

**Submittal for:  
Busch Drive PS**

**For:**

**City of Lagrange**

**Pump and Process Equipment Corporate Office:**

**8343 Roswell Road, Suite 315**

**Atlanta, Ga 30350**

**Office: (770)-814-0402**

**Cell: (404) 796-1995**

# Scope of Supply:

## Pumps:

- (2) KSB Pump Model KRT F 80-217/72XG2-S Submersible Pump  
3450 RPM, 10 HP, 230 Volt, 3 Phase, 65' Power Cables.
- (2) Pump Claw with Gaskets
- (2) Lifting Chain Assembly
- (4) Floats With 50' Cables
- (1) Duplex Control Panel 4X SS Enclosure, includes dead front, main breaker, pump breakers, Pump Safe Relays, HOA's, run light, seal light overload resets
- (1) Preassembled Fiberglass Basin Package with Integral Valve Vault; system to include:
  - (1) Fiberglass Wet Well, 72" x 240"
  - (1) 48 x 48 attached valve box
  - (4) 2" SS guide rails
  - (2) 4" CI flanged plug valves
  - (2) 4" CI flanged lever and weight check valves
  - (4) 4" CI Flanged 90 elbows
  - (1) 4" CI Flanged cross
  - (9) 4" UNI flanges
  - (1) Plug valve handle
  - (2) 4" CI discharge pipes
  - (2) 2" electrical coupling
  - (1) 6" inlet (6" CI hub)
  - (1) SS duplex float bracket, ss nuts, bolts & washers
  - (3) PL-4lks discharge fittings
  - (1) 4" mushroom vent
  - (6) Lifting lugs
  - (1) 2" Gravity drain check valve
  - (2) 3" x 4" Flanged Eccentric Increaser
  - (1) Cover Aluminum 72" Valvebox 300# PSF Rated, not gas tight
  - (1) 4" Plastic Vent
  - (1) Link Seal, 10" Bolt on Inlet hub

## TECHNICAL DESCRIPTION/ SPECIFICATION

Submersible Wet Pit Pump, Cast Iron Construction, Motor Version X  
KRT standard motor design – installation P

### SUBMERSIBLE WET PIT SEWAGE PUMPS

#### **PART 1 - GENERAL SYSTEM DESCRIPTION PERFORMANCE REQUIREMENTS**

Operating Conditions - Design: \_\_\_\_\_ GPM @ \_\_\_\_ FT TDH @ \_\_\_\_\_%

Minimum Shutoff head: 105 FT

Maximum Motor HP: 10 HP

Minimum Hydraulic Efficiency (at design): \_\_\_\_\_%

#### **QUALITY ASSURANCE - REFERENCED STANDARDS:**

American Iron & Steel Institute (AISI)

American Society for Testing and Materials (ASTM)

Factory Mutual (FM)

Hydraulic Institute Standards for Centrifugal, Rotary, and Recip Pumps (HI)

National Fire Protection Agency (NFPA)

National Electric Code(NEC)

National Electrical Manufacturers Association(NEMA)

Anti-Friction Bearing Manufacturers Association(AFBMA)

International Standards Organization (ISO) - ISO9001

#### **WARRANTY**

The pump manufacturer shall warrant the pump, motor and guide system to the Owner against defects in workmanship and materials for a period of seven (7) years under normal use and service. If a guide cable system is used the pump manufacturer shall warrant the guide cable system (including guide cables and brackets) to the Owner against defects in workmanship and materials for a period of ten (10) years under normal use and service. Both pump manufacturer warranties shall be in published form, and shall apply to all similar units. A copy of each warranty shall be provided to the Owner at startup.

#### **PART 2 - PRODUCTS**

##### **ACCEPTABLE MANUFACTURERS**

Subject to compliance with the Contract Documents, the following are acceptable:

KSB

Equal alternates as approved by the engineer prior to bid

All products, whether named as "acceptable" or proposed as "equal" must fully comply with these specifications. Standard product must be modified, if required, for compliance. The contractor shall base his bid price on product offered by KSB, Inc. for purposes of determining the successful bidder on this project. The contractor may submit, with the bid, an alternate proposal with applicable deduct if any for supplying product other than KSB. Alternate proposals must include a clear statement of each point of difference between the proposed alternate product and these specifications. The Owner and Engineer reserve the right to reject any bid not based on KSB product.

#### **MATERIALS**

**G2 (Cast Iron pump with Hard Metal Impeller)**

##### **MATERIALS SUBMERSIBLE SEWAGE PUMPS**

*Pump Case: Cast Iron, ASTM A48, Class 35B*

*Motor Housing: Cast Iron, ASTM A48, Class 35B*

*Impeller: wear resistant high chrome white iron, minimum Brinell Hardness Rating (BHR) of 750-1000*

*Intermediate Housing (Backplate): Cast Iron, ASTM A48, Class 35B*  
*Discharge Base Elbow: Cast Iron, ASTM A48, Class 35B*  
*Pump/Motor Shaft: ASTM A276 Type 420 shaft*  
*O-Rings: Nitrile Rubber (NBR)*  
*Fasteners (including impeller fastener): Stainless Steel, ASTM A276 Type 316Ti.*  
*Lower Seal Faces: Silicon Carbide/Silicon Carbide*  
*Upper Seal Faces: Silicon Carbide stationary/Carbon rotating*  
*Guide rails/cables and mounting brackets: Stainless Steel, ASTM A276 Type 304*  
*Lifting Chain: Stainless Steel, ASTM A276 Type 316*  
*Oil-all uses (seal lubrication, etc): Ecologically safe, paraffin or mineral base*  
*Power/Control Cable Jacket: Chloroprene with non-wicking fillers*

## **ACCESSORIES**

### **POWER CABLE**

Provide 65 ft of power/control cable with each pump, suitable for submersible wastewater application, sized in accordance with NEC requirements. Provide cable terminal box on side of motor housing, with cable entry sealed to insure that no entry of moisture is possible into the high-voltage motor/ terminal area even if the cable is damaged or severed below water level. Cable seal shall include a compressed rubber grommet to seal the cable exterior and epoxy fill to seal the interior passages. A strain relief device, in direct contact with both the cable and the cast iron entry housing, shall be provided. The cable entry shall be rated by Factory Mutual (or UL) for submerged operating depths to 85 feet.

### **TEMPERATURE PROTECTION**

Furnish temperature monitoring devices in motor windings for use in conjunction with and supplemental to external motor overload protection. Arrange controls to shut down pump should any of the monitors detect high temperature and automatically reset once motor temperature returns to normal. Set temperature monitors at levels recommended by pump manufacturer

### **SEAL LEAK DETECTION**

Provide a detector in the motor's stator cavity which allows a control panel mounted relay to indicate leakage into the motor. In addition, on motors 80HP and larger provide a stainless steel float switch in a separate leakage collection chamber to indicate leakage past the inner mechanical seal prior to its entrance into either the motor stator cavity or the lower bearing. Electronic probes which depend on sensing resistance value changes in seal oil will not be acceptable as seal leak indicators.

### **“PumpSafe” MOTOR SENSOR MONITORING RELAY**

The pump supplier shall furnish all relays required for monitoring all motor sensors. The relays shall be installed by others in the motor control panel and properly wired in accordance with pump manufacturer's instructions. Relays shall mount in standard 12-pin socket bases (provided) and shall operate on available control voltage of 24-240 VAC. If relays require an input voltage that is not available in the motor control panel an adequate transformer (with fused input) shall be provided by the pump supplier. Relays shall have a power consumption of no more than 2.8 watt, and shall be UL approved. Relays shall be modular in design, with each relay monitoring no more than two motor sensor functions.

Each relay module shall include a dual color (red/green) LED to indicate the status of each monitored sensor. Green will indicate “status OK”; red will indicate a failure or alarm condition. A self-corrected fault will allow the relay output contacts to reset, and cause the LED to change from a steady alarm indication to a flashing signal. The LED shall continue to flash until locally cleared, providing the operator an indication of a potential intermittent fault. Each relay shall also include a power-on LED and both “test” and “reset” pushbuttons.

An independent fail-safe (switch on power loss) form-C output contact shall be included for each monitored sensor to provide a normally-open / normally-closed dry contact to initiate a remote alarm device or shut down the motor. Contacts shall be rated for 5 amps at 120 volt.

## **FABRICATION** **GENERAL**

Provide pumps capable of handling raw unscreened wastewater. Design pumps to allow for removal and reinstallation without the need to enter the wet well and without removal of bolts, nuts or other fasteners. Provide a pump which connects to a permanently mounted discharge connection by simple downward motion, without rotation, guided by at least two non-load-bearing guides. All system components for guide cable systems, including cable, shall be supplied and warranted by the pump manufacturer. For guide pipe systems the pipe shall be supplied and warranted by the installing contractor. Guide cable systems shall be suitable for proper operation when installed at up to 5 degree misalignment from vertical, pipe guides must be installed perfectly plumb and vertical. Intermediate guide supports (between upper bracket and discharge elbow connections) shall not be required for cable systems but MUST be supplied where needed to maintain perfect alignment for pipe guides. Final connection shall insure zero leakage between pump and discharge connection flange. Provide a discharge connection/ guide system so that no part of the pump bears directly on the floor of the wet well. Provide Type 316 stainless steel chain of sufficient length to properly and safely lift pumps from the wet well. All exposed cast iron and ferrous surfaces shall be cleaned of dirt and grease, sandblasted to near white finish, and coated with an anti-corrosion reaction primer. The pump shall then be coated with two-component thick coat paint, with an epoxy resin base, having at minimum 83% solids by volume. This coating shall be non-toxic and approved for both wastewater and water applications.

### **MAJOR COMPONENTS**

Furnish major components (pump case, impeller, intermediate housing, motor housing) of cast material as specified with smooth surfaces devoid of blow holes and other irregularities. Pump case design shall incorporate a centerline discharge for stability when mounted on the base elbow.

### **IMPELLER**

The impeller(s) shall be of gray cast iron, Class 35B, dynamically balanced, semi-open, nonclogging design capable of handling soils, fibrous materials, heavy sludge and other matter found in wastewater. The impeller(s) shall have a back shroud only with back pump-out vanes to equalize axial thrust, and curved blades which protrude into the pump casing for maximum efficiency. The impeller will create a vortex which carries solids through the pump casing without passing through the blades. Impeller(s) shall be capable of passing a minimum 3" diameter solid.

### **SHAFT**

Provide common pump/motor shaft of sufficient size to transmit full driver output with a maximum deflection of 0.002 inches measured at the lower mechanical seal. Machine the shaft of carbon steel (for maximum strength and motor efficiency) and isolate the shaft from the pumped media with a replaceable Type 420 stainless steel shaft sleeve under the lower mechanical seal. Do not use carbon steel as shaft material without a stainless steel sleeve. If a sleeve is not used, machine the entire pump/motor shaft of ASTM A276 Type 420 stainless steel

### **SHAFT SEAL**

Provide two totally independent mechanical shaft seals, installed in tandem, each with its own independent single spring system acting in a common direction. Install the upper seal in an oil-filled chamber with drain and inspection plug (with positive anti-leak seal) for easy access from external to the pump. Provide seals requiring neither routine maintenance nor adjustment, but capable of being easily inspected and replaced. Provide seals which are non-proprietary in design, with replacements available from a source other than the pump manufacturer or its distributors. Do not provide seals with the following characteristics: conventional double mechanical seals with single or multiple springs acting in opposed direction; cartridge-type mechanical seals; seals incorporating coolant circulating impellers, seals with face materials other than those specified

### **BEARINGS**

Furnish upper and lower bearings, single row (preferred) or double row as needed to provide a B10 life of, at minimum, 100,000 hours at all anticipated axial and radial loadings. Provide sealed/shielded (permanently lubricated) bearings. If open-type (non-shielded) bearings are used, provide re-lubrication ports with positive anti-leak plugs for periodic addition of lubrication from external to the pump

**MOTOR**

Provide a motor which is squirrel cage, induction in design, housed in a completely watertight and air filled chamber, with a min 1.15 service factor. The motor shall be adequately sized and rated for continuous operation at a maximum fluid temperature of 104° F (40° C) [optional: 140°F (60° C)]. Allowable maximum submergence shall not be less than 100ft (30 m). The motor stator shall be wound using Class H monomer-free polyester resin insulation resulting in an overall motor rating of 311 Degrees F (155 degrees C), Class F insulation. The stator windings shall be trickle impregnated resulting in a winding fill factor of at least 95%. The use of a multiple step "dip and bake" type stator insulation method shall not be acceptable. The rotor bars and short circuit rings shall be made of aluminum. The motor and pump set complete shall be designed and manufactured by the same company. Provide temperature protection and seal leak detection as described in section above. Provide adequately rated motor with sufficient surface area for ambient only cooling suited for the intermittent mode of operation in wet well wastewater applications, submerged or partially submerged, without damage. Motors containing dielectric oils used for motor cooling and/or bearing lubrication or motors where the pumped media or externally provided fresh water is directed through the motor shell for cooling are not acceptable.

Provide motors which are FM listed for use in Class I Division 1 Groups C&D hazardous locations as defined by the National Electric Code

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## Data sheet

### Pump type

### KRT F 80-217/72XEG2-S IE3

#### Operating data

Flow		US g.p.m.	Fluid		
Head		ft	Density of fluid	62.3	lb/ft <sup>3</sup>
Operating speed	3517	rpm	Viscosity	1.08E-5	ft <sup>2</sup> /s
Shaft power		hp	Temperature	68	°F
Efficiency		%			
Required pump NPSH		ft			
Head H(Q=0)	106	ft			
Application range	Head		Flow		
	From	105 ft	4.81	US g.p.m.	
	To	27.5 ft	337	US g.p.m.	

#### Design

Make	KSB	Impeller type	Vortex impeller
Design	Submersible pump		Open
Series	KRT F	Impeller size	( 160 ) 6 5/16 inch
Frame size	80-217		Max. ( 200 ) 7 7/8 inch
Stages	1		Min. ( 120 ) 4 3/4 inch
Curve number	K43503/0	Free passage	3 inch
		Weight	inch lb
Type of bearings	Antifriction		
Nos. of bearings	1 / 1		
Lubrication	Grease lubrication. lubricated for lifetime		
Suction port	Pressure rating		--
	Flange size	DN0	---
	Flange size	DN1	4"
	Norm		--
Discharge port	Pressure rating		CLASS 125
	Flange size	DN2	3 inch
	Flange size	DN3	3 inch
	Norm		ASME/ANSI B16.1
Suction port: pump (DN1)			Discharge port: discharge elbow (DN3)

#### Materials

Pump casing	Grey cast iron EN-GJL-250 (A 48 Class 35B)
Discharge cover	Grey cast iron EN-GJL-250 (A 48 Class 35B)
Impeller	Chilled cast iron EN-GJN-HB555 (A 532 II B 15% Cr-Mo)
Shaft	Stainless steel EN-1.4021+QT800 (A 276 Type 420)
Bearing bracket	Grey cast iron EN-GJL-250 (A 48 Class 35B)
Motor casing	Grey cast iron EN-GJL-250 (A 48 Class 35B)
Bolts. nuts	Stainless steel A4 (EN-1.4571) (A 276 Type 316)
Shaft protection sleeve	---
Casing wear ring	
Impeller wear ring	
O-Rings	Nitrile rubber (NBR)

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## Data sheet

### Pump type

**KRT F 80-217/72XEG2-S IE3**

### Shaft seal

Type of seal	Double mechanical seal
Arrangement:	Tandem
Seal on medium side	with elastomer bellows
Mechanical seal. pump-side	Silicon carbide / Silicon carbide
Mechanical seal. bearing-side	Carbon / Silicon carbide

### Monitoring

Thermal winding protection	By temperature sensitive switches
Explosion proof protection	By PTC (Explosion proof models only)
Motor housing monitoring	By conductive moisture sensor electrode
Mechanical seal leakage detection	---
Bearing temperature monitoring	---

### Coating

Preparatory treatment	SSPC near white SP 10
Blasting method	Steel grit blasting
Primer	Zinc phosphate or Zinc dust
Dry film thickness primer	> 1 1/2 mils (35 microns)
Top coat	2-component epoxy resin
Solids content	> 82 %
Dry film thickness top coat	> 6 mils (150 microns)
Color	Ultramarine Blue (RAL 5002 to DIN 6174)

### Installation

#### INSTALLATION

Type of installation:	Wet well installation designed for
automatic connection to a permanently installed discharge elbow	
Discharge elbow size (DN2/DN3):	3 inch / 3 inch
Flange to suit:	ASME/ANSI B16.1, CLASS 125
Claw:	Bolted to the pump
Guide system:	Double guide bars, by contractor
Guide bar dimension:	2" diameter pipes
Installation depth:	15 ft (4.5 m)
Lifting device:	
Length of lifting device:	33 ft (10 m)
Lifting loops:	Every 8 ft (2.5 m )
Installation accessories:	Discharge elbow, 3 inch / 3 inch
fasteners, claw, bracket, lifting chain, but without guide bars	
Materials:	
Discharge elbow:	Grey cast iron EN-GJL-250 (A 48 Class 35B)
Claw:	Grey cast iron EN-GJL-250 (A 48 Class 35B)
Bracket:	Stainless steel EN-1.4571 (A 276 Type 316 Ti)
Lifting device:	

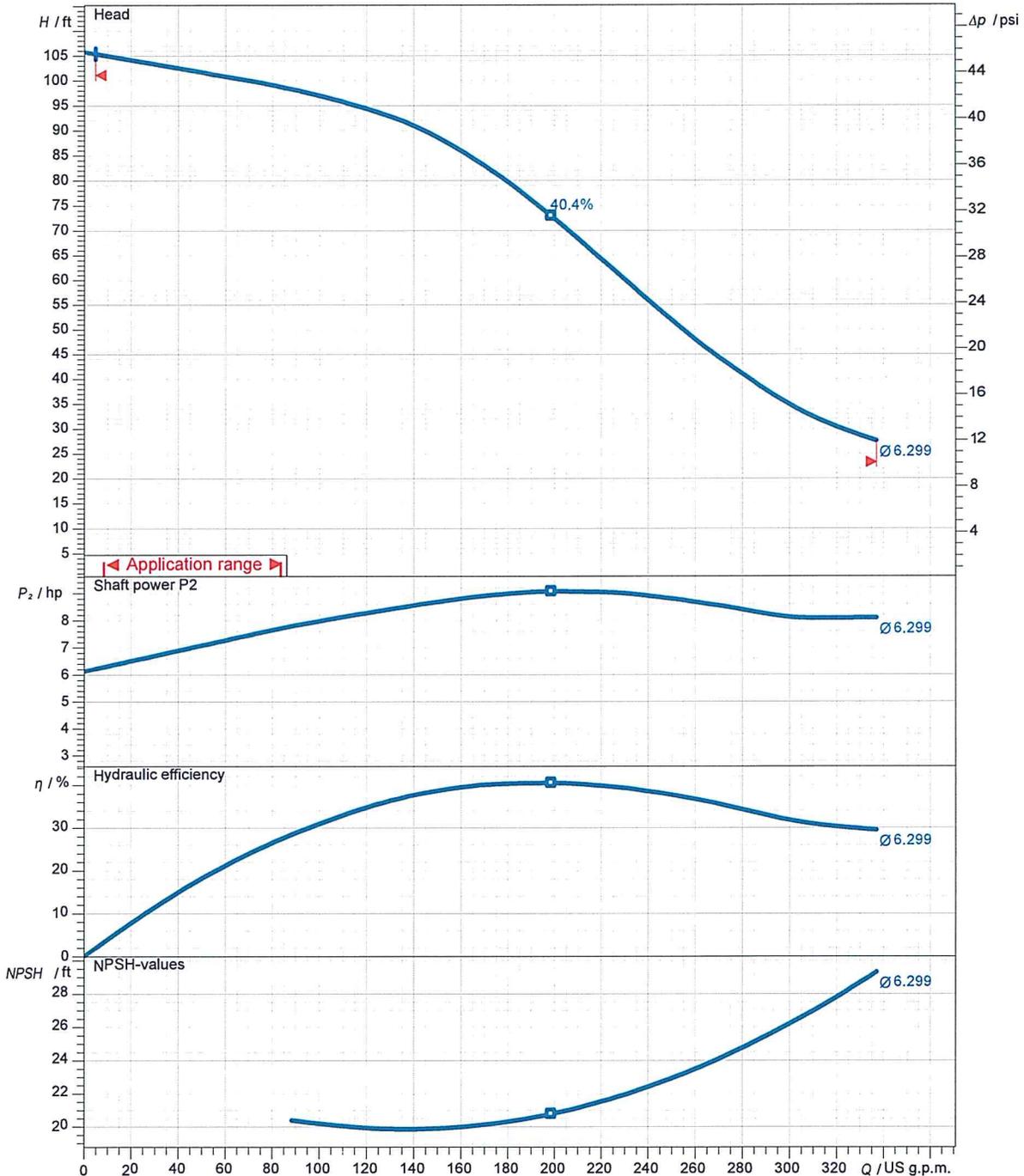
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**Performance curve**

**Pump type** KRT F 80-217/72XEG2-S IE3



Impeller type	Vortex impeller	, Open	Curve number	K43503/0	
Free passage	3 inch	Density of fluid	62.322 lb/ft <sup>3</sup>	Frequency	60 Hz
Impeller size	6 5/16 inch (160 )	Viscosity	1.082E-5 ft <sup>2</sup> /s	Speed	3517 1/min

KSB Inc., Richmond, VA. / KSB Pumps Inc., Mississauga, Ontario / KSB AG, Halle (Germany)

4.3.12 - 2019/06/25 (Build 259) 10.10.2019 15:25 UTC +2.00 ALL USA



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Pos.no

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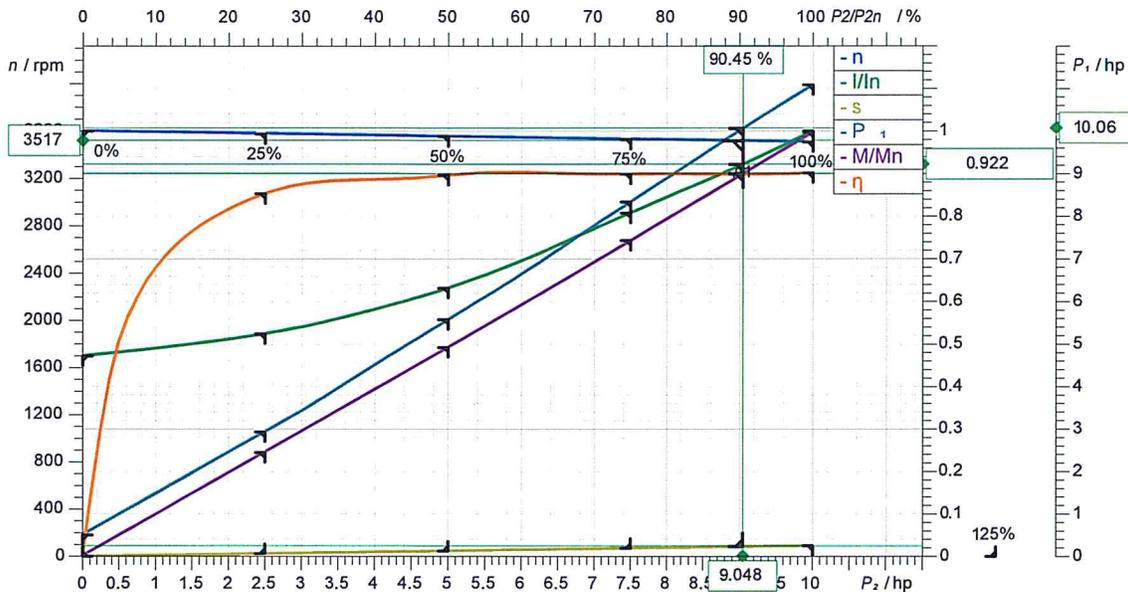
Data sheet: Motor data

Motor type **72XEG** **IE3**

Motor manufacturer	KSB SE & Co. KGaA	Rated voltage	230	V
Design acc. standard	IE3	Rated frequency	60	Hz
Service factor	1.15	Rated HP (D.O.L) or VFD	10	hp
Degree of protection	IP68	Rated current	25	A
Insulation class		Nominal speed	3508	rpm
Starting mode	Direct starting	NEMA code letter	G	
No. starts / h	30	Starting to rated current	6	
Coolant temperature	< / = 104 °F (40 °C)	Starting current	150	A
Motor casing	Grey cast iron EN-GJL-250 (A 48 Class 35B)			
Explosion protection	Class I, Div. 1, Groups C,D, T3			
Pump type	KRT F 80-217/72XEG2-S IE3			

Load	P1 kW	P2 hp	eta %	cos phi	I A
4/4	8.27	10.0	90.2	0.83	25.0
3/4	6.22	7.5	90.0	0.77	20.2
2/4	4.16	5.0	89.6	0.66	15.8
1/4	2.18	2.5	85.5	0.42	13.1

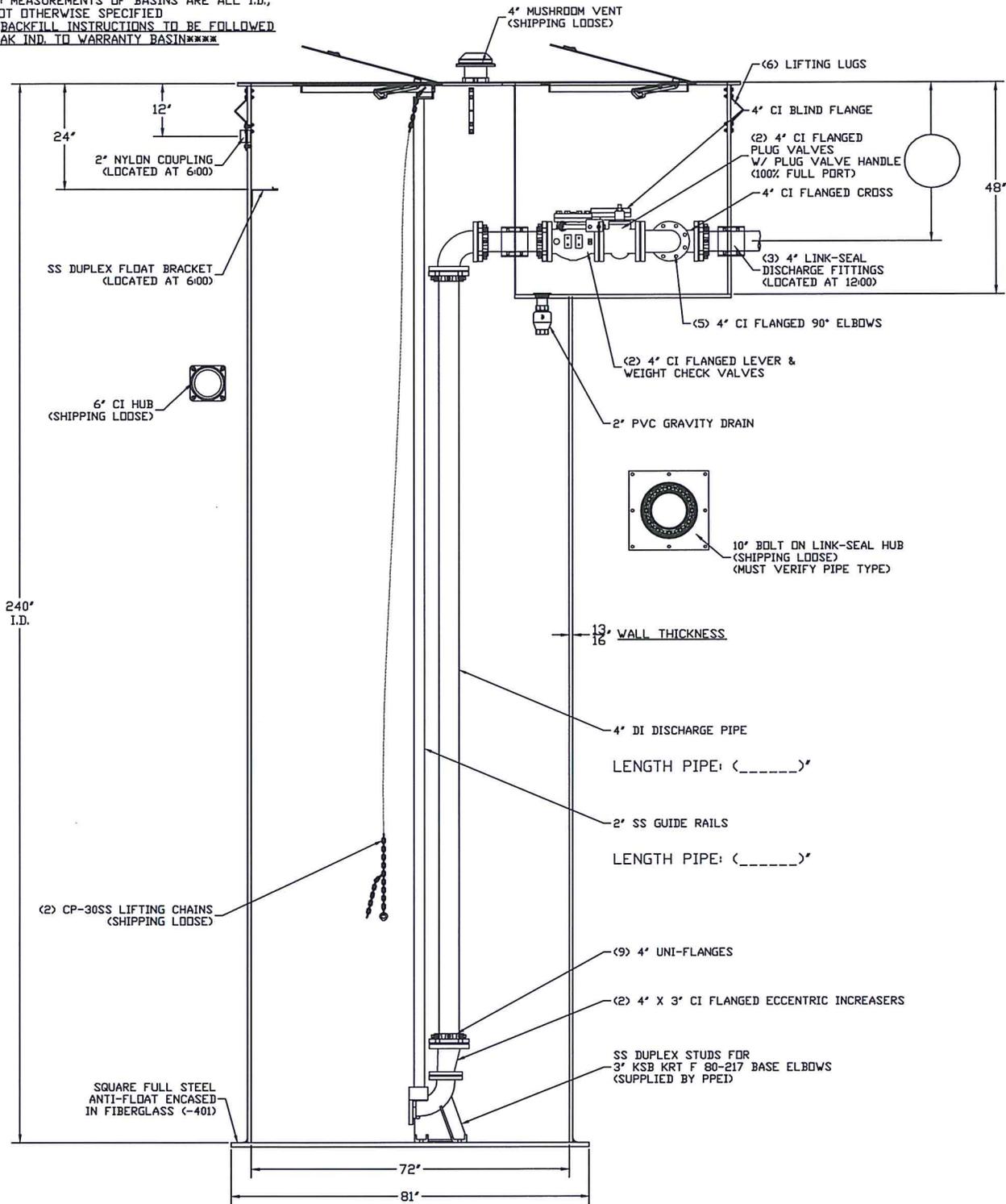
Main cable 1 x AWG 13-12 Diameter 0.73 inch...0.77 inch  
Control cable --- Diameter  
Cable. outer sheath Waterproof synthetic rubber compound  
Cable length 65 ft (20 m)



KSB Inc., 4415 Sarellen Road, Richmond, Virginia 23231, Phone: 001-804-222-1818, Fax: 001-804-226-6961  
KSB Pumps Inc, 5885 Kennedy Road, Mississauga, Ontario L4Z 2G3 (Canada), Phone: (0905) 568-9200, Fax: (0905) 568-9120

KSB Aktiengesellschaft, Turmstrasse 92, 06110 Halle (Germany), Phone +49 (345) 48260, Fax +49 (345) 4826 4699, www.ksb.com

NOTE: MEASUREMENTS OF BASINS ARE ALL I.D.,  
 IF NOT OTHERWISE SPECIFIED  
 \*\*\*\*\*BACKFILL INSTRUCTIONS TO BE FOLLOWED  
 FOR AK IND. TO WARRANTY BASIN\*\*\*\*\*



TO CUSTOMER:  
 EXAMINE THIS DRAWING CAREFULLY. VERIFY ALL DIMENSIONS, LOCATIONS, AND ELEVATIONS FOR ACCURACY. SIGN AND DATE AT LINE. ANY MODIFICATIONS OR CHANGES TO THIS DRAWING OR FINISHED PRODUCT, AFTER IT HAS BEEN SIGNED, MAY RESULT IN ADDITIONAL CHARGES AND SHIPPING DELAYS. NO JOB WILL BE STARTED UNTIL CONFIRMATION THROUGH SIGNATURE.

(REQUESTED SIGNATURE & DATE PER ABOVE)

CONFIRMATION THROUGH SIGNATURE RELEASES ORDER FOR PRODUCTION

DRAWN FOR: <b>PUMP &amp; PROCESS EQUIPMENT INC.</b>		PO# --- QUOTE # 72024	DISCONNECTS: 3" KSB PUMPS: KSB KRT F 80-271	SHEET 1 OF 2	Revision 3
JOB REFERENCE / Notes: <b>BUSCH DRIVE PS</b>		BASIN DESCRIPTION: 72 X 240-401 W/ 48 X 48 VB	DRAWN BY: A.HARTUNG / DATE: 1/6/22	 "THE BEST AROUND UNDERGROUND" PH: (574)-936-6022 FX: (574)-936-5811 WWW.AKINDUSTRIES.COM	
		COVER DESCRIPTION: 1/4" ALUMINUM VBC	CHECKED BY: / DATE CHECKED:		





# anchor scientific inc.

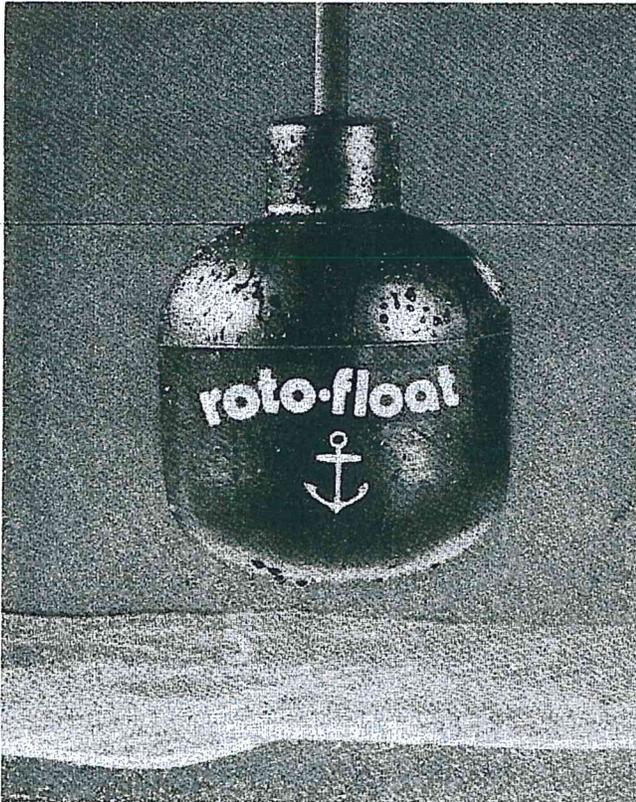
Box 378, Long Lake, MN 55356  
952-473-7115 • FAX 952-473-6002 • www.anchorscientific.com

## roto-float

### Type S - Suspended

Form 2700-B

## TYPE S



**The ROTO-FLOAT is a direct acting float switch.** Each ROTO-FLOAT contains a single pole mercury switch which actuates when the longitudinal axis of the float is horizontal, and deactuates when the liquid level falls 1" below the actuation elevation.

The float is a chemical resistant polypropylene casing with a firmly bonded electrical cable protruding. One end of the cable is permanently connected to the enclosed mercury switch and the entire assembly is encapsulated to form a completely water tight and impact resistant unit. Type S — Suspended has built in weight.

ROTO-FLOATS can be mounted on a support pipe (type P) or suspended from above (type S). Advantages of the ROTO-FLOAT are low cost, simplicity and reliability.



**Listed**

- Pilot Duty
- Industrial Control Equipment

### CABLE

P.V.C. type STO #18 conductors (41 strand) rated 600 volts • Various lengths available  
• See table of models • Non-standard lengths also available on special order.

Switch Arrangement	Cable Length	Suspended Type S Model No.	Ship. Wt.
Normally Open	20	S20NO	4#
	30	S30NO	4 1/2#
	40	S40NO	5 1/4#
Normally Closed	20	S20NC	4#
	30	S30NC	4 1/2#
	40	S40NC	5 1/4#

Effective 4/93

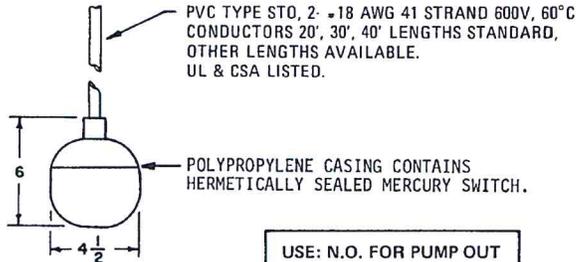
**GENERAL DESCRIPTION:**

THE ROTO-FLOAT IS A DIRECT ACTING FLOAT SWITCH. EACH ROTO-FLOAT CONTAINS A SINGLE POLE MERCURY SWITCH WHICH ACTUATES WHEN THE LONGITUDINAL AXIS OF THE FLOAT IS HORIZONTAL, AND DEACTUATES WHEN THE LIQUID FALLS 1" BELOW THE ACTUATION ELEVATION.

THE FLOAT IS A CHEMICAL RESISTANT POLYPROPYLENE CASING WITH A FIRMLY BONDED ELECTRICAL CABLE PROTRUDING. ONE END OF THE CABLE IS PERMANENTLY CONNECTED TO THE GLASS ENCLOSED MERCURY SWITCH AND THE ENTIRE ASSEMBLY IS ENCAPSULATED TO FORM A COMPLETELY WATER TIGHT AND IMPACT RESISTANT UNIT.

ROTO-FLOATS CAN BE MOUNTED ON A SUPPORT PIPE, (TYPE P); OR SUSPENDED FROM ABOVE, (TYPE S). ADVANTAGES OF THE ROTO-FLOAT ARE LOW COST, SIMPLICITY AND RELIABILITY. VARIOUS CIRCUIT CONFIGURATIONS, OTHER THAN THE ONES LISTED BELOW, ARE AVAILABLE.

**SPECIFICATIONS:**



USE: N.O. FOR PUMP OUT  
N.C. FOR PUMP IN

- UL LISTED, IND. CONT. EQ.  
PILOT DUTY  
4.5 AMPS 120 VAC  
2.25 AMPS 240 VAC
- FLOAT COLOR  
N.O., BLACK  
N.C., RED
- MOUNTING ARRANGEMENT  
TYPE P - PIPE MOUNTED MODEL INCLUDES POLYPROPYLENE CLAMP  
TYPE S - SUSPENDED MODEL WITH STABILIZING WEIGHT.

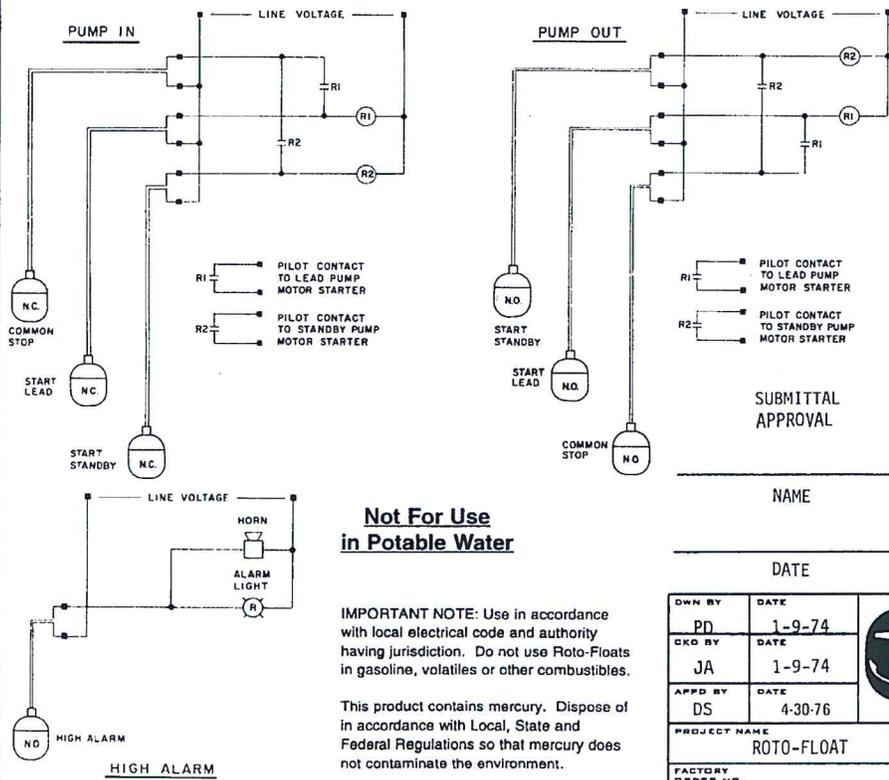
**MODELS:**

SWITCH ARRANGEMENT	CABLE LENGTH	SUSPENDED TYPE S		PIPE MOUNTED TYPE P	
		MODEL NO.	SHIP WT.	MODEL NO.	SHIP WT.
NORMALLY OPEN	20	S20NO	4#	P20NO	2#
	30	S30NO	4 1/2#	P30NO	2 3/4#
	40	S40NO	5 1/2#	P40NO	3 1/2#
NORMALLY CLOSED	20	S20NC	4#	P20NC	2#
	30	S30NC	4 1/2#	P30NC	2 3/4#
	40	S40NC	5 1/2#	P40NC	3 1/2#

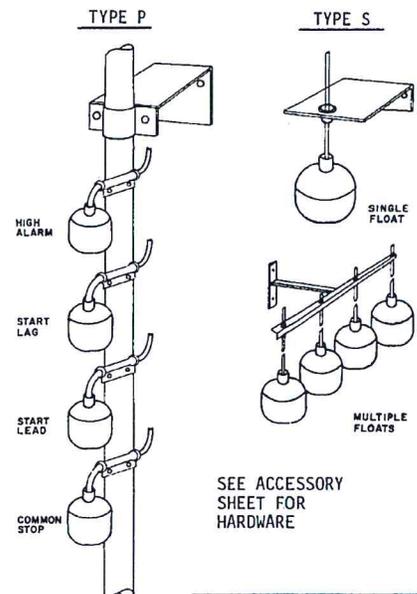
**APPLICATIONS:**

FOR USE IN CONTROLLING PUMPS OR OTHER MACHINES AND MEASURING ALARM LEVELS IN WATER, SEWAGE AND MANY OTHER LIQUIDS. ROTO-FLOATS MAY BE USED FOR PUMP IN OR PUMP OUT CONTROL, FOR LOW LEVEL CUTOUT, OR FOR LOW AND HIGH LEVEL ALARMS.

**TYPICAL 2 PUMP CIRCUITS**



**TYPICAL MOUNTING**



LETTER A      4-81 REVISIONS      DATE

NAME \_\_\_\_\_

DATE \_\_\_\_\_

DWN BY	DATE	
PD	1-9-74	
CRD BY	DATE	
JA	1-9-74	
APPD BY	DATE	
DS	4-30-76	
PROJECT NAME		
ROTO-FLOAT		
FACTORY ORDER NO.		

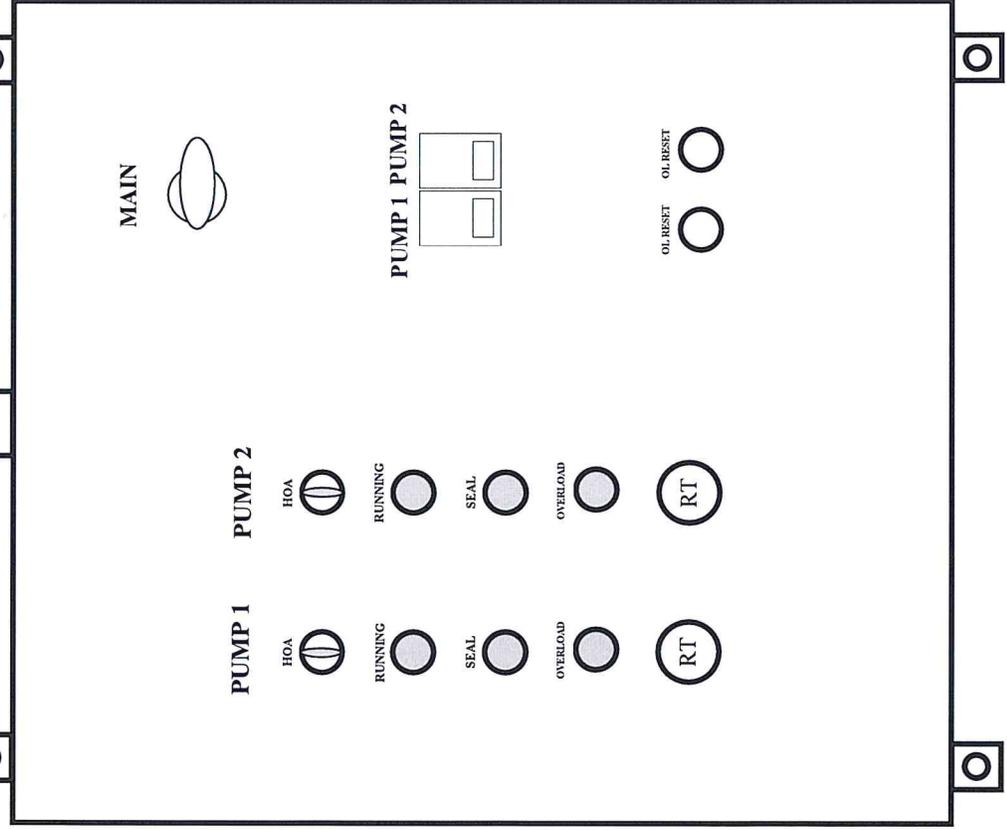
**anchor scientific inc.**  
Box 378, Long Lake, MN 55356  
952/473-7115

SPECIFICATION DATA SUBMITTAL AND INSTRUCTION SHEET

DWG. NO. 174 - 4

<b>10 HP Duplex Power Panel</b>		
<b>Bill of Materials</b>		
<b>230V 3Phase 4 Wire</b>		
<b>QUANTITY</b>	<b>DESCRIPTION</b>	<b>MFG</b>
1	Circuit Breaker 100 Amp 3 Pole DWB100CE100-3DX	WEG
1	Operator MRXL-A-DWB160-BU	WEG
2	Circuit Breaker 50 Amp 3 Pole QOU350	SQUARE D
1	Power Dist. Block 1333552CH	MARATHON
1	Alarm Light SBN120AC-R	INGRAM
2	HOA Switch 2AS2-3	ALTECH
4	N.O. Contact S1	ALTECH
2	Starter AF30-30-00-13	ABB
2	Aux. Contact CA4-10	ABB
2	Overload TF42-29	ABB
2	Overload Reset	WEG
1	10 Amp Breaker QOU110	SQUARE D
1	15 Amp Breaker QOU115	SQUARE D
1	GFCI Outlet 2094-GRY	P&S
1	PumpSafe Relay	KSB
3	Ground Lug ADR-6	BLACKBURN
1	Ground Lug ADR-25	BLACKBURN
1	NEMA 4X Enclosure 30 x 24 x 12 SPN4SS302412-1025	SCHAFFERS
1	Control Panel Back Plate SPP3024	SCHAFFERS
24	Terminal 3044131	PHOENIX
2	Terminal End 3047028	PHOENIX
4	Terminal End Stop 0800886	PHOENIX
4	Angle Brackets 1201086	PHOENIX
6ft	1 x 1.5 Wire Channel	ABB
2ft	35mm Din Rail	ABB
1	Wire and Terminals	
1	Alternator ARP120A3R	MACROMATIC
1	Base 90.26	FINDER
2	Green Pilot Light CL513-G	ABB
2	Red Pilot Light CL513-R	ABB
2	Amber Pilot Light CL513-Y	ABB
2	Hour Meter T50A2	ENM
3	Fuse Holder 2541000	ABB
3	Fuse FNM-1	LITTLEFUSE
1	Phase Monitor PMPU	MACROMATIC
1	Base OTO8	MACROMATIC
1	SDSA3650	SQUARE D
1	Labels Engraved	ACS
1	Laminated DWG	ACS

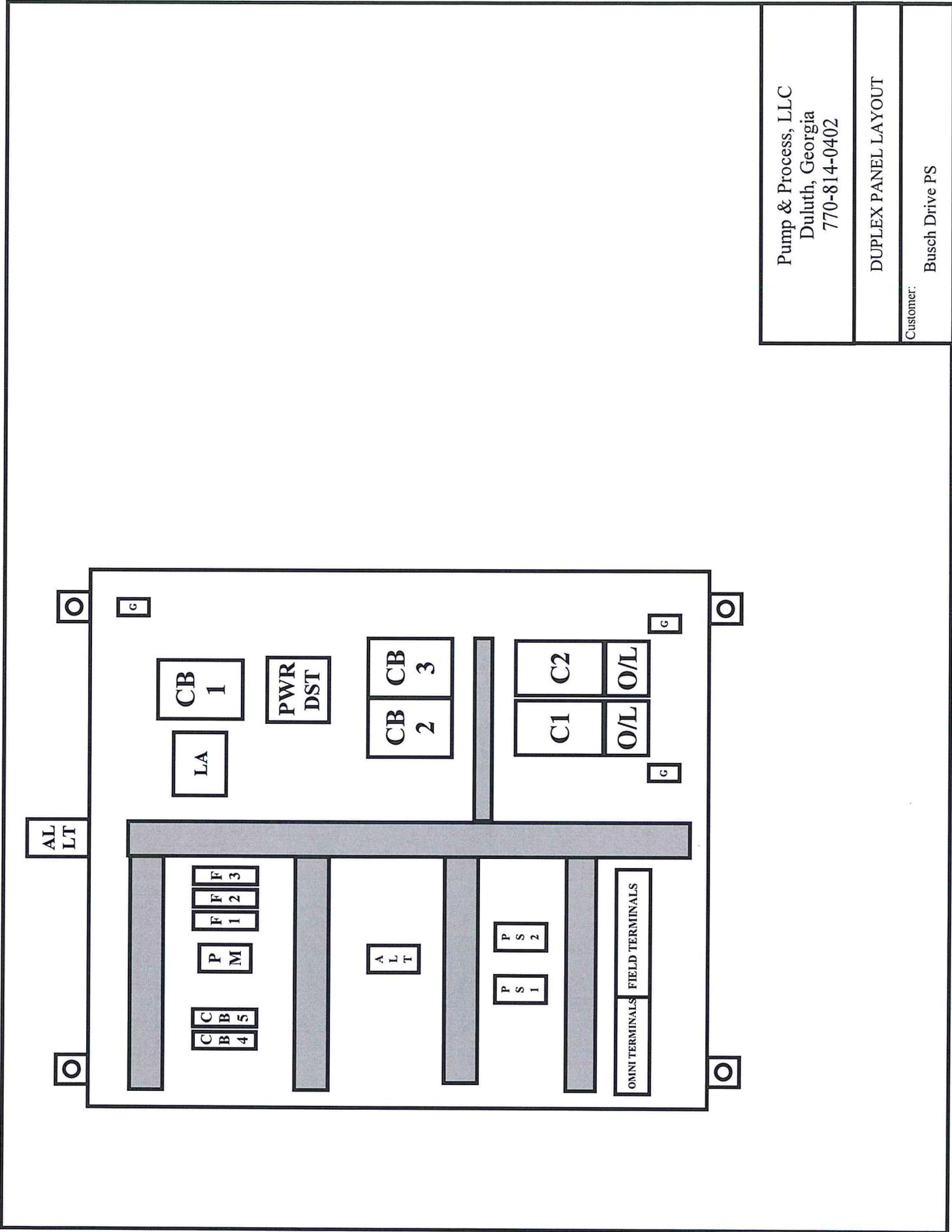
AL  
LT



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Duluth, Georgia  
770-814-0402

DUPLEX PANEL DEAD FRONT

Customer:  
Busch Drive PS

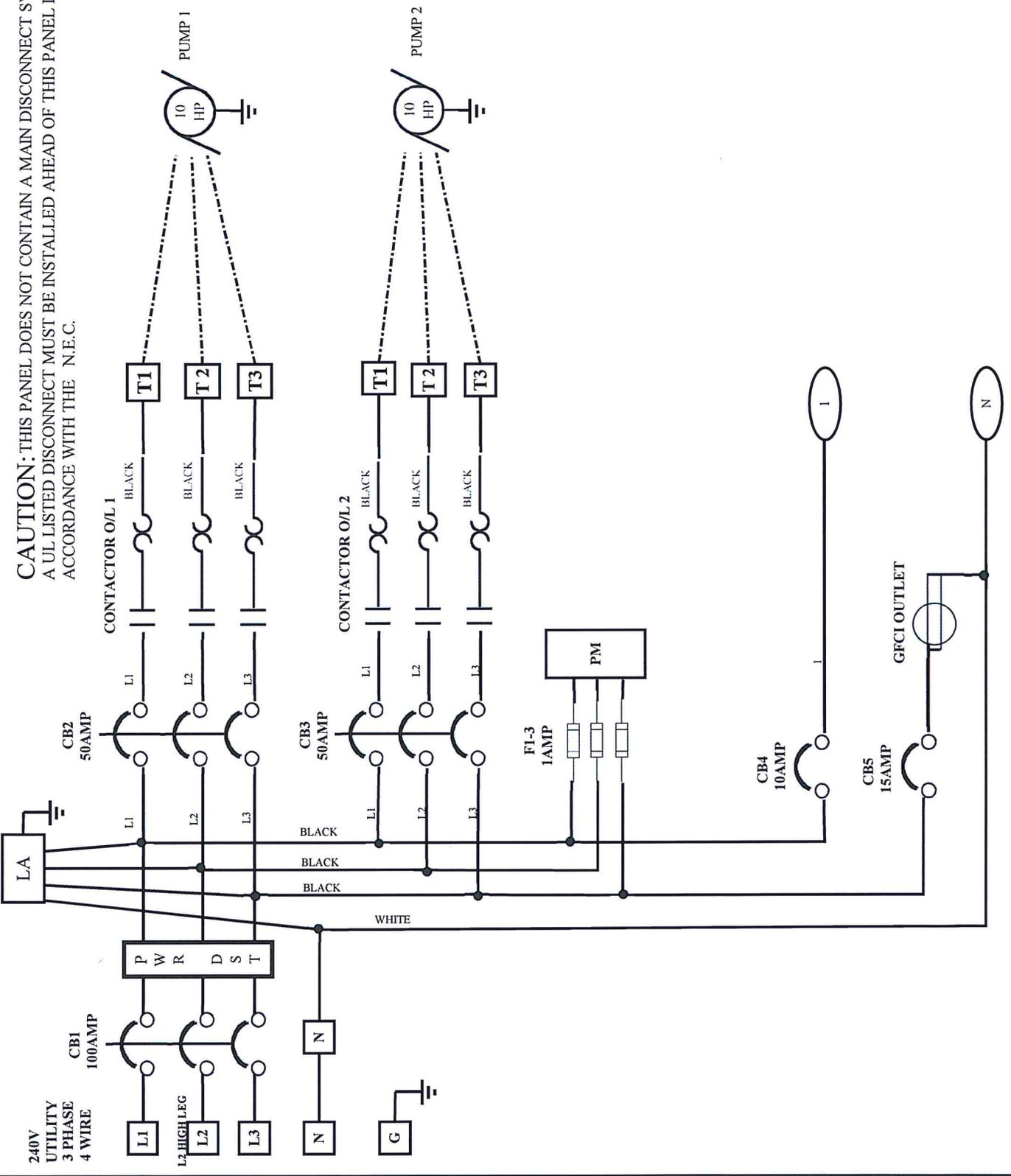


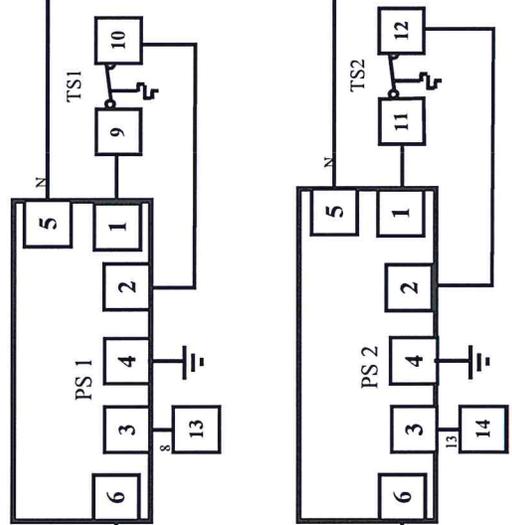
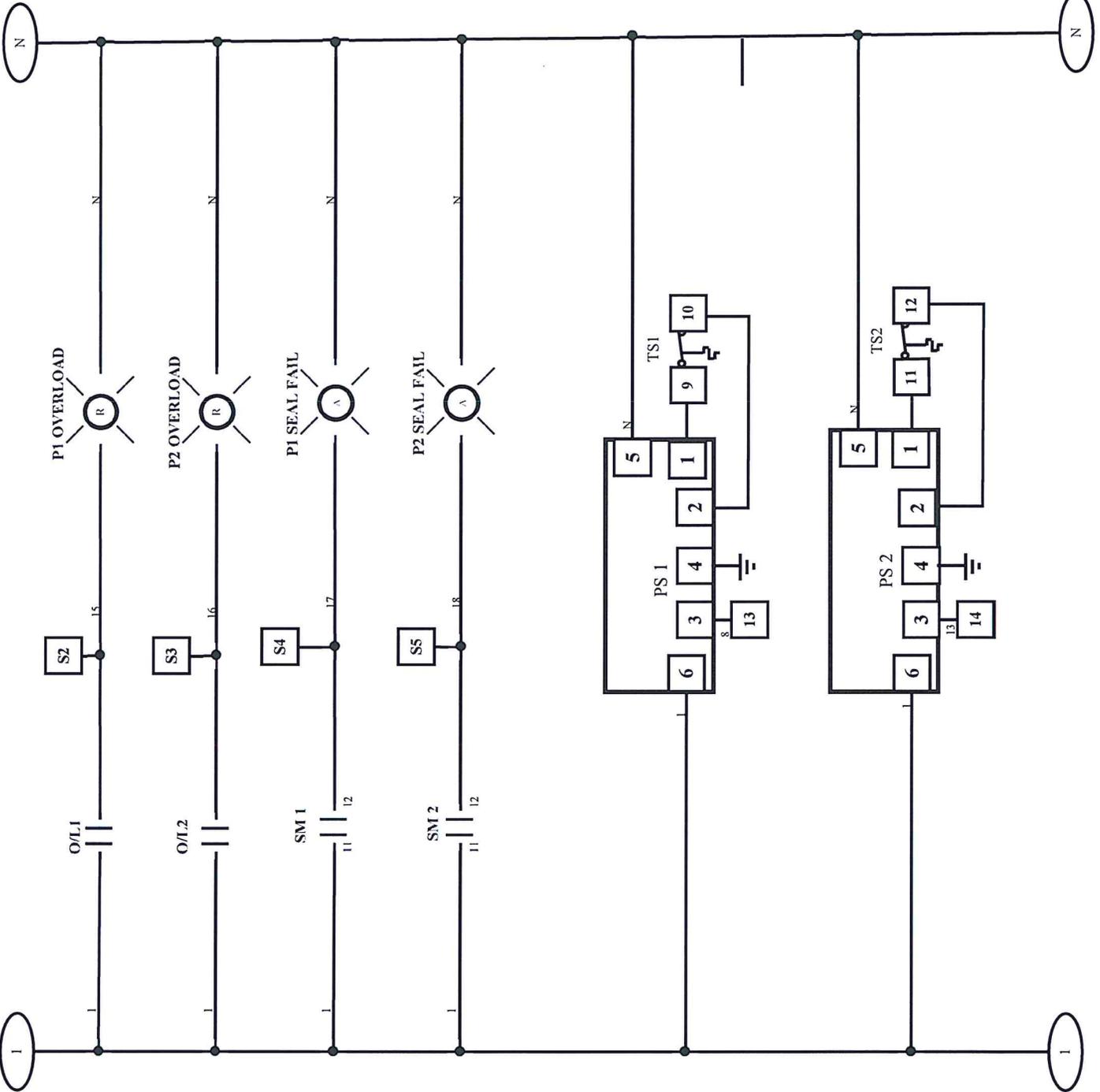
Pump & Process, LLC  
 Duluth, Georgia  
 770-814-0402

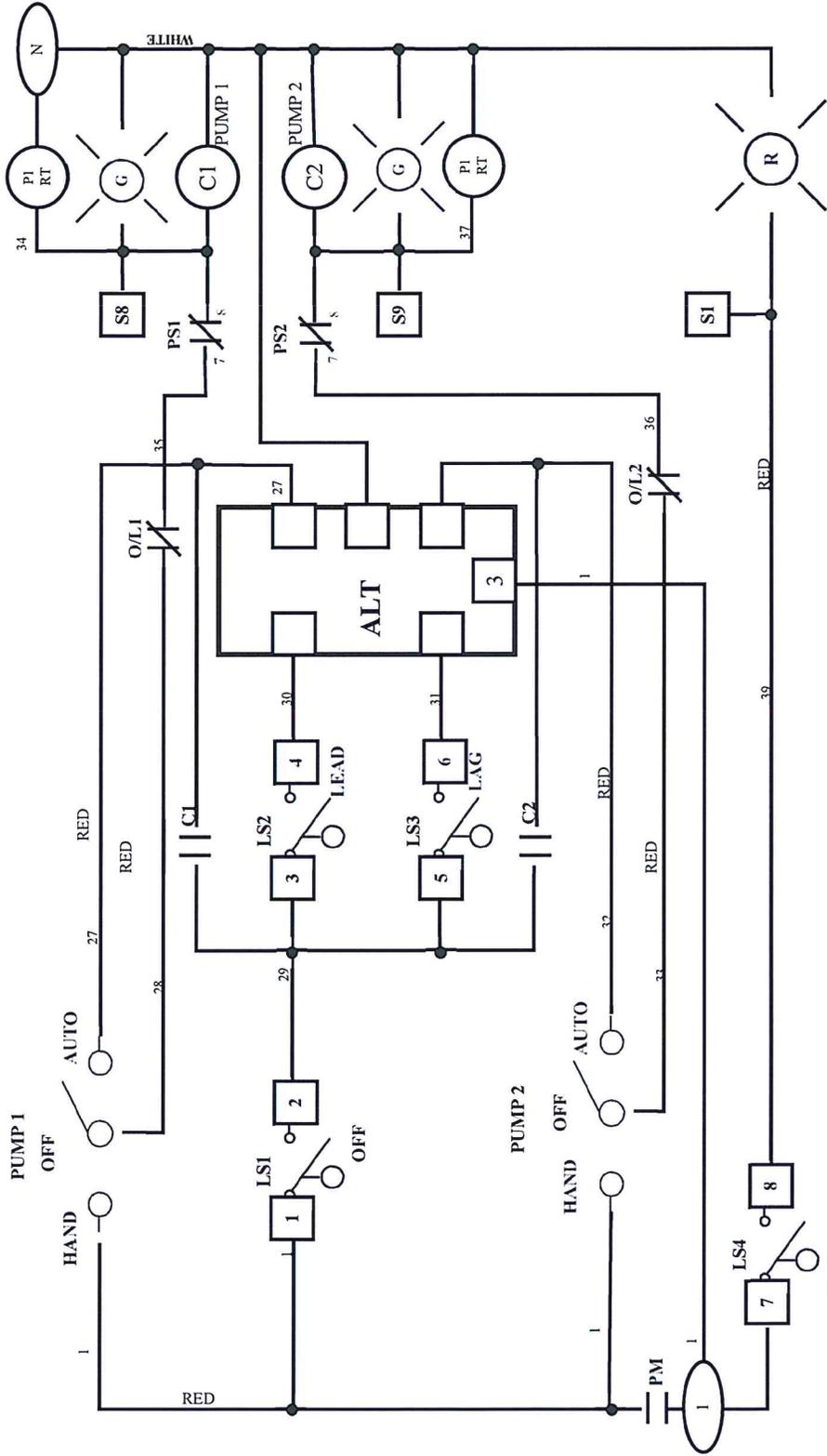
DUPLEX PANEL LAYOUT

Customer:  
 Busch Drive PS

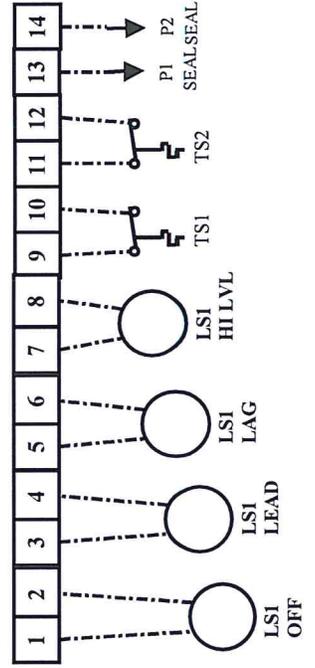
**CAUTION:** THIS PANEL DOES NOT CONTAIN A MAIN DISCONNECT SWITCH  
 A UL LISTED DISCONNECT MUST BE INSTALLED AHEAD OF THIS PANEL IN  
 ACCORDANCE WITH THE N.E.C.







### FIELD TERMINALS



120V OMNI TERMINALS

HIGH LEVEL S1

PUMP 1 OVERLOAD S2

PUMP 2 OVERLOAD S3

PUMP 1 SEAL FAIL S4

PUMP 2 SEAL FAIL S5

S6

S7

PUMP 1 RUNNING S8

PUMP 2 RUNNING S9

S10

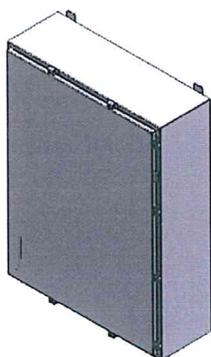
WIRE TYPE      COLOR  
115V CONTROL    BLACK  
115V NEUTRAL    WHITE  
GROUND           GREEN

Pump & Process LLC.  
Duluth, Georgia  
770-814-0402

Power Requirements      Drawing ACS-PPE-1284  
HP 2 x 10    F.L.A. 65    Voltage 240    Phase 3    Hz 60

Duplex Control Panel

Customer:  
Busch Drive PS



**APPLICATION** - Designed to protect electrical controls, instruments, and/or terminals in certain outdoor applications or wet areas, where regular hosing down with water is standard procedure.

**CONSTRUCTION** - Fabricated from 14 gauge carbon steel, 14 gauge type 304,

type 316 stainless steel or .125" 5052 H32 aluminum with continuously welded seams. Enclosure features:

- Door is secured with heavy-duty continuous hinge with removable hinge pin and stainless steel clamps
- Padlocking hasp and staple
- Adhesive backed, oil resistant gasket applied to the doors
- Print pocket
- External mounting feet for wall or machinery mounting
- Ground studs installed inside cabinet and door
- Collar studs provided for mounting optional sub panels.

**FINISH** - Standard RAL 7035 texture polyester powder coat finish on interior and exterior of enclosures. Recoatable, smooth, white or ANSI-61 gray available at no charge. Standard RAL and custom

match finishes available for an additional charge, please contact Schaefer's Electrical Enclosures, Inc. for further assistance. All powder coat finishes applied over cleaned phosphatized surfaces. Carbon steel sub panels have a white polyester powder coat finish. Stainless Steel and Aluminum enclosures have a polished #4 finish.

**OPTIONS** - Schaefer's Electrical Enclosures, Inc. can modify standard enclosures or custom design enclosures according to your specifications. Holes, cutouts, sizes, materials, and many more options are available. Quotations upon request.

**INDUSTRY STANDARDS**

- UL 50 Listed
- CUL 50 Listed
- Type 4 & 4X

Carbon Steel #	Catalog Number			Enclosure Size H x W x D (inches)	Shpg. Wt.	Sub Panel Part Number	Sub Panel Size H x L (inches)
	304 Stainless Steel #	316 Stainless Steel #	Aluminum #				
SPN4-16126	SPN4SS-16126	SPN4SS6-16126	SPN4AL-16126	16 x 12 x 6	24	SPP-1612	13 x 9
SPN4-16166	SPN4SS-16166	SPN4SS6-16166	SPN4AL-16166	16 x 16 x 6	29	SPP-1616	13 x 13
SPN4-16206	SPN4SS-16206	SPN4SS6-16206	SPN4AL-16206	16 x 20 x 6	33	SPP-1620	13 x 17
SPN4-20166	SPN4SS-20166	SPN4SS6-20166	SPN4AL-20166	20 x 16 x 6	33	SPP-2016	17 x 13
SPN4-20206	SPN4SS-20206	SPN4SS6-20206	SPN4AL-20206	20 x 20 x 6	38	SPP-2020	17 x 17
SPN4-24126	SPN4SS-24126	SPN4SS6-24126	SPN4AL-24126	24 x 12 x 6	32	SPP-2412	21 x 9
SPN4-24166	SPN4SS-24166	SPN4SS6-24166	SPN4AL-24166	24 x 16 x 6	39	SPP-2416	21 x 13
SPN4-24206	SPN4SS-24206	SPN4SS6-24206	SPN4AL-24206	24 x 20 x 6	45	SPP-2420	21 x 17
SPN4-24246	SPN4SS-24246	SPN4SS6-24246	SPN4AL-24246	24 x 24 x 6	51	SPP-2424	21 x 21
SPN4-30206	SPN4SS-30206	SPN4SS6-30206	SPN4AL-30206	30 x 20 x 6	53	SPP-3020	27 x 17
SPN4-30246	SPN4SS-30246	SPN4SS6-30246	SPN4AL-30246	30 x 24 x 6	61	SPP-3024	21 x 21
SPN4-36246	SPN4SS-36246	SPN4SS6-36246	SPN4AL-36246	36 x 24 x 6	69	SPP-3624	33 x 21
SPN4-20126	SPN4SS-20126	SPN4SS6-20126	SPN4AL-20126	20 x 12 x 6	29	SPP-2012	17 x 9
SPN4-12246	SPN4SS-12246	SPN4SS6-12246	SPN4AL-12246	12 x 24 x 6	32	SPP-1224	9 x 21
SPN4-20246	SPN4SS-20246	SPN4SS6-20246	SPN4AL-20246	20 x 24 x 6	46	SPP-2024	17 x 21
SPN4-30166	SPN4SS-30166	SPN4SS6-30166	SPN4AL-30166	30 x 16 x 6	46	SPP-3016	27 x 13
SPN4-36306	SPN4SS-36306	SPN4SS6-36306	SPN4AL-36306	36 x 30 x 6	86	SPP-3630	33 x 27
SPN4-12248	SPN4SS-12248	SPN4SS6-12248	SPN4AL-12248	12 x 24 x 8	35	SPP-1224	9 x 21
SPN4-16128	SPN4SS-16128	SPN4SS6-16128	SPN4AL-16128	16 x 12 x 8	27	SPP-1612	13 x 9
SPN4-16168	SPN4SS-16168	SPN4SS6-16168	SPN4AL-16168	16 x 16 x 8	31	SPP-1616	13 x 13
SPN4-16208	SPN4SS-16208	SPN4SS6-16208	SPN4AL-16208	16 x 20 x 8	29	SPP-1620	13 x 17
SPN4-20128	SPN4SS-20128	SPN4SS6-20128	SPN4AL-20128	20 x 12 x 8	30	SPP-2012	17 x 9
SPN4-20168	SPN4SS-20168	SPN4SS6-20168	SPN4AL-20168	20 x 16 x 8	36	SPP-2016	17 x 13
SPN4-20208	SPN4SS-20208	SPN4SS6-20208	SPN4AL-20208	20 x 20 x 8	43	SPP-2020	17 x 17
SPN4-20248	SPN4SS-20248	SPN4SS6-20248	SPN4AL-20248	20 x 24 x 8	50	SPP-2024	17 x 21
SPN4-24168	SPN4SS-24168	SPN4SS6-24168	SPN4AL-24168	24 x 16 x 8	41	SPP-2416	21 x 13
SPN4-24208	SPN4SS-24208	SPN4SS6-24208	SPN4AL-24208	24 x 20 x 8	50	SPP-2420	21 x 17
SPN4-24248	SPN4SS-24248	SPN4SS6-24248	SPN4AL-24248	24 x 24 x 8	57	SPP-2424	21 x 21
SPN4-24308	SPN4SS-24308	SPN4SS6-24308	SPN4AL-24308	34 x 30 x 8	66	SPP-2430	21 x 27
SPN4-30208	SPN4SS-30208	SPN4SS6-30208	SPN4AL-30208	30 x 20 x 8	56	SPP-3020	27 x 17
SPN4-30248	SPN4SS-30248	SPN4SS6-30248	SPN4AL-30248	30 x 24 x 8	67	SPP-3024	27 x 21
SPN4-30308	SPN4SS-30308	SPN4SS6-30308	SPN4AL-30308	30 x 30 x 8	79	SPP-3030	27 x 27
SPN4-30368	SPN4SS-30368	SPN4SS6-30368	SPN4AL-30368	30 x 36 x 8	90	SPP-3036	27 x 33
SPN4-36248	SPN4SS-36248	SPN4SS6-36248	SPN4AL-36248	36 x 24 x 8	75	SPP-3624	33 x 21
SPN4-36308	SPN4SS-36308	SPN4SS6-36308	SPN4AL-36308	36 x 30 x 8	95	SPP-3630	33 x 27
SPN4-36368	SPN4SS-36368	SPN4SS6-36368	SPN4AL-36368	36 x 36 x 8	104	SPP-3636	33 x 33
SPN4-42248	SPN4SS-42248	SPN4SS6-42248	SPN4AL-42248	42 x 24 x 8	85	SPP-4224	39 x 21
SPN4-42308	SPN4SS-42308	SPN4SS6-42308	SPN4AL-42308	42 x 30 x 8	105	SPP-4230	39 x 27
SPN4-42368	SPN4SS-42368	SPN4SS6-42368	SPN4AL-42368	42 x 36 x 8	120	SPP-4236	39 x 33
SPN4-48248	SPN4SS-48248	SPN4SS6-48248	SPN4AL-48248	48 x 24 x 8	97	SPP-4824	45 x 21
SPN4-48308	SPN4SS-48308	SPN4SS6-48308	SPN4AL-48308	48 x 30 x 8	119	SPP-4830	45 x 27
SPN4-48368	SPN4SS-48368	SPN4SS6-48368	SPN4AL-48368	48 x 36 x 8	137	SPP-4836	45 x 33

**NOTE:** Sub panels must be ordered separately. Reference page 122 for sub panel layout. Weights for Aluminum Enclosures are not listed. Please contact Schaefer's Electrical Enclosures, Inc. for weight.

# Wall Mount Enclosures

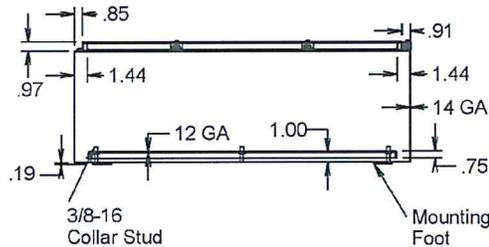
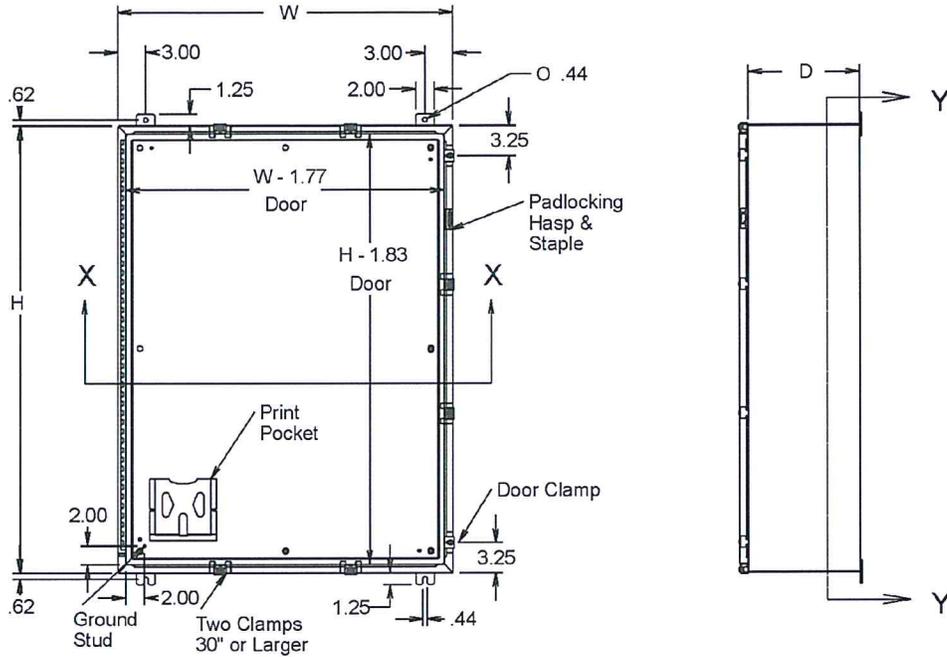
## Type 4 & 4X Single Door



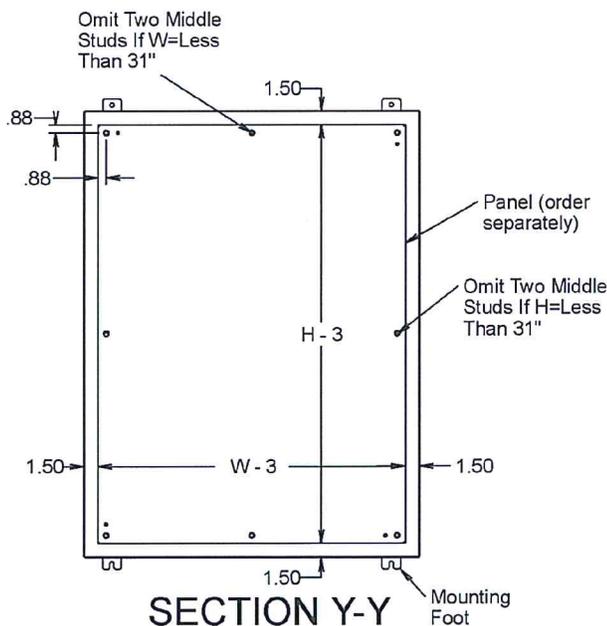
Carbon Steel #	Catalog Number			Enclosure Size H x W x D (inches)	Shpg. Wt.	Sub Panel Part Number	Sub Panel Size H x L (inches)
	304 Stainless Steel #	316 Stainless Steel #	Aluminum #				
SPN4-60368	SPN4SS-60368	SPN4SS6-60368	SPN4AL-60368	60 x 36 x 8	164	SPP-6036	57 x 33
SPN4-161210	SPN4SS-161210	SPN4SS6-161210	SPN4AL-161210	16 x 12 x 10	29	SPP-1612	13 x 9
SPN4-201610	SPN4SS-201610	SPN4SS6-201610	SPN4AL-201610	20 x 16 x 10	39	SPP-2016	17 x 13
SPN4-241210	SPN4SS-241210	SPN4SS6-241210	SPN4AL-241210	24 x 12 x 10	39	SPP-2412	21 x 9
SPN4-242010	SPN4SS-242010	SPN4SS6-242010	SPN4AL-242010	24 x 20 x 10	53	SPP-2420	21 x 17
SPN4-302010	SPN4SS-302010	SPN4SS6-302010	SPN4AL-302010	30 x 20 x 10	60	SPP-3020	27 x 17
SPN4-242410	SPN4SS-242410	SPN4SS6-242410	SPN4AL-242410	24 x 24 x 10	63	SPP-2424	21 x 21
SPN4-302410	SPN4SS-302410	SPN4SS6-302410	SPN4AL-302410	30 x 24 x 10	73	SPP-3024	27 x 21
SPN4-362410	SPN4SS-362410	SPN4SS6-362410	SPN4AL-362410	36 x 24 x 10	82	SPP-3624	33 x 21
SPN4-363010	SPN4SS-363010	SPN4SS6-363010	SPN4AL-363010	36 x 30 x 10	100	SPP-3630	33 x 27
SPN4-423010	SPN4SS-423010	SPN4SS6-423010	SPN4AL-423010	42 x 30 x 10	116	SPP-4230	39 x 27
SPN4-423610	SPN4SS-423610	SPN4SS6-423610	SPN4AL-423610	42 x 36 x 10	124	SPP-4236	39 x 33
SPN4-483010	SPN4SS-483010	SPN4SS6-483010	SPN4AL-483010	48 x 30 x 10	124	SPP-4830	45 x 27
SPN4-483610	SPN4SS-483610	SPN4SS6-483610	SPN4AL-483610	48 x 36 x 10	148	SPP-4836	45 x 33
SPN4-603610	SPN4SS-603610	SPN4SS6-603610	SPN4AL-603610	60 x 36 x 10	166	SPP-6036	57 x 33
SPN4-201612	SPN4SS-201612	SPN4SS6-201612	SPN4AL-201612	20 x 16 x 12	42	SPP-2016	17 x 13
SPN4-242012	SPN4SS-242012	SPN4SS6-242012	SPN4AL-242012	24 x 20 x 12	57	SPP-2420	21 x 17
SPN4-242412	SPN4SS-242412	SPN4SS6-242412	SPN4AL-242412	24 x 24 x 12	64	SPP-2424	21 x 21
SPN4-302412	SPN4SS-302412	SPN4SS6-302412	SPN4AL-302412	30 x 24 x 12	77	SPP-3024	27 x 21
SPN4-303012	SPN4SS-303012	SPN4SS6-303012	SPN4AL-303012	30 x 30 x 12	94	SPP-3030	27 x 27
SPN4-362412	SPN4SS-362412	SPN4SS6-362412	SPN4AL-362412	36 x 24 x 12	89	SPP-3624	33 x 21
SPN4-363012	SPN4SS-363012	SPN4SS6-363012	SPN4AL-363012	36 x 30 x 12	103	SPP-3630	33 x 27
SPN4-423012	SPN4SS-423012	SPN4SS6-423012	SPN4AL-423012	42 x 30 x 12	122	SPP-4230	39 x 27
SPN4-723012	SPN4SS-723012	SPN4SS6-723012	SPN4AL-723012	72 x 30 x 12	181	SPP-7230	69 x 27
SPN4-363612	SPN4SS-363612	SPN4SS6-363612	SPN4AL-363612	36 x 36 x 12	127	SPP-3636	33 x 33
SPN4-423612	SPN4SS-423612	SPN4SS6-423612	SPN4AL-423612	42 x 36 x 12	135	SPP-4236	39 x 33
SPN4-483612	SPN4SS-483612	SPN4SS6-483612	SPN4AL-483612	48 x 36 x 12	152	SPP-4836	45 x 33
SPN4-603612	SPN4SS-603612	SPN4SS6-603612	SPN4AL-603612	60 x 36 x 12	190	SPP-6036	57 x 33
SPN4-723612	SPN4SS-723612	SPN4SS6-723612	SPN4AL-723612	72 x 36 x 12	215	SPP-7236	69 x 33
SPN4-242016	SPN4SS-242016	SPN4SS6-242016	SPN4AL-242016	24 x 20 x 16	67	SPP-2420	21 x 17
SPN4-242416	SPN4SS-242416	SPN4SS6-242416	SPN4AL-242416	24 x 24 x 16	75	SPP-2424	21 x 21
SPN4-302416	SPN4SS-302416	SPN4SS6-302416	SPN4AL-302416	30 x 24 x 16	88	SPP-3024	27 x 21
SPN4-363016	SPN4SS-363016	SPN4SS6-363016	SPN4AL-363016	36 x 30 x 16	121	SPP-3630	33 x 27
SPN4-723016	SPN4SS-723016	SPN4SS6-723016	SPN4AL-723016	72 x 30 x 16	206	SPP-7230	69 x 27
SPN4-423616	SPN4SS-423616	SPN4SS6-423616	SPN4AL-423616	42 x 36 x 16	155	SPP-4236	39 x 33
SPN4-483616	SPN4SS-483616	SPN4SS6-483616	SPN4AL-483616	48 x 36 x 16	170	SPP-4836	45 x 33
SPN4-603616	SPN4SS-603616	SPN4SS6-603616	SPN4AL-603616	60 x 36 x 16	199	SPP-6036	57 x 33
SPN4-302420	SPN4SS-302420	SPN4SS6-302420	SPN4AL-302420	30 x 24 x 20	96	SPP-3024	27 x 21
SPN4-363020	SPN4SS-363020	SPN4SS6-363020	SPN4AL-363020	36 x 30 x 20	127	SPP-3630	33 x 27
SPN4-723020	SPN4SS-723020	SPN4SS6-723020	SPN4AL-723020	72 x 30 x 20	227	SPP-7230	69 x 27
SPN4-483620	SPN4SS-483620	SPN4SS6-483620	SPN4AL-483620	48 x 36 x 20	190	SPP-4836	45 x 33
SPN4-603620	SPN4SS-603620	SPN4SS6-603620	SPN4AL-603620	60 x 36 x 20	240	SPP-6036	57 x 33
SPN4-302424	SPN4SS-302424	SPN4SS6-302424	SPN4AL-302424	30 x 24 x 24	109	SPP-3024	27 x 21
SPN4-723024	SPN4SS-723024	SPN4SS6-723024	SPN4AL-723024	72 x 30 x 24	243	SPP-7230	69 x 27

**NOTE:** Sub panels must be ordered separately. Reference page 122 for sub panel layout.  
Weights for Aluminum Enclosures are not listed. Please contact Schaefer's Electrical Enclosures, Inc. for weight.

SPN4 • SPN4SS • SPN4SS6



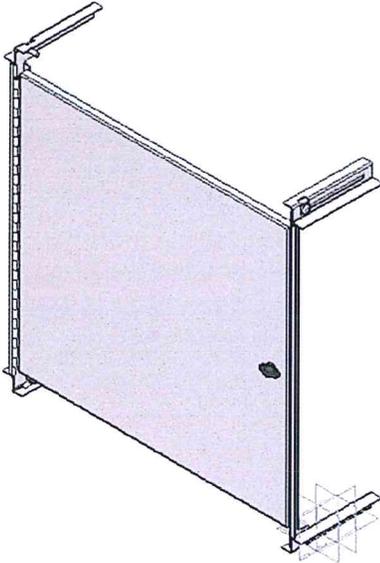
SECTION X-X



SECTION Y-Y

**NOTES:**

1. Print pocket = 6" x 6" when H and W are 24" or less.  
Print pocket = 9" x 9" when H and W are greater than 24".
2. Panels have formed flanges on all four sides when Height or Width is equal to or greater than 18".
3. On 12" wide enclosures, center of mounting foot to edge of enclosure is 1.25".
4. Maximum spacing between door clamps is 16.84" (center to center).



**SPSW3 – Fully Adjustable Swing Panel Kit**

**APPLICATIONS** - Allows for additional component mounting on a 90 degree swing panel.

**Kit includes:**

- Brackets (fabricated from 12 gauge carbon steel).
- Panel (fabricated from 12 gauge carbon steel).
- Quarterturn Wing Latch(es)
- Bolt on Continuous Hinge

**FINISH** - White polyester powder coat over cleaned phosphatized surfaces. Aluminum kits have a polished #4 finish.

**OPTIONS** - Schaefer's Electrical Enclosures, Inc. can modify standard enclosures to your specifications. Holes, cutouts, sizes, materials, and many more options are available. Quotations upon request.

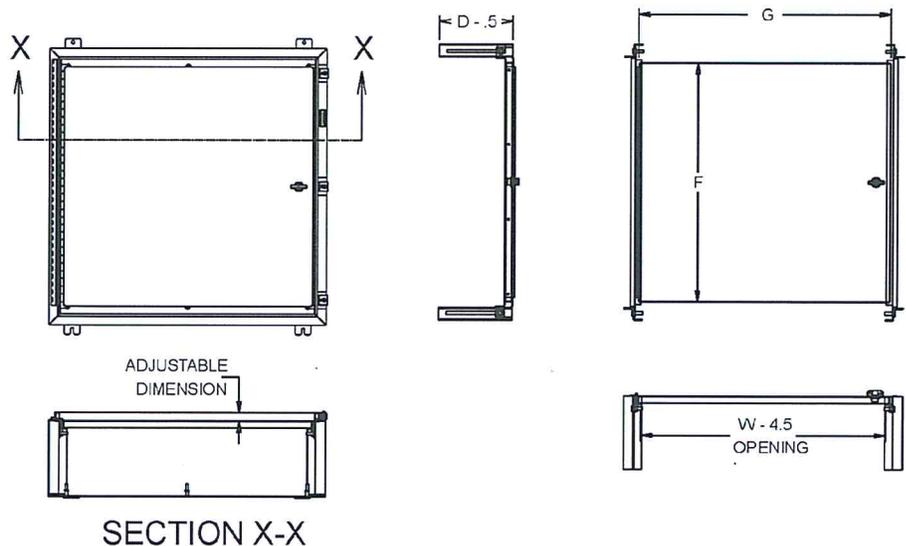
**NOTE** - Must order the appropriate **SPSW3B** (according to the depth of enclosure) for full adjustability. These brackets will be welded in each corner of enclosure and the Swing panel kit will be attached to them. If installing with a door stop kit, holes must be drilled in Swing panel flange.

SPSW3's are for installation in SPN4, SPN12, ES, and SPLRHC only. Installation by Schaefer's Electrical Enclosures, Inc. will require an extra installation fee. (see price list) Some assembly required.

Catalog Number		Fits Enclosure	Panel Size	Shpg. Wt.
Carbon Steel #	Aluminum #	Size H x W	F x G (inches)	
SPSW3-1224	SPSW3AL-1224	12 x 24	7.13 x 20.38	14
SPSW3-1612	SPSW3AL-1612	16 x 12	11.13 x 8.38	9
SPSW3-1616	SPSW3AL-1616	16 x 16	11.13 x 12.38	12
SPSW3-1620	SPSW3AL-1620	16 x 20	11.13 x 16.38	15
SPSW3-2012	SPSW3AL-2012	20 x 12	15.13 x 8.38	11
SPSW3-2016	SPSW3AL-2016	20 x 16	15.13 x 12.38	15
SPSW3-2020	SPSW3AL-2020	20 x 20	15.13 x 16.38	19
SPSW3-2024	SPSW3AL-2024	20 x 24	15.13 x 20.38	23
SPSW3-2412	SPSW3AL-2412	24 x 12	19.13 x 8.38	14
SPSW3-2416	SPSW3AL-2416	24 x 16	19.13 x 12.38	19
SPSW3-2420	SPSW3AL-2420	24 x 20	19.13 x 16.38	23
SPSW3-2424	SPSW3AL-2424	24 x 24	19.13 x 20.38	27
SPSW3-2430	SPSW3AL-2430	24 x 30	19.13 x 26.38	34
SPSW3-3016	SPSW3AL-3016	30 x 16	25.13 x 12.38	23
SPSW3-3020	SPSW3AL-3020	30 x 20	25.13 x 16.38	28
SPSW3-3024	SPSW3AL-3024	30 x 24	25.13 x 20.38	34
SPSW3-3030	SPSW3AL-3030	30 x 30	25.13 x 26.38	43
SPSW3-3036	SPSW3AL-3036	30 x 36	25.13 x 32.38	52
SPSW3-3624	SPSW3AL-3624	36 x 24	31.13 x 20.38	42
SPSW3-3630	SPSW3AL-3630	36 x 30	31.13 x 26.38	52
SPSW3-3636	SPSW3AL-3636	36 x 36	31.13 x 32.38	62
SPSW3-4224	SPSW3AL-4224	42 x 24	37.13 x 20.38	48
SPSW3-4230	SPSW3AL-4230	42 x 30	37.13 x 26.38	60
SPSW3-4236	SPSW3AL-4236	42 x 36	37.13 x 32.38	72
SPSW3-4824	SPSW3AL-4824	48 x 24	43.13 x 20.38	55
SPSW3-4830	SPSW3AL-4830	48 x 30	43.13 x 26.38	69
SPSW3-4836	SPSW3AL-4836	48 x 36	43.13 x 32.38	83
SPSW3-6036	SPSW3AL-6036	60 x 36	55.13 x 32.38	104
SPSW3-7230	SPSW3AL-7230	72 x 30	67.13 x 26.38	104

Catalog Number	Enclosure Depth	Bracket Length	Shpg. Wt.
<b>Brackets for the Swing Panel Kits</b>			
SPSWB3-8	8	7.5	5
SPSWB3-10	10	9.5	6
SPSWB3-12	12	11.5	7
SPSWB3-16	16	15.5	8
SPSWB3-18	18	17.5	9
SPSWB3-20	20	19.5	10
SPSWB3-24	24	23.5	12

**NOTE:** Weights for Aluminum Swing panels are not listed. Please contact Schaefer's Electrical Enclosures, Inc. for Weight. Brackets for the Swing Panel Kits must be ordered separate based on depth of Enclosure.



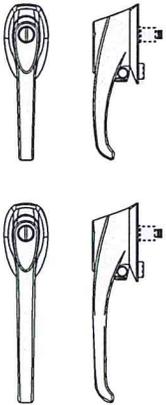
## Replacement Handle Kits

Kit includes the following: handle, cam, retainers, hardware, latch rods, latch rod guides. All kits are packaged for field installation.

Enclosure Family	Catalog Number	Description
SPWF	BPL305-90CCW-KIT	Keylocking Assembly
SPSDN12	261612-10-KIT	Padlocking 2-Point Assembly
SPN12D	BPL305-90CCW-KIT	Keylocking Assembly
SP-X	261621-41-KIT	Padlock with Defeater Assembly
SP-X	261623-KIT	Padlock Non-Defeater Assembly
SP-XM	261621-41-KIT	Padlock with Defeater Assembly
SP-XM	261623-KIT	Padlock Non-Defeater Assembly
SPFS	BPL305-90CCW-KIT	Keylocking Assembly
	R02-0100BLK/BLK-KIT	Console 3-Point Assembly

## Replacement Handles

The replacement handles shown on this page are standard features on Schaefer's Electrical Enclosures, Inc. and can be ordered separately.



### Euro-Design Padlocking Handle

- Made of black zinc die cast
- Available in compact and heavy duty style
- Available with or without defeater mechanism
- Used for UL Type 12
- Suitable for three point latching systems
- Custom inserts are available
- Compact is the replacement for SPABN12 enclosures
- Heavy-duty is the replacement for Type 12 Floor Mount, Type 12 Modular and Type 12 Freestanding enclosure families

Part Number	Description
261631-41	Compact With Defeater
261623	Heavy Duty
261621-41	Heavy Duty With Defeater

**NOTE:** Cams are ordered separately



### Heavy-Duty Keylocking Handle

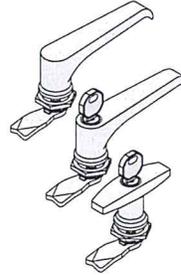
- Made of black zinc die cast with key included
- Standard replacement handle for Free Standing enclosures
- Used for three point latching systems
- Maintains UL Type 12 enclosure ratings

Part Number	Description
261612-10	Heavy-Duty Keylocking Handle

**NOTE:** Cams are ordered separately

## Custom Handles

These handles can be used in three point latching systems and will maintain the enclosures UL rating. Factory installation is recommended. These handles can be used on special enclosures as an option. Call for availability.

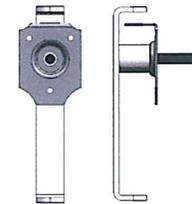


### Light Duty Quarter Turn Handles

- Available in black polyamide, black zinc die cast, or chrome
- Suitable for three point UL Type 12 latching systems
- Specify material when ordering

Part Number	Description
R020-0100-SS	Non-locking Stainless Steel
R020-0400CH	Keylocking Black Zinc Die
R020-0200-CH	Keylocking Chrome
R021-0200	T-Type Keylocking Chrome

**NOTE:** Cams are ordered separately



### Type 304 Stainless Steel Heavy-Duty Padlocking Handle

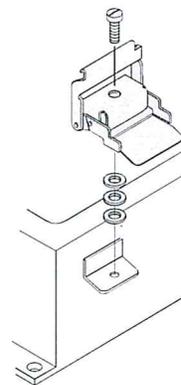
- Made of stainless steel
- Suitable for three point latching systems where enhanced corrosion resistance is required
- Suitable for UL Type 12 applications

Part Number	Description
LH-40510	Stainless Steel Padlock Handle

**NOTE:** Cams are ordered separately

## Custom Latches & Clamps

Custom latches and clamps can be used on standard or custom enclosures and will maintain the enclosure's UL rating. Spacing and quantity limitations apply to maintain an enclosure's UL rating. Call for application information. Specify type of latch, material and insert when ordering.



### Quick Release J-Series Enclosure Clamps

- Available in zinc plated mild steel and stainless steel
- Clamps have 1/4-20 thread
- Suitable for UL type 4, 4X, 12 and 13 enclosures

Part Number	Description
JH-40160	Plated Mild Steel
JH-40150	Stainless Steel



DWB600  
 $I_n$  325...600

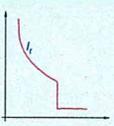
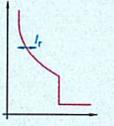
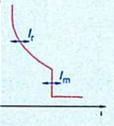
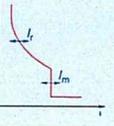
DWB400  
 $I_n$  200...400

DWB100  
 $I_n$  20...100

DWB250  
 $I_n$  80...250

## Main Characteristics

### Current Ratings and Trip Units

Reference code	Rated current $I_n$ (A)	Trip unit		Curve
DWB100	20, 25, 30, 40, 50, 60, 70, 80, 90, 100	Fixed thermal	Fixed magnetic <sup>1)</sup> ( $10 \times I_n$ )	
DWB250	80-100, 100-125, 120-150, 160-200, 200-250	Adjustable thermal ( $0.8...1 \times I_n$ )	Fixed magnetic ( $10 \times I_n$ )	
DWB400	160-200, 180-225, 200-250, 220-275, 240-300, 260-325, 280-350, 320-400	Adjustable thermal ( $0.8...1 \times I_n$ )	Adjustable magnetic ( $5...10 \times I_n$ )	
DWB600	228-325, 245-350, 280-400, 315-450, 350-500, 385-550, 420-600	Adjustable thermal ( $0.7...1 \times I_n$ )	Adjustable magnetic ( $5...10 \times I_n$ )	

Note: 1) Circuit breakers with rated currents of 20 and 25 A, the magnetic trip point is 300 A.

## Selection Guide

### DWB100 for Distribution - Standard 80% Rated - Fixed Thermal and Fixed Magnetic Trip Unit

Rated current (A)	Magnetic trip point (A)	Interrupting ratings (kA)		Reference code 3 poles
		240 V ac	480Y/277 V ac	
<b>DWB100CE</b>				
20	300	25	10	DWB100CE20-3DX
25	300	25	10	DWB100CE25-3DX
30	300	25	10	DWB100CE30-3DX
40	400	25	10	DWB100CE40-3DX
50	500	25	10	DWB100CE50-3DX
60	600	25	10	DWB100CE60-3DX
70	700	25	10	DWB100CE70-3DX
80	800	25	10	DWB100CE80-3DX
90	900	25	10	DWB100CE90-3DX
100	1000	25	10	<b>DWB100CE100-3DX</b>
<b>DWB100JE</b>				
20	300	50	14	DWB100JE20-3DX
25	300	50	14	DWB100JE25-3DX
30	300	50	14	DWB100JE30-3DX
40	400	50	14	DWB100JE40-3DX
50	500	50	14	DWB100JE50-3DX
60	600	50	14	DWB100JE60-3DX
70	700	50	14	DWB100JE70-3DX
80	800	50	14	DWB100JE80-3DX
90	900	50	14	DWB100JE90-3DX
100	1000	50	14	DWB100JE100-3DX

### DWB250 for Distribution - Standard 80% Rated - Adjustable Thermal and Fixed Magnetic Trip Unit

Current range (A)	Magnetic trip point (A)	Interrupting ratings (kA)		Reference code 3 poles
		240 V ac	480Y/277 V ac	
<b>DWB250JE</b>				
80-100	1000	50	14	DWB250JE100-3DF
100-125	1250	50	14	DWB250JE125-3DF
120-150	1500	50	14	DWB250JE150-3DF
160-200	2000	50	14	DWB250JE200-3DF
200-250	2500	50	14	DWB250JE250-3DF
<b>DWB250PE</b>				
80-100	1000	80	35	DWB250PE100-3DF
100-125	1250	80	35	DWB250PE125-3DF
120-150	1500	80	35	DWB250PE150-3DF
160-200	2000	80	35	DWB250PE200-3DF
200-250	2500	80	35	DWB250PE250-3DF

### DWB400 for Distribution - Standard 80% Rated - Adjustable Thermal and Magnetic Trip Unit

Current range (A)	Magnetic trip point (A)	Interrupting ratings (kA)		Reference code 3 poles
		240 V ac	480 V ac	
<b>DWB400JE</b>				
160-200	1600-2000	50	18	DWB400JE200-3DA
180-225	1800-2250	50	18	DWB400JE225-3DA
200-250	2000-2500	50	18	DWB400JE250-3DA
220-275	2200-2750	50	18	DWB400JE275-3DA
240-300	2400-3000	50	18	DWB400JE300-3DA
260-325	2600-3250	50	18	DWB400JE325-3DA
280-350	2800-3500	50	18	DWB400JE350-3DA
320-400	3200-4000	50	18	DWB400JE400-3DA
<b>DWB400PE</b>				
160-200	1600-2000	80	35	DWB400PE200-3DA
180-225	1800-2250	80	35	DWB400PE225-3DA
200-250	2000-2500	80	35	DWB400PE250-3DA
220-275	2200-2750	80	35	DWB400PE275-3DA
240-300	2400-3000	80	35	DWB400PE300-3DA
260-325	2600-3250	80	35	DWB400PE325-3DA
280-350	2800-3500	80	35	DWB400PE350-3DA
320-400	3200-4000	80	35	DWB400PE400-3DA

### DWB600 for Distribution - Standard 80% Rated - Adjustable Thermal and Magnetic Trip Unit

Current range (A)	Magnetic trip point (A)	Interrupting ratings (kA)		Reference code 3 poles
		240 V ac	480 V ac	
<b>DWB600PE</b>				
227.5-325	1625-3250	80	35	DWB600PE325-3DA
245-350	1750-3500	80	35	DWB600PE350-3DA
280-400	2000-4000	80	35	DWB600PE400-3DA
315-450	2250-4500	80	35	DWB600PE450-3DA
350-500	2500-5000	80	35	DWB600PE500-3DA
385-550	2750-5500	80	35	DWB600PE550-3DA
420-600	3000-6000	80	35	DWB600PE600-3DA

Notes: Wiring terminals (lugs) built-in for DWB100 and supplied as standard with DWB250, DWB400 and DWB600. Lugs are also available as an accessory for DWB250, DWB400 and DWB600, see the section Accessories.

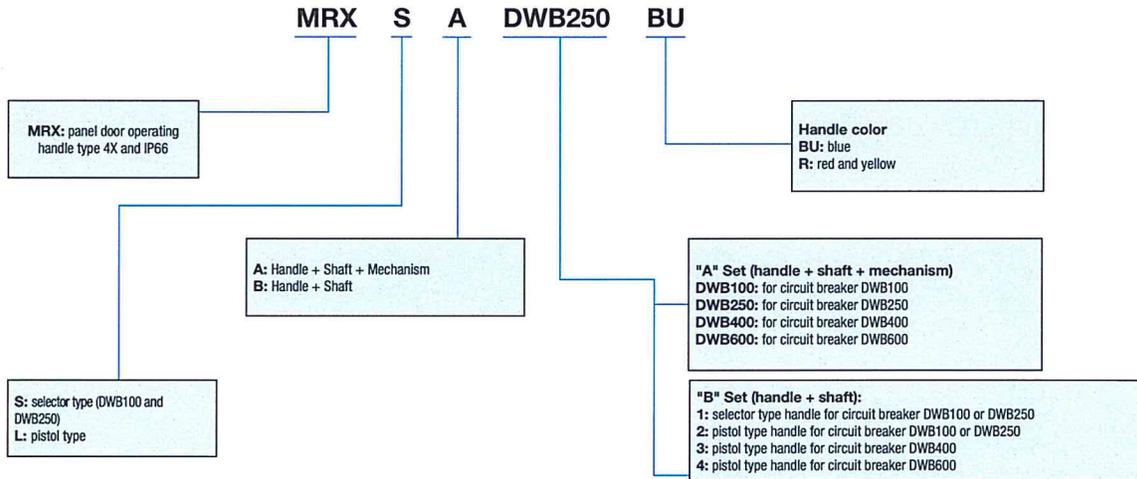
## External Accessories

### Panel Door Operating Handles

#### Handle (NEMA 4X/IP66)

- When in ON position, panel door cannot be opened, unless a tool is used to bypass the panel door locking system, allowing thermometry of the panel.
- Circuit breaker and panel door padlocking in OFF position using 1 to 3 padlocks.

#### Coding



### Panel Door Operating Handles (NEMA 4X/IP66)

#### "A" Set: Handle + Shaft + Mechanism

Description	Circuit breaker	Shaft in (mm)	Length of handle in (mm)	Handle color
MRXS-A-DWB160-R	DWB100	18.11 (460)	2.42 (61.6)	Red and yellow
MRXS-A-DWB250-R	DWB250	18.11 (460)	2.42 (61.6)	Red and yellow
MRXL-A-DWB160-R	DWB100	18.11 (460)	4.13 (105)	Red and yellow
MRXL-A-DWB250-R	DWB250	18.11 (460)	4.13 (105)	Red and yellow
MRXL-A-DWB400-R	DWB400	18.11 (460)	4.13 (105)	Red and yellow
MRXL-A-DWB1000-R	DWB600	18.11 (460)	6.22 (158)	Red and yellow
MRXS-A-DWB160-BU	DWB100	18.11 (460)	2.42 (61.6)	Blue
MRXS-A-DWB250-BU	DWB250	18.11 (460)	2.42 (61.6)	Blue
MRXL-A-DWB160-BU	DWB100	18.11 (460)	4.13 (105)	Blue
MRXL-A-DWB250-BU	DWB250	18.11 (460)	4.13 (105)	Blue
MRXL-A-DWB400-BU	DWB400	18.11 (460)	4.13 (105)	Blue
MRXL-A-DWB1000-BU	DWB600	18.11 (460)	6.22 (158)	Blue

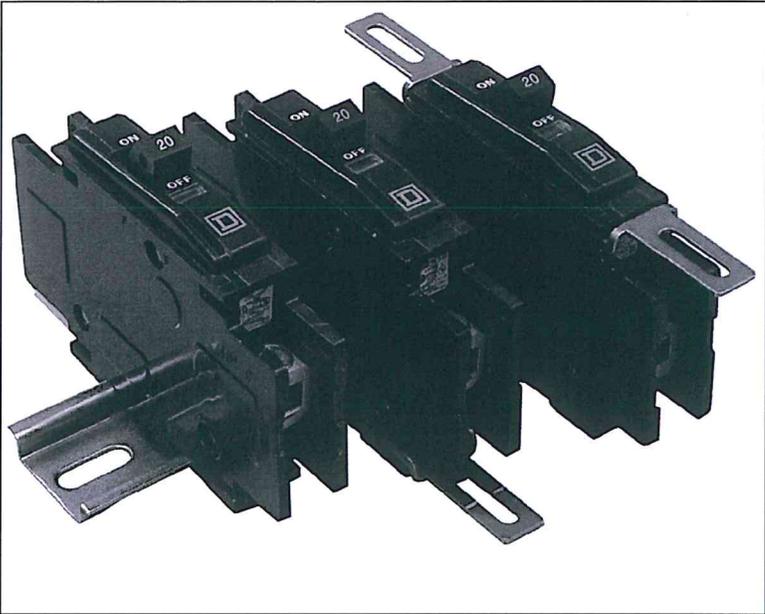


Notes: 1) Padlocks 0.16 up to 0.31 in may be fit to the handles.  
2) Sold separately only. It is not sold assembled on the circuit breaker.

# QOU Miniature Circuit Breakers and Switches Unit Mount (Cable-in/Cable-out)

Class 720

Catalog  
September  
**2005**



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# QOU Miniature Circuit Breakers and Switches

## Application Information

### APPLICATION INFORMATION

#### QOU Miniature Circuit Breaker Types

Miniature molded case circuit breakers are intended for use in residential and commercial applications. They are tested and listed according to UL Standard 489 and CSA Standard C22.2 No. 5-02 for molded case circuit breakers and enclosures.

QOU miniature circuit breakers are unit-mount (lug/lug) thermal-magnetic circuit breakers which:

- Provide a means to manually open a circuit.
- Automatically open a circuit under overload or short circuit conditions.
- Feature common tripping of all poles.
- Have a Visi-Trip<sup>®</sup> trip indicator.
- Can be flush-, surface-, or DIN rail-mounted.
- Has lugs at both ends (cable-in/cable-out construction)
- Operate in any position.
- Are fully tested, UL Listed, and CSA certified for reverse connection without restrictive line/load markings.

#### Non-automatic Switches

QOU non-automatic switches are intended for use as disconnect devices only. UL Standard 489 requires switches to be protected by a thermal-magnetic circuit breaker (or fuse) of equivalent rating. QOU switches are UL Listed for use on circuits capable of delivering not more than 10,000 amperes when protected by an equivalent rated circuit breaker or fuse. QOU switches contain no automatic tripping mechanisms and do not provide overcurrent protection.

#### Description

QOU miniature circuit breakers and switches are available for surface-, flush-, or DIN rail mounted applications in one-, two-, and three-pole constructions. QOU miniature circuit breakers are used for overcurrent protection and switching on both ac and dc electrical systems. QOU circuit breakers and switches measure 0.75 in. (19 mm) wide per pole. Two- and three-pole circuit breakers are both equipped with an internal crossbar for common tripping of all poles. QOU switches are available in one-pole, 60 ampere and two- and three-pole, 60, 100 and 125 ampere construction.

Cases for QOU miniature circuit breakers and switches are constructed of a glass-reinforced insulating material that provides high dielectric strength. Current carrying components are isolated from the handle. The handle position indicates whether the circuit breaker is off, on or tripped.

#### Applications

One-pole QOU miniature circuit breakers rated 120/240 Vac are UL Listed for use on 120/240 Vac single-phase, three-wire or 208Y/120 Vac three-phase, four-wire electrical systems.

Two-pole QOU circuit breakers rated 120/240 Vac are UL Listed for use on 120/240 Vac single-phase, three-wire or 208Y/120 Vac three-phase, four-wire electrical systems. They cannot be used on 240 Vac delta systems. Use QOU-H two-pole circuit breakers rated 240 Vac on 240 Vac delta and 240 Vac single-phase, two wire systems.

Three-pole QOU circuit breakers rated 240 Vac are UL Listed for use on any system where the maximum phase-to-phase or phase-to-ground voltage is 240 Vac or less.

For application information on other systems, contact your local field office

## QOU Miniature Circuit Breakers and Switches Application Information

**Table 1: Selection Data**

Rating	Catalog Number						Terminal Lug Wire Size (AWG)	
	One-Pole		Two-Pole			Three-Pole		
	120/240 Vac		120/240 Vac	240 Vac	120/240 Vac	240 Vac		
	10K AIR	22K AIR	10 K AIR		22K AIR	10K AIR		
10 A	QOU110	—	QOU210	—	—	QOU310	1—#14—#2 Cu or Al	
15 A	QOU115 <sup>†</sup>	QOU115VH	QOU215 <sup>*</sup>	QOU215H <sup>*</sup>	QOU215VH	QOU315 <sup>*</sup>		
15 A	QOU115HM <sup>††</sup>	—	—	—	—	—		
20 A	QOU120 <sup>*</sup>	QOU120VH	QOU220 <sup>*</sup>	QOU220H <sup>*</sup>	QOU220VH	QOU320 <sup>*</sup>		
20 A	QOU120HM <sup>††</sup>	—	—	—	—	—		
25 A	QOU125 <sup>*</sup>	QOU125VH	QOU225 <sup>*</sup>	QOU225H <sup>*</sup>	QOU225VH	QOU325 <sup>*</sup>		
30 A	QOU130 <sup>*</sup>	QOU130VH	QOU230 <sup>*</sup>	QOU230H <sup>*</sup>	QOU230VH	QOU330 <sup>*</sup>		
35 A	QOU135 <sup>*</sup>	QOU135VH	QOU235 <sup>*</sup>	—	QOU235VH	QOU335 <sup>*</sup>		
40 A	QOU140 <sup>*</sup>	QOU140VH	QOU240 <sup>*</sup>	—	QOU240VH	QOU340 <sup>*</sup>		
45 A	QOU145 <sup>*</sup>	QOU145VH	QOU245 <sup>*</sup>	—	QOU245VH	QOU345 <sup>*</sup>		
50 A	QOU150 <sup>*</sup>	QOU150VH	QOU250 <sup>*</sup>	—	QOU250VH	QOU350 <sup>*</sup>		
60 A	QOU160 <sup>*</sup>	QOU160VH	QOU260 <sup>*</sup>	—	QOU260VH	QOU360 <sup>*</sup>		
70 A	QOU170 <sup>*</sup>	—	QOU270 <sup>*</sup>	—	—	QOU370 <sup>‡</sup>		1—#12—#2/0 Cu or Al
80 A	QOU180 <sup>‡</sup>	—	QOU280 <sup>‡</sup>	—	—	QOU380 <sup>‡</sup>		
90 A	QOU190 <sup>‡</sup>	—	QOU290 <sup>‡</sup>	—	—	QOU390 <sup>‡</sup>		
100 A	QOU1100 <sup>‡</sup>	—	QOU2100 <sup>‡</sup>	—	—	QOU3100 <sup>‡</sup>		
125 A	—	—	QOU2125 <sup>‡</sup>	—	—	—		
Switch—60 Amperes Max.—240 Vac				QOU200	—	QOU300	1—#14—#2	
Switch—100 Amperes Max.—240 Vac				QOU2000 <sup>‡</sup>	—	QOU3000 <sup>‡</sup>	1—#12—#2/0	
Switch—125 Amperes Max.—240 Vac				QOU20001 <sup>‡</sup>	—	QOU30001 <sup>‡</sup>	1—#12—#2/0	

\* UL Listed as HACR type for use with heating, air conditioning and refrigeration equipment containing motor-group combinations and marked for use with HACR type circuit breakers.

† High-magnetic trip circuit breakers. Recommended for applications where high initial inrush current can occur and for individual dimmer applications.

‡ Available as Series 1 with forward box lugs only. (No optional terminations)

### Tripping Mechanisms

A tripping mechanism is an assembly within the circuit breaker molded case that causes the circuit breaker to open automatically under sustained overload or short circuit conditions.

The tripping mechanisms in two- and three-pole circuit breakers operate such that an overcurrent on any pole of the circuit breaker will cause all poles of the circuit breaker to open simultaneously. Thermal and magnetic factory calibration (with current) is performed on each pole of every Square D circuit breaker.

These mechanisms operate to trip the circuit breaker:

- Thermal trip
- Magnetic trip
- Optional shunt trip accessory (see Accessories, page 12)

The sensing system is an integral part of a thermal-magnetic circuit breaker. The sensing system continually monitors current flowing through the circuit breaker. It detects abnormal current conditions and, depending on the magnitude of the current, initiates an inverse-time or an instantaneous tripping response. This action causes the tripping mechanism to open the circuit breaker contacts and interrupt current flow. The speed of the tripping process must be controllable and inversely matched to the severity of the overcurrent. QOU miniature circuit breakers have an over-center toggle mechanism for quick-make, quick-break action with positive handle indication. The handle assumes a position between ON (I) and OFF (O) when the circuit breaker has tripped.

# Power Distribution Blocks

## 600 Volts

### Specifications:

- Connector, High Conductive Aluminum, Tin Plated
- Rated for Copper and Aluminum Wire
- Amp Rating Based on NEC Table 310-16 Using 75°C Copper Wire
- UL Recognized File No. XCFR2.E62806
- CSA Certified File No. LR19766
- CE
- For detailed SCCR information, please visit [www.marathonsp.com](http://www.marathonsp.com)



\*\* Openings rated for #4-14 AWG are multiple wire rated: (2) #10 CU Str, (2 to 4) #12 CU Str, and (2 to 4) #14 CU Str.

\*\*\* Openings rated for #2-14 AWG are multiple wire rated: (2) #8 CU Str, (2) #10 CU Str, (2) #12 CU Str, and (2) #14 CU Str

Catalog #	Hinge Cover	Poles	Amps	Material	Connector Configuration	Line Wire Range	Openings Per Pole	Connector Configuration	Load Wire Range	Openings Per Pole
1411403		1	60	Thermoplastic		#2-#14 AWG	1		#10-#18 AWG	2
1412403		2								
1413403		3								
1414403		4								
1411400		1	115	Thermoplastic		#2-#14 AWG	1		#10-#16 AWG	4
1412400		2								
1413400		3								
1414400		4								
1320570		Adder	175	Thermoplastic		2/0-#14 AWG	1		**	4
1321570	CH	1								
1322570	CH	2								
1323570	CH	3								
1421570		1	175	Phenolic		2/0-#14 AWG	1		**	4
1422570		2								
1423570		3								
1320580		Adder	175	Thermoplastic		2/0-#14 AWG	1		**	6
1321580	CH	1								
1322580	CH	2								
1323580	CH	3								
1402402		2	175	Phenolic		2/0-#14 AWG	1		**	4
1403402		3								
1402401		2	175	Phenolic		2/0-#14 AWG	1		**	6
1403401		3								
1402404		2	310	Phenolic		350 kcmil - #6 AWG	1		#4-#14 AWG	6
1403404		3								
1331554	CH	1	310	Thermoplastic		350 kcmil - #6 AWG	1		#2/0-#14 AWG	2
1332554	CH	2								
1333554	CH	3								
1441401		1	335	Phenolic		400 kcmil - #6 AWG	1		#2-#14 AWG	6
1442401		2								
1443401		3								
1431552		1	335	Phenolic		400 kcmil - #6 AWG	1		#2-#14 AWG	4
1432552		2								
1433552		3								
1431553		1	335	Phenolic		400 kcmil - #6 AWG	1		#2-#14 AWG	6
1432553		2								
1433553		3								
1441560		1	335	Phenolic		400 kcmil - #6 AWG	1		#2-#14 AWG	8
1442560		2								
1443560		3								
1331552	CH	1	335	Thermoplastic		400 kcmil - #6 AWG	1		***	4
1332552	CH	2								
1333552	CH	3								

CH = Available with hinge cover attached  
See pages 54-56 for dimensional information

# Sunlight Visible LED Alarm Light



Part No. SunBurst II: **SBN120AC**, SBN1224AD



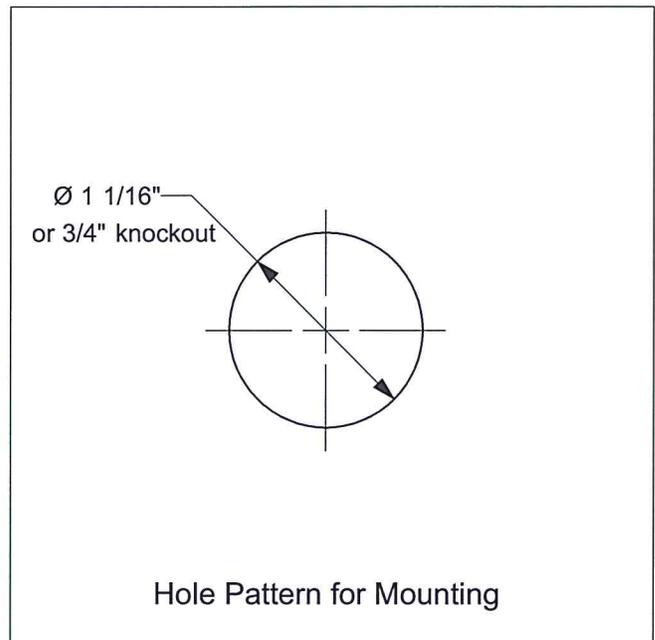
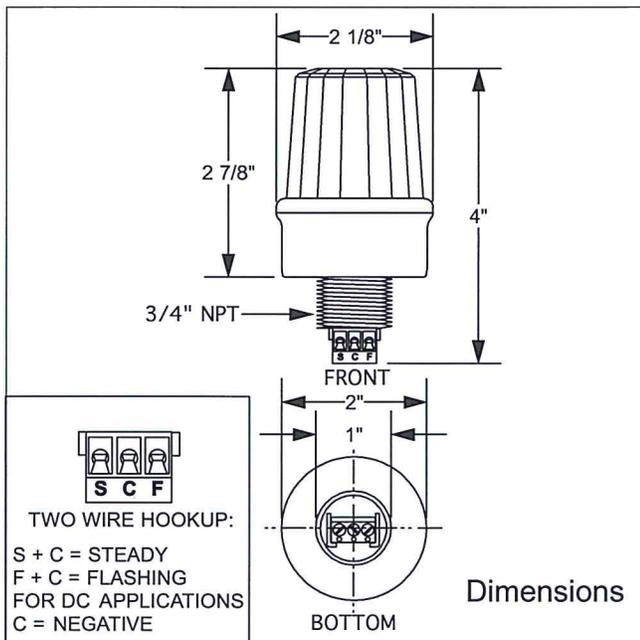
The Ingram SunBurst II is a super bright, daylight visible LED light that can not be ignored. It is designed for use as an alarm beacon. It requires only a 3/4" knockout (1-1/16" diameter hole) to mount. It can be installed on panels up to 1/4" thick. Meets UL Type 3, 3R, 4, 4X, 12, and, 13 requirements.

## 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.



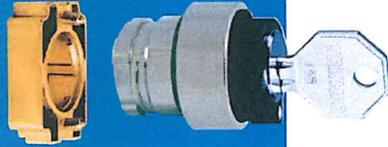
# 22mm Non-Illuminated Metal Selector Switch Operators



Certified for  
**NEMA Type 4X**  
12 environment.

## Key Selector

with mounting bracket



Other key combinations and colors are available on request.  
All keys are "keyed alike". Different keys are available on request.

Color	Description	Key Removal	Cat No.
Black	Maintained	Left/Right	2AK2-01
Black	Maintained	Left	2AK2-02
Black	Maintained	Right	2AK2-03
Black	Spring Return	Left	2AK2-04
Black	Maintained	Left/Right	2AK2-05
Black	Maintained	All	2AK2-06
Black	Maintained	Center	2AK2-07
Black	Spring Return	Center	2AK2-08
Black	Spring Return	Center	2AK2-09
Black	Spring Return	Center	2AK2-10
Black	Maintained	Left	2AK2-11



Replacement Key

2KY455

## Selector

with mounting bracket



Other colors are available on request.

Color	Description	Cat No.
Black	Maintained	2AS2-1
Black	Spring Return	2AS2-2
Black	Maintained	2AS2-3
Black	Spring Return	2AS2-4
Black	Spring Return	2AS2-5
Black	Spring Return	2AS2-6

## Extended Selector

with mounting bracket



Other colors are available on request.

Color	Description	Cat No.
Black	Maintained	2AS2E-1
Black	Spring Return	2AS2E-2
Black	Maintained	2AS2E-3
Black	Spring Return	2AS2E-4
Black	Spring Return	2AS2E-5
Black	Spring Return	2AS2E-6

## Switch Contacts

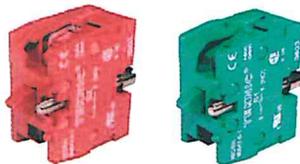
(sold separately)



### Markings on Request



Altech Push Buttons are available in a variety of markings, including molded arrows. Please contact Altech for further information and part numbers.



- Heavy-duty contact blocks with mounting screws. Blocks can be stacked 2 blocks across by 3 blocks deep for a total of 6 circuits.
- Contact blocks are available with silver contacts or gold plated contacts
- Self-wiping contacts

### Panel Mount

Normally Open Silver	<b>S1</b>
Normally Closed Silver	<b>S2</b>
Normally Open Gold Plated	<b>S3</b>
Normally Closed Gold Plated	<b>S4</b>

### Base Mount\*

Normally Open Silver	<b>S5</b>
Normally Closed Silver	<b>S6</b>
Normally Open Gold Plated	<b>S7</b>
Normally Closed Gold Plated	<b>S8</b>

\* For use with non-illuminated operators in thermoplastic or aluminum enclosures listed on pages 30 and 36-37.

# AF09 ... AF38 3-pole contactors

## 5 to 20 hp at 480 V AC

### AC / DC operated



AF09-30-10



AF26-30-00

#### Description

AF09 ... AF38 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC. These contactors are of the block type design with 3 main poles.

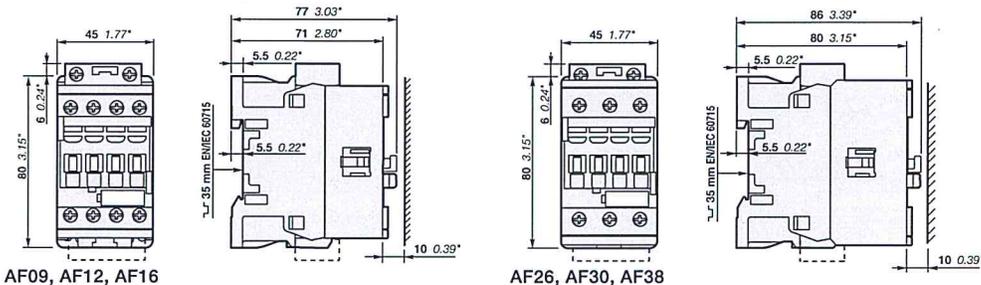
- control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC), only 4 control voltage ranges covering 24...500V 50/60 Hz and 20...500 V DC
- can manage large control voltage variations
- reduced panel energy consumption
- very distinct closing and opening.
- built-in surge suppression
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

#### Ordering details

IEC		UL/CSA		Rated control circuit voltage		Auxiliary contacts fitted	Catalog number	Global reference code	Weight									
Rated operational power	operational current $\theta \leq 40^\circ\text{C}$	3-phase motor rating	General use rating	Uc min. ... Uc max.														
400 V AC-3	AC-1	480 V	600 V AC	V 50/60 Hz	V DC				Pkg (1 pce)									
kW	A	hp	A					kg										
4	25	5	25	24...60	-	(1)	1 0	AF09-30-10-41	1SBL137001R4110	0.270								
							0 1	AF09-30-01-41	1SBL137001R4101	0.270								
							1 0	AF09-30-10-12	1SBL137001R1210	0.270								
							0 1	AF09-30-01-12	1SBL137001R1201	0.270								
							1 0	AF09-30-10-13	1SBL137001R1310	0.270								
							0 1	AF09-30-01-13	1SBL137001R1301	0.270								
				250...500	250...500	1 0	0 1	AF09-30-10-14	1SBL137001R1410	0.310								
								AF09-30-01-14	1SBL137001R1401	0.310								
								5.5	28	7.5	28	24...60	-	(1)	1 0	AF12-30-10-41	1SBL157001R4110	0.270
															0 1	AF12-30-01-41	1SBL157001R4101	0.270
															1 0	AF12-30-10-12	1SBL157001R1210	0.270
															0 1	AF12-30-01-12	1SBL157001R1201	0.270
1 0	AF12-30-10-13	1SBL157001R1310	0.270															
0 1	AF12-30-01-13	1SBL157001R1301	0.270															
250...500	250...500	1 0	0 1	AF12-30-10-14	1SBL157001R1410	0.310												
				AF12-30-01-14	1SBL157001R1401	0.310												
				7.5	30	10	30					24...60	-	(1)	1 0	AF16-30-10-41	1SBL177001R4110	0.270
															0 1	AF16-30-01-41	1SBL177001R4101	0.270
															1 0	AF16-30-10-12	1SBL177001R1210	0.270
															0 1	AF16-30-01-12	1SBL177001R1201	0.270
1 0	AF16-30-10-13	1SBL177001R1310	0.270															
0 1	AF16-30-01-13	1SBL177001R1301	0.270															
250...500	250...500	1 0	0 1					AF16-30-10-14	1SBL177001R1410	0.310								
								AF16-30-01-14	1SBL177001R1401	0.310								
								11	45	15	45	24...60	-	(1)	0 0	AF26-30-00-41	1SBL237001R4100	0.310
															0 0	AF26-30-00-12	1SBL237001R1200	0.310
															0 0	AF26-30-00-13	1SBL237001R1300	0.310
															0 0	AF26-30-00-14	1SBL237001R1400	0.350
250...500	250...500	0 0	0 0	AF30-30-00-41	1SBL277001R4100	0.310												
				AF30-30-00-12	1SBL277001R1200	0.310												
				AF30-30-00-13	1SBL277001R1300	0.310												
				AF30-30-00-14	1SBL277001R1400	0.350												
				15	50	20	50					24...60	-	(1)	0 0	AF30-30-00-41	1SBL277001R4100	0.310
															0 0	AF30-30-00-12	1SBL277001R1200	0.310
0 0	AF30-30-00-13	1SBL277001R1300	0.310															
0 0	AF30-30-00-14	1SBL277001R1400	0.350															
250...500	250...500	0 0	0 0					AF38-30-00-41	1SBL297001R4100	0.310								
								AF38-30-00-12	1SBL297001R1200	0.310								
								AF38-30-00-13	1SBL297001R1300	0.310								
								AF38-30-00-14	1SBL297001R1400	0.350								
								18.5	50	20	50	24...60	-	(1)	0 0	AF38-30-00-41	1SBL297001R4100	0.310
															0 0	AF38-30-00-12	1SBL297001R1200	0.310
0 0	AF38-30-00-13	1SBL297001R1300	0.310															
0 0	AF38-30-00-14	1SBL297001R1400	0.350															

(1) For 24...60 V 50/60 Hz - 20...60 V DC, use AF.-30...-11 (see voltage code table). AF.-30...-11 not suitable for direct control by PLC-output.

#### Main dimensions mm, inches



# TF42 thermal overload relays

0.10 ... 38.0 A

For direct coupling to AF09 ... AF38 3-pole contactors

## Description

The TF42 thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

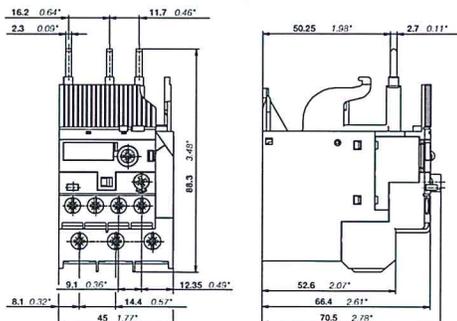
## Ordering details

Setting range	For contactors	Trip class	Catalog number	Global reference code	Weight (1 pce) kg
<b>A</b>					
0.10 ... 0.13	AF09... AF38	10	TF42-0.13	1SAZ721201R1005	0.130
0.13 ... 0.17	AF09... AF38	10	TF42-0.17	1SAZ721201R1008	0.130
0.17 ... 0.23	AF09... AF38	10	TF42-0.23	1SAZ721201R1009	0.130
0.23 ... 0.31	AF09... AF38	10	TF42-0.31	1SAZ721201R1013	0.130
0.31 ... 0.41	AF09... AF38	10	TF42-0.41	1SAZ721201R1014	0.130
0.41 ... 0.55	AF09... AF38	10	TF42-0.55	1SAZ721201R1017	0.130
0.55 ... 0.74	AF09... AF38	10	TF42-0.74	1SAZ721201R1021	0.130
0.74 ... 1.00	AF09... AF38	10	TF42-1.0	1SAZ721201R1023	0.130
1.00 ... 1.30	AF09... AF38	10	TF42-1.3	1SAZ721201R1025	0.130
1.30 ... 1.70	AF09... AF38	10	TF42-1.7	1SAZ721201R1028	0.130
1.70 ... 2.30	AF09... AF38	10	TF42-2.3	1SAZ721201R1031	0.130
2.30 ... 3.10	AF09... AF38	10	TF42-3.1	1SAZ721201R1033	0.130
3.10 ... 4.20	AF09... AF38	10	TF42-4.2	1SAZ721201R1035	0.130
4.20 ... 5.70	AF09... AF38	10	TF42-5.7	1SAZ721201R1038	0.130
5.70 ... 7.60	AF09... AF38	10	TF42-7.6	1SAZ721201R1040	0.130
7.60 ... 10.0	AF09... AF38	10	TF42-10	1SAZ721201R1043	0.130
10.0 ... 13.0	AF09... AF38	10	TF42-13	1SAZ721201R1045	0.130
13.0 ... 16.0	AF09... AF38	10	TF42-16	1SAZ721201R1047	0.130
16.0 ... 20.0	AF09... AF38	10	TF42-20	1SAZ721201R1049	0.145
20.0 ... 24.0	AF09... AF38	10	TF42-24	1SAZ721201R1051	0.145
24.0 ... 29.0	AF09... AF38	10	TF42-29	1SAZ721201R1052	0.145
29.0 ... 35.0	AF09... AF38	10	TF42-35	1SAZ721201R1053	0.145
35.0 ... 38.0/40.0	AF09... AF38	10	TF42-38	1SAZ721201R1055	0.145

## Ordering details accessories

For thermal overload relays	Description	Catalog number	Global reference code	Weight (1 pce) kg
<b>A</b>				
TF42	Single mounting kit	DB42	1SAZ701902R0001	0.087
TF42	Reset push button (1)	KPR-101L	1SFA616162R1014	0.027

## Main dimensions mm, inches



TF42

TF42



DB42



KPR-101L

(1) Note: for more information see catalog 1SXU000023C0202 Rev. A.

# GFCIs

## TradeMaster® & Specification Grade GFCI Receptacles with SafeLock™ Protection

2 Pole, 3 Wire Grounding 15 & 20A, 125VAC

**Pass & Seymour**  
**legrand®**

GFCIs

TradeMaster® & Spec Grade GFCI Receptacles

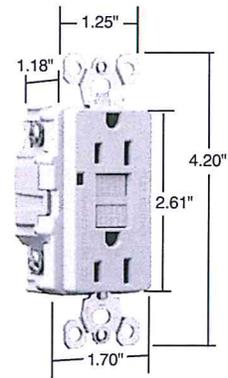
### Features

- Meets 2003 UL requirements.
- SafeLock™ Protection: if critical components are damaged and ground fault protection is lost, power to receptacle is disconnected.
- Prevents line-load reversal miswire: If miswired, GFCI cannot be RESET.
- Trip Indicator Light (red lamp).
- Improved resistance to surge, corrosion and electrical power line noise.
- Side or internal screw-pressure-plate back wire with #14 – #10 AWG solid or stranded copper wire.
- Ground screw with a wire guide channel and back wire clamp.
- Line and load terminations supplied backed out and ready-to-wire.
- High-impact resistant thermoplastic construction.
- Extra-long strap.
- Two back wire holes per terminal.
- Welding of face to back body provides sealed tamperproof construction.
- Button colors match the device face.
- Dual-direction test and reset buttons.
- Class A rated GFCI.
- Supplied with matching TP26 nylon wall plate.
- Tri-drive screws.
- GFCIs with Auto-Ground assure a positive ground to metal box.

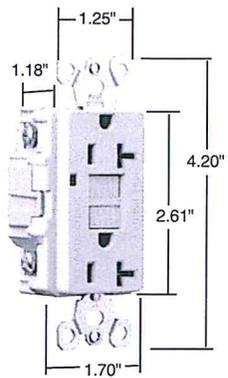


### Specifications

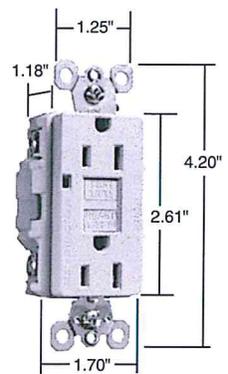
- Supply Voltage: 125VAC, 60 Hz
- Supply Voltage Range: 102-132 VAC
- Trip Threshold: 5± 1mA
- Trip Time: 0.025 sec., nominal per UL Standard
- 20 Amp feed-thru capacity



1594-I



2094-I



1594-SLA

Catalog Number	Rating		Color	NEMA Config. No.	3rd Party Compliance		
	A.	VAC			UL943 C22.2 No. 144	UL498 C22.2 No. 42	FSUL WC596
<b>TradeMaster/Spec Grade 15 Amp Duplex GFCI</b>							
1594-I	15	125	Ivory	5-15R	•	•	•
1594-W	15	125	White	5-15R	•	•	•
1594	15	125	Brown	5-15R	•	•	•
1594-GRY	15	125	Gray	5-15R	•	•	•
1594-BK	15	125	Black	5-15R	•	•	•
1594-RED	15	125	Red	5-15R	•	•	•
1594-LA	15	125	Light Almond	5-15R	•	•	•
<b>TradeMaster/Spec Grade 15 Amp Duplex GFCI with Auto-Ground</b>							
1594-SI	15	125	Ivory	5-15R	•	•	•
1594-SW	15	125	White	5-15R	•	•	•
1594-SLA	15	125	Light Almond	5-15R	•	•	•
<b>Specification Grade 20 Amp Duplex GFCI</b>							
2094-I	20	125	Ivory	5-20R	•	•	•
2094-W	20	125	White	5-20R	•	•	•
2094	20	125	Brown	5-20R	•	•	•
2094-GRY	20	125	Gray	5-20R	•	•	•
2094-BK	20	125	Black	5-20R	•	•	•
2094-RED	20	125	Red	5-20R	•	•	•
2094-LA	20	125	Light Almond	5-20R	•	•	•
<b>Specification Grade 20 Amp Duplex GFCI with Auto-Ground</b>							
2094-SI	20	125	Ivory	5-20R	•	•	•
2094-SW	20	125	White	5-20R	•	•	•
2094-SLA	20	125	Light Almond	5-20R	•	•	•

NEW

NEW

NEW

NEW

NEW

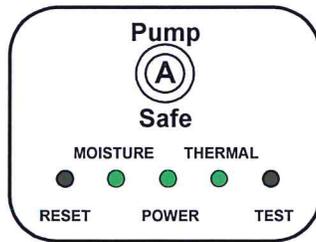
NEW

Available in Bulk Packaging, please contact Customer Support at 1-800-223-4189.

For Configurable Solutions, see Page T-1.



All devices listed on this page conform to NEMA WD-1.



Monitoring Module  
O/A Size 3.75"H x 2.62"W x 2.25"D

### Module Types (by sensor types and pump leads)

- A** – Bi-Metal (21 & 22) *or* Thermistor (10 & 11) & Moisture Probe (9 & Pump Ground)
- B** – Bi-Metal (21 & 22) *or* Thermistor (10 & 11) & Float Switch (3 & 4)
- D** – Bearing RTD (15 & 16) & Float Switch (3 & 4)

**Overview:** KSB submersible pump motors have varying combinations of over-temperature and moisture intrusion protection. The alternatives employed by the KSB factory are motor specific. The alternatives include bi-metal or thermistors for winding thermal protection, an RTD for bearing temperature monitoring and either conductivity probe, a float switch or on some motors both sensor types. The appropriate module(s) should be specified accordingly.

**PumpSafe™ Module ‘A’:** Monitors both thermal winding sensor (bi-metal or thermistor) and the conductivity probe to detect moisture intrusion. This sensor combination is typical for low horsepower motors. Each type module monitors one thermal and one moisture function input (see above listing). Each module type likewise has one set of form C output contacts per alarm function to provide remote pump monitoring or to directly control the pump’s operation.

**Installation:** The PumpSafe™ Module can be installed locally or in a MCC on the supplied 12 pin socket. Modules can be combined in a single Nema 4X local control panel for monitoring multiple pump installations.

**Operation:** Integrally the module indicates using bi-colored LEDs, one each for each fault type; **GREEN** being OK, **ORANGE** (Channel A) or **RED** (Channel B) a failure "ALARM" condition. In addition a power ON LED and a "TEST" and a "RESET" button are provided. A self correcting fault, either moisture or thermal, causes the respective LED to change from a steady (alarm) to a flashing signal. This LED continues to flash until locally cleared, providing the plant operator annunciation of a potential intermittent fault condition. Rev 1.7, 4/20/06



#### Module Specifications:

Power supply: 24-240VAC/1/60 or 50 cycle  
Thermal circuit: <25 ma @ 12VDC  
Moisture Sensor Circuit: <300uA @ 5 Volts VDC  
Output Contact Rating: 5A @ 120 Volts AC  
Power Consumption: 2.8 Watts Maximum

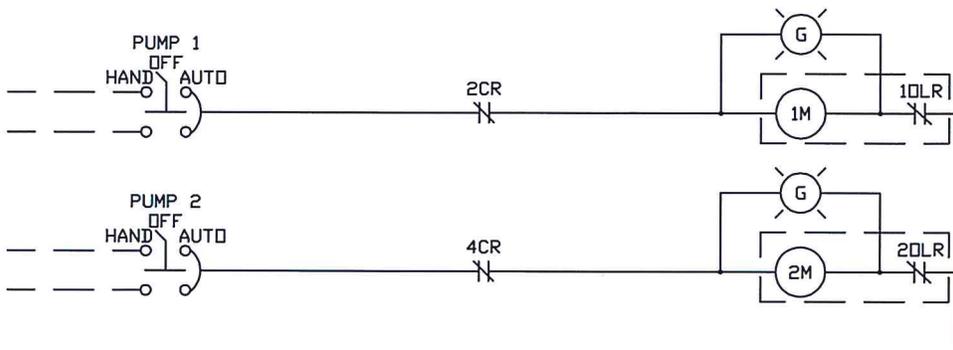
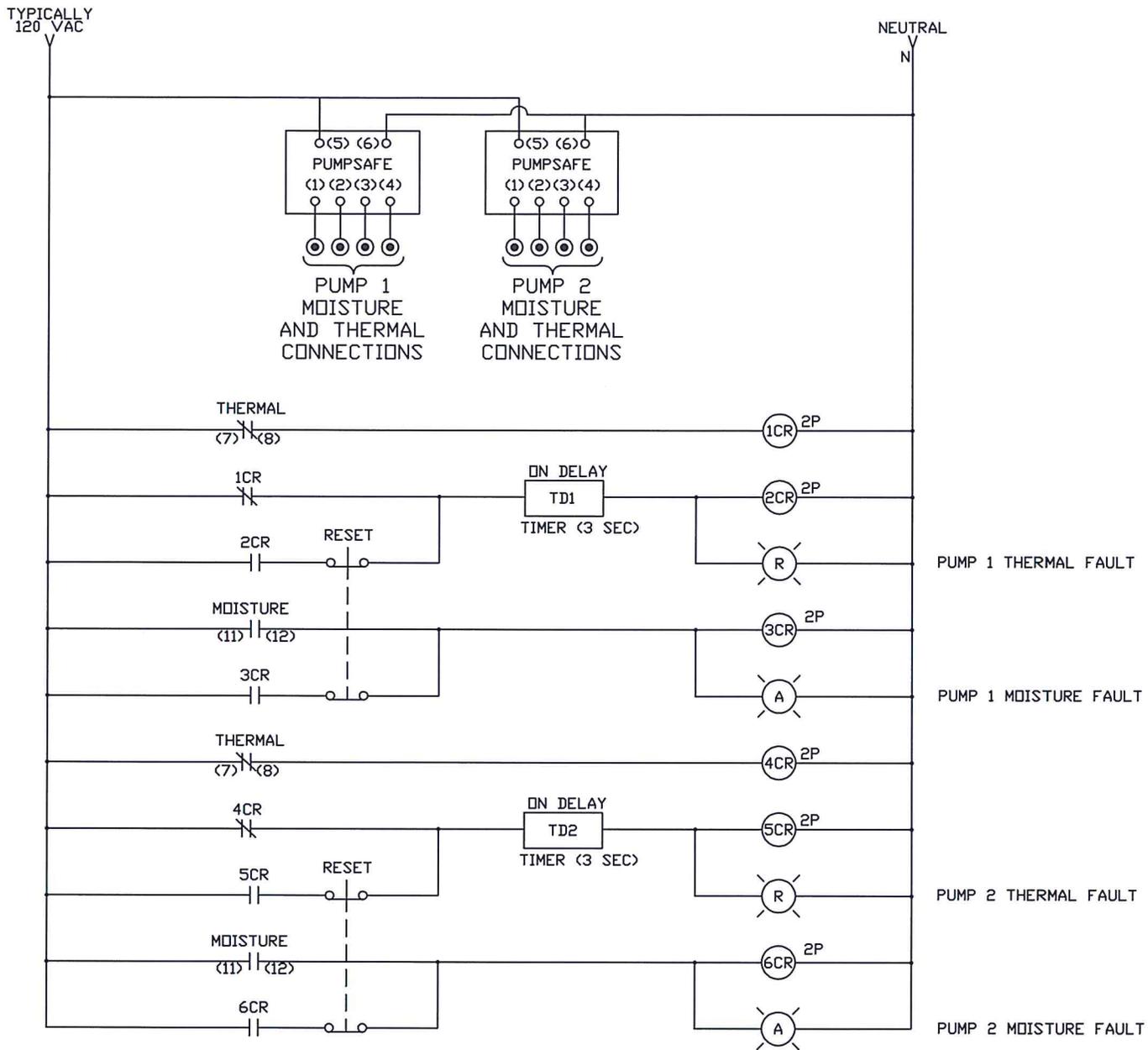
#### Pin Configuration & Function:

1 & 2 Motor Thermal Circuit – Input  
3 & 4 Motor Moisture Circuit – Input  
5 & 6 24-240 Volts AC – Input  
7/8/9 Thermal NC/COM/NO Output Contacts  
10/11/12 Moisture NC/COM/NO Output Contacts

**Note:** Relays are electrically held in their “Normal” states.

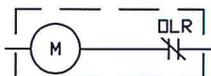
[www.PumpSafe.com](http://www.PumpSafe.com) – Presently under construction

4415 Sarellen Road, Richmond, VA 23231  
[www.ksb-inc.com](http://www.ksb-inc.com)  
804-222-1818



THERMAL  
 (7) (8) OPENS ON THERMAL FAULT

MOISTURE  
 (11) (12) CLOSURES ON MOISTURE FAULT



PUMP STARTER/OVERLOAD RELAY

Typical wiring to prevent the pumps from being locked out in the event of a power failure.





## READ THIS FIRST! IMPORTANT SETUP PROCEDURES

### PumpSafe Model D Moisture/Thermal (RTD) Detection Relay

Upon application of power to the PumpSafe™ Model D relay, it immediately starts an internal test routine to verify correct operation and transfers the output relay contacts to their Normal positions (power applied and no alarms). This test routine lasts for 15 seconds, after which the relay is ready to monitor the Moisture and Thermal (RTD-Temperature) inputs. *(The output relay contacts for each channel do not change from their Normal state until after the test routine is completed and the input channels have been polled.) (This initial sequence will occur any time power is removed then re-applied to the relay. Removing power also resets all alarm indications.)*

*(Pressing the Reset pushbutton will also initiate the internal test routine.)*

After the test routine is complete, the **Green** Power On LED and the Moisture and Thermal LED's will be illuminated. If there is no fault condition present on either input channel, both channel LED's will be illuminated **Green**.

The Moisture and Thermal input channels have built in time delays to prevent false failure indications.

#### **A Moisture Fault condition will be indicated if:**

An open circuit exists for a **minimum of 15 seconds, 3 times in a 24-hour period**  
**OR**

An open circuit exists for a **minimum of 45 seconds.**

If an alarm condition exists, the Moisture LED will illuminate **ORANGE**.

If/when the alarm condition clears, the Moisture LED will flash to indicate an alarm existed, but does not exist currently, until the Reset pushbutton is pressed.

#### **A Thermal (RTD) Fault condition will be indicated if:**

A temperature of  $117\pm 5^{\circ}\text{C}$  ( $243\pm 9^{\circ}\text{F}$ ) exists for a **minimum of 2 seconds, 3 times in a 24-hour period**

**OR**

A temperature of  $117\pm 5^{\circ}\text{C}$  ( $243\pm 9^{\circ}\text{F}$ ) exists for a **minimum of 7 seconds.**

If an alarm condition exists, the Thermal LED will illuminate **RED**.

If/when the alarm condition clears, the Thermal LED will flash to indicate an alarm existed, but does not exist currently, until the Reset pushbutton is pressed.

Once an alarm has occurred on either channel once in a 24-hour period, and cleared, any subsequent occurrence will not be restricted to the time delay. The circuit will indicate an alarm instantly upon recurrence of an alarm condition.

## READ THIS FIRST! IMPORTANT SETUP PROCEDURES

### PumpSafe Model B Moisture/Thermal Relay

Upon application of power to the PumpSafe™ Model B relay, it immediately starts an internal test routine to verify correct operation and transfers the output relay contacts to their Normal positions (power applied and no alarms). This test routine lasts for 15 seconds, after which the relay is ready to monitor the Moisture and Thermal inputs. *(The output relay contacts for each channel do not change from their Normal state until after the test routine is completed and the input channels have been polled.)* ***(This initial sequence will occur any time power is removed then re-applied to the relay. Removing power also resets all alarm indications.)***

*(Pressing the Reset pushbutton will also initiate the internal test routine.)*

After the test routine is complete, the **Green** Power On LED and the Moisture and Thermal LED's will be illuminated. If there is no fault condition present on either input channel, both channel LED's will be illuminated **Green**.

The Moisture and Thermal input channels have built in time delays to prevent false failure indications.

#### **A Moisture Fault condition will be indicated if:**

An open circuit exists for a **minimum of 15 seconds, 3 times in a 24-hour period**  
**OR**

An open circuit exists for a **minimum of 45 seconds.**

If an alarm condition exists, the Moisture LED will illuminate **ORANGE**.  
If/when the alarm condition clears, the Moisture LED will flash to indicate an alarm existed, but does not exist currently, until the Reset pushbutton is pressed.

#### **A Thermal Fault condition will be indicated if:**

an open circuit exists for a **minimum of 2 seconds, 3 times in a 24-hour period**  
**OR**

an open circuit exists for a **minimum of 7 seconds.**

If an alarm condition exists, the Thermal LED will illuminate **RED**.  
If/when the alarm condition clears, the Thermal LED will flash to indicate an alarm existed, but does not exist currently, until the Reset pushbutton is pressed.

Once an alarm has occurred on either channel once in a 24-hour period, and cleared, any subsequent occurrence will not be restricted to the time delay. The circuit will indicate an alarm instantly upon recurrence of an alarm condition.



## **READ THIS FIRST!**

### **IMPORTANT SETUP PROCEDURES**

#### **PumpSafe Model A Moisture/Thermal Relay**

Upon application of power to the PumpSafe™ Model A relay, it immediately starts an internal test routine to verify correct operation and transfers the out put relay contacts to their Normal positions (power applied and no alarms). This test routine lasts for 15 seconds, after which the relay is ready to monitor the Moisture and Thermal inputs. *(The output relay contacts for each channel do not change from their Normal state until after the test routine is completed and the input channels have been polled.)* ***(This initial sequence will occur any time power is removed then re-applied to the relay. Removing power also resets all alarm indications.)***

*(Pressing the Reset pushbutton will also initiate the internal test routine.)*

After the test routine is complete, the **Green** Power On LED and the Moisture and Thermal LED's will be illuminated. If there is no fault condition present on either input channel, both channel LED's will be illuminated **Green**.

The Moisture and Thermal input channels have built in time delays to prevent false failure indications.

#### **A Moisture Fault condition will be indicated if:**

a resistance of 125k ohms or less exists for a **minimum of 15 seconds, 3 times in a 24-hour period**

**OR**

a resistance of 125k ohms or less exists for a **minimum of 45 seconds.**

If an alarm condition exists, the Moisture LED will illuminate **ORANGE**. If/when the alarm condition clears, the Moisture LED will flash to indicate an alarm existed, but does not exist currently, until the Reset pushbutton is pressed.

#### **A Thermal Fault condition will be indicated if:**

an open circuit exists for a **minimum of 2 seconds, 3 times in a 24-hour period**

**OR**

an open circuit exists for a **minimum of 7 seconds.**

If an alarm condition exists, the Thermal LED will illuminate **RED**. If/when the alarm condition clears, the Thermal LED will flash to indicate an alarm existed, but does not exist currently, until the Reset pushbutton is pressed.



Actual

**Catalog Number:** **ADR6**  
**Product ID:** 7TAH006600R0232  
**UPC Number:** 78378661001  
**EAN Number:** 05414363147527  
**Status:** Active

Type ADR-ALCUL Single-Conductor, One-Hole Mount, Conductor Range 14 AWG-6 Str, Length 1-3/64 Inches, Width 1/2 Inch, Height 31/64 Inch, Slotted Screw, Tin Plated

- Easy Installation - no special tools required.

### North American Specifications (UNSPSC)

UNSPSC	39121408 Mechanical connectors
IGCC	4541 Mechanical connectors
Brand Name	Blackburn
Type	Dual-Rated Mechanical Connector
Special Features	Easy Installation - no special tools required.
Standard	UL E9809
Number Of Conductors	1
Material	Aluminum
Finish	Tin-Plated
Conductor Range (Main/Primary)	14-6
Number Of Mounting Holes	1

### Packaging

Inner Quantity	50
Inner Dimensions (inches)	4.3x2.9x3.1
Outer Quantity	500
Outer Dimensions (inches)	14.7x6.6x4.6
Weight Uom	10 lbs. per 1000

### Documents / Support Tools

Technical Data Sheet CA	Available on Website
Technical Data Sheet Global	wsd-000391

For further technical assistance, please contact us...

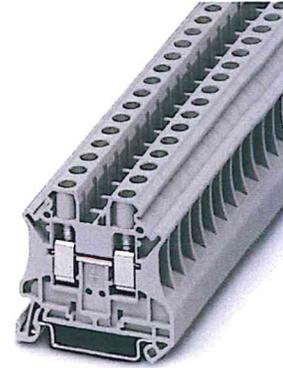
Thomas & Betts - USA  
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[www.tnb.com](http://www.tnb.com)

T&B Technical Support  
 MS 3B-50  
 8155 T&B Blvd.  
 Memphis, TN 38125

Hours: 7AM - 6PM CDT  
 Monday-Friday  
 Phone: (888) 862-3289  
 Fax: (901) 252-1321  
 Email: [techsupport@tnb.com](mailto:techsupport@tnb.com)

# UT 6

Order No.: 3044131

<http://eshop.phoenixcontact.de/phoenix/treeViewClick.do?UID=3044131>

Universal terminal block with screw connection, cross section: 0.2 - 6 mm<sup>2</sup>, AWG: 24 - 8, width: 8.2 mm, color: Gray



## Commercial data

EAN	4017918960438
Pack	50 Pcs.
Customs tariff	85369010
Weight/Piece	0.01503 KG
Catalog page information	Page 27 (CL-2007)

## Product notes

WEEE/RoHS-compliant since:  
10/26/2006



<http://www.download.phoenixcontact.com>  
Please note that the data given here has been taken from the online catalog. For comprehensive information and data, please refer to the user documentation. The General Terms and Conditions of Use apply to Internet downloads.

## Technical data

### General

Number of levels	1
Number of connections	2
Color	gray

Insulating material	PA
Inflammability class acc. to UL 94	V0
<b>Dimensions</b>	
Width	8.2 mm
Length	47.7 mm
Height NS 35/7,5	47.5 mm
Height NS 35/15	55 mm
<b>Technical data</b>	
Maximum load current	57 A (with 10 mm <sup>2</sup> 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
Nominal current I <sub>N</sub>	41 A
Nominal voltage U <sub>N</sub>	1000 V
Open side panel	ja
<b>Connection data</b>	
Conductor cross section solid min.	0.2 mm <sup>2</sup>
Conductor cross section solid max.	10 mm <sup>2</sup>
Conductor cross section stranded min.	0.2 mm <sup>2</sup>
Conductor cross section stranded max.	10 mm <sup>2</sup>
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 mm <sup>2</sup>
Conductor cross section stranded, with ferrule without plastic sleeve max.	6 mm <sup>2</sup>
Conductor cross section stranded, with ferrule with plastic sleeve min.	0.25 mm <sup>2</sup>
Conductor cross section stranded, with ferrule with plastic sleeve max.	6 mm <sup>2</sup>
2 conductors with same cross section, solid min.	0.2 mm <sup>2</sup>
2 conductors with same cross section, solid max.	2.5 mm <sup>2</sup>

# ALTERNATING RELAYS

## DPDT CROSS-WIRED DUPLEXOR

### ARP SERIES PLUG-IN



- ◆ For duplex loads
- ◆ 10A DPDT Cross-Wired Output Configuration when additional capacity is required
- ◆ Can be used with two or three Control Switches
- ◆ Control voltages of 12, 24, 120 & 240V AC
- ◆ Compact plug-in design utilizing industry-standard 8 pin octal socket
- ◆ Optional low profile selector switch to lock either load ON first
- ◆ 2 LED's indicate load to energize first



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**sales@macromatic.com**

Alternating Relays with DPDT cross-wired outputs are used in applications requiring both (a) the optimization of load usage by equalizing the run time of two loads and (b) additional capacity in case of excess load requirements. This alternating action is initiated by a control switch, such as a float switch, manual switch, timing relay, pressure switch, or other isolated control contact. Each time the initiating switch is opened, the output relay contacts will change state, thus alternating the two loads. Two LED indicators show the load to energize first.

Alternating Relays with DPDT cross-wired output configurations can be used with two or three control switches. See "Typical Installations" on Page 35 for more information. For products with SPDT or DPDT output configurations, see Page 32.

An optional three position selector switch is offered. This allows a DPDT cross-wired unit to alternate the two loads as normal, or lock the relay to always operate the same load first each time. In this manner, a load that has fewer hours of operation than the other load could be used more often in an effort to eventually balance the run time of both loads.

OUTPUT CONTACTS	CONTROL VOLTAGE	PRODUCT NUMBER	WIRING/SOCKET
<b>DPDT CROSS-WIRED</b> w/o Selector Switch	12V AC 24V AC 120V AC 240V AC	ARP012A3 ARP024A3 ARP120A3 ARP240A3	8 Pin Octal <b>70169-D</b>  <b>DIAGRAM 19</b>
<b>DPDT CROSS-WIRED</b> w/ Selector Switch	12V AC 24V AC 120V AC 240V AC	ARP012A3R ARP024A3R <b>ARP120A3R</b> ARP240A3R	 <b>DIAGRAM 147</b>
<b>DPDT CROSS-WIRED</b> w/o Selector Switch	12V AC 24V AC 120V AC 240V AC	ARP012A5 ARP024A5 ARP120A5 ARP240A5	8 Pin Octal <b>70169-D</b>  <b>DIAGRAM 147</b>
<b>DPDT CROSS-WIRED</b> w/ Selector Switch	12V AC 24V AC 120V AC 240V AC	ARP012A5R ARP024A5R ARP120A5R ARP240A5R	 <b>DIAGRAM 147</b>

Application Data & Dimensions—Page 35  
 Sockets & Accessories—Pages 80 & 81

# ALTERNATING RELAYS

## DPDT CROSS-WIRED DUPLEXOR

### APPLICATION DATA & DIMENSIONS

#### APPLICATION DATA

**Voltage Tolerances:** +10%/-15% of control voltage at 50/60Hz.

**Load (Burden):** Less than 3VA

**Output Contacts:**

10A @ 240V AC/30V DC,  
1/2HP @ 120/240V AC (N.O.), 1/3HP @ 120/240VAC (N.C.)

**Life:**

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

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

**Transient Protection:** 10,000 volts for 20 microseconds

**Indicator LED's:** 2 LED's marked LOAD A and LOAD B

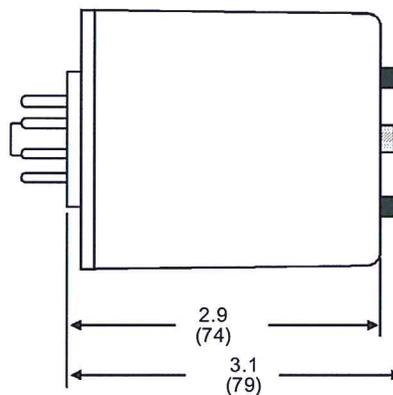
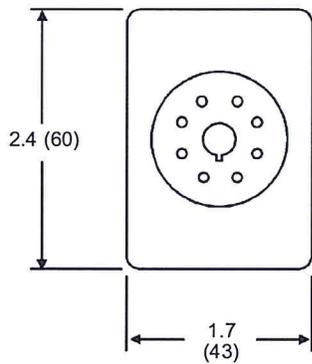
**Optional Selector Switch Settings:**

LOAD 1 (always energizes first)  
ALTERNATE  
LOAD 2 (always energizes first)

**Approvals:**



#### DIMENSIONS



All Dimensions in Inches (Millimeters)

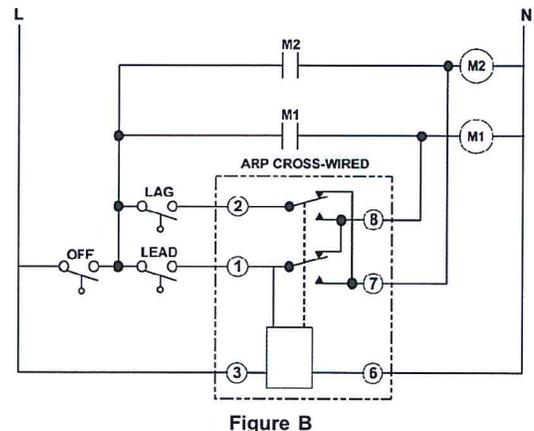
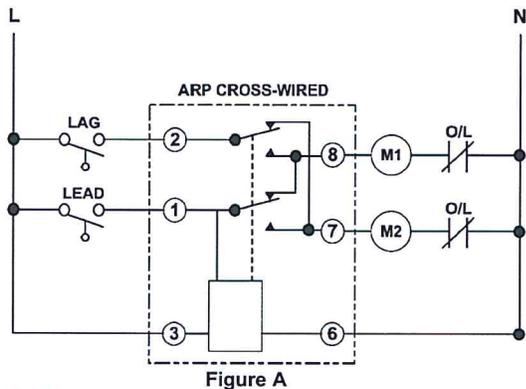
#### TYPICAL INSTALLATIONS

In the initial off state (diagram below left), both the LEAD Control Switch and the LAG Control Switch are open, the Alternating Relay is in the LOAD 1 position, and both loads are off. The red LED marked "LOAD 1" is ON. When the LEAD Control Switch closes, it energizes Load M1. As long as the LEAD Control Switch remains closed, Load M1 remains energized. If the LAG Control Switch closes, it energizes Load M2. When the LAG Control Switch opens, Load M2 is turned off. When the LEAD Control Switch opens, Load M1 is turned off and the Alternating Relay toggles to the LOAD 2 position. The red LED marked "LOAD 2" is ON. When the LEAD Control Switch closes, it turns on Load M2. If the LAG Control Switch closes, it will energize Load M1. When the LAG Control Switch opens, Load M1 is turned off. When the LEAD Control Switch opens, Load M2 is turned off, the Alternating Relay toggles back to the LOAD 1 position, and the process can be repeated again.

The diagram below right illustrates a type of operation known as "Sequence On - Simultaneously Off (S.O.S.O.)"-the two loads are energized sequentially, but remain on together until the OFF switch is opened.

In the initial OFF state, all three switches are open, the Alternating Relay is in the LOAD 1 position, and both loads are off. No action happens with the Alternating Relay or either load when the OFF Switch closes. When the LEAD Switch closes, Load M1 turns on. When the LAG Switch closes, Load M2 turns on. Both loads remain on as long as all three switches are closed.

When the LAG Switch opens, Load M2 remains on because the OFF Switch is still closed. When the LEAD Switch opens, Load M1 remains on because the OFF Switch is still closed. When the OFF Switch opens, both Load M1 and Load M2 are turned off simultaneously. The Alternating Relay toggles to the LOAD 2 position. The entire cycle is then repeated, but with Load M2 energized first followed by Load M1.



# Pilot lights

Pilot Devices  
Compact range



## Pilot light Ba 9s base, bulb not included

Description	Catalog No.	Ref. Code	List Price
Color:			
Red	CL-100R	1SFA 619 402 R1001	\$ 14.00
Green	CL-100G	1SFA 619 402 R1002	
Yellow	CL-100Y	1SFA 619 402 R1003	
Blue	CL-100L	1SFA 619 402 R1004	
White	CL-100W	1SFA 619 402 R1005	
Clear	CL-100C	1SFA 619 402 R1008	

## Pilot light with integrated LED Service life >50 000 hours

Color	Rated current mA	Lumiance mcd	Wave-length nm	Catalog No.	Ref. Code	List Price
<b>Rated voltage 12 V, DC ①</b>						
Red	30	60	625	CL-501R	1SFA 619 402 R5011	\$ 25.00
Green	15	126	520	CL-501G	1SFA 619 402 R5012	
Yellow	30	60	590	CL-501Y	1SFA 619 402 R5013	
Blue	30	22	470	CL-501L	1SFA 619 402 R5014	
White	30	88	②	CL-501W	1SFA 619 402 R5015	
<b>Rated voltage 24 V, AC/DC</b>						
Red	15	60	625	CL-502R	1SFA 619 402 R5021	25.00
Green	15	126	520	CL-502G	1SFA 619 402 R5022	
Yellow	15	60	590	CL-502Y	1SFA 619 402 R5023	
Blue	15	22	470	CL-502L	1SFA 619 402 R5024	
White	15	88	②	CL-502W	1SFA 619 402 R5025	
<b>Rated voltage 48 V, AC/DC</b>						
Red	15	60	625	CL-504R	1SFA 619 402 R5041	25.00
Green	15	126	520	CL-504G	1SFA 619 402 R5042	
Yellow	15	60	590	CL-504Y	1SFA 619 402 R5043	
Blue	15	22	470	CL-504L	1SFA 619 402 R5044	
White	15	88	②	CL-504W	1SFA 619 402 R5045	
<b>Rated voltage 60 V, AC/DC</b>						
Red	15	60	625	CL-505R	1SFA 619 402 R5051	25.00
Green	15	126	520	CL-505G	1SFA 619 402 R5052	
Yellow	15	60	590	CL-505Y	1SFA 619 402 R5053	
Blue	15	22	470	CL-505L	1SFA 619 402 R5054	
White	15	88	②	CL-505W	1SFA 619 402 R5055	
<b>Rated voltage 110-130 V, AC</b>						
Red	15	60	625	CL-513R	1SFA 619 402 R5131	25.00
Green	15	126	520	CL-513G	1SFA 619 402 R5132	
Yellow	15	60	590	CL-513Y	1SFA 619 402 R5133	
Blue	15	22	470	CL-513L	1SFA 619 402 R5134	
White	15	88	②	CL-513W	1SFA 619 402 R5135	
<b>Rated voltage 110-130 V, DC ①</b>						
Red	15	60	625	CL-515R	1SFA 619 402 R5151	25.00
Green	15	126	520	CL-515G	1SFA 619 402 R5152	
Yellow	15	60	590	CL-515Y	1SFA 619 402 R5153	
Blue	15	22	470	CL-515L	1SFA 619 402 R5154	
White	15	88	②	CL-515W	1SFA 619 402 R5155	
<b>Rated voltage 220 V, DC ①</b>						
Red	15	60	625	CL-520R	1SFA 619 402 R5201	25.00
Green	15	126	520	CL-520G	1SFA 619 402 R5202	
Yellow	15	60	590	CL-520Y	1SFA 619 402 R5203	
Blue	15	22	470	CL-520L	1SFA 619 402 R5204	
White	15	88	②	CL-520W	1SFA 619 402 R5205	
<b>Rated voltage 230 V, AC</b>						
Red	15	60	625	CL-523R	1SFA 619 402 R5231	25.00
Green	15	126	520	CL-523G	1SFA 619 402 R5232	
Yellow	15	60	590	CL-523Y	1SFA 619 402 R5233	
Blue	15	22	470	CL-523L	1SFA 619 402 R5234	
White	15	88	②	CL-523W	1SFA 619 402 R5235	
<b>Rated voltage 380 V, AC</b>						
Red	15	60	625	CL-530R	1SFA 619 402 R5301	25.00
Green	15	126	520	CL-530G	1SFA 619 402 R5302	
Yellow	15	60	590	CL-530Y	1SFA 619 402 R5303	
Blue	15	22	470	CL-530L	1SFA 619 402 R5304	
White	15	88	②	CL-530W	1SFA 619 402 R5305	
<b>Rated voltage 415 V, AC</b>						
Red	15	60	625	CL-541R	1SFA 619 402 R5411	25.00
Green	15	126	520	CL-541G	1SFA 619 402 R5412	
Yellow	15	60	590	CL-541Y	1SFA 619 402 R5413	
Blue	15	22	470	CL-541L	1SFA 619 402 R5414	
White	15	88	②	CL-541W	1SFA 619 402 R5415	

① Care should be taken for DC supply where + and - must be correctly connected. (this is marked on the product, X1 (+) and X2 (-)).

② X=0.31, Y=0.32

Minimum Ref. quantity: 10 pieces  
Packing: 10 pieces/plastic bag, 10 bags/box

Item # T50A4 T50 Quartz AC Hour Meter I.

T50 Quartz AC Hour Meter I.  
T50 Quartz AC Hour Meter



[larger image](#)

### Specifications

Series	T50
Display	6-Digit
Voltage	24 V AC
Reset	None
Size	1.68W x 1.68H x 1.26D Inch
Face Dia - Flange	2.31 Inch
Face Dia - Cutout	2 Inch
Weight	2 oz.
Mounting Style	Panel Mount
Power	Less than 0.4 W

## PANEL

Panel Mounting is obtained by cutting a circular or rectangular cut-out in the desired panel and the instrument is inserted with the flange resting on the top of the panel. The instrument is held in place by compressing a plastic or steel spring clip from behind the panel. This type of mounting is very popular because it requires no additional fasteners. Models are also considered panel mounted when they are inserted into a panel cut-out and mounted from the front using a two or more hole flange and fastened with screws from the front of the panel (pictured to the right).



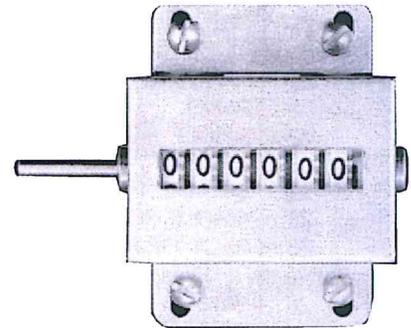
## BACK OF PANEL

Back of panel mounting is usually achieved by cutting an opening in a thin panel large enough to read the display. Two or more holes are drilled in the panel and screws are inserted from the front to secure the instrument against the back of the panel wall.



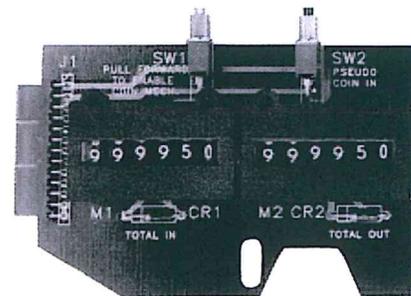
## BASE

Base mounting is usually a free standing mount and connections are made with a two or more hole flange at the bottom of the unit. This is a standard mount for most mechanical counters and is sometimes used for hour meters when a panel is not available.



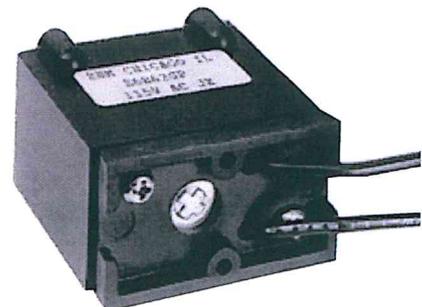
## PCB

PC board mounting is common for using counters in add-on PCB modules to electronic machinery. This type of mounting eliminates the need for any wires and multiple counters can be assembled as one unit. The counters are attached by soldering the protruding pins into the PCB and two or more fasteners are also screwed into the bottom of the unit for additional support onto the PC board.



## REAR

Rear mounting is similar to PCB mounting except there are no pins for soldering, only two or more holes on the bottom for threaded or self-tapping screws. This is an optional type of mounting used mainly when a suitable panel is not available.



# PHASE MONITOR RELAYS

## PHASE LOSS, PHASE REVERSAL, PHASE UNBALANCE, AND UNDER/OVER VOLTAGE

### PMP SERIES PLUG-IN

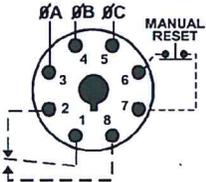


- ◆ Universal voltage range of 208-480V on PMPU provides the flexibility to cover a variety of applications with one unit
- ◆ Protects against phase loss, phase reversal, phase unbalance, undervoltage and overvoltage
- ◆ Variety of user-selectable and adjustable settings for the ultimate in three-phase 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
- ◆  (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 <b>70169-D</b>  <b>DIAGRAM 104</b>
	208-480V	<b>PMPU*</b>	

▲ 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**.



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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.

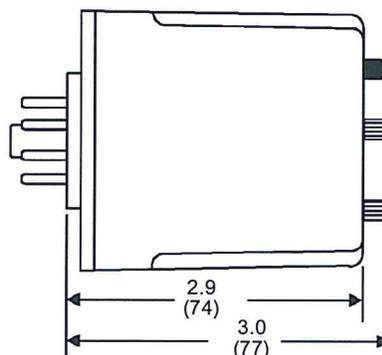
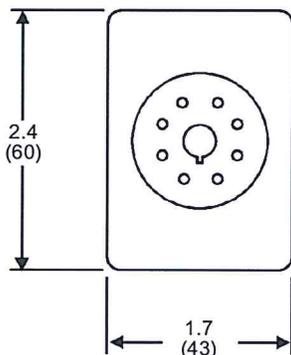
##### Approvals:



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

with appropriate socket  
File #E109466

#### DIMENSIONS



All Dimensions in Inches (Millimeters)

# SDSA3650 SPDs

## Square D Type 1 Surge Protective Devices

Square D™ brand Surgelogic™ SDSA3650 products are compact and affordable Surge Protective Devices (SPDs). SDSA3650 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.



by Schneider Electric

# SDSA3650 SPDs

## Features

### Superior Performance

Square D brand SurgeLogic SDSA3650 SPDs utilize high-energy suppression circuitry that can be located at any point in the electrical system. As a Type 1 rated device, they have the flexibility to be used with or without an Overcurrent Protection Device (OCPD).

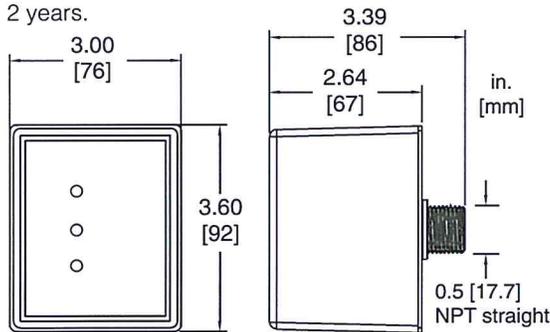
SDSA3650 SPDs provide surge suppression for equipment from severe transient activity. Each metal oxide varistor (MOV) is individually fused and the products carry a NEMA Type 4X rating suitable for installing indoors, outdoors, or in other harsh environments.

### Easy Installation

SurgeLogic SDSA3650 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 SDSA3650 and SDSA3650D warranty is 2 years.



## SDSA3650 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	Plastic
NEMA Rating	NEMA Type 4X
Connection Method	#12 AWG
Weight	1.8 lbs
Mounting Method	Close Nippled, Back Mounted
Operating Altitude	Sea Level-12,000' (3,658 m)
Storage Temperature	-40° F to +149° F (-40° C to +65° C)
Operating Temperature	-40° F to +149° F (-40° C to +65° C)

### Diagnostics

Green status LED

### Listings and Performance

cULus Listed per UL 1449 3rd edition Type 1 SPD, UL 1283, CSA C22.2 No. 8-M1986, C233.1-87 CE marked (IEC 61643-11)

The SDSA3650 is a four-wire surge suppressor designed for use on all solidly grounded systems up to 600Y/347 Vac. The SDSA3650D is a three-wire surge suppressor designed for delta applications up to 600 Vac.

Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCOV	SCCR	I <sub>n</sub>	VPR			
								L-N	L-G	L-L	N-G
600Y/347V <sup>1</sup>	40kA	6	3 Ø, 4-wire	SDSA3650	750V L-N 1500V L-L	200kA	10kA	2500V	N/A	4000V	N/A
600V Delta <sup>2</sup>	40kA	3	3 Ø, 3-wire	SDSA3650D	1500V L-L	200kA	10kA	N/A	N/A	4000V	N/A

1 Applicable voltages: 120/240V, 208Y/120V, 380Y/220V, 400Y/230V, 480Y/277V, 600Y/347V

2 Applicable voltages: 240V Delta, 480V Delta, 600V Delta

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Schneider Electric USA, Inc. 1751 S. 4800 W., Salt Lake City, UT 84104, USA Telephone: (801)-977-9009 Fax: (801)-977-0200 www.surgeologic.com

Fuse disconnectors for cylindrical fuse-links

Fuse disconnecter VLC 10

Rated current **max. 32 A**    Rated operational voltage **690 V**    Utilization category **AC22B**

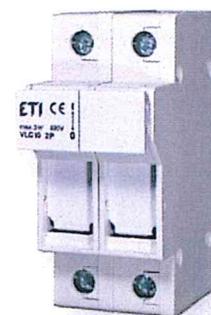
1-pole					
U <sub>1</sub> /U <sub>2</sub> [V]	I <sub>max</sub> [A]	code No.	indicator	weight [g]	packaging [pcs]
690	32	002541000	-	65	12/108
		002541100	L-LED		
		002541200	I-NEON		

1-pole + N					
U <sub>1</sub> /U <sub>2</sub> [V]	I <sub>max</sub> [A]	code No.	indicator	weight [g]	packaging [pcs]
690	32	002542000	-	128	6/54
		002542100	L-LED		
		002542200	I-NEON		

2-pole					
U <sub>1</sub> /U <sub>2</sub> [V]	I <sub>max</sub> [A]	code No.	indicator	weight [g]	packaging [pcs]
690	32	002543000	-	124	6/54
		002543100	L-LED		
		002543200	I-NEON		

3-pole					
U <sub>1</sub> /U <sub>2</sub> [V]	I <sub>max</sub> [A]	code No.	indicator	weight [g]	packaging [pcs]
690	32	002544000	-	187	4/36
		002544100	L-LED		
		002544200	I-NEON		

3-pole + N					
U <sub>1</sub> /U <sub>2</sub> [V]	I <sub>max</sub> [A]	code No.	indicator	weight [g]	packaging [pcs]
690	32	002545000	-	270	3/27
		002545100	L-LED		
		002545200	I-NEON		



C