



370 W. Burgess Road
Pensacola, FL 32503
Office (850) 432-0334 / Butch's Cell (850) 393-7686

For Record Only Submittal

To: Joseph Carr
The City of Crestview

Date: 01/19/2022
Project: Blackwater Golf Club Master LS
Location: Crestview, FL

Equipment with Elec. Package Installation: Fiberglass LS Package, Control Panel, Pumps

Terms: NET 30 Days

Delivery: 14 Weeks

We are pleased to be providing the following equipment:

FIBERGLASS WETWELL, Pages 4 thru 46

-One (1) **96" Diameter X 186" Deep** fiberglass insert kitted up with 4" 316 SST pipe, pump guide rail systems, SST braces and SST brackets. Includes 96" round odor gasketed cover with dual discharge hubs by U.S Fabrication. To include One (1) 4" above ground piping package to include Sch. 40 316 SST Fittings, Pipe Stands and Epoxy coated cast iron check valves with SST pressure gauge assemblies, SST ball valves and ARI air release valves.

1. Wet Well bottom "Z" Bar Support System must be set into a wet concrete base 24" thick, **see page 40**.
2. Wet Well Antiflotation "donut" 12 inches thick by 24.25 inches wide (this is in addition to the 24" thick wet concrete bottom is to be set into) to be poured ontop of antiflotation flange, **see page 28**.

PUMPS/MIXER, pages 47 thru 57

-Two (2) Barnes Pumps with 5 year 100% parts and labor warranty- 50 HP/ 460 volt/3 phase with 50' cord, hard metal white chromium iron impellers and integral hardened 400 series SST chopper blades, spare striker plates and shim kits

1. Pumps will deliver up to **271 GPM @ 156ft TDH**. Pumps can be throttled to desired flows via the Danfoss VFD starters.
2. KSB 3.4 HP, 460 volt mixer with 50ft power cord and Duplex 316 SST with Titanium Stabilized propeller.

CONTROL PANEL/GEN.SET with SST TRANSFER SWITCH, pages 56 thru 155

-One (1) air break pedestal mounted duplex control panel and air break pedestal junction box in SST, powder-coated forest green enclosures- 460 volt/3-phase. Includes spare telemetry/controller unit and fiber-optic floats, power supplies and transceivers. Includes Pump and Process Danfoss "card carrying" certified startup technician for programming of the VFDs., Gen.Set with Automatic Transfer Switch in SST enclosure.

1. Includes Electrical installation package by licensed Electrical Contractor, Clark Services.
2. Gen.Set will be Diesel powered with large tank. Does NOT include diesel fuel, **see pages 87 thru 155**.
3. Does not include concrete pads for panel or Gen.Set.
4. Panel load calculation = 153.92 amps, data is on **page 64**

NOTES

1. Concrete antiflotation and concrete pads around top of wet well and for control panel and Junction pedestal by Contractor.
2. Only items mentioned above are included. If it is not listed it is to be provided by others.
3. **Delivery promise date begins upon return of approved Submittal or approved drawings.**
4. Panel will match LS9 and will include 10 year starter warranty and 5 year panel warranty.
5. Pumps/Mixer will match LS9 and LS1 Pumps and will include 5 year, 100% warranty.
6. Panel will include Omni Site Crystal Ball with 5 year monitoring Service, **see pages 73 thru 84**.

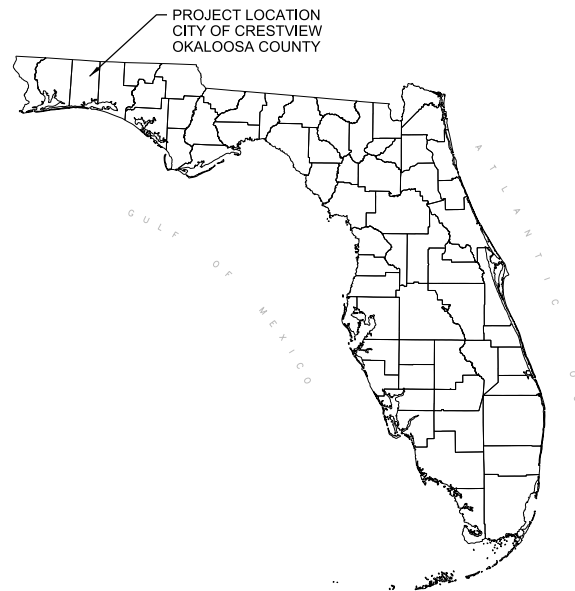
This Information has been prepared by:

F.D. "Butch" Branton

For Pump & Process Equipment, Inc.

CONTRACT DOCUMENTS
FOR THE CONSTRUCTION OF THE

BLACKWATER GOLF CLUB LIFT STATION AND FORCE MAIN PROJECT

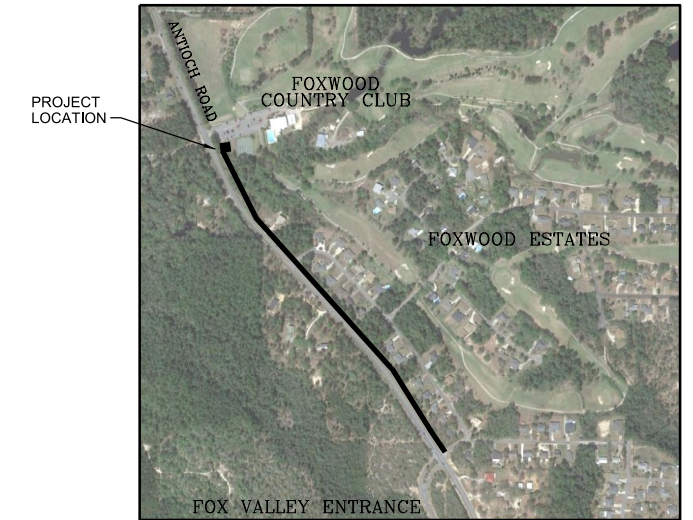


LOCATION IN FLORIDA
NTS



CITY OF CRESTVIEW
FLORIDA

90% DESIGN DRAWINGS



LOCATION MAP
NTS

INDEX OF DRAWINGS	
SHEET NO.	TITLE
G-001	COVER SHEET / INDEX OF DRAWINGS
G-002	ABBREVIATIONS
G-003	GENERAL, CIVIL LEGEND AND NOTES
G-004	PROCESS MECHANICAL LEGEND
G-005	ELECTRICAL LEGEND
C-101	EXISTING CONDITIONS
C-102	OVERALL PROJECT PLAN
C-103	BLACKWATER GOLF CLUB LIFT STATION SITE PLAN
C-201	FORCE MAIN PLAN
C-202	FORCE MAIN PLAN
C-501	CIVIL DETAILS
C-502	CIVIL DETAILS
M-201	BLACKWATER GOLF CLUB LIFT STATION
M-501	PROCESS DETAILS
E-101	LIFT STATION LAYOUT PLAN
E-202	ELECTRICAL RISER DIAGRAM AND POWER PLAN
E-501	ELECTRICAL DETAILS

For information regarding
this project, contact:

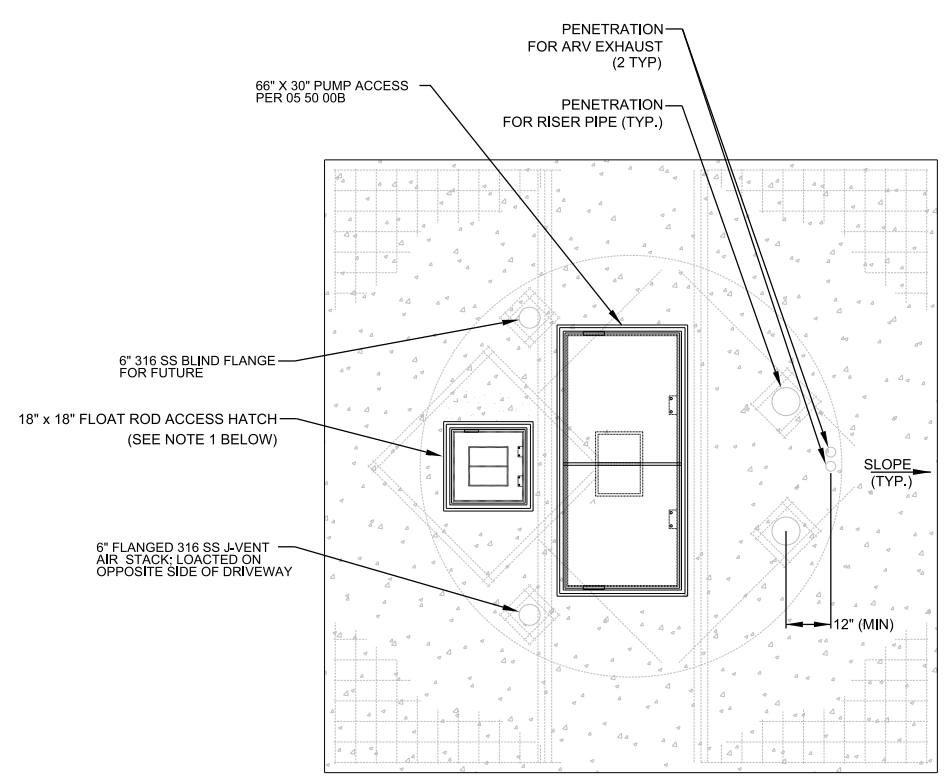
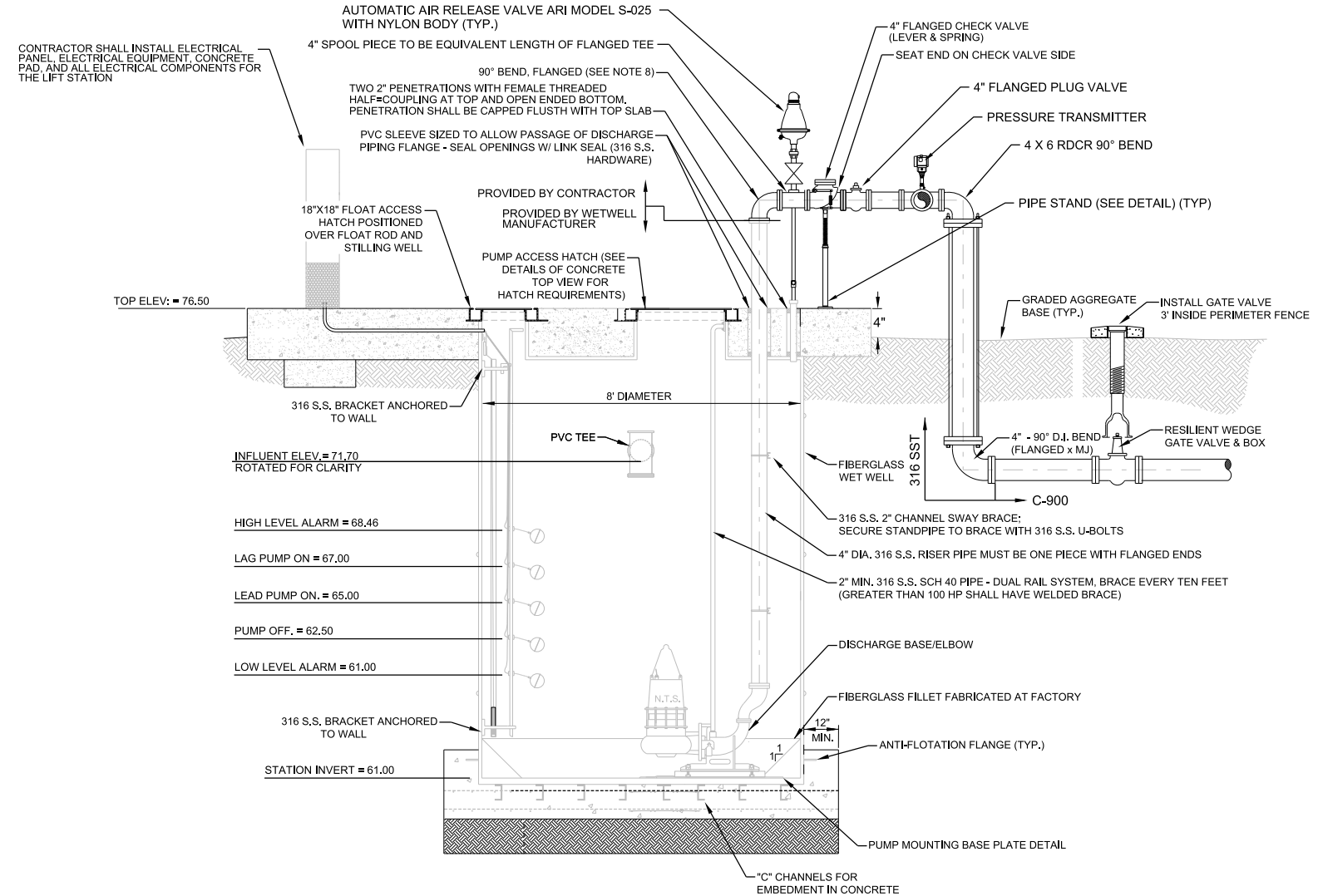
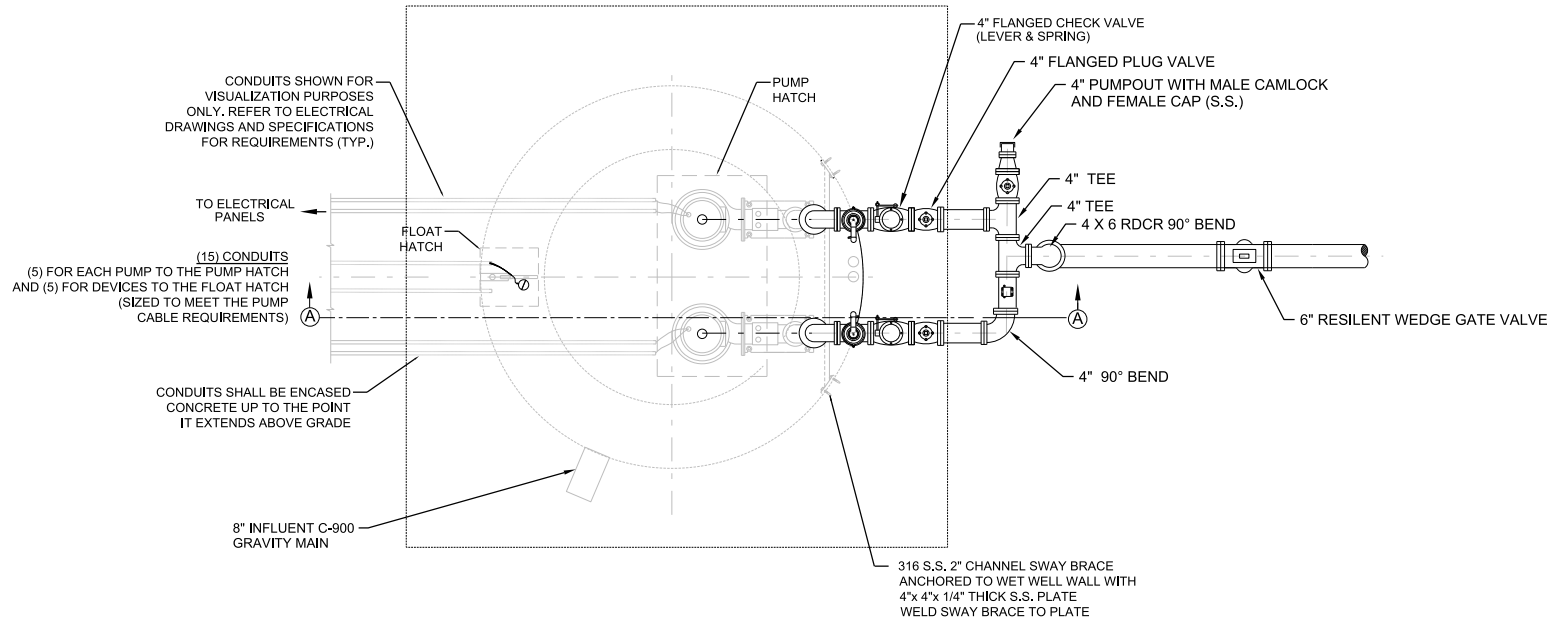
Scott Jernigan, PE
25 W Cedar Street, Suite 350
Pensacola, FL 32502
Phone: 850-941-7282



Project No. D3553000

OCTOBER 2021

1. WETWELL, PUMPS, AND CONTROL PANEL TO BE PURCHASED BY THE OWNER AND PROVIDED TO CONTRACTOR AS OWNER FURNISHED EQUIPMENT.
2. WETWELL MANUFACTURER SHALL PROVIDE SIGNED AND SEALED SHOP DRAWINGS.
3. CONTRACTOR SHALL COORDINATE WITH WETWELL MANUFACTURER DURING INSTALLATION AND START UP.
4. WET WELL SHALL BE PROVIDED WITH GUIDE RAILS, PIPING, FLOAT ROD AND STILLING WELL. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING PUMPS, BASE ELBOWS FLOATS, AND PIPING STARTING WITH THE FIRST 90° ELBOW ATTACHED TO THE RISER PIPE.
5. WET WELL MANUFACTURER SHALL PROVIDE HATCHES AS SHOWN. HATCHES SHALL BE MANUFACTURED BY HALLIDAY, USF FABRICATION, OR APPROVED EQUAL.
6. WETWELL MANUFACTURER SHALL NOTE LOCATIONS WHERE EQUIPMENT IS MOUNTED TO WET WELL WALL.
7. ALL INFLUENT PIPING AND FITTINGS SHALL BE 8" DR 25.
8. WETWELL MANUFACTURER SHALL PROVIDE ANTI FLOATION CALCULATIONS. CONTRACTOR SHALL PROVIDE A MINIMUM OF 7.5 CY CONCRETE FOR ANTI FLOATION.



- NOTES:
1. FAILURE TO PROVIDE HATCHES AS SPECIFIED IN SECTION 2575 WILL RESULT IN THE REJECTION OF ACCESS HATCH AND/OR WET WELL.
 2. ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE SHALL BE COATED WITH A BITUMASTIC PAINT.

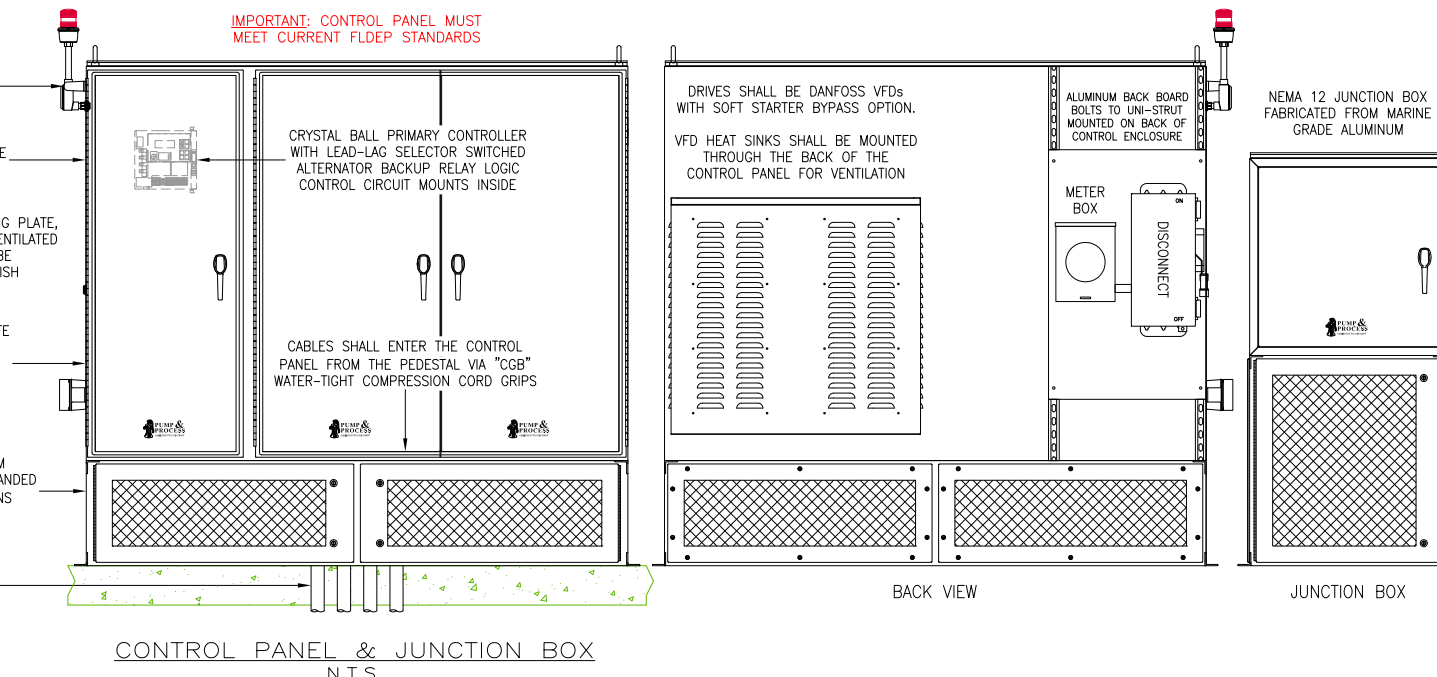
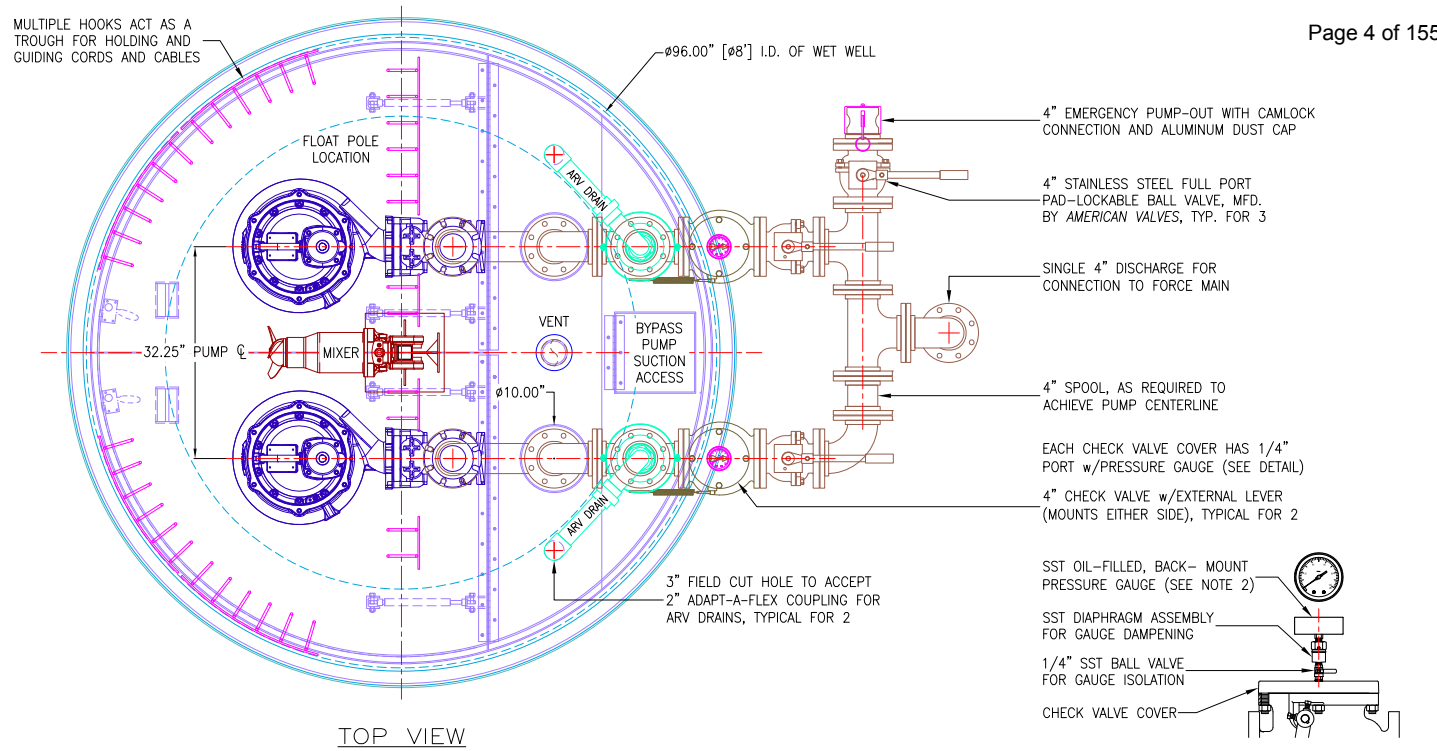
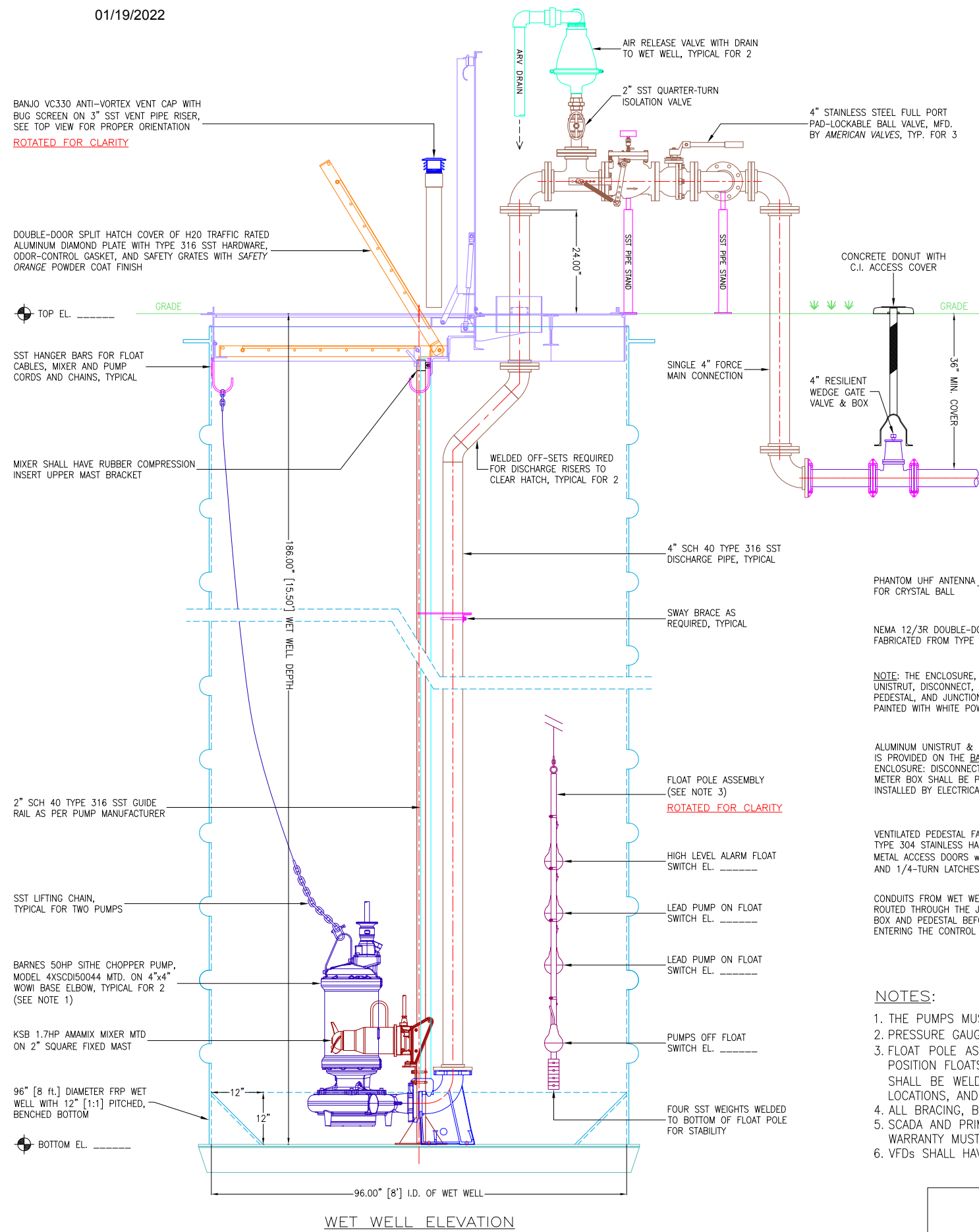
Jacobs

PROCESS MECHANICAL
LIFT STATION PLAN AND SECTION

BLACKWATER GOLF CLUB LIFT STATION
AND FORCE MAIN
CRESTVIEW PUBLIC SERVICES
CRESTVIEW, FLORIDA

DATE	OCT 2021
PROJ	D3553000
DWG	M-201
SHEET	of

90% DESIGN



- NOTES:**
1. THE PUMPS MUST HAVE A 5-YEAR 100% REPAIR PARTS AND LABOR WARRANTY AS PROVIDED BY PUMP MANUFACTURER.
 2. PRESSURE GAUGE TO BE SIZED TO READ NO MORE THAN 1-1/2 TIMES THE MAXIMUM PRESSURE PUMP PROVIDES AT DEAD HEAD.
 3. FLOAT POLE ASSEMBLY CONSISTS OF A 1" SST PIPE WITH SST LIFTING CHAIN MOUNTED TO WELDED EYE. CHAIN SHALL BE LONG ENOUGH TO POSITION FLOATS AT THE REQUIRED DEPTH. FLOATS ARE WEIGHTLESS AND MOUNT TO POLE WITH PIPE CLAMPS. ONE SST WEIGHT FOR EACH FLOAT SHALL BE WELDED TO BOTTOM OF FLOAT POLE FOR STABILITY. FIBER OPTIC "OPTI-FLOATS" ARE EXPLOSION PROOF, SUITABLE FOR HAZARDOUS LOCATIONS, AND MEET EPA NON-MERCURY REQUIREMENTS.
 4. ALL BRACING, BRACKETS, AND HARDWARE SHALL BE 316 STAINLESS STEEL.
 5. SCADA AND PRIMARY CONTROLLER SHALL BE OMNI SITE CRYSTAL BALL. FIVE YEARS OF MONITORING WITH ADVANTAGE PLAN COVERAGE AND LIFETIME WARRANTY MUST BE INCLUDED.
 6. VFDs SHALL HAVE 10-YEAR ONSITE DRIVE PROTECTION COVERAGE AND EMERGENCY DRIVE SUPPORT AS PROVIDED BY DANFOSS.

PUMP DATA TABLE	
MANUFACTURER	BARNES
MODEL	SITHE 4XSCDI50044
VOLTAGE	460
PHASE	3
HP	50
FLA	67.1
RPM	1750
GPM	-
TDH (Feet)	-

IMPORTANT:
 THE PUMPS SHALL BE 50HP, MAKING THEM INTERCHANGEABLE WITH EXISTING CRESTVIEW LIFT STATIONS. THE VFDs SHALL BE CONFIGURED TO CLIP THE PERFORMANCE CURVE TO FIT EACH APPLICATION.



Butch Branton
 Sales Engineer
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TITLE:	BLACKWATER GOLF CLUB CRESTVIEW, FLORIDA DUPLIX PUMP STATION		
CREATED BY:	DS	APPROVED BY:	BB
SCALE:	NTS	REVISION:	0
DATE:	12/10/21	SHEET:	1 OF: 1

NOT FOR CONSTRUCTION

LFM

L. F. Manufacturing, Inc.
The FRP Specialists



Fiberglass Wetwells

Experience...

Let us put our experience to work for you. LFM has been building quality fiberglass reinforced manholes and wetwells since 1982. We utilize the latest in chop and filament winding equipment, therefore providing our customers with the highest quality fiberglass products on the market today. Our production facility is located on 35 acres near Giddings, Texas and covers 83,000 square feet.



Corrosion Resistant...

Our wetwells are corrosion resistant to wastewater gases such as hydrogen sulfide. Over a short period of time, concrete wetwells can start to leak or decay. Fiberglass wetwells by LFM can withstand years of exposure to the most severe conditions within a wastewater system.

Economical...

Fiberglass wetwells by LFM are an economical value. Our fiberglass wetwells have a longer service life than concrete wetwells. As a result, the cost of repairs, disruptive excavations and maintenance is minimized; saving you money over the long run.

Professional Delivery...

LFM maintains its own fleet of delivery trucks; helping to lower delivery costs considerably. Our fiberglass wetwells are light-weight and can be more easily loaded and unloaded on construction job sites than conventional concrete wetwells. Our delivery personnel see to it that our products are shipped on time and safely to their destination.



Quality Built Right In...

LFM incorporates a comprehensive in-plant testing program. Our quality control enables us to provide our customers with consistent workmanship in every fiberglass wetwell that we build. We inspect and test each fiberglass wetwell before it is released for shipping. Wall thickness reports, raw material analysis and continuous chemical analysis reports are just some of the test procedures that we perform. Testing reports are recorded and maintained at our office, and are available upon request.

Light-weight...

Fiberglass wetwells and basins by LFM are light-weight, making them easier to handle. This means easier, safer, faster and less costly installations.

Available Diameters...

LFM builds fiberglass manholes to your specified dimensions with standard diameters from 36 inches through 15 & 1/2 feet. Depths are available from 2 feet through 40 feet. Greater depths can be custom fabricated. Ask your LFM sales representative for details. We manufacture several different wall thicknesses for different load, depth and diameter specifications. LFM also incorporates a ribbed wall system into wetwells requiring added strength. Reinforced FRP tops and bottoms are also available. Contact your LFM sales representative to find out which dimensions best suit your needs.

Connections...

LFM can build fiberglass wetwells to fit your specific requirements complete with pipe stub outs already in place, making installation easier and less time consuming. We also offer alternative methods for connecting pipe to our fiberglass wetwells such as Kor-N-Seal™ boots, as well as connectors from other manufacturers.

Quality Assurance...

We stand behind the products that we build. Our fiberglass wetwells carry a one year limited warranty. For additional information, see the warranty section of our brochure.

ASTM Certified...

Our fiberglass wetwells are built to meet the rigid requirements of ASTM Specification D3753. LFM strives to supply its customers with the highest quality fiberglass wetwells available on the market today by meeting and exceeding all applicable ASTM requirements.

Installation...

Prepare the excavation in a normal manner. Measure and cut holes for any existing pipes. Next, pour the concrete base and insert the wetwell into the wet concrete. Use the provided lifting lugs to lift the wetwell. After the wetwell has been leveled and set to proper grade, pour concrete over the anti-flotation flange. Finally, backfill to engineer's specifications using moderately compacted sand or crushed stone. The backfill should be added evenly in one foot lifts. Note: always observe all safety rules and regulations when installing fiberglass wetwells.

Summary of Test Results

Tests Performed	Average Results
Stiffness	5% Deflection @ 2.45 lbs. / in ² 10% Deflection @ 2.28 lbs. / in ²
Material Composition	54.25 wt. % Resin
Compressive Strength	Transverse: 22,7000 psi Longitudinal: 10,500 psi
Flexural Strength	Transverse: 56,000 psi Longitudinal: 11,700 psi
Modulus	Transverse: 2,084,000 psi Longitudinal: 1,114,000 psi
Load Rating	24,000 lbs. – 0.157" Deflection 40,000 lbs. – No Damage
Barcol Hardness	Cylinder: 43.1 Reducer: 41.0
Wall Thickness	Cylinder: 0.308
Soundness	No Leaks Detected at 5 psi Air Pressure

Hwy. 290 East @ CR 236
Giddings, Texas 78942
Phone 800.237.5791
Fax 979.542.0911

300 W. Riddleville Road
Karnes City, Texas 78118
Phone 800.237.5791
Fax 979.542.0911

2450 Industrial Boulevard
Waycross, Georgia 31503
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Fax 912.285.7553



Technical Support & Sales:

800.237.5791
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L. F. Manufacturing, Inc.

FIBERGLASS WETWELL OR LIFT STATION

Specification # LP1056SP

A.1 GENERAL:

Fiberglass reinforced polyester wetwells shall be manufactured from commercial grade polyester resin or vinyl ester resin, with fiberglass reinforcements. The resin system shall be suitable for atmospheres containing hydrogen sulfide and dilute sulfuric acid as well as other gases associated with the wastewater collection systems. The wetwell shall be a one-piece unit manufactured by L. F. Manufacturing, Inc., Giddings, Texas, 1-800-237-5791 or an approved equal.

A.2 MATERIALS:

RESIN: The resins used shall be a commercial grade unsaturated polyester resin.

REINFORCING MATERIALS: The reinforcing materials shall be commercial Grade "E" type glass in the form of mat, continuous roving, chopped roving, roving fabric or a combination of the above, having a coupling agent that will provide a suitable bond between the glass reinforcement and the resin.

SURFACING MATERIALS: If reinforcing materials are used on the surface exposed to the contained substance, it shall be a commercial grade chemical-resistant glass that will provide a suitable bond with the resin and leave a resin rich surface.

FILLERS AND ADDITIVES: Fillers, when used, shall be inert to the environment and wetwell construction. Additives, such as thixotropic agents, catalysts, promoters, etc., may be added as required by the specific manufacturing process to be used. The resulting reinforced plastic material must meet the requirement of this specification.

A.3 FABRICATION:

EXTERIOR SURFACE: The exterior surface shall be relatively smooth with no sharp projections. Handwork finish is acceptable if enough resin is present to eliminate fiber show. The exterior surface shall be free of blisters larger than 1/2 inch in diameter, delamination and fiber show. For a UV inhibitor the resin on the exterior surface of the manhole shall have gray pigment added for a minimum thickness .125 inches.

INTERIOR SURFACE: The interior surface shall be resin rich with no exposed fibers. The surface shall be free of grazing, delamination, and blisters larger than 1/2 inch in diameter, and wrinkles of 1/8 inch or greater in depth. Surface pits shall be permitted up to 6 square feet if they are less than 3/4 inch in diameter and less than 1/16 inch deep.

FIBERGLASS REINFORCED BOTTOM: The bottom to be fabricated using fiberglass material as stated in section A.2. Material and installation to meet all physical requirements as per section A.4. Bottom to be attached to wetwell pipe with fiberglass layup to comply with A.S.T.M.-D3299

specifications. When reinforcement is necessary for strength, the reinforcement shall be fiberglass channel laminated to wetwell bottom per A.S.T.M.-D3299.

INTEGRAL INTERNAL FIBERGLASS FILLET: Fiberglass wetwells and basins may have an internal sloped fillet bottom. The fillet shall be constructed of the same fiberglass material as the wetwell or basin and shall be integral to the wetwell or basin. The fiberglass fillet shall have a 1:1 slope and shall not interfere with pump mounting in the wetwell or basin.

FIBERGLASS REINFORCED TOP: The fiberglass wetwell top shall be fabricated using fiberglass material as stated in section A.2. Material and installation to meet all physical requirements as per section A.4. Top to be attached to wetwell pipe with fiberglass layup to comply with A.S.T.M.-D3299 specifications. When reinforcement is necessary for strength, the reinforcement shall be fiberglass channel laminated to wetwell bottom per A.S.T.M.-D3299.

INSTALLATION OF STUBOUTS: Effluent, service, or discharge lines may be factory installed. Approved methods are PVC sewer pipe, Inserta-Tee fittings, or Kor-N-Seal boots. Installation of stubouts to be fiberglass layup to comply with A.S.T.M.-D3299 specifications.

DEFECTS NOT PERMITTED:

- a. Exposed fibers: glass fibers not wet out with resin.
- b. Resin runs: runs of resin and sand on the surface.
- c. Dry areas: areas with glass not wet out with resin.
- d. Delamination: separation in the laminate.
- e. Blisters: light colored areas larger than 1/2 inch in diameter.
- f. Crazeing: cracks caused by sharp objects.
- g. Pits or Voids: air pockets.
- h. Wrinkles: smooth irregularities in the surface.
- i. Sharp projection: fiber or resin projections necessitating gloves for handling.

A.4 PHYSICAL REQUIREMENTS:

LOAD RATING: The complete wetwell shall have a minimum dynamic-load rating of 16,000 ft-lbs when tested in accordance with Section A.5. To establish this rating, the complete wetwell shall not leak, crack, or suffer other damage when load tested to 40,000 ft-lbs and shall not deflect vertically downward more than 1/4 inch at the point of load application when loaded to 24,000 lbs.

STIFFNESS: The wetwell cylinder shall have a minimum pipe-stiffness value shown in Table 1 when tested in accordance with Section A.5.

TABLE #1 STIFFNESS REQUIREMENTS

LENGTH - FT.	F/AY - PSI
10 to 20	2.01
21 to 30	3.02
31 to 40	5.24

PHYSICAL PROPERTIES:	HOOP	AXIAL
	DIRECTION	DIRECTION
a. Tensile Strength (psi)	18,000	5,000
b. Tensile Modules (psi)	0.8×10^6	0.7×10^6
c. Flexural Strength (psi)	26,000	4,500
d. Flexural Modules (psi)		
(no ribs - 48", 60", 72")	1.4×10^6	0.7×10^6
(with ribs - 96", 144")	0.7×10^6	0.7×10^6

A.5 TEST METHODS: Tests shall be performed as specified in A.S.T.M.-D3753 latest edition, Section 8.

A.6 INSTALLATION:

EXCAVATION:

GENERAL: The limit of excavation shall be such to allow for placing and removing forms, installing sheeting, shoring, bracing, etc. The Contractor shall pile excavated material in a manner that will not endanger the work and will avoid obstructing sidewalks, driveways, power poles, etc. Drainage shall be kept clear.

VERTICAL SIDES: When necessary to protect existing or proposed structures or other improvements, the Contractor shall maintain vertical sides of the excavation. The limit shall not exceed three feet outside the footing on a vertical plane parallel to the footing except where specifically approved otherwise by the Engineer. The Contractor shall provide and install any sheeting, shoring, and bracing as necessary to provide a safe work area as required to protect workmen, structures, equipment, power poles, etc. The Contractor shall be responsible for the design and adequacy of all sheeting, shoring, and bracing. The sheeting, shoring, and bracing shall be removed as the excavation is backfilled in such a manner as to prevent injurious caving.

SLOPING SIDES: Where sufficient space is available, the Contractor shall be allowed to back slope the sides of the excavation. The back slope shall be such that the excavation shall be safe from caving. The type of material being excavated shall govern the back slope used, but in any case the back slope shall be no steeper than 1 foot horizontal to 1 foot vertical.

DEWATERING: The Contractor shall keep the excavation free from water by use of cofferdams, bailing, pumping, well pointing, or any combination as the particular situation may warrant. All dewatering devices shall be installed in such a manner as to provide clearance for construction, removal of forms, and inspection of exterior of form work. It is the intent of these specifications that the foundation be placed on a firm dry bed. The foundation bed shall be kept in a dewatered condition a sufficient period of time to insure the safety of the structure. All dewatering methods and procedures are subject to the approval of the Engineer. The excavation shall be protected from excessive rainfall, drainage and drying. The excavation shall be inspected and approved by the Engineer before work on the structure is started. It is the intent of these specifications that the Contractor provide a relatively smooth, firm foundation bed for footings and slabs that bear directly on the undisturbed earth without additional cost to the Owner, regardless of the soil conditions

encountered. The Engineer will be the sole judge as to whether these conditions have been met. The contractor shall pile excavated material in a manner that will not endanger the work.

UNAUTHORIZED OVER EXCAVATION: Excavation for slabs, footings, etc., that bear on earth shall not be carried below the elevation shown on the drawings. In the event the excavation is carried on below the indicated elevation, the Contractor shall bring the slab, footing, etc., to the required grade by filling with concrete having a minimum compressive strength of at least 3,000 psi at 28 days.

HANDLING: Do not drop or impact the wetwell. Wetwells shall be chocked if stored horizontally. If wetwells must be moved by rolling, the ground transversed shall be smooth and free of rocks, debris, etc. FRP wetwells may be lifted by the installation of two lifting lugs as specified by the manufacturer on the outside surface near the top or by a sling or "choker" connection around the center. Use of chains or cables in contact with the wetwell surface is prohibited. Wetwells may be lifted horizontally using one support point.

OPEN BOTTOM WETWELL INSTALLATION: Bottom of excavation should be compacted to 95% Standard Proctor Density. Pour reinforced concrete base one foot deep and at least two feet larger than the fiberglass wetwell outside diameter. As soon as the concrete has set-up enough to support the fiberglass wetwell, lower the wetwell into place. Pour a minimum of one foot of reinforced concrete on the inside, also a minimum of one foot deep and two feet from the fiberglass wetwell wall on the outside of the wetwell. Insert ram neck type sealant on the outside of fiberglass wetwell around the bottom where the fiberglass and concrete come together.

CUTOUTS: Cutouts in wetwell wall should be made with proper cutting tools, such as jig saw or hole saw. Do not use axe or other impact-type tools.

INSTALLATION OF SEWER PIPE:

TYPE 1: Make the cutout in the wetwell wall, the outside diameter of pipe, plus 1/2 inch maximum. Slip pipe into position. Apply industrial grade silicone around the pipe next to the wetwell wall cutout on the inside and on the outside. Cover the outside siliconed area with epoxy grout and backfill.

TYPE 2: Make the cutout in the wetwell wall, the outside diameter of pipe, plus 1/2 inch maximum. Grind the outside surface of the pipe and both the inside and the outside surfaces of the cutout in the wetwell wall. (Apply a priming agent to any PVC pipe that might be used before fiberglass lay-up.) Insert the pipe through the cutout in the wall of the wetwell. Apply fiberglass putty to the inside and the outside of the wetwell wall cutout, filling openings between pipe and cutout. Make a good radius for the fiberglass lay-up. After putty has set-up, fiberglass the pipe into place. Use one layer of woven roving sandwiched between two layers of fiberglass mat. Allow fiberglass to completely set-up before backfilling. Fiberglass layup method to comply with A.S.T.M.-D3299 specifications.

TYPE 3: Install Insert-A-Tee type fitting per manufacturers instruction. (Fowler Mfg. Co., P.O. Box 767, Hillsboro, Or. 97123. PH. 503-359-5417) or approved equal.

CLOSED BOTTOM WETWELL INSTALLATION: Bottom of excavation should be compacted to 95% Standard Proctor Density. Wetwells with diameters up to 54 inches and depths no greater than 12 feet, may be placed on a base of 6 inches of crushed stone. Wetwells with depths greater than 12' feet, should have a poured reinforced concrete base at least one foot deep and at least two feet larger than fiberglass wetwell outside diameter. The fiberglass wetwell shall be lowered into the wet

concrete and brought to plumb. Pour reinforced concrete over the anti-flotation flange. The concrete shall be a minimum of one foot deep and two feet from outside wall of the wetwell. More concrete may be required in high water table areas. In high water table areas you should consult an Engineer for backfill requirements.

INTERNAL BOTTOM RIBS: Wetwells with internal bottom stiffening ribs will require that concrete be poured on the inside of the wetwell to a depth equal to that of the stiffening ribs. This is typically 4 – 6 inches.

FIBERGLASS WETWELL TOP: The fiberglass top may have stubouts installed or may have a raised fiberglass collar around the hatch opening. The fiberglass top has been designed to withstand the weight of a concrete reinforced slab to be installed over it.

BACKFILL:

BACKFILL MATERIAL: Unless shown otherwise on the drawings, sand or crushed stone shall be used for backfill around the wetwell for a distance of two feet from the outside surface and extending from the bottom of the excavation to the bottom of the top slab. Suitable material chosen from the excavation may be used for the remainder of the backfill. The material chosen shall be free of large lumps or clods, which will not readily break down under compaction. This material will be subject to approval by the Engineer. Backfill material shall be free of vegetation or other extraneous material. Excavated materials which are to be used for fill or backfill may be stockpiled on the site. Location of stockpiles shall be approved by the Engineer. Top soil should be stockpiled separately and used for finish grading around the structure.

SCHEDULE OF BACKFILLING: The Contractor may begin backfilling of wetwell as soon as the concrete has been allowed to cure and the forms removed.

BACKFILL LIFTS: Backfill shall be placed in layers of not more than 12 loose measure inches and mechanically tamped to at least 95% Standard Proctor Density. Flooding will not be permitted. Backfill shall be placed in such a manner as to prevent any wedging action against the structure.

TOP SLAB SUPPORT: When installing a fiberglass wetwell without a fiberglass top you should pour a reinforced concrete slab support a minimum of two feet outside of fiberglass wetwell wall and a minimum of six inches thick. The slab shall be specified and designed by project engineer.

MARKING AND IDENTIFICATION: Each wetwell shall be marked with the following information.

1. Manufacturer's name or trademark
2. Manufacturing special number
3. Total length and nominal diameter

Fiberglass Warranty Information

WARRANTY

WARRANTY: L. F. Manufacturing, Inc., warrants its products against failure due to improper workmanship or defective materials, for a period of ten (10) years from delivery date; provided, however, that L. F. Manufacturing, Inc., liability shall be limited to repairing such products or the replacement of defective parts F.O.B. point of manufacture with freight allowed (dismantling and installation are not included). L. F. Manufacturing, Inc., does not warrant products which are not manufactured by L. F. Manufacturing, Inc., except to the extent of the warranty L. F. Manufacturing, Inc., may receive from the manufacturer. L. F. Manufacturing, Inc., makes no warranty expressed or implied as to the merchantability or fitness for any particular purpose of the property sold under this contract.

Except as expressed in this section, L. F. Manufacturing, Inc., makes no warranties, expressed or implied. L. F. Manufacturing, Inc., liability shall be limited to the warranties expressed herein and L. F. Manufacturing, Inc., shall not be liable for any direct or consequential damage, including loss of use, which Dealer or Dealer's customers may suffer.

L. F. Manufacturing, Inc., fiberglass reinforced plastic (FRP) equipment and products are designed to meet certain design and load requirements. The foregoing warranties do not apply to any fiberglass reinforced plastic (FRP) equipment or products which are misused or which consist of anything except L. F. Manufacturing, Inc., parts.

Dealer is not and will not represent itself as an agent or employee of L. F. Manufacturing, Inc., and will not make any other representations or warranties on behalf of L. F. Manufacturing, Inc., other than by referring the customer to this warranty. Dealer will not assume or create any other obligation on behalf of L. F. Manufacturing, Inc., other than by referring the customer to this warranty.



OPTIONAL, IF ECUA WANTS IT, WE CAN DO IT.



20 Year Fiberglass Wetwell Corrosion and Structural Warranty

WARRANTY: L. F. Manufacturing, Inc., (LFM) warrants its fiberglass wetwells against failure due to improper workmanship or defective materials, for a period of one (1) year from delivery date; provided, however, that LFM liability shall be limited, at LFM's option to repairing such products or the replacement of defective parts by delivery to the point of original delivery. LFM does not warrant products which are not manufactured by LFM except to the extent of the warranty LFM may receive from their suppliers. LFM makes no warranty expressed or implied as to the merchantability or fitness for any particular purpose of the property sold under this contract.

In addition, LFM warrants that its fiberglass wetwells: I. Will not leak due to natural external corrosion and/or internal corrosion for a period of twenty (20) years from date of original purchase; provided all products are used solely in municipal waste water systems handling or storing human waste. II. Wetwells will not leak due to structural failure, due to the improper manufacture of the products listed in this warranty. This provision does not apply if the wetwell has been altered or modified by anyone not qualified to perform such actions or if it has been removed from the ground following original installation.

Except as expressed in this section, LFM makes no warranties, expressed or implied. LFM liability shall be limited to the warranties expressed herein and LFM shall not be liable for any special, direct or indirect consequential damage, except as stated above in connection with such wetwell, including without limitation, costs, expenses or liabilities associated with environmental contamination, loss of use, which Dealer or Dealer's Customer may suffer, removal, installation or costs associated with removal and installation.

LFM fiberglass reinforced plastic (FRP) equipment and products are designed to meet certain design and load requirements. The foregoing warranties do not apply to any FRP equipment or products which are misused or which consist of anything except LFM parts.

Dealer is not and will not represent itself as an agent or employee of LFM and will not make any other representations or warranties on behalf of LFM, or assume or create any other obligation on behalf of LFM other than by referring the customer to this warranty.



Standard Specification for Glass-Fiber-Reinforced Polyester Manholes and Wetwells¹

This standard is issued under the fixed designation D 3753; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers glass fiber-reinforced polyester manholes and wetwells for use primarily in sanitary and storm sewer applications.

1.2 The values given in inch-pound units are to be regarded as the standard. The values in parentheses are provided for information purposes only.

1.3 The following precautionary caveat pertains only to the test methods portion, Section 8, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—There is no similar or equivalent ISO standard.

2. Referenced Documents

2.1 ASTM Standards:

- C 581 Practice for Determining Chemical Resistance of Thermosetting Resins Used in Glass-Fiber-Reinforced Structures Intended for Liquid Service²
- D 695 Test Method for Compressive Properties of Rigid Plastics²
- D 785 Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials²
- D 790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials²
- D 883 Terminology Relating to Plastics²
- D 1600 Terminology for Abbreviated Terms Relating to Plastics²
- D 2412 Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel Plate Loading³
- D 2583 Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor⁴

D 2584 Test Method for Ignition Loss of Cured Reinforced Resins⁴

D 3892 Practice for Packaging/Packing of Plastics⁵

3. Terminology

3.1 *General*—Definitions are in accordance with Terminology D 883 and the abbreviations are in accordance with Terminology D 1600 unless otherwise indicated.

3.2 *manway reducer, n*—the top portion of the manhole through which entrance to the manhole is made and where the diameter increases from the entrance way to the larger manhole cylinder.

3.3 *manhole, n*—cylinder with the manway reducer designed to handle a manhole cover and ring.

3.4 *manhole cover and ring, n*—those accessories used with the manhole to close the manway entrance (includes adjustment rings).

3.5 *manhole cylinder, n*—the portion below the manway reducer that extends in a large diameter to the manhole base. May include an eccentric or concentric reducer to allow change in cylinder diameter.

3.6 *pipe connectors, n*—connectors that provide access for the sewer pipe into the manhole.

3.7 *resin rich, adj*—describes that portion of the glass fiber-reinforced polyester material where the resin-to-glass ratio is significantly greater than in other portions of the manhole.

3.8 *wetwell, n*—manhole cylinder with an open, domed, flat, or other top not designed to support a manhole cover and ring.

4. Materials

4.1 *Resin*—The resins used shall be a commercial grade unsaturated polyester resin.

4.2 *Reinforcing Materials*—The reinforcing materials shall be commercial grade of E-type glass in the form of mat, continuous roving, chopped roving, roving fabric, or both, having a coupling agent that will provide a suitable bond between the glass reinforcement and the resin.

4.3 *Surfacing Material*—If reinforcing material is used on the surface exposed to the contained substance, it shall be a commercial grade chemical-resistant glass or organic surfacing mat having a coupling agent that will provide a suitable bond with the resin.

¹ This specification is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.23 on Reinforced Plastic Piping Systems and Chemical Equipment.

Current edition approved Dec. 10, 1999. Published March 2000. Originally published as D 3753 – 79. Last previous edition D 3753 – 81 (1991).

² *Annual Book of ASTM Standards*, Vol 08.01.

³ *Annual Book of ASTM Standards*, Vol 08.04.

⁴ *Annual Book of ASTM Standards*, Vol 08.02.

⁵ *Annual Book of ASTM Standards*, Vol 08.03.



4.4 *Fillers and Additives*—Fillers, when used, shall be inert to the environment and manhole construction. Additives, such as thixotropic agents, catalysts, promoters, pigments, etc., may be added as required by the specific manufacturing process to be used to meet the requirements of this standard. The resulting reinforced-plastic material must meet the requirement of this specification.

4.5 *Other*—Polyester continuous roving, polyester scrim, glass scrim, or other material, may be used. The resulting reinforced-plastic material must meet the requirement of this specification.

4.6 *Ribs*—When used, ribs may be manufactured as a solid construction or with materials applied over a structural or non-structural form. The resulting reinforced-plastic material must meet the requirement of this specification.

5. Manufacture

5.1 Manhole cylinders, manway reducers, and connectors shall be produced from glass fiber-reinforced polyester resin with construction determined by the particular process of manufacture and configuration. Ribs may be attached to the interior or the exterior surface. The process may include contact molding, compression molding, pultrusion, resin transfer molding, hand lay-up, etc.

5.2 *Interior Access*—All manholes or wetwells shall be designed so that a ladder or step system can be supported by the installed manhole or wetwell.

5.3 *Manway Reducer*—Manway reducers may be eccentric or concentric with respect to the larger portion of the manhole.

5.4 *Cover and Ring Support*—The manhole shall provide an area from which a typical ring and cover plate can be supported without damage to the manhole.

5.5 *Assembly Joints*—Product segments may be joined together to form a complete manhole or wetwell.

6. Requirements

6.1 Workmanship:

6.1.1 *Exterior Surface*—The exterior surface shall be relatively smooth with no sharp projections. Hand-work finish is acceptable if enough resin is present to saturate all fibers. The exterior surface shall be free of blisters larger than 0.5 in. (12.7 mm) in diameter and delamination. Fibers loosely attached (can be removed with wire brush) are allowed if not excessive. Paint or other coatings that impair the visual inspection of the laminate are not allowed.

6.1.2 *Interior Surface*—The interior surface shall be resin rich with no exposed fibers. The surface shall be free of crazing, delamination, blisters larger than 0.5 in. (12.7 mm) in diameter, and wrinkles of 0.125 in. (3.2 mm) or greater in depth. Surface pits shall be permitted up to 6/ft² (60/m²) if they are less than 0.75 in. (19 mm) in diameter and less than 0.0625 in. (1.6 mm) deep. Voids that cannot be broken with finger pressure and that are entirely below the resin surface shall be permitted up to 4/ft² (40/m²) if they are less than 0.5 in. (12.7 mm) in diameter and less than 0.0625 in. (1.6 mm) thick. Paint or other coatings are not allowed.

6.2 *Repairs*—Any manhole or wetwell may be repaired to meet all requirements of this specification.

6.3 *Dimensions*—The dimensions shall be as shown below

when measured in accordance with 8.3.1.

6.3.1 Minimum cylinder internal diameter of the manhole shall be 42 in. (1057 mm). The minimum reducer inside diameter shall be 21 in. (526 mm).

6.3.2 Manhole or wetwells lengths shall be in 6-in. (150-mm) increments \pm 2 in. (51 mm).

6.3.3 Nominal inside diameters shall be 36 in. (914 mm), 42 in. (1067 mm), 48 in. (1219 mm), 54 in. (1372 mm), 60 in. (1524 mm), 66 in. (1676 mm) and 72 in. (1829 mm). Tolerance on the inside diameter shall be \pm 1 %. Other diameters as agreed upon between the purchaser and the manufacturer are covered by this specification.

6.4 *Performance Test*—A complete manhole manufactured in a manner consistent in every way with this specification must meet the following performance criteria. If a change in materials or methods of manufacturing is made and that change may effect the results of the following tests, then the testing must be repeated. Manhole testing is conducted to qualify the finished product characteristics. It is not considered to be a quality control procedure.

6.4.1 *Load Rating*—The complete manhole shall have a minimum dynamic-load rating of 16 000 lbf (71 171.5 N) when tested in accordance with 8.4. To establish this rating, the complete manhole shall not leak, crack, or suffer other damage when load tested to 40 000 lbf (177 929 N) and shall not deflect vertically downward more than 0.25 in. (6.35 mm) at the point of load application when loaded to 24 000 lb (106 757 N).

6.4.2 *Stiffness*—The manhole cylinder shall have the minimum pipe-stiffness values shown in Table 1 when tested in accordance with 8.5. Stiffness requirements for other manhole lengths may be interpolated between the values in Table 1.

6.4.3 *Soundness*—The manholes shall not leak when tested in accordance with 8.6.

6.5 *Chemical Resistance*—A manhole or wetwell sample manufactured in a manner consistent in every way with this specification must be tested in accordance with 8.7. The log of percent retention of each property after immersion testing when plotted against the log of immersion time, and extrapolated to 100 000 h shall assure retention of at least 50 % of initial properties. If a change is made in the manhole construction and that change may effect the results of the following tests, then the testing must be repeated. Chemical testing is conducted to determine the applicability of the materials used in the manufacture of the manhole to the specified use conditions. It is not considered to be a quality control procedure.

6.6 *Material Properties*—The following properties shall be established for each type of construction used in the manhole. If a change in materials or methods of manufacturing is made and that change may effect the results of the following tests,

TABLE 1 Stiffness Requirements

Manhole Length, ft (mm)	$F/\Delta Y$, psi (kPa)
6 (1829)	0.72 (4.96)
12 (3658)	1.26 (8.69)
20 (6096)	2.01 (13.86)
25 (7620)	3.02 (20.82)
35 (10668)	5.24 (36.13)



then the testing must be repeated. Material properties tests are conducted to qualify the finished product characteristics. It is not considered to be a quality control procedure.

6.6.1 *Material Composition*—The material composition in percent by weight shall be determined in accordance with 8.8.1.

6.6.2 *Compressive Strength*—The compressive strength in the hoop and axial directions of the manhole shall be determined in accordance with 8.8.2.

6.6.3 *Flexural Strength and Modulus*—The flexural strength and flexural modulus of elasticity, in the hoop and axial directions of the manhole, shall be determined in accordance with 8.8.3.

6.7 *Hardness*—The surface hardness shall be determined in accordance with 8.8.4.

6.8 *Thickness*—The thickness of each manhole-component part shall be determined in accordance with 8.3.2.

7. Quality Control

7.1 *Examination*—Each manhole-component part shall be examined for workmanship dimensions, hardness, and thickness in accordance with Section 6.

7.2 *Composition Control*—Controls on glass and resin content shall be maintained for all manufacturing processes. Records shall be maintained as needed to ensure products meet the requirements of the specification. Proper glass content may be shown by glass usage checks, by glass and resin application rate checks, or material composition testing in accordance with 8.8.1, or both.

8. Test Methods

8.1 *Conditioning*—Specimens tested should be representative of the actual manufacturing process. Conditioning of the specimens is not allowed unless specified by this specification.

8.2 *Test Conditions*—Conduct at ambient temperature without any special controls on temperature unless otherwise specified.

8.3 Dimensions:

8.3.1 Measure dimensions other than thickness with a steel tape with graduations of 0.125 in. (3 mm) or less.

8.3.2 *Thickness*—Measure to the nearest 0.01 in. (0.25 mm) with a micrometer, caliper, gage, or other suitable instrument. Make a minimum of one thickness reading per 34 ft² (3 m²) of surface in areas of constant thickness. Through regions of wall taper, make sufficient checks to establish the actual thickness.

8.4 Load Rating:

8.4.1 *Load Test*—The manhole tested must be long enough to include at least one of all unique or repetitive features such as: bonded joints, adhesive seams, gasketed joints, etc. In any case, the minimum length of the manhole cylinder shall not be less than 36 in. (914 mm) for each cylinder diameter.

8.4.1.1 *Concentric Manholes*—The manhole to be tested must be complete with cover and supporting ring installed. Apply the specified load eccentrically (see Fig. 1 for typical test model) on a 6- by 6- by ½-in. (152- by 152- by 12.7-mm) steel plate resting on the manhole cover. Locate the steel loading plate so that the center of the plate is within 4 in. (102 mm) from the edge of the cover. Load in 2000-lbf (8896-N) increments with close inspection between increases. Maintain

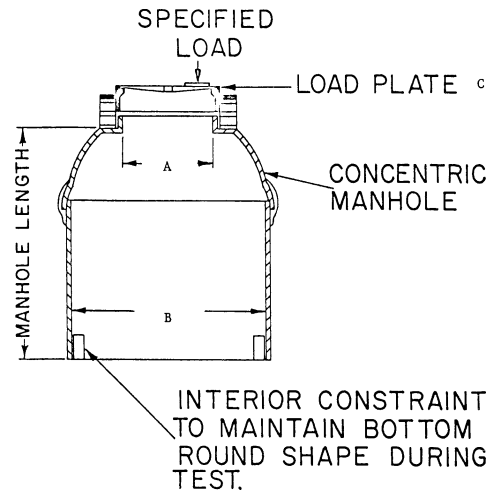


Table of Dimensions

	in.	(mm)
A	21 min	(533 min)
B	42 min	(1067 min)
C	6 by 6 by ½	(152 by 152 by 12.7)

FIG. 1 Concentric Manhole Load Test Model

the specified load for not less than 15 min.

8.4.1.2 *Eccentric Manholes*—The manhole to be tested must be complete with cover and supporting ring installed. Apply the specified load eccentrically (see Fig. 2 for typical test model) 6- by 6- by ½-in. (152- by 152- by 12.7-mm) steel plate resting on the manhole cover. Locate the steel loading plate so that the center of the plate is within 4 in. (102 mm) from the edge of the cover at a point where the edge of the

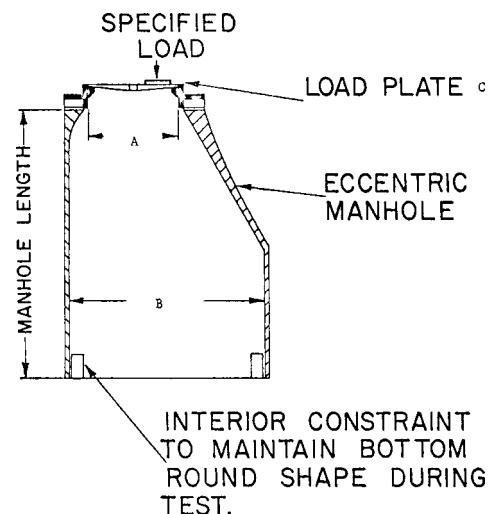


Table of Dimensions

	in.	(mm)
A	21 min	(533 min)
B	42 min	(1067 min)
C	6 by 6 by ½	(152 by 152 by 12.7)

FIG. 2 Eccentric Manhole Load Test Model



cover is nearest to the axis of the manhole cylinder. Load in 2000-lbf (8896-N) increments with close inspection between increases. Maintain the specified load for not less than 15 min.

8.4.2 *Deflection Test*—When load tested according to the procedure as outlined in 8.4.1.1 and 8.4.1.2 the top of the manhole(s) shall not deflect vertically downward more than 0.25 in. (6.35 mm) when measured at the point of load application when the specified load is 24 000 lbf (106 757 N).

8.5 *Stiffness*—Test a section of the cylinder portion of the manhole in accordance with Test Method D 2412. The section tested must be free of any joints, repetitive features, or repairs.

8.6 *Soundness*—In order to determine soundness, apply an air or water pressure test, or both to the manhole test sample described in 8.4.1. The test pressure shall not be less than 3 psig (20.68 kPa) or greater than 5 psig (34.47 kPa). While holding at the established pressure, inspect the entire manhole for leaks. Any leakage through the laminate, joints, or repairs is cause for failure of the test. **Caution**—Care should be taken in the air test ensuring that the test is run in an isolated or confined area. The preferred method is to fill the manhole with water and add air pressure.

8.7 *Chemical Resistance*—The testing procedure for measuring chemical resistance shall conform with Practice C 581 with the exceptions noted below.

8.7.1 *Test Specimen Construction*—Make the basic test specimen in a manner consistent in every way with the manhole construction. This includes, among other considerations, percent glass, type of glass, resin type, catalyst system, post-cure (if any), fillers and additives (if any), and the exclusion or not of air from the laminate surfaces. Test specimens should be tested in their as-manufactured state with no conditioning. Each specimen should be large enough to allow a minimum of three individual flexural test samples.

8.7.1.1 If the specimen is to be tested in an environment simulating a contained substance, a resin-rich layer may be added to the exterior portion of the specimen. This second resin-rich surface, not present in the manhole itself, shall be of the same construction and thickness; and made with the same considerations (that is, exclusion of air) as the primary layer on the opposite side of the specimen. Where a dual-resin construction is used, this second resin-rich layer should employ the same resin as the primary layer. Seal cut edges with the resin used in the resin-rich surfaces.

8.7.1.2 If the specimen is to be tested in an environment simulating soil conditions, it shall be that described in 8.7.1. Seal cut edges of the specimen with that resin used in the outer surface of the manhole.

8.7.2 *Test Intervals*—Draw and test specimens after one, three, six, and twelve months immersions in each test medium. It may be advisable to include an extra specimen at the time of initial immersion in the event it is necessary to extend the test interval beyond one year because of inconclusive results at that time. Cut each specimen into at least three samples for flexural tests.

8.7.3 *Test Media*—Test media shall represent as completely as possible the actual environment of the manhole in service. Throughout the test period, change the test media as required to maintain the properties of the test media.

8.7.3.1 *Interior Manhole Surface*—The required test medium for the interior manhole surface shall be the material to be contained in the manhole. When raw sewage is the medium, the sewage should be replenished to maintain initial biochemical oxygen demand (BOD) levels. Raw sewage may also be simulated with 5 % sulfuric acid.

8.7.3.2 *Exterior Manhole Surface*—Test the following media representing the exterior-manhole surface environment:

(a) Sodium chloride, saturated solution.

(b) Standard buffer aqueous solution at 73°F (22.8°C) simulating alkaline soil (pH of 10).

(c) Standard buffer aqueous solution at 73°F (22.8°C) simulating acidic soil (pH of 4).

8.7.4 *Test Temperatures*—The temperature of each test medium used in corrosion-resistance verification of manhole interior shall be the maximum suggested service temperature for a manhole containing that medium. All media representing soil conditions and sanitary sewage shall be 73°F (22.8°C).

8.7.5 *Interpretation of Results:*

8.7.5.1 Properties to be determined initially and after each test period are flexural strength and flexural modulus (both in accordance with Test Methods D 790, Method I, Procedure A), and Barcol hardness (in accordance with Test Method D 2583) of the interior of the laminate. The specimen should not be cured and should represent the as-manufactured state of cure.

8.7.5.2 Note any effect upon the immersion medium or specimen observed during visual inspection and use to augment physical data determining the suitability of the manhole in any given medium.

8.7.5.3 Plot the average log of percent retention of each property (see 8.7.5.1) for all samples (at least three samples per specimen, see 8.7.3.2) after immersion testing (versus initial) against the log of immersion time in hours (see Fig. 3).

8.8 *Material Properties*—Specimens taken from a manhole should be used, if possible, to establish material properties. If it is not possible to take the specimens from a manhole because of dimensional requirements for testing, make the specimens independently of the manhole but, in any case, they must be consistent in all respects with the construction of the manhole. Test specimens should be tested in their as-manufactured state with no conditioning.

8.8.1 *Material Composition*—Determine composition in accordance with Test Method D 2584. For specimens with fillers or additives, or both, separate the residue into its components (glass, sand, etc.) to determine the glass content.

8.8.2 *Compressive Strength*—Determine compressive strength in accordance with Test Method D 695.

8.8.3 *Flexural Strength and Modulus*—Determine flexural strength and flexural modulus of elasticity in accordance with Test Methods D 790. Strength property test methods may require flat specimens constructed consistently with the method of fabrication selected for the manhole.

8.8.4 *Hardness*—Determine Rockwell hardness in accordance with Test Method D 785 or Barcol hardness in accordance with Test Method D 2583. The frequency of checks shall not be less than three random points per component part. The minimum acceptable value of cure shall not be less than 90 % of the resin manufacturers minimum value for the cured resin.

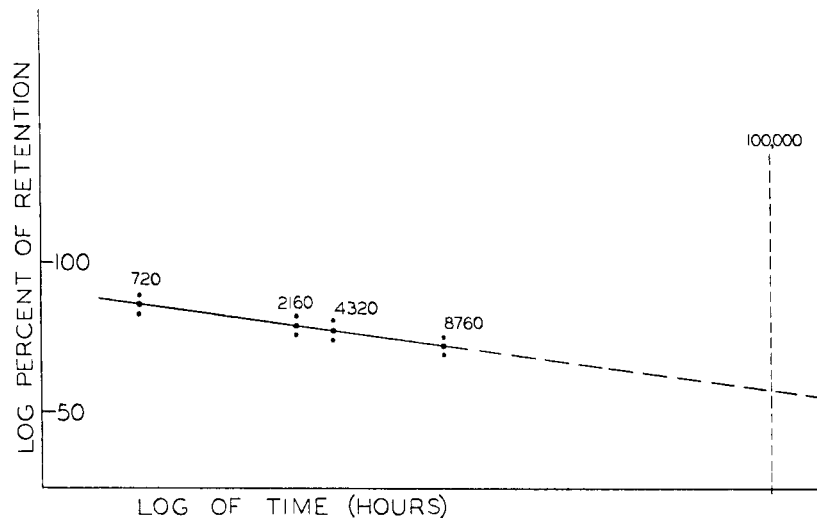


FIG. 3 Chemical Test Property Retention

9. Inspection

9.1 Inspection of finished manholes and wetwells shall be made as agreed upon between the purchaser and the supplier as part of the purchase contract.

10. Rejection and Rehearing

10.1 Manholes or wetwells that fail to conform to the requirements of this specification may be rejected. Rejection should be reported to the manufacturer or supplier promptly and in writing. In case of dissatisfaction with the results of any test, the manufacturer or supplier may make a claim for a rehearing.

11. Certification

11.1 When requested by the purchaser on his order, a certification shall be made the basis of acceptance. This shall consist of a copy of the manufacturer's test report or a

statement by the supplier, accompanied by a copy of the test results, that the manhole or wetwell has been tested, and inspected in accordance with the provisions of this specification and meets all requirements. Each certification so furnished shall be signed by an authorized agent of the supplier or manufacturer.

12. Packaging and Package Marking

12.1 The manholes shall be marked with the following information:

- 12.1.1 This ASTM designation,
- 12.1.2 Manufacturer's name or trademark,
- 12.1.3 Manufacturing serial number, and
- 12.1.4 Manhole total length.

12.2 All packing, packaging, and marking provisions of Practice D 3892 shall apply to this specification.

SUMMARY OF CHANGES

This section identifies the location of selected changes to this specification. For the convenience of the user, Committee D-20 has highlighted those changes that may impact the use of this specification. This section may include descriptions of the changes or the reasons for the changes, or both.

D 3753 – XX:

(1) Added Note 1.

(2) In Section 3, added terms manhole and wetwell, and revised terms manhole cover and ring, and manhole cylinder.

(3) In Section 4, minor revisions in 4.2 and 4.4. Added 4.5 and 4.6.

(4) In Section 5, revised 5.1, 5.2 and 5.5.

(5) In Sections 6, 7, 8 and 9, revised throughout.

(6) Removed ranges from Table 1.

(7) Added reference to wetwells to 10.1 and 11.1.

(8) Deleted reference to installation assist marks and installation instructions from Section 12.

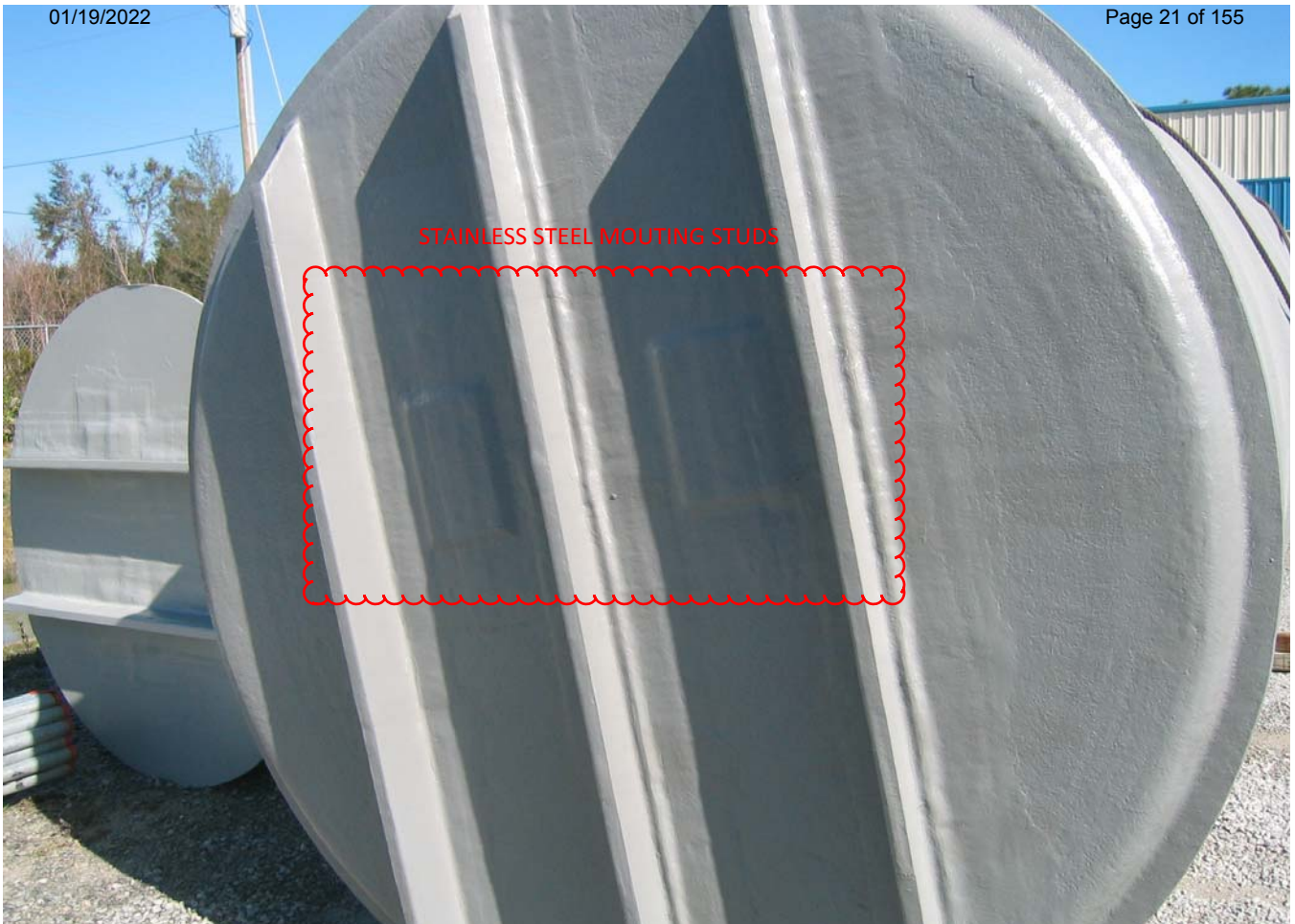
(9) Added summary of changes section.

**D 3753**

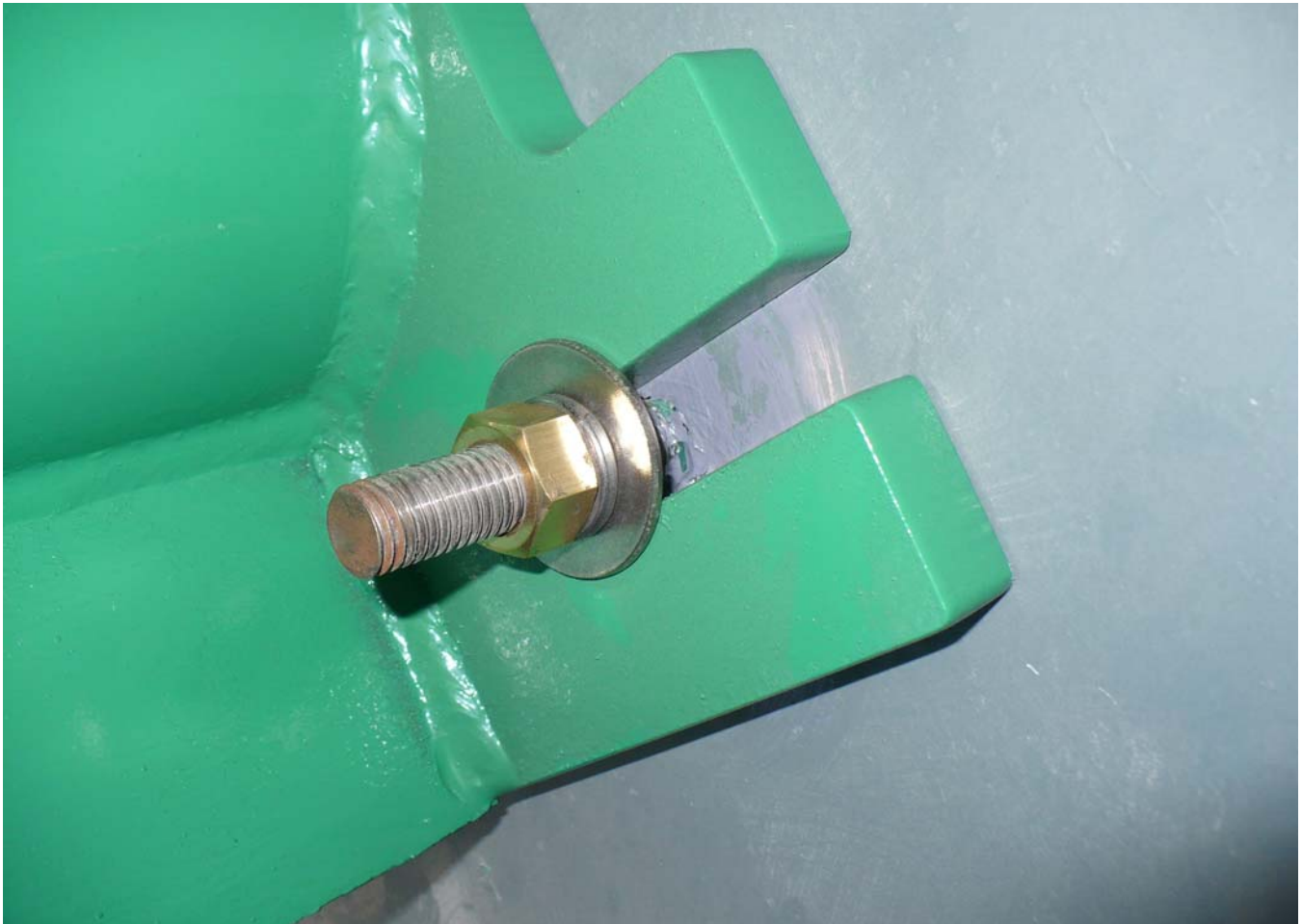
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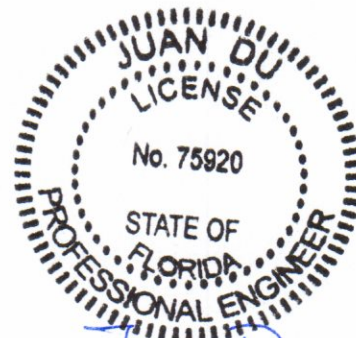
STAINLESS STEEL MOUNTING STUDS



FIBERGLASS REINFORCED PLASTIC WET WELL BUOYANCY CALCULATION

End User: Kaleidoscope Cove
Equipment Name: North Lift Station
Customer: Fiberglass Tank Solutions

Diameter:	8'-0" ID
Shell Height:	15'-3 1/4" H
Configuration:	Flat Bottom, Flat Top, Cylindrical Shell, Vertical
Design Pressure:	Atmospheric
Design Temperature:	Ambient
Burial Depth of Wet Well Base:	16'-9 1/4" H
Max. Water Table Above Wet Well Base:	16'-9 1/4" H
Specific Gravity:	1.0
Equipment Service Location:	Freeport, FL
Designed By:	Joann Du, P.E.
Issue Date:	10/11/2021
Rev.:	0



Juan Du
exp. 2/28/2023



Design Inputs

Shell Inside Diameter $D := 8 \cdot \text{ft} = 96 \cdot \text{in}$

Shell Inside Radius $R_{\text{ww}} := \frac{D}{2} = 48 \cdot \text{in}$

Total Straight Shell Height $H_{\text{ww}} := 15 \cdot \text{ft} + 3.25 \cdot \text{in} = 183.25 \cdot \text{in}$

Applied Internal Pressure $P_{\text{int}} := 0 \cdot \text{psi}$

Applied External Pressure $P_{\text{ext}} := 0 \cdot \text{psi}$

Specific Gravity $\text{sg} \equiv 1$

Max. Groundwater Level
Above Base of
the Wet Well $H_{\text{wt}} := H = 183.25 \text{ in}$

Water Density: $\rho_{\text{w}} := 0.0361 \cdot \frac{\text{lb}}{\text{in}^3}$

Bak Fill Material Density $\rho_{\text{fil}} := 130 \cdot \frac{\text{lb}}{\text{ft}^3}$

Concrete Density $\rho_{\text{c}} := 150 \cdot \frac{\text{lb}}{\text{ft}^3}$

Buoyancy Calculation

1. Buoyant force acting on the underground wet well is equal to the weight of fluid which the wet well and concrete ring / pad displaces.
2. Downward frictional resistance of the backfill material is neglected in this analysis to be conservative.
3. Wet well shell w/ stiffeners' weights, vertical backfill weight, and the weight of the concrete ring / pad attached to the wetwell are used to resist buoyancy.

Buoyancy Design Safety Factor	$SF_{by} \equiv 1.2$
Wet Well Bot. Area	$A_{ba_in} := \frac{1}{4} \cdot \pi \cdot D^2 = 50.265 \cdot \text{ft}^2$
Depth of the Concrete Pad Connected to the Wet Well Bot.	$h_{b_c} := 0 \cdot \text{in}$
Base Concrete Pad O.D.	$D_{b_c} := du \cdot \text{in} = 141 \text{ in}$
Volume of the Concrete Pad Connected to the Wet Well Bot.	$V_{b_c} := \frac{1}{4} \cdot \pi \cdot (D_{b_c})^2 \cdot h_{b_c} = 0 \cdot \text{ft}^3$
Estimated Weight of Wet Well Used to Counteract Buoyancy	$W_{by_ww} := 1300 \cdot \text{lb}$
Total Volume of Wet Well Under Max. Groundwater Level	$V_{ww} := A_{ba_in} \cdot H = 767.596 \cdot \text{ft}^3$
Total Volume of Water Displaced	$V_{h2o} := V_{ww} + V_{b_c} + V_{w_con} \cdot \text{ft}^3 = 825.596 \cdot \text{ft}^3$
Total Weight of Water Displaced	$W_{h2o} := \rho_w \cdot V_{h2o} = 5.15 \times 10^4 \cdot \text{lb}$

Design Buoyancy Force

$$F_{by} := W_{h2o} \cdot SF_{by} = 6.18 \times 10^4 \cdot \text{lb}$$

Concrete Ring OD

$$D_{con_o} := du \cdot \text{in}$$

Concrete Ring Depth

$$h_{cr} := 12 \cdot \text{in}$$

Volume of Concrete Ring

$$V_{con} := \frac{\pi}{4} \cdot (D_{con_o}^2 - D^2) \cdot h_{cr} = 58.169 \cdot \text{ft}^3$$

$$V_{con} = 2.154 \cdot \text{yd}^3$$

Volume of Water Displaced
By Concrete Ring

$$V_{w_con} \equiv 58$$

Weight of Concrete

$$W_{con} := [(\rho_c - \rho_w) \cdot (V_{con} + V_{b_c})] = 5.097 \times 10^3 \cdot \text{lb}$$

Weight of Backfill Required
To Hold Down the Wet Well
At Max. Water Table

$$W_{fil_r} := F_{by} - W_{by_ww} - W_{con} = 5.54 \times 10^4 \cdot \text{lb}$$

Volume of Backfill Required

$$V_{fil_r} := \frac{W_{fil_r}}{\rho_{fil} - \rho_w} = 819.367 \cdot \text{ft}^3$$

Outside Diameter of the Backfill

$$D_{od_fil} := du \cdot \text{in} = 141 \cdot \text{in}$$

Volume of the Backfill

$$V_{fil} := \frac{\pi}{4} \cdot (D_{od_fil}^2 - D^2) \cdot (H - h_{cr})$$

Width of the Backfill

$$w_{fil} := \frac{D_{od_fil} - D}{2} = 22.5 \cdot \text{in} \quad du \equiv 141$$

Weight of the Backfill

$$W_{fil} := V_{fil} \cdot (\rho_{fil} - \rho_w) = 5.613 \times 10^4 \cdot \text{lb}$$

$$\Delta_{bu} := W_{fil} - W_{fil_r} = 726.714 \cdot lb$$

checkbuoyancy := if($\Delta_{bu} \geq 0 \cdot lb$, "OK", "Backfill not enough to hold down the wet well") = "OK"

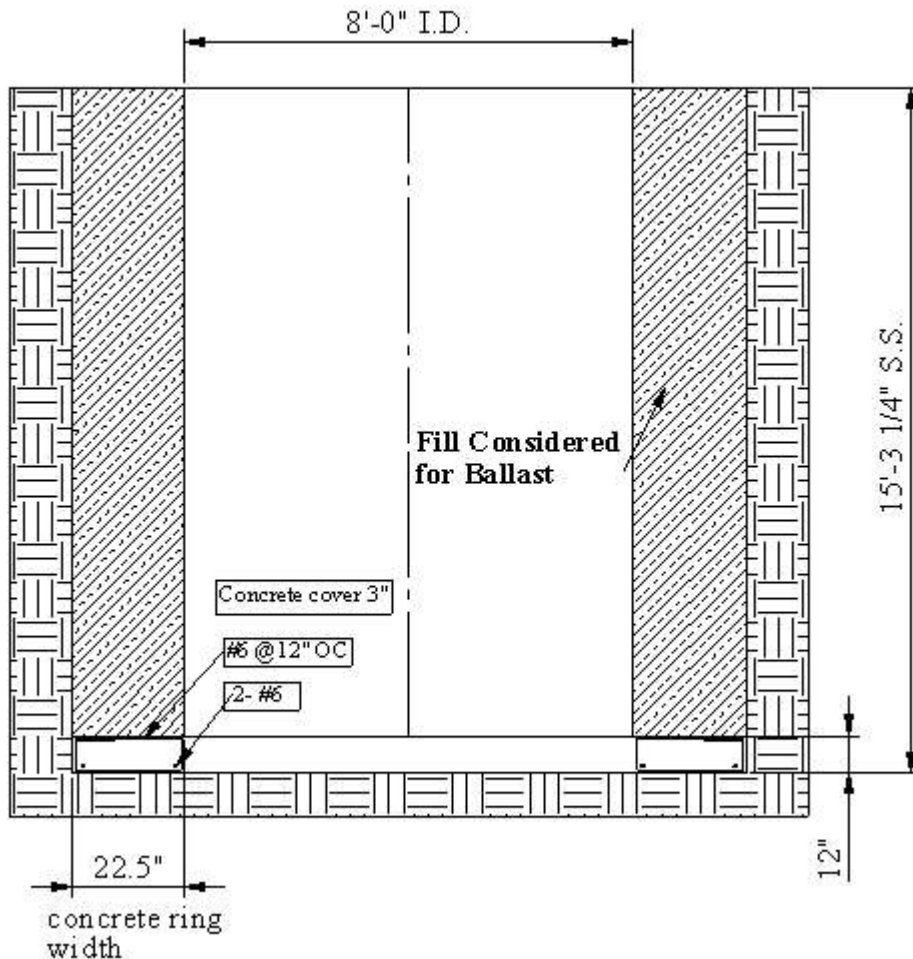
Width of the Backfill

$$wd_{fil} := \frac{D_{od_fil} - D}{2} = 22.5 \cdot in$$

Concrete Base Ring

The following criteria should be met to ensure sufficient ballast to counter buoyancy force on the wet well due to a high water table.

- Min. 6" FRP wet well base flange width.
- Concrete ring per dimension and spec. shown in the sketches below.
- A well graded gravel or select fill with min. 130 pcf density, bearing down on a 12" thick, 22.5" wide concrete ring will provide adequate weight to hold down an empty wet well when water table is at the maximum level.
- Bottom of excavation should be compacted to 95 percent Standard Proctor Density.

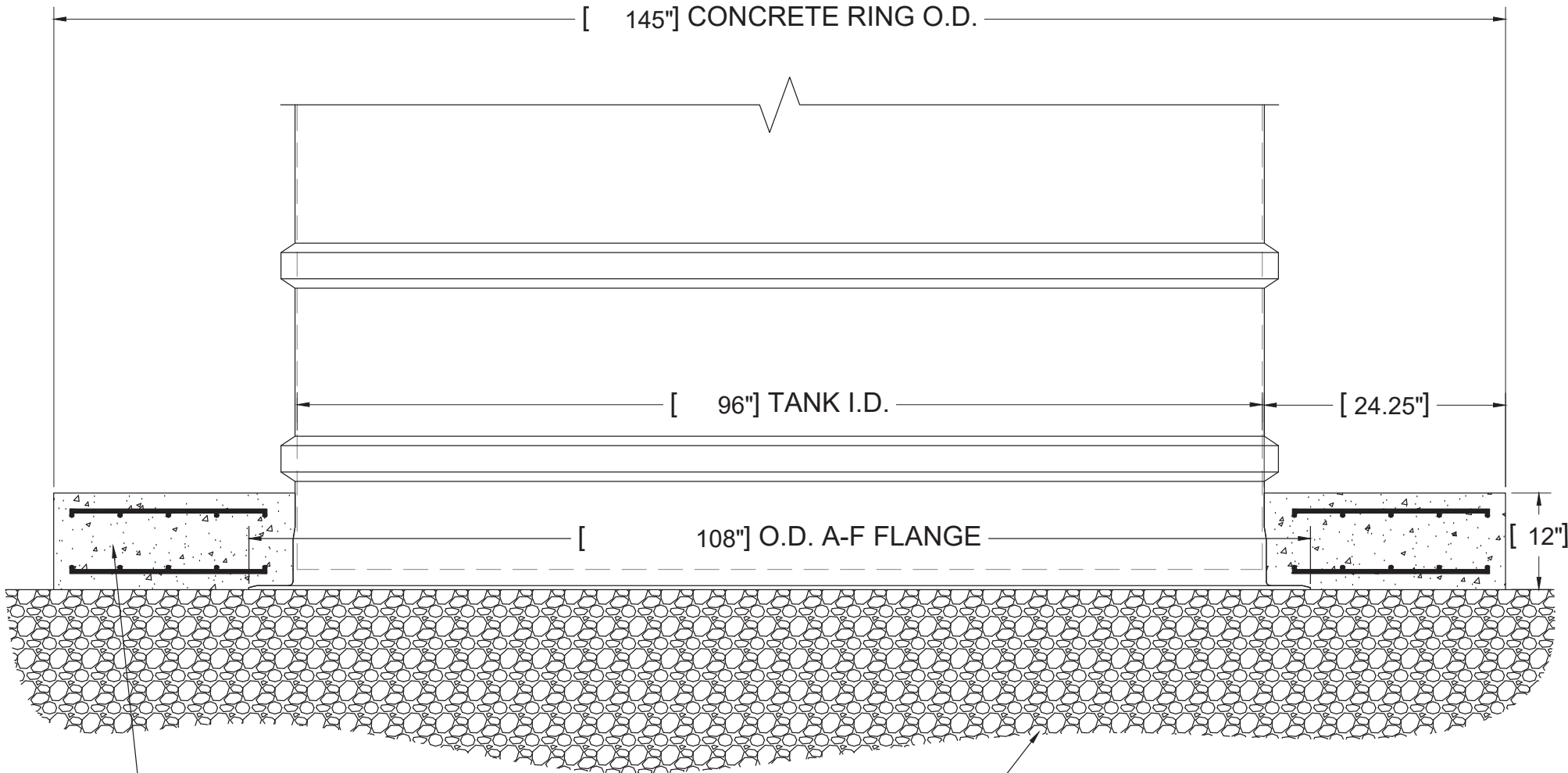


- 4000 psi compressive strength concrete.
- ASTM A615 bars

Wet Well Concrete Base Ring Design			
Version 2.0 Last Revised 5/15/2017			
Customer	Pump & Process Equipment Co. Inc.		
Project	Kaleidoscope Cove North LS		
Date	10/22/2021		
Revision	00		
DESIGN INPUTS			
Wet Well (W.W.) Outside Diameter	D	96.5	in
Wet Well Height(straight shell height)	H	186	in
Is Water Table Above or Below Top Head	-	Above	
Water Table Above W.W. Top Head	hwt	0	in (positive number)
Water Table Below W.W. Top Head	hwtb	0	in (positive number)
Concrete Base Ring O.D.	Dcr	145	in
Concrete Base Ring Thk.	tcr	12	in
Backfill Density	pfil	60	lb/ft ³
Water Density	pw	62.4	lb/ft ³
Concrete Density	pc	150	lb/ft ³
CALCULATION			
Volume of Water Displaced	Vw	926	ft ³
Weight of Water Displaced	Ww	57,799	lb
Concrete Ring Area	Acr	64	ft ²
Concrete Ring Volume	Vcr	64	ft ³
Concrete Ring Weight	Wcr	9582	lb
Weight of FRP Used to Resist Buoyancy	Wfrp	0	lb
Buoyancy Design Safety Factor	SF	1.2	-
Design Buoyancy Force	Fu	69,359	lb
Weight of Backfill Req'd	Wfil_r	59,776	lb
Actual Weight of Backfill	Wfil	61,248	lb
Actual Backfill - Req'd Backfill	ΔWfil	1,472	lb
Is Backfill Adequate to Resist Buoyancy	OK		
DESIGN SUMMARY			
Concrete Base Ring Width	bcr	24.25	in
Concrete Ring Depth	tcr	12	in

NOTE

1. Yellow cells require user inputs.
2. Pay attention to units.



4,000 PSI COMPRESSIVE
STRENGTH CONCRETE
WITH ASTM A615 BARS

COMPACTED BASE TO
95% STANDARD
PROCTOR DENSITY

SHEET TITLE: CONCRETE RING DETAIL	DRAWN DATE:	DRAWN BY:	REV.
	05/2020	MC	00

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1. INTRODUCTION

SAFETY

The following definitions will serve as a guide when reading this manual:

WARNING

Indicates a potentially hazardous situation, which if not avoided could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation, which if not avoided may result in minor or moderate injury.

CAUTION

A caution without the safety alert symbol indicates a potentially hazardous situation, which if not avoided may result in property damage.

- It is the responsibility of the owner, installer and operator to follow all requirements contained in these instructions and to comply with all federal, state, and local safety regulations that may apply to wet well installation and operations.
- No instructions or procedures presented in this document should be interpreted so as to put at risk any person's health or safety, or to harm any property of the environment.

WARNING

Follow OSHA regulations for excavations. Collapse of excavation walls could result in death or serious injury.

- Working in and around excavations is dangerous. The Occupational Safety and Health Administration (OSHA) have specific requirements that must be followed. Prior to beginning work at the site, the installer should obtain a copy of OSHA's Standard, Part 1926 (Construction), Subpart P -Excavations. A copy of this standard is available free of charge at OSHA's Web site (www.osha.gov).
- Careless activity or reckless operation of equipment can cause death, serious injury or property damage.
- It is important to follow the procedures and instructions in this document in order to safely and properly install an FTS wet well. Failure to follow these instructions will void FTS' obligations under the limited warranty and may cause product failure, serious personal injury or property damage. A copy of the relevant FTS limited warranty is found in the printed material that accompanies each tank, and on the FTS website (www.fgtsolutions.com).
- The FTS limited warranty applies only to a wet well installed according to these instructions. Since FTS does not control the parameters of any installation, FTS sole responsibility in any installation is that presented in the limited warranty.
- Comply with all applicable federal, state and local construction, health, safety and environmental codes, and industry standard practices.
- For additional information, contact your state, county and city authorities having jurisdiction, including health, fire or building departments, and environmental agencies. All work must be performed according to standard industry practices and OSHA regulations.
- Federal, state and local codes and regulations always take precedence over an FTS requirement.
- FTS must authorize – in writing and prior to wet well installation – any variation to, or deviation from, these instructions.

- All correspondence regarding variations must be retained for any warranty claim to be valid.
- If you have questions or encounter situations not covered in these instructions, contact FTS at 573-317-9620.

2. PREPARATION FOR INSTALLATION

- Although FTS wet wells are rugged, the wet well owner and/or the wet well owner's representative must take care so that the wet well is not dropped or damaged during delivery, unloading and handling on the jobsite.
- Before unloading the wet well from the truck, the wet well owner and/or the wet well owner's representative must make sure that all tools or other items that may damage the wet well during unloading are removed from the trailer bed.
- When unloading the wet well from the truck, the wet well owner and/or the wet well owner's representative must make sure that the wet well is secured in such a way that it does not roll off the truck.

WARNING

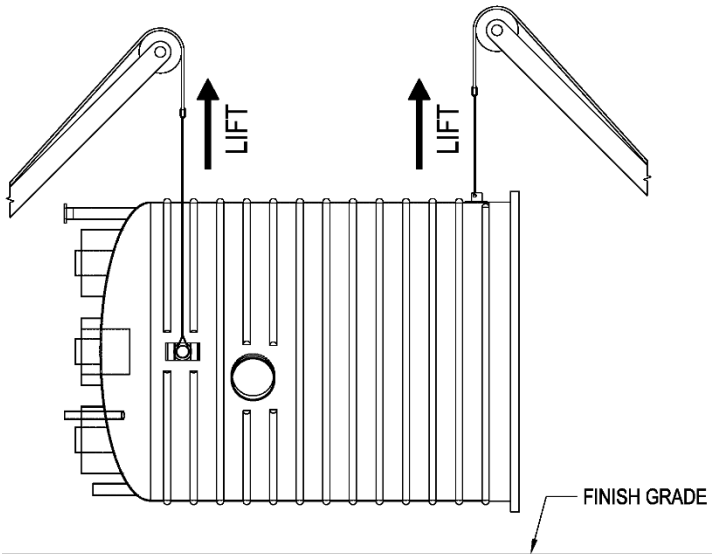
Do not allow driver to release straps securing the wet well to the truck until lifting equipment (such as a crane) is secured to the wet well's lifting lug(s). Failure to do so could result in death or serious injury.

WARNING

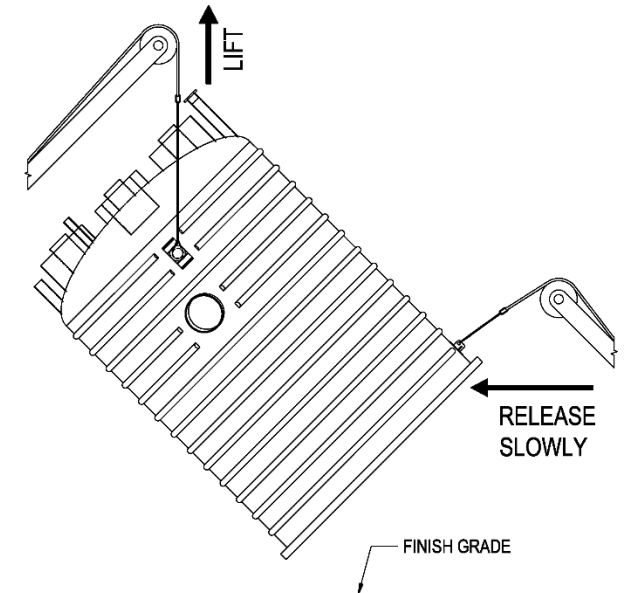
Always chock the wet well. The wet well is heavy and has a large surface area. The wet well will roll on sloped surfaces and could be blown about by the wind. Movement of the wet well could result in death or serious injury.

- Before the wet well is unloaded or relocated on the jobsite, the wet well owner and/or the wet well owner's representative must complete the following steps:
 - Visually inspect the entire exterior and interior surface of the wet well to make sure that no shipping or handling damage has occurred. Look particularly for holes, cracks or deep scrapes. If damage is detected, do not attempt repairs. Contact FTS immediately.
 - Sign the shipping papers accepting the wet well as delivered.
 - Be sure that all equipment used to lift the wet well is rated to handle the load.
 - Select a solid, level area to place the wet well, and clear that area of all rocks, trash and debris.
 - Inspect all interior components to assure nothing has come loose during shipping.
- When hoisting the wet well follow these instructions: (See figures 2-1 – 2-7.)
 - To unload these wet wells, use the lifting lugs that are situated on top of the wet well in its rotated position. To install the wet well, carefully rotate the wet well to its upright position and then use all lifting lugs situated on top of the wet well in its upright position. (See FIGURES 2-1 – 2.7.)
 - Do not wrap chain or cable around the wet well.
 - Use guide ropes to guide the wet well when needed.
 - Do not roll the wet well to move it.
 - When the wet well is rotated (the wet well is upright), use all top lifting lug(s) provided to lift and install the wet well. (See figure 2-6.)
- Whenever a wet well is temporarily placed aboveground at the site, chock it in place to prevent rolling. Tie the wet well down if high winds are expected.
- Whenever a wet well is temporarily placed above the ground in a situation in which there could be freezing temperatures, always take extra care so that water does not accumulate in a way that could result in damage to the wet well or any internal components.

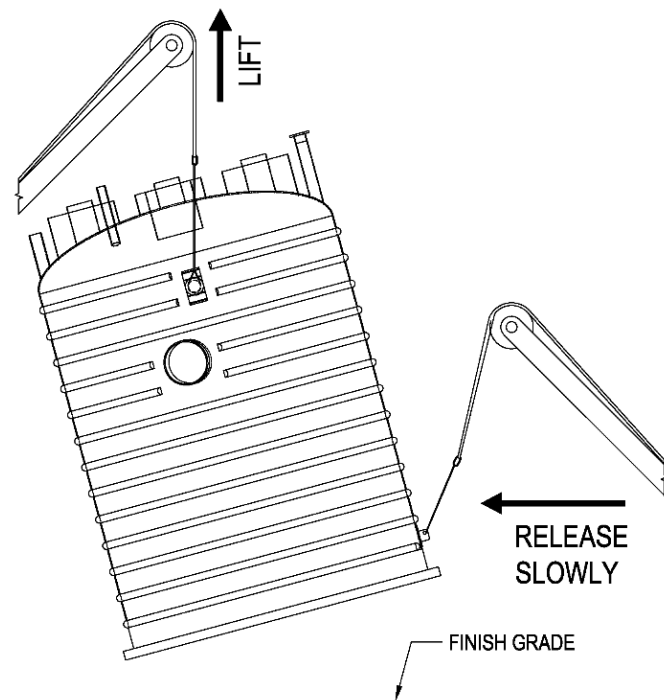
- Excavate a hole large enough to accommodate basin, underground piping, backfill material, and adequate working space.
- When using multiple lifting lugs, the angle of the lifting sling should never exceed 30 degrees. When a situation arises that the angles will be greater than 30-degree, utilize a spreader bar to achieve an acceptable angle degree – see FIGURE 2-5 & FIGURE 2-7.



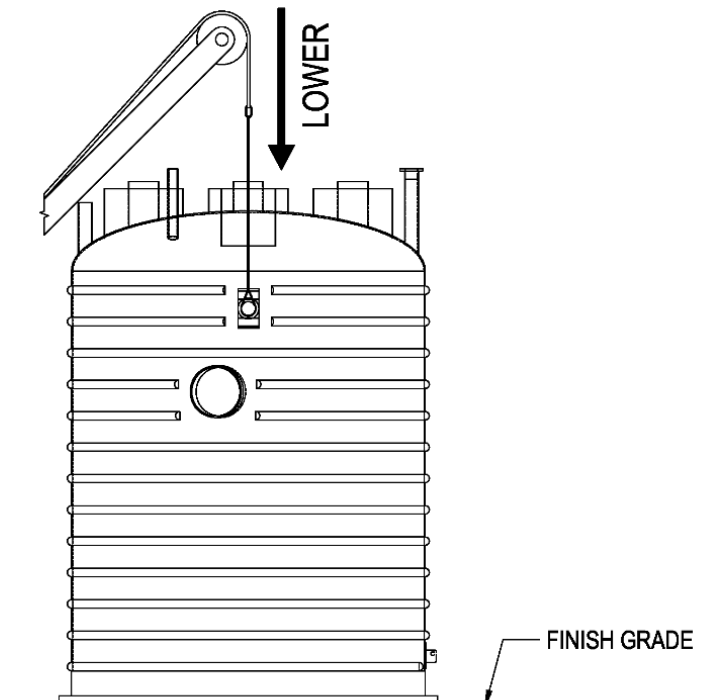
STEP 1
FIGURE 2-1



STEP 2
FIGURE 2-2



STEP 3
FIGURE 2-3



STEP 4
FIGURE 2-4

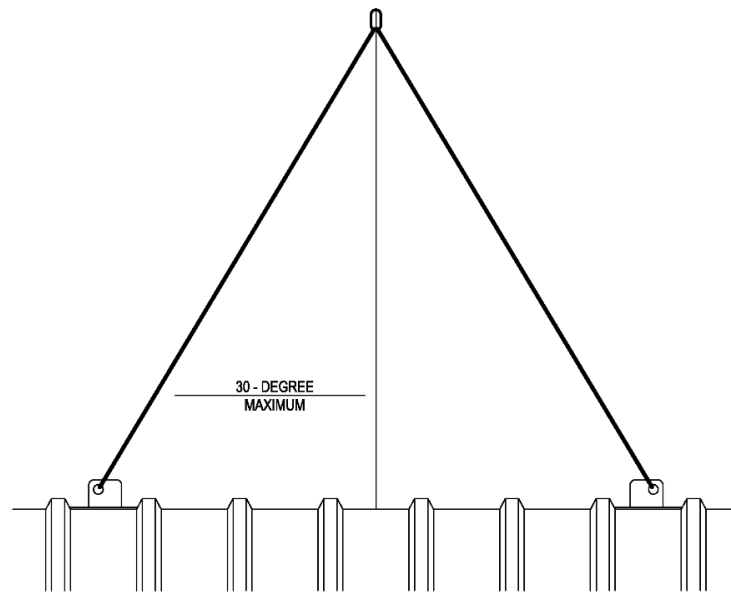


FIGURE 2-5

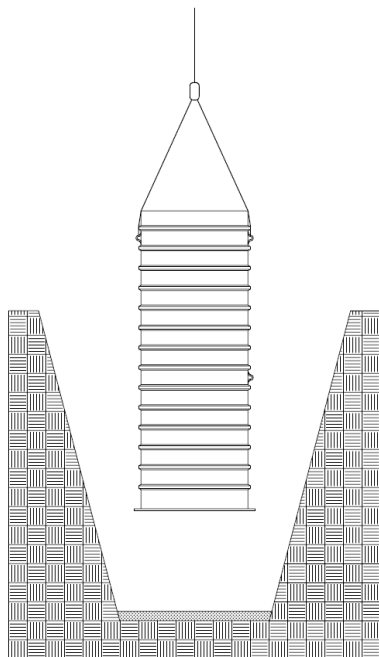


FIGURE 2-6

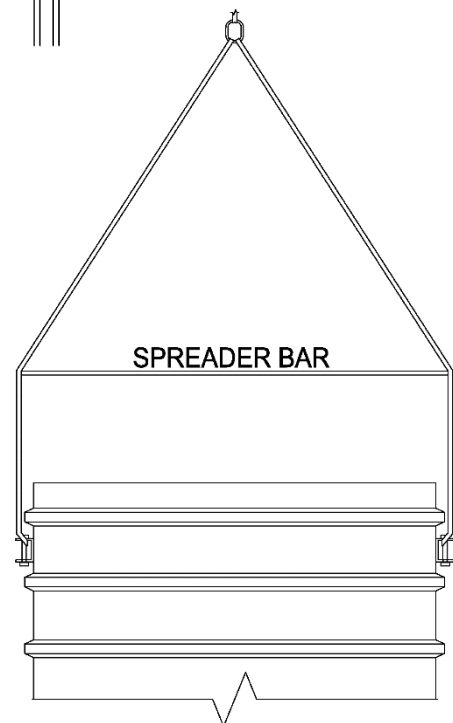








FIGURE 2-7

3. BACKFILL MATERIAL







- FTS wet well must be installed using pea gravel, crushed stone or select backfill as the backfill material. (See FIGURE 3-1.)
- When using rounded stone, the material is to be a mix of rounded particles, sizes between 1/8 inch and 3/4 inch. The rounded stone must conform to the specification of ASTM C-33, paragraph 9.1, sizes 6, 67 or 7.
- When using crushed stone, the material is to be mix of angular particles, sizes between 1/8 inch and 1/2 inch. The crushed stone must conform to the specifications of ASTM C-33, paragraph 9.1, sizes 7 or 8.
- If material which meets these specifications is not available, contact FTS at 573-317-9620.

TABLE 1 – Standard size of coarse aggregate meeting FTS’ rounded gravel Specifications.

Amount of material passing through each laboratory sieve given as percentage of total weight.								
Grade Number	6	100%	90-100%	20-55%	0-15%	0-5%	-	
	67	100%	90-100%	-	20-55%	0-10%	0-5%	
	7	-	100%	90-100%	40-70%	0-15%	0-5%	
Sieve Size								
	1 inch 25.0 mm		¾ inch 19.0 mm		½ inch 12.5 mm		3/8 inch 9.5 mm	
								
	0.187 inch 4.75 mm No. 4		0.094 inch 2.36 mm No. 8					

Note: Standard sizes of coarse aggregate per ASTM D-448, ASTM C-33 and AASHTO M 43.

TABLE 2 – Standard sizes of coarse aggregate meeting FTS’ crushed stone specifications.

Amount of material passing through each laboratory sieve given as percentage of total weight.								
Grade Number	7	-	100%	90-100%	40-70%	0-15%	0-5%	
	8	-	-	100%	85-100%	10-30%	0-10%	
Sieve Size								
	1 inch 25.0 mm		¾ inch 19.0 mm		½ inch 12.5 mm		3/8 inch 9.5 mm	
								
	0.187 inch 4.75 mm No. 4		0.094 inch 2.36 mm No. 8					

Note: Standard sizes of coarse aggregate per ASTM D-448, ASTM C-33 AND AASHTO M 43.

ACCEPTABLE BEDDING AND BACK FILL MATERIALS FOR WET WELLS

- Round stone and crushed stone materials as described in FTS Backfill Guidelines document are essentially self-compacting. However, other materials are suitable for bedding and backfilling around wet wells, provided that these materials are compacted and meet the density requirements.
- Another important characteristic of good backfill materials is hardness or stability when exposed to water or loads. Most natural materials have no problem meeting the hardness requirement. However, materials like soft limestone, sandstone, seashells or shale should not be used as back fill because they may break down over time.
- Terminology in the document is referred from ASTM D 2487: “Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)”. Most unconsolidated materials can be represented by the Unified Soil Classification System (USCS) definitions. The USCS defines materials using two-letter combinations. For example, the USCS symbol “GW” refers to “well

graded gravel". Additionally, mixtures of soils can be referenced with hyphens; for example, "GW-GM" corresponds to "well graded gravel with silt"

TABLE 3 – Shows the relevant USCS symbols for other acceptable backfill and bedding materials. If these materials are used, they must be placed and compacted as shown in Table 4.

First Letter		Second Letter	
Letter	Definition	Letter	Definition
G	Gravel	P	Poorly Graded (uniform particle sizes)
S	Sand	W	Well Graded (diversified particle sizes)
M	Silt	H	High Plasticity
C	Clay	L	Low Plasticity
O	Organic		

TABLE 3

When using approved alternate bedding and backfill material around wet wells, **additional compactive effort is required.**

TABLE 4 – Defines compactive effort terminology and explains in-place and relative density requirements.

Compactive Effort	Definition	Proctor Density (In-Place)	Relative Density
Dumped	No compaction effort (self-compacting).	At least 85%	At least 40%
Slight	Some compactive effort required.	At least 85%	At least 40%
Moderate	Additional compactive effort required.	85% - 95%	40% - 70%
High	High level of compactive effort.	At least 95%	At least 70%

TABLE 4

TABLE 5 – Describes compaction requirements for various acceptable bedding and backfill materials for wet wells.

Material	Description	Compaction Requirement
Crushed Stone/Round Stone	Standard material as described in FTS Backfill guidelines	Dumped
GW, GP, SW, SP	Coarse grained soils with less than 12% fines	Slight
CL, ML, ML-CL	Fine grained material (with liquid limit < 50) with medium to no plasticity. More than 25% coarse-grained particles in the material.	Moderate
GM, GP, SW, SP	Coarse-grained soils with fines	Moderate
CL,ML,ML-CL	Fine grained materials (with liquid limit < 50) with medium to no plasticity. Less than 25% coarse-grained particles in the material.	High

TABLE 5

4. INSTALLATION

GENERAL EXCAVATION PARAMETERS

WARNING

Follow OSHA regulations for tank excavations. Collapse of excavation walls could result in death or serious injury.

- The installing contractor must take all precautions necessary to protect employees working in or near a tank excavation. These precautions should include but are not limited to the following.
- Locate and protect any utility installations near the excavation before opening the excavation.
- Secure the walls of the excavation.
- Protect employees from hazards associated with water accumulation in the excavation.
- Erect barricades, etc. to prevent unauthorized vehicle or pedestrian traffic
- Inspect a minimum of once a day, the excavation and surrounding area.
- For additional information on excavation, trenching and shoring safety practice, consult OSHA's Standard, Part 1926, Subpart P (Excavations), 650-652; and "Fall Protection Rules and Regulations."

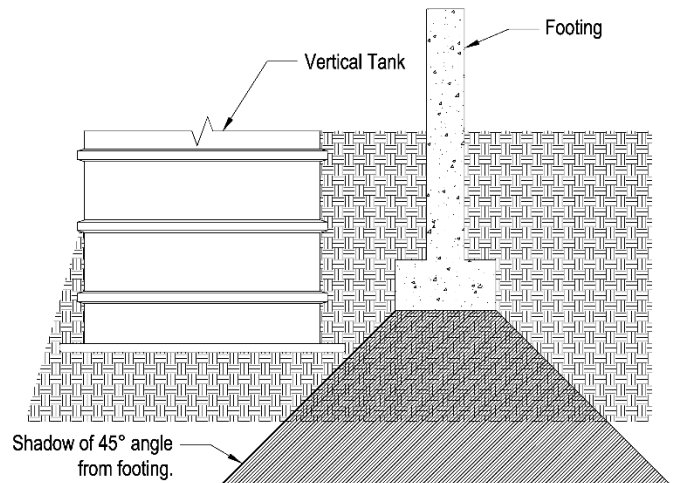


FIGURE 4-1

EXCAVATION AND TANK LOCATION

NOTICE

Improper placement of the excavation may result in damage to the tank and/or property damage.

- FTS recommends that the tank owner seek the advice of a local foundation professional engineer to determine the proper placement of a tank excavation near any existing structure(s).
- The tank owner and/or the owner's technical representative is responsible for determining the proper placement of a tank excavation.
- In general terms, the size of the excavation is determined by:
 - The number of tanks to be installed
 - The size of the tanks to be installed
- The location of a tank can be affected by the location of nearby structures. When selecting a tank site, care must be taken to avoid undermining the foundations of existing structures or new buildings to be constructed. See FIGURE 4-1.
- Ensure that downward forces from loads carried by the foundations and supports of nearby structures (constructed before or after tank installation) are not transmitted to the tanks.
- Typically, the way to check the placement of the tank in relationship to a nearby structure is to do the following:
 - **Step 1** – Determine the depth of burial needed for the tank.
 - **Step 2** – Locate the footing of the structure to be considered.
 - **Step 3** – Determine the line that would fall into the ground from a 45-degree angle drawn downward from the corner(s) of the footing of the foundation that is closest to the tank.
 - **Step 4** – The tank must not fall within the "shadow" of the 45-degree-angle line drawn from the foundation's footing. See FIGURE 4-1.

- **Step 5** – If the tank would fall within this “shadow,” do one of the following to ensure that the tank does not fall within the “shadow”:
 - Move the tank away from the existing building.
 - Move the foundation of the building to be constructed away from the tank.
 - Deepen the footing of the planned building’s foundation.

DRY-HOLE INSTALLATION

- **Step 1** – Prepare a smooth, level bed, 6 inches thick, of approved backfill material, or a concrete pad designed by a project engineer.
- **Step 2** – Place the wet well onto the bed or concrete pad.
- **Step 3** – Test base compaction to 85% density proctor and documented.

WET-HOLE INSTALLATION

- **Step 1** – Before performing Step 1 of the dry-hole installation, pump the water from the hole and continue pumping to maintain minimum water level during wet well installation.
- **Step 2** – Test base compaction to 85% density proctor and documented.
- **Step 3** – During Step 2 of the dry-hole installation, when setting the wet well, partially ballast the wet well until it settles firmly on the prepared bed. The ballast level in the wet well must never exceed the water level in the hole by more than 1 foot until the backfill reaches the top of the wet well.

DRY-HOLE AND WET-HOLE INSTALLATION

- From the edge of the hole, bring the backfill up in the excavation. Approved backfill material must be used at least 12 inches around the entire periphery of the wet well.
- FTS recommends the use of a geotextile fabric to help separate the select backfill from the in-situ soil.
- For further information concerning geotextile specifications and installation procedures, consult the geotextile supplier’s installation guidelines or instructions.
- Polyethylene film is not considered an effective geotextile material. It may tear or degrade while in service.
- The minimum amount of back fill around the periphery of the well is normally determined by the presence or absence of traffic at the site. (See Figure 4.3 and 4.4)

Top Slab Construction Method

- The wet well fiberglass top is designed to support the dead weight, including 6" of granular bedding and 6" of a wet concrete. All load-bearing weight of the concrete pad and the traffic load exerted to the pad must be distributed to the outside perimeter of the wet well. The concrete pad and outside support perimeter shall be designed by the Engineer of Record.

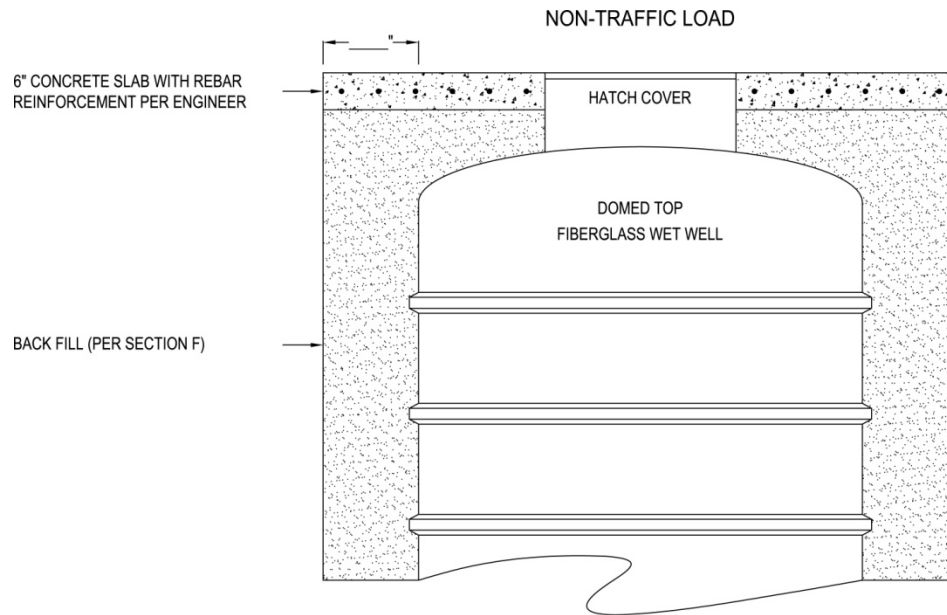


FIGURE 4.3

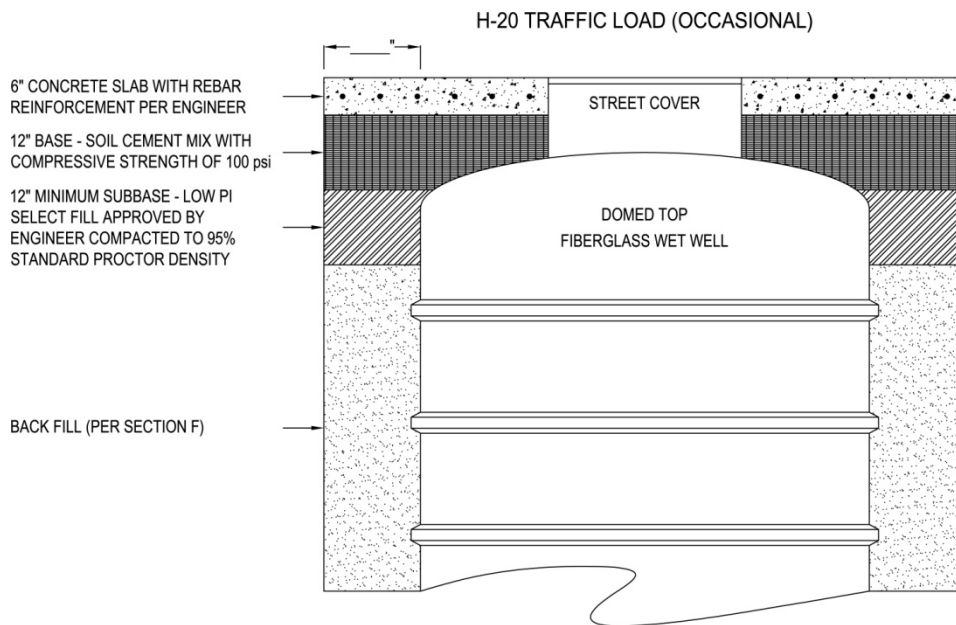


FIGURE 4.4

Fiberglass / Concrete Base Construction Methods

- For combination base designs using closed bottom fiberglass wet wells, the base is designed with C-channel or I-beam ribs that shall be bedded into a base concrete slab. The concrete base shall be designed by the Engineer of Record, to withstand all hydrostatic and vertical structural loads of the wet well. All typical engineering practices should be followed to insure the base design is stable to support all vertical loads. Third part testing for sufficient compaction must be provided to fulfill requirements of the FTS manufacturer's limited warranty. (See Figure 4.6)

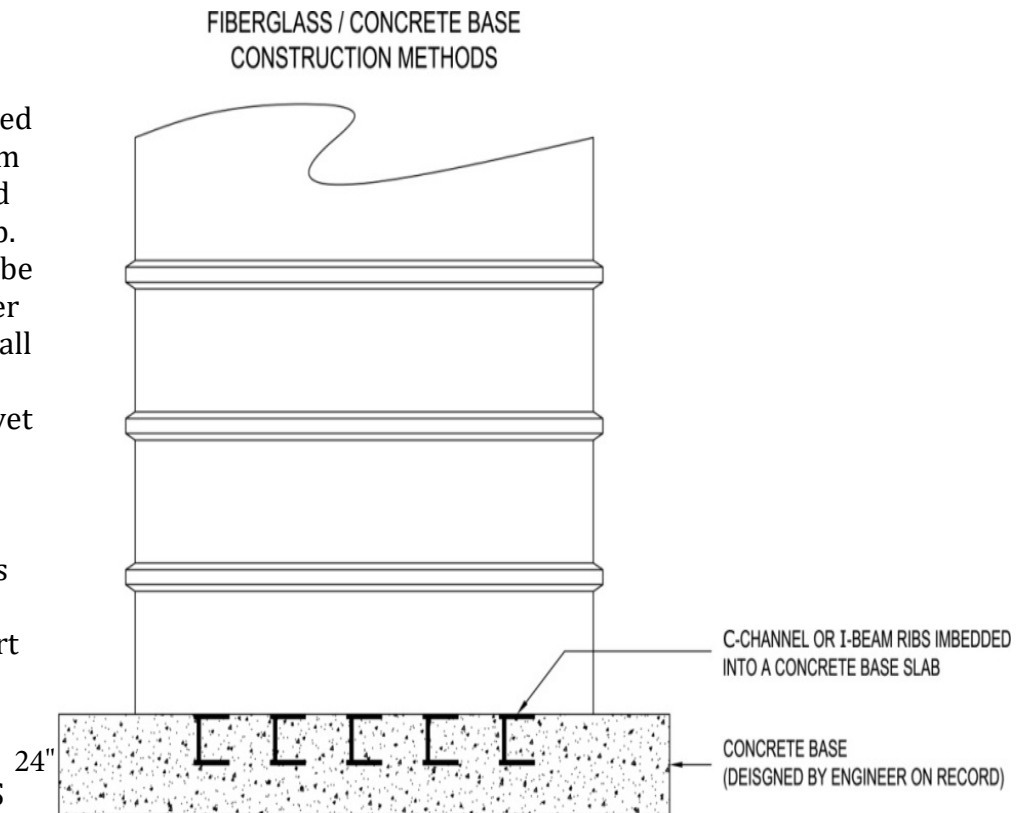


FIGURE 4.6

- To aid in positioning and handling the wet well while constructing the concrete slab, supports or shims may be utilized. (See Figure 4-2)
 - Supports should be made from a material that will not degrade or rot.
 - The wet well must rest on a minimum of 3 evenly spaced supports. The supports should position the wet well bottom above the rebar. Wet well cannot sit on rebar reinforcement.
 - The supports must be in contact with the flat bottom of the wet well at the outside diameter, and must not contact the external structural anchors.
 - The supports must not extend more than 8" from the outside diameter of the wet well toward the center.

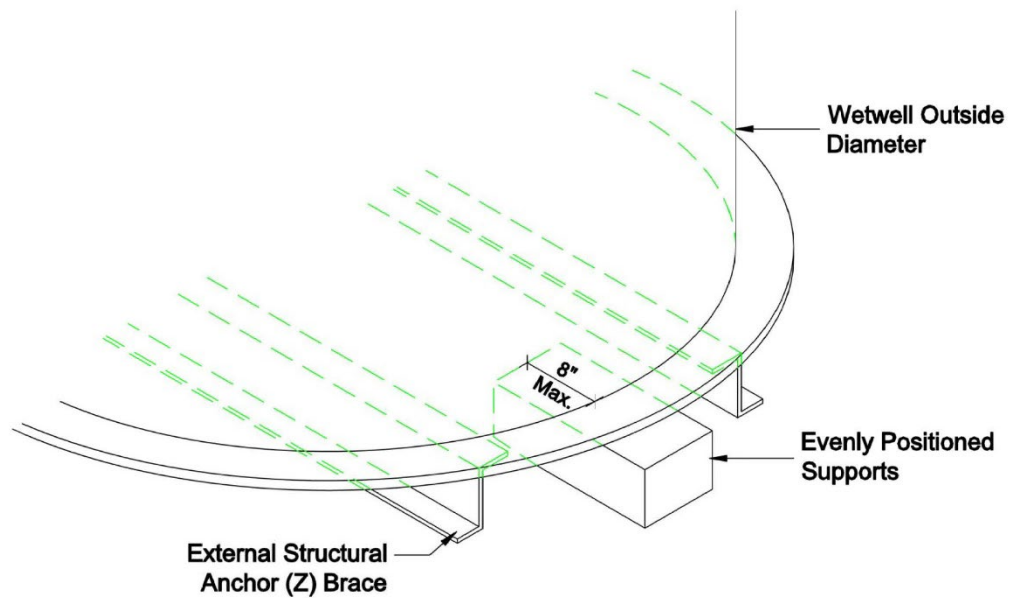


Figure 4-2

5. INSTALLATION OF REHABILITATION INSERTS

The following steps are the installation procedures for a fiberglass rehabilitation insert once it has been delivered to job site.

- Step 1.** Establish jobsite procedures for bypass pumping and well point dewatering as needed.
See Figure 5-1.



FIGURE 5-1

- Step 2.** Remove top slab of existing concrete wet well.
See Figure 5-2.



FIGURE 5-2

- Step 3.** Remove all existing concrete wet well interior pumps, piping, rails, and accessories.
a. Pump out and accumulated sludge, loose mortar, bricks, and trash from existing concrete wet well. See Figure 5-3.

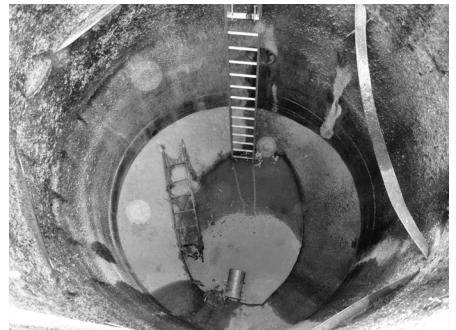


FIGURE 5-3

- Step 4.** Cut off inlet pipe flush with existing concrete wet well.
a. Chip out around existing inlet pipes to accept a new pipe hub and pipe stub, matching the pipe type and diameter. See Figure 5-4.



FIGURE 5-4

- Step 5.** Insert the new fiberglass wet well into the existing concrete wet well for a dry fit.
- a. Insure that the tank is centered in the hole.
See Figure 5-5.



FIGURE 5-5

- Step 6.** Locate, mark and cut openings for inlet pipes.
- a. Insert new pipe hubs and stubs over existing inlet pipes in the concrete wet well.
 - b. Field crew to glass new inlet pipes into place.
See Figure 5-6.



FIGURE 5-6

- Step 7.** Ballast tank with one foot of water in bottom of fiberglass wet well.

- Step 8.** Pump Controlled Low Strength Materials (CLSM) into annular space between fiberglass wet well and the existing concrete wet well.

- a. CLSM shall meet ASTM D 4832 specifications for Compressive Strength.
- b. CLSM shall meet ASTM D 6023 specification for Unit Weight.
- c. CLSM shall meet ASTM D 6103 specification for Flowability.
- d. Insure that the bottom of the tank is fully settled with 6" of CLSM to support the tank bottom. The Z braces on the bottom of the fiberglass wet well bottom should be fully encompassed with the CLSM. Vibrate as needed. See Figure 5-7.

- Step 9.** Continue filling annular space with CLSM, maintaining 1 foot of ballast water above the grout fill line at all times.



FIGURE 5-7

- Step 10.** Remove ballast water from fiberglass wet well, once CLSM has set up and cured to 90%.
- Step 11.** Install pumps, controls, electrical service, and other mechanical equipment as needed. See Figure 5-8.
- Step 12.** Start-up and test all pumps and controls.



FIGURE 5-8

6. PIPING & CONNECTION

All piping must conform to all applicable codes and standards.

CAUTION

All underground tanks shall be adequately vented to prevent the development of vacuum or pressure when filling or emptying the tank. Failure to properly vent a tank or compartment could cause tank failure and result in death or serious injury and will void manufacturer's warranty.

CAUTION

All connections to the wet well must be flexible. Provisions must be made to accommodate movement and misalignment between the piping and the wet well. Failure to do this may damage the wet well and/or surrounding property and void manufacturer's warranty.

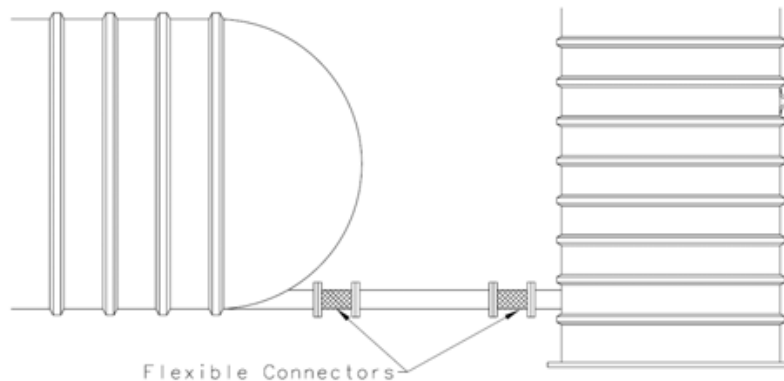


Figure 5-1

7. OPTIONAL HYDROSTATIC TEST

- Seal off influent and effluent piping with watertight caps or plugs.
- Fill the wet well with water at test level openings after the hole is backfilled to top of the wet well.
- Let the water stand in the wet well for a minimum of 1 hour (or longer if required by applicable local codes).
- If the water level drops, check to see that plugs or caps sealing off piping are tight and then add more water to fill air voids back to the standard testing level.
- If water level does not stabilize, there may be a leak in the system. If damage is detected, do not attempt repairs. Contact the FTS by email at kevin@fgtsolutions.com, by Phone 573-317-9620

8. OPERATING GUIDELINES

- Owner must retain the wet well Installation Manual and Operating Guidelines for future reference to operating guidelines.
- In addition to the wet well Installation Manual and Operating Guidelines, follow all federal, state and local laws, regulations, codes and safety precautions that pertain to underground storage wet wells and/or their associated systems.
- Consult the applicable limited warranty for each wet well for further operating guidelines and limitations.
- An FTS wet well is designed to store materials identified in the manufacturer's applicable limited warranty.

CAUTION

Storing materials other than those identified in the manufacturer's applicable limited warranty will void FTS' obligation under the warranty and may cause wet well failure or property damage.

- Maximum temperature for wastewater products is 150° F.
- The minimum temperature for chemicals is 100° F.

CAUTION

Storing a material in a wet well in excess of the allowable temperature may damage the wet well. Failure to follow this caution may damage the wet well and/or surrounding property and void manufacturer's warranty.

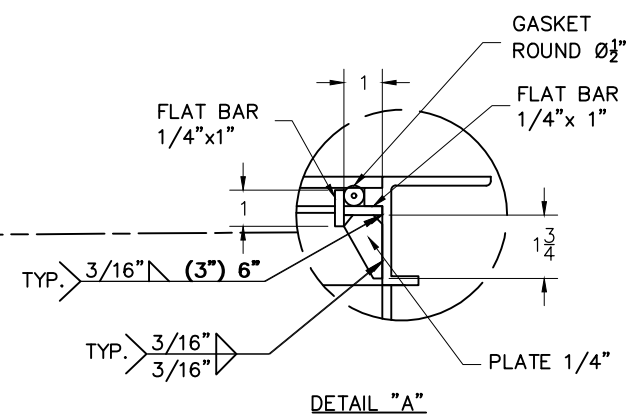
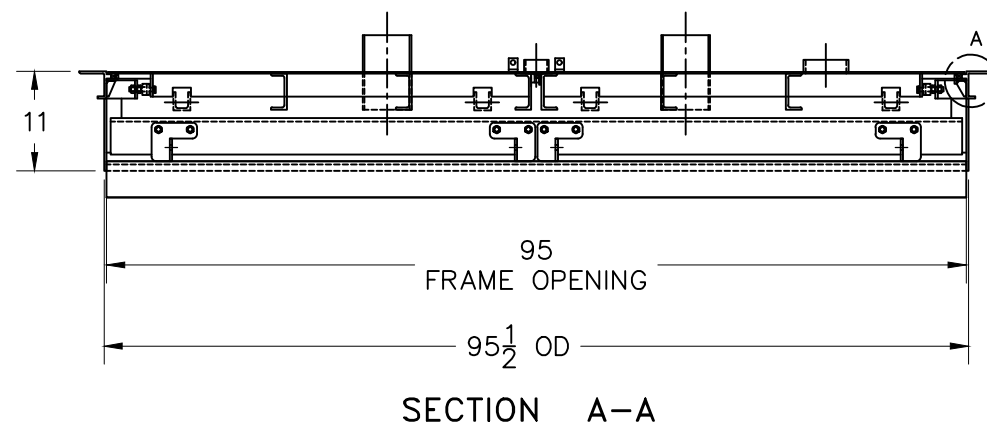
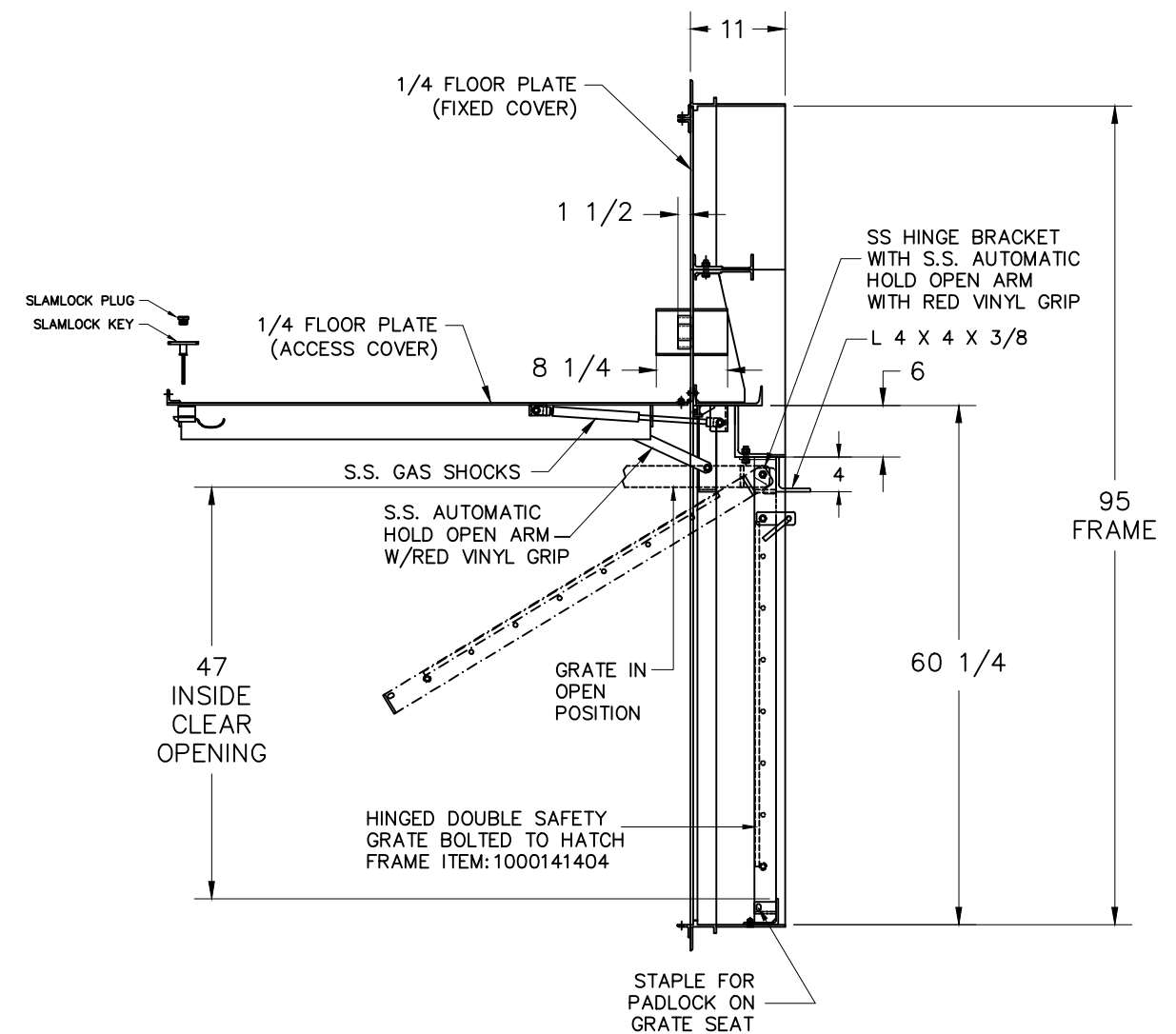
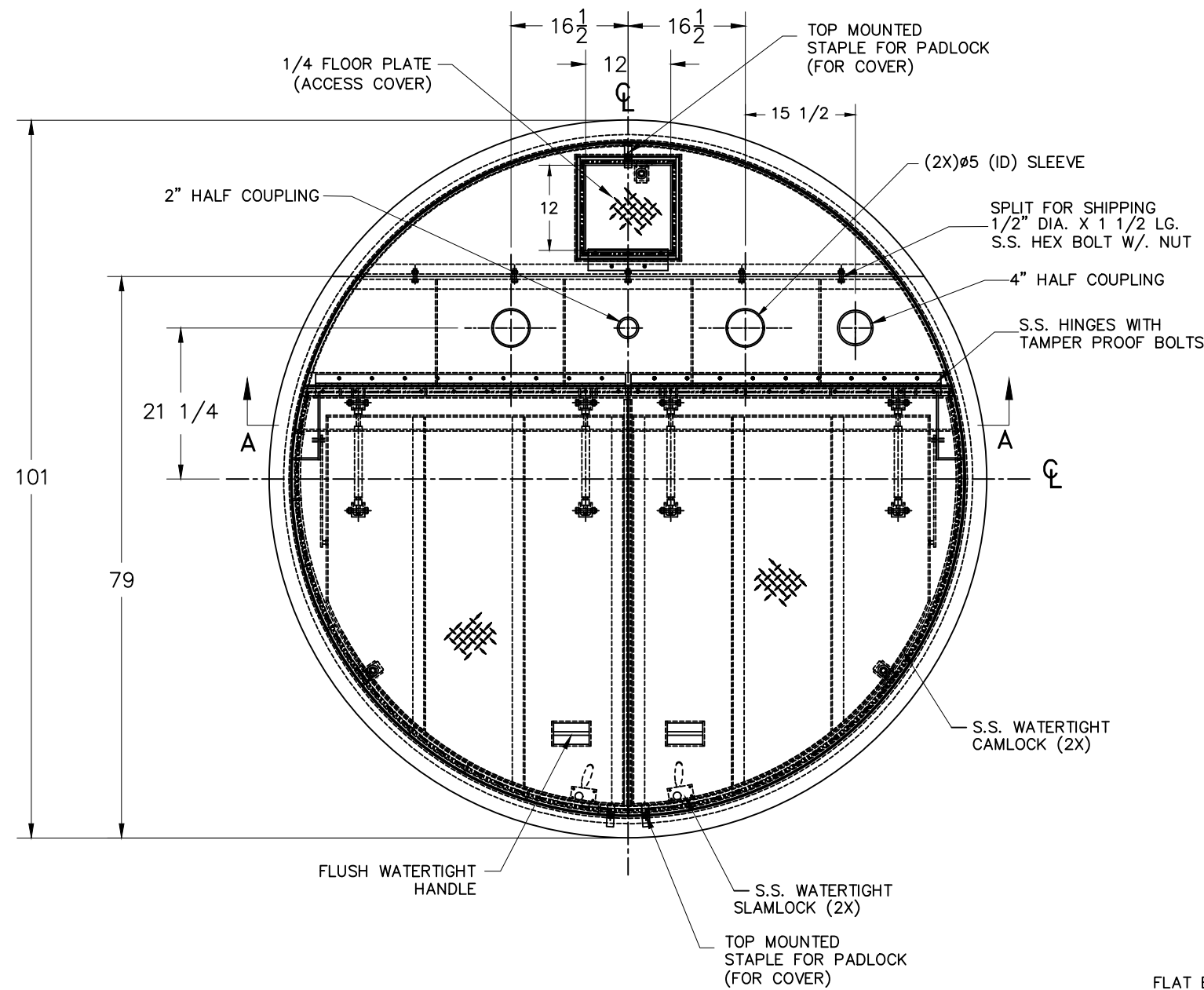
- Do not allow anyone to enter the wet well unless it has been properly emptied and vented, and unless the person entering the wet well has been trained in confined-space entry procedures and applicable OSHA regulations.

WARNING

Improper wet well entry could cause fire, explosion or asphyxiation and could result in death or serious injury.

9. RETAINING INSTALLATION MANUAL AND OPERATING GUIDELINES

- After installation, wet well owner must retain the wet well Installation Manual and Operating Guidelines for future reference to operating guidelines.



NOTES:

- 1- MATERIAL: ALUMINUM
- 2- LOADING: 300 LBS. PER SQ. FT.
- 3- 316 STAINLESS STEEL NUTS & BOLTS
- 4- HATCH SPLIT FOR SHIPPING AND BOLTED TOGETHER IN FIELD.
- 5- SAFETY GRATING TO BE PAINTED WITH SAFETY ORANGE POWDER COAT
- 6- APPRX. HATCH WEIGHT: 860 LBS

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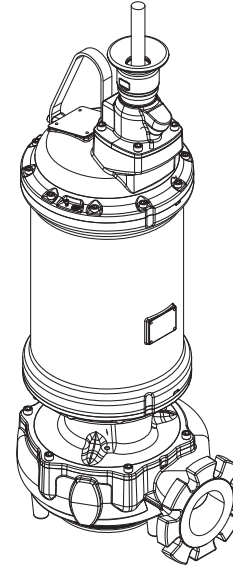
INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M BREAK ALL SHARP CORNERS & EDGES TOLERANCES UNLESS OTHERWISE SPECIFIED: INCHES AND FRACTIONS: <10" = ± 1/8 >10" = ± 1/4	U.S.F. FABRICATION INC. HIALEAH, FLORIDA HATCH RPD FOR 96 1/4" ID TANK & 95 FRAME OPENING ALUM W/ SHOCKS, SLAMLOCK, STAPLE, DOUBLE SAFETY GRATE, CAMLOCK & ROUND GASKET DRAWN BY: JG SCALE: 1:10 SHEET: 1 of 1 DATE: DATE: DATE: DATE: APP'D BY: DATE: DATE: DATE: DATE:
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BARNES[®]

www.cranepumps.com

Series 4XSCM
28 Frame Driver**SITHE** X-Pruf[®] Submersible Chopper Pumps**Specifications:**

DISCHARGE	4", 125 lb. Horizontal Flange Slotted to accommodate 100mm ISO Flanges
LIQUID TEMPERATURE	104°F (40°C) Continuous
VOLUTE	Cast Iron ASTM A-48, Class 30
STRIKER PLATE	440C Stainless Steel Heat Treated to 53-60 HRC Hole Pattern to Accomodate 4" 125 # Flange
WEAR RING	C954 Lead-Free Bronze
MOTOR HOUSING	Cast Iron ASTM A-48, Class 30
SEAL PLATE	Ductile Iron ASTM A-536, 65-45-12
IMPELLER:	
<i>Design</i>	Enclosed Monovane, With Pump Out Vaness on Back Side. Dynamically Balanced ISO G6.3
<i>Material</i>	Ductile Iron ASTM A-536, 65-45-12
SLICING BLADE	440C Stainless Steel Heat Treated to 53-60 HRC
SHAFT	416 Stainless Steel
"O" RINGS	Buna-N
HARDWARE	300 Series Stainless Steel
LIFTING BAIL	300 Series Stainless Steel
PAINT	Axalta [™] Corlar [®] Epoxy, Two Coats
SEAL:	
<i>Design</i>	Tandem Mechanical, Oil Filled Reservoir.
<i>Material: Inboard</i>	Rotating Faces - Carbon Stationary Faces - Ceramic
<i>Material: Outboard</i>	Rotating Faces - Silicon Carbide Stationary Faces - Silicon Carbide Elastomer - Buna-N Hardware - 300 Series Stainless
CORD ENTRY	Rigid quick change epoxy-potted Jhousing
POWER CORD	CSA Certified Submersible Power Cable 2000V - Ordered Separately
SPEED	1750 or 1150 RPM
UPPER BEARING:	
<i>Design</i>	Single Row, Ball, Oil Lubricated
<i>Load</i>	Radial
LOWER BEARING:	
<i>Design</i>	Double Row, Ball, Oil Lubricated
<i>Load</i>	Radial & Thrust
MOTOR: Design	NEMA B Three Phase Torque Curve. Oil-Filled, Squirrel Cage Induction, Inverter Duty rated per NEMA MG1
<i>Insulation</i>	Class H Varnish & Magnet Wire
THREE PHASE	Requires overload protection to be included in control panel.
MOISTURE SENSOR	Normally Open (N/O), Requires Relay in Control Panel
TEMPERATURE SENSOR	Three Normally Closed (N/C). To be wired in series with control circuit.
OPTIONAL EQUIPMENT	White Iron Impeller, Seal Material, Impeller Trims, Cord Length
MARKINGS	CSA
WEIGHT (MAX)	881 lbs (400 Kg)
SUBMERGENCE	Max Depth 66ft (20m)
RECOMMENDED:	
<i>Accessories</i>	Break Away Fitting (BAF) Check Valve Control Panel Moisture/Temp. Sensor Relay (Pump Monitor Relay) Leg Kit

**SITHE****Series: 4XSCM****50HP, 1750RPM, 60Hz**
460 Volt / 3-Phase**Explosion Proof, Class I,**
Division 1, Groups C & D, T4

Sample Specifications: Section 0.2D Page E.

This product may be covered by one or more of the following
patents and other patent(s) pending: NZ DSN NO. 424412,
NZ DSN NO. 424413, AUS DSN NO. 201812608,
AUS DSN NO. 201812609, EU Design Reg. 005293040-0001**DESCRIPTION:****SUBMERSIBLE CHOPPER PUMP**
DESIGNED FOR RAW SEWAGE
APPLICATIONS.**WARNING:****CANCER AND REPRODUCTIVE HARM -**
WWW.P65WARNINGS.CA.GOV**CRANE**[®]

A Crane Co. Company

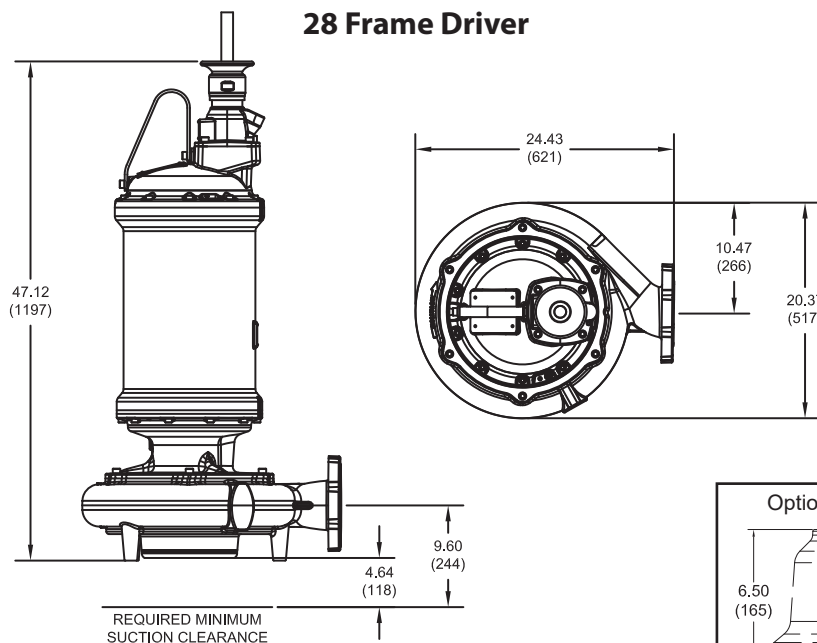
PUMPS & SYSTEMS

USA: (937) 778-8947 • Canada: (905) 457-6223 • International: (937) 615-3598

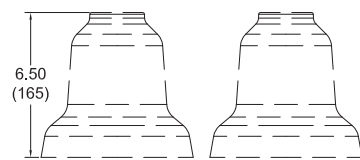
SECTION 0.2D
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DATE 2/19

inches (mm)

28 Frame Driver



Optional Leg Kit - p/n 125506B



IMPORTANT !

- 1.) MOISTURE AND TEMPERATURE SENSORS MUST BE CONNECTED TO VALIDATE THE CSA LISTING.
- 2.) A SPECIAL MOISTURE SENSOR RELAY IS REQUIRED IN THE CONTROL PANEL FOR PROPER OPERATION OF THE MOISTURE SENSORS. CONTACT BARNES PUMPS FOR INFORMATION CONCERNING MOISTURE SENSING RELAYS FOR CUSTOMER SUPPLIED CONTROL PANELS.
- 3.) THESE PUMPS ARE CSA LISTED FOR PUMPING WATER AND WASTEWATER. **DO NOT USE TO PUMP FLAMMABLE LIQUIDS.**
- 4.) INSTALLATIONS SUCH AS DECORATIVE FOUNTAINS OR WATER FEATURES PROVIDED FOR VISUAL ENJOYMENT MUST BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE ANSI/NFPA 70 AND/OR THE AUTHORITY HAVING JURISDICTION. THIS PUMP IS NOT INTENDED FOR USE IN SWIMMING POOLS, RECREATIONAL WATER PARKS, OR INSTALLATIONS IN WHICH HUMAN CONTACT WITH PUMPED MEDIA IS A COMMON OCCURRENCE.

	MODEL NO	HP	VOLT	PH	Hz	RPM (Nom)	NEMA START CODE	FULL LOAD AMPS	SERVICE FACTOR	SERVICE FACTOR AMPS	LOCKED ROTOR AMPS	DRIVER FRAME	CORD P/N ▲	CORD SIZE	
SITHE XSCME Pump	4XSCME30094	30.0	208	3	60	1750	E	93.4	1.2	116.9	359.0	28	138319	2/4 - 18/4	
			230					82.3		98.7					
	4XSCME30044	30.0	460	3	60	1750	F	38.9	1.2	45.9	191.9	21	125499	8/4 - 18/4	
	4XSCME30054	30.0	575	3	60	1750	F	31.1	1.2	36.7	153.5	21	125499	8/4 - 18/4	
	4XSCME40034	40.0	230	3	60	1750	E	106.0	1.2	126.4	486.0	28	138319	2/4 - 18/4	
	4XSCME40044	40.0	460	3	60	1750	E	53.0	1.2	63.2	243.0	28	138318	6/4 - 18/4	
	4XSCME40054	40.0	575	3	60	1750	F	42.4	1.2	50.6	194.4	28	138317	8/4 - 18/4	
	4XSCME50044	50.0	460	3	60	1750	F	67.1	1.2	79.0	339.0	28	138318	6/4 - 18/4	
	4XSCME50054	50.0	575	3	60	1750	F	53.7	1.2	63.2	271.2	28	138318	6/4 - 18/4	
	SITHE XSCME Pump	4XSCME150N6	15.0	208	3	60	1150	H	47.0	1.2	56.8	248.6	21	125498	8/4 - 18/4
				230					44.1		51.4				
				460					22.0		25.7				
		4XSCME15056	15.0	575	3	60	1150	H	17.6	1.2	20.6	99.4	21	125497	12/4 - 18/4
		4XSCME20096	20.0	208	3	60	1150	H	60.3	1.2	71.5	354.0	28	138318	6/4 - 18/4
230				57.2					69.8						
4XSCME20046		20.0	460	3	60	1150	E	28.6	1.2	34.9	124.3	21	125499	8/4 - 18/4	
4XSCME20056	20.0	575	3	60	1150	E	22.9	1.2	27.9	99.4	21	125497	12/4 - 18/4		
SITHE XSCMEA Pump	4XSCMEA100N6	10.0	208	3	60	1150	F	32.9	1.2	41.0	137.6	21	125498	8/4 - 18/4	
			230					30.2		35.8					
			460					15.1		17.9					
	4XSCMEA10056	10.0	575	3	60	1150	F	12.1	1.2	14.3	55.0	21	125497	12/4 - 18/4	
	4XSCMEA150N6	15.0	208	3	60	1150	H	47.0	1.2	56.8	248.6	21	125498	8/4 - 18/4	
			230					44.1		51.4					
			460					22.0		25.7					
	4XSCMEA15056	15.0	575	3	60	1150	H	17.6	1.2	20.6	99.4	21	125497	12/4 - 18/4	
	4XSCMEA20096	20.0	208	3	60	1150	H	60.3	1.2	71.5	354.0	28	138318	6/4 - 18/4	
			230					57.2		69.8					
	4XSCMEA20046	20.0	460	3	60	1150	E	28.6	1.2	34.9	124.3	21	125499	8/4 - 18/4	
4XSCMEA20056	20.0	575	3	60	1150	E	22.9	1.2	27.9	99.4	21	125497	12/4 - 18/4		
4XSCMEA25096	25.0	208	3	60	1150	G	75.2	1.2	90.8	354.0	28	138319	2/4 - 18/4		
		230					70.8		82.6						
4XSCMEA25046	25.0	460	3	60	1150	G	35.4	1.2	41.3	177.0	28	138317	8/4 - 18/4		
4XSCMEA25056	25.0	575	3	60	1150	G	28.3	1.2	33.0	141.6	28	138317	8/4 - 18/4		

IMPORTANT !

Moisture and Temperature sensor leads are integral to power cord.
 Pump rated for operation at ± 10% voltage at motor.
 ▲ Cord Suffix: XF - 50 Feet, XJ - 75 Feet, or XL - 100 Feet.
 ▲ Cord sold separately.

Company: Pump & Process Equipment, Inc.
 Name: Butch Branton for Pump & Process
 Date: 11/02/2021

Blackwater Golf Club Master LS / The City of Crestview



Pump:		
Size:	4SCMB / 4XSCMB	<u>Dimensions:</u>
Type:	SC 4" Sub. Chopper	Suction: ---
Synch Speed:	1800 rpm	Discharge: 4 in
Dia:	320 mm	
Curve:	---	

Fluid:		
Name:	Water	
SG:	1	Vapor Pressure: 0.256 psi a
Density:	62.4 lb/ft ³	Atm Pressure: 14.7 psi a
Viscosity:	1.1 cP	
Temperature:	60 °F	Margin Ratio: 1

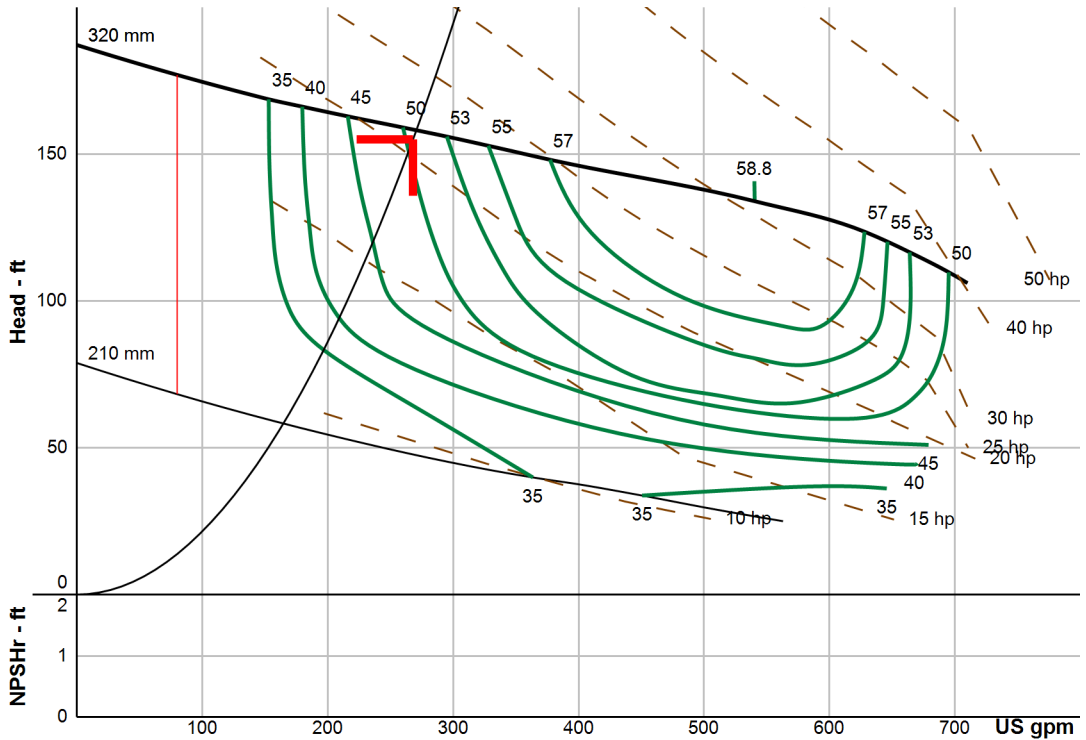
Search Criteria:			
Flow:	268 US gpm	Near Miss:	---
Head:	155 ft	Static Head:	0 ft

Pump Limits:		
Temperature:	104 °F	Sphere Size: 3 in
Wkg Pressure:	---	

Motor:		
Standard:	NEMA	Size: 50 hp
Enclosure:	TEFC	Speed: 1800 rpm
Frame:	326T	
Sizing Criteria:	Max Power on Design Curve	

Pump Selection Warnings:
 None

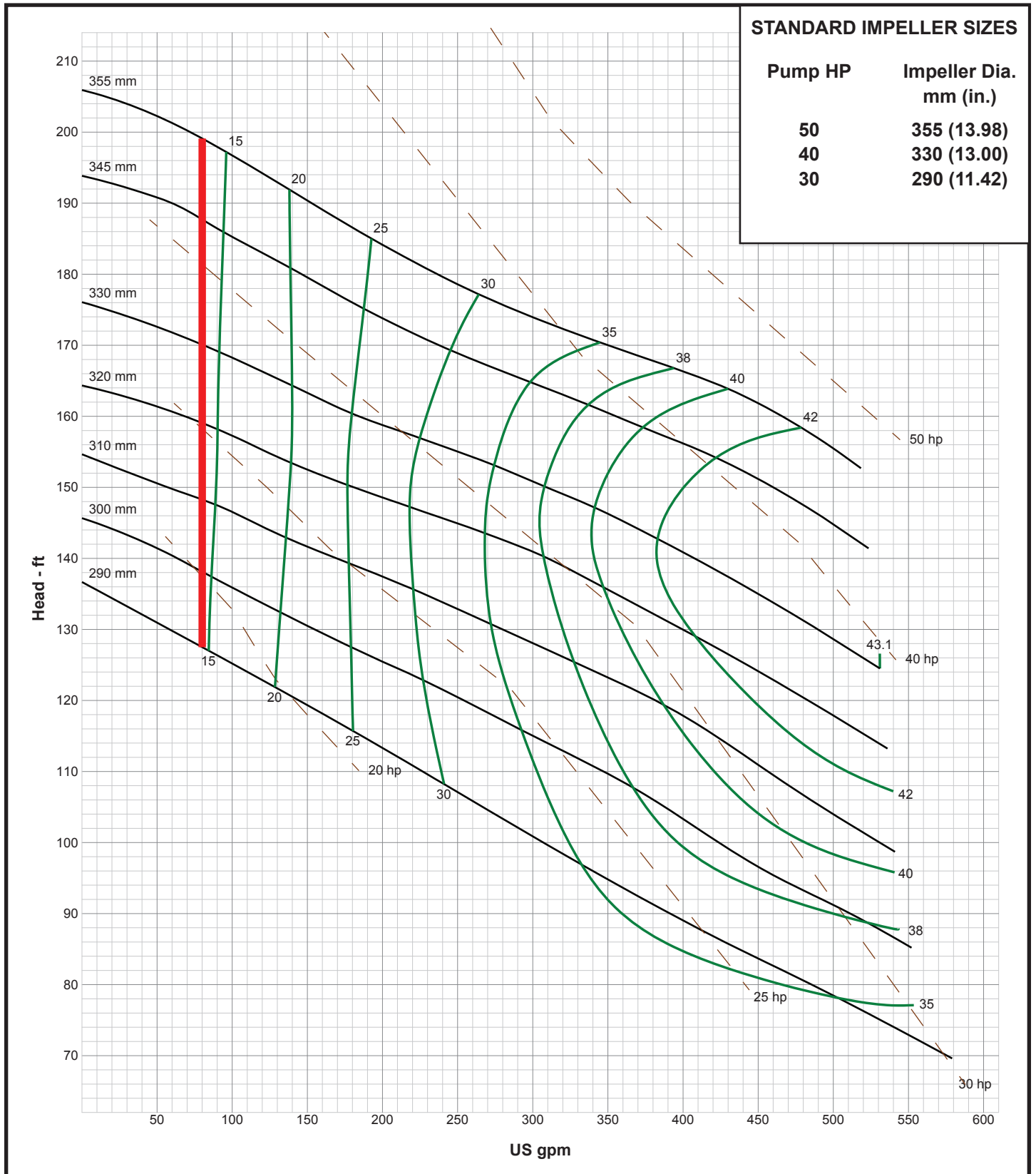
--- Duty Point ---	
Flow:	271 US gpm
Head:	158 ft
Eff:	50.9%
Power:	21.2 hp
NPSHr:	---
Speed:	1750 rpm
--- Design Curve ---	
Shutoff Head:	187 ft
Shutoff dP:	81.1 psi
Min Flow:	80 US gpm
BEP:	58.8% @ 540 US gpm
NOL Power:	41 hp @ 710 US gpm
--- Max Curve ---	
Max Power:	41 hp @ 710 US gpm



Performance Evaluation:

Flow	Speed	Head	Efficiency	Power	NPSHr
US gpm	rpm	ft	%	hp	ft
322	1750	153	55	22.8	---
268	1750	158	51	21.1	---
214	1750	163	45	19.7	---
161	1750	168	36	18.7	---
107	1750	174	30	15.9	---

SITHE X-Pruf® Submersible Chopper Pumps



A Crane Co. Company

PUMPS & SYSTEMS

USA: (937) 778-8947 • Canada: (905) 457-6223 • International: (937) 615-3598

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BARNES[®]**BARNES**
PRESSURE **PS** SYSTEMS**burks**[®]**WEINMAN**[®]**DEMING**[®]**PROSSER**[®]

Limited 60 Month Warranty

Crane Pumps & Systems warrants that products of our manufacture will be free of defects in material and workmanship under normal use and service for sixty (60) months after manufacture date, when installed and maintained in accordance with our instructions. This warranty gives you specific legal rights, and there may also be other rights which vary from state to state. In the event the product is covered by the Federal Consumer Product Warranties Law (1) the duration of any implied warranties associated with the product by virtue of said law is limited to the same duration as stated herein, (2) this warranty is a LIMITED WARRANTY, and (3) no claims of any nature whatsoever shall be made against us, until the ultimate consumer, his successor, or assigns, notifies us in writing of the defect, and delivers the product and/or defective part(s) freight prepaid to our factory or nearest authorized service station. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply. **THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY AND ALL WARRANTIES WITH RESPECT TO ANY PRODUCT SHALL BE TO REPLACE OR REPAIR AT OUR ELECTION, F.O.B. POINT OF MANUFACTURE OR AUTHORIZED REPAIR STATION, SUCH PRODUCTS AND/OR PARTS AS PROVEN DEFECTIVE. THERE SHALL BE NO FURTHER LIABILITY, WHETHER BASED ON WARRANTY, NEGLIGENCE OR OTHERWISE.** Unless expressly stated otherwise, guarantees in the nature of performance specifications furnished in addition to the foregoing material and workmanship warranties on a product manufactured by us, if any, are subject to laboratory tests corrected for field performance. Any additional guarantees, in the nature of performance specifications must be in writing and such writing must be signed by our authorized representative. Due to inaccuracies in field testing if a conflict arises between the results of field testing conducted by or for user, and laboratory tests corrected for field performance, the latter shall control. **RECOMMENDATIONS FOR SPECIAL APPLICATIONS OR THOSE RESULTING FROM SYSTEMS ANALYSES AND EVALUATIONS WE CONDUCT WILL BE BASED ON OUR BEST AVAILABLE EXPERIENCE AND PUBLISHED INDUSTRY INFORMATION. SUCH RECOMMENDATIONS DO NOT CONSTITUTE A WARRANTY OF SATISFACTORY PERFORMANCE AND NO SUCH WARRANTY IS GIVEN.**

This warranty shall not apply when damage is caused by (a) improper installation, (b) improper voltage (c) lightning (d) excessive sand or other abrasive material (e) scale or corrosion build-up due to excessive chemical content. Any modification of the original equipment will also void the warranty. We will not be responsible for loss, damage or labor cost due to interruption of service caused by defective parts. Neither will we accept charges incurred by others without our prior written approval.

This warranty is void if our inspection reveals the product was used in a manner inconsistent with normal industry practice and/or our specific recommendations. The purchaser is responsible for communication of all necessary information regarding the application and use of the product. **UNDER NO CIRCUMSTANCES WILL WE BE RESPONSIBLE FOR ANY OTHER DIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO TRAVEL EXPENSES, RENTED EQUIPMENT, OUTSIDE CONTRACTOR FEES, UNAUTHORIZED REPAIR SHOP EXPENSES, LOST PROFITS, LOST INCOME, LABOR CHARGES, DELAYS IN PRODUCTION, IDLE PRODUCTION, WHICH DAMAGES ARE CAUSED BY ANY DEFECTS IN MATERIAL AND/OR WORKMANSHIP AND/OR DAMAGE OR DELAYS IN SHIPMENT. THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

No rights extended under this warranty shall be assigned to any other person, whether by operation of law or otherwise, without our prior written approval.



A Crane Co. Company

PUMPS & SYSTEMS

420 Third Street
Piqua, Ohio 45356
Phone: (937) 778-8947
Fax: (937) 773-7157
www.cranepumps.com

83 West Drive, Brampton
Ontario, Canada L6T 2J6
Phone: (905) 457-6223
Fax: (905) 457-2650

Data sheet

Customer item no.:
 Communication dated:
 Doc. no.: Stock Order
 Quantity: 3

Number: 4003370577
 Item no.: 400
 Date: 16/08/2018
 Page: 9 / 16

Amamix C 2223/24 XDG

Version no.: 4

Design

Max. temperature	104.0 °F	Type (propeller side)	MG
weight	83 lbm	Material code (propeller side)	SIC/SIC/FPM
Type	Amamix C 2223 / 2 4	Mixer standard	KSB-Aggregate North American execution
Execution of drive	direct		
Number of blades	2		
Propeller diameter	8.86 in	Ex protection	Yes
Propeller speed	1695 rpm	Description	Explosion protection to NEC Class1, Div 1, Gr.C, D T3
Absorbed power P1 at operating point based on pure water	1.25 HP	Norm	Explosion protection to NEC Class I.Div.1,GroupsC&D
Shaft seal	2 mech. seals in tandem arrangement with oil reservoir	Device category	T3
Sealing plan	T Tandem mechanical seal	Temperature classes	
Manufacturer	KSB	aggregate	
		additional leakage control	Without
		Weight	39.2

Motor

FI operation permitted	Yes (acc. motor manufacturer)	Winding	460 V
Driver type	Electric motor	Poles	4
Motor manufacturer	KSB	Starting mode	Direct-on-line starting
Motor generation	D	Starting mode	
Motor supplied by	Standard motor supplied by KSB - mounted by KSB	Connection mode	Star
Rated voltage	460 V	Cooling method	Surface cooling
Frequency	60 Hz	Motor version	X
Motor speed	1695 rpm	Operation with Frequency Inverter.	No
Rated power	3.41 HP	Cable design	Rubber hose
Rated current	5.0 A	Cable entry	Sealed along entire length
Starting current ratio	4.2	Sales description power cable	AWG 15-7
Insulation class	F to IEC 34-1	Number of power cables	1
Type of protection	XP/II/1/CD	Motor moisture sensor	1
Motor enclosure	IP68	Cable length	49.21 ft
Temperature classes	T3	Number of additional cable support including catch hook	0
Temperature sensor	PTC resistor		

Material variant

Axial propeller (ECB)	Stainless steel A 276 Type 316 Ti	Motor housing	Cast iron A 48 Class 35 B
Gear casing		Shaft	Stainless steel A 276 Type 316 Ti
Jet pipe	Without	Studs	A4
Gasket	FKM 80		

Nameplates

Nameplates language	International	Duplicate nameplate	With
---------------------	---------------	---------------------	------

Installation parts

Scope of supply	Mixer without installation parts	Additional fastening set	Without
Type of Installation	Universal Instalation (Accessories 22)	lower holder	Without
Holder for square guide rail	Yes	Number of center supports	0
Claw material	Grey cast iron EN-GJL-250	Adapter for tilt adjustment	Without
Bracket	Without		

Data sheet



Customer item no.:
Communication dated:
Doc. no.: Stock Order
Quantity: 3

Number: 4003370577
Item no.: 400
Date: 16/08/2018
Page: 10 / 16

Amamix C 2223/24 XDG

Version no.: 4

Please note

KSB does not guarantee specific process results such as flow velocities, degrees of mixing, or deposit-free mixing. Furthermore, we shall not assume any liability if KSB mixers are used in patented processes and/or in case of protected rights of third parties. In the event of a warranty claim, the parts supplied must be dismantled and returned to KSB.

Motor data sheet



Customer item no.:
 Communication dated:
 Doc. no.: Stock Order
 Quantity: 3

Number: 4003370577
 Item no.:400
 Date: 16/08/2018
 Page: 11 / 16

Amamix C 2223/24 XDG

Version no.: 4

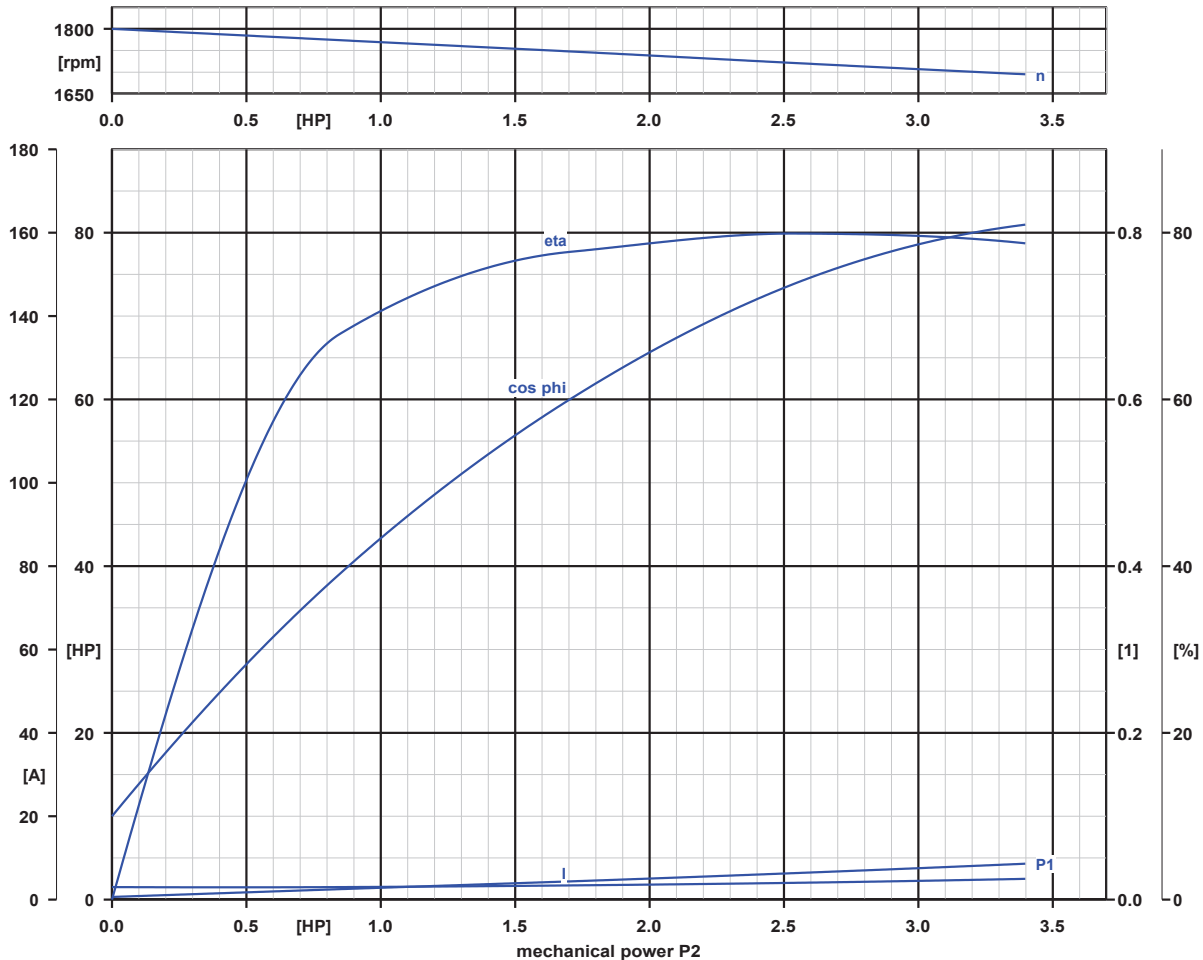
Motor data

Motor manufacturer	KSB	Rated speed	1695 rpm
Motor size	2D	Starting current ratio	4.2
Motor construction type	KSB Sub. motor	Starting mode	Direct-on-line starting
Motor material	Grey cast iron EN-GJL-250	Power cable	AWG 15-7
Efficiency class	not classified	Number of power cables	1
Rated voltage	460 V	Power cable Ø min.	0.52 in
Frequency	60 Hz	Power cable Ø max.	0.57 in
Motor power	3.41 HP	Cable standard	NEC
Rated current	5.0 A	Switching frequency	20.00 1/h

Curve data

The no-load point is not a guarantee point within the meaning of IEC 60034

Load	0.0 %	24.8 %	50.0 %	74.8 %	100.0 %
P2	0.00 HP	0.84 HP	1.70 HP	2.55 HP	3.41 HP
n	1800 rpm	1774 rpm	1748 rpm	1721 rpm	1695 rpm
P1	0.32 HP	1.25 HP	2.19 HP	3.19 HP	4.32 HP
I	3.0 A	3.0 A	3.4 A	4.0 A	5.0 A
Eta	0.0 %	67.8 %	77.7 %	79.9 %	78.7 %
cos phi	0.10	0.39	0.60	0.74	0.81



Installation plan

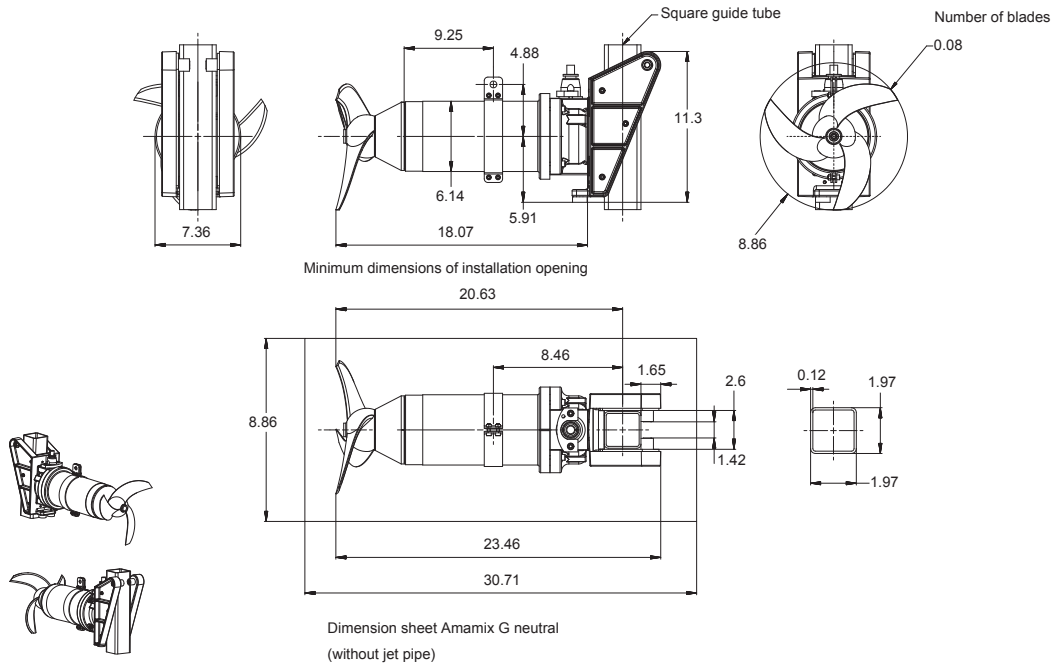


Customer item no.:
Communication dated:
Doc. no.: Stock Order
Quantity: 3

Number: 4003370577
Item no.:400
Date: 16/08/2018
Page: 12 / 16

Amamix C 2223/24 XDG

Version no.: 4



Drawing is not to scale

Dimensions in in

01/19/2022



**Submersible Pumps, Mixers, Axial Flow, and Semi-Axial Flow Products;
Type KRT, KRTB, AMAMIX, AMALINE, AMAPROP AND AMACAN P / K / S**

**KSB Full Five Year Or 10,000
Hour Warranty
For Permanent Installations**

KSB, Inc. warrants to the Original End Purchaser that its products will be free from defects in workmanship and materials covering parts and labor for a period of five (5) years or 10,000 hours of operation when pumping or mixing abrasive-free, non-corrosive liquids used in permanent installations. This warranty commences on the date KSB, Inc. or its authorized Representative ships the equipment.

KSB products are warranted for five (5) years of use in Sewage Collection systems, for intermittent duty cycle pumping. KSB pumps and mixers are warranted for 10,000 hours of operation for use in Sewage Treatment Processing or for continuous duty cycle pumping and mixing.

In the event that defects in workmanship or materials appears during the term of the warranty, the obligation of KSB, Inc. under the warranty shall be limited to replacement of defective part(s) and/or labor whichever KSB, Inc., in its sole discretion, chooses to elect. The Original End Purchaser shall be entitled to this warranty provided that the terms of payment have been complied with and the pump(s) / mixer(s) with cable(s) attached or faulty part(s) thereof have been returned freight prepaid to KSB, Inc. or to an authorized KSB-Service facility and the defect has been acknowledged in writing by KSB, Inc. to be caused by faulty workmanship or defective material. Normal wear and tear is specifically excluded from warranty coverage.

Electrical system schematics (including bills of material) may be required to support any warranty claims at the request of KSB, Inc.

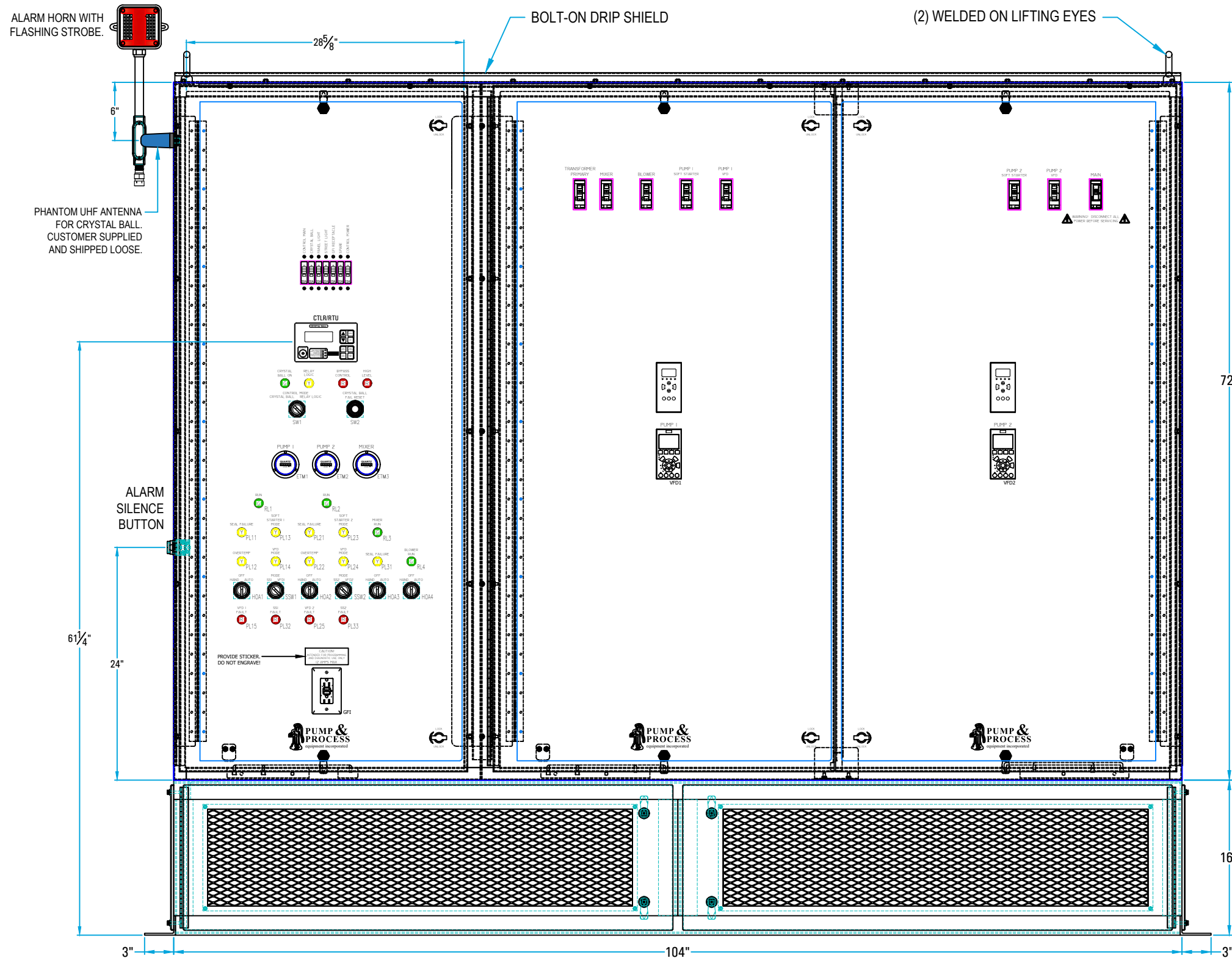
KSB, Inc. will bear the cost for such repair or replacement as follows:

Item	Categories	I	II	III
A. Pumps, Mixers Axial Flow and Semi-Axial Flow Products	Months after shipment	0-18	19-39	40-60
	Hours of Operation	0 - 2999	3000 - 6499	6500 - 10000
	KSB Share of Cost	100%	100%	100%

This warranty does not apply to KSB Grinder Pumps. The warranty shall be void if the pump(s) / mixer (s) or its part(s) have not been used and maintained in accordance with the printed instructions of KSB, Inc., or have been damaged wholly or in part by misuse, accident, neglect, faulty electrical system, or any other cause beyond the control of KSB, Inc.

Unless otherwise specified by KSB, Inc., the warranty period shall be computed from the original shipping date to the date the pump(s) / mixer(s) and/or parts are returned to KSB, Inc., or, if repairs are made on site, the warranty period shall be computed to the date notice of defects is received by KSB, Inc. In the event the actual months and hours fall into two different categories above, the higher numbered category shall apply.

Pump(s) / Mixer(s) or part(s) repaired or replaced will be returned at the cost of the Original End Purchaser. Repairs or replacement parts are warranted free from defects in workmanship and materials for the longer of the un-expired term of this warranty or ninety (90) days from the date KSB, Inc. ships such repaired or replaced items, and all other terms and conditions of this warranty shall apply. The extent of the Original End Purchaser's share in the repair or replacement cost detailed above shall be paid prior to shipment by KSB, Inc.



INNER DOOR LAYOUT (OUTER DOOR SHOWN REMOVED FOR CLARITY)

ENCLOSURE:
 SPHCDSS-7210414 (72"H x 104"W x 14"D) NEMA 12/3R RATED, WITH OVERLAPPING DOORS, (2) WELDED ON LIFTING EYES AND BOLT-ON DRIP SHIELD. FABRICATED FROM 12ga. TYPE 304 STAINLESS STEEL WITH WHITE POWDER-COAT FINISH. ENCLOSURE MOUNTED ON 16"H VENTED PEDESTAL. OUTER DOORS HAVE 3-POINT ROLLER CAM TYPE PAD-LOCKABLE HANDLES AND 90° DOOR STOPS AND WELDED ON STUDS FOR THE PRINT POCKETS. INCLUDES REMOVABLE, BACK-MOUNTED RAIN HOOD FOR VFD HEAT SINK ACCESS.

BACK PANELS:
 (1) SPP-7231 (69"H x 28"W) FABRICATED FROM 12ga. CARBON STEEL AND PAINTED WITH WHITE POLYESTER POWDER COAT FINISH.
 (1) SPP-7271 (69"H x 68"W) FABRICATED FROM 12ga. CARBON STEEL AND PAINTED WITH WHITE POLYESTER POWDER COAT FINISH.

INNER DOORS:
 (1) HID-7227 FABRICATED FROM .125 BLACK ENGRAVED ALUMINUM WITH CONTINUOUS HINGES, TWIST LATCHES, AND 90° DOOR STOPS AT BOTTOM.
 (2) HID-7233 FABRICATED FROM .125 BLACK ENGRAVED ALUMINUM WITH CONTINUOUS HINGES, TWIST LATCHES, AND 90° DOOR STOPS AT BOTTOM.

VENTILATED MOUNTING PEDESTAL:
 SPSS-PEDESTAL-1610414 (16"H X 104"W X 14"D) FABRICATED FROM TYPE 304 STAINLESS STEEL. (2) HINGED ACCESS DOORS ARE STAINLESS STEEL EXPANDED METAL WITH INSECT SCREEN AND 1/4 TURN LATCHES. PEDESTAL PAINTED WITH WHITE POWDER-COAT FINISH.



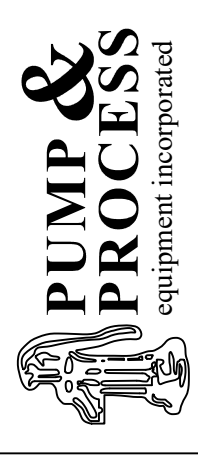
CHECKED BY:	Jeff Nuckols
DRAWN BY:	BWG
DATE CREATED:	12/23/2021
DWG DESCRIPTION:	ENCLOSURE INNER DOOR LAYOUT
DWG TYPE:	SUBMITTAL
SCALE:	N.T.S.

REV.	DATE	INITIAL	DESCRIPTION
00	01-10-22	BWG	Submittal Dwg. out for Customer Review and Approval.
01	01-12-22	BWG	Revised Submittal Dwg. to remove Barnes Pump Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.

SUBMITTAL



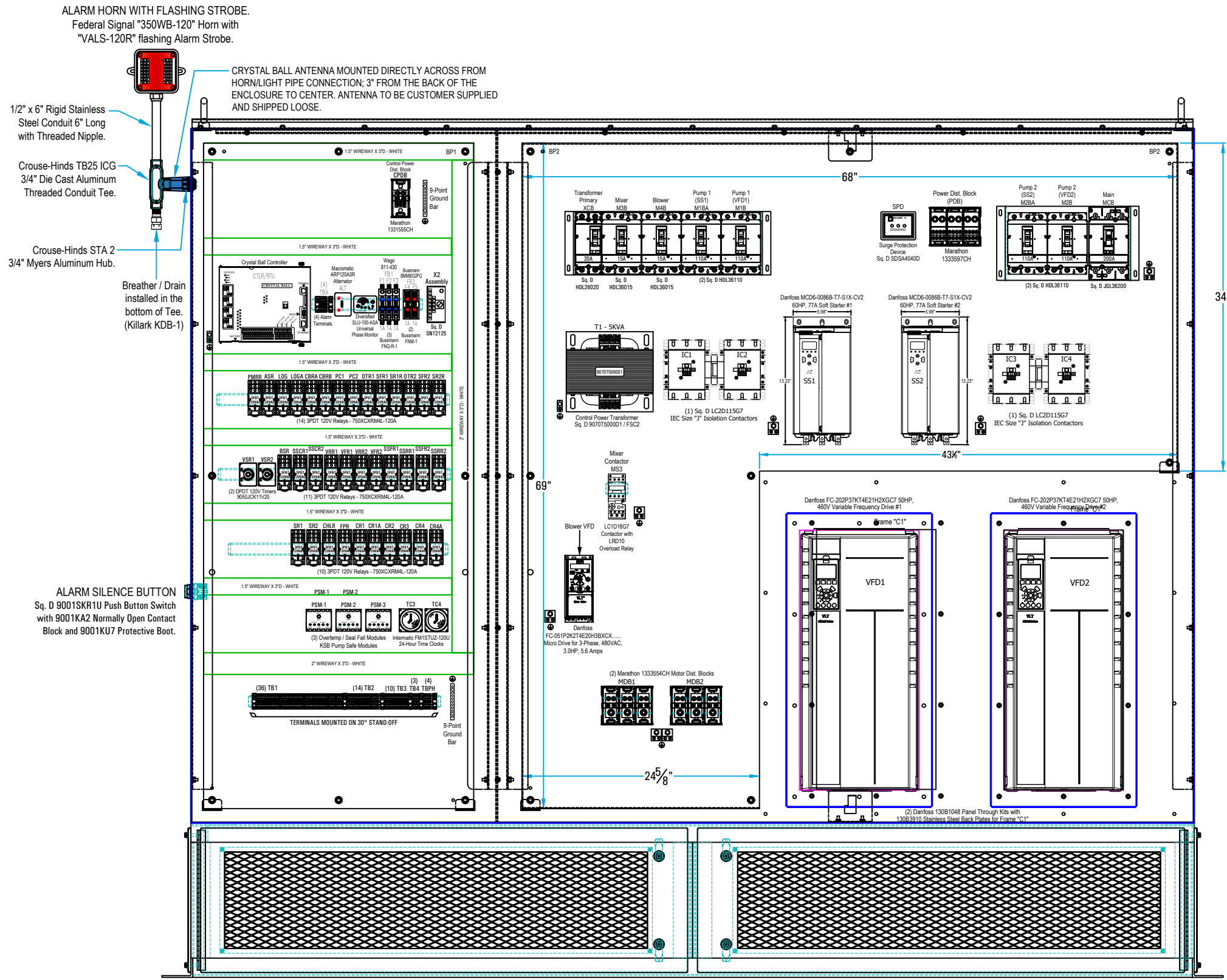
CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
 PROJECT: City of Crestview
 Black Water Golf Club Master Station
 480VAC, 3-Phase, 50.0HP, 67.1FLA
 Duplex VFD with Mixer & Blower Motor Control Panel
 JOB No: 221659
 SHEET 1A OF 13
 REVISION No. 01



CHECKED BY:	Jeff Nuckols
DRAWN BY:	BWG
DATE CREATED:	12/23/2021
SCALE:	N.T.S.
DWG DESCRIPTION:	ENLARGED INNER DOOR DETAILS
DWG. TYPE:	SUBMITTAL

REV.	DATE	INITIAL	DESCRIPTION
00	01-10-22	BWG	Submittal Dwg. out for Customer Review and Approval.
01	01-12-22	BWG	Revised Submittal Dwg. to remove Bames Pump Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.

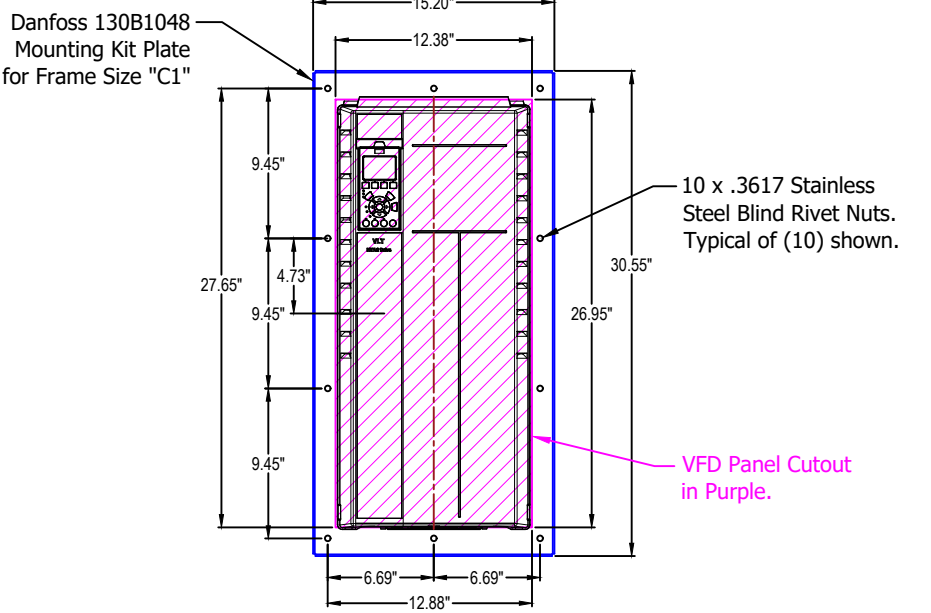




ENCLOSURE:
SPHCDSS-7210414 (72"H x 104"W x 14"D) NEMA 12/3R RATED, WITH OVERLAPPING DOORS, (2) WELDED ON LIFTING EYES AND BOLT-ON DRIP SHIELD. FABRICATED FROM 12ga. TYPE 304 STAINLESS STEEL WITH WHITE POWDER-COAT FINISH. ENCLOSURE MOUNTED ON 16"H VENTED PEDESTAL. OUTER DOORS HAVE 3-POINT ROLLER CAM TYPE PAD-LOCKABLE HANDLES AND 90° DOOR STOPS AND WELDED ON STUDS FOR THE PRINT POCKETS. INCLUDES REMOVABLE, BACK-MOUNTED RAIN HOOD FOR VFD HEAT SINK ACCESS.

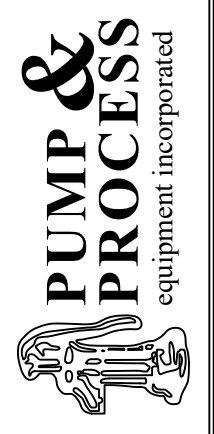
BACK PANELS:
(1) VERTICAL BACK PANEL - SPP-7231 (69"H x 28"W) FABRICATED FROM 12ga. CARBON STEEL AND PAINTED WITH WHITE POLYESTER POWDER COAT FINISH.
(1) "L" SHAPE BACK PANEL - SPP-7271 (69 / 35"H x 68 / 12"W) FABRICATED FROM 12ga. CARBON STEEL AND PAINTED WITH WHITE POLYESTER POWDER COAT FINISH.

VENTILATED MOUNTING PEDESTAL:
SPSS-PEDESTAL-1610414 (16"H X 104"W X 14"D) FABRICATED FROM TYPE 304 STAINLESS STEEL. (2) HINGED ACCESS DOORS ARE STAINLESS STEEL EXPANDED METAL WITH INSECT SCREEN AND 1/4 TURN LATCHES. PEDESTAL PAINTED WITH WHITE POWDER-COAT FINISH.



SUBMITTAL

CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
PROJECT: City of Crestview Black Water Golf Club Master Station 480VAC, 3-Phase, 50.0HP, 67.1FLA Duplex VFD with Mixer & Blower Motor Control Panel



REV.	DATE	INITIAL	DESCRIPTION
00	01-10-22	BWG	Submittal Dwg. out for Customer Review and Approval.
01	01-12-22	BWG	Revised Submittal Dwg. to remove Bames Pump Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.

CHECKED BY: Jeff Nuckols
SCALE: N.T.S.
DATE CREATED: 12/23/2021
DWG DESCRIPTION: ENCLOSURE BACK PANEL LAYOUT
DWG. TYPE: SUBMITTAL

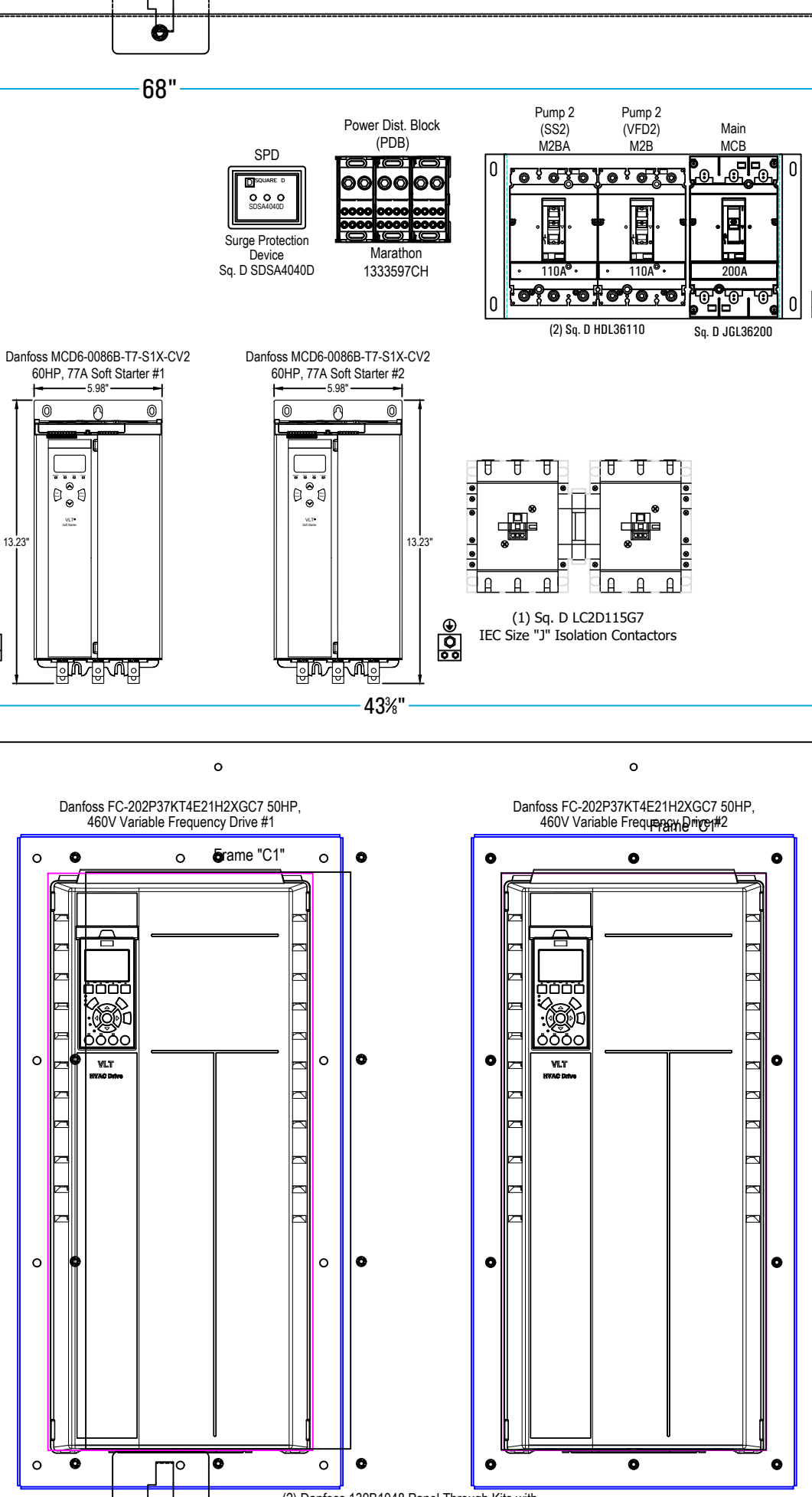
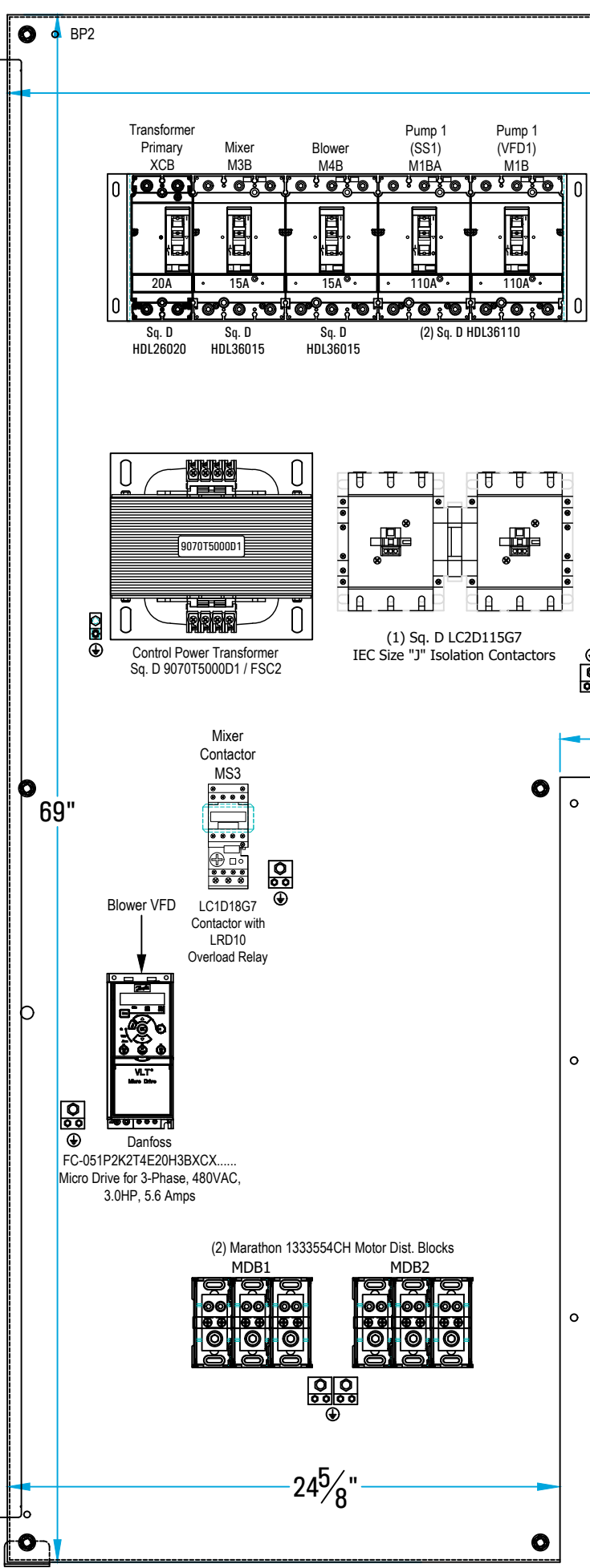
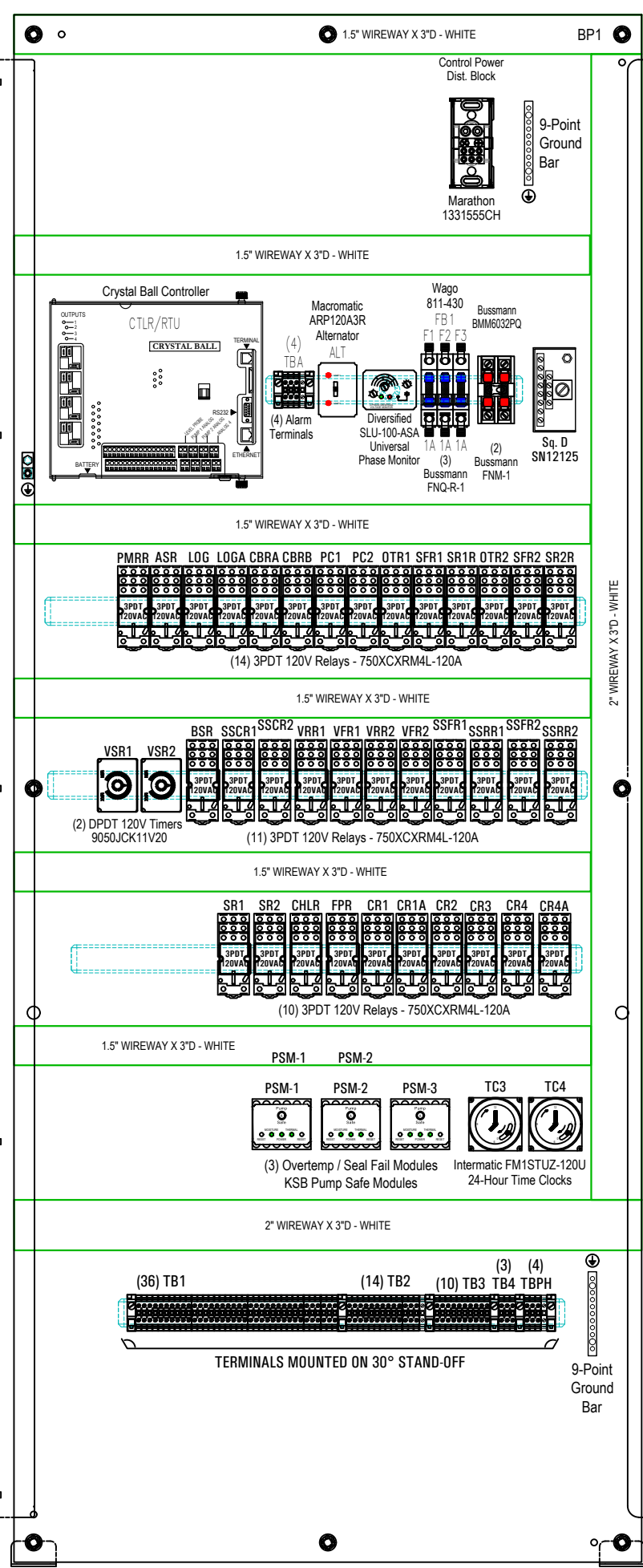
SHEET 2 OF 13
JOB No: 221659
REVISION No: 01

AND SHIPPED LOOSE.

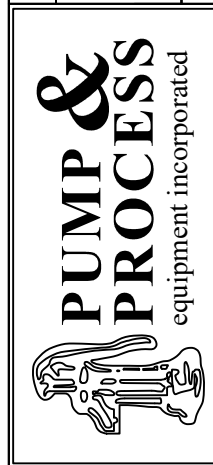
01/19/2022

Page 61 of 55

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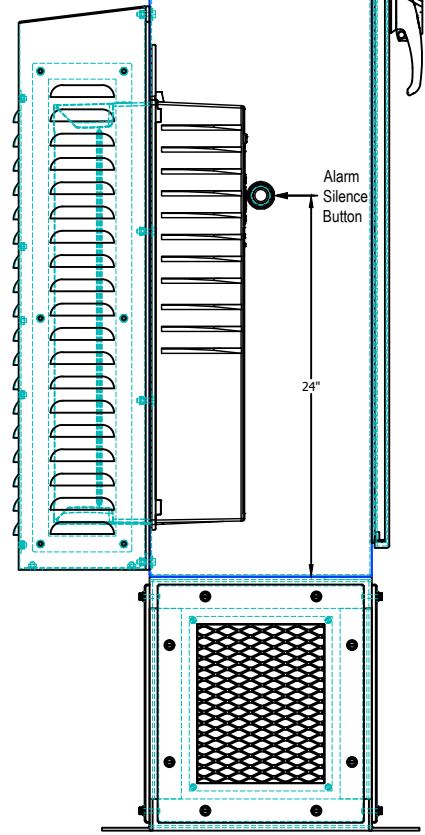
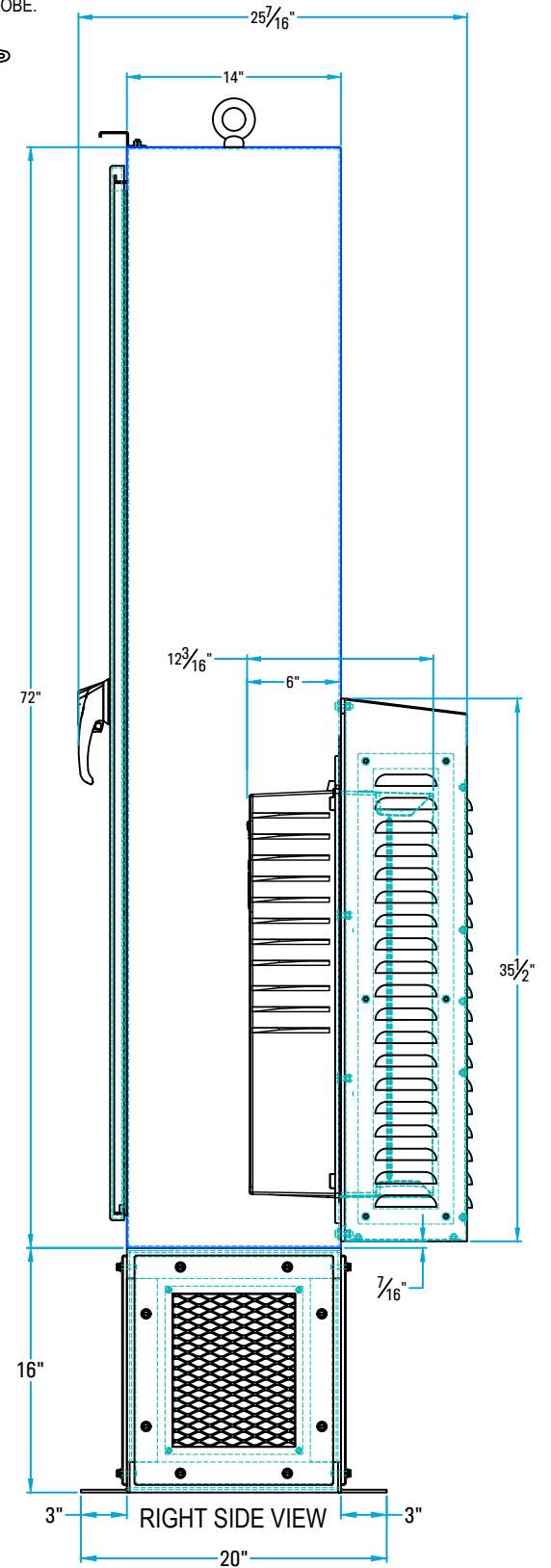
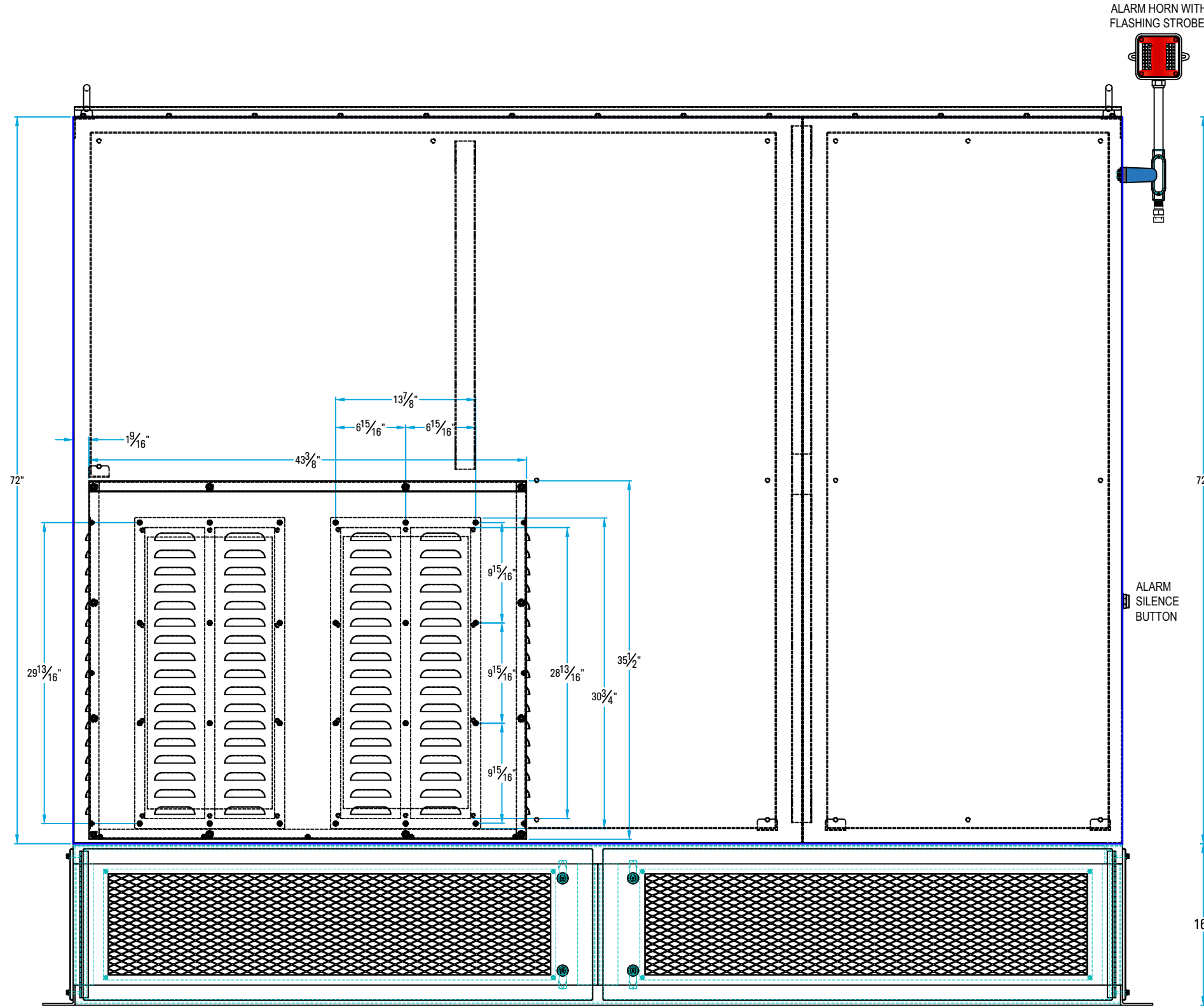
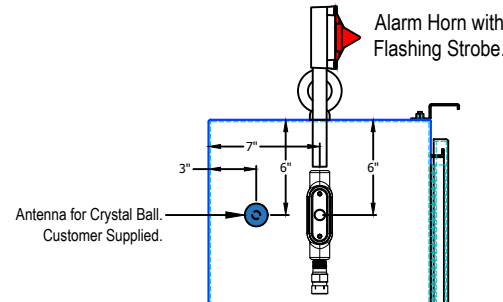


CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
 PROJECT: City of Crestview Black Water Golf Club Master Station 480VAC, 3-Phase, 50.0HP, 67.1FLA Duplex VFD with Mixer & Blower Motor Control Panel
 JOB No: 221659
 SHEET 2A OF 13
 REVISION No 01



REV.	DATE	INITIAL	DESCRIPTION
00	01-10-22	BWG	Submittal Dwg. out for Customer Review and Approval.
01	01-12-22	BWG	Revised Submittal Dwg. to remove Bames Pump Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.
			BACK PANEL ENLARGED DETAIL
			SUBMITTAL

CHECKED BY: Jeff Nuckols
 SCALE: N.T.S.
 DATE CREATED: 12/23/2021
 DWG DESCRIPTION: BACK PANEL ENLARGED DETAIL
 DWG. TYPE: SUBMITTAL



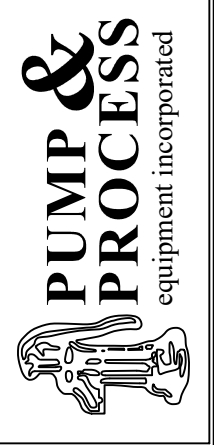
LEFT SIDE VIEW

ENCLOSURE REAR VIEW

RIGHT SIDE VIEW

SUBMITTAL

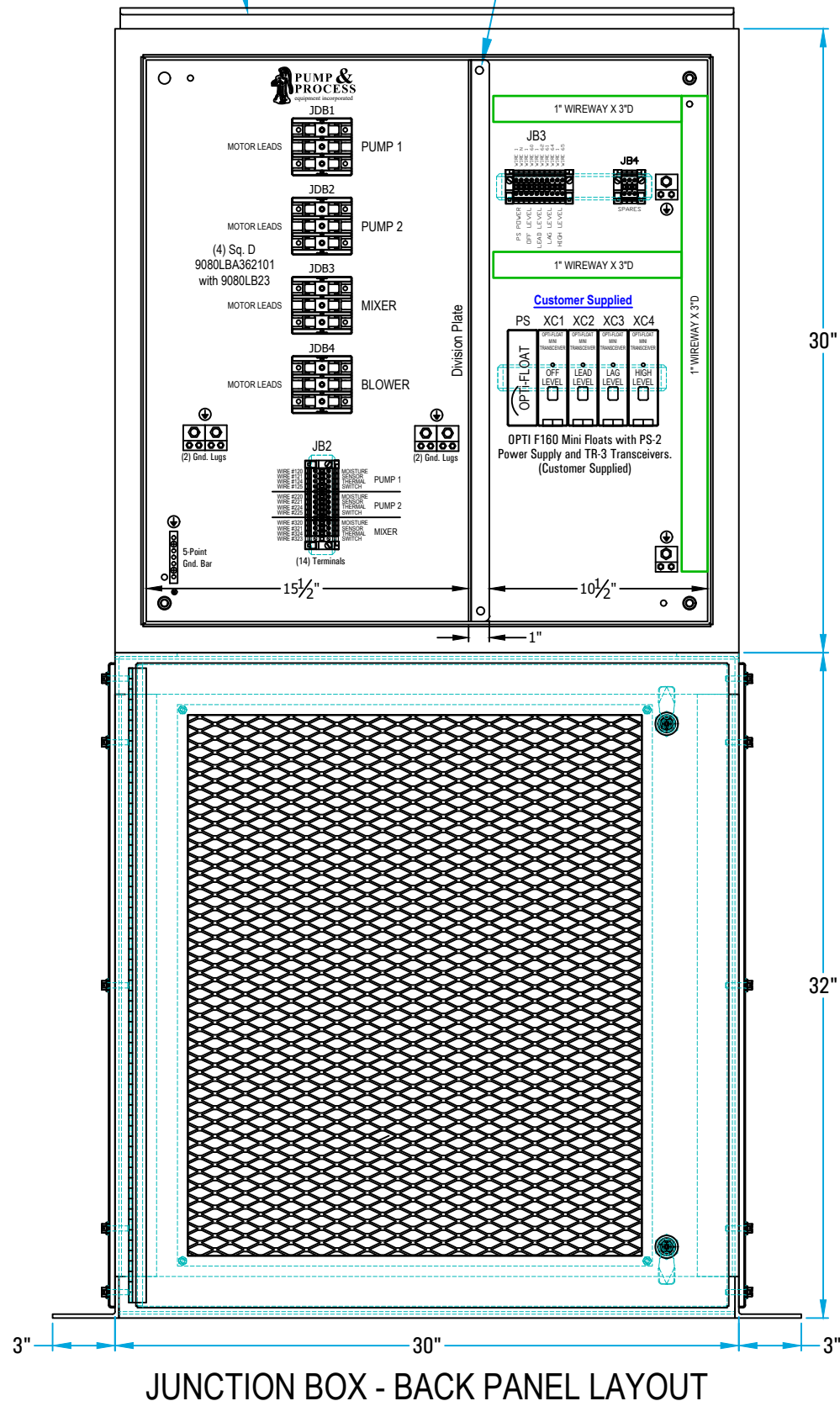
CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
 PROJECT: City of Crestview
 Black Water Golf Club Master Station
 480VAC, 3-Phase, 50.0HP, 67.1FLA
 Duplex VFD with Mixer & Blower Motor Control Panel
 JOB No: 221659
 SHEET 3 OF 13
 REVISION No 01



CHECKED BY:	Jeff Nuckols
DRAWN BY:	BWG
DATE CREATED:	12/23/2021
SCALE:	N.T.S.
DWG DESCRIPTION:	REAR VIEW WITH RAIN HOOD DETAIL
DWG TYPE:	SUBMITTAL

REV.	DATE	INITIAL	DESCRIPTION
00	01-10-22	BWG	Submittal Dwg. out for Customer Review and Approval.
01	01-12-22	BWG	Revised Submittal Dwg. to remove Barnes Pump Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.

DRIP SHIELD, SHIP INSTALLED
DIVIDER / PARTITION



JUNCTION BOX ENCLOSURE:

SPN12AL-303010 (30"H x 30"W x 10"D) NEMA 12 RATED ENCLOSURE. (BUILT LIKE NEMA 4X WITHOUT DRAIN HOLE IN BOTTOM). FABRICATED FROM MARINE GRADE ALUMINUM WITH PAINTED WHITE FINISH. TOP HAS BOLT-ON DRIP SHIELD. OUTER DOOR HAS CONTINUOUS HINGE, GASKET, AND 3-POINT PADLOCKING HANDLE.

JUNCTION BOX ENCLOSURE BACK PANEL:

EBP-3030 (27"H x 27"W) - FABRICATED FROM .125 ALUMINUM WITH ANODIZED BLACK FINISH AND WITH ENGRAVED LABELING.

JUNCTION BOX BILL of MATERIALS

ITEM	PART No.	DESCRIPTION	MFR.	QTY.
1	SPN12AL-303010	J-BOX ENCLOSURE, NEMA 12 ALUMINUM, PAINTED WHITE FINISH	SCHAEFER	1
2	EBP-3030	J-BOX BACK PANEL, .125 ALUMINUM, ANODIZED BLACK FINISH ENGRAVED	SCHAEFER	1
3	SPAL-PED-323010	VENTILATED AIR BREAK PEDESTAL, ALUMINUM, PAINTED WHITE FINISH	SCHAEFER	1
4	9080LBA362101	MOTOR SPLICER BLOCK, 3-POLE, 600VAC, 175 AMP	SQUARE D	4
5	8WA1011-0DG21	TERMINAL BLOCK, 600VAC, 10-POLE, 35 AMP, #22 - #8 AWG	SIEMENS	2
6	8WA1011-3DG21	TERMINAL BLOCK, 600VAC, 3-POLE, 35 AMP, #22 - #8 AWG	SIEMENS	2
7	8WA1011-1DG11	TERMINAL BLOCK, 600VAC, 1-POLE, 35 AMP, #22 - #8 AWG	SIEMENS	1
8	ADR11-21	GROUND LUG, TWO BARREL, #14-1/0AWG	THOMAS & BETTS	5
9	PK5GTA	5-POINT EQUIPMENT GROUND BAR	SQUARE D	1

AIR BREAK VENTILATED PEDESTAL:

SPAL-PEDESTAL-323010 (32"H x 30"W x 10"D) AIR BREAK VENTILATED PEDESTAL. FABRICATED FROM MARINE GRADE ALUMINUM WITH PAINTED WHITE FINISH. HINGED ACCESS DOOR HAS STAINLESS STEEL EXPANDED METAL INSERTED WITH STAINLESS STEEL BUG SCREEN. 1/4-TURN TWIST LATCHES USED TO SECURE ACCESS DOOR.

NOTES:

1. [Symbol] TERMINAL ON CONTROL CIRCUIT TERMINAL STRIP
2. [Symbol] TERMINAL ON POWER DISTRIBUTION BLOCK
3. [Symbol] TERMINAL IN JUNCTION BOX CONTROL CIRCUIT TERMINAL STRIP
4. [Symbol] NEUTRAL AND GROUND LUGS
5. - - - - - FIELD WIRING (EXTERNAL TO CONTROL PANEL)
6. ——— INTERNAL PANEL WIRING
7. SEAL ALL CONDUITS ENTERING CONTROL PANEL
8. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE N.E.C.
9. MINIMUM #14 AWG WIRE AT 600V

CONTROL WIRE COLOR CODE:

120VAC POWER	BLACK	24VDC POSITIVE (+)	ORANGE
120VAC CONTROL	RED	24VDC POSITIVE (+)	BROWN
120VAC NEUTRAL	WHITE	12VDC POSITIVE (+)	RED
24VAC HOT	BLUE	12DC NEGATIVE (-)	BLACK
24VAC NEUTRAL	YELLOW	GROUND	GREEN

TORQUE TABLES:

CONTROL TERMINALS					
RECOMMENDED TIGHTENING TORQUE					
MFG	PART#	RATING (I, E)	WIRE SIZE	WIRE STRIP LENGTH	TORQUE
SIEMENS	8WA1011	35A, 600V	18-10AWG	.43"	4.4 lb.in.

POWER DISTRIBUTION BLOCK					
RECOMMENDED TIGHTENING TORQUE					
MFG	PART#	WIRE SIZE MAIN	TORQUE	WIRE SIZE BRANCH	TORQUE
SQUARE D	9080LBA_62101	(1) #6-2/0AWG	120 lb.in.	(1) #6-2/0AWG	120 lb.in.
		(1) #8AWG	40 lb.in.	(1) #8AWG	40 lb.in.
		(1) #14-#10AWG	35 lb.in.	(1) #14-#10AWG	35 lb.in.
MARATHON	132X580	(1) #6-2/0AWG	120 lb.in.	(6) #14-#4AWG	35 lb.in.
		(1) #8AWG	40 lb.in.		
		(1) #14-#10AWG	35 lb.in.		
MARATHON	134X585	(1) 600MCM-#2AWG	375 lb.in.	(8) #2 AWG	50 lb.in.
				(8) #4-#6AWG	45 lb.in.
				(8) #8AWG	40 lb.in.
				(8) #10AWG	35 lb.in.
				(8) #12-#14AWG	35 lb.in.

GROUND TERMINALS			
RECOMMENDED TIGHTENING TORQUE			
MFG	PART#	WIRE SIZE	TORQUE - SCREWDRIVER
THOMAS & BETTS	ADR11-21	12AWG	20 lb.in.
		10AWG	20 lb.in.
		8AWG	20 lb.in.
		6AWG	35 lb.in.
		4AWG	35 lb.in.
		2AWG	50 lb.in.
		1AWG	50 lb.in.
SQUARE D	PK_GTA	1/0AWG	50 lb.in.
		2/0AWG	50 lb.in.
		14-10AWG	20 lb.in.
		8AWG	25 lb.in.
		6-4AWG	35 lb.in.

SUBMITTAL

CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
PROJECT: City of Crestview Black Water Golf Club Master Station 480VAC, 3-Phase, 50.0HP, 67.1FLA Duplex VFD with Mixer & Blower Motor Control Panel

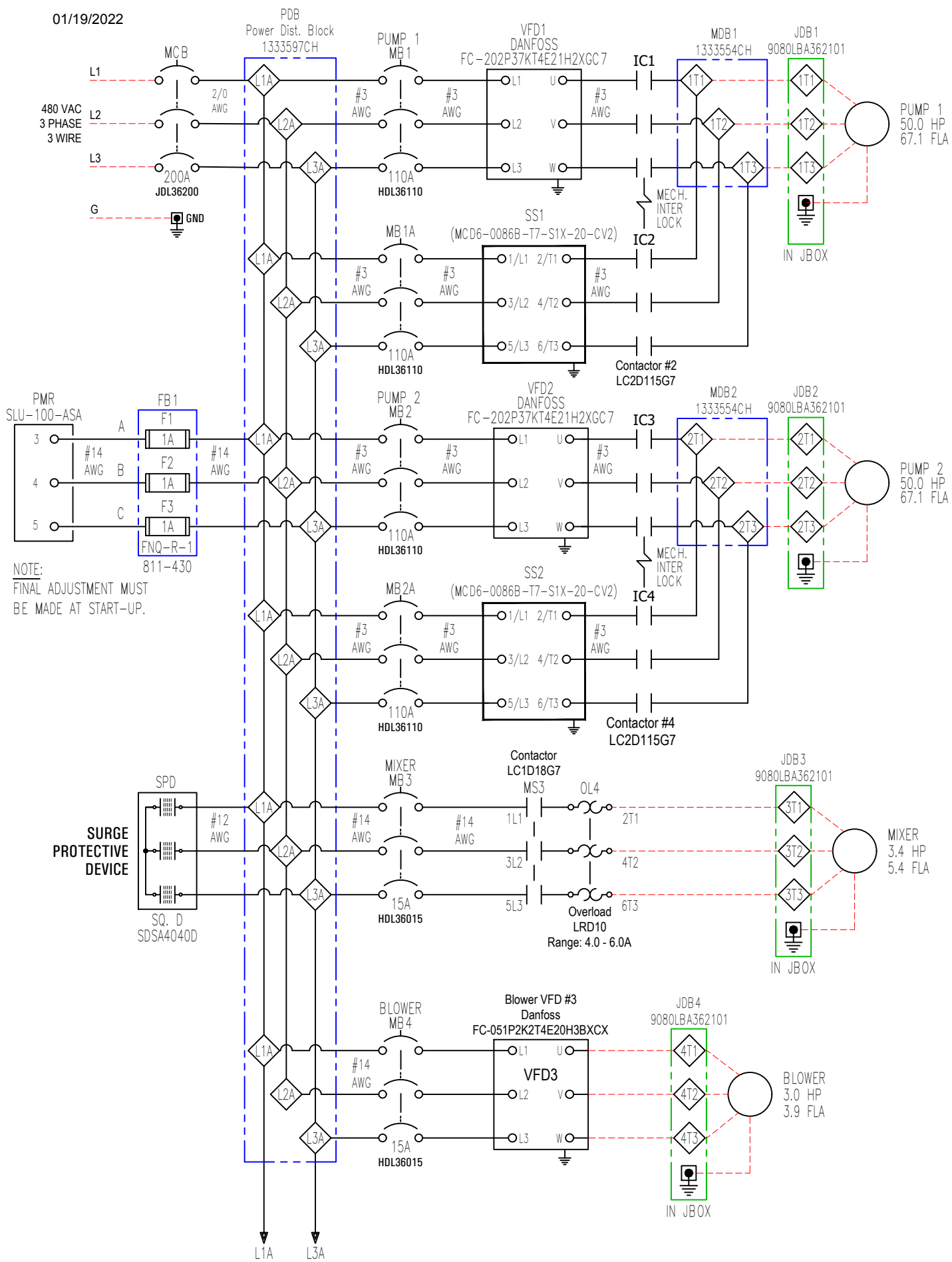
PUMP & PROCESS
equipment incorporated

CHECKED BY: Jeff Nuckols
SCALE: N.T.S.
DATE CREATED: 12/23/2021
DWG DESCRIPTION: J-BOX LAYOUT WITH NOTES & TABLES
DWG TYPE: SUBMITTAL

REV. DATE DESCRIPTION
00 01-10-22 BWG Submittal Dwg. out for Customer Review and Approval.
01 01-12-22 BWG Revised Submittal Dwg. to remove Barnes Pump Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.

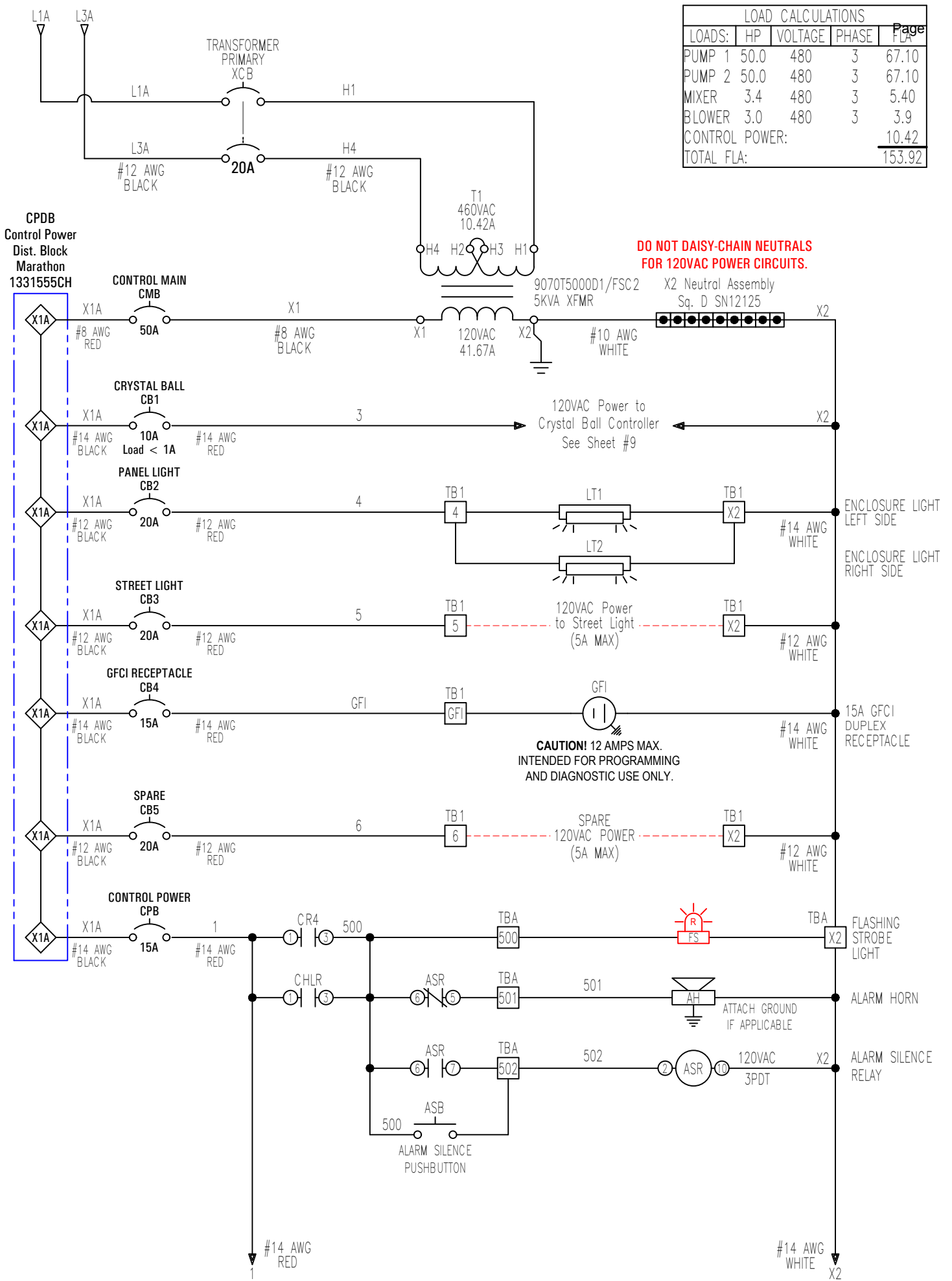
SHEET 4 OF 13
JOB No: 221659
REVISION No: 01

01/19/2022



NOTE:
FINAL ADJUSTMENT MUST
BE MADE AT START-UP.

SUBMITTAL

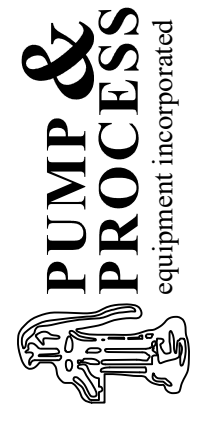


**DO NOT DAISY-CHAIN NEUTRALS
FOR 120VAC POWER CIRCUITS.**

**CAUTION! 12 AMPS MAX.
INTENDED FOR PROGRAMMING
AND DIAGNOSTIC USE ONLY.**

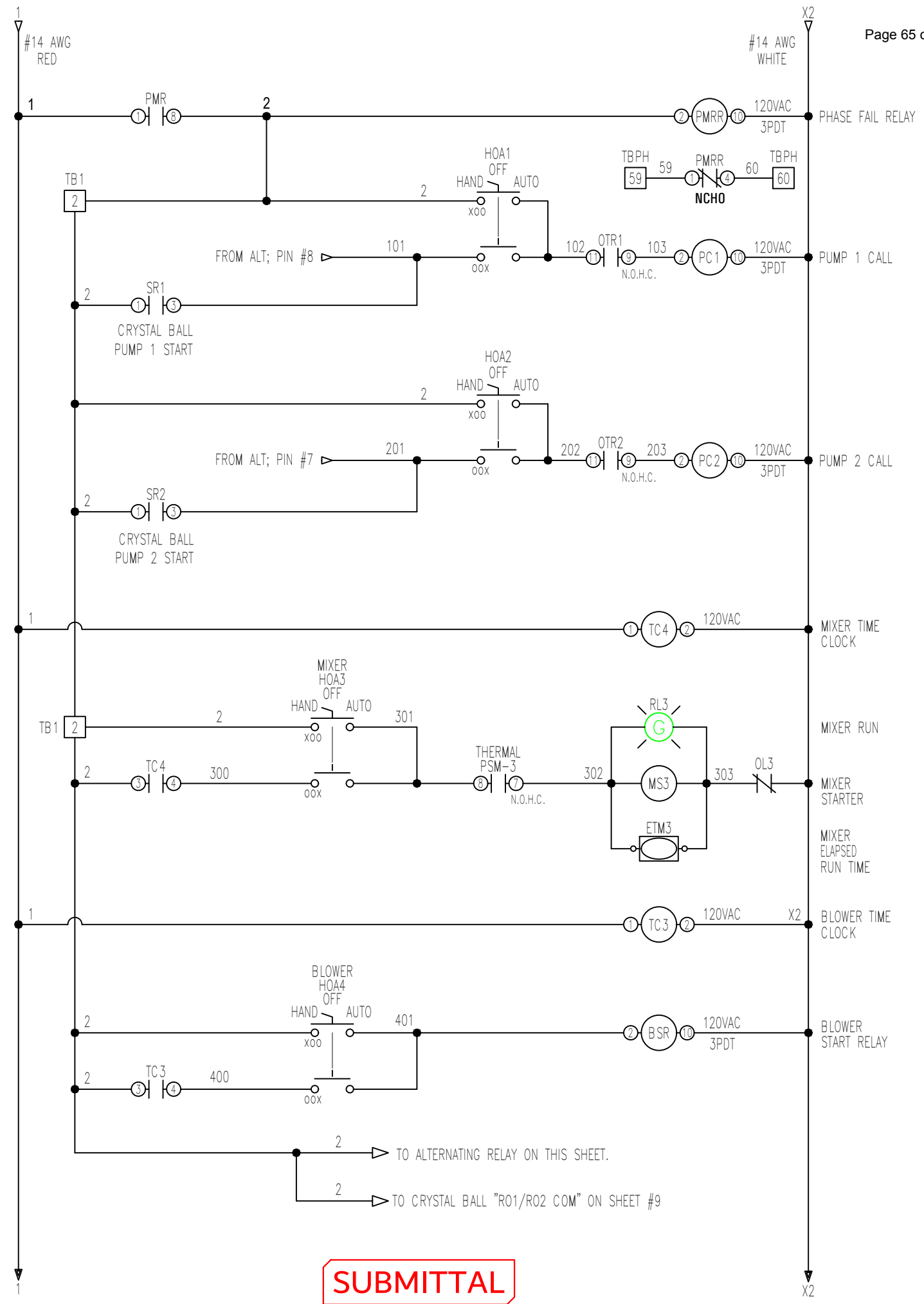
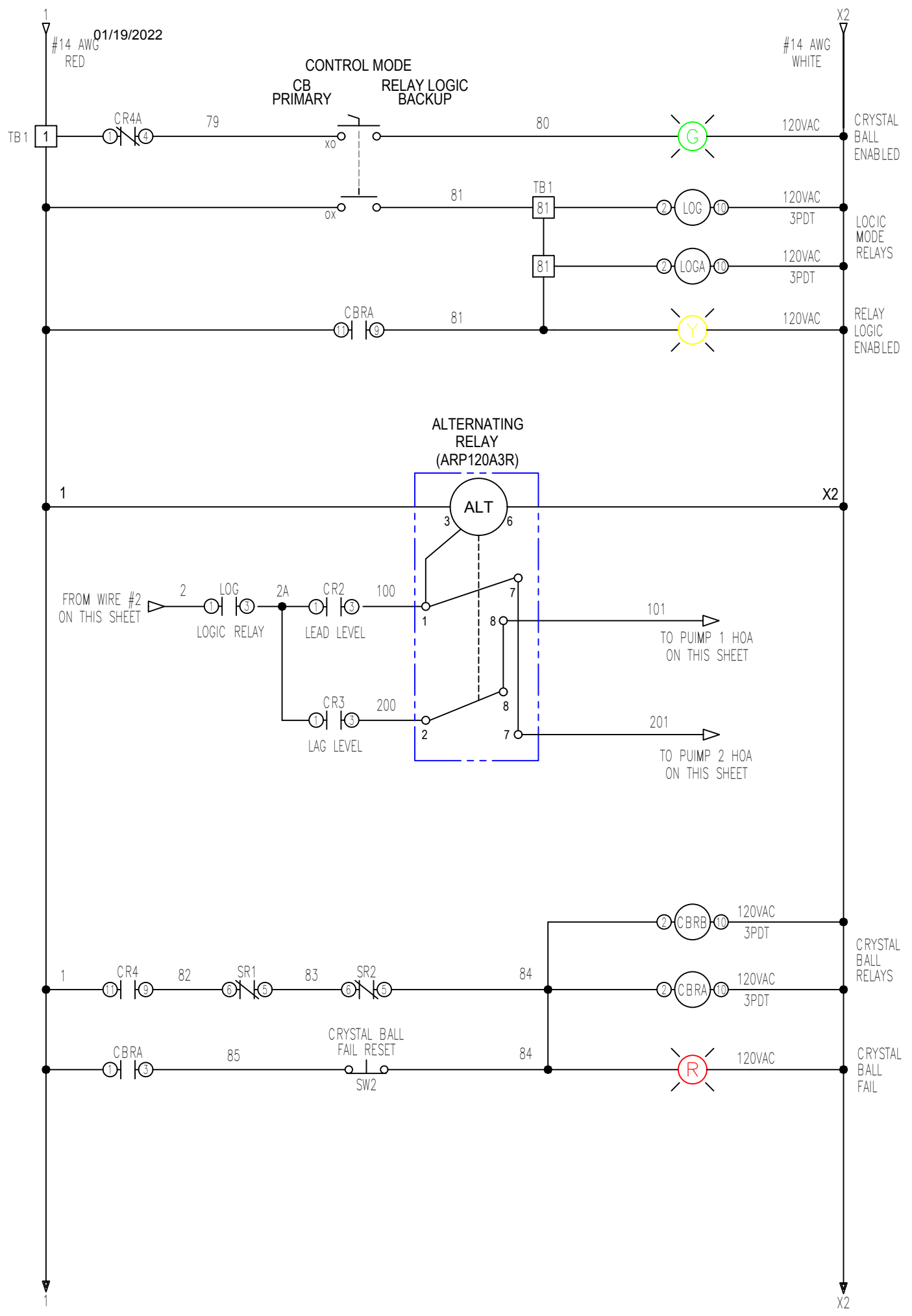
LOAD CALCULATIONS				
LOADS:	HP	VOLTAGE	PHASE	Page
PUMP 1	50.0	480	3	67.10
PUMP 2	50.0	480	3	67.10
MIXER	3.4	480	3	5.40
BLOWER	3.0	480	3	3.9
CONTROL POWER:				10.42
TOTAL FLA:				153.92

925 of 955
CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
PROJECT: City of Crestview
Black Water Golf Club Master Station
480VAC, 3-Phase, 50.0HP, 67.1FLA
Duplex VFD with Mixer & Blower Motor Control Panel
JOB No: 221659
SHEET 5 OF 13
REVISION No. 01



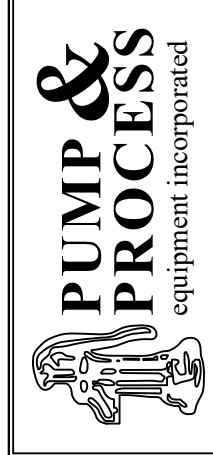
REV.	DATE	INITIAL	DESCRIPTION
00	01-10-22	BWG	Submittal Dwg. out for Customer Review and Approval.
01	01-12-22	BWG	Revised Submittal Dwg. to remove Barnes Pump Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.

CHECKED BY:	Jeff Nuckols
DRAWN BY:	BWG
DATE CREATED:	12/23/2021
DWG DESCRIPTION:	ELECTRICAL (E1)
DWG TYPE:	SUBMITTAL



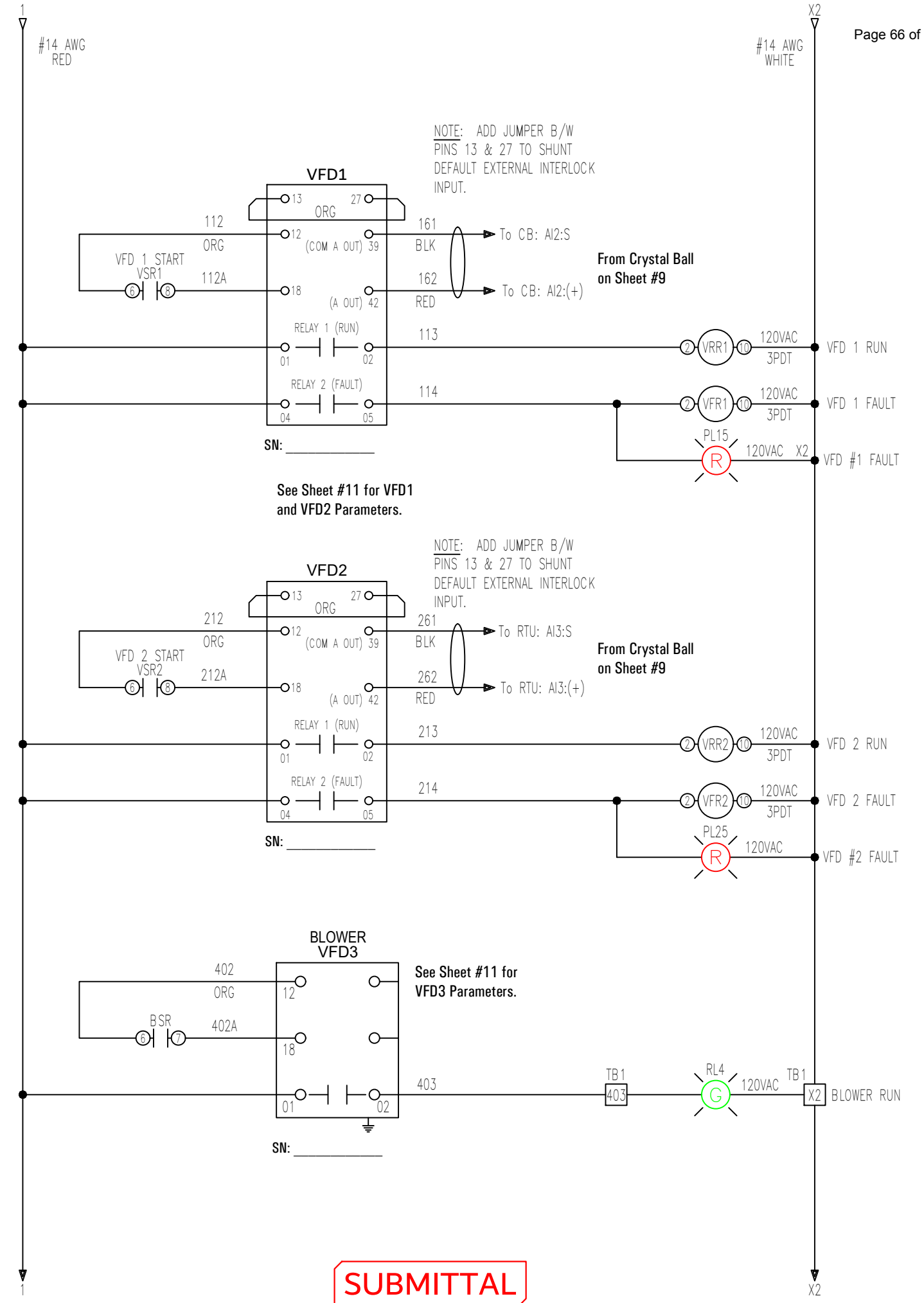
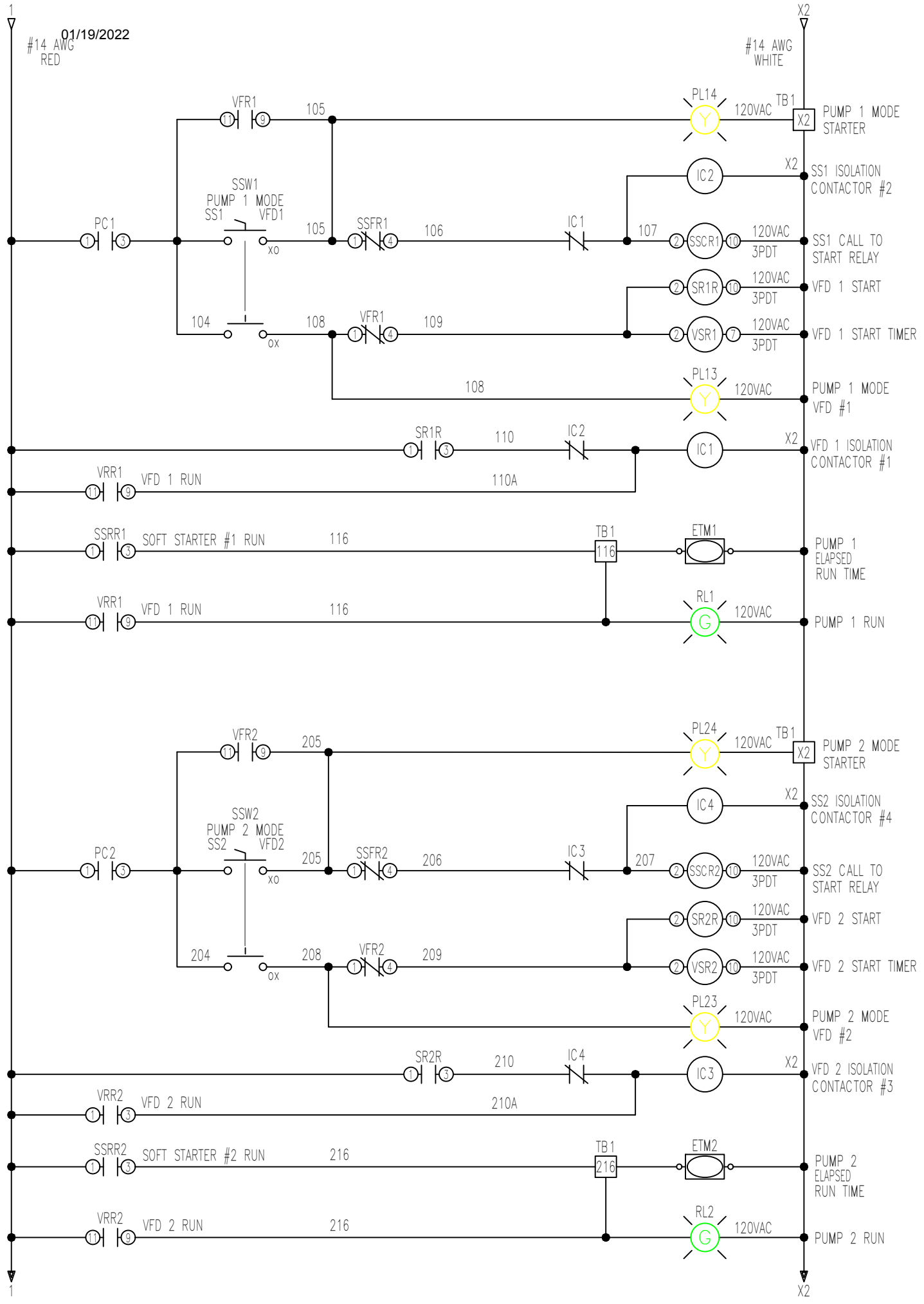
SUBMITTAL

CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
 PROJECT: City of Crestview
 Black Water Golf Club Master Station
 480VAC, 3-Phase, 50.0HP, 67.1FLA
 Duplex VFD with Mixer & Blower Motor Control Panel
 JOB No: 221659
 SHEET OF 13
 REVISION No 01



CHECKED BY:	Jeff Nuckols
SCALE:	N.T.S.
DWG DESCRIPTION:	ELECTRICAL (E2)
DWG TYPE:	SUBMITTAL

REV.	DATE	INITIAL	DESCRIPTION
00	01-10-22	BWG	Submittal Dwg. out for Customer Review and Approval.
01	01-12-22	BWG	Revised Submittal Dwg. to remove Barnes Pump Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.



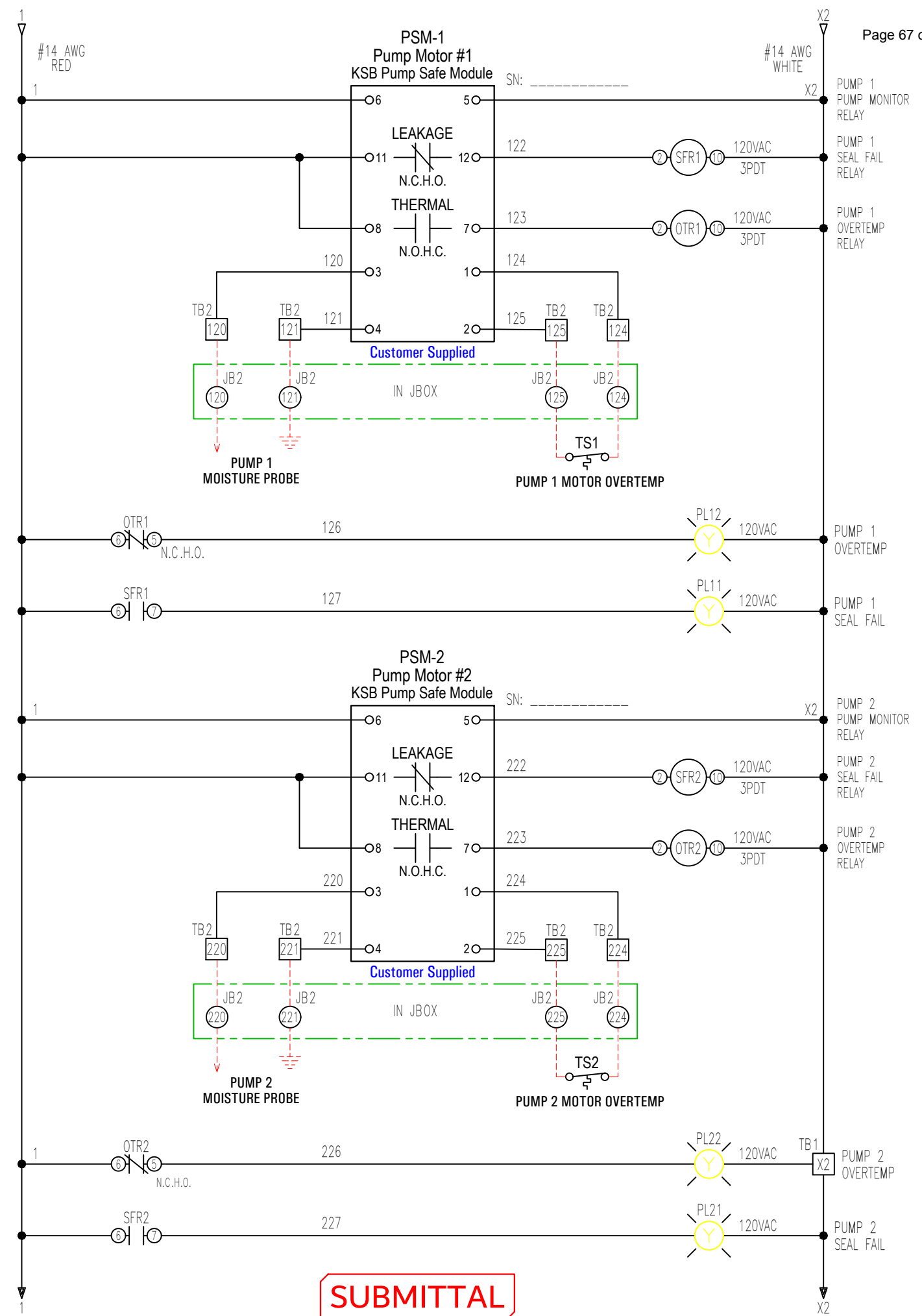
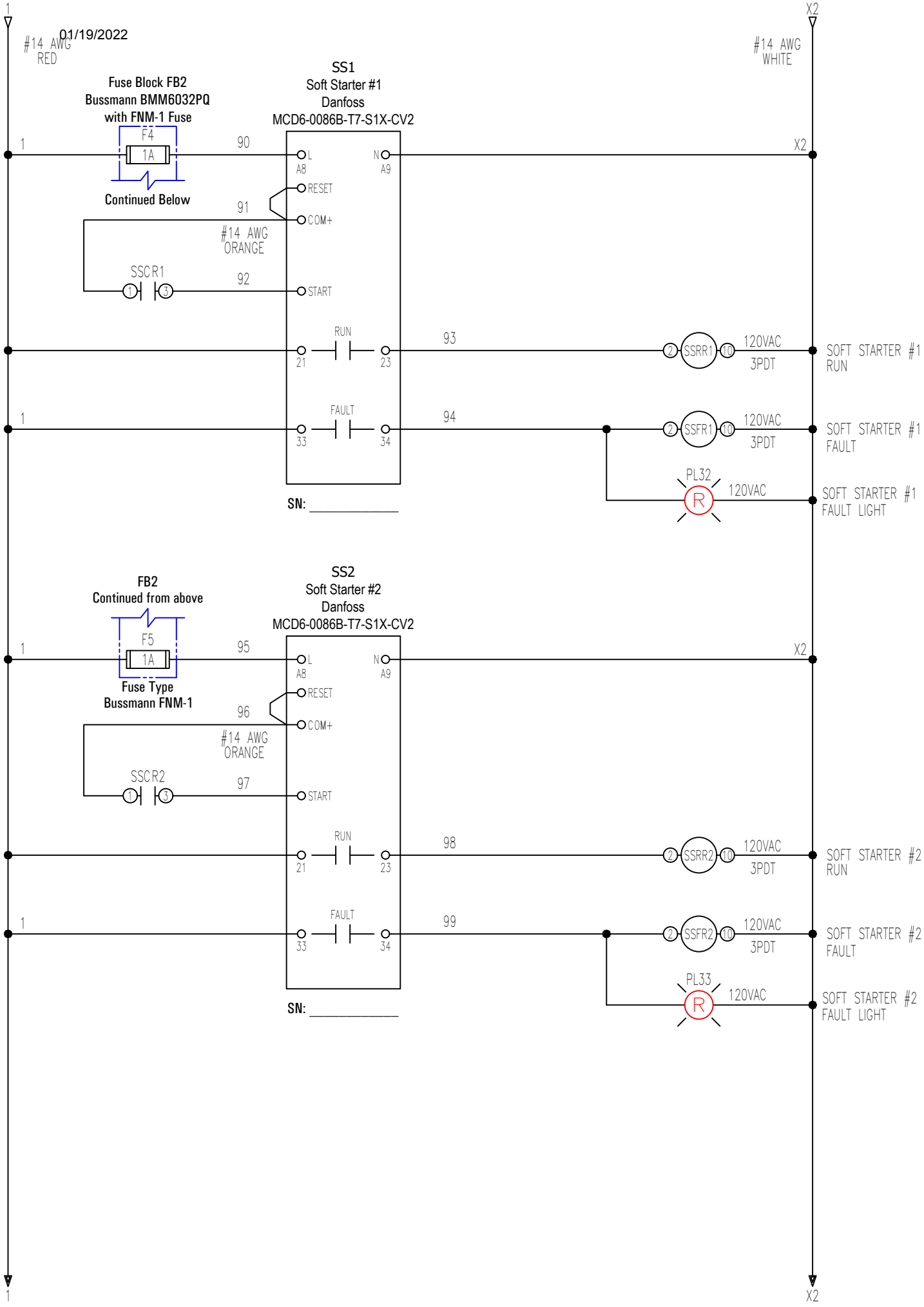
SUBMITTAL

CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
 PROJECT: City of Crestview
 Black Water Golf Club Master Station
 480VAC, 3-Phase, 50.0HP, 67.1FLA
 Duplex VFD with Mixer & Blower Motor Control Panel
 JOB No: 221659
 SHEET 7 OF 13
 REVISION No 01



CHECKED BY:	Jeff Nuckols
DRAWN BY:	BWG
DATE CREATED:	12/23/2021
DWG DESCRIPTION:	ELECTRICAL (E3)
DWG TYPE:	SUBMITTAL
SCALE:	N.T.S.

REV.	DATE	INITIAL	DESCRIPTION
00	01-10-22	BWG	Submittal Dwg. out for Customer Review and Approval.
01	01-12-22	BWG	Revised Submittal Dwg. to remove Barnes Pump Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.



SUBMITTAL

CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
PROJECT: City of Crestview
Black Water Golf Club Master Station
480VAC, 3-Phase, 50.0HP, 67.1FLA
Duplex VFD with Mixer & Blower Motor Control Panel



REV.	DATE	INITIAL	DESCRIPTION	DRAWN BY:	CHECKED BY:	SCALE:	DWG. DESCRIPTION:	DWG. TYPE:
00	01-10-22	BWG	Submittal Dwg. out for Customer Review and Approval.	BWG	Jeff Nuckols	N.T.S.	Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.	ELECTRICAL (E4)
01	01-12-22	BWG	Revised Submittal Dwg. to remove Barnes Pump Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.	BWG	Jeff Nuckols	N.T.S.	Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.	ELECTRICAL (E4)
								SUBMITTAL

REVISION No. 01
SHEET 8 OF 13
JOB No. 221659

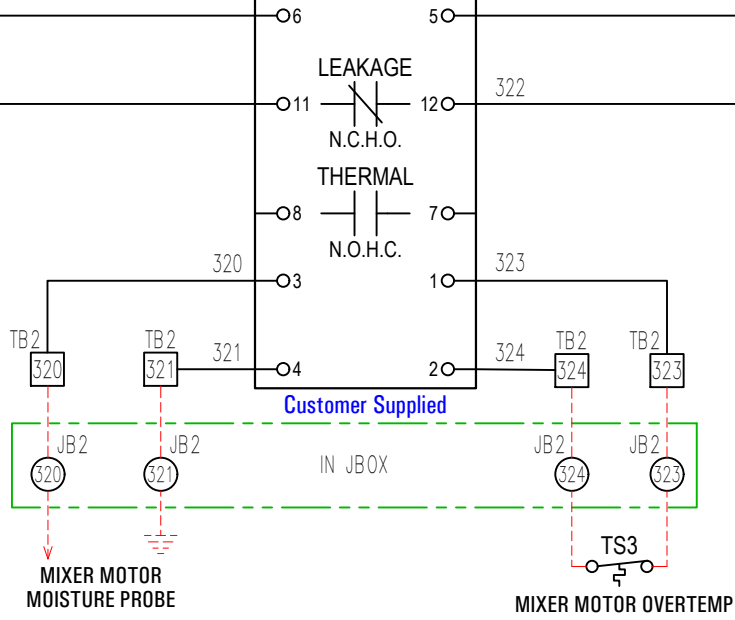
01/19/2022

#14 AWG RED

#14 AWG WHITE

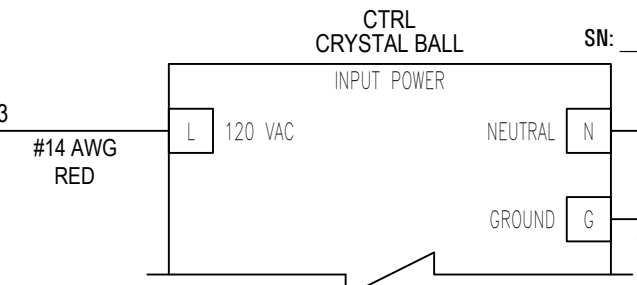
PSM-3 Mixer Pump Motor KSB Pump Safe Module

SN: _____



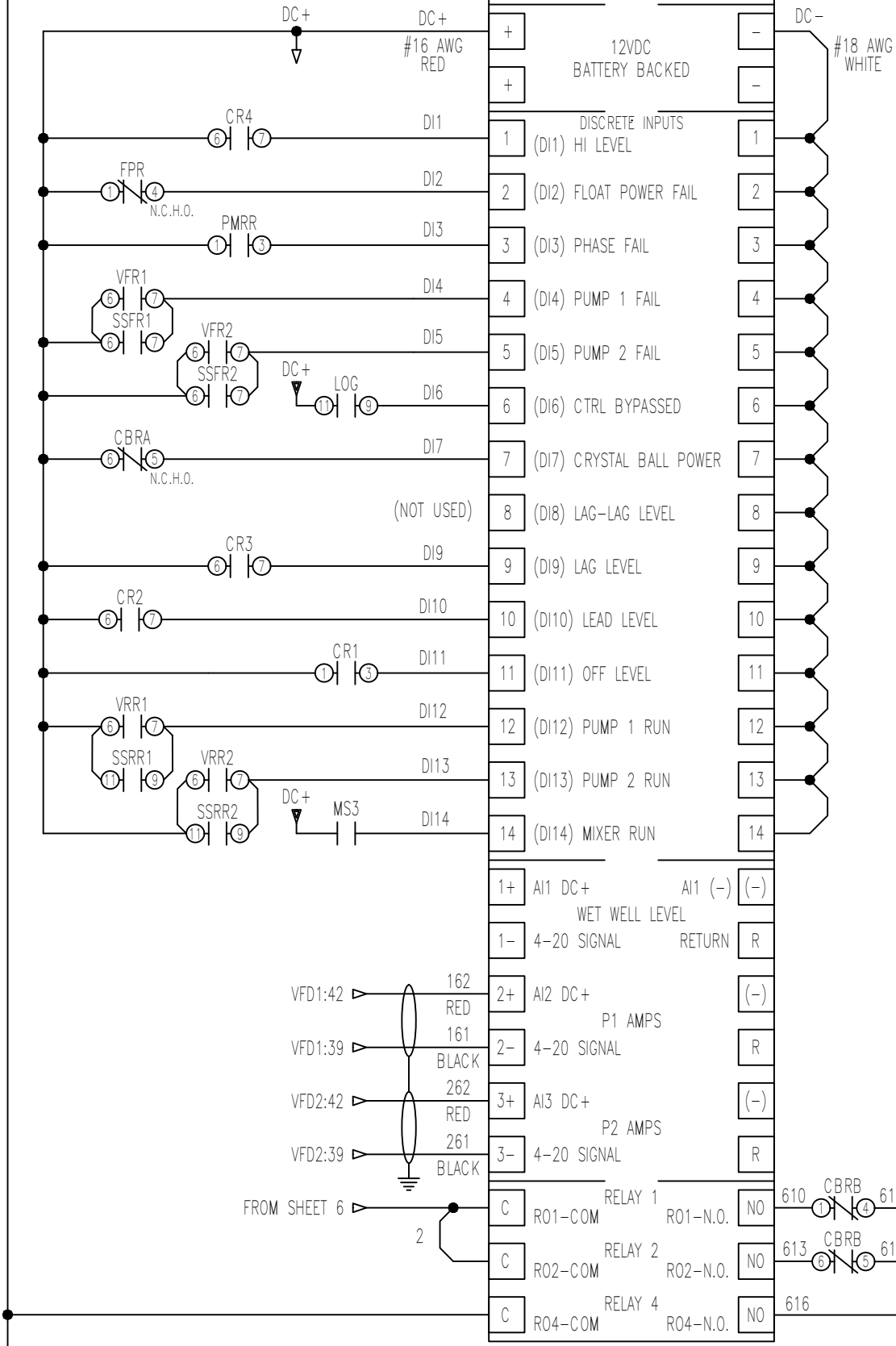
MIXER PUMP MONITOR RELAY
MIXER MOTOR SEAL LEAK

120VAC POWER FROM CIRCUIT BREAKER "CB1" ON SHEET #5.



Continued above on this Sheet

CRYSTAL BALL CONTROLLER CONTINUED



SUBMITTAL

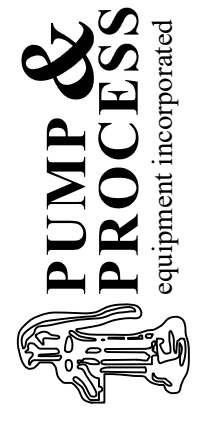
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#18 AWG WHITE

X2

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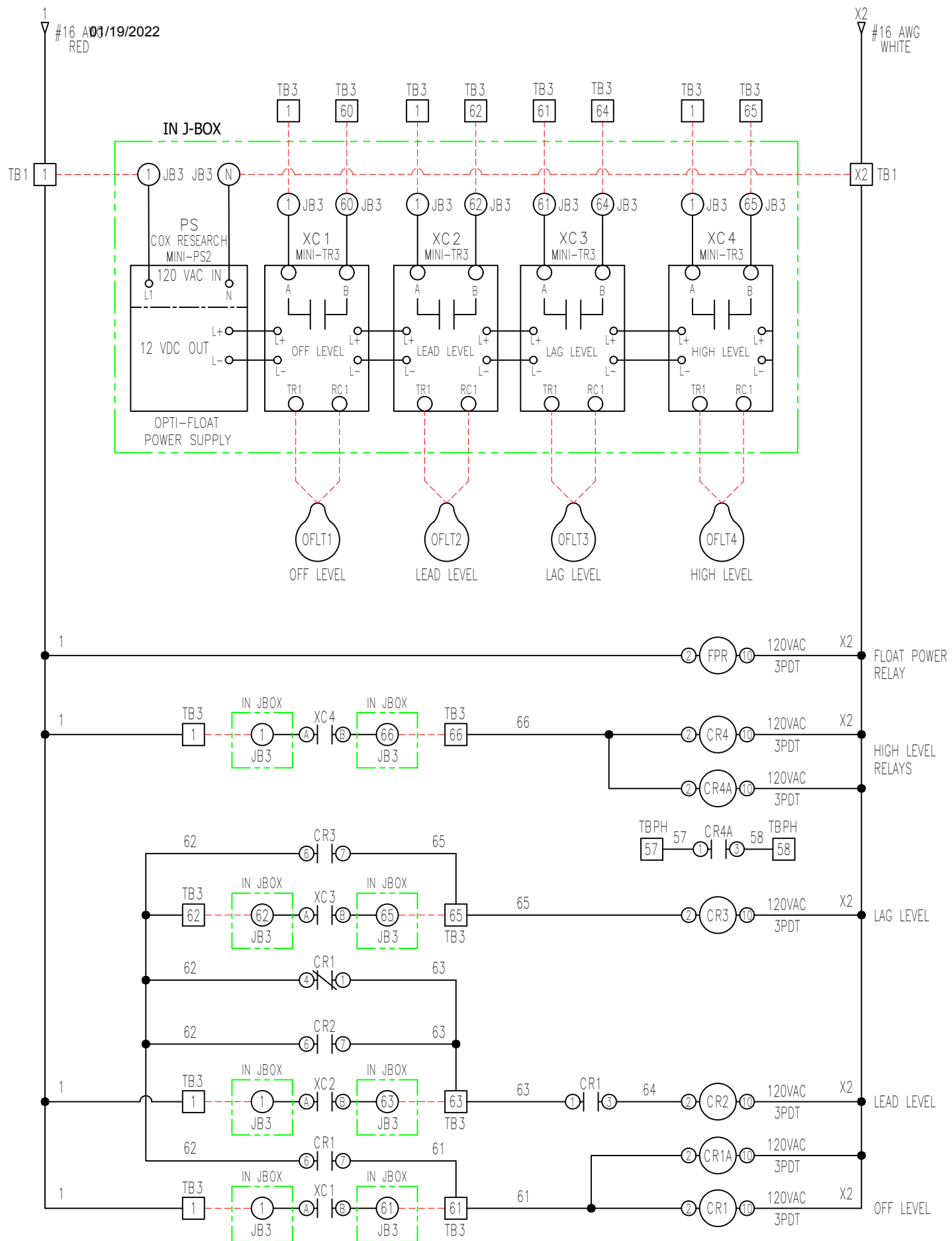
CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
 PROJECT: City of Crestview
 Black Water Golf Club Master Station
 480VAC, 3-Phase, 50.0HP, 67.1FLA
 Duplex VFD with Mixer & Blower Motor Control Panel



CHECKED BY: Jeff Nuckols
 DRAWN BY: BWG
 DATE CREATED: 12/23/2021
 SCALE: N.T.S.
 DWG DESCRIPTION: ELECTRICAL (E6)
 DWG TYPE: SUBMITTAL

REV.	DATE	INITIAL	DESCRIPTION
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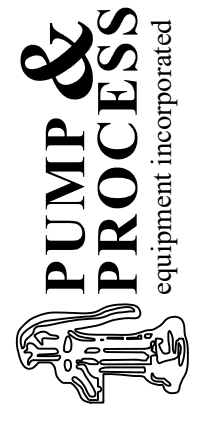
REVISION NO. 01
 SHEET 9 OF 13
 JOB No. 221659



SUBMITTAL

REV.	DATE	INITIAL	DESCRIPTION
00	01-10-22	BWG	Submittal Dwg. out for Customer Review and Approval.
01	01-12-22	BWG	Revised Submittal Dwg. to remove Barnes Pump Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.

DRAWN BY:	BWG	CHECKED BY:	Jeff Nuckols
DATE CREATED:	12/23/2021	SCALE:	N.T.S.
DWG. DESCRIPTION:	ELECTRICAL (E6)		
DWG. TYPE:	SUBMITTAL		

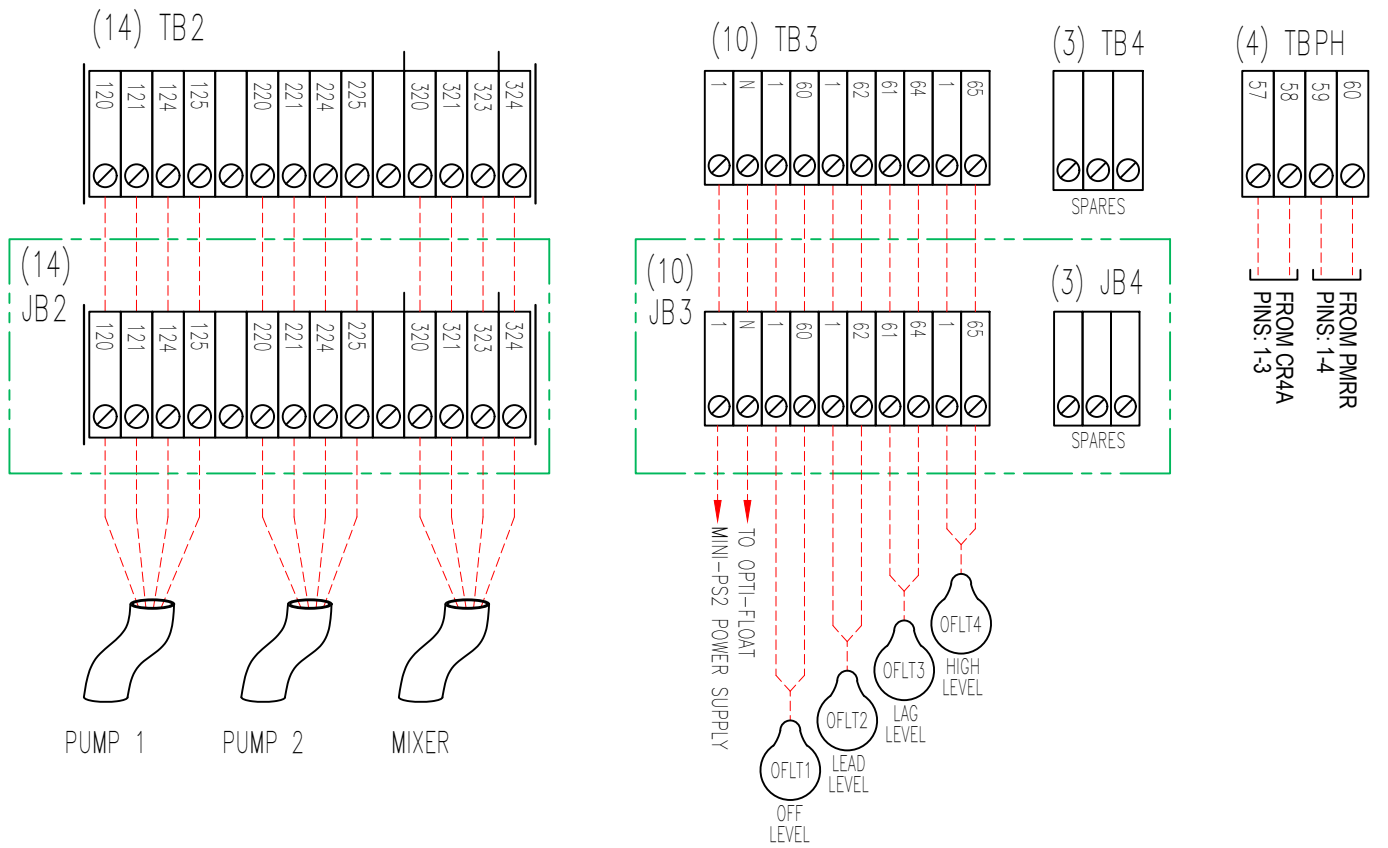
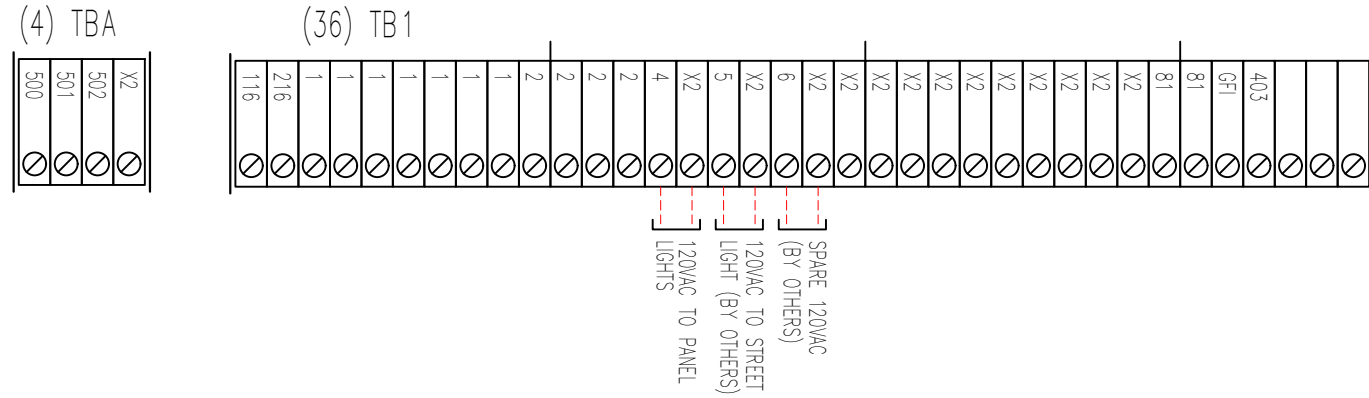


PUMP & PROCESS
equipment incorporated

CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
 PROJECT: City of Crestview
 Black Water Golf Club Master Station
 480VAC, 3-Phase, 50.0HP, 67.1FLA
 Duplex VFD with Mixer & Blower Motor Control Panel

JOB No: 221659
 SHEET OF 13
 REVISION No 01

TERMINAL BLOCK LAYOUTS:



Programming for Pump Motor 1 and 2 VFD's - FC-202P37KT4E21H2XGC7....

QUICK MENU:

0-01	[0] ENGLISH	LANGUAGE
0-02	[1] Hz	MOTOR SPEED UNIT
1-21	50HP	MOTOR POWER (Horsepower)
1-22	480V	MOTOR VOLTAGE
1-23	60Hz	MOTOR FREQUENCY
1-24	67.1A	MOTOR CURRENT
1-25	1776	MOTOR NORMAL SPEED

MAIN MENU:

3-41	10 SECONDS	RAMP UP TIME
3-42	10 SECONDS	RAMP DOWN TIME
4-12	60.0Hz	MOTOR LOW LIMIT
4-14	60 .0Hz	MOTOR HIGH LIMIT
1-29	[0] OFF	AUTOMATIC MOTOR ADAPTATION
5-40	[5]	RELAY 1 = RUNNING
5-40	[9]	RELAY 2 = ALARM
6-50	133	A0(T42) = MOTOR CURRENT 4-20mA
22-75	[1] ENABLE	SHORT CYCLE PROTECTION
22-76	1 Minute - 30 Seconds	INTERNAL B / W STARTS

Programming for Blower Motor VFD - FC-051P2K2T4E20H3BXCX.....

QUICK MENU:

1-29	[0] OFF	AUTOMATIC MOTOR
1-25	1704	MOTOR NORMAL
1-24	3.9A	MOTOR CURRENT
1-23	60Hz	MOTOR FREQUENCY
1-22	480V	MOTOR VOLTAGE
1-20	3.0HP	MOTOR POWER (Horsepower)
3-42	3.0 SECONDS	RAMP DOWN TIME
3-41	3.0 SECONDS	RAMP UP TIME
3-03	60.0	MAXIMUM REFERENCE
3-02	60.0	MINIMUM REFERENCE

MAIN MENU:

5-40	[5]	RUN
------	-----	-----

Programming Note for Soft Starters "SS1" and "SS2": MCD6-0086B-T5-S1X-CV2

(1.2)	41A	MOTOR CURRENT
(1.3)	22	MOTOR KILOWATTS
(2.2)	10.0 SECONDS	RAMP UP TIME
(2.10)	10.0 SECONDS	STOP TIME
(8.4)	TRIP	RELAY B

SUBMITTAL

CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
 PROJECT: City of Crestview
 Black Water Golf Club Master Station
 480VAC, 3-Phase, 50.0HP, 67.1FLA
 Duplex VFD with Mixer & Blower Motor Control Panel

CHECKED BY: Jeff Nuckols
 DRAWN BY: BWG
 DATE CREATED: 12/23/2021
 DWG DESCRIPTION: TERMINAL BLOCKS & VFD PROGRAMMING
 DWG. TYPE: SUBMITTAL

REVISION No. 11 OF 13 SHEET 11 OF 13

01

BILL OF MATERIALS

PART No.	DESCRIPTION	MFR.	QTY.
1	SPHCDSS-7210414	ENCLOSURE, NEMA 12/3R, TYPE 304 STAINLESS STEEL, WITH PAINTED WHITE FINISH (72"H X 104"W X 14"D)	SCHAEFER 1
2	SPP-7231	ENCLOSURE VERTICAL BACK PANEL, 11 GA. CARBON STEEL WITH PAINTED WHITE FINISH (69"H X 28"W)	SCHAEFER 1
3	SPP-7271	ENCLOSURE L-SHAPE BACK PANEL, 11 GA. CARBON STEEL WITH PAINTED WHITE FINISH (69"H X 68"W)	SCHAEFER 1
4	HID-7227	ENCLOSURE FAR LEFT INNER DOOR, FABRICATED FROM .125 BLACK ENGRAVED ALUMINUM	ECS 1
5	HID-7233	ENCLOSURE CENTER AND FAR RIGHT INNER DOORS, FABRICATED FROM .125 BLACK ENGRAVED ALUMINUM	ECS 2
6	SPSS-PEDESTAL-1610414	VENTILATED PEDESTAL WITH ACCESS DOORS AND EXPANDED METAL, FLOOR MOUNTED, WITH PAINTED WHITE FINISH	SCHAEFER 1
7	SDSA4040D	SURGE PROTECTION DEVICE, 3-PHASE, 3-WIRE, 480VAC DELTA	SQUARE D 1
8	QOSAMK	MOUNTING BRACKET FOR SURGE PROTECTION DEVICE	SQUARE D 1
9	JDL36200	MAIN CIRCUIT BREAKER, 3-POLE, 200 AMP, 18KAIC @ 480VAC	SQUARE D 1
10	HDL36110	PUMP MOTOR CIRCUIT BREAKERS, 3-POLE, 110 AMP, 18KAIC @ 480VAC	SQUARE D 4
11	HDL36015	MIXER AND BLOWER CIRCUIT BREAKERS, 3-POLE, 15 AMP, 18KAIC @ 480VAC	SQUARE D 2
12	HDL26020	TRANSFORMER #1 PRIMARY CIRCUIT BREAKER, 2-POLE, 20 AMP, 18KAIC @ 480VAC	SQUARE D 1
13	QOU150	TRANSFORMER #1 SECONDARY CIRCUIT BREAKER, 1-POLE, 50 AMP, 10KAIC @ 120VAC	SQUARE D 1
14	QOU110	CRYSTAL BALL CIRCUIT BREAKER, 1-POLE, 10 AMP, 10KAIC @ 120VAC	SQUARE D 1
15	QOU115	CONTROL POWER & GFCI RECEPTACLE CIRCUIT BREAKERS, 1-POLE, 15 AMP, 10KAIC @ 120VAC	SQUARE D 2
16	QOU120	PANEL AND STREET LIGHTS ALONG WITH SPARE CIRCUIT BREAKERS, 1-POLE, 20 AMP, 10KAIC @ 120VAC	SQUARE D 3
17	LC2D115G7	FVNR REVERSING ISOLATION CONTACTORS, IEC SIZE "J", 3-POLE, 480VAC, 75HP, 115 AMP	SQUARE D 2
18	LC1D18G7	FVNR MIXER MOTOR CONTACTOR, IEC SIZE "C", 3-POLE, 480VAC, 10HP, 18 AMP	SQUARE D 1
19	LRD10	MIXER MOTOR OVERLOAD RELAY, 3-POLE, CLASS 10, RANGE: 4.0 - 6.0 AMP	SQUARE D 1
20	SLU-100-ASA	UNIVERSAL PHASE MONITOR, 3-PHASE, SPDT, 360-500VAC, MULTI-MODE PHASE MONITORING, 8-PIN OCTAL	DIVERSIFIED 1
21	FNQ-R-1	PHASE MONITOR RELAY FUSES (F1 - F3), Slo-Blo, TIME-DELAY, REJECTION TYPE, 500VAC, 1 AMP	BUSSMANN 3
22	811-430	FUSE BLOCK FOR PMR FUSES (FB1), 3-POLE, CLASS "CC", ULTRA-SAFE, 30 AMP	WAGO 1
23	FNM-1	SOFT STARTER PROTECTION FUSES, Slo-Blo, TIME-DELAY, 250VAC, 1 AMP	BUSSMANN 2
24	BMM6032PQ	FUSE BLOCK FOR SOFT STARTER PROTECTION FUSES (FB2), 1-POLE, 30 AMP, 600V	BUSSMANN 1
25	ARP120A3R	ALTERNATING RELAY, DPDT, CROSS-WIRED, 120VAC, WITH SELECTOR SWITCH, 8-PIN OCTAL	MACROMATIC 1
26	9050JCK11V20	ON-DELAY TIMERS FOR VFD 1 & 2 START (VSR1 & VSR2), DPDT, 10A, RANGE: 0.1 - 10.0 SEC., 120VAC, 8-PIN OCTAL	MACROMATIC 2
27	70169-D	RELAY SOCKET FOR PMR, ALTERNATING, AND ON-DELAY TIMING RELAYS, OCTAL, 8-PIN OCTAL, 600VAC	MACROMATIC 4
28	750XCXRM4L-120A	VARIOUS CONTROL RELAYS, PLUG-IN, 3PDT, 10A, 120VAC, 11-PIN OCTAL	MAGNECRAFT 35
29	RUZSC3M	RELAY SOCKETS FOR VARIOUS CONTROL RELAYS, PLUG-IN, 11-PIN OCTAL, 12A, 250VAC	SQUARE D 35
30	FM1STUZ-120U	TIME CLOCK FOR MIXER AND BLOWER (TC3 & TC4), 24-HOUR, 15 MINUTE INTERVALS, 1-CHANNEL, SPDT, 120VAC	INTERMATIC 2
31	722-0004	ELAPSED TIME METERS (ETM1, ETM2, & ETM3), ROUND TYPE, 6-DIGIT, 120VAC	TRUMETER 3
32	9001SKS43B	3-POSITION SELECTOR SWITCH FOR HAND-OFF-AUTO, 30mm, 120V, MAINTAINED	SQUARE D 4
33	9001SKS11B	2-POSITION SELECTOR SWITCH FOR CONTROL MODE, 30mm, 120V, MAINTAINED	SQUARE D 3
34	XB7EV04GP	22mm PILOT LIGHT, INTEGRAL LED, 120VAC, RED	SQUARE D 5
35	XB7EV03GP	22mm PILOT LIGHT, INTEGRAL LED, 120VAC, GREEN	SQUARE D 5
36	XB7EV05GP	22mm PILOT LIGHT, INTEGRAL LED, 120VAC, YELLOW	SQUARE D 10
37	9001SKR1U	PUSH BUTTON SWITCH, 30mm, 120VAC, FLUSH TYPE, UNIVERSAL	SQUARE D 2
38	9001KU7	PUSH BUTTON SWITCH PROTECTIVE BOOT FOR ALARM SILENCE BUTTON	SQUARE D 1
39	9001KA1	CONTACT BLOCK, (1) NORMALLY OPEN / (1) NORMALLY CLOSED	SQUARE D 7
40	9001KA2	CONTACT BLOCK, (1) NORMALLY OPEN	SQUARE D 1
41	9001KA3	CONTACT BLOCK, (1) NORMALLY CLOSED	SQUARE D 1
42	1333597CH	POWER DISTRIBUTION BLOCK (PDB), 3-POLE, 510 AMP, 600VAC / WITH PROTECTIVE COVER	MARATHON 1
43	1333554CH	MOTOR DISTRIBUTION BLOCKS (MDB#), 3-POLE, 310 AMP, 600VAC / WITH PROTECTIVE COVER	MARATHON 2
44	1331555CH	CONTROL POWER DISTRIBUTION BLOCK (CPDB), 1-POLE, 350 AMP, 600VAC / WITH PROTECTIVE COVER	MARATHON 1

CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
 PROJECT: City of Crestview
 Black Water Golf Club Master Station
 480VAC, 3-Phase, 50.0HP, 67.1FLA
 Duplex VFD with Mixer & Blower Motor Control Panel
 JOB No: 221659
 SHEET 12 OF 13
 REVISION No. 01



CHECKED BY: Jeff Nuckols
 DRAWN BY: BWG
 DATE CREATED: 12/23/2021
 SCALE: N.T.S.
 DWG DESCRIPTION: BILL OF MATERIALS
 DWG. TYPE: SUBMITTAL

REV.	DATE	INITIAL	DESCRIPTION
00	01-10-22	BWG	Submittal Dwg. out for Customer Review and Approval.
01	01-12-22	BWG	Revised Submittal Dwg. to remove Barnes Pump Monitor Modules and replaced with KSB Pump Safe Modules for all Motors.

SUBMITTAL

BILL OF MATERIALS CONTINUED

PART No.	DESCRIPTION	MFR.	QTY.
45	GFRST15SNAPW	HUBBELL	1
46	SNAP2RA	HUBBELL	1
47	8WA1 011-1DG11	SIEMENS	3
48	8WA1 011-3DG21	SIEMENS	6
49	8WA1 011-0DG21	SIEMENS	5
50	8WA1808	SIEMENS	8
51	8WA746	SIEMENS	4
52	ADR11-21	THOMAS & BETTS	7
53	LAMA2-14-QY	PANDUIT	2
54	PK9GTA	SQUARE D	2

SHIPPED LOOSE PARTS

PART No.	DESCRIPTION	MFR.	QTY.
1	350-120-30	FEDERAL SIGNAL	1
2	WB (G0325972)	FEDERAL SIGNAL	1
3	T15 CGN	CROUSE-HINDS	1
4	STA 1	CROUSE-HINDS	1
5	1/2 X 3 ALUM	N/A	1
6	1/2 X 6 ALUM	N/A	1
7	VALS-120R (G1321433)	FEDERAL SIGNAL	1
8	CD1 SA	CROUSE-HINDS	1

SPARE PARTS

PART No.	DESCRIPTION	MFR.	QTY.
1	FNQ-R-1	BUSSMANN	1
2	FNM-1	BUSSMANN	1
3	XB7EV04GP	SQUARE D	1
4	XB7EV03GP	SQUARE D	1
5	XB7EV05GP	SQUARE D	1
6	SLU-100-ASA	MACROMATIC	1
7	ARP120A3R	MACROMATIC	1
8	750XCXRM4L-120A	MAGNECRAFT	1

CUSTOMER SUPPLIED PARTS

PART No.	DESCRIPTION	MFR.	QTY.
1	MODULE A	KSB	3
2	CRYSTAL BALL	OMNI-SITE	1
3	TRAB4503	LAIRD	1
4	MINI-PS2	COX RESEARCH	1
5	MINI-TR3	COX RESEARCH	4
6	OPTI-F160	COX RESEARCH	4
7	FC-051P2K2T4E20H3BXCX....	DANFOSS	1
8	FC-202P37KT4E21H2XGC7....	DANFOSS	2
9	130B1048	DANFOSS	2
10	130B3910	DANFOSS	2
11	130B1117	DANFOSS	2
12	MCD6-0086B-T7-51X-20-CV2	DANFOSS	2

CUSTOMER: PUMP & PROCESS EQUIPMENT, INC.
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 Black Water Golf Club Master Station
 480VAC, 3-Phase, 50.0HP, 67.1FLA
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CHECKED BY: Jeff Nuckols
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 DWG DESCRIPTION: BILL OF MATERIALS CONTINUED
 DWG. TYPE: SUBMITTAL

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SUBMITTAL

SHEET 13 OF 13
 REVISION No. 221659



Emergency response expense threatens your budget Danfoss DrivePro-tection provides the solution

Downtime expense and hassle of many types of accidental drive damage are minimized for periods up to 10 years. One call provides quick and complete

response from the leaders in variable frequency drive technology and support.



\$3,500

average savings

Compared to the cost of repairing or replacing a mid-sized drive

60%

downtime reduction

Typically achieved with factory-direct support

Zero



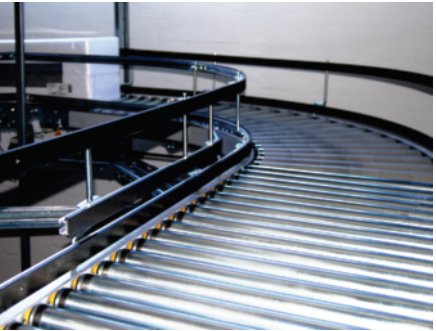
unexpected cost

For emergency drive support



DrivePro-tection

DrivePro-tection coverage is available at the time of drive purchase for periods up to ten years. Contact Danfoss for details.

Application	Coverage	Support
<p>HVAC and Water / Wastewater</p>  	<ul style="list-style-type: none"> • Line anomalies - including lightning strikes • Load anomalies • Accidental exposure to moisture or corrosives • Accidental collision or other physical damage • Defects in product material or workmanship • Normal product wear <p>Product misapplication, vandalism, facility disasters, chronic problems due to the application and shipping damage are not included</p>	<p>Onsite Service is provided by local authorized Danfoss service partner companies throughout the US* and Canada</p> <ul style="list-style-type: none"> • Replacement drive material • Drive repair labor • Travel Expense • Material freight costs <p>*Continental 48 states plus Anchorage, Alaska and Oahu, Hawaii.</p>
<p>Industrial</p> 	<ul style="list-style-type: none"> • Line anomalies - including lightning strikes • Load anomalies • Accidental exposure to moisture or corrosives • Accidental collision or other physical damage • Defects in product material or workmanship • Normal product wear <p>Product misapplication, vandalism, facility disasters, chronic problems due to the application and shipping damage are not included</p>	<p>Depot Repair is provided at a Danfoss North America factory repair facility</p> <ul style="list-style-type: none"> • Replacement drive material • Drive repair labor • Return freight <p>Onsite support available on a charge/call basis</p> <p>Onsite Service DrivePro-tection contracts available for some Industrial applications. Contact Danfoss DrivePro sales for details.</p>

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 1.414.355.8800
 Fax: 1.414.355.6117
 Email: drivepro@danfoss.com





Application

The OmniSite Crystal Ball provides for a flexible, easy to install and configure, powerful controller/monitor.

The OmniSite Crystal Ball data may be also fully integrated into existing SCADA databases using OmniSite's SCADA-Bridge™ software package.

Single integrated controller eliminates the need for multiple PLCs, radios, software, computers, modems, relays and other accessories. Complete packaged unit can be installed in under two hours, without the need for highly specialized technicians.

The Crystal Ball includes OmniSite's "plug and play" GuardDog web interface, which eliminates the need for custom programming.

OmniSite products are protected by US Patent #7,228,129 and other patents pending

Item Description

The OmniSite Crystal Ball is a stand alone single channel set point controller and web based alarm notification system that provides the capability to monitor and control remotely located equipment of any type without dedicated telephone lines or proprietary radio systems. Your connected equipment and machinery is completely monitored over the Internet using just a web browser, so there is no software to buy. If an abnormal condition occurs, notifications are sent by e-mail, pager, or voice call to any location.

Features

- Immediate alarm reporting, otherwise report machinery operational data every 15 minutes using the Elite Data package
- True SCADA replacement at fraction of cost/complexity
- Perfect solution for monitoring critical or remote applications
- Advanced internet based monitor, analyzer and controller

Specification Highlights

Power	12 VDC or 120 VAC
Communications	Cellular GSM 850/900/1800/1900 MHZ
Access Key	Smart security key to identify personnel on site
Terminal Blocks	Removable style accepts #14-18 AWG solid or stranded wire
Operating Temp.	-20/150 Deg F
Operating Humidity	0-90% RH Non-condensing
Certification	UL Pending
Dimensions	8.9"H x 9.4"W x 3.8"D
Memory Stick	32Mb- 1 Gb user selectable
LCD Display	4 X 20 rugged operation
Keypad	(8) universal navigation buttons
Analog Inputs	(4) 4-20mA, isolated, 10 bit resolution
Relay Outputs	(4) 20A @ 120VAC resistive
Digital Inputs	(14) Universal Inputs accept 12 VAC/VDC – 120 VAC/VDC



Ordering Information

Model	Description
CB	Crystal Ball Set Point Controller
Enclosure Options	
PM	No Enclosure – NEMA 1 Rated
EN	NEMA 4X Enclosure with Solid Opaque Cover
ENCV	NEMA 4X Enclosure with Clear See-Through Cover
Power Supply	
12	12 VD C
120	120 VAC

CB	ENCV	120
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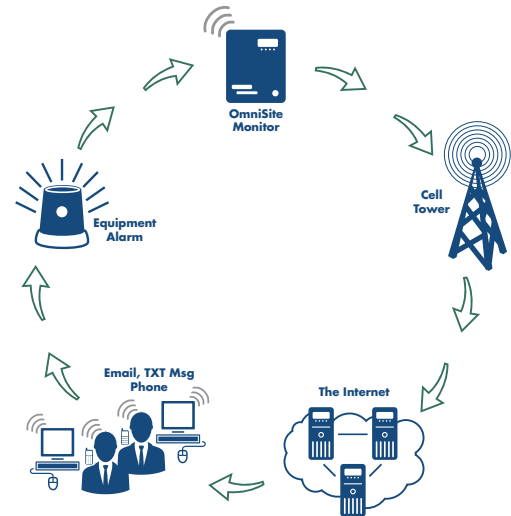
Example: CB-ENCV-120 Crystal Ball Set Point Controller in NEMA 4X Enclosure w/ clear cover and 120VAC power.

How OmniSite Works

OmniSite relies on a combination of cellular telephone and web based technology. The Crystall Ball is installed at your remote equipment and sends a wireless signal to the local cellular tower.

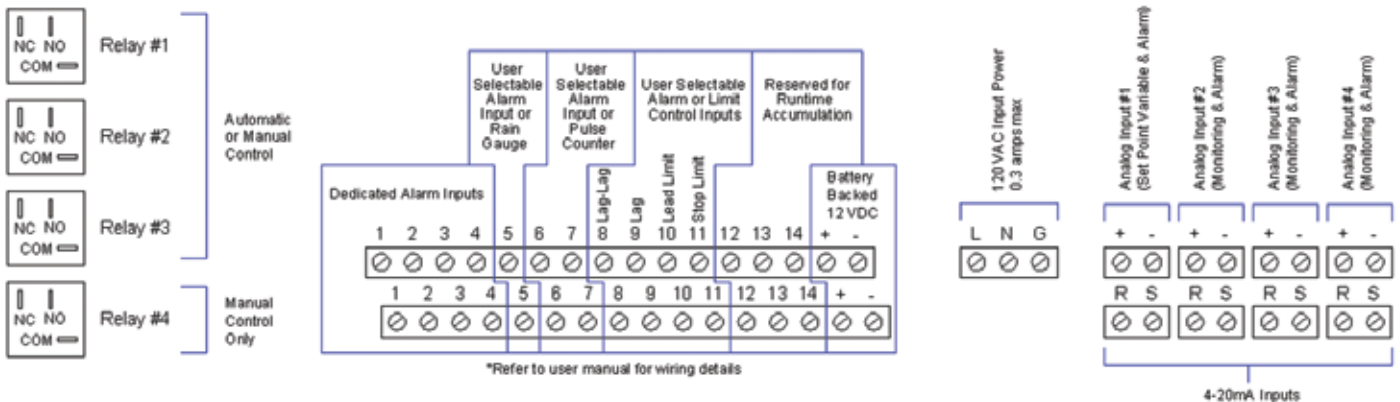
That signal is bounced to OmniSite’s web interface, where you can log on - any day, any time, from any computer - and see how your remote equipment is operating. A “call out” list is set up online, so that when an alarm is triggered, identified operators are contacted immediately.

Because OmniSite engineers recognize today’s fast-paced busy world, that notification comes by way of text message, email or call to your cellular or hard-wired phone.



Wiring

CRYSTAL BALL SETPOINT CONTROLLER*



OmniAdvantage Plan

2018 / 19

Your Plan Upgrade **EXPERIENCE**

THE END TO TELEMETRY REPAIR AND REPLACEMENT COSTS

The OmniAdvantage Plan

Putting an end to repair and replacement costs. Lifetime protection for every device, plus more:



LIFETIME PRODUCT WARRANTY

Never pay for an RMA, unit inspection, or even shipping. We cover failures for the life of the device. No quotes, approvals, or costs. What if an input is wired incorrectly, covered! What if a board fails and the device is 15 years old, covered! You have enough to worry about; cross device repair and replacement off the list. Some warranty exclusions apply.



LIFETIME RADIO UPGRADES

This solution, available only to OmniAdvantage customers, provides an end to radio upgrades and connection issues that use to affect every telemetry connected device. Our new Modular Radio, OSMR (pronounced Oz-Mer) is field replaceable, and simply plugs into your device. Zero cost, minimal effort, no RMA. Free shipping on all OSMR Radio kits.



FREE SOFTWARE UPGRADES AND 2.0 MOBILE APP

Our software team is integrating new features and software updates. As an OmniAdvantage account holder, you get every new software upgrade and feature. Including our new GuardDog 2.0 Mobile App, which allows full reporting, diagnostics and device setup from your mobile device or tablet. Device setup is now available with the new GuardDog 2.0 App.



GUARDDOG SETUP AND PRIORITY SUPPORT

Need to setup a new device or require assistance with a new GuardDog account and want hands-on assistance? In addition to troubleshooting current devices, we include free GuardDog setup on all new devices and accounts. Priority support includes unlimited phone and email support, and same day support if you call/email before 4p EST on a business day.



PROFESSIONAL TRAINING

A comprehensive training course that covers the many aspects of installing OmniSite products, configuring alarms, and monitoring day-to-day activity. Training will be hosted in our newly renovated, state-of-the-art Training Center, where we incorporate OmniSite devices into real-world wastewater control panels. Available free to any member of your organization.

OmniAdvantage features apply account wide, every device must have annual OmniAdvantage subscription in addition to annual cellular service. Not available for all devices. Can not be used for SmarteLight, and Viper Kit. Ask your account rep about upgrading devices. Exclusions to OmniAdvantage warranty apply. See OmniAdvantage Warranty statement for more details.

Basic plan is available, features apply account wide. Basic plan includes Standard 1-Year Warranty for New XR50, Crystal Ball and OmniBeacon products for 1 year only, read-only GuardDog app, \$89/device GuardDog Setup Fee (If requested), and \$129 inspection fee on RMA devices. Training supplied as a paid for service. No Extended Warranty or Service Contract Option, fees vary on Radio upgrades and repairs; will be quoted on an individual RMA basis.

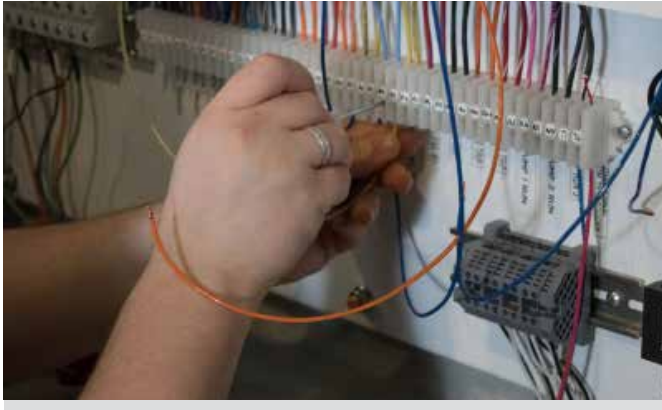
Plan Comparison

OmniAdvantage and Basic Plan features apply account wide, every device must have annual OmniAdvantage or Basic subscription in addition to cellular service. OmniAdvantage is not available for all devices. Cannot be used for Smartelight or Viper Kit products. Ask an OmniSite Inside Sales Specialist about upgrading devices.

Description	OmniAdvantage	Basic
Lifetime Product Warranty Zero RMA costs, we'll repair or replace any defect. See OmniAdvantage Limited Warranty Statement.		Inspection Fee Starting at \$129 per RMA
Lifetime Radio Upgrades We'll replace your radio at no additional cost due to failure or network sunset.		Restrictions Apply Starting at \$299 per Radio
Professional Training Free in-house and webinar training available to all of your employees.		Webinar Training Only
Priority Support and GuardDog Setup Will return all calls and emails same day if received by 4p EST. Free device setup by our Support Team.		-
GuardDog 2.0 Full Featured Mobile App Our full featured app allows device setup , callout list customization and reporting.		-
Free standard support Access to phone queue and email support. Return emails within 2 business days.		
Web-based Device Management Software GuardDog Web is a full featured device setup and management software package.		
GuardDog 1.0 Read-Only Mobile App Notifications and device status only. Download via Android Play Store and iTunes AppStore.		
1 Year Limited Warranty on New Products Covers new products for 1 Year after activation. Exclusions apply. See Standard Warranty Statement.		

TRAINING AND SUPPORT

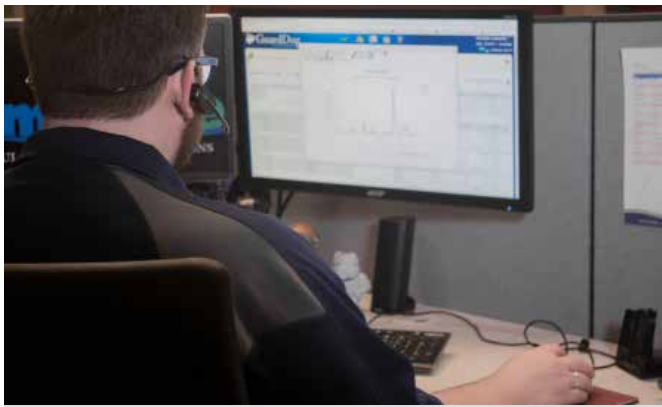
It's the difference in our product. From in-person, hands on training to webinars, phone and email support. We ensure you understand our product and that it's reporting and alerting when you need it.



TRAINING WORKSHOP

Weekly // Up to 4 Participants

Our 2-day, hands-on training lab covers everything from software that powers our products to the hardware that detects alarms. Our teacher led course leaves no stone unturned in regards to cellular telemetry and your lift station. All participants receive breakfast daily, in addition to lunch and dinner on day 1. Centrally located on the Southside of Indianapolis.



ONLINE SOFTWARE WEBINAR

Multiple times per week

Detailed training on our GuardDog Web Software. From device setup to customizations, we'll cover aspects that help you better manage your OmniSite devices. Topics include: callout lists, specific input and application setup.

Sign up for training:
www.omnisite.com/training



PRIORITY SUPPORT

UNLIMITED M-F, 8A-5P EST

Our OmniAdvantage customers get priority, same-day support from our team of experts. We return all phone calls and emails received before 4pm the same-day. We also provide full GuardDog setup to help fit your application.

Email us at support@omnisite.com to learn more.

VIEW OUR SUPPORT PAGE WITH MORE INFO. VISIT // www.omnisite.com/support

OmniSite Modular Radio (OSMR)



OVERVIEW

Cellular networks are evolving. From the early days of analog to today's blazing fast 4G/LTE networks, to tomorrow's 5G. When a cell network evolves, it brings with it the challenges of a Sunset as one network bandwidth is shutdown and transitioned to the next. In the past, our solution involved bringing in every device and physically replacing the radio circuit board.

With our new OSMR system, we will simply send you a field installable radio card. Once retrofitted, OSMR will make tear out and replace a thing of the past.

How does it work?

Once your existing devices are OSMR retrofitted, we'll be able to simply mail you a new OSMR card to plug into your device. Some of your units may already be retrofitted and ready to go. A member of our Account team will contact you to discuss your options.

Why should you upgrade?

We want to put an end the time and effort that comes with cellular network sunsets. Our new OSMR radio and GuardDog 2.0 application allow the best in remote telemetry and real-time notifications plus reporting.

SIMPLIFY YOUR TELEMETRY RADIO UPGRADES!

Introducing GuardDog 2.0

With our new app, you have a way to gather all notifications at your fingertip. With advanced information that you would expect to find in our web app. The only telemetry provider with full featured app capabilities. From Real-Time alerts to notification history, you have all the data you need to keep your water and wastewater system working 24/7.

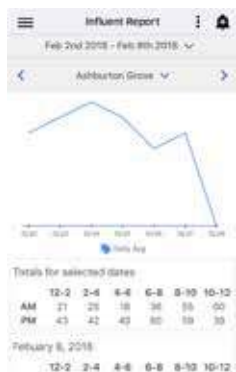
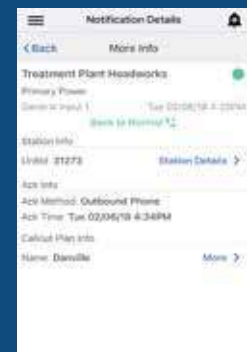
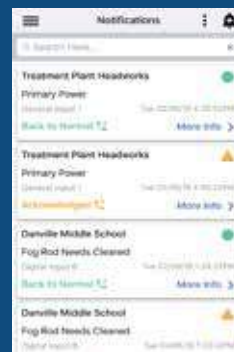


STATION DETAILS

Easy navigation puts station status and details at your fingertips. From current alarms to setup, access your stations from anywhere at anytime.

REAL-TIME NOTIFICATIONS

In addition to our standard phone call, SMS, and email alerts, you can access complete notification details at anytime.



Total for Selected Dates			
	Pump 1	Pump 2	Pump 3
Cycles	1940	1099	1028
Runtimes	242155	234630	238131
GPM	1914	1973	1970

November 10, 2017			
	Pump 1	Pump 2	Pump 3
Cycles	24	33	24
Runtimes	7122	4538	6534
GPM	1900	1000	1000

November 9, 2017			
	Pump 1	Pump 2	Pump 3
Cycles	24	24	24
Runtimes	7122	4534	6534
GPM	1900	1000	1000

November 8, 2017			
	Pump 1	Pump 2	Pump 3
Cycles	24	24	24
Runtimes	7122	4534	6534
GPM	1900	1000	1000

REPORTING

What's data collection without the reports? Access all your station reports from the app, accessible with just a few taps of your finger.

Software & Application Updates

Our software team is constantly making updates and adding improvements. As an OmniAdvantage customer you'll have access to every update as soon as it's released. For instance, our new GuardDog 2.0 mobile application was just released and is only available to OmniAdvantage customers.



SOFTWARE HIGHLIGHTS

Real-time alerts and station status

Flexible notification scheduling by day and time

Notifications via phone call, email, text and GuardDog 2.0 Application

Graphing, charting and full reporting capabilities

Easy setup, no custom programming or software knowledge needed

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2018 / 19

THANK YOU FOR YOUR BUSINESS

**WE LOOK FORWARD TO PROVIDING
A WORLD CLASS TELEMETRY SOLUTION**

ADDRESS

203 W. Morris St.
Indianapolis, IN 46225

PHONE

Sales : 317-885-6330 x104
Support : 317-885-6330 x102
Main : 317-885-6330

EMAIL / WEB

omniadvantage@omnisite.com
support@omnisite.com
www.OmniSite.com/omniadvantage

OmniSite makes Internet of Things (IoT) enabled monitors and controls; both the hardware and software that help protect people and the planet. OmniSite's industrial wastewater products prevent sewage at lift stations from flowing into our lakes and streams, this helps ensure our drinking water is pure and clean.



OmniAdvantage LIMITED WARRANTY

- 1. Warranty and Term.** By and through this OmniAdvantage Limited Warranty (“Warranty”), OmniSite warrants to User that Products will operate according to product specifications, except as otherwise excluded herein and subject to the terms and conditions set forth herein, for the period that Product is subscribed to the OmniAdvantage Plan (“Warranty Period”).
- 2. Products Covered.** “Product” or “Products” shall mean OmniBeacon, XR-50 and/or Crystal Ball subscribed to the OmniAdvantage Plan.
- 3. Not Covered.** This Warranty does not cover: a) field services to remove, troubleshoot or reinstall Product(s); b) removal and reinstallation of the Product(s); and c) replacement of batteries. Additionally, the Product(s) should be inspected immediately upon initial receipt and delivery damage claims should be filed with the delivery carrier. OmniSite recommends saving the original box and packing material as User is responsible for any damage to the Product(s) if returned to OmniSite improperly packaged.
- 4. Notice of Claim.** To present a claim, call OmniSite for a Returned Material Authorization (“RMA”) number. Once the RMA number is received, the entire Product assembly (unless specifically listed otherwise on the RMA form) must be sent back to OmniSite for inspection. The RMA form must be included with the Product(s) shipped back to OmniSite. OmniSite is responsible for all shipping charges to send Product(s) to OmniSite and then back User. OmniSite will provide User a prepaid shipping label. By complying with this paragraph, User authorizes OmniSite or its designee to inspect the Product(s) and investigate the cause of the claim.
- 5. Inspection and Remedy.** The Product(s) will be inspected within 1-3 days from receipt by OmniSite. If upon inspection OmniSite determines that the claim is covered and not excluded under this Warranty, the User’s sole and exclusive remedy and OmniSite’s total liability shall be limited to the repair and/or replacement of affected Product(s) or component(s). For valid claims under this Warranty, OmniSite will, in its sole discretion and option, either replace and/or repair Product(s) and component(s). Should the inspection reveal that the claim is not covered or otherwise excluded under this Warranty, OmniSite will advise the User of the type and/or extent of repairs required to be made at the User’s expense that will permit this Warranty to remain in effect for the unexpired portion of its term. OmniSite will not begin work until a written purchase order is received.
- 6. Exclusions.** In addition to other exclusions provided for in this Warranty, OmniSite shall have no obligation under this Warranty, or any other liability, now or in the future, if any damage, defect, or claim is caused by natural forces, disasters, or acts of God including, but not limited to, lightning, fires, hurricanes, floods, tornadoes, hail, wind-blown debris, earthquakes, volcanic activity.
- 7. No Extension.** Payment of any wireless service charge for Product(s) covers only cellular transmission fees and in no way extends any portion of this Warranty.
- 8. Payment Required.** OmniSite shall have no obligation under this Warranty unless and until OmniSite has been paid in full for all Products, services, plans and other costs which are due and owing to OmniSite. Non-payment of OmniAdvantage Plan subscription fees will render this Warranty null and void.



OmniAdvantage LIMITED WARRANTY (CONT.)

9. Disclaimer. THE USER SHOULD TAKE CARE TO DETERMINE PRIOR TO USE WHETHER PRODUCTS ARE SUITABLE, ADEQUATE AND/OR SAFE FOR THE USE INTENDED. INDIVIDUAL APPLICATIONS ARE SUBJECT TO VARIATION AND AS SUCH OMNISITE MAKES NO REPRESENTATION OR WARRANTY AS TO SUITABILITY OR FITNESS OF PRODUCTS FOR ANY SPECIFIC APPLICATION. THIS LIMITED WARRANTY SUPERSEDES AND IS IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND OMNISITE HEREBY DISCLAIMS ALL SUCH WARRANTIES.
10. Limitation of Damages. THIS LIMITED WARRANTY SHALL BE THE OWNER'S SOLE AND EXCLUSIVE REMEDY AGAINST OMNISITE, AND OMNISITE SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL OR OTHER DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE, REAL OR PERSONAL.
11. Transfer and Amendment. This limited warranty cannot be transferred, amended, altered or modified in any way except in writing signed by an authorized officer of OmniSite. No other person has any authority to bind OmniSite with any representation or warranty whether oral or written.
12. Waiver. OmniSite's failure to enforce any of the terms or conditions stated herein shall not be construed as a waiver of such provision or of any other terms and conditions of this Limited Warranty.
13. Disputes. Any dispute, controversy or claim regarding, arising out of or related to this Warranty shall be settled by mediation. In the event the parties do not resolve the dispute, controversy or claim in mediation, the parties agree that neither party will commence or prosecute any suit, proceeding, or claim other than in the courts of Marion County in the state of Indiana or the United States District Court, Southern District of Indiana, Indianapolis Division. Each party irrevocably consents to the jurisdiction and venue of the above-identified courts.
14. Governing Law. This Limited Warranty shall be governed by and construed in accordance with the laws of the State of Indiana without regard to that State's rules on conflict of laws.
15. Severability. If any portion of this Limited Warranty is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions shall nevertheless continue in full force

**LIGHT LINK
TRANSCIEVER:**

Operating voltage:
12VDC

Power consumption:
1 VA/Transceiver

Relay output:
SPDT 3 amp @ 240 VAC

Ambient operating temperature:
-15 to +130F (-25 to +55C)

Storage temperature:
-15 to +155F (-25 to +70C)

Dimensions:
L: 3.7" W: 1.16" H: 1.43"

RoHS compliant

POWER SUPPLY:

Operating Voltage:
120VAC in, 12VDC out

**Maximum Light Link
Transceiver per power supply:**
5

FLOAT:

Housing material:
Polypropylene

Cable:
Polyurethane over dual
plastic fibers (.31" O.D)

Standard cable lengths:
15', 25', 50', 75'

Ambient liquid operating temperature:
+32 to +130F (0 to +55C)

**Ambient air standby
operating temperature:**
-15 to +155F (-25 to +70C)

Storage temperature:
-15 to +155F (-25 to +70C)

Operating wavelength:
400 to 1200 nm

Bend radius:
1"

Dimensions:
Diameter: 3.5" Length: 4.9"

Typical tether length:
4"

**OPTI-FLOAT[®]
MINI**



**QUICK START
INSTALLATION
GUIDE**

OPTIFLOAT.COM

225.756.3271 > 800.910.9109

COMPONENTS



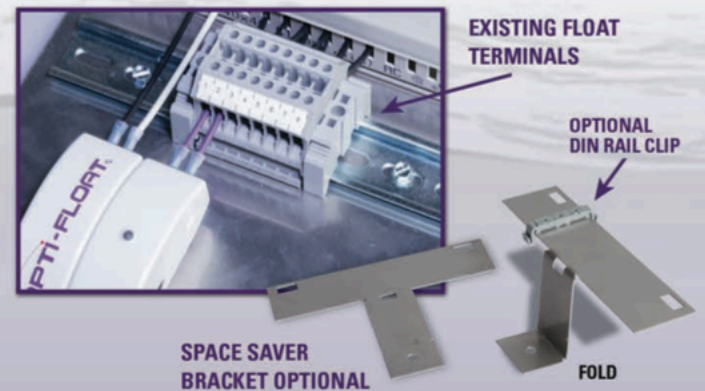
1 WIRE CONNECTIONS



2 INSERT FLOAT FIBER



3 RETROFIT EXISTING PANEL





Engineering Submittal Package

Crestview Blackwater Golf Club PS SD 150

Dealer:

James Mabry
Gulf Coast Industrial Sales Manager
Energy Systems Southeast, LLC
3235 Veterans Circle
Birmingham, AL 35235-3151
205-296-2615
james.mabry@essellc.com
www.ESSSELLC.com

Contractor:

Ken Clark
Clark Services Inc.
5944 Loop Road
Pace, FL 32571
850-463-1089
clarkservices99@gmail.com

SPECIFICATION SHEET

0K5095

SD150 6.7L

0L0187

SPEC OPEN & DELAYED TRANS.CONT

CONTROL PANEL AND OPTIONS

0161920SBY

10 AMP ENGINE-RUN RELAY

0172110SBY

SPEC SHEET H-100 CONTROL PANEL

ALTERNATOR AND OPTIONS

0182630SSD

G26 ALT DATA SHEET 200 KW

0187980SBY

GENPROTECT DATA SHEET

UNIT OPTIONS

0161970SBY

BATTERY INDEX

0163180SBY

SERIES 2000 ENCL SPEC

0180230SBY

SPEC SHEET RHINO COAT

0189380SSD

EATON CB TABLE THERM/MAG

0191900SBY

2.5A & 10A BATT CHRGR H&G

0192390SSD

EATON CB LUG DATA

0192670SBY

PSTS ATC-300 SPC SHT

084918H_SBM

HEATER BLOCK 1500W 240V

INSTALLATION DRAWINGS

0J4194

INSTALL D6.7L OPEN SET D-GRP

0J4194A

INSTALL D6.7L G17 STD D-GRP

0J4214

INSTALL BASE TANK D6.7L D-GRP

67B8424

ATC3C2 200A 3P 208-480 1,3R

GENSET ELECTRICAL DRAWINGS

0H9882

WD D6.7L G17 H-PANEL

0H9883

SD D6.7L G17 H-PANEL

SYSTEM INTERCONNECT DRAWINGS

0191120SSD

INTERCONNECT DIAG H PANEL

EMISSIONS DATA

0185110SSD

SOUND DATA SD150 6.7L

A0001316719

EMISSIONS SD150 D6.7 2021

A0001350199

MFPXL06.7DGS_002

CERTIFICATIONS

0184520SSD

QUALITY CERTIFICATION DOC

0J4299

2YEAR LIMITED WARRANTY STANDBY

0J4303

2YEAR EXTND WARR-TRNSFR SWITCH

0K8347

ISO CERTIFICATE 9001 : 20

A0000083487

2019 EPA CERT KFPXL06.7DGS-007

A0000519419

2020 EPA CERT LFPXL06.7DGS-005

EMSNWRNTY003

EPA WARRANTY STATEMENT US



BILL OF MATERIALS

3235 Veterans Circle
 Birmingham, Alabama 35242
 Phone: 205-296-2615
 Fax: 205-508-4258

Quote Date: 12/13/21

Bill of Materials for: SD 150

Quote #:20545873

Reference: Crestview Blackwater Golf Club PS

We are pleased to offer the following quote for the above project:

Quantity 1 - Generac Industrial diesel engine-driven generator set with turbocharged/aftercooled 6-cylinder 6.7L engine, consisting of the following features and accessories:

- **SD0150KG176.7D18HPYY3**
- **Stationary Emergency-Standby rated**
- **150 kW Rating, wired for 277/480 VAC three phase, 60 Hz**
- **Permanent Magnet Excitation**
- **With upsized 200 kW alternator**
- **Standard Weather Protective Enclosure, Aluminum**
 - **Industrial Grey Baked-On Powder Coat Finish**
- **150 MPH Wind Load Certified**
- **UL2200**
- **EPA Certified**
- **H-100 Control Panel**
 - Meets NFPA 99 and 110 requirements
 - Temp Range -40 to 70 degrees C
 - Digital Microprocessor:
 - Two 4-line x 20 displays, full system status
 - 3 Phase sensing, +/-0.25% digital voltage regulation
 - RS232, RS485 and Canbus remote ports
 - Waterproof connections
 - All engine sensors are 4-20ma for minimal interference
 - Programmable I/O
 - Built-in PLC for special applications
 - Engine function monitoring and control:
 - Full range standby operation; programmable auto crank, Emergency Stop, Auto-Off-Manual switch
 - Isochronous Governor, +/-0.25% frequency regulation
 - Full system status on all AC output and engine function parameters
 - Service reminders, trending, fault history (alarm log)
 - I2T function for full generator protection
 - Selectable low-speed exercise
 - 2-wire start controls for any 2-wire transfer switch
- **Remote Emergency Stop Switch, Flush-Mount, shipped loose**
- **110 AH, 925 CCA Group 31 Batteries, dual-paralleled, with rack, installed**

- 150 MPH Wind Load Certified
- Battery Charger, 10 Amp, NFPA 110 compliant, installed
- Coolant Heater, 1500W
- 36" 510 Gallon Double-Wall UL142 Basetank
 - Mechanical fuel level indicator gauge
 - Electronic fuel level sender
 - Emergency Vent
- 3 Owner's Manuals
- 120V GFCI and 240V Outlet
- Alternator Tropical Coating
- Engine Run Relay
- MLCB, 100% rated thermal-magnetic
 - 200 Amp
- 2-Year Comprehensive Warranty
- SD0150KG176.7D18HPYY3

Quantity 1 - 4.5 6.7 DSL 2C 2 YR P/L/T

Quantity 1 - PSTS Series Automatic Transfer Switch consisting of the following features and accessories:

- **ATC3C2X30200XDU**
- **Standard Open Transition**
- **32F - Inphase Transfer**
- **Contactor-Based Design**
- **200 Amp, 3 Pole, 277/480 VAC three phase**
- **CSA C22.2 Certified**
- **CUL Listed**
- **UL1008 Listed**
- **NEMA 4X Enclosure**
- ATC-300+ Microprocessor-Based Controller
 - 2-Line, 32-Character Alphanumeric LCD Display
 - Front Panel Mimic Diagram with colored LEDs for Source/Load Indication
 - Standard Features:
 - Sensing and Programmable Setpoints for both Normal (S1) and Emergency (S2): Under-voltage/Under-frequency, Over-voltage/Over-frequency; Voltage Unbalance Sensing and Phase Reversal for all phases
 - Adjustable Time Delays: Engine Start, Transfer Normal to Emergency & Emergency to Normal, Engine Cooldown, Emergency Fail
 - Pushbutton for Bypassing Time Delays on Transfer/Retransfer
 - Test Pushbutton
 - Contacts for Go to Emergency (S2)
 - MODBUS Communication
 - Digital Programmable Plant Exerciser:
 - Off, 1-Day, 7-Day, 14-Day, 28-Day Intervals
 - Adjustable 0-600 Minutes Run Time
 - Selectable for Load or No Load
 - Auxiliary Contacts:
 - Normal (S1) Source Present (2 Form C)
 - Emergency (S2) Source Present (2 Form C)
 - Normal (S1) Position Indication (1 Form C)
 - Emergency (S2) Position Indication (1 Form C)
 - Pre-Transfer Signal Contacts (1 Form C)
- 32F - In-Phase Transition
- 41A - 100W Space Heater with Adjustable Thermostat
- 42 - IBC/CBC Seismic Qualified

- 36 - Load Shed from Emergency
- Normal Terminal Mechanical Lugs, Customer Connection: (1) #6-250MCM per phase
- Emergency Terminal Mechanical Lugs, Customer Connection: (1) #6-250MCM per phase
- Load Terminal Mechanical Lugs, Customer Connection: (1) #6-250MCM per phase
- Neutral Terminal Mechanical Lugs, Customer Connection: (3) 1/0-250MCM
- 2-Year Extended Warranty
- ATC3C2X30200XDU

Quantity 1 - PSTS 150-260 2C 2 YR P/L/T

SD150 | 6.7L | 150 kW INDUSTRIAL DIESEL GENERATOR SET

EPA Certified Stationary Emergency

Standby Power Rating

150 kW, 188 kVA, 60 Hz

Prime Power Rating*

135 kW, 169 kVA, 60 Hz



*Assembled in the USA using domestic and foreign parts

*EPA Certified Prime ratings are not available in the US or its Territories

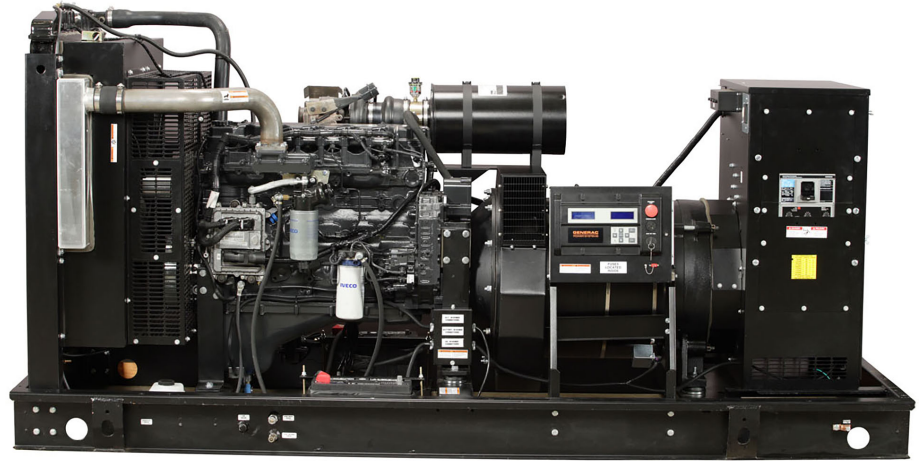


Image used for illustration purposes only

Codes and Standards

Not all codes and standards apply to all configurations. Contact factory for details.



UL2200, UL6200, UL1236, UL489, UL142



CSA C22.2, ULC S601



BS5514 and DIN 6271



SAE J1349



NFPA 37, 70, 99, 110



NEC700, 701, 702, 708



ISO 3046, 7637, 8528, 9001



NEMA ICS10, MG1, 250, ICS6, AB1



ANSI C62.41



IBC 2009, CBC 2010, IBC 2012, ASCE 7-05, ASCE 7-10, ICC-ES AC-156 (2012)

Powering Ahead

For over 60 years, Generac has provided innovative design and superior manufacturing.

Generac ensures superior quality by designing and manufacturing most of its generator components, including alternators, enclosures and base tanks, control systems and communications software.

Generac gensets utilize a wide variety of options, configurations and arrangements, allowing us to meet the standby power needs of practically every application.

Generac searched globally to ensure the most reliable engines power our generators. We choose only engines that have already been proven in heavy-duty industrial applications under adverse conditions.

Generac is committed to ensuring our customers' service support continues after their generator purchase.

STANDARD FEATURES

ENGINE SYSTEM

- Oil Drain Extension
- Heavy Duty Air Cleaner
- Level 1 Fan and Belt Guard (Open Set Only)
- Stainless Steel Flexible Exhaust Connection
- Factory Filled Oil and Coolant
- Radiator Duct Adapter (Open Set Only)
- Engine Coolant Heater
- Critical Silencer

FUEL SYSTEM

- Fuel Lockoff Solenoid
- Primary Fuel Filter

COOLING SYSTEM

- Closed Coolant Recovery System
- UV/Ozone Resistant Hoses
- Factory-Installed Radiator
- Radiator Drain Extension
- 50/50 Ethylene Glycol Antifreeze

Electrical System

- Battery Charging Alternator
- Battery Cables
- Battery Tray
- Rubber-Booted Engine Electrical Connections
- Solenoid Activated Starter Motor

ALTERNATOR SYSTEM

- UL2200 GENprotect™
- 12 Leads (3-Phase, Non 600V)
- Class H Insulation Material
- Vented Rotor
- 2/3 Pitch
- Skewed Stator
- Auxiliary Voltage Regulator Power Winding
- Permanent Magnet Excitation
- Sealed Bearing
- Automated Manufacturing (Winding, Insertion, Lacing, Varnishing)
- Rotor Dynamically Spin Balanced
- Amortisseur Winding
- Full Load Capacity Alternator
- Protective Thermal Switch

GENERATOR SET

- Internal Genset Vibration Isolation
- Separation of Circuits - High/Low Voltage
- Separation of Circuits - Multiple Breakers
- Wrapped Exhaust Piping
- Standard Factory Testing
- 2 Year Limited Warranty (Standby Rated Units)
- 1 Year Limited Warranty (Prime Rated Units)
- Silencer Mounted in the Discharge Hood (Enclosed Units Only)

ENCLOSURE (If Selected)

- Rust-Proof Fasteners with Nylon Washers to Protect Finish
- High Performance Sound-Absorbing Material (Sound Attenuation Enclosures)
- Gasketed Doors
- Upward Facing Discharge Hoods (Radiator and Exhaust)
- Stainless Steel Lift Off Door Hinges
- Stainless Steel Lockable Handles
- RhinoCoat™ - Textured Polyester Powder Coat Paint

FUEL TANKS (If Selected)

- UL 142/ULC S601
- Double Wall
- Vents
- Sloped Top
- Sloped Bottom
- Factory Pressure Tested - 2 psi
- Rupture Basin Alarm
- Fuel Level
- Check Valve In Supply and Return Lines
- RhinoCoat™ - Textured Polyester Powder Coat Paint
- Stainless Steel Hardware

CONTROL SYSTEM



Digital H Control Panel- Dual 4x20 Display

Program Functions

- Programmable Crank Limiter
- 7-Day Programmable Exerciser
- Special Applications Programmable Logic Controller
- RS-232/485 Communications
- All Phase Sensing Digital Voltage Regulator
- 2-Wire Start Capability
- Date/Time Fault History (Event Log)
- Isochronous Governor Control
- Waterproof/Sealed Connectors
- Audible Alarms and Shutdowns
- Not in Auto (Flashing Light)

- Auto/Off/Manual Switch
- E-Stop (Red Mushroom-Type)
- NFPA 110 Level I and II (Programmable)
- Customizable Alarms, Warnings, and Events
- Modbus® Protocol
- Predictive Maintenance Algorithm
- Sealed Boards
- Password Parameter Adjustment Protection
- Single Point Ground
- 16 Channel Remote Trending
- 0.2 msec High Speed Remote Trending
- Alarm Information Automatically Annunciated on the Display

Full System Status Display

- Power Output (kW)
- Power Factor
- kW Hours, Total, and Last Run
- Real/Reactive/Apparent Power
- All Phase AC Voltage
- All Phase Currents
- Oil Pressure
- Coolant Temperature
- Coolant Level
- Engine Speed
- Battery Voltage
- Frequency

Alarms and Warnings

- Oil Pressure
- Coolant Temperature
- Coolant Level
- Engine Overspeed
- Battery Voltage
- Alarms and Warnings Time and Date Stamped
- Snap Shots of Key Operation Parameters During Alarms and Warnings
- Alarms and Warnings Spelled Out (No Alarm Codes)

CONFIGURABLE OPTIONS

ENGINE SYSTEM

- Oil Heater
- Level 1 Fan and Belt Guards (Enclosed Units Only)
- Air Filter Restriction Indicator
- Radiator Stone Guard (Open Set Only)
- Critical Silencer (Open Set Only)

ELECTRICAL SYSTEM

- 10A UL Listed Battery Charger**
- Battery Warmer

ALTERNATOR SYSTEM

- Alternator Upsizing
- Anti-Condensation Heater
- Tropical Coating**

CIRCUIT BREAKER OPTIONS

- Main Line Circuit Breaker**
- 2nd Main Line Circuit Breaker
- Shunt Trip and Auxiliary Contact
- Electronic Trip Breakers

GENERATOR SET

- IBC Seismic Certification
- 8 Position Load Center
- Pad Vibration Isolators

ENCLOSURE

- Weather Protected Enclosure**
- Level 1 Sound Attenuated
- Level 2 Sound Attenuated
- Level 2 Sound Attenuated with Motorized Dampers
- Steel Enclosure
- Aluminum Enclosure**
- Up to 200 MPH Wind Load Rating (Contact Factory for Availability)
- AC/DC Enclosure Lighting Kit
- Enclosure Heater (with Motorized Dampers Only)
- Door Open Alarm Switch

FUEL TANKS (Size On Last Page)

- 8 in (203.2 mm) Fill Extension
- 13 in (330.2 mm) Fill Extension
- Overfill Protection Valve
- Return Hose
- Tank Risers
- 90% Fuel Level Switch
- 12' Above Grade Vent Extension
- Stainless Steel Fire Rated Fuel Hose

CONTROL SYSTEM

- NFPA 110 Compliant 21-Light Remote Annunciator
- Remote Relay Assembly (8 or 16)
- Remote E-Stop (Break Glass-Type, Surface Mount)**
- Remote E-Stop (Red Mushroom-Type, Surface Mount)
- Remote E-Stop (Red Mushroom-Type, Flush Mount)
- 100 dB Alarm Horn
- Ground Fault Annunciator
- 120V GFCI and 240V Outlets**
- Damper Alarm Contacts (with Motorized Dampers Only)
- Remote Communication - Modem
- 10A Engine Run Relay
- Oil Temperature Indication and Alarm

WARRANTY

- 2 Year Extended Limited Warranty**
- 5 Year Limited Warranty
- 5 Year Extended Limited Warranty
- 7 Year Extended Limited Warranty
- 10 Year Extended Limited Warranty

ENGINEERED OPTIONS

ENGINE SYSTEM

- Coolant Heater Ball Valves
- Fluid Containment Pan

CONTROL SYSTEM

- Spare Inputs/Outputs
- Battery Disconnect Switch

ALTERNATOR SYSTEM

- 3rd Breaker System

GENERATOR SET

- Special Testing

FUEL TANKS

- UL2085 Tank
- Stainless Steel Tank
- Special Fuel Tanks (MIDEQ and FL DEP/DERM, etc.)

01/19/2022
SD150 | 6.7L | 150 kW
INDUSTRIAL DIESEL GENERATOR SET

EPA Certified Stationary Emergency

APPLICATION AND ENGINEERING DATA

ENGINE SPECIFICATIONS

General

Make	Iveco/FPT
EPA Emissions Compliance	Stationary Emergency
EPA Emissions Reference	See Emission Data Sheet
Cylinder #	6
Type	In-Line
Displacement - in ³ (L)	408.86 (6.7)
Bore - in (mm)	4.09 (104)
Stroke - in (mm)	5.2 (128)
Compression Ratio	16.5:1
Intake Air Method	Turbocharged/Aftercooled
Cylinder Head Type	4-Valve
Piston Type	Aluminum Alloy
Crankshaft Type	Forged Steel

Engine Governing

Governor	Electronic Isochronous
Frequency Regulation (Steady State)	±0.25%

Lubrication System

Oil Pump Type	Gear
Oil Filter Type	Full-Flow Cartridge
Crankcase Capacity - qt (L)	20.7 (19.6)

Cooling System

Cooling System Type	Closed
Water Pump Type	Belt Driven Centrifugal
Fan Type	Pusher
Fan Speed - RPM	2,538
Fan Diameter - in (mm)	26 (660)

Fuel System

Fuel Type	Ultra Low Sulfur Diesel Fuel #2
Fuel Specifications	ASTM
Fuel Filtering (Microns)	5
Fuel Pump Type	Engine Driven Gear
Injector Type	Electronic
Fuel Supply Line - in (mm)	0.5 (12.7) NPT
Fuel Return Line - in (mm)	0.5 (12.7) NPT

Engine Electrical System

System Voltage	12 VDC
Battery Charger Alternator	Standard
Battery Size	See Battery Index 0161970SBY
Battery Voltage	12 VDC
Ground Polarity	Negative

ALTERNATOR SPECIFICATIONS

Standard Model	K0150124Y21
Poles	4
Field Type	Revolving
Insulation Class - Rotor	H
Insulation Class - Stator	H
Total Harmonic Distortion	<5%
Telephone Interference Factor (TIF)	< 50

Standard Excitation	Permanent Magnet
Bearings	Single Sealed Cartridge
Coupling	Direct via Flexible Disc
Prototype Short Circuit Test	Yes
Voltage Regulator Type	Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	±0.25%

OPERATING DATA

POWER RATINGS - DIESEL

	Standby	
Single-Phase 120/240 VAC @1.0pf	150 kW	Amps: 625
Three-Phase 120/208 VAC @0.8pf	150 kW	Amps: 520
Three-Phase 120/240 VAC @0.8pf	150 kW	Amps: 451
Three-Phase 277/480 VAC @0.8pf	150 kW	Amps: 226
Three-Phase 346/600 VAC @0.8pf	150 kW	Amps: 180

MOTOR STARTING CAPABILITIES (skVA)

skVA vs. Voltage Dip					
120/240 VAC 1Ø	30%	277/480 VAC 3Ø	30%	208/240 VAC 3Ø	30%
A0150044N21	260	K0150124Y21	326	K0150124Y21	244
A0200044N21	459	K0200124Y21	478	K0200124Y21	361
		K0250124Y21	630	K0250124Y21	506

FUEL CONSUMPTION RATES*

Fuel Pump Lift- ft (m)	Diesel - gph (Lph)	
	Percent Load	Standby
3 (1)	25%	3.3 (12.5)
Total Fuel Pump Flow (Combustion + Return) - gph (Lph)	50%	6.2 (23.5)
	75%	8.8 (33.5)
	100%	11.2 (42.2)

* Fuel supply installation must accommodate fuel consumption rates at 100% load.

COOLING

		Standby
Coolant Flow	gpm (Lpm)	44.6 (168.8)
Coolant System Capacity	gal (L)	7.5 (28.4)
Heat Rejection to Coolant	BTU/hr (kW)	412,900 (121)
Inlet Air	scfm (m ³ /hr)	7,946 (13,502)
Maximum Operating Radiator Air Temperature	°F (°C)	122 (50)
Maximum Operating Ambient Temperature (Before Derate)		See Bulletin No. 0199270SSD
Maximum Additional Radiator Backpressure	in H ₂ O (kPa)	0.5 (0.12)

COMBUSTION AIR REQUIREMENTS

	Standby
Flow at Rated Power - cfm (m ³ /min)	440 (12.5)

ENGINE

		Standby
Rated Engine Speed	RPM	1,800
Horsepower at Rated kW**	hp	240
Piston Speed	ft/min (m/min)	1,559 (475)
BMEP	psi (kPa)	257 (1,772)

EXHAUST

		Standby
Exhaust Flow (Rated Output)	cfm (m ³ /min)	1,050 (29.7)
Maximum Allowable Backpressure	inHg (kPa)	1.5 (5.1)
Exhaust Temperature (Rated Output)	°F (°C)	895 (479)

** Refer to "Emissions Data Sheet" for maximum bHP for EPA and SCAQMD permitting purposes.

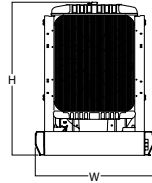
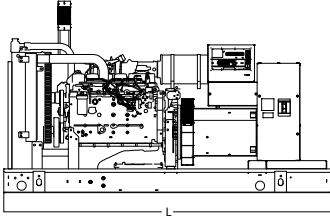
Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions.

Please contact a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5514, ISO8528, and DIN6271 standards.

Standby - See Bulletin 0187500SSB

Prime - See Bulletin 0187510SSB

DIMENSIONS AND WEIGHTS*



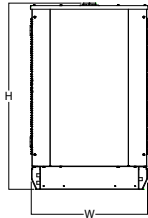
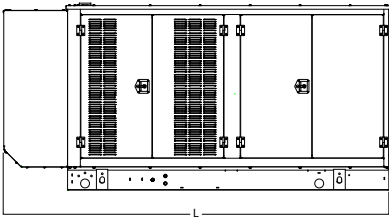
OPEN SET

Run Time - Hours	Tank Capacity Gal (L)	L x W x H - in (mm)	Weight - lbs (kg)
No Tank		117.9 (2,996) x 49.7 (1,262) x 57.2 (1,453)	3,333 - 3,920 (1,512 - 1,778)
11	134 (507)	117.9 (2,996) x 49.7 (1,262) x 70.2 (1,783)	4,117 - 4,704 (1,868 - 2,134)
28	322 (1,219)	117.9 (2,996) x 49.7 (1,262) x 82.2 (2,088)	4,405 - 4,992 (1,998 - 2,264)
45	510 (1,931)	117.9 (2,996) x 49.7 (1,262) x 94.2 (2,393)	4,698 - 5,285 (2,133 - 2,399)
39	440 (1,666)	156.7 (3,980) x 49.7 (1,262) x 81.2 (2,063)	4,776 - 5,363 (2,051 - 2,317)
61	693 (2,623)	136.0 (3,455) x 53.0 (1,346) x 97.7 (2,482)	4,928 - 5,515 (2,237 - 2,503)
62	705 (2,669)	156.7 (3,980) x 49.7 (1,262) x 93.2 (2,367)	5,199 - 5,786 (2,208 - 2,474)
84	946 (3,581)	208.3 (5,291) x 53.0 (1,346) x 98.2 (2,493)	6,358 - 6,945 (2,884 - 3,150)
118	1,325 (5,016)	277.8 (7,055) x 53.0 (1,346) x 96.6 (2,453)	7,373 - 7,960 (3,345 - 3,611)

WEATHER PROTECTED ENCLOSURE

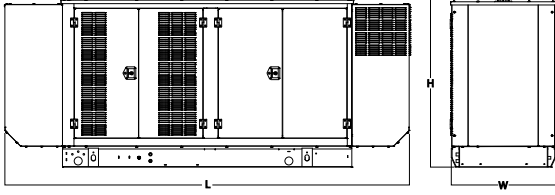
Run Time - Hours	Tank Capacity Gal (L)	L x W x H - in (mm)	Weight - lbs (kg) Enclosure Only
No Tank		143.0 (3,634) x 50.4 (1,280) x 68.2 (1,732)	
11	134 (507)	143.0 (3,634) x 50.4 (1,280) x 81.2 (2,062)	
28	322 (1,219)	143.0 (3,634) x 50.4 (1,280) x 93.2 (2,367)	
45	510 (1,931)	143.0 (3,634) x 50.4 (1,280) x 105.2 (2,672)	
39	440 (1,666)	156.7 (3,980) x 50.4 (1,280) x 92.2 (2,342)	
61	693 (2,623)	143.0 (3,634) x 53.0 (1,346) x 108.7 (2,761)	
62	705 (2,669)	156.7 (3,980) x 50.4 (1,280) x 104.2 (2,646)	
84	946 (3,581)	208.3 (5,291) x 53.0 (1,346) x 109.2 (2,772)	
118	1,325 (5,016)	277.8 (7,055) x 53.0 (1,346) x 107.6 (2,732)	

Steel: 898 (407)
 Aluminum: 439 (199)



* All measurements are approximate and for estimation purposes only. Specification characteristics may change without notice. Please contact a Generac Power Systems Industrial Dealer for detailed installation drawings.

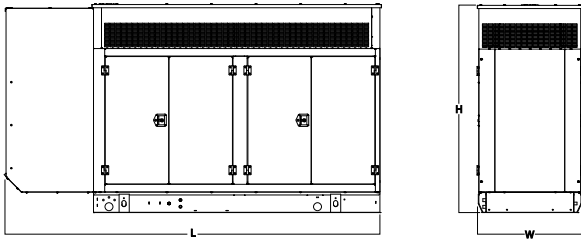
DIMENSIONS AND WEIGHTS*



LEVEL 1 SOUND ATTENUATED ENCLOSURE

Run Time - Hours	Tank Capacity Gal (L)	L x W x H - in (mm)	Weight - lbs (kg) Enclosure Only
No Tank		168.5 (4,279) x 50.4 (1,280) x 68.2 (1,732)	
6	134 (507)	168.5 (4,279) x 50.4 (1,280) x 81.2 (2,062)	
16	322 (1,219)	168.5 (4,279) x 50.4 (1,280) x 93.2 (2,367)	
26	510 (1,931)	168.5 (4,279) x 50.4 (1,280) x 105.2 (2,672)	
22	440 (1,666)	168.5 (4,279) x 50.4 (1,280) x 92.2 (2,342)	
35	693 (2,623)	168.5 (4,279) x 53.0 (1,346) x 108.7 (2,761)	
35	705 (2,669)	168.5 (4,279) x 50.4 (1,280) x 104.2 (2,646)	
48	946 (3,581)	208.3 (5,291) x 53.0 (1,346) x 109.2 (2,772)	
118	1,325 (5,016)	277.8 (7,055) x 53.0 (1,346) x 107.6 (2,732)	

Steel: 1,185 (537)
 Aluminum: 563 (255)



LEVEL 2 SOUND ATTENUATED ENCLOSURE

Run Time - Hours	Tank Capacity Gal (L)	L x W x H - in (mm)	Weight - lbs (kg) Enclosure Only
No Tank		143.0 (3,633) x 50.4 (1,280) x 91.7 (2,330)	
6	134 (507)	143.0 (3,633) x 50.4 (1,280) x 104.7 (2,660)	
16	322 (1,219)	143.0 (3,633) x 50.4 (1,280) x 116.7 (2,965)	
26	510 (1,931)	143.0 (3,633) x 50.4 (1,280) x 128.7 (3,270)	
22	440 (1,666)	156.7 (3,980) x 50.4 (1,280) x 115.7 (2,940)	
35	693 (2,623)	143.0 (3,633) x 53.0 (1,346) x 132.2 (3,359)	
35	705 (2,669)	156.7 (3,980) x 50.4 (1,280) x 127.7 (3,244)	
48	946 (3,581)	208.3 (5,291) x 53.0 (1,346) x 132.7 (3,370)	
118	1,325 (5,016)	277.8 (7,055) x 53.0 (1,346) x 131.1 (3,330)	

Steel: 1,377 (624)
 Aluminum: 645 (292)

* All measurements are approximate and for estimation purposes only. Specification characteristics may change without notice. Please contact a Generac Power Systems Industrial Dealer for detailed installation drawings.

- Automatic Transfer Switch
- 100 – 1,600 A, up to 600 VAC, 50/60 Hz
- 2, 3 or 4 Poles
- NEMA 1, 3R or 4X
- Open with Inphase and Delayed Transition
- UL 1008 Listed
- CSA C22.2 No. 178 Certified

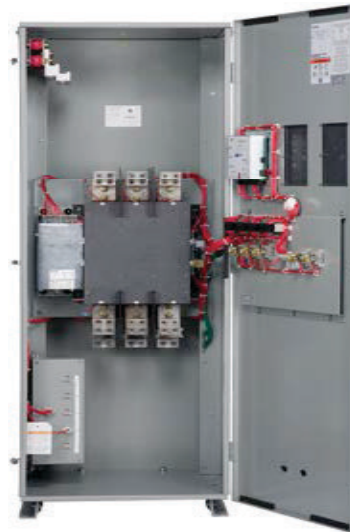


Image used for illustration purposes only

Codes and Standards

Not all codes and standards apply to all configurations. Contact factory for details.



UL 1008 Listed



CSA C22.2 No. 178 Certified



NFPA 37, 70, 99, 110



NEC 700, 701, 702, 708



ISO 3046, 7637, 8528, 9001,
Pluses #2b, 4



NEMA ICS10, MG1, 250, ICS6, AB1



ANSI C62.41



IEC 61000 EMC Testing and
Measuring



IBC 2009, CBC 2010, IBC 2012,
ASCE 7-05, ASCE 7-10, ICC-ES
AC-156 (2012)

Description

Generac's Contactor Type Transfer Switches are double-throw and interlocked with an over center design to ensure safe, positive transfer between power sources. The switches are 3 cycle rated to ease breaker selection and coordination. The mechanism is field proven and operated via a reliable, compact solenoid for high speed transfer of loads between power sources. The contacts are silver composite for long life, resisting pitting or burning. The switches are rated for full load transfers in critical operating, emergency, legally required, and optional power systems.

The microprocessor based controller is flexible with extensive programmable options. The standard product offers both open with inphase and delayed transition. The 2 line – 32 character LCD displays real time and historical information with time-stamped events. The integrated plant exerciser is configurable in off, daily, 7, 14, 28 day intervals with user configurable run time. With the standard features of pretransfer contacts, three phase sensing on utility and generator sources, phase unbalance, phase reversal, load shed/emergency inhibit and communications (Modbus[®] RTU).

Power Series Transfer Switch

100 – 1,600 Amps

Contacting Type · Open and Delayed Transition

STANDARD FEATURES

GENERAL

- Double-Throw, Solenoid-Operated Transfer Mechanism
- LCD-Based Display for Programming, System Diagnostics and Help Menu Display
- Mimic Diagram with Source Available and Connected LED Indicator
- Time-Stamped History Log
- System TEST Pushbutton
- Programmable Plant Exerciser - OFF, Daily, 7, 14, 28 Day Interval Selectable Run Time 0-600 Minutes No Load/Load with Failsafe
- Methods of Transfer Include: Open with Inphase Transition Only, Time Delay in Neutral Transition, or Inphase with a Default to Time Delay in Neutral Transfer
- Mechanically Interlocked to Prevent Connection of Both Sources
- Field-Selectable Multi-Tap Transformer Panel Permits Operation on a Wide Range of System Voltages
- Modbus® RTU
- ATC-300+ Controller
- Operating Temperature -4 ° to 158 °F (-20 ° to 70 °C)

VOLTAGE AND FREQUENCY SENSING

- Three Phase Under and Over Voltage Sensing on Normal and Emergency Sources
- Under and Over Frequency Sensing on Normal and Emergency
- Selectable Settings: Single or Three Phase Voltage Sensing on Normal, Emergency and Load 50 or 60 Hz
- Phase Sequence Sensing for Phase Sensitive Loads

CONTACTS

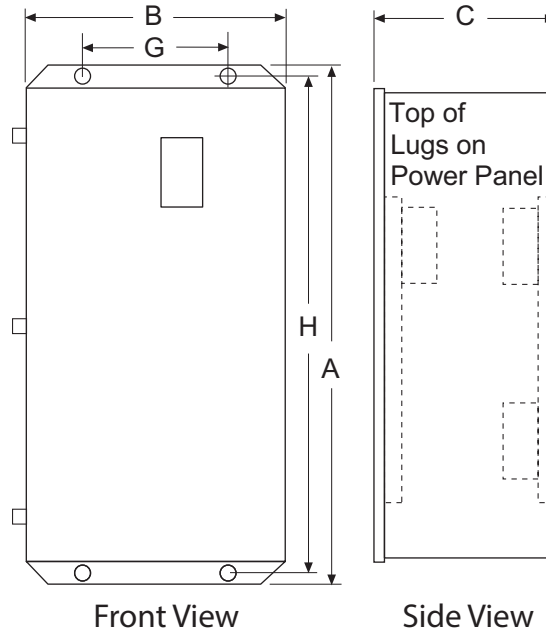
- Source Available:
 - Source-1 Present, 2-N.O. and 2-N.C.
 - Source-2 Present, 2-N.O. and 2-N.C.
- Switch Position:
 - Source-1 Position, 1-N.O. and 1-N.C.
 - Source-2 Position, 1-N.O. and 1-N.C.
- Pre-Transfer Signal Contacts 1-N.O. and 1-N.C.

CONFIGURABLE OPTIONS

- ATC-900 Controller
- Digital Multi-Function Power Quality Metering
- Ethernet Connectivity
- Remote Annunciator Panel with Control
- Remote Multi-Switch Annunciator Panel with Control
- Maintenance Selector Switch
- General Alarm Indication
- Transient Voltage Surge Suppression (TVSS)
- Padlockable Cover for Controller
- Padlockable Cover for Device Panel
- Emergency Inhibit
- Selectable Retransfer
- Manual Generator Retransfer

UNIT DIMENSIONS*

Automatic, Open Transition with Inphase up to 400A Wall Mount



Contactor Type, Open and Delayed Transition, 100 – 600 A, Wall Mount

Voltage	Amperes	Transition	Enclosure Type (NEMA)	in (mm)			G (Horizontal)	H (Vertical)	Cu/Al		lbs (kg) Weight
				A (Height)	B (Width)	C (Depth)			Load Side, Normal and Standby Source	Neutral Connection	
480 and below	100	Open with Inphase	1, 3R	38.7 (983)	18.3 (465)	13.3 (334)	10.3 (260)	37.4 (950)	(1) #14-2/0	(3) #14-1/0	156 (71)
			4X	37.5 (953)	17.5 (445)	14.3 (364)	11.5 (292)	36.3 (921)	(1) #14-2/0	(3) #14-1/0	156 (71)
		Open with Inphase and Delayed	1, 3R	52.0 (1,321)	19.8 (503)	16.8 (426)	13.0 (330)	47.8 (1,215)	(1) #14-2/0	(3) #14-1/0	250 (113)
			4X	52.0 (1,321)	21.0 (533)	16.8 (426)	15.0 (381)	50.8 (1,289)	(1) #14-2/0	(3) #14-1/0	250 (113)
	150-200	Open with Inphase	1, 3R	38.7 (983)	18.3 (465)	13.3 (334)	10.3 (260)	37.4 (950)	(1) #6-250 MCM	(3) 1/0-250 MCM	160 (73)
			4X	37.5 (953)	17.5 (445)	14.3 (364)	11.5 (292)	36.3 (921)	(1) #6-250 MCM	(3) 1/0-250 MCM	160 (73)
		Open with Inphase and Delayed	1, 3R	52.0 (1,321)	19.8 (503)	16.8 (426)	13.0 (330)	47.8 (1,215)	(1) #6-250 MCM	(3) 1/0-250 MCM	250 (113)
			4X	52.0 (1,321)	21.0 (533)	16.8 (426)	15.0 (381)	50.8 (1,289)	(1) #6-250 MCM	(3) 1/0-250 MCM	250 (113)
	225-400	Open with Inphase	1, 3R	52.0 (1,321)	19.8 (503)	16.8 (426)	13.0 (330)	47.8 (1,215)	(2) 1/0-250 MCM or (1) 1/0-750 MCM	(6) 250-500 MCM	250 (113)
			4X	52.0 (1,321)	21.0 (533)	16.8 (426)	15.0 (381)	50.8 (1,289)	(2) 1/0-250 MCM or (1) 1/0-750 MCM	(6) 250-500 MCM	250 (113)
		Open with Inphase and Delayed	1, 3R	52.0 (1,321)	19.8 (503)	16.8 (426)	13.0 (330)	47.8 (1,215)	(2) 1/0-250 MCM or (1) 1/0-750 MCM	(6) 250-500 MCM	250 (113)
			4X	52.0 (1,321)	21.0 (533)	16.8 (426)	15.0 (381)	50.8 (1,289)	(2) 1/0-250 MCM or (1) 1/0-750 MCM	(6) 250-500 MCM	250 (113)
600	100	Open with Inphase	1, 3R	38.7 (983)	19.8 (503)	13.3 (339)	10.3 (260)	37.4 (950)	(1) #6-250 MCM	(3) #14-1/0	164 (74)
			4X	37.5 (953)	21.0 (533)	14.3 (364)	11.5 (292)	36.3 (921)	(1) #6-250 MCM	(3) #14-1/0	164 (74)
	150-200	Open with Inphase	1, 3R	52.0 (1,321)	19.8 (503)	16.8 (426)	13.0 (330)	47.8 (1,215)	(1) #6-250 MCM	(3) 1/0-250 MCM	260 (118)
			4X	52.0 (1,321)	21.0 (533)	16.8 (426)	15.0 (381)	50.8 (1,289)	(1) #6-250 MCM	(3) 1/0-250 MCM	260 (118)
		Open with Inphase and Delayed	1, 3R	52.0 (1,321)	19.8 (503)	16.8 (426)	13.0 (330)	47.8 (1,215)	(1) #6-250 MCM	(3) 1/0-250 MCM	260 (118)
			4X	52.0 (1,321)	21.0 (533)	16.8 (426)	15.0 (381)	50.8 (1,289)	(1) #6-250 MCM	(3) 1/0-250 MCM	260 (118)

* All measurements are approximate and for estimation purposes only. Specification characteristics may change without notice. Please contact a Generac Power Systems Industrial Dealer for detailed installation drawings.

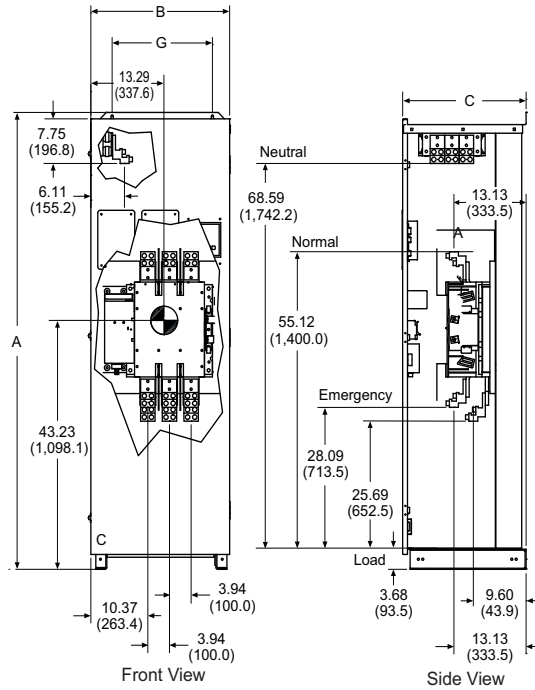
Power Series Transfer Switch

100 – 1,600 Amps

Contactor Type · Open and Delayed Transition

UNIT DIMENSIONS*

Automatic, 600–1,200A Open and Delayed Transition, Floor Standing, Wall Secured



Contactor Type, Open and Delayed Transition, 600 – 1,200A, Floor Standing, Wall Secured

Voltage	Amperes	Transition	Enclosure Type (NEMA)	in (mm)			G (Horizontal)	H (Vertical)	Cu/Al		lbs (kg) Weight
				A (Height)	B (Width)	C (Depth)			Load Side, Normal and Standby Source	Neutral Connection	
480 and below	600-1,200	Open with Inphase and Delayed	1, 3R	79.4 (2,017)	25.3 (641) 3-pole 29.20 (741) 4-pole	22.5 (571)	N/A	N/A	(4) 1/0-750 MCM	(12) 1/0-750 MCM	600 (272) 3-pole 650 (295) 4-pole
			4X	84.8 (2,153)	29.0 (737) 3-pole	24.3 (616)	N/A	N/A	(4) 1/0-750 MCM	(12) 1/0-750 MCM	700 (318) 3-pole 750 (340) 4-pole
600	225-1,200	Open with Inphase and Delayed	1, 3R	79.4 (2,017)	29.2 (741)	22.5 (571)	N/A	N/A	(2) 1/0-250 MCM or (1) 1/0-750 MCM	(6) 250-500 MCM	600 (272) 3-pole 650 (295) 4-pole
			4X	84.8 (2,153)	29.0 (737) 3-pole	24.3 (616)	N/A	N/A	(2) 1/0-250 MCM or (1) 1/0-750 MCM	(6) 250-500 MCM	700 (318) 3-pole 750 (340) 4-pole

* All measurements are approximate and for estimation purposes only. Specification characteristics may change without notice. Please contact a Generac Power Systems Industrial Dealer for detailed installation drawings.

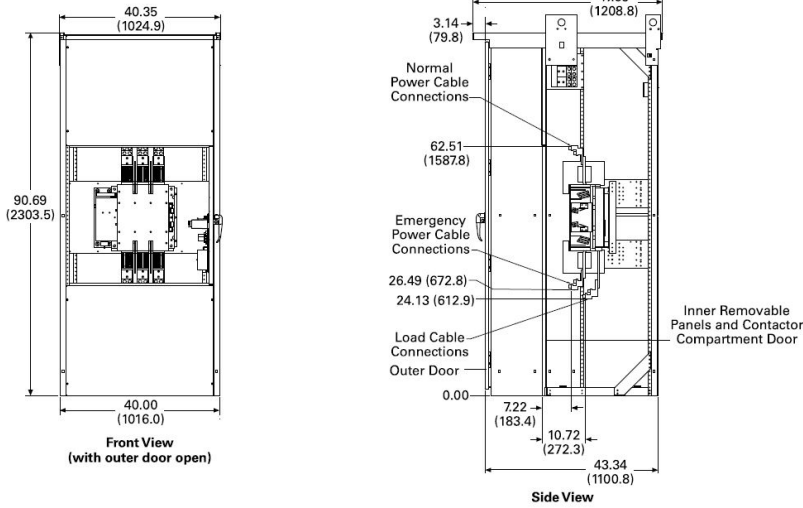
Power Series Transfer Switch

100 – 1,600 Amps

Contactor Type · Open and Delayed Transition

UNIT DIMENSIONS*

Automatic, 1,600A, Open and Delayed Transition, Freestanding



Contactor Type, Open and Delayed Transition, 1,600A, Freestanding

Voltage	Amperes	Transition	Enclosure Type (NEMA)	in (mm)			G (Horizontal)	H (Vertical)	Cu/Al		lbs (kg)
				A (Height)	B (Width)	C (Depth)			Load Side, Normal and Standby Source	Neutral Connection	
480 and below	1,600	Open with Inphase and Delayed	1	90.0 (2,286)	40.0 (1,016)	29.0 (737)	N/A	N/A	(4) 1/0-750 MCM	(12) 1/0-750 MCM	480 (218) 3-pole 500 (227) 4-pole
			3R	90.7 (2,304)	40.4 (1,025)	47.6 (1,209)	N/A	N/A	(4) 1/0-750 MCM	(12) 1/0-750 MCM	530 (241) 3-pole 550 (250) 4-pole

* All measurements are approximate and for estimation purposes only. Specification characteristics may change without notice. Please contact a Generac Power Systems Industrial Dealer for detailed installation drawings.

Power Series Transfer Switch

100 – 1,600 Amps

Contactor Type · Open and Delayed Transition

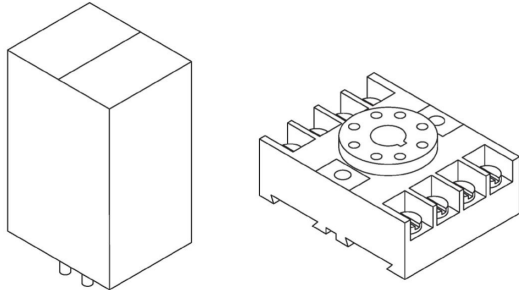
SPECIFICATIONS

UL 1008 Withstand and Closing Ratings

Ampere Rating	Transition	Any Breaker (0.05 sec)		Specific Breaker ¹		Specific Fuse					
		480 V and Below Max (kA)	600 V Max (kA)	480 V and Below Max (kA)	600 V Max (kA)	480 V and Below Max (kA)	Fuse Class	Max Fuse	600 V Max (kA)	Fuse Class	Max Fuse
100	Open with Inphase Only	10	10	30	22	100	K5, RK5	200	100	K5, RK5	200
							K1, RK1	400		K1, RK1	400
							J, T	450		J, T	450
	Open with Inphase and Delayed	30	22	50	35	200	RK1, RK5, J, C, K1, K5	600	200	RK1, RK5, J, C, K1, K5	600
							L	800		L	800
							T	1,200		T	1,200
150-200	Open with Inphase Only	10	22	30	35	100	K5, RK5	400	200	RK1, RK5, J, C, K1, K5	600
							J, K1, RK1	600		L	800
							T	800		T	1,200
	Open with Inphase and Delayed	30	22	50	35	200	RK1, RK5, J, C, K1, K5	600	200	RK1, RK5, J, C, K1, K5	600
							L	800		L	800
							T	1,200		T	1,200
225-400	Open with Inphase Only	30	50	50	65	200	RK1, RK5, J, C, K1, K5	600	200	J, T, L, RK5	600
							L	800		L	1,600
							T	1,200			
	Open with Inphase and Delayed	30	50	50	65	200	RK1, RK5, J, C, K1, K5	600	200	J, T, L, RK5	600
							L	800		L	1,600
							T	1,200			
600-1,200	Open with Inphase and Delayed	50	50	65	65	200	J, T, L, RK5	600	200	J, T, L, RK5	600
							L	1,600		L	1,600
1,600	Open with Inphase and Delayed	50	-	65	-	200	J, T, L, RK5	600	-	-	-
							L	2,000			

¹ See specific breaker list available on GenConnect

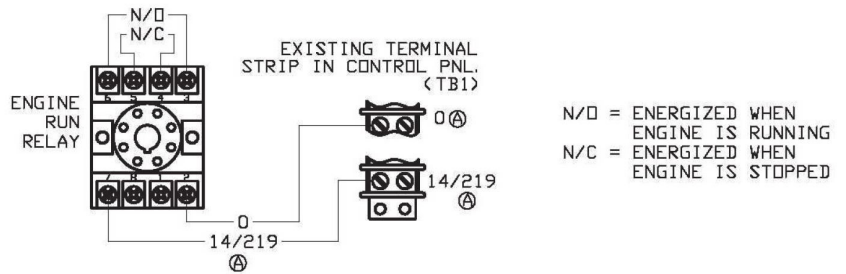
ENGINE RUN RELAY



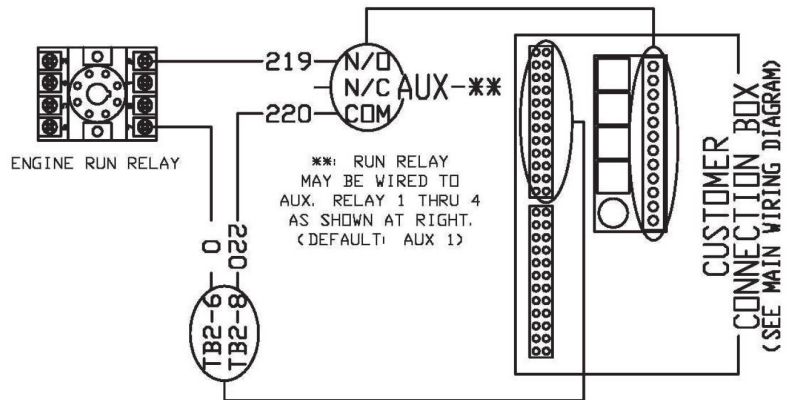
- For use with Generac's Digital Control Platforms
- 10 Amp Contact Rating
- 12 or 24 Volt DC Input
- Contact Open or Closure on Engine Run

Contacts	
Type	DPDT
Material	Silver
Rating	UL 10A @ 240VAC 10A @ 30VDC
Coils	
Input Voltage	24VDC
Resistance	400 Ohms
Nominal Power	1.5W

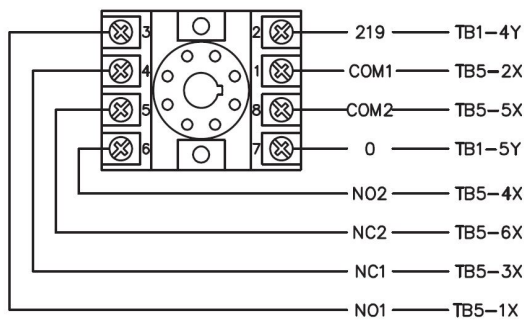
Wiring Diagram with E panel, H-100 Panel



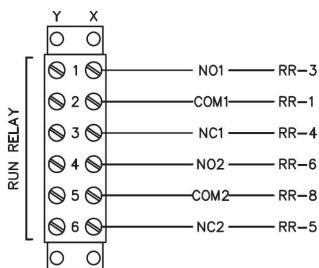
Wiring Diagram with PMDCP



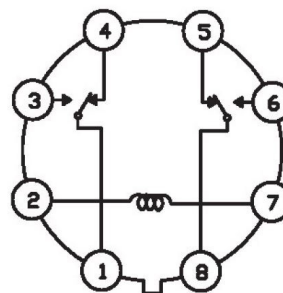
Wiring Diagram with Power Zone Pro Sync



TB5



Pin Detail



H-100 CONTROL PANEL



The Quiet-Test™ H-100 Control Panel is a digital microprocessor electronic controller that integrates all engine and transfer switch functions into a single control system.

- Digital Controls for All Safety Shutdowns
- Isochronous Governor Control
- Digital 3 Phase Sensing Voltage Regulator
- Sealed Digital Circuit Board
- Mates with HTS Transfer Switch and Any 2-wire Start ATS
- Alarm and Event Logging
- Built-in Diagnostics
- Internal PLC

Features

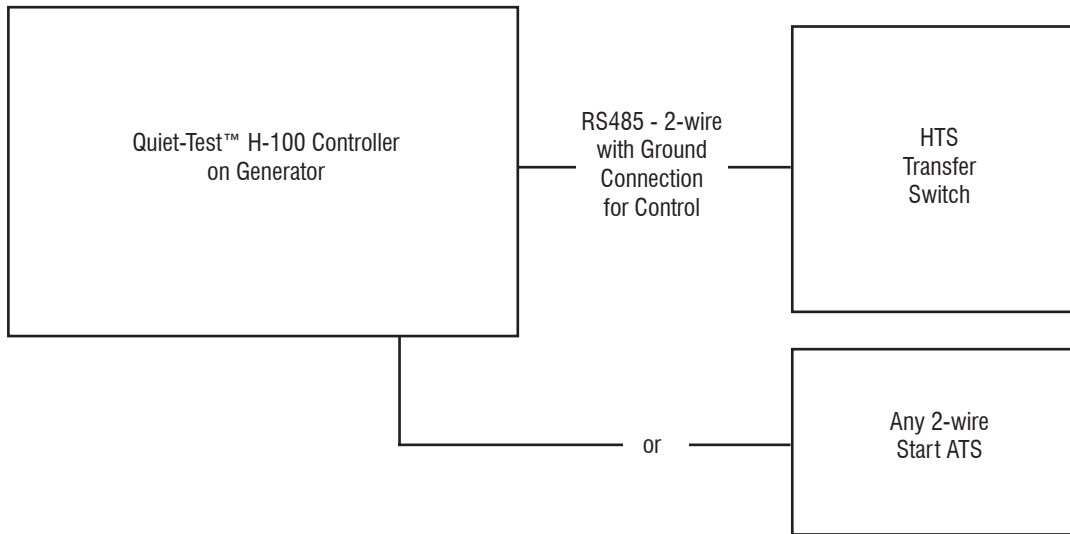
- Two 4-line x 20 Displays
- Full System Status
- 3 Phase Sensing Digital Voltage Regulator
- Remote Ports
 - RS232
 - RS485
 - CANbus
- Waterproof Connections
- Built -in PLC
- Full Range Standby Operation
- Full System Status
 - 3 Phase AC Volts
 - 3 Phase Amps
 - kW
 - Power Factor
 - Reactive Power
 - Oil Pressure
 - Water Temperature
 - Water Level
 - Oil Temperature (Optional)
 - Fuel Pressure
 - Engine Speed
 - Battery Voltage
 - Alternator Frequency
 - Time
 - Date
 - Transfer Switch Status
 - Run Hours
 - Service Reminders
 - Trending
 - Fault History (Alarm Log)
 - I²T Function for Full Generator Protection
- Shutdowns
 - Overvoltage
 - Overspeed
 - Low Oil Pressure
 - High Coolant Temperature
 - Low Coolant Level
- Remote Communications
- Configurable to NFPA 110, Level 1 or 2
- Programmable Auto Crank
- Emergency Stop
- On/Off/Manual Switch
- Not in Auto Flashing Light
- Audible Alarm for Fault Condition
- Transfer Switch Logic Communicates with HTS Transfer Switch
- Selectable Low Speed Exercise
- Temperature Range: -40° to +70°C

The generator set parameters can be manipulated and monitored without standing in front of the control panel with GenLink® software. The Generac H-100 control panel also monitors and controls transfer switch functions when used with the HTS transfer switch.

- Monitors Utility Voltage
- Monitors Generator Voltage
- Timer for Line Interrupt Delay
- Timer for Engine Warmup
- Timer for Minimum Engine Run Time
- Timer for Return to Utility Position
- Timer for Engine Cooldown
- Built-in Exerciser Timer (7 Day)
- Additional 2-wire Start Controls for Any 2-wire Transfer Switch

H-100 CONTROL PANEL

Typical Control Connection



ALTERNATOR DATA SHEET

K0200124Y21

General Characteristics

Voltages (V)	208/240 and 480	Number of Leads	12
Frequency (Hz)	60	Winding Type	Reconnectable
Phases	3	Air Flow (CFM)	1,660
Speed (RPM)	1,800	Total Harmonic Distortion (%)	<5
Excitation System	PMG	Largest Single Harmonic Value (%)	<3.5
Insulation Class	H	Telephone Interference Factor (TIF)	<50
Winding Pitch	2/3	Reference Part Number	OL3717E01R

Ratings at 0.8 pf based on 40°C Ambient

Voltage (V)	80°C Rise		105°C Rise		120°C Rise		150°C Rise	
	kW	kVA	kW	kVA	kW	kVA	kW	kVA
208/240	152	190	182	227	200	250	214	267
480	152	190	182	227	200	250	214	267

Base Data at 480V, 250 kVA, 1,800 RPM, 60 Hz, 3Ø

Description	Value	Description	Value
Stator Resistance, Line to Line, High Wye Connection (Ω)	0.0151	T ["] d, Direct Axis Subtransient Short Circuit Time Constant (s)	0.016
Rotor Resistance (Ω)	1.0800	T ['] do, Direct Axis Transient Open Circuit Time Constant (s)	2.245
Exciter Stator Resistance - PMG (Ω)	6.4250	Ta, Short Circuit Time Constant of Armature Winding (s)	0.028
Exciter Rotor Resistance - PMG (Ω)	0.2060	Phase Sequence CCW-NDE	T1, T2, T3
Excitation Winding Resistance -PMG (Ω)	1.2824	Voltage Balance, L-L or L-N (%)	2.5
Xd, Direct Axis Synchronous Reactance (p.u.)	3.360	Deviation Factor (%)	<7
X2, Negative Sequence Reactance (p.u.)	0.230	High Wye Connection, Sustained 3Ø Short Circuit Current (%) - PMG	300
X0, Zero Sequence Reactance (p.u.)	0.080	X/R	11
X ['] d, Direct Axis Transient Reactance (p.u.)	0.190	Short Circuit Ratio	0.53
X ["] d, Direct Axis Subtransient Reactance (p.u.)	0.170	Heat Rejection (BTU/hr) - 100% Rated Load, 480V, 0.8pf, 120°C Temperature Rise	87,807
Xq, Quadrature Axis Synchronous Reactance (p.u.)	1.610		
T ['] d, Direct Axis Transient Short Circuit Time Constant (s)	0.103		

Reference: Mil-STD-705B
All Ratings are Nominal

ALTERNATOR DATA SHEET

K0200124Y21

skVA

	10%	15%	20%	25%	30%	35%
480V @ 0.3PF	116	175	246	324	428	552
480V @ 0.6PF	134	200	286	367	478	589
208/240V @ 0.3PF	89	132	185	244	325	396
208/240V @ 0.6PF	99	151	212	275	361	437

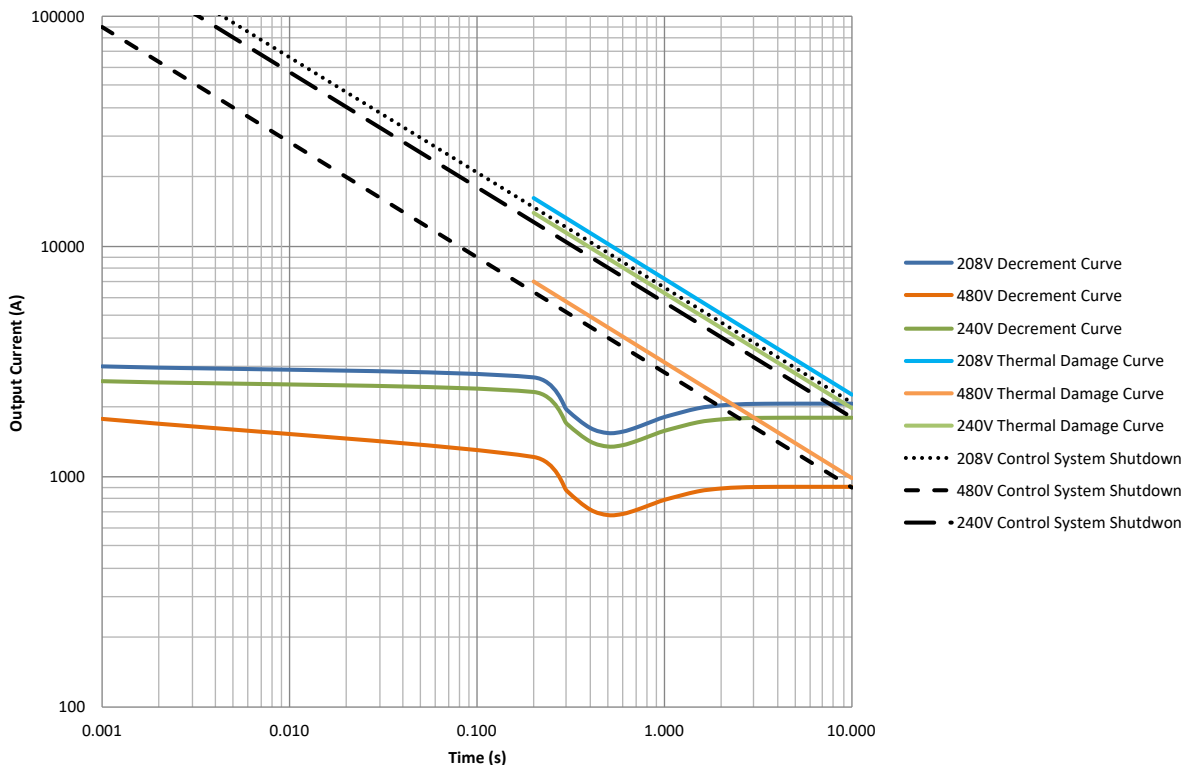
Efficiencies

*Rated Power	480V @ 0.8 PF	480V @ 1.0 PF	208/240V @ 0.8PF	208/240V @ 1.0 PF
20%	79.2	80.3	81.7	82.5
40%	85.5	87.1	86.7	88.2
60%	88.2	90.4	88.6	90.6
80%	88.8	91.6	88.7	91.2
100%	88.6	92.1	88.1	91.2

*Rated Power value is rating kW at 120°C Winding Temperature Rise and 0.8pf

LOG LOG Decrement Curve

Balanced 3-Phase Short Circuit Decrement & Thermal Damage Current Limit Curves



GENprotect™

Seamless Protection for Industrial Power Generators

GENprotect Operation

The design choice of an onsite power system using a Generac Industrial Power Generator assures your emergency power source is protected from unexpected power distribution faults. Typically, a generator will include some type of over-current device, such as a circuit breaker, or be protected by inherent design with the controller protecting the alternator through a protection algorithm. Generac's GENprotect generator protection system monitors the system current output and protects the alternator with extended security against fault scenarios that could occur within the site's downstream distribution system.

It is a common misconception that the alternator's main circuit breaker protects the alternator from a short circuit event. The main output breaker protects the cabling and provides a convenient disconnect. The characteristic trip curve for the industry standard thermal magnetic breaker (MCCB, molded case thermal magnetic or solid state) does not coordinate with the thermal damage limitation for an on-site generator. If circuit breakers are used for generator protection, a solid-state circuit breaker with full adjustments (Long Time, Short Time and Instantaneous, LSI) is required to coordinate the breaker protection curve within the generator thermal damage curve. Historically, this limitation was often accepted in system design since failures of the main generator feeder are extremely rare. Most short circuit events happen at a branch circuit, equipment level, where the fault is easily cleared by the smaller down stream breakers.

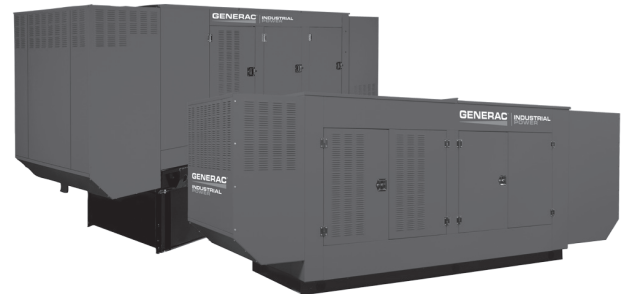
Given the mission critical nature of today's back-up power applications, it is more desirable to protect the system against even relatively rare failure modes. As generator controllers have become more powerful it is feasible for manufacturers to supply coordinated short circuit protection integral to the generator control system, negating the need for a main-line circuit breaker.

Generac's GENprotect alternator protection algorithm monitors the generator output. If this monitoring senses short circuit current in excess of rated amps, GENprotect steps in to provide a controlled and safe approach to breaker coordination and alternator protection. GENprotect first limits the alternator short circuit current level to 300%. By limiting the available fault current, GENprotect extends the time the alternator can maintain fault current resulting in consistent breaker coordination. Without this functionality a

line to neutral fault may be at 800% of rated current and need to be cleared within 1.4 seconds. The second function GENprotect performs is I²T thermal protection for the alternator. Since a short circuit event can heat the alternator so rapidly, it is not possible to protect the alternator by monitoring temperature. Instead GENprotect calculates the heat energy of the fault current. When this energy reaches the limits of NEMA MG1, GENprotect trips the generator off-line. This configuration ensures the alternator is protected and the power system is ensured 10 seconds of 300% fault current for breaker coordination.

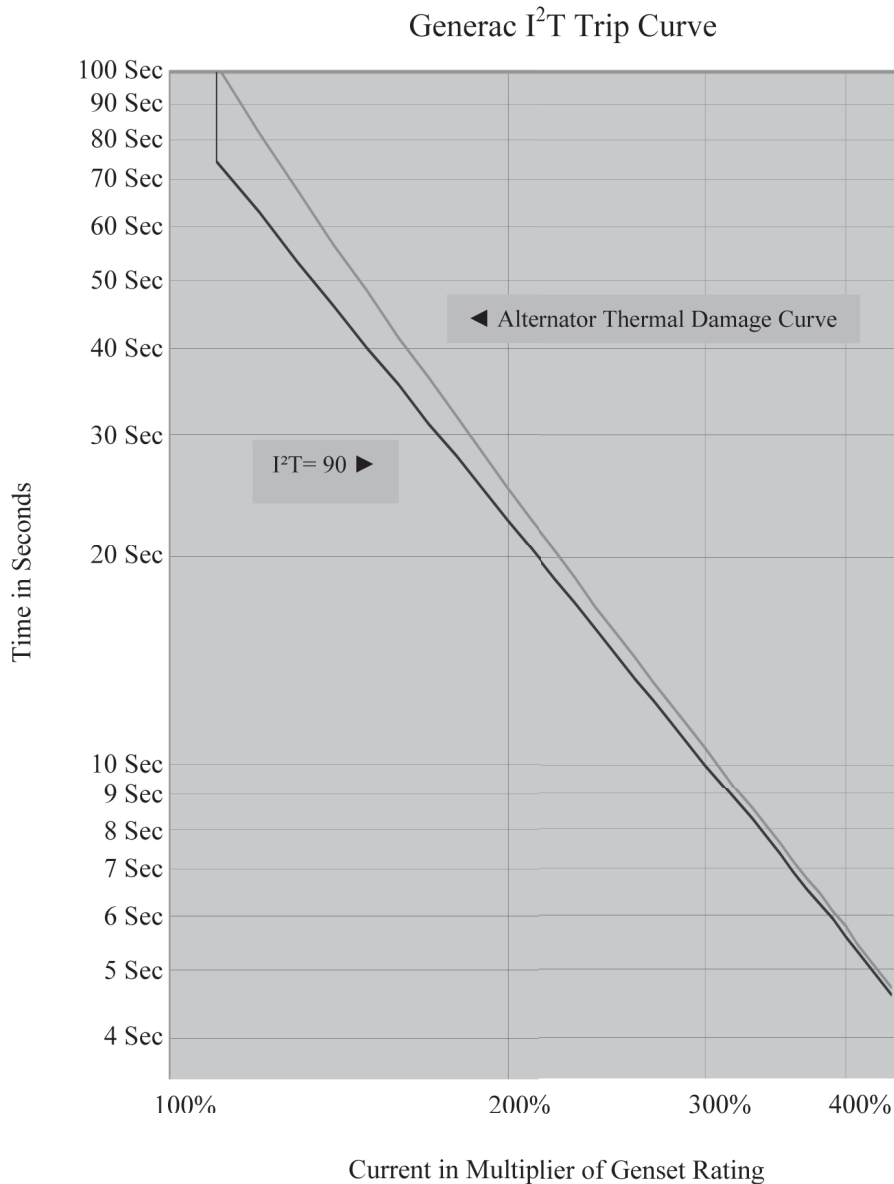
DESCRIPTION

- GENprotect is an alternator protection algorithm approved by UL.
- Protects alternator from damage due to shorts and electrical faults.
- Provides breaker coordination and alternator protection.
- Allows for use of multiple circuit breaker choices, including "no" breaker.



GENprotect™

Seamless Protection for Industrial Power Generators



The above Figure shows the Generac GENprotect thermal protection curve for use in protection and coordination studies. The alternator Thermal Damage Curve is shown just to the right of the GENprotect protection curve. If the alternator load is greater than the thermal damage protection curve for the alternator, the generator set will trip off-line. For example, an overload current of 110% for 75 seconds causes an overload alarm and will trip the generator off-line, shutting down the engine. GENprotect will provide generator protection over a full range of time and current, from instantaneous faults to overloads lasting several minutes. An advantage of GENprotect over a MCCB is that GENprotect allows for downstream breakers to clear faults without tripping the generator off-line, providing selective coordination with the first level of downstream breakers.

INDUSTRIAL GENSET - BATTERY INDEX

• Warranty by Exide Corp. • Exide e-mail: tbгна@exide.com • 800-782-7848 National Hot line

INDUSTRIAL SPARK-IGNITED GENSETS - AVAILABLE BATTERIES

Engine	System Voltage	Battery Quantity	GENERAC PART #					
			058208 (Group 24F)	077483 (Group 26)	058665 (Group 27F)	061119 (Group 31)	061104 (Group 8D)	BT0015A02 (Group 8D)
G2.4	12	1		X				
G4.5	12	1			X	X		
G9.0	12	1			X	X		
G14.2	24	2					X	
G21.9	24	2					X	
G25.8	24	2					X	
G33.9	24	4					X	
G49.0	24	4					X	X

INDUSTRIAL DIESEL GENSETS - AVAILABLE BATTERIES

Engine	System Voltage	Battery Quantity	GENERAC PART #			
			058665 (Group 27F)	061119 (Group 31)	061104/BT0015A00 (Group 8D)	BT0015A02 (Group 8D)
D2.2 Perkins	12	1	X	X		
D2.4 Generac	12	1	X	X		
D3.4 Generac	12	1	X	X		
D4.5 FPT	12	1		X		
D6.7 FPT 100, 130kW	12	1 or 2 [†]		X		
D6.7 FPT 150, 175kW	12	2[†]		X		
D8.7 FPT	24	2		X		
D10.3 FPT	24	2		X	X	
D12.9 FPT	24	2		X	X	
D12.5 Perkins	24	2			X	
D15.2 Perkins	24	2			X	
D16.0 Volvo	24	2		X	X	
D18.1 Perkins	24	2			X	
D33.9 MHI	24	2			X	X
D37.1 MHI	24	4			X	X
D49.0 MHI	24	4			X	X
D65.4 MHI	24	4			X	X

DIMENSIONS (in) NOMINAL

Part Number	Group Number*	Nominal CCA @ 0° F	L	W	H
058208	24F	525	6.75	10.63	9.00
077483	26	525	6.75	8.25	7.75
058665	27F	700	6.75	12.50	9.00
061119	31	925	6.75	13.00	9.40
061104/ BT0015A00	8D	1,155	11.00	20.80	10.00
BT0015A02	8D	1,300	11.00	20.80	10.00

All batteries are 12V, 6 cell construction, lead calcium type.
For 24V systems, batteries are wired in series.

X Battery available with electrolyte and installed in genset.

† Single or dual-paralleled battery options are available on 100 and 130kW. Single-battery option not available on 150 and 175kW.

* BCI Group Size reference.

GENERATOR ENCLOSURES



DESCRIPTION

GENERAC POWER SYSTEMS' generator enclosures provide year-round weather protection for your power equipment. Engineered with functionality and value in mind, the enclosure design benefits are unique in that the enclosures utilize dimensionally matched components for either a weather protective configuration or a sound attenuated/acoustic configuration. With common components used between design, modification and on-site upgrades can be accomplished with ease.

The enclosure design offers several benefits over the "standard enclosures" of other manufacturers. Generac's enclosures have been created with the goal of maximizing the customer's product performance satisfaction while maintaining the functionality of reducing exterior noise levels and discouraging product tampering.

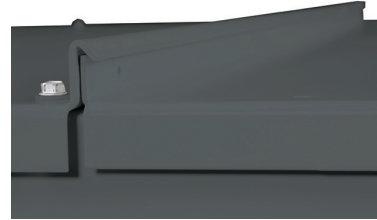
Although others may require a "premium" for a self-enclosed exhaust system, rugged steel panel construction or protective polyethylene washers under all exterior panel fasteners, Generac includes these and several other features on every enclosure configuration. Be sure to compare. Generac Enclosures offer additional design enhancement extras that other "standard enclosures" do not.

GENERATOR ENCLOSURES

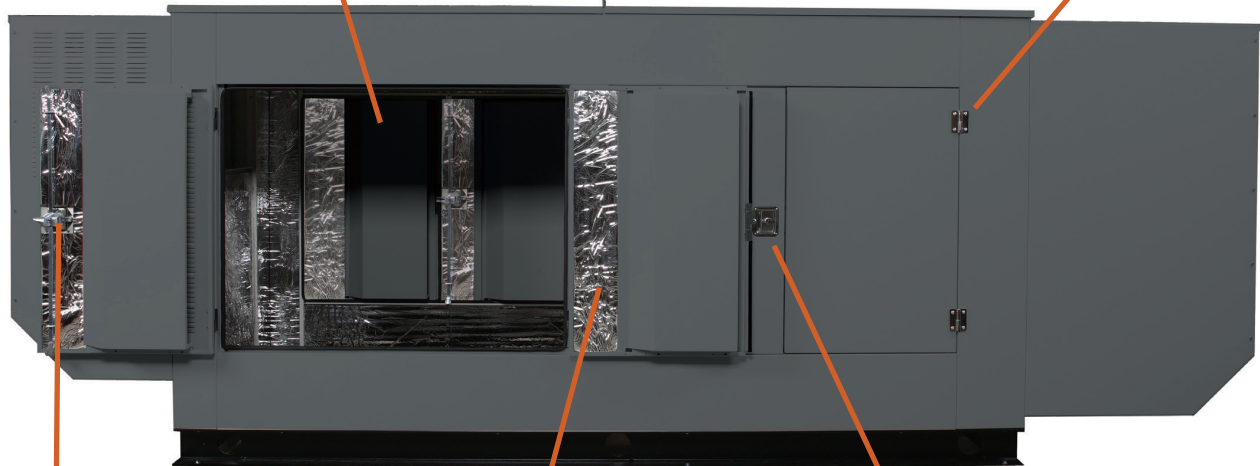
Post-Free Twin Doors
Provide Large, Unobstructed Service Access



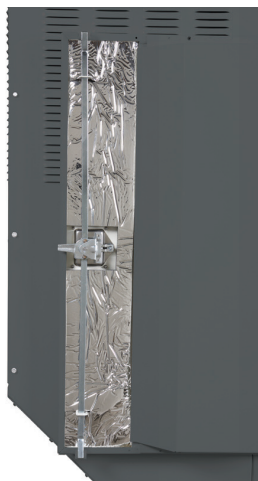
Heavy Gauge, Stainless Steel, Partial Pin Hinges with Nylon Spacers
Durable, Corrosion-Free, Removable Doors



Gasket-Free, Interconnected Roof Panel Joint
Drip-Free, Maintenance-Free



Two-Point Door Latch System
Ensures Proper Seal Preventing Water Ingress and Sound Egress



Dense, Closed-Cell Foam Insulation with Reflective Silver Mylar Layer
Improved Sound Attenuation Without Damaging Effects From Radiant Heat Exposure



Lockable Turn and Tuck Stainless Steel Latch Handle
Corrosion-Free, Non-Protruding and Secure

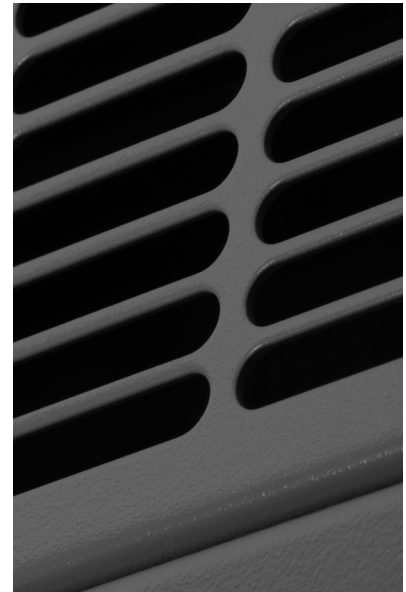
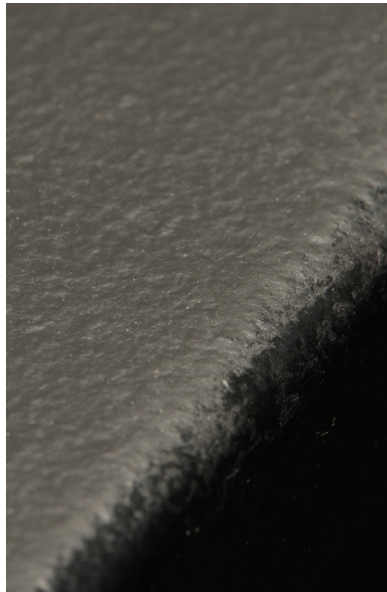
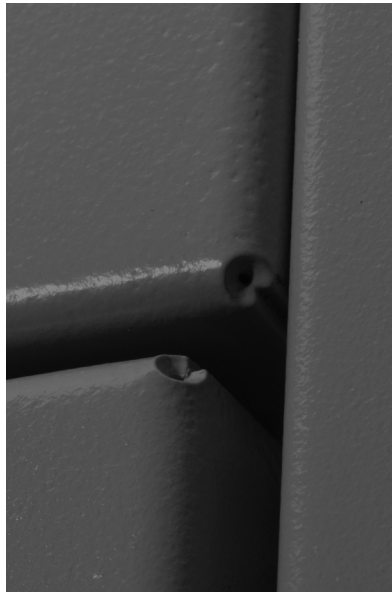


GENERATOR ENCLOSURES

FEATURES:	BENEFITS:
Dimensional matching of acoustic and non-acoustic enclosure designs	Reduces variation in fuel tank pricing, inventory; removes need to change out fuel tank or retrofit
Standardized enclosure components *	Ease of retrofit or upgrade to acoustic system; reduced parts inventory, costs
Enclosure mounted directly to unit baseframe	Simplified delivery and installation with enclosure and unit in single component design
Electrostatically painted panels	Maximum protection from weather elements
12 or 14 gauge steel based on kW rating	Maximum sound attenuation, protection and product life
Aluminum Enclosure optional	Prevents corrosion in coastal regions
Stainless steel door latch and hinge hardware	Provides extended component life; maximum protection against rusting
Stainless steel door latch strike plate	Maximum protection against enclosure paint damage from door latch pin
Door hinges utilize slip-pin design	Provides quick door removal for full-unit access
Polyethylene gasketing under door hinges	Additional protection for enclosure paint finish
Keyed door latches	Protection for equipment and personnel
Large removable access doors	Ease of maintenance
Relocation of access doors	Provides improved access to MLCB on all units
Redesigned door gasketing	Improved sealing quality from sound and weather elements
Weather resistant aluminum roof design with drip ledge	Provides optimum moisture/rain runoff from unit
Cabled and gasketed radiator access cover	Provides improved radiator access and additional protection from weather elements
Acoustic roof panels manufactured with mechanical retention pins	Increased acoustic foam retention within unit
Polyethylene washers under all panel fasteners	Additional paint finish protection from stainless steel fastener
Internally fastened enclosure panels (where possible)	Provides streamlined unit appearance
Additional roof panel stiffener	Added overall compartment rigidity and acoustic foam panel retention
Self-enclosed exhaust system	Provides safe unit operation; no enclosure hot spots; streamlined unit appearance
Discharge air duct has been designed with minimal fasteners	Ease of removal and access to exhaust system
Stainless steel exhaust band clamps	Provides extended component life; ensures proper exhaust seal
Drain holes within air ducts	Enables maximum water run-off
Rodent-proof, tamper proof enclosure design	Safety and security for personnel and equipment
Redesigned baseframe lifting lugs	Ease of unit relocation; prevents compartment damage from lifting straps
Up to 200 MPH wind kit options (Contact Factory for Availability)	Meets locally enforced wind requirements

* Consult Generac Power Systems, Inc. for installation drawings for specific configurations and dimensions.

RhinoCoat™



Generac's RhinoCoat™ finish system provides superior durability as a standard for all Generac Industrial enclosures, tanks and frames.*

Testing Standards

Generac's RhinoCoat™ finished surfaces are subjected to numerous tests. These include:

- ASTM D - 1186 - 87.....2.5+ MIL Paint Thickness
- ASTM D - 3363 - 92a.....Adequate Material Hardness
- ASTM D 522 - B.....Resistant to Cracking
- ASTM D 3359 - B.....Exceptional Adhesion
- ASTM B117 D 1654.....Resistant to Salt Water Corrosion
- ASTM D1735 D 1654.....Resistant to Humidity
- ASTM 2794 93 (2004).....Exceptional Impact Resistance
- SAEJ1690 - UV Specifications.....UV Protection

In addition to the testing standards above, Generac adds the following test requirements more specific to generator applications:

- Resistant to Typical Oils
- Resistant to Typical Fuels
- Resistant to Typical Antifreeze
- Resistant to Distilled Water

Primary Codes and Standards



*RhinoCoat™ powder coat paint is durable and corrosion resistant however it is not a rust preventative. Generac pretreats all powder coated parts to assist with resistance to corrosion.

EATON CIRCUIT BREAKERS

100% Rated Thermal-Magnetic

AMPS	VOLTS	ACCESSORIES	EATON PART #	SERIES	FRAME	GENERAC PART#
70	600	No Accessories	JGE3070FAGC	G	JG-FRAME	0H9302TH00
		Shunt Trip & Aux. Contacts	JGE3070FAGCA2 **			0H9302TH ***
80		No Accessories	JGE3080FAGC			0J0841TH00
		Shunt Trip & Aux. Contacts	JGE3080FAGCA2 **			0J0841TH ***
90		No Accessories	JGE3090FAGC			0J0837TH00
		Shunt Trip & Aux. Contacts	JGE3090FAGCA2 **			0J0837TH ***
100		No Accessories	JGE3100FAGC			0H9314TH00
		Shunt Trip & Aux. Contacts	JGE3100FAGCA2 **			0H9314TH ***
125		No Accessories	JGE3125FAGC			0J0231TH00
		Shunt Trip & Aux. Contacts	JGE3125FAGCA2 **			0J0231TH ***
150		No Accessories	JGE3150FAGC		0H9315TH00	
		Shunt Trip & Aux. Contacts	JGE3150FAGCA2 **		0H9315TH ***	
175		No Accessories	JGE3175FAGC		0H9316TH00	
		Shunt Trip & Aux. Contacts	JGE3175FAGCA2 **		0H9316TH ***	
200		No Accessories	JGE3200FAGC		0J0232TH00	
225		Shunt Trip & Aux. Contacts	JGE3200FAGCA2 **		0J0232TH ***	
		No Accessories	JGE3225FAGC		0H9317TH00	
250		Shunt Trip & Aux. Contacts	JGE3225FAGCA2 **		0H9317TH ***	
		No Accessories	JGE3250FAGC		0H9318TH00	
300		Shunt Trip & Aux. Contacts	JGE3250FAGCA2 **		0H9318TH ***	
	No Accessories	LGE3300FAGC	0H9319TH00			
350	Shunt Trip & Aux. Contacts	LGE3300FAGCA2 **	0H9319TH ***			
	No Accessories	LGE3350FAGC	0H9320TH00			
400	Shunt Trip & Aux. Contacts	LGE3350FAGCA2 **	0H9320TH ***			
	No Accessories	LGE3400FAGC	0H9321TH00			
500	Shunt Trip & Aux. Contacts	LGE3400FAGCA2 **	0H9321TH ***			
	No Accessories	LGE3500FAGC	0H9323TH00			
600	Shunt Trip & Aux. Contacts	LGE3500FAGCA2 **	0H9323TH ***			
	No Accessories	LGE3600FAGC	0H9324TH00			
700*	Shunt Trip & Aux. Contacts	LGE3600FAGCA2 **	0H9324TH ***			
	No Accessories	CMDLB3800T33W	0H9325TH00			
800*	Shunt Trip & Aux. Contacts	CMDLB3800T33WA13S02	0H9325THB0			
	No Accessories	CMDLB3800T33W	0H9326TH00			
900 ¹	Shunt Trip & Aux. Contacts	CMDLB3800T33WA13S02	0H9326THB0			
	No Accessories	NGS312033MCZ08	0H9327TH00			
1,000 ¹	Shunt Trip & Aux. Contacts	NGS312033MCA12S03Z08	0H9327THB0			
	No Accessories	NGS312033MCZ08	0H9328TH00			
1,200 ¹	Shunt Trip & Aux. Contacts	NGS312033MCA12S03Z08	0H9328THB0			
	No Accessories	NGS312033MCX23Y08	0H9329TH00			
1,400 ¹	Shunt Trip & Aux. Contacts	NGS312033MCA12S03Y08	0H9329THB0			
	No Accessories	RGH316033MCY22	0H9360TH00			
1,600 ¹	Shunt Trip & Aux. Contacts	RGH316033MCA12S21Y22	0H9360THB0			
	No Accessories	RGH316033MCY22	0H9361TH00			
2,000 ¹	Shunt Trip & Aux. Contacts	RGH316033MCA12S21Y22	0H9361THB0			
	No Accessories	RGH320033MC	0H9367TH00			
	Shunt Trip & Aux. Contacts	RGH320033MCA12S21	0H9367THB0			

*LS-type electronic trip breaker RMS 310 trip unit. ¹LS-type electronic trip breaker equipped with RMS 310+ trip unit.

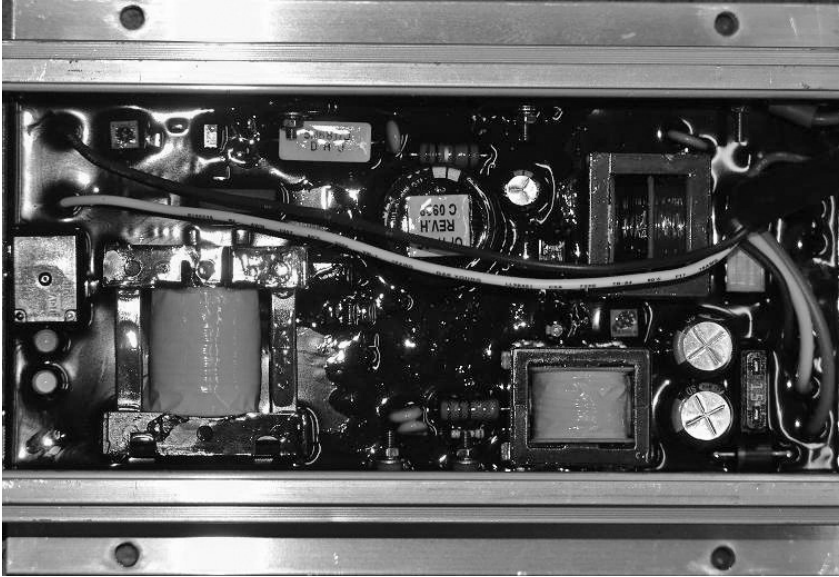
To finish part numbers with either a ** or *** Please see data below:

** 12V System, Use - S4
24V System, Use - S6

*** 12V System, use BO
24V System, use CO

BATTERY CHARGER

2.5 amp and 10 amp



Battery charger shown from inside of control panel enclosure.
Connections are made via an attached harness.

The Generac 2.5 amp 12 volt and 10 amp 12/24 volt battery chargers are designed to work with Generac Industrial Controls to provide the ultimate in automatic battery voltage maintenance.

The 2.5 amp charger is self-regulating and produces instantaneous output current adjustments to keep the battery charged to an optimum level. Battery voltage is read on the control panel digital display.

The 10 amp charger has automatic float and equalize control. It precisely monitors the battery's voltage and automatically activates the correct charging mode. The charge rate is limited and controlled to efficiently and safely maintain ideal battery levels under varying conditions.

The equalize system uses a control circuit to limit charging current to 10 amps. When battery voltage drops below a preset level, charging current increases to 5 amps and then to the 10 amp charge rate if needed. When the battery reaches maximum charge, the charger switches to float mode to supply just enough current to maintain the battery at or above 13/26 volts. Battery voltage and charging current are read at the control panel digital display.

Specifications	2.5A	10A
Nominal Input	120 VAC	120 VAC
Operating AC Line Voltage Range	108 to 132 VAC	108 to 132 VAC
Input AC Line Frequency	50/60 Hz	50/60 Hz
Battery Fuse	N/A	15 A
Nominal Charge Rate	2.5 A	10 A
Equalize Voltage	N/A	13.8/27.6 V
Float Voltage	13.4 V	13.0/26.0 V
Current @ Equalize to Float Transition	N/A	5 A
Battery Under-voltage shutdown	N/A	11/22 V
LED Indicators	No	Yes
AC Line Voltage	N/A	Green LED
Battery Connected and Charging	N/A	Yellow LED
Battery Current Drain	30 mA	30 mA
AC Line Connection	Connector Plug	Connector Plug
Battery Connection	Connector Plug	Connector Plug
Control Connection		AC Power Fail Form Relay Form C 2 A Rating
CUL Recognized	Yes	Yes
NFPA 110 Compliant	No	Yes
AGM Compatible	No	Yes
UL1236	No	Yes
CSA 22.2 No. 107	No	Yes



EATON CIRCUIT BREAKER DATA LUG INFORMATION

Eaton Series C Circuit Breaker Lugs

Amps	Series	Frame	Standard Lug	
			Eaton Part #	Wire (QTY) Size
15-70	C	G	-	(1) #10-1/0
15-100	C	F	3T100FB	(1) #14-1/0
125-200	C	F	3TA225FD	(1) #4-4/0
225	C	F	3TA225FDK	(1) #6-300MCM
250	C	J	TA250KB	(1) #4-350MCM
300	C	K	TA350K	(1) 250-500MCM
350-400	C	K	3TA400K	(2) 3/0-250MCM
450-500	C	L	TA602LD	(2) 3/0-350MCM
600	C	L	3TA603LDK	(2) 400-500MCM
700-800	C	M	TA800MA2	(3) 3/0-400MCM
900-1,000	C	N	T1200NB3	(4) 3/0-400MCM
1,200	C	N	TA1201NB1	(3) 500-750MCM

Eaton Series G Circuit Breaker Lugs

Amps	Series	Frame	Standard Lug	
			Eaton Part #	Wire (Qty) Size
50-250	G	JG	TA250FJ	(1) #8-350MCM
300-600	G	LG	3TA632LK	(2) #2-500MCM
900-1,200	G	NG	TA1201NB1	(3) 500-750MCM
1,400-1,600	G	RG	T1600RD	(4) 1-600MCM
2,000	G	RG	Lugs Not Included	
2,500	G	RG	Lugs Not Included	

- Automatic Transfer Switch, Open and Delayed Transition Controller
- Up to 600 VAC, 50/60 Hz
- Single and Three Phase
- UL Recognized Component

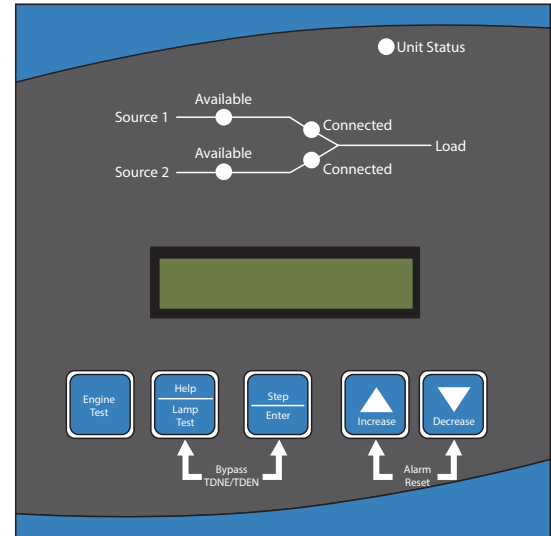


Image used for illustration purposes only

Codes and Standards



UL recognized component, complies with UL1008 and UL991



NFPA 37, 70, 99, 110 (complies)



Applicable for use in NEC 700, 701, 702, 708



ISO 3046, 7637, 8528, 9001, Pluses #2b, 4



ANSI C62.41



Seismic IBC 2009, CBC 2010, IBC 2012, ASCE 7-05, ASCE 7-10, ICC-ES AC-156 (2012) Certified in ATS assemblies



IEC 61000-4-2, 3, 4, 5, 6, 11 EMC Testing and Measuring (complies)



FCC Part 15, Class A (complies)

CISPR 11, Class A

Description

The ATC-300+ microprocessor-based ATS controller is unmatched in performance, reliability and functionality for critical operating, emergency, legally required and optional power systems. The easy to use front LCD display panel simplifies programming, routine operation, data presentation, and setting adjustments. The mimic diagrams displays source availability and connection, providing “at a glance” indication, further simplifying users interface. Designed beyond industry EMC standards, the ATC-300+ is rock-solid for transfer control operations, monitoring and reporting.

Customer/factory established parameters are stored in non-volatile memory. The controller has field-programmable time delays, plus displays real-time and historical information with a time-stamped history log. System testing is performed via a front screen test pushbutton. Features also include programmable plant exerciser—OFF, daily, 7, 14, 28-day interval programmable run times. With the standard features of pretransfer contacts, 3 phase sensing on utility and generator source, phase unbalance, phase reversal, load shed/emergency inhibit, and communications (Modbus® RTU) the ATC-300+ is the industry benchmark for transfer switch controllers. The ATC-300+ complies with UL 1008 / CSA C22.2-178.

STANDARD FEATURES

GENERAL

- Monitors Both Voltage and Frequency on Utility and Generator
- Provides Undervoltage and Overvoltage Protection of the Utility and Generator Power Sources
- Provides Underfrequency and Overfrequency Protection of the Utility Generator Power Source
- Permits Easy Customer Set Up
- Displays Real-time and Historical Information
- Permits System Testing
- Stores Customer/Factory Established Parameters in Nonvolatile Memory
- Provides Faceplate Source Status Indications

INPUT FUNCTIONS

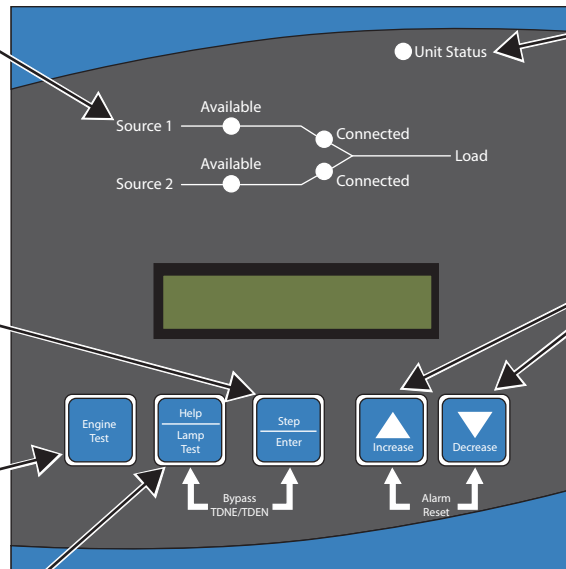
- Help/Lamp Test
- Engine Test
- Step/Enter
- Increase
- Decrease
- Alarm Reset
- Bypass Time Delay

OUTPUT FUNCTIONS

- Unit Status
- Utility Available
- Utility Connected
- Generator Available
- Generator Connected

Source 1, Source 2, and Load LEDs:

Shows status of both Sources and Load.



Unit Status LED:

Blinks once per second while the controller is in "Run" mode to indicate the controller has completed a self-diagnostic and system diagnostic cycle.

Step/Enter Button:

Allows for navigation through information and setpoint displays.

Increase/Decrease Buttons:

Increase or decrease setpoint values.

Engine Test Button:

Allows for testing of the Source 2 (generator) engine.

Help/Lamp Test Button:

Displays additional information about what is on the screen or, when pressed from the Home Screen, momentarily illuminates all LEDs and displays information such as the controller serial number and firmware version.

01/19/2022
Power Series Transfer Switch

ATC-300+

Open and Delayed Transition Controller

SPECIFICATIONS AND PROGRAMMABLE SETPOINTS

SPECIFICATIONS

System Application Voltage	Up to 600 VAC RMS	50/60 Hz
Input Control Voltage	65 to 145 VAC	50/60 Hz
Voltage Measurements of	Utility VAB	Generator VAB
	Utility VBC	Generator VBC
	Utility VCA	Generator VCA
Voltage Measurement Range	0 to 790 VAC RMS	50/60 Hz
Voltage Measurement Accuracy	± 1% of Full Scale	
Frequency Measurements of	Utility and Generator (Source 1 and Source 2)	
Frequency Measurement Range	40 Hz to 70 Hz	
Frequency Measurement Accuracy	± 0.3 Hz Over the Measurement Range	
Operating Temperature Range	-4 to +158 °F (-20 to +70 °C)	
Storage Temperature Range	-22 to +185 °F (-30 to +85 °C)	
Operating Humidity	0 to 95% Relative Humidity (Non-condensing)	
Operating Environment	Resistant to Ammonia, Methane, Nitrogen, Hydrogen, and Hydrocarbons	
Generator Start Relay	5 A, 1/6 HP @ 250 VAC 5 A @ 30 VDC with a 150 W Maximum Load	
K1, K2 Relays	10 A, 1-3 HP @ 250 VAC	
	10 A @ 30 VDC	

PROGRAMMABLE SETPOINTS

Undervoltage Dropout Range	Breaker/Switch Style ATS	50% to 97% of the Nominal System Voltage
	Contactactor Style ATS	78% to 97% of the Nominal System Voltage
Undervoltage Pickup Range	Breaker/Switch Style ATS	(Dropout +2%) to 99% of the Nominal System Voltage
	Contactactor Style ATS	(Dropout +2%) to 99% of the Nominal System Voltage
Overvoltage Dropout Range	Breaker/Switch Style ATS	105% to 120% of the Nominal System Voltage
	Contactactor Style ATS	105% to 110% of the Nominal System Voltage
Overvoltage Pickup Range	Breaker/Switch Style ATS	103% to (Dropout -2%) of the Nominal System Voltage
	Contactactor Style ATS	103% to (Dropout -2%) of the Nominal System Voltage
Underfrequency Dropout Range	Breaker/Switch Style ATS	90% to 97% of the Nominal System Frequency
	Contactactor Style ATS	90% to 97% of the Nominal System Frequency
Underfrequency Pickup Range	Breaker/Switch Style ATS	(Dropout +1Hz) to 99% of the Nominal System Frequency
	Contactactor Style ATS	(Dropout +1Hz) to 99% of the Nominal System Frequency
Overfrequency Dropout Range	Breaker/Switch Style ATS	103% to 110% of the Nominal System Frequency
	Contactactor Style ATS	103% to 105% of the Nominal System Frequency
Overfrequency Pickup Range	Breaker/Switch Style ATS	101% to (Dropout -1Hz) of the Nominal System Frequency
	Contactactor Style ATS	101% to (Dropout -1Hz) of the Nominal System Frequency

01/19/2022
Power Series Transfer Switch

ATC-300+

Open and Delayed Transition Controller

SPECIFICATIONS AND PROGRAMMABLE SETPOINTS

ADDITIONAL PROGRAMMABLE SETPOINTS

Time Delay Nml to Emr	0 to 1,800 seconds
Time Delay Emr to Nml	0 to 1,800 seconds
Time Delay Engine Cool	0 to 1,800 seconds
Time Delay Engine Start	0 to 120 seconds
Time Delay Neutral ¹	0 to 120 seconds
Time Delay Source 2 Fail	0 to 6 seconds
Time Delay Volt Unbal	10 to 30 seconds
Volt Unbal 3-Phase	0 or 1 (1 = Enable)
% of Unbal Volt Dropout	5% to 20% (DO)
	Dropout -2% to 3% (PU)
Nominal Voltage	120 to 600 Volts
Nominal Frequency	50 or 60Hz
Baud Rate	9,600 or 19,200
Phase Reversal 3-Phase	OFF, ABC, or CBA
In-Phase ²	0 or 1 (1 = Enable)
Pre-Transfer Signal	1 to 120 seconds
Manual/Retransfer	0 or 1 (1 = Enable)
Plant Exerciser	Off, Daily, 7-Day, 14-Day, 28-Day Intervals
	0 to 600 minutes
	Load or No Load
Daylight Svgs Time Adj	0 or 1 (1 = Enable)
System Selection	Utility/Generator or Dual Utility
Modbus Address	1 to 247
Communications	Modbus [®] RTU
	Ethernet and/or Remote Annunciator (Optional)
Applicable Testing	UL Recognized Component
	UL 1008, UL 991 Environmental
	IEC 61000-4-2, 61000-4-3, 61000-4-4, 61000-4-5, 61000-4-6, 61000-4-11
	CISPR 11, Class A
	FCC Part 15, Class A
Enclosure Compatibility	NEMA 1, NEMA 3R, NEMA 4X, and NEMA 12
	UV Resistant ATC-300+ Faceplate

1. Not available on open transition with inphase only switches
2. Not available on molded case type switches

COOLANT HEATER OPTION 1500 WATT, 240VAC



SPECIFICATIONS:

VOLTAGE: 240VAC

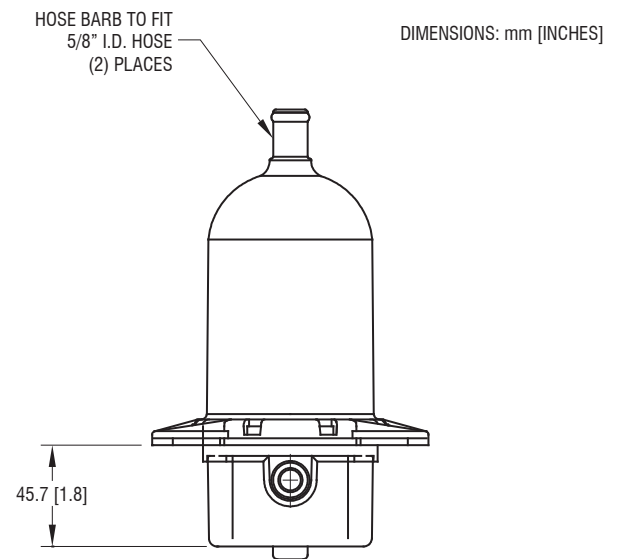
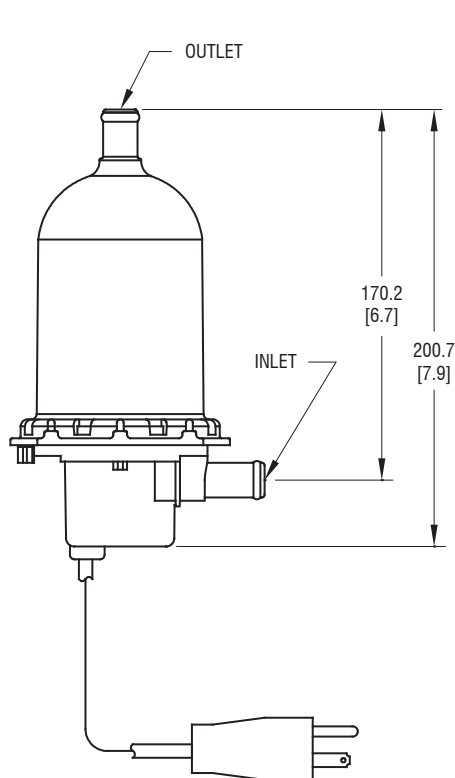
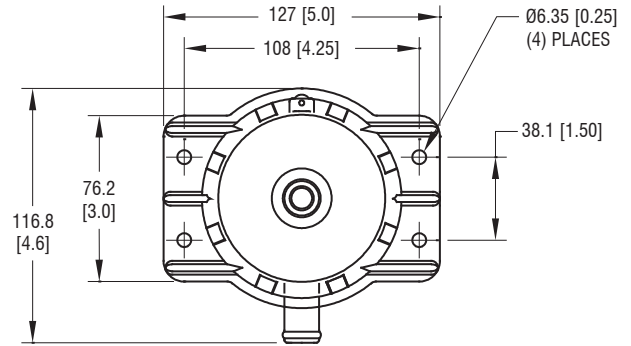
HEAT POWER: 1500W

FIXED THERMOSTAT: 100°-120°F

HEATING ELEMENT: INCOLOY 800

MAXIMUM PRESSURE: 90 PSI (620 kPa)

PLUG NEMA STD: 6-15P



4

3

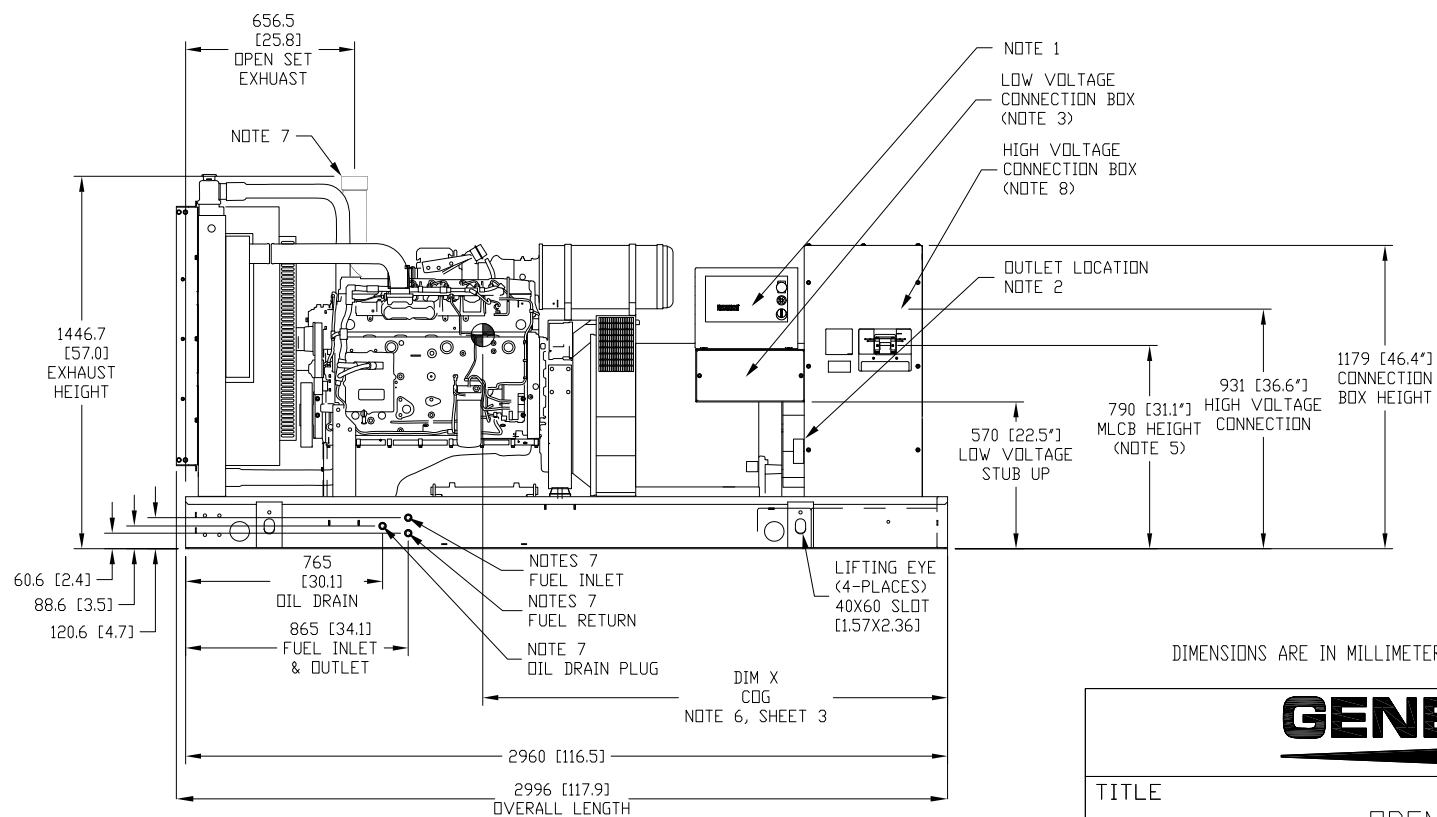
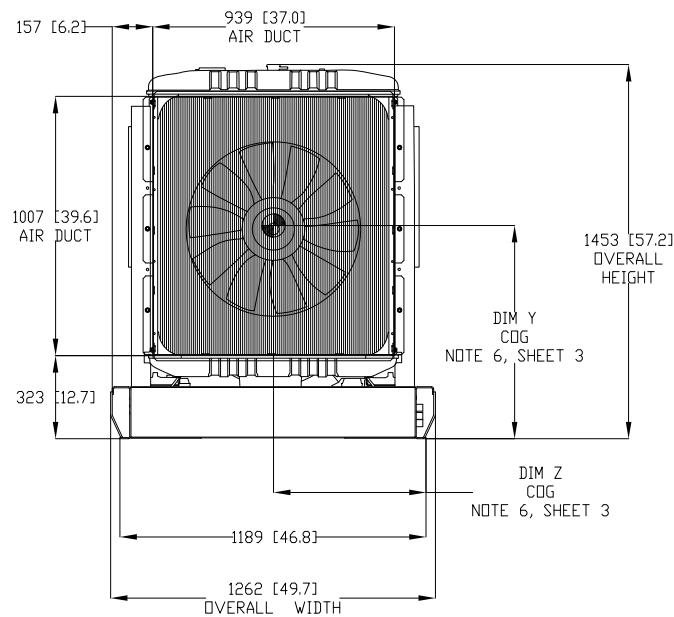
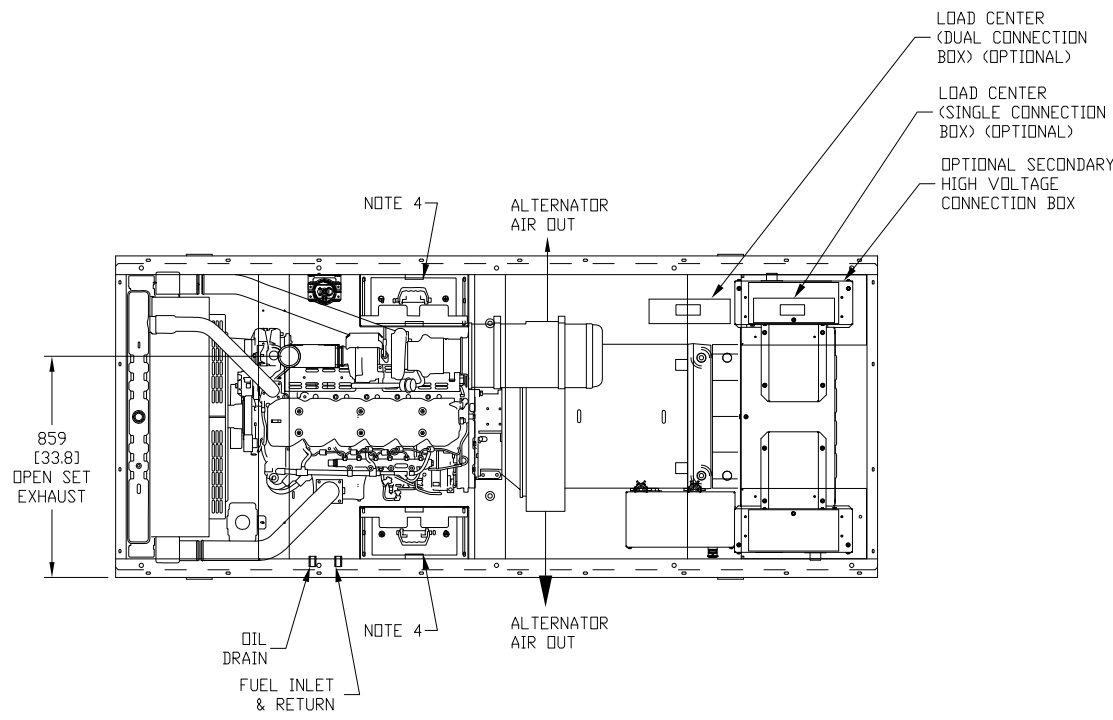
SH 1/3 REV J

1

- Notes:
- CONTROL PANEL, (OPTIONAL BATTERY CHARGER INSIDE).
 - 120V, 20A GFCI & 250V, 15A OUTLET (OPTIONAL).
 - CONNECTION POINTS FOR CONTROL WIRES PROVIDED IN THE LOW VOLTAGE CONNECTION BOX (USE LOW VOLTAGE STUB-UP AREA).
 - BATTERY (12 VOLT NEGATIVE GROUND SYSTEM).
 - MAIN LINE CIRCUIT BREAKER (MLCB), AC LOAD LEADS. (DIMENSIONS MAY VARY DUE TO UNIT CONFIGURATION)
 - CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS.

- ENGINE SERVICE CONNECTIONS:
 INLET NATURAL GAS = N/A
 INLET DIESEL = 1/2" NPT COUPLING
 RETURN DIESEL = 1/2" NPT COUPLING
 OIL DRAIN = 1/2" NPT COUPLING
 RADIATOR DRAIN = N/A
 FLEX PIPE OUTLET = 4" I.D.
 EXHAUST OUTLET = N/A
 ***** SEE GENERATOR SIZING GUIDE FOR FUEL PIPE SIZING TO SUIT APPLICATION *****

- AUXILIARY AC CONNECTION FOR UNIT OPTIONS ARE LOCATED IN HIGH VOLTAGE CONNECTION BOX, UNLESS AN OPTIONAL LOAD CENTER IS INSTALLED.
 - EXHAUST PIPES MAY BE ROTATED TO ALLOW MUFFLER TO POINT OUT TO THE RIGHT OR LEFT SIDE OF GENERATOR. (MAY NOT APPLY TO ALL UNITS)
 - GENERATOR SET MUST BE INSTALLED SUCH THAT FRESH COOLING AIR IS AVAILABLE AND DISCHARGE AIR FROM THE RADIATOR IS NOT RECIRCULATED.
 - BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
 - INSTALL EXHAUST BLANKETS ALONG THIS LINE.
 - CONNECT THE OPEN SET EXHAUST PER NFPA 37
 - BOLTS OR STUDS USED TO MOUNT UNIT TO PAD, OR BASE TANK, SHALL BE 5/8"-11 GRADE 5. USE STANDARD SAE TORQUE SPECS. (FOR INSTALLATION OF FUEL TANK TO PAD REFER TO INSTALL DRAWING OF THE BASE TANK)
- ADDITIONAL NOTES:
 FOR WEIGHT AND CENTER OF GRAVITY DATA SEE NOTE 6, AND SHEET 3.



DIMENSIONS ARE IN MILLIMETERS (INCHES)

DRAWING CREATED FROM PRO/ENGINEER 3D FILE. ECD MODIFICATION TO BE APPLIED TO SOLID MODEL ONLY.

INSTALLATION DRAWING

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ELECTRONICALLY APPROVED
INSIDE WINDCHILL



TITLE				
OPEN SET D6.7L, 60HZ: SD150, PD135 SD175, PD158				
ISSUE DATE:		9/30/14		
SIZE	CAGE NO	DWG NO	REV	
B	N/A	0J4194	J	
SCALE	0.035	WT-KG	SHEET 1 of 3	

4

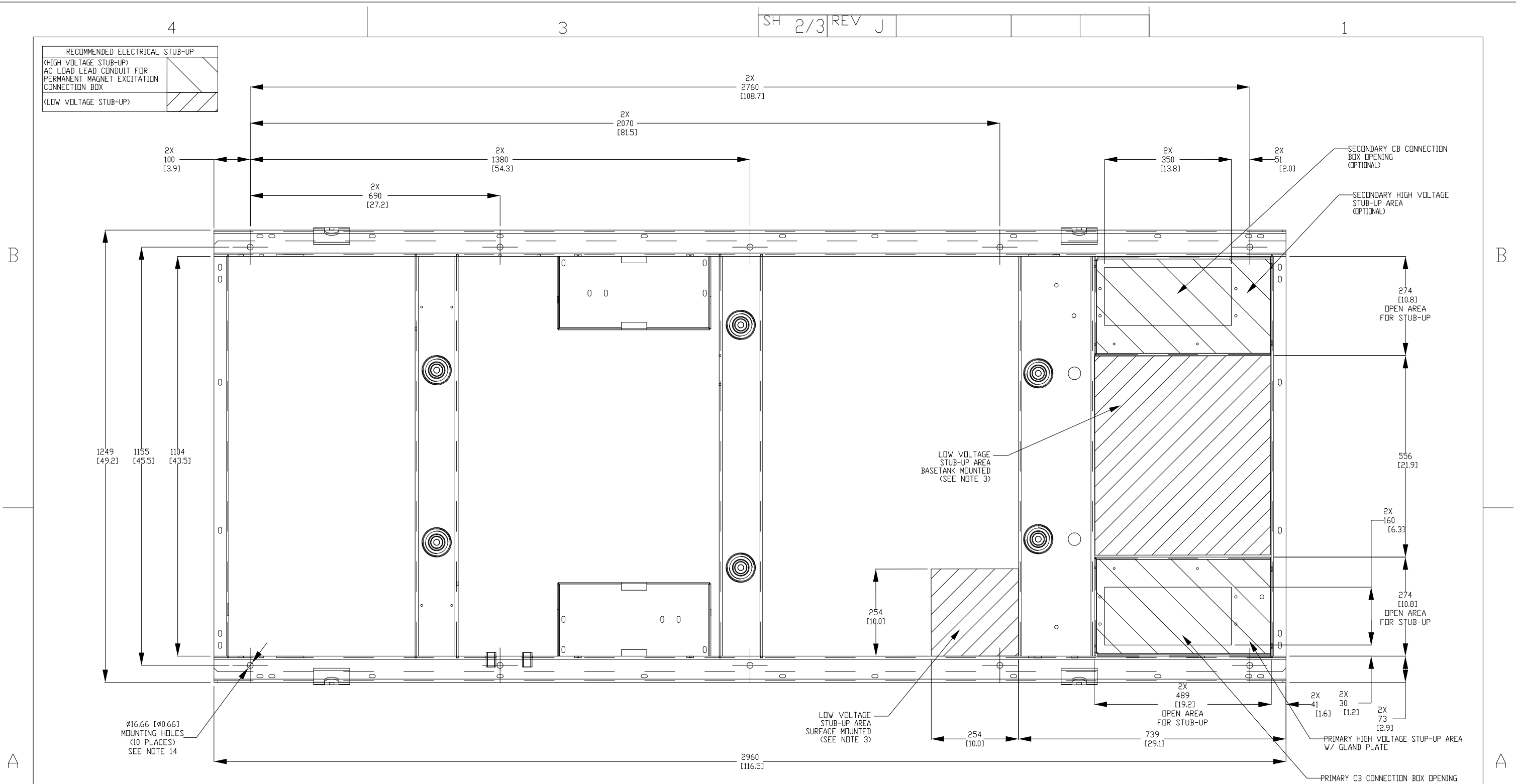
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SH 2/3 REV J

RECOMMENDED ELECTRICAL STUB-UP (HIGH VOLTAGE STUB-UP) AC LOAD LEAD CONDUIT FOR PERMANENT MAGNET EXCITATION CONNECTION BOX	
(LOW VOLTAGE STUB-UP)	



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DIMENSIONS ARE IN MILLIMETERS (INCHES)



TITLE
 STUB-UP VIEW
 D6.7L, 60HZ: SD150, PD135
 SD175, PD158

ISSUE DATE:	9/30/14		
SIZE	CAGE NO	DWG NO	REV
B	N/A	0J4194	J
SCALE	0.120	WT-KG	SHEET 2 of 3

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INSTALLATION DRAWING

4

3

SH 3/3 REV J

1

OPEN SET

Table with 7 columns: MODEL, VOLTAGE, UPSIZE, WEIGHT, CENTER OF GRAVITY DIM X, CENTER OF GRAVITY DIM Y, CENTER OF GRAVITY DIM Z. Lists various SDI50, SDI75, SDI158 models with their specifications.

NOTE: CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO OPTIONS

STD ENCLOSURE, STEEL

Table with 7 columns: MODEL, VOLTAGE, UPSIZE, WEIGHT, CENTER OF GRAVITY DIM X, CENTER OF GRAVITY DIM Y, CENTER OF GRAVITY DIM Z. Lists various SDI50, SDI75, SDI158 models with their specifications.

STD ENCLOSURE, ALUMINUM

Table with 4 columns: WEIGHT, CENTER OF GRAVITY DIM X, CENTER OF GRAVITY DIM Y, CENTER OF GRAVITY DIM Z. Lists weight and center of gravity data for aluminum enclosures.

L1A ENCLOSURE, STEEL

Table with 7 columns: MODEL, VOLTAGE, UPSIZE, WEIGHT, CENTER OF GRAVITY DIM X, CENTER OF GRAVITY DIM Y, CENTER OF GRAVITY DIM Z. Lists various SDI50, SDI75, SDI158 models with their specifications.

L1A ENCLOSURE, ALUMINUM

Table with 4 columns: WEIGHT, CENTER OF GRAVITY DIM X, CENTER OF GRAVITY DIM Y, CENTER OF GRAVITY DIM Z. Lists weight and center of gravity data for aluminum enclosures.

L2A ENCLOSURE, STEEL

Table with 7 columns: MODEL, VOLTAGE, UPSIZE, WEIGHT, CENTER OF GRAVITY DIM X, CENTER OF GRAVITY DIM Y, CENTER OF GRAVITY DIM Z. Lists various SDI50, SDI75, SDI158 models with their specifications.

L2A ENCLOSURE, ALUMINUM

Table with 4 columns: WEIGHT, CENTER OF GRAVITY DIM X, CENTER OF GRAVITY DIM Y, CENTER OF GRAVITY DIM Z. Lists weight and center of gravity data for aluminum enclosures.

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ELECTRONICALLY APPROVED INSIDE WINDCHILL



Table with 2 columns: TITLE (WEIGHT & CENTER OF GRAVITY D6.7L, 60HZ: SD150, PD135 SD175, PD158) and ISSUE DATE (9/30/14). Includes fields for SIZE, CAGE NO, DWG NO, SCALE, and SHEET.

4

3

2

1

01/19/2022

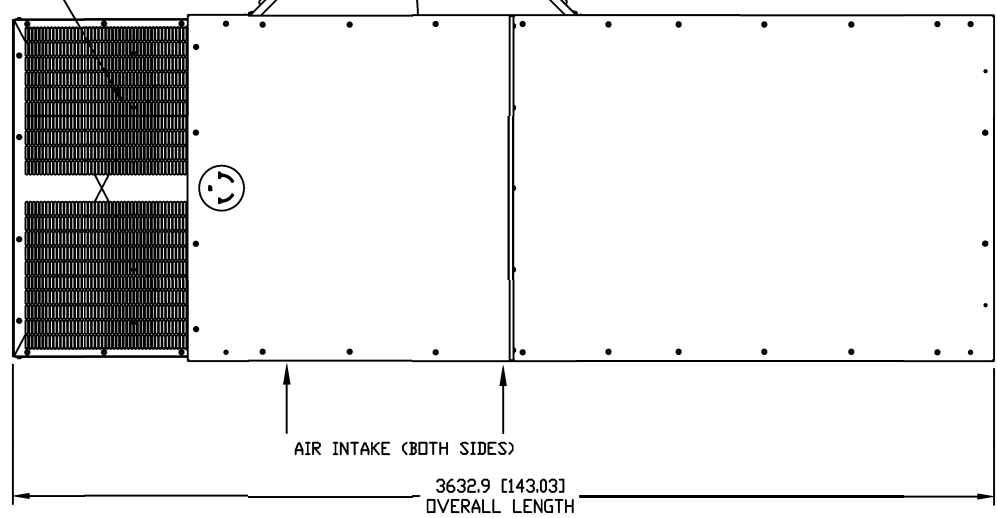
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DISCHARGE AIR RADIATOR & EXHAUST

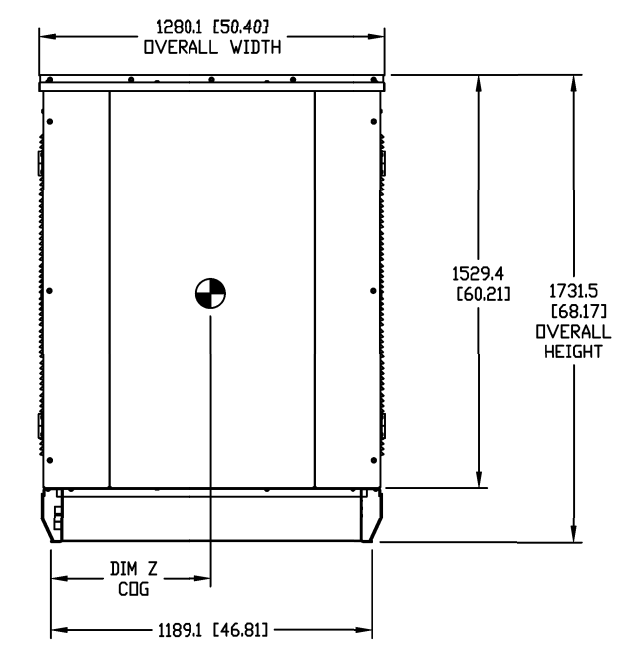
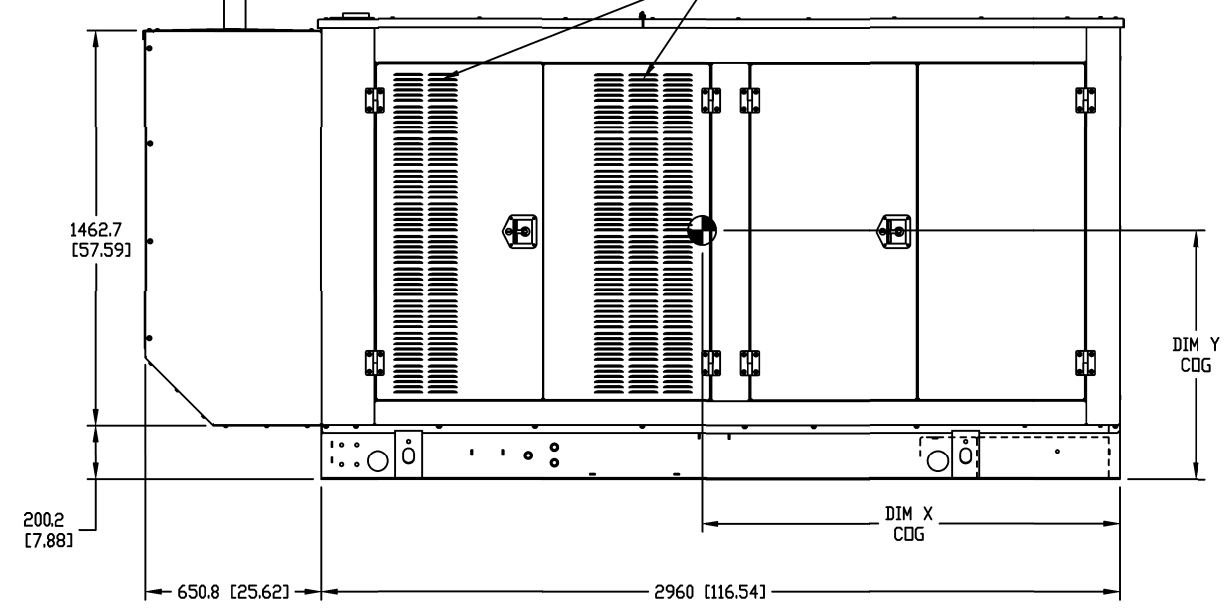
R642 [R25.3] TYP (4-PLACES) DOOR SWING
R621 [R24.4] TYP (4-PLACES) DOOR SWING



FOR ALL STUB-UP, WEIGHT, AND COG DETAILS, SEE CORRESPONDING OPEN SET DRAWING PER UNIT CONFIGURATION.

RADIATOR/EXHAUST DISCHARGE AIR

AIR INTAKE



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DIMENSIONS ARE IN MILLIMETERS [INCHES]



TITLE

STD ENCLOSURE
D6.7L, 60HZ: SD150, PD135
SD175, PD158

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ISSUE DATE:		6/13/14	
SIZE	CAGE NO	DWG NO	REV
B	N/A	0J4194A	F
SCALE	0.035	WT-KG	SHEET 1 of 1

ELECTRONICALLY APPROVED
INSIDE WINDCHILL

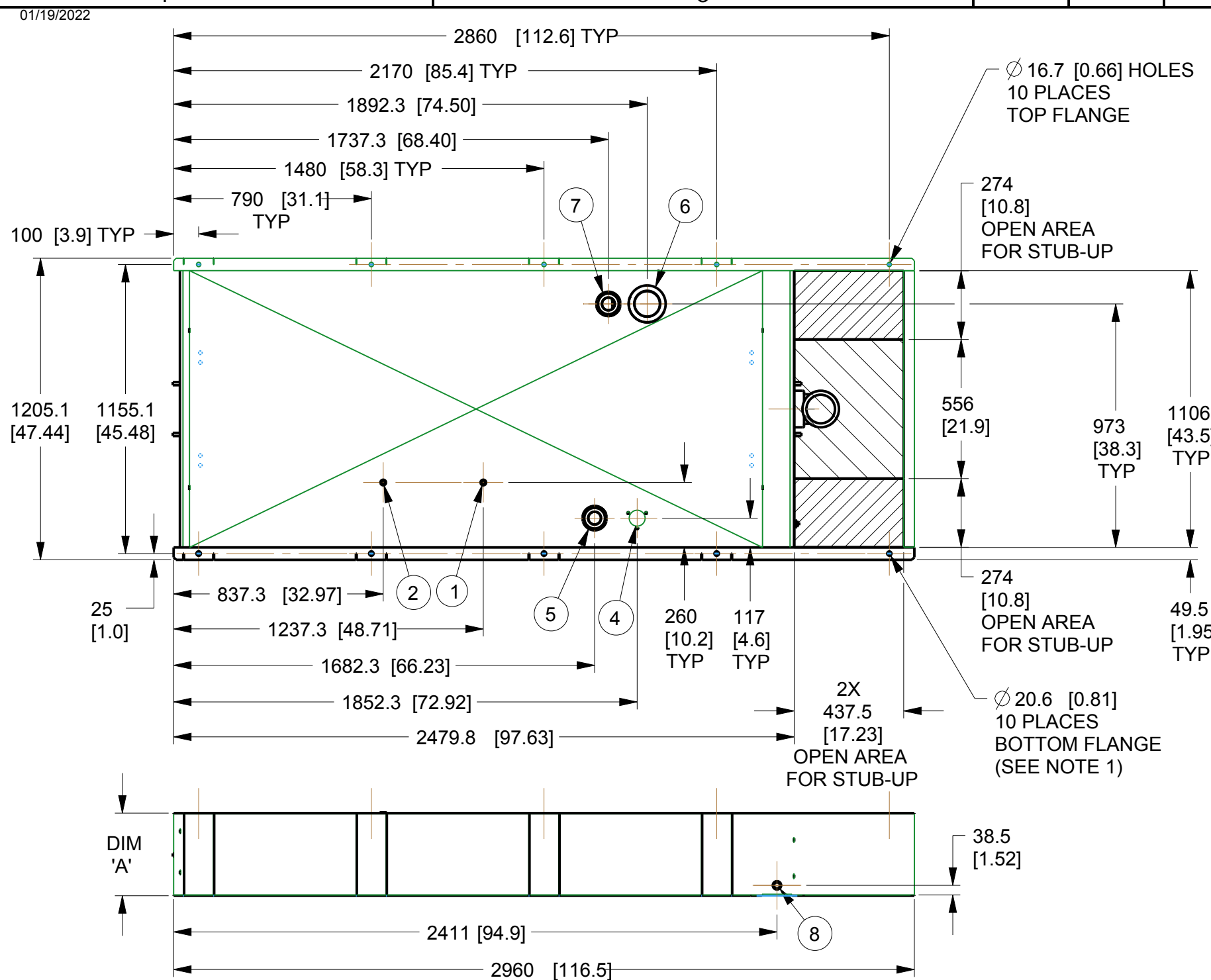
INSTALLATION DRAWING

4

3

2

1

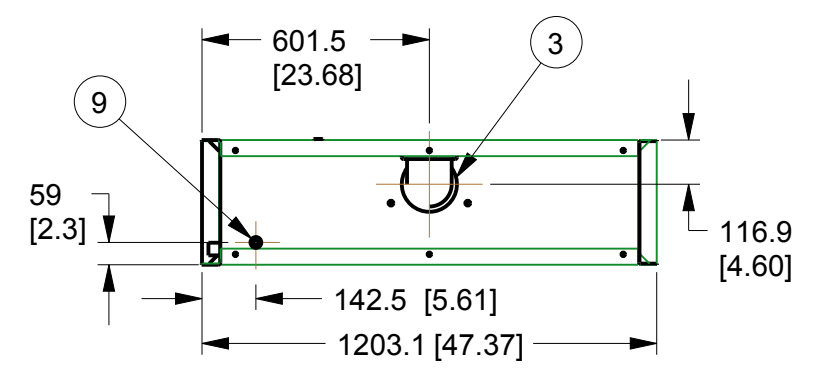


I/N	TANK FITTING	FUNCTION
1	3/8" NPT COUPLING	FUEL SUPPLY
2	3/8" NPT COUPLING	FUEL RETURN
3	4" NPT WELD FLANGE	EMERGENCY VENT (OUTER)
4		FUEL LEVEL
5	2" NPT WELD FLANGE	FUEL FILL
6	4" NPT WELD FLANGE	EMERGENCY VENT (INNER)
7	2" NPT WELD FLANGE	VENT
8	3/4" NPT FITTING	DRAIN
9	Ø 22 MM HOLE	LEAK DETECTOR

CAPACITY SHOWN: LITER [GALLONS]
 WEIGHT SHOWN: KILOGRAMS [POUNDS]
 LENGTH SHOWN: MM [INCH]
 UL #142 / ULC-S601 LISTED

NOTE:
 1. MOUNTING BOLTS OR STUDS FOR MOUNTING BASE TANK TO CONCRETE PAD SHALL BE 3/4-10 GRADE 5. (USE STANDARD SAE TORQUE SPECS)

- LOW VOLTAGE STUB-UP
- HIGH VOLTAGE STUB-UP



TANK P/N	0J18470ST03	0J18490ST03	0J18510ST03
DIM 'A'	330 [13]	635 [25]	940 [37]
TOTAL TANK CAPACITY	547 [145]	1260.5 [333]	1972 [521]
USABLE TANK CAPACITY	507 [134]	1219 [322]	1930 [510]
DRY WEIGHT [EST]	356 [784]	486 [1072]	621 [1365]

DRAWING CREATED FROM PRO/ENGINEER 3D FILE. ECO MODIFICATION TO BE APPLIED TO SOLID MODEL ONLY.

INSTALLATION DRAWING

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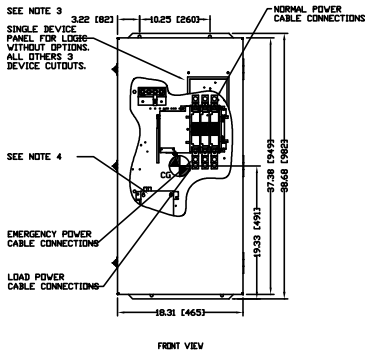
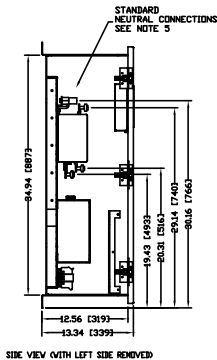
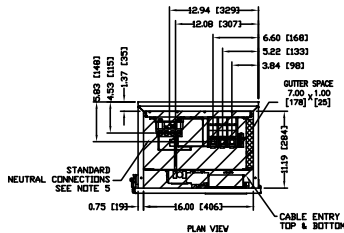
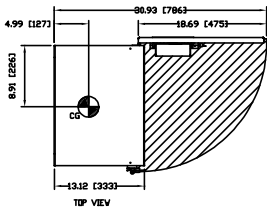
ELECTRONICALLY APPROVED
INSIDE WINDCHILL

GENERAC

TITLE
INSTALL BASE TANK D6.7L D-GRP

ISSUE DATE: 02/07/11

SIZE B	CAGE NO N/A	DWG NO 0J4214	REV D
SCALE 0.050	WT-KG 349.009	SHEET 1 of 1	



APPROXIMATE SHIPPING WEIGHT: 160 LBS (73 KG)

NOTED:

1. DIMENSIONS SHOWN IN INCHES (MILLIMETERS)
2. CENTER OF GRAVITY.
3. AUTOMATIC CONTROLS PROVIDED.
4. TRANSFORMER PACK IS NOT INCLUDED WITH 240/120V, 1 PHASE OR 208/120V SYSTEMS.
5. FOR SWITCHED NEUTRAL APPLICATIONS, CONNECT TO TERMINALS MARKED "NN", "EN", AND "LN". NEUTRAL ASSEMBLY WILL NOT BE PROVIDED.

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INSTALLATION DRAWING

AUTOMATIC TRANSFER SWITCH

2 POSITION CONTACTOR

208-480V 200A 3POLE

NEMA 1, 3R

GENERAC POWER SYSTEMS
Waukesha
 P.O. BOX 8
 WAUKESHA, WIS. 53187

FILE NAME	67B8424.DWG	SIZE	B
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SCALE	NTS	FIRST USE	
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DWG NO.	67B8424	REV	-
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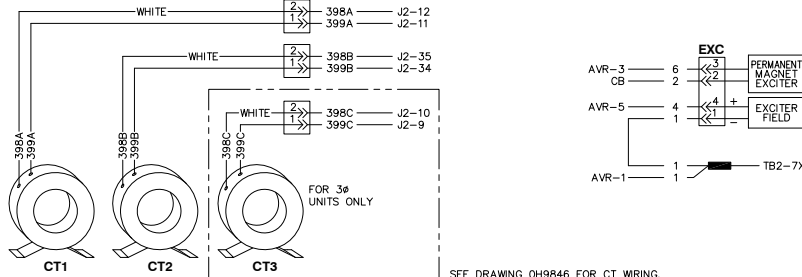
LEGEND

AH1 - ALARM HORN	GND - GROUND BAR CONNECTION
ALT - DC CHARGE ALTERNATOR	IFT - INTERFACE TRANSFORMER
AVR - AUTO VOLTAGE REGULATOR	J_ - ENGINE CONTROL MODULE CONN.
BCC - BATTERY CHARGER CONNECTOR	LD - LEAK DETECTOR
BCH - BATTERY CHARGER	MLCB - MAIN LINE CIRCUIT BREAKER
CAND - CAN BUS DIAGNOSTIC CONNECTOR	MOD - MODEM CONNECTOR
CB - CIRCUIT BREAKER DPE	NB - NEUTRAL BLOCK
CO - CROSS OVER CONNECTOR	R_ - RESISTOR
COM - COMMUNICATION CONNECTOR	RE_ - RELAY BOARD
CT_ - CURRENT TRANSFORMER	RB_A - RELAY BOARD CONNECTOR
DB - DIODE BRIDGE	RR - RUN RELAY
EDC - ENGINE DIGITAL CONTROL	SC - STARTER CONTACTOR
ESI - EMERGENCY STOP SWITCH	SM - STARTER MOTOR
EXC - EXCITER	SW1 - OFF/AUTO/MANUAL SWITCH
F_ - FUSE	SWC - SWITCH CONNECTOR
FLS_ - FUEL LEVEL SENDER	TB_ - TERMINAL BLOCK
GFCI - GROUND FAULT CIRCUIT INTERRUPT	WLS_ - COOLANT LEVEL SENDER

NOTE: ALL WIRES 18 AWG 300V UL LISTED UNLESS SHOWN OTHERWISE



COMPONENTS LOCATED IN ALTERNATOR CONNECTION BOX



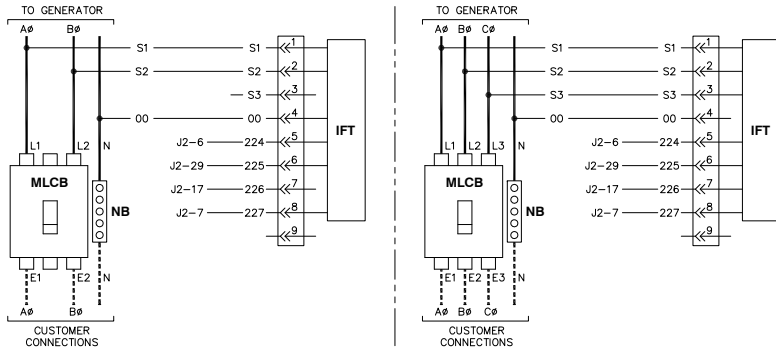
SEE DRAWING 0H9846 FOR CT WIRING.

COMPONENTS LOCATED IN HIGH VOLTAGE CUSTOMER CONNECTION MODULE

CONNECTIONS FOR 1Ø UNIT

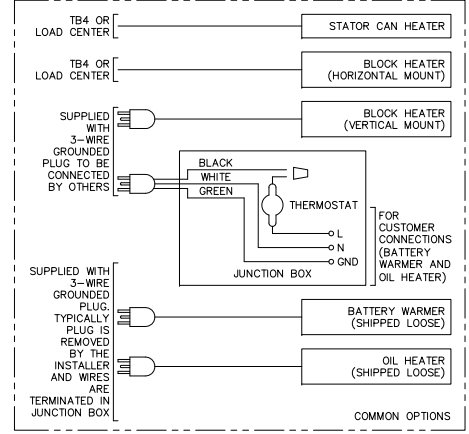
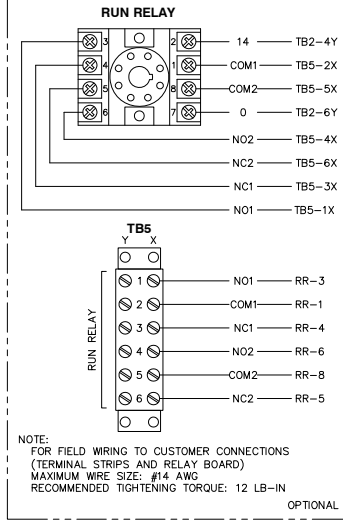
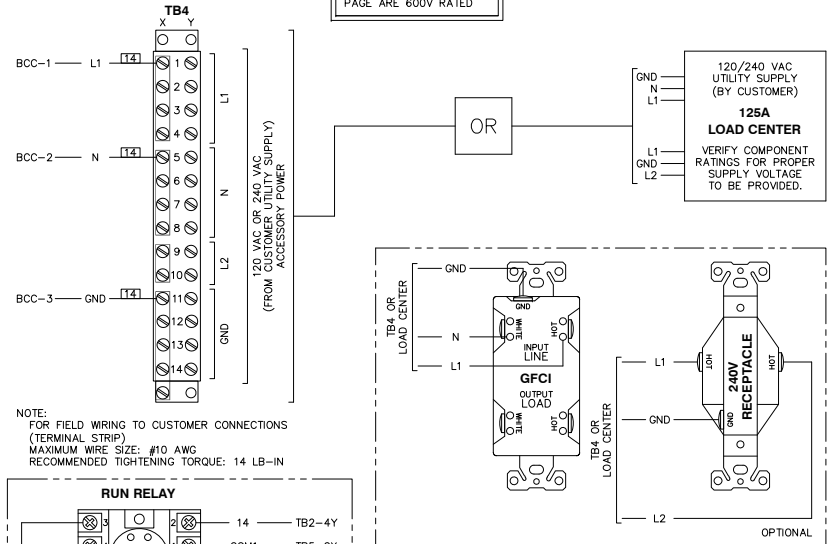
NOTE: ALL WIRES IN THIS SECTION ARE 600V RATED

CONNECTIONS FOR 3Ø UNIT



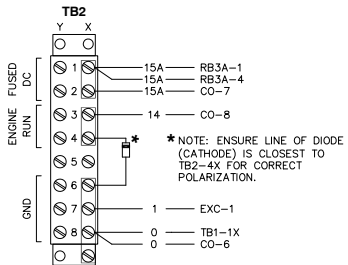
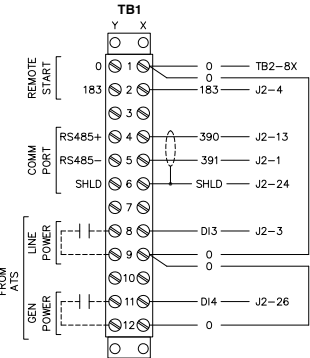
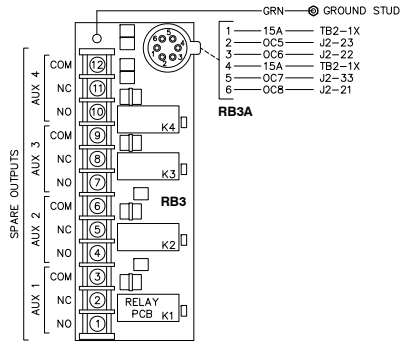
COMPONENTS LOCATED IN HIGH VOLTAGE CUSTOMER CONNECTION MODULE

NOTE: ALL WIRES ON THIS PAGE ARE 600V RATED



01/19/2022

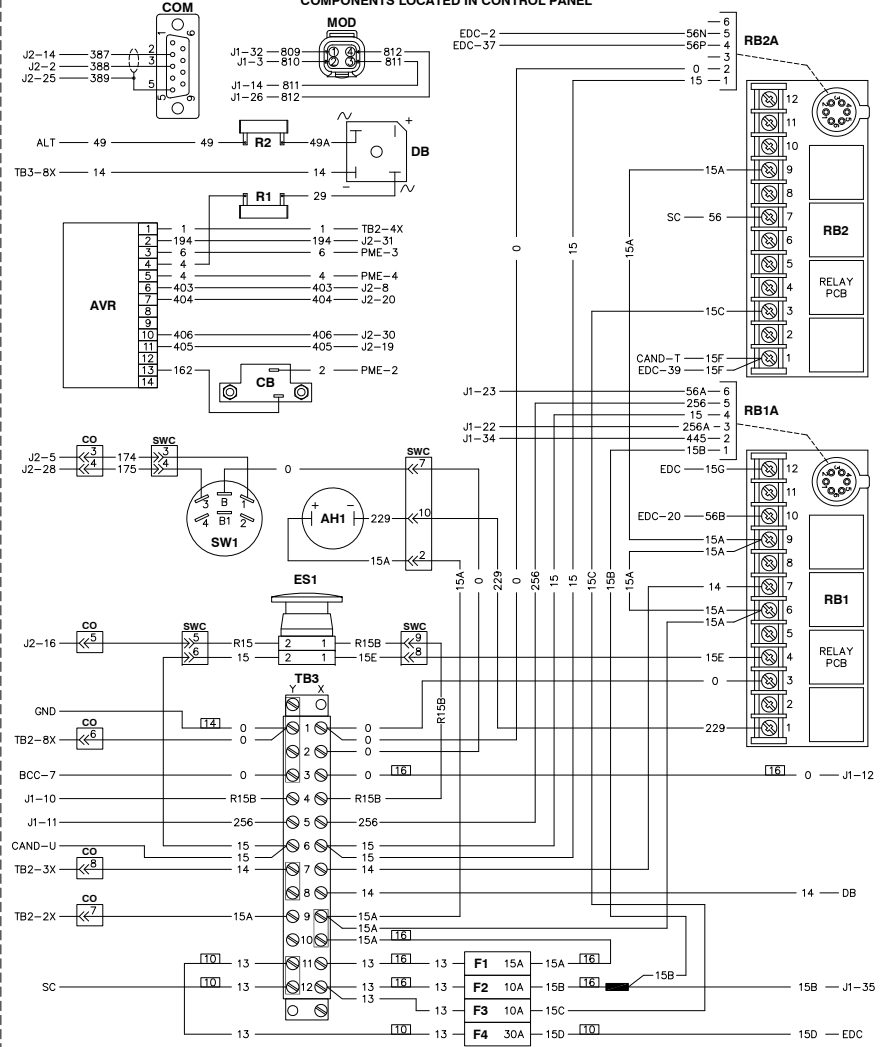
COMPONENTS LOCATED ON LOW VOLTAGE CUSTOMER CONNECTION PANEL



NOTE:
FOR FIELD WIRING TO CUSTOMER CONNECTIONS
(TERMINAL STRIPS AND RELAY BOARD)
MAXIMUM WIRE SIZE: #14 AWG
RECOMMENDED TIGHTENING TORQUE: 12 LB-IN

Page 135 of 155

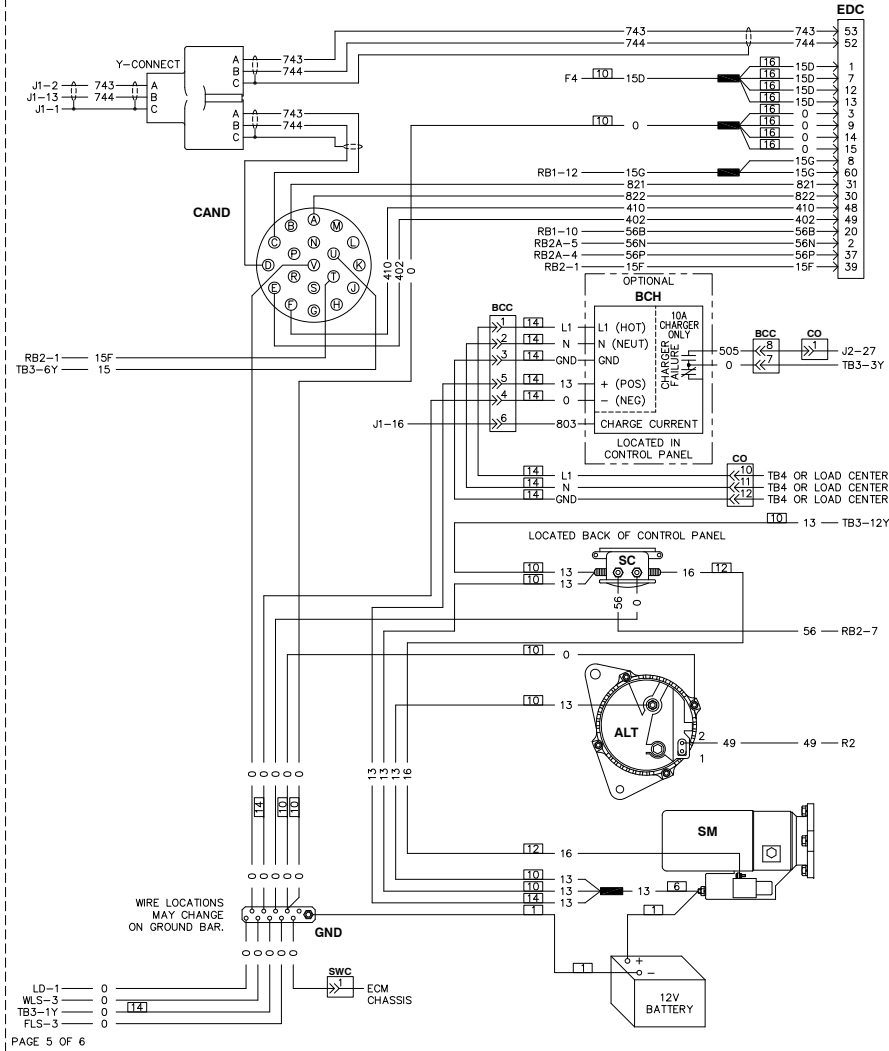
COMPONENTS LOCATED IN CONTROL PANEL



01/19/2022

GROUP G

COMPONENTS LOCATED ON ENGINE



PAGE 5 OF 6

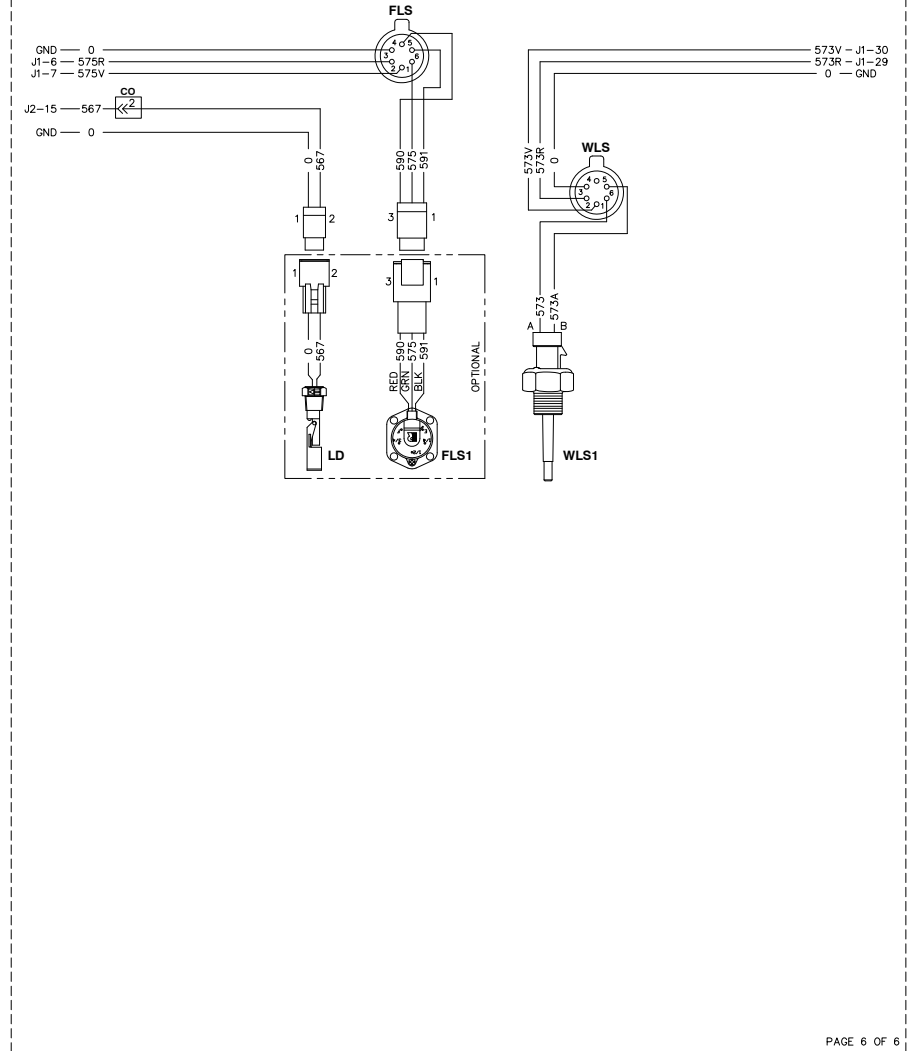
REVISION: H-9136-D
DATE: 6/9/11

WIRING - DIAGRAM
D6.7L G17 12V W/CAN BUS
DRAWING #: 0H9882

GROUP G

Page 136 of 155

COMPONENTS LOCATED ON ENGINE



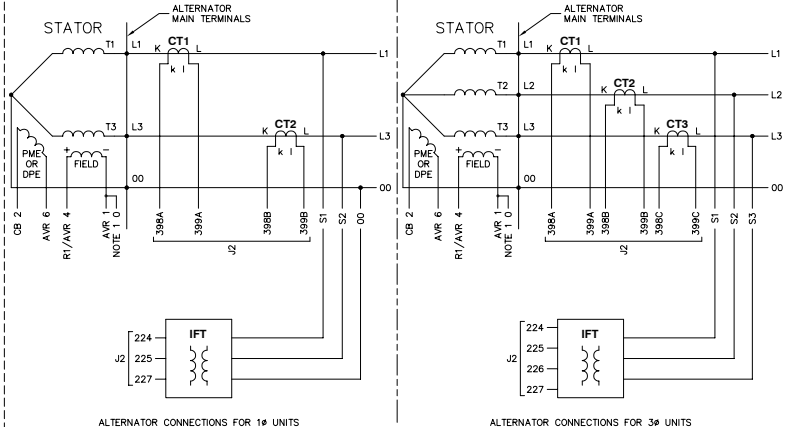
PAGE 6 OF 6

REVISION: H-9136-D
DATE: 6/9/11

WIRING - DIAGRAM
D6.7L G17 12V W/CAN BUS
DRAWING #: 0H9882

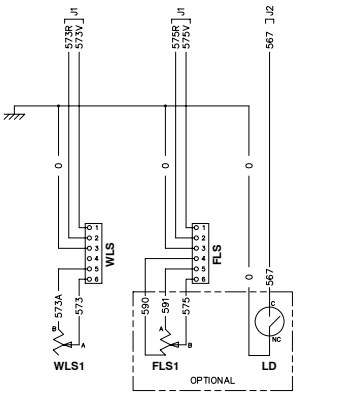
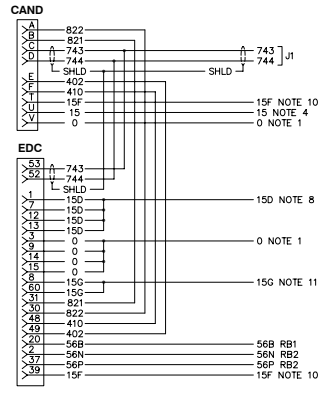
01/19/2022

GROUP G

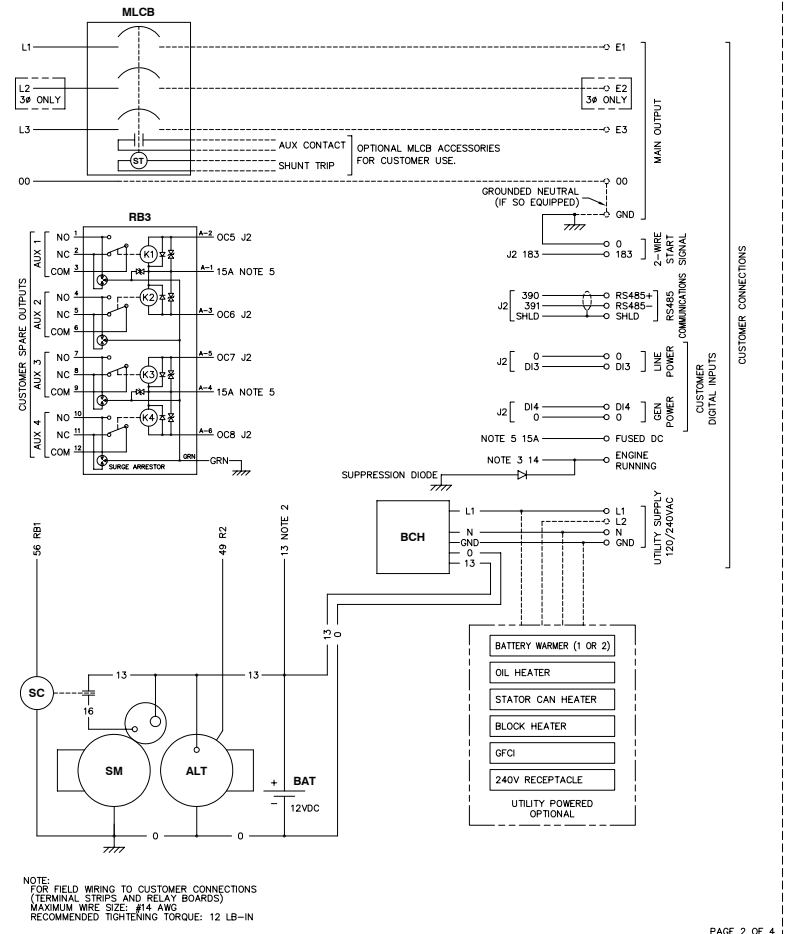


ALTERNATOR CONNECTIONS FOR 1φ UNITS

ALTERNATOR CONNECTIONS FOR 3φ UNITS



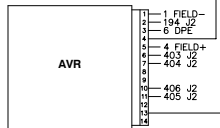
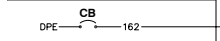
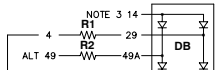
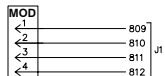
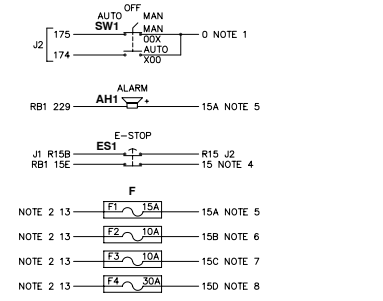
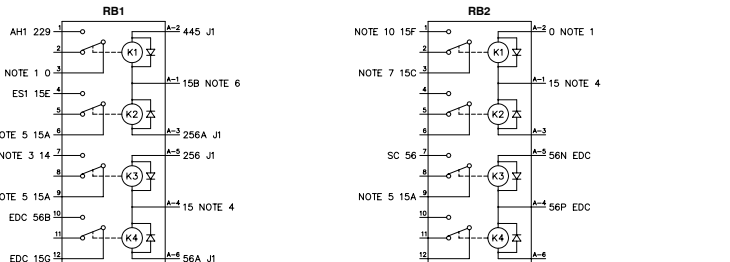
GROUP G



NOTE:
FOR FIELD WIRING TO CUSTOMER CONNECTIONS
(TERMINAL STRIPS AND RELAY BOARDS)
MAXIMUM WIRE SIZE: #14 AWG
RECOMMENDED TIGHTENING TORQUE: 12 LB-IN

01/19/2022

GROUP G



LEGEND
 GO - NEUTRAL
 AH1 - ALARM HORN
 ALT - DC CHARGE ALTERNATOR
 AVR - AUTO VOLTAGE REGULATOR
 BAT - BATTERY
 BCH - BATTERY CHARGER
 CAND - CAN BUS DIAGNOSTIC CONN.
 CB - CIRCUIT BREAKER
 COM - COMMUNICATION CONNECTOR
 CT - CURRENT TRANSFORMER
 DB - DIODE BRIDGE
 DPE - EXCITER
 EDC - ENGINE DIGITAL CONTROL
 ESI - EMERGENCY STOP SWITCH
 F - FUSE
 GND - GROUND
 GFCI - GROUND FAULT CIRCUIT INTERRUPT
 IFT - INTERFACE TRANSFORMER
 + - ENGINE CONTROL MODULE CONN.
 LD - LEAK DETECTOR
 MLCB - MAIN LINE CIRCUIT BREAKER
 MOD - MODEM CONNECTOR
 PME - PERMANENT MAGNET EXCITER
 R - RESISTOR
 RB - RELAY BOARD
 SC - STARTER CONTACTOR
 SW - STARTER MOTOR
 SWI - OFF/AUTO/MANUAL SWITCH
 WLS - COOLANT LEVEL SENDER

Page 138 of 155

GROUP G

EDC CONNECTOR

PIN	WIRE	TO	FUNCTION
1	15D	F4	NOTE 8
2	56N	RB2A-5	EDC START RELAY OUTPUT -
3	0	GND	NOTE 1
4	15D	F4	NOTE 8
5	15G	RB1-12	NOTE 11
6	0	GND	NOTE 1
7	15D	F4	NOTE 8
8	15D	F4	NOTE 8
9	0	GND	NOTE 1
10	15D	F4	NOTE 8
11	15D	F4	NOTE 8
12	15D	F4	NOTE 8
13	15D	F4	NOTE 8
14	0	GND	NOTE 1
15	0	GND	NOTE 1
16	0	GND	NOTE 1
17	56B	RB1-10	ENGINE START COMMAND INPUT
18	0	GND	NOTE 1
19	822	CAND-A	ISO DIAGNOSTIC L-LINE
20	822	CAND-B	ISO DIAGNOSTIC K-LINE
21	0	GND	NOTE 1
22	0	GND	NOTE 1
23	56P	RB2A-4	EDC START RELAY OUTPUT +
24	15F	RB2-1	NOTE 10
25	410	CAND-E	EDC SYNC OUTPUT
26	402	CAND-E	EDC TACHOMETER OUTPUT
27	744	CAND-D/J1-13	CAN BUS LOW
28	743	CAND-D/J1-12	CAN BUS HIGH
29	15G	RB1-12	NOTE 11
30	0	GND	NOTE 1
31	0	GND	NOTE 1
32	0	GND	NOTE 1

AVR CONNECTOR

PIN	WIRE	TO	FUNCTION
1	1	FIELD	- FIELD
2	194	J2-31	+12VDC
3	0	DPE	DPE OUTPUT
4	4	R17/FIELD	+ FIELD
5	4	R17/FIELD	+ FIELD
6	403	J2-8	GATE TRIGGER B
7	404	J2-20	GATE TRIGGER A
8	406	J2-30	ZERO CROSSING I/P
9	405	J2-19	GROUND (ISO)
10	162	CB	DPE OUTPUT (AFTER CB)

CAND CONNECTOR

PIN	WIRE	TO	FUNCTION
A	822	EDC-30	ISO DIAGNOSTIC L-LINE
B	821	EDC-31	ISO DIAGNOSTIC K-LINE
C	743	EDC-D/J1-2	CAN BUS HIGH
D	744	EDC-D/J1-13	CAN BUS LOW
E	402	EDC-48	EDC TACHOMETER OUTPUT
F	410	EDC-48	EDC SYNC OUTPUT
G	15	RB2-1	NOTE 10
H	0	GND	NOTE 4
V	0	GND	NOTE 1

ENGINE CONTROL MODULE CONNECTIONS

J1

PIN	WIRE	TO	FUNCTION
1	SHLD	-	CAN BUS DRAIN
2	743	EDC-D/J1-C	CAN BUS HIGH
3	810	MOD-2	MODEM SIGNAL RETURN
4	575R	FLS-2	FUEL LEVEL RTN
5	575V	FLS-1	FUEL LEVEL +
6	R15B	ESI	OVERSPEED/WATCHDOG
7	256	RB1A-5	FUEL RELAY
8	0	GND	NOTE 1
9	744	EDC-D/J1-D	CAN BUS LOW
10	811	MOD-3	MODEM DATA CARRIER DETECT
11	803	BCH	BAT CHARGER CURRENT
12	256A	RB1A-3	ENGINE ECU POWER RELAY
13	56A	RB1A-6	STARTER RELAY
14	812	MOD-4	MODEM ENABLE
15	575R	WLS-2	COOLANT LVL. RIN
16	575V	WLS-1	COOLANT LVL. +
17	809	MOD-1	MODEM 12V POWER
18	445	RB1A-2	ALARM RELAY
19	15B	F2	NOTE 6

J2

PIN	WIRE	TO	FUNCTION
1	391	CUST CON	RS485+ (XFER SW)
2	388	COM-3	RS232 TX (GENLINK)
3	0	CUST CON	SPARE IN (DNE PWR)
4	183	CUST CON	REMOTE START
5	174	SWI	AUTO START
6	224	IFT	V. SENSE GEN A PH
7	227	IFT	V. SENSE RIN
8	403	AVR-6	AVR GATE TRIGGER B
9	399C	C13	GEN C PH CURRENT -
10	398C	C13	GEN C PH CURRENT +
11	399A	C11	GEN A PH CURRENT -
12	398A	C11	GEN A PH CURRENT +
13	390	CUST CON	RS485+ (XFER SW)
14	387	COM-2	RS232 TX (GENLINK)
15	587	IFT	LEAK DETECTOR
16	815	ESI	EMERGENCY STOP
17	226	IFT	V. SENSE GEN C PH
18	404	AVR-7	AVR GATE TRIGGER A
19	0	RB1A-6	SPARE OUTPUT 4
20	0	RB1A-3	SPARE OUTPUT 2
21	0	RB1A-2	SPARE OUTPUT 1
22	0	SHLD	SPARE DRAIN (XFER SW)
23	0	COM-5	RS232 COM (GENLINK)
24	0	CUST CON	SPARE IN (DNE PWR)
25	0	BCH	BAT CHARGER FAS
26	0	SWI	MANUAL START
27	0	IFT	V. SENSE GEN B PH
28	0	AVR-10	AVR ZERO CROSSING I/P
29	0	AVR-2	AVR +12VDC
30	0	RB1A-5	SPARE OUTPUT 3
31	0	C12	GEN B PH CURRENT -
32	0	C12	GEN B PH CURRENT +

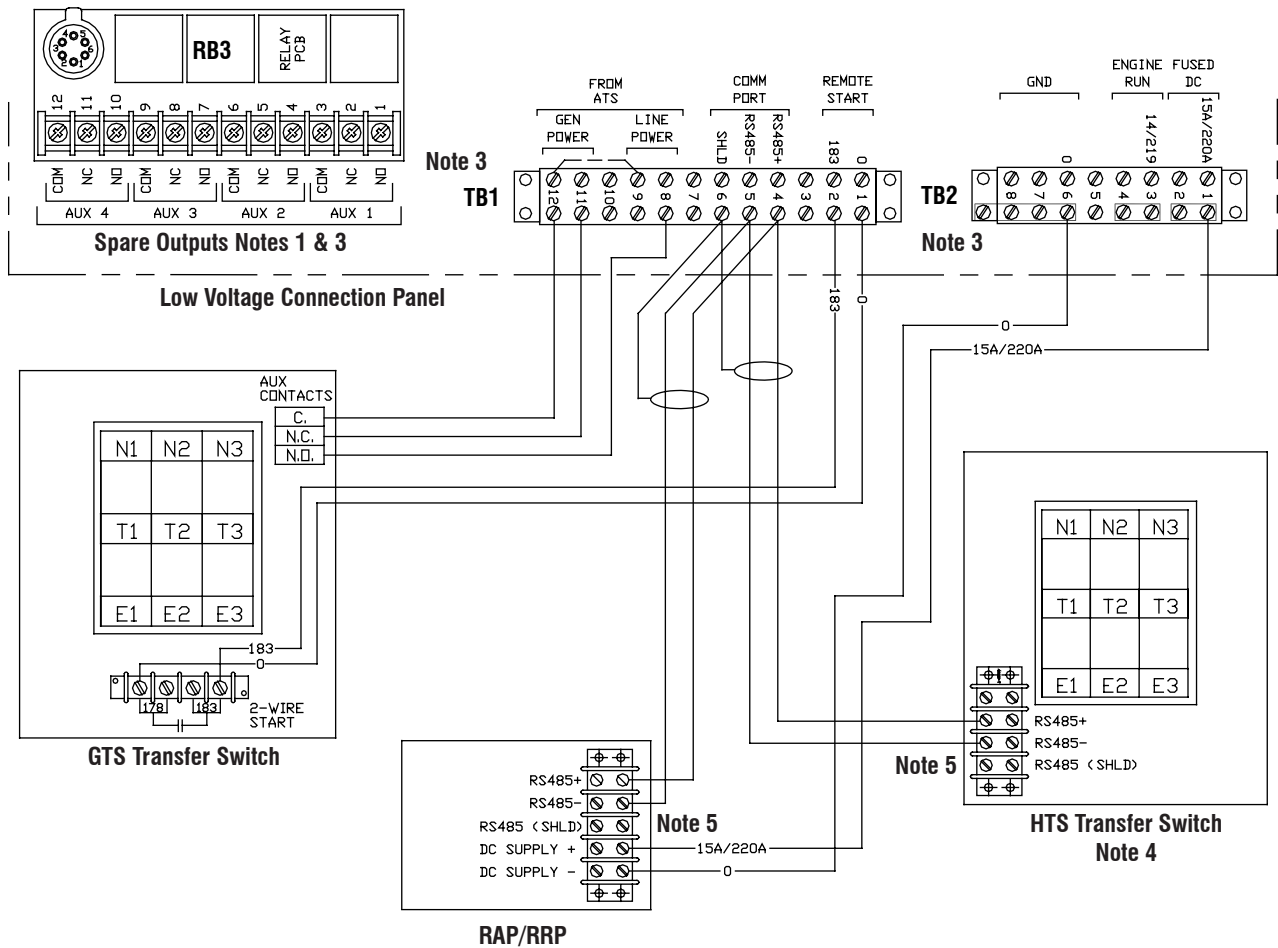
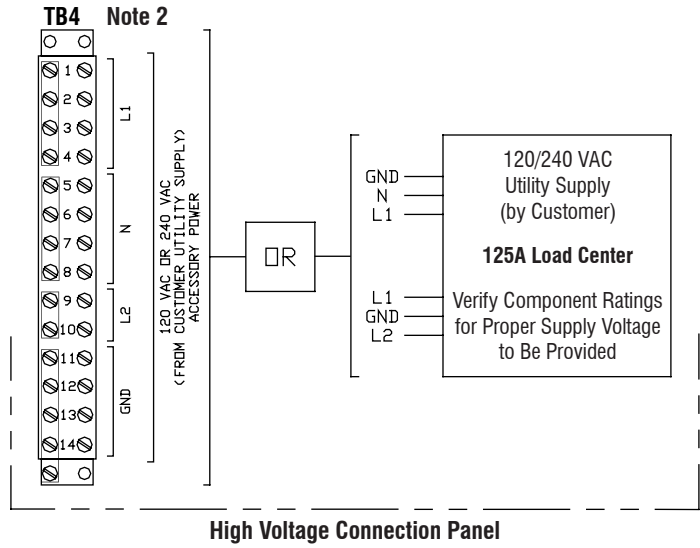
- NOTES:**
- WIRE# 0 IS CHASSIS GROUND (BATTERY-) UNLESS NOTED OTHERWISE.
 - WIRE# 13 IS UNFUSED +12VDC (BATTERY+). WIRE# 14 IS FUSED +12VDC WHEN GENERATOR IS CRANKING OR RUNNING.
 - WIRE# 15 IS FUSED +12VDC WHEN E-STOP IS NOT ACTIVATED.
 - WIRE# 15A IS FUSED +12VDC FOR GENERAL USE.
 - WIRE# 15B IS FUSED +12VDC FOR THE GENERATOR CONTROL MODULE.
 - WIRE# 15C IS FUSED +12VDC TO SOURCE SWITCHED POWER FOR ENGINE CONTROL UNIT.
 - WIRE# 15D IS FUSED +12VDC FOR ENGINE CONTROL UNIT.
 - WIRE# 15E IS FUSED +12VDC CONTROLLED BY GENERATOR CONTROL MODULE PRIOR TO E-STOP.
 - WIRE# 15F IS FUSED +12VDC CONTROLLED BY GENERATOR CONTROL MODULE TO SWITCH ENGINE CONTROL UNIT.
 - WIRE# 15G IS SWITCHED +12VDC TO SOURCE START COMMAND INPUT ON ENGINE CONTROL UNIT.

* - CONNECTIONS NOT USED IN 10 UNITS.

H-PANEL CONTROL INTERCONNECTIONS

Notes:

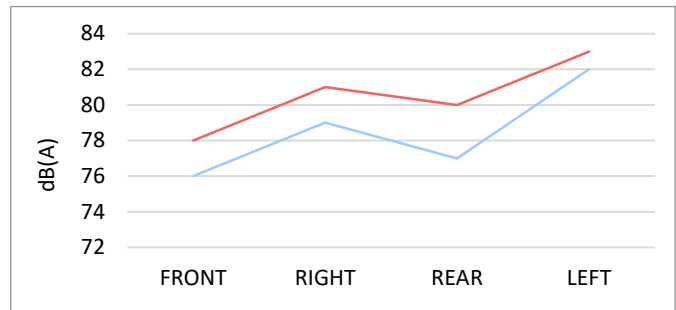
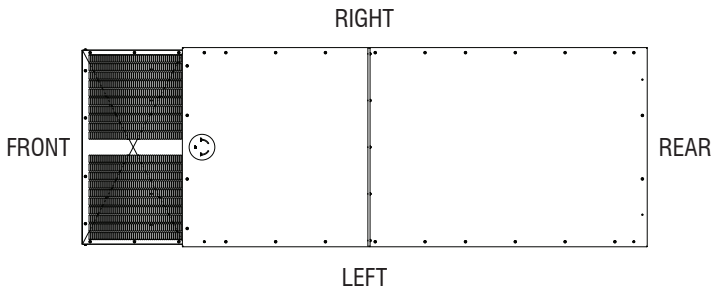
1. Spare Outputs are Standard on Industrial Product Only. GenLink® Required for Programming. Contacts Rated at 5A at 30VAC/30VDC
2. TB4 Max Wire Size: #10 AWG, Recommended Tightening Torque: 14 LB-IN
3. TB1, TB2, TB9 & RB3 Max Wire Size: #14 AWG, Recommended Tightening Torque: 12 LB-IN
4. Refer to H-Panel Manual for Instructions on Enabling HTS Transfer Switch. Refer to HTS Transfer Switch Manual for Dip Switch Settings for Multiple HTS Application
5. Connect the RS-485 Overall Shield at Genset Connection Terminal Only



WEATHER PROTECTED ENCLOSURE D6.7L FPT, SD150

60Hz NO-LOAD, dB(A)										DISTANCE: 7 METERS
MICROPHONE LOCATION	OCTAVE BAND CENTER FREQUENCY (Hz)									dB(A)
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	
FRONT	31	48	62	63	73	69	67	63	57	76
RIGHT	29	50	66	64	72	75	73	69	64	79
REAR	31	58	65	67	74	71	68	65	59	77
LEFT	30	55	66	65	76	77	76	71	65	82
AVERAGE	30	53	65	65	74	73	71	67	61	79

60Hz FULL-LOAD, dB(A)										DISTANCE: 7 METERS
MICROPHONE LOCATION	OCTAVE BAND CENTER FREQUENCY (Hz)									dB(A)
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	
FRONT	37	60	71	69	74	71	67	64	58	78
RIGHT	36	60	72	67	72	76	76	72	68	81
REAR	34	64	75	69	73	71	69	66	61	80
LEFT	37	63	74	67	77	77	76	72	67	83
AVERAGE	36	62	73	68	74	74	72	68	64	80



- All positions at 23 feet (7 meters) from side faces of generator set.
- Test conducted on a 100 foot diameter asphalt surface.
- Sound pressure levels are subject to instrumentation, installation and testing conditions.
- Sound levels are ±2 dB(A).

STATEMENT OF EXHAUST EMISSIONS

2021 FPT Diesel Fueled Generator

The measured emissions values provided here are proprietary to Generac and its authorized dealers. This information may only be disseminated upon request to regulatory governmental bodies for emissions permitting purposes or to specifying organizations as submittal data when expressly required by project specifications, and shall remain confidential and not open to public viewing. This information is not intended for compilation or sales purposes and may not be used as such, nor may it be reproduced without the expressed written permission of Generac Power Systems, Inc.. The data provided shall not be meant to include information made public by Generac.

Generator Model:	SD150	EPA Certificate Number:	MFPXL06.7DGS-002
kW _e Rating:	150	CARB Certificate Number:	Not Applicable
Engine Family:	MFPXL06.7DGS	SCAQMD CEP Number:	511717
Engine Model:	F4HE9685A*J	Emission Standard Category:	Tier 3
Rated Engine Power (BHP)*:	279	Certification Type:	Stationary Emergency CI (40 CFR Part 60 Subpart IIII)
Fuel Consumption (gal/hr)*:	13.5		
Aspiration:	Turbocharged/Aftercooled		
Rated RPM:	1,800		

*Engine power and fuel consumption are declared by the engine manufacturer of record and the U.S EPA.

EMISSIONS BASED ON ENGINE POWER OF SPECIFIC ENGINE MODEL

These Values Are Actual Composite Weighted Exhaust Emissions Results Over the EPA 5-Mode Test Cycle

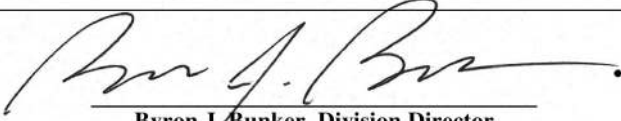
CO	NOx + NMHC	PM	
1.1	3.71	0.08	Grams/kW-hr
0.82	2.77	0.06	Grams/bhp-hr

- The stated values are actual exhaust emission test measurements obtained from an engine representative of the type described above.
- Values based on 5-Mode testing are official data of record as submitted to regulatory agencies for certification purposes. Testing was conducted in accordance with prevailing EPA protocol, which is typically accepted by SCAQMD and other regional authorities.
- No emissions values provided above are to be construed as guarantees of emission levels for any given Generac generator unit.
- Generac Power Systems, Inc. reserves the right to revise this information without prior notice.
- Consult state and local regulatory agencies for specific permitting requirements.
- The emission performance data supplied by the equipment manufacturer is only one element required toward completion of the permitting and installation process. State and local regulations may vary on a case-by-case basis and local agencies must be consulted by the permit application/ equipment owner prior to equipment purchase or installation. The data supplied herein by Generac Power Systems Inc. cannot be construed as a guarantee of installability of the generating set.



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2021 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT**

Page 142 of 155
**OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: FPT Industrial S.p.A. (U.S. Manufacturer or Importer) Certificate Number: MFPXL06.7DGS-002	<u>Effective Date:</u> 05/26/2020 <u>Expiration Date:</u> 12/31/2021	 <hr/> Byron J. Bunker, Division Director Compliance Division	<u>Issue Date:</u> 05/26/2020 <u>Revision Date:</u> N/A
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Model Year: 2021 Manufacturer Type: Original Engine Manufacturer Engine Family: MFPXL06.7DGS	Mobile/Stationary Indicator: Stationary Emissions Power Category: 130<=kW<225 Fuel Type: Diesel After Treatment Devices: No After Treatment Devices Installed Non-after Treatment Devices: No Non-After Treatment Devices Installed
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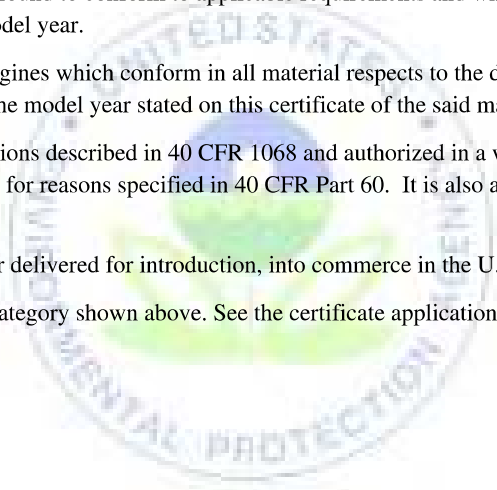
Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

The actual engine power may lie outside the limits of the Emissions Power Category shown above. See the certificate application for details.



Certification of Quality

Generac Power Systems certifies that the products we manufacture have been built and tested in accordance with strict internal and external standards for quality. Our quality management system has been registered with the internationally recognized ISO 9001:2008 standard and our products comply with external standards that include, but are not limited to, CSA, NEMA, EGSA, ISO, and UL.

The Generac Quality Management System (GQMS) ensures the highest standards of quality at every level of production, from raw materials to the finished product. This includes receiving inspection, in-process checks, product and process audits, testing, final inspections, and shipping standards.

Tests of our products are performed in accordance with our internal procedures and controlled through the GQMS to ensure accuracy and effectiveness. The testing process and product designs comply with external standards which may include, but are not limited to: ISO 8528-5, ISO 3046, NFPA 99, NFPA 110, BS 5514, SAE J1349, and DIN 6271.

Generac Power Systems has over one million square feet of manufacturing space and over 2000 employees dedicated to designing and manufacturing power generation equipment in our multiple State of Wisconsin, USA factories. All of our installed and mobile generators are built with pride by our skilled American workforce to ensure our customers receive the quality that they expect from Generac.

We are committed to producing quality products for both our internal and external customers. We will continuously improve our processes and diligently measure all aspects of our business.

Daniel Waschow

Vice President of Quality
Generac Power Systems, Inc.
Waukesha, Wisconsin USA

For the period of warranty noted below, which begins upon the successful start-up and/or on-line activation of the unit, Generac Power Systems, Inc. "Generac" warrants that its Generator will be free from defects in material and workmanship for the items and period set forth below. Generac will, at its discretion, repair or replace any part(s) which, upon evaluation, inspection and testing by Generac or an Independent Authorized Service Dealer, is found to be defective. Any equipment that the purchaser/owner claims to be defective must be evaluated by the nearest Independent Authorized Service Dealer. Emissions components are excluded from coverage under this extended warranty. Emissions warranty coverage is detailed in a separate emissions warranty.

Warranty Coverage: Warranty coverage period is for Two (2) years or two-thousand (2,000) hours, whichever occurs first.

Warranty Coverage in Year(s) 1-2
Parts, Labor and Limited Travel

Limited Gearbox Coverage:

Year(s): 1-5 Coverage	Year(s): 6-10 Coverage
Limited Parts and Labor	Limited Parts Only

Guidelines:

1. Unit must be registered and proof of purchase available.
2. Any and all warranty repairs and/or concerns must be performed and/or addressed by an Independent Authorized Service Dealer, or branch thereof. Repairs or diagnostics performed by individuals other than an Independent Authorized Service Dealer not authorized in writing by Generac will not be covered.
3. This Warranty is transferable between ownership of original install site.
4. Generac supplied engine coolant heaters (block-heaters), heater controls and circulating pumps are only covered during the first year of the warranty provision.
5. Generac may choose to repair, replace or refund a piece of equipment in its sole discretion.
6. Enclosures are warranted against rust for the first year of ownership only. Damage caused after receipt of generator is the responsibility of the owner and is not covered by this warranty. Nicks, scrapes, dents or scratches to the painted enclosure should be repaired promptly by the owner.
7. Warranty only applies to permanently wired and mounted units.
8. Damage to any covered components or consequential damages caused by the use of a non-OEM part will not be covered by the warranty.
9. Proof of performance of all required maintenance must be available.
10. Travel allowance is limited to 300 miles maximum and seven and one half (7.5) hours maximum (per occurrence, whichever is less) round trip from the nearest Independent Authorized Service Dealer. Any additional travel required will not be covered.
11. Engines, driven components and fuel tanks used in Generac's standby power products system can carry a separate manufacturer's (OEM) warranty (the "OEM Warranties"), unless otherwise expressly stated. OEM Warranties are in addition to this Warranty. All warranty claims for defects in material and/or workmanship on Generac product OEM components, may be directed through the OEM distributor/dealer network. OEM Warranties may vary and are subject to change. Generac shall have no liability under OEM warranties.

The following will NOT be covered by this warranty:

1. Costs of normal maintenance (i.e. tune-ups, associated part(s), adjustments, loose/leaking clamps, installation and start-up).
2. Damage/failures to the generator caused by accidents, shipping, handling, or improper storage.
3. Damage/failures caused by operation with improper fuels, speeds, loads or installations other than what's recommended or specified by Generac Power Systems.
4. Damage to the generator due to the use of non-Generac parts and/or equipment, contaminated fuels, oils, coolants/antifreeze or lack of proper fuels, oil or coolants/antifreeze.
5. Failures due to normal wear and tear, accident, misuse, abuse, neglect, improper installation, improper sizing, or rodent, reptile, and/or insect infestation.
6. Rental equipment used while warranty repairs are being performed and/or any extraordinary equipment used for removal and/or reinstallation of generator (i.e. cranes, hoists, lifts, et. al.).
7. Planes, ferries, railroad, buses, helicopters, snowmobiles, snow-cats, off-road vehicles or any other mode of transport deemed not standard by Generac.
8. Products that are modified or altered in a manner not authorized by Generac in writing.
9. Starting batteries, fuses, light bulbs, engine fluids and any related labor.
10. Steel enclosures that rust as a result of improper installation, location in a harsh or salt water environment, or are scratched where the integrity of applied paint is compromised.
11. Units sold, rated or used for "Prime Power", "Trailer Mounted" or "Rental Unit" applications as defined by Generac. Contact an Independent Authorized Service Dealer for definitions.
12. Shipping costs associated with expedited shipping.
13. Additional costs for overtime, holiday or emergency labor costs for repairs outside of normal business hours.
14. Any incidental, consequential or indirect damages caused by defects in materials or workmanship, or any delay in repair or replacement of the defective part(s).
15. Failures caused by any act of God or external cause including without limitation, fire, theft, freezing, war, lightning, earthquake, windstorm, hail, water, tornado, hurricane, or any other matters which are reasonably beyond the manufacturer's control.

THIS WARRANTY SUPERSEDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. SPECIFICALLY, GENERAC MAKES NO OTHER WARRANTIES AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY IMPLIED WARRANTIES WHICH ARE ALLOWED BY LAW, SHALL BE LIMITED IN DURATION TO THE TERMS OF THE EXPRESS WARRANTY PROVIDED HEREIN. SOME JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. GENERAC'S ONLY LIABILITY SHALL BE THE REPAIR OR REPLACEMENT OF PART(S) AS STATED ABOVE. IN NO EVENT SHALL GENERAC BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH DAMAGES ARE A DIRECT RESULT OF GENERAC'S NEGLIGENCE. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU ALSO HAVE OTHER RIGHTS UNDER APPLICABLE LAW.

FOR AUSTRALIA ONLY: Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation that cannot be excluded under the Australian Consumer Law. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

FOR NEW ZEALAND ONLY: Nothing in this warranty statement excludes, restricts or modifies any condition, warranty right or remedy which pursuant to the New Zealand Legislation (Commonwealth or State) including the Fair Trading Practices Act of 1986 or the Consumer Guarantees Act 1993 ("CGA") applies to this limited warranty and may not be so excluded, restricted or modified. Nothing in this statement is intended to have the effect of contracting out of the provisions of the CGA, except to the extent permitted by that Act, and these terms are to be modified to the extent necessary to give effect to that intention. If you acquire goods from Generac Power Systems or any of its authorized resellers and distributors for the purposes of a business, then pursuant to section 43(2) of the CGA, it is agreed that the provisions of the CGA do not apply.

GENERAC POWER SYSTEMS, INC. • P.O. BOX 8 • Waukesha, WI, USA 53187
Ph: (888) GENERAC (436-3722) • Fax: (262) 544-4851

To locate the nearest Independent Authorized Service Dealer and to download schematics, exploded views and parts lists
visit our website: www.generac.com

Garantía limitada extendida de 2 años (2C) de Generac Power Systems para los generadores de respaldo industriales

Durante el período de garantía indicado abajo, que comienza desde la puesta en marcha y/o activación exitosa en línea de la unidad, Generac Power Systems, Inc. "Generac" garantiza que generador estará libre de defectos de material y/o mano de obra para los ítems y el período indicados a continuación. Generac, a su discreción, reparará o sustituirá cualquier pieza o piezas que, por medio de la evaluación, inspección y prueba efectuada por Generac o un Concesionario de servicio autorizado independiente de Generac, se determine que es o son defectuosa(s). Todo equipo que el comprador o propietario reclame como defectuoso debe ser evaluado por el Concesionario de servicio autorizado independiente de Generac más cercano. Los componentes relacionados con emisiones están excluidos de la cobertura bajo esta garantía extendida. La cobertura de la garantía de emisiones se detalla por separado en una garantía de emisiones.

Cobertura de la garantía: El período de cobertura de la garantía es de dos (2) años o dos mil (2000) horas, lo que ocurra primero.

Cobertura de la garantía en año(s) 1-2
Sobre piezas, mano de obra y gastos de viaje limitados

Cobertura limitada sobre la caja de engranajes:

Año(s) de cobertura: 1-5 Cobertura	Año(s) de cobertura: 6-10 Cobertura
Limitada sobre piezas y mano de obra	Limitada solo sobre piezas

Directrices:

- La unidad debe estar registrada y tener prueba de compra disponible.
- Cualquiera y todas las reparaciones y/o preocupaciones por garantía deben ser efectuadas y/o dirigidas por un Concesionario de servicio autorizado independiente de Generac, o una sucursal de este. No serán cubiertas las reparaciones o los diagnósticos efectuados por personas diferentes del Concesionario de servicio autorizado independiente de Generac no autorizados por escrito por Generac.
- Esta garantía es transferible entre propietarios del sitio de instalación original.
- Los calentadores de refrigerante de motor (calentadores de bloque), los controles del calentador y las bombas de circulación suministrados por Generac solo están cubiertos durante el primer año de prestación de la garantía.
- Generac puede elegir reparar, sustituir o reembolsar una pieza del equipo a su exclusiva discreción.
- Los gabinetes están garantizados contra corrosión solamente durante el primer año de propiedad. El daño causado después de la recepción del generador es responsabilidad del comprador y no está cubierto por esta garantía. Las muescas, raspaduras, abolladuras o rayaduras de gabinete pintado deben ser reparadas sin demora por el propietario.
- La garantía corresponde solamente a las unidades conectadas y montadas en forma permanente.
- Los daños a cualquier componente o los daños emergentes causados por el uso de una pieza que no sea OEM no estarán cubiertos por la garantía.
- Debe haber disponible prueba de la ejecución de todo el mantenimiento requerido.
- Las asignaciones para viaje están limitadas a 300 millas como máximo y siete horas y media (7.5) horas como máximo (por ocurrencia, lo que sea menor), viaje de ida y vuelta, desde el Concesionario de servicio autorizado independiente de Generac más cercano. Todo gasto de viaje adicional requerido no será cubierto.
- Los motores, los componentes accionados y los tanques de combustible usados en los productos de respaldo de Generac pueden llevar una garantía de fabricante (OEM) separada (las "Garantías de OEM"), a menos que se estipule expresamente lo contrario. Las garantías de OEM son un agregado a esta garantía. Todos los reclamos de garantía por defectos de material y/o mano de obra en los componentes OEM del producto Generac, pueden ser dirigidos a través de la red de distribuidores/concesionarios OEM. Las garantías de OEM pueden variar y están sujetas a cambios. Generac no tendrá responsabilidad bajo las garantías de OEM.

Lo siguiente NO será cubierto por esta garantía:

- Costes del mantenimiento normal (es decir: afinaciones, pieza[s] relacionada[s], ajustes, abrazaderas sueltas o con fugas, instalación y puesta en marcha).
- Daños/fallos del generador causados por accidentes, transporte, manejo o almacenamiento incorrecto.
- Los daños/fallos causados por la operación con combustibles, velocidades, cargas, o instalaciones incorrectas diferentes de las recomendadas o especificadas por Generac Power Systems.
- Los daños al generador debidos al uso de piezas y/o equipos que no sean de Generac; combustibles, aceites, refrigerantes/anticongelantes contaminados; o falta de combustibles, aceites, refrigerantes/anticongelantes apropiados.
- Fallos debidos a: desgaste y daño normal, accidente, uso indebido, abuso, negligencia, instalación incorrecta, dimensionamiento incorrecto, o plagas de roedores y/o insectos.
- Equipos arrendados usados mientras se llevan a cabo reparaciones de garantía y/o todos los equipos extraordinarios usados para retirar y/o reinstalar el generador, (esto es: grúas, malacates, elevadores, etc.).
- Aeronaves, transbordadores, ferrocarril, autobuses, helicópteros, motocicletas para nieve, camiones para nieve, vehículos fuera de ruta o cualquier otro modo de transporte no considerado estándar por Generac.
- Productos que se modifiquen o alteren en forma no autorizada por Generac por escrito.
- Baterías de arranque, fusibles, bombillas de luz, fluidos para el motor y mano de obra relacionada.
- Los gabinetes de acero que se corroen debido a instalación incorrecta, ubicación en un entorno agresivo o con agua salada, o se rayen donde esté comprometida la integridad de la pintura aplicada.
- Las unidades vendidas, calificadas para, o usadas en aplicaciones de "Alimentación eléctrica principal", "Montada en remolque" o "Unidad en alquiler" como las define Generac. Comuníquese con un Concesionario de servicio autorizado independiente para las definiciones.
- Costes de envío asociados con envío urgente.
- Costes adicionales por horas extra y feriados o los costes de mano de obra de emergencia por reparaciones fuera del horario de trabajo normal.
- Todos los daños accesorios, emergentes o indirectos causados por defectos en los materiales o mano de obra o toda demora en la reparación o sustitución de la(s) pieza(s) defectuosa(s).
- Los fallos causados por cualquier acto de fuerza mayor o causa externa, que incluyen, sin limitaciones, incendio, robo, congelamiento, guerra, rayos, terremoto, tormenta de viento, granizo, agua, tornado, huracán, o cualesquiera otros asuntos que estén fuera del control razonable del fabricante.

ESTA GARANTÍA SUSTITUYE CUALQUIER OTRA GARANTÍA, EXPRESA O IMPLÍCITA. ESPECÍFICAMENTE, GENERAC NO EXTIENDE NINGUNA OTRA GARANTÍA ACERCA DE LA COMERCIALIZACIÓN O APTITUD PARA UN PROPÓSITO EN PARTICULAR. LA DURACIÓN DE TODAS LAS GARANTÍAS IMPLÍCITAS PERMITIDAS POR LA LEY ESTARÁ LIMITADA A LAS CONDICIONES DE LA GARANTÍA EXPRESA ESTIPULADA EN LA PRESENTE. ALGUNAS JURISDICIONES NO PERMITEN LIMITACIONES DE LA DURACIÓN DE UNA GARANTÍA IMPLÍCITA; POR LO TANTO, LA LIMITACIÓN PRECEDENTE PUEDE NO APLICARSE A USTED. LA ÚNICA RESPONSABILIDAD DE GENERAC SERÁ REPARAR O SUSTITUIR LA(S) PIEZA(S) COMO SE ESTIPULÓ PRECEDENTEMENTE. GENERAC NO SERÁ RESPONSABLE EN NINGÚN CASO POR NINGÚN DAÑO ACCESORIO O EMERGENTE, AUN CUANDO TAL DAÑO SEA RESULTADO DIRECTO DE LA NEGLIGENCIA DE GENERAC. ALGUNAS JURISDICIONES NO PERMITEN LA EXCLUSIÓN O LIMITACIÓN DE DAÑOS ACCESORIOS O EMERGENTES, DE MANERA QUE LA LIMITACIÓN PRECEDENTE PUEDE NO APLICARSE A USTED. ESTA GARANTÍA LE OTORGA DERECHOS LEGALES ESPECÍFICOS. TAMBIÉN TIENE OTROS DERECHOS BAJO LA LEY CORRESPONDIENTE.

SOLO PARA AUSTRALIA: Nuestros productos se entregan con garantías que no pueden ser excluidas según la Australian Consumer Law (Ley australiana de consumidores). Usted tiene derecho a sustitución o reembolso por un fallo mayor y a compensación por cualquier otra pérdida o daño razonable previsible. Usted también tiene derecho a que los bienes sean reparados o sustituidos si los bienes no son de calidad aceptable y la falla no llega a ser un fallo mayor.

SOLO PARA NUEVA ZELANDA: Nada de esta declaración de garantía excluye, restringe o modifica ninguna condición, derecho de garantía o solución que, conforme a la legislación de Nueva Zelanda (Comunidad o Estado), incluso la Fair Trading Practices Act (Ley de transacciones comerciales justas) de 1986 o la Consumer Guarantees Act (Ley de garantías de los consumidores, "CGA") de 1993, se aplique a esta garantía limitada y por lo tanto no puede ser sometida a exclusiones, restricciones o modificaciones. Nada de esta declaración tiene el propósito de tener efecto de contratar fuera de las previsiones de la CGA, excepto con el alcance permitido por la ley y estos términos se deben modificar con el alcance necesario para hacer efectiva esta intención. Si adquiere bienes de Generac Power Systems o alguno de sus revendedores y distribuidores autorizados con propósitos comerciales, entonces, conforme a la sección 43(2) de la CGA, se acuerda que no se aplican las previsiones de la CGA.

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Tel.: (888) GENERAC (436-3722) • Fax: (262) 544-4851

Para ubicar el Concesionario de servicio autorizado independiente más cercano y descargar diagramas esquemáticos, despieces y listas de piezas visite nuestro sitio Web: www.generac.com

Garantie limitée prolongée de 2 ans (2C) de Generac Power Systems sur les générateurs de secours industriels

Pendant la période de garantie mentionnée ci-bas, qui débute dès le démarrage réussi de l'appareil ou l'activation en ligne de l'appareil, Generac Power Systems, Inc. (Generac) garantit que son générateur sera exempt de vices de matériaux et fabrication en ce qui concerne les éléments et la période indiqués ci-dessous. À sa seule discrétion, Generac réparera ou remplacera toute pièce qui est jugée défectueuse après l'évaluation, l'inspection et la mise à l'essai par Generac ou un fournisseur de services d'entretien agréé indépendant. Tout équipement que l'acheteur/propriétaire prétend être défectueux doit être évalué par le fournisseur de services d'entretien agréé indépendant le plus près. Les composantes relatives aux émissions ne sont pas couvertes en vertu de la présente garantie. La couverture des composantes relatives aux émissions est détaillée dans une garantie distincte.

Couverture de la garantie : La période de garantie est de deux (2) ans ou de deux mille (2000) heures, selon la première éventualité.

Période de garantie de 1 à 2 ans
Pièces, main-d'œuvre et couverture limitée des déplacements

Couverture limitée de la boîte à engrenages :

Période : couverture de 1 à 5 ans	Période : couverture de 6 à 10 ans
Couverture limitée – pièces et main-d'œuvre	Couverture limitée – pièces seulement

Lignes directrices :

- L'appareil doit être enregistré et la preuve d'achat doit être présentée sur demande.
- Toute réparation sous garantie doit être effectuée par un fournisseur de services d'entretien agréé indépendant ou l'une de ses succursales, et toute préoccupation doit être également traitée par un fournisseur de services d'entretien agréé indépendant de Generac ou l'une de ses succursales. Toute réparation ou évaluation effectuée par des personnes autres qu'un fournisseur de services d'entretien agréé indépendant qui n'a pas été autorisée par écrit par Generac ne sera pas couverte.
- La présente garantie est transférable conjointement à la propriété du site d'installation d'origine.
- Les chauffe-redettes à liquide de refroidissement du moteur (chauffe-moteur), les commandes de chauffage et les pompes de circulation fournies par Generac ne sont couvertes que pendant la première année de la période de garantie.
- Generac peut choisir, à sa seule discrétion, de réparer, de remplacer ou de rembourser une pièce d'équipement.
- Les boîtiers sont garantis contre la rouille pendant la première année de possession seulement. Les dommages causés après la réception du générateur sont la responsabilité du propriétaire et ne sont pas couverts par la présente garantie. Les entailles, éraflures, bosses ou égratignures au boîtier peint doivent être réparées sans délai par le propriétaire.
- La garantie s'applique uniquement aux appareils montés et câblés en permanence.
- Aucun dommage ou dommage indirect à toute pièce couverte découlant de l'utilisation de pièces non fabriquées par un fabricant d'équipement d'origine ne sera couvert par la garantie.
- Une preuve d'exécution de tous les travaux d'entretien requis doit être présentée sur demande.
- La présente garantie couvre les déplacements aller-retour d'un maximum de 480 km (300 miles) et de sept heures et demie (7,5) (par déplacement, selon le moindre des deux) à partir du fournisseur de services d'entretien agréé indépendant le plus près. Tout déplacement supplémentaire requis ne sera pas couvert.
- Les moteurs, les pièces d'entraînement et les réservoirs de carburant utilisés dans les systèmes d'alimentation de secours de Generac peuvent être protégés au titre de la garantie d'un fabricant d'équipement distinct (les « garanties des fabricants d'équipement d'origine »), sauf indication expresse à l'effet contraire. Les garanties des fabricants d'équipement d'origine s'ajoutent à la présente garantie. Toute réclamation au titre de la garantie pour vices de matériaux ou de fabrication de pièces d'un fabricant d'équipement d'origine sur un produit Generac peut être faite auprès du distributeur ou du réseau de fournisseurs de ce fabricant d'équipement d'origine. Les garanties des fabricants d'équipement d'origine peuvent varier et faire l'objet de modifications. Generac n'a aucune responsabilité découlant des garanties offertes par les fabricants d'équipement d'origine.

Les éléments suivants ne seront PAS couverts par la présente garantie :

- Les coûts d'entretien normal (c'est-à-dire mises au point, réglages de pièces associées, ajustements, resserrage de fixations, installation et démarrage).
- Les dommages ou défaillances du générateur causés par un accident, le transport, la manutention ou un entreposage inadéquat.
- Les dommages/défaillances causés par l'utilisation de carburants inappropriés ou l'utilisation à des vitesses, avec des charges ou selon une installation autres que ce qui est recommandé ou spécifié par Generac Power Systems.
- Les dommages au générateur causés par l'utilisation de pièces ou d'équipement non fabriqués par Generac, de carburant, d'huile, de liquide de refroidissement et d'antigel contaminé ou encore du manque de carburant, d'huile, de liquide de refroidissement et d'antigel.
- Les défaillances causées par l'usure normale, un accident, une utilisation inappropriée, une utilisation abusive, une négligence, une installation inadéquate, un dimensionnement inadéquat ou une infestation de rongeurs, de reptiles ou d'insectes.
- L'équipement de location utilisé pendant que des réparations sous garantie sont effectuées et/ou tout équipement extraordinaire utilisé pour retirer ou réinstaller le générateur (c'est-à-dire grues, appareils de levage, élévateurs, etc.).
- Les avions, les traversiers, les trains, les autobus, les hélicoptères, les motoneiges, les dameuses, les véhicules hors route ou tout autre moyen de transport jugé non standard par Generac.
- Les produits modifiés ou altérés d'une manière qui n'a pas été autorisée par écrit par Generac.
- Les batteries de démarrage, les fusibles, les ampoules électriques, les fluides de moteur et toute main-d'œuvre connexe.
- Les boîtiers en acier qui rouillent en raison d'une installation inadéquate, d'une installation dans un environnement difficile ou salin ou d'égratignures qui compromettent l'intégrité de la peinture appliquée sur le boîtier.
- Les appareils vendus, cotés ou utilisés selon les applications suivantes, telles qu'elles sont définies par Generac : « puissance électrique de base », « monté sur remorque » ou « unité de location ». Veuillez communiquer avec un fournisseur de services d'entretien agréé indépendant pour obtenir les définitions.
- Les coûts d'expédition liés à l'expédition accélérée.
- Les coûts supplémentaires liés aux heures supplémentaires, aux jours fériés ou aux services d'urgence pour toute réparation effectuée en dehors des heures normales de bureau.
- Tout dommage accessoire, subséquent ou indirect causé par un défaut de matériau et de fabrication ou par tout retard dans la réparation ou le remplacement de pièces défectueuses.
- Les défaillances causées par un cas de force majeure ou une cause externe y compris, sans toutefois s'y limiter, le feu, le vol, le gel, la guerre, la foudre, un tremblement de terre, une tempête, la grêle, la pluie, une tornade, un ouragan ou toute autre situation raisonnablement hors du contrôle du fabricant.

LA PRÉSENTE GARANTIE REMPLACE TOUTES LES AUTRES GARANTIES, EXPLICITES OU IMPLICITES. EN PARTICULIER, GENERAC N'OFFRE AUCUNE AUTRE GARANTIE QUANT À LA QUALITÉ MARCHANDE OU À LA CONVENANCE À UN USAGE PARTICULIER. TOUTE GARANTIE IMPLICITE AUTORISÉE PAR LA LOI SERA LIMITÉE À LA DURÉE DE LA PÉRIODE DE LA PRÉSENTE GARANTIE EXPLICITE. CERTAINS ÉTATS OU PROVINCES NE PERMETTENT PAS LES LIMITATIONS SUR LA DURÉE D'UNE GARANTIE IMPLICITE ET, PAR CONSÉQUENT, LA PRÉSENTE LIMITATION PEUT NE PAS S'APPLIQUER. LA RESPONSABILITÉ DE GENERAC SE LIMITERA À LA RÉPARATION OU AU REMPLACEMENT DES PIÈCES, COMME INDICÉ PRÉCÉDEMMENT. EN AUCUN CAS GENERAC NE POURRA ÊTRE TENUE RESPONSABLE DE DOMMAGES ACCESSOIRES OU SUBSÉQUENTS, MÊME SI LES DOMMAGES RÉSULTENT DIRECTEMENT DE LA NÉGLIGENCE DE GENERAC. CERTAINS ÉTATS OU PROVINCES N'AUTORISENT PAS L'EXCLUSION NI LA LIMITATION DES DOMMAGES ACCESSOIRES OU INDIRECTS ET, PAR CONSÉQUENT, LA LIMITATION ÉNONCÉE CI-DESSUS PEUT NE PAS S'APPLIQUER. CETTE GARANTIE VOUS CONFÈRE DES DROITS LÉGAUX PRÉCIS. VOUS POUVEZ ÉGALEMENT JOUIR D'AUTRES DROITS EN VERTU DES LOIS APPLICABLES.

POUR L'Australie UNIQUEMENT : Nos produits sont fournis avec des garanties qui ne peuvent être exclues en vertu de la loi australienne sur la consommation (Australian Consumer Law). Vous avez droit à un remplacement ou à un remboursement pour une défaillance majeure et à une indemnisation pour toute autre perte ou tout dommage raisonnablement prévisible. Vous disposez également d'un droit à la réparation ou au remplacement si les produits ne sont pas d'une qualité acceptable et si cette défaillance n'est pas considérée comme majeure.

POUR LA NOUVELLE-ZÉLANDE UNIQUEMENT : Cette garantie n'exclut, ne restreint ni ne modifie aucune condition, aucun droit de garantie ou recours qui, conformément à la législation de Nouvelle-Zélande (Commonwealth ou État), y compris la loi sur la pratique commerciale loyale de 1986 (Fair Trading Practices Act) ou la loi sur la protection du consommateur de 1993 (CGA ou Consumer Guarantees Act), s'applique à cette garantie limitée et ne peut pas être exclue, restreinte ou modifiée. Cette garantie ne vise en aucun cas à contourner les dispositions de la CGA, sauf dans la mesure permise par cette loi, et ces termes doivent être modifiés dans la mesure nécessaire pour donner effet à cette intention. Si vous faites l'acquisition d'un produit de Generac Power Systems ou d'un de ses distributeurs et revendeurs autorisés à des fins commerciales, alors, conformément à l'article 43(2) de la CGA, il est convenu que les dispositions de la CGA ne s'appliquent pas.

GENERAC POWER SYSTEMS, INC. • C.P. 8 • Waukesha, WI (É.-U.) 53187
Téléphone : (888) GENERAC (436-3722) • Télécopieur : (262) 544-4851

Pour trouver le fournisseur de services d'entretien agréé indépendant le plus près et pour télécharger les schémas, les vues éclatées et les listes de pièces visitez notre site Web : www.generac.com

For the period of warranty noted below, which begins upon the successful start-up and/or on-line activation/registration of the unit, Generac Power Systems, Inc. "Generac" warrants that its transfer switch will be free from defects in material and workmanship for the items and period set forth below. Generac will, at its discretion, repair or replace any part(s) which, upon evaluation, inspection and testing by Generac or an Independent Authorized Service Dealer, is found to be defective. Any equipment that the purchaser/owner claims to be defective must be evaluated by the nearest Independent Authorized Service Dealer.

Warranty Coverage in Year(s) 1-2
Parts, Labor and Limited Travel

Guidelines:

1. Unit must be registered and proof of purchase available.
2. Any and all warranty repairs and/or concerns must be performed and/or addressed by an Independent Authorized Service Dealer, or branch thereof. Repairs or diagnostics performed by individuals other than Independent Authorized Service Dealers not authorized in writing by Generac will not be covered.
3. Warranty is transferable between ownership of original installation site.
4. Generac may choose to repair, replace or refund a piece of equipment in its sole discretion.
5. Warranty only applies to permanently wired and mounted units.
6. Enclosures are warranted for the first year of ownership only. Damage caused after receipt of generator is the responsibility of the owner and is not covered by this warranty. Nicks, scrapes, dents or scratches to the painted enclosure should be repaired promptly by the owner.
7. Proof of performance of all required maintenance must be available.
8. Travel allowance is limited to 300 miles maximum or seven and one half (7.5) hours maximum (per occurrence, whichever is less) round trip from the nearest Independent Authorized Service Dealer. Any additional travel required will not be covered.

The following will NOT be covered by this warranty:

1. Costs of normal maintenance (i.e. associated part(s), adjustments, installation or start-up).
2. Damage to the transfer switch system caused by accidents, shipping, handling or improper storage.
3. Damage/failures caused by operation with loads or installations other than what's recommended or specified by Generac. Unauthorized modification/misapplication will not be warranted unless authorized by Generac in writing.
4. Rental equipment used while warranty repairs are being performed and/or any extraordinary equipment used for removal and/or reinstallation of transfer switch (i.e. cranes, hoists, lifts, et. al.).
5. Planes, ferries, railroad, buses, helicopters, snowmobiles, snowcats, off-road vehicles or any other mode of transport deemed not standard by Generac.
6. Failures due to normal wear and tear, accident, misuse, abuse, neglect, improper installation, or improper sizing.
7. Damage to any covered components or consequential damages caused by the use of a non-OEM part will not be covered by this warranty.
8. Damage related to rodent, reptile, and/or insect infestation.
9. Repairs or diagnostics performed by individuals other than Independent Authorized Service Dealers not authorized in writing by Generac.
10. Steel enclosures that rust as a result of improper installation, location in a harsh or salt water environment, or are scratched where the integrity of applied paint is compromised.
11. Fuses, light bulbs and any related labor.
12. Units sold, rated or used for "Prime Power," "Trailer Mounted" or "Rental Unit" applications as defined by Generac. Contact an Independent Authorized Service Dealer for definitions.
13. Failures caused by any act of God or external cause including without limitation, fire, theft, freezing, war, lightning, earthquake, windstorm, hail, water, tornado, hurricane, or any other matters which are reasonably beyond the manufacturer's control.
14. Shipping costs associated with expedited shipping.
15. Any incidental, consequential or indirect damages caused by defects in materials or workmanship, or any delay in repair or replacement of the defective part(s).
16. Any unit built/manufactured prior to 2014 models.
17. Overtime, holiday or emergency labor.
18. Living or travel expenses of person(s) performing service, except as specifically included within the terms of a specific unit warranty period.

THIS WARRANTY SUPERSEDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. SPECIFICALLY, GENERAC MAKES NO OTHER WARRANTIES AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY IMPLIED WARRANTIES WHICH ARE ALLOWED BY LAW, SHALL BE LIMITED IN DURATION TO THE TERMS OF THE EXPRESS LIMITED WARRANTY PROVIDED HEREIN. SOME JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. GENERAC'S ONLY LIABILITY SHALL BE THE REPAIR OR REPLACEMENT OF PART(S) AS STATED ABOVE. IN NO EVENT SHALL GENERAC BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH DAMAGES ARE A DIRECT RESULT OF GENERAC'S NEGLIGENCE. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU COULD ALSO HAVE OTHER RIGHTS UNDER APPLICABLE LAW.

FOR AUSTRALIA ONLY: Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

FOR NEW ZEALAND ONLY: Nothing in this warranty statement excludes, restricts or modifies any condition, warranty right or remedy which pursuant to the New Zealand Legislation (Commonwealth or State) including the Fair Trading Practices Act of 1986 or the Consumer Guarantees Act 1993 ("CGA") applies to this limited warranty and may not be so excluded, restricted or modified. Nothing in this statement is intended to have the effect of contracting out of the provisions of the CGA, except to the extent permitted by that Act, and these terms are to be modified to the extent necessary to give effect to that intention. If you acquire goods from Generac Power Systems or any of its authorized resellers and distributors for the purposes of a business, then pursuant to section 43(2) of the CGA, it is agreed that the provisions of the CGA do not apply.

**GENERAC POWER SYSTEMS, INC. • P.O. BOX 8 • Waukesha, WI, USA 53187
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To locate the nearest Independent Authorized Service Dealer and to download schematics, exploded views and parts lists
visit our website: www.generac.com

Garantía limitada extendida de 2 años (2C) de Generac Power Systems para interruptores de transferencia industriales

Para el periodo de garantía que se indica a continuación y que comienza a partir de la fecha en la que la unidad se ponga en marcha de manera correcta y/o se active/registre online, Generac Power Systems, Inc. "Generac" garantiza que este interruptor de transferencia está libre de todo defecto en material y mano de obra para los elementos y periodo de tiempo que se indican a continuación. Generac, según su propio criterio, reparará o sustituirá cualquier componente o componentes que, una vez evaluados, inspeccionados y probados por Generac, o por un servicio técnico autorizado independiente, se consideren defectuosos. Cualquier equipo que el comprador/propietario reclame como defectuoso deberá ser evaluado por el servicio técnico autorizado independiente más cercano.

Cobertura de la garantía en año(s) 1-2

Piezas, mano de obra y desplazamiento limitado

Directrices:

1. La unidad debe estar registrada y tener prueba de compra disponible.
2. Sean cuales sean los tipos de problemas y reparaciones de la garantía, deben ser efectuados y/o dirigidos por un concesionario de servicio autorizado independiente, o una sucursal de este. Las reparaciones o los diagnósticos efectuados por personas diferentes de los concesionarios de servicio autorizados independientes, y que no estén autorizados por escrito por Generac, no serán cubiertos.
3. La garantía es transferible entre el propietario del sitio de la instalación original.
4. Generac puede elegir reparar, sustituir una pieza del equipo o reembolsar el dinero correspondiente a su exclusivo criterio.
5. La garantía solamente se aplica a las unidades montadas y conectadas de manera permanente.
6. Los gabinetes tienen garantía durante el primer año de propiedad solamente. El daño causado después de la recepción del generador es responsabilidad del comprador y no está cubierto por esta garantía. Las muescas, raspaduras, abolladuras o ralladuras del gabinete pintado deben ser reparadas inmediatamente por el propietario.
7. Debe tener disponible una prueba de ejecución de todas las tareas de mantenimiento requeridas.
8. Los gastos de desplazamiento están limitados a un máximo de 482.8 Km (300 millas) o a un tiempo máximo de siete horas y media (7.5) (por ocurrencia, lo que sea menos costoso) por viaje de ida y vuelta desde el servicio técnico independiente autorizado más cercano. Cualquier otro gasto de desplazamiento no está cubierto por la garantía.

Esta garantía NO cubrirá los siguientes aspectos:

1. Los costos del mantenimiento normal (es decir, pieza(s) relacionada(s), ajustes, instalación o puesta en marcha).
2. Los daños en el interruptor de transferencia ocasionados por accidentes, durante el envío, la manipulación o el almacenamiento incorrecto del mismo.
3. Los daños/fallas causados por la operación con cargas o instalaciones diferentes a las recomendadas o especificadas por Generac. Las modificaciones o aplicaciones inadecuadas no autorizadas no estarán cubiertas por la garantía a menos que Generac lo autorice por escrito.
4. El equipo alquilado utilizado mientras se lleven a cabo reparaciones cubiertas por la garantía y/o cualquier equipo extraordinario utilizado para realizar los traslados y/o reinstalaciones del interruptor de transferencia (es decir, grúas, montacargas, elevadores y otros).
5. Los daños en aviones, barcos, carreteras, autobuses, helicópteros, vehículos para la nieve, tractores para la nieve, vehículos todoterreno o cualquier otro medio de transporte considerado no estándar por Generac.
6. Las fallas debidas a desgaste y deterioro normal, accidente, uso indebido, abuso, negligencia, instalación incorrecta o dimensionamiento incorrecto.
7. Los daños causados en cualquiera de los componentes cubiertos por esta garantía o los daños derivados del uso de piezas que no sean originales no están cubiertos por esta garantía.
8. Los daños causados por plagas de roedores, reptiles y/o insectos.
9. Las reparaciones o los diagnósticos efectuados por personas diferentes de los concesionarios de servicio autorizados independientes, y que no estén autorizados por escrito por Generac.
10. Los gabinetes de acero que se oxidan debido a una instalación incorrecta, ubicación en entornos con condiciones difíciles o de agua salada, o que están rayados en algún lugar en el que la integridad de la pintura aplicada se pueda ver afectada.
11. Los fusibles, bombillas y cualquier trabajo relacionado con los mismos.
12. Las unidades vendidas, usadas o clasificadas para aplicaciones de "Alimentación eléctrica principal", "Montada en remolque" o "Unidad en alquiler" tal y como las define Generac. Contacte con un servicio técnico independiente autorizado para obtener las definiciones.
13. Las averías provocadas por cualquier acto de fuerza mayor, o causa externa, incluyendo entre otros, incendios, robos, congelación, guerras, relámpagos, terremotos, vendavales, granizo, agua, tornados, huracanes, o cualquier otro motivo que se escape del control del fabricante.
14. Los gastos de envío asociados a envíos rápidos.
15. Cualquier daño accidental, consecuente o indirecto provocado por defectos en el material o la mano de obra, o cualquier daño en la reparación o sustitución del o de los componentes defectuosos.
16. Cualquier unidad diseñada/fabricada antes de los modelos del 2014.
17. La mano de obra en situaciones de emergencia, festivos y horas extraordinarias.
18. Los gastos de viaje y estadía de la/las persona(s) que realizan el servicio, salvo que estén incluidos específicamente en los términos de un determinado periodo de la garantía de la unidad.

ESTA GARANTÍA SUSTITUYE CUALQUIER OTRA GARANTÍA, EXPRESA O IMPLÍCITA. ESPECÍFICAMENTE, GENERAC NO OFRECE NINGUNA OTRA GARANTÍA EN CUANTO A LA COMERCIALIZACIÓN O IDONEIDAD PARA UN PROPÓSITO PARTICULAR. CUALQUIER GARANTÍA IMPLÍCITA PERMITIDA POR LA LEY TENDRÁ UNA VIGENCIA LIMITADA A LOS TÉRMINOS DE LA GARANTÍA EXPRESA AQUÍ INCLUIDOS. ALGUNAS JURISDICIONES NO PERMITEN LIMITACIONES DE LA DURACIÓN DE UNA GARANTÍA IMPLÍCITA; POR LO TANTO, LA LIMITACIÓN PRECEDENTE PUEDE NO APLICARSE A USTED. LA ÚNICA RESPONSABILIDAD DE GENERAC SERÁ LA REPARACIÓN O SUSTITUCIÓN DEL COMPONENTE O COMPONENTES ARRIBA INDICADOS. EN NINGÚN CASO GENERAC SERÁ RESPONSABLE DE NINGÚN DAÑO INCIDENTAL O CONSECUENTE, INCLUSO SI TALES DAÑOS SON RESULTADO DIRECTO DE UNA NEGLIGENCIA DE GENERAC. ALGUNAS JURISDICIONES NO PERMITEN LA EXCLUSIÓN O LIMITACIÓN DE DAÑOS ACCESORIOS O EMERGENTES, DE MANERA QUE LA LIMITACIÓN PRECEDENTE PUEDE NO APLICARSE A USTED. ESTA GARANTÍA LE CONCEDE DERECHOS LEGALES ESPECÍFICOS. USTED PUEDE CONTAR CON OTROS DERECHOS QUE LE OTORGAN LAS LEYES VIGENTES.

SÓLO PARA AUSTRALIA: Nuestros productos se presentan con garantías que no se pueden excluir en virtud de la Ley del Consumidor de Australia. Usted tiene derecho a un reemplazo o sustitución por una avería grave y a una compensación por cualquier otro daño o pérdida razonablemente previsible. Asimismo, también tiene derecho a la reparación o sustitución de los productos si estos no cumplen con la calidad aceptable y si la avería no constituye una avería importante.

SÓLO PARA NUEVA ZELANDA: Nada en esta declaración de garantía excluye, restringe o modifica ninguna condición, derecho de garantía o remedio que de conformidad con la legislación de Nueva Zelanda (Commonwealth o Estado), incluyendo la Ley sobre Prácticas de Comercio Justo de 1986 o la Ley de Garantías del Consumidor de 1993 ("CGA" por sus siglas en inglés), se aplique a esta garantía limitada y no puede ser así excluida, restringida o modificada. Nada en esta declaración se prevé que tenga el efecto de renuncia de las cláusulas de la CGA, excepto en la medida que así lo permita dicha Ley, y estos términos se modificarán en la medida que sea necesario para dar efecto a tal intención. Si adquiere productos de Generac Power Systems, o de cualquiera de sus revendedores o distribuidores autorizados con fines empresariales, entonces, de conformidad con el artículo 43(2) de la CGA, se acuerda que no se apliquen las cláusulas de la CGA.

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Para localizar el distribuidor autorizado independiente más cercano y para descargar los esquemas, vistas ampliadas y listas de componentes, visite nuestro sitio web: www.generac.com

Pour la période de garantie mentionnée ci-dessous, qui débute lors du démarrage et/ou de l'activation/enregistrement en ligne de l'appareil, Generac Power Systems, Inc. « Generac » garantit que son commutateur de transfert sera exempt de défauts de matériaux et de fabrication pour les articles et la période indiqués ci-dessous. Generac, à son entière discrétion, réparera ou remplacera toute pièce dont le défaut a été établi, après évaluation, inspection et contrôle par Generac ou par un concessionnaire de service agréé indépendant. Tout équipement jugé défectueux par l'acheteur/le propriétaire devra être vérifié par le concessionnaire réparateur indépendant agréé le plus proche.

Couverture de garantie en année(s) 1-2

Pièces, main-d'œuvre et déplacement limité

Directives :

1. Le groupe électrogène doit être enregistré et une preuve d'achat doit être fournie.
2. Les réparations ou les questions touchant à la garantie doivent être confiées ou communiquées à un concessionnaire réparateur indépendant agréé. Les réparations ou les diagnostics effectués par d'autres personnes qu'un concessionnaire réparateur indépendant agréé, non autorisés par écrit par Generac, ne seront pas couverts.
3. Cette garantie est transférable entre propriétaires du lieu d'installation d'origine.
4. Generac décidera, à son entière discrétion, de réparer, de remplacer ou de rembourser toute pièce dont le défaut a été établi.
5. Cette garantie s'applique uniquement aux groupes électrogènes fixes et câblés en permanence.
6. Les enceintes sont garanties pendant la première année de possession seulement. Les dommages subis après la réception du générateur relèvent de la responsabilité du propriétaire et ne sont pas couverts par cette garantie. Les éraflures, les marques superficielles, les rayures ou les bosses sur l'enveloppe peinte doivent être réparées sans délai par le propriétaire.
7. Une preuve de l'entretien obligatoire ayant été effectué doit être fournie.
8. L'allocation de déplacement est limitée à un aller-retour de 480 km et de sept heures et demie (7,5) maximum (par cas, le moindre des deux prévalant) à partir du concessionnaire réparateur indépendant agréé le plus proche. Les déplacements supplémentaires requis ne seront pas couverts.

Les éléments suivants NE seront PAS couverts par cette garantie :

1. Les coûts d'entretien normal (c.-à-d., pièce(s) connexe(s), réglages, installation ou mise en route).
2. Les dommages au commutateur de transfert causés par : un accident, l'expédition, la manutention, ou un mauvais entreposage.
3. Les dommages/les défaillances causés par : l'utilisation de charges ou des installations non recommandées ou non indiqués par Generac. Les modifications/mauvaises utilisations non autorisées ne seront pas couvertes par cette garantie, sauf autorisation écrite de Generac.
4. Le matériel de location utilisé pendant les réparations de garantie ou tout équipement spécial utilisé pour le retrait ou la réinstallation du commutateur de transfert (c.-à-d., grues, treuils, appareils de levage, etc.).
5. Les avions, les traversiers, les trains, les autobus, les hélicoptères, les motoneiges, les autoneiges, les véhicules hors route et tout autre moyen de transport jugés comme étant non standard par Generac.
6. Les défauts causés par : l'usure normale, un accident, une mauvaise utilisation, une utilisation abusive, une négligence, une mauvaise installation, un mauvais dimensionnement.
7. Cette garantie ne couvre pas les dommages causés par l'utilisation de pièces non d'origine, y compris les dommages consécutifs subis par une pièce sous garantie.
8. Les dommages causés par une infestation d'insectes ou de rongeurs.
9. Les réparations ou les diagnostics effectués par d'autres personnes qu'un concessionnaire réparateur indépendant, non autorisés par écrit par Generac.
10. Les enveloppes de protection en acier attaquées par la rouille en raison d'une mauvaise installation; installées dans un milieu agressif ou salin; qui ont subies des rayures compromettant l'intégrité de la couche de peinture.
11. Les fusibles, les ampoules et la main-d'œuvre connexe.
12. Les appareils vendus, classés ou utilisés pour des utilisations « source principale d'alimentation », « monté sur remorque » ou « unité de location », tel que défini par Generac. Informez-vous auprès d'un concessionnaire réparateur indépendant agréé au sujet des définitions.
13. Les défaillances causées par une catastrophe naturelle ou une cause externe, y compris sans s'y limiter, un incendie, un vol, un gel, une guerre, la foudre, un tremblement de terre, une tempête de vent, la grêle, l'eau, une tornade, un ouragan ou autres circonstances étant à juste titre indépendantes de la volonté du fabricant.
14. Les frais d'expédition associés à l'expédition accélérée.
15. Tout dommage consécutif ou indirect causé par des défauts de matériaux ou de fabrication, ou tout retard de réparation ou de remplacement de la (des) pièce(s) défectueuse(s).
16. Tout groupe électrogène fabriqué avant les modèles 2014.
17. Les heures supplémentaires, les congés et la main-d'œuvre d'urgence.
18. Les frais de subsistance ou de déplacement des personnes qui effectuent la réparation, sauf s'ils sont expressément prévus dans les conditions de période de garantie d'un groupe électrogène particulier.

CETTE GARANTIE REMPLACE TOUTES LES AUTRES GARANTIES, EXPRESSES OU IMPLICITES. SPÉCIFIQUEMENT, GENERAC N'EFFECTUE AUCUNE AUTRE GARANTIE QUANT À LA VALEUR MARCHANDE OU L'ADAPTATION À UN USAGE PARTICULIER. TOUTES LES GARANTIES IMPLICITES QUI SONT PERMISES PAR LA LOI SERONT LIMITÉES DANS LE TEMPS À LA DURÉE DE LA GARANTIE LIMITÉE EXPRESSE FOURNIE AUX PRÉSENTES. LES LOIS APPLICABLES INTERDISANT PARFOIS LES LIMITATIONS SUR LA DURÉE DES GARANTIES IMPLICITES, LA LIMITATION CI-DESSUS PEUT NE PAS S'APPLIQUER À VOTRE CAS. LA SEULE RESPONSABILITÉ DE GENERAC SERA DE RÉPARER OU DE REMPLACER LA (LES) PIÈCE(S) COMME IL EST INDICÉ CI-DESSUS. GENERAC NE SERA EN AUCUN CAS RESPONSABLE DES DOMMAGES INDIRECTS OU CONSÉCUTIFS, MÊME SI CES DOMMAGES SONT UNE CONSÉQUENCE DIRECTE DE LA NÉGLIGENCE DE LA PART DE GENERAC. LES LOIS APPLICABLES INTERDISANT PARFOIS L'EXCLUSION OU LA LIMITATION DES DOMMAGES INDIRECTS OU CONSÉCUTIFS, LA LIMITATION CI-DESSUS PEUT NE PAS S'APPLIQUER À VOTRE CAS. CETTE GARANTIE VOUS CONFÈRE DES DROITS PRÉCIS, RECONNUS PAR LA LOI. VOUS POURRIEZ AUSSI AVOIR D'AUTRES DROITS EN VERTU DE LA LOI EN VIGUEUR.

POUR L'Australie SEULEMENT : Nos produits sont offerts avec des garanties qui ne peuvent pas être exclues en vertu de la loi sur la protection des consommateurs de l'Australie. Vous avez droit à un remplacement ou un remboursement pour toute défaillance majeure et à une compensation pour les autres pertes et dommages raisonnablement prévisibles. Vous avez aussi droit à ce que les produits soient réparés ou remplacés s'ils ne répondent pas à des critères de qualité acceptables et si la défaillance n'est pas un défaut majeur.

POUR LA NOUVELLE-ZÉLANDE SEULEMENT : Rien dans cette déclaration de garantie n'exclut, ne restreint ni modifie toute condition, droit de garantie ou recours qui, en vertu de la législation de la Nouvelle-Zélande (Commonwealth ou d'État), y compris la loi sur les pratiques commerciales équitables de 1986 ou la loi sur la protection du consommateur de 1993 (« LPC »), s'appliquent à cette garantie limitée et ne peuvent pas être exclus, restreints ou modifiés. Rien dans cette déclaration n'est conçu pour avoir comme effet d'externaliser les dispositions de la LPC, à l'exception de ce qui est permis par cette loi, et ces conditions doivent être modifiées dans la mesure nécessaire pour donner effet à cette intention. Si vous achetez des produits Generac Power Systems ou d'un de ses revendeurs ou distributeurs autorisés pour des besoins commerciaux, en vertu de la section 43(2) de la LPC, il est entendu que les dispositions de la LPC ne s'appliquent pas.

GENERAC POWER SYSTEMS, INC. • P.O. BOX 8 • Waukesha, WI, USA 53187
Tél. : (888) GENERAC (436-3722) • Fax : (262) 544-4851

Pour trouver le concessionnaire réparateur indépendant le plus proche et pour télécharger les schémas, les vues éclatées et les listes de pièces, visitez notre site Web : www.generac.com



CERTIFICATE



This is to certify that

Generac Power Systems, Inc.

S45 W29290 Hwy. 59
Waukesha, WI 53189
United States of America

with the organizational units/sites as listed in the annex

has implemented and maintains a **Quality Management System.**

Scope:

Design, Manufacture, and Distribution of Power Products and Solutions.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

ISO 9001 : 2015

Certificate registration no.	10012920 QM15
Date of original certification	2013-12-09
Date of revision	2021-06-25
Date of certification	2021-07-16
Valid until	2024-07-15



DQS Inc.

Brad McGuire
Managing Director



Annex to certificate**Registration No. 10012920 QM15****Generac Power Systems, Inc.**

S45 W29290 Hwy. 59
Waukesha, WI 53189
United States of America

Location**Scope**

10012920
Generac Power Systems, Inc.
S45 W29290 Hwy. 59
Waukesha, WI 53189
United States of America

Design and Support of Power Products and Solutions.

10012922
Generac Power Systems, Inc.
211 Murphy Dr.
Eagle, WI 53119
United States of America

Manufacture and Distribution of Power Products and Solutions.

10012923
Generac Power Systems, Inc.
757 N. Newcomb St.
Whitewater, WI 53190
United States of America

Manufacture and Distribution of Power Products and Solutions.

10012924
Generac Power Systems, Inc.
900 N. Parkway
Jefferson, WI 53549
United States of America

Manufacture of Power Products and Solutions.

10013528
Generac Power Systems
3815 Oregon St.
Oshkosh, WI 54902
United States of America

Manufacture and Distribution of Power Products.

10017103
Generac Mobile
215 Power Drive
Berlin, WI 54923
United States of America

Manufacture and Distribution of Power Products.

This annex (edition: 2021-06-25) is only valid in connection with the above-mentioned certificate.



Annex to certificate**Registration No. 10012920 QM15****Generac Power Systems, Inc.**

S45 W29290 Hwy. 59
 Waukesha, WI 53189
 United States of America

Remote Location**Scope**

10014175
Generac Power Systems, Inc.
351 Collins Road
Jefferson, WI 53549
United States of America

The remote location at Jefferson, WI performs the following primary functions: Parts and Components Receiving, Inventory, Return and Reconditioning of Product, and Distribution to Generac Locations.

10017439
Generac Mobile
745 E. Knopf St.
Berlin, WI 54923
United States of America

The remote location at Berlin, WI performs the following primary functions: Warehousing and Shipping.

10018422
Generac Power Systems, Inc.
303 Venture Court
Janesville, WI 53546
United States of America

The remote location at Janesville, WI performs the following primary functions: Parts and Components Receiving, Kitting, Warehousing, Inventory, and Distribution to Generac locations.





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2019 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

Page 153 of 155
**OFFICE OF TRANSPORTATION
AND AIR QUALITY**
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: FPT Industrial S.p.A.
(U.S. Manufacturer or Importer)
Certificate Number: KFPXL06.7DGS-007

Effective Date:
07/16/2018
Expiration Date:
12/31/2019

Byron J. Bunker, Division Director
Compliance Division

Issue Date:
07/16/2018
Revision Date:
N/A

Model Year: 2019
Manufacturer Type: Original Engine Manufacturer
Engine Family: KFPXL06.7DGS

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 130<=kW<225
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: No Non-After Treatment Devices Installed

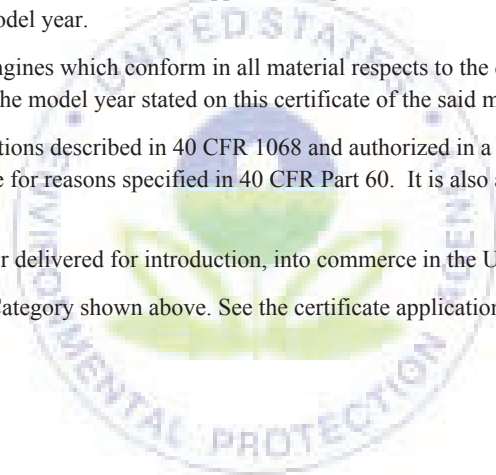
Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

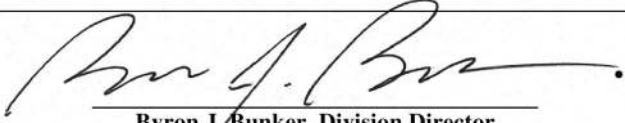
The actual engine power may lie outside the limits of the Emissions Power Category shown above. See the certificate application for details.





**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2020 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT**

Page 154 of 155
**OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: FPT Industrial S.p.A. (U.S. Manufacturer or Importer) Certificate Number: LFPXL06.7DGS-005	<u>Effective Date:</u> 07/11/2019 <u>Expiration Date:</u> 12/31/2020	 <hr/> Byron J. Bunker, Division Director Compliance Division	<u>Issue Date:</u> 07/11/2019 <u>Revision Date:</u> N/A
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Model Year: 2020 Manufacturer Type: Original Engine Manufacturer Engine Family: LFPXL06.7DGS	Mobile/Stationary Indicator: Stationary Emissions Power Category: 130<=kW<225 Fuel Type: Diesel After Treatment Devices: No After Treatment Devices Installed Non-after Treatment Devices: No Non-After Treatment Devices Installed
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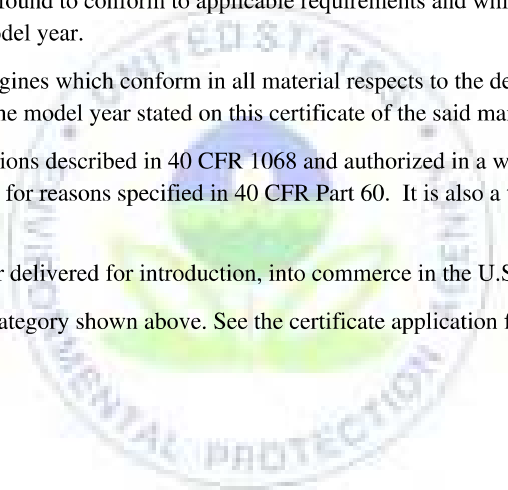
Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

The actual engine power may lie outside the limits of the Emissions Power Category shown above. See the certificate application for details.



Warranty

United States Environmental Protection Agency Warranty Statement (Stationary Emergency Compression-Ignition Generators)

Warranty Rights, Obligations and Coverage

Your emission-related warranty covers only components whose failure would increase an engine's emissions of any regulated pollutant where they are designed, built, and equipped to be free from defects in materials and workmanship under applicable regulations of section 213 of the clean air act. To receive information about how to make an emission-related warranty claim, and how to make arrangements for authorized repairs call **1-800-333-1322** or **www.generac.com**. Emission-related warranty claims may be denied without proof of proper maintenance or use, accidents beyond the control of the manufacturer, or act of God. Proper maintenance is specified in the Owner's Manual. Usage is limited to stationary emergency operations and 100 hours per year for maintenance and readiness testing. The warranty period begins when the engine is placed into service. Warranty periods for compression ignition engines greater than 25 horsepower is five years. This warranty is applicable to compression-ignition generator models; equal to and larger than an SD80 starting 1/1/2011, equal to and larger than an SD35 starting 1/1/2012, and all compression-ignition generator models starting 1/1/2013.

Important Note

This warranty statement explains your rights and obligations under the Emission Control System Warranty, which is provided to you by Generac pursuant to federal law. Note that this warranty shall not apply to any incidental, consequential or indirect damages caused by defects in materials or workmanship or any delay in repair or replacement of the defective part(s). This warranty is in place of all other warranties, expressed or implied. Specifically, Generac makes no other warranties as to the merchantability or fitness for a particular purpose. Any implied warranties which are allowed by law, shall be limited in duration to the terms of the express warranty provided herein. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.