June 14, 2023

Addendum 1

Bid No. 23-027

Planter's Pointe Lift Station

Addendum 1 contains questions and answers submitted via email or at the pre-bid meeting held at 10:00 AM on Tuesday, June 13, 2023. Clarifications from the pre-bid meeting are also included in this addendum.

This bid will be opened at the City of Fairhope's City Services and Public Utilities Building, 555 South Section Street, Fairhope, AL 36532 at 1:00 PM on Thursday, June 22, 2023. Vendors shall acknowledge this Addendum 1 on their submitted Bid Response Form.

Questions Submitted Via Email or in the Pre-Bid Meeting:

1. It appears satellite imagery that there is a new development in the same area as the pump station. Is the new pavement/curb reflected on the drawings?
   A. There is curbing that is a part of the north entrance for the complex. This should not have any effect on the lift station. The station's location is north of the driveway. There is a temporary lift station installed to the west of where the permanent station will be installed.

2. If we are in direct conflict with the new pavements, can the pump station be moved so that the excavation footprint does not encroach and damage the asphalt?
   A. The City does not anticipate a direct conflict with the new pavements. Should a conflict become apparent during the course of the project, the City will decide on a resolution of the conflict at that time.

3. We have a crew in the area. Would we be allowed to dig a test hole?
   A. Yes, contact Daryl Morefield at daryl.morefield@fairhopeal.gov or Tim Manuel at tim.manuel@fairhopeal.gov for access to the project site.

4. If dirt is needed for the project, is the Contractor responsible for acquiring the dirt?
   A. Yes. The City does have dirt available, but the Contractor would be responsible for the transport to the project site.

5. Is a fence still part of the project specifications?
   A. No.

6. What are the specifications of the wet well?
   A. The specifications for the fiberglass wet well are attached.

Clarifications from the Pre-Bid Meeting held at 10:00 AM on Tuesday, June 13, 2023.

1. The Control Building is not a part of this project. Bidders shall disregard that portion of the bid set drawings.

2. LFM Wet Well Specifications and Installation Instructions are attached.

3. Primex Control Panel Specifications are attached.

4. JHW Duplex Lift Station Specifications are attached.

5. Typical drawing sets for Standard Sanitary Sewer Lift Station Details are attached.

City of Fairhope, Public Works Department
555 South Section Street Fairhope, Alabama 36532
Phone: (251) 928-8003

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, 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 ft^2.

Quality Built Right In

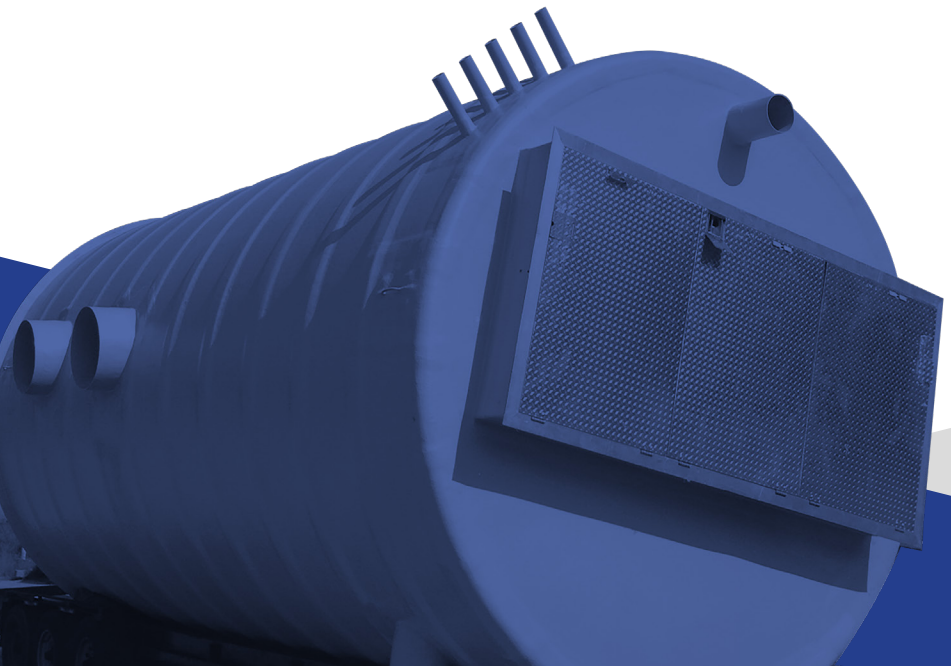
LFM incorporates a comprehensive in-plant testing program. Our quality control enables us to provide our customers with consistent workmanship in every fiberglass wetwell that we build. We inspect and test each fiberglass wetwell before it is released for shipping. Wall thickness reports, raw material 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.

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. They are also light-weight, making them easier to handle. This means easier, safer, faster and less costly installations.

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.



LFM
Fiberglass Structures

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 Assurance

At LFM, we stand behind the products we build. Our fiberglass wetwells carry a one-year warranty. Speak to your LFM sales representative for complete details.

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.

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.

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

Corporate Headquarters • 5528 East Hwy. 290 • Giddings, TX 78942
800.237.5791 • LFM-frp.com

LFM® Fiberglass Structures

LFM Fiberglass Structures
5228 East Hwy. 290 | P.O. Box 578
Giddings, TX 78642
Ph: 979.542.8027 | Fax: 979.542.0911
www.lfm-frp.com

FRP CLOSED BOTTOM WETWELL (WW) INSTALLATION STEPS:

1. Consult the LF Manufacturing (LFM) installation drawing for closed bottom WWs, A-WW2880, Rev. G. Read completely before proceeding with installation.

2. Excavate the hole to install the WW. The WW excavation hole size should be a minimum of 2' larger than the WW outer diameter. LFM designs for the WW excavation holes to be 75% larger than the WW unless LFM has had project contract drawing showing WW excavation details. If the excavation hole size is greater than twice the WW diameter, LFM must be notified. LFM must give written approval to install before the installation may proceed.

3. Excavation hole walls shall be properly supported in compliance with OSHA regulations. Sheeting, shoring, bracing or sloping walls of an excavation shall be done to protect personnel from hole cave ins. Excavated soil/material shall be stored, piled or stacked in a manner it does not endanger work being performed at the site. It is the responsibility of the installing contractor to insure on site personnel safety and to protect on-site equipment.

4. As required, dewater the WW excavation site completely below the WW's bottom elevation. The intent of these instructions is for the WW to be installed in a dry firm bed. Excavation sites shall be protected against excessive rain and drainage for groundwater sources. DO NOT attempt to sink the WW in an excavation hole full of water without written consent from LF Manufacturing.

5. Spread 4"-6" deep of pea gravel or crushed rock on the bottom bed of the WW excavation.

6. Install WW subterranean concrete foundation steel reinforcement and minimum of (3) blocks to set the bottom WW on. See item 10. Block material must not be such that it will degrade over time. The reinforced WW concrete foundation shall be designed by a professional engineer (PE) with experience designing subgrade concrete foundations.

   Note: The minimum foundation thickness beneath the WW anchor channel is 12". The project's foundation design engineer may require a thicker foundation than 12" depending on the projects load requirements.

7. Pour the WW's foundation wet concrete up to a level that will place the WW sidewall anchor flange submerged a minimum 4" and a maximum 6".

8. Lower the WW into the excavation hole. Sink WW into the wet concrete foundation set it on the blocks as state in step 6. Make WW level and plumb. It is highly recommended to fill the WW with water while positioning the WW into the foundation's wet concrete and during concrete/flowable fill (FF) ballast pours. This is done to counter WW hydrostatic uplift (eliminate WW flotation) and external loads.

9/30/2021, Rev. 0
By: DSP
Valid: (3) yrs

LFM Fiberglass Structures
5228 East Hwy. 290 | P.O. Box 578
Giddings, TX 78642
Ph: 979.542.8027 | Fax: 979.542.0911
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9. The WW shall NOT be installed on top of a cured concrete foundation. This installation configuration will result in a concrete foundation horizontal cold joint. A WW sitting on horizontal cold joint is unacceptable. This type of installation configuration will lead to a failure of the WW bottom with anchor channel.

10. The WW shall NOT set on the concrete foundation's steel rebar. Set the WW on the block spacers to elevate the WW to the required elevation inside the excavation per steps 6 and 8. Minimum distance between the WW anchor channel and the foundations upper rebar reinforcement shall not be less than 2" but shall be verified adequate by the foundation's design PE.

11. After the WW is placed in the holes and the concrete/FF is poured, it is required to be pushed, prodded and fibrated to completely fill all voids under and around the WW. The total encasement of the WW's anchor channels and support of the flat bottom is an integral aspect of a successful WW installation. Failure to completely encase and support the WWs anchor flange, channel and flat bottom will result in a WW failure or shortened service life.

12. Allow the foundation slab to fully cure solid. The foundation design PE or concrete manufacturer consultant shall advise the installing contractor regarding the required amount of time for the concrete/FF to cure solid.

13. Make the required external pipe fitting connections to the WW as required on the contract drawings. When a cutting hole in a WW wall to make a connection use a hole saw or jig saw. Do NOT use impact tools such as an axe to cut holes.

14. When the foundation slab has cured solid and all external pipe connections are complete, the ballast concrete/FF backfill may be poured on top of the foundation slab and around the WW. Note, "cured solid" does not equate to "cured to full strength". Concrete/FF ballast pours shall be done in maximum of 5' lifts. Pours shall be made uniformly. Concrete or FF shall not exceed a 6" difference in hydrostatic pressure elevation at any time around the circumference of the WW during the lift pour.

15. Ballast pours may exceed the 5' lifts when the WW is filled with water. The allowable lift requires the following hydrostatic heads in the wetwell – 10' lift requires 18' water; 15' lift requires 30' water; 20' lift requires 43' water. The water depth is from the bottom of the ballast pour. Ballast pours shall cure solid before the next lift pour. Note: These are based on a 2.5 concrete/FF specific gravity. Lower specific gravities will allow greater lift pours.

16. If the WW is NOT being completely encased in concrete/FF, backfill shall be $^{3}/_{8}$" – ¾" dia. pea gravel or ½" maximum crushed rock. Backfill is to be done in 12" high even lifts. If gravel or rock is unavailable, soil backfill shall be compacted to 90-95% Standard Proctor Density. Flooding to compact soil is not permitted.

17. Do not use sand to backfill unless approved in writing by the LFM project manager or engineer. Keep the backfill free of frost and ice. Do not allow large excessive pouring of backfill material to dislodge or displace the WW.

Control Panel Submittal Documentation – REV A	
Project	Fairhope, AL – Publix Lift Station Control Panel Duplex 50HP/460VAC/3PH 65.0 FLA
Project #	5009294
Quote #	20222376
Customer	J.H. Wright & Associates Inc.
PO No.	9030980
Date	3/20/23
Design Engineer	William González

- **UL508a**
- **Transducer and floats supplied by J.H. Wright.**
- **Wilo Pump Sensor Relays supplied by J.H. Wright.**

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☐ 220 Ohio Street
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St. Petersburg, FL 33716
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☐ 22650 County Highway 6
Detroit Lakes, MN 56501
Toll Free: 888-342-5753
Phone: 218-847-1317
Fax: 218-847-4617

☐ 400 Techne Center Drive
Suite 104
Milford, OH 45150
Phone: 513-831-9959
Fax: 513-831-3549

WARRANTY: SJE warrants to the buyer that this product shall be free of manufacturing defects for 2___ year(s) from the date of shipment. During that time period, SJE will repair or replace, at the sole discretion of SJE and subject to the Terms, Conditions & Warranty provisions found on SJE's website (https://sjeinc.com/terms-and-conditions/) and the terms and conditions set forth below, for the buyer, any component which proves to be defective due solely to defective materials or workmanship of SJE. Items that are considered consumable, including, but not limited to, lamps, surge protectors and fuses are not covered under SJE's warranty.

ANY ELECTRICAL WIRING AND SERVICING OF THE PRODUCT MUST BE PERFORMED BY A LICENSED ELECTRICIAN. WARRANTY CLAIMS FOR PRODUCTS WHICH WERE AT ANY TIME WIRED OR SERVICED BY ANYONE OTHER THAN A LICENSED ELECTRICIAN SHALL NOT BE HONORED IN WHOLE OR PART BY SJE.

THIS WARRANTY DOES NOT APPLY TO: (a) damage due to any weather-related or other conditions beyond the reasonable control of SJE; (b) defects or malfunctions resulting from the product not being installed, operated, or maintained in accordance with written instructions provided by SJE; (c) defects or malfunctions resulting from the product not being installed, operated, or maintained in accordance with applicable local codes, ordinances, or accepted trade practices; (d) failures resulting from abuse, misuse, accident, or negligence; (e) products repaired and/or modified without prior written authorization from SJE; or (f) product parts furnished by any party other than SJE.

TO OBTAIN WARRANTY SERVICE: The buyer can contact SJE Service Center at 218-847-1317 or toll free at 888-342-5753 for a Returned Material Authorization, which is required for any product being submitted for a warranty claim. Any products to be repaired or replaced under this warranty must be returned to SJE, or such place as designated by SJE, at the instruction of SJE. The buyer shall assume all responsibility and expense for removal, reinstallation, and freight associated with any warranty service.

SJE DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SJE SHALL NOT, IN ANY MANNER, BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES AS A RESULT OF A BREACH OF THIS WRITTEN WARRANTY OR ANY IMPLIED WARRANTY.

Some states do not allow limitations on implied warranty duration, as such, this limitation may not apply to the buyer. Some states do not allow the exclusion or limitation of incidental or consequential damages, as such, these limitations or exclusions may not apply to the buyer. The above-described warranty gives the buyer specific legal rights, and the buyer may also have other rights which vary from state to state.

For complete terms and conditions, please visit our websites.

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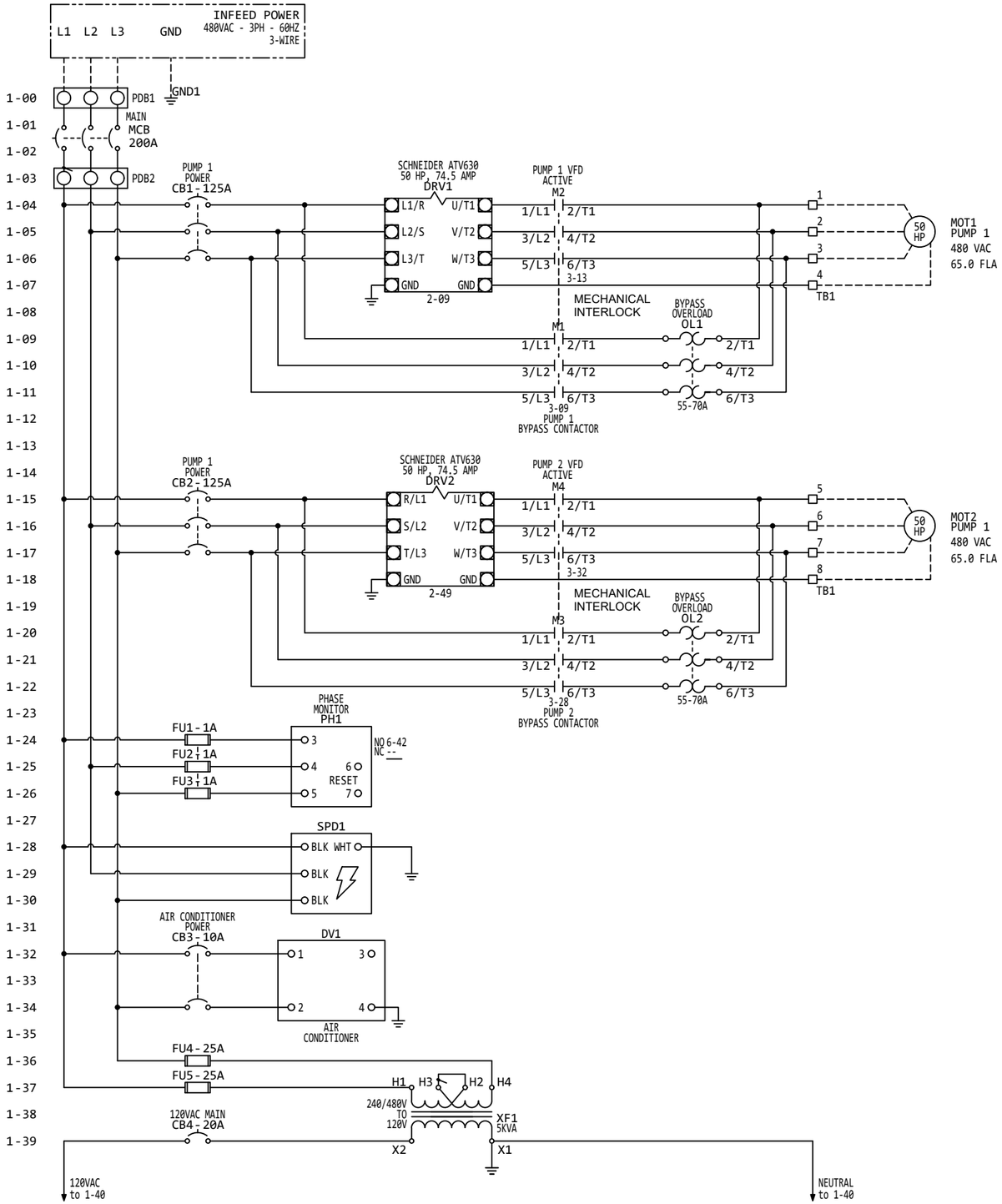

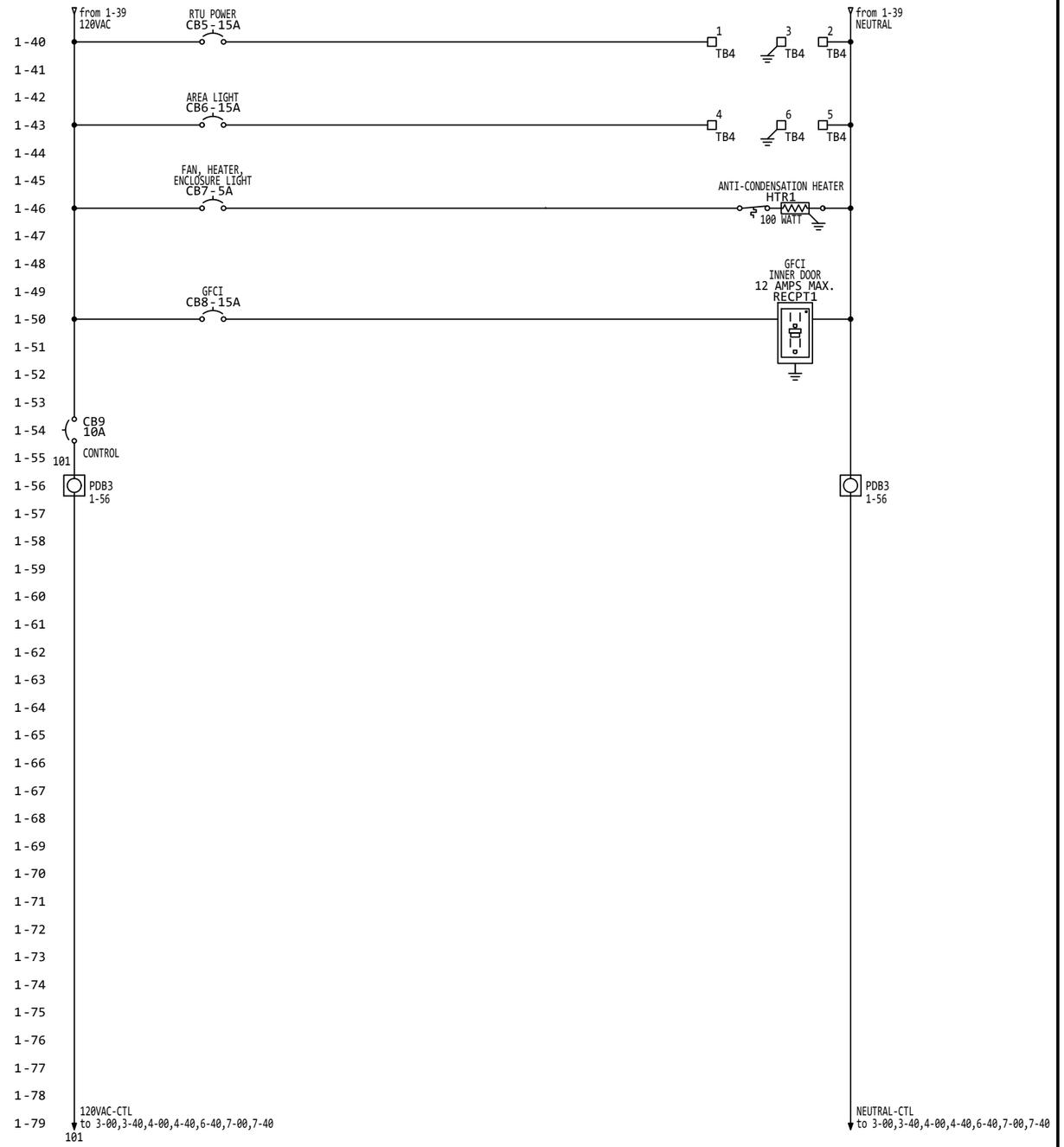

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1 OF 9

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10040 18th Street North Suite1, St. Peterburg, FL 33716
800-349-1905

FAIRHOPE, AL

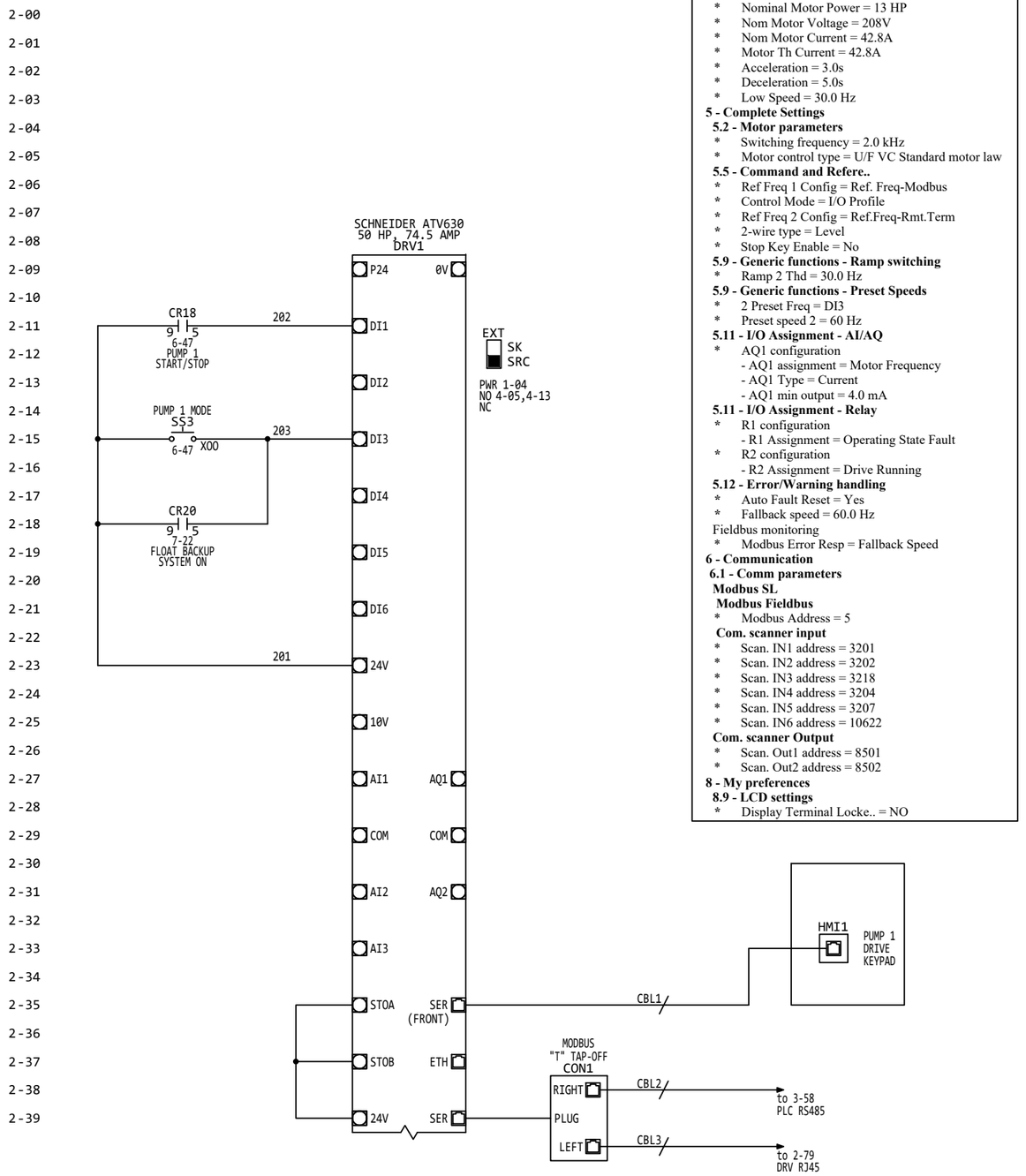
PUBLIX LS
DUPLEX CONTROL PANEL
JH WRIGHT

DRAWN BY WGR
DATE 3/15/23

PANEL REQUIREMENTS	
SYM.	
VOLTAGE	480 VAC
PHASE	3 PHASE 3 WIRE
FREQUENCY	60 Hz
SCCR	5 kA RMS SYM
TOTAL FLA	140.42 FLA
TYPE	4X

LARGEST MOTOR POWER REQUIREMENTS	
HP	50 HP
FLA	65.0 FLA

PROJECT NUMBER
5009294A



VFD PARAMETERS CHANGED FROM DEFAULT:

1 - Simply Start
- Motor Standard = 60 Hz NEMA
- Nominal Motor Power = 13 HP
- Nom Motor Voltage = 208V
- Nom Motor Current = 42.8A
- Motor Th Current = 42.8A
- Acceleration = 3.0s
- Deceleration = 5.0s
- Low Speed = 30.0 Hz

5 - Complete Settings

5.2 - Motor parameters
- Switching frequency = 2.0 kHz
- Motor control type = U/F VC Standard motor law

5.5 - Command and Refere..
- Ref Freq 1 Config = Ref. Freq-Modbus
- Control Mode = I/O Profile
- Ref Freq 2 Config = Ref.Freq-Rmt.Term
- 2-wire type = Level
- Stop Key Enable = No

5.9 - Generic functions - Ramp switching
- Ramp 2 Thd = 30.0 Hz

5.9 - Generic functions - Preset Speeds
- 2 Preset Freq = DI3
- Preset speed 2 = 60 Hz

5.11 - I/O Assignment - AI/AQ
- AQ1 configuration
  - AQ1 assignment = Motor Frequency
  - AQ1 Type = Current
  - AQ1 min output = 4.0 mA

5.11 - I/O Assignment - Relay
- R1 configuration
  - R1 Assignment = Operating State Fault
- R2 configuration
  - R2 Assignment = Drive Running

5.12 - Error/Warning handling
- Auto Fault Reset = Yes
- Fallback speed = 60.0 Hz

Fieldbus monitoring
- Modbus Error Resp = Fallback Speed

6 - Communication

6.1 - Comm parameters

Modbus SL

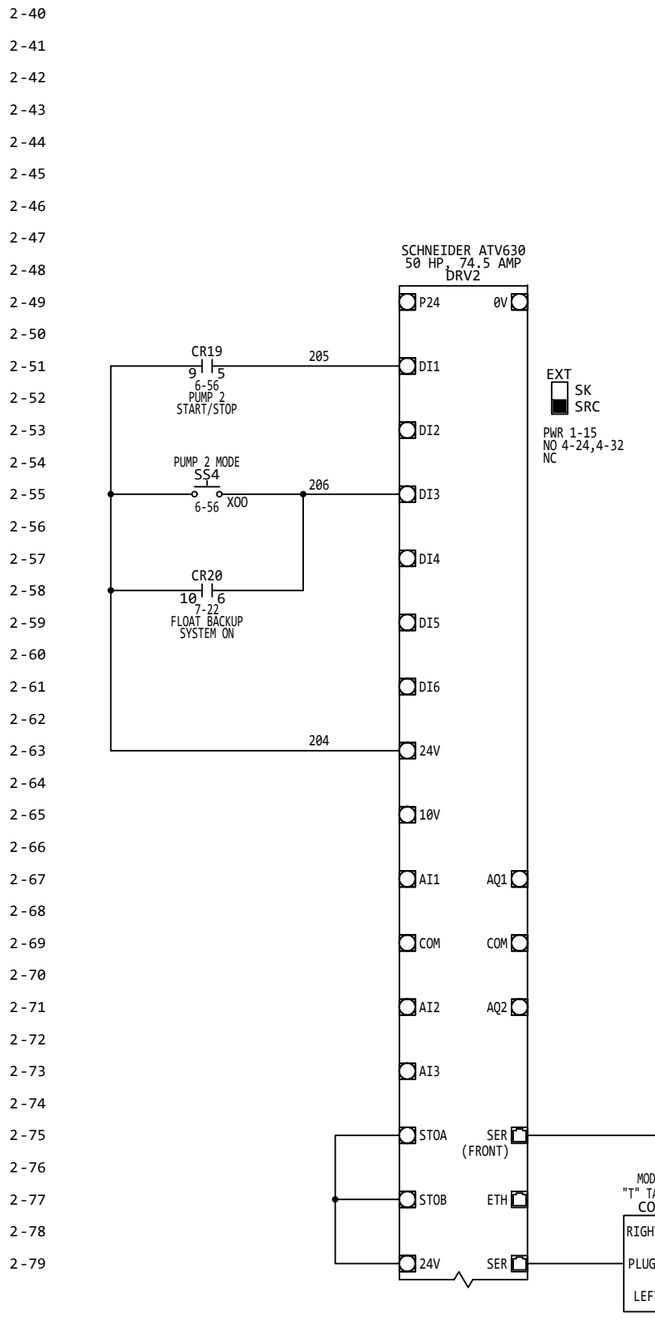
Modbus Fieldbus
- Modbus Address = 5

Com. scanner input
- Scan. IN1 address = 3201
- Scan. IN2 address = 3202
- Scan. IN3 address = 3218
- Scan. IN4 address = 3204
- Scan. IN5 address = 3207
- Scan. IN6 address = 10622

Com. scanner Output
- Scan. Out1 address = 8501
- Scan. Out2 address = 8502

8 - My preferences

8.9 - LCD settings
- Display Terminal Locke.. = NO



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- Modbus Error Resp = Fallback Speed

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Modbus SL

Modbus Fieldbus
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FAIRHOPE, AL

PUBLIX LS
DUPLEX CONTROL PANEL
JH WRIGHT

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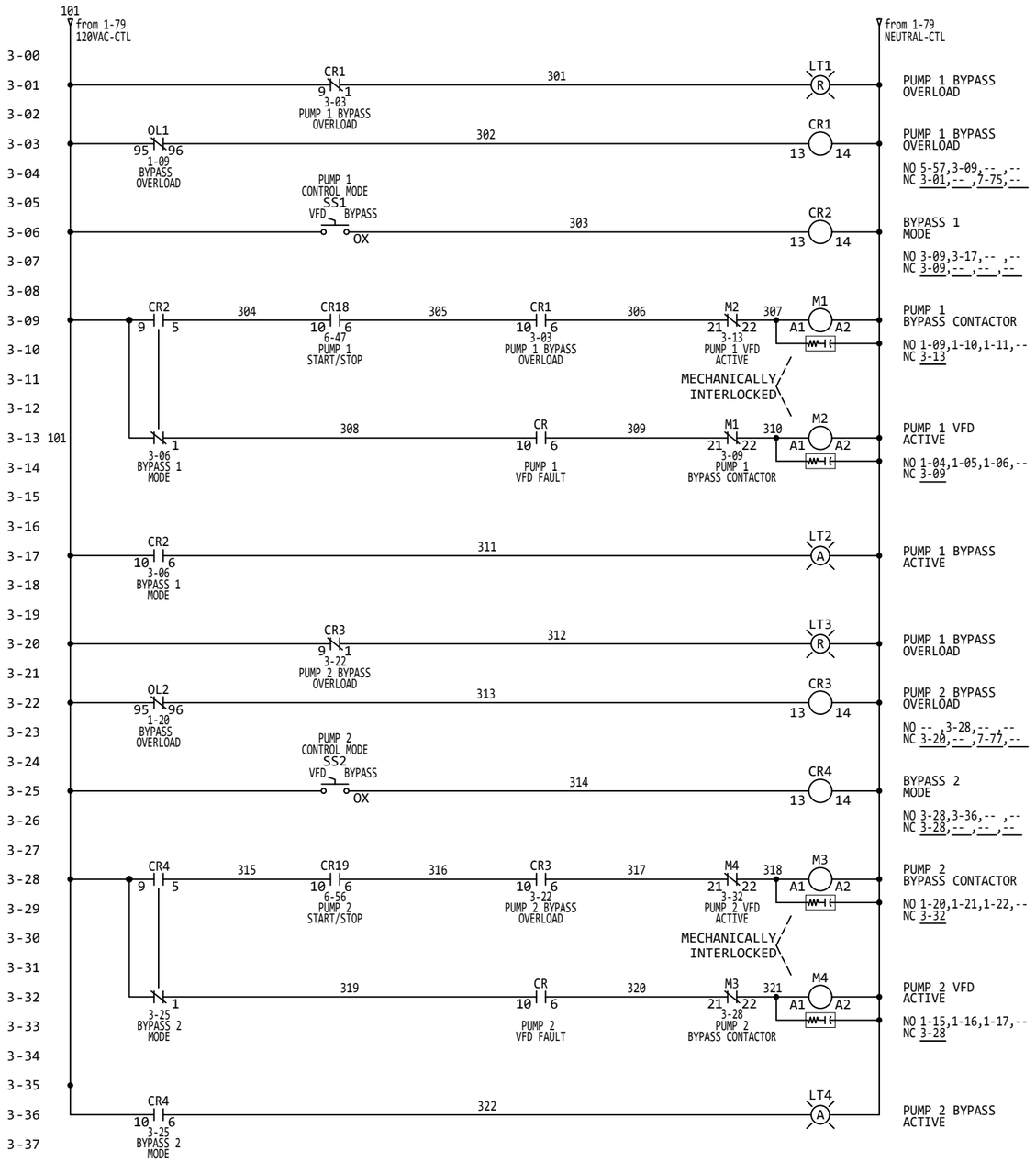
PANEL REQUIREMENTS

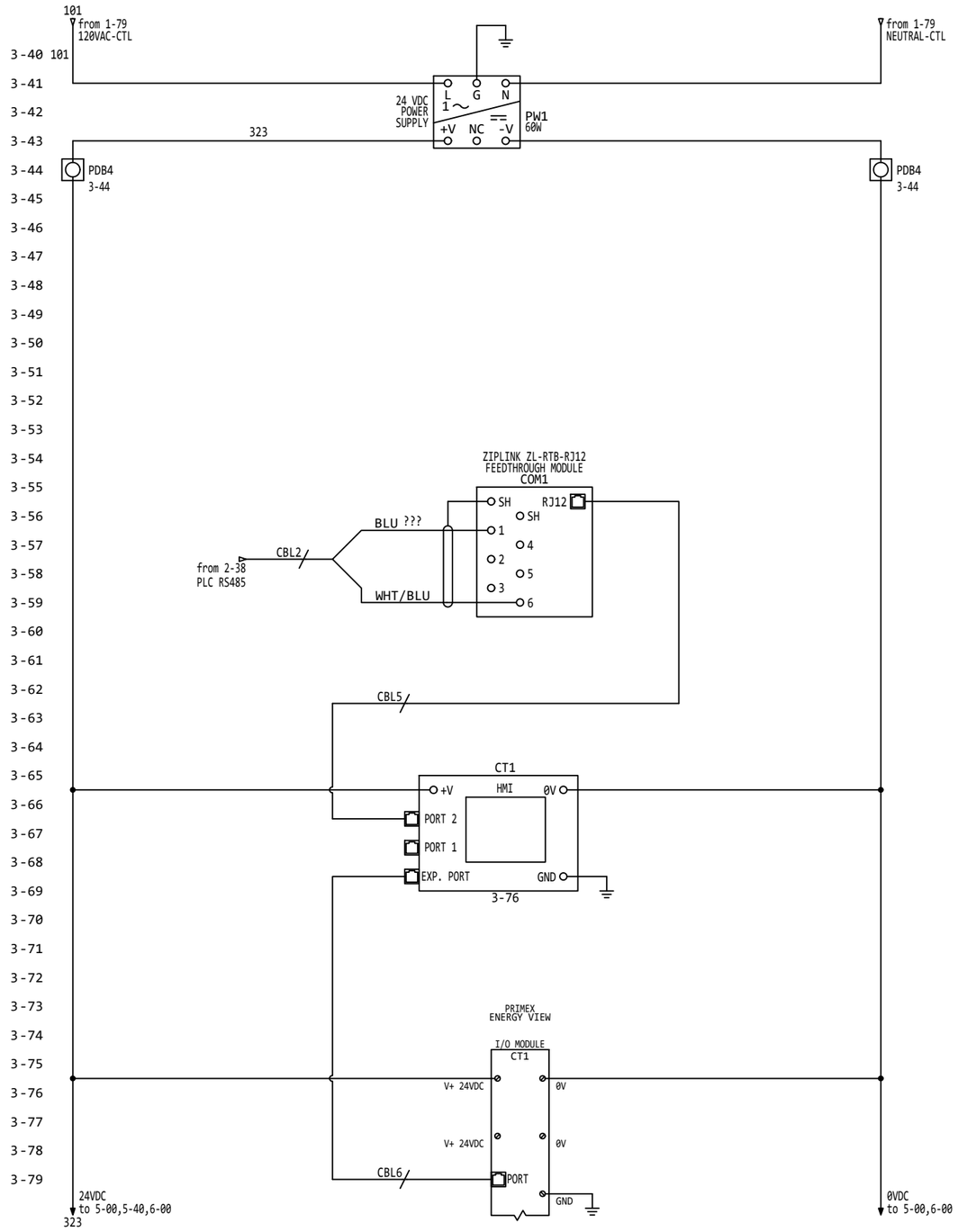
SYM.	
VOLTAGE	480 VAC
PHASE	3 PHASE 3 WIRE
FREQUENCY	60 Hz
SCCR	5 kA RMS SYM
TOTAL FLA	140.42 FLA
TYPE	4X

LARGEST MOTOR POWER REQUIREMENTS

HP	50 HP
FLA	65.0 FLA

PROJECT NUMBER
5009294A





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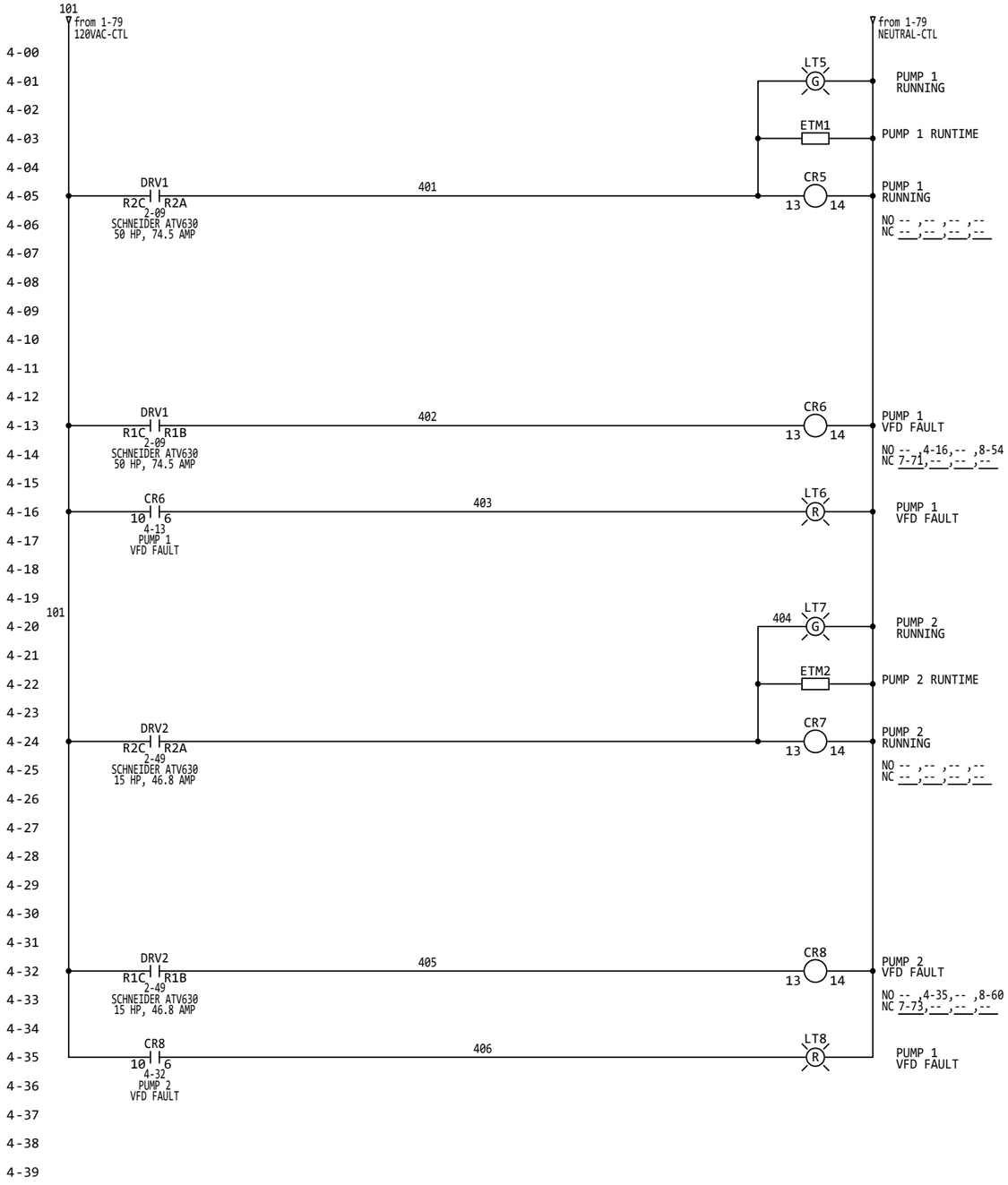

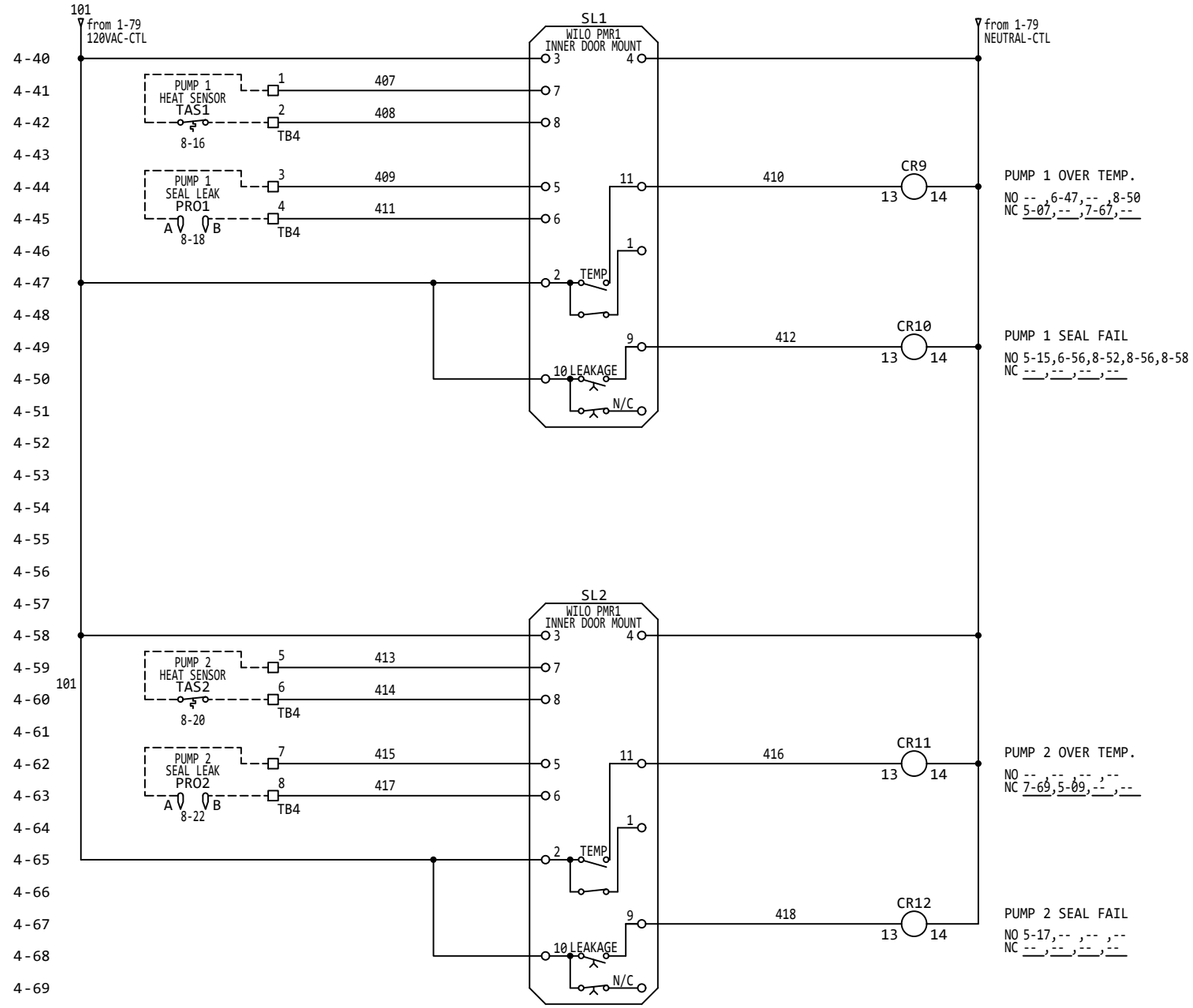

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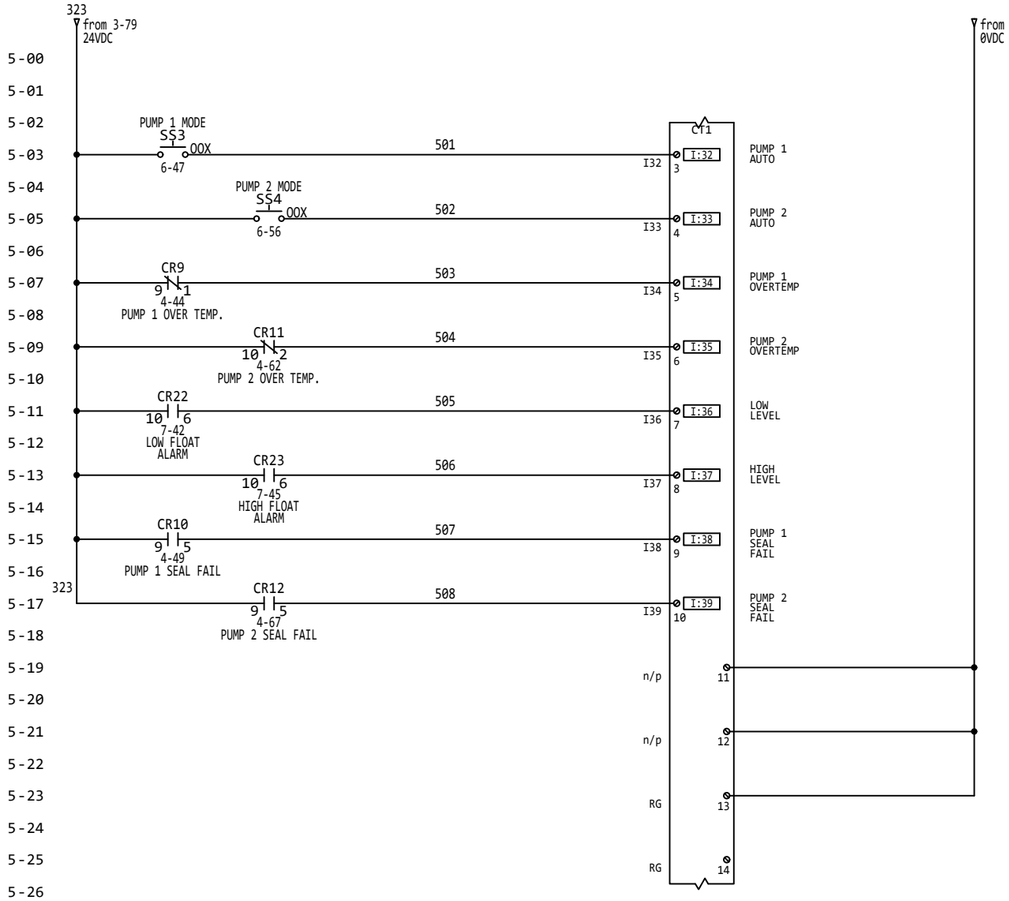

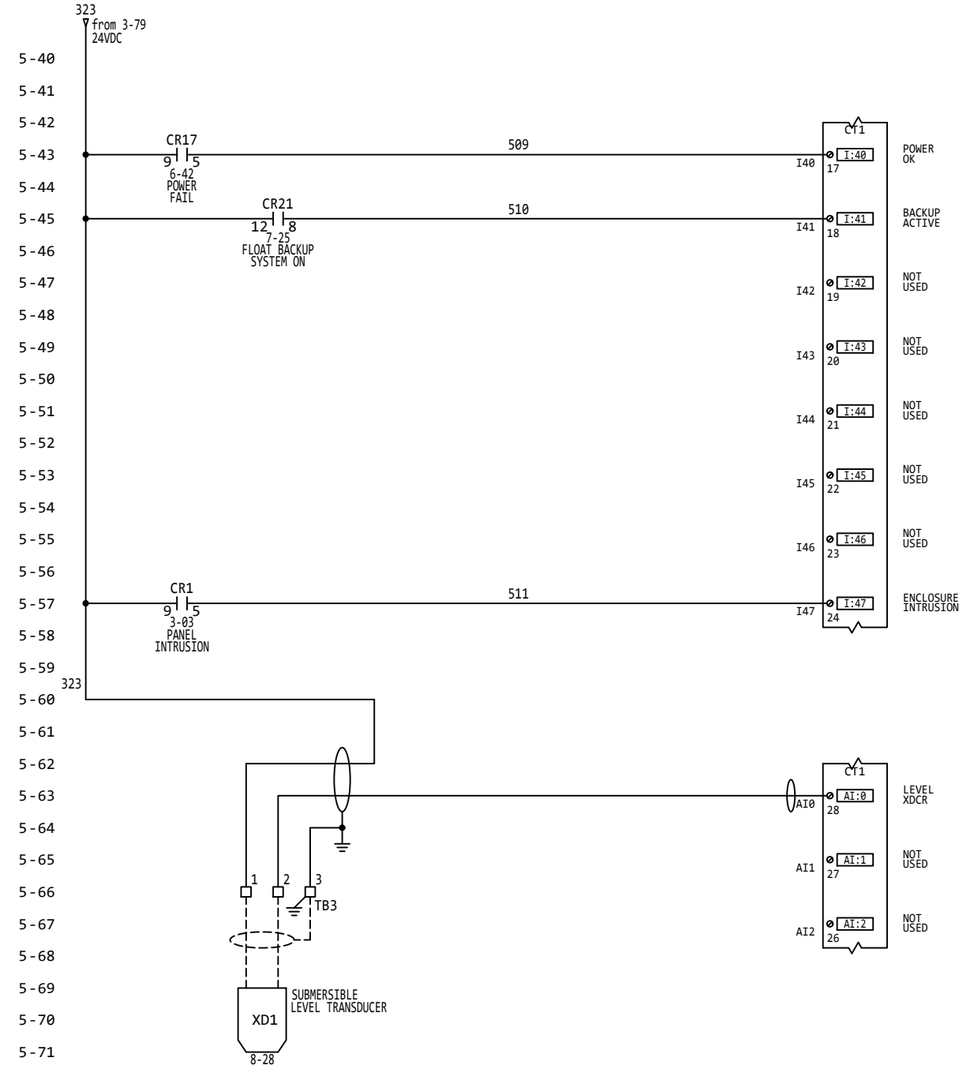

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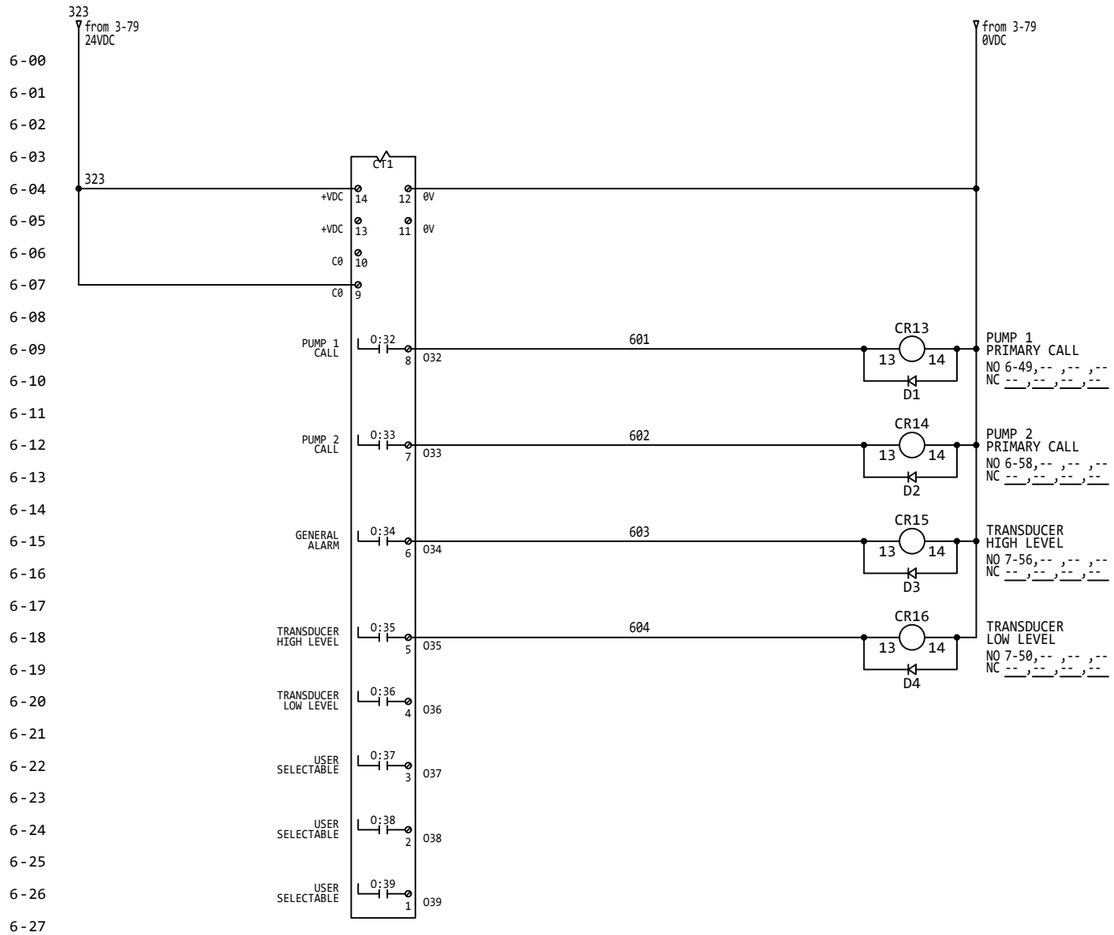
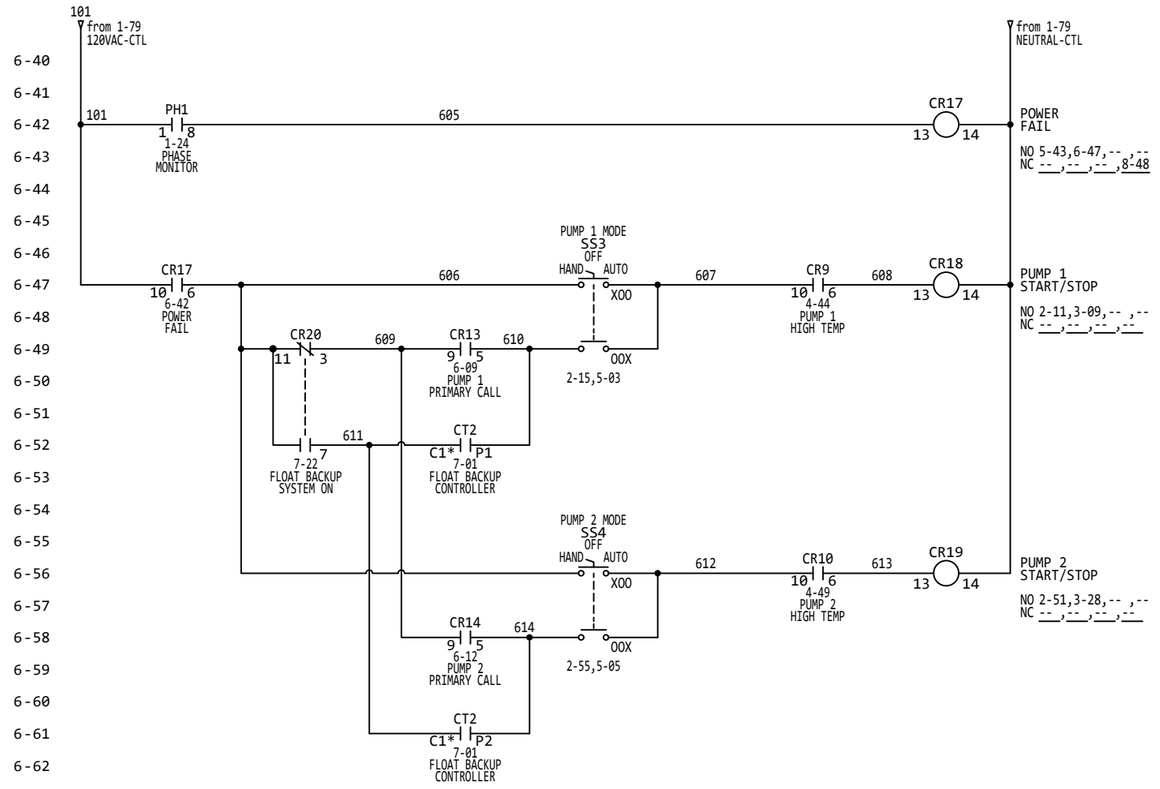




NO.	REVISION HISTORY	DATE	BY

PRIMEX
primexcontrols.com
10040 18th Street North Suite1, St. Peterburg, FL 33716
800-349-1905

FAIRHOPE, AL

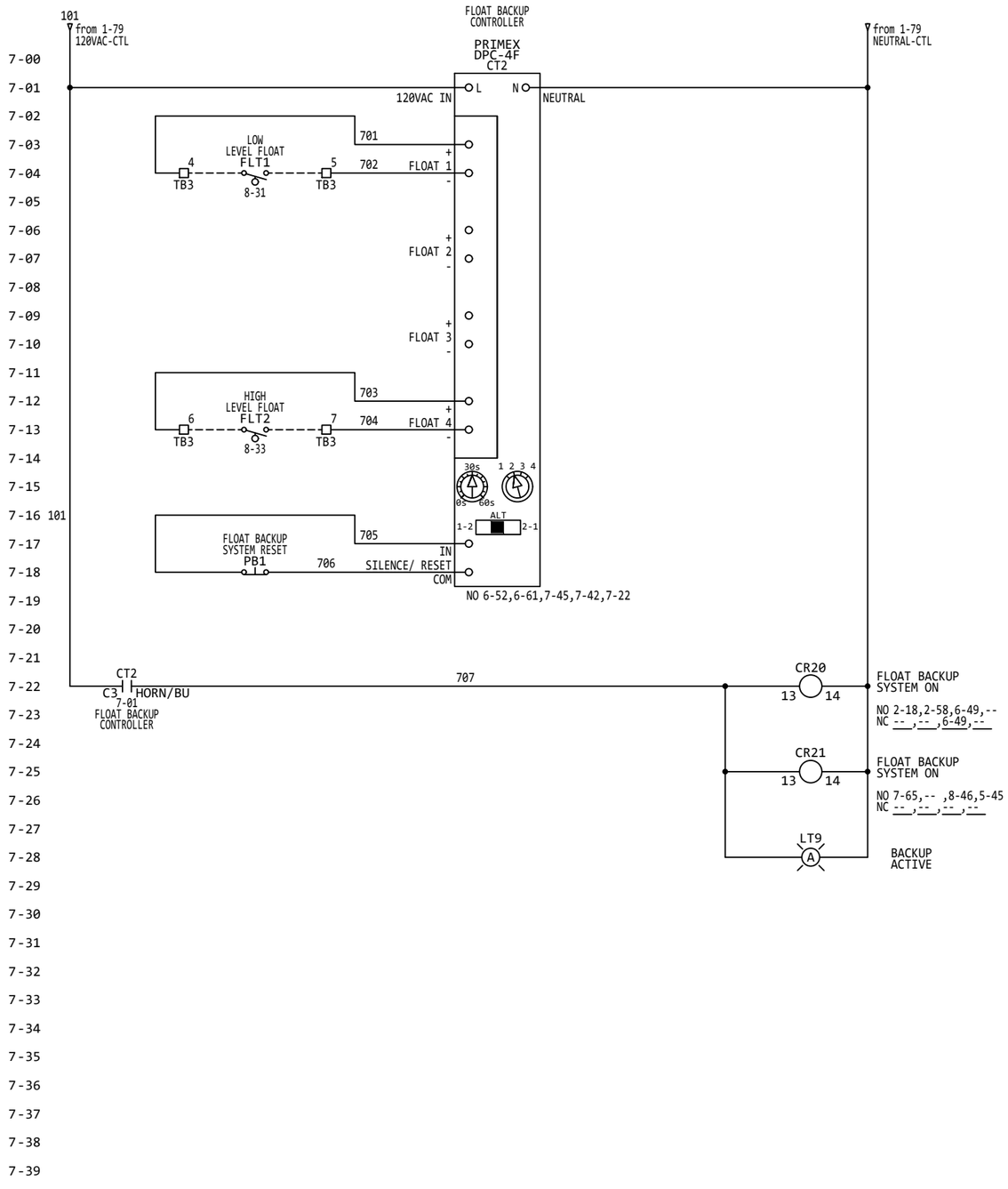
PUBLIX LS
DUPLEX CONTROL PANEL
JH WRIGHT

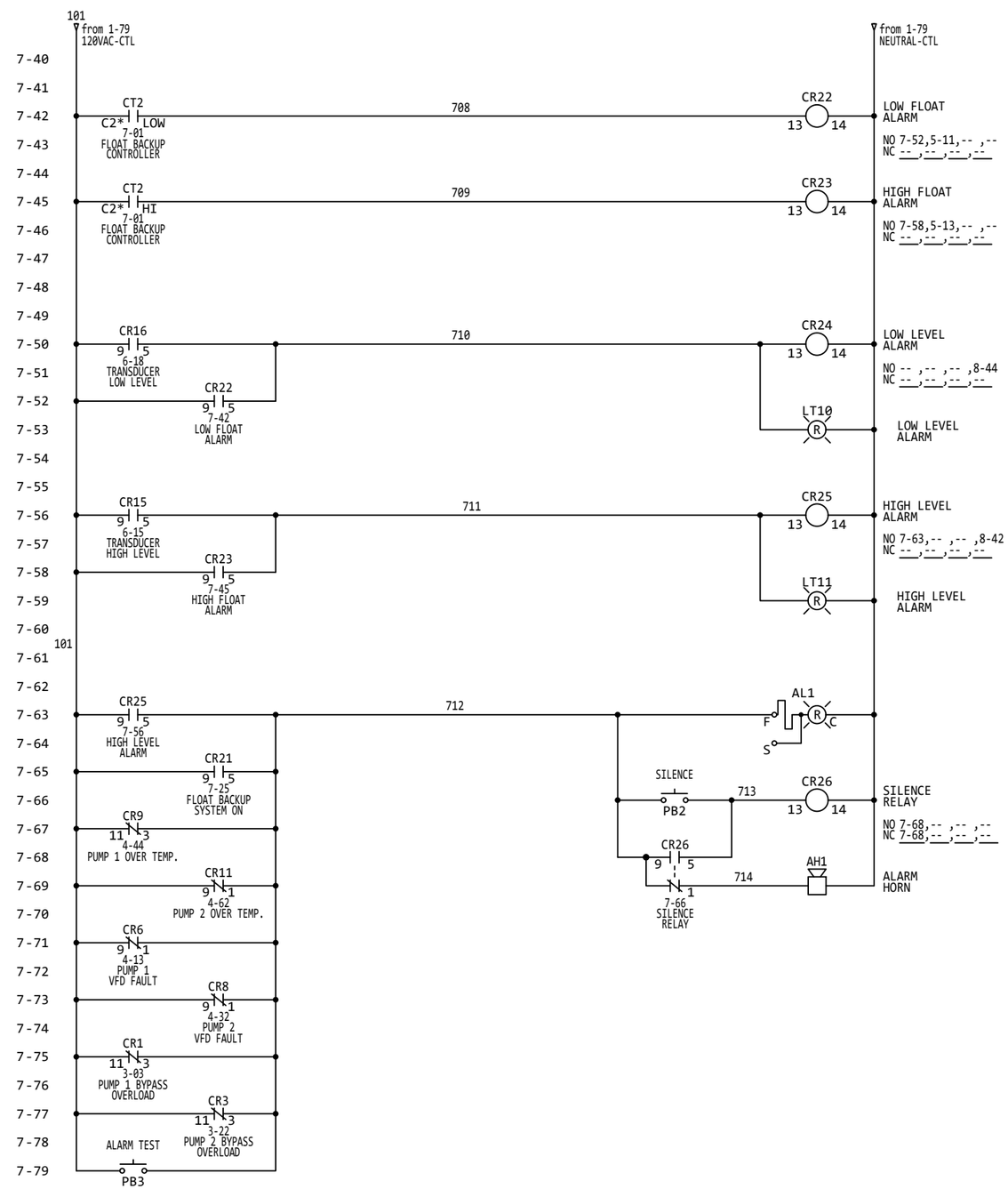
DRAWN BY WGR
DATE 3/15/23

PANEL REQUIREMENTS	
SYM.	
VOLTAGE	480 VAC
PHASE	3 PHASE 3 WIRE
FREQUENCY	60 Hz
SCCR	5 kA RMS SYM
TOTAL FLA	140.42 FLA
TYPE	4X

LARGEST MOTOR POWER REQUIREMENTS	
HP	50 HP
FLA	65.0 FLA

PROJECT NUMBER
5009294A





SHEET NUMBER
7 OF 9

NO.	REVISION HISTORY	DATE	BY

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10040 18th Street North Suite1, St. Peterburg, FL 33716
800-349-1905

FAIRHOPE, AL

PUBLIX LS
DUPLEX CONTROL PANEL
JH WRIGHT

DRAWN BY: WGR
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LARGEST MOTOR POWER REQUIREMENTS	
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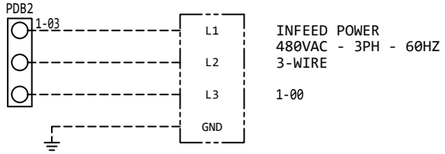
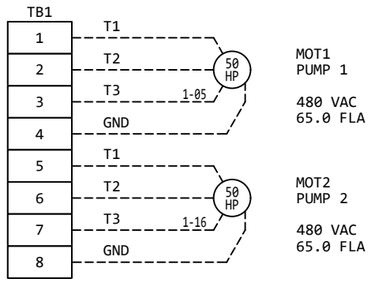
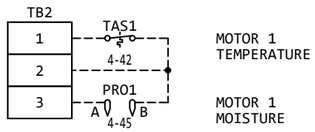
FLA	65.0 FLA

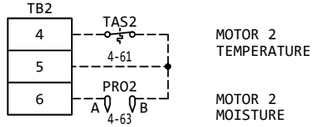
PROJECT NUMBER
5009294A

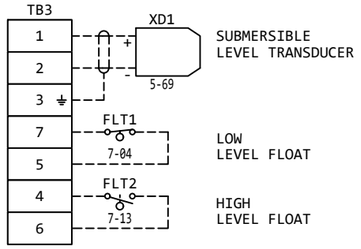
FIELD WIRING SECTION





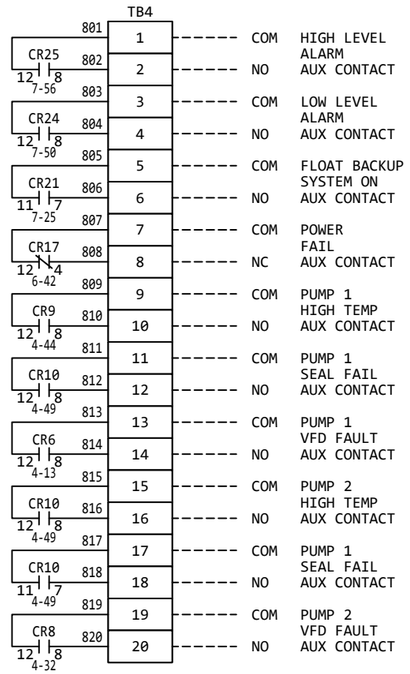






FIELD WIRING TORQUE SPECIFICATIONS		
TERMINATION	WIRE SIZE	TORQUE
INCOMING POWER (PDB1)	#6 - #2/0 AWG	120 LB-IN
INCOMING POWER (GND LUG)	#6 - #4 AWG	45 LB-IN
INCOMING POWER (GND LUG)	#8 AWG	40 LB-IN
PUMP POWER (TB1)	#16 - #4 AWG	22.2 - 26.5 LB-IN
CONTROL & SENSORS (TB2 - TB5)	#24 - #8 AWG	13.3 - 15.9 LB-IN

NOTES:
1. FIELD WIRING IS SHOWN ----------
2. TEMPERATURE RATING OF FIELD INSTALLED CONDUCTORS LESS THAN 100 AMPS MUST BE RATED 60DEG C OR ABOVE. FIELD INSTALLED CONDUCTORS GREATER THAN OR EQUAL TO 100 AMPS MUST BE RATED 75 DEG C OR ABOVE.
3. FIELD WIRING WILL ACCEPT COPPER CONDUCTORS ONLY.



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FAIRHOPE, AL
PUBLIX LS
DUPLEX CONTROL PANEL
JH WRIGHT

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FLA	65.0 FLA

PROJECT NUMBER
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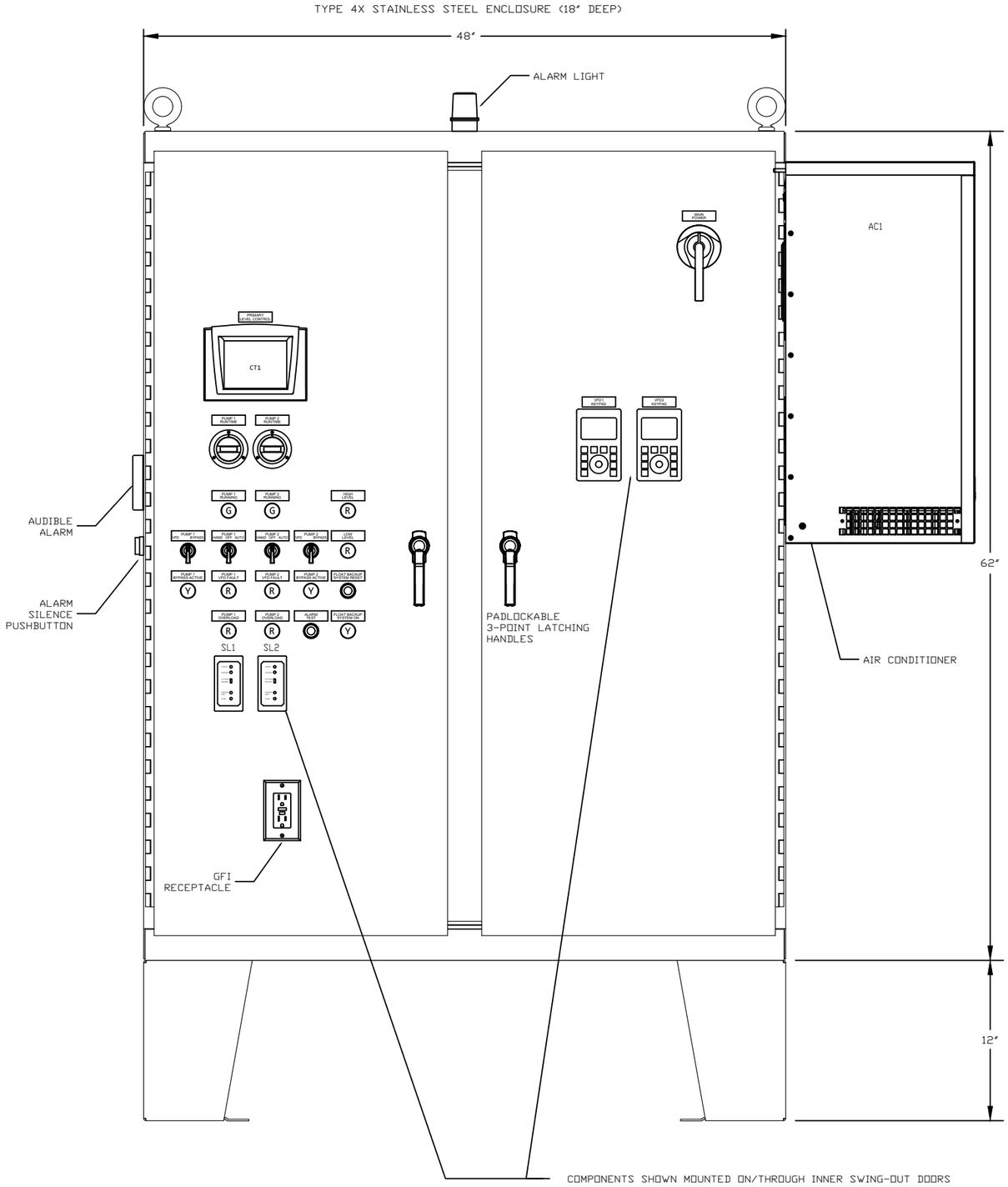

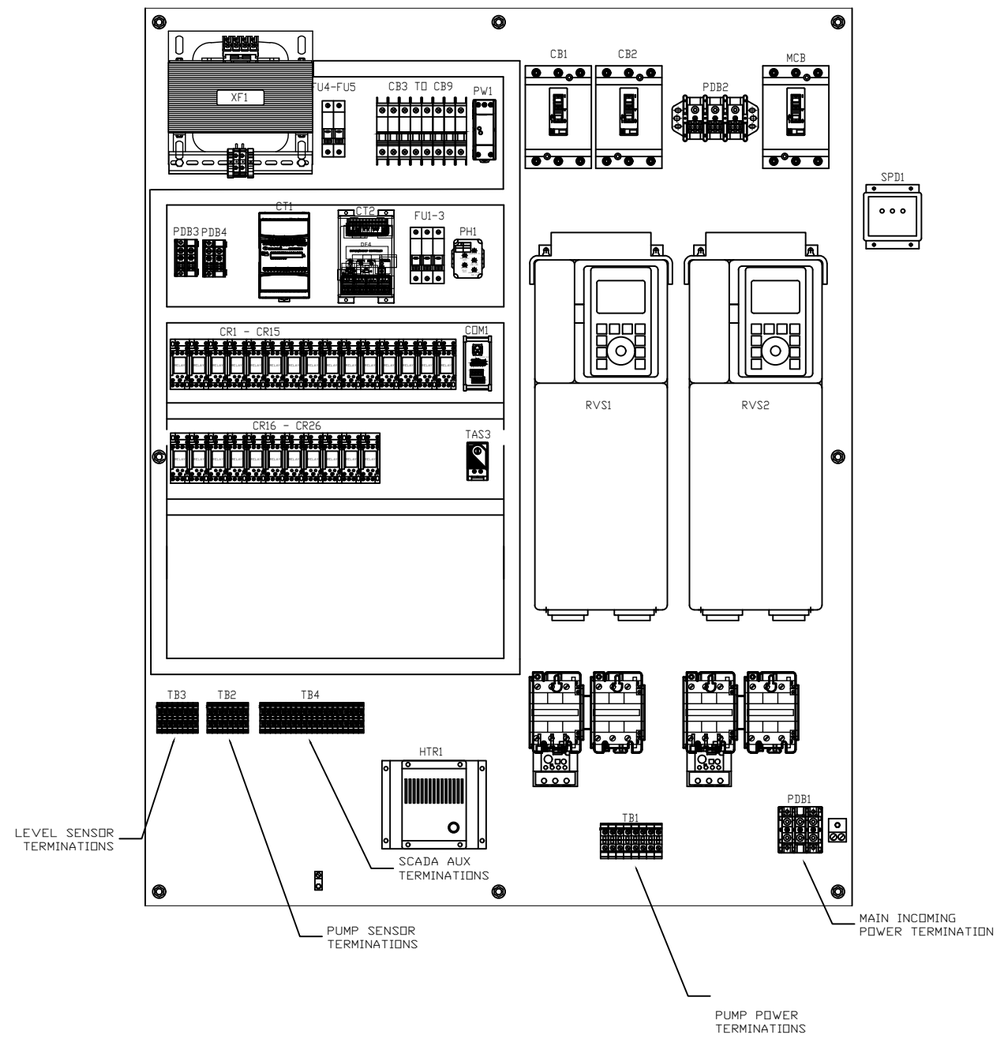

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LARGEST MOTOR POWER REQUIREMENTS	
HP	50 HP
FLA	65.0 FLA

PROJECT NUMBER
5009294A

TAGS	QTY	IFS	CATALOG	MANUFACTURER	DESCRIPTION	QUERY2	QUERY3
ENCLOSURE	1	1030290	A62H4818SSLP3PT	HOFFMAN	TWO-DOOR, STAINLESS STEEL TYPE 4X ENCLOSURE, 3 POINT LATCH, 62 x 48 x 18 IN	FREE STANDING ENCLOSURE	NEMA 3, 3R, 4, 4X, 12, 13
BACKPANEL	1	6000993	A60P48	HOFFMAN	PANEL, 56.00 x 44.00 IN, STEEL, WHITE	PANEL	WHITE
ENCLOSURE	1	1029584	SCE-DS48SS	SCE	DRIP SHIELD, 48", STAINLESS STEEL	DRIP SHIELD	NEMA 4X
ENCLOSURE	2	1040573	CPC-INDR-60X48AL	NSI	SWING OUT PANEL, W/HINGE FOR NEMA ENCLOSURES, 60.00 x 24.00 IN, ALUMINUM, PAIR OF	INNER DOOR	WHITE
DOOR STOP	2	1031477	SCE-DSTOPK	SCE	DOOR STOP KIT, NEMA 4, 12, STAINLESS, LARGE ENCLOSURE	DOOR STOP KIT	NEMA 4, 12
ENCLOSURE	4	1040596	HB52.50	ACTION FABRICATING INC	HINGE, BRACKET, 52.5IN FOR INNER DOORS 60-71IN	INNER DOOR HINGE	CONTINUOUS
ENCLOSURE	8	1030448	1000-U711	EMKA Inc	QUARTER TURN, LATCH, WING KNOB INSERT	LATCH	ASSEMBLY
ENCLOSURE	8	1030447	1000-991	EMKA Inc	QUARTER TURN, LATCH, CHARGE, ASSEMBLY	LATCH	ASSEMBLY
ENCLOSURE	8	1030446	1000-386-18	EMKA Inc	QUARTER TURN, LATCH, CAM, ASSEMBLY	LATCH	ASSEMBLY
ENCLOSURE	8	1030445	1000-U675	EMKA Inc	QUARTER TURN, LATCH, HOUSING, ASSEMBLY	LATCH	ASSEMBLY
DV1	1	1076193	IQ5000EV-480-304SS-CP3-N4X	ICE QUBE INC	ICE QUBE, 5000BTU VERTICAL EV, 480V, 304 STAINLESS STEEL, TYPE 4X, TOTAL CORROSIVE PACKAGE	5000BTU	SIDE MOUNT
HTR1	1	1004419	DAH1001A	HOFFMAN	HEATER, FORCED AIR, ADJUSTABLE THERMOSTAT, 100W, 115VAC	HEATER	115VAC, 100W
PDB3,PDB4	2	1047503	CC1412	MARATHON	Cover: 2-pole block 115 Amp 141 SERIES (PLASTIC)	COVER	2.40"x1.42"
PDB3,PDB4	2	6000531	1412400	MARATHON	POWER DISTRIBUTION BLOCK, 2-POLE	1x 14-2	4x 16-10
PDB2	1	1033814	CC1403	MARATHON	Cover: 3-pole bloc 310 Amp 140 SERIES	COVER	4" x 2.25"
PDB2	1	1034987	1403401	MARATHON	POWER DISTRIBUTION BLOCK, 3-POLE	1x 14-2/0	6x 14-4
PDB1	1	1036483	1433126	MARATHON	SPLICER BLOCK, 3-POLE	1x 6-350KCMIL	1x 6-350KCMIL
TB2,TB3,TB4	32	1038973	3044131	PHOENIX CONTACT	UNIVERSAL TERMINAL BLOCK - UT 6	FEED-THROUGH	57AMPS
TB3	1	1039246	3044157	PHOENIX CONTACT	UNIVERSAL GROUND TERMINAL BLOCK - UT 6-PE	FEED-THROUGH GROUND	57AMPS
TB1	8	1039828	3044199	PHOENIX CONTACT	UNIVERSAL TERMINAL BLOCK - UT 16	FEED-THROUGH	101AMPS
SPD1	1	1031734	QOSAMK	SQUARE D	BRACKET, MOUNTING, LIGHTNING AND SURGE SUPPRESSOR	BRACKET	N/A
SPD1	1	6000368	SDSA3650	SQUARE D	SURGE PROTECTIVE DEVICE, NEMA 4X, THREE PHASE, LIGHTNING AND SURGE SUPPRESSION	SURGE PROTECTIVE DEVICE	THREE PHASE

TAGS	QTY	IFS	CATALOG	MANUFACTURER	DESCRIPTION	QUERY2	QUERY3
GND2	1	1028348	TA-2	ILSCO	GROUND LUG, ALUMINIUM, LUG SIZE 1	GROUND LUG	1x 14-2
GND1	1	1030204	AU-2/0	ILSCO	GROUND LUG, ALUMINIUM, LUG SIZE 2	GROUND LUG	2x 14-2/0
PW1	1	1022853	PS5R-VD24	IDEC	UNIVERSAL 24VDC POWER SUPPLY, CLASS 1-DIV2 RATED, NEC CLASS2 UL508	24VDC/2.5A	SINGLE-PHASE
PH1	1	1034017	70169-D	MACROMATIC	SOCKET, PHASE MONITOR, 8-PIN MOUNITNG BASE, SURFACE OR DIN RAIL MOUNT	MOUNTING BASE	PHASE MONITOR
PH1	1	1030949	PMPU	MACROMATIC	PHASE MONITOR, 190-500V, 3P, FULL FEATURED	190-500V	3PHASE
MCB	1	1024677	JDL36200	SQUARE-D	CIRCUIT BREAKER - J FRAME, 200AMP	3-POLE CIRCUIT BREAKER	200AMP
MCB	1	1034597	9421LH46	TELEMECANIQUE	CIRCUIT BREAKER, PANEL MOUNT, ROTARY HANDLE, 6", PAINTED, NEMA 3R, DOOR INTERLOCK	3-POLE CIRCUIT BREAKER	H AND J FRAME
MCB	1	1027492	9421LS13	TELEMECANIQUE	CIRCUIT BREAKER, PANEL MOUNT, SHAFT, 5.5-21.375"	3-POLE CIRCUIT BREAKER	H AND J FRAME
MCB	1	1027486	9421LJ7	TELEMECANIQUE	CIRCUIT BREAKER, PANEL MOUNT, OPERATING MECHANISM	3-POLE CIRCUIT BREAKER	H AND J FRAME
CB1,CB2	2	1024471	HDL36125	SQUARE-D	CIRCUIT BREAKER - H FRAME, 125AMP	3-POLE CIRCUIT BREAKER	125AMP
CB4	1	1030218	M9F42120	SQD	MINIATURE CIRCUIT BREAKER MULTI 9 - C60N - 1 POLE - 20AMP - C CURVE	1-POLE MINIATURE CIRCUIT BREAKER	20AMP
CB7	1	1032140	M9F42105	SQD	MINIATURE CIRCUIT BREAKER MULTI 9 - C60N - 1 POLE - 5AMP - C CURVE	1-POLE MINIATURE CIRCUIT BREAKER	5AMP
CB9	1	1003024	QOU110	SCHNEIDER ELECTRIC	MINIATURE CIRCUIT BREAKER QOU - 1 POLE - 10A	1-POLE MINIATURE CIRCUIT BREAKER	10AMP
CB5,CB6,CB8	3	1030942	M9F42115	SCHNEIDER ELECTRIC	MINIATURE CIRCUIT BREAKER, 1-POLE, C CHARACTERISTIC, DIN RAIL MOUNTING	1-POLE CIRCUIT BREAKER	15AMP
CB3	1	1074697	M9F42210	SCHNEIDER ELECTRIC	MINIATURE CIRCUIT BREAKER, 2-POLE, C CHARACTERISTIC, DIN RAIL MOUNTING	2-POLE CIRCUIT BREAKER	10AMP
COM1	1	1044301	ZL-RTB-RJ12	ZIP LINK	INTERFACE, RJ12 TO 8-PIN TERM	CONNECTOR	CONNECTOR
M1,M2,M3,M4	4	1012388	LC1D80G7	TELEMECANIQUE	CONTACTOR TESYS LC1-D - 3P - AC-3 80A - COIL 120VAC	CONTACTOR	80AMPS, 120VAC
M1,M2,M3,M4	4	1028049	LADN22	TELEMECANIQUE	MOTOR STARTER IEC, EXTERNAL AUXILLARY CONTACT, 2 NO, 2 NC	AUX CONTACT	2 NO, 2 NC
M1,M3,M4	3	1064536	LAD4CM	TELEMECANIQUE	MECHANICAL INTERLOCK, IEC CONTACTOR LC1D40A - LC1D65A	CONTACTOR	INTERLOCK
CON1,CON2	2	1032357	VW3A8306TF10	SCHNEIDER ELECTRIC	CABLE,RJ-45 SPLITTER, 1 METER SQD	ALTIVAR 630	ACCESSORY
DRV1,DRV2	2	1051240	ATV630D37N4	SCHNEIDER	ALTIVAR 630 VARIABLE SPEED DRIVE, 380-480VAC 50/60Hz	ALTIVAR 630	50HP
R1	1	1032397	VW3A8306R	SCHNEIDER ELECTRIC	TERMINATION,RJ45,MODBUS RC	ALTIVAR 630	ACCESSORY

TAGS	QTY	IFS	CATALOG	MANUFACTURER	DESCRIPTION	QUERY2	QUERY3
HMI1,HMI2	2	1044863	VW3A1112	SCHNEIDER ELECTRIC	VFD, REMOTE KEYPAD MOUNT	ALTIVAR 630	ACCESSORY
FU1,FU2,FU3	3	1040019	KTK-R-1	BUSSMANN	FUSE - CLASS CC, 1AMP, 600VAC	FAST ACTING	600VAC
FU1	1	1031449	DFCC3	SCHNEIDER ELECTRIC	3 POLE FUSE BLOCK - CLASS CC, 1/10-30AMPS, 600VAC	FUSE HOLDER	600VAC
FU4,FU5	2	1044379	FNQ-R-25	BUSSMANN	FUSE - CLASS CC	TIME DELAY	600VAC
FU4	1	1031448	DFCC2	SCHNEIDER ELECTRIC	2 POLE FUSE BLOCK - CLASS CC, 1/10-30AMPS, 600VAC	FUSE HOLDER	600VAC
XF1	1	1019766	9070T5000D1	SQD	INDUSTRIAL CONTROL TRANSFORMER, CLASS 9070, 5KVA, 240X480V-120V, 230X460V-115V, 220X440V-	CONTROL TRANSFORMER	5KVA
CBL1,CBL2,CBL4	3	1040548	C5E-07STP	CAT5CABLE	CABLE, CAT 5E, SHEILDED, 7FT, GREY	SHIELDED COMMUNICATION	24AWG
CBL3	1	1032987	C5E-03STP	CAT5CABLE	CABLE, CAT 5E, SHEILDED, 3FT, GREY	SHIELDED COMMUNICATION	24AWG
CBL5	1	1045322	A26637-07-ND	ASSMANN ELECTRONICS	CABLE, RU12 6P6C, 7FT, GREY	COMMUNICATION CABLE	24AWG
CT1	1	1044000	ENERGY VIEW	PRIMEX	CONTROLLER, LIFT STATION, ENERGY VIEW	ENERGY VIEW	XDCR, VFD, RELAY
CT2	1	1052204	DPC-4F	PRIMEX	CONTROLLER, LIFT STATION, DPC-4F(PC-240)	RELAY	LIFT STATION CONTROLLER
OL1,OL2	2	1028085	LRD3361	TELEMECANIQUE	THERMAL OVERLOAD RELAY FOR MOTOR TESYS - 55-70 A - CLASS 10A	AUTO/MANUAL RESET	55-70AMPS
ETM1,ETM2	2	1033953	T50B2	ENM COMPANY	ELAPSED TIME METER, QUARTZ AC HOUR METER II, 5 DIGIT HOURS, 1 DIGIT TENTHS	T50	120VAC
CR1,CR10,CR11,CR12,CR13,CR14,CR15,CR16,C	26	1028815	RXZE2M114M	SCHNEIDER ELECTRIC	SOCKET FOR RELAYS TYPE RXM	TYPE RXM	SOCKET
CR1,CR10,CR11,CR12,CR17,CR18,CR19,CR2,CR	22	1030214	RXM4AB2F7	SCHNEIDER ELECTRIC	PLUG-IN MINIATURE RELAY, TYPE RXM, SOCKET RXZE2M114M, WITH LED	TYPE RXM	120VAC
CR13,CR14,CR15,CR16	4	1030213	RXM4AB2BD	SCHNEIDER ELECTRIC	PLUG-IN MINIATURE RELAY, TYPE RXM, SOCKET RXZE2M114M, WITH LED	TYPE RXM	24VDC
D1,D2,D3,D4	4	1024314	RXM040W	SCHNEIDER ELECTRIC	DIODE PROTECTION MODULE	TYPE RXM	ADD ON
SS1,SS2	2	1024712	XB4BJ21	TELEMECANIQUE	XB4 BLACK SELECTOR SWITCH Ã˜22 LONG HANDLE 2 POSITIONS - 1NO	22mm	BLACK
SS3,SS4	2	1017226	XB4BJ33	TELEMECANIQUE	XB4 BLACK SELECTOR SWITCH Ã˜22 LONG HANDLE 3 POSITIONS - 2NO	22mm	BLACK
SS3,SS4	4	1022054	ZBE101	TELEMECANIQUE	CONTROL BUTTON CONTACT BLOCK - ZBE Ã˜22 - 1NO	22mm	SCREW-CLAMPS TERMINALS
LT1,LT10,LT11,LT3,LT6,LT8	6	1024711	XB4BVG4	TELEMECANIQUE	ROUND PILOT LIGHT Ã˜22 - IP 65 - RED - INTEGRAL LED - 120V - LUGS	22mm	120V
LT2,LT4,LT9	3	6001985	XB4BVG5	TELEMECANIQUE	ROUND PILOT LIGHT Ã˜22 - IP 65 - YELLOW - INTEGRAL LED - 120V - LUGS	22mm	120V

TAGS	QTY	IFS	CATALOG	MANUFACTURER	DESCRIPTION	QUERY2	QUERY3
LT5,LT7	2	1017411	XB4BVG3	TELEMECANIQUE	ROUND PILOT LIGHT Ã˜22 - IP 65 - GREEN - INTEGRAL LED - 120V - LUGS	22mm	120V
PB2,PB3	2	1027100	XB4BA21	TELEMECANIQUE	PUSH BUTTON ASSEMBLY, Ã˜22mm - IP 65 - BLACK	22mm	BLACK
PB2,PB3	2	1028513	ZBA147	TELEMECANIQUE	PUSH BUTTON CAP, 22MM, SILENCE INSERT	22mm	SILENCE
PB1	1	1028462	XB4BA42	TELEMECANIQUE	PUSHBUTTON ASSEMBLY, 22MM 1NC RED	22mm	RED
AL1	1	1032874	SBN120AC-R	INGRAM	BEACON, SBN LED, RED, TYPE 4X, 120VAC	LED	120VAC
AH1	1	1037675	AH115A8R-RED	INGRAM	SOUND UNIT WITH GASKET, PIEZO, 115 VAC, 50.0 mA, 110+dB, UL 3, 3R, 4, 4X, 12, 13	115 VAC	SOUND UNIT
RECPT1	1	1040368	GF15WLA	HUBBELL	DUPLEX RECEPTACLE, GFCI, WHITE, 2 POLE, 3-WIRE	15 AMP	125 VOLT
RECPT1	1	1004438	SS26	PASS AND SEYMOUR	STAINLESS STEEL HORIZONTAL GFI COVER	NA	NA
SL1,SL2	2	1069177	14347-2763882	JH WRIGHT	CSP-WILO PMR1	RELAY	MOISTURE
WARNING LABEL	1	1005699	1005699	PRIMEX	LABEL, WARNING, DISCONNECT POWER, ENGLISH / FRENCH, LARGE	LABEL	DISCONNECT POWER
UL STICKER	1	1003055	1003055	UL	LABEL, UL/cUL, 508A	LABEL	UL/cUL 508A
UL STICKER	1	1051682	1051682	SJE-RHOMBUS	LABEL, UL, 508A	UL	ASSEMBLY
SAME SCHEMATIC CHECK	1	1028516	PRODUCT SCHEMATIC	SJE-RHOMBUS	LABEL, SCHEMATIC, MATCHES PANEL NUMBER	LABEL	SCHEMATIC
PRIMEX LBL	1	1041279	1041279	PRIMEX	LABEL, PRIMEX BUILT WITH PRIDE	LABEL	ASSEMBLY
PRIMEX LBL	1	1039124	1039124	PRIMEX	NAME PLATE, PRIMEX, PANEL OVER 30", STICKER	LABEL	ASSEMBLY

PRIMEX
MUNICIPAL AND INDUSTRIAL WATER CONTROL SOLUTIONS
844-4PRIMEX (477-4639)
WWW.PRIMEXCONTROLS.COM

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Clearwater, FL 800-349-1905
Detroit Lakes, MN 888-342-5753
Milford, OH 513-831-9959

TWO-DOOR WITH 3-POINT LATCHES, TYPE 4X

SPECIFICATIONS

- Manufactured from 12 gauge Type 304 or 316L stainless steel
- Backs are 10 or 12 gauge stainless steel with x-form stiffeners
- Seams continuously welded and ground smooth; no holes or knockouts
- Removable centerpost for easy panel installation
- Collar studs provided for mounting optional panels
- Panel supports included
- Heavy-duty lifting eyes are Type 316L stainless steel
- Heavy-duty 3-point latching mechanism operated by Type 316L stainless steel POWERGLIDE padlocking handles
- Body flange trough collar excludes liquids and contaminants
- Heavy-duty stainless steel continuous hinges support each door
- Bonding provision on doors; grounding studs on body
- Accessory mounting channel provided in enclosure top
- Data pocket is high-impact thermoplastic
- 12-in. (305-mm) removable floor stands are bolted to enclosure
- Seamless foam-in-place one-piece gasket provides oil-tight and dust-tight seal against contaminants
- External hardware manufactured of Type 316 stainless steel

INDUSTRY STANDARDS

UL 508A Listed; Type 3R, 4, 4X, 12; File No. E61997
cUL Listed per CSA C22.2 No 94; Type 3R, 4, 4X, 12; File No. E61997

NEMA Type 3, 3R, 4, 4X, 12, 13
IEC 60529, IP66
Meets NEMA Type 3RX requirements

APPLICATION

These two-door enclosures provide industry-leading protection for large components or complex mounting configurations in highly-corrosive environments. Three-point latching with the Hoffman POWERGLIDE padlocking handles and a foam-in-place gasket combine convenience with security. They are well-suited for use in petrochemical plants; pulp and paper processing; water treatment facilities; and food, pharmaceutical and packaging applications.

FINISH

Enclosures are unpainted. Front, sides, top and back have smooth #4 brushed finish. Optional mild steel panels are painted white. Optional conductive panels are available.

ACCESSORIES

Industrial Corrosion Inhibitors
Electric Heater
Electrical Interlocks
PANELITE Enclosure Lights Overview
Panel Support Kit

MODIFICATION AND CUSTOMIZATION

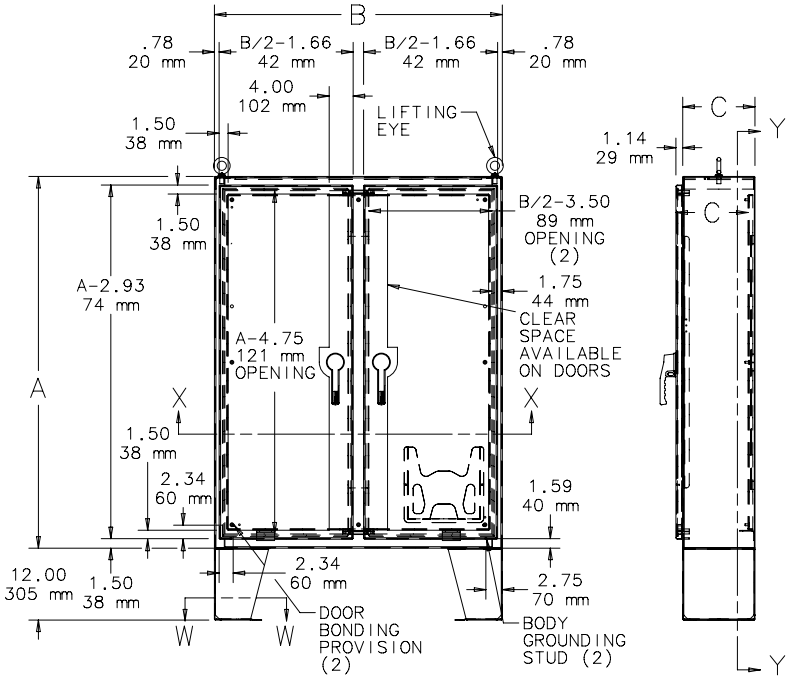
Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

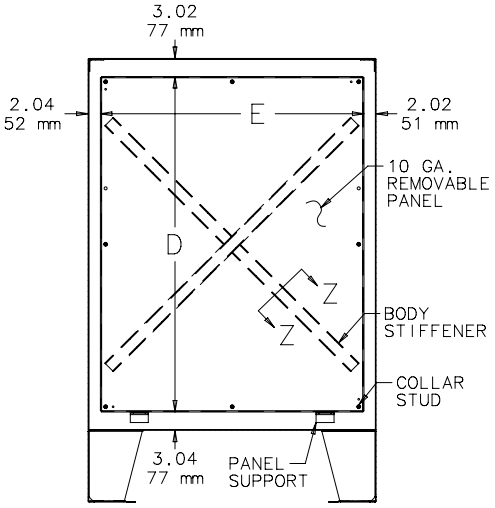
BULLETIN: A4S3

Standard Product

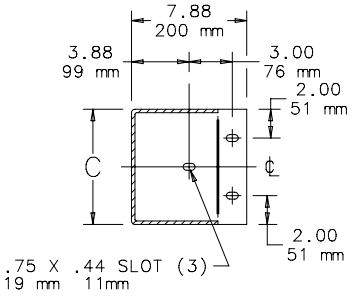
Catalog Number	AxBxC in.	AxBxC mm	Stainless Steel Type	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)
A62H4812SSLP3PT	62.06 x 48.06 x 12.06	1576 x 1221 x 306	304	A60P48	A60P48G	56.00 x 44.00	1422 x 1118
A62H4812SS6LP3PT	62.06 x 48.06 x 12.06	1576 x 1221 x 306	316L	A60P48	A60P48G	56.00 x 44.00	1422 x 1118
A62H6012SSLP3PT	62.06 x 60.06 x 12.06	1576 x 1526 x 306	304	A60P60	A60P60G	56.00 x 56.00	1422 x 1422
A62H6012SS6LP3PT	62.06 x 60.06 x 12.06	1576 x 1526 x 306	316L	A60P60	A60P60G	56.00 x 56.00	1422 x 1422
A74H6012SSLP3PT	74.06 x 60.06 x 12.06	1881 x 1526 x 306	304	A72P60	A72P60G	68.00 x 56.00	1727 x 1422
A74H6012SS6LP3PT	74.06 x 60.06 x 12.06	1881 x 1526 x 306	316L	A72P60	A72P60G	68.00 x 56.00	1727 x 1422
A74H7212SSLP3PT	74.06 x 72.06 x 12.06	1881 x 1830 x 306	304	A72P72	A72P72G	68.00 x 68.00	1727 x 1727
A74H7212SS6LP3PT	74.06 x 72.06 x 12.06	1881 x 1830 x 306	316L	A72P72	A72P72G	68.00 x 68.00	1727 x 1727
A62H4818SSLP3PT	62.06 x 48.06 x 18.06	1576 x 1221 x 459	304	A60P48	A60P48G	56.00 x 44.00	1422 x 1118
A62H4818SS6LP3PT	62.06 x 48.06 x 18.06	1576 x 1221 x 459	316L	A60P48	A60P48G	56.00 x 44.00	1422 x 1118
A62H6018SSLP3PT	62.06 x 60.06 x 18.06	1576 x 1526 x 459	304	A60P60	A60P60G	56.00 x 56.00	1422 x 1422
A62H6018SS6LP3PT	62.06 x 60.06 x 18.06	1576 x 1526 x 459	316L	A60P60	A60P60G	56.00 x 56.00	1422 x 1422
A74H6018SSLP3PT	74.06 x 60.06 x 18.06	1881 x 1526 x 459	304	A72P60	A72P60G	68.00 x 56.00	1727 x 1422
A74H6018SS6LP3PT	74.06 x 60.06 x 18.06	1881 x 1526 x 459	316L	A72P60	A72P60G	68.00 x 56.00	1727 x 1422
A74H7218SSLP3PT	74.06 x 72.06 x 18.06	1881 x 1830 x 459	304	A72P72	A72P72G	68.00 x 68.00	1727 x 1727
A74H7218SS6LP3PT	74.06 x 72.06 x 18.06	1881 x 1830 x 459	316L	A72P72	A72P72G	68.00 x 68.00	1727 x 1727
A74H7224SSLP3PT	74.06 x 72.06 x 24.06	1881 x 1830 x 611	304	A72P72	A72P72G	68.00 x 68.00	1727 x 1727
A74H7224SS6LP3PT	74.06 x 72.06 x 24.06	1881 x 1830 x 611	316L	A72P72	A72P72G	68.00 x 68.00	1727 x 1727

Purchase panels separately.

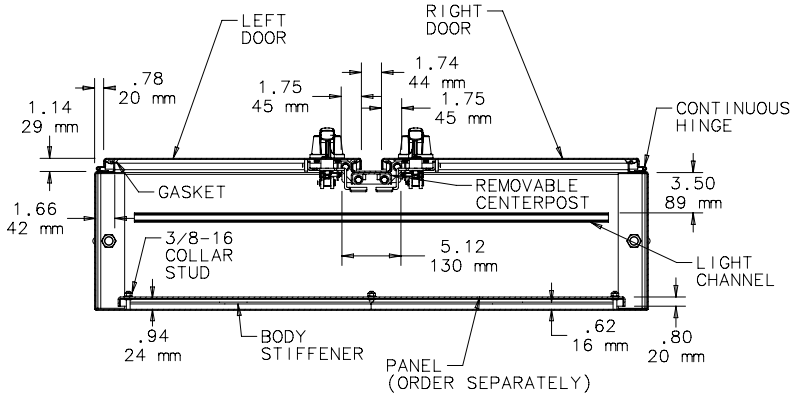




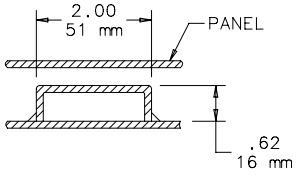
SECTION Y-Y



SECTION W-W



SECTION X-X



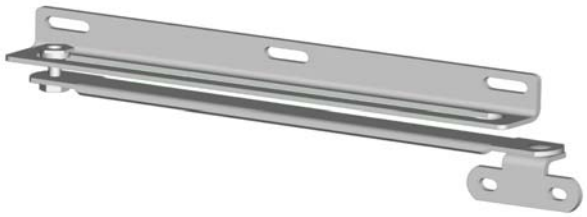
SECTION Z-Z

87784698

Saginaw Control and Engineering
95 Midland Road Saginaw, MI 48638-5770
(800) 234-6871 - Fax: (989) 799-4524
SCE@SaginawControl.com

SCE-DSTOPK

Product Specifications:



Part Number: SCE-DSTOPK
Description: Kit, Door Stop
Height: 9.00"
Width: 1.75"
Depth: 1.25"
Price Code: P2

Catalog Page: 358
Est. Ship Weight: 2.00 lbs
Finish: Zinc Plated

Application
For use on most SCE Type 4, 4x and 12 enclosures to lock door in the open position. Door opening must be at least 12 inches and must open horizontally. Designed to be installed at the bottom of the door opening.

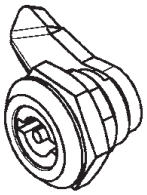
Industry Standards - (IS17)
- NEMA Not Applicable
- UL Not Applicable
- CSA N/A

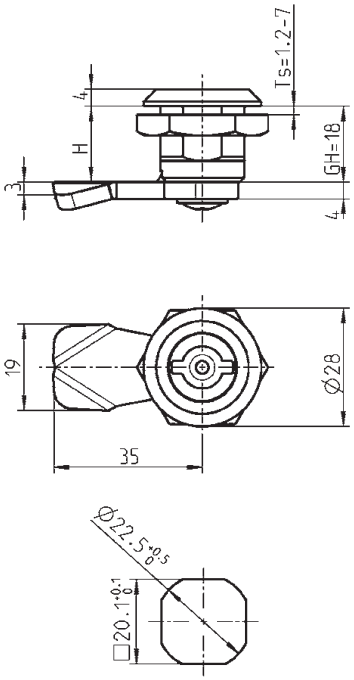
Installation Information
- Door Stop Hole Pattern & Assembly

Plastic quarter turn

PROGRAM 1000

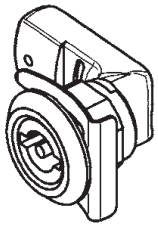
Nut fixing

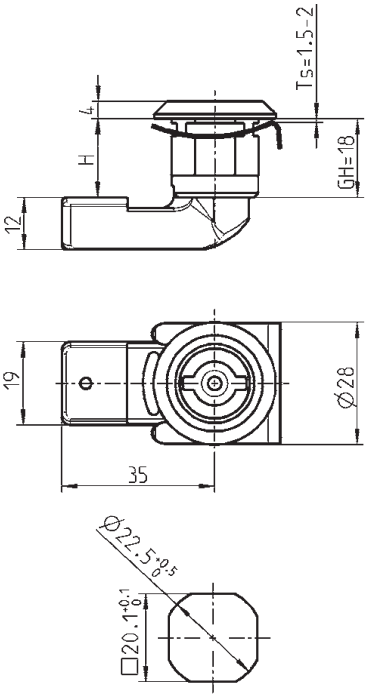




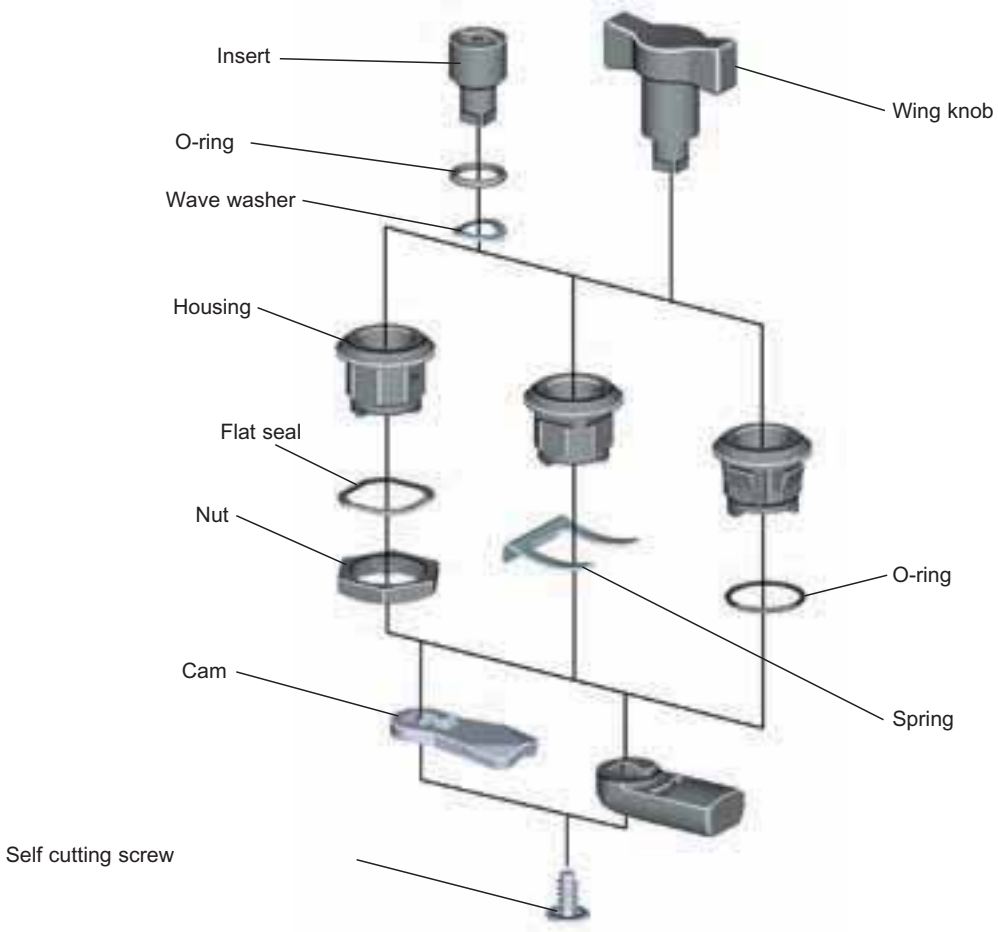
Cut out

spring fixing

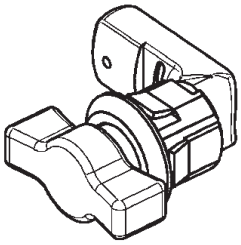


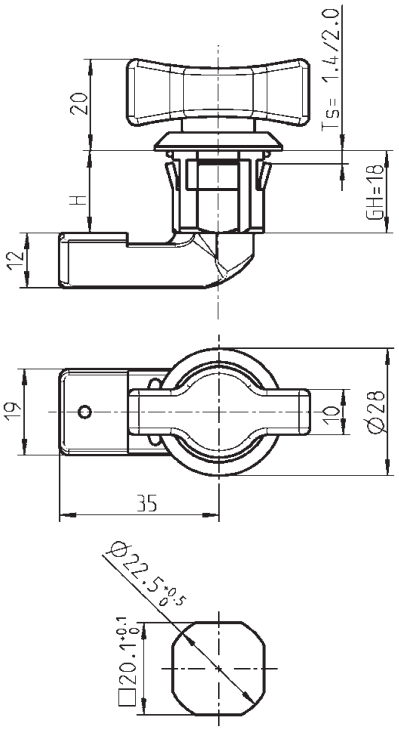


Cut out



Clip-in fixing



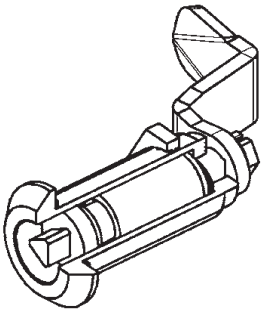


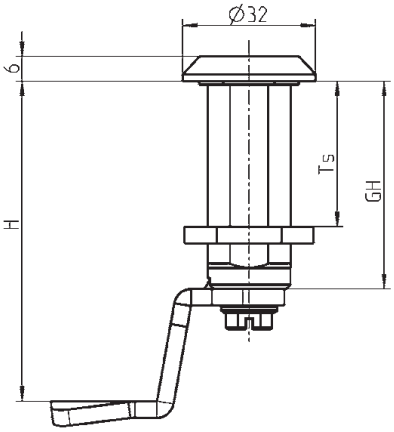
Cut out

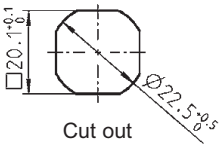
Housing polyamide GF black with nut or spring fixing AISI 301		Housing polyamide black with O-ring	
*nut fixing	Spring fixing	Ts	clip-in
1000-U675	1000-U709	1,4**	1000-U695
		2,0	1000-U696
Insert polyamide black, wave washer and self cutting screw m.s. zinc plated			
Square 7		1000-U666	
Square 8		1000-U676	
Triangular 8		1000-U667	
Double bit 3		1000-U677	
Double bit 5		1000-U678	
Slot 2 x 4		1000-U679	
Eastern Europe Ø 13		1000-U680	
Wing knob (IP 50), IP 65 upon request		1000-U711	
Cam on choice			
H		**m.s. zinc plate, t=4**	**polyamide black**
18		1000-5046	1000-386-18
20		1000-5161	1000-386-20
22		1000-5119	1000-386-22
24		-	1000-386-24
28		1000-5164	1000-386-28
30		-	1000-386-30
IP 65 (see housing) with:			
Flat seal (nut fixing only)		1000-23	
O-ring		1000-24	

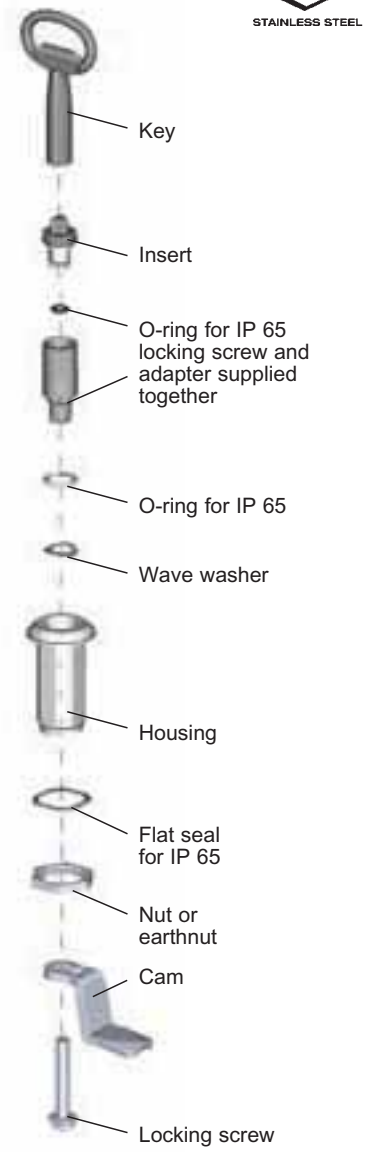
Note:
Quarter turn assembling 1B-105

Further parts see page
– Insert with wing knob 1B-720
– Handle (only nut fixing) 1C-320
– Dust cap (only nut fixing) 1C-320
– Key 12B-120







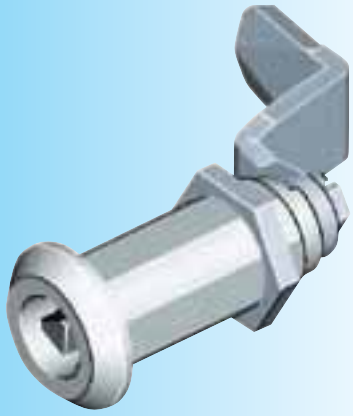


Assembling instruction

IP 65 with:	
Flat seal	1000-23
O-ring	1000-24
IP 66 with:	
Seal-set	1000-U769
Assembly on request:	
without O-ring	1000-990
with O-ring	1000-991

Housing with nut or earthnut m.s. zinc plated

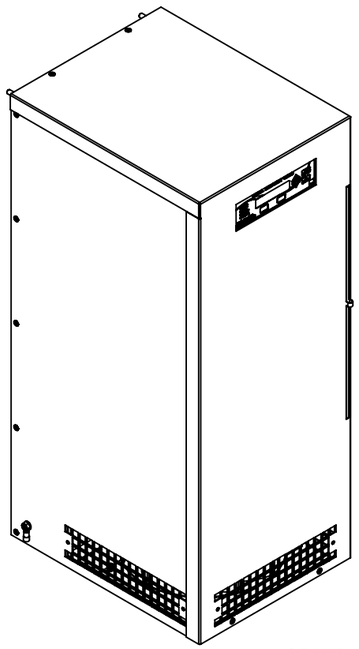
GH	Ts	Zinc die chrome plated		Zinc die black powder coated		PA black
	1,5 –	Nut	Earthnut	Nut	Earthnut	Nut
30 mm	**20 mm**	1000-U51	1000-U65	1000-U225	1000-U226	–
– adapter				1000-U164		
36 mm	**26 mm**	1000-U246	1000-U248	1000-U317	1000-U318	–
– adapter				1000-U198		
40 mm	**30 mm**	1000-U66	1000-U67	1000-U227	1000-U228	1000-U737
– adapter				1000-U165		
50 mm	**40 mm**	1000-U68	1000-U69	1000-U229	1000-U230	1000-U736
– adapter				1000-U166		
60 mm	**50 mm**	1000-U504	1000-U505	1000-U506	1000-U507	–
– adapter				1000-U535		

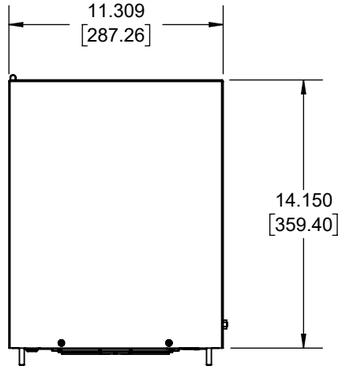


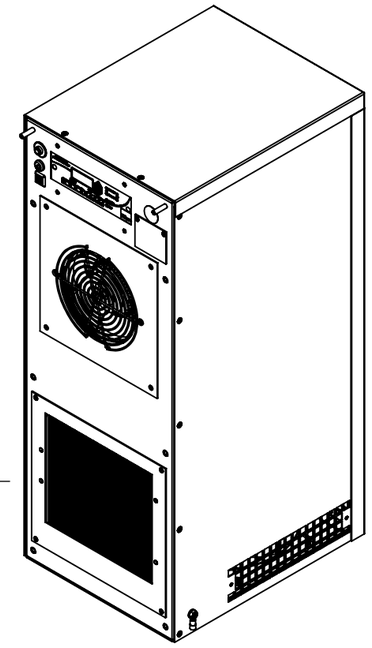
Note:
Quarter turn assembling 1B-105

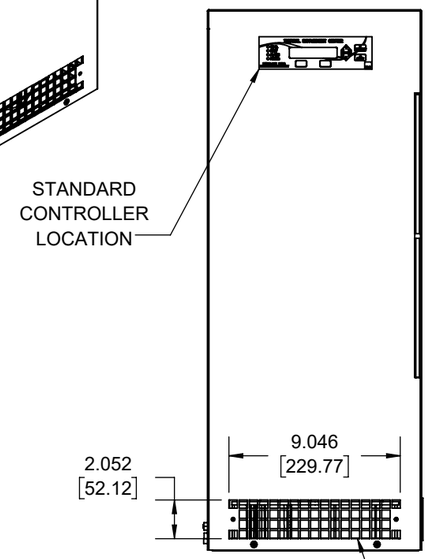
Further parts see page
– Housing 1B-760, 1B-680, 1B-820
– Quarter turn with stepped cam 1B-240
– Cam 1C-120
– Accessories up to 1C-220, from 1C-220
– Insert with wing knob 1B-720
– Escutcheon 3B-140
– Door lock prominent 12A-220
– Key 12B-120

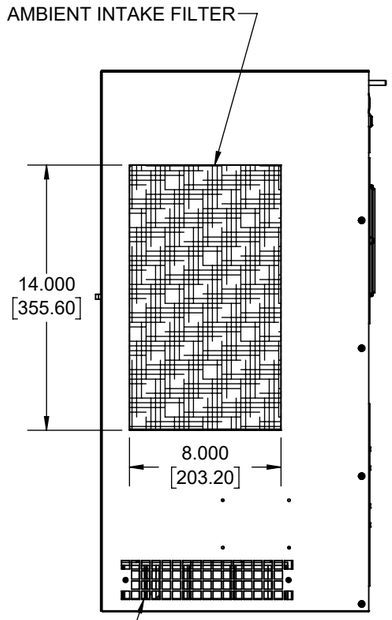
IQ5000EV

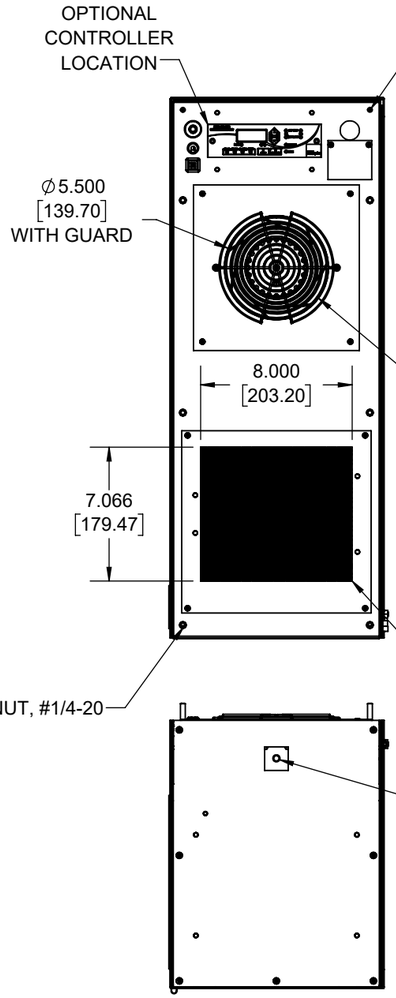


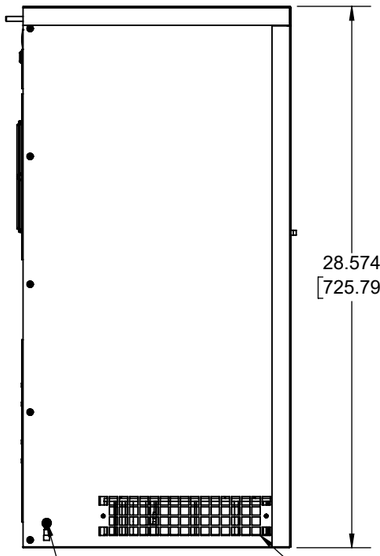












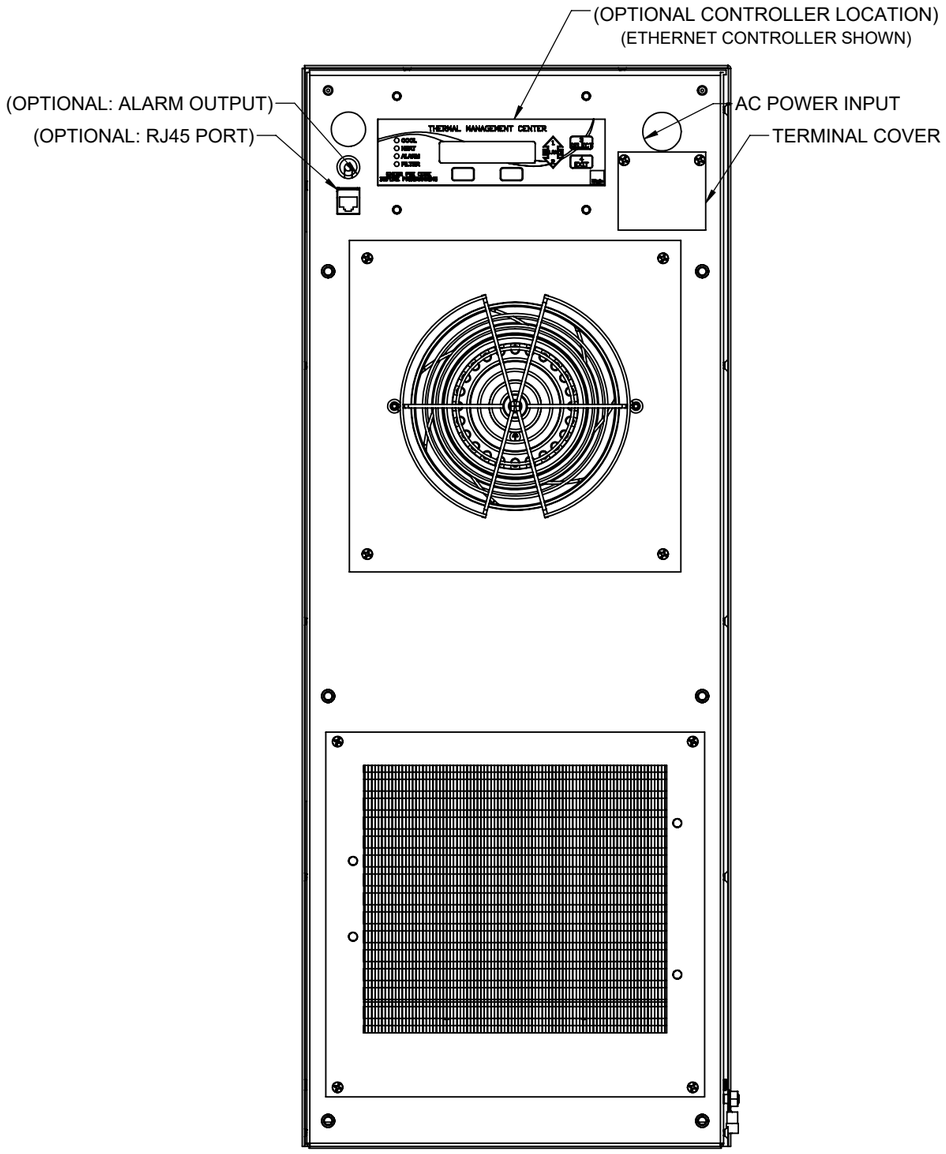
IQ5000EV
NOMINAL COOLING CAPACITY:
5600 BTUH (1641W) @ 140-140°F (60°C-60°C)
5300 BTUH (1553W) @ 95-95°F (35°C-35°C)
MAXIMUM AMPS: 8.29 (995W) @ 120V/60Hz
MAXIMUM AMPS: 3.73 (821W) @ 220V/50Hz
MAXIMUM AMPS: 4.31 (991W)@ 230V/60Hz
MAXIMUM AMPS: 2.29 (916W) @ 400V/50Hz
MAXIMUM AMPS: 2.49 (996W) @ 400V/60Hz
MAXIMUM AMPS: 2.00 (960W)@ 480V/50Hz
MAXIMUM AMPS: 2.09 (1003W) @ 480V/60Hz
MAXIMUM OPERATING TEMPERATURE: 140°F (60°C)
DIMENSIONS: 28.584" (726MM) H x 11.309" (287MM) W x 14.150" (359MM) D
WEIGHT: 97.5 LBS (44.2KG) @ 120/220/230V
WEIGHT: 117.5 LBS (53.3KG) @ 400/480V
REFRIGERANT CHARGE: R134-A 24OZ (680G)

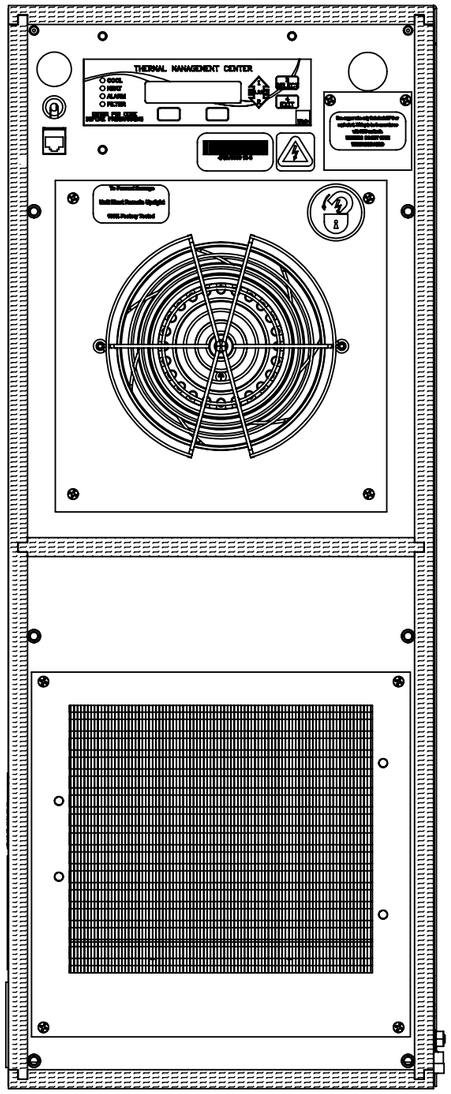
REV	REVISION	CHG	DATE	APP	DATE	CN #
F	ADDED CFM, dBA, AND CLEARANCE INFO	RCC	3/22/2018	ART	5/11/2018	1347
E	UPDATED UNIT DATA	JGG	12/15/2017	ART	12/15/2017	1336

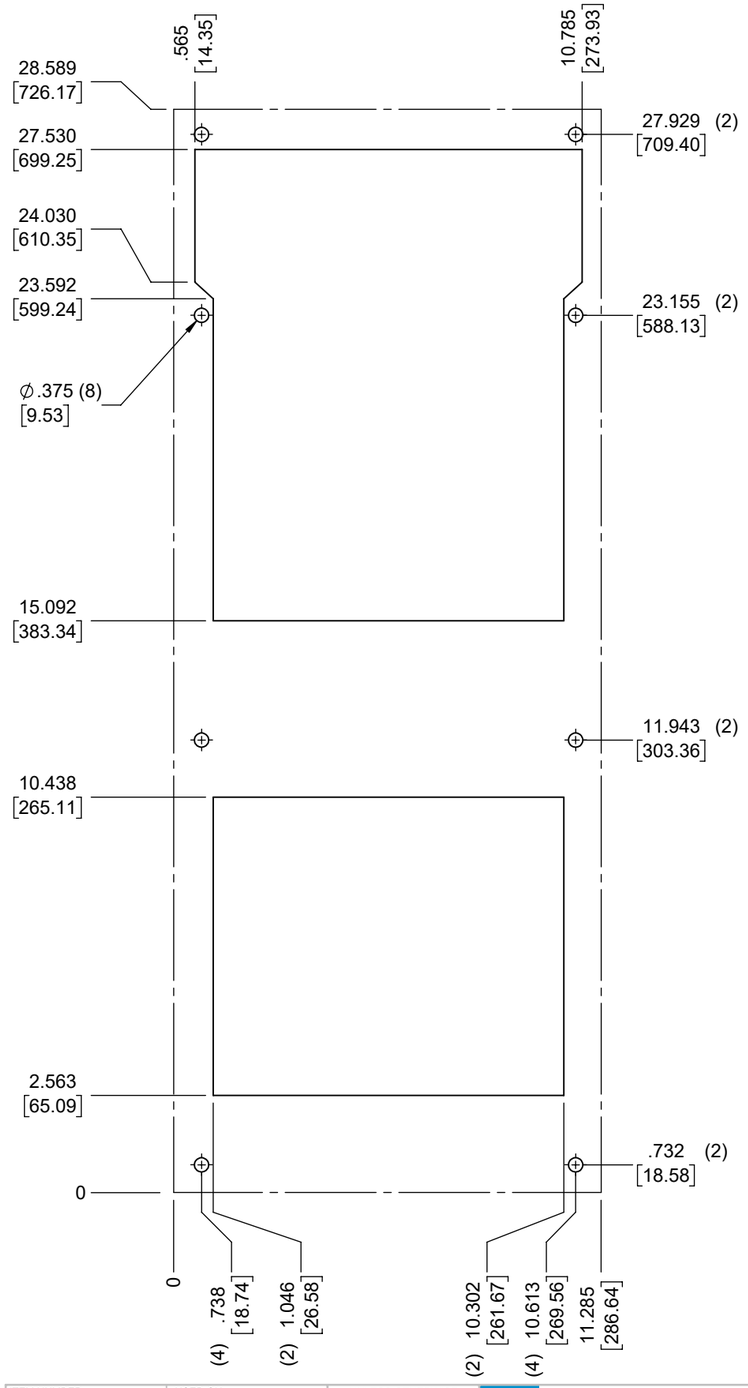
ITEM NUMBER *N/A*
MATERIAL *N/A*
EST WT: lbs
USED ON *IQ5000EV*
DRAWN BY *ART*
DATE *1/20/2016*
SCALE *1:8*

UNLESS OTHERWISE SPECIFIED TOLERANCES
.X ±.060
.XX ±.030
.XXX ±.015
FRACTIONAL ±1/16
ANGULAR ±1/2°
SURFACE FINISH 63
DO NOT SCALE DRAWING DIMENSIONS ARE INCHES

DESCRIPTION *IQ5000EV SPEC DRAWING*
DRAWING NUMBER *IQ350928*
REV *F*







IMPORTANT
GASKET MUST BE APPLIED AS SHOWN FOR PROPER OPERATION AND TO MAINTAIN ENCLOSURE INTEGRITY

EVAP. OUTLET ≈ 360 CFM
COND. OUTLET ≈ 510 CFM
SOUND LEVEL @5FT FROM UNIT @ A HT. OF 3FT = 62 dBA
SOUND LEVEL @2FT FROM UNIT @ A HT. OF 5FT = 65 dBA
CONDENSER INLET MIN. CLEARANCE 2.54"

ITEM NUMBER: *N/A*	USED ON: *IQ5000EV*	UNLESS OTHERWISE SPECIFIED TOLERANCES: .X ±.060, .XX ±.030, .XXX ±.015, FRACTIONAL ±1/4, ANGULAR ±1/2°, SURFACE FINSH 63	ICE QUBE, INC.
MATERIAL: *N/A*			DESCRIPTION: *IQ5000EV SPEC DRAWING*
EST WT: lbs		DO NOT SCALE DRAWING DIMENSIONS ARE INCHES	DRAWING NUMBER: *IQ350928* REV: *F*
DRAWN BY: *ART*	DATE: *1/20/2016*	SCALE: *1:4*	

Electric Heaters

Application

Designed to protect sensitive mechanical, electrical, and electronic equipment from the harmful effects of condensation, corrosion, and low temperatures. Thermostatically controlled fan-driven heater units maintain a stable temperature within enclosures so critical components can perform more reliably over a longer period of time.

Construction

- Attractive and durable housing is brushed aluminum
- Thermostat, standard on all units, is adjustable from 0°F to 100°F (-18°C to 38°C)
- Fan draws cool air from the bottom of the enclosure and passes this air across the thermostat and heating elements before being released into enclosure cavity
- Heated air is discharged through the top of the heater unit
- Four 10-32 x self-tapping screws are included with each heater
- Ball bearing fan runs continuously for even temperature distribution
- Terminal strip with clamp connector that accepts both solid and stranded wire

Finish

Brushed aluminum.

Industry Standards

UL Component Recognized
CSA Listed
CE

Installation

CAUTION

These electric heaters are not designed for use in dusty, dirty, corrosive, or hazardous locations.

Portions of the heater can get hot. Adequate protection must be taken to protect people from potential burns, and to protect other components from this heat.

This heater can only be installed in a totally enclosed metal enclosure.

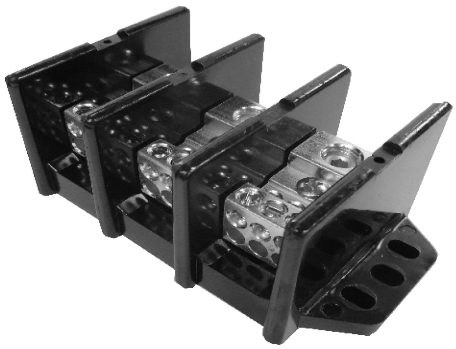
Hoffman electric heaters should be centered as low as possible on an interior enclosure panel. This permits the unit to heat the cool air located at the bottom of the enclosure. For maximum efficiency and longevity, the heater should be mounted in a vertical position with the terminal block to the bottom and the air outlet openings at the top in a sealed enclosure free from dust or debris. However, the unit will also effectively distribute heat if turned 90 degrees with the terminal block out the bottom and the air outlet at the side. Although enclosure panels are preferable, heaters may be installed on any flat sheet metal surface. Do not install heaters on wood panels.

Heat sensitive components should not be placed near the heater discharge area since this air can be quite warm. The clearance range defines the space that must be kept free of these components for proper and safe operation of the heater.

Standard Sizes Electric Heaters

Catalog Number	Watts	Voltage	Hz	Amps	Weight lb.	(kg.)
DAH1001A	100	115	50/60	0.9	4.00	(1.81)
DAH1002A	100	230	50/60	0.6	4.00	(1.81)
DAH2001A	200	115	50/60	1.7	4.00	(1.81)
DAH2002A	200	230	50/60	0.9	4.00	(1.81)
DAH4001B	400	115	50/60	3.3	6.00	(2.72)
DAH4002B	400	230	50/60	1.7	6.00	(2.72)
DAH8001B	800	115	50/60	6.5	6.00	(2.72)
DAH8002B	800	230	50/60	3.3	6.00	(2.72)

763 422 2211 FAX 763 422 2600



marathon™ Special Products

Product Data Sheet

140X401

Replace "x" with 2,or 3 for number of poles

Power Terminal Block

175 Amps 600 Volts AC/DC

Wire Range

- Line: (1) 2/0 - #14 AWG
- Load: (6) #4 - #14 AWG

Electrical Ratings

- 175 Amps
- 600V per UL 1059 & CSA 22.2 No.158, class B & C requirements
- Short circuit current ratings (SCCR): See SCCR section below for specifications.
- CU7AL - 75°C connector terminal rating with copper or aluminum wire
- Factory & Field Wiring

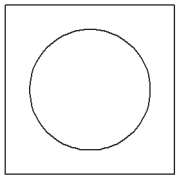
Agency Compliance

- UR - UL Recognized Terminal Block, Evaluated to UL 1059, File No.XCFR2.E62806
- CSA - certifed to C22.2 No. 158, File No. LR19766 (wire classes B & C only)
- CE compliant to IEC 60947-7-1

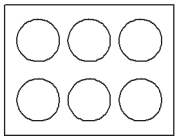
Material Information

- Insulator base:
  - Phenolic
  - Flammability rating of insulator base UL94V0
  - Insulator base temperature rating: -40°C to 150°C (UL RTI)
- Connector: aluminum, tin plated
- Line terminal screw: aluminum, tin plated
- Load terminal screws: steel, nickel plated
- Connector mounting screws: steel, zinc plated
- RoHS compliant

Termination Specifications

Line Side	Wire Size (CU Stranded)	Torque	Wires / Terminal	Wire Class (UL) [1]
	2/0 - 1/0 AWG	13.6 N·m (120 lbf·in)	1	B, C
	1 - 6	13.6 N·m (120 lbf·in)	1	B, C, G, H, I (DLO)
	8	4.5 N·m (40 lbf·in)	1	B, C, G, H, I (DLO)
	10 - 14	4 N·m (35 lbf·in)	1	B, C, I (DLO)

- Aluminum wire range: 2/0 - #14 AWG
- Wire strip length: 11/16 in. (17mm)
- Terminal screw drive: 5/16 in. (8mm) hex

Load Side	Wire Size (CU Stranded)	Torque	Wires / Terminal	Wire Class (UL) [1]
	4 AWG	4 N·m (35 lbf·in)	1	B, C
	6 - 8	4 N·m (35 lbf·in)	1	B, C, G, H, I (DLO)
	10	4 N·m (35 lbf·in)	1 - 2	B, C, I (DLO)
	12 - 14	4 N·m (35 lbf·in)	1 - 2	I (DLO)
			1 - 4	B, C

- Aluminum wire range: #4 - 14 AWG
- Wire strip length: load side tap
  - top row: 3/8 in. (10mm)
  - bottom row: 3/4 in. (19mm)
- Terminal screw drive: slotted

[1] For information on copper stranded wire classes please reference:
http://www.marathonsp.com/CatalogPDFs/Flexible-Stranded-Wire.pdf

Short Circuit Current Ratings (SCCR)

- The suitable conductor ranges are limited to the table values only for achieving the SCCR in excess of the default rating of 10,000A.
- Other conductor combinations within the "Terminal Specifications" noted are suitable for achieving a SCCR of 10,000A (the default rating of terminal blocks).
- Enclosure size – investigated with a minimum 16x12x6 enclosure. Use in smaller enclosures is subject to end use evaluation.

SCCR With Fuses

Wire Type	Suitable Conductors		Max Overcurrent Protection **Fuse** Required Amp Rating / Class						SCCR RMS Sym. Amps 600V. Max
	Line	Load	J	T	RK1	RK5	G	CC	
B, C	2/0 - 6	4 - 14	200	200	100	100	60	30	100,000
B, C	2/0 - 10	4 - 14	150	150	100	30	60	30	100,000
G, H, I	1 - 10	6 - 14	60	60	60	30	-	30	100,000
(*)	2/0 - 14	4 - 14	None						10,000

* Any wire class evaluated (see terminal specification section)

SCCR With Circuit Breakers

Suitable Conductors		Overcurrent Protection **Circuit Breaker** Required		Max AMP	Volts Max	SCCR RMS Sym. Amps 600V. Max
Line	Load	MFR	TYPE			
2/0 - 6 AWG	4 - 10	Square-D	JDL36250	250	480	18,000
		Square-D	JGL36250	250	480	35,000
		Square-D	JJL36250	250	480	65,000
		Square-D	JLL36250	250	480	65,000

Installation & Accessories

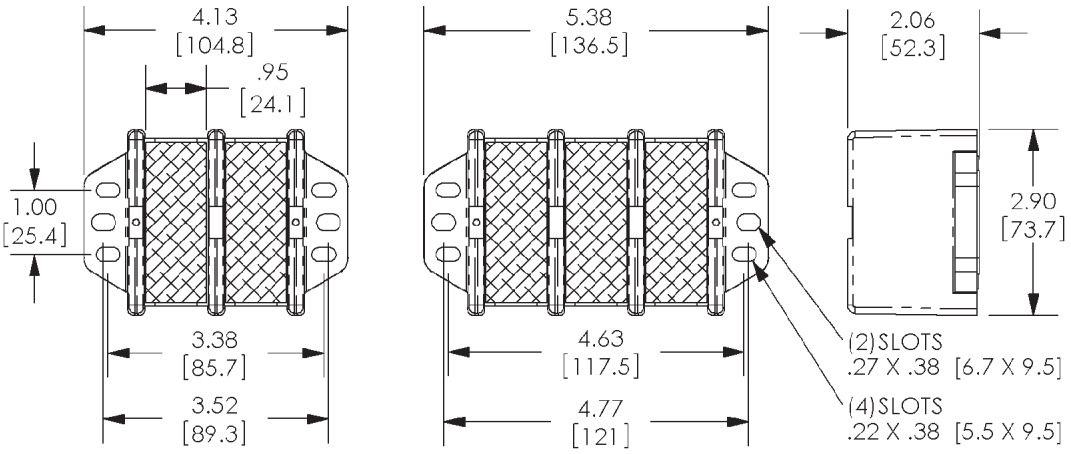
- Mounting (Panel):
  - For use with #1/4 fastener.
  - Torque mounting fastener to 30-40 lbf·in (3.4 - 4.5 N·m).

- Covers:
  - Flat covers available upon request
  - Catalog Number: CH140x (replace "x" with number of poles)
  - Covers are clear polycarbonate
  - Accessory covers are not intended to provide insulation for electrical spacings.

- Marker Strip: white vinyl strip with mounting screws available.

- Printing options available, consult customer service for specifications.

Drawing



Product Data Sheet

MARATHON® SPECIAL PRODUCTS
A REGAL-BELOIT Company

141X400

Replace "X" with 1, 2, 3 or 4 for number of poles

Distribution Power Block
115 Amps, 600 Volts (AC/DC)

Wire Range:
Line side: (1) #2 - #14 AWG
Load Side: (4) #10- #18 AWG
See tables below for SCCR wire ranges, flexible stranded and multiple wire approvals.

Electrical Ratings:
- 115A copper wire, 90A aluminum wire (Based on NEC Table 310-16, 75°C columns)
- 600 Volts AC/DC (UL 1059 Class C, User Group - General Industrial)
- Factory and Field Wiring

Short Circuit Current Ratings (Copper wire only):

Suitable (kcmil/AWG)		Overcurrent Protection Fuse Required Class/Max Amp Rating						SCCR, RMS SYM Amps	Volts Max
Line	Load	J	T	RK1	RK5	G	CC		
2 - 6	10 - 14	200	200	200	100	60	30	200,000	600
8 - 10	10 - 14	100	100	100	30	60	30	100,000	600

		Overcurrent Protection Circuit Breaker Required			SCCR, RMS	Volts
Line	Load	MFR	Type	Max Amp	SYM Amps	Max
2 - 6	10	Square D	JDL36250	250	18,000	480
		Square D	JGL36250	250	35,000	480
		Square D	JJL36250	250	65,000	480
		Square D	JLL36250	250	65,000	480
8 - 10	14	Square D	JDL36250	250	18,000	480
		Square D	JGL36250	250	35,000	480
		Square D	JJL36250	250	65,000	480
		Square D	JLL36250	250	65,000	480
		Square D	HDL36100	100	18,000	480
		Square D	HGL36100	100	35,000	480
		Square D	HJL36100	100	65,000	480
		Square D	HLL36100	100	65,000	480

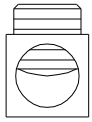
		Overcurrent Protection Circuit Breaker Required			SCCR, RMS	Volts
Line	Load	MFR	Type	Max Amp	SYM Amps	Max
2 - 10	10 - 14	Allen Bradley	14OU-H3C3	125	25,000	480
		Allen Bradley	14OU-H6C3	125	25,000	480

Mechanical Ratings:
- Maximum insulator base temperature: 125°C (257°F) UL RTI
- Storage and transportation temperature range: -35°C to 110°C (-31°F to 230°F)
- Flammability rating of insulator base: UL 94 V-0

Materials:
- Connector: High conductivity aluminum, tin plated
- Insulator base: glass filled polycarbonate (thermoplastic)
- Terminal set screws: Steel, nickel plated
- Connector mounting screws: Steel, zinc plated

Agency Approvals:
- UL Recognized, UL 1059 Terminal Block Standard, File No. XCFR2.E62806
- CSA Certified, CSA C22.2 No. 158, File No. LR19766 (Wire Classes B & C only)
- CE compliant to IEC 60947-7-1
- RoHS Compliant

Wire Approvals:

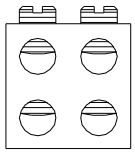


Line Side Wire Approvals:

		Copper Wire Stranding Classes - Number of Strands						
Wire Size	**Torque**	**Solid**	**Class B**	**Class C**	**Class G**	**Class H**	**Class I**	**Class K**
2 AWG	50 in. lbs		7	19				
4	45 in. lbs		7	19	~ 49	~ 133	~ 105	~ 420
6	45 in. lbs		7	19	~ 49	~ 133	~ 63	~ 266
8	40 in. lbs		7	19	~ 49	~ 133	~ 41	~ 168
10	35 in. lbs	1	7	19			~ 27	~ 104
12	35 in. lbs	1	7	19			~ 19	~ 65
14	35 in. lbs	1	7	19			~ 19	~ 41

~Quantity of strands for Classes G, H, I, K may vary by manufacturer.

Aluminum stranded wire range: #2 – #12 AWG



Load Side Wire Approvals:

		Copper Wire Stranding Classes - Number of Strands						
Wire Size	**Torque**	**Solid**	**Class B**	**Class C**	**Class G**	**Class H**	**Class I**	**Class K**
10 AWG	7 in. lbs	1	7	19			27	104
12	7 in. lbs	1	7	19			19	65
14	7 in. lbs	1	7	19			(1-2)* 19	(1-2)* 41
16	7 in. lbs	1	7	19				(1-2)* 26
18	7 in. lbs	1	7	19				(1-2)* 16

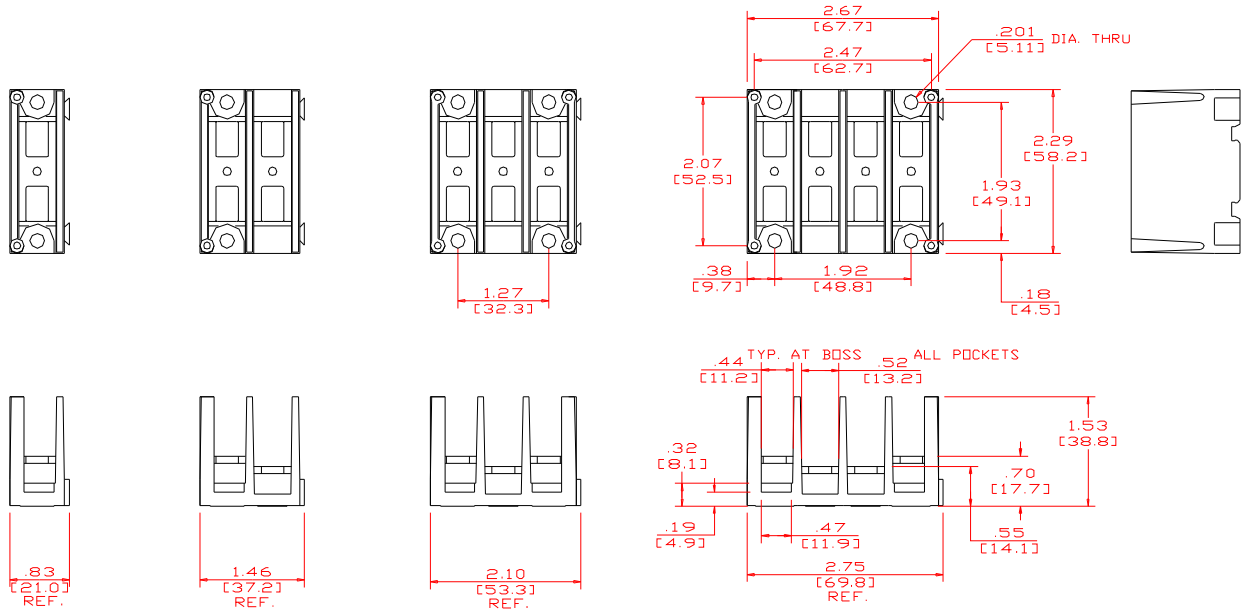
~ Quantity of strands for Classes G, H, I, K may vary by manufacturer.
* Multiple conductor approvals for **LOAD** side only. (copper wire only)

Aluminum stranded wire range: #10 – #18

- Wire strip length, line side tap – 1/2”
- Wire strip length, load side tap, top row – 3/8”, bottom row – 5/8”
- Terminal Set Screws: slotted
- Panel mountable: #10 fastener, torque to 25-30 in. lbs.

Accessories:

- Cover: Clear protective plastic cover. Catalog description CC141X (“X” numbers of poles: 1,2, 3 or 4)
- Marking strip: White vinyl strip to mark circuits. Supplied with mounting screws.
- Printing available. Consult factory.



1 Pole 2 Pole 3 Pole 4 Pole

WWW.MARATHONSP.COM
1-419-352-8441

Feed-through terminal block - UT 6 - 3044131

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Feed-through terminal block, Connection method: Screw connection, Cross section: 0.2 mm² - 10 mm², AWG: 24 - 8, Width: 8.2 mm, Color: gray, Mounting type: NS 35/7,5, NS 35/15

Product Features

- The large wiring space enables the connection of solid and stranded conductors without ferrules, even above the nominal cross section
- Tested for railway applications
- As well as saving space, the compact design enables user-friendly wiring in a small amount of space
- Optimum screwdriver guidance through closed screw shafts
- The multi-conductor connection offers maximum flexibility and wiring density
- The cable entry funnel enables the use of conductors with ferrules and plastic collars within the nominal cross section

Key commercial data

Packing unit	1 pc
Minimum order quantity	50 pc
Weight per Piece (excluding packing)	14.8 GRM
Custom tariff number	85369010
Country of origin	Germany

Technical data

General

Number of levels	1
Number of connections	2
Color	gray
Insulating material	PA
Inflammability class according to UL 94	V0
Area of application	Railway industry

Feed-through terminal block - UT 6 - 3044131

Technical data

General

	Mechanical engineering
	Plant engineering
	Process industry
Maximum load current	57 A (with 10 mm² conductor cross section)
Rated surge voltage	8 kV
Pollution degree	3
Surge voltage category	III
Insulating material group	I
Connection in acc. with standard	IEC 60947-7-1
Maximum load current	57 A (with 10 mm² conductor cross section)
Nominal current I_N	41 A
Nominal voltage U_N	1000 V
Maximum load current	57 A (with 10 mm² conductor cross section)
Open side panel	ja
Shock protection test specification	DIN EN 50274 (VDE 0660-514):2002-11
Back of the hand protection	guaranteed
Finger protection	guaranteed
Surge voltage test setpoint	9.8 kV
Result of surge voltage test	Test passed
Power frequency withstand voltage setpoint	2.2 kV
Result of power-frequency withstand voltage test	Test passed
Checking the mechanical stability of terminal points (5 x conductor connection)	Test passed
Bending test rotation speed	10 rpm
Bending test turns	135
Bending test conductor cross section/weight	0.2 mm² / 0.2 kg
	6 mm^2 / 1.4 kg
	10 mm² / 2 kg
Result of bending test	Test passed
Conductor cross section tensile test	0.2 mm²
Tractive force setpoint	10 N
Conductor cross section tensile test	6 mm²
Tractive force setpoint	80 N
Conductor cross section tensile test	10 mm²
Tractive force setpoint	90 N
Tensile test result	Test passed
Tight fit on carrier	NS 35

Feed-through terminal block - UT 6 - 3044131

Technical data

General

Setpoint	5 N
Result of tight fit test	Test passed
Requirements, voltage drop	≤ 3.2 mV
Result of voltage drop test	Test passed
Temperature-rise test	Test passed
Conductor cross section short circuit testing	6 mm²
Short-time current	0.72 kA
Conductor cross section short circuit testing	10 mm²
Short-time current	1.2 kA
Short circuit stability result	Test passed
Proof of thermal characteristics (needle flame) effective duration	30 s
Result of thermal test	Test passed
Test specification, oscillation, broadband noise	DIN EN 50155 (VDE 0115-200):2008-03
Test spectrum	Service life test category 1, class B, body mounted
Test frequency	f_1 = 5 Hz to f_2 = 150 Hz
ASD level	1.857 $(m/s^2)^2/Hz$
Acceleration	0.8g
Test duration per axis	5 h
Test directions	X-, Y- and Z-axis
Oscillation, broadband noise test result	Test passed
Test specification, shock test	DIN EN 50155 (VDE 0115-200):2008-03
Shock form	Half-sine
Acceleration	5 g
Shock duration	30 ms
Number of shocks per direction	3
Test directions	X-, Y- and Z-axis (pos. and neg.)
Shock test result	Test passed
Temperature index, insulating material (DIN EN 60216-1 (VDE 0304-21))	130 °C
Static insulating material application in cold	-60 °C

Dimensions

Width	8.2 mm
Length	47.7 mm
Height NS 35/7,5	47.5 mm
Height NS 35/15	55 mm

Connection data

Connection in acc. with standard	IEC 60947-7-1

Feed-through terminal block - UT 6 - 3044131

Technical data

Connection data

Connection method	Screw connection
Note	Note: Product releases, connection cross sections and notes on connecting aluminum cables can be found in the download area.
Conductor cross section solid min.	0.2 mm²
Conductor cross section solid max.	10 mm²
Conductor cross section AWG/kcmil min.	24
Conductor cross section AWG/kcmil max	8
Conductor cross section stranded min.	0.2 mm²
Conductor cross section stranded max.	10 mm²
Min. AWG conductor cross section, stranded	24
Max. AWG conductor cross section, stranded	8
Conductor cross section stranded, with ferrule without plastic sleeve min.	0.25 mm²
Conductor cross section stranded, with ferrule without plastic sleeve max.	6 mm²
Conductor cross section stranded, with ferrule with plastic sleeve min.	0.25 mm²
Conductor cross section stranded, with ferrule with plastic sleeve max.	6 mm²
2 conductors with same cross section, solid min.	0.2 mm²
2 conductors with same cross section, solid max.	2.5 mm²
2 conductors with same cross section, stranded min.	0.2 mm²
2 conductors with same cross section, stranded max.	2.5 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, min.	0.5 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, max.	4 mm²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, min.	0.25 mm²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, max.	1.5 mm²
Stripping length	10 mm
Internal cylindrical gage	A5
Screw thread	M4
Tightening torque, min	1.5 Nm
Tightening torque max	1.8 Nm

Classifications

eCl@ss

eCl@ss 4.0	27141120
eCl@ss 4.1	27141120
eCl@ss 5.0	27141120

Feed-through terminal block - UT 6 - 3044131

Classifications

eCl@ss

eCl@ss 5.1	27141120
eCl@ss 6.0	27141120
eCl@ss 7.0	27141120
eCl@ss 8.0	27141120

ETIM

ETIM 2.0	EC000897
ETIM 3.0	EC000897
ETIM 4.0	EC000897
ETIM 5.0	EC000897

UNSPSC

UNSPSC 6.01	30211811
UNSPSC 7.0901	39121410
UNSPSC 11	39121410
UNSPSC 12.01	39121410
UNSPSC 13.2	39121410

Approvals

Approvals

Approvals

CSA / UL Recognized / VDE Gutachten mit Fertigungsüberwachung / cUL Recognized / LR / GL / RS / IECEE CB Scheme / GOST / DNV / cULus Recognized

Ex Approvals

IECEx / ATEX

Approvals submitted

Approval details

Feed-through terminal block - UT 6 - 3044131

Approvals

CSA

	B	C
mm²/AWG/kcmil	24-8	24-8
Nominal current IN	50 A	50 A
Nominal voltage UN	600 V	600 V

UL Recognized

	B	C
mm²/AWG/kcmil	24-8	24-8
Nominal current IN	50 A	50 A
Nominal voltage UN	600 V	600 V

VDE Gutachten mit Fertigungsüberwachung

mm²/AWG/kcmil	0.2-6
Nominal voltage UN	800 V

cUL Recognized

	B	C
mm²/AWG/kcmil	24-8	24-8
Nominal current IN	50 A	50 A
Nominal voltage UN	600 V	600 V

LR

GL

RS

Feed-through terminal block - UT 6 PE - 3044157

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Feed-through terminal block, Connection method: Screw connection, Cross section: 0.2 mm² - 10 mm², AWG 24 - 8, Width: 8.2 mm, Color: green-yellow, Mounting type: NS 35/7.5, NS 35/15

Key commercial data

Packing unit	1
Minimum order quantity	50
Catalog page	Page 35 (CL1-2011)
GTIN	4 017918 960414
Custom tariff number	85369010
Country of origin	GERMANY

Technical data

General

Number of levels	1
Number of connections	2
Color	green-yellow
Insulating material	PA
Inflammability class according to UL 94	V0

Dimensions

Width	8.2 mm
Length	47.7 mm
Height NS 35/7.5	47.5 mm
Height NS 35/15	55 mm

Technical data

Maximum load current	57 A
Rated surge voltage	8 kV
Pollution degree	3
Surge voltage category	III
Insulating material group	I

Feed-through terminal block - UT 6 PE - 3044157

Technical data

Technical data

Connection in acc. with standard	IEC 60947-7-2
Open side panel	ja
Test specification, oscillation, broadband noise	DIN EN 50155 (VDE 0115-200):2008-03
Test spectrum	Service life test category 1, class B, on vehicle body
Test frequency	f1 = 5 Hz to f2 = 150 Hz
ASD level	0.02 g²/Hz
Acceleration	0.8 g
Test duration per axis	5 h
Test directions	X-, Y- and Z-axis
Oscillation, broadband noise test result	Test passed
Test specification, shock test	DIN EN 50155 (VDE 0115-200):2008-03
Shock form	Half-sine
Acceleration	5 g
Shock duration	30 ms
Number of shocks per direction	3
Test directions	X-, Y- and Z-axis (pos. and neg.)
Shock test result	Test passed
Temperature index, insulating material (DIN EN 60216-1 (VDE 0304-21))	130 °C
Static insulating material application in cold	-60 °C

Connection data

Note	Note: Product releases, connection cross sections and notes on connecting aluminum cables can be found in the download area.
Conductor cross section solid min.	0.2 mm²
Conductor cross section solid max.	10 mm²
Conductor cross section stranded min.	0.2 mm²
Conductor cross section stranded max.	10 mm²
Conductor cross section AWG/kcmil min.	24
Conductor cross section AWG/kcmil max	8
Conductor cross section stranded, with ferrule without plastic sleeve min.	0.25 mm²
Conductor cross section stranded, with ferrule without plastic sleeve max.	6 mm²
Conductor cross section stranded, with ferrule with plastic sleeve min.	0.25 mm²
Conductor cross section stranded, with ferrule with plastic sleeve max.	6 mm²
2 conductors with same cross section, solid min.	0.2 mm²
2 conductors with same cross section, solid max.	2.5 mm²
2 conductors with same cross section, stranded min.	0.2 mm²
2 conductors with same cross section, stranded max.	2.5 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, min.	0.5 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, max.	4 mm²

Feed-through terminal block - UT 6 PE - 3044157

Technical data

Connection data

2 conductors with same cross section, stranded, ferrules without plastic sleeve, min.	0.25 mm²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, max.	1.5 mm²
Connection method	Screw connection
Stripping length	10 mm
Internal cylindrical gage	A5
Screw thread	M4
Tightening torque, min	1.5 Nm
Tightening torque max	1.8 Nm

Classifications

eclass

eCl@ss 4.0	27141118
eCl@ss 4.1	27141118
eCl@ss 5.0	27141118
eCl@ss 5.1	27141118
eCl@ss 6.0	27141141
eCl@ss 7.0	27141141

etim

ETIM 2.0	EC000901
ETIM 3.0	EC000901
ETIM 4.0	EC000901
ETIM 5.0	EC000901

unspsc

UNSPSC 6.01	30211811
UNSPSC 7.0901	39121410
UNSPSC 11	39121410
UNSPSC 12.01	39121410
UNSPSC 13.2	39121410

Approvals

Approvals

Approvals

CSA / UL Recognized / VDE report with production monitoring / cUL Recognized / LR / GL / DNV / RS / IECEE CB Scheme / GOST / cULus Recognized

Feed-through terminal block - UT 16 - 3044199

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Feed-through terminal block, Connection method: Screw connection, Cross section: 1.5 mm² - 25 mm², AWG: 16 - 4, Width: 12.2 mm, Height: 54.4 mm, Color: gray, Mounting type: NS 35/7,5, NS 35/15

Product Features

- The reducing bridges can be used to connect terminal blocks with different connection technologies, e.g., UT 35 screw terminal block with Push-in technology 2,5 Push-in terminal blocks, to form power blocks
- Tested for railway applications
- Easy and time-saving potential supply and distribution of large currents and cross sections up to 35 mm² with reducing bridges
- The flexible options for reducing bridging in the CLIPLINE complete system can be found in "Accessories for the CLIPLINE complete modular terminal block system"

Key commercial data

Packing unit	1 pc
Minimum order quantity	50 pc
Weight per Piece (excluding packing)	30.0 GRM
Custom tariff number	85369010
Country of origin	Turkey

Technical data

General

Number of levels	1
Number of connections	2
Color	gray
Insulating material	PA
Inflammability class according to UL 94	V0
Area of application	Railway industry
	Mechanical engineering

Feed-through terminal block - UT 16 - 3044199

Technical data

General

	Plant engineering
	Process industry
Maximum load current	101 A (with 25 mm² conductor cross section)
Rated surge voltage	8 kV
Pollution degree	3
Surge voltage category	III
Insulating material group	I
Connection in acc. with standard	IEC 60947-7-1
Maximum load current	101 A (with 25 mm² conductor cross section)
Nominal current I_N	76 A
Nominal voltage U_N	1000 V
Maximum load current	101 A (with 25 mm² conductor cross section)
Open side panel	ja
Shock protection test specification	DIN EN 50274 (VDE 0660-514):2002-11
Back of the hand protection	guaranteed
Finger protection	guaranteed
Surge voltage test setpoint	9.8 kV
Result of surge voltage test	Test passed
Power frequency withstand voltage setpoint	2.2 kV
Result of power-frequency withstand voltage test	Test passed
Checking the mechanical stability of terminal points (5 x conductor connection)	Test passed
Bending test rotation speed	10 rpm
Bending test turns	135
Bending test conductor cross section/weight	1.5 mm² / 0.4 kg
	16 mm² / 2.9 kg
	25 mm² / 4.5 kg
Result of bending test	Test passed
Conductor cross section tensile test	1.5 mm²
Tractive force setpoint	40 N
Conductor cross section tensile test	16 mm²
Tractive force setpoint	100 N
Conductor cross section tensile test	25 mm²
Tractive force setpoint	135 N
Tensile test result	Test passed
Tight fit on carrier	NS 35
Setpoint	5 N

Feed-through terminal block - UT 16 - 3044199

Technical data

General

Result of tight fit test	Test passed
Requirements, voltage drop	≤ 3.2 mV
Result of voltage drop test	Test passed
Temperature-rise test	Test passed
Conductor cross section short circuit testing	16 mm²
Short-time current	1.92 kA
Conductor cross section short circuit testing	25 mm²
Short-time current	3 kA
Short circuit stability result	Test passed
Proof of thermal characteristics (needle flame) effective duration	30 s
Result of thermal test	Test passed
Test specification, oscillation, broadband noise	DIN EN 50155 (VDE 0115-200):2008-03
Test spectrum	Service life test category 1, class B, body mounted
Test frequency	f_1 = 5 Hz to f_2 = 150 Hz
ASD level	0.02 g²/Hz
Acceleration	0.8g
Test duration per axis	5 h
Test directions	X-, Y- and Z-axis
Oscillation, broadband noise test result	Test passed
Test specification, shock test	DIN EN 50155 (VDE 0115-200):2008-03
Shock form	Half-sine
Acceleration	5 g
Shock duration	30 ms
Number of shocks per direction	3
Test directions	X-, Y- and Z-axis (pos. and neg.)
Shock test result	Test passed
Temperature index, insulating material (DIN EN 60216-1 (VDE 0304-21))	120 °C

Dimensions

Width	12.2 mm
Length	55.5 mm
Height	54.4 mm
Height NS 35/7,5	55 mm
Height NS 35/15	62.5 mm

Connection data

Connection in acc. with standard	IEC 60947-7-1
Connection method	Screw connection

Feed-through terminal block - UT 16 - 3044199

Technical data

Connection data

Note	Note: Product releases, connection cross sections and notes on connecting aluminum cables can be found in the download area.
Conductor cross section solid min.	1.5 mm²
Conductor cross section solid max.	25 mm²
Conductor cross section AWG/kcmil min.	16
Conductor cross section AWG/kcmil max	4
Conductor cross section stranded min.	1.5 mm²
Conductor cross section stranded max.	25 mm²
Min. AWG conductor cross section, stranded	16
Max. AWG conductor cross section, stranded	4
Conductor cross section stranded, with ferrule without plastic sleeve min.	1 mm²
Conductor cross section stranded, with ferrule without plastic sleeve max.	16 mm²
Conductor cross section stranded, with ferrule with plastic sleeve min.	1 mm²
Conductor cross section stranded, with ferrule with plastic sleeve max.	16 mm²
2 conductors with same cross section, solid min.	1 mm²
2 conductors with same cross section, solid max.	6 mm²
2 conductors with same cross section, stranded min.	1 mm²
2 conductors with same cross section, stranded max.	6 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, min.	0.75 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, max.	10 mm²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, min.	1 mm²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, max.	6 mm²
Stripping length	14 mm
Internal cylindrical gage	A7
Screw thread	M5
Tightening torque, min	2.5 Nm
Tightening torque max	3 Nm

Classifications

eCl@ss

eCl@ss 4.0	27141120
eCl@ss 4.1	27141120
eCl@ss 5.0	27141120
eCl@ss 5.1	27141120

Feed-through terminal block - UT 16 - 3044199

Classifications

eCl@ss

eCl@ss 6.0	27141120
eCl@ss 7.0	27141120
eCl@ss 8.0	27141120

ETIM

ETIM 2.0	EC000897
ETIM 3.0	EC000897
ETIM 4.0	EC000897
ETIM 5.0	EC000897

UNSPSC

UNSPSC 6.01	30211811
UNSPSC 7.0901	39121410
UNSPSC 11	39121410
UNSPSC 12.01	39121410
UNSPSC 13.2	39121410

Approvals

Approvals

Approvals

CSA / UL Recognized / VDE Zeichengenehmigung / cUL Recognized / GL / RS / IECEE CB Scheme / cULus Recognized

Ex Approvals

IECEx / ATEX

Approvals submitted

Approval details

CSA

	B	C
mm²/AWG/kcmil	16-4	16-4

Feed-through terminal block - UT 16 - 3044199

Approvals

	B	C
Nominal current IN	85 A	85 A
Nominal voltage UN	600 V	600 V

UL Recognized

	B	C
mm²/AWG/kcmil	16-4	16-4
Nominal current IN	85 A	85 A
Nominal voltage UN	600 V	600 V

VDE Zeichengenehmigung

mm²/AWG/kcmil	1.5-16
Nominal current IN	76 A
Nominal voltage UN	1000 V

cUL Recognized

	B	C
mm²/AWG/kcmil	16-4	16-4
Nominal current IN	85 A	85 A
Nominal voltage UN	600 V	600 V

GL

RS

IECEE CB Scheme

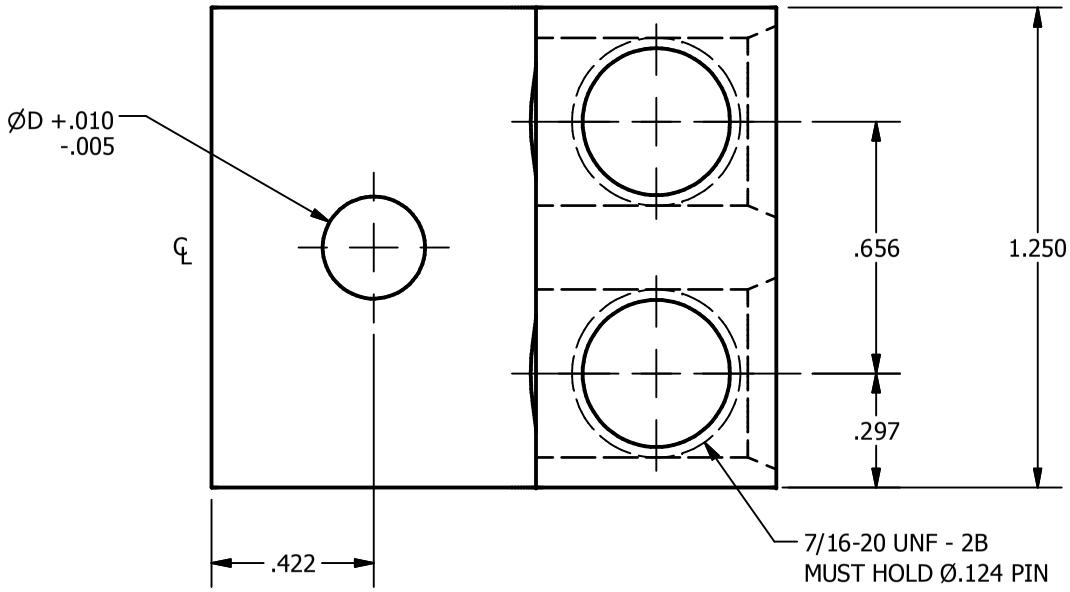
mm²/AWG/kcmil	1.5-16
Nominal current IN	76 A
Nominal voltage UN	1000 V

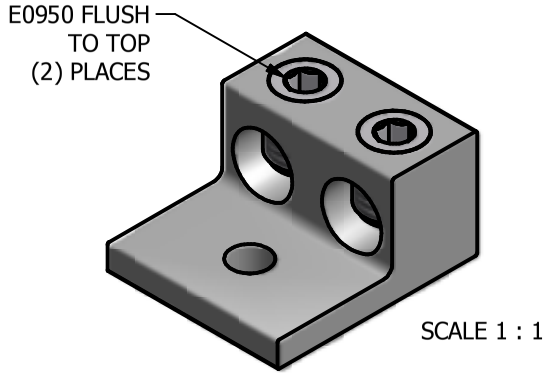
SCREW: E0950	MATERIAL:ALUMINUM, X0031	TOLERANCES-UNLESS OTHERWISE SPECIFIED 2 PL. DEC. ±.015 TRUE C.L. ±.015 3 PL. DEC. ±.015 ANGLES ±1	DWG. NO. D2057	ILSCO CORP.
CAT. NO.:	PLATING: EL-TIN			
MASS:SEE CHART	MARKING: SEE CHART	DRAWN BY:CLH SCALE: 2:1	SHEET 1 OF 1	
SURFACE AREA: SEE CHART²		DATE:1/16/2008 SIZE: A		
STUFFER SHT: FORM 1	CELL:AMP			

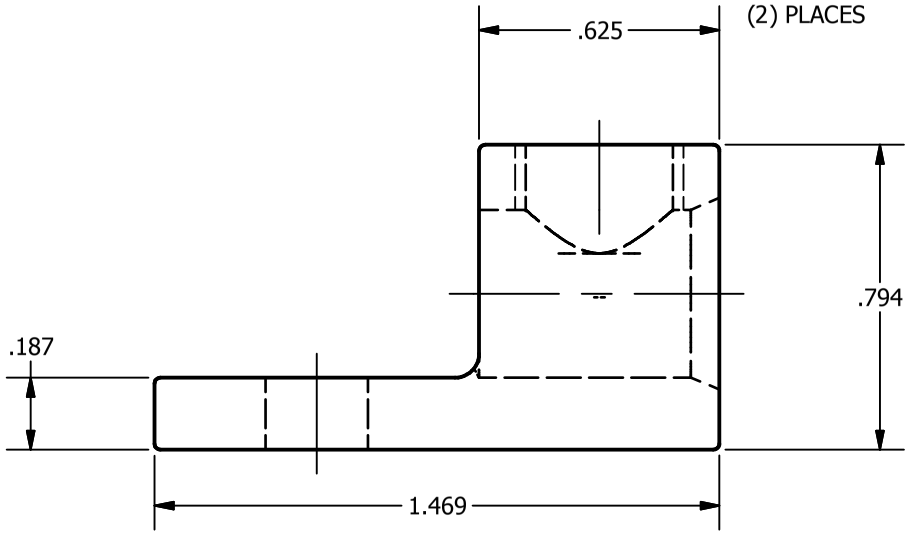
REV.	DESCRIPTION
E	

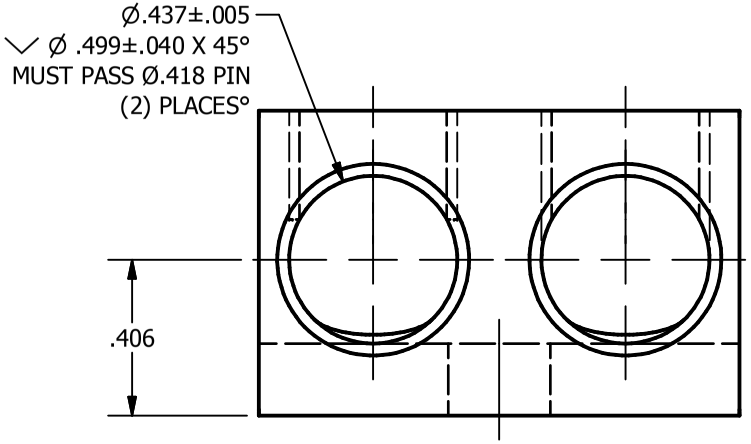
Cat #: AU-2/0

AU-2/0-B2









DEV	D	MASS LBS.	SURFACE AREA IN²	MARKING
-22	.272	.0555	8.0048	ILSCO, D2057, AU-2/0, 2/0-14, AL9CU

Product Data Sheet

QOSAMK

Load Center Surge Arrester Mounting Kit, Circuit Breaker Type: QO, UL Listed

Availability **Stock Item: This item is normally stocked in our distribution facility.**

Technical Characteristics

Approvals	UL Listed
Marketing Trade Name	QO
Circuit Breaker Type	QO
Application	For Mounting SDSA1175 Surge Arrester into Ground Bar Mounting Holes on Convertible Main Circuit Breaker Load Centers

Shipping and Ordering

Category	00102 - Load Centers, Accessories, Type QO
Discount Schedule	DE3A
Article Number	785901002987
Package Quantity	10
Weight	0.15 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

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SDSA 3-Phase SPDs

Square D Type 1
Surge Protective Devices

Square D™ brand Surgelogic™ SDSA 3-Phase products are compact and affordable Surge Protective Devices (SPDs) available in Wye and Delta configurations. SDSA 3-Phase SPDs offer a simple means to bring down initial surges to manageable levels and can offer additional value in a cascaded SPD system. Their compact design allows surge suppression to be installed adjacent to power panels or directly on sensitive equipment.

SQUARE D™
by Schneider Electric

SDSA 3-Phase SPDs Features

Superior Performance

Square D brand Surgelogic SDSA 3-Phase SPDs utilize high-energy suppression circuitry that can be located at any point in the electrical system. They have the flexibility to be used with or without an Overcurrent Protective Device (OCPD).

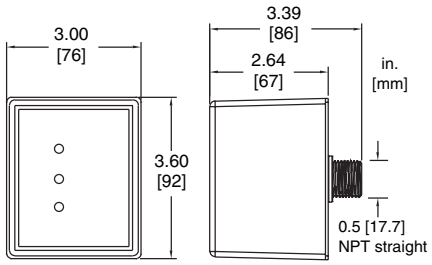
SDSA 3-Phase SPDs provide surge suppression for equipment from severe transient activity. Each metal oxide varistor (MOV) is individually fused and the products carry a NEMA Type 4X rating suitable for installing indoors, outdoors, or in other harsh environments.

Easy Installation

Surgelogic SDSA 3-Phase SPDs are some of the most versatile, yet compact devices available on the market today. This compact package can be mounted on an electrical panel, meter socket, or inside electrical control cabinets.

Warranty

The SDSA 3-Phase SPD warranty is 2 years.



SDSA 3-Phase SPDs

Performance

Surge Current Rating per Phase	40kA
Short Circuit Current Rating	200kA
Modes of Protection	6
Fusing	Individually fused MOVs
Thermal Fusing	Yes
Overcurrent Fusing	Yes
Operating Frequency	50/60 Hz

Mechanical Description

Enclosure	Non-Metallic
NEMA Rating	NEMA Type 4X
Connection Method	#12 AWG
Weight	1.63 lbs (0.738 kg)
Mounting Method	Close Nippled, Back Mounted
Operating Altitude	Sea Level-12,000' (3,658 m)
Storage Temperature	-31˚ F to +176˚ F (-35˚ C to +80˚ C)
Operating Temperature	-31˚ F to +176˚ F (-35˚ C to +80˚ C)
Operating Humidity	0 to 95% non-condensing

Diagnostics

Green status LED

Listings and Performance

cULus Listed per UL 1449 4th Edition Type 1 SPD, CSA C22.2 No. 269.1-14

The SDSA2040, SDSA4040, and SDSA3650 is a four-wire surge suppressor designed for use on solidly grounded systems. The SDSA2040D, SDSA4040D, and SDSA3650D is a three-wire surge suppressor designed for delta applications.

Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCOV	SCCR	I_n	VPR L-N	VPR L-G	VPR L-L	VPR N-G
208Y/120V[1]	40kA	6	3 Ø, 4-wire	SDSA2040	180V L-N 360V L-L	200kA	10kA	700V	N/A	1200V	N/A
240V Delta[2]	40kA	3	3 Ø, 3-wire	SDSA2040D	360V L-L	200kA	10kA	N/A	N/A	1200V	N/A
480Y/277V[3]	40kA	6	3 Ø, 4-wire	SDSA4040	420V L-N 840V L-L	200kA	10kA	1500V	N/A	2500V	N/A
480V Delta	40kA	3	3 Ø, 3-wire	SDSA4040D	840V L-L	200kA	10kA	N/A	N/A	2500V	N/A
600Y/347V	40kA	6	3 Ø, 4-wire	SDSA3650	510V L-N 1020V L-L	200kA	10kA	1800V	N/A	3000V	N/A
600V Delta	40kA	3	3 Ø, 3-wire	SDSA3650D	1020V L-L	200kA	10kA	N/A	N/A	3000V	N/A

1 Applicable voltages: 220Y/127V, 208Y/120V
2 Applicable voltages: 240V Delta, 240/120V High-Leg Delta
3 Applicable voltages: 480Y/277V, 415Y/240V, 400Y/230V, 380Y/220V

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Schneider Electric México, S.A. de C.V. AV. Ejercito Nacional No. 904, Col. Palmas, Polanco 11560 México, D.F. Tel. 55-5804-5000 www.schneider-electric.com.mx
Schneider Electric Canada, Inc. 5985 McLaughlin Road, Mississauga, ON L5R 1B8 Canada Tel:1-800-565-6699 www.schneider-electric.ca

Switching Power Supplies
PS5R-V Series

STANDARDS COMPLIANCE

Applicable Standards	Mark	File No. or Organization
UL508 UL1310[1] ANSI/ISA 12.12.01 CSA C22.2 No.107.1 CSA C22.2 No.213 CSA C22.2 No.223[1]	c UL us LISTED	UL/c-UL Listed File No. E467154, E177168
EN60950-1 EN50178 EN61204-3 EN50581	TÜV	TÜV SÜD[2]
	CE	EU Low Voltage Directive EMC Directive RoHS Directive
SEMI F47	—	EPRI

Note 1: PS5R-VB/VC/VD/VE only
Note 2: EN60950-1, EN50178 only

POWER SUPPLY PART NUMBERS

Output Capacity	Part Number	Input Voltage	Output Voltage	Output Current
10W	PS5R-VB05	100 to 240V AC (Voltage range: 85 to 264V AC / 100 to 370V DC)	5V	2.0A
15W	PS5R-VB12		12V	1.3A
	PS5R-VB24		24V	0.65A
30W	PS5R-VC12		12V	2.5A
	PS5R-VC24		24V	1.3A
60W	PS5R-VD24		24V	2.5A
90W	PS5R-VE24		24V	3.75A
120W	PS5R-VF24		24V	5.0A
240W	PS5R-VG24		24V	10.0A

Part Number Structure

PS5R - V □ □

Output Voltage
05: 5V[3]
12: 12V[4]
24: 24V

Output Capacity
B: 10W/15W
C: 30W
D: 60W
E: 90W
F: 120W
G: 240W

Note 3: PS5R-VB only
Note 4: PS5R-VB/VC only
Use only for interpreting part numbers.
Do not use for developing part numbers.

PRODUCT DESCRIPTION

DIN-rail mount switching power supplies with global approvals for both industrial and hazardous locations

KEY FEATURES

- Compact size preserves panel space
- Slim size (width):
  22.5mm (10W/15W/30W)
  36mm (60W/90W)
  46mm (120W)
  60mm (240W)
- Universal Voltage Input:
  85-264V AC/100-370V DC
- Wide operating temperature range
- Spring-up terminals accept ring & fork terminals
- Approved for use in Class I Division 2 hazardous locations
- Can be installed in 6 directions
- 10W ~ 90W meet NEC Class 2 output ratings
- Overcurrent protection with auto-reset
- Meets SEMI F47 Sag Immunity (208V AC input)
- RoHS compliant
- Five-year factory warranty

SPECIFICATIONS

Model	5V DC output	PS5R-VB05	-	-	-	-	-
	12V DC output	PS5R-VB12	PS5R-VC12	-	-	-	-
	24V DC output	PS5R-VB24	PS5R-VC24	PS5R-VD24	PS5R-VE24	PS5R-VF24	PS5R-VG24
Output Capacity		15W (5V Model is 10W)	30W	60W	90W	120W	240W
Input	Rated Input Voltage (Single-phase two-wire)[1]	100 to 240V AC (Voltage range: 85 to 264V AC/100 to 370V DC) (Load ≤ 80% at 100-105V DC)					
	Frequency	50/60 Hz					
	Input Current (Typ.) 100V AC	5V: 0.25A 12V, 24V: 0.35A	0.7A	1.3A	1.1A	1.4A	2.7A
	Input Current (Typ.) 230V AC	5V: 0.14A 12V, 24V: 0.19A	0.3A	0.8A	0.6A	0.7A	1.2A
	Inrush Current (Typ.) (Ta=25°C, cold start) 100V AC	18A					14A
	Inrush Current (Typ.) (Ta=25°C, cold start) 230V AC	45A				41A	30A
	Leakage Current 120V AC	0.5mA max.					
	Leakage Current 230V AC	1.0mA max.					
	Efficiency (Typ.) (at rated output)[2] 100V AC	5V: 77%, 12V: 82%, 24V: 84%	12V: 83%, 24V: 85%	86%	88%		89%
	Efficiency (Typ.) (at rated output)[2] 230V AC	5V: 73%, 12V: 80%, 24V: 81%	12V: 85%, 24V: 87%	86%	89%		90%
	Power Factor (Typ.) 100V AC	—	—	—	0.99		
	Power Factor (Typ.) 230V AC	—	—	—	0.86	0.92	0.96
Output	Rated Voltage/Current	5V/2.0A[3], 12V/1.3A, 24V/0.65A	12V/2.5A, 24V/1.3A	24V/2.5A	24V/3.75A	24V/5A	24V/10A
	Adjustable Voltage Range	±10%			±5%	±10%	
	Output Holding Time (Typ.) (at rated output) 100V AC	5V: 53ms, 12V: 34ms, 24V: 36ms	12V: 13ms, 24V: 15ms	13ms	20ms	30ms	
	Output Holding Time (Typ.) (at rated output) 230V AC	5V: 330ms 12V: 215ms 24V: 230ms	12V: 110ms 24V: 110ms	105ms	30ms	33ms	40ms
	Start Time (at rated input and output)	500ms max.	600ms max.	800ms max.		700ms max.	800ms max.
	Rise Time (at rated input and output)	5V, 12V: 200ms max. 24V: 250ms max.	200ms max.				
	Regulation: Input Fluctuation	0.4% max.					
	Regulation: Load Fluctuation	5V: 2.5% max. 12V, 24V: 1.0% max.	1.0% max.				
	Regulation: Temperature Change	0.05%/°C max. (-10 to +65°C)	12V: 0.05%/°C max. (-10 to +50°C) 24V: 0.05%/°C max. (-10 to +55°C)	0.05%/°C max. (-10 to +55°C)	0.05%/°C max. (-10 to +50°C)	0.05%/°C max. (-25 to +55°C)	0.05%/°C max. (-25 to +50°C)
	Regulation: Ripple (including noise)	5V: 8% p-p max. (-25 to -10°C) 12V: 6% p-p max. (-25 to -10°C) 24V: 4% p-p max. (-25 to -10°C)	12V: 6% p-p max. (-25 to -10°C) 24V: 4% p-p max. (-25 to -10°C)	4% p-p max. (-25 to -10°C)			
	Regulation: Ripple (including noise)	5V: 5% p-p max. (-10 to +0°C) 12V: 2.5% p-p max. (-10 to +0°C) 24V: 1.5% p-p max. (-10 to +0°C)	12V: 2.5% p-p max. (-10 to +0°C) 24V: 1.5% p-p max. (-10 to +0°C)	1.5% p-p max. (-10 to +0°C)			
	Regulation: Ripple (including noise)	5V: 2.5% p-p max. (0 to +65°C) 12V: 1.5% p-p max. (0 to +65°C) 24V: 1% p-p max. (0 to +65°C)	12V: 1.5% p-p max. (0 to +50°C) 24V: 1% p-p max. (0 to +55°C)	1% p-p max. (0 to +55°C)	1% p-p max. (0 to +50°C)	1% p-p max. (0 to +55°C)	1% p-p max. (0 to +50°C)
Overcurrent Protection		105% min. (auto reset)			101% min. (auto reset)	105% min. (auto reset)	
Operation Indicator		LED (green)					
Dielectric Strength	Between input and output terminals	3,000V AC, 1 minute					
Dielectric Strength	Between input and ground terminals	2,000V AC, 1 minute					
Dielectric Strength	Between output and ground terminals	500V AC, 1 minute					
Insulation Resistance		Between input and output terminals: 100MΩ min. (500V DC megger) Between input and ground terminals: 100MΩ min. (500V DC megger)					
Operating Temperature[4] (No freezing)		-25 to +75°C	-25 to +70°C		-25 to +65°C		
Operating Humidity		20 to 90% RH (no condensation)					
Storage Temperature (No freezing)		-25 to +75°C					
Storage Humidity		20 to 90% RH (no condensation)					
Vibration Resistance		10 to 55Hz, amplitude 0.375mm, 2 hours each in 3 axes (when used with BNL6 end clips)		10 to 55Hz, amplitude 0.33mm, 2 hours each in 3 axes (when used with BNL6 end clips) 10 to 55Hz, amplitude 0.375mm, 2 hours each in 3 axes (when used with BNL8 end clips)		10 to 55Hz, amplitude 0.21mm, 2 hours each in 3 axes (when used with BNL6 end clips) 10 to 55Hz, amplitude 0.375mm, 2 hours each in 3 axes (when used with BNL8 end clips)	10 to 55 Hz, amplitude 0.375mm, 2 hours each in 3 axes (when used with part no. BNL6 mounting clips)
Shock Resistance		300 m/s^2 (30G), 3 times each in 6 directions					
Expected Life[5]		8 years minimum (at the rated input, 50% load, operating temperature +40°C, standard mounting direction)					
EMC	EMI	EN61204-3 (Class B)					
EMC	EMS	EN61204-3 (industrial)					
Safety Standards		UL508 (Listing), UL1310 Class 2, ANSI/ISA-12.12.01 CSA C22.2 No. 107.1, 213, 223 EN60950-1, EN50178				UL508 (Listing) ANSI/ISA-12.12.01 CSA C22.2 No. 107.1, 213 EN60950-1, EN50178	
Other Standard		SEMI F47 (at 208V AC input only)					
Degree of Protection		IP20 (EN60529)					
Dimensions (mm)		90H × 22.5W × 95D		95H × 36W × 108D		115H × 46W × 121D	125H × 60W × 125D
Weight (approx.)		140g	150g	260g	310g	470g	960g
Terminal Screw		M3.5					

At normal temperature and humidity unless otherwise specified.
Note 1: DC input voltage is not subject to safety standards. When using on DC input, connect a fuse to the input terminal for DC input protection.
Note 2: Under stable state.
Note 3: PS5R-VB05 (5V DC/2.0A) is 10W (Up to 3.0A at Ta = 0 to 40°C. Not subject to safety standards above 2.0A.)
Note 4: See the output derating curves on page 3.
Note 5: Calculation of the expected life is based on the actual life of the aluminum electrolytic capacitor. The expected life depends on operating conditions.

PHASE MONITOR RELAYS

Phase Loss, Phase Reversal, Phase Unbalance, and Under/Over Voltage

PMP Series Plug-in

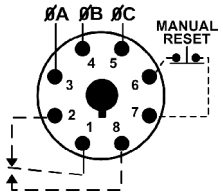
- Universal voltage range of 208-480V on PMPU provides the flexibility to cover a variety of applications with one unit
- Protects against phase loss, phase reversal, phase unbalance, undervoltage and overvoltage
- Variety of user-selectable and adjustable settings for the ultimate in three-phase protection
- Automatic & Manual Reset in Same Unit
- Multi-Color LED indicates normal condition and provides specific fault indication to simplify troubleshooting
- Compact plug-in case utilizing industry-standard 8 pin octal socket
- 10A SPDT output contacts
- c UL us CE UL LISTED

(with appropriate socket)

The PMP Series Phase Monitor Relays utilize a microprocessor-based design to provide protection against phase loss, phase reversal, phase unbalance, undervoltage and overvoltage. The PMPU is a universal voltage product that works on any three-phase system voltage from 208-480V (a separate 120V version is available). These devices are designed to be compatible with most Wye or Delta systems with no connection to Neutral required. PMP Series products protect against unbalanced voltages or single phasing regardless of any regenerative voltages.

The relay is energized when the phase sequence and all voltages are correct. Any one of five fault conditions will de-energize the relay. As standard, re-energization is automatic upon correction of the fault condition. Manual reset is available if a momentary N.C. switch is wired to the appropriate terminals. A multi-color LED indicates normal condition and also provides specific fault indication to simplify troubleshooting.

The PMP Series offers a variety of user-adjustable settings. The percent phase unbalance is adjustable from 2-10%, and also has a "Disable" setting for those applications where poor voltage conditions could cause nuisance tripping. The undervoltage drop-out can be set at 80-95% of operating voltage (overvoltage setting is fixed at 110% of nominal). The adjustable time delay drop-out on undervoltage (0.1-20 seconds) eliminates nuisance tripping caused by momentary voltage fluctuations. There is also an adjustable time delay (1-300 seconds) on both power up and restart after a fault has been cleared.

PROTECTS AGAINST	NOMINAL VOLTAGE▲ 50/60 Hz	PRODUCT NUMBER	WIRING/SOCKET ■
Phase Loss, Phase Reversal, Phase Unbalance, Undervoltage & Overvoltage	120V	PMP120	8 Pin Octal **70169-D**  **DIAGRAM 104**
	208-480V	PMPU *	

▲ Phase-to-Phase (Line-to-Line).
* Requires a 600V-rated socket when used on system voltages above 300V.
■ See Pages 80 & 81 for **Sockets & Accessories**.

MACROMATIC

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PHASE MONITOR RELAYS

Phase Loss, Phase Reversal, Phase Unbalance, and Under/Over Voltage

PMP Series Plug-in

Application Data & Dimensions

Application Data

Phase Loss:
Unit trips on loss of any Phase A, B or C.

Phase Reversal:
Unit trips if rotation (sequence) of the three phases is anything other than A-B-C.

Undervoltage:
Adjustable from 80-95% of nominal voltage. Unit trips when the average of all three lines is less than the adjusted set point for a period longer than the adjustable time delay drop-out.

Overvoltage:
Fixed at 110% of nominal voltage. Unit trips when the average of all three lines is greater than the fixed set point for a period longer than the time delay drop-out.

Phase Unbalance:
Adjustable from 2 - 10% unbalance. Unit trips when any one of the three lines deviates from the average of all three lines by more than the adjusted set point. There is also a "Disable" setting adjustment that will turn off the Phase Unbalance Protection if nuisance tripping is a problem.

Output Contacts:
SPDT: 10A @ 240V AC/30V DC, 1/2HP @ 240V AC

Life:
Mechanical: 10,000,000 operations
Full Load: 100,000 operations

Response Times:

Power Up & Restart After Fault:	1 - 300 seconds adjustable
Drop-out Due to Fault:	
Phase Loss & Reversal	100ms fixed
Phase Unbalance	2 seconds fixed
Undervoltage	0.1 - 20 seconds adjustable
Overvoltage	Fixed Time Based on Inverse Time Curve

Hysteresis: 2 - 3%

Load (Burden): Less than 3VA

Temperature: -28° to 65°C (-18° to 149°F)

Mounting:
Uses an 8 pin octal socket. Requires a 600V-rated socket when used on system voltages greater than 300V (Macromatic Product Number 70169-D--see Page 80).

Indicator LED:

LED Status	Indicator
Green Steady	Normal / Relay ON
Green Flashing	Power Up / Restart Delay
Red Steady	Unbalance
Red Flashing	Undervoltage / Overvoltage
Amber Steady	Reversal
Amber Flashing	Loss
Green / Red Alternating	Undervoltage / Overvoltage Trip Pending
Red / Amber Alternating*	Nominal Voltage Set Error

* Applies to 208-480V units only.

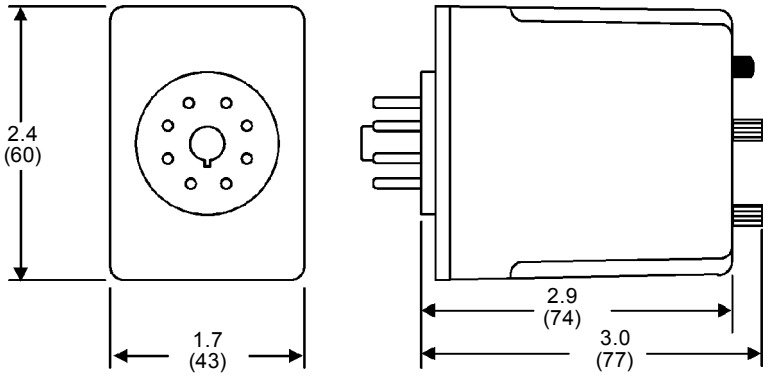
Reset:
As standard, reset is automatic upon correction of fault. When a momentary-contact N.C. switch is wired across the Manual Reset terminals (6 & 7), the unit switches to manual reset mode and remote manual reset is available.

Approvals:
c UL us
File #E109466

CE
Low Voltage & EMC Directives
EN60947-1, EN60947-5-1

UL LISTED IND. CONT. EQUIP. 5U07
with appropriate socket
File #E109466

Dimensions



All Dimensions in Inches (Millimeters)

Product Data Sheet

JDL36200

Molded Case Circuit Breaker (J-Frame) 200A, 3-Pole, 600 Vac/250 Vdc, 80% Rated

SQUARE D by Schneider Electric

Technical Characteristics

Adjustable Magnetic Trip	Low: 1000A - High: 2000A
Weight	5 Pounds
Ampere Rating	200A
For Use With	Industrial Enclosures and Switchboards
Frame Type	J-Frame
HACR Rated	Yes
Interrupting Rating	25kA@240VAC - 18kA@480VAC - 14kA@600VAC - 20kA@250VDC
Marketing Trade Name	Powerpact
Circuit Breaker Rating	80% Rated
General Application	Provides overload and short circuit protection
Voltage Rating	600VAC/250VDC
Number of Poles	3-Pole
Approvals	UL Listed - CSA Certified - IEC Rated
Circuit Breaker Type	Standard
Mounting Type	Unit Mount
Terminal Type	Line: Lug - Load: Lug
Wire Size	#3/0 to 350 AWG/kcmil(Al/Cu)
Depth	5.00 Inches
Height	7.52 Inches
Width	4.12 Inches

Shipping and Ordering

Category	01110 -
Discount Schedule	DE2
GTIN	00785901955856
Package Quantity	1
Weight	4.79 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y
Country of Origin	US

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

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Schneider Electric

Product Data Sheet

9421LS13

OPERATING MECHANISM LONG SHAFT NEMA

Technical Characteristics

For Use With	9421LG7 or LJ7 Operating Mechanisms
Shaft Type	Long

Shipping and Ordering

Category	21731 - Mechanism, Operating, Door Mounted, For Circuit Breakers, Type L
Discount Schedule	CP1
GTIN	00785901499336
Package Quantity	1
Weight	2.2 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y
Country of Origin	MX

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

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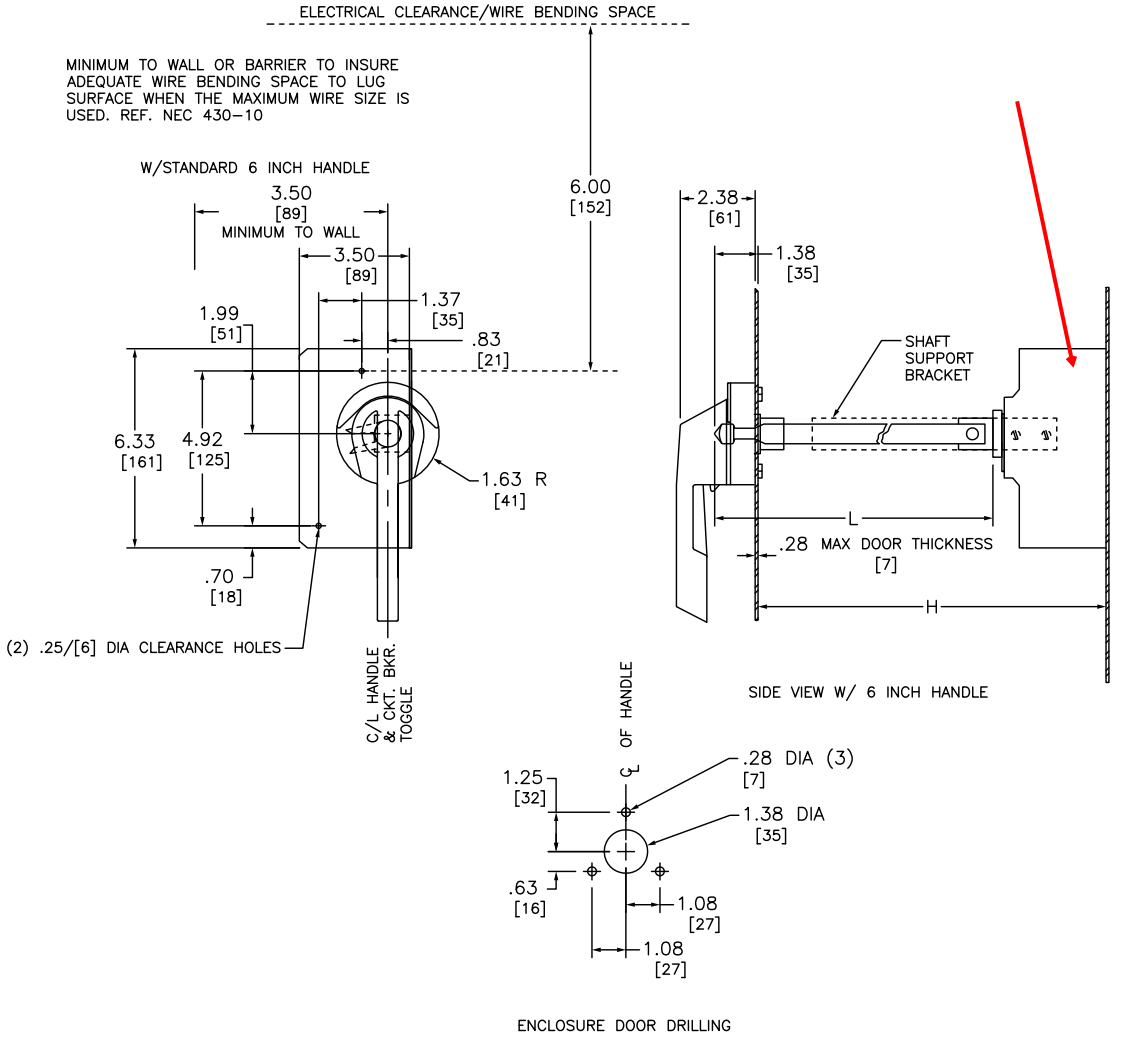
TYPE	HANDLE LENGTH (INCHES)	HANDLE CAT. NUM.	SHAFT TYPE	SHAFT CAT. NUM.
LJ1	6	LH6	STANDARD	LS8
LJ4	6	LH6	LONG	LS13

DIMENSION H W/STANDARD SHAFT		DIMENSION H W/LONG SHAFT	
MIN	MAX	MIN	MAX
5.50/[140]	10.75/[273]	5.50/[140]	21.38/[543]

SHAFT LENGTH FORMULA: L=H−3/[76]
MOUNTING DEPTH (H): MEASURED FROM THE CIRCUIT BREAKER MOUNTING SURFACE TO THE OUTSIDE OF THE ENCLOSURE DOOR.

IF THE SHAFT LENGTH IS GREATER THAN 10/[254] A SHAFT SUPPORT BRACKET MUST BE USED.



CATALOG NUMBER: 9421−LJ1, LJ4, LJ7
RATINGS: FOR USE W/POWERPACT H & J 3 POLE CIRCUIT BREAKER
UL FILE/CCN: E62922/DIHS2
MEETS STANDARDS: −
WEIGHT: −
WIRE SIZE: −
TERMINAL TORQUE: −
MOUNTING HWD: (2) M5 x .8 DIA SCREWS

OPERATING MECHANISM
CLASS 9421
TYPE LJ1, LJ4, LJ7
LZ250..., LZL250L...

SQUARE D
Schneider Electric

DWG# NO. 9422 LJ_OUTLINE_001

NOVEMBER 2005

Product Data Sheet

9421LH6

OPERATING MECHANISM HANDLE NEMA

Technical Characteristics

Enclosure Type	Rated for NEMA 1/3R/12 Enclosures
For Use With	9421LG7, LF1, LK1, LJ7 or LL1 Operating Mechanisms
Handle Type	6 Inch Handle - Painted Black

Shipping and Ordering

Category	21731 - Mechanism, Operating, Door Mounted, For Circuit Breakers, Type L
Discount Schedule	CP1
GTIN	00785901830108
Package Quantity	1
Weight	2.34 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y
Country of Origin	MX

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

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Product data sheet
Characteristics

HDL36125
MOLDED CASE CIRCUIT BREAKER 600V 125A

Main

Commercial Status	Commercialised
Product or component type	Molded Case Circuit Breaker
Range of product	PowerPact H
[In] rated current	125 A
Product certifications	CSA IEC UL listed
[Ue] rated operational voltage	250 V DC 600 V AC
Mounting mode	Unit mount
Poles description	3P
Breaking capacity	20 kA 250 V DC 14 kA 600 V AC 18 kA 480 V AC 25 kA 240 V AC
[Ics] rated service short-circuit breaking capacity	80 %
Electrical connection	Lugs line 14...3/0 AWG aluminium/copper Lugs load 14...3/0 AWG aluminium/copper
Trip unit technology	Thermal-magnetic
Magnetic hold current	900 A
Magnetic tripping current	1700 A

Ordering and shipping details

Category	01110 - HD,JD UNIT MT BREAKER/SWITCH
Discount Schedule	DE2
GTIN	00785901955849
Nbr. of units in pkg.	1
Package weight(Lbs)	4.07
Returnability	Y
Country of origin	US

Offer Sustainability

Sustainable offer status	Not Green Premium product
RoHS	Compliant - since 0832 - Schneider Electric declaration of conformity

Contractual warranty

Period	18 months

UL/CSA + IEC/EN 60947-2 + GB

C60BP - UL 489 - Z, C, D curves – Tunnel terminals

DB105727 DB105728 DB405227

UL 489 / CSA C22.2 No 5 / IEC/EN 60947-2 / GB 14048-2

As per the above standards:

C60BP are multi-standard miniature circuit breakers and branch circuit protection as defined by UL 489. It combines following functions:

- circuit protection against short-circuit currents
- circuit protection against overload currents
- tripping and electrical fault indication by the addition of auxiliaries.

PB116664-40

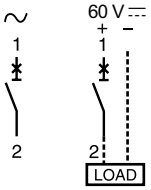
Number of 18 mm (0.71 in) poles	Rating (A) 25°C/77°F	Breaking capacity (kA rms) AIR UL 489 / CSA C22.2 No 5				Icu IEC 60947-2			
	Voltage (Ue)	277 V ~	240 V ~	120 V ~	60 V ⎓	440 V ~	415 V ~	240 V ~	60 V ⎓
1P	0.5 to 35	10	14	14	10	-	3	10	20
	40 to 63	-	10	10	10	-	3	10	20
	Voltage (Ue)	480Y/277 V ~		240 V ~	125 V ⎓	440 V ~	415 V ~	240 V ~	125 V ⎓
2P	1 to 25	10		14	10	6	10	20	-
	30 to 35	10		14	-	6	10	20	-
3P	1 to 35	10		14	-	6	10	20	-
2P/3P	40 to 63	-		10	-	6	10	20	-

PB116665-40

Electrical diagrams

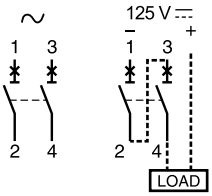
1P

DB408609



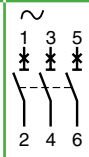
2P

DB408610



3P

DB408611



Catalog numbers

Tunnel terminal connection

Type	UL489 and CSA voltages	1P				2P			3P		
Auxiliaries		Remote indication and tripping, see page 49									
Rating (In)		Curve Z	C	D (=K)	Width in 9 mm (0.35 in) modules	Curve C	D (=K)	Width in 9 mm (0.35 in) modules	Curve C	D (=K)	Width in 9 mm (0.35 in) modules
C60BP											
0.5	480Y/277 V and 240 V	M9F44170	M9F42170	M9F43170	2	-	-	4	-	-	6
1		M9F44101	M9F42101	M9F43101		M9F42201	M9F43201		M9F42301	M9F43301	
2		M9F44102	M9F42102	M9F43102		M9F42202	M9F43202		M9F42302	M9F43302	
3		M9F44103	M9F42103	M9F43103		M9F42203	M9F43203		M9F42303	M9F43303	
4		M9F44104	M9F42104	M9F43104		M9F42204	M9F43204		M9F42304	M9F43304	
5		M9F44105	M9F42105	M9F43105		M9F42205	M9F43205		M9F42305	M9F43305	
6		M9F44106	M9F42106	M9F43106		M9F42206	M9F43206		M9F42306	M9F43306	
7		-	M9F42107	-		M9F42207	-		-	-	
8		M9F44108	M9F42108	M9F43108		M9F42208	M9F43208		M9F42308	M9F43308	
10		M9F44110	M9F42110	M9F43110		M9F42210	M9F43210		M9F42310	M9F43310	
13		-	M9F42113	-		M9F42213	-		-	-	
15		M9F44115	M9F42115	M9F43115		M9F42215	M9F43215		M9F42315	M9F43315	
20		M9F44120	M9F42120	M9F43120		M9F42220	M9F43220		M9F42320	M9F43320	
25		M9F44125	M9F42125	M9F43125		M9F42225	M9F43225		M9F42325	M9F43325	
30		M9F44130	M9F42130	M9F43130		M9F42230	M9F43230		M9F42330	M9F43330	
35		M9F44135	M9F42135	M9F43135		M9F42235	M9F43235		M9F42335	M9F43335	
40	240 V only	M9F44140	M9F42140	M9F43140	2	M9F42240	M9F43240	4	M9F42340	M9F43340	6
45		M9F44145	M9F42145	-		M9F42245	-		M9F42345	-	
50		M9F44150	M9F42150	-		M9F42250	-		M9F42350	-	
63		M9F44163	M9F42163	-		M9F42263	-		M9F42363	-	
Accessories		See page 62									

Product data sheet

Specifications

Variable speed drive, Altivar Process ATV600, ATV630, 37kW/50 hp, 380...480 V, IP21/UL type 1

ATV630D37N4

Product availability : Stock - Normally stocked in distribution facility

Price* : 6,608.40 USD

Main

Range of Product	Altivar Process ATV600
Product or Component Type	Variable speed drive
Product Specific Application	Process and utilities
Device short name	ATV630
Variant	Standard version
Product destination	Asynchronous motors Synchronous motors
EMC filter	Integrated 164.04 ft (50 m) EN/IEC 61800-3 category C2 Integrated 492.13 ft (150 m) EN/IEC 61800-3 category C3
IP degree of protection	IP21IEC 61800-5-1 IP21IEC 60529
[Us] rated supply voltage	380...480 V
Degree of protection	UL type 1 UL 508C
Type of cooling	Forced convection
Supply frequency	50...60 Hz - 5...5 %
[Us] rated supply voltage	380...480 V - 15...10 %
Motor power kW	37 kW normal duty) 30 kW heavy duty)
Maximum Horse Power Rating	50 hp normal duty 40 hp heavy duty
Line current	66.2 A 380 V normal duty) 57.3 A 480 V normal duty) 54.8 A 380 V heavy duty) 48.3 A 480 V heavy duty)
Prospective line Isc	50 kA
Apparent power	47.6 kVA 480 V normal duty) 40.2 kVA 480 V heavy duty)
Continuous output current	74.5 A 4 kHz normal duty 61.5 A 4 kHz heavy duty
Maximum transient current	82 A 60 s normal duty) 92.3 A 60 s heavy duty)
Asynchronous motor control profile	Variable torque standard Constant torque standard Optimized torque mode
Synchronous motor control profile	Permanent magnet motor Synchronous reluctance motor

* Price is “List Price” and may be subject to a trade discount – check with your local distributor or retailer for actual price.

Speed drive output frequency	0.1…500 Hz
Nominal switching frequency	4 kHz
Switching frequency	2...12 kHz adjustable 4...12 kHz with derating factor
Safety function	STO (safe torque off) SIL 3
Discrete input logic	16 preset speeds
Communication port protocol	Ethernet Modbus TCP Modbus serial
Option card	Slot A communication module, Profibus DP V1 Slot A communication module, PROFINET Slot A communication module, DeviceNet Slot A communication module, Modbus TCP/EtherNet/IP Slot A communication module, CANopen daisy chain RJ45 Slot A communication module, CANopen SUB-D 9 Slot A communication module, CANopen screw terminals Slot A/slot B digital and analog I/O extension module Slot A/slot B output relay extension module Slot A communication module, Ethernet IP/Modbus TCP/MD-Link communication module, BACnet MS/TP communication module, Ethernet Powerlink

Complementary

Mounting Mode	Wall mount
Phase	3 phase
Discrete output number	0
Discrete output type	Relay outputs R1A, R1B, R1C 250 V AC 3000 mA Relay outputs R1A, R1B, R1C 30 V DC 3000 mA Relay outputs R2A, R2C 250 V AC 5000 mA Relay outputs R2A, R2C 30 V DC 5000 mA Relay outputs R3A, R3C 250 V AC 5000 mA Relay outputs R3A, R3C 30 V DC 5000 mA
Output voltage	<= power supply voltage
Permissible temporary current boost	1.1 x In 60 s normal duty) 1.5 x In 60 s heavy duty)
Motor slip compensation	Not available in permanent magnet motor law Can be suppressed Adjustable Automatic whatever the load
Acceleration and deceleration ramps	Linear adjustable separately from 0.01...9999 s
Physical interface	Ethernet 2-wire RS 485
Braking to standstill	By DC injection
Protection type	Thermal protection motor Safe torque off motor Motor phase break motor Thermal protection drive Safe torque off drive Overheating drive Overcurrent between output phases and earth drive Overload of output voltage drive Short-circuit protection drive Motor phase break drive Overvoltages on the DC bus drive Line supply overvoltage drive Line supply undervoltage drive Line supply phase loss drive Overspeed drive Break on the control circuit drive
Transmission Rate	10, 100 Mbits 4800 bps, 9600 bps, 19200 bps, 38.4 Kbps
Frequency resolution	Display unit 0.1 Hz Analog input 0.012/50 Hz
Transmission frame	RTU
Electrical connection	Control removable screw terminals 0.5...1.5 mm² AWG 20...AWG 16 Line side screw terminal 35...50 mm² AWG 3...AWG 1

	Motor screw terminal 35...50 mm² AWG 3...AWG 1
Connector type	RJ45 on the remote graphic terminal)Ethernet/Modbus TCP RJ45 on the remote graphic terminal)Modbus serial
Data format	8 bits, configurable odd, even or no parity
Type of polarization	No impedance
Exchange mode	Half duplex, full duplex, autonegotiation Ethernet/Modbus TCP
Number of addresses	1…247 Modbus serial
Method of access	Slave Modbus TCP
Supply	External supply for digital inputs 24 V DC 19…30 V), <1.25 mA overload and short-circuit protection Internal supply for reference potentiometer (1 to 10 kOhm) 10.5 V DC +/- 5 %, <10 mA overload and short-circuit protection Internal supply for digital inputs and STO 24 V DC 21…27 V), <200 mA overload and short-circuit protection
Local signalling	for local diagnostic 3 LEDs for embedded communication status 3 LEDs (dual colour) for communication module status 4 LEDs (dual colour) for presence of voltage 1 LED (red)
Width	8.90 in (226 mm)
Height	26.50 in (673 mm)
Depth	10.67 in (271 mm)
Net Weight	62.17 lb(US) (28.2 kg)
Analogue input number	3
Analogue input type	AI1, AI2, AI3 software-configurable voltage 0...10 V DC 31.5 kOhm 12 bits AI1, AI2, AI3 software-configurable current 0...20 mA 250 Ohm 12 bits AI2 voltage analog input - 10...10 V DC 31.5 kOhm 12 bits
Discrete input number	8
Discrete input type	DI7, DI8 programmable as pulse input 0…30 kHz, 24 V DC <= 30 V)
Input compatibility	DI1...DI6 discrete input level 1 PLC EN/IEC 61131-2 DI5, DI6 discrete input level 1 PLC IEC 65A-68 STOA, STOB discrete input level 1 PLC EN/IEC 61131-2
Discrete input logic	Positive logic (source) DI1...DI8), < 5 V, > 11 V Negative logic (sink) DI1...DI8), > 16 V, < 10 V
Analogue output number	2
Analogue output type	Software-configurable voltage AQ1, AQ2 0...10 V DC 470 Ohm 10 bits Software-configurable current AQ1, AQ2 0...20 mA 10 bits Software-configurable current DQ-, DQ+ 30 V DC Software-configurable current DQ-, DQ+ 100 mA
Sampling duration	2 ms +/- 0.5 ms DI1...DI4) - discrete input 5 ms +/- 1 ms DI5, DI6) - discrete input 5 ms +/- 0.1 ms AI1, AI2, AI3) - analog input 10 ms +/- 1 ms AO1) - analog output
Accuracy	+/- 0.6 % AI1, AI2, AI3 for a temperature variation 60 °C analog input +/- 1 % AO1, AO2 for a temperature variation 60 °C analog output
Linearity error	AI1, AI2, AI3 +/- 0.15 % of maximum value analog input AO1, AO2 +/- 0.2 % analog output
Relay output number	3
Relay output type	Configurable relay logic R1 fault relay NO/NC 100000 cycles Configurable relay logic R2 sequence relay NO 100000 cycles Configurable relay logic R3 sequence relay NO 100000 cycles
Refresh time	Relay output R1, R2, R3)5 ms +/- 0.5 ms)
Minimum switching current	Relay output R1, R2, R3 5 mA 24 V DC
Maximum switching current	Relay output R1, R2, R3 resistive, cos phi = 1 3 A 250 V AC Relay output R1, R2, R3 resistive, cos phi = 1 3 A 30 V DC Relay output R1, R2, R3 inductive, cos phi = 0.4 7 ms 2 A 250 V AC Relay output R1, R2, R3 inductive, cos phi = 0.4 7 ms 2 A 30 V DC
Isolation	Between power and control terminals
Maximum output frequency	500 kHz

Maximum Input Current per Phase	66.2 A
Variable speed drive application selection	Compressor centrifugal Building - HVAC Other application Food and beverage processing Fan Mining mineral and metal Pump Mining mineral and metal Fan Oil and gas Other application Water and waste water Screw compressor Building - HVAC Pump Food and beverage processing Fan Food and beverage processing Atomization Food and beverage processing Electro submersible pump (ESP) Oil and gas Water injection pump Oil and gas Jet fuel pump Oil and gas Compressor for refinery Oil and gas Centrifuge pump Water and waste water Positive displacement pump Water and waste water Electro submersible pump (ESP) Water and waste water Screw pump Water and waste water Lobe compressor Water and waste water Screw compressor Water and waste water Compressor centrifugal Water and waste water Fan Water and waste water Conveyor Water and waste water Mixer Water and waste water
Motor power range AC-3	30…50 kW 380…440 V 3 phase 30…50 kW 480…500 V 3 phase
Quantity per Set	1
Enclosure mounting	Wall mounted

Environment

Insulation resistance	> 1 MOhm 500 V DC for 1 minute to earth
Noise level	63.5 dB 86/188/EEC
Power dissipation in W	Natural convection 106 W 380 V 4 kHz Forced convection 796 W 380 V 4 kHz
Volume of cooling air	63402.43 Gal/hr(US) (240 m3/h)
Operating position	Vertical +/- 10 degree
Maximum THDI	<48 % from 80...100 % of load IEC 61000-3-12
Electromagnetic compatibility	Electrostatic discharge immunity test level 3 IEC 61000-4-2 Radiated radio-frequency electromagnetic field immunity test level 3 IEC 61000-4-3 Electrical fast transient/burst immunity test level 4 IEC 61000-4-4 1.2/50 µs - 8/20 µs surge immunity test level 3 IEC 61000-4-5 Conducted radio-frequency immunity test level 3 IEC 61000-4-6
Pollution degree	2 EN/IEC 61800-5-1
Vibration resistance	1.5 mm peak to peak 2…13 Hz)IEC 60068-2-6 1 gn 13…200 Hz)IEC 60068-2-6
Shock resistance	15 gn 11 ms IEC 60068-2-27
Relative humidity	5…95 % without condensation IEC 60068-2-3
Ambient air temperature for operation	5…122 °F (-15…50 °C) without derating) 122…140 °F (50…60 °C) with derating factor)
Ambient Air Temperature for Storage	-40…158 °F (-40…70 °C)
Operating altitude	<= 3280.84 ft (1000 m) without derating 1000...4800 m with current derating 1 % per 100 m
Standards	UL 508C EN/IEC 61800-3 Environment 1 category C2 EN/IEC 61800-3 Environment 2 category C3 EN/IEC 61800-3 EN/IEC 61800-5-1 IEC 61000-3-12 IEC 60721-3 IEC 61508 IEC 13849-1
Product Certifications	DNV-GL TÜV ATEX INERIS CSA

	UL ATEX zone 2/22
Marking	CE
Standards	UL 508C EN/IEC 61800-3 EN/IEC 61800-3 environment 1 category C2 EN/IEC 61800-3 environment 2 category C3 EN/IEC 61800-5-1 IEC 61000-3-12 IEC 60721-3 IEC 61508 IEC 13849-1
Overvoltage category	III
Regulation loop	Adjustable PID regulator
Noise level	63.5 dB
Pollution degree	2

Ordering and shipping details

Category	22206-ATV630 FRAMES 3 & 4
Discount Schedule	CP4E
GTIN	3606480701429
Nbr. of units in pkg.	1
Package weight(Lbs)	72.75 lb(US) (33.0 kg)
Returnability	Yes
Country of origin	IN

Packing Units

Unit Type of Package 1	PCE
Package 1 Height	16.54 in (42.0 cm)
Package 1 width	12.99 in (33.0 cm)
Package 1 Length	31.50 in (80.0 cm)
Unit Type of Package 2	P06
Number of Units in Package 2	1
Package 2 Weight	83.78 lb(US) (38.0 kg)
Package 2 Height	30.31 in (77.0 cm)
Package 2 width	31.50 in (80.0 cm)
Package 2 Length	23.62 in (60.0 cm)
Unit Type of Package 3	PAL
Number of Units in Package 3	1
Package 3 Weight	83.78 lb(US) (38.0 kg)
Package 3 Height	20.47 in (52.0 cm)
Package 3 width	13.78 in (35.0 cm)
Package 3 Length	31.89 in (81.0 cm)

Offer Sustainability

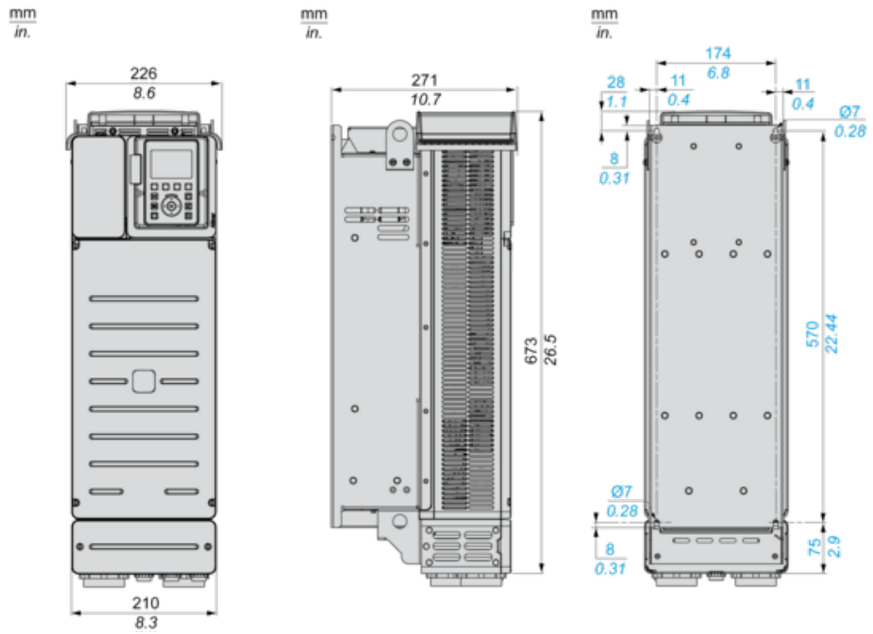
Sustainable offer status	Green Premium product
California proposition 65	WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov
REACh Regulation	REACh Declaration

EU RoHS Directive	Pro-active compliance (Product out of EU RoHS legal scope) EU RoHS Declaration
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS declaration
Environmental Disclosure	Product Environmental Profile
Circularity Profile	End of Life Information
WEEE	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins.
Upgradeability	Upgraded components available

Dimensions

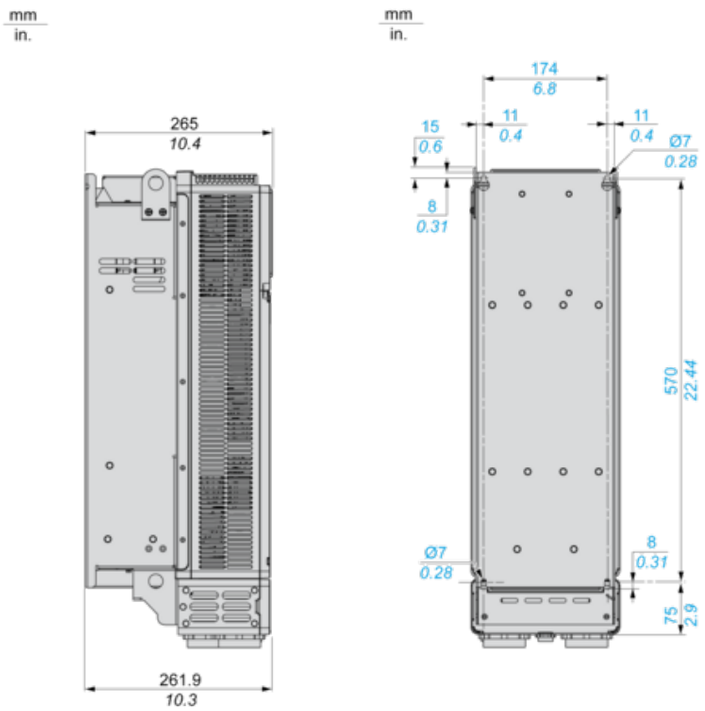
Drives with IP21 Top Cover

Front, Left and Rear Views

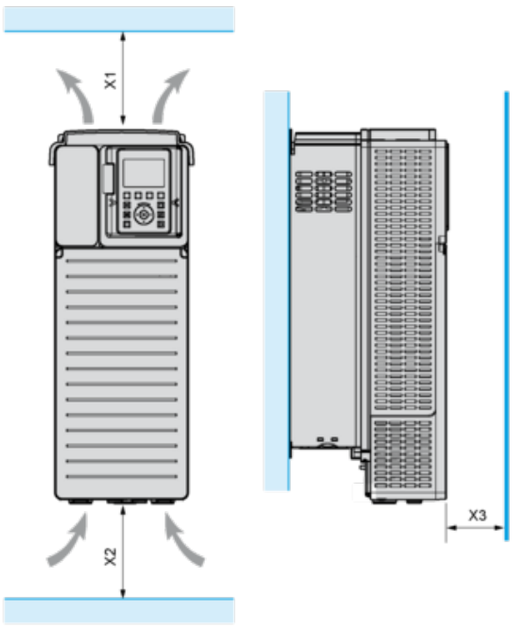


Drives Without IP21 Top Cover

Left and Rear Views



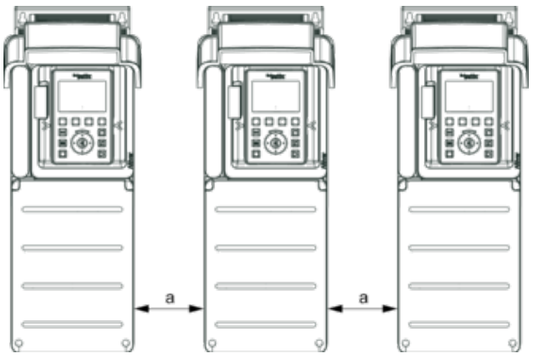
Clearances



X1	X2	X3
≥ 100 mm (3.94 in.)	≥ 100 mm (3.94 in.)	≥ 10 mm (0.39 in.)

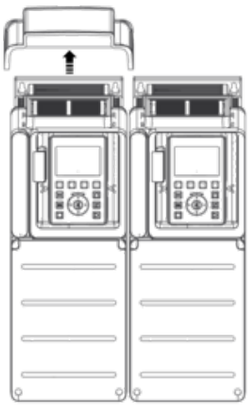
Mounting Types

Mounting Type A: Individual IP21

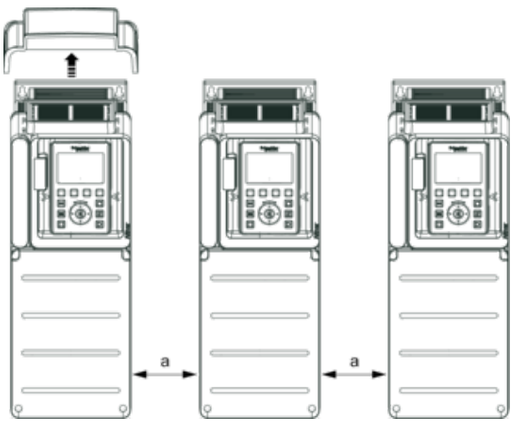


a ≥ = 110 mm (4.33 in.)

Mounting Type B: Side by Side IP20 (Possible, 2 Drives Only)



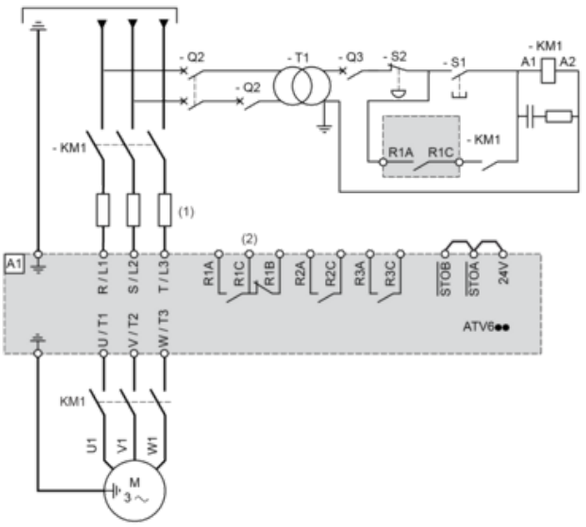
Mounting Type C: Individual IP20



a ≥ = 110 mm (4.33 in.)

Three-Phase Power Supply with Upstream Breaking via Line Contactor

Connection diagrams conforming to standards EN 954-1 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1



(1) Line choke if used

(2) Use relay R1 set to operating state Fault to switch Off the product once an error is detected.

A1 : Drive

KM1 : Line Contactor

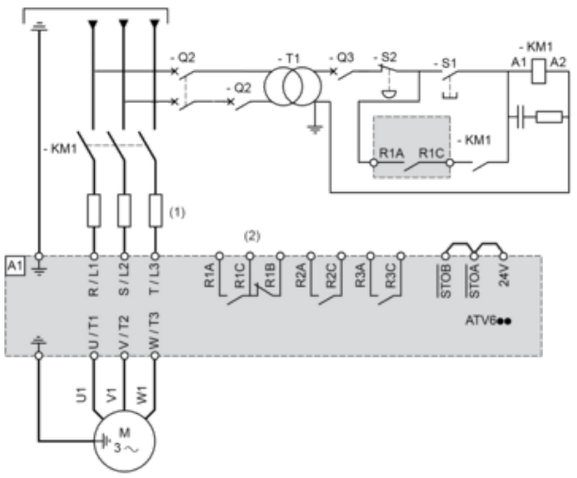
Q2, Q3 : Circuit breakers

S1, S2 : Pushbuttons

T1 : Transformer for control part

Three-Phase Power Supply with Downstream Breaking via Contactor

Connection diagrams conforming to standards EN 954-1 category 1 and IEC/EN 61508 capacity SIL1, stopping category 0 in accordance with standard IEC/EN 60204-1



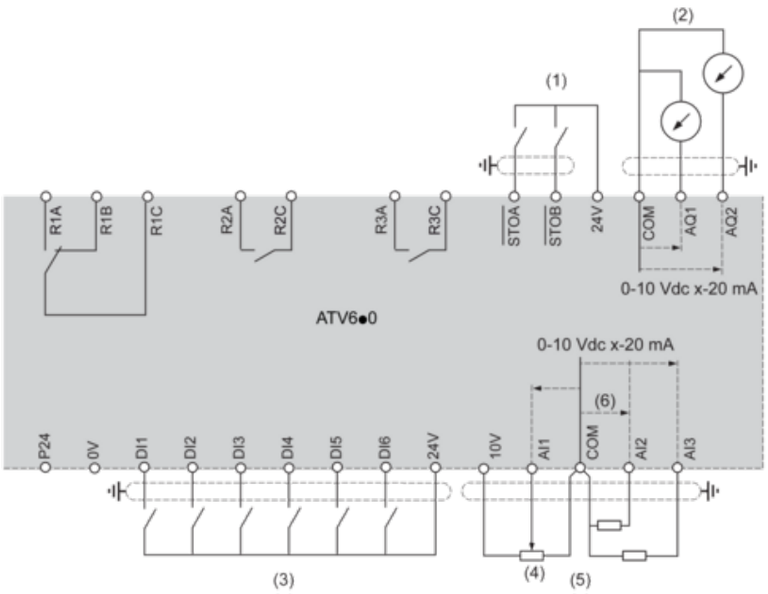
(1) Line choke if used

(2) Use relay R1 set to operating state Fault to switch Off the product once an error is detected.

A1 : Drive

KM1 : Contactor

Control Block Wiring Diagram



(1) Safe Torque Off

(2) Analog Output

(3) Digital Input

(4) Reference potentiometer

(5) Analog Input

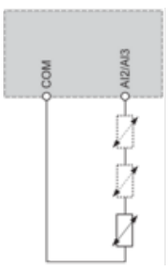
R1A, R1B, R1C : Fault relay

R2A, R2C : Sequence relay

R3A, R3C : Sequence relay

Sensor Connection

It is possible to connect either 1 or 3 sensors on terminals AI2 or AI3.

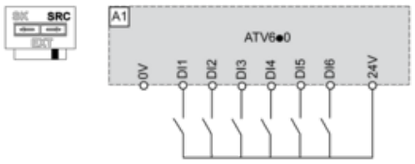


Sink / Source Switch Configuration

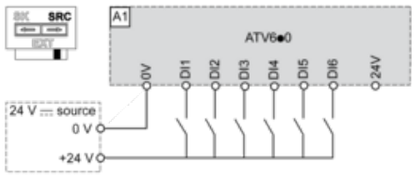
The switch is used to adapt the operation of the logic inputs to the technology of the programmable controller outputs.

- Set the switch to Source (factory setting) if using PLC outputs with PNP transistors.
- Set the switch to Ext if using PLC outputs with NPN transistors.

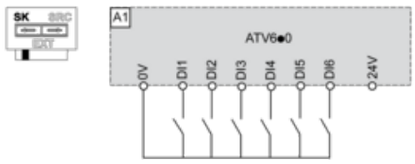
Switch Set to SRC (Source) Position Using the Output Power Supply for the Digital Inputs



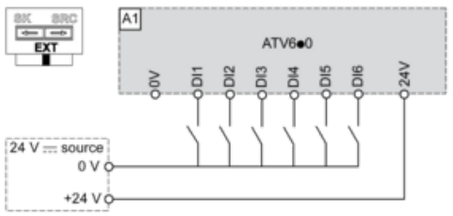
Switch Set to SRC (Source) Position and Use of an External Power Supply for the DIs



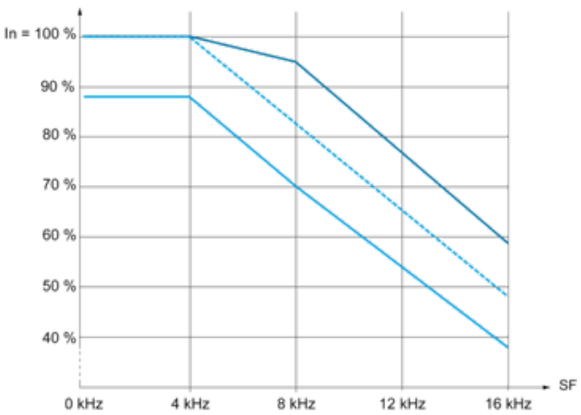
Switch Set to SK (Sink) Position Using the Output Power Supply for the Digital Inputs



Switch Set to EXT Position Using an External Power Supply for the DIs



Derating Curves



40 °C (104 °F) - Mounting type A, B and C
50 °C (122 °F) - Mounting type A, B and C
60 °C (140 °F) - Mounting type B and C

In : Nominal Drive Current

SF : Switching Frequency

Product data sheet
Characteristics

VW3A1112
door mounting kit - for remote graphic terminal - variable speed drive - IP65 / UL type 12

Product availability : Stock - Normally stocked in distribution facility

Main

Range of product	Altivar
Accessory / separate part category	Mounting and fixing accessory
Accessory / separate part type	Mounting kit
Accessory / separate part destination	Variable speed drive
Range compatibility	Altivar Easy 610 Altivar Process ATV600 Altivar Process ATV900 Altivar Machine ATV320 Altivar Machine ATV340
IP degree of protection	IP65

Complementary

Kit composition	Fixing nut Mounting plate Anti-rotation tee Tightening wrench

Ordering and shipping details

Category	22205 - ATV630 FRAMES 1 & 2
Discount Schedule	CP4E
GTIN	00785901623816
Nbr. of units in pkg.	1
Package weight(Lbs)	0.27000000000000002
Returnability	Y
Country of origin	CN

Offer Sustainability

RoHS (date code: YYWW)	Compliant - since 1430 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity

RJ12 and RJ45 Feedthrough Modules

The RJ12 and RJ45 feedthrough modules provide convenient break-out of wiring to terminal blocks.

Modules mount on 35mm DIN rail (part #DN-R35S1) or 15mm DIN rail (part #DN-R15S1).

ZL-RTB-RJ12

ZL-RTB-RJ45

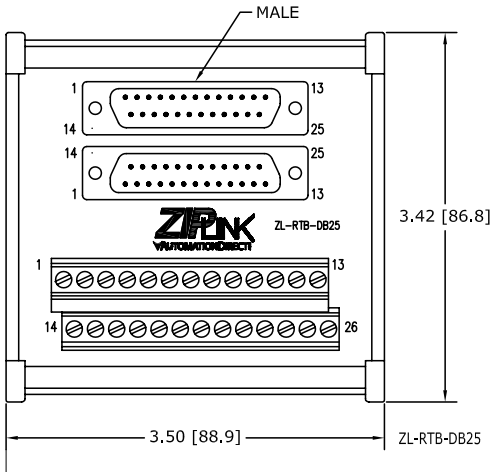
Specifications		
	Part #	
	ZL-RTB-RJ12	***ZL-RTB-RJ45***
Price	$29.00	$37.50
Pcs/Pkg	1	
Weight (lbs)	0.32	0.45
Description [3]	RJ12 Connector to terminal block	RJ45 Connector to terminal block
UL Voltage Rating [1]	30VDC	
Maximum Current per Circuit	1A	
Number of Circuits	6	8
Terminal Block Contacts	Copper alloy, tin-lead plated	
Wire Range (Rated Cross Section) [2]	12–24 AWG Solid or Stranded Copper Conductor (2.5 mm²)	
Wire Strip Length	0.24–0.27 in (6–7 mm)	
Screw Torque	4.4 in·lbs (0.5 N·m)	
Surrounding Temperature Range	32 to 140°F (0 to 60°C)	
Cable/Wire Clearance	0.5 in (12.7 mm) Required	
Mounting Restrictions	None	
Connecting Cables (Sold Separately)	ZL-RJ12-CBL-2, ZL-RJ12-CBL-2P, GS-RJ12-CBL-2, SVC-232RJ12-CBL-2 Click on link: Connection Cable Specifications Tables	Cat5e Cable w/RJ45 connectors
Approvals	File # E200031 UL, cUL, Class 1, Division 2, Groups A,B,C,D Hazardous Locations, CE, EN 61131-2:2007	File # E139594 UL, cUL, CE EN 61131-2:2007

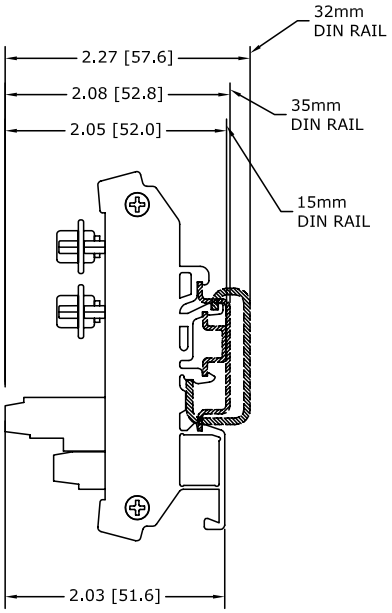
1 Use Class 2 power supply.
2 Use conductors rated for 60°/75°C.
3 Connecting cables are for internal wiring only.

Note: See wiring details and dimensional drawings on our Web site at: http://www.automationdirect.com/static/manuals/ziplinks/ziplinks.html.

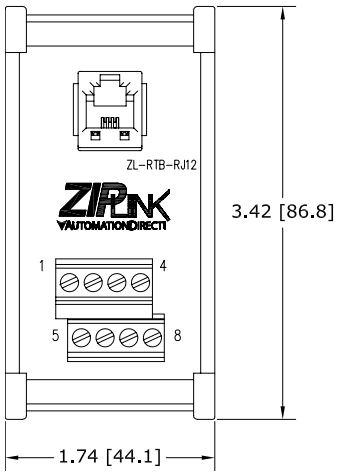
Module Dimensions

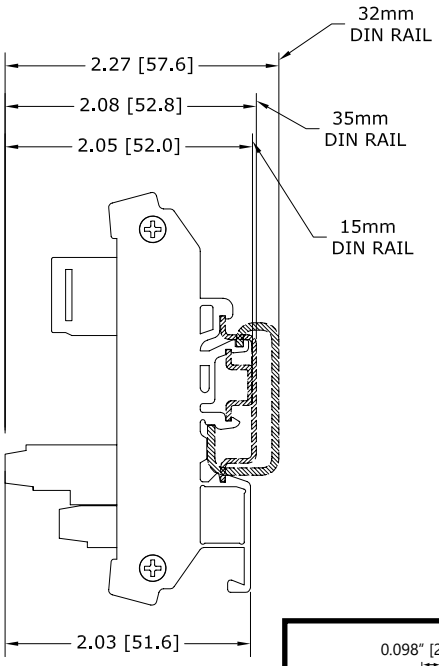
ZL-RTB-DB09/15/25

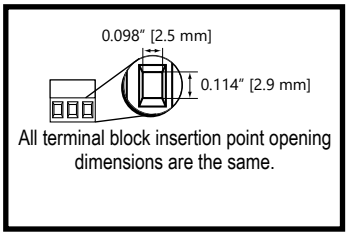




ZL-RTB-RJ12





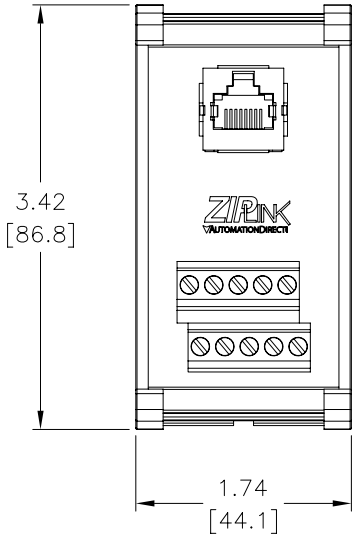


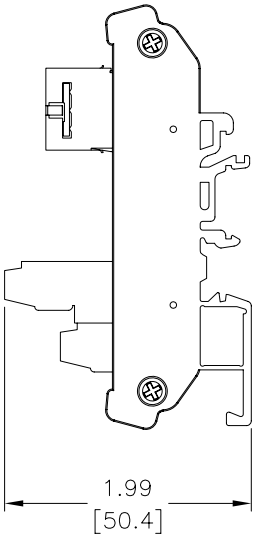
All terminal block insertion point opening dimensions are the same.

Note: Dimensions shown in Inches [mm]

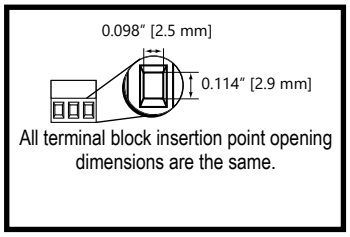
Module Dimensions

ZL-RTB-RJ45





Note: Dimensions shown in Inches [mm]



Product data sheet
Characteristics

LC1D80G7
TeSys D contactor - 3P(3 NO) - AC-3 - <= 440 V 80 A - 120 V AC 50/60 Hz coil

Product availability : Stock - Normally stocked in distribution facility

Main

Range of product	TeSys D
Range	TeSys
Product name	TeSys D
Product or component type	Contactor
Device short name	LC1D
Contactor application	Resistive load Motor control
Utilisation category	AC-3 AC-1
Poles description	3P
Pole contact composition	3 NO
System Voltage	<= 690 V AC power circuit <= 300 V DC 25...400 Hz power circuit
[Ie] rated operational current	80 A (<= 140 °F (60 °C)) at <= 440 V AC AC-3 power circuit 125 A (<= 140 °F (60 °C)) at <= 440 V AC AC-1 power circuit
Motor power kW	45 kW at 1000 V AC 50/60 Hz 22 kW at 220...230 V AC 50/60 Hz 45 kW at 415...440 V AC 50/60 Hz 45 kW at 660...690 V AC 50/60 Hz 37 kW at 380...400 V AC 50/60 Hz 55 kW at 500 V AC 50/60 Hz
Motor power hp	25 hp at 230/240 V AC 50/60 Hz 3 phases motors 60 hp at 460/480 V AC 50/60 Hz 3 phases motors 15 hp at 230/240 V AC 50/60 Hz 1 phase motors 20 hp at 200/208 V AC 50/60 Hz 3 phases motors 7.5 hp at 115 V AC 50/60 Hz 1 phase motors 60 hp at 575/600 V AC 50/60 Hz 3 phases motors
Control circuit type	AC 50/60 Hz
Control circuit voltage	120 V AC 50/60 Hz
Auxiliary contact composition	1 NO + 1 NC

[Uimp] rated impulse withstand voltage	Conforming to IEC 60947
Overvoltage category	III
[Ith] conventional free air thermal current	10 A at <= 140 °F (60 °C) signalling circuit 125 A at <= 140 °F (60 °C) power circuit
Irms rated making capacity	140 A AC signalling circuit conforming to IEC 60947-5-1 1100 A at 440 V power circuit conforming to IEC 60947 250 A DC signalling circuit conforming to IEC 60947-5-1
Rated breaking capacity	1100 A at 440 V power circuit conforming to IEC 60947
[Icw] rated short-time withstand current	135 A <= 104 °F (40 °C) 10 min power circuit 140 A 100 ms signalling circuit 100 A 1 s signalling circuit 990 A <= 104 °F (40 °C) 1 s power circuit 320 A <= 104 °F (40 °C) 1 min power circuit 120 A 500 ms signalling circuit 640 A <= 104 °F (40 °C) 10 s power circuit
Associated fuse rating	200 A gG at <= 690 V coordination type 1 power circuit 10 A gG signalling circuit conforming to IEC 60947-5-1 160 A gG at <= 690 V coordination type 2 power circuit
Average impedance	0.8 mOhm at 50 Hz - Ith 125 A power circuit
[Ui] rated insulation voltage	1000 V power circuit conforming to IEC 60947-4-1 600 V power circuit certifications UL 600 V signalling circuit certifications UL 600 V power circuit certifications CSA 600 V signalling circuit certifications CSA 690 V signalling circuit conforming to IEC 60947-1
Electrical durability	0.8 Mcycles 125 A AC-1 at Ue <= 440 V 1.5 Mcycles 80 A AC-3 at Ue <= 440 V
Power dissipation per pole	5.1 W AC-3 12.5 W AC-1
Protective cover	With
Mounting support	Rail Plate
Standards	IEC 60947-4-1 IEC 60947-5-1 EN 60947-4-1 CSA C22.2 No 14 UL 508 EN 60947-5-1
Product certifications	DNV CSA UL BV LROS RINA GL GOST CCC
Connections - terminals	Control circuit: screw clamp terminals 1 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: flexible - without cable end Power circuit: connector 2 cable(s) 0.01...0.04 in² (4...25 mm²) - cable stiffness: flexible - without cable end Control circuit: screw clamp terminals 2 cable(s) 0...0 in² (1...2.5 mm²) - cable stiffness: flexible - with cable end Power circuit: connector 2 cable(s) 0.01...0.04 in² (4...25 mm²) - cable stiffness: solid - without cable end Control circuit: screw clamp terminals 2 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: solid - without cable end Control circuit: screw clamp terminals 1 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: solid - without cable end Control circuit: screw clamp terminals 2 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: flexible - without cable end Power circuit: connector 1 cable(s) 0.01...0.08 in² (4...50 mm²) - cable stiffness: flexible - with cable end Power circuit: connector 1 cable(s) 0.01...0.08 in² (4...50 mm²) - cable stiffness: solid - without cable end Power circuit: connector 1 cable(s) 0.01...0.08 in² (4...50 mm²) - cable stiffness: flexible - without cable end Power circuit: connector 2 cable(s) 0.01...0.02 in² (4...16 mm²) - cable stiffness: flexible - with cable end

	Control circuit: screw clamp terminals 1 cable(s) 0...0 in² (1...2.5 mm²) - cable stiffness: flexible - with cable end
Tightening torque	Power circuit: 79.65 lbf.in (9 N.m) - on connector - with screwdriver flat Ø 6 to Ø 8 mm Control circuit: 10.62 lbf.in (1.2 N.m) - on screw clamp terminals - with screwdriver Philips No 2 Power circuit: 79.65 lbf.in (9 N.m) - on connector hexagonal 0.16 in (4 mm) Control circuit: 10.62 lbf.in (1.2 N.m) - on screw clamp terminals - with screwdriver flat Ø 6 mm
Operating time	6...20 ms opening 20...35 ms closing
Safety reliability level	B10d = 1369863 cycles contactor with nominal load conforming to EN/ISO 13849-1 B10d = 20000000 cycles contactor with mechanical load conforming to EN/ISO 13849-1
Mechanical durability	4 Mcycles
Operating rate	3600 cyc/h at <= 140 °F (60 °C)

Complementary

Coil technology	Without built-in suppressor module
Control circuit voltage limits	0.8...1.1 Uc operational at 55 °C, AC 50 Hz 0.85...1.1 Uc operational at 55 °C, AC 60 Hz 0.3...0.6 Uc drop-out at 55 °C, AC 50/60 Hz
Inrush power in VA	245 VA at 68 °F (20 °C) (cos ϕ 0.75) 60 Hz 245 VA at 68 °F (20 °C) (cos ϕ 0.75) 50 Hz
Hold-in power consumption in VA	26 VA at 68 °F (20 °C) (cos ϕ 0.3) 50 Hz 26 VA at 68 °F (20 °C) (cos ϕ 0.3) 60 Hz
Heat dissipation	6...10 W at 50/60 Hz
Auxiliary contacts type	Type mirror contact (1 NC) conforming to IEC 60947-4-1 Type mechanically linked (1 NO + 1 NC) conforming to IEC 60947-5-1
Signalling circuit frequency	25...400 Hz
Minimum switching current	5 mA signalling circuit
Minimum switching voltage	17 V signalling circuit
Non-overlap time	1.5 ms on de-energisation (between NC and NO contact) 1.5 ms on energisation (between NC and NO contact)
Insulation resistance	> 10 MOhm signalling circuit
Contact compatibility	M11
Compatibility code	LC1D

Environment

IP degree of protection	IP2x front face conforming to IEC 60529
Protective treatment	TH conforming to IEC 60068-2-30
Pollution degree	3
Ambient air temperature for operation	23...140 °F (-5...60 °C)
Ambient air temperature for storage	-76...176 °F (-60...80 °C)
Permissible ambient air temperature around the device	-40...158 °F (-40...70 °C) at Uc
Operating altitude	9842.52 ft (3000 m) without derating in temperature
Fire resistance	1562 °F (850 °C) conforming to IEC 60695-2-1
Flame retardance	V1 conforming to UL 94
Mechanical robustness	Shocks contactor closed 10 Gn for 11 ms Vibrations contactor closed 3 Gn, 5...300 Hz Shocks contactor open 8 Gn for 11 ms Vibrations contactor open 2 Gn, 5...300 Hz
Height	5 in (127 mm)
Width	3.35 in (85 mm)
Depth	5.12 in (130 mm)
Product weight	3.51 lb(US) (1.59 kg)

Ordering and shipping details

Category	22345 - CTR,D-LINE,OPEN,NONREV-NEW
Discount Schedule	I12

GTIN	00785901440864
Nbr. of units in pkg.	1
Package weight(Lbs)	3.4399999999999999
Returnability	Y
Country of origin	CZ

Offer Sustainability

Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 0701 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold Reference not containing SVHC above the threshold
Product environmental profile	Available
Product end of life instructions	Need no specific recycling operations

Contractual warranty

Warranty period	18 months

Product data sheet

Specifications

Mechanical interlock, TeSys Deca contactors LC1D40A-D80A LC1DT60A-DT80A

LAD4CM

Product availability : Stock - Normally stocked in distribution facility

Price* : 54.00 USD

Main

Range of Product	TeSys Deca
Range	TeSys
Device short name	LAD4
Product or Component Type	Mechanical interlock
Accessory / separate part category	Interlocking accessory
Interlocking type	Mechanical
Poles description	4P 3P
Electrical circuit type	Reversing Changeover
Range compatibility	TeSys (TeSys D) contactor
Product Compatibility	LC1D40A LC1D50A LC1D65A LC1D80A LC1DT60A LC1DT80A

Complementary

Net Weight	0.09 lb(US) (0.04 kg)

Ordering and shipping details

Category	22341-CONTACTOR,D,K,&F ACCESS
Discount Schedule	I12
GTIN	3389119410045
Returnability	Yes
Country of origin	CZ

Packing Units

Unit Type of Package 1	Db
Number of Units in Package 1	1
Package 1 Height	0.98 in (2.5 cm)

* Price is “List Price” and may be subject to a trade discount – check with your local distributor or retailer for actual price.

Package 1 Width	3.94 in (10.0 cm)
Package 1 Length	3.94 in (10.0 cm)
Package 1 Weight	1.46 oz (41.5 g)
Unit Type of Package 2	S01
Number of Units in Package 2	50
Package 2 Height	5.91 in (15.0 cm)
Package 2 Width	5.91 in (15.0 cm)
Package 2 Length	15.75 in (40.0 cm)
Package 2 Weight	5.01 lb(US) (2.273 kg)

Offer Sustainability

Sustainable offer status	Green Premium product
REACh Regulation	REACh Declaration
REACh free of SVHC	Yes
EU RoHS Directive	Compliant EU RoHS Declaration
Toxic heavy metal free	Yes
Mercury free	Yes
China RoHS Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
RoHS exemption information	Yes
Environmental Disclosure	Product Environmental Profile
WEEE	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins.

Contractual warranty

Warranty	18 months

Recommended replacement(s)

TeSys® DF Fuseholders

Provides simple and effective protection in a modular style

For protection of low voltage equipment against potentially damaging short circuits, fuses are a simple and effective solution to reduce risk of equipment damage. TeSys® DF Fuseholders by Schneider Electric provide the flexibility to integrate Class CC fuses into your applications.

TeSys fuseholders offer a compact, modular configuration that are DIN rail mountable. For increased focus on worker safety, their fingersafe design meets IP-20 grade protection for compliance with IEC standards.

The modular design meets a wide variety of application needs, including single pole, single pole + neutral, 2 pole, 3 pole, 3 pole + neutral, with various cylindrical cartridge fuse sizes available.

Key Features:

- Version for Class CC fuses
- Fuses from 0.5A to 125A
- Cylindrical cartridge fuses: 8x32, 10x38, 14x51 and 22x58 up to 690V, from 0.5 to 125Amps
- LED blown fuse indicator
- Din rail mountable
- High breaking capacity 120kA / 500V and 80kA / 690V
- Multi-pole configurations 1P, N, 1P+N, 2P, 3P, 3P+N
- Certifications: IEC 60947-3, UL512 and CSA, RoHS compliant
- Protection against direct finger contact

Make the most of your energy℠

Schneider Electric

TeSys® DF Fuseholders

Fuseholders[1]				
Conventional Thermal Current (Ith)	Size of Cartridge Fuse or Link	Composition P=Poles	Sold in Lots of	Catalog Number
30 A	Class CC	1 P	12	DFCC1
		2 P	6	DFCC2
		3 P	4	DFCC3
Fuseholders with "Blown Fuse" Indicators (neon) (1)				
30 A	Class CC	1 P	12	DFCC1V
		2 P	6	DFCC2V
		3 P	4	DFCC3V

Fuseholders[1]				
Conventional Thermal Current (Ith)	Size of Cartridge Fuse or Link mm (inch)	Composition P=Poles N=Neutral	Sold in Lots of	Catalog Number
25 A	8.5 x 31.5 (0.3 x 1.2)	1 P	12	DF81
		N	12	DF10N
		1 P + N[2]	6	DF81N
		2 P	6	DF82
		3 P	4	DF83
		3 P + N[2]	3	DF83N
32 A	10 x 38 (0.4 x 1.5)	1 P	12	DF101
		N	12	DF10N
		1 P + N[2]	6	DF101N
		2 P	6	DF102
		3 P	4	DF103
		3 P + N[2]	3	DF103N
50 A	14 x 51 (0.6 x 2.0)	1 P	6	DF141
		N	6	DF14N
		1 P + N[2]	3	DF141N
		2 P	3	DF142
		3 P	2	DF143C[3]
		3 P + N[2]	1	DF143NC[3]
125 A	22 x 58 (0.9 x 2.3)	1 P	6	DF221
		N	6	DF22N
		1 P + N[2]	3	DF221N
		2 P	3	DF222
		3 P	2	DF223[3]
		3 P + N[2]	1	DF223NC[3]

Fuseholders with "blown fuse" indicators (neon)[1, 4]				
Conventional Thermal Current (Ith)	Size of Cartridge Fuse or Link mm (inch)	Composition P=Poles N=Neutral	Sold in Lots of	Catalog Number
25 A	8.5 x 31.5 (0.3 x 1.2)	1 P	12	DF81V
		1 P + N[2]	6	DF81NV
		2 P	6	DF82V
		3 P	4	DF83V
		3 P + N[2]	3	DF83NV
32 A	10 x 38 (0.4 x 1.5)	1 P	12	DF101V
		1 P + N[2]	6	DF101NV
		2 P	6	DF102V
		3 P	4	DF103V
		3 P + N[2]	3	DF103NV
50 A	14 x 51 (0.6 x 2.0)	1 P	6	DF141V
		1 P + N[2]	3	DF141NV
		2 P	3	DF142V
		3 P	2	DF143VC[3]
		3 P + N[2]	1	DF143NVC[3]
125 A	22 x 58 (0.9 x 2.3)	1 P	6	DF221V
		1 P + N[2]	3	DF221NV
		2 P	3	DF222V
		3 P	2	DF223VC[3]
		3 P + N[2]	1	DF223NVC[3]

Put our expertise to work for you.

For more information on Schneider Electric fuseholder solutions, visit us online at **www.Schneider-Electric.us** or talk to one of our experts at **1-888-778-2733**.

1 Each pole can be marked. A clip-in marker holder is provided for this purpose. Clip-in markers type AB1 R• or AB1 G• can also be used.

2 N: neutral pole fitted with a locked tubular link as standard.

3 A letter "C" in the catalog number indicates that the fuseholder can be fitted with auxiliary early break, "blown fuse" signaling and "fuse present" signaling contacts.

4 Operator voltage of the blown fuse indicator: 110V…690V.

Schneider Electric - North American Operating Division

1415 S. Roselle Road
Palatine, IL 60067
Tel: 847-397-2600
Fax: 847-925-7500

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Class CC Rejection-Type Fuses

FNQ-R

Time-Delay, Rejection Type
Branch Circuit Fuse
Class CC
Physical Size:
13/32″ × 1½″ (10.3mm × 38.1mm)
Construction: Melamine Tube
Ampere Ratings: ¼-30A.
Voltage Rating: 600Vac or less
Interrupting Rating: 200,000A RMS Sym.
Agency Information: Std. 248-4, Class CC
UL Listed, Guide JDDZ, File E4273
CSA Certified, Class 1422-01, File 53787

Catalog Symbol & Current Ratings

600Vac		
FNQ-R-¼	FNQ-R-1 6/10	FNQ-R-7
FNQ-R-3/10	FNQ-R-1 8/10	FNQ-R-7½
FNQ-R-4/10	FNQ-R-2	FNQ-R-8
FNQ-R-½	FNQ-R-2¼	FNQ-R-9
FNQ-R-6/10	FNQ-R-2½	FNQ-R-10
FNQ-R-¾	FNQ-R-2 8/10	FNQ-R-12
FNQ-R-8/10	FQN-R-3	FNQ-R-15
FNQ-R-1	FNQ-R-3 2/10	FNQ-R-17½
FNQ-R-1⅛	FNQ-R-3 1/20	FNQ-R-20
FNQ-R-1¼	FNQ-R-4	FNQ-R-25
FNQ-R-1 3/10	FNQ-R-5	FNQ-R-30
FNQ-R-1 4/10	FNQ-R-6	—
FNQ-R-1½	FNQ-R-6¼	—

Time-Current Curves on page 225.

CE CE logo denotes compliance with European Union Low Voltage Directive (50-1000Vac, 75-1500Vdc). Refer to Data Sheet: 8002 or contact Bussmann Application Engineering at 636-527-1270 for more information.

Data Sheet: 1014

KTK-R Limitron® Fuse

Fast Acting; Branch Circuit Fuse
Class CC - Rejection Feature
Physical Size:
13/32″ × 1½″ (10.3mm × 38.1mm)
Construction: Melamine Tube
Ampere Ratings: 1/10-30A.
Voltage Rating: 600Vac (or less).
Interrupting Rating: 200,000A RMS Sym.
Agency Information: Std. 248-4, Class CC
UL Listed, Guide JDDZ, File E4273
CSA Certified, File 53787, Class 1422-02

Catalog Symbol & Current Ratings

600Vac		
KTK-R-1/10	KTK-R-1	KTK-R-7
KTK-R-⅛	KTK-R-1½	KTK-R-8
KTK-R-2/10	KTK-R-2	KTK-R-9
KTK-R-¼	KTK-R-2½	KTK-R-10
KTK-R-3/10	KTK-R-3	KTK-R-12
KTK-R-4/10	KTK-R-3½	KTK-R-15
KTK-R-½	KTK-R-4	KTK-R-20
KTK-R-6/10	KTK-R-5	KTK-R-25
KTK-R-¾	KTK-R-6	KTK-R-30

Time-Current Curves on page 226.

CE CE logo denotes compliance with European Union Low Voltage Directive (50-1000Vac, 75-1500Vdc). Refer to Data Sheet: 8002 or contact Bussmann Application Engineering at 636-527-1270 for more information.

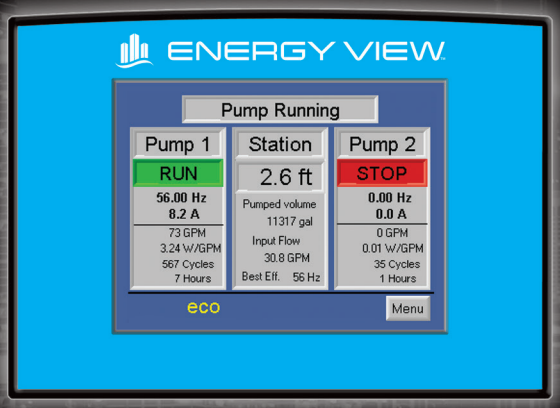
Data Sheet: 1015

Recommended fuseblocks/fuseholders for Class CC 600V fuses

- Open fuseblocks - see page 64
- Finger-safe fuseholders - see pages 41-44, 65
- Panel-mount fuseholders - see page 78
- In-line fuseholders - see page 80

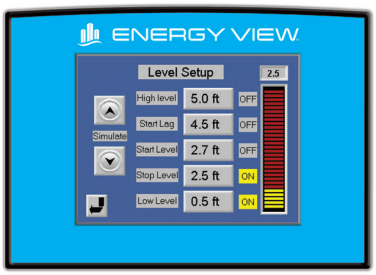
ENERGY VIEW®

DUPLEX PUMP STATION CONTROLLER

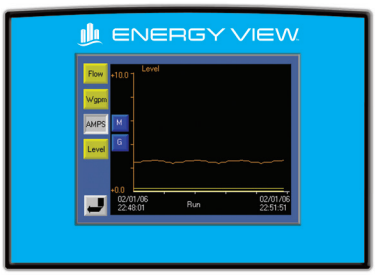


OVERVIEW

The Energy View® controller is powered by **KW Logix® Software** (patent pending). The color touch screen HMI has the ability to provide level control, pump alternation, flow monitoring, data logging, alarm logging, historical trending and comes equipped with a SD memory card for data storage and download. It can connect through multiple communication streams for remote monitoring and control.



Level Setup



Live Trends

FEATURES

- Continuous level monitoring
- Flow monitoring (with or without a flow meter)
- Power monitoring
- Motor current monitoring
- Pump speed control
- Pump efficiency monitoring (W/GPM)
- Energy View® LE available
  - Duplex or triplex
  - Constant or variable speed

SPECIFICATIONS

Pump Control and Protection:

- Pump efficiency Auto-Tuning (lowest W/GPM)
- Automatically switches to PID mode during high in-flow
- Automatic alternation
- Pump low efficiency alarm
- Pump over temperature and seal fail monitoring
- Pump dry run protection

System:

- 6 inch color touch screen
- LED backlit, sunlight readable
- Intuitive menu navigation
- Simple setup and operation
- Multiple password protection
- Data logging on SD memory card

Electrical:

- Requires external 24 VDC power supply
- Input voltage range 20.4 - 28.8 VDC
- Optional battery backup

Communication:

- (2) isolated RS 232/RS 485 ports
- Isolated CAN bus port
- Optional Ethernet port
- SMS, GPRS, Modbus
- Pump Watch™ controller compatible

PRIMEX
WATER SYSTEM INTEGRATOR AND CONTROLS PROVIDER

844-4PRIMEX (477-4639)
WWW.PRIMEXCONTROLS.COM

9500263B 04/19

ENERGY VIEW®

DUPLEX PUMP STATION CONTROLLER

ENERGY EFFICIENCY

Energy and maintenance expenses for a typical pumping system can add up to be more than 65% of the total life cycle cost. Therefore, energy efficiency is a critical factor when investing in new equipment or simply retrofitting existing control systems. With the Eco Smart Station® control system featuring the Energy View® controller, up to **30% energy savings** is achievable.

ENERGY SAVINGS

The Affinity Laws define the relationship between pump speed (n) and power (P):

$P2 = P1 (n2/n1)^3$

Motor speed (n) in RPM can be controlled with the use of Variable Frequency Drives (VFDs):

n = (120 x Hz)/Poles

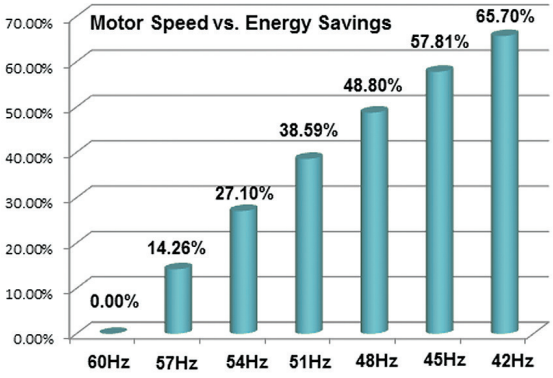
The Energy View® controller with the **kW Logix® Software** uses an "Efficiency Auto-Tune" algorithm that searches for the pump speed (Hz) that will consume the least amount of energy per gallons of liquid pumped (W/GPM). The flow (GPM) is calculated from the level changes, tank dimensions, fill and discharge times. A flow meter is not needed.

The pump motor power (W) is monitored by the VFDs and transmitted to the controller. No power meters are required. The auto-tun program takes into account the reduction in flow and head characteristics of the pump resulting from speed reductions to determine the Best Efficiency Frequency (BEF).

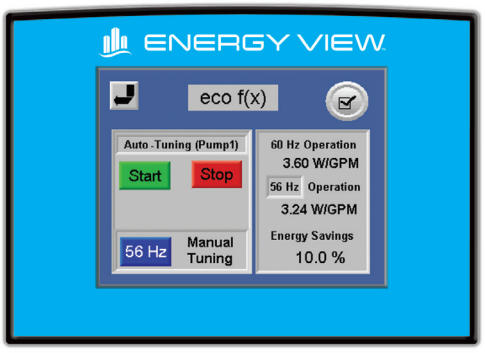
When the Best Efficiency Frequency (BEF) is found, the pumps will operate at this speed during every cycle. This mode of operation (ECO mode) is very efficient during low and normal in-flow to the station.

OPERATION

During high in-flow operation (peak hours) it is more efficient to operate in proportional-integral-derivative (PID) mode than cycling the pump ON and OFF. kW Logix® Software recognizes high in-flow conditions and automatically switches the operation mode from ECO mode to PID mode. During PID operation, the pump speed is controlled to match the incoming flow and maintain a constant wet well level. When the in-flow returns to normal, the operation returns to cycle based (ECO mode) operation automatically.



Motor Speed vs. Energy Savings



ECO (fx) Setup

PRIMEX

WATER SYSTEM INTEGRATOR AND CONTROLS PROVIDER

844-4PRIMEX (477-4639)

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DPC-4F DUPLEX/BACKUP 4 FLOAT PUMP CONTROLLER INSTALLATION INSTRUCTIONS

⚠WARNING **ELECTRICAL SHOCK HAZARD**

A qualified service person must install and service this product according to applicable codes and electrical schematics. Disconnect power prior to servicing any equipment with the DPC-4F controller.

⚠WARNING **EXPLOSION OR FIRE HAZARD**

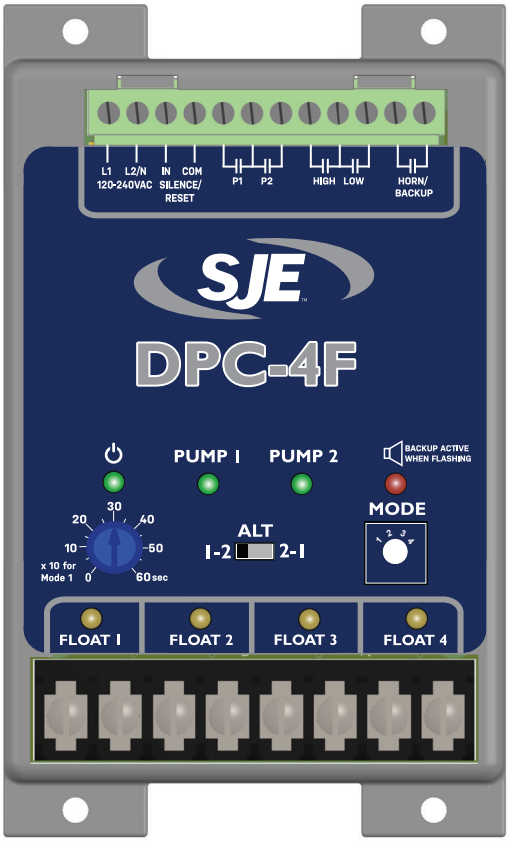
Do not use this product with flammable liquids. Do not install in hazardous locations as defined by National Electrical Code, ANSI/NFPA 70.

Failure to follow these precautions could result in serious injury or death. Keep these instructions with warranty after installation. This product must be installed in accordance with National Electric Code, ANSI/NFPA 70 so as to prevent moisture from entering or accumulating within the controller housing.

- Do not connect power to this equipment if it has been damaged or has any missing parts.
- The DPC-4F contains no serviceable parts: do not attempt to repair this equipment.
- Do not install in areas with excessive or conductive dust, corrosive or flammable gas, moisture or rain, excessive heat, regular impact shocks or excessive vibration.

OVERVIEW

The DPC-4F is a multi-function pump controller designed to operate two pumps. The unit can be configured to operate as a backup controller or a duplex controller. The controller operates using inputs from 1-4 float switches.



MULTI-FUNCTION

4 MODE selector switch and operation
- MODE 1: 1-float backup operation with pump run timer
- MODE 2: 2-float backup operation
- MODE 3: 3- or 4-float backup operation
- MODE 4: 3- or 4-float duplex operation

Pump alternator selector switch
Adjustable lag pump delay/pump run timer

FEATURES

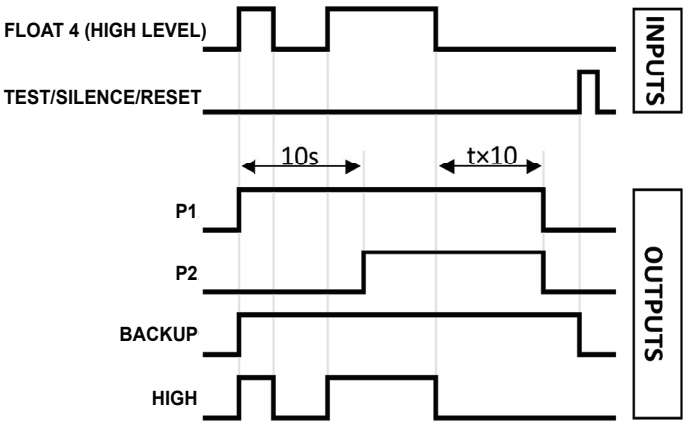
- Green LED indicators for Power On and Pump Call-To-Run
- Red LED indicator for Alarm and Backup Mode
- Amber LED indicators for Float Status
- Float out of sequence detection (Mode 4 only)
- HIGH level relay directly operated by FLOAT 4, independent of microcontroller
- 12 VDC power to float switches
- Relay Outputs: Pump Call-To-Run (2), Low, High, Horn/Backup
- UL Listed
- 2-year limited warranty

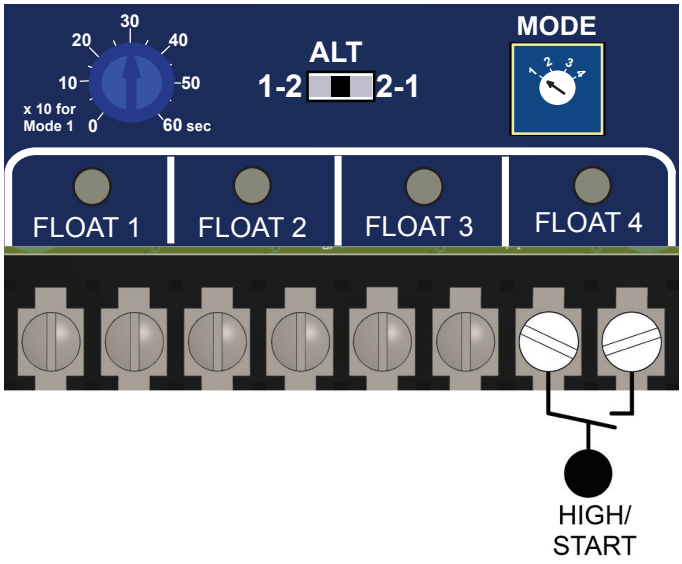
c UL us LISTED

WARNINGS

Users must read this manual and understand controller operation before changing any settings. Incorrect settings may result in damage to equipment. All floats shall be normally open floats for proper operation.

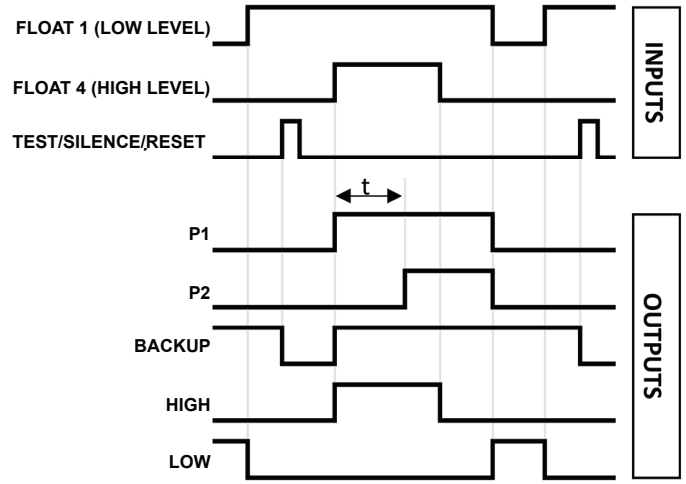
MODE 1: Single Float Backup with Pump Timer

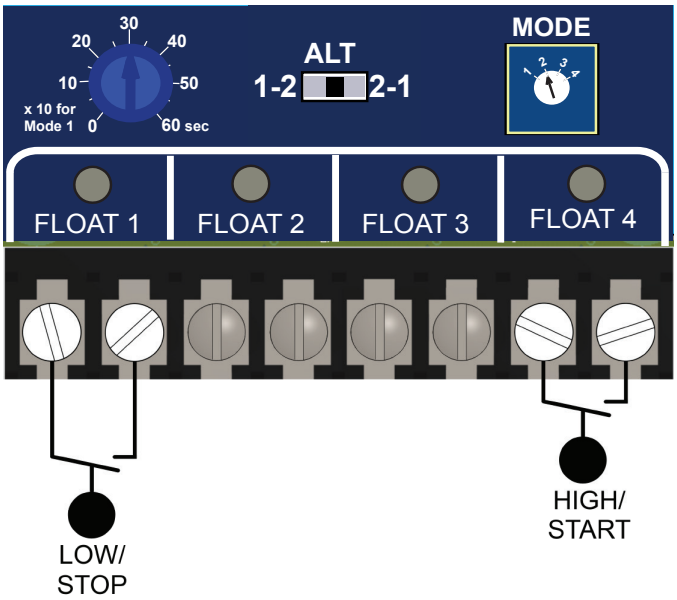




Basic Operation:
Pump turns on when Float 4 closes. Pump turns off when Float 4 opens and pump run timer expires.
Backup Mode Activated by: Float 4 closed.
Backup Mode Reset: Trigger the Reset input while Float 4 is open.
Lag Pump Delay Timer: 10 seconds (not adjustable).
Timer Dial: Controls pump run time (0—600 seconds), timer begins when Float 4 opens. Set timer based on actual field conditions to prevent short cycling pump or running the pump dry.
The High relay will close when Float 4 is closed.

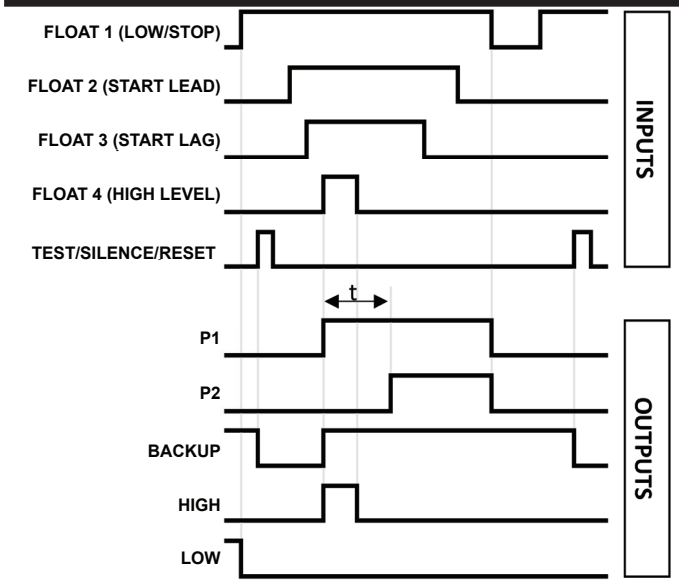
MODE 2: Two Float Backup

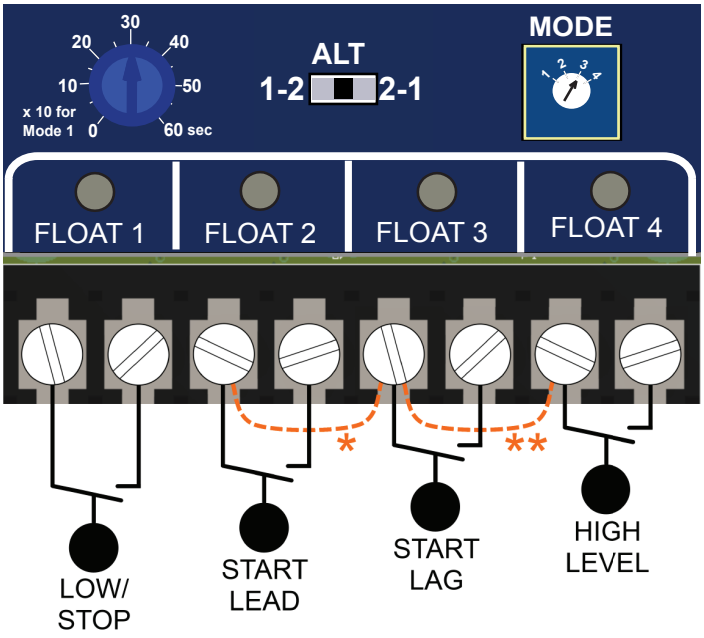




Basic Operation:
Pump turns on when Float 4 closes. Pump turns off when Float 1 opens.
Backup Mode Activated by: Float 4 closed or Float 1 open.
Backup Mode Reset: Trigger the Reset input while Float 4 is open and Float 1 is closed.
Timer Dial: Controls lag pump delay time (0—60 seconds).
The High relay will close when Float 4 is closed.
The Low relay will close when Float 1 is open.

MODE 3: Three or Four Float Backup



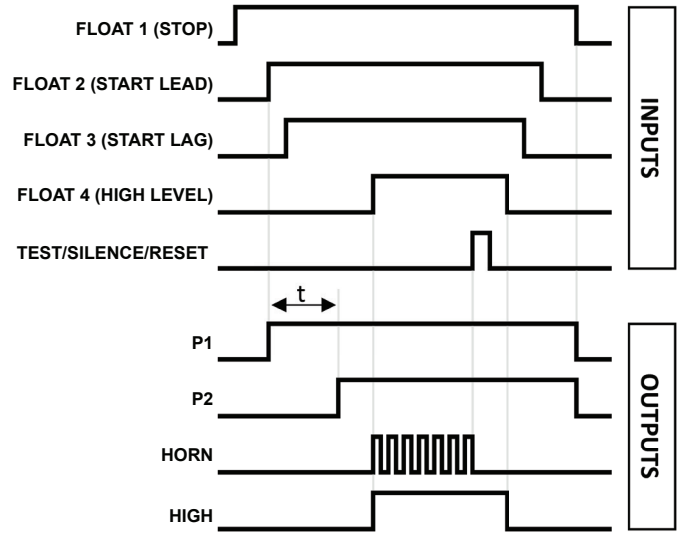


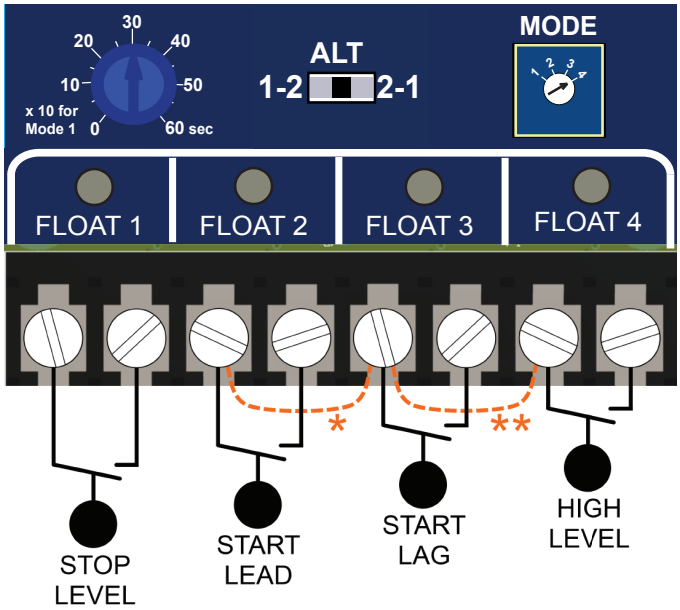
Basic Operation:

Pump turns on only in Backup Mode when Float 4 closes. Pump turns off when Float 1 opens or backup mode is reset.
Backup Mode activated by: Float 4 closed or Float 1 open.
Backup Mode Reset: Trigger the Reset input while Float 4 is open and Float 1 is closed.
Timer Dial: Controls lag pump delay time (0—60 seconds).
The High relay will close when Float 4 is closed.
For 3-float operation, connect floats to Float 1, Float 2, and Float 4.

* Jumper Float 2 and 3 for lead pump and lag pump activation.
** Jumper Floats 3 and 4 for lead pump start, and lag pump/alarm activation.

MODE 4: Four Float Duplex Operation





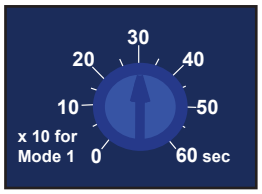
Basic Operation:

Pump turns on when Float 2 closes. Lag pump turns on when Float 3 closes. Pumps turn off when Float 1 opens.
Timer Dial: Controls lag pump delay time (0—60 seconds).
The High relay will close when Float 4 is closed. The Horn relay will flash while Float 4 is closed unless it is silenced by triggering the Silence input.
For 3-float operation, connect floats to Float 1, Float 2, and Float 4.

* Jumper Float 2 and 3 for lead pump and lag pump activation.
** Jumper Floats 3 and 4 for lead pump start, and lag pump/alarm activation
*** Alarm Test Feature - If the Test/Silence/Reset input is activated when there is no alarm condition present, the Horn Relay will flash, and the Low Relay will close.
**** Mode 4 provides for Float Out-Of-Sequence detection. If Float 1, 2, or 3 fails to activate in the correct sequence (example below), the low relay will activate ON. The Out-Of-Sequence fault will clear when the failed float returns to the correct position.

Mode	Input Functions					Output Relay Functions			Time Dial Function
	Float 1	Float 2	Float 3	Float 4	Pushbutton	Horn/Backup	Low	High	
1	None	None	None	High/ Start	Backup Mode Reset	Backup	None	High	Pump Run (0-600s)
2	Low/ Stop	None	None	High/ Start	Backup Mode Reset	Backup	Low	High	Lag Delay (0-60s)
3	Low/ Stop	Lead Start	Lag Start	High	Backup Mode Reset	Backup	Low	High	Lag Delay (0-60s)
4	Stop	Lead Start	Lag Start	High	Test/Silence	Horn	Floats Out-of-Sequence	High	Lag Delay (0-60s)

Pump Run/Lag Timer

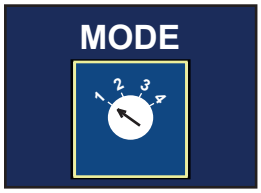


Pump Run Timer: Mode 1
(10x number indicated)
Pump Lag Delay Timer: Modes 2, 3 & 4

Alternation Selector Switch

ALT: Automatic alternation
1-2: Pump 1 always lead
2-1: Pump 2 always lead

Mode Switch



Controller flashes pump and alarm lights the number of times indicated on the Mode selector at power-up or if the mode is changed.

SPECIFICATIONS

Electrical Ratings:

Input voltage: 100 ~ 250 VAC (50/60 Hz)
Transient Protection: 10,000 V for 20 microseconds
Float switch inputs: 12 VDC, 26 mA each
Max float switch cable length: 328 feet (100 m)

Relay Outputs:

Rating: 5 A max. @ 240 VAC
Mechanical: 10,000,000 operations
Full load: 100,000 operations

Environmental Rating:

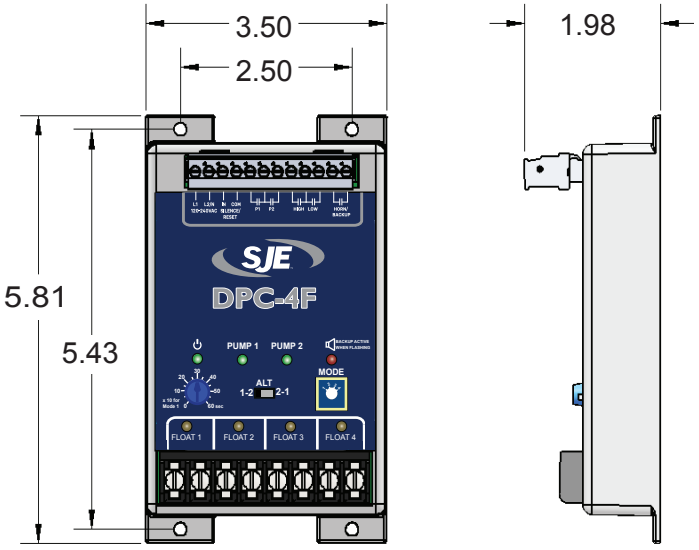
Internal panel mount only
Operating temperature: -18°F ~ 140°F (-28°C ~ 60°C)
Storage temperature: -40°F ~ 185°F (-40°C ~ 85°C)
Relative humidity: 95% non-condensing

Conductor Size and Terminal Torque Requirements:

Float terminals: 22-14 AWG, 7 in-lbs.
Top green terminals (pluggable): 22-14 AWG, 7in-lbs

Dimensions:

Enclosure: 5.81 x 3.5 x 1.98 inches (14.8 x 8.9 x 5.1 cm)
Mounting holes: 5.43 x 2.50 inches (13.8 x 6.4 cm)
Recommended mounting screws: Size 8
Weight: 7.5 oz (213 g)



Manufactured by: SJE Inc.
Technical support: +1-800-746-6287
techsupport@sjeinc.com
www.csicontrols.com **www.primexcontrols.com** **www.sjerhombus.com**

CONTROLADOR DPC-4F DUPLEX / RESPALDO
CONTROLADOR DE BOMBA DE 4 FLOTADORES
INSTRUCCIONES DE INSTALACION

⚠WARNING

RIESGO DE CHOQUE ELÉCTRICO
La instalación y mantenimiento debe ser efectuada por personal idóneo siguiendo los diagramas de instalación y códigos eléctricos. Desconecte la alimentación antes de reparar cualquier equipo con el controlador DPC-4F.

⚠WARNING

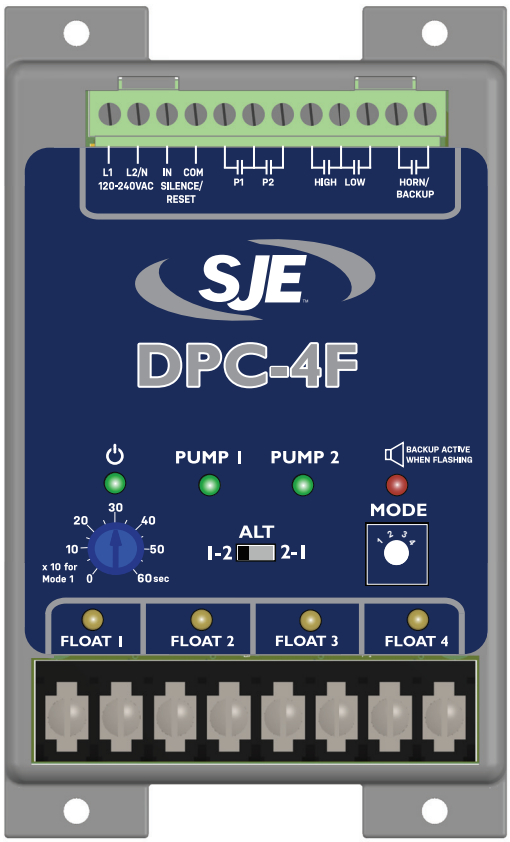
EXPLOSIÓN O INCENDIO
NO utilice este producto con líquidos inflamables. NO lo instale en lugares peligrosos como los definidos en el Código Eléctrico Nacional, ANSI / NFPA 70

El incumplimiento de estas precauciones podría causar lesiones graves o mortales. Guarde estas instrucciones junto a la garantía después de la instalación. Este producto debe ser instalado de acuerdo con el Código Eléctrico Nacional, ANSI / NFPA 70 con el fin de evitar la entrada y acumulación de humedad dentro del controlador.

- NO conecte la alimentación (poder) a este equipo si se ha dañado o le faltan piezas.
- El DPC-4F no contiene piezas reparables: no intente reparar este equipo.
- NO lo instale en áreas con excesivo polvo o conductor, gas corrosivo o inflamable, humedad o lluvia, calor excesivo, golpes de impacto regulares o vibración excesiva.

DESCRIPCIÓN GENERAL:

El DPC-4F es un controlador multifuncional diseñado para operar dos bombas. La unidad se puede configurar para operar como un controlador dúplex o de respaldo. El controlador opera utilizando entradas (1 - 4) para interruptores de flotador o interruptores de presión 4 MODE selector switch and operation



MULTI FUNCIÓN:

- Modo 1: Operación de respaldo con temporizador ajustable de bomba corriendo 1 Flotador
- Modo 2: Operación de respaldo con temporizador ajustable de bomba secundaria 2 Flotadores
- Modo 3: Operación de respaldo con temporizador ajustable de bomba secundaria 3 o 4 Flotadores
- Modo 4: Operación dúplex de 3 o 4 Flotadores

CARACTERÍSTICAS

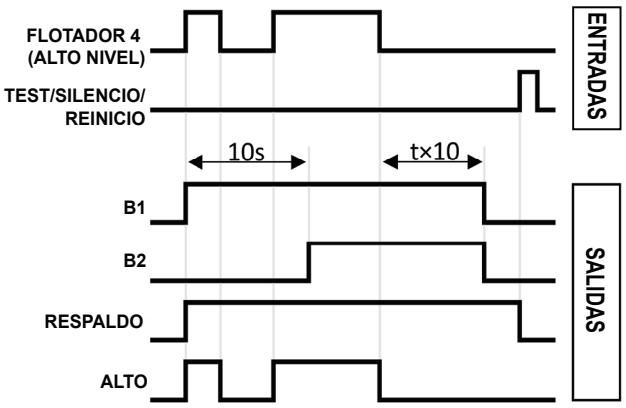
- Indicadores LED verdes de encendido y bombas funcionando
- Indicador LED rojo de alarma y modo de respaldo
- Indicadores LED ámbar de estado de interruptores de flotador/ presión
- Detección de interruptores de flotador fuera de secuencia (solo en modo 4)
- Relé de alto nivel operado directamente por interruptor de flotador 4 (FLOAT 4), independiente del controlador
- Alimentación de 12 VDC para interruptores de flotadores/presión
- Salidas de relé: Funcionamiento de bombas (2), bajo y alto nivel, bocina / respaldo
- Certificado UL
- Garantía limitada de 2 años

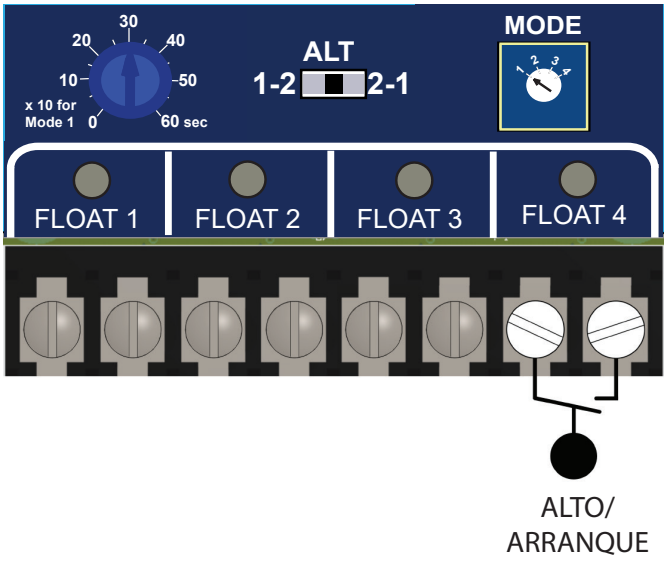
c UL us LISTED

ADVERTENCIAS

Los usuarios deben leer este manual y comprender el funcionamiento del controlador, antes de realizar cambios en cualquier configuración. Las configuraciones incorrectas pueden dañar el equipo.

MODO 1: Operación de Respaldo de 1 Flotador con Temporizador de Bomba

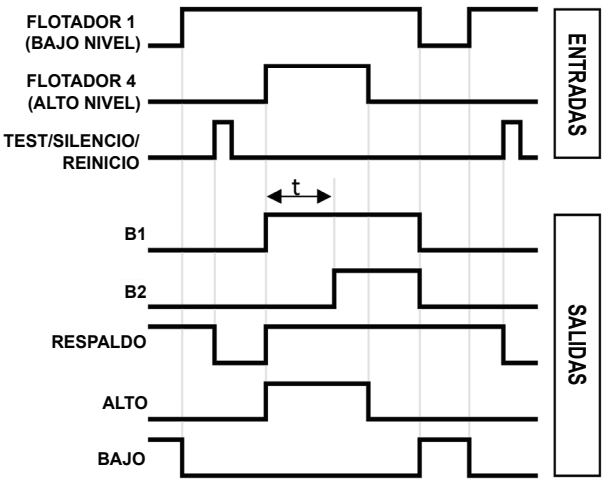


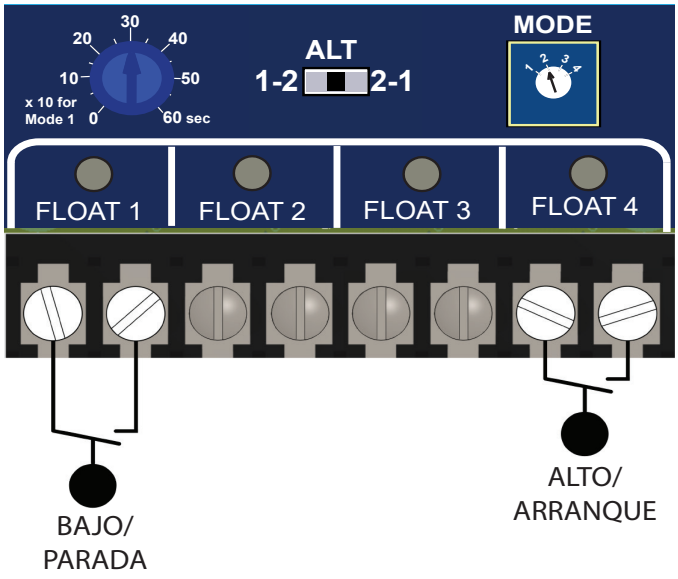


Operación Básica:

La bomba se enciende cuando el interruptor de flotador 4 se cierra. La bomba se apaga cuando el interruptor de flotador 4 se abre y el tiempo del temporizador de bomba funcionando termina.
Modo de Respaldo Activado por: Interruptor de flotador 4 cerrado.
Restablecer Modo de Respaldo: Activa la entrada de reinicio mientras el interruptor de flotador 4 está abierto.
Temporizador de Retraso de la Bomba Secundaria: 10 segundos (no ajustable).
Dial del Temporizador: Controla el tiempo de funcionamiento de la bomba (0-600 segundos), el temporizador comienza cuando el interruptor de flotador 4 se abre. Establecer temporizador basado en condiciones reales en terreno para evitar ciclos cortos de funcionamiento o que la bomba funcione en seco.
El relé de alto nivel se cerrará cuando el interruptor de flotador 4 esté cerrado.

MODO 2: Operación de Respaldo de 2 Flotadores

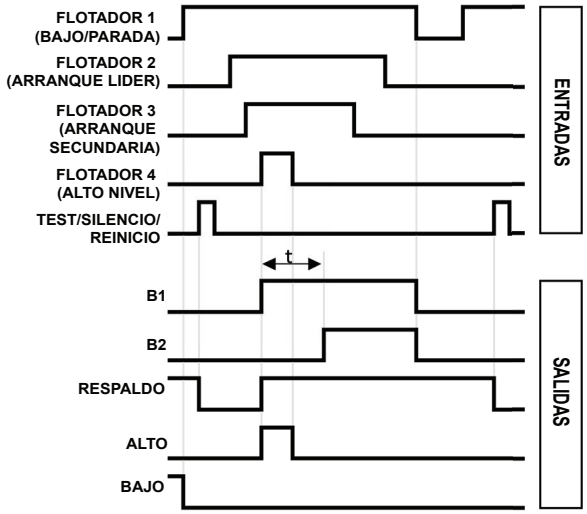


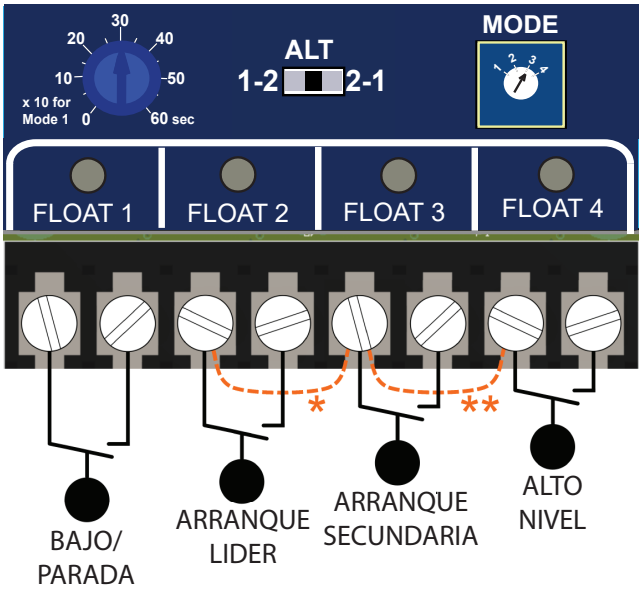


Operación Básica:

La bomba se enciende cuando el interruptor de flotador 4 se cierra. La bomba se apaga cuando el interruptor de flotador 1 se abre.
Modo de Respaldo Activado por: Interruptor de flotador 4 cerrado o interruptor de flotador 1 abierto.
Restablecer Modo de Respaldo: Activa la entrada de reinicio mientras el interruptor de flotador 4 está abierto y el interruptor de flotador 1 está cerrado.
Dial del Temporizador: Controla el tiempo de retraso de la bomba secundaria (0-60 segundos).
El relé de alto nivel se cerrará cuando el interruptor de flotador 4 esté cerrado.
El relé de bajo nivel se cerrará cuando el interruptor de flotador 1 esté abierto.

MODO 3: Operación de Respaldo de 3-4 Flotadores

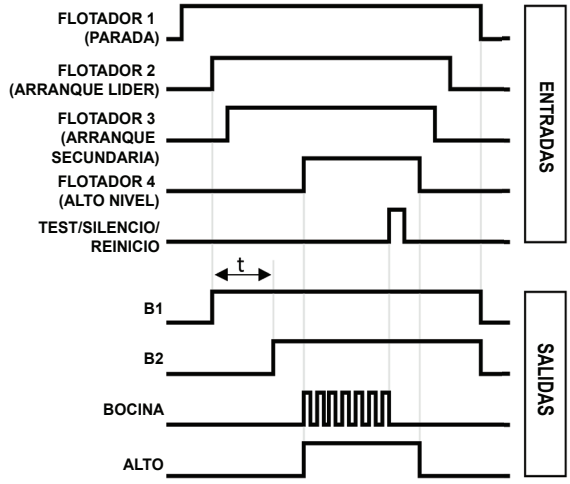


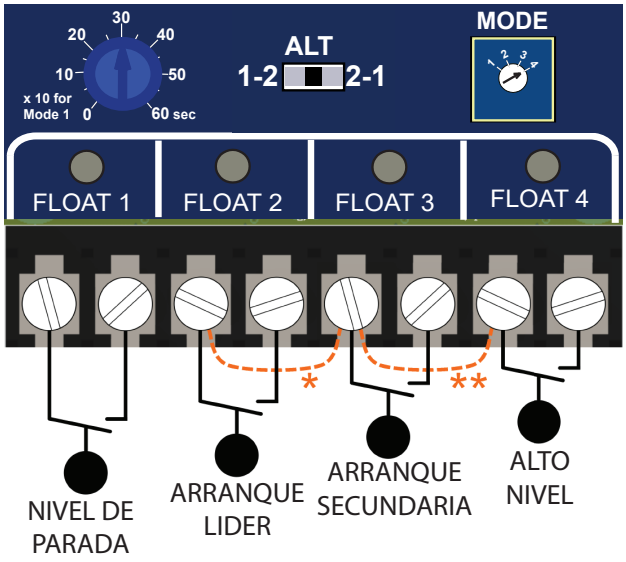


Operación Básica:

La bomba se enciende solo en modo de respaldo, cuando el interruptor de flotador 4 se cierra. La bomba se apaga cuando el interruptor de flotador 1 se abre o se restablece el modo de respaldo.
Modo de Respaldo Activado por: Interruptor de flotador 4 cerrado o Interruptor de flotador 1 abierto.
Restablecer Modo de Respaldo: Activa la entrada de reinicio mientras el interruptor de flotador 4 está abierto y el interruptor de flotador 1 está cerrado.
Dial del Temporizador: Controla el tiempo de retraso de la bomba secundaria (0-60 segundos).
El relé de alto nivel se cerrará cuando el interruptor de flotador 4 esté cerrado.
Para la operación con 3 interruptores de flotador, conecte los interruptores de flotador a 1, 2 y 4.
* Hacer un puente entre el interruptor de flotador 2 y 3 para activar la bomba principal y secundaria.
** Hacer un puente entre el interruptor de flotador 3 y 4 para el arranque de la bomba principal y la activación de la bomba secundaria / alarma.

MODO 4: Operación Dúplex de 4 Flotadores



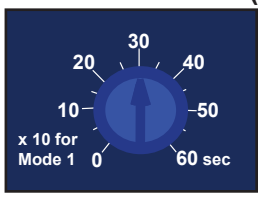


Operación Básica:

La bomba se enciende cuando el interruptor de flotador 2 se cierra. La bomba secundaria se enciende cuando el interruptor de flotador 3 se cierra. Las bombas se apagan cuando el interruptor de flotador 1 se abre.
Dial del Temporizador: Controla el tiempo de retraso de la bomba secundaria (0-60 segundos).
El relé de alto nivel se cerrará cuando el interruptor de flotador 4 esté cerrado. El relé de bocina parpadeará mientras el interruptor de flotador 4 esté cerrado a menos que sera silenciado por la entrada de silencio.
Para la operación con 3 interruptores de flotador, conecte los interruptores de flotador a 1, 2 y 4.
* Hacer un puente entre el interruptor de flotador 2 y 3 para activar la bomba principal y secundaria.
** Hacer un puente entre el interruptor de flotador 3 y 4 para el arranque de la bomba principal y la activación de la bomba secundaria / alarma.
*** Función de Prueba de Alarma: Si la entrada Prueba/Silencio/Reinicio se activa cuando NO hay una condición de alarma presente, el relé de la bocina parpadeará y el relé de bajo nivel se cerrará.
**** El Modo 4 proporciona detección de interruptores de flotador fuera de secuencia. Si el interruptor de flotador 1, 2 o 3 no se activan en la secuencia correcta (ejemplo a continuación), el relé de bajo nivel se activará ON. El error de fuera de secuencia se borrará cuando el interruptor de flotador en falla vuelva a la posición correcta o se reemplace.

Modo	Funciones de Entrada					Funciones de Relé de Salida			Función de Tiempo
	Flotador 1	Flotador 2	Flotador 3	Flotador 4	Selector de Modo	Bocina / Respaldo	Bajo	Alto	
1	Nada	Nada	Nada	**Alto** / Prende	Modo de Respaldo	Respaldo	Nada	**Alto**	Bomba Corr. (0-600s)
2	Bajo / Parada	Nada	Nada	**Alto** / Prende	Modo de Respaldo	Respaldo	Bajo	**Alto**	Retraso Sec. (0-60s)
3	Bajo / Parada	Principal Prende	Respaldo Prende	**Alto**	Modo de Respaldo	Respaldo	Bajo	**Alto**	Retraso Sec. (0-60s)
4	Parada	Principal Prende	Respaldo Prende	**Alto**	Test / Silencio	Bocina	Flotadores fuera de secuencia	**Alto**	Retraso Sec. (0-60s)

Temporizador Bomba Secundaria (B2)

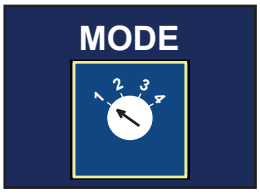


Temporizador de bomba funcionando:
Modo 1 (10x número indicado)
Temporizador (retardo) de bomba secundaria (B2): modos 2, 3 y 4

Selector de Alternación

ALT: Alternación y Simultaneacion Automática de bombas por ciclos
1-2: Bomba 1 siempre Líder
2-1: Bomba 2 siempre Líder

Selector de Modo



El controlador enciende/parpadea las luces de bombas y alarma el número de veces en que se encuentra el modo.

ESPECIFICACIONES

Clasificaciones Eléctricas:

Voltaje de entrada: 100 ~ 250 VAC (50/60 Hz)
Protección transitoria: 10,000 V por 20 microsegundos
Entradas para flotadores: 12 VDC, 26 mA, cada una
Longitud máxima del cable del flotador: 100 metros

Salidas de Relé:

Clasificación: 5A Max. @ 240 VAC
Mecánico 10,000,000 operaciones
Operaciones carga completa:100,000

Calificación Ambiental:

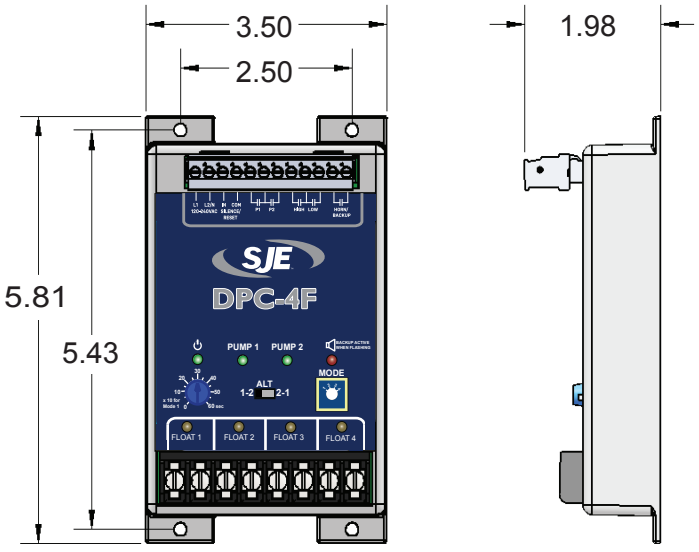
Para uso interno (dentro de un gabinete)
Temperatura de funcionamiento: -28°C ~ 60°C
Temperatura de almacenamiento: -40°C ~ 85°C
Humedad relativa: 95% sin condensación

Tamaño del Conductor y Torque del Terminal:

Terminales de Flotadores: 22-14 AWG, 7 pulgadas-libras
Terminales verdes en la parte superior (conectables): 22-14 AWG, 7 pulgadas-libras

Dimensiones:

Gabinete: 14.8 x 8.9 x 5.1 cm
Orificios de montaje: 13.8 x 6.4 cm
Tornillos de montaje recomendados: Tamaño 8
Peso: 213 gramos



Manufactured by: SJE Inc.
Technical support: +1-800-746-6287
techsupport@sjeinc.com
www.csicontrols.com **www.primexcontrols.com** **www.sjerhombus.com**

Product data sheet

Specifications

Thermal overload relays, TeSys Deca, 55...70 A , class 10A

LRD3361

Main

Range	TeSys
Product name	TeSys LRD TeSys Deca
Product or component type	Differential thermal overload relay
Device short name	LRD
Relay application	Motor protection
Product compatibility	LC1D95 LC1D80
Network type	DC AC
Thermal overload class	Class 10A conforming to IEC 60947-4-1
Thermal protection adjustment range	55…70 A
[Ui] rated insulation voltage	Power circuit: 1000 V conforming to IEC 60947-4-1 Power circuit: 600 V conforming to CSA Power circuit: 600 V conforming to UL

Complementary

Network frequency	0...400 Hz
Mounting support	Plate, with specific accessories Rail, with specific accessories Under contactor
Tripping threshold	1.14 +/- 0.06 Ir conforming to IEC 60947-4-1
Auxiliary contact composition	1 NO + 1 NC
[Ith] conventional free air thermal current	5 A for signalling circuit
Permissible current	0.72 A at 500 V AC-15 for signalling circuit 0.06 A at 440 V DC-13 for signalling circuit
[Ue] rated operational voltage	1000 V AC 0...400 Hz for power circuit conforming to IEC 60947-4-1
Associated fuse rating	4 A gG for signalling circuit 4 A BS for signalling circuit
[Uimp] rated impulse withstand voltage	6 kV conforming to IEC 60947-1
Phase failure sensitivity	Tripping current 130 % of Ir on two phase, the last one at 0
Control type	Red push-button: stop Blue push-button: reset

Temperature compensation	-20…60 °C
Connections - terminals	Power circuit: screw clamp terminals 1 cable(s) 4…35 mm² flexible without cable end Power circuit: screw clamp terminals 1 cable(s) 4…35 mm² flexible with cable end Power circuit: screw clamp terminals 1 cable(s) 4…35 mm² solid without cable end Control circuit: screw clamp terminals 2 cable(s) 1…2.5 mm² flexible without cable end Control circuit: screw clamp terminals 2 cable(s) 1…2.5 mm² flexible with cable end Control circuit: screw clamp terminals 2 cable(s) 1…2.5 mm² solid without cable end
Tightening torque	Control circuit: 1.7 N.m - on screw clamp terminals Power circuit: 9 N.m - on screw clamp terminals
Height	81 mm
Width	70 mm
Depth	115 mm
Net weight	0.51 kg

Environment

Climatic withstand	conforming to IACS E10
IP degree of protection	IP20 conforming to IEC 60529
Ambient air temperature for operation	-20…60 °C without derating conforming to IEC 60947-4-1
Ambient air temperature for storage	-60…70 °C
Flame retardance	V1 conforming to UL 94
Mechanical robustness	Vibrations: 6 Gn conforming to IEC 60068-2-6 Shocks: 15 Gn for 11 ms conforming to IEC 60068-2-7
Dielectric strength	2.2 kV at 50 Hz conforming to IEC 60947-1
Standards	EN/IEC 60947-4-1 EN/IEC 60947-5-1 UL 60947-4-1 UL 60947-5-1 CSA C22.2 No 60947-4-1 CSA C22.2 No 60947-5-1 GB/T 14048.4 GB/T 14048.5 EN 50495
Product certifications	IEC UL CSA CCC EAC ATEX INERIS UKCA

Packing Units

Unit Type of Package 1	Db
Number of Units in Package 1	1
Package 1 Height	8 cm
Package 1 Width	8.6 cm
Package 1 Length	11.9 cm
Package 1 Weight	510 g
Unit Type of Package 2	S02
Number of Units in Package 2	12
Package 2 Height	15 cm
Package 2 Width	30 cm
Package 2 Length	40 cm
Package 2 Weight	6.45 kg
Unit Type of Package 3	P06

Number of Units in Package 3	192
Package 3 Height	75 cm
Package 3 Width	60 cm
Package 3 Length	80 cm
Package 3 Weight	113.7 kg

Offer Sustainability

Sustainable offer status	Green Premium product
REACh Regulation	REACh Declaration
REACh free of SVHC	Yes
EU RoHS Directive	Compliant EU RoHS Declaration
Toxic heavy metal free	Yes
Mercury free	Yes
China RoHS Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)
RoHS exemption information	Yes
Environmental Disclosure	Product Environmental Profile
Circularity Profile	End of Life Information
California proposition 65	WARNING: This product can expose you to chemicals including: Antimony oxide & Antimony trioxide, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov

Contractual warranty

Warranty	18 months

Recommended replacement(s)

Counting Instruments

Technical Data 211

Electronic Hour Meter, AC Hour Meter

T50 Series

T50A2, T50B2

ENM's Series T50 electronic AC hour meter is a low cost reliable hour meter incorporating the latest state-of-the-art in electronics. It's quartz-crystal time base insures accurate long term time-keeping. A reliable electromechanical wheel-type indicator is used to store accumulated hours.

This compact tamperproof meter is sealed against the environment to provide years of service.

The T50 elapsed time indicator was designed for use on test and recording equipment, for providing maintenance control, for establishing warranty programs, for measuring machine utilization and production time, or for any application where time-in-use is to be determined.

Features

- Low Power Consumption
- Solid State Electronic Drive Circuit
- Quartz-Crystal for Accurate Timing
- Non-reset
- UL/cUL Recognized, CE & RoHS Compliant
- High Impact, Tamperproof Plastic Case
- IP65
- Indicates Operating Time in Hours and Tenths
- No Battery Back-Up Required
- Quiet operation
- MADE IN THE U.S.A.

Specifications

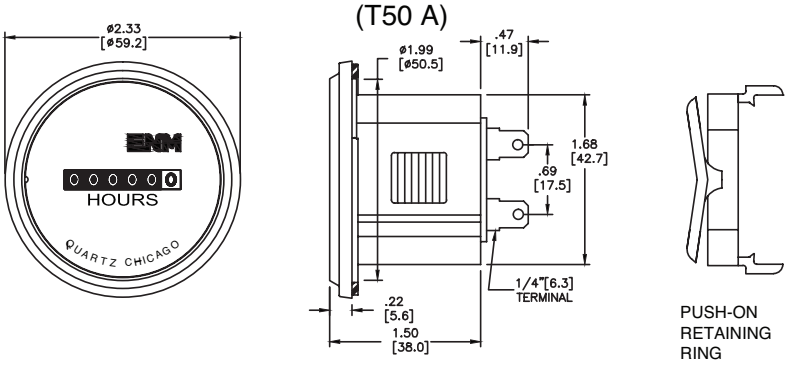
Time Scale:	6-digits 99,999.9 Hours Automatic recycle to zero
Figures:	Hours - White on black Tenths - Red on white Height - 0.140"
Operation Voltage:	230, 115, 48, 24 VAC ±10% 50/60 Hz Other voltage available
Power Consumption:	Less than 0.4 Watts
Accuracy:	Better than ±0.02% over entire range
Temperature:	-40°F to +185°F (-40°C to +85°C)
Vibration Resistance:	Withstands 10-80 Hz at 20g's max. (SAE J1378)
Shock:	55g at 9-13 ms (SAE J1378)
Humidity:	95% (SAE J1378)
Terminations:	1/4" male blade terminals
Configuration:	Round SAE Bezel with new push-on retaining ring Round 3-Hole Bezel

Counting Instruments

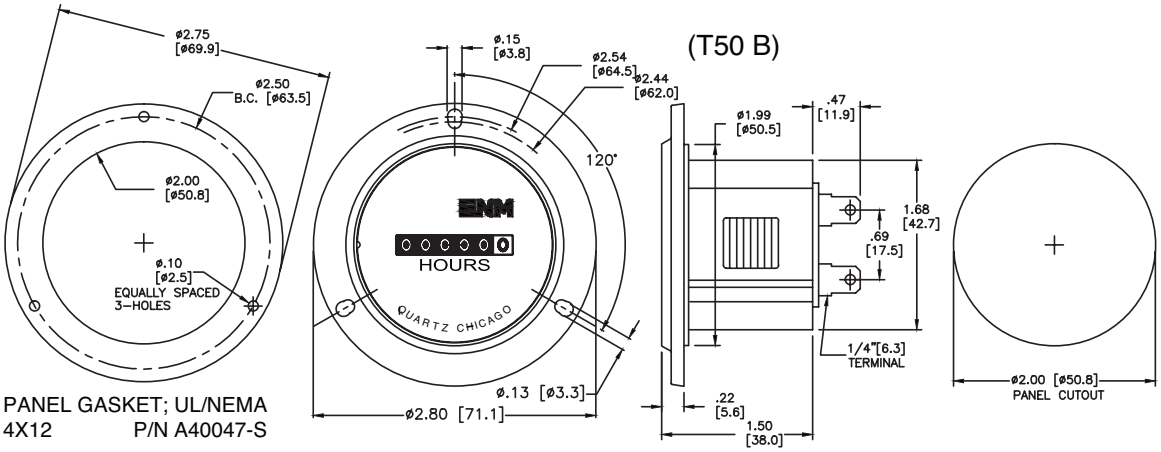
ENM Company
5617 Northwest Highway, Chicago, IL 60646-6135
(773) 775-8400 • Fax: (773) 775-5968
Toll Free (888) 372-0465 • e-mail: customerservice@enmco.com
web site: www.enmco.com

T50 Series

(T50 A)



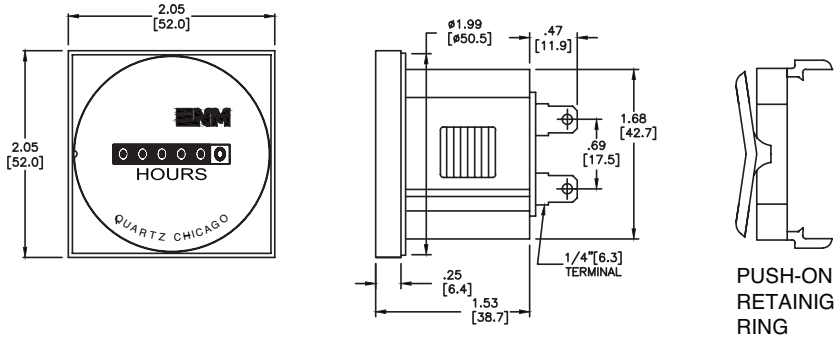
(T50 B)



PANEL GASKET; UL/NEMA 4X12 P/N A40047-S

PANEL GASKET; UL/NEMA 4X12 WITH MTG HARDWARE; P/N B20017

(T50 E)



LIMITED WARRANTY

ENM Company resettable electromechanical counters are warranted to the consumer to be free from defects in material and workmanship for a period of 3 years. All ENM products which fall within the warranty period due to defects in material or workmanship will be repaired or replaced, at ENM's option, without charge to the consumer when returned with proof of purchase to any authorized ENM dealer in the United States, transportation charges prepaid, provided there is no evidence of improper installation, tampering, or other abuse. All implied warranties, including any implied warranty of merchantability or fitness for a particular purpose, shall be limited in duration to the express warranty period specified above. ENM disclaims any liability for consequential damages due to breach of any written or implied warranty on its products. Datasheet information subject to change.

Counting Instruments

ENM Company
5617 Northwest Highway, Chicago, IL 60646-6135
(773) 775-8400 • Fax: (773) 775-5968 • Toll Free (888) 372-0465
e-mail: customerservice@enmco.com
ISO 9001:2000 **web site: www.enmco.com**

Product data sheet
Characteristics

RXZE2M114M
socket RXZ - mixed contact - 10A - < 250V - connector - for relay RXM2.., RXM4..

Product availability : Stock - Normally stocked in distribution facility

Main

Range of product	Zelio Relay
Product or component type	Socket
Contact terminal arrangement	Mixed
Product compatibility	Plug-in relay RXM (2 C/O) Plug-in relay RXM (4 C/O)
Shape of pin	Flat
Device short name	RXZ
Sale per indivisible quantity	10

Complementary

[Ith] conventional free air thermal current	12 A 6 A
System Voltage	< 250 V
Tightening torque	<= 8.85 lbf.in (1 N.m) (M3 screw(s))
Fixing mode	By screw panel Clip-on 35 mm symmetrical DIN rail
Marking	CE
Width	1.06 in (27 mm)
Product weight	0.12 lb(US) (0.056 kg)

Environment

Connections - terminals	Connector, flexible cable with cable end 1 x 0.25...1 x 2.5 mm² / AWG 22...AWG 14 Connector, flexible cable with cable end 2 x 0.25...2 x 1 mm² / AWG 22...AWG 17 Connector, solid cable without cable end 1 x 0.5...1 x 2.5 mm² / AWG 20...AWG 14 Connector, solid cable without cable end 2 x 0.5...2 x 1.5 mm² / AWG 20...AWG 16
Standards	IEC 61984
Product certifications	CSA UL Lloyd's
Ambient air temperature for storage	-40...185 °F (-40...85 °C)
Ambient air temperature for operation	-40...131 °F (-40...55 °C)
IP degree of protection	IP20 conforming to EN/IEC 60529

Product data sheet
Characteristics

RXM4AB2F7
Miniature Plug-in relay - Zelio RXM 4 C/O 120 V AC 6 A with LED

Product availability : Stock - Normally stocked in distribution facility

Main

Range of product	Zelio Relay
Series name	Miniature
Product or component type	Plug-in relay
Device short name	RXM
Contacts type and composition	4 C/O
[Uc] control circuit voltage	120 V AC, 50/60 Hz
[Ithe] conventional enclosed thermal current	6 Aat -40...131 °F (-40...55 °C)
Status LED	With
Control type	Lockable test button
Utilisation coefficient	20 %

Complementary

Shape of pin	Flat
[Ui] rated insulation voltage	250 V conforming to IEC 300 V conforming to UL 300 V conforming to CSA
[Uimp] rated impulse withstand voltage	2.5 kV for 1.2/50 µs
Contacts material	AgNi
[Ie] rated operational current	3 A at 28 V DC (NC) conforming to IEC 3 A at 250 V AC (NC) conforming to IEC 6 A at 28 V DC (NO) conforming to IEC 6 A at 250 V AC (NO) conforming to IEC 6 A at 277 V AC conforming to UL 8 A at 30 V DC conforming to UL
Maximum switching voltage	250 V conforming to IEC
Load current	6 A at 250 V AC 6 A at 28 V DC

Maximum switching capacity	1500 VA/168 W
Minimum switching capacity	170 mW at 10 mA, 17 V
Operating rate	<= 18000 cycles/hour no-load <= 1200 cycles/hour under load
Mechanical durability	10000000 cycles
Electrical durability	100000 cycles resistive load
Average consumption	1.2 VA 60 Hz
Average coil consumption in VA	1.2 at 60 Hz
Drop-out voltage threshold	>= 0.15 Uc
Operating time	20 ms
Reset time	20 ms
Average resistance	3630 Ohm at 20 °C +/- 15 %
Rated operational voltage limits	96...132 V AC
Safety reliability data	B10d = 100000
Protection category	RT I
Operating position	Any position
Product weight	0.08 lb(US) (0.037 kg)
Device presentation	Complete product

Environment

Dielectric strength	1300 V AC between contacts with micro disconnection insulation 2000 V AC between coil and contact with reinforced insulation 2000 V AC between poles with basic insulation
Product certifications	CSA RoHS Lloyd's REACH CE GOST UL
Standards	EN/IEC 61810-1 UL 508 CSA C22.2 No 14
Ambient air temperature for storage	-40...185 °F (-40...85 °C)
Ambient air temperature for operation	-40...131 °F (-40...55 °C)
Vibration resistance	3 gn (f = 10...150 Hz), amplitude +/- 1 mm (on 5 cycles in operation) 5 gn (f = 10...150 Hz), amplitude +/- 1 mm (on 5 cycles not operating)
IP degree of protection	IP40 conforming to EN/IEC 60529
Shock resistance	10 gn in operation 30 gn not operating
Pollution degree	2

Ordering and shipping details

Category	21127 - ZELIO ICE CUBE RELAYS
Discount Schedule	CP2
GTIN	00785901646464
Nbr. of units in pkg.	10
Package weight(Lbs)	8.00000000000000002E-2
Returnability	Y
Country of origin	CN

Offer Sustainability

Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 0801 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold

Product data sheet
Characteristics

RXM4AB2BD
Miniature Plug-in relay - Zelio RXM 4 C/O 24 V DC 6 A with LED

Product availability: Stock - Normally stocked in distribution facility

Price*: 6.80 USD

Main

Commercial Status	Commercialised
Range of product	Zelio Relay
Series name	Miniature
Product or component type	Plug-in relay
Device short name	RXM
Contacts type and composition	4 C/O
Control circuit voltage	24 V DC
[Ithe] conventional enclosed thermal current	6 Aat -40...131 °F (-40...55 °C)
Status LED	With
Control type	Lockable test button
Utilisation coefficient	20 %

Complementary

Shape of pin	Flat
[Ui] rated insulation voltage	300 V conforming to UL 300 V conforming to CSA 250 V conforming to IEC
[Uimp] rated impulse withstand voltage	2.5 kV for 1.2/50 µs
Contacts material	AgNi
[Ie] rated operational current	8 A at 30 V DC conforming to UL 6 A at 277 V AC conforming to UL 6 A at 250 V AC (NO) conforming to IEC 6 A at 28 V DC (NO) conforming to IEC 3 A at 250 V AC (NC) conforming to IEC 3 A at 28 V DC (NC) conforming to IEC
Maximum switching voltage	250 V conforming to IEC
Load current	6 A at 28 V DC 6 A at 250 V AC
Maximum switching capacity	1500 VA/168 W
Minimum switching capacity	170 mW at 10 mA, 17 V
Operating rate	<= 18000 cycles/hour no-load <= 1200 cycles/hour under load
Mechanical durability	10000000 cycles
Electrical durability	100000 cycles resistive load
Average consumption in W	0.9 W
Drop-out voltage threshold	>= 0.1 Uc
Operating time	20 ms
Reset time	20 ms
Average resistance	650 Ohm at 20 °C +/- 10 %
Rated operational voltage limits	19.2...26.4 V DC
Safety reliability data	B10d = 100000
Protection category	RT I

Operating position	Any position
Product weight	0.08 lb(US) (0.037 kg)

Environment

Dielectric strength	2000 V AC between poles with basic insulation 2000 V AC between coil and contact with reinforced insulation 1300 V AC between contacts with micro disconnection insulation
Product certifications	CE CSA GOST RoHS UL REACH Lloyd's
Standards	EN/IEC 61810-1 UL 508 CSA C22.2 No 14
Ambient air temperature for storage	-40...185 °F (-40...85 °C)
Ambient air temperature for operation	-40...131 °F (-40...55 °C)
Vibration resistance	5 gn (f = 10...150 Hz), amplitude +/- 1 mm (on 5 cycles not operating) 3 gn (f = 10...150 Hz), amplitude +/- 1 mm (on 5 cycles in operation)
IP degree of protection	IP40 conforming to EN/IEC 60529
Shock resistance	30 gn not operating 10 gn in operation
Pollution degree	2

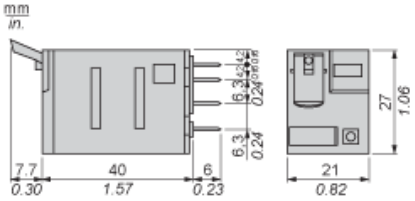
Ordering and shipping details

Category	21127 - ZELIO ICE CUBE RELAYS
Discount Schedule	CP2
GTIN	00785901758112
Nbr. of units in pkg.	10
Product availability	Stock - Normally stocked in distribution facility
Returnability	Y
Country of origin	CN

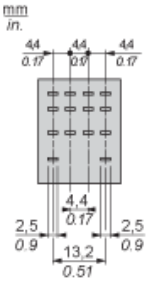
Contractual warranty

Warranty period	18 months

Dimensions

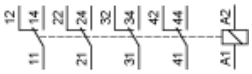


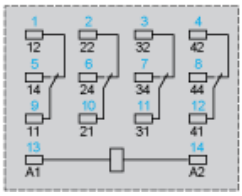
Pin Side View



RXM4AB2BD

Wiring Diagram





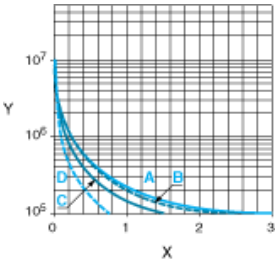
Symbols shown in blue correspond to Nema marking.

RXM4AB2BD

Electrical Durability of Contacts

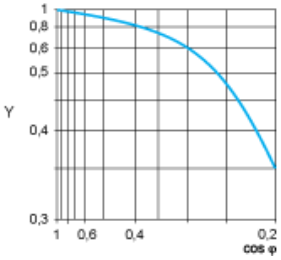
Durability (inductive load) = durability (resistive load) x reduction coefficient.

Resistive AC load



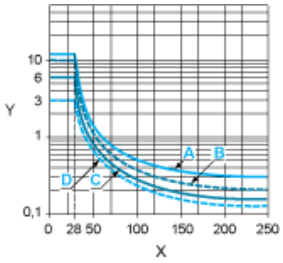
X Switching capacity (kVA)
Y Durability (Number of operating cycles)
A RXM2AB•••
B RXM3AB•••
C RXM4AB•••
D RXM4GB•••

Reduction coefficient for inductive AC load (depending on power factor cos ϕ)



Y Reduction coefficient (A)

Maximum switching capacity on resistive DC load



X Voltage DC
Y Current DC
A RXM2AB•••
B RXM3AB•••
C RXM4AB•••
D RXM4GB•••

Note : These are typical curves, actual durability depends on load, environment, duty cycle, etc.

Product Data Sheet

XB4BJ33

SELECTOR SWITCH 600VAC 1.2A XB4

Technical Characteristics

Ampere Rating	10A
Approvals	UL Listed File Number E164353 CCN NKCR - CSA Certified File Number LR44087 Class 321103 - CE Marked
Bezel Material	Chromium Plated Metal
Enclosure Type	Water tight, Dust tight and Corrosion Resistant (Indoor/Outdoor)
Enclosure Rating	NEMA 4/4X/13
Maximum Voltage Rating	600VAC
Head Type	Round
Mounting Type	Panel
Number of Positions	3
Operator Action	Maintained
Operator Type	Non-Illuminated
Size	22mm
Terminal Type	Screw Clamp
Type	XB4
Utilization Category	AC15 - DC13
Contact Configuration	2 NO
Knob Color	Black
Knob Type	Extended Lever

Shipping and Ordering

Category	22468 - Push Buttons, Metal, 22mm, ZB4, XB4
Discount Schedule	CS2
GTIN	00785901380696
Package Quantity	1
Weight	0.21 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y
Country of Origin	FR

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

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Product Data Sheet

RXM040W

RELAY MODULE 6-250VDC RXM +OPTIONS

SQUARE D
by Schneider Electric

Technical Characteristics

Shipping and Ordering

Category	21128 -
Discount Schedule	CP2
GTIN	00785901582168
Package Quantity	20
Weight	0.01 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y
Country of Origin	CN

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

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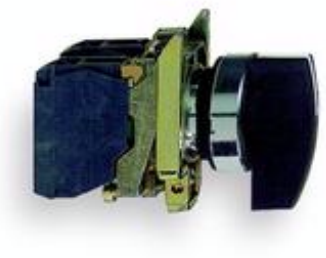
Schneider Electric

Product Data Sheet

XB4BJ21

SELECTOR SWITCH 600VAC 1.2A XB4



Technical Characteristics

Ampere Rating	10A
Approvals	UL Listed File Number E164353 CCN NKCR - CSA Certified File Number LR44087 Class 321103 - CE Marked
Bezel Material	Chromium Plated Metal
Enclosure Rating	NEMA 4/4X/13
Maximum Voltage Rating	600VAC
Head Type	Round
Mounting Type	Panel
Number of Positions	2
Operator Action	Maintained
Operator Type	Non-Illuminated
Size	22mm
Terminal Type	Screw Clamp
Type	XB4
Utilization Category	AC15 - DC13
Contact Configuration	1 NO
Knob Color	Black
Knob Type	Extended Lever
Enclosure Type	Water tight, Dust tight and Corrosion Resistant (Indoor/Outdoor)

Shipping and Ordering

Category	22468 - Push Buttons, Metal, 22mm, ZB4, XB4
Discount Schedule	CS2
GTIN	00785901380689
Package Quantity	1
Weight	0.18 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y
Country of Origin	FR

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

Product Data Sheet

XB4BVG4

PUSH BUTTON LIGHT MODULE 120V 22MM XB4

Technical Characteristics

Approvals	UL Listed File Number E164353 CCN NKCR - CSA Certified File Number LR44087 Class 321103 - CE Marked
Bezel Material	Chromium Plated Metal
Enclosure Type	Water tight, Dust tight and Corrosion Resistant (Indoor/Outdoor)
Light Module Supply Voltage	110/120VAC
Light Module Type	LED (Red)
Enclosure Rating	NEMA 4/4X/13
Head Type	Round
Mounting Type	Panel
Size	22mm
Terminal Type	Screw Clamp
Type	XB4
Utilization Category	AC15 - DC13
Lens Color	Red

Shipping and Ordering

Category	22468 - Push Buttons, Metal, 22mm, ZB4, XB4
Discount Schedule	CS2
GTIN	00785901381334
Package Quantity	1
Weight	0.16 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y
Country of Origin	FR

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

Product Data Sheet

XB4BVG5

PUSH BUTTON LIGHT MODULE 120V 22MM XB4

Technical Characteristics

Approvals	UL Listed File Number E164353 CCN NKCR - CSA Certified File Number LR44087 Class 321103 - CE Marked
Bezel Material	Chromium Plated Metal
Enclosure Type	Water tight, Dust tight and Corrosion Resistant (Indoor/Outdoor)
Light Module Supply Voltage	110/120VAC
Light Module Type	LED (Amber)
Enclosure Rating	NEMA 4/4X/13
Head Type	Round
Mounting Type	Panel
Size	22mm
Terminal Type	Screw Clamp
Type	XB4
Utilization Category	AC15 - DC13
Lens Color	Amber

Shipping and Ordering

Category	22468 - Push Buttons, Metal, 22mm, ZB4, XB4
Discount Schedule	CS2
GTIN	00785901381334
Package Quantity	1
Weight	0.16 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y
Country of Origin	FR

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

Product Data Sheet

XB4BVG3

PUSH BUTTON LIGHT MODULE 120V 22MM XB4

Technical Characteristics

Approvals	UL Listed File Number E164353 CCN NKCR - CSA Certified File Number LR44087 Class 321103 - CE Marked
Bezel Material	Chromium Plated Metal
Enclosure Type	Water tight, Dust tight and Corrosion Resistant (Indoor/Outdoor)
Light Module Supply Voltage	110/120VAC
Light Module Type	LED (Green)
Enclosure Rating	NEMA 4/4X/13
Head Type	Round
Mounting Type	Panel
Size	22mm
Terminal Type	Screw Clamp
Type	XB4
Utilization Category	AC15 - DC13
Lens Color	Green

Shipping and Ordering

Category	22468 - Push Buttons, Metal, 22mm, ZB4, XB4
Discount Schedule	CS2
GTIN	00785901381334
Package Quantity	1
Weight	0.16 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y
Country of Origin	FR

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

Product Data Sheet

XB4BA21

PUSHBUTTON OPERATOR 22MM XB4 +OPTIONS

Technical Characteristics

Ampere Rating	10A
Approvals	UL Listed File Number E164353 CCN NKCR - CSA Certified File Number LR44087 Class 321103 - CE Marked
Bezel Material	Chromium Plated Metal
Style	Standard: Flush
Enclosure Type	Water tight, Dust tight and Corrosion Resistant (Indoor/Outdoor)
Markings	None
Enclosure Rating	NEMA 4/4X/13
Maximum Voltage Rating	600V
Mounting Type	Panel
Operator Action	Momentary
Operator Type	Non-Illuminated
Size	22mm
Terminal Type	Screw Clamp
Type	XB4
Utilization Category	AC15 - DC13
Button/Cap Color	Black
Head Type	Round
Contact Configuration	1 NO

Shipping and Ordering

Category	22468 - Push Buttons, Metal, 22mm, ZB4, XB4
Discount Schedule	CS2
GTIN	00785901371113
Package Quantity	1
Weight	0.17 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y
Country of Origin	FR

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

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Product Data Sheet

XB4BA42

PUSHBUTTON OPERATOR 22MM XB4 +OPTIONS

Technical Characteristics

Ampere Rating	10A
Approvals	UL Listed File Number E164353 CCN NKCR - CSA Certified File Number LR44087 Class 321103 - CE Marked
Bezel Material	Chromium Plated Metal
Style	Standard: Flush
Button/Cap Color	Red
Markings	None
Enclosure Rating	NEMA 4/4X/13
Maximum Voltage Rating	600V
Head Type	Round
Mounting Type	Panel
Operator Action	Momentary
Operator Type	Non-Illuminated
Size	22mm
Terminal Type	Screw Clamp
Type	XB4
Utilization Category	AC15 - DC13
Contact Configuration	1 NC
Enclosure Type	Water tight, Dust tight and Corrosion Resistant (Indoor/Outdoor)

Shipping and Ordering

Category	22468 - Push Buttons, Metal, 22mm, ZB4, XB4
Discount Schedule	CS2
GTIN	00785901380481
Package Quantity	1
Weight	0.16 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y
Country of Origin	FR

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

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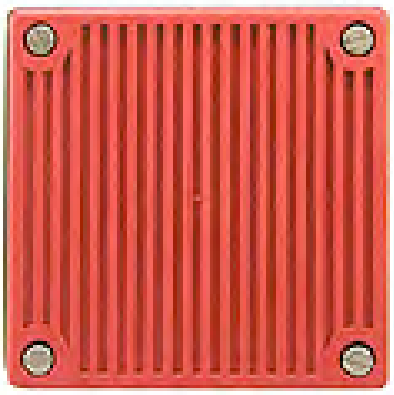
The Sounder 120 VAC Alarm

Part No. AH115A8R & AH115A8G



Designed for use with Ingram's Silence Module

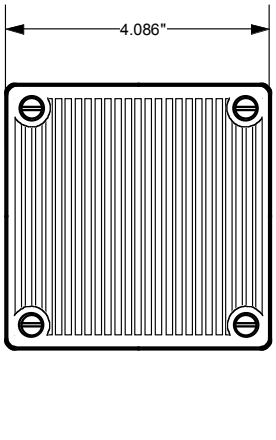
The Ingram 120 VAC Sounder is NEMA and UL Type 4X alarm horn suitable for heavy duty applications inside and outdoors. This horn features 8 user selectable alert sounds. Add quality to your control panel with the Ingram Sounder.

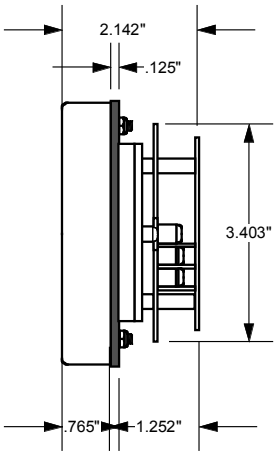
Features

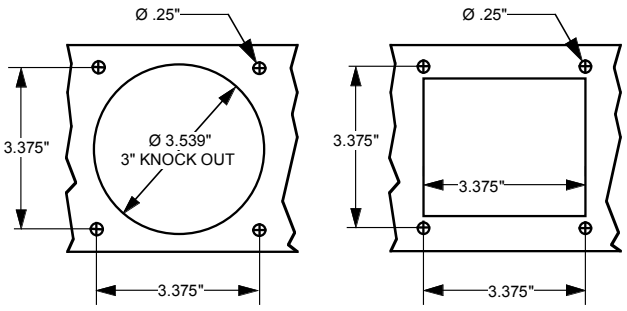
- UL listed (E175530) for use in NEMA and UL Type 3, 3R, 4, 4X, 12 and 13
- Loud: 110+ decibels at 5 feet
- 8 user selectable alert sounds
- 2 user selectable sound output levels
- Low profile protrudes less than 1" from mounting surface
- Does not generate electrical noise due to piezo electronic sound element
- Self locking stainless steel hex nuts makes it tamper resistant
- Highly reliable solid state circuitry

Technical Specifications

- Voltage: AH115A8R, AH115A8G - 115 VAC
- Average current draw: 50 mA @ 120 VAC
- Ambient operating temperature: -40°F - 151°F
- Maximum humidity of 98% RH±2%
- Each wire screw clamp terminal will accept two #18AWG - #12AWG wires.
- 3 year warranty
- Available in red or gray







Hole Pattern for Mounting

⚠ **WARNING:** Do not operate this device within 15 inches of a person's ear. Exposure to such high sound level can result in permanent damage to a persons hearing.

8725 Youngerman Court Suite 206 Jacksonville, FL 32257 ■ 888-875-2221 ph (904)778-1010 fax ■ Website:www.ingramproducts.com ■ e-mail: info@ingramproducts.com

Sunlight Visible LED Alarm Light

Part No. SunBurst II: SBN120AC, SBN1224AD

The Ingram SunBurst II is a super bright, daylight visible LED light that can not be ignored. It is designed for use as an alarm beacon. It requires only a 3/4" knockout (1-1/16" diameter hole) to mount. It can be installed on panels up to 1/4" thick. Meets UL Type 3, 3R, 4, 4X, 12, and, 13 requirements.

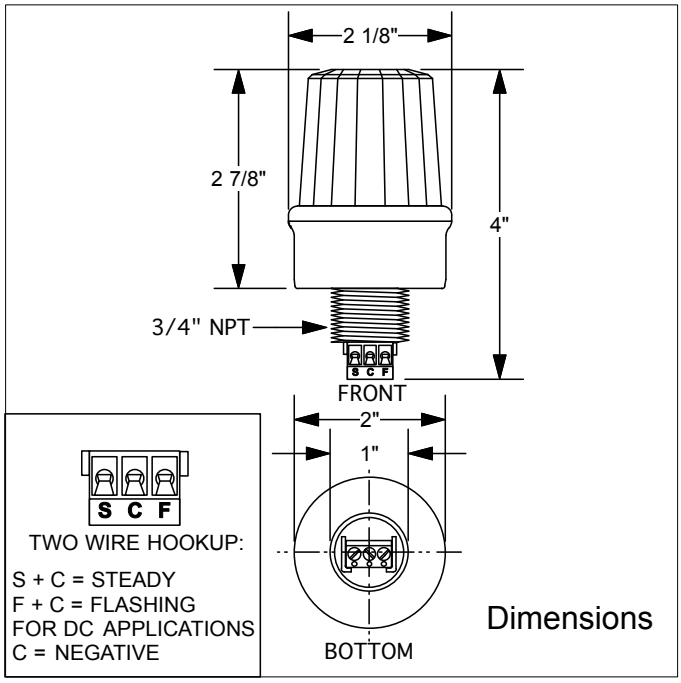
Features

- Super Bright - Daylight Visible
- 2 operation modes: steady on and flash
- Molded from GE Lexan
- Hermetically sealed for corrosion resistance and reliability
- Available with red, amber, green, clear and blue lens
- Easy one hole mounting
- Provides 360° visibility
- Comes with gasket and Lexan mounting nut
- UL Recognized - File E121431

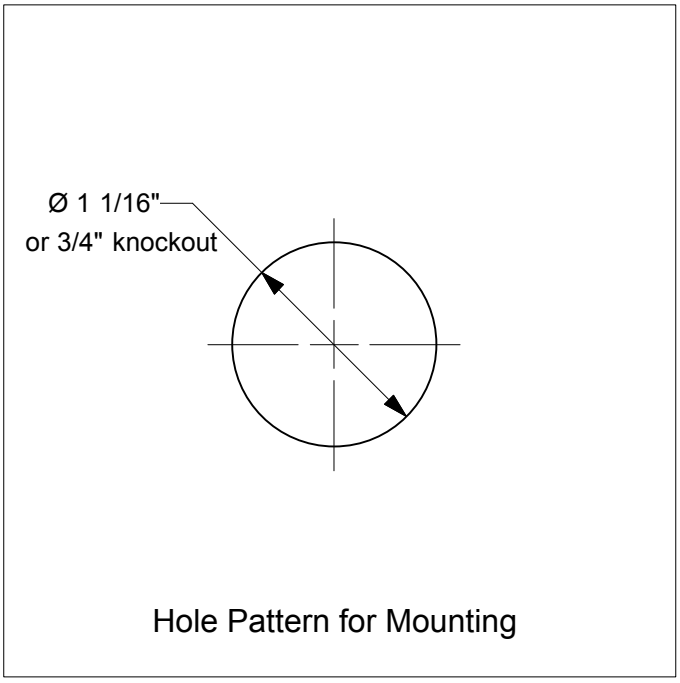
Technical Specifications

• Voltage:	SBN120AC	120VAC
	SBN1224AD	12/24VDC or VAC
• Current :	SBN120AC	48mA (max.)
	SBN1224AD	230mA (max.)@12V
		125mA flashing
		110mA (max.)@24V
		67mA flashing

- Flash rate: 60 flashes per minute
- Mounting Nut Torque: 14 in-lbs.



Dimensions



Hole Pattern for Mounting

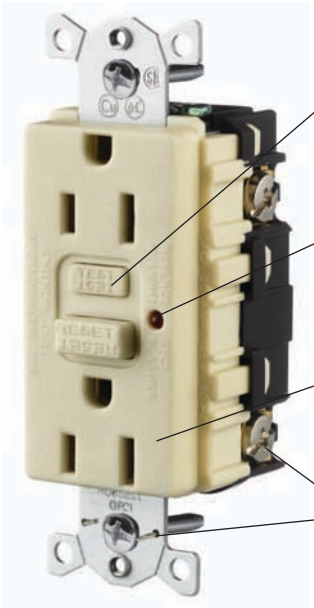
8725 Youngerman Court, Ste 206, Jacksonville, FL 32244 ■ 888-875-2221 ph (904)778-2444 fax ■ Website:www.ingramproducts.com ■ e-mail: info@ingramproducts.com

Ground Fault Products

Heavy Duty Commercial and Hospital Grade GFCI Receptacles with Auto Grounding

15 and 20 Ampere, 125 Volts AC
2 Pole, 3 Wire Grounding

Meets UL Standard 943
Class A GFCI



GF15ILA

10kA Short Circuit Current Rating

Comprehensive diagnostics
- When test button is actuated, both the electronic components and mechanical trip mechanism are functionally tested

Ground fault indicator
- Flashing **RED** indicates device has lost capability to provide protection

No power at face if reverse wired
- Open circuit condition eliminates false assumption of protection at face

Installation ease
- Internal back wiring
- Automatic grounding feature
- Captive mounting screws

GF15ILA

GF20WLA

GFR8200HOWLA

Circuit Guard® GFCI Receptacles

15A 125V NEMA 5-15R | 20A 125V NEMA 5-20R

Description	Rating	Color	Catalog Number	
Flush, nylon face, back and side wired, multiple drive screws, automatic grounding clip.	15 and 20A 125V AC	Almond	**GF15ALLA**	**GF20ALLA**
		Black	**GF15BKLA**	**GF20BKLA**
		Brown	**GF15LA**	**GF20LA**
		Gray	**GF15GYLA**	**GF20GYLA**
		Ivory	**GF15ILA**	**GF20ILA**
		Light Almond	**GF15LALA**	**GF20LALA**
		Office White	**GF15OWLA**	**GF20OWLA**
		Red	**GF15RLA**	**GF20RLA**
		White	**GF15WLA**	**GF20WLA**

Hospital Grade ● Circuit Guard® GFCI Receptacles

15A 125V NEMA 5-15R | 20A 125V NEMA 5-20R

Description	Rating	Color	Catalog Number	
Flush, nylon face, back and side wired, multiple drive screws, automatic grounding clip.	15 and 20A 125V AC	Almond	**GFR8200HALLA**	**GFR8300HALLA**
		Black	**GFR8200HBKLA**	**GFR8300HBKLA**
		Brown	**GFR8200HLA**	**GFR8300HLA**
		Gray	**GFR8200HGYLA**	**GFR8300HGYLA**
		Ivory	**GFR8200HILA**	**GFR8300HILA**
		Light Almond	**GFR8200HLAA**	**GFR8300HLAA**
		Office White	**GFR8200HOWLA**	**GFR8300HOWLA**
		Red	**GFR8200HRLA**	**GFR8300HRLA**
		White	**GFR8200HWLA**	**GFR8300HWLA**

Note: GFCI type receptacles should not be used in critical care patient areas or for electrical life support equipment applications because of the possibility of power interruption. All GFCI receptacles listed above are furnished with a matching color nylon wallplate. 20 amp feed-through capability.

DECORATOR OPENINGS, ONE GANG, 302/304 STAINLESS STEEL

SS26 | Pass & Seymour

FEATURES & BENEFITS

Smooth Metal Wall Plate 1gang Decorator 302/304 Stainless Steel

RoHS

- Type 302/304 Stainless Steel, non-magnetic: .032" nominal thickness.
- Brushed finish.
- This alloy contains 18% chromium and 8% nickel for superior resistance to corrosion.
- Recommended for use in food processing plants, dairies, chemical plants, and other industrial, institutional, and commercial applications where corrosive atmospheres exist.
- Standard, Jumbo, and Tandem plates available, as well as special Panel plates up to 5-gangs high and 10-gangs wide.
- Packaged in protective film, with finish-matching screws.
- Variety of special plated finishes.
- Paintable to match plastic plates.
- Can be silk-screened or engraved, and custom punched with over 300 opening styles.

SPECIFICATIONS

GENERAL INFO

Size: Standard
Style: Decorator

LISTING AGENCIES/THIRD PARTY CERTIFICATIONS

RoHS: Yes
CSA Listing Info: Yes
CUL Listing No: No
cULus: No
cURus: No
Federal Spec: No

LFM
Fiberglass Structures
5228 East Hwy. 290 | P.O. Box 578
Giddings, TX 78642
Ph: 979.542.8027 | Fax: 979.542.0911
www.lfm-frp.com

18. Where mud, bog, peatmoss or permafrost exist at the WW installation site, a geotechnical engineer shall be consulted for backfilling requirements by the installing contractor. LFM must be notified of this issue before the WW is installed.

19. WW TOP HEAD SUPPORT: All flat top WWs requiring traffic loads require an over concrete slab that is 12" larger than the wetwell on all sides (24" total). The project's PE of record shall design the top over slab for the required traffic and live loads.

20. Standard flat top heads are designed for 12" thick of wet concrete poured on top of the WW. If a thicker top slab is required, the top slab will be required to be done in two pours creating a horizontal cold joint. If this is not acceptable, notify LFM to inquire about alternative top head designs capable of greater WW installation loads.

21. The top slab concrete shall be poured evenly and NOT allowed to "pile" in concentrated loads. Top slabs shall be poured after the WW is backfilled.

22. Top slabs that have traffic loads shall not transfer the loads to the WW. Do not pour a top slab around the top of the WW encasing the top WW sidewall ribs. This will transfer traffic loads to the WW.

23. If there are any additional questions or further explanation is required, please contact LFM for further consultation.

9/30/2021, Rev. 0
By: DSP
Valid: (3) yrs

J.H. Wright & Associates

Submittal Data

PROJECT:
PLANTERS POINTE PUBLIX
FAIRHOPE, AL

CONTRACTOR:
FAIRHOPE UTILITIES
FAIRHOPE, AL

ENGINEER:
THOMPSON
MOBILE, AL

DATE
3-3-23

DUPLEX LIFT STATION PACKAGE

wilo®

Submitted by:
Paul Coletta

J.H. Wright & Associates, Inc.
27395 Pollard Road · P.O. Box 1085
Daphne, Alabama 36526
Phone: 251-621-1491 · Fax: 251-621-8111

JHW MATERIAL MANIFEST

JOB NAME: PLANTERS POINTE PUBLIX
EQUIPMENT IDENTIFICATION: DUPLEX LIFT STATION EQUIPMENT
ENGINEERING FIRM: THOMPSON
CONTRACTOR: FAIRHOPE UTILITIES
UTILITY PROVIDER: FAIRHOPE UTILITIES
POWER: 3/460/60

1LT **COMPONENTS FOR PUMP STATION AS FOLLOWS:**

2	WILO MODEL FA15.97Z SUBMERSIBLE PUMP, 50HP, 1750RPM, 3/460/60, 50' CORDS, STAINLESS STEEL LIFTING CHAIN
2	BASE ELBOWS
2	STAINLESS STEEL RAIL SYSTEM
1	PRIMEX DUPLEX CONTROL PANEL AS PER FAIRHOPE SPECIFICATIONS WITH VFD'S AND FLOW MODULATING CONTROLLER **(TO BE SUBMITTED SEPARATELY)**
1	VEGA RADAR LEVEL SENSOR
1	STAINLESS STEEL CABLE HANGER
1LT	WET-WELL PIPING, SCH10 304 STAINLESS STEEL, 8" FLANGED, INCLUDES BY-PASS SUCTION LINE, ALUMINUM PASS-THRUS AND LINK SEALS
1LT	ABOVE GROUND VALVE ASSEMBLY PIPING, SCH10 304 STAINLESS STEEL, 8" FLANGED, INCLUDES AVK CAST IRON CHECK & GATE VALVES, ARI AIR RELEASE VALVES, PRESSURE GAUGE ASSEMBLIES, BY-PASS CONNECTION AND SS PIPE SUPPORTS
2	ANCHOR SCIENTIFIC CONTROL FLOAT, STAINLESS STEEL, 40' CORD
1	USF APD300 48" X 72" ALUMINUM HATCH WITH GRATING
1	CERTIFIED STARTUP

NOTE: ABOVE GROUND PIPING ASSEMBLY COMPONENTS WILL STOP AT THE 8" DISCHARGE WYE AND 45-ELBOW THAT WILL TIE-IN TO THE FORCE MAIN. ALL PIPING FROM THAT POINT FORWARD TO BE PROVIDED BY OTHERS.

VERIFY AVAILABLE POWER

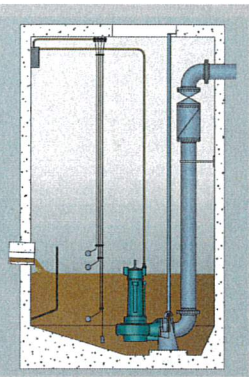
WILO

Pumpen Intelligenz.

Wilo FA Series

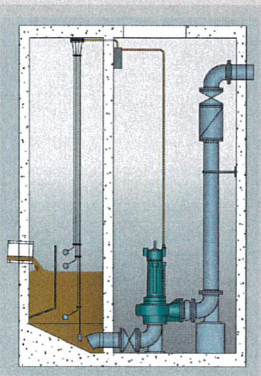
Submersible Sewage Pumps

Product Brochure



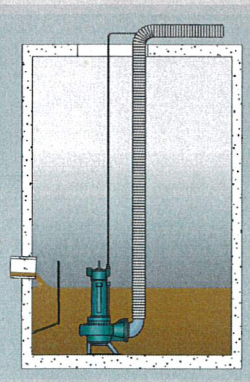
Wet Sump Installation

- Low costs for lift station and assembly
- Low space requirement for the pumps
- Service-friendly installation and removal thanks to suspension device
- Motor is cooled by the pumped media



Dry Sump Installation

- Accessible pump chamber
- Pump can be monitored during operation
- Quick repairs under hygienic conditions
- Pump remains in operation in case of flooding
- Internal cooling system, external cooling not required



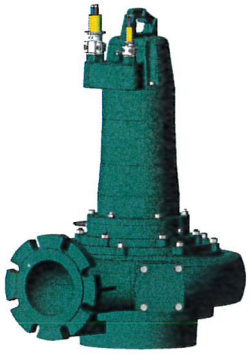
Transportable Installation

- Deep, narrow shafts
- Shallow basins
- Dewatering on construction sites
- Industrial and municipal sewage disposal
- Sewer renewal

Wilo Motors

FK, HC, FKT, & T Motors

FK Motors



FK motors feature an oil-filled motor chamber. By means of an internal oil circulation cooling system, the heat produced by the motor is dissipated to the pumped media via a heat exchanger. The type FK 17.1 of this series is available in explosion-proof design.

Advantages:

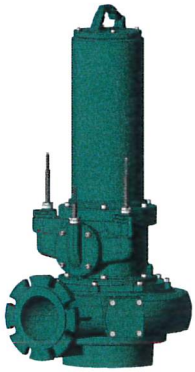
- Continuous operation in wet and dry sump installation
- Draining wet well to very low level is possible
- Cooling independent of the type of pumped media
- Room ventilation not necessary in the event of dry sump installation
- Sump volume can be reduced, resulting in lower construction costs

HC Motors

HC motors are air filled with a closed loop water/glycol cooling system. The heat of the motor is dissipated to the pumped liquid by the cooling liquid - driven by a magnetic coupling – by means of a highly efficient heat exchanger. This series is available in explosion-proof design.

Advantages:

- 2-chamber system – therefore control of both mechanical shaft seals possible
- Separate leakage chamber, high process security
- Cooling system hermetically sealed, no penetration and leakage of liquid possible
- Same advantages as the FK-motor



FKT Motors

FKT motors are air filled with a closed loop water/glycol or oil cooling system. The motor heat is dissipated to the pumped media via a heat exchanger.

Advantages:

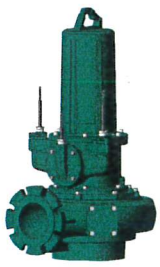
- Continuous operation in wet and dry sump installation
- Draining pump sump to very low level is possible
- Cooling independent of the type of pumped media
- Room ventilation not required in the event of dry sump installation
- Sump volume can be reduced, resulting in lower construction costs
- Most available in explosion proof design

T Motors

Air filled T motors are cooled when submerged in the surrounding pumped media. Here, the motor waste heat is emitted directly via the casing, to the pumped medium. The types of this series are available in explosion-proof design.

Advantages:

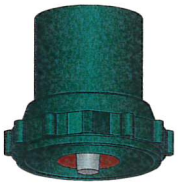
- Competitive solution
- Separate cooling system not required



**More details available upon request*

Wilo Impellers
Modular system impellers

Modular System



» Multiple combinations of pump ends and motors to fulfill the requirements of each project.

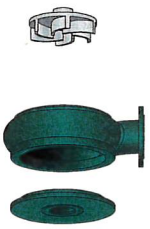
Single-Channel Impeller

» Low to medium capacity at medium to high heads
» Raw unscreened sewage and dewatering applications
» Return and Waste Activated Sludges and recycled sludge with up to 8% solids

Multi-Channel Impeller

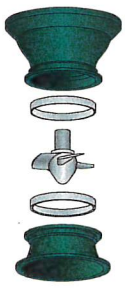
» Raw unscreened sewage of larger pumps
» Screened wastewater and sludges, storm water and drainage applications.

Vortex-Type System



» Raw unscreened sewage and dewatering applications
» Raw and digested sludges with up to 8% solids
» Best in solids passage and abrasive duty

Propeller-Type System



» High capacity at low heads
» Storm water, irrigation and well screened wastewater
» Return sludge and recycle of activated sludge in wastewater treatment plants

Wilo Block Seal

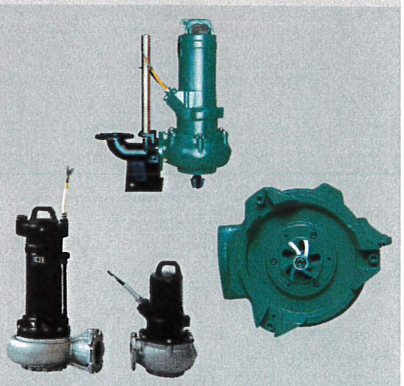
Mechanical shaft seals of high wear-resistant silicon-carbide at the motor and pumpside integrated in a stainless steel cartridge

» High wear and corrosion resistance
» High operation safety
» Long working life
» Operation not dependent on the direction of rotation

Special Materials

» Wear-resistant materials and coatings
» Corrosion-resistant materials and coatings
» Ceram coatings

ceram protected



Special Designs

» Mechanical mixing head
» Grinder pumps
» Cast stainless steel

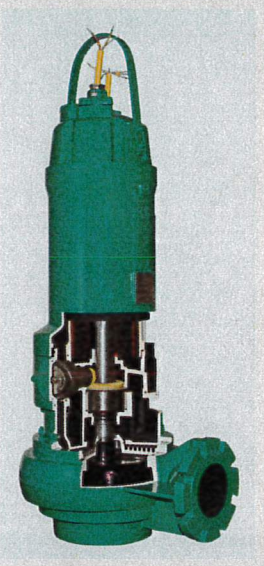
Wilo FA Series

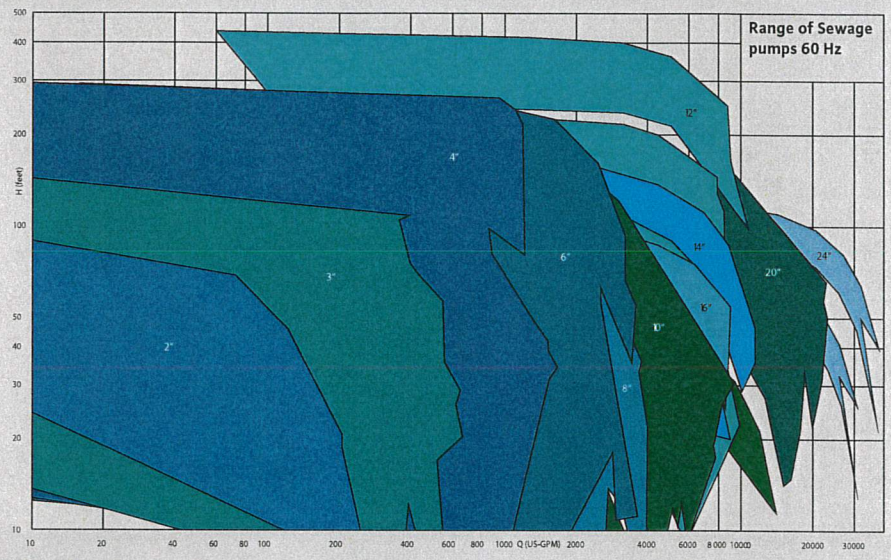
Sumbersible Sewage Pumps

Applications Include:

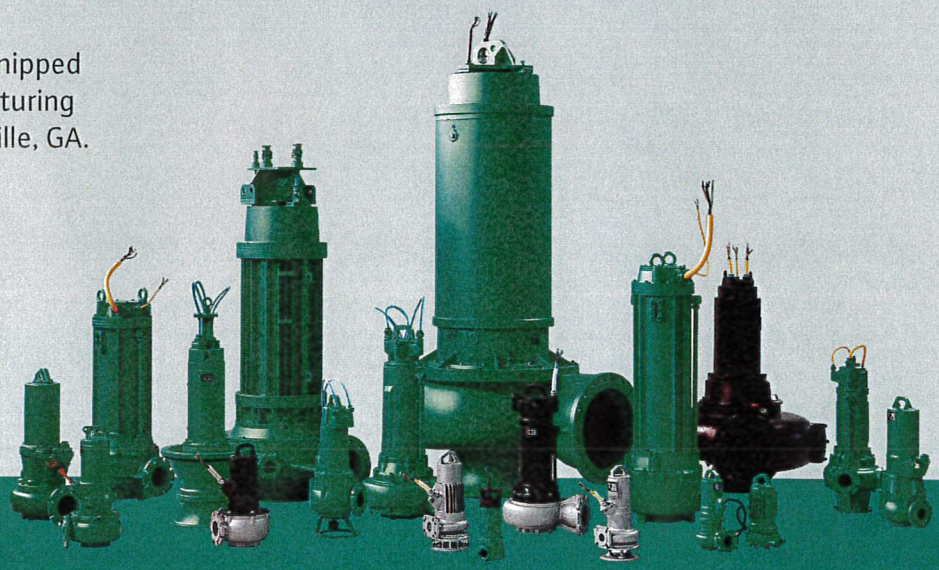
- » Sewage Collection
- » Sewage Treatment
- » Storm Water
- » Dewatering
- » Raw Water
- » Industry

Wilo FA Series





All FA pumps are shipped from our manufacturing facility in Thomasville, GA.



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Email: info@wilo-canada.com

GERMAN QUALITY since 1872.

WILO

Pumpen Intelligenz.

10-27-001-1111

SECTION 11XXX

RAW WASTEWATER PUMPS

PART 1 - GENERAL

1.01. DESCRIPTION

The General Contractor shall furnish, install, test and place in satisfactory operation, as shown on the Plans and specified, Two wet-pit submersible pump(s) complete with all appurtenances, accessories and spare parts as will be required to produce a complete and workable installation.

1.02. RELATED WORK SPECIFIED ELSEWHERE

A. Refer to Division ____ for supplementary requirements for guarantees, shop drawings, technical manuals, startup, etc.

B. Division ____ for Painting

C. Division ____ for Electrical and Sewage Pump Controls

D. Division ____ for Pressure Gauges and Valves

1.03. SUBMITTALS

A. Data to be submitted:

1. The Contractor shall submit pump curves for the units which he proposes to supply, showing Total Dynamic Head, Pump Efficiency, Brake Horsepower, Power Input to Electric Drive Motor of Pumping Unit for the various conditions under which the units are to operate along with descriptive data and specifications describing in detail the construction of the complete units.

2. The manufacturer shall have a minimum of five installations of similar combination of pump and motor model proposed to be furnished for this project. Installations must be in operation for a minimum of five years.

B. Dimensional Data:

The successful bidder shall submit to the Engineer for approval, shop drawings, showing all weights and dimensions necessary for the installation of foundations, anchor bolts, piping and valve connections.

PART 2 - MATERIALS

2.01. MANUFACTURERS

A. Manufacturer

Sewage pumps shall be manufactured by Wilo USA LLC of Thomasville, Georgia, or pre-approved equal.

Any pump manufacturer, other than specified, proposing to offer the following equipment must submit sufficient information to the Engineer to determine that the equipment complies with the

requirements of the Contract Documents. This information must be received by the Engineer not less than 14 days prior to the Bid Date. The Engineer will issue an addendum prior to the bid date that lists any pre-approved equipment. Contractors and manufacturers are advised that a manufacturer named as an approved supplier is not excused from meeting all of the technical and performance requirements of this specification. The pre-bid qualification package shall include complete pump performance data, evidence of compliance with the installation experience requirements of this Section and a letter from an officer of the company of the pump manufacturer listing all exceptions to the specifications.

B. Pump Performance:

Each pump shall be capable of the following performance:

SEE ATTACHED PUMP/MOTOR DATA SHEET

2.02. PUMP CONSTRUCTION

A. General

The sewage pumping units shall be vertical, non-clogging, centrifugal sewage pumps with bottom inlet and side discharge. The pumps shall be direct driven by integral squirrel cage, electric induction motors. Each pump shall include-quick removal system, anchor bolts and all accessories specified herein.

B. Volute

1. The volute shall be constructed of ASTM A48 Class 35B (GG25) or higher cast iron capable of prolonged resistance to raw sewage.

2. Suction and discharge flanges shall be 125# and meet ANSI standard B16.1.

3. All nuts, bolts, washers, and other fastening devices supplied with the pumps shall be stainless steel.

4. All mating surfaces requiring a watertight seal shall be machined and fitted with FPM (Viton) O-rings. Paper gaskets are not acceptable.

C. Impeller

1. Pump impellers shall be of the solids handling non-clog type. The impeller vane shall be smooth, finished throughout, and shall be free from sharp edges.

2. Pump impellers shall be manufactured from ASTM A48 Class 35B (GG25) or higher cast iron.

3. Impellers shall be key driven and securely held to the shaft by a streamlined impeller washer and bolt assembly specifically designed to reduce friction in the suction eye of the impeller. The arrangement shall be such that the impeller cannot unscrew or be loosened by torque from either forward or reverse rotation. Designs based on threaded connection between pump shaft and impeller will not be considered.

4. The impeller shall be capable of passing a 3.9-inch solid non-deformable sphere. Designs that cannot pass a sphere through the impeller or rely on deforming, cutting, or chopping solid materials shall not be acceptable.

D. Wear Rings

1. The impeller shall be provided with an AISI 329 (1.4462) duplex stainless steel wear ring that is drive fitted to the suction eye of the impeller.

2. The casing shall be provided with an AISI 304 (1.4308) stainless steel wear ring that is drive fitted to the bottom suction inlet.

2.03. MOTORS

A. Submersible Motors

1. Each pump shall be furnished with a squirrel cage, induction motor enclosed in a watertight housing suitable for use and compatible with all variable frequency drive systems.

2. The motor shall be air-filled or oil-filled and constructed with moisture resistant NEMA Class H insulation and Class H slot liners and constructed to NEMA B design standards. The copper wound stator shall be dipped in epoxy enamel and hardened to withstand a temperature of 180 °C for Class H as defined in NEMA Standard MG-1. Each winding phase or layer shall be laced with Class H glass lined paper. The use of cable ties to restrain windings shall not be allowed. The rotor shall be statically and dynamically balanced after fabrication. The rotor shall utilize aluminum amortisseur bars and short circuit rings. The motor shall be certified for continuous duty with a service factor of 1.10 and shall be non-overloading over the entire range of the impeller.

3. The motor shall be capable of sustaining 15 starts per hour (unlimited starts with VFD) at a minimum ambient temperature of 40°C.

4. The motor shall be capable of uninterrupted operation with a voltage drop of 10%.

5. The motor shall bear the Factory Mutual (FM) explosion-proof label certifying its use in a Class 1, Division 1, Groups C & D hazardous location.

6. Thermal switches shall be furnished to monitor stator temperatures. The stator shall be equipped with three (3) thermal switches. Thermal switches shall automatically de-energize the motor when its temperature exceeds a preset limit as recommended by the manufacturer.

7. The pump manufacturer's nameplates shall be engraved, laser etched, or stamped on stainless steel and fastened to the motor casing.

B. Shafts

1. All shafts shall be dynamically balanced and shall be constructed of AISI 420 (1.4021) stainless steel. Carbon steel shafts or shafts with sleeves of any type are not acceptable. The shaft shall be one-piece construction without joints or stubs attached.

2. Multiple row lower bearings for axial thrust and a single row upper bearing for radial thrust shall support the motor/pump shafts. Thrust bearings shall be restrained from thrust in both directions. Designs that do not protect the pump/motor from thrust in reverse directions shall not be acceptable.

3. Bearings shall be sealed and grease lubricated.

4. Minimum shaft diameter shall be 3.125-in at the lowest bearing.

5. Shaft overhang ratio L^3/D^4 shall not exceed 10.

C. Mechanical Seals

1. Each pump shall be provided with tandem mechanical seals with the seal housing constructed of AISI 420 series (1.4028) stainless steel and the spring system constructed of AISI 301 (1.4310) stainless steel. The block seal housing shall be constructed such that it can be dismantled allowing the seal faces and springs to be renewed and the seal system to be placed back into service. Cartridge seals constructed such that they cannot be repaired or renewed shall not be acceptable. Both upper and lower seal faces shall be silicon carbide versus silicon carbide.

2. The seal shall be mounted in a separate and isolated seal chamber. The seal chamber shall be filled with non-conductive lubricating oil as recommended by the manufacturer.

3. A moisture sensor shall be furnished to sense moisture intrusion for each pump. This sensor shall be wired to the Pump Control Panel (specified in Division ___) and shall activate an alarm light upon moisture intrusion. The sensor probe shall be mounted in the seal chamber and shall be of the conductive type, sensing moisture intrusion above the lower seal, but below the upper seal. Designs that sense moisture intrusion above the upper seal using a float switch are not acceptable.

D. Power and Control Cables

1. Power and control cables shall be furnished in lengths to run un-spliced from the pump to the pump control panel as shown on the Contract Drawings and as specified herein (__40-ft). Cables shall terminate with conductor sleeves that bundle the entire group of strands of each phase to improve termination at the pump control panel. The sleeves shall be provided to confirm that all strands of each conductor are terminated properly. Termination shall be coordinated with the connection to the Pump Control Panel.

2. Cables shall be of the "NSSHOU" type and shall be approved by the MSHA for use in hazardous locations and shall conform to industry standards for loads, resistance under submersion against sewage, and be of stranded construction. The cables shall enter the pump through a heavy duty galvanized cast iron entry assembly that shall be provided with an external clamp assembly to protect against tension once secured providing a strain relief function as part of standard construction.

3. The cables for each pump shall pass through the galvanized cast iron strain relief component and then through a series of stainless steel disks and Buna-n grommet that is sandwiched between the disks to control compression of the grommet. The cable entry design shall be of the type recommended in the FM specifications for Explosion Proof Certification. The entry shall be comprised of the cast iron fitting that will include the Buna-N strain relief grommet coupled with a poured conductor section. In the poured section, only FM-approved sealant shall be used to wick into each conductor strand that has the insulation removed in this area to provide a positively leak proof seal for the power and sensor cords.

2.04. REMOVAL SYSTEM

A. General Description

The removal system shall consist of a discharge base elbow that mounts in the bottom of the wet pit, a replaceable pump coupling, guide pipes and supports and hardware as required for a complete and operational system. Connections to piping shall be standard ANSI flanges.

B. Discharge Base Elbow

The ASTM A48 Class 30B or higher cast iron discharge base elbow shall be provided to support the full weight of the submersible pump in the installation and provide a leak proof connection in which the pump coupling mates using a conformed Buna-N seal that is held in place by the combined weight of the cantilevered pump and motor. The hydraulic pressure generated while the pump is in operation also aids the sealing. The discharge base elbow shall be provided guide pipe retention lugs.

C. Pump Coupling

The pump coupling shall be close grained gray cast iron construction. The coupling shall be located between the pump discharge flange and the vertical face of the discharge base. The purpose of the coupling shall be to allow use of a standard ANSI drilled pump-casing flange on the pump. The coupling acts as the intermediate part between the pump and the discharge base. The coupling vertical face is designed to seal against the vertical face of the discharge base using a replaceable Buna-N elastomeric compressible one-piece seal that acts as both the discharge face seal and the gasket between the coupling and the pump flange. Wet pit installation designs that utilize the flat face of the pump flange to seal against the discharge base are not allowed.

D. Guide Rails

AISI 304 stainless steel guide rails supported by upper and intermediate brackets of AISI 316 stainless steel shall guide each pump. The guide rails shall consist of standard dimension Schedule 40 piping with a minimum diameter of 1.5-in. The guide rails shall be supported by a AISI 316 SS upper guide rail bracket that will be mounted in the opening of the access cover to support and guide the pump/motor into and out of the wet well. Intermediate guide rail brackets shall be provided for all installations deeper than 20-ft.

E. Lifting Device

A lifting chain of 20-ft AISI 304 Stainless Steel shall be provided for each pump. Additional lifting devices, if required, shall be provided by the supplier of the hoist/crane. The responsibility to determine compatibility of the lifting chain with a hoist/crane is by others.

2.05. SHOP PAINTING

A. Primer and Finish Paint - Shop apply to all exterior ferrous surfaces of the pump and motor a single coat (6 – 8 mils DFT) of two-component epoxy. Coating shall be resistant to sewage of normal pH and contain no more than 3.5 pounds per gallon of VOCs.

B. Surface Preparation - Prepare all surfaces to receive coating system. Surfaces must be free from dust, grease, rust, scale, and other coatings.

PART 3 - EXECUTION

3.01. WARRANTY

Municipal-use pumps and motors shall be covered by a limited five (5) year warranty that shall comprise the following terms: The initial year from start-up of the equipment shall be covered 100% for parts and labor. The following years 2 through 5 shall be covered 100% for parts. This warranty shall not be limited by hours of running time or operation from variable speed drives.

3.02. FIELD QUALITY CONTROL

A. Field Testing

1. After the installation of the pumps, controls and all appurtenances, and when construction of other units of the pump station will permit, each complete pumping unit will be subject to field tests as specified herein under actual operating conditions.

2. The field tests shall be made by the Contractor under the direct supervision of a qualified factory-trained engineer or manufacturer's representative, and in the presence of, and as directed by the Engineer. The Contractor shall provide, calibrate and install all temporary gauges and meters, shall make necessary tapped holes in the pipes, and install all temporary piping and wiring required for the field tests.

3. The field tests shall determine the head, discharge flow and overall efficiency characteristics of each pumping unit and in addition, shall demonstrate that under all conditions of operation each unit:

   Has not been damaged by transportation or installation.
   Has been properly installed.
   Has no mechanical defect.
   Is in proper alignment.
   Has been properly connected.
   Is free of overheating of any parts.
   Is free of all-objectionable vibration and noise.
   Is free of overloading of any parts.

3.03. SPARE PARTS

A. The manufacturer shall furnish one set of the following spare parts for each pump model number:

1. None

2.

+ +END OF SECTION + +

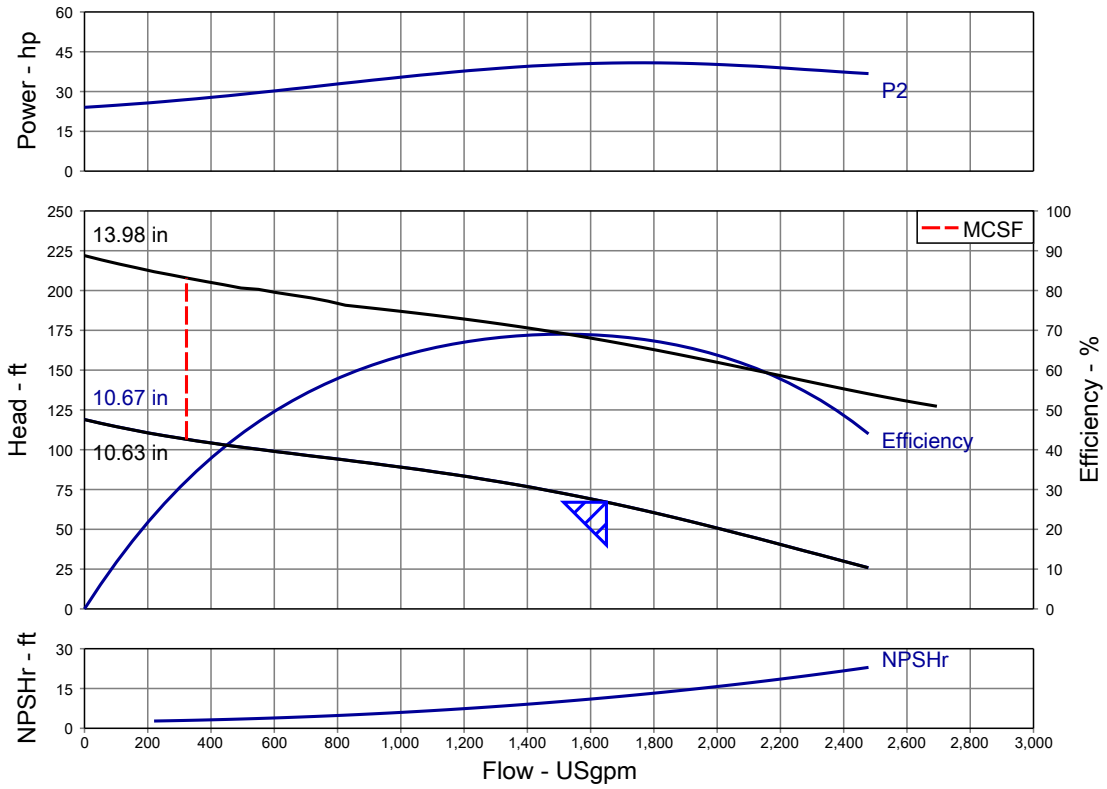
Customer :
Reference :

Pump Performance Datasheet

Wilo Quotation System 22.1.1

Item number	: 001	Size	: EMU FA15.97Z with Motor T24-4/36KEx
Service	:		
Quantity	: 1	Stages	: 1
Quote number	: 795463	Based on curve number	: FA15.97Z 1740
		Article Number	:
		Date last saved	: 17 May 2022 5:20 PM

Operating Conditions		**Liquid**	
Flow, rated	: 1,650.0 USgpm	Liquid type	: Water
Head, rated (requested)	: 67.00 ft	Additional liquid description	:
Head, rated (actual)	: 67.11 ft	Solids Diameter, required / pump max	: 0.00 in / 3.10 in
Suction pressure, rated / max	: 0.00 / 0.00 psi.g	Solids concentration, by volume	: 0.00 %
NPSH available	: Ample	Temperature	: 68.00 deg F
Site Supply Frequency	: 60 Hz	Fluid density	: 1.000 / 1.000 SG
Performance		Viscosity	: 1.00 cP
Speed criteria	: Synchronous	Vapor pressure, rated	: 0.34 psi.a
Speed	: 1770 rpm	**Material**	
Impeller dia.	: 10.67 in	Material selected	: Standard
Impeller diameter, maximum	: 13.98 in	**Pressure Data**	
Impeller diameter, minimum	: 10.63 in	Maximum working pressure	: 51.50 psi.g
Efficiency	: 68.67 %	Maximum allowable working pressure	: N/A
NPSH required / margin required	: 11.54 / 0.00 ft	Maximum allowable suction pressure	: N/A
Ns (imp. eye flow) / Nss (imp. eye flow)	: 1,917 / 9,787 US Units	Hydrostatic test pressure	: N/A
MCSF	: 322.5 USgpm	**Driver & Power Data (@Max density)**	
Head max.	: 119.0 ft	Driver sizing specification	: Rated power
Head rise to shutoff	: 77.32 %	Margin over specification	: 0.00 %
Flow, best eff. point	: 1,515.5 USgpm	Service factor	: 1.00
Flow ratio, rated / BEP	: 108.88 %	Power, hydraulic	: 27.95 hp
Diameter ratio (rated / max)	: 76.34 %	Power, rated	: 40.71 hp
Head ratio (rated dia / max dia)	: 39.85 %	Power, maximum	: 40.84 hp
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00	Motor rating	: 50.30 hp / 37.51 kW
Selection status	: Acceptable		



Construction Datasheet

EMU FA15.97Z with Motor T24-4/36KEx

Customer	:
Customer Referance	:
Item Number	: 001
Service	:
Quanity of Pumps	: 1

Quote Number	: 795463
Pump Size	: EMU FA15.97Z with Motor T24-4/36KEx
Stages	: 1
Speed	: 1770 rpm
Date Last Saved	: 17 May 2022 5:20 PM

Duty Point Data

Flow	: 1,650.0 USgpm
Head	: 67.00 ft
Shaft Power	: 40.71 hp
Pump Efficiency	: 68.67 %
Fluid	: Water
Speed	: 1770 rpm

Construction

Installation Type	: Wet Pit
Free Passage	: 3.10 in

Suction Port	**Pressure Rating**	**PN10**
	Rated Diameter	**Size 6**
	Standard	**EN1092-2-S**
Discharge Port	**Pressure Rating**	**PN10**
	Rated Diameter	**Size 6**
	Standard	**EN1092-2-D**

Materials

Material Combination Code	: 89
Pump Housing	: Grey Cast Iron, ASTM A48 Class 35/40B
Impeller	: Grey Cast Iron, ASTM A48 Class 35/40B
Stationary Wear Ring	: ANSI 304 CF8 / ASTM A351 Gr.CF8
Mobile Wear Ring	: ANSI 329 (2205) / ANSI 329
Suction Port	: -

Weights

Weight of Pump End	: 518.1 lb
Weight of Motor	: 573.2 lb
Weight of Unit	: 1,091.3 lb

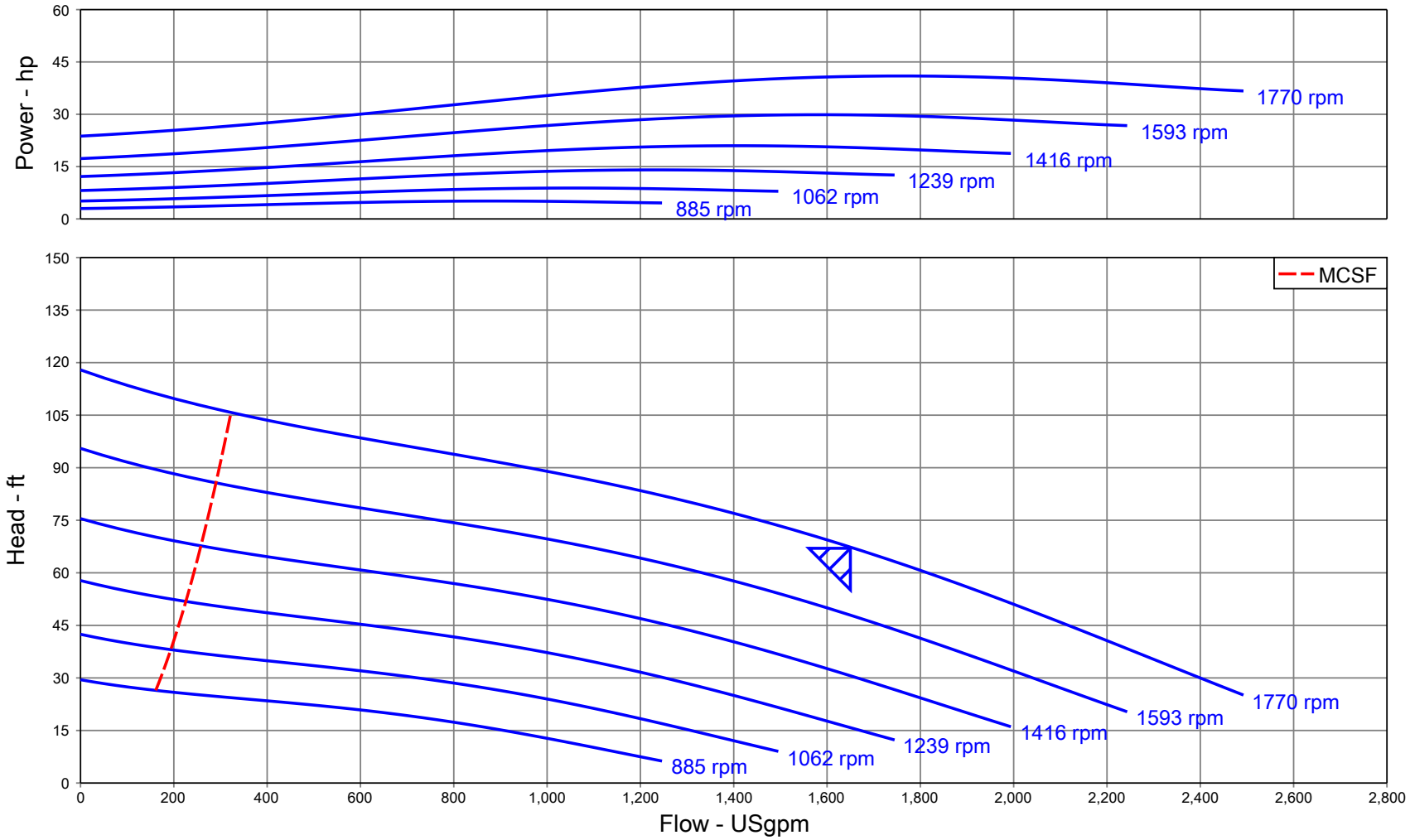
Driver Information

Motor Name	: T24-4/36KEx 50.3 HP
Motor Voltage	: 3/60/460V
Rated Power	: 50.30 hp
Rated Speed	: 1760 rpm
Power Input with Rated Power (P1)	: 57.13 hp
Current Input with Rated Power (FLA)	: 65.00 A
Efficiency with Rated Power	: 88.00 %
Cos Phi with Rated Power	: 0.83
Cos Phi with Starting Power	: 0
Starting Current, Direct Starting (LRA)	: 400.00 A
Starting Current, Star-Delta	: 133.30 A
Starting Torque	: 6.71 hp/100 rpm
Inertia Moment	: 4.10 lb.ft2
Max. Fluid Temperature	: 104.0 deg F
Starts per Hour, Max.	: 15
Degree of Protection	: IP 68
Selected Explosion Protection	: FM
	:
	:

Customer :
Reference :

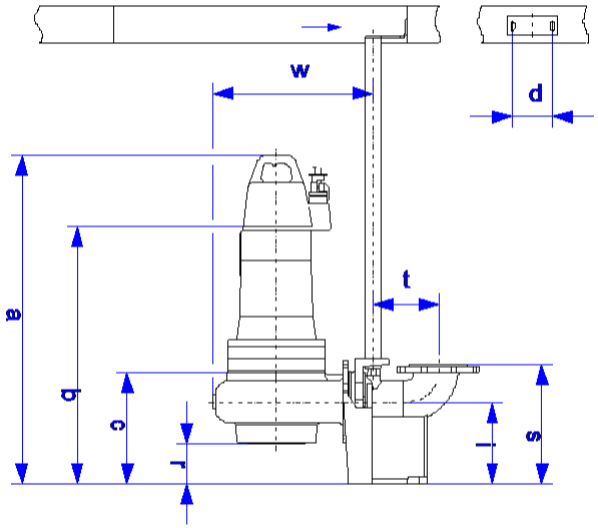
Multi-Speed Performance Curve

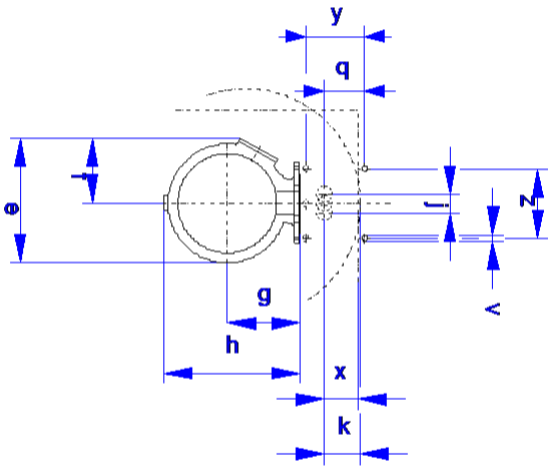
Wilo Quotation System 23.0.0



Item number	: 001	Size	: EMU FA15.97Z with Motor T24-4/36KEx	Flow, rated	: 1,650.0 USgpm
Service	:			Head, rated	: 67.00 ft
Quantity	: 1	Stages	: 1	Speed	: 1770 rpm
Quote number	: 795463	Efficiency	: 68.67 %	Impeller dia.	: 10.67 in
Based on curve number	: FA15.97Z 1740	Power, rated	: 40.71 hp	Fluid density	: 1.000 / 1.000 SG
		NPSH required	: 11.54 ft	Viscosity	: 1.00 cP
Date last saved	: 03 Mar 2023 11:41 AM	Site Supply Frequency	: 60 Hz	Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00
		Nominal speed	: 1760 rpm		

General Arrangment Drawing





Dimensions	
Well Type	Wet Pit
a	56.65
b	46.69
c	16.18
d	4.33
e	24.65
f	13.31
g	17.72
h	29.96
i	12.60
j	1.97
k	3.74
l	-
m	-
mm	-
n	-
o	-
p	-
q	5.87
r	4.72
s	18.31
t	8.66
v	0.75
w	33.43
x	3.54
y	8.27
z	9.45
zz	-

Dimensions		
Suction Port	Rated Diameter	Size 6
	Pressure Rating	PN10
Discharge Port	Rated Diameter	Size 6
	Pressure Rating	PN10

Certification Content	
Customer	
Customer P.O.	
Location	
Service	
Pump Size/Motor	EMU FA15.97Z with Motor T24-4/36KEx
Article Number	
Item Number	001
DRWN	
CHKD	
APVD	

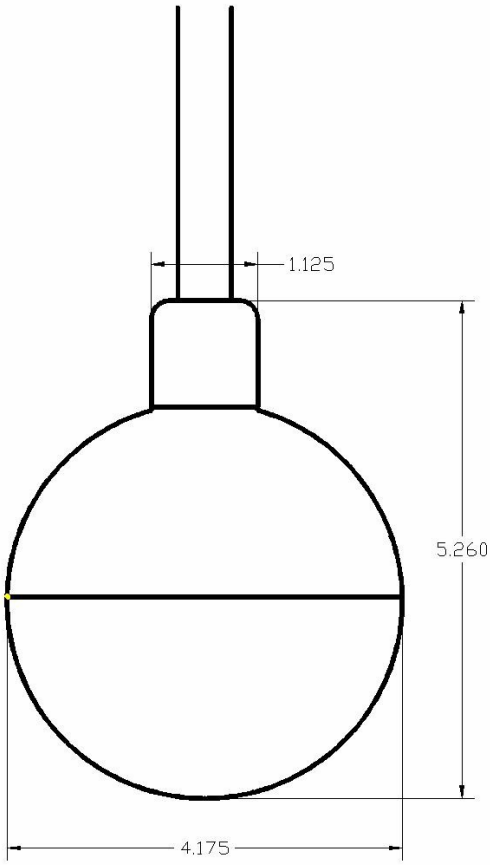
Special Note
1. All weights and dimensions are approximate and should not be used as exact rough-in dimensions

WILO USA LLC
Tel: (888) 945-6872
Web: www.wilo-usa.com

EMU FA15.97Z with Motor T24-4/36KEx	REV

FLOAT SWITCH – CONTROL DUTY

2900 MERCURY SERIES – STAINLESS STEEL FLOAT SWITCH



GENERAL

DESIGNED FOR ACCURATE LIQUID LEVEL CONTROL IN MANY APPLICATIONS INCLUDING CHEMICAL WASH TANKS, VIOLENT APPLICATIONS OR SEWAGE ENVIRONMENTS. THE FLOAT SWITCH CAN BE UTILIZED TO SIGNIFY SPECIFIC WATER LEVELS OR FOR DIRECT ALARM ACTUATION.

SWITCH VARIATIONS

NORMALLY OPEN (N/O)

THE CONTACTS ARE OPEN (OR OFF) IN THE HANGING POSITION. AS THE FLOAT RISES 1" (5°) ABOVE HORIZONTAL, THE CONTACTS BECOME CLOSED AND ACTUATE (TURN ON) THE SWITCH. THIS FLOAT IS GENERALLY USED IN PUMP DOWN APPLICATIONS.

NORMALLY CLOSED (N/C)

THE CONTACTS ARE CLOSED (OR ON) IN THE HANGING POSITION. AS THE FLOAT RISES 1" (5°) ABOVE HORIZONTAL, THE CONTACTS BECOME OPEN AND ACTUATE (TURN OFF) THE SWITCH. THIS FLOAT IS GENERALLY USED IN PUMP UP APPLICATIONS.

SWITCH SPECIFICATIONS

2900 SERIES MERCURY FLOAT SWITCHES ARE DESIGNED TO OPERATE UNDER THE FOLLOWING PARAMETERS.

MINIMUM OPERATING TEMPERATURE	-	32 DEGREES F.
MAXIMUM OPERATING TEMPERATURE	-	221 DEGREES F.
ELECTRICAL RATING	-	18 AMP – 120 VAC.
ACTUATION POINT	-	1" ABOVE / BELOW HORIZONTAL.

POWER CORD SPECIFICATIONS

CONDUCTOR CORD – PHYSICAL	-	CHLORINATED POLY ETHYLENE.
ELECTRICAL FOR N/O OR N/C SWITCH	-	14 AWG 3, TYPE SOO-600 VOLT.

FLOAT SPECIFICATIONS

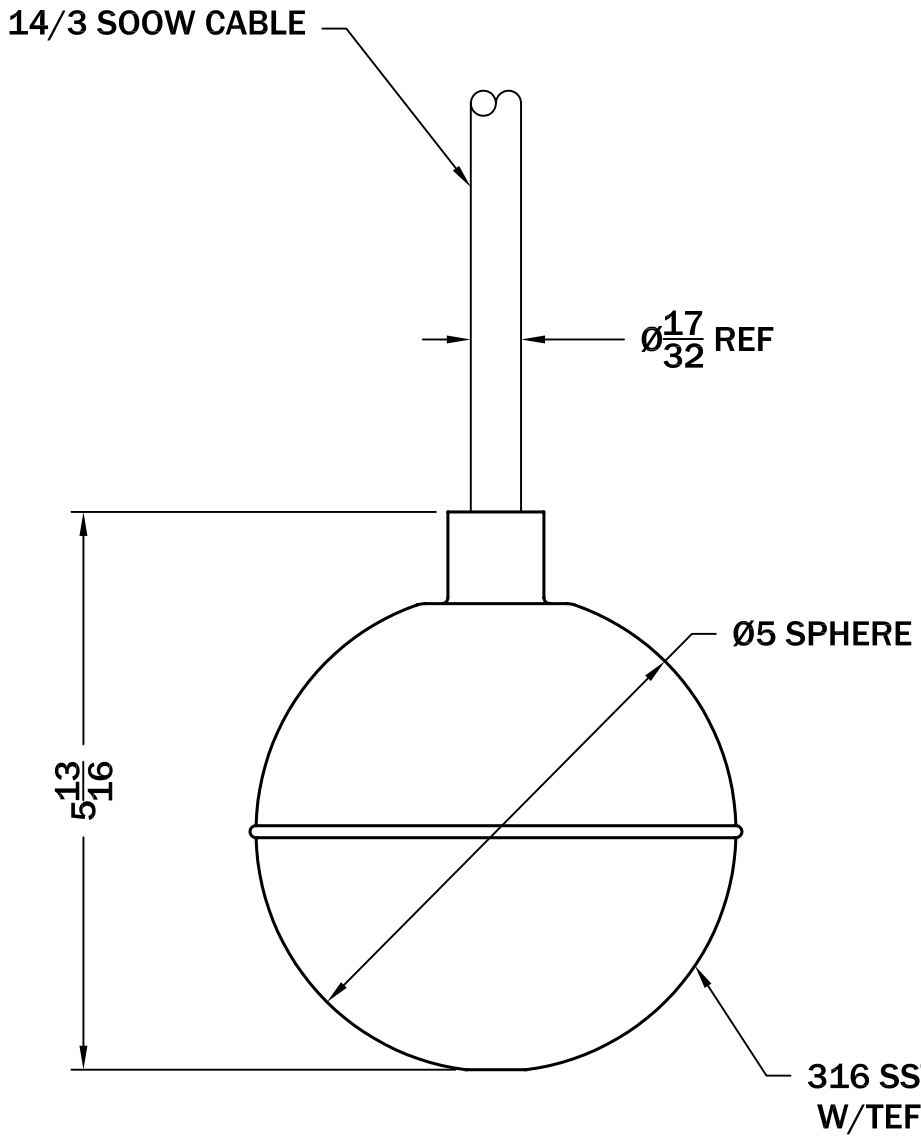
TEFLON® COATED TYPE 316 STAINLESS STEEL HOUSING.
CAN WITHSTAND HIGH TEMPERATURES AND MOST CORROSIVE CHEMICALS.
FOR USE WITH INTRINSICALLY SAFE CIRCUITS.

CORD BRACKET

COMES STANDARD WITH A 1" STAINLESS STEEL PIPE MOUNT ASSEMBLY

CONERY MFG INC 1380 ENTERPRISE PARKWAY ASHLAND, OH 44805
info@conerymfg.com PH (419) 289-1444 FAX (419) 281-0366

SSF FLOAT



CONERY MFG INC

CHANGES		TOLERANCES	DRAWN BY	DATE
F		DECIMALS .XXX = ±.005 .XX = ±.010 FRACTIONAL X/X = ±.1/64 ANGLES X° = ±1/2°	D. MIDDLETON	02/20/04
E			MATERIAL SPECIFICATION: NARROW ANGLE MERCURY FLOAT	
D				
C				
B				
A				

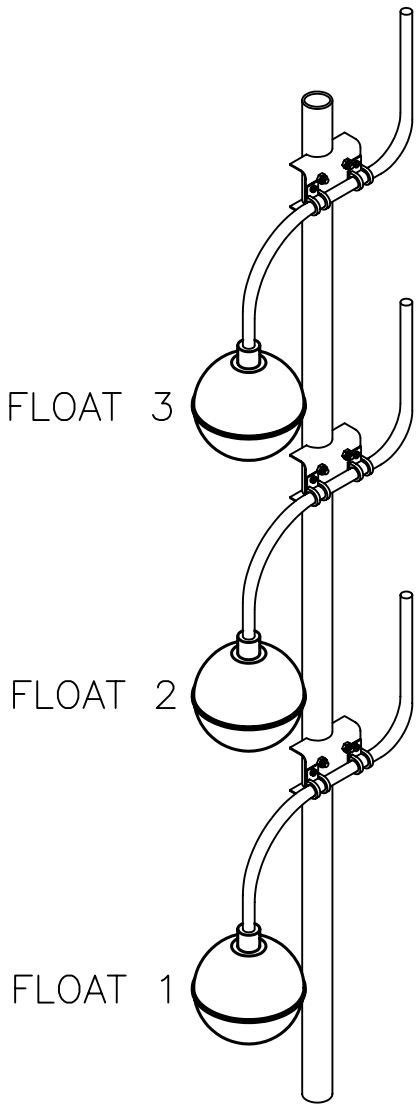
SPECIFICATION SHEET
SSF SST FLOAT

SCALE:	PART NO.
HALF	SSF FLOAT

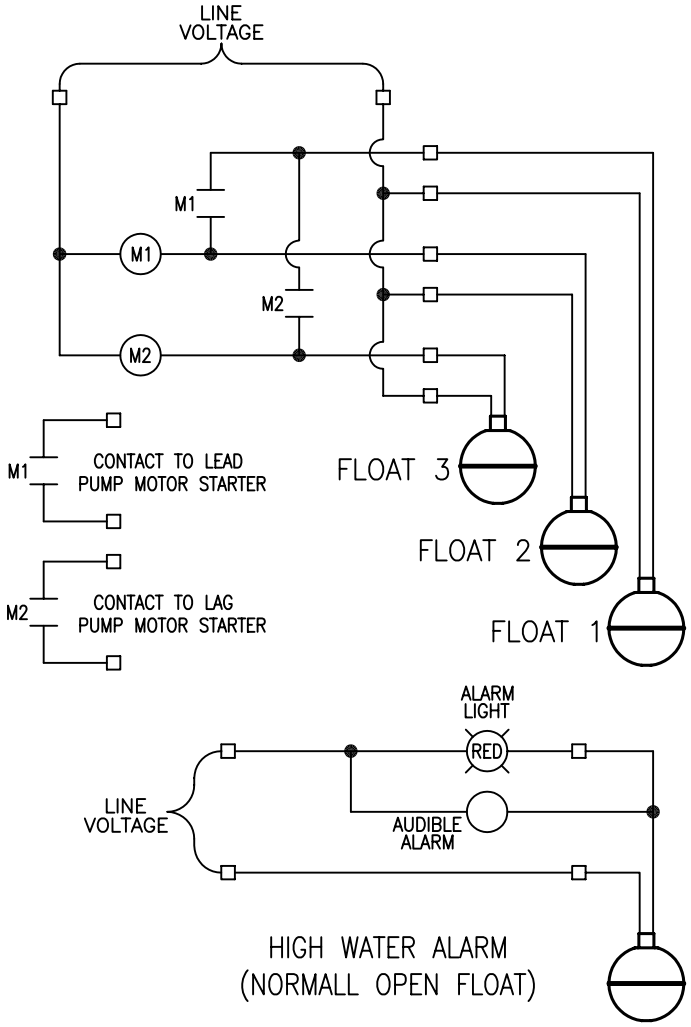
NOTE: ALL ELECTRICAL DIAGRAMS SHOWN ARE EXAMPLES ONLY, CONSULT WITH LOCAL ELECTRICAL AUTHORITIES AND CODES. DO NOT USE THESE PRODUCTS IN GASOLINE, VOLATILES, OTHER COMBUSTIBLES.

SSF FLOAT

TYPICAL MOUNTING



FOR PUMP DOWN USE (NORMALLY OPEN FLOATS) FOR PUMP UP USE (NORMALLY CLOSED FLOATS)



CONERY MFG INC

CHANGES		TOLERANCES	DRAWN BY	DATE
F		DECIMALS .XXX = ±.005 .XX = ±.010 FRACTIONAL X/X = ±.1/64 ANGLES X° = ±1/2°	D. MIDDLETON	02/20/04
E			MATERIAL SPECIFICATION: NARROW ANGLE MERCURY FLOAT	
D				
C				
B				
A				

SPECIFICATION SHEET
SSF SST FLOAT

SCALE:	PART NO.
NONE	SSF FLOAT

AMERICAN AVK RESILIENT SEATED, 250 PSI, DUCTILE IRON GATE VALVE

45/51

To AWWA C509 / C515 - Flanged Ends to ANSI B 16.1, Class 125 - Valve sizes 2.5" - 12"

Use:

For water and neutral liquids to maximum 160°F.

Tests:

Hydraulic test to AWWA C509 / C515:

Shell Test: 500 PSI
Seat Test: 250 PSI

Operating Torque Test

Optional Materials:

Stem 2.5" - 12"	Option a):	For UL,FM.ULC Low zinc bronze ASTM copper alloy No. C99500
Anti Friction Washers	Polyamide	
Bonnet Bolts	Option a):	For UL,FM.ULC ASTM A164 zinc coated steel sealed with hot melt
	Option b):	Stainless Steel -A4-Grade 316 sealed with hot melt
Gland Bolts	Option a):	For UL,FM.ULC ASTM A153 zinc coated steel Hexagon bolt
	Option b):	Stainless Steel -A4-Grade 316 Hexagon bolt

Standard Materials:

Body, Bonnet, Gland Flange, Wrench Nut	Ductile iron ASTM A536 (Wrench Nut-painted black for clockwise closing, red for counterclockwise closing)
Coating	Electrostatically applied fusion-bonded epoxy-resin Meets or exceeds AWWA C550
Stem	Standard: Stainless steel AISI 430F, ASTM A582
Wedge	Ductile iron ASTM A536 vulcanized with EPDM-rubber compound
Wedge Nut	Bronze
Bonnet Bolts	Stainless Steel -A2- Grade 304 sealed with hot melt
Gland Bolts Hexagon bolt	Stainless Steel -A2- Grade 304
Bonnet Gasket, Wiper Ring, O-Ring Stem Seals, O-Ring Gland Seal	ASTM D2000 Buna "N" nitrile rubber

Approvals:

*UL Listed,
*FM Approved
*ULC Listed
NSF-61 (audited by UL)

* Approved at 200 PSI working pressure

1000773

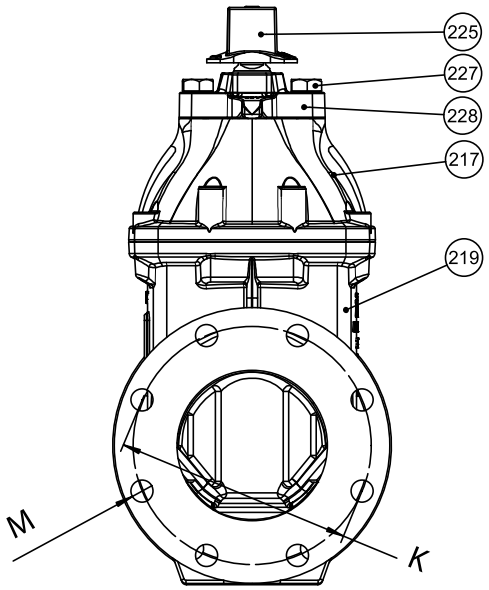
AMERICAN AVK RESILIENT SEATED, 250 PSI, DUCTILE IRON GATE VALVE

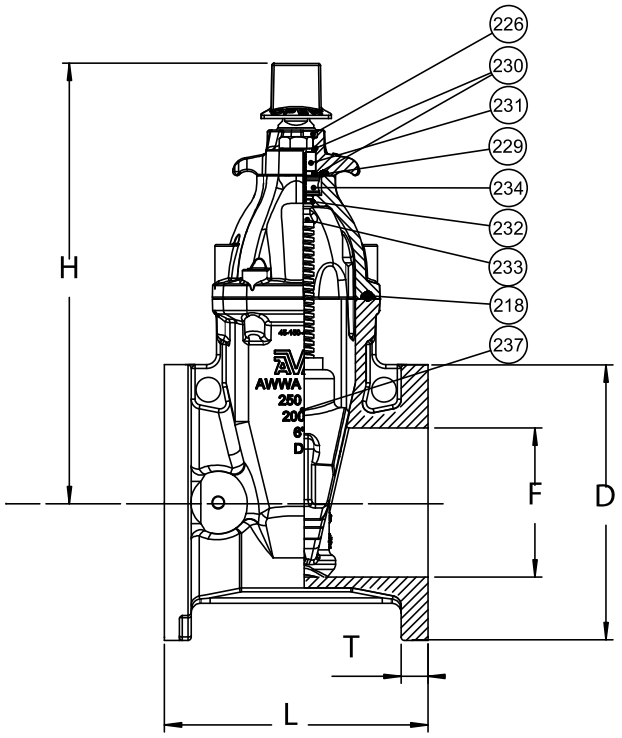
45/51

To AWWA C509 / C515 - Flanged Ends to ANSI B 16.1, Class 125 - Valve sizes 2.5" - 12"

Component List:

217. Bonnet
218. Bonnet Gasket
219. Body
225. Wrench Nut
226. Wiper RIng
227. Gland Flange Bolt
228. Gland Flange
229. Gland O-Ring
230. Upper Stem Seal O-Rings
231. Stem Seal Bushing
232. Lower Stem Seal O-Ring
233. NRS Stem
234. Thrust Collar
237. Wedge





Ref No.	Size	D	F	H	K	L	M	T	Flange Holes	Turns to Open	Weight (lbs.)
45-065-51X	2.5"	7.00"	2.50"	12.09"	5.51"	7.48"	0.75"	0.71"	4	12	37.8
45-080-51x	3"	7.51"	3.00"	12.09"	5.98"	7.99"	0.75"	0.79:	4	12	42.2
45-100-51X	4"	9.00"	4.00"	13.50"	7.50"	9.01"	0.75"	1.00"	8	14	63.2
45-150-51X	6"	11.00"	6.00"	17.50"	9.50"	10.51"	0.88"	1.06"	8	21	96.7
45-200-51X	8"	13.50"	8.00"	21.50"	11.75"	11.50"	0.88"	1.14"	8	26	153.6
45-250-51X	10"	16.00"	10.00"	24.75"	14.25"	12.99"	1.00"	1.22"	12	32	268.9
45-300-51X	12"	19.01"	12.00"	27.63"	17.00"	14.02"	1.00"	1.29"	12	38	408.8

X: 0 = Open Left X: 1 = Open Right

AMERICAN AVK SWING CHECK VALVE, 250 PSI 41/45

Tested to AWWA C508 - Resilient seated (41/45) - Flanged ends to ANSI B16.1, Class 125 - Valve sizes 3" - 8"

Use:

For potable water and sewage to maximum 160°F.

Tests:

Hydraulic test to AWWA C508:

Shell Test: 500 PSI
Seat Test: 250 PSI

Optional Extras:

Available with lever and weight, lever and spring, right-hand or left-hand mounted.

W/O Lever&Weight, Lever&Spring also available.

Tapping boss, tapped and plugged also optional.

Standard Materials:

Body, Bonnet, Weight, Lever	Ductile iron, ASTM A536
Coating	Electrostatically applied fusion-bonded epoxy inside and out Meets or exceeds AWWA C550
O-Rings, Bonnet Gasket	NBR
Shaft, Hinge, Bonnet Bolts, Washers, Keys	Stainless steel
Bushings	Bronze
Resilient Seated Disc	EPDM rubber with a carbon steel core

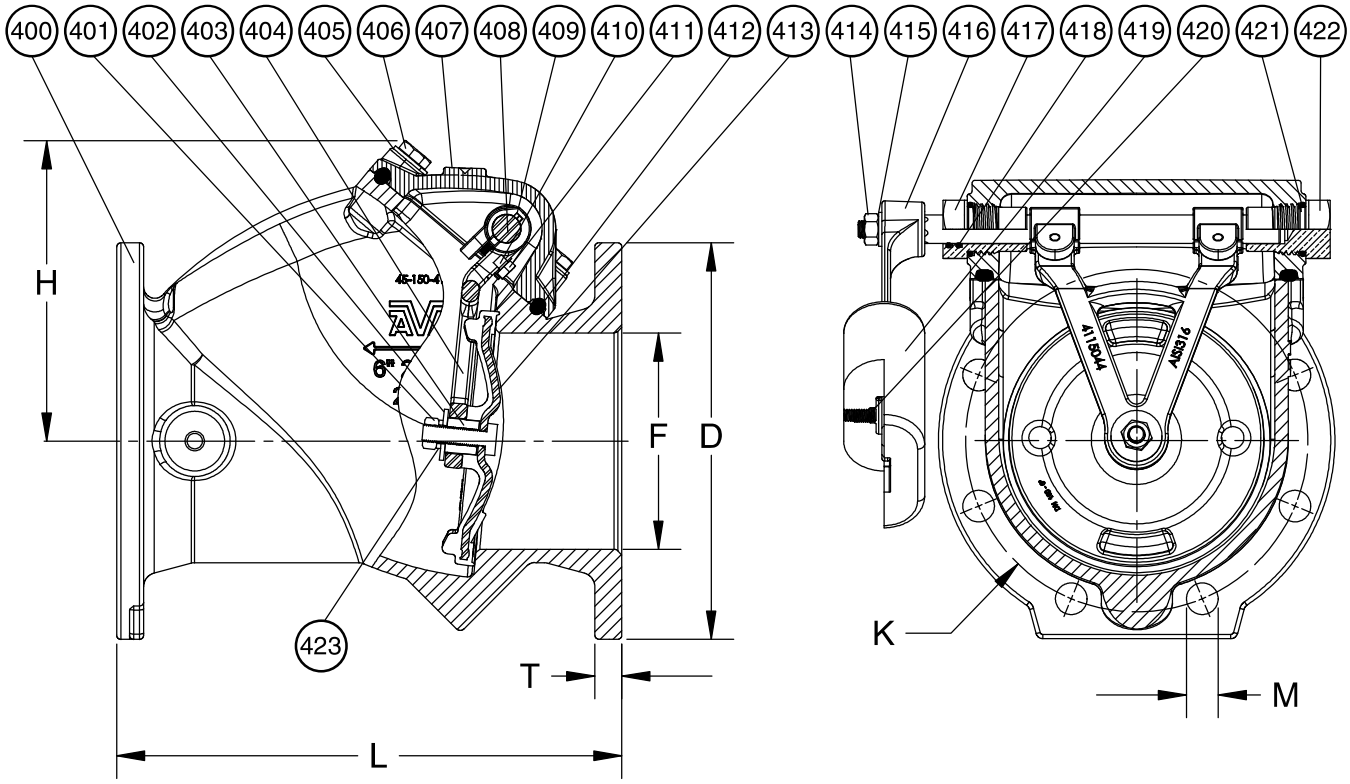
C508 clear waterway design. Laylength to ANSI B16-10

AMERICAN AVK SWING CHECK VALVE, 250 PSI 41/45

Tested to AWWA C508 - Resilient seated (41/45) - Flanged ends to ANSI B16.1, Class 125 - Valve sizes 3" - 8"

Components

400. Body	405. Bonnet Washer	410. Lock Washer	415. Shaft Washer	420. Set Screw
401. Disc Nut	406. Bonnet Bolt	411. Hinge Bolt	416. Lever	421. Outer Bushing
402. Disc Washer	407. Bonnet	412. Bonnet Gasket	417. Open Bushing	O-ring
403. Disc Bushing	408. Shaft	413. Disc	418. Inner Bushing O-ring	422. Closed Bushing
404. Hinge	409. Key	414. Shaft Nut	419. Weight	423. Disc Lock Washer



Ref No.	Size	D	F	H	K	L	M	T	Holes	Weight Lbs.
41-080-45014	3”	7.50”	3.0”	5.50”	6.0”	9.50”	0.75”	0.75”	4	35
41-100-45014	4”	9.0”	4.0”	6.0”	7.5”	11.5”	0.75”	0.75”	8	51
41-150-45014	6”	11.0”	6.0”	7.75”	9.5”	14.0”	0.88”	0.75”	8	86
> 41-200-45014	8”	13.50”	8.0”	9.0”	11.75”	19.50”	0.88”	0.80”	8	165

Wastewater

D-025 PN 10

Combination Air Valve for Wastewater - Short Version

Description

The D-025 Combination Air Valve combines an air & vacuum component and an air release component in a single body. The valve is specifically designed to operate with liquids carrying solid particles such as wastewater and effluents. The combination air valve discharges air (gases) during the filling or charging of the system, admits air into the system during drainage and at water column separation and releases accumulated air (gases) from the system while it is operating under pressure. The valve's unique design enables the separation of the liquid from the sealing mechanism and assures optimum working conditions.

Applications

- Wastewater & water treatment plants.
- Wastewater and effluent water transmission lines.

Operation

The air & vacuum component discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during drainage and at water column separation. High velocity air will not blow the float shut. Water will lift the float which activates the sealing of the valve.
At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system. The smooth discharge of air reduces pressure surges and other destructive phenomena.
The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air entry is essential to efficiently drain the system.
The air release component releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:
- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Acceleration of cavitation damages.
- Increase in pressure transients and surges.
- Internal corrosion of pipes, fittings and accessories.
- Dangerous high-energy bursts of compressed air.
- Inaccuracies in flow metering.

As the system fills and is pressurized, the combination wastewater air valve functions in the following stages:
1. Air (gas) is discharged by the valve
2. When the liquid level reaches the valve's lower portion, the lower float is lifted, pushing the sealing mechanism to its sealing position.
3. The entrapped air is confined in a pocket between the liquid and the sealing mechanism. The air pressure is equal to the system pressure.
4. Increases in system pressure compress the trapped air in the upper section of the conical chamber. The conical shape assures the height of the air gap. This enables separation of the liquid from the sealing mechanism.
5. Entrapped air (gas), accumulating at peaks and along the system, rises to the top of the valve and displaces the liquid in the valve's body.
6. When the liquid level lowers to a point where the float is no longer buoyant, the float drops, unsealing the rolling seal. The air release orifice opens and allows part of the air that accumulated in the upper portion of the valve to be released to the atmosphere.
7. Liquid enters the valve. The float rises, pushing the rolling seal to its sealing position. The remaining air gap prevents the wastewater from fouling the mechanism.

When internal pressure falls below atmospheric pressure (negative pressure):
1. The floats will drop down, immediately opening the air & vacuum and air release orifices.
2. Air will enter into the system.

Main Features

- Working pressure range: 0.05 - 10 bar.
- Testing pressure: 16 bar.
- Maximum working temperature: 60° C.
- Maximum intermittent temperature: 90° C.
- The unique design of the valve prevents contact between the wastewater and the sealing mechanism by creating an air gap at the top of the valve. These features are achieved by:

• **The conical body shape:** designed to maintain the maximum distance between the liquid and the sealing mechanism and still obtain minimum body length.
• **Independent spring-guided linkage between the lower float/ rod assembly and the upper float sealing mechanism:** allows free movement of the float and rod. Vibrations and movement of the lower float due to turbulence will not unseal the upper float sealing mechanism.
• **The Rolling Seal Mechanism:** less sensitive to pressure

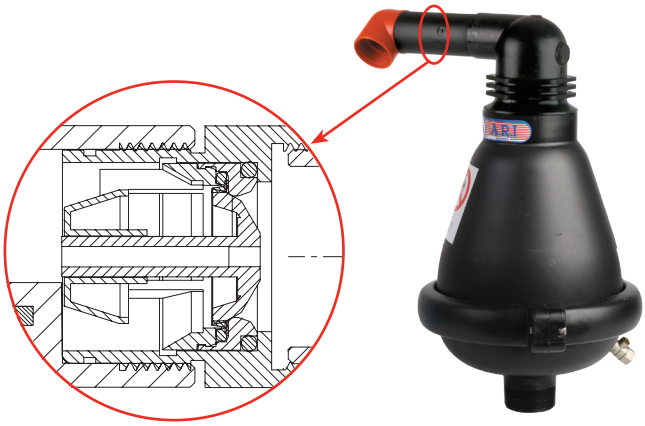
differentials than a direct float seal. It accomplishes this by having a comparably large orifice for a wide pressure range (up to 10 bar).
• **Funnel-shaped lower body:** designed to ensure that residue wastewater matter will fall back into the system and be carried away by the main pipe.
- All inner metal parts made of stainless steel. Float made of composite materials.
- 1 ½" threaded discharge outlet enables connection of a vent pipe.
- Dynamic design allows for high capacity air discharge while preventing premature closure.
- The ball valve can be opened to release trapped pressure and drain the valve body prior to maintenance and for back-flushing during maintenance.

Valve Selection

- These valves are available in 2", 3", and 4" with a BSP/NPT male threaded connection or flanged, standard upon request.
- Valve is manufactured in reinforced nylon, also available in stainless steel or ductile iron.
- With a One-way, Out-only attachment, allows for air discharge only, prevents air intake.
- With a Vacuum Breaker, In-only attachment, allows for air intake only, prevents air discharge.
- With a Non-Slam discharge-throttling attachment, allows for free air intake, throttles air discharge.

Note

- The D-025 air valve is intended for use with raw wastewater. For use with aggressive liquids, please consult with our application engineers or with the marketing dept.
- For best suitability, it is recommended to send the fluid chemical properties along with the valve request.
- Upon ordering, please specify: model, size, working pressure, thread and flange standard and type of liquid.

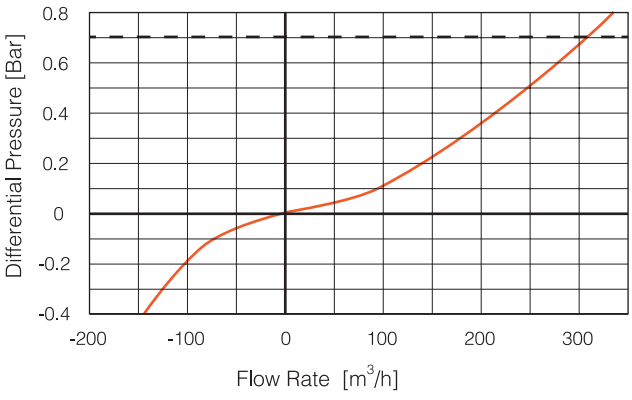


D-025-NS

D-025 Non-Slam Single Orifice Add-on Component Data Table

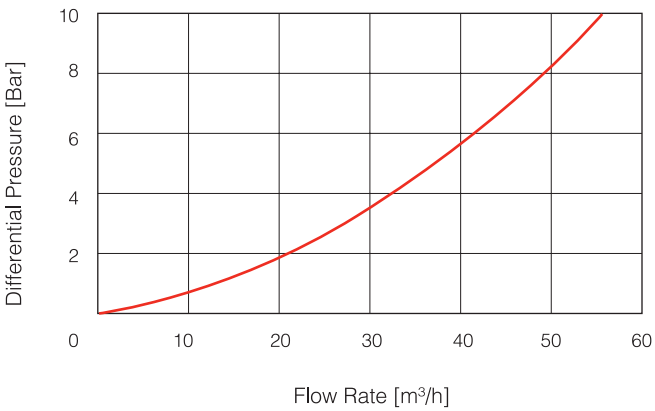
Nominal Size	Discharge orifice	Total NS area	NS orifice	Switching point	Flow at 0.4 bar
2" (50mm) 3" (80mm) 4" (100mm)	37.5 mm	12.6 mm^2	4 mm	Spring loaded normally closed	17.5 m^3/h

AIR AND VACUUM FLOW RATE



— — — Max. recommended design air discharge

AUTOMATIC AIR RELEASE FLOW RATE

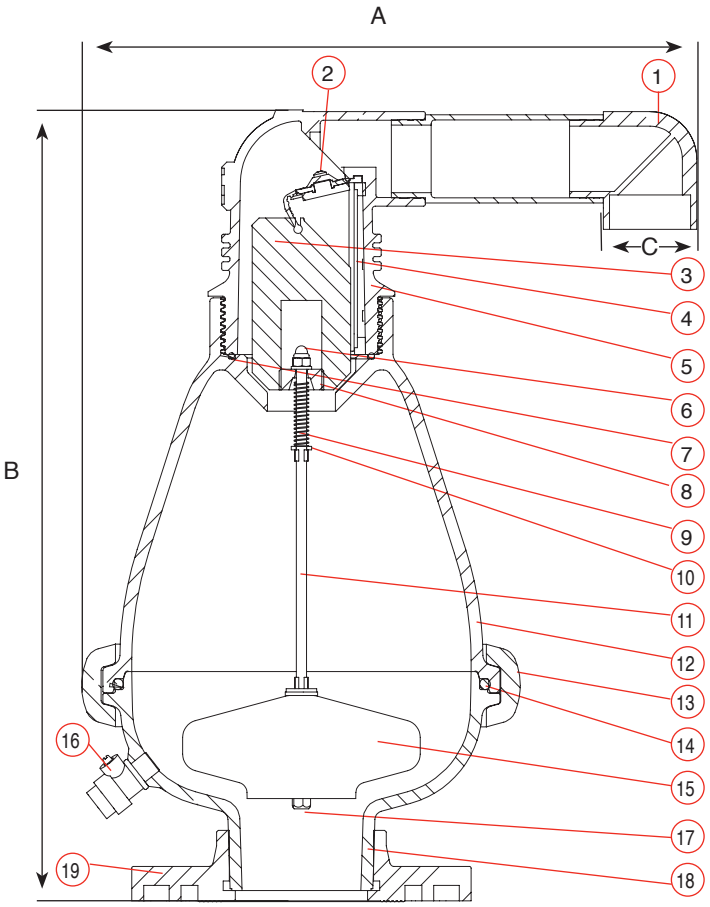


DIMENSIONS AND WEIGHTS

Nominal Size	Dimensions mm A	B	Connection C	Weight Kg. RN	ST ST	DI	Orifice Area mm² Auto.	A / V
2" (50mm) Threaded	370	455	1½" BSP Female	3.8	14.4	14.4	12	804
2" (50mm) Flanged	370	460	1½" BSP Female	4.2	16.2	16.2	12	804
3" (80mm) Threaded	370	455	1½" BSP Female	3.8	14.7	14.7	12	804
3" (80mm) Flanged	370	460	1½" BSP Female	5.4	16.5	16.5	12	804
4" (100mm) Threaded	370	455	1½" BSP Female	3.9	16.6	16.6	12	804
4" (100mm) Flanged	370	460	1½" BSP Female	6.0	18.4	18.4	12	804

PARTS LIST AND SPECIFICATION

No.	Part	Material
1.	Air Release Outlet	Polypropylene
2.	Rolling Seal Assembly	RN + EPDM + ST ST
3.	Float	Foamed Polypropylene
4.	Clamping Stem	Reinforced Nylon
5.	Body	Reinforced Nylon / Stainless Steel 316
6.	Domed Nut	Stainless Steel 316
7.	O-Ring	BUNA-N
8.	Stopper	Polypropylene
9.	Spring	Stainless Steel 316
10.	Washer	Stainless Steel 316
11.	Float Stem	Stainless Steel 316
12.	Body	Reinforced Nylon / Ductile Iron / Stainless Steel 316
13.	Clamp RN Body	Reinforced Nylon + Stainless Steel 316
	ST ST/ DI Body	Stainless Steel 316
14.	O-Ring	BUNA-N
15.	Float	Foamed Polypropylene
16.	Tap 1/4 "	Brass / Stainless Steel
17.	Washer	Stainless Steel 316
18.	Base	Reinforced Nylon / Ductile Iron / Stainless Steel 316
19.	Flange	Reinforced Nylon / Ductile Iron / Stainless Steel 316

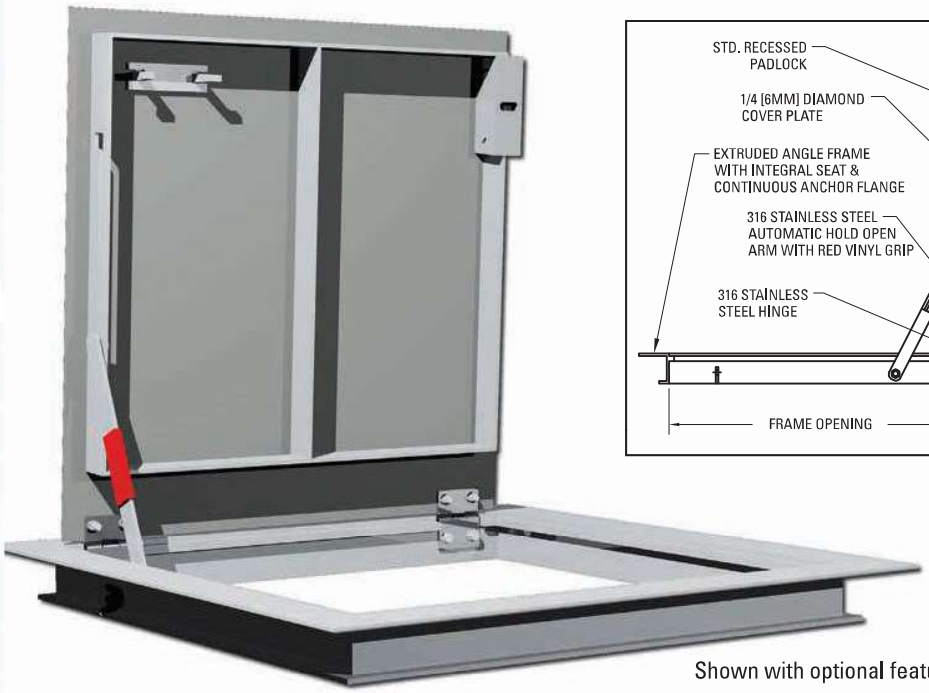


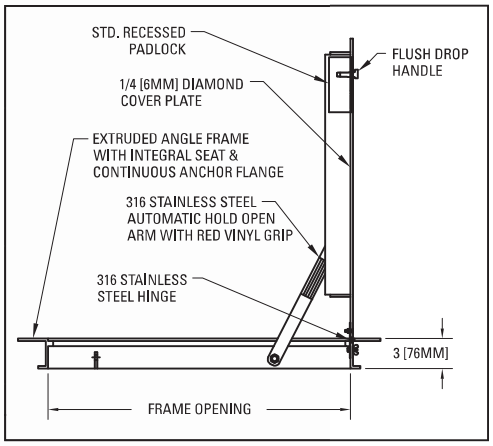
* in STST or DI Body, the flange is an integral part of the base.

A.R.I. FLOW CONTROL ACCESSORIES Ltd. www.arivalves.com ari@ari.co.il Tel: 972-4-6761988

APS/APD

Angle Frame Pedestrian Loading Single or Double Leaf





Shown with optional features

General Description

Angle frame floor access doors are the most economical solution for interior or exterior applications where water intrusion is not a concern.

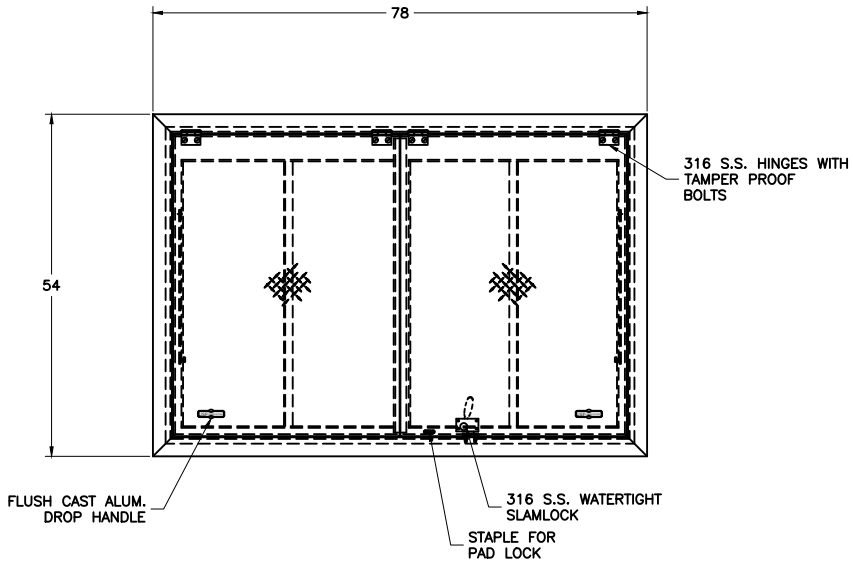
Standard Features/Specifications

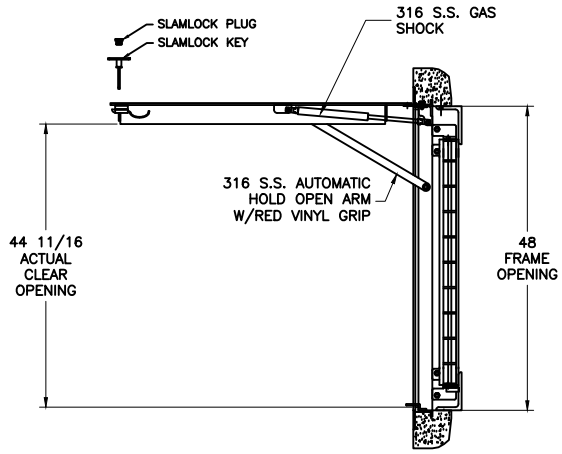
Material:	Aluminum, steel or stainless steel available
Frame:	1/4" material with integral anchoring systems
Covers:	1/4" diamond plate reinforced for 300 PSF Pedestrian loads
Hardware:	All 316 SS nuts, bolts and washers
Hold-Open Device:	316 SS Hold-open arm with **secondary latch mechanism**
Lock device:	Staple for padlock protrudes through cover
Lift handle:	Recessed lift handle lays flush with top of cover
Warranty:	Ten (10) years on aluminum, five (5) years on steel and stainless steel

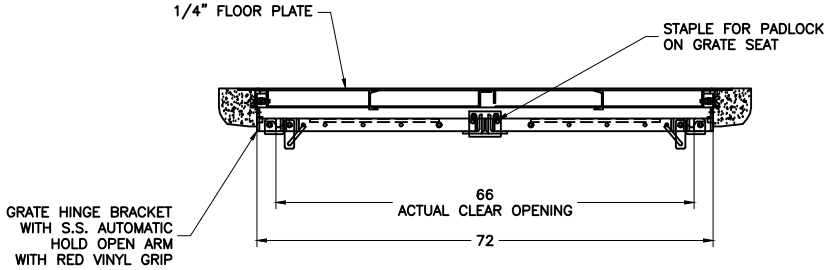
SEE AVAILABLE OPTIONS TAB

AVAILABLE IN SINGLE, DOUBLE AND MULTIPLE DOOR CONFIGURATIONS

Light Pedestrian / Pedestrian
ASTM C1802-14 Load Level 1 & 2

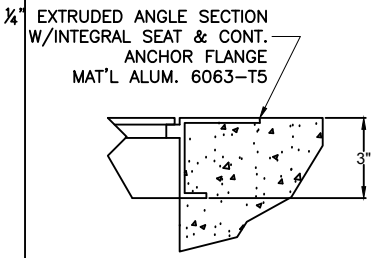






SELECTED FEATURES
1. HINGED SAME SIDE
2. S.S GAS SHOCKS
3. SLAMLOCK
4. BOLT LOCK
5. SAFETY GRATING
6. BITUMINOUS COATING

NOTES
1. MATERIAL: ALUMINUM
2. FINISH: MILL
3. LOADING: 300 PSF
4. 316 SS NUTS & BOLTS
5. AREA OF FRAME IN CONTACT WITH CONCRETE TO BE PAINTED WITH BITUMINOUS COATING
6. SAFETY GRATING TO BE PAINTED WITH SAFETY ORANGE POWDER COAT
7. APPROX HATCH WT: 286.78 LBS



FRAME DETAIL

NOTE:
AS AN AUTOMATED DRAWING, THE DESIGN HAS NOT BEEN REVIEWED BY USFF ENGINEERING AND IS THEREFORE TO BE USED FOR REFERENCE ONLY. USFF RESERVES THE RIGHT TO ADJUST DIMENSIONS TO INSURE ADHERENCE TO CUSTOMER REQUIREMENTS AND PROPER OPERATION OF THE PRODUCT.

UNLESS OTHERWISE NOTED ON THIS DRAWING, CLEARANCE BETWEEN FRAME AND COVER(S) IS DESIGNED NOT TO EXCEED 3/8".

INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M

BREAK ALL SHARP CORNERS & EDGES TO 0.01

TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL
<10' = ± 1/8
>10' = ± 1/4

U.S.F. FABRICATION INC.
HIALEAH, FL

HATCH APD 300 48 X 72 ALUM

DWN. BY:	SCALE:	SHEET:	DATE:
BOB	1:30	1 OF 1	05/18/22

CHK. BY:	DWG #	SHEET SIZE:	REV:
BOB	1000205565	A	0

The Next Generation of Wireless Real-Time Alarm, Monitoring, and Remote-Control

All of the functionality of the legacy series (M110 and M800) with an onboard interactive display and enhanced electronics

MyDro 150 and 850 RTUs

Easy to Install

Each remote terminal unit (RTU) includes all necessary hardware for a standard installation, such as a cellular radio, enclosure, backup battery, transformer, antenna with cable, and mounting hardware. Purpose-built RTUs simplify and speed installation. There is no programming required, and RTUs are self-enrolling.

Reliable Wireless Communications

RTUs feature a game-changing radio with an embedded SIM that supports multiple carriers (AT&T, T-Mobile, Verizon, and Telenor) as well as a removable SIM for future options such as FirstNet. That means access to multiple carriers is automatic with no need for a site visit to change a SIM. There are no radios to license, nor cellular contracts to set up.

Real-Time Alarms Delivered To All Devices

Real-time alarms are delivered via phone call, text message, email, fax, page, and even to an existing HMI software through an OPC data link. Each alarm is logged with a time stamp for tracking and reporting. The alarm call-out schedule is easy, flexible, and intuitive to set up.

Managed Service–The Complete Package

The Mission system includes all cellular data service, data storage, alarm call-outs, reports, and on-call, 24-7-365 technical support. The highly reliable turnkey system offers more features at a lower cost than an in-house setup. No engineering or programming is required, and there are no networks to maintain.

View data and reports using the secure 123SCADA web portal, accessible from any web-enabled device. The 123SCADA user interface is designed to mimic industry-standard HMI SCADA and also includes a legacy user mode. Tabular and graphical reports can be used for compliance reporting and comparative studies. System enhancements are available immediately and included at no cost.

M150 RTUs

Real-Time Alarms with Hourly Summaries

M150 RTUs summarize pump runtimes and pump starts hourly. All alarm data is reported in real-time. Analog data and RTU status are reported hourly. Simultaneous pump runtimes can be reported when two pumps run.

M850 RTUs

Real-Time Alarms and Streaming Data

M850 RTUs report pump starts and stops in real-time. Analog values are reported every two minutes or on a five percent change. Volumetric flow calculations can utilize this information along with sump volume (as determined by an analog level sensor or fixed entries) to calculate hourly volumetric flow rates.

Remote-Control

Expand system operations with optional remote-control for off-site wells, tanks, gates, chlorine dosers, variable frequency drives, and more. Optional automatic remote control interfaces include the Tank and Well Control Package, Digital Interconnect, and Analog Interconnect.

LCD Touch Screen

- Displays current status
- Supports local configuration

Radio

- Cellular radio supports multiple carriers to ensure optimal connection and signal quality
- No radio licenses or site path studies required

Expandable

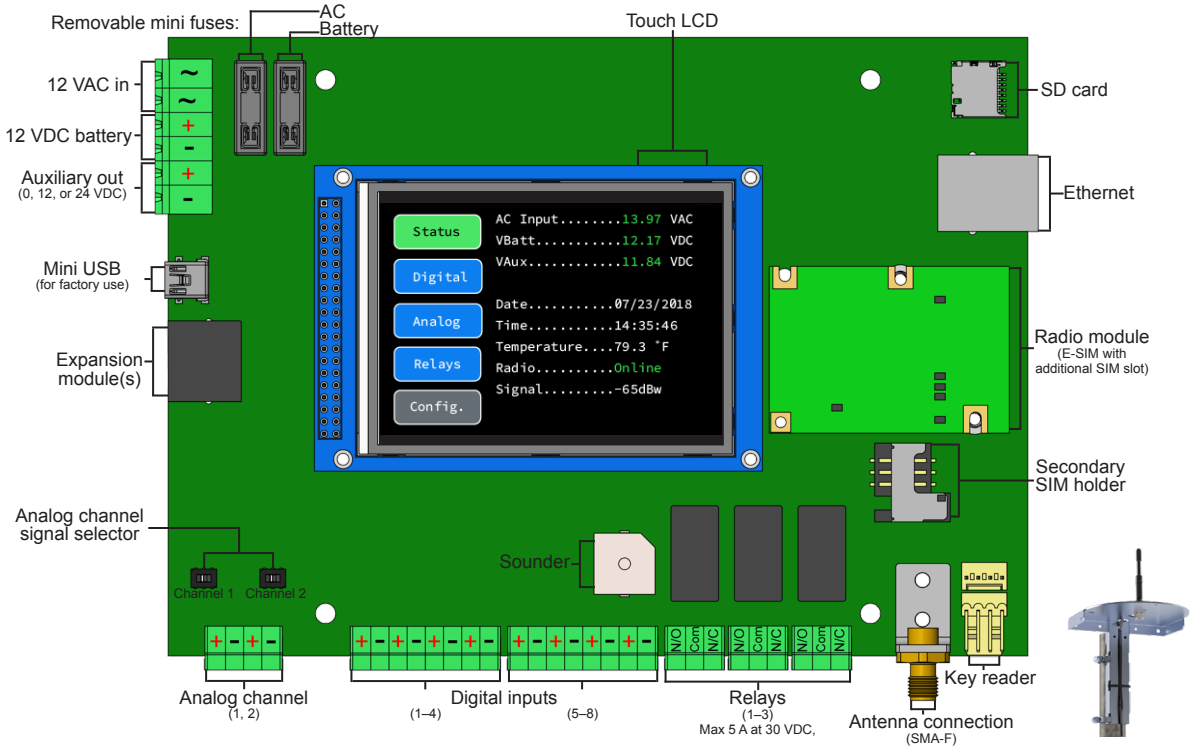
- Up to 16 digital inputs, 6 analog inputs, 4 pulse inputs (with SMP), and 2 analog outputs, simultaneously
- Onboard digital inputs configurable for wire fault supervision or strap on current sensing switch for easier pump run indication
- RS485 for digital, analog, and pulse expansion

Enhanced

- 12 or 24 VDC auxiliary output for battery-backed analog instrument loop power
- Over-the-air upgradeable firmware

	MyDro 150	MyDro 850
Wastewater	Sewage lift station, industrial water quality (WQ) alarming, lift station generator alarming	Master pump station monitoring and remote-control, critical process monitoring, open channel flow monitoring, sewer station power monitoring, reuse water monitoring and control
Water	Pump station alarming, reservoir level alarming, remote valve alarming, chlorine (Cl) residual WQ alarming, pressure reducing valve station alarming	Pump station monitoring, tank and multiple well control, remote valve monitoring and control, Cl residual WQ alarming, flow or pressure monitoring
Other	Gate status alarming, rainfall monitoring	Septic offload and billing, custody transfer and billing, canal level monitoring and gate control, I&I flow, level data logging

Technical Specifications



Outdoor NEMA 4X enclosure:
13.25" w x 13.75" h x 6.25" d
With sun shield
Weight: 7.6 lbs

NEMA 1 enclosure:
11.375" w x 11.25" h x 3.5" d
Use indoors, wall mounting
Weight: 3.6 lbs

FlatPak NEMA 1 enclosure:
10.5" w x 7.75" h x 1.5" d
Use inside MCC cabinet
Weight: 1.8 lbs

5 Ah battery weighs additional 3.6 lbs

		MyDro 150	MyDro 850
Data	**Alarm Data**	Real-time	Real-time
	Pump State	Summarized hourly	Real-time
	Analog Reporting	Current value reported hourly	Every 2 minutes or on 5% change
	Device Health	Built-in inputs reported hourly	
Input/Output	**Digital Inputs**	8 onboard, dry digital inputs with selectable wire fault supervision or direct attach current sensing switch; Expandable to 16 with PN OP653	
		3 configurable for pump run summary reporting; Simultaneous runtimes reported when 2 pumps are monitored	8 configurable for pump run; Pump states reported in real-time. Simultaneous pump runtime reporting supported for up to 7 pumps
	Analog Inputs	2 onboard, 4–20 mA isolated or 0–5 VDC; 4 alarm set points each; Expandable to 6 with PN OP465	
	Relay Outputs	3 remotely controllable, form C, dry contact relay outputs; 5 A at 30VDC, SPDT, N/O, or N/C	
	RS485	Support for specified expansion modules	
	Pulse Inputs	4 channels with Safe Module Plus expansion module PN OP750	
		15-minute reporting	2-minute reporting
	Analog Output	2 channels (4–20 mA or 0–5 V) with PN OP461	
	Electronic Key Reader	Key reader for site activity tracking and service mode	
	Built-in Inputs	AC voltage, battery voltage, board temp, and signal strength; Optional second key reader	
Electrical	**AC Power**	Supervised 120 VAC to 12 VAC, 1.2 A, UL-recognized class II/class III transformer	
	Backup Power	12 V, 5 Ah battery standard with enhanced charging system	
		Up to 50 hours	Up to 18 hours
	Auxiliary	Auxiliary output selectable 12 VDC or 24 VDC for battery-backed analog instrument loop powering; 250 mA max	
	Removable Terminals	Included: Amphenol PN 20020008-G061B01LF (6 pin for power), 20020004-D081B01LF (D08, D04, D03 for I/O)	
	Power Consumption	4.2 W	
Other	**Enclosures**	FlatPak (PN M153), NEMA 1 (PN M151), NEMA 4X (PN M152), Large NEMA 4X (PN M152L)	FlatPak (PN M853), NEMA 1 (PN M851), NEMA 4X (PN M852), Large NEMA 4X (PN M852L)
	Environment	Operating temperature -20–60°C, non-condensing	
	Cellular Radio	Radios make live, continuous, encrypted TCP socket connections; Payload is end-to-end acknowledged; Penta band (850, 900, 1700, 1900, 2100 mHz); AT&T and partners: LTE, HSPA+, 3G; Verizon and partners: LTE, EVDO, 1XRTT	
	Antenna	Omnidirectional antenna with 11' cable, SMA termination, universal mounting bracket	
	Options	Optional SCADA integration OPC link (PN SW586) to client/server HMI, Tank and Well Control Package (see Accessory Catalog for details)	
	Service	Requires Service Packages for the unit and optional expansion boards (see Accessory Catalog for details)	
	Warranty	One-year manufacturing and material warranty	

RoHS COMPLIANT

FC

SGS c US 710198

Safety Certified

MISSION COMMUNICATIONS

(877) 993-1911 • sales@123mc.com • 123mc.com

RADAR
IS THE BETTER ULTRASONIC

Compact level sensors with
80 GHz radar technology

Looking Forward VEGA

ULTRASONIC WAS YESTERDAY – THE FUTURE IS 80 GHZ RADAR!

As the market leader, VEGA has been developing radar based level sensors for 30 years. These radar sensors are currently in use in more than 1,000,000 applications. Users all around the globe appreciate the many advantages of this technology:

- **Maximum reliability and accuracy**
- **Unaffected by temperature fluctuations**
- **Resistant to dirt and buildup**
- **Measurement under vacuum and high pressure**
- **Wear and maintenance free**

A new era in radar measurement technology began a few years ago when VEGAPULS sensors based on an operating frequency of 80 GHz were introduced. The 80 GHz technology allows a much more precise focusing of the transmission signal. This makes it easier to separate actual level signals from interfering signals – this means the measurement becomes easier to make and much more reliable. That's why VEGA radar sensors with 80 GHz are steadily taking over new applications all over the world.

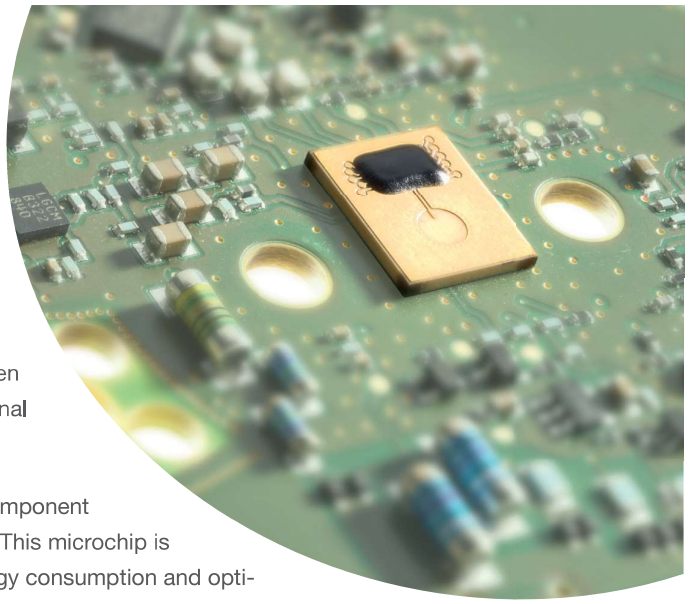
VEGA has now added a new compact instrument series to this portfolio of radar sensors. These devices are also ideal for more economical applications such as those found in the water and wastewater industry or for auxiliary measuring points in process automation.

Level measurement with ultrasonic sensors, which are still in use today, is thus rapidly becoming a thing of the past. The future is radar!

About VEGA

VEGA is a world-leading manufacturer of process instrumentation. Their product portfolio includes sensors for measurement of level and pressure as well as point level detection, with additional devices and software for integrating sensors into process control systems.

Founded in the Black Forest in 1959, VEGA today employs over 1,800 people worldwide, more than 750 of them at the headquarters in Schiltach in the Black Forest. Each and every one of them works with great passion to find the best solution for the customer's application – across all industries.



A new heart for radar sensors

Today, radar sensors can be found in all areas of daily life, from simple motion detectors for door openers to complex distance sensors in vehicles. The technical requirements for industrial level measurement, however, are completely different. While people and vehicles reflect radar signals very well, process media are often difficult to detect. For this task, sensors require a much higher signal sensitivity.

That's why VEGA have developed their own radar microchip, a component specifically optimized for the requirements of level measurement. This microchip is at the heart of the new sensors. Thanks to its small size, low energy consumption and optimized frequency ranges, very compact radar instruments can now be built. These are considerably less expensive and can replace ultrasonic measurement technology in virtually all applications.

Made for everyday use

80 GHz radar sensors feature excellent signal focusing capability. Unaffected by temperature fluctuations and virtually all other operational conditions, they impress users with their reliable measured values. The new compact instrument series is designed for standard measuring tasks and thus ideally compliments the existing range of VEGAPULS 60 series plics® radar sensors.

Compact version

- Small PVDF process fittings
- For liquids and bulk solids
- Optional display

VEGAPULS 11, 21, 31

Adjustment via smartphone

VEGAMET 841/842, 861/862

VEGAMET 141/142

VEGAMET 341/342

Cable version

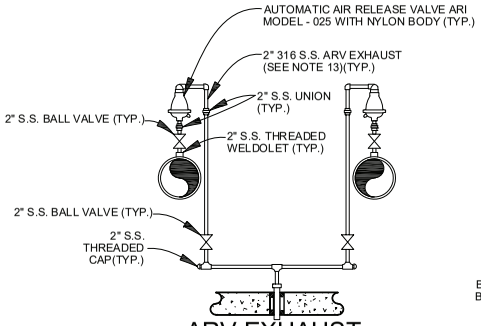
- Fixed cable connection (IP68)
- Reliable performance, even during flooding
- Direct output signals 4 ... 20 mA, HART, SDI-12, Modbus

VEGAPULS C 11, C 21, C 22, C 23

Controllers

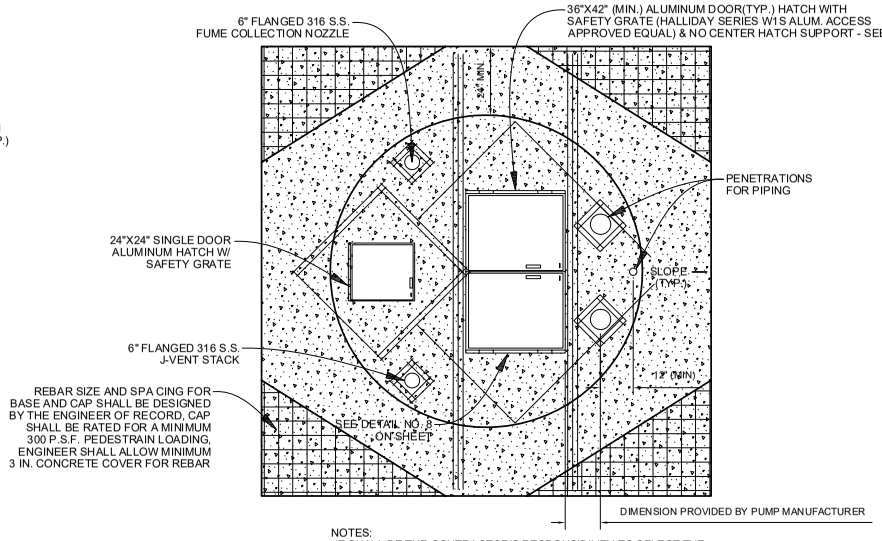
in combination with up to two radar sensors

- Large graphical display
- Optimized for applications in water and wastewater
- Weatherproof housing



ARV EXHAUST DETAIL

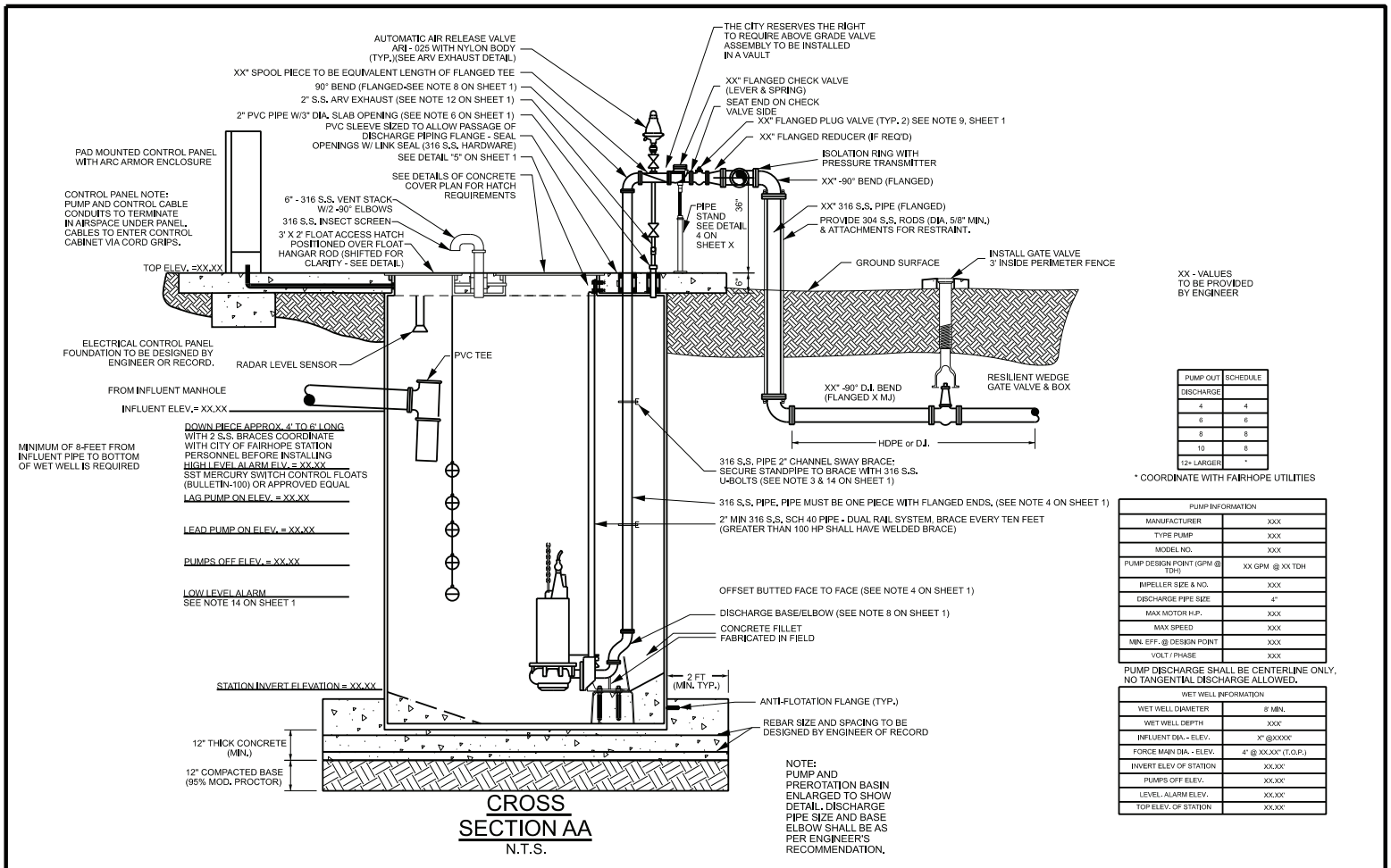
N.T.S.



NOTES:
-IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SELECT THE HATCH SIZE THAT WILL ENABLE THE PUMP(S) TO BE EASILY REMOVED FROM THE WET WELL THROUGH THE HATCH, SEE SPECIFICATIONS FOR CLEARING REQUIREMENTS.
-HATCH SHALL BE HALLIDAY TYPE ALUM. WSI OR APPROVED EQUAL, FLUSH INSTALLATION, SINGLE COVER(S), 300 LB/SF LOADING, AND GASKETED TO BE RAIN TIGHT AND PROMOTED ODOR CONTROL.
-SAFETY GATE(S) SHALL BE HINGED ON SAME SIDE AS HATCH.
-HEAVIER DESIGN LOADS MAY BE REQUIRED.

CONCRETE COVER PLAN

N.T.S.



CROSS SECTION AA
N.T.S.

NOTE:
PUMP AND PREROTATION BASIN ENLARGED TO SHOW DETAIL. DISCHARGE PIPE SIZE AND BASE ELBOW SHALL BE AS PER ENGINEER'S RECOMMENDATION.

PUMP OUT	SCHEDULE
DISCHARGE	
4	4
6	6
8	8
10	8
12+ LARGER	*

* COORDINATE WITH FAIRHOPE UTILITIES

PUMP INFORMATION	
MANUFACTURER	XXX
TYPE PUMP	XXX
MODEL NO.	XXX
PUMP DESIGN POINT (GPM @ TDH)	XX GPM @ XX TDH
IMPELLER SIZE & NO.	XXX
DISCHARGE PIPE SIZE	4"
MAX MOTOR H.P.	XXX
MAX SPEED	XXX
MIN. EFF. @ DESIGN POINT	XXX
VOLT / PHASE	XXX

PUMP DISCHARGE SHALL BE CENTERLINE ONLY, NO TANGENTIAL DISCHARGE ALLOWED.

WET WELL INFORMATION	
WET WELL DIAMETER	8' MIN.
WET WELL DEPTH	XXX'
INFLUENT DIA. - ELEV.	X" @XXX'
FORCE MAIN DIA. - ELEV.	4" @ XX.XX" (T.O.P.)
INVERT ELEV OF STATION	XX.XX'
PUMPS OFF ELEV.	XX.XX'
LEVEL. ALARM ELEV.	XX.XX'
TOP ELEV. OF STATION	XX.XX'

CITY OF FAIRHOPE

CITY OF FAIRHOPE PUBLIC UTILIES
555 SOUTH SECTION STREET
FAIRHOPE, ALABAMA 36532
251.928.8003

STANDARD SANITARY SEWER DETAILS

LIFT STATION DETAILS

DATE ISSUED 11/25/20

SHEET NO. LS-5

CITY OF FAIRHOPE, ALABAMA

NON-MANDATORY PRE-BID MEETING

Meeting Date: 06/13/23 at 10:00 a.m.

Bid No. 23-027 Planter's Pointe Lift Station

Representative's Name	Company	Phone	Email
Erin Wolfe EW	City of Fairhope – Purchasing Dept.	251-279-6231	Erin.Wolfe@FairhopeAL.gov
Rhonda Cunningham RC	City of Fairhope – Purchasing Dept.	251-990-0118	Rhonda.Cunningham@FairhopeAL.gov
Jason Langley	COF – Water/Wastewater Superintendent	251-928-8003	Jason.Langley@FairhopeAL.gov
Samie Montgomery	Hill Brothers	251-604-9002	Samie@hillbrothersgc.com
Scott Appleton / Ranger Enviro		251-487-6999	SAppleton@RangerEnv.us
Bill McGough	W.R. Mitchell	251-452-6576	Mitchellwrcontrac@bellsouth.net
Robert Costantin	Sycamore Sycamore Construction	251-234-7984	sycamoreinc@bellsouth.net
Aaron Godwin	CLS	251-645-4147	Aaron@CLS-Midway.com
Matt Swoboda	James Bros	251-510-1398	matt.jbe@icloud.com
Ben McDowell	Hemphill Construction	601-720-5143	bmcdowell@hemphillconstruction.com