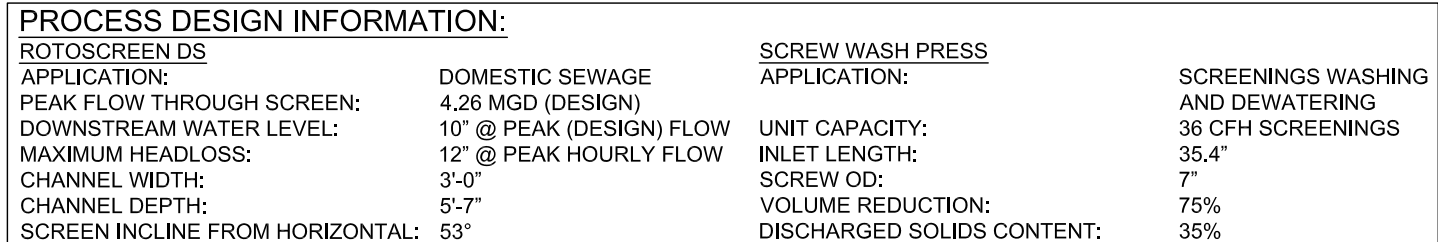
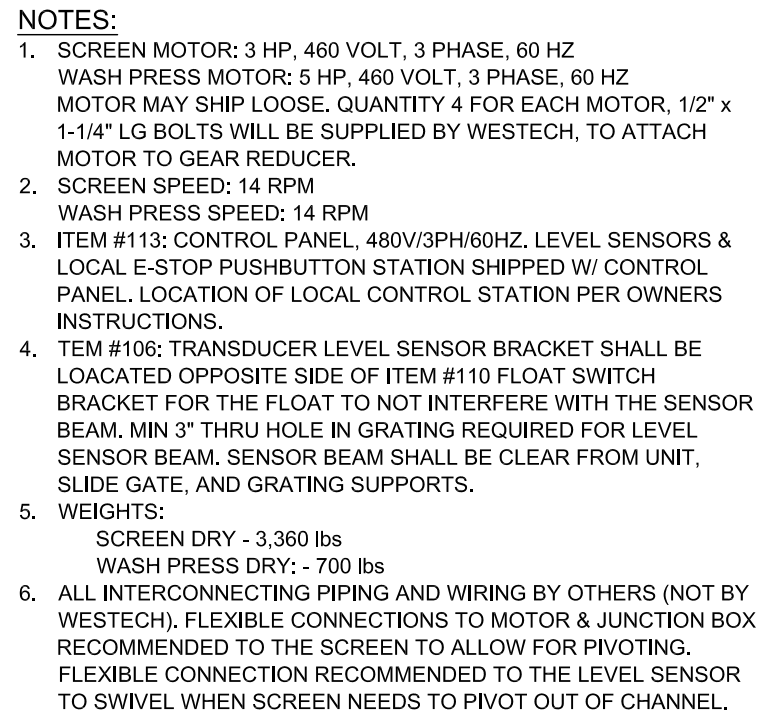
22218B PARTS LIST
CLEANWASH SCREW WASH PRESS
PORT ST LUCIE, FL

ASSEMBLY: 22218B REV: A DWG #: 22218AB-1000 PART DESCRIPTION: ST LUCIE, SWP20-80 DWG REV: A									
WRITTEN BY: BE14 CHKD BY: BE00 APP: WA108 DATE: 1/27/2014 DATE: 1/27/2014 DATE: 3/3/2014									
ITEM	SP	PART NUMBER	DRAWING NUMBER	DWG REV	MATL CODE	PART DESCRIPTION	QTY	B/M	B/M REV
201	W	22218B-2001	-	-	316SS	MAIN ASSY, SWP20-80	1	N	-
-	-	-	-	-	-	UNIT MATERIAL: 316 STAINLESS STEEL	-	-	-
-	-	-	-	-	-	SPIRAL MATERIAL: CARBON STEEL	-	-	-
-	-	-	-	-	-	REDUCER: SWE DRIVE, F240 WITH	-	-	-
202	W	EPO316-050C0750	-	-	316SS	EPOXY ANCHOR, 1/2" X 7 1/2", 316 SST W/2 NUTS & 2 WASHERS	4	N	-
203	W	3002-007-012/M	-	-	M	MOTOR, EX-PROOF, 5 HP, 1750 RPM	1	N	-
204	W	BHH316-050C0125	-	-	316SS	CAPSCREW HH 1/2"-13 X 1 1/4" LG	4	N	-
205	W	3027-001-001/M	-	-	BRS	VALVE, SOLENOID EX PROOF, 1/2" NPT	3	N	-
206	W	UNIBRSSE050F	-	-	BRS	FITTING, UNION, 1/2" NPT	3	N	-
207	W	3027-003-015/M	-	-	BRZ	VALVE, BALL, 1/2" NPT	3	N	-
208	W	22218B-2002	-	-	316SS	INLET HOPPER, W/ SPRAY BAR	1	N	-
-	-	-	-	-	-	SPRAY BAR:1/2" NPT INLET	-	-	-
209	W	22218B-2003	-	-	304SS	DISCHARGE PIPE #1	1	N	-
210	W	22218B-2004	-	-	NEOP	DISCHARGE PIPE #2	1	N	-
211	W	1008-014-015/R	1008-014-001.DWG	0	NEOP	GASKET, 14" FLANGE	2	N	-
212	W	BHH316-100C0350	-	-	316SS	CAPSCREW, HH, 1"-8 X 3 1/2" LG	12	N	-
213	W	WFL316-100	-	-	316SS	WASHER, FLAT, 1"	24	N	-
214	W	WLO316-100	-	-	316SS	WASHER, LOCK, 1"	12	N	-
215	W	NFI316-100	-	-	316SS	NUT, 1"-8	12	N	-
216	W	22218B-2013	-	-	304SS	PIPE SUPPORT	1	N	-
217	W	22218B-2006	-	-	FRP	DROP CHUTE, 14" PIPE	1	N	-
218	W	22218B-2007	-	-	304SS	SUPPORT CHUTE ASSEMBLY	2	N	-
219	W	22218B-2008	-	-	304SS	ADAPTER BAGGER	1	N	-
220	W	22218B-2009	-	-	M	BAGGER ASSEMBLY	1	N	-
221	W	3037-001-006/M	-	-	M	STRAINER, Y, 1" NPT, 20 MESH	1	N	-
222	W	BHH304-025C0125	-	-	304SS	CAPSCREW HH 1/4"-20 X 1-1/4" LG	4	N	-
223	W	WFL304-025	-	-	304SS	WASHER, FLAT, 1/4"	8	N	-
224	W	NFI304-025	-	-	304SS	NUT, HEX, 1/4"-20	4	N	-
225	W	22218B-2012	-	-	304SS	NAMEPLATE	1	N	-

**22218B PARTS LIST
CLEANWASH SCREW WASH PRESS
PORT ST LUCIE, FL**

ASSEMBLY: 22218B				REV: A		DWG #: 22218AB-1000			
PART DESCRIPTION: ST LUCIE, SWP20-80				DWG REV: A					
WRITTEN BY: BE14				CHKD BY: BE00		APP: WA108			
DATE: 1/27/2014				DATE: 1/27/2014		DATE: 3/3/2014			
ITEM	SP	PART NUMBER	DRAWING NUMBER	DWG REV	MATL CODE	PART DESCRIPTION	QTY	B/M	B/M REV
226	W	SPARES	-	-	----	SPARE PARTS LISTED BELOW	0	N	-
227	W	22218B-2010	-	-	M	WIPER / SCRAPER SET	1	N	-
228	W	22218B-2011	-	-	M	WEAR BAR SET	1	N	-

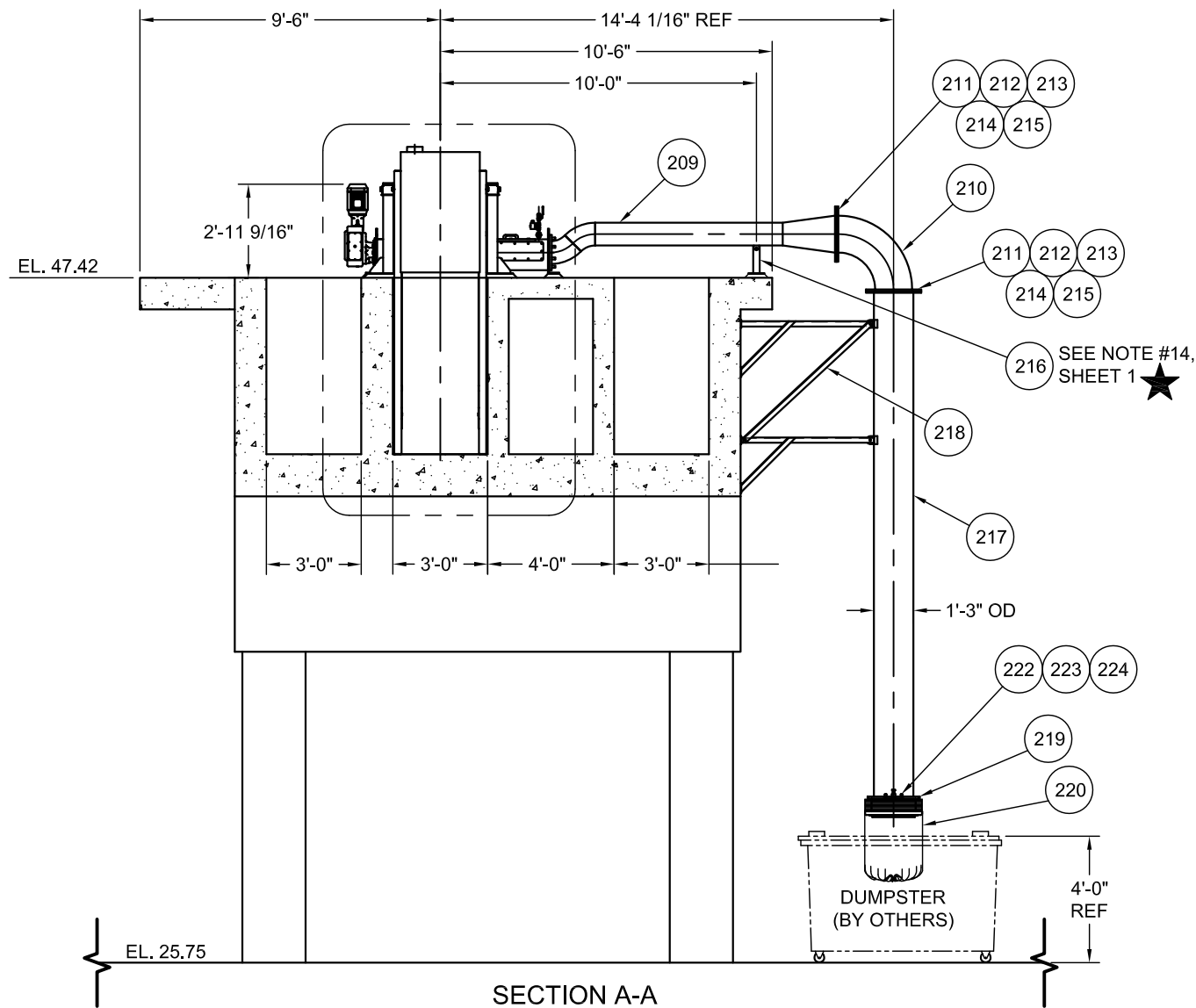
Revision:



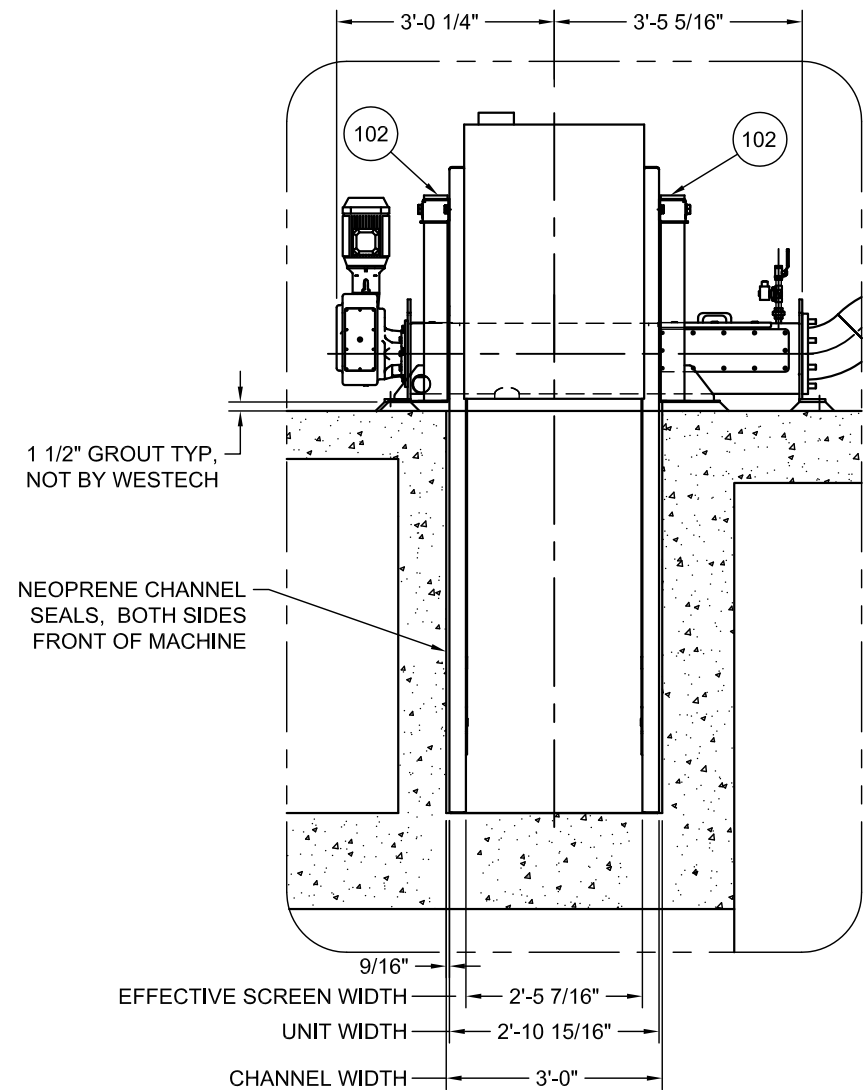
STATUS	FOR APPROVAL
PROJECT	22218AB ST. LUCIE WEST SERVICES DISTRICT FLORIDA
ENGINEER	BASKERVILLE DONOVAN, INC.
CONTRACTOR	WHARTON - SMITH, INC.
PO/CONTRACT NUMBER	REF: 1260889

WESTECH			
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TITLE	GENERAL ARRANGEMENTS CLEANFLO ROTOSCREENS / CLEANWASH SCREW WASH PRESS RSDS25-80-6 / SWP20-80		
DESIGNER	CHECKER	APPROVER	DATE
BE14	BE00	WA108	2/14
DOCUMENT NUMBER			REV
22218AB-1000			1 OF 4 A

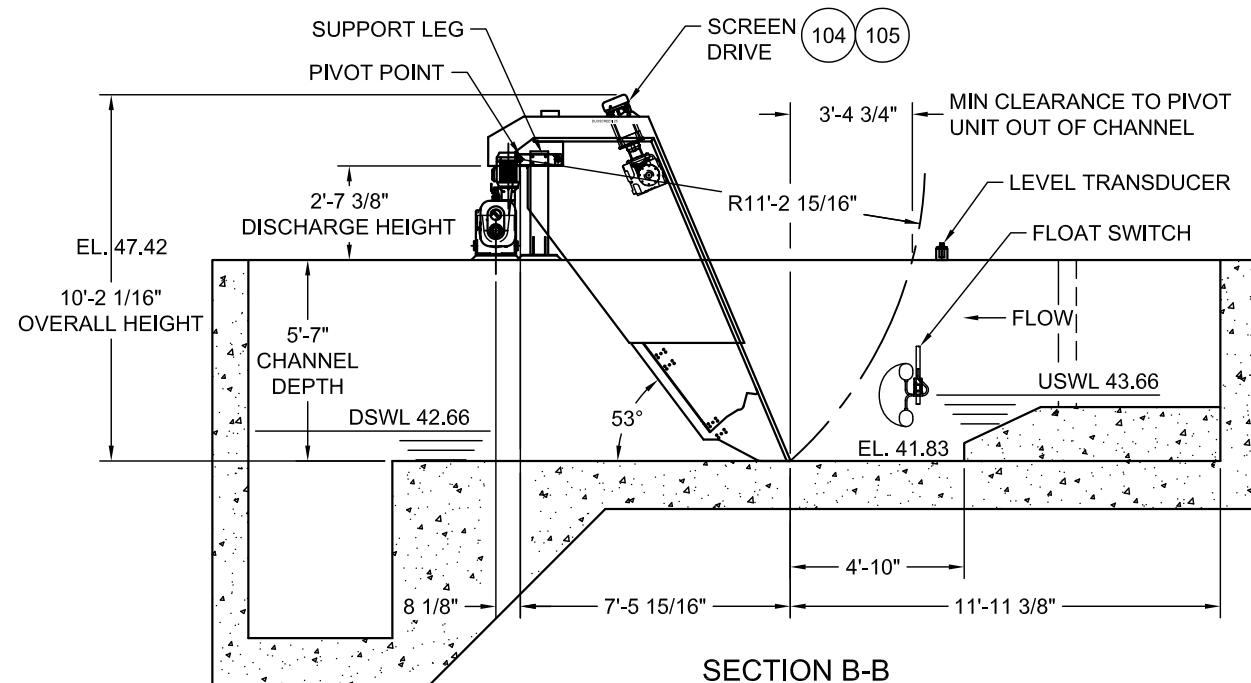
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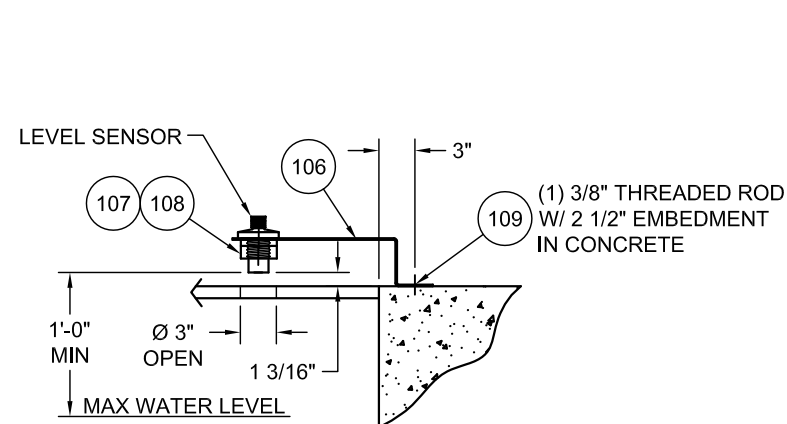
SECTION A-A
SCALE: 1" = 1'-0"



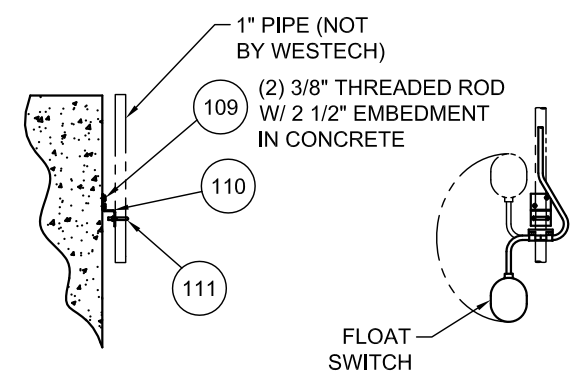
FRONT ELEVATION DETAIL
SCALE: 3/8" = 1'-0"



SECTION B-B
SCALE: 3/16" = 1'-0"



LEVEL TRANSDUCER DETAIL
SCALE: 3/4" = 1'-0"



FLOAT SWITCH DETAIL
SCALE: 1/2" = 1'-0"

REV	DESCRIPTION	ECN	DESIGNER	APPROVER	DATE	REFERENCE DOCUMENTS
A	UPDATED PER CUSTOMER COMMENTS		BE00	WA108	3-4-14	22218A PARTS LIST
						22218B PARTS LIST

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TITLE GENERAL ARRANGEMENTS CLEANFLO ROTOSCREENS / CLEANWASH SCREW WASH PRESS RSDS25-80-6 / SWP20-80			
DESIGNER BE14	CHECKER BE00	APPROVER WA108	DATE 02/14
DOCUMENT NUMBER 22218AB-1000			SHEET 2 OF 4
			REV A

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	TITLE GENERAL ARRANGEMENTS CLEANFLO ROTOSCREENS / CLEANWASH SCREW WASH PRESS RSDS25-80-6 / SWP20-80			
	DESIGNER	CHECKER	APPROVER	DATE
	BE14	WA108	BE00	02/14
22218A PARTS LIST	DOCUMENT NUMBER			SHEET
22218B PARTS LIST	22218AB-1000			3 OF 4
REFERENCE DOCUMENTS				A

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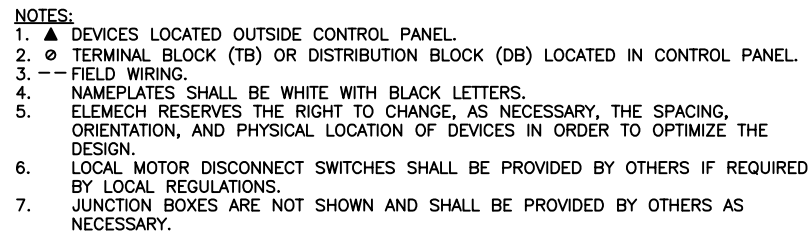
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Item	Component	Description	Manufacturer Part Number	QTY	Device
Rotoscreen / SWP Control Panel (Quantity: 1)					
1	00-000-000	Wire, Hardware, Wire labels, etc.	EleMech: Miscellaneous	2	
2	10-069-000	Wireway Duct Cover, 1.5"W, 6 Ft. Section, w/Panduit F Series	Panduit: C1.5WH6	6	
3	10-069-001	Wireway Duct Cover, 1"W, 6 Ft. Section, w/Panduit F Series	Panduit: C1WH6	6	
4	10-069-002	Wireway Duct Cover, 2"W, 6 Ft. Section, w/Panduit F Series	Panduit: C2WH6	6	
5	10-069-005	Wireway Duct, 1.5"Wx3"H, 6 Foot Section	Panduit: F1.5X3WH6	6	
6	10-069-007	Wireway Duct, 1"Wx3"H, 6 Foot Section	Panduit: F1X3WH6	6	
7	10-069-008	Wireway Duct, 2"Wx3"H, 6 Foot Section	Panduit: F2X3WH6	6	
8	25-000-A001	Legendplate Assembly, Yellow E-Stop, Standard Encl.	EleMech: 25-000-A001 Assembly	1	
9	25-000-A002	Legendplate Assembly, White, Black Text, Standard Encl.	EleMech: 25-000-A002 Assembly	6	
10	25-000-A019	Nameplate Assembly, Power Supply - 3/60/480VAC	EleMech: 25-000-A019 Assembly	1	
11	42-063-007	Terminal Block, Din Rail, 35MM Wide, 15 High, 2 Meters Long	Wieland: 98.370.1000	2	
12	68-035-006	Air Cond, NEMA 4X, 800 BTU, 115VAC, 3.8 Amps, w/150W Heater	Hoffman: T150116G151	1	AC1
13	18-000-002	Steel Barrier, 14 Ga., White Finish, 0.5"Wx10.0"x6.0"D	EleMech: 18-000-002	1	BAR1
14	03-001-084	Circuit Breaker, Aux. Contact, Form C, w/ wiring leads,T1,T2	ABB: KT3AS	1	CB1
15	03-001-A010	CB Assembly, 3 Pole, 480VAC, 20A, 65KAIC, T2H, 12" Depth	ABB: T2H020TW Assembly	1	CB1
16	03-056-029	Circuit Breaker, 1 Pole, 240VAC, 8A, 14kA, UL489, Type C	Siemens: 5SJ4108-7HG40	1	CB2
17	03-056-031	Circuit Breaker, 1 Pole, 240VAC, 15A, 14kA, UL489, Type C	Siemens: 5SJ4118-7HG40	1	CB3
18	03-056-030	Circuit Breaker, 1 Pole, 240VAC, 10A, 14kA, UL489, Type C	Siemens: 5SJ4110-7HG40	3	CB4-6
19	03-056-024	Circuit Breaker, 1 Pole, 240VAC, 2A, 14kA, UL489, Type C	Siemens: 5SJ4102-7HG40	1	CB7
20	57-000-002	Cable, Comm., Ethernet, Standard, RJ45M - RJ45M, Blue, 7'	Deep Surplus: CB242-7BL	2	CBL1,2
21	57-009-006	Cable, Signal, Shielded, 2 Conductor, 18AWG, Per Foot	Belden: 8760	5	CBL3,4
22	06-058-011	Control Relay, 3PDT,120VAC, 11Pin Spade, Indicator, Operator	Square D: RXM3AB2F7	11	CR1-11
23	06-058-012	Control Relay, Bus Jumper, 2-Pole, w/Telemec. RXM Relay	Square D: RXZ S2	10	CR1-11
24	06-058-013	Control Relay Retension Clip, w/Telemec. RXM Relay	Square D: RXZ 400	11	CR1-11
25	38-058-003	Socket, 11 Pin Spade, Din, Screw Term., 3Tier, 250V w/3-Pole	Square D: RXZE2S111M	11	CR1-11
26	34-024-000	PM, Current Xfmr, 1PH, 0.4-10A, Din Rail, CTM10, w/EL-FI	Emotron: 01-2471-10	1	CT1
27	42-063-004	Terminal Block, Ground, 30A, 600V, 6MM Wide, w/WK4/U	Wieland: 57.504.9055.0	6	DB, TB
28	07-063-000	Distribution Block, End Cover, 4 Pole, 300V,10A, w/WK4E\V\VB	Wieland: 07.311.4053.1	2	DB1
29	07-063-001	Distribution Block, Jumper, 4 Pole, 300V,10A, w/WK4E\V\VB	Wieland: Z7.210.3427	5	DB1

Item	Component	Description	Manufacturer Part Number	QTY	Device
30	07-063-002	Distribution Block, Single Pole, 10A, 300V, WK4E\VB	Wieland: 57.404.6955.1	17	DB1
31	11-000-A001	Wind Kit, Alum/Hinge, Wing Knob w/out Frame, 12"H x 12"W	EleMech: 11-000-A001	1	EN1
32	11-035-142	Sub-Panel, Painted Steel, w/48"Hx36"W C. Hinge Encl	Hoffman: A-48P36	1	EN1
33	11-035-470	Enclosure, Nema 4X, 316SS, 48"Hx36"Wx8"D, C. Hinge, 3-PT	Hoffman: A-48H3608SS6LP3PT	1	EN1
34	13-030-042	Fuse, Class CC, Time Delay, 600VAC, 6 Amp, w/Xfmr. Primary	Ferraz-Shawmut: ATQ-R-6	1	FU1
35	13-030-069	Fuse Block, 2 Pole, Class CC, 600VAC, 30A, Ultrasafe, w/Ind	Ferraz-Shawmut: USCC2I	1	FU1
36	15-011-000	Ground Lug	Blackburn: L70	3	GND
37	06-058-024	Control Relay, SPDT,120VAC, 5Pin Spade, Operator, 15A	Square D: RPM12F7	9	IR1-9
38	06-058-027	Control Relay Retension Clip, w/Telemec. RPM 1-Pole Relay	Square D: RPZR235	9	IR1-9
39	38-058-009	Socket, 5 Pin Spade, Din Mount, Screw Term., w/ RPM 1-Pole	Square D: RPZF1	9	IR1-9
40	08-113-001	Signal Isolator, 24VDC Power, w/ 1-AI, 1-AO, DIN Mtd	Weidmuller: 8594810000	1	ISO1
41	52-137-002	Label, Multiple Supply Sources, Warning, 2.5"Wx1.5"H, Yellow	Nameplate Tech: 52-137-002	1	LBL1
42	52-137-001	Label, High Voltage, Danger, 6.5"Wx3.5"H, White/Black/Red	Nameplate Tech: 52-137-001	1	LBL2
43	34-001-003	PM, 1/3PH, 110-500VAC, 2-20A, 2)SPDT, 120VAC	ABB: 1SVR 450 330 R0100	1	LM1
44	32-005-A000	Pilot light, PTT, NEMA 4X, Universal, LED, White	Allen-Bradley: 800H-QRTH2W	1	LT1
45	32-005-A002	Pilot light, PTT, NEMA 4X, Universal, LED, Red	Allen-Bradley: 800H-QRTH2R	3	LT2,4,5
46	32-005-A003	Pilot light, PTT, NEMA 4X, Universal, LED, Amber	Allen-Bradley: 800H-QRTH2A	2	LT3,6
47	22-018-000	Motor Starter, Non-Rev., NEMA 0, 1 NO Aux, 120VAC Coil, w/OL	Cutler-Hammer: AN16BNOAC	1	M1
48	22-018-007	Aux. Contact, Top mounted, 3NO/1NC, w/C-H Freedom	Cutler-Hammer: C320KGT14	3	M1,2
49	22-018-002	Motor Starter, Reversing, NEMA 0, 120VAC Coil, w/OL	Cutler-Hammer: AN56BNOAC	1	M2-F/R
50	21-018-027	Motor Circuit Prot, 600VAC, 7A, 1.5-6.1 FLA, HMCPE	Cutler-Hammer: HMCPE007C0C	1	MCP1
51	21-018-020	Motor Circuit Prot, 600VAC, 15A, 3.4-13.0 FLA, HMCPE	Cutler-Hammer: HMCPE015E0C	1	MCP2
52	25-000-A010	Nameplate Assembly, White, Black Text, 1"Hx3"W	EleMech: 25-000-A010 Assembly	2	NP1,2
53	25-000-A013	Nameplate Assembly, Yellow: Intrinsically Safe Circuits P&F	EleMech: 25-000-A013 Assembly	1	NP3
54	26-005-054	OIU, PV C400, NEMA 4X Indoor, 24VDC, Color, Touch, Ethernet	Allen-Bradley: 2711C-T4T	1	OIU1
55	WES-246-P009	Program, OIU, Panelview C400, Standard	EleMech: WES-246-P009	1	OIU1
56	28-018-007	Overload Relay Heater Pack, 3PH, 3.23-5.23A, w/Freedom, C20	Cutler-Hammer: H2008B-3	1	OL1
57	28-018-009	Overload Relay Heater Pack, 3PH, 6.75-11.0A, w/Freedom, C20	Cutler-Hammer: H2010B-3	1	OL2
58	29-005-010	Pushbutton E-Stop, NEMA 4X, Oper+1NCLB, Twist Rel. Red Head	Allen-Bradley: 800H-FRXT6D4	1	PB1
59	02-005-002	Contact Block, 2NC, w/A-B 800 Series	Allen-Bradley: 800T-XA4	1	PB3

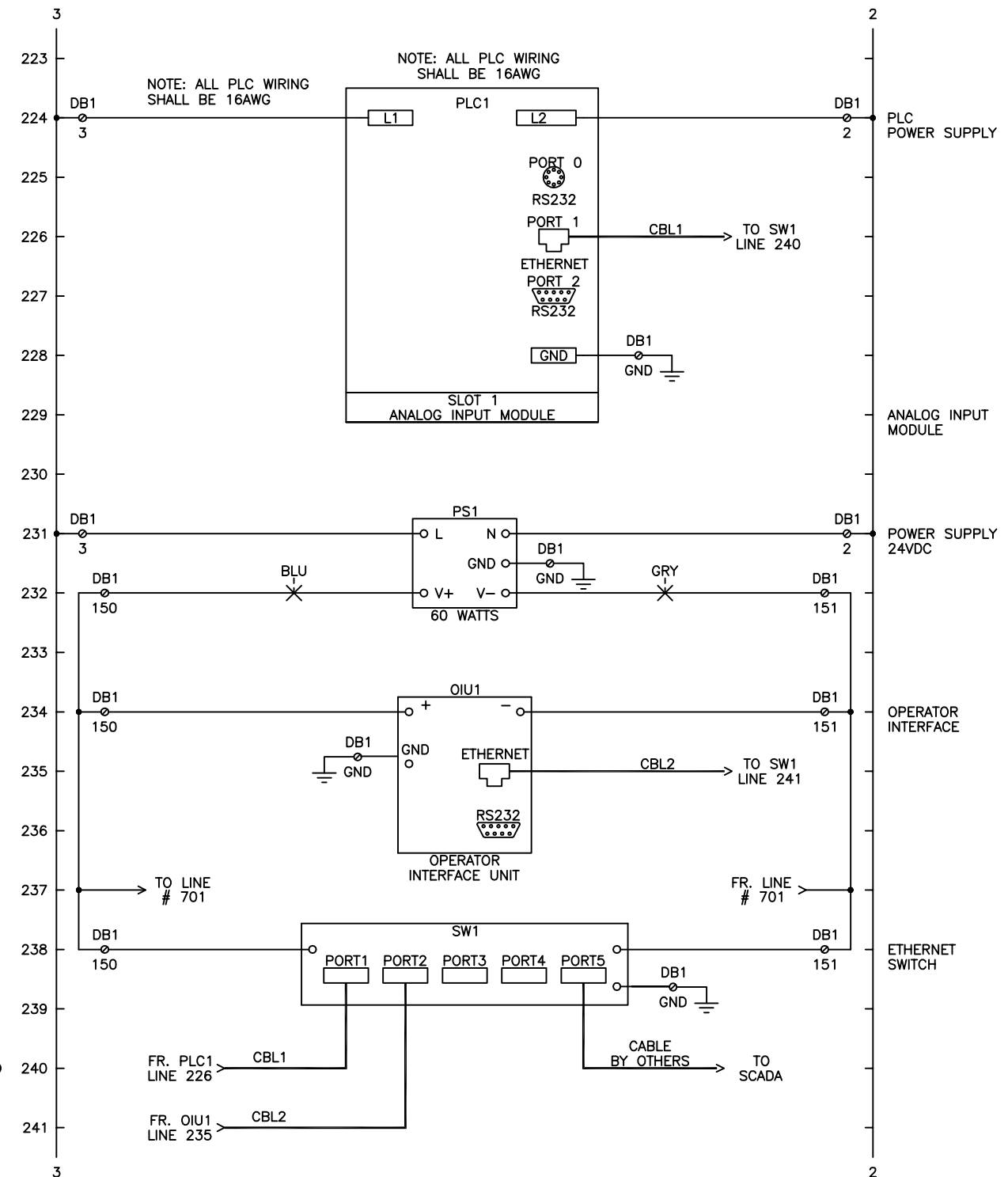
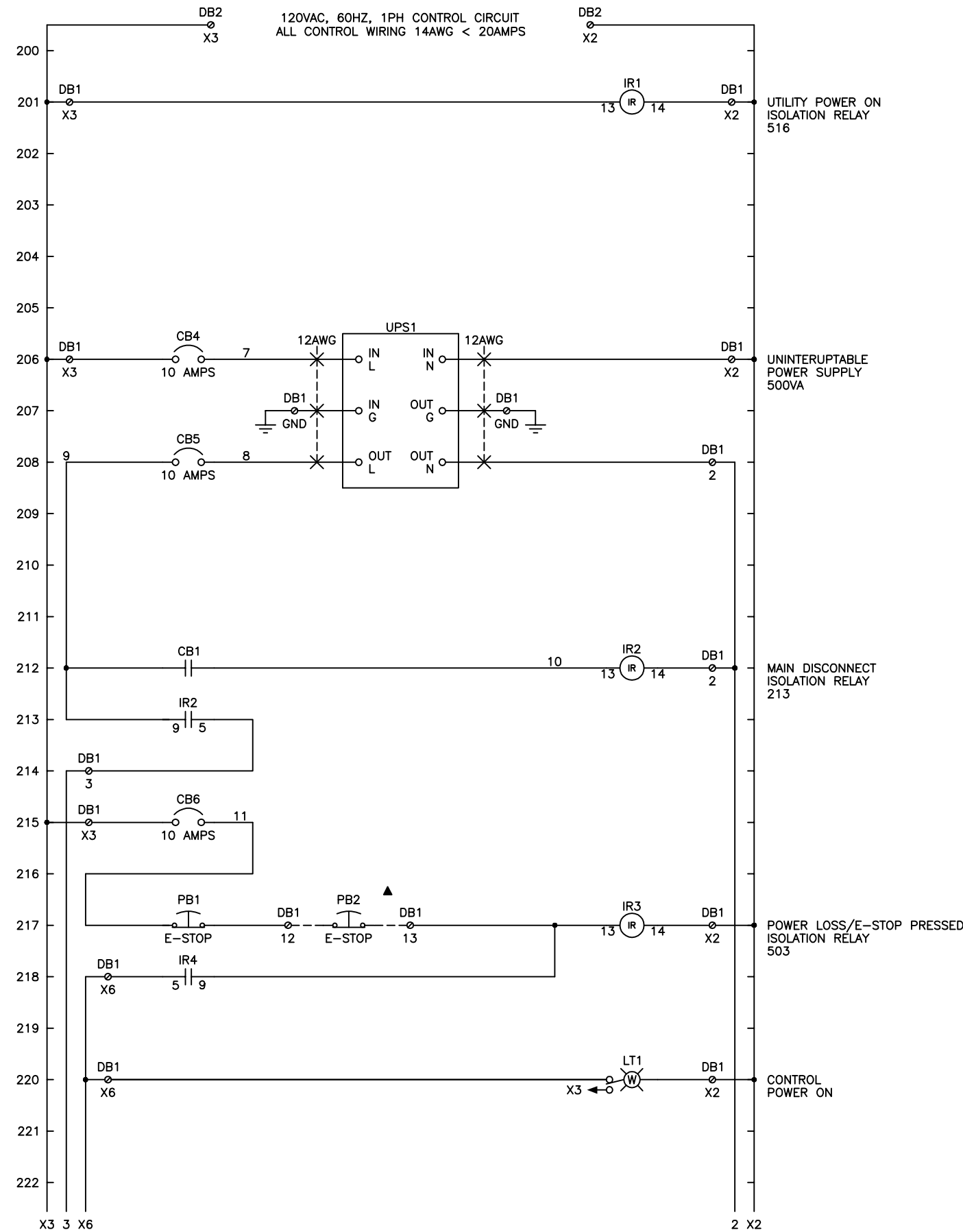
Item	Component	Description	Manufacturer Part Number	QTY	Device
60	29-005-005	Pushbutton, NEMA 4X, Oper+1NO, Extended Head, Black	Allen-Bradley: 800H-BR2D1	1	PB3
61	33-005-038	MicroLogix 1100/1200/1400, Analog Input, 4 Chnl. V/I	Allen-Bradley: 1762-IF4	1	PLC1
62	33-005-154	MicroLogix 1400, 20-120V In, 12-Rly Out, 2-232, Eth, 120VAC	Allen-Bradley: 1766-L32AWA	1	PLC1
63	WES-246-P007	Program, PLC, MicroLogix 1400, Standard	EleMech: WES-246-P007	1	PLC1
64	34-024-009	PM, EL-FI M20 3PH, 380-500VAC, 2)SPST Out, 4/20mA Out	Emotron: 01-2520-40	1	PM1
65	37-323-000	Power Supply, 60W, 100-240VAC 1.5A In, 24VDC 2.5A Out	Delta: DRP024V060W1AZ	1	PS1
66	13-000-A000	Spare Parts Box Assembly, Din Rail Mount	EleMech: 13-000-A000 Assembly	1	PT1
67	14-071-A000	Receptacle Assembly, 6mA GFCI Trip, 15 Amps, 125VAC	Leviton: 6599-I Assembly	1	RECP1
68	40-098-009	Surge Suppressor, 120VAC, 20A, 10kA, w/Filter, Din Mtd.	Phoenix: 28 56 70 2	1	SFP1
69	40-098-006	Mounting Base, Surge Suppressor, w/PLUGTRAB	Phoenix: 28 39 28 2	9	SP1-9
70	40-098-012	Surge Suppressor, Power Plug, PT 2x1VA-120AC-ST, w/out Base	Phoenix: 28 39 18 5	9	SP1-9
71	33-098-002	Ethernet Switch, 5TX, 9-32VDC, RJ45, 5 Port	Phoenix: 2891152	1	SW1
72	41-018-A042	Transformer Assembly, 480/240-120VAC, 1.5KVA, NEMA 3R, 316SS	Cutler-Hammer: S20N11P16PS6 Assen	1	T1
73	42-063-000	Terminal Block, Labels, Custom Printed, w/WK4/U	Wieland: 04.242.6353-CUSTOM	172	TB, DB
74	42-063-009	Terminal Block, End Clamp, w/WKN10/U	Wieland: Z5.522.8553	8	TB, DB
75	42-063-008	Terminal Block, Labels, Blank, w/WK4/U	Wieland: Z4.242.6353	22	TB1
76	42-063-015	Terminal Block, Jumper, w/WK4/U, 02 pole, Insulated	Wieland: Z7.281.1227	3	TB1, DB2
77	42-063-001	Terminal Block, End Plate, Beige, w/WK4/U	Wieland: 07.311.0155.0	4	TB1-3, DB2
78	42-063-003	Terminal Block, Single Pole, 30A, 600V, 6MM Wide, WK4/U	Wieland: 57.504.0055.0	73	TB1-3, DB2
79	18-049-000	Transformer Isolated Barrier, Single Channel, 120VAC	P&F: KFA5-SR2/EX1.W	2	TIB1,2
80	52-000-003	Label, Underwriters Laboratories 698A, w/Decal Set	EleMech: 698A	1	UL
81	48-005-000	UPS, 1609U Series, 120VAC, 500VA, 325 Watts	Allen Bradley: 1609-U500NS	1	UPS1
LCS, 6 Hole, Nema 4/7/9, 4) H-O-A, 1) F-O-R, E-Stop (Quantity: 1)					
82	25-000-A004	Legendplate Assembly, White, Black Text, LCS Encl.	EleMech: 25-000-A004 Assembly	5	
83	25-000-A005	Legendplate Assembly, Yellow E-Stop, LCS Encl.	EleMech: 25-000-A005 Assembly	1	
84	53-053-003	Conduit, Lockwasher, 3/4", Use w/3/4" Nipple	Steel City: LN102	6	
85	11-004-001	Local Control Station, NEMA 4/7/9, 6 Hole, (2)1-1/4 NPT	Akron Electric: CX I 3133-X6-N4-N5-2R	1	LCS1
86	29-005-009	Pushbutton E-Stop, NEMA 7/9, Oper+1NCLB, Push-Pull Red Head	Allen-Bradley: 800H-FPX6D4	1	PB2
87	39-005-005	Selector Switch, NEMA 7/9, 3 Pos. Maintained, 1NO-1NC	Allen-Bradley: 800H-JP2KB7AXXX	4	SS1,2,4,5
88	39-005-007	Selector Switch, Nema 7/9, 3 Pos. Spring Fr. Right, 1NO-1NC	Allen-Bradley: 800H-JP5KB7AXXX	1	SS3

Item	Component	Description	Manufacturer Part Number	QTY	Device
ULC, Hydorranger200, NEMA 4X FRP, En. w/Win, Non-Haz, No Dif (Quantity: 1)					
89	11-035-126	Sub-Panel, Painted Steel, w/12"Hx10"W Junction Box	Hoffman: A-12P10	1	EN
90	11-035-176	Enclosure Mounting Feet, Fiberglass, J box	Hoffman: A-50MFKR	1	EN
91	11-035-273	Enclosure, Nema 4X, Fiberglass, 13.53"Hx10"Wx7"D, w/Window	Hoffman: A-14107JFGQRPWR	1	EN
92	25-000-A023	Nameplate Assembly, White: Ultrasonic Level Controller	EleMech: 25-000-A023 Assembly	1	NPL
93	49-043-097	ULC, Hydro 200, 120VAC, 3-Relay, 4-20mA, Non-Haz, No Diff	Siemens: 7ML50341AD01	1	ULC
Spare Parts / Ship Loose (Total Quantity Provided)					
94	49-043-008	ULS, STH, 2"NPT, 10M Cable, FM Class 1 Div. 1	Siemens: 7ML1100-0BA20	1	
95	49-043-027	ULC, Hydro/MultiRanger 200 Hand Held Programmer	Siemens: 7ML1830-2AK	1	
96	12-356-003	Float Switch, Mech., Mercury-Free, N.O., 20' Cable,w/ TIB	APG: FT-300A	1	
97	11-000-182	Sun Shield Legs, Stainless, w/8"D Enclosure, Low Profile	EleMech: 11-000-182	1	
98	11-000-028	Sun Shield Cover, Stainless Steel, w/36"Wx8"D enclosure	EleMech: 11-000-028	1	
99	13-030-042	Fuse, Class CC, Time Delay, 600VAC, 6 Amp, w/Xfmr. Primary	Ferraz-Shawmut: ATQ-R-6	2	



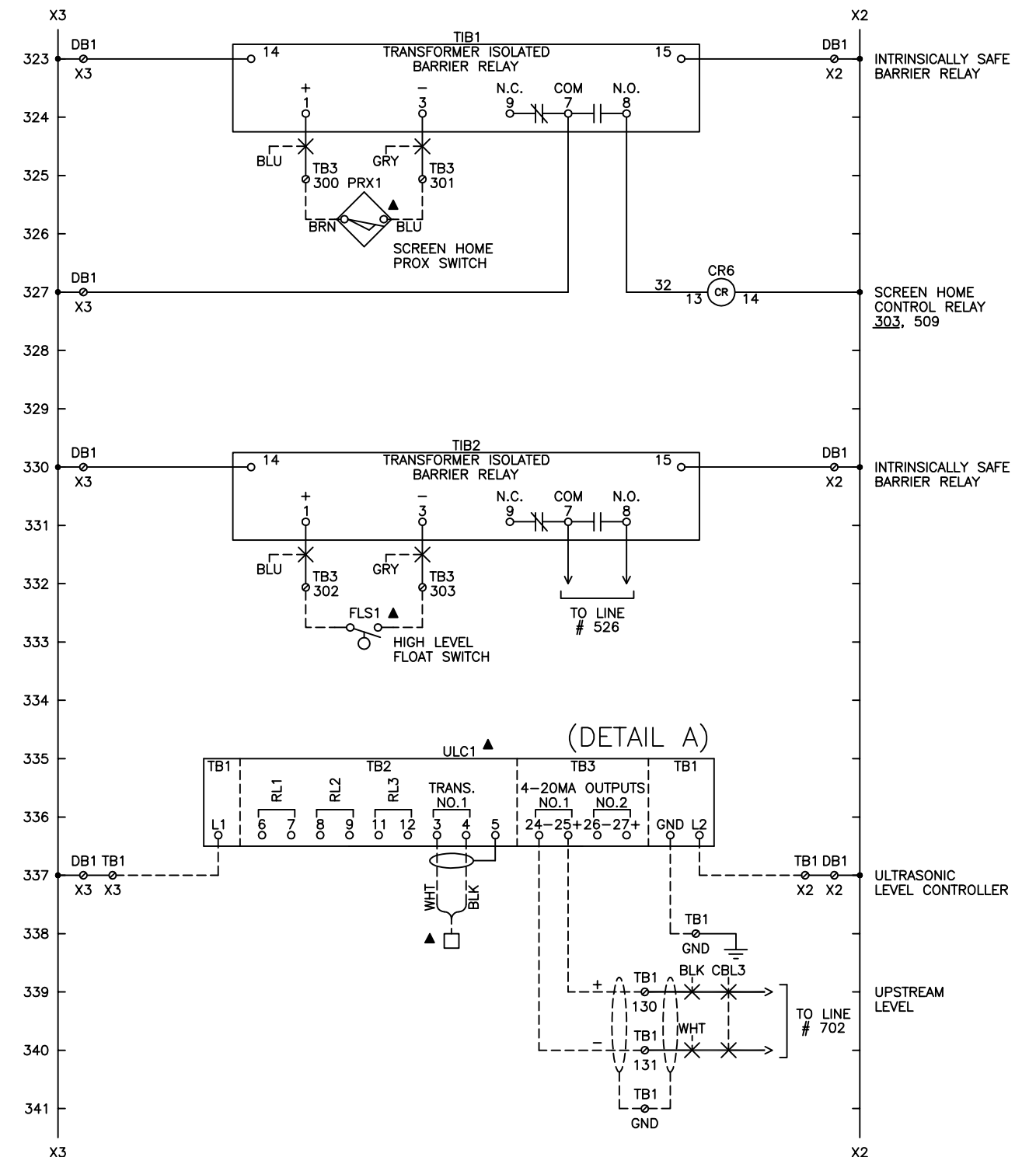
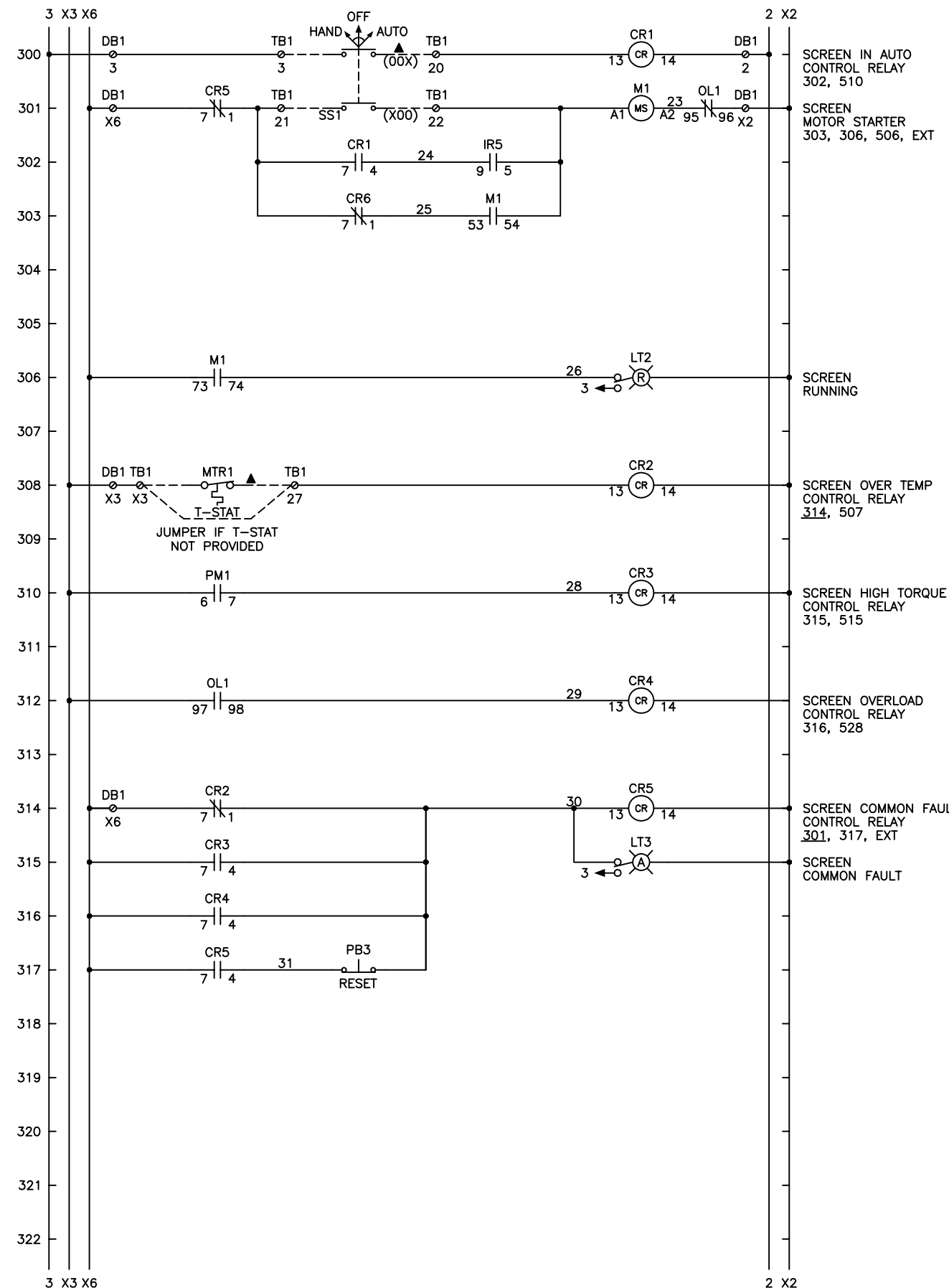
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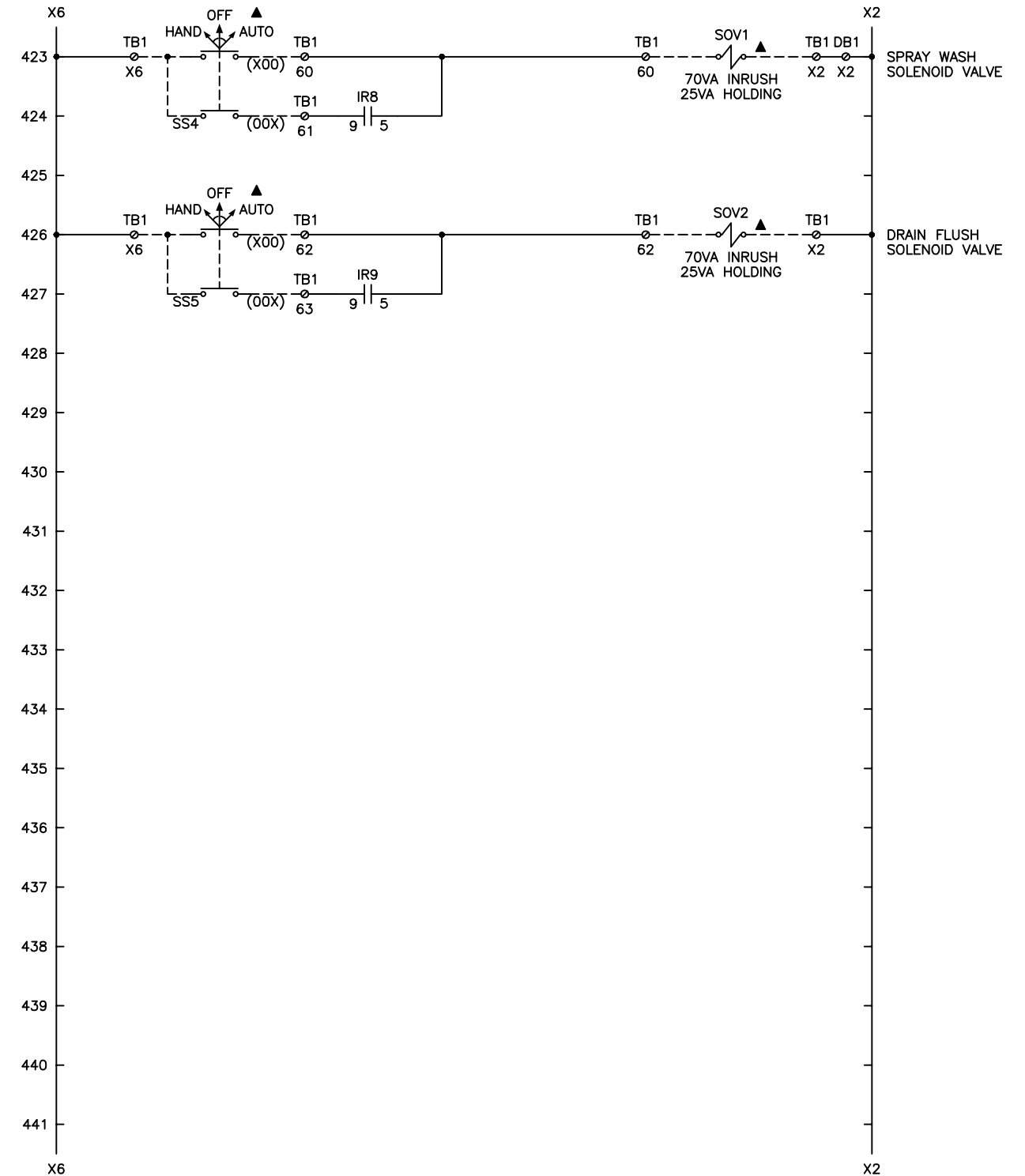
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DESCRIPTION									
3HP, 5HP, 480VAC									
TYPE					SIZE				
DATE	STD. BY	STD. CHKD.	STD. APPVD	NONE	02/14	PTW	RTH	RTH	
ALL COMPONENTS MUST BE FABRICATED AND MACHINED ACCORDING TO WESTECH STANDARD SPECIFICATION (DRAWING P24Z-024A), UNLESS SPECIFICALLY NOTED ON THIS DRAWING.									
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DRAWING NUMBER					PROJECT NUMBER				
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REVISION					REV.				

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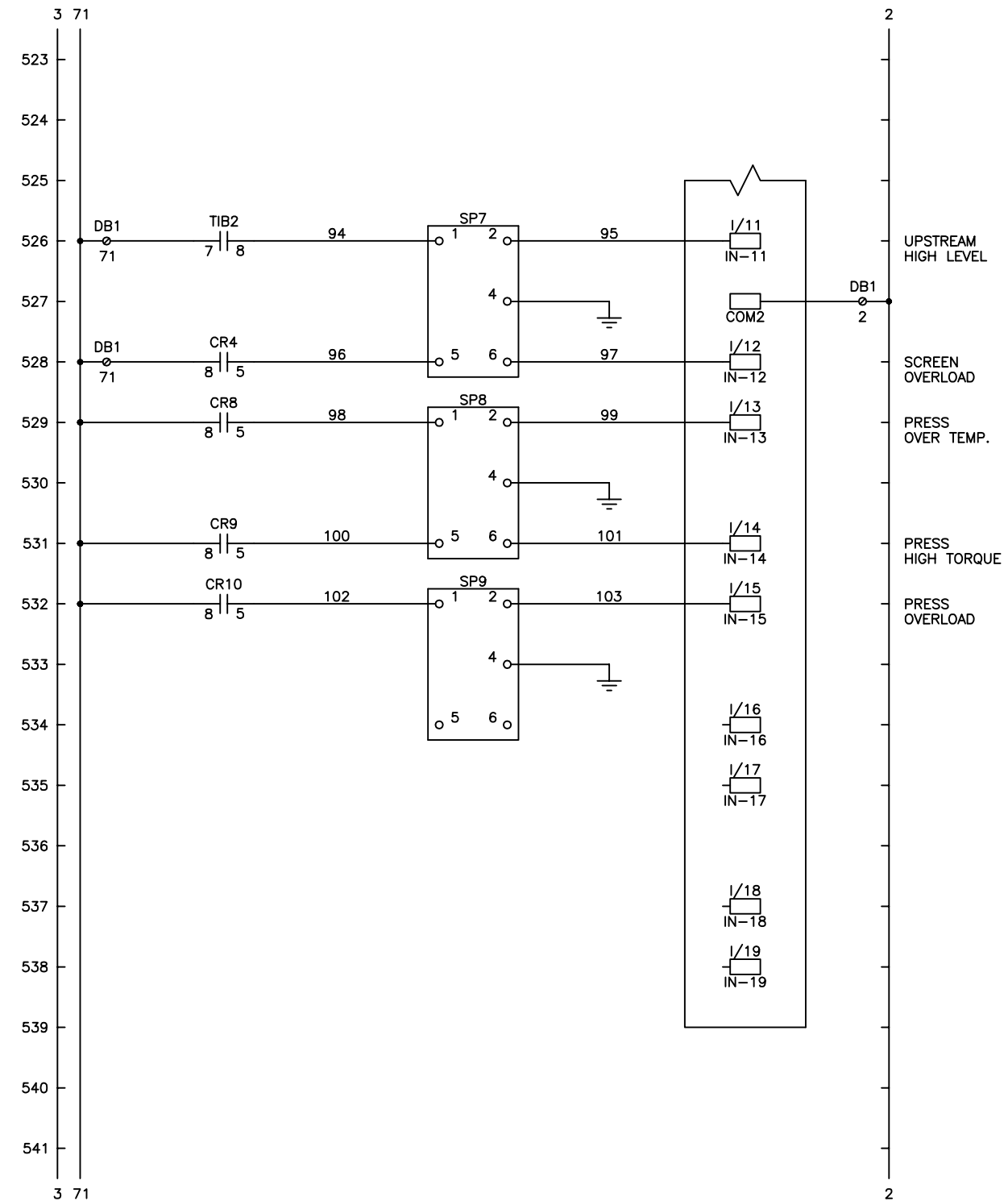
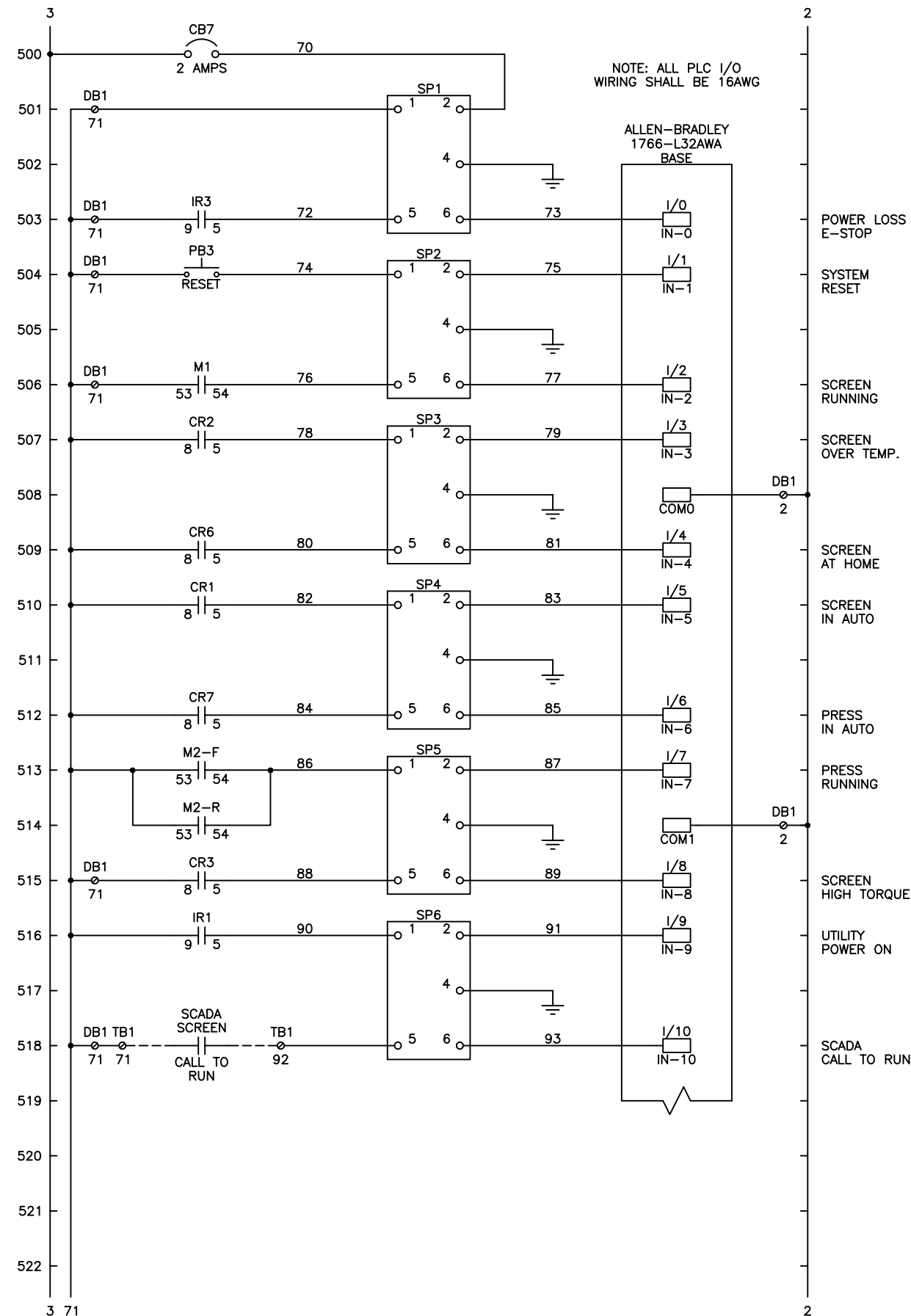
ROTOSCREEN / SWP CONTROL PANEL									
DESCRIPTION									
3HP, 5HP, 480VAC									
TYPE					SIZE				
DATE	STD. BY	STD. CHKD.	STD. APPVD	NONE	02/14	PTW	RTH	RTH	
DATE	STD. BY	STD. CHKD.	STD. APPVD	SCALE	DATE	PROJ. BY	PROJ. CHKD.	PROJ. APPVD	
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REVISION	BY	CHKD	DATE	L

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ROTOSCREEN / SWP CONTROL PANEL									
DESCRIPTION									
3HP, 5HP, 480VAC									
TYPE					SIZE				
DATE	STD. BY	STD. CHKD.	STD. APPVD.	NONE	02/14	PTW	RTH	RTH	
DATE	STD. BY	STD. CHKD.	STD. APPVD.	SCALE	DATE	PROJ. BY	PROJ. CHKD.	PROJ. APPVD.	
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WIRING SHALL BE 16AWG

ALLEN-BRADLEY
1766-L32AWA
BASE

DB1
3

0/0
VAC0

0/1
OUT-0

110

IR4
13 14

CONTROL POWER ENABLE
ISOLATION RELAY
218

0/1
VAC1

0/1
OUT-1

111

IR5
13 14

SCREEN CALL TO RUN
ISOLATION RELAY
302

0/2
VAC2

0/2
OUT-2

112

IR6
13 14

PRESS CALL TO RUN FWD
ISOLATION RELAY
403

0/3
VAC3

0/3
OUT-3

113

IR7
13 14

PRESS CALL TO RUN REV
ISOLATION RELAY
404

0/4-5
VAC4

0/4
OUT-4

114

IR8
13 14

SPRAY WASH CALL TO RUN
ISOLATION RELAY
424

0/5
OUT-5

115

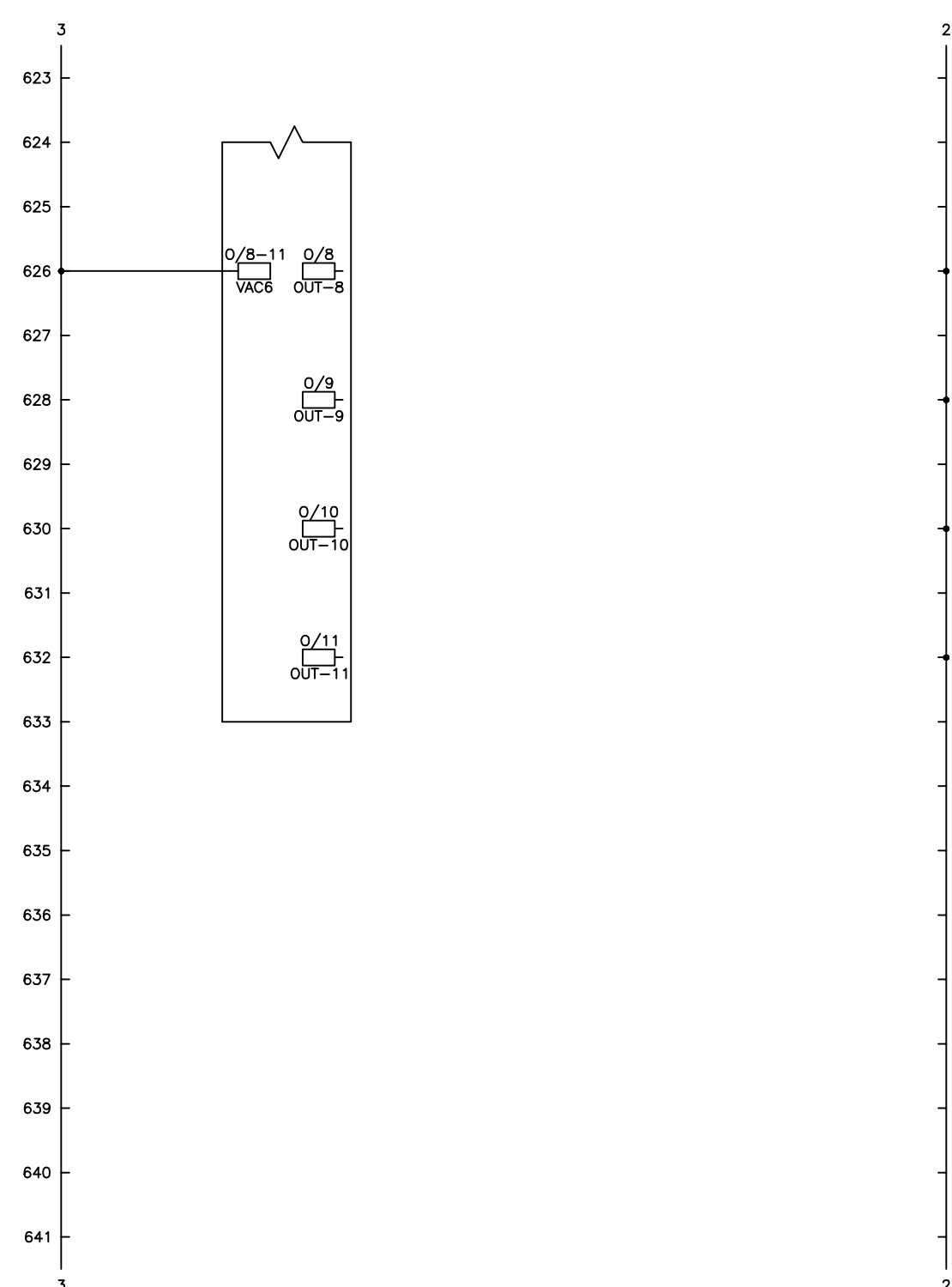
IR9
13 14

DRAIN FLUSH CALL TO RUN
ISOLATION RELAY
427

0/6-7
VAC5

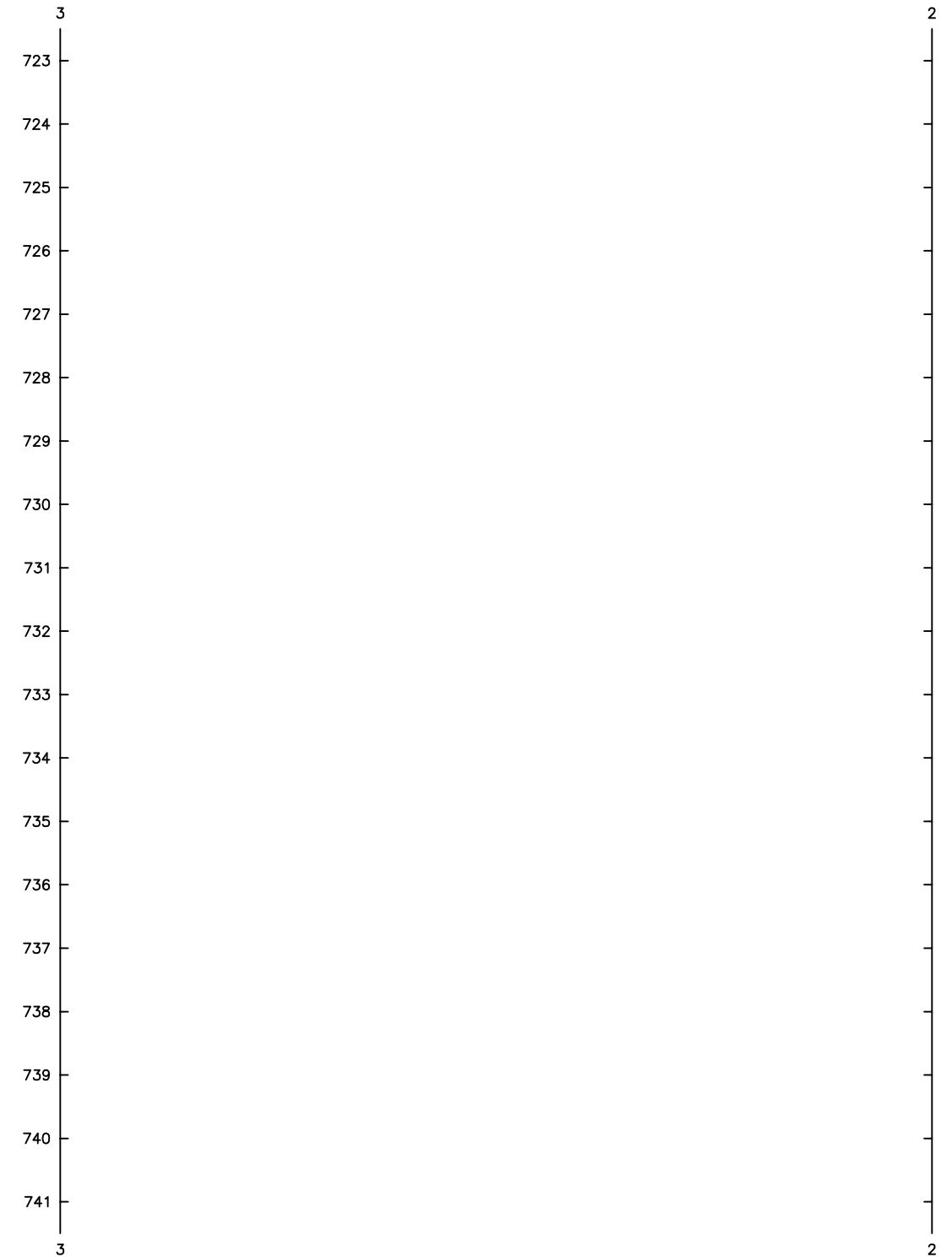
0/6
OUT-6

0/7
OUT-7



ROTOSCREEN / SWP CONTROL PANEL								
DESCRIPTION								
3HP, 5HP, 480VAC								
TYPE						SIZE		
				NONE	02/14	PTW	RTH	RTH
DATE	STD. BY	STD.CHKD.	STD.APPVD	SCALE	DATE	PROJ. BY	PROJ.CHKD.	PROJ.APPVD
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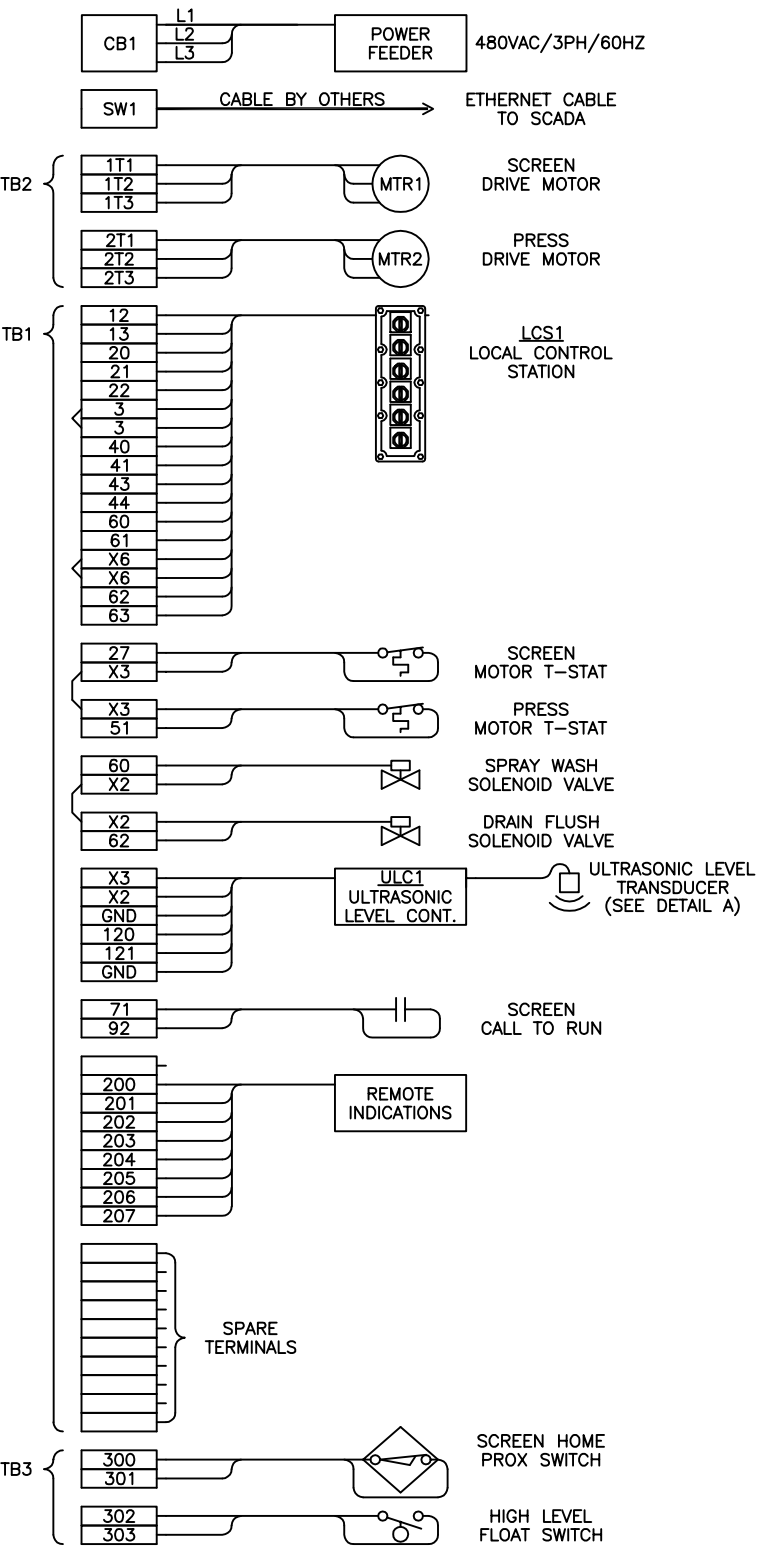
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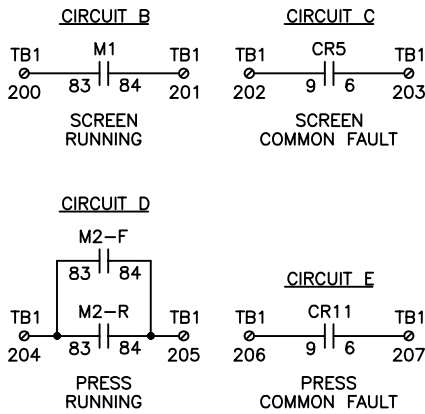
REVISION	BY	CHKD	DATE	

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FIELD WIRING DIAGRAM



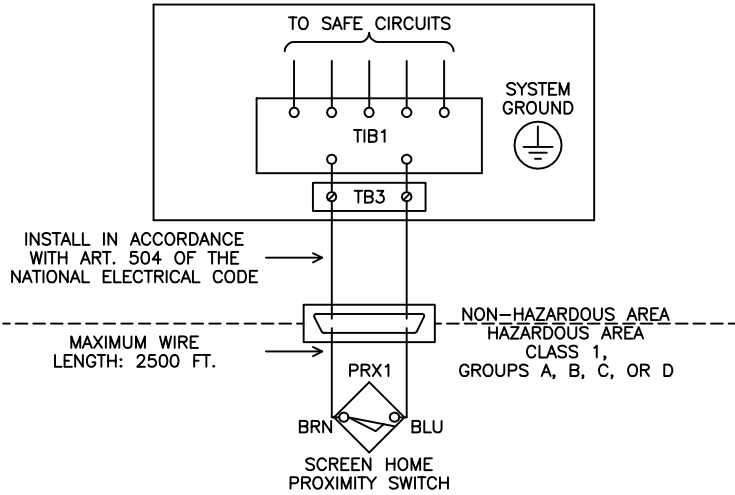
REMOTE INDICATIONS



MAX. CONTROLLED LOAD: 10A @ 120VAC

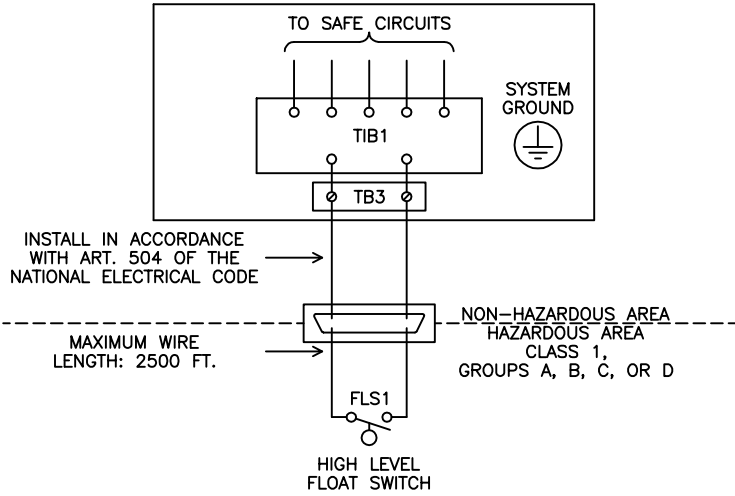
NOTE: BRANCH CIRCUIT PROTECTION PROVIDED BY OTHERS PER N.E.C.

TIB1 WIRING DETAIL



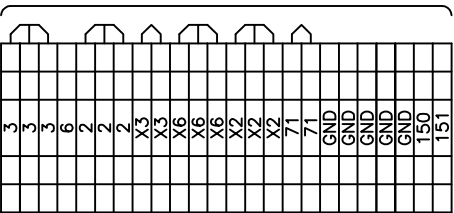
- NOTES:
1. ENSURE CONTROL PANEL IS CONNECTED TO GROUND.
 2. CAUTION: MAINTAIN SEPARATION BETWEEN INTRINSICALLY SAFE WIRING AND OTHER WIRING.

TIB2 WIRING DETAIL



- NOTES:
1. ENSURE CONTROL PANEL IS CONNECTED TO GROUND.
 2. CAUTION: MAINTAIN SEPARATION BETWEEN INTRINSICALLY SAFE WIRING AND OTHER WIRING.

DB1 DETAIL



DB2 DETAIL



ROTOSCREEN / SWP CONTROL PANEL									
DESCRIPTION									
3HP, 5HP, 480VAC									
TYPE					SIZE				
NONE					02/14				
DATE	STD. BY	STD. CHKD.	STD. APPVD	SCALE	DATE	PROJ. BY	PROJ. CHKD.	PROJ. APPVD	REV.
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DEVICE SETTINGS

PLC – I/O

ALLEN-BRADLEY
MICROLOGIX 1400

IN

025781013151719

134691112141618

012347810

56911

OUT

☐ POWER
☐ RUN
☐ FAULT
☐ FORCE
☐ COM0
☐ DCOMM

PLC INPUTS

I/0	POWER LOSS / E-STOP
I/1	SYSTEM RESET
I/2	SCREEN RUNNING
I/3	SCREEN OVER TEMP.
I/4	SCREEN HOME
I/5	SCREEN IN AUTO
I/6	PRESS IN AUTO
I/7	PRESS RUNNING
I/8	SCREEN HIGH TORQUE
I/9	UTILITY POWER ON
I/10	SCADA SCREEN CALL TO RUN
I/11	UPSTREAM HIGH LEVEL
I/12	SCREEN OVERLOAD
I/13	PRESS OVER TEMP
I/14	PRESS HIGH TORQUE
I/15	PRESS OVERLOAD
I/16	PRESS
I/17	PRESS
I/18	SPARE
I/19	SPARE

PLC OUTPUTS

O/0	CONTROL POWER ENABLE
O/1	SCREEN CALL TO RUN
O/2	PRESS CALL TO RUN FORWARD
O/3	PRESS CALL TO RUN REVERSE
O/4	SPRAY WASH CALL TO RUN
O/5	DRAIN FLUSH CALL TO RUN
O/6	SPARE
O/7	SPARE
O/8	SPARE
O/9	SPARE
O/10	SPARE
O/11	SPARE

ANALOG INPUTS SLOT 1

IN0	UPSTREAM LEVEL
IN1	SPARE
IN2	SPARE
IN3	SPARE

PLC1 – COMMUNICATIONS SETUP

PARAMETER	VALUE	PARAMETER	VALUE
DRIVER	DF1 FULL DUPLEX	IP ADDRESS	10.1.1.1
BAUD RATE	19200	SUBNET MASK	255.255.255.0
PARITY	NONE		
SOURCE ID (NODE)	1		
CONTROL LINE	NO HANDSHAKING		
STOP BITS	1		

QIU1 – COMMUNICATIONS SETUP

PARAMETER	VALUE	PARAMETER	VALUE
DRIVER	DF1 FULL DUPLEX	IP ADDRESS	10.1.1.2
BAUD RATE	19200	SUBNET MASK	255.255.255.0
PARITY/STOP BITS	NONE/1		
ERROR DETECTION	CRC		
HANDSHAKING	OFF		

PLC1 – NETWORK COMMUNICATION

REGISTER	DESCRIPTION	DATA TYPE	FUNCTION
N25:0/0	CONTROL POWER ON	BIT	READ
N25:0/1	SCREEN IN AUTO	BIT	READ
N25:0/2	SCREEN RUNNING	BIT	READ
N25:0/3	SCREEN OVER TEMPERATURE	BIT	READ
N25:0/4	SCREEN HIGH TORQUE	BIT	READ
N25:0/5	SCREEN OVERLOAD	BIT	READ
N25:0/6	SCREEN AT HOME	BIT	READ
N25:0/7	PRESS IN AUTO	BIT	READ
N25:0/8	PRESS RUNNING	BIT	READ
N25:0/9	PRESS OVER TEMPERATURE	BIT	READ
N25:0/10	PRESS HIGH TORQUE	BIT	READ
N25:0/11	PRESS OVERLOAD	BIT	READ
N25:0/12	UTILITY POWER LOST	BIT	READ
N25:0/13	E-STOP PRESSED	BIT	READ
N25:0/14	HIGH LEVEL	BIT	READ
F27:0	UPSTREAM LEVEL	FLOAT	READ
N26:0/0	SCREEN CALL TO RUN	BIT	WRITE

DEVICE SETTINGS

PLC1 – SETTINGS

BIT REF.	DESCRIPTION	TIMER RESOLUTION	FACTORY SETTINGS
N7:0	SCREEN AUTO STEP COUNTER	STEPS	1
N7:1	SCREEN DWELL TIME	SECONDS	15
N7:2	SCREEN REPEAT CYCLE OFF TIME	MINUTES	480
N7:3	SCREEN HIGH LEVEL OFF DELAY TIME	SECONDS	30
N7:4	SCREEN START UPSTREAM LEVEL	INCHES	12
N7:5	SCREEN HIGH UPSTREAM LEVEL	INCHES	30
N7:6	SCREEN CYCLE COUNTER, (INITIATES PRESS)	CYCLES	10
N7:7	PRESS INITIAL RUN TIME	SECONDS	3
N7:8	PRESS FORWARD RUN TIME	SECONDS	10
N7:9	PRESS FOR-REV DWELL TIME	SECONDS	2
N7:10	PRESS REVERSE RUN TIME	SECONDS	2
N7:11	PRESS REV-FOR DWELL TIME	SECONDS	2
N7:12	SPRAY WASH RUN TIME	SECONDS	5
N7:13	PRESS WASH CYCLE COUNTER	CYCLES	6
N7:14	PRESS DISCHARGE TIME	SECONDS	30
N7:15	DRAIN FLUSH RUN TIME	SECONDS	10
F8:0	SCREEN UPSTREAM LEVEL EMPTY (4 MA)	INCHES	0
F8:1	SCREEN UPSTREAM LEVEL SPAN (20 MA)	INCHES	30

NOTES:

- ABOVE IS A LISTING OF ALL THE FIELD SELECTABLE SETTINGS IN THE CONTROLLER.

PM1 – POWER MONITOR

WINDOW NUMBER	FUNCTION DESCRIPTION	DEFAULT	FACTORY SETTING
04	PARAMETER LOCK	369	
05	MONITOR TYPE	OVERLOAD	
11	MAIN ALARM	100%	*
12	PRE-ALARM	100%	*
21	MAIN ALARM MARGIN	16%	10%
22	PRE-ALARM MARGIN	8%	5%
31	START-UP DELAY	2 SEC.	
32	RESPONSE DELAY	0.5 SEC.	
33	HYSTERESIS	0%	
41	MOTOR RATED POWER	3.0 HP	2.0 HP
42	MOTOR RATED CURRENT	5.6 AMP	3.4 AMPS
61	MAIN ALARM LATCHED	OFF	
62	ALARM AT ZERO CURRENT	OFF	
63	MAIN ALARM (NO/NC)	NC	NO
64	PRE-ALARM (NO/NC)	NO	

NOTES:

- FACTORY SETTING '*' NOTES PARAMTERS SET IN THE FIELD.
- RELAYS CHANGE TO PROGRAMMED STATE ON POWER-UP.
- THE ABOVE IS A PARTIAL PARAMETER LIST AND THEIR SETTINGS. FOR A COMPLETE LIST REFER TO THE OWNERS MANUAL.

LM1 – MOTOR LOAD MONITOR

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

NOTES:

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

DEVICE SETTINGS

ULC1 – HYDRORANGER 200

FUNCTION NUMBER	FUNCTION DESCRIPTION	DEFAULT	FACTORY SETTING
P000	LOCK	1954	
P001	OPERATION	3	4
P002	MATERIAL	1	
P003	01 MEASUREMENT RESPONSE	2	3
	02 MEASUREMENT RESPONSE	2	3
P004	01 TRANSDUCER	0	100
	02 TRANSDUCER	0	100
P005	UNITS	1	5
P006	01 EMPTY	26.2	*
	02 EMPTY	26.2	*
P007	01 SPAN	26.2	*
	02 SPAN	26.2	*
P060	01 DECIMAL POSITION	2	
	02 DECIMAL POSITION	2	
P070	FAIL SAFE TIMER	10.0 MIN	0.5 MIN
P071	01 FAIL SAFE LEVEL	HOLD	HI
	02 FAIL SAFE LEVEL	HOLD	LO
P200	01 MA OUTPUT 1 RANGE	2	
	02 MA OUTPUT 2 RANGE	2	
P201	01 MA OUTPUT 1 FUNCTION	0	1
	02 MA OUTPUT 2 FUNCTION	0	1
P202	01 MA OUTPUT 1 ALLOCATION	1	
	02 MA OUTPUT 2 ALLOCATION	2	
P219	01 MA OUTPUT 1 FAILSAFE	OFF	HI
	02 MA OUTPUT 2 FAILSAFE	OFF	LO

NOTES:

- FACTORY SETTING '*' NOTES PARAMETERS SET IN THE FIELD.
- THE ABOVE IS A PARTIAL LISTING OF SETPOINTS. REFER TO THE INSTRUCTION MANUAL FOR A COMPLETE PARAMETER LISTING.

TIB1 – TRANSFORMER ISOLATED BARRIER

DIP SWITCH	SET AT
S1	I
S2	I
S3	II

TIB2 – TRANSFORMER ISOLATED BARRIER

DIP SWITCH	SET AT
S1	I
S2	I
S3	I

AC1

AC FAN ON/OFF	40 °F
AC COMP. ON/OFF	70 °F

ROTESCREEN / SWP CONTROL PANEL

DESCRIPTION

3HP, 5HP, 480VAC

TYPE

SIZE

NONE

02/14

PTW

RTH

RTH

DATE

STD. BY

STD.CHKD.

STD.APPVD

SCALE

DATE

PROJ. BY

PROJ.CHKD.

PROJ.APPVD

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SEQUENCE OF OPERATION CONTINUED

EMERGENCY STOP:

The Screen, Press, and all Spray Washes will stop immediately, and the control power on light will de-energize if any of the E-Stop pushbuttons are pressed. To Reset, insure all E-Stops are enabled and then press the System Reset pushbutton.

SCREEN FAULTS/Resets:

1. A fault occurs when the Screen Common Fault light will be illuminated.

Reset: Push the System Reset button.

the Screen Power Monitor is tripped. The Screen will stop immediately, and

2.A fault occurs when the Screen Motor Starter Thermal Overload is tripped. The Screen will stop immediately, and the Screen Common Fault light will be illuminated.

- Reset:** Push the Reset pushbutton on the Screen Motor Starter Thermal Overload located inside the control panel. Unless entry into the control panel is being performed by a qualified electrician, the control panel power should be shut off prior to entry. After resetting, push the System Reset button.

3.A fault occurs when the Screen Motor Thermostat is tripped. The Screen will stop immediately and the Screen Common Fault light will be illuminated.

Reset: Push the System Reset button after the Screen Motor returns to a safe temperature.

SCREW WASH PRESS FAULTS/Resets:

4.A fault occurs when the Press Load Monitor is tripped. The Press will stop immediately, and the Press Common light will be illuminated.
Reset: Push the System Reset button.

5.A fault occurs when the Press Motor Starter Thermal Overload is tripped. The Press will stop immediately, and the Press Common Fault light will be illuminated.

Reset: Push the Reset pushbutton on the Press Motor Starter Thermal Overload located inside the control panel. Unless entry into the control panel is being performed by a qualified electrician, the control panel power should be shut off prior to entry. After resetting, push the System Reset button.

6.A fault occurs when the Press Motor Thermostat is tripped. The Press will stop immediately and the Press Common Fault light will be illuminated.

Reset: Push the System Reset button after the Press Motor returns to a safe temperature.

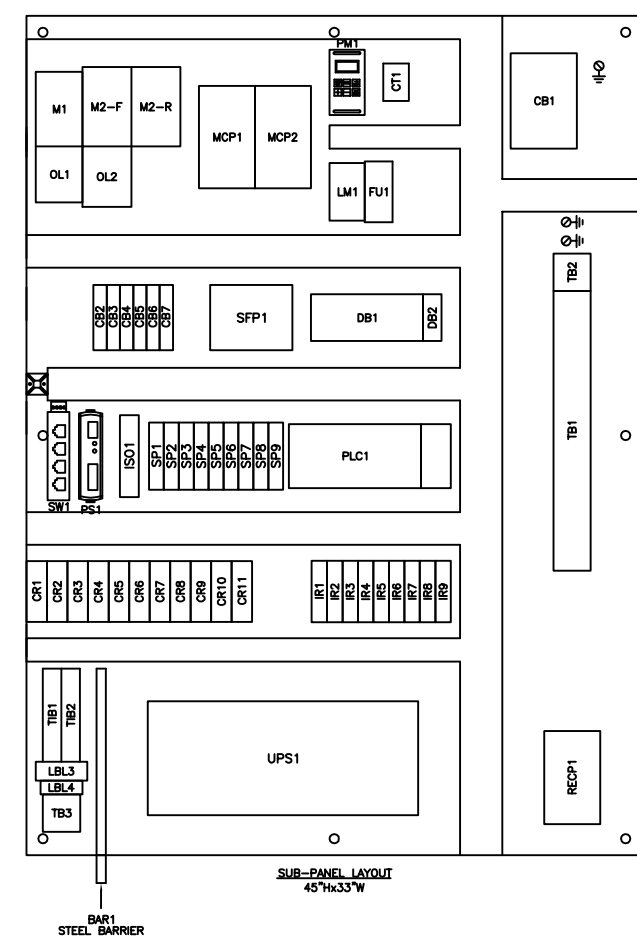
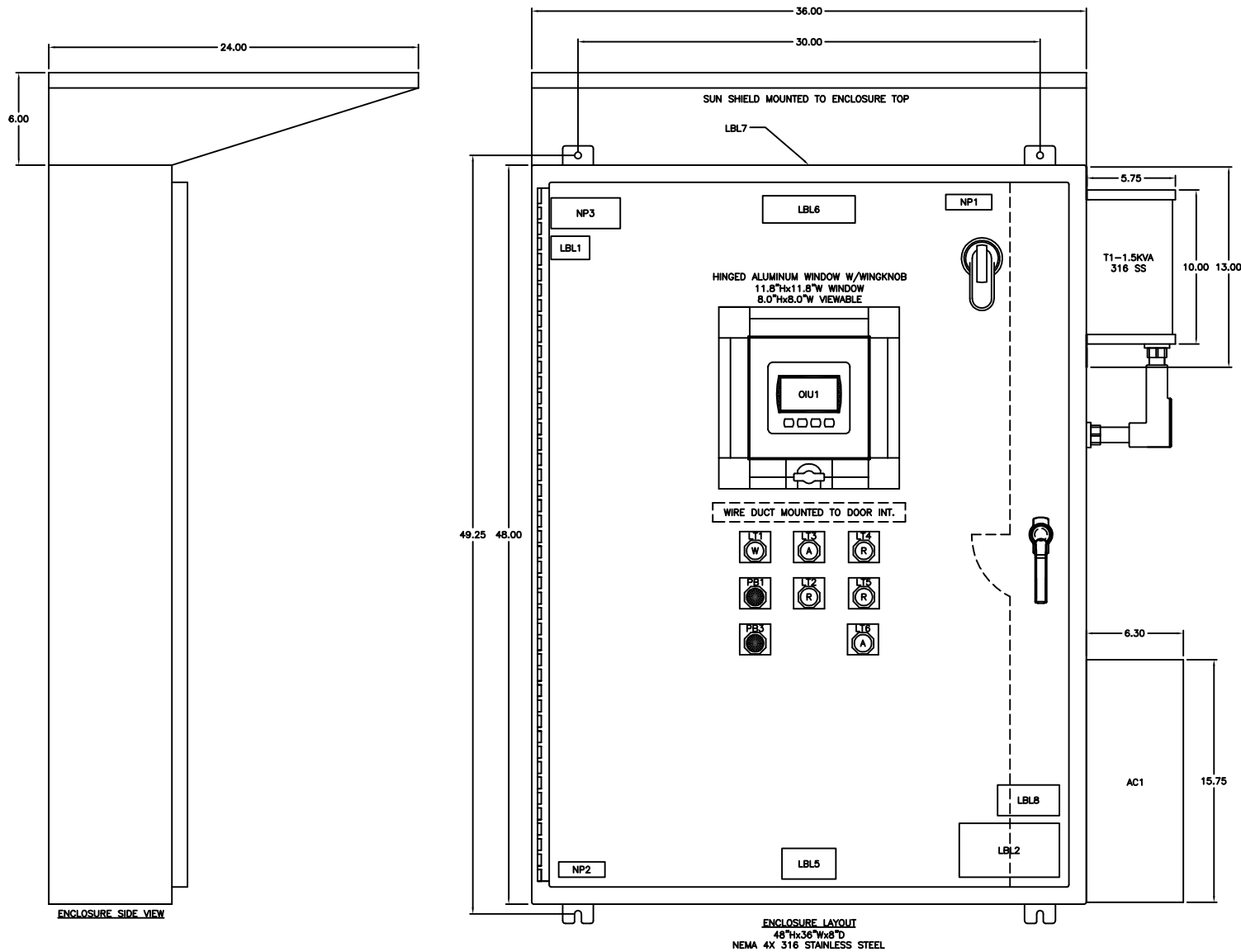
NOTE:

1. When any of the above faults occur their respective Common Fault lights will illuminate. The specific nature of the fault (e.g. Over Temperature, High Torque, Overload) will be displayed on the OIU.

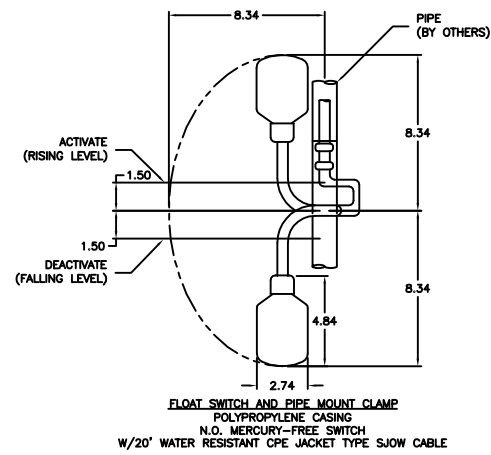
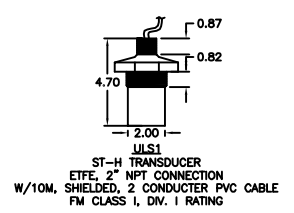
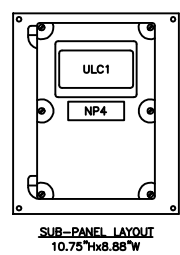
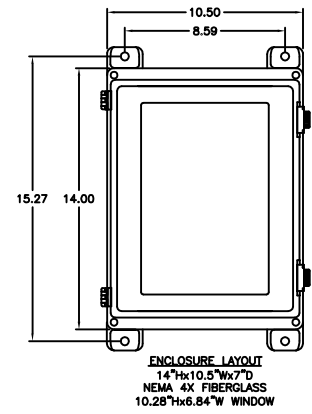
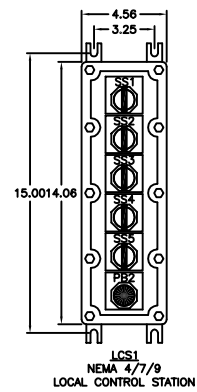
2. The System Reset button, located on the front of the panel, must be pressed to clear any fault.

				
				
				
				
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- PILOT DEVICE LEGEND PLATES:**
- LT1 - CONTROL POWER ON
 - LT2 - SCREEN RUNNING
 - LT3 - SCREEN COMMON FAULT
 - LT4 - PRESS RUNNING FORWARD
 - LT5 - PRESS RUNNING REVERSE
 - LT6 - PRESS COMMON FAULT
 - PB1 - EMERGENCY STOP
 - PB2 - EMERGENCY STOP
 - PB3 - SYSTEM RESET
 - SS1 - SCREEN
 - SS2 - PRESS
 - SS3 - PRESS
 - SS4 - SPRAY WASH
 - SS5 - DRAIN FLUSH
 - HAND-OFF-AUTO
 - HAND-OFF-AUTO
 - FOR-OFF-REV
 - HAND-OFF-AUTO
 - HAND-OFF-AUTO
- NAMEPLATES:**
- NP1 - 480VAC-3PH-60HZ
 - NP2 - INTRINSICALLY SAFE CIRCUITS
 - NP3 - CONTROL PANEL PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR USE IN CLASS I, GROUPS A, B, C, D; CLASS II, GROUPS E, F, G; CLASS III HAZARDOUS LOCATIONS WHEN CONNECTED PER PEPPERL & FUCHS INSTALLATION DRAWING NO. 116-0145
 - NP4 - ULTRASONIC LEVEL 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 - WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY
 - LBL4 - INTRINSICALLY SAFE FIELD WIRING TERMINALS
 - LBL5 - ELEMTECH ELECTRICAL CONTROL SYSTEMS
 - LBL6 - WESTECH
 - LBL7 - WARNING DAMAGE RESULTING FROM INSTALLATION OF TOP ENTRY CONDUIT WILL VOID WARRANTY - USE PROPER FITTINGS, MEYERS TYPE 4 OR EQUAL - PROTECT INTERIOR DEVICES FROM INSTALLATION DEBRIS
 - LBL8 - DANGER ARC FLASH AND SHOCK HAZARD FOLLOW ALL REQUIREMENTS NFPA 70E FOR SAFE WORK PRACTICES AND FOR PERSONAL PROTECTIVE EQUIPMENTS.



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