

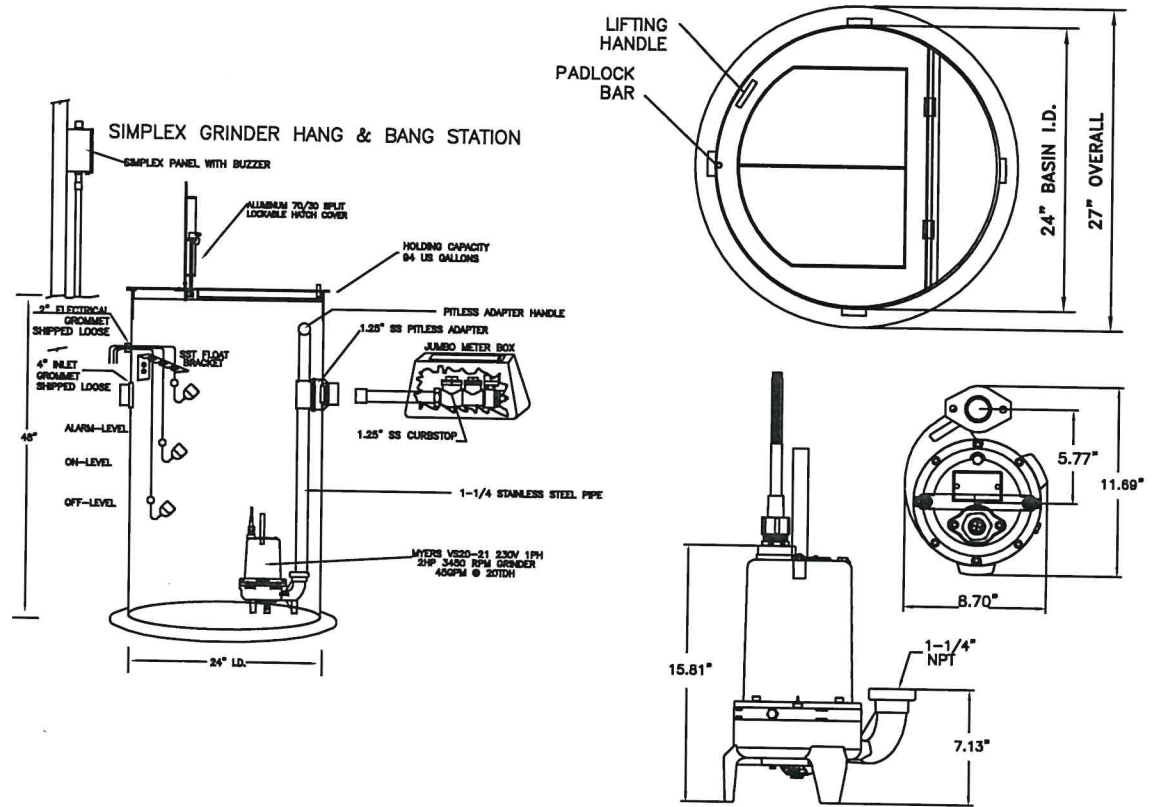
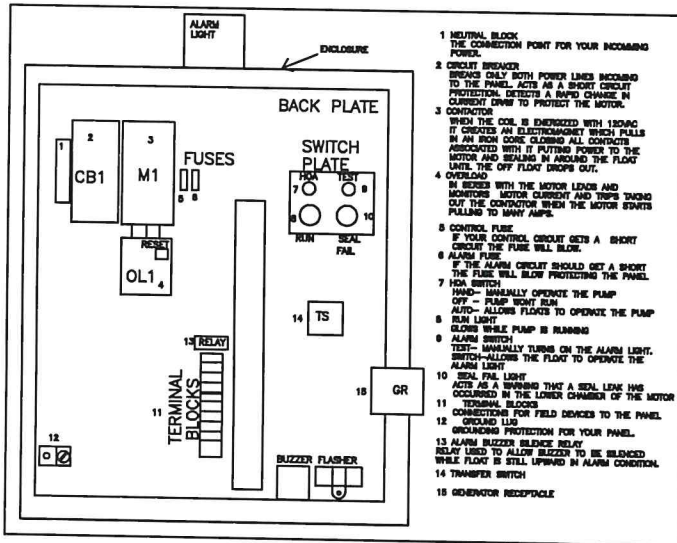
**O&M MANUAL
SIMPLEX GRINDER STATIONS**

JOB:
**CITY OF GULF BREEZE
HIGHPOINT SEPTIC-TO-SEWER
CONVERSION**

Submitted By:
Gulf Coast Pump and Equipment, Inc.
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12-11-24



FEB. 21, 2024

DRAWING NO. 073


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PUMP DATA



V2 GRINDER SERIES

SHREDDING WASTEWATER CHALLENGES



PATENTED AXIAL
CUTTER TECHNOLOGY



ADVANCED HYDRAULICS



LEGENDARY SEAL
LEAK DETECTION

pentair.com

MYERS® V2 SERIES SUBMERSIBLE GRINDER PUMPS

The Myers V2 series grinder is engineered from the ground up, in order to overcome the increased debris and higher pressure required in today's wastewater environment. It features a patented axial cutter design and semi-open impeller to effectively macerate challenging sewage solids into a fine slurry.

Watch the video at www.Femyers.com



PATENTED AXIAL CUTTER TECHNOLOGY

Easily slices through solids and trash found in domestic wastewater without roping or clogging.



ADVANCED HYDRAULICS

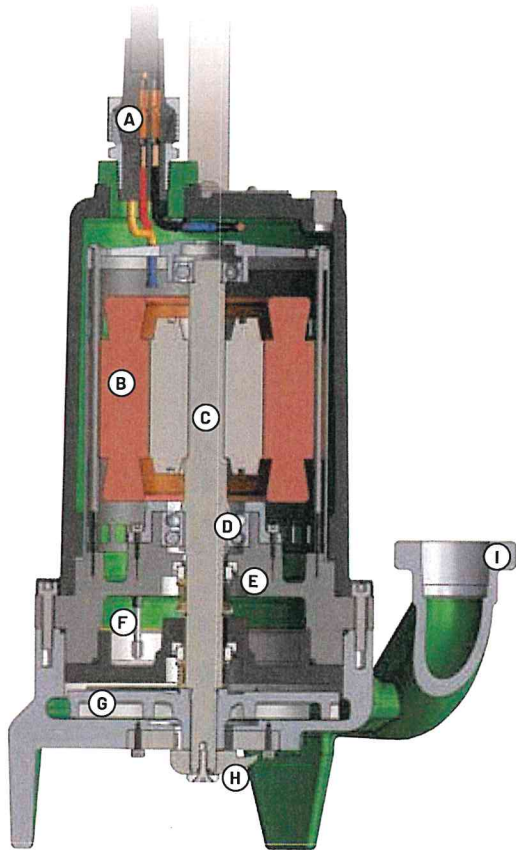
The only single stage 2 HP grinder that can deliver up to 185' of lift for superior performance and reliability.



LEGENDARY SEAL LEAK DETECTION

True early warning system for reduced downtime and maintenance costs.

Features



A. Cable Entry System

- NEW! Optional quick disconnect cord available for ease of maintenance
- Cable jacket sealed by compression fitting; individual wires sealed by compression grommet for double seal protection against water ingress
- Replace power cord without disturbing motor for ease of maintenance

B. Oil-Filled Motor

- Maximizes heat dissipation; provides constant bearing lubrication for long life
- High torque start/run capacitor for single or three-phase motors, assured starting under heavy loads

C. Heavy 416 SST Shaft

- Corrosion resistant, reduces shaft deflection for long life

D. Lower Double Row Ball Bearings

- Absorb both axial and radial loads for increased durability

E. Double Mechanical Shaft Seals

- In oil-filled seal chamber for continuous lubrication, superior motor protection

F. Seal Leak Probe

- Located in seal chamber instead of motor area for true early warning of water leaks. Allows corrective action before costly motor or bearing failure occurs.
- Activates warning light in control panel

G. SST Semi-Open Impeller

- Provides improved performance, resists clogging
- Pump-out vanes help keep trash from seal, reduces pressure at seal face for longer life

H. Axial Cutter System

- Constructed of 440 SST hardened to 57-60Rc for long life
- Easily replaceable without dismantling pump

I. Volute Case

- Cast iron 1-1/4" NPT vertical flanged discharge

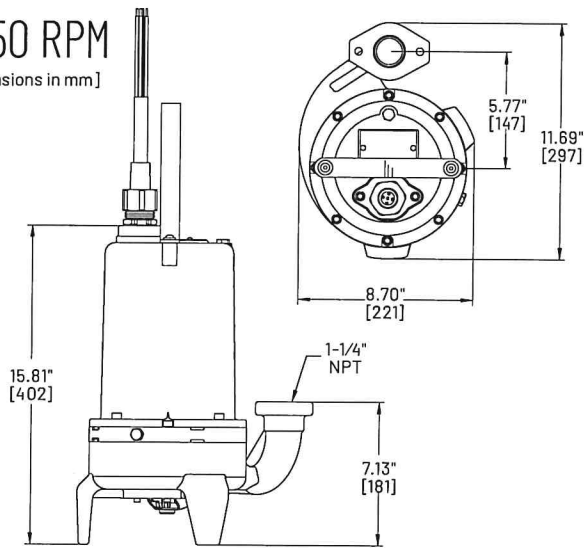
Electrical Data

	V/Ph/Hz	HP	Start Amps	FL Amps	Full Load kW	Start KVA	FL KVA	NEC Code Letter	Service Factor	Model	Standard Cord	
											20'	35'
High Head	230/1/60	2	49	18.5	4.2	11.27	4.26	G	1	Catalog Eng	VH20-21-20 28148D000	VH20-21-35 28148D004
	200/3/60	2	53	12.5	3.9	18.3	4.33	L	1	Catalog Eng	VH20-03-20 28148D001	VH20-03-35 28148D005
	230/3/60	2	46	12	3.9	18.3	4.77	L	1	Catalog Eng	VH20-23-20 28148D002	VH20-23-35 28148D006
	460/3/60	2	23	6	3.9	18.3	4.77	L	1	Catalog Eng	VH20-43-20 28148D003	VH20-43-35 28148D007
	575/3/60	2	25	5	3.9	24.9	4.98	L	1	Catalog Eng	VH20-53-20 28148D020	VH20-53-35 28148D021
Standard Flow	200/1/60	2	66	16	3.2	13.2	3.2	G	1	Catalog Eng	VS20-01-20 28151D020	VS20-01-35 28151D021
	230/1/60	2	49	13.5	3.2	11.27	3.12	G	1	Catalog Eng	VS20-21-20 28151D000	VS20-21-35 28151D004
	200/3/60	2	53	10	3.2	18.3	3.46	L	1	Catalog Eng	VS20-03-20 28151D001	VS20-03-35 28151D005
	230/3/60	2	46	9	3.2	18.3	3.58	L	1	Catalog Eng	VS20-23-20 28151D002	VS20-23-35 28151D006
	460/3/60	2	23	4.2	3.2	18.3	3.35	L	1	Catalog Eng	VS20-43-20 28151D003	VS20-43-35 28151D007
	575/3/60	2	25	5	3.9	24.9	4.98	L	1	Catalog Eng	VS20-53-20 28151D022	VS20-53-35 28151D023
	200/1/60	2	66	16	3.2	3.2	13.2	3.2	G	1	Catalog Eng	VF20-01-20 28247D020
High Flow	230/1/60	2	49	13.5	3.2	11.27	3.12	G	1	Catalog Eng	VF20-21-20 28247D000	VF20-21-35 28247D004
	200/3/60	2	53	10	3.2	18.3	3.46	L	1	Catalog Eng	VF20-03-20 28247D001	VF20-03-35 28247D005
	230/3/60	2	46	9	3.2	18.3	3.58	L	1	Catalog Eng	VF20-23-20 28247D002	VF20-23-35 28247D006
	460/3/60	2	23	4.2	3.2	18.3	3.35	L	1	Catalog Eng	VF20-43-20 28247D003	VF20-43-35 28247D007
	575/3/60	2	25	5	3.9	24.9	4.98	L	1	Catalog Eng	VF20-53-20 28247D022	VF20-53-35 28247D023

Performance Data and Dimensions

3450 RPM

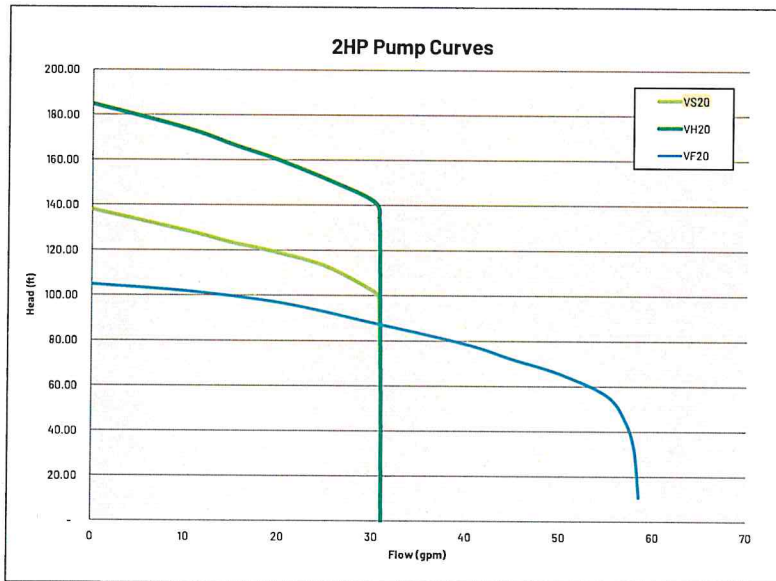
[Dimensions in mm]



Product Capabilities

Capacities To	58.5 gpm	221.4 lpm
Heads To	185 ft.	56.34 m
Liquids Handling	domestic raw sewage	
Intermittent Liquid Temp.	up to 140°F	up to 60°C
Winding Insulation Temp. (Class F)	311°F	155°C
Motor Electrical Data (Single phase motors are capacitor start type. Myers control panels or capacitor kits are recommended for proper operation and warranty.)	2 hp, 3450 rpm 1 ph - capacitor start/run. 230 volts; 60 Hz 3 ph - induction run 200, 230, 460 volts, 60 Hz	
Std. Third Party Approvals	CSA	
Acceptable pH Range	6 - 9	
Specific Gravity	.9 - 1.1	
Viscosity	28 - 35 SSU	
Discharge (Flange Dia.)	1-1/4 in.	31.75 mm
Min. Sump Diameter		
Simplex	24 in.	61.0 cm
Duplex	36 in.	91.4 cm

2HP Pump Curves



Construction Materials

Motor Housing, Seal Housing, Cord Cap and Volute Case	Cast Iron, Class 30, ASTM A48
Impeller	Semi-Open, Stainless Steel
Mechanical Seals: Standard Optional	Double Tandem Carbon and Ceramic Lower Tungsten Carbide
Pump, Motor Shaft	416 SST
Fasteners	300 Series SST
Rotating Cutter, Stationary Cutter	440 SST 57-60 Rockwell



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MYERS®

Specifications V² Series

OPERATING CONDITIONS – Each pump shall be rated 2 hp, 230 volts, 1 phase, 60 hertz, and 3450 rpm. The unit shall produce 45 U.S. GPM at 20 feet TDH.

CONSTRUCTION – Each pump shall be of the sealed submersible grinder type, model V² as manufactured by Myers. The pump volute, motor and seal housing shall be high quality gray cast iron, ASTM A-48, Class 30. All external mating parts shall be machined and Nitrile O-ring sealed on a beveled edge. Gaskets shall not be acceptable. All fasteners exposed to the pumped liquid shall be 300 series stainless steel.

POWER CORD – Power cord shall be SOOW water resistant 600V, UL and/or CSA approved. The single cord shall incorporate both power and sensor leads and shall be a minimum of seven 12 gauge conductors. The pump shall be protected with compression fitting and epoxy potted area at the power cord entry to the pump. A separation between the junction box area of the pump and the motor, by a stator lead sealing gland or terminal board, shall not be acceptable. The power cable entry into the cord cap assembly shall first be made with a compression fitting. Each individual lead shall be stripped down to bare wire, at staggered intervals, and each strand shall be individually separated. This area of the cord cap shall then be filled with an epoxy compound potting which will prevent water contamination to gain entry even in the event of wicking or capillary attraction. The power cord leads shall be connected to the motor leads with extra heavy connectors having copper inserts with a crimped wire-to-wire connection rather than a terminal board that allows for possible leaks. The cord cap assembly shall be sealed with a Nitrile O-ring on a beveled edge to assure proper sealing.

MOTOR – The stator, rotor and bearings shall be mounted in a sealed submersible type housing. The stator windings shall have Class F insulation (155°C or 311°F) and a dielectric oil-filled motor, NEMA B design (three-phase), NEMA L design (single-phase). Because air-filled motors do not dissipate heat as efficiently as oil-filled motors, they shall not be acceptable. The pump and motor shall be specifically designed so that they may be operated partially dry or completely submerged in the liquid being pumped. The pump shall not require cooling water jackets. Supplemental cooling shall not be acceptable.

BEARINGS AND SHAFT – An upper single row ball radial bearing and a lower double row angular contact bearing shall be provided. Bearings shall be permanently lubricated by the dielectric oil that fills the motor housing. The shaft shall be machined from solid 400 series stainless steel and be designed with large diameters and minimum overhang to reduce shaft deflection and prolong bearing and seal life.

SEALS AND SENSORS – The rotor and stator in the motor housing shall be separated and protected from the pumped liquid by an oil-filled seal housing incorporating two type 21 carbon ceramic mechanical seals mounted in tandem. The seal housing shall be equipped with a moisture sensing probe installed between the seals, and the sensing of moisture in the seal chamber shall be automatic, continuous and not require the pump be stopped or removed from the wet well.

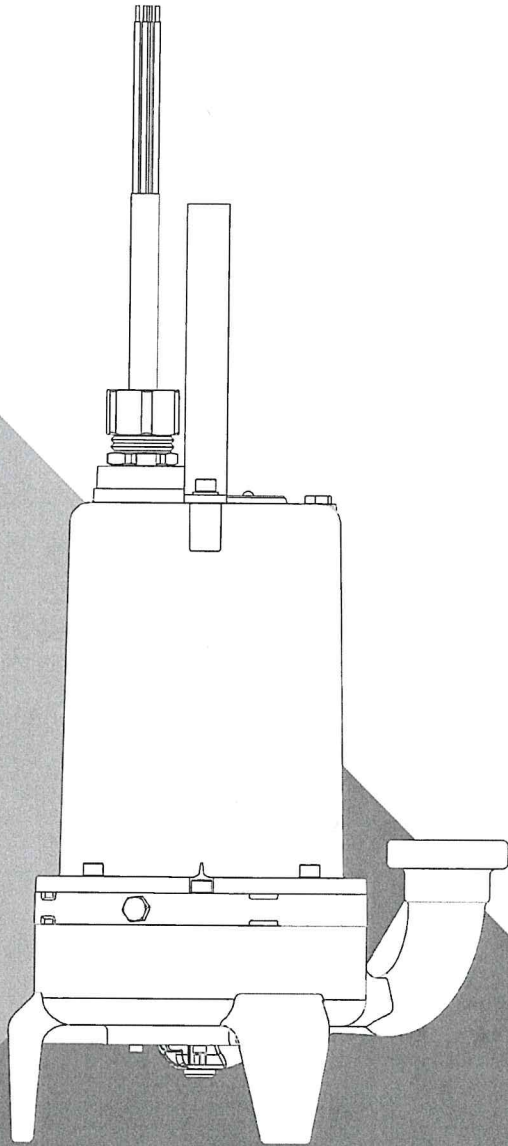
IMPELLER – The impeller shall be constructed of 316 stainless steel and be designed for rough duty service. It shall be a eight-vane, semi-open design with two wash out vanes on the rear shroud. The impeller shall be a non-overloading design.

GRINDER MECHANISM – The stationary cutter shall be circular in design and contain evenly spaced cutting slots that extend outwards from the inlet of the pump. The slots are tapered inward toward the inlet to help direct slurry through the cutting slots into the pump. The slots are to be angled, or undercut, to help maintain a sharp axial cutting edge, even as the axial face wears during use. The stationary cutter shall be pressed into the suction opening of the volute and held in place by four 300 series stainless steel screws. The stationary cutter shall be provided with tapped back-off holes so that screws can be used to remove the cutter from the volute. The rotating cutter shall contain three axial cutting arms extending from the hub, perpendicular to the pump shaft, that are shaped to aid in the rejection of suspended debris that has not been sufficiently reduced in size by the axial cutting action. The curved, leading edge of the cutting arms shall create a scissor action with the cutting slots of the stationary cutter plate to minimize the required torque. This will allow the cutter to macerate tough objects and prolong cutter life. Serrations on the hub of the cutter add additional cuts that prevent debris from becoming entangled within the rotating cutter. The rotating cutter shall thread onto the end of the pump shaft and be secured by a 300 series stainless steel washer in conjunction with a 300 series stainless steel flat head cap screw threaded into the end of the shaft. Both stationary and rotating cutters shall be made of 440C stainless steel, hardened to Rockwell 57-60C and ground close to tolerance. The grinder shall be capable of grinding normal domestic sewage into a fine slurry.

PAINT – The pump shall be painted with waterborne hybrid acrylic/alkyd paint. This custom engineered, quick dry paint shall provide superior levels of corrosion and chemical protection.



GRINDER PUMPS V2 SERIES



INSTALLATION AND OPERATION MANUAL

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Part # 23833A698 (08/15/2021)

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SAFETY INSTRUCTIONS

NOTICE to the installer: Please make sure you provide this manual to the owner of the equipment or to the responsible party who maintains the system.

⚠ This is the safety alert symbol. When you see this symbol on your pump or in this manual, look for one of the following signal words and be alert to the potential for personal injury.

⚠ DANGER warns about hazards that will cause serious personal injury, death or major property damage if ignored.

⚠ WARNING warns about hazards that can cause serious personal injury, death or major property damage if ignored.

⚠ CAUTION warns about hazards that will or can cause minor personal injury or property damage if ignored.

The label **NOTICE** indicates special instructions which are important but not related to hazards.

This manual contains important information for the safe use of this product. Read this manual completely and follow the instructions. Check local codes and requirements before installation.

⚠ DANGER Risk of Electrical Shock or Electrocution. May result in serious injury, death or fire hazard. Installer must disconnect all electrical sources prior to installation, handling or servicing. Only qualified personnel may install this system. NFPA 70/National Electric Code (NEC) or local codes must be followed. System must be properly grounded according to NEC.

⚠ DANGER Biohazard Risk. Once wastewater source has been connected to system, biohazard risk exists. Service personnel must use proper personal protective equipment and follow handling procedures per OSHA 29 CFR 1910.1030 when handling equipment after wastewater source has been connected to system.

⚠ DANGER Risk of Asphyxiation. Service personnel must use proper personal protective equipment and follow OSHA 29 CFR 1910.146 or OSHA 29 CFR 1926. Pump may be installed in a location classified as a confined space.

⚠ DANGER Risk of Fire or Explosion. Do not smoke or use open flames in or around this system. This system is not intended for use in hazardous locations per NFPA 70 National Electric Code. Do not pump flammable liquids.

⚠ DANGER Cutting Risk. Risk of serious cutting or amputation exists. Disconnect all power sources prior to servicing pump. Pump may start without warning. Use caution when handling grinder mechanism as it is extremely sharp.

Do not modify the cord strain relief. When wiring to a system control, connect the pump ground lead to the system ground.

Do not run the pump dry. Dry running can overheat the pump causing burns to anyone handling it and will void the warranty.

CALIFORNIA PROPOSITION 65 WARNING

⚠ WARNING This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

SAFETY

Submersible grinder pumps are not approved for use in swimming pools, recreational water installations, decorative fountains or any installation where human contact with the pumped fluid is common. This specialized pump is designed to incorporate a grinding mechanism to remove wastewater particulate and pump the resulting slurry.

On single and three-phase pumps, the motor protection must be provided by the installer. All three-phase pumps must be installed with magnetic starters having three-leg overload protection in accordance with the National Electrical Code (NEC). For duplex installations, both pump motors must have separate overload protection. Seal leak detectors must be connected to the proper control circuitry.

Examine all lifting devices, rope or chain, for damage before and after each lift. Do not use any lifting devices that are not rated for and designed to lift the weights involved with these pumps.

Keep clear of suction and discharge openings and do not insert fingers in the pump with the power connected. Make sure lifting devices are securely fastened each time before lifting pump and do not lift pump by the power cord. Do not exceed manufacturer's recommendation for maximum performance, as this could cause the motor to overheat. Do not pump without safety devices in place.

CONTROL PANELS AND CONTROLS

All Myers control panels used on these grinders are UL listed and CSA certified. Intrinsically safe type float controls are recommended for all applications. An intrinsically safe control panel relay will limit the current and voltage to the level controls. Pentair Myers control panels can be supplied with this type circuitry.

The float level controls maintain the basin sewage water level by controlling pump turn-on and turn-off level. The lower turn-off control should be set so that the pump stops at approximately the top of the pump. The upper turn-on control should be set above the lower turn-off control. The exact height between the two controls is determined by the number of pump starts desired and the depth of the basin. A maximum of 10 starts per hour should not be exceeded. The override control is set at a specified height above the upper turn-on control. The alarm control is set about 6" to 12" above the override control. No control should be set above the inlet invert.

PUMP

Myers V2 pumps are equipped with 230 and 200 volt single-phase and 200, 230, 460 and 575 volt three-phase with seal leak detector. Pentair Myers V2 Series pumps are available in high flow, standard, or high head flows. This pump is intended to grind and pump all normal sewage.

⚠ CAUTION Pump is only to be disassembled at Myers factory or an authorized Pentair Myers service facility.

Single-phase motors are capacitor start, capacitor run and the relays are mounted in the electrical control box. All single-phase motors must have a special electrical control box by Myers. Installing single-phase motors with controls other than Myers voids warranty.

SAFETY INSTRUCTIONS

Pump has two oil-filled chambers, the motor and ball bearings, and the seal chamber. The lower seal above the pump impeller acts as a buffer for the upper seal that holds oil in the motor chamber. The lower seal detection will alarm if water enters the seal chamber.

CORDS

Pump models with a seal leak detector use a seven-conductor cord. The three power conductors are black, white and red. The orange conductor connects to the seal leak probe and the green conductor connects to the ground screw inside the cord cap. The white with black stripe and blue wires are for the heat sensors.

Single-phase pumps use the black and white as main winding leads and the red for the start winding.

CUTTERS

The Myers V2 grinder is equipped with an axial style cutter, a stationary plate and rotating cutter. To ensure proper operation of the cutting mechanism, the gap between the stationary plate and rotating cutter must be no more than .008". If the pump is ever disassembled, the gap must be checked before the pump can return to service. To check the gap, use a .008" feeler gauge. If the .008" feeler gauge does not fit between the surface of the stationary cutter and rotating cutter and the motor shaft turns freely, the gap is set properly. If the .008" feeler gauge fits between the surfaces, shims must be removed to close the gap.

THREE-PHASE CONTROL BOX

Myers three-phase control equipment can be used for simplex or duplex operation. The overload heaters are in accordance with full load amp ratings.

If any amp readings are higher than listed, it indicates voltage may be higher or lower than normal, or that the pump may be clogged.

RESISTANCE OF WINDING

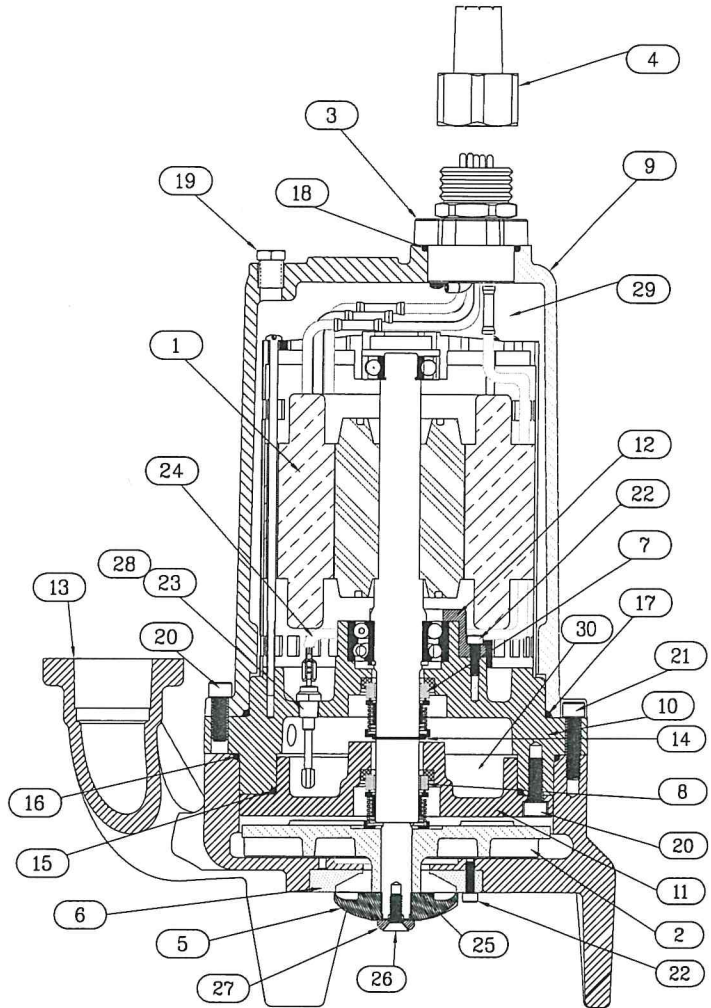
Every motor winding has a fixed resistance and windings must check close to the specification values. This winding resistance also indicates if the motor is connected for the voltage being used. Use an ohmmeter to test and read output directly in ohms.

SEMI-OPEN IMPELLER AND VOLUTE

To maximize the hydraulic performance of the Myers V2 grinder, the gap between the pumping vanes of the impeller and the volute must be no more than .010". If the wet end of the pump is ever disassembled, the gap must be checked before the pump can return to service. With the stationary cutter plate removed from the volute measure between the vanes of the impeller and the face of the volute using a .010" feeler gauge. If the impeller and motor shaft turn freely and the .010" feeler gauge does not fit between the two faces, the gap is set properly. If the .010" feeler gauge fits between the surfaces, shims must be removed to close the gap. In the case that the impeller and motor shaft are locked up, shims must be added to open up the gap.

COMMON PARTS LIST (For pumps built prior to June 2017)

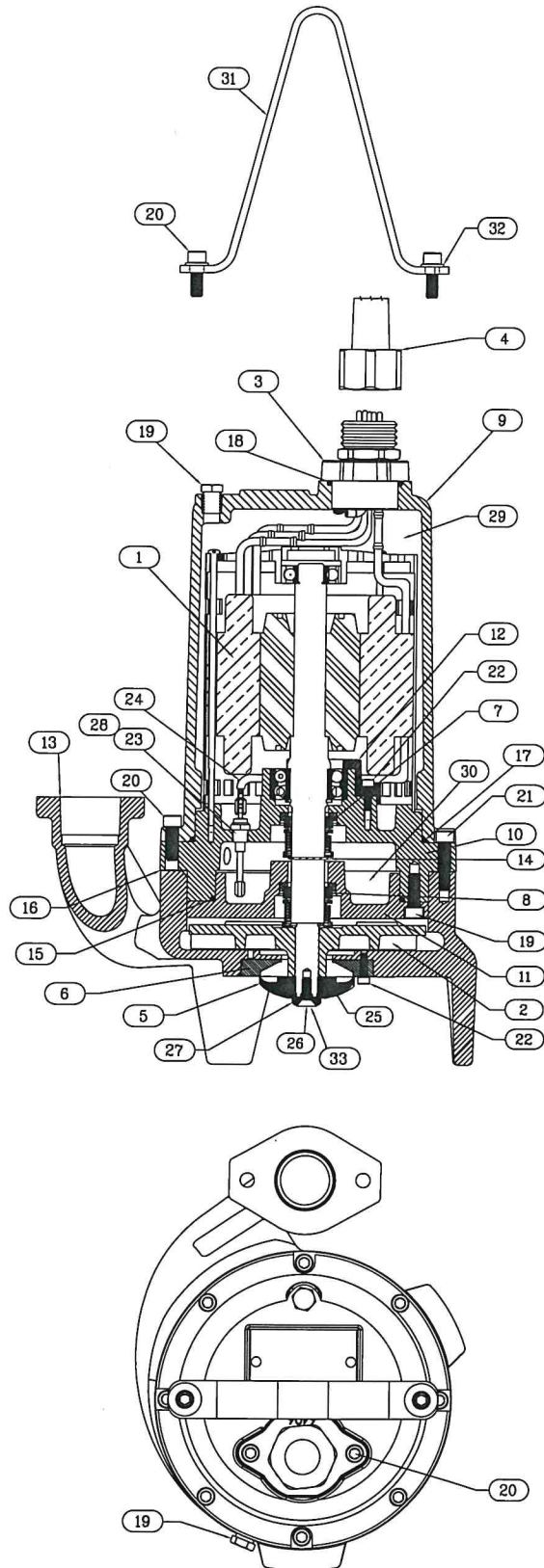
Item No.	Engineering No.	Description	Qty.
1	28139B000	VH20-21 Motor Assembly	1
	28139B001	VH20-03 Motor Assembly	1
	28139B002	VH20-23 Motor Assembly	1
	28139B002	VH20-43 Motor Assembly	1
	28139B000	VS20-21 Motor Assembly	1
	28139B001	VS20-03 Motor Assembly	1
	28139B002	VS20-23 Motor Assembly	1
	28139B002	VS20-43 Motor Assembly	1
2	28134B000	Impeller, V2H, 6.25" O.D.	1
	28134B001	Impeller, V2S, 5.25" O.D.	1
3	144245005	Cord Cap, Standard, 12-5	1
	28159B020	Cord Cap, O/D (Optional)	1
4	28171B020	Power Cord, O/D, 12-5 (Optional)	1
5	28145B000	Rotating Cutter	1
6	28146B000	Stationary Cutter, V2H	1
	28146B001	Stationary Cutter, V2S	1
7	21576A010	Seal, 7/8" Shaft, Upper	1
8	21576A010	Seal, 7/8" Shaft, Lower	1
9	28132B000	Motor Dome	1
10	28135D000	Seal/Bearing Housing	1
11	28136D000	Lower Seal Plate	1
12	28154B000	Bearing Cap	1
13	28133D000	Volute	1
14	12558A006	Ring, Retaining	1
15	001500131	O-ring, 1/8" X 4.12 I.D.	1
16	05876A120	O-ring, 1/8" X 6.25 I.D.	1
17	05876A125	O-ring, 1/8" X 5.859 I.D.	1
18	05876A244	O-ring, 3/32" X 1.737 I.D.	1
19	05022A088	Plug, 1/4" Pipe	2
20	001780081	Screw, Socket Head, 5/16" X .875"	10
21	001780051	Screw, Socket Head, 5/16" X 1.25"	4
22	048200061	Screw, Socket Head, 10-24 X .625"	7
23	109010001	Probe, Seal Fail	1
24	22578A102	Electrode Assembly	1
25	006280571	Shim, 1.00 O.D. X .625 I.D. X .002	1
	006280581	Shim, 1.00 O.D. X .625 I.D. X .005	2
26	011300021	Screw, Flat Head, 1/4" X .75"	1
27	21583A000	Washer, Retaining	1
28	000870081	Plug, 1/8" Pipe	1
29	132531001	Premium Oil, Motor	1.92 qts.
30	132531001	Premium Oil, Seal Chamber	.32 qts.



COMMON PARTS LIST (For pumps built after June 2017)

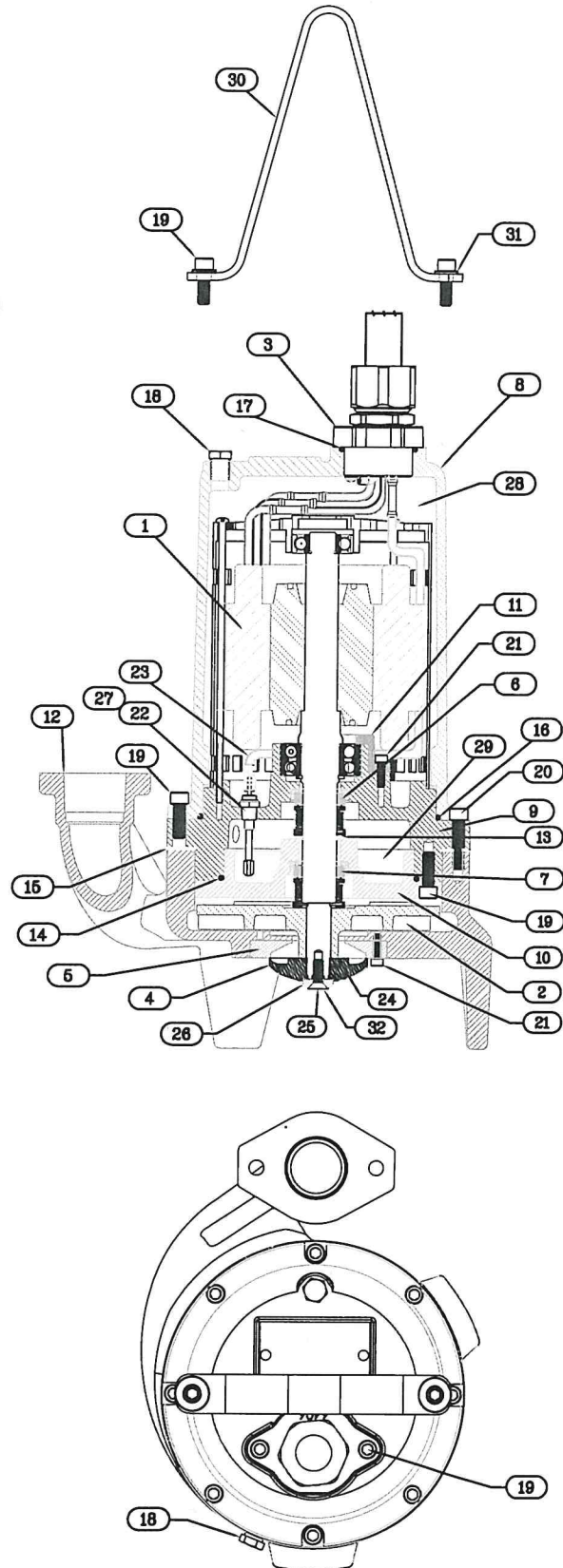
Item No.	Engineering No.	Description	Qty.
1	28139B000	230 V 1 Phase Motor Assembly	1
	28139B001	200 V 3 Phase Motor Assembly	
	28139B002	230/460 V 3 Phase Motor Assembly	
	28139B004	575 V 3 Phase Motor Assembly	
	28139B003	200 V 1 Phase Motor Assembly	
2	28228B000	Impeller, VH20, 6.25" O.D.	1
	28228B001	Impeller, VS20, 5.313" O.D.	
	28228B003	Impeller, VF20, 4.50" O.D.	
3	144245005	Cord Cap, Standard, 20" 12-5	1
	28159B020	Cord Cap, O/D (Optional)	
4	28171B020	Power Cord, O/D, 12-5 (Optional)	
5	28145B000	Rotating Cutter - VH20/VS20 models	1
	28187B000	Rotating Cutter - VF20 models	
6	28227B000	Stationary Cutter - VH20/VS20 models	1
	28168B000	Stationary Cutter - VF20 models	
7	21576A010	Seal, 7/8" Shaft, Upper	1*
8	21576A010	Seal, 7/8" Shaft, Lower	1*
9	28132B000	Motor Dome	1
10	28135D000	Seal/Bearing Housing	1
11	28136D000	Lower Seal Plate	1
12	28154B000	Bearing Cap	1
13	28133D001	Volute	1
14	12558A006	Ring, Retaining	1
15	001500131	O-ring, 1/8" X 4.12 I.D.	1*
16	28229A000	Volute Shim; .005 Thickness	4
	28229A101	Volute Shim; .010 Thickness	1
	28229A102	Volute Shim; .020 Thickness	1
17	05876A125	O-ring, 1/8" X 5.859 I.D.	1*
18	05876A244	O-ring, 3/32" X 1.737 I.D.	1*
19	05022A088	Plug, 1/4" Pipe	2
20	001780081	Screw, Socket Head, 5/16" X .875"	12
21	001780051	Screw, Socket Head, 5/16" X 1.25"	4
22	048200061	Screw, Socket Head, 10-24 X .625"	7
23	109010001	Probe, Seal Fail	1*
24	22578A102	ELECTRODE ASSY V2 GRINDER	1*
25	006280571	Shim, 1.00 O.D. X .625 I.D. X .002	1*
	006280581	Shim, 1.00 O.D. X .625 I.D. X .005	2*
26	011300021	SCREW-MACH(FL HD)1/4-20 X 3/4	1
27	21583A000	Washer, Retaining	1
28	000870081	Plug, 1/8" Pipe	1
29	132531001	Premium Oil, Motor	1.92 qts.
30	132531001	Premium Oil, Seal Chamber	.32 qts.
31	25371B010	Lifting Bail	1
32	001560231	Washer, Flat, 5/16" SST	2
33	001560711	Spacer, VF20 models only	1

* All components listed with an asterisk are included in repair kit 25218A425.



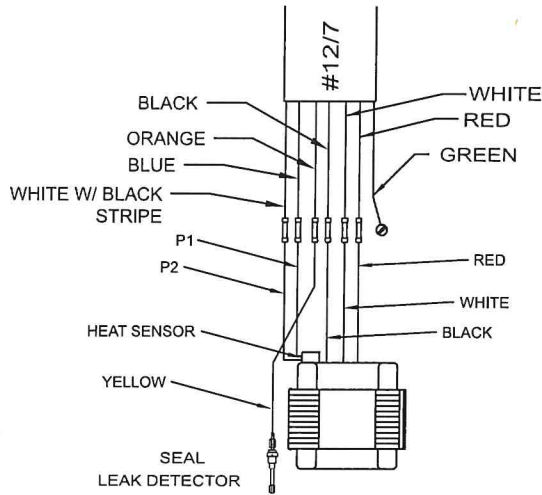
COMMON PARTS LIST (For pumps built after September 2021)

ITEM	ENGINEERING NO.	DESCRIPTION	QTY.
1	28139B000	230 V 1 Phase Motor Assembly	1
	28139B001	200 V 3 Phase Motor Assembly	1
	28139B002	230/460 V 3 Phase Motor Assembly	1
	28139B004	575 V 3 Phase Motor Assembly	1
	28139B003	200 V 1 Phase Motor Assembly	1
2	28228B000	Impeller, VH20, 6.25" O.D.	1
	28228B001	Impeller, VS20, 5.313" O.D.	1
	28228B003	Impeller, VF20, 4.50" O.D.	1
3	144240025	Cord Cap, Standard, 20' 12-7	1
	144240115	Cord Cap, Standard, 35' 12-7	1
4	28145B000	Rotating Cutter - H20/VS20 models	1
	28187B000	Rotating Cutter - VF20 models	1
5	28227B000	Stationary Cutter - VH20/VS20 models	1
	28168B000	Stationary Cutter - VF20 models	1
6	21576A010	Seal, 7/8" Shaft, Upper	1*
7	21576A010	Seal, 7/8" Shaft, Lower	1*
8	28132B000	Motor Dome	1
9	28135D000	Seal/Bearing Housing	1
10	28136D000	Lower Seal Plate	1
11	28154B000	Bearing Cap	1
12	28133D001	Volute	1
13	12558A006	Ring, Retaining	1
14	001500131	O-Ring, 1/8" X 4.12 I.D.	1*
15	28229A100	Volute Shim; .005 Thickness	4
	28229A101	Volute Shim; .010 Thickness	1
	28229A102	Volute Shim; .020 Thickness	1
16	05876A125	O-Ring, 1/8" X 5.859 I.D.	1*
17	05876A244	O-Ring, 3/32" X 1.7371 D.	1*
18	05022A088	Plug, 1/4" Pipe	2
19	001780081	Screw, Socket Head, 5/16" X .875"	12
20	001780051	Screw, Socket Head, 5/16" X 1.25"	4
21	048200061	Screw, Socket Head, 10-24 X .625"	7
22	109010001	Probe, Seal Fail	1*
23	22578A102	ELECTRODE ASSY V2 GRINDER	1*
24	006280571	Shim, 1.00 O.D. X .625 I.D. X .002	1*
	006280581	Shim, 1.00 O.D. X .625 I.D. X .005	2*
25	011300021	SCREW-MACH(FL HD)1/4-20 X 3/4	1
26	21583A000	Washer, Retaining	1
27	000870081	Plug, 1/8" Pipe	1
28	132531001	Premium Oil, Motor	1.92 qts.
29	132531001	Premium Oil, Seal Chamber	.32 qts.
30	25371B010	Lifting Bail	1
31	001560231	Washer, Flat, 5/16" SST	2
32	001560711	Spacer, VF20 models only	1

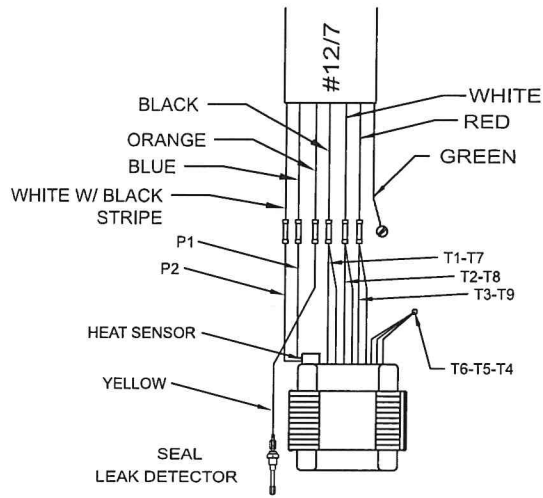


*All components listed with an asterick are included in repair kit 25218A425

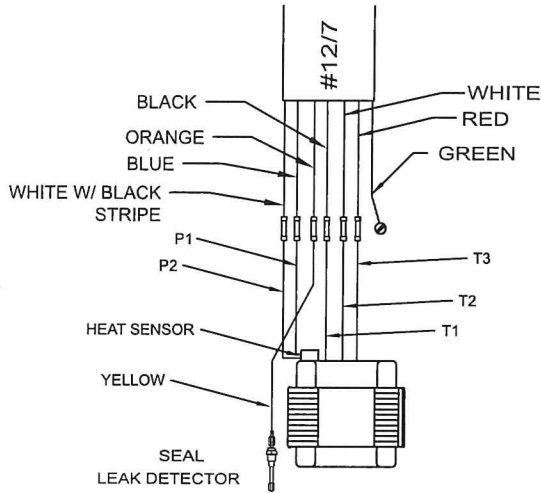
MOTOR WIRING DIAGRAM



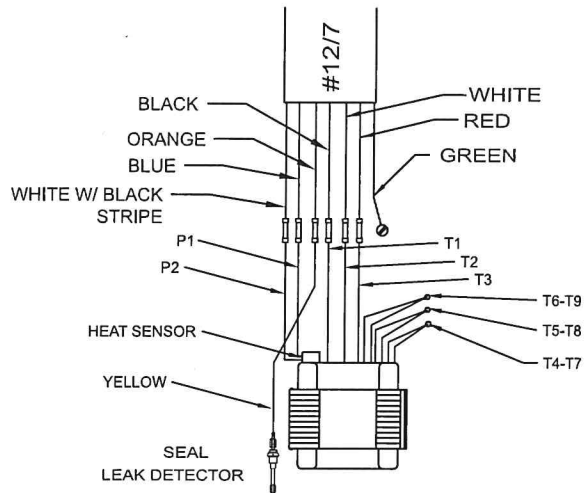
2HP, 200V AND 230V 1PH
WITH SEAL LEAK DETECTOR
& 12/7 COND. CORD



2HP, 230V 3PH WITH
WITH SEAL LEAK DETECTOR
& 12/7 COND. CORD



2HP, 200V AND 575V 3PH
WITH SEAL LEAK DETECTOR
& 12/7 COND. CORD



2HP, 460V 3PH WITH
WITH SEAL LEAK DETECTOR
& 12/7 COND. CORD

Motor	Resistance Main (Ohms)	Resistance Start (Ohms)
230/1/60	1.27	7.35
200/3/60	1.74	-
230/3/60	2.23	-
460/3/60	8.67-8.80	-
200/1/60	1.03	3.58
575/3/60	8.55-8.80	

TROUBLESHOOTING

CONDITION	PROBABLE CAUSE
<p>Pump runs but does not pump liquid from basin.</p>	<p>Pump impeller may be air locked; this occasionally occurs in a new installation. Start and stop pump several times to purge air.</p> <ol style="list-style-type: none"> a. Run additional water into basin so that the pump will be submerged deeper to clear air. b. If air does not clear, it may be necessary to lift pump out of sealing elbow and start motor to allow pump to pump for a few seconds. If discharge is piped in with union, slightly break union and start pump to clear air. <p>If pump has been installed for some time and does not pump, it may be clogged at grinder inlet.</p> <p>Discharge gate valve may be closed.</p> <p>Discharge check valve may be clogged or have a broken clapper.</p> <p>Discharge head may be too high. Check elevation.</p>
<p>Red light comes on at control box.</p>	<p>This indicates some water has leaked past the lower seal and has entered the seal chamber and made contact with the electrode probe. Pump must be removed from basin immediately for replacement of lower seal.</p>
<p>Overload trips and high water level alarms.</p>	<p>Push in red reset button to reset overload. If overload trips again after short run, remove pump and check for damage.</p> <p>Check grinder for clogged material as this can cause an overload condition on the motor. A faulty component in the control box could exist.</p>
<p>Yellow run light stays on continuously.</p>	<p>Indicates H-O-A switch may be in the Hand position.</p> <p>Level control switch may have failed causing pump to continue to operate when water is below lower float.</p> <p>Grinder assembly may be partially clogged causing pump to operate at very reduced capacity.</p> <p>Check valve may be clogged causing low pump flow. Gate valve may be in OFF position.</p> <p>Pump may be air locked.</p>
<p>Circuit breaker trips.</p>	<p>Reset breaker by pushing down on the handle, then put back to the ON position.</p> <p>If breaker trips again in a few seconds, that indicates excessive load probably caused by a short in the motor or control box.</p> <p>If condition happens after an electrical storm, motor or control box may be damaged by lightning.</p> <p>A resistance reading of the motor with the lead wires disconnected from the control box can determine if the trouble is in the motor or control box.</p>
<p>Pump is noisy and pump rate is low.</p>	<p>Grinder assembly may be partially clogged with foreign objects causing overload on the motor.</p> <p>Grinder impeller may be rubbing due to bent shaft or misalignment.</p>
<p>Grease and solids have accumulated around pump and will not pump out of the basin.</p>	<p>Pump On switch may be set too high.</p> <p>Run pump on Hand operation for several minutes with small amount of water running into basin to clean out solids and grease. This allows pump to break suction and break up the solids.</p> <p>Trash may have accumulated around lower weight causing pump to turn off too soon.</p> <p>Clean the trash from the weight and suspension cable.</p>

LIMITED WARRANTY



V AND VR SERIES

LIMITED WARRANTY

Pentair Myers warrants its V and VR series grinders against defects in material and workmanship for a period of 24 months from the manufacturing date, or 36 months from the manufacturing date with completion of a start-up report within 30 days of installation. Product must be properly installed, serviced and operated in compliance with the manufacturer's instruction manuals.

During the warranty period and subject to the conditions set forth, Pentair Myers, at its discretion, will repair or replace to the original user, the parts that prove defective in materials and workmanship. Pentair Myers reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for prior sold and/or shipped units.

Start-up reports and electrical schematics may be required to support warranty claims. Submit at the time of start-up through the Pentair Myers website: <http://forms.pentairliterature.com/startupform/startupform.asp?type=m>. All seal fail and heat sensing devices must be connected, functional and monitored or this warranty will be void. Pentair Myers will cover only the lower seal and labor thereof for all dual seal pumps. Under no circumstance will Pentair Myers be responsible for the cost of field labor, travel expenses, rented equipment, removal/reinstallation costs or freight expenses to and from the factory or an authorized Pentair Myers service facility.

This limited warranty will not apply:

- a) To defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with the printed instructions provided;
- b) To failures resulting from abuse, accident or negligence;
- c) To failures resulting from excessive sand, lime, cement, gravel or other abrasive materials
- d) To failures caused by scale or corrosion build-up due to excessive hydrocarbons or chemical content
- e) To normal maintenance services and parts used in connection with such service;
- f) To units that are not installed in accordance with applicable local codes, ordinances and good trade practices;
- g) If the unit is moved from its original installation location;
- h) If unit is used for purposes other than for what it is designed and manufactured;
- i) To any unit that has been repaired or altered by anyone other than Pentair Myers or an authorized Pentair Myers service provider;
- j) To any unit that has been repaired using non factory specified/OEM parts.

Warranty Exclusions: PENTAIR MYERS MAKES NO EXPRESS OR IMPLIED WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. PENTAIR MYERS SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE.

Liability Limitation: IN NO EVENT SHALL PENTAIR MYERS BE LIABLE OR RESPONSIBLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES RESULTING FROM OR RELATED IN ANY MANNER TO ANY PENTAIR MYERS PRODUCT OR PARTS THEREOF. PERSONAL INJURY AND/OR PROPERTY DAMAGE MAY RESULT FROM IMPROPER INSTALLATION. PENTAIR MYERS DISCLAIMS ALL LIABILITY, INCLUDING LIABILITY UNDER THIS WARRANTY, FOR IMPROPER INSTALLATION. PENTAIR MYERS RECOMMENDS INSTALLATION BY PROFESSIONALS.

Some states do not permit some or all of the above warranty limitations or the exclusion or limitation of incidental or consequential damages and therefore such limitations may not apply to you. no warranties or representations at any time made by any representatives of Pentair Myers shall vary or expand the provision hereof.

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**FIBERGLASS BASIN
DATA**



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Prefabricated FRP Lift Station Sample Specifications

Section 2 – Products

1. *Materials*

- 1.1. Fiberglass Reinforced Polyester Wet Well (and Integral Valvebox): Unless otherwise indicated the plastic terminology used in this specification shall be in accordance with the definitions given in American Society for Testing and Materials (ASTM) designations D883 - Definitions of Terms Relating to Plastics.

2. *Resins:*

- 2.1. The resins used shall be a commercial grade polyester and shall be evaluated as a laminate by test or determined by previous service to be acceptable for the intended environment. The resins used may contain the minimum amount of fillers or additives required to improve handling properties. Up to 5% by weight of thixotropic agent, which will not interfere with visual inspection, may be added to the resin for viscosity control. Resins may contain pigments and dyes by agreement between manufacturer and engineer, recognizing that such additives may interfere with visual inspection of FRP laminate quality.

3. *Reinforced Material:*

- 3.1. The reinforcing material shall be a commercial grade of glass fiber (continuous strand, chopped-strand, continuous mat and non-continuous mat) having a coupling agent, which will provide a suitable bond between the glass reinforcement material and resin.

4. *Laminate Structure:*

- 4.1. The FRP laminate shall consist of a resin rich inner surface: chop-spray interior liner; and, a chop-hoop filament-wound structural exterior layer.
 - 4.1.1. Inner surface:
 - 4.1.1.1. The resin rich inner surface shall be free of cracks and crazing with smooth finish and with an average of not over two (2) pits per square foot, providing the pits are less than 0.125 inches in diameter and 0.3125 inches in depth and are covered with sufficient resin to avoid exposure of any fiberglass reinforcement material. Some waviness shall be permissible as long as the surface is smooth. Between 0.01 to 0.02 inches of resin, rich surface shall be provided.
 - 4.1.1.2. Chop-Spray Interior Liner: The interior liner shall be reinforced by 25 to 35% by weight of chopped strand glass fiber having fiber lengths from 0.5 to 2.0 inches. The chop-spray interior liner protects the chop-hoop filament-wound structural exterior liner from corrosion damage caused by “wicking” of the wet well liquid contents. A minimum of 0.100 inches of chop-spray interior liner shall be provided.
 - 4.1.1.3. Chop-Hoop Filament-Wound Structural Exterior Layer:
 - 4.1.1.3.1.1. The structural reinforcement of the wet well shall be by the chop-hoop filament-wound manufacturing method only. The axial reinforcement shall be continuous-strand glass fiber. The longitudinal reinforcement shall be chopped-strand glass fiber. The glass fiber reinforcement content of the chop-hoop filament wound structural exterior layer shall be 50 to 80% by weight. The exterior surface of the wet well shall be relatively smooth with no exposed reinforcement fibers or sharp projections. Hand finish work is permissible to prevent reinforcement fiber exposure. The wall thickness of the chop-hoop filament-wound structural exterior layer shall vary with the wet well height to provide the aggregate strength necessary to meet the tensile and flexural physical properties requirements.



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Prefabricated FRP Lift Station Sample Specifications

Section 2 – Products *(continued)*

5. *Physical Properties:*

- 5.1. Wet Well FRP Wall Laminate: The wet well FRP wall laminate must be designed to withstand wall collapse or buckling based on the following assumptions and third party specifications:
- 5.1.1.1. Hydrostatic Pressure of 62.4 lbs. per square foot
 - 5.1.1.2. Saturated soil weight of 120 lbs. per cubic foot
 - 5.1.1.3. Soil Modulus of 700 pounds per square foot
 - 5.1.1.4. Pipe stiffness values as specified in ASTM D3753
- The wet well FRP laminate must be constructed to withstand or exceed two times the assumed loading on any depth of the wet well.

6. *Wet Well FRP Bottom Laminate:*

- 6.1. The wet well FRP bottom laminate shall have less than 0.375 inches of center elastic deflection (deformation) when in service in totally submerged conditions.

7. *FRP Laminate Surface Hardness:*

- 7.1. The finished FRP laminate will have a Barcol Hardness of at least 90% of the resin manufacturer's specified hardness for the fully cured resin. The Barcol Hardness shall be the same for both interior and exterior surfaces.

8. *Wet Well Top Flange:*

- 8.1. The wet well top flange shall have an outside diameter at least 4.0 inches greater than the inside diameter of the well.
- 8.2. A six-hole pattern shall accommodate the mounting of a cover with at least 0.375 inches in diameter 300 series stainless steel fasteners. Non-corroding stainless steel threaded inserts shall be fully encapsulated with non-continuous mat or chopped-strand glass fiber reinforcement. The inserts shall have an offset tab to prevent stripping or spinning out when removing and reinserting cover fasteners.

9. *Steel Anti-Floatation Flange:*

- 9.1. The steel anti-floatation flange shall be constructed from 0.1875 inches thick ASTM A36 structural steel plate, encapsulated in at least 0.125 inches of chopped-strand glass fiber reinforcement on all sides. The steel anti-floatation flange shall be square with outside dimensions of at least 4.0 inches greater than the wet well inside diameter. The steel anti-floatation flange shall be attached to the wet well bottom with chopped-strand glass fiber reinforcement. Contractor shall place the wet well on a concrete pad and fill with grout covering the entire steel anti-floatation flange. The amount of grout shall be sufficient to prevent floatation of the wet well based on the jobsite conditions. The steel anti-floatation flange shall not require bolt holes to secure it to the concrete pad.

10. *Pump Quick Disconnect Mounting Studs:*

- 10.1.1. Shall be 300 series stainless steel threaded studs of at least 0.375 inches in diameter shall be used. The studs shall first be threaded into the 0.1875" inches thick ASTM A36 structural steel anti-floatation flange/bottom of the wet well and then welded into place. Once installed, the studs shall be sealed with at least two layers of non-continuous glass fiber mat or chopped-strand glass fiber reinforcement.



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Prefabricated FRP Lift Station Sample Specifications

Section 2 – Products (continued)

11. Discharge Coupling:

- 11.1. (1 1/4" and 2" Systems) A 1/4" or 2" NPT full coupling full welded in the center of a 14 gauge steel plate, finished with black enamel, shall be factory installed with at least 0.375 inches in diameter 300 series stainless steel fasteners. The wet well wall penetrations shall be sealed with silicone sealer. Couplings are also available in 304 stainless steel material. (3" and 4" systems) A sufficient quantity and type of "Link-Seal" type modular, mechanical, inter-locking, synthetic rubber links shaped to continuously fill the annular space between the discharge pipe and the aluminum sleeve shall be used to provide a hydrostatic seal. The aluminum sleeve shall be bolted on the wet well or valvebox wall and sealed with silicone sealer.

12. Electrical Coupling:

- 12.1. A NPT full coupling full welded in the center of an 14 gauge steel plate, finished with black enamel, shall be factory installed with at least 0.375 inches in diameter 300 series stainless steel fasteners. The wet well wall penetrations shall be sealed with silicone sealer. Couplings are also available in 304 stainless steel material.

13. Inlet Hub:

- 13.1. A 4" nominal pipe diameter thermoplastic pipe grommet shall be field installed by the contractor in a 5" diameter hole in the wet well wall. The pipe grommet shall provide a mechanical seal and shall not require any secondary sealing materials.

14. Float Bracket:

- 14.1. Float Bracket shall be fabricated from 300 series stainless steel with four compression style cord grips to maintain float level position. It shall be factory installed with at least 0.375 inches in diameter 300 series stainless steel fasteners. The wet well wall penetrations shall be sealed with silicone sealer.

15. Ventilation:

- 15.1. Wet well ventilation shall comply with all applicable codes.

16. Slide Rail Assembly:

- 16.1. The slide rail assembly shall include pump quick disconnect discharge elbow, sealing flange with rail guide, upper guiderail bracket, lifting cable and guiderails.

17. Pump Quick Disconnect (QDC) Discharge Elbow:

- 17.1. The pump quick disconnect (QDC) discharge elbow, made of cast iron, designed to mount directly on the wet well floor, shall be supplied for each pump. It shall have a standard ANSI B16.1 125 lb. flange, flat faced and drilled on the discharge side, with a machined mating pump connection. The design shall be such that connection between the pump and QDC is made without the need for any nuts, bolts or gaskets.

18. Sealing Flange with Rail Guide:

- 18.1. The sealing flange with rail guide shall be mounted on each pump discharge. It shall have a machined mating flange, which matches the QDC discharge elbow. Sealing of this pump and discharge piping connection shall be accomplished by a simple linear downward motion of the pump along the guiderails culminating with the entire weight of the pumping unit supported by the QDC discharge elbow.



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Prefabricated FRP Lift Station Sample Specifications

Section 2 – Products *(continued)*

19. Upper Guiderail Bracket:

19.1. The upper guiderail bracket, made from ASTM A283D structural steel, shall align and support the two guiderails at the top of the wet well. It shall bolt directly to the hatch frame (or aluminum upper guiderail bracket in wet wells with solid fiberglass covers) and incorporate a beveled stainless steel inserts for secure rail installation.

20. Lifting Cable:

20.1. The lifting cable shall be 300 series stainless steel with a diameter of at least 3/16" and a nominal breaking strength of at least 2500 pounds.

21. Guiderails:

21.1. The guiderails shall be _____ inch schedule 40 galvanized / stainless steel pipe. There shall be two guiderails per pump to insure proper alignment with the QDC discharge elbow and stationary piping.

22. Submersible Pumps:

23. Motor Control Panel:

24. Discharge Pipe and Fittings:

25. Valves

26. Solid Fiberglass Cover:

26.1. The solid fiberglass cover shall be constructed with continuous mat or chopped-strand glass fiber reinforcement with a minimum thickness of 0.325 inches. The cover shall be grass green in color. The cover shall be mounted to the wet well with six 300 series stainless steel fasteners of at least 0.375 inches in diameter.

-OR-

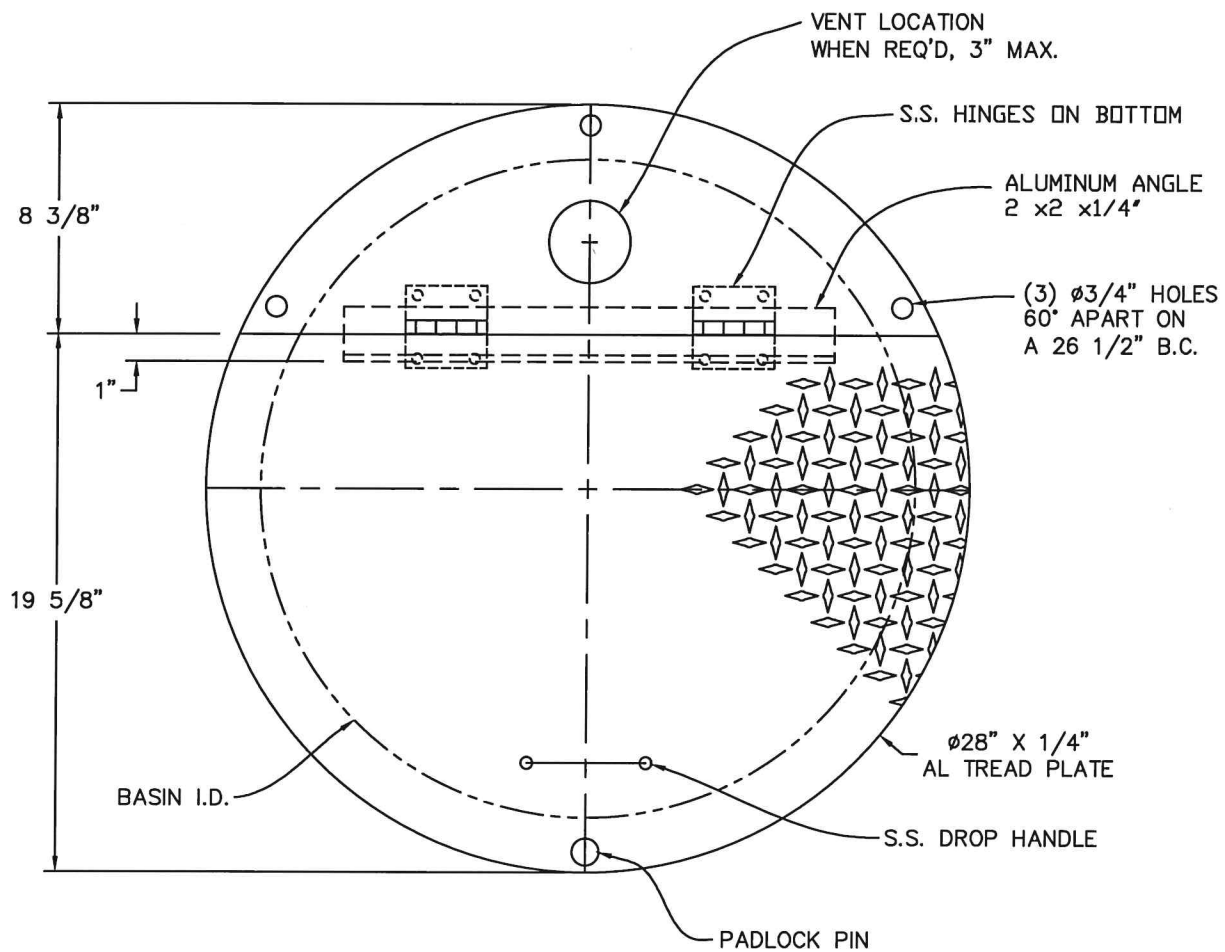
27. Steel Hatch Cover:

27.1. The wet well (and integral valvebox) cover shall be constructed of 0.375 inches thick black enameled ASTM A36 structural steel plate. The access hatch shall have a recessed handle and locking pin. The hatch shall be held open in the vertical position by means of a positive locking arm of corrosion resistant design. The cover shall be mounted to the wet well (and integral valvebox) with at least six 300 series stainless steel fasteners of at least 0.375 inches in diameter.

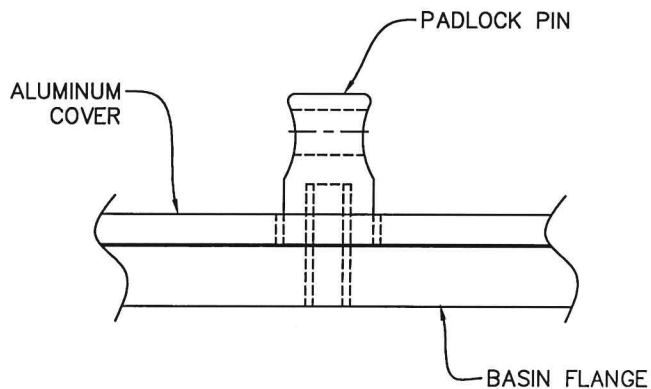
-OR-

28. Aluminum Hatch Cover:

28.1. The wet well (and integral valvebox) cover shall be constructed of 0.250 inches thick mill finish aluminum diamond plate with 300 series stainless steel hardware. The access hatch shall have a recessed handle and locking pin. The hatch shall be held open in the vertical position by means of a hold open arm of corrosion resistant design. The cover shall be mounted to the wet well (and integral valvebox) with a least six 300 series stainless steel fasteners of at least 0.375 inches in diameter.



TOP VIEW



DETAILED SIDE VIEW OF
PADLOCK PIN INSTALLED

-300 PSF LOAD RATING



STEELE PLASTICS, LLC
1280 Sturgis Road
Conway, AR 72034
(501) 327-5122 Fax (501) 327-0807

TITLE 24" ALUMINUM 70/30 SPLIT COVER

PROJECT

JOB NO.

P.O. NO.

ACCESSORIES



FLOAT SWITCH – CONTROL DUTY

2900 MERCURY SERIES – NARROW ANGLE FLOAT SWITCH

GENERAL

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

SWITCH VARIATIONS

NORMALLY OPEN (N/O)

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

NORMALLY CLOSED (N/C)

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

SINGLE POLE, DOUBLE THROW (SPDT)

A VARIATION OF THE PREVIOUSLY LISTED SWITCHES. THIS FLOAT SWITCH CAN BE WIRED TO OPERATE AS EITHER (BUT NOT BOTH) A NORMALLY OPEN OR NORMALLY CLOSED SWITCH BASED ON THE USER'S NEED.

SWITCH SPECIFICATIONS

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

MINIMUM OPERATING TEMPERATURE	-	32 DEGREES F.
MAXIMUM OPERATING TEMPERATURE	-	170 DEGREES F.
ELECTRICAL RATING	-	10 AMP – 120 VAC, 3 AMP – 240 VAC
ACTUATION POINT	-	1" ABOVE / BELOW HORIZONTAL.

POWER CORD SPECIFICATIONS

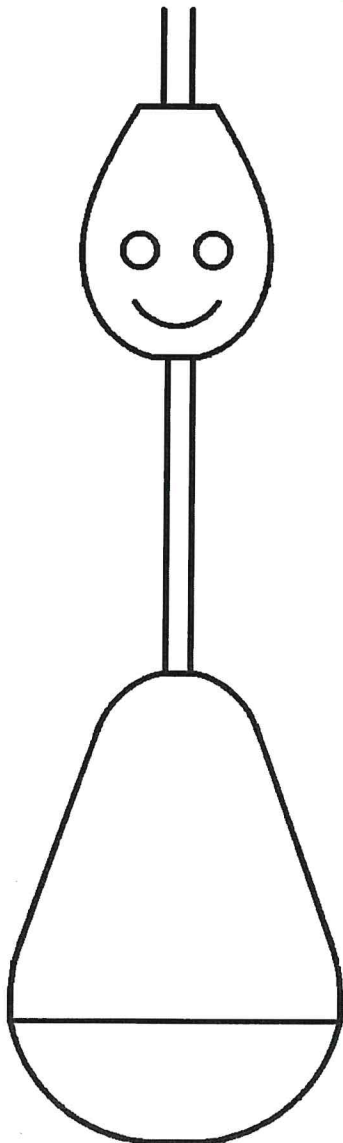
CONDUCTOR CORD – PHYSICAL	-	CHLORINATED POLY ETHYLENE.
ELECTRICAL FOR N/O OR N/C SWITCH	-	18 AWG 2, TYPE SJOOW-300 VOLT.
ELECTRICAL FOR SPDT SWITCH	-	18 AWG 3, TYPE SJOOW-300 VOLT.

FLOAT SPECIFICATIONS

DURABLE POLYPROPYLENE MATERIAL CONSTRUCTION.
 SOLID POLYURETHANE FOAM INTERIOR.
 LEAK PROOF, SHOCK PROOF, AND IMPACT RESISTANT.
 RESISTANT TO SEWAGE AND WASTEWATER APPLICATIONS.
 FOR USE WITH INTRINSICALLY SAFE CIRCUITS.

CORD WEIGHT

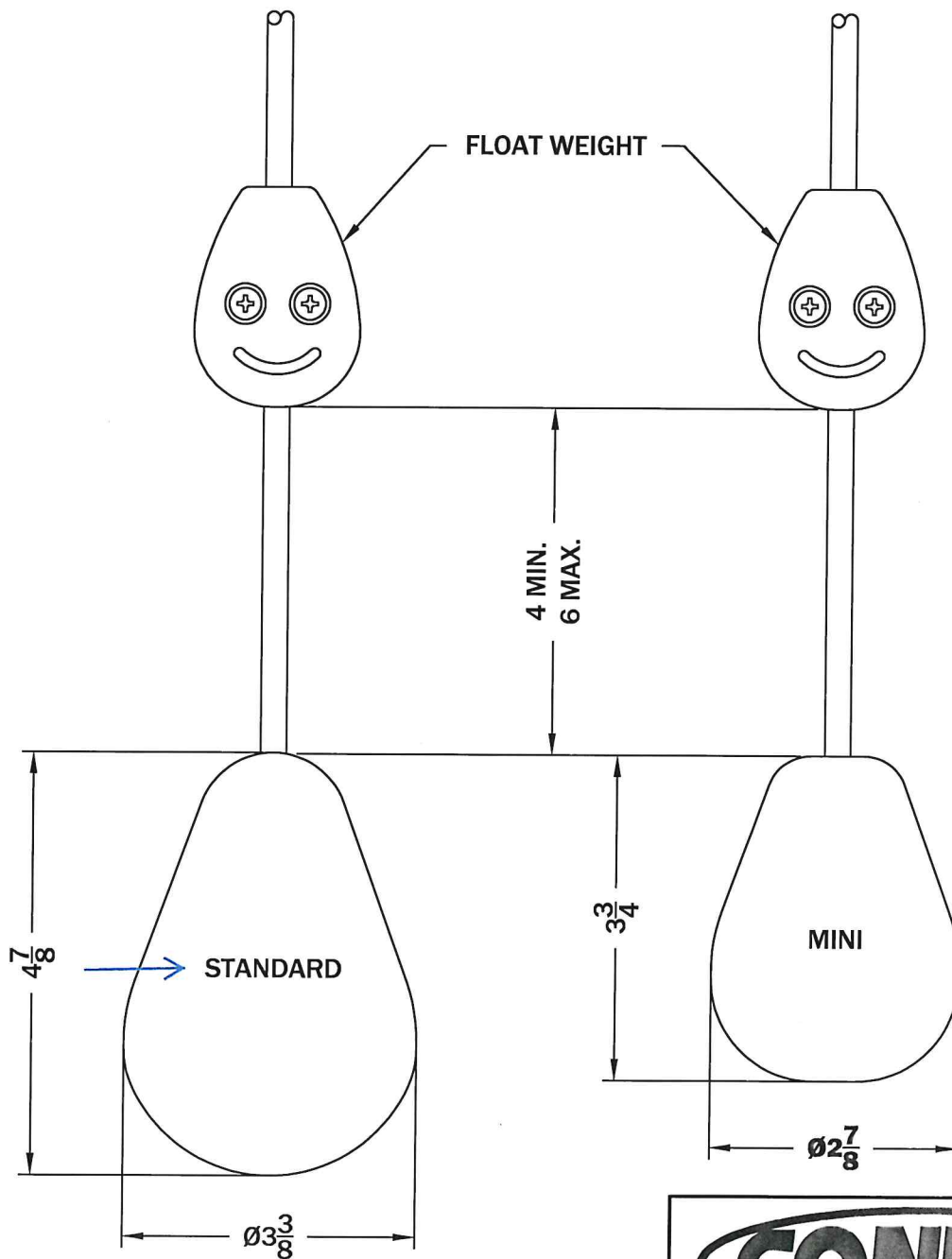
ZINC PLATED CAST IRON – 1.22 LBS.
 SPLIT WEIGHT DESIGN ALLOWS FOR EASY ADJUSTMENT.
 DESIGN ALLOWS FOR SECURE AND PERMANENT ATTACHMENT TO CORD.



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CHANGES	TOLERANCES	DRAWN BY	DATE
F	DECIMALS	D. MIDDLETON	03/18/04
E	.XXX = ±.005	MATERIAL SPECIFICATION: NARROW ANGLE FLOAT SWITCH	
D	.XX = ±.010		
C	FRACTIONAL		
B	X/X = ±.1/64		
A	ANGLES		
	X' = ±1/2'		

SPECIFICATION SHEET MERCURY FLOAT	
SCALE: HALF	PART NO. 2900 SERIES B1,B2

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

2900 SERIES B1, B2

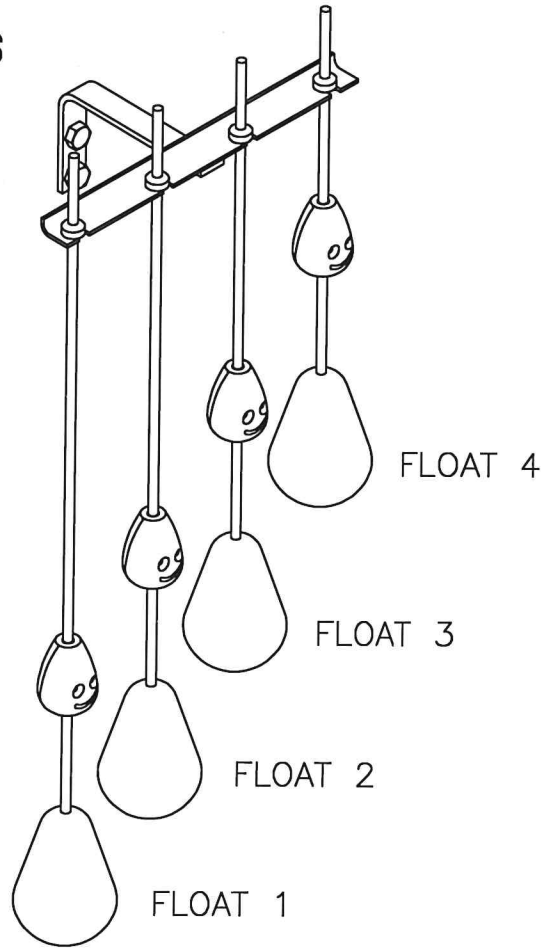
PAGE
2

→ NOTE; ONLY AN EXAMPLE

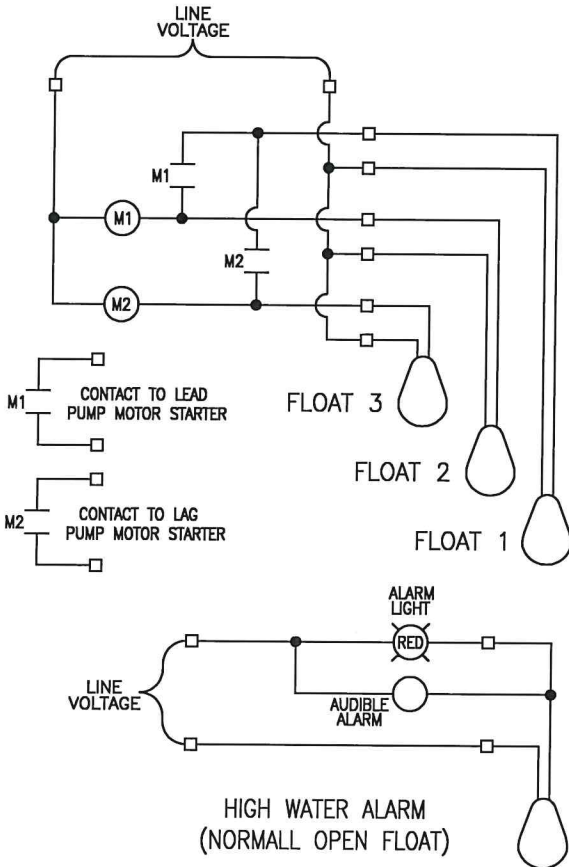
FOR PUMP DOWN USE
 (NORMALLY OPEN FLOATS)
 FOR PUMP UP USE
 (NORMALLY CLOSED FLOATS)
 FOR SPDT FLOATS
 GREEN - N/O
 WHITE - COMMON
 BLACK - N/C



TYPICAL MOUNTING



TYPICAL 2 PUMP USES



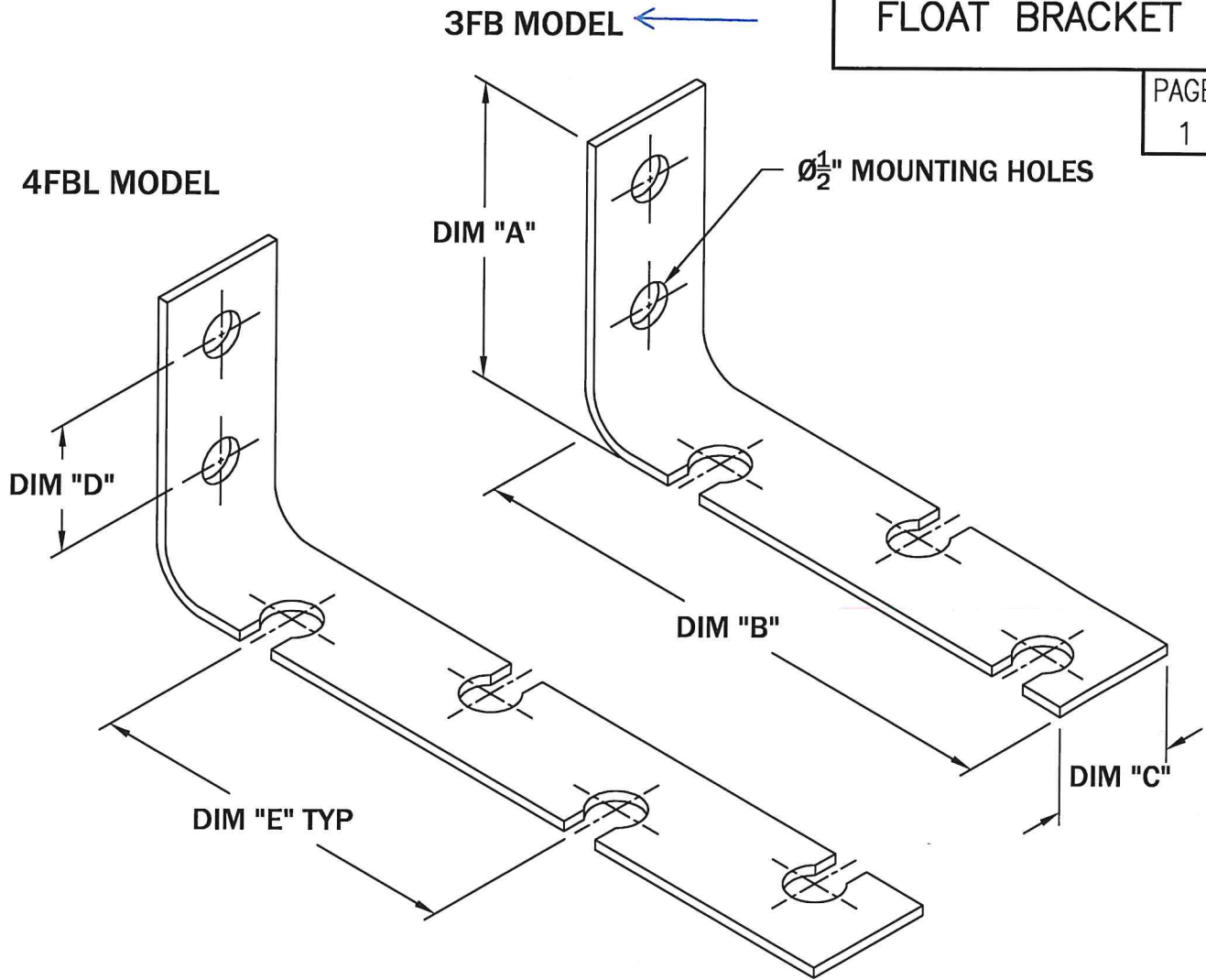
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 CONFIDENTIAL AND PROPRIETARY TO CONERY MFG, INC.



CHANGES		TOLERANCES	DRAWN BY	DATE	SPECIFICATION SHEET MERCURY FLOAT	
F		DECIMALS	D. MIDDLETON	03/18/04	SCALE:	PART NO.
E		.XXX = ±.005	MATERIAL SPECIFICATION: NARROW ANGLE FLOAT SWITCH		NONE	2900 SERIES B1,B2
D		.XX = ±.010				
C		FRACTIONAL				
B		X/X = ±.1/64				
A		ANGLES				
		X' = ±1/2'				

FLOAT BRACKET

PAGE
1



MODEL NO.	DIA. "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"
→ 3FB	3 1/2"	6 1/2"	1 1/2"	1 1/2"	4 1/2"
4FBL	3 1/2"	9"	1 1/2"	1 1/2"	4 1/2"

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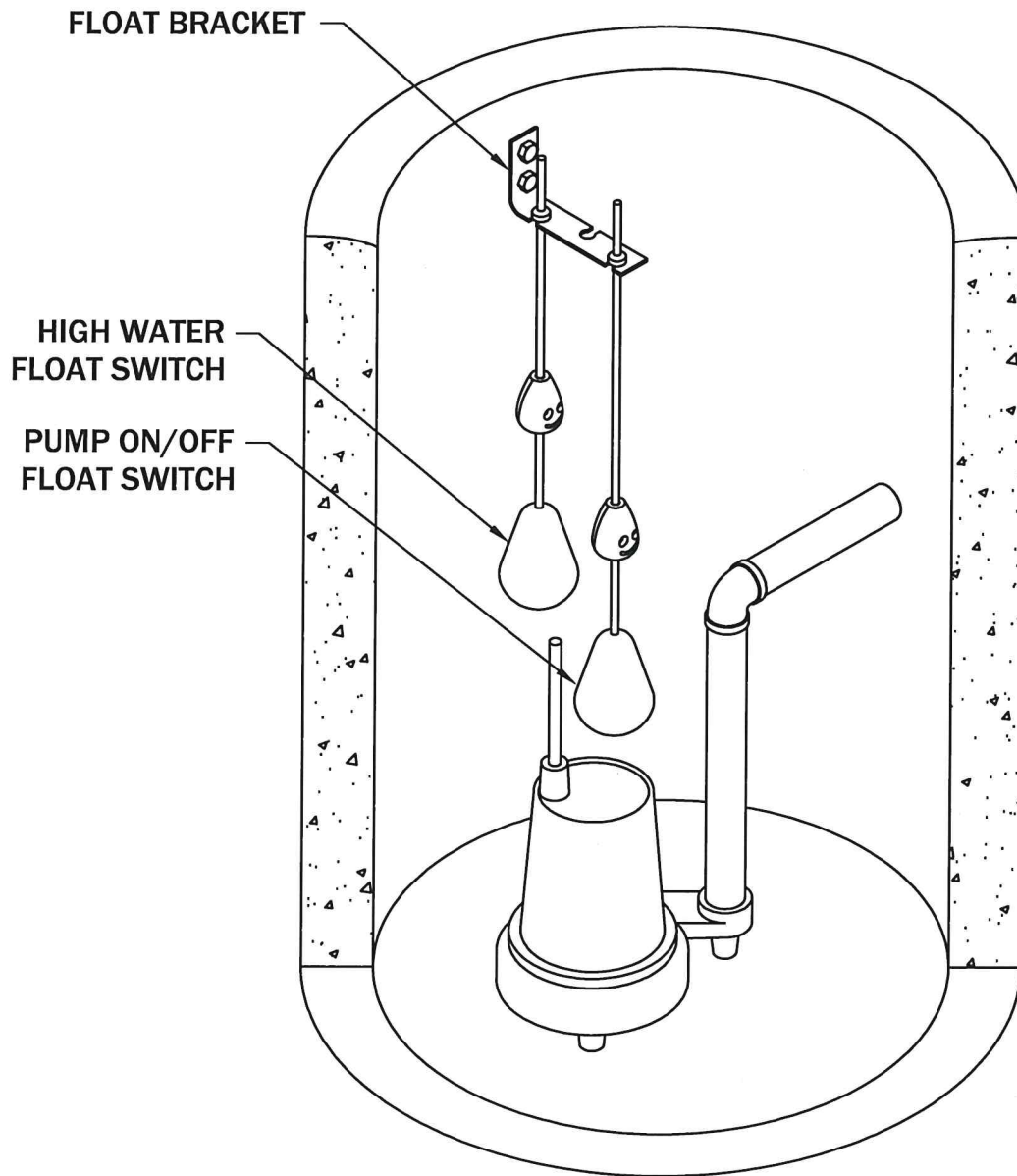


CHANGES	TOLERANCES	DRAWN BY	DATE	SPECIFICATION SHEET DIMENSIONAL DATA	
F	DECIMALS .XXX = ±.005 .XX = ±.010 FRACTIONAL X/X = ±.1/64 ANGLES X° = ±1/2°	D. MIDDLETON	03/22/04	SCALE:	PART NO.
E		MATERIAL SPECIFICATION: 300 SERIES SST		HALF	"L" SHAPED
D					
C					
B					
A					

TYPICAL APPLICATIONS

FLOAT BRACKET

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2



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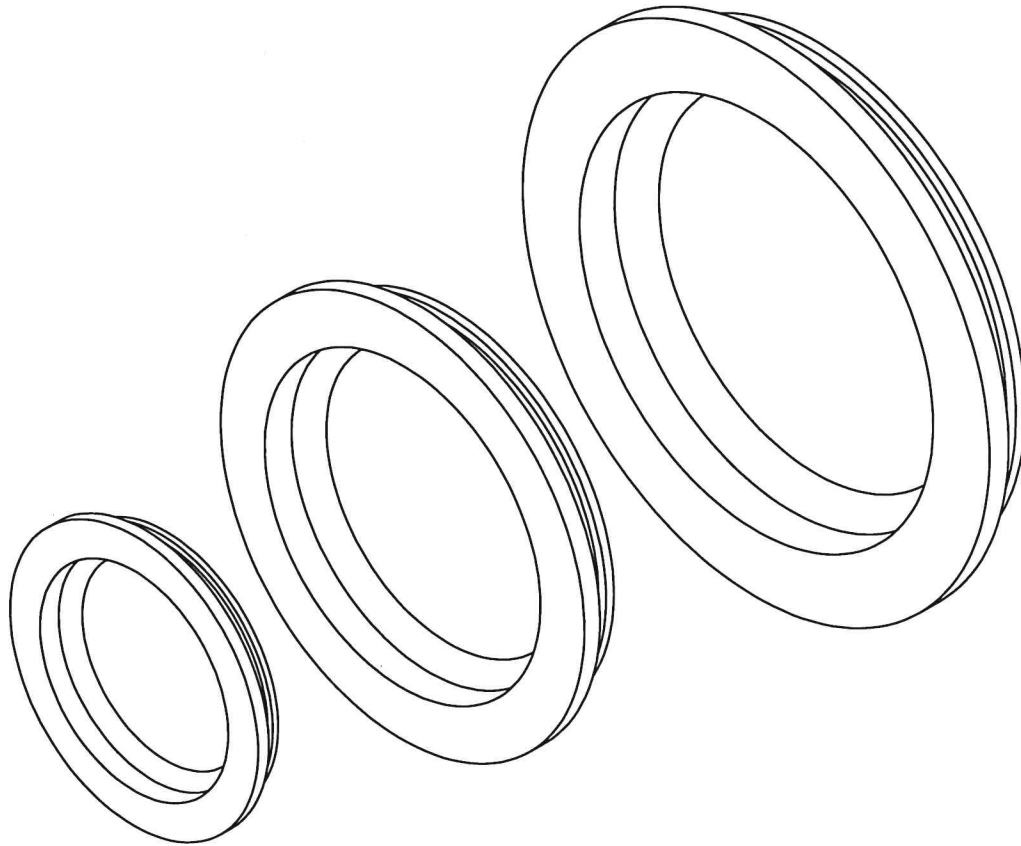


CHANGES	TOLERANCES	DRAWN BY	DATE	SPECIFICATION SHEET DIMENSIONAL DATA	
F	DECIMALS	D. MIDDLETON	03/22/04	SCALE:	PART NO.
E	.XXX = ±.005	MATERIAL SPECIFICATION: 300 SERIES SST		HALF	"L" SHAPED
D	.XX = ±.010				
C	FRACTIONAL				
B	X/X = ±.1/64				
A	ANGLES				
	X° = ±1/2°				

AVAILABLE IN A WIDE SIZE RANGE: 1/2" TO 6" PIPE
 4" & 6" MODELS AVAILABLE FOR SCH. 35 OR 40 PIPE
 QUICK & EASY INSTALLATION
 PROVIDES LIQUID TIGHT & VAPOR TIGHT SEAL
 NO MOUNTING HARDWARE REQUIRED.
 MADE FROM DURABLE RUBBER MATERIAL.

AAF SERIES

PAGE
1

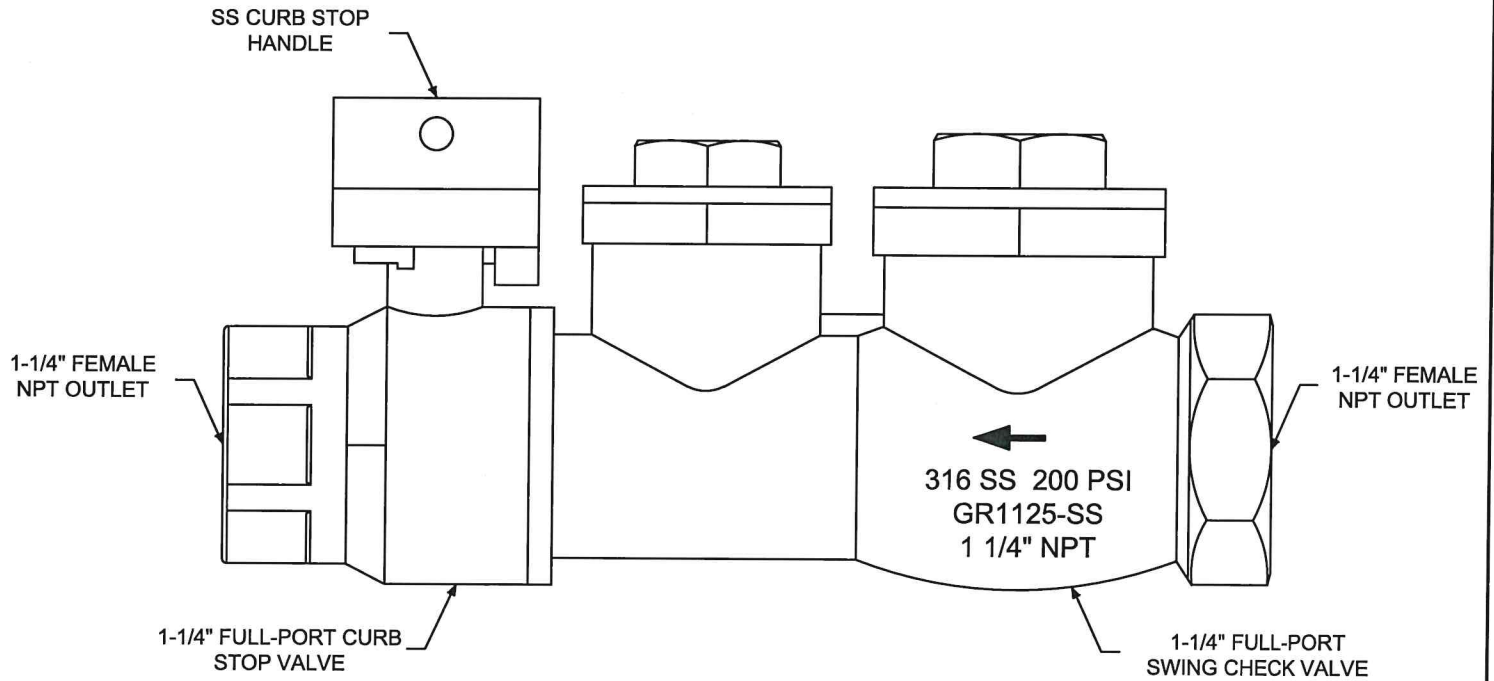


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CHANGES	TOLERANCES	DRAWN BY	DATE	SPECIFICATION SHEET DIMENSIONAL DATA	
F	DECIMALS	D. MIDDLETON	03/20/07	SCALE:	PART NO.
E	.XXX = ±.005	MATERIAL SPECIFICATION: AS NOTED		NONE	TANK FITTINGS
D	.XX = ±.010				
C	FRACTIONAL				
B	X/X = ±.1/64				
A	ANGLES				
	X° = ±1/2°				

ITEM	DESCRIPTION	MATERIAL SPECS	REMARKS
1	CURB STOP	316 STAINLESS STEEL	
2	SWING CHECK	316 STAINLESS STEEL	
3	SEATS	PTFE	
4	VALVE STEM PACKING	RPTFE	



NOTES:

1. WORKING PRESSURE RATING = 200 PSI
2. 316 SS MATERIAL
3. 1-1/4" NPT OUTLETS

NOTES: 100% HYDRO TESTED PRIOR TO LEAVING FACTORY	APP'D		DATE	
	CK'D		DATE	
	DRN	STM	DATE	3/13/18

TITLE

**1-1/4" SS LATERAL
ASSEMBLY FIPT x FIPT**



THE LATERAL CONNECTION CORP.

P/N GR1125-SS

DWG. NO.

1	OF	1	REV.
SHEET			

FORCED SEWER ASSEMBLY

SUBMITTAL INFORMATION - 316 SS

Curb Stop / Swing Check Assembly:

Steel Curb Stop / Swing Check Assembly for forced sewer applications shall be manufactured from 316 Stainless Steel Material. All valves shall be rated for 200 PSI Service. Each valve shall have an operating handle profiled for manual or service key operation, test port and access point to service check valve if required. Valves shall have female iron pipe end connections.

Service Connection Fittings:

Thermoplastic pressure fittings for cold-water applications shall be manufactured from Polypropylene compound and shall be rated for 200-PSI service. Fittings shall have outside O-ring sealed compression ends designed for the specified service tubing. Fittings should be ISO 9002 and NSF certified. Install fittings as per manufacture's recommendations.

Polypropylene Service Saddles:

Injection molded hinge style plastic saddle for use on O.D. controlled High Density Polyethylene Pipe (HDPE) and Schedule 40 and Schedule 80 PVC shall provide a pressure rated connection. Gasket shall be manufactured from SBR rubber and be molded in place. Saddles shall have a working pressure of 150 PSI and have been fully tested for use on Polyethylene main line pipe up through 4" diameter.



NDS[™]
WE PUT WATER IN ITS PLACE

TECHNICAL SPECIFICATIONS

113BC

Series: Standard Series

Box Color: Black

Box material : Polypropylene

Cover Color: Green

Cover Marking: Irrigation Control Valve

Cover material: HDPE

Box Weight: 5.70 lbs

Lid Weight: 2.61 lbs

Total Weight: 8.31 lbs

Load rating:

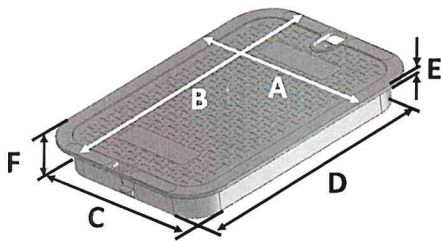
Pedestrian & lawn care equipment

Box includes 3/8-16 brass nut

All 14"x19" covers and risers fit this box

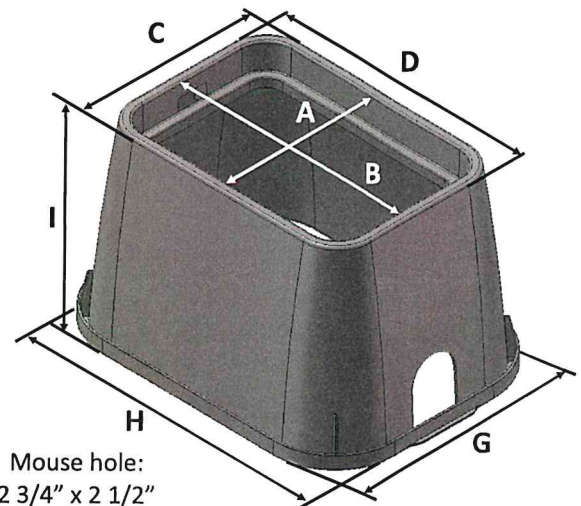
Made in USA

Made from 100% recycled materials



Lid Dimensions	
A. Top width	11 5/8"
B. Top length	16 13/16"
C. Bottom width	10 1/8"
D. Bottom length	15 1/4"
E. Rim thickness	1/4"
F. Overall height	2"

Box Dimensions	
A. Top inside width	10"
B. Top inside length	15"
C. Top outside width	11 5/8"
D. Top outside length	16 13/16"
E. Bottom inside width	15"
F. Bottom inside length	20"
G. Bottom outside width	16"
H. Bottom outside length	21"
I. Height	12"



851 N. Harvard Avenue
Lindsay, CA 93247
800-726-1994



Visit ndspro.com for specs,
detail drawings, and case studies



NDS[®]
WE PUT WATER IN ITS PLACE

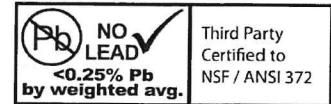
P-SS SERIES STAINLESS STEEL PITLESS ADAPTER

SPECIFICATION:

- Threads conform to ANSI/ASME B1.20.1
- Heavy duty stainless steel castings
- Fits 5" to 12" I.D. casing sizes
- Large gaskets ensure positive seal to well casing
- Chamfered slide for easy installation

CERTIFICATION:

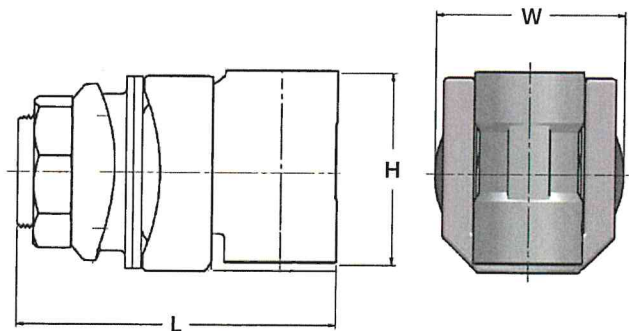
- NSF/ANSI Standard 372 Certified
- * Water Systems Council listed PAS-97 (2017)



Listed PAS-97 (2017)



MATERIAL LIST	
Part	Materials
Elbow	304 Stainless Steel
Slide	304 Stainless Steel
O-ring	NBR Rubber
Gaskets	NBR Rubber
Washer	304 Stainless Steel
Nut	304 Stainless Steel



DIMENSIONS												
Part No.	Drop Pipe Size	Casing Size I.D.	Hole Saw Size	Replacement O-ring	Working Load	H		L		W		Weight
	Inches	Inches	Inches	Standard	lbs	inches	mm	inches	mm	inches	mm	grams
P-800-SS	1	5 - 12	1-3/4	AS568-324	6000	2.75	69.95	4.48	113.87	2.60	65.99	1218
P-100-SS *	1	5 - 12	1-3/4	AS568-324	6000	2.77	70.36	4.64	117.73	2.76	70.10	1415
P-125-SS *	1-1/4	5 - 12	2-1/8	AS568-326	6000	3.15	79.88	5.02	127.41	3.15	79.88	2263
P-150-SS *	1-1/2	5 - 12	2-1/2	AS568-329	6000	4.09	103.89	5.74	145.85	3.71	94.23	4337
P-200-SS *	2	5 - 12	3-1/8	AS568-332	6000	4.75	120.65	6.50	165.05	4.50	114.30	6013



25 Whaley Avenue, PO Box 310, Milverton, ON CANADA N0K 1M0
Tel: 800-561-3164

boshart.com blog.boshart.com

proense® Stainless Steel Case / Stainless Steel Wetted Pressure Gauges

Dry and Liquid Filled Cases

Lower Mount



Center Back Mount



Features

- Stainless steel wetted parts for use with air, oil, water and corrosive liquids
- Restricted orifice to dampen pressure surges
- Crimp-on bezel
- Dual scale (psig/kPa)
- Dry or glycerin filled case to reduce needle fluctuations due to vibration
- ±1.5% of full scale value accuracy
- 5 year warranty

Applications

- Ideal for pumps, compressors, hydraulic presses, machinery, pneumatic equipment and motors in harsh environments



ProSense 2.5" All Stainless Steel Pressure Gauges				
Part Number	Description	Pcs/Pkg	Wt(lb)	Price
G25-SDV-4LS	Gauge, 2.5 in., SS Case, dry, -30 to 0 inHg/-100 to 0 kPa vacuum, SS-1/4 NPT, lower mount	1	0.4	\$36.50
G25-SD30-4LS	Gauge, 2.5 in., SS Case, dry, 0-30 psig/0-200 kPa, SS-1/4 NPT, lower mount	1	0.4	\$36.50
G25-SD60-4LS	Gauge, 2.5 in., SS Case, dry, 0-60 psig/0-420 kPa, SS-1/4 NPT, lower mount	1	0.4	\$36.50
G25-SD100-4LS	Gauge, 2.5 in., SS Case, dry, 0-100 psig/0-700 kPa, SS-1/4 NPT, lower mount	1	0.4	\$36.50
G25-SD160-4LS	Gauge, 2.5 in., SS Case, dry, 0-160 psig/0-1,100 kPa, SS-1/4 NPT, lower mount	1	0.4	\$36.50
G25-SD200-4LS	Gauge, 2.5 in., SS Case, dry, 0-200 psig/0-1,400 kPa, SS-1/4 NPT, lower mount	1	0.4	\$36.50
G25-SD300-4LS	Gauge, 2.5 in., SS Case, dry, 0-300 psig/0-2,000 kPa, SS-1/4 NPT, lower mount	1	0.4	\$36.50
G25-SD600-4LS	Gauge, 2.5 in., SS Case, dry, 0-600 psig/0-4,200 kPa, SS-1/4 NPT, lower mount	1	0.4	\$36.50
G25-SD1000-4LS	Gauge, 2.5 in., SS Case, dry, 0-1000 psig/0-7,000 kPa, SS-1/4 NPT, lower mount	1	0.4	\$36.50
G25-SDV-4CS	Gauge, 2.5 in., SS Case, dry, -30 to 0 inHg/-100 to 0 kPa vacuum, SS-1/4 NPT, center back mount	1	0.4	\$36.50
G25-SD30-4CS	Gauge, 2.5 in., SS Case, dry, 0-30 psig/0-200 kPa, SS-1/4 NPT, center back mount	1	0.4	\$36.50
G25-SD60-4CS	Gauge, 2.5 in., SS Case, dry, 0-60 psig/0-420 kPa, SS-1/4 NPT, center back mount	1	0.4	\$36.50
G25-SD100-4CS	Gauge, 2.5 in., SS Case, dry, 0-100 psig/0-700 kPa, SS-1/4 NPT, center back mount	1	0.4	\$36.50
G25-SD160-4CS	Gauge, 2.5 in., SS Case, dry, 0-160 psig/0-1,100 kPa, SS-1/4 NPT, center back mount	1	0.4	\$36.50
G25-SD200-4CS	Gauge, 2.5 in., SS Case, dry, 0-200 psig/0-1,400 kPa, SS-1/4 NPT, center back mount	1	0.4	\$36.50

ProSense 2.5" All Stainless Steel Steel Glycerin Filled Pressure Gauges				
Part Number	Description	Pcs/Pkg	Wt(lb)	Price
G25-SLV-4LS	Gauge, 2.5 in., SS Case, liquid fill, -30 to 0 inHg/-100 to 0 kPa vacuum, SS-1/4 NPT, lower mount	1	0.5	\$39.00
G25-SL30-4LS	Gauge, 2.5 in., SS Case, liquid fill, 0-30 psig/0-200 kPa, SS-1/4 NPT, lower mount	1	0.5	\$39.00
G25-SL60-4LS	Gauge, 2.5 in., SS Case, liquid fill, 0-60 psig/0-420 kPa, SS-1/4 NPT, lower mount	1	0.5	\$39.00
G25-SL100-4LS	Gauge, 2.5 in., SS Case, liquid fill, 0-100 psig/0-700 kPa, SS-1/4 NPT, lower mount	1	0.5	\$39.00
G25-SL160-4LS	Gauge, 2.5 in., SS Case, liquid fill, 0-160 psig/0-1,100 kPa, SS-1/4 NPT, lower mount	1	0.5	\$39.00
G25-SL200-4LS	Gauge, 2.5 in., SS Case, liquid fill, 0-200 psig/0-1,400 kPa, SS-1/4 NPT, lower mount	1	0.5	\$39.00
G25-SL300-4LS	Gauge, 2.5 in., SS Case, liquid fill, 0-300 psig/0-2,000 kPa, SS-1/4 NPT, lower mount	1	0.5	\$39.00
G25-SL600-4LS	Gauge, 2.5 in., SS Case, liquid fill, 0-600 psig/0-4,200 kPa, SS-1/4 NPT, lower mount	1	0.5	\$39.00
G25-SL1000-4LS	Gauge, 2.5 in., SS Case, liquid fill, 0-1000 psig/0-7,000 kPa, SS-1/4 NPT, lower mount	1	0.5	\$39.00
G25-SLV-4CS	Gauge, 2.5 in., SS Case, liquid fill, -30 to 0 inHg/-100 to 0 kPa vacuum, SS-1/4 NPT, center back mount	1	0.5	\$39.00
G25-SL30-4CS	Gauge, 2.5 in., SS Case, liquid fill, 0-30 psig/0-200 kPa, SS-1/4 NPT, center back mount	1	0.5	\$39.00
G25-SL60-4CS	Gauge, 2.5 in., SS Case, liquid fill, 0-60 psig/0-420 kPa, SS-1/4 NPT, center back mount	1	0.5	\$39.00
G25-SL100-4CS	Gauge, 2.5 in., SS Case, liquid fill, 0-100 psig/0-700 kPa, SS-1/4 NPT, center back mount	1	0.5	\$39.00
G25-SL160-4CS	Gauge, 2.5 in., SS Case, liquid fill, 0-160 psig/0-1,100 kPa, SS-1/4 NPT, center back mount	1	0.5	\$39.00
G25-SL200-4CS	Gauge, 2.5 in., SS Case, liquid fill, 0-200 psig/0-1,400 kPa, SS-1/4 NPT, center back mount	1	0.5	\$39.00

ProSense® Stainless Steel Case / Stainless Steel Wetted Pressure Gauges

ProSense All Stainless Steel Gauges Specifications	
Dial Size	2.5" [63 mm]
Case	AISI 304 SS
Lens	Polycarbonate
Ring	AISI 304 SS, Crimp-On
Socket	AISI 316 SS
Connection	1/4" NPT
Fill Liquid	Dry = None / Liquid Fill = Glycerin
Bourdon Tube	AISI 316 SS C-shaped for pressures up to 1000 psig (6,895 kPa)
Movement	Brass
Wetted Parts	AISI 316 SS
Pointer	Aluminum, anodized black
Welding	316 SS TIG Argon arc
Over Pressure Limit	125% of full scale
Gasket Material	Silicone rubber for socket; EPDM for lens, filling plug and blow-out vent (Liquid fill models)
Working Pressure	Maximum 75% of full scale value
Ambient/Process Temperature	Dry: -40°F to 250°F (-40°C to 120°C) Glycerin filled: -4°F to 150°F (-20°C to 65°C)
Accuracy	±1.5% of full scale value
Enclosure Rating	IP65

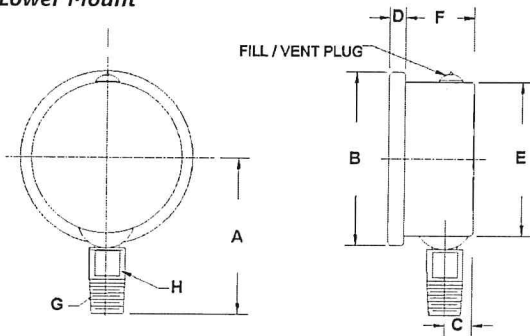


Warning: CHECK THE CHEMICAL COMPATIBILITY OF THE GAUGE'S WETTED PARTS WITH THE MEDIUM TO BE MEASURED. Use a suitable thread sealant such as Teflon® tape. Always tighten with an open end or adjustable wrench on the wrench flats. Never use any part of the pressure gauge to tighten other than the wrench flats that are on the gauge socket. Failure to do so will severely damage the pressure gauge.

Due to pressure buildup, some gauges (usually lower pressure ranges such as vacuum, up to 100 psig) may reflect a reading that is slightly "off zero". To properly "vent" the pressure gauge to atmosphere, make a small hole in the fill plug after you have installed the instrument.

Dimensions

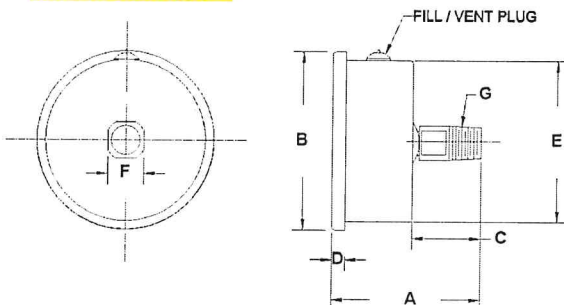
Lower Mount



Dimensions - Lower Mount Gauge

A	2.190" [55.6 mm]
B	2.700" [68.5 mm]
C	0.433" [11.0 mm]
D	0.250" [6.3 mm]
E	2.440" [61.9 mm]
F	1.035" [26.3 mm]
G	1/4" NPT
H	0.551" [14.0 mm]

Center Back Mount



Dimensions - Center Back Mount Gauge

A	2.264" [57.5 mm]
B	2.7" [68.5 mm]
C	1.175" [29.8 mm]
D	0.210" [5.3 mm]
E	2.445" [62 mm]
F	0.551" [14.0 mm]
G	1/4" NPT

See our website www.AutomationDirect.com for complete Engineering drawings.

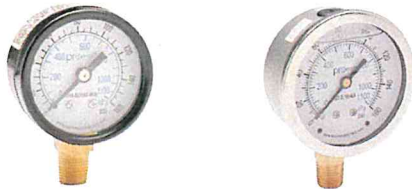
proSense® Pressure Gauges



Bourdon Tube Pressure Gauges

ProSense mechanical dial pressure gauges are available in a variety of configurations for use in most pneumatic, hydraulic, HVAC, plumbing, industrial and commercial applications. These high quality gauges use Bourdon tube sensing elements and do not require any external power sources to operate other than the media being sensed. Cases are available in durable steel or stainless steel and in either dry or liquid filled to dampen vibration and pulsations. Brass wetted parts are suitable for air, oil, or water applications while stainless steel wetted parts are available for corrosive applications. Dual marked dial faces (psig/kPa or inHg/kPa) are available in pressure ranges from vacuum up to 6000 psig.

The Bourdon tube pressure gauge applies the principle that a flattened tube will change to a more circular cross section when pressurized. These tubes are then bent into a C-shape with one end crimped close and the other connected to the process. When the pressure inside the tube becomes greater than the ambient pressure the tube tries to straighten; this elongation is converted to a rotational motion with the use of a pinion gear attached to the pointer.



The bourdon tubes are calibrated at the factory for a specific range known as gauge pressure*. This pressure is relative to ambient atmospheric pressure.

Pressure Gauge Terms:

- **Atmospheric Pressure:** The weight of a column of air measuring one square inch from sea level to the top of the atmosphere. Sea level pressure = 29.92 inHg / 101.325 kPa / 14.696 psig / 1.0132 bar
- **Absolute Pressure:** Zero (0) in reference to a perfect vacuum "Absolute Pressure" = gauge pressure (+) atmospheric pressure.
- ***Gauge Pressure:** Zero (0) in reference to "Atmospheric Pressure". "Gauge Pressure" = absolute pressure (-) atmospheric pressure.
- **Differential Pressure:** Is the difference in pressure between two measuring points.

Gauge Accuracy and Grade

Gauge accuracy and grade categorized by ASME (ANSI) Standard B40.1	
Gauge Accuracy	ANSI Grade
±5% Full Scale	D
±3% lower 1/4 Scale; ±2% middle 1/2 scale; ±3% upper 1/4 scale	B
±2% lower 1/4 Scale; ±1% middle 1/2 scale; ±2% upper 1/4 scale	A
±1% Full Scale	1A
±0.5% Full Scale	2A
±0.25% Full Scale	3A

Gauge Selection Considerations

Environment and Application

As the Bourdon tube is in direct contact with the medium being measured, the characteristics of the medium must be considered. If the medium is corrosive, stainless steel internals and casing should be chosen over brass. Brass is more suitable for general applications. The effects of moisture and weather conditions may also be harmful to the gauge and should be considered when selecting a gauge. Liquid filled gauges help prevent moisture build-up. Medium that will leave a deposit, clog or solidify in the Bourdon tube should be avoided.

For applications that produce harmful pulsation, vibration or pressure spikes, a liquid filled gauge will minimize the effects of vibration and provide a more accurate pressure reading.

Gauge Size

ProSense gauges are available with dial sizes of 1.5, 2 or 2.5 inches.

Connection

ProSense gauges offer lower and center back connections. The standard threads are 1/8" and 1/4" NPT.

Accuracy

The degree of accuracy required should be determined to ensure that the proper gauge is used. ProSense gauges offer accuracies of +/- 1.5% or +/- 3-2-3% (ANSI/ASME Grade B). Generally, the more critical the application, the higher the accuracy required.

Gauge Mounting

ProSense pressure gauges can be mounted in a variety of ways. For direct stem mount, we offer lower and center back connections. Bear in mind that if a piece of equipment produces heavy vibration making pressure reading difficult due to needle fluctuations, consider a liquid-filled gauge or remote mounting.

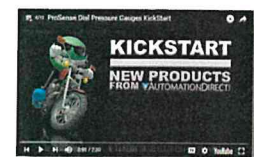
Pressure Range

It is important to select a pressure range that is approximately twice the normal operating pressure of the media. The maximum operating pressure should not exceed 75% of the full scale range. If a gauge is not selected considering these criteria, it may result in fatigue of the Bourdon tube.

Temperature Range

The normal temperature ranges for dry gauges are between -40°C to 65°C (-40°F to 150°F). The normal temperature ranges for glycerin-filled gauges are -20°C to 65°C (-4°F to 150°F). It is important to know the normal operating temperature of the environment for proper gauge use.

Click on the thumbnail or go to <https://www.automationdirect.com/VID-PR-0002> for a short video on ProSense Dial Pressure Gauges



Series 25 SS-CS Ball Valve

Two-Piece Ball Valve, Standard Port
 Sizes 1/4" ~ 2"



The SVF Series 25 SS - CS standard port ball valves are designed for general purpose performance in a wide variety of utility applications. The 25 SS-CS is an economical, 2000 psi, manually operated valve that meets industry requirements for performance and dependability.

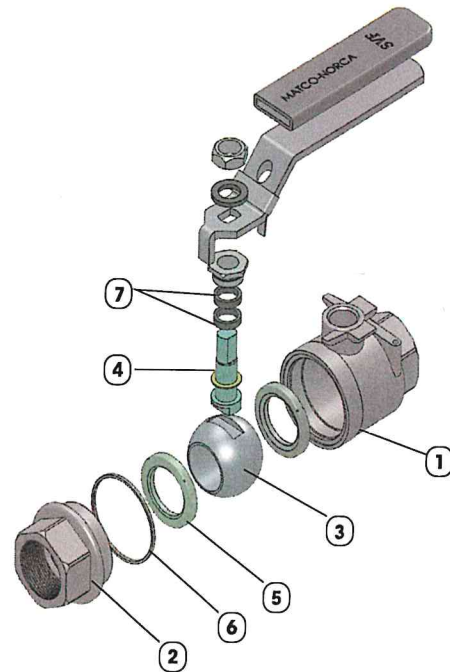
SERIES 25SS-CS DESIGN FEATURES

- ✓ Designed & built for economical performance
- ✓ Pressure rated for 2000 WOG
- ✓ Threaded End Connections
- ✓ Vinyl grip handle
- ✓ Blowout proof stem adds safety & reliability
- ✓ Lockable in the "Open" or "Closed" position



MATERIALS OF CONSTRUCTION

ITEM	DESCRIPTION	MATERIALS SPECIFICATIONS
1	Body	316 Stainless Steel (ASTM A351-CF8M) Carbon Steel (ASTM 216 WCB)
2	End Connector	316 Stainless Steel (ASTM A351-CF8M) Carbon Steel (ASTM 216 WCB)
3	Ball	316 Stainless Steel (ASTM A351-CF8M)
4	Stem	316 Stainless Steel (ASTM A276-316)
5	Seat	RTFE
6	Body Seal	RTFE
7	Stem Seal	RTFE



What do you need today?™



Series 25 SS-CS Ball Valve

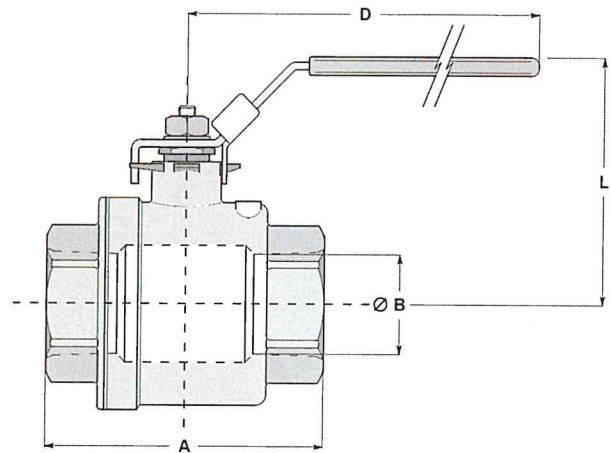
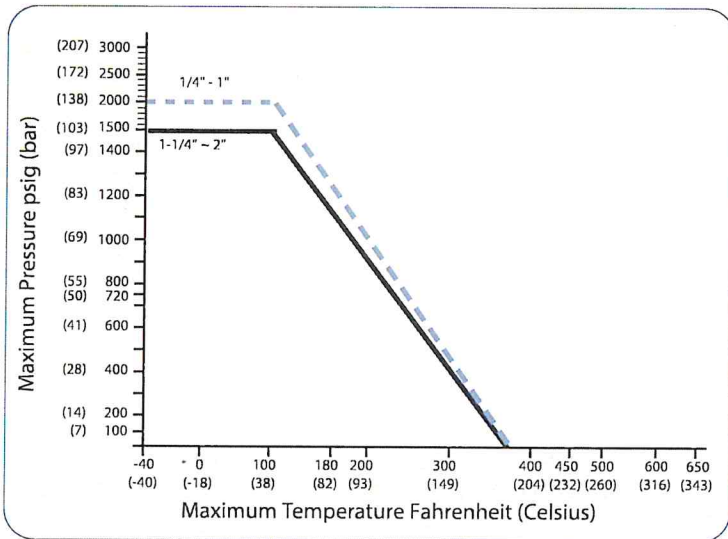
Two-Piece Ball Valve, Standard Port
 Sizes 1/4" ~ 2"



DIMENSIONS, WEIGHT, C V

Size	A		B		D		L		Weight		Cv
	in.	mm	in.	mm	in.	mm	in.	mm	lbs	kg	
1/4"	2.27	58	0.43	11	4.02	102	2.21	56	0.66	0.30	3
3/8"	2.27	58	0.43	11	4.02	102	2.21	56	0.66	0.30	5
1/2"	2.36	60	0.50	13	4.02	102	2.21	56	0.68	0.31	8
3/4"	3.11	79	0.59	15	4.85	123	2.56	65	1.17	0.53	12
1"	3.35	85	0.79	20	4.85	123	2.68	68	1.59	0.72	30
1-1/4"	4.10	104	0.99	25	6.03	153	3.15	80	2.80	1.27	52
1-1/2"	4.33	110	1.26	32	6.03	153	3.59	91	3.84	1.74	74
2"	5.40	137	1.50	38	7.21	183	3.86	98	4.67	2.12	125

25 SS - CS - PRESSURE/TEMPERATURE CHART



Class 900 (Sizes: 1/4" to 1")
 Class 600 (Sizes: 1-1/4" to 2")

25 SS-CS Series Part Numbers

Stainless Steel				Carbon Steel			
Size	Part #	Size	Part #	Size	Part #	Size	Part #
1/4"	25SSTH01M	1"	25SSTH05M	1/4"	25CSTH01M	1"	25CSTH05M
3/8"	25SSTH02M	1-1/4"	25SSTH06M	3/8"	25CSTH02M	1-1/4"	25CSTH06M
1/2"	25SSTH03M	1-1/2"	25SSTH07M	1/2"	25CSTH03M	1-1/2"	25CSTH07M
3/4"	25SSTH04M	2"	25SSTH08M	3/4"	25CSSTH04M	2"	25CSTH08M

CONTROL DATA

Panel Functionality Description

The panel will have a transfer switch to operate on line power or generator power.

The panel will be equipped with 2 pole pump breakers and 1 single pole control breaker. Each pump is protected by a Class 10 overload relay that monitors the Amp draw of each pump. Should the overloads trip, there is a manual reset switch on each overload relay.

The panel will have a Hand-Off-Auto switch for pump control. The pump can be operated manually or placed in the Off or Automatic position for float operation. If the H-O-A is in the auto position, then the three float switches in the basin control the pumping cycles. An Amber indicator light show pump run status.

When water enters the basin and reaches the first (Off) float, nothing shall happen. As the water level rises to lift the second (On) float this will call for the "Lead" pump. If the first pump can handle the water level, then the pump will drop the level until the Off float drops and will shut off the pump. If the pump cannot drop the water level fast enough and the water reaches the third (Alarm) float, this will turn on an Alarm light located at the top of the control enclosure. The alarm status will reset as the level of water lowers the third float.

The alarm toggle switch "Test-Off-Auto" can be placed in the test position and will flash the alarm light while held in the test position. Once placed in the auto position, the third float will turn the high-water light on. The buzzer will sound with a high-water alarm. It Can be silenced by a side mounted toggle switch. The light will continue to flash until the hi-water alarm has dropped.

A red LED pilot will illuminate for seal failure.

SINGLE PHASE (1PH) SIMPLEX CONTROL PANEL SPECIFICATIONS (For Grinder Pump Model VS20-21)

A NEMA 4X non-metallic control panel shall be furnished with each pumping unit to be installed as shown on the plans.

The control panel enclosure shall be molded of reinforced polyester resins that are chemically resistant to corrosive atmospheres. The enclosure shall include a non-metallic hinge and be pad-lockable (padlock not included). The enclosure dimensions shall be 16" by 14".

The panel shall include pump circuit breaker (SQUARE D QOU225), control circuit breaker (SQUARE D QOU110), motor contactor (SQUARE D LC1D18G7), motor overload relay (SQUARE D LRD21), transfer switch for line power and generator power, generator plug-in, start capacitor, run capacitor, start relay, indicator lights (VCC) and switches (GAYNOR TOGGLE), (hoa switches, alarm test switch, seal fail indicator, and pump run indicator), hi-temp circuit, terminal blocks (ENTRELEC D 6/8), ground lugs, and all necessary wiring and brackets.

The control panels shall be equipped with a red alarm light (Conery RX-7). The lens shall be mounted externally on the top of the enclosure with a neoprene gasket for watertight integrity. The light shall have a bright flash under hi-water conditions and will remain flashing until the water level returns to normal. The panel will include an audible buzzer to sound with a high water alarm. It can be silenced by a side mounted toggle switch with weather proof boot.

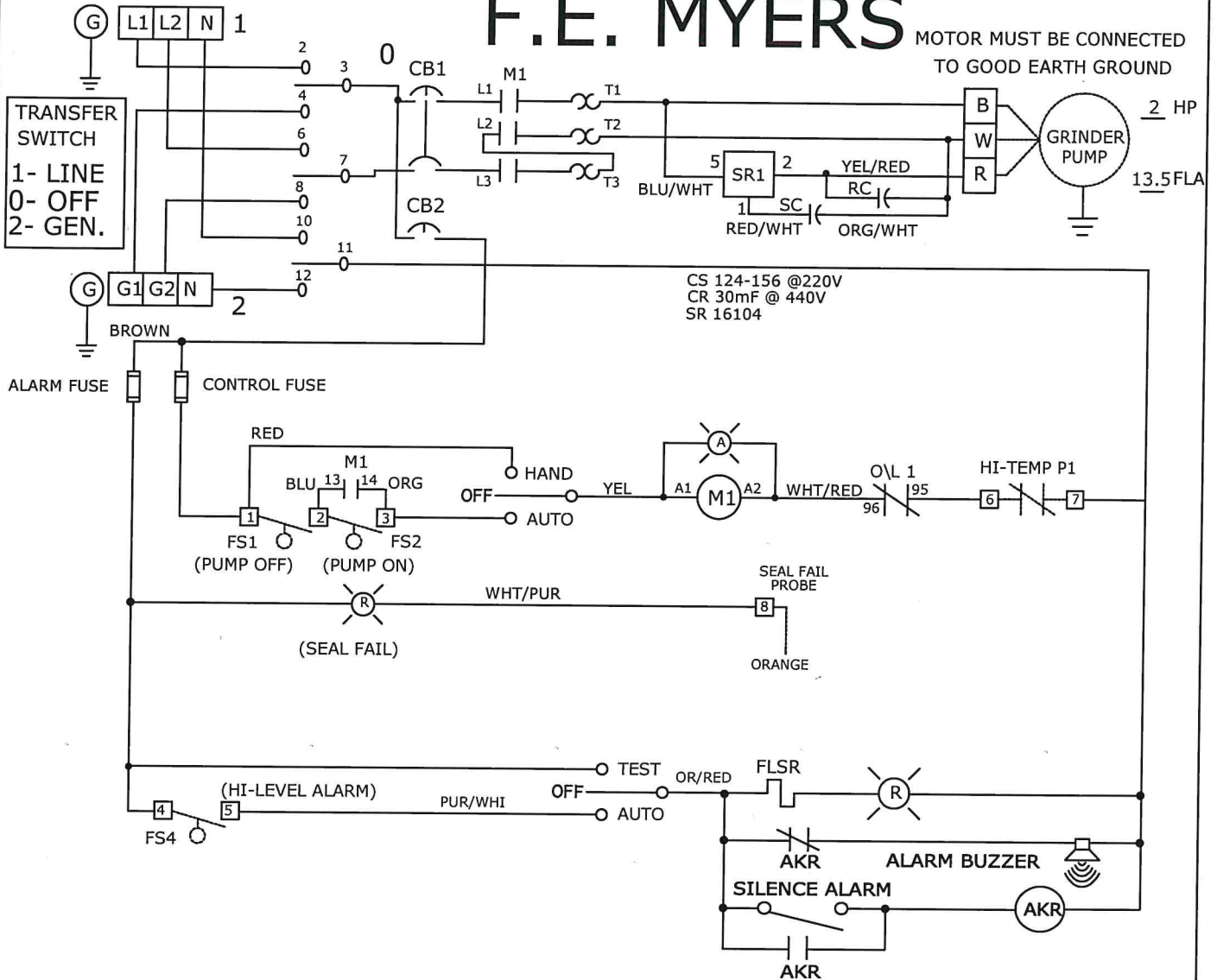
All internal wiring shall be neat and color-coded. All incoming wires shall terminate in a box clap type terminal block.

A schematic wiring diagram shall be located on the interior of the panel door.

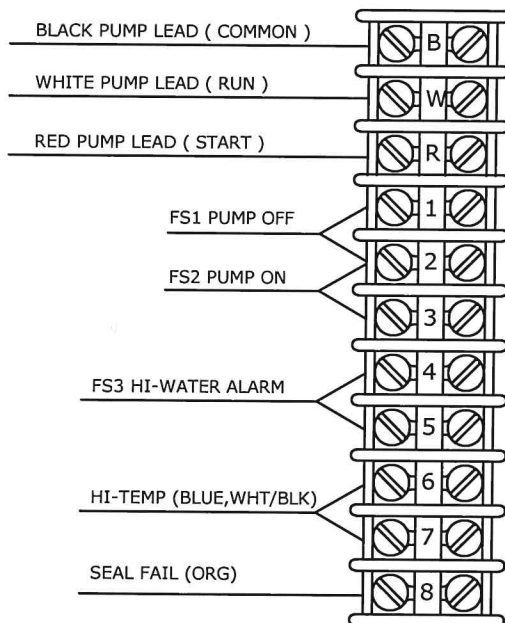
230V - 1PH - 3 WIRE SERVICE

F.E. MYERS

MOTOR MUST BE CONNECTED TO GOOD EARTH GROUND



TERMINAL CONNECTIONS



GROUND LUG

F.E. MYERS
BLACK=COMMON
WHITE=RUN
RED=START

GULF COAST
CONTROLS
&
UTOMATION

UL
 508,698A

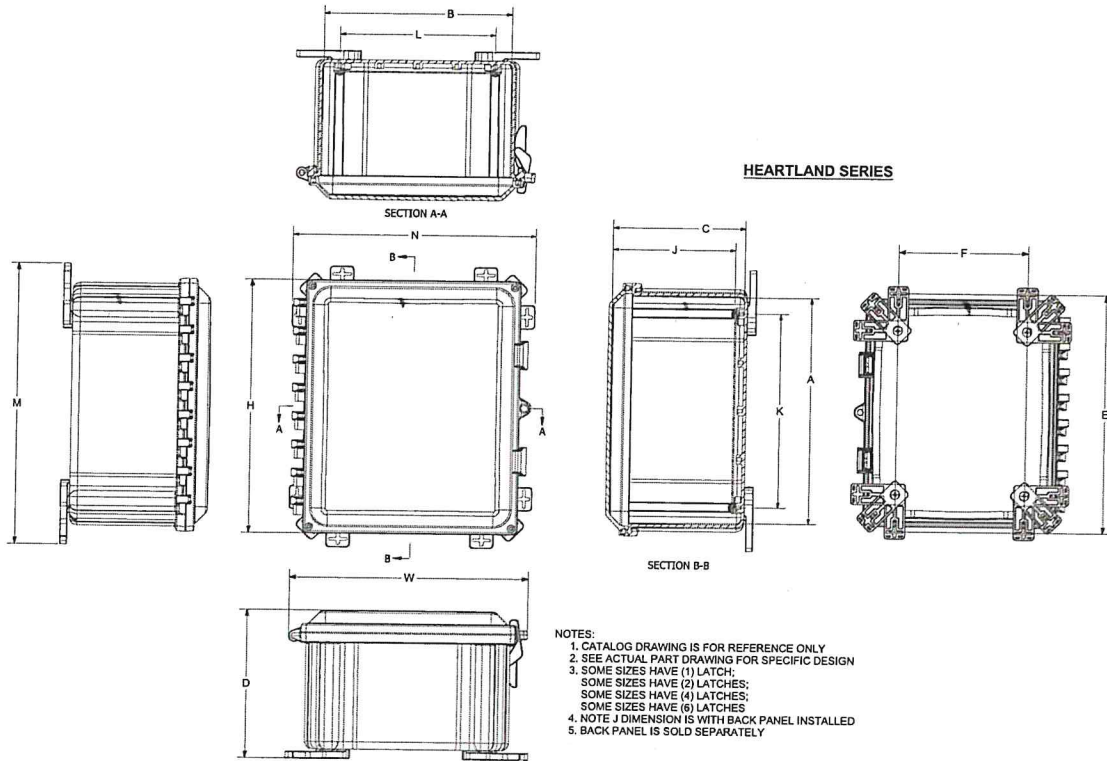
1271 SCHILLINGER RD MOBILE, AL.36608
 PH.(251)645-5006 FAX (251)645-5038

DATE	2-5-24
DRAWN	WJF
MODEL	PS2G21
FILED	DEP-SIMPLEX-SINGLE

Heartland

TECHNICAL DRAWINGS / DIMENSIONS

4
Heartland (AH)



- NOTES:
 1. CATALOG DRAWING IS FOR REFERENCE ONLY
 2. SEE ACTUAL PART DRAWING FOR SPECIFIC DESIGN
 3. SOME SIZES HAVE (1) LATCH;
 SOME SIZES HAVE (2) LATCHES;
 SOME SIZES HAVE (4) LATCHES;
 SOME SIZES HAVE (6) LATCHES
 4. NOTE J DIMENSION IS WITH BACK PANEL INSTALLED
 5. BACK PANEL IS SOLD SEPARATELY

HEARTLAND SERIES DIMENSIONS

SIZE ID NUMBER	OVERALL H X W X D	INSIDE A X B X C	MOUNTING HOR. EX F	MOUNTING VER. EX F	MOUNTING 45 EX F	J	K	L	M	N	SHIPPING WEIGHT	PANEL NUMBER
AH664 AH664C	7.41 x 8.68 x 5.84 (188 x 223 x 148)	5.94 x 5.94 x 5.02 (151 x 151 x 127)	3.64 x 8.40 (93 x 213)	8.04 x 3.64 (204 x 93)	6.75 x 6.74 (171 x 171)	4.50 (114)	4.25 (108)	4.25 (108)	8.89 (226)	8.89 (226)	2.50 lbs.	BP66**
AH864 AH864C	9.41 x 8.68 x 5.86 (239 x 223 x 149)	7.97 x 5.97 x 5.07 (202 x 152 x 129)	5.64 x 8.04 (143 x 213)	10.04 x 3.64 (255 x 93)	8.76 x 6.75 (223 x 171)	4.56 (116)	6.25 (159)	4.25 (108)	10.89 (277)	8.89 (226)	3.19 lbs.	BP86**
AH884 AH884C	9.41 x 10.68 x 5.86 (239 x 271 x 149)	7.97 x 7.97 x 5.03 (202 x 202 x 128)	5.63 x 10.03 (143 x 255)	10.04 x 5.63 (255 x 143)	8.74 x 8.78 (222 x 223)	4.53 (115)	6.25 (159)	6.25 (159)	10.88 (277)	10.88 (277)	CF	BP88**
AH1084 AH1084C	11.41 x 10.68 x 6.36 (290 x 271 x 161)	9.96 x 7.96 x 5.57 (253 x 202 x 142)	7.64 x 10.04 (194 x 255)	12.04 x 5.64 (306 x 143)	10.76 x 8.75 (273 x 222)	5.05 (128)	8.25 (210)	6.25 (159)	12.89 (327)	10.89 (277)	4.31 lbs.	BP108**
AH1086 AH1086C	11.41 x 10.68 x 7.89 (209 x 271 x 200)	9.95 x 7.95 x 7.06 (253 x 202 x 179)	7.63 x 10.03 (194 x 255)	12.03 x 5.63 (306 x 143)	10.76 x 8.75 (273 x 222)	6.54 (166)	8.25 (210)	6.25 (159)	12.88 (327)	10.88 (277)	CF	BP108**
AH10106 AH10106C	11.41 x 12.68 x 6.97 (209 x 322 x 177)	9.95 x 9.95 x 6.15 (253 x 253 x 156)	7.63 x 12.03 (194 x 306)	12.03 x 7.63 (306 x 194)	10.76 x 10.75 (273 x 273)	5.65 (144)	8.25 (210)	8.25 (210)	12.88 (327)	12.88 (327)	CF	BP1010**
AH12106 AH12106C	13.40 x 12.68 x 7.86 (340 x 322 x 200)	11.95 x 9.95 x 7.07 (304 x 253 x 180)	9.64 x 12.04 (245 x 306)	14.04 x 7.64 (357 x 194)	12.76 x 10.75 (324 x 273)	6.56 (167)	10.25 (260)	8.25 (210)	14.89 (378)	12.89 (327)	6.19 lbs.	BP1210**
AH14126 AH14126C	15.40 x 14.68 x 7.86 (391 x 373 x 200)	13.95 x 11.95 x 7.07 (354 x 304 x 180)	11.64 x 14.04 (296 x 357)	16.04 x 9.64 (407 x 245)	14.76 x 12.75 (375 x 324)	6.56 (167)	12.25 (311)	10.25 (260)	16.89 (429)	14.89 (378)	7.99 lbs.	BP1412**
AH16148 AH16148C	17.65 x 16.68 x 9.98 (448 x 424 x 253)	15.93 x 13.93 x 9.20 (405 x 354 x 234)	13.64 x 16.04 (347 x 407)	18.04 x 11.64 (458 x 296)	16.76 x 14.75 (426 x 375)	8.68 (220)	14.25 (362)	12.25 (311)	18.89 (480)	16.89 (429)	10.00 lbs.	BP1614**
AH181610 AH181610C	19.41 x 18.68 x 11.90 (493 x 474 x 302)	17.83 x 15.83 x 11.08 (453 x 402 x 281)	15.64 x 18.04 (397 x 458)	20.04 x 13.64 (509 x 347)	18.75 x 16.74 (476 x 425)	10.56 (268)	16.25 (413)	14.25 (362)	20.89 (531)	18.89 (480)	11.25 lbs.	BP1816**
AH18164 AH181614C	19.41 x 18.68 x 5.41 (493 x 474 x 137)	18.16 x 16.16 x 5.08 (461 x 410 x 129)	N/A	20.50 x 13.50 (521 x 343)	N/A	4.56 (116)	16.25 (413)	14.25 (362)	21.75 (552)	N/A	CF	BP1816**
AH20168 AH20168C	21.41 x 18.68 x 9.97 (544 x 474 x 253)	19.86 x 15.86 x 9.15 (504 x 403 x 232)	18.75 x 19.17 (476 x 487)	23.15 x 14.75 (588 x 375)	21.91 x 17.87 (557 x 454)	8.65 (220)	18.25 (464)	14.25 (362)	24.00 (610)	20.02 (509)	CF	BP2016**
AH242410 AH242410C	25.41 x 26.68 x 11.41 (645 x 678 x 290)	23.91 x 23.91 x 11.88 (607 x 607 x 302)	N/A	25.69 x 18.00 (653 x 457)	N/A	10.56 (268)	22.25 (565)	22.25 (565)	26.69 (678)	21.86 (555)	CF	BP2424**

All measures are in inches, items in parentheses are in millimeters.

* AH1614 size does not exhibit same mounting foot design. Mounting feet are molded into the box rather than installed separately.

** Panel sold separately.

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

Table 18.1: 3- or 4-Pole Screw Terminal Connections

Maximum Horsepower Ratings						Maximum Current Utilization Categories		No of Poles		Instantaneous Auxiliary Contacts		Catalog Number ▲	\$ Price	
Single Phase		Three Phase				Inductive AC3 Amperes	Resistive AC1 Amperes	N.O.	N.C.	N.O.	N.C.		AC Coils	DC Coils
115 V hp	230 V hp	200 V hp	230 V hp	460 V hp	575 V hp									
0.5	1	2	2	5	7.5	9	20	3	0	1	1	LC1D09 ♦♦♦	94.00	119.00
—	—	—	—	—	—	—		4	—			—	—	—
—	—	—	—	—	—	—	25	2	2	1	1	LC1D098 ♦	94.00	119.00
1	2	3	3	7.5	10	12		3	—			—	—	—
—	—	—	—	—	—	—	32	4	0	1	1	LC1D125 ♦	119.00	149.00
—	—	—	—	—	—	—		2	2			—	—	—
1	3	5	5	10	15	18	40	3	0	1	1	LC1D18 ♦♦	136.00	160.00
—	—	—	—	—	—	—		4	—			—	—	—
—	—	—	—	—	—	—	50	2	2	—	—	LC1D188 ♦	149.00	183.00
—	—	—	—	—	—	—		3	—			—	—	—
2	3	7.5	7.5	15	20	25	60	4	0	1	1	LC1D188 ♦	149.00	183.00
—	—	—	—	—	—	—		2	2			—	—	—
—	—	—	—	—	—	—	80	3	0	1	1	LC1D25 ♦	193.00	240.00
2	5	10	10	20	30	32		4	—			—	—	—
3	5	10	10	30	30	40	125	3	0	1	1	LC1D32 ♦♦	172.00	213.00
—	—	—	—	—	—	—		4	0			0	0	0
3	7.5	15	15	40	40	50	200	3	0	1	1	LC1D50A	234.00	291.00
5	10	20	20	40	50	65		4	0			0	0	0
—	—	—	—	—	—	—	200	3	0	1	1	LC1D780A	446.00	503.00
7.5	15	25	30	60	60	80		4	0			1	1	1
—	—	—	—	—	—	—	200	2	2	0	0	LC1D80004 ■	489.00	524.00
—	—	30	40	75	100	115		3	—			—	—	—
—	—	40	50	100	125	150	200	3	0	1	1	LC1D115	479.00	479.00
—	—	—	—	—	—	—		4	—			—	—	—
—	—	—	—	—	—	—	4	0	0	0	0	LC1D15004	630.00	630.00

- ▲ Complete catalog number with coil voltage code from table on page 18-6; example, LC1D09G7.
- For DC version of these devices replace the 'C' with 'P' (ex. LC1D80004** becomes LP1D80004**). This applies only to 80A 4 pole devices.
- ♦ On LC1D09 - LC1D65A and LC1D120 through LC1D128, for ring tongue versions add '6' to the catalog number prior to adding the voltage code (ex. LC1D09G7 becomes LC1D096G7 and LC1D50AG7 becomes LC1D50A6G7). No price adder for this modification.
- ★ On LC1D09 - LC1D65A, for spring terminals versions add '3' to the catalog number prior to adding the voltage code (ex. LC1D12G7 becomes LC1D123G7 and LC1D40AG7 becomes LC1D40A3G7 - Note that 40A to 65A spring terminals are only on the control terminations and not on power terminations). No price adder for this modification.
- ▼ On LC1D09 and LC1D12 only, for slip-on connector versions add '*9' to the catalog number prior to adding the voltage code (ex. LC1D09G7 becomes LC1D099G7). No price adder for this modification.

Table 18.2: TeSys D Overload Relays — Ambient Compensated, Bi-Metallic Direct Mount

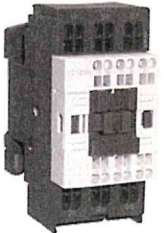
Current Setting Range Amperes	For Direct Mounting to LC1...	Class 10 with Single Phase Sensitivity	Class 10 without Single Phase Sensitivity	Class 20 with Single Phase Sensitivity	Class 20 without Single Phase Sensitivity	\$ Price
0.10-0.16	D09-D32	LRD01	LR3D01	—	—	60.00
0.16-0.25		LRD02	LR3D02	—	—	
0.25-0.40		LRD03	LR3D03	—	—	
0.40-0.63		LRD04	LR3D04	—	—	
0.63-1		LRD05	LR3D05	—	—	
1-1.6		LRD06	LR3D06	—	—	
1.6-2.5		LRD07	LR3D07	—	—	
2.5-4		LRD08	LR3D08	LRD1508	LR3D1508A1	
4-6		LRD10	LR3D10	LRD1510	LR3D1510A1	
5.5-8		D09-D32	LRD12	LR3D12	LRD1512	
7-10	D09-D32	LRD14	LR3D14	LRD1514	LR3D1514A1	
9-13	D12-D32	LRD16	LR3D16	LRD1516	LR3D1516A1	
12-18	D18-D32	LRD21	LR3D21	LRD1521	LR3D1521A1	
16-24	D25-D32	LRD22	LR3D22	—	—	
17-25	D25-D32	—	—	LRD1522	LR3D1522A1	
23-32	D25-D32	LRD32	LR3D32	—	—	73.00
23-28	D25-D32	—	—	LRD1530	LR3D1530A1	
25-32	D25-D32	—	—	LRD1532	LR3D1532A1	
30-38	D32	LRD35	LR3D35	—	—	107.00
9-13	D40-D65A Δ	LRD313	LR3D313	LRD313L	—	
12-18	D40-D65A Δ	LRD318	LR3D318	LRD318L	—	
16-25	D40-D65A Δ	LRD325	LR3D325	LRD325L	—	
23-32	D40-D65A Δ	LRD332	LR3D332	LRD332L	—	
30-40	D40-D65A Δ	LRD340	LR3D340	LRD340L	—	
37-50	D40-D65A Δ	LRD350	LR3D350	LRD350L	—	
48-65	D40-D65A Δ	LRD365	LR3D365	LRD365L	—	
17-25	D40-D80 □	LRD3322	LR3D3322	LRD3322	LR3D3322	107.00
23-32	D40-D80 □	LRD3353	LR3D3353	LRD3353	LR3D3353	
30-40	D40-D80 □	LRD3355	LR3D3355	LRD3355	LR3D3355	
37-50	D50-D80 □	LRD3357	LR3D3357	LRD3357	LR3D3357	
48-65	D50-D80 □	LRD3359	LR3D3359	LRD3359	LR3D3359	
55-70	D65-D80	LRD3361	LR3D3361	LRD3361	LR3D3361	127.00
63-80	D65-D80	LRD3363	LR3D3363	LRD3363	LR3D3363	
80-104	D80	LRD3365	—	—	—	
80-104	D115-D150	LRD4365	—	—	—	362.00
95-120	D115-D150	LRD4367	—	—	—	
110-140	D150	LRD4369	—	—	—	

- Δ Overload relays with Everlink termination - direct mount to D40A to D65A only.
- Direct mount to old D2 style D40 to D65 (no Everlink terminations) and to D80 only.
- TeSys D contactor accessories pages 18-8 to 18-11
- TeSys D overload relay accessories page 18-16
- TeSys D replacement coils pages 18-17 to 18-19
- Dimensions pages 18-40 to 18-46
- TeSys T pages 16-91

18 IEC CONTACTORS AND STARTERS



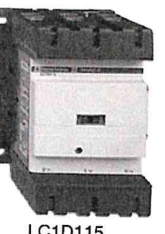
LC1D09



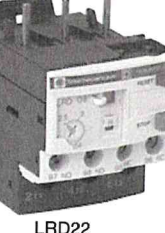
LC1D093



LC1D40A



LC1D115



LRD22



LRD3



E164862
CCN NLDX
LR43364
Class 3211 04

Twist-Lock® Devices



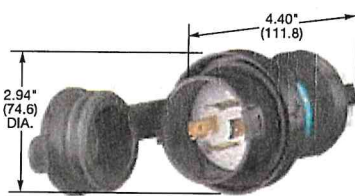
20 Amp, 125/250, 3Ø 250 and 3Ø 480 Volts AC
3 Pole, 4 Wire, Grounding



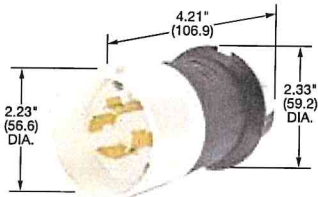
20A 125/250V AC
NEMA L14-20P
2 (1) HP

20A 3Ø 250V AC
NEMA L15-20P
3 HP

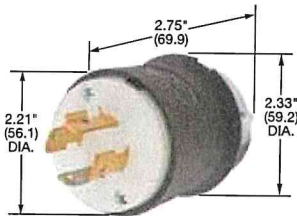
20A 3Ø 480V AC
NEMA L16-20P
5 HP



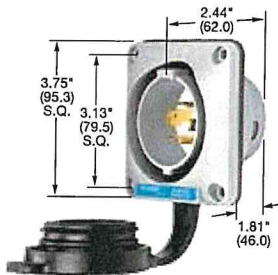
HBL2421SW



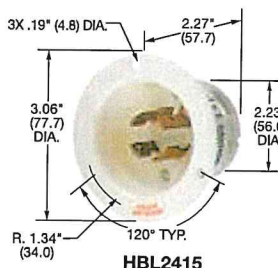
HBL2421S



HBL2411



HBL2425SW



HBL2415

Dimensions in Inches (mm)

Plugs

Watertight Safety-Shroud®

IP66 SUITABILITY UL Type 4x, 12

Description	Cord Dia.	Catalog Number		
Black Valox® housing, white Valox® clamps.	.350"-1.150" (9-29)	HBL2411SW	HBL2421SW	HBL2431SW

Safety-Shroud®

IP20 SUITABILITY

Description	Cord Dia.	Catalog Number		
Black and white nylon body, white Valox® shroud. Can be used with the Insulgrip Connector Bodies.	.350"-1.150" (9-29)	HBL2411S	HBL2421S	HBL2431S

Note: See page B-54 for accessories.

Insulgrip®

IP20 SUITABILITY

Description	Cord Dia.	Catalog Number		
Black and white nylon.	.350"-1.150" (9-29)	HBL2411	HBL2421	HBL2431
Corrosion resistant, yellow nylon.	.350"-1.150" (9-29)	HBL24CM11	HBL24CM21	HBL24CM31
All black nylon.	.350"-1.150" (9-29)	HBL2411BK	-	-

Note: See page B-54 for accessories.

Flanged Inlets

Watertight Safety-Shroud®

IP66 SUITABILITY UL Type 4x, 12

Description	Catalog Number		
Gray Valox® housing and flange.	HBL2415SW	HBL2425SW	HBL2435SW

Note: See page B-56 for accessories.

Insulgrip®

IP20 SUITABILITY

Description	Catalog Number		
Nylon casing, back wired.	HBL2415	HBL2425	HBL2435

Note: See page B-54 for accessories.

See pages B-71 and B-72 for technical information on Twist-Lock and Watertight Safety-Shroud devices.

HBLMITL - For use with Watertight Safety-Shroud receptacles, see page B-43.



Valox® is a trademark of SABIC Innovative Plastics, acquired from General Electric Company.



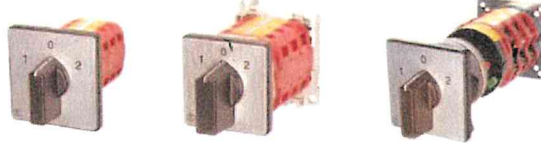
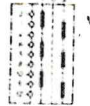
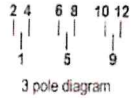
SERIES VN HEAVY DUTY BYPASS CAM SWITCHES



BYPASS SWITCH with "OFF" position To 250 Amp, 600 Volt
 (Change over switch) **Open Type 400 Amp to 1200 Amp, 690 Volt**



Load Make/Load Break
Positive Opening



Safety door interlock includes misalignment feature

1-0-2 600V	Amps CSA/UL General Purpose	Amps IEC	No. Chambers	Catalog Number	Front Mount	List	Base Mount	List	Safety Door Interlock	List
2 P O L E	25	25	2	E V2N-2U B1-	-FS	\$76	-BS	\$84	-SS	\$112
	35	32	2	E V3N-2U B3-	-FS	\$100	-BS	\$110	-SS	\$134
	50	45	2	E VN32-2U B3-	-FS	\$178	-BS	\$198	-SS	\$237
	60	63	2	E VN50-2U B4-	-FS	\$268	-BS	\$296	-SS	\$356

1-0-2 600V	Amps CSA/UL General Purpose	Amps IEC	No. Chambers	Catalog Number	Front Mount	List	Base Mount	List	Safety Door Interlock	List
3 P O L E	25	25	3	E V2N-3U B1-	-FS	\$87	-BS	\$102	-SS	\$121
	35	32	3	E V3N-3U B3-	-FS	\$108	-BS	\$117	-SS	\$141
	50	45	3	E VN32-3U B3-	-FS	\$220	-BS	\$227	-SS	\$302
	60	63	3	E VN50-3U B4-	-FS	\$322	-BS	\$338	-SS	\$405
	100	100	3	E VN80-3U B4-	-FS	\$420	-BS	\$447	-SS	\$542
	100	150	3	EVN125-3U B5-	-FS	\$914	-BS	\$949	-SS	\$1009
	200	250	6	E VN200-3U B5-	-FS	\$1613	-BS	\$1648	-SS	\$1675

1-0-2 600V	Amps CSA/UL General Purpose	Amps IEC	No. Chambers	Catalog Number	Front Mount	List	Base Mount	List	Safety Door Interlock	List
4 P O L E	25	25	4	E V2N-4UB1-	-FS	\$102	-BS	\$114	-SS	\$132
	35	32	4	E V3N-4UB3-	-FS	\$126	-BS	\$135	-SS	\$160
	50	45	4	E VN32-4UB3-	-FS	\$243	-BS	\$260	-SS	\$310
	60	63	4	E VN50-4UB4-	-FS	\$373	-BS	\$390	-SS*	\$467
	100	100	4	E VN80-4UB4-	-FS	\$471	-BS	\$493	-SS*	\$586
	100	150	4	EVN125-4UB5-	-FS	\$1068	-BS	\$1097	-SS*	\$1143
	200	250	4	E VN200-4UB5-	-FS	\$1912	-BS	\$1965	-SS*	\$2005

(Applications requiring 4 pole units above 250 Amp, please contact EE Controls.)

1-0-2 1000V	Amps IEC	No. Chambers	Catalog Number	Front Mount	List	Base Mount	List	Safety Door Interlock	List
3 P O L E	400	3	E NLU-400-3U	-FS	+	-BS	+	-SS	+
	630	3	E NLU-630-3U	-FS	+	-BS	+	-SS	+
	800	6	E NLU-800-3U	-FS	+	-BS	+	-SS	+
	1200	6	E NLU-1200-3U	-FS	+	-BS	+	-SS	+

Rating were requested from UL/CSA. Higher ratings are possible to match IEC.

+ Contact Factory for Pricing

Name plate is 1-0-2. Many other standard name plates are available at no extra cost. Check with factory.

Example: DRIVE-OFF-BYPASS

*Size 4 and 5 plate not available on B Operator with safety door interlocks.

46 SERIES

Miniature industrial relays 8 to 16 A



46
SERIES

A

1 & 2 CO industrial style power relays
For socket mount or direct connection via Faston connectors

Type 46.52

- 2 CO 8 A

Type 46.61

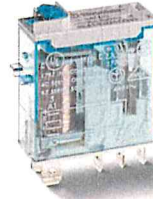
- 1 CO 16 A

- AC coils & DC coils
- Available with: lockable test button, mechanical indicator & LED indicator
- 8 mm, 6 kV (1.2/50 μs) isolation, coil-contacts
- Cadmium free contacts
- 97 series 35 mm rail (EN 60715) Screw, Screwless or Push-in terminals, and PCB mount sockets
- Coil Indication and EMC suppression modules 99 series and Timer module 86.30 options
- Optional alternative mounting adaptors
- European Patent

46.52

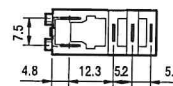
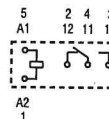
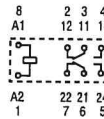


46.61



- 2 CO 8 A
- Plug-in/Solder terminals

- 1 CO 16 A
- Plug-in/Faston 187



FOR UL RATINGS SEE:

"General technical information" page V

For outline drawing see page 6

Contact specification

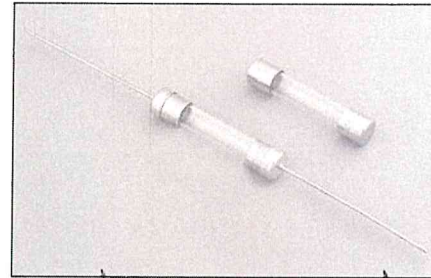
Contact configuration		2 CO (DPDT)	1 CO (SPDT)
Rated current/Maximum peak current	A	8/15	16/25*
Rated voltage/ Maximum switching voltage	V AC	250/440	250/440
Rated load AC1	VA	2000	4000
Rated load AC15 (230 V AC)	VA	350	750
Single phase motor rating (230 V AC)	kW	0.37	0.55
Breaking capacity DC1: 30/110/220 V	A	6/0.5/0.15	12/0.5/0.15
Minimum switching load	mW (V/mA)	300 (5/5)	300 (5/5)
Standard contact material		AgNi	AgNi
Coil specification			
Nominal voltage (U _N)	V AC (50/60 Hz)	12 - 24 - 48 - 110 - 120 - 230 - 240	
	V DC	12 - 24 - 48 - 110 - 125	
Rated power	VA/W	1.2/0.5	1.2/0.5
Operating range	AC	(0.8...1.1)U _N	(0.8...1.1)U _N
	DC	(0.73...1.1)U _N	(0.73...1.1)U _N
Holding voltage	AC/DC	0.8 U _N / 0.4 U _N	0.8 U _N / 0.4 U _N
Must drop-out voltage	AC/DC	0.2 U _N / 0.1 U _N	0.2 U _N / 0.1 U _N
Technical data			
Mechanical life AC/DC	cycles	10 · 10 ⁶	10 · 10 ⁶
Electrical life at rated load AC1	cycles	100 · 10 ³	100 · 10 ³
Operate/release time	ms	10/3	15/5
Insulation between coil and contacts (1.2/50 μs)	kV	6 (8 mm)	6 (8 mm)
Dielectric strength between open contacts	V AC	1000	1000
Ambient temperature range	°C	-40...+70	-40...+70
Environmental protection		RT II	RT II
Approvals (according to type)			

* With the AgSnO₂ material the maximum peak current is 80 A - 5 ms on normally open contact.

1/4" x 1-1/4" Fuses
AGC Series, Fast Acting, Glass Tube

Description

- Fast-acting, glass tube
- Optional axial leads available
- 1/4 x 1-1/4 (6.3mm x 32mm) physical size
- Glass tube, nickel-plated brass endcap construction
- UL Listed product meets standard 248-14



ELECTRICAL CHARACTERISTICS	
% of Amp Rating	Opening Time
100%	None
135%	60 Minutes Maximum
200%	120 Seconds Maximum

Agency Information

- UL Listed Card: AGC 1/500-10
- UL Recognition Card: AGC 11-45
- CSA Component Acceptance Card (Class No. 1422 30)
- CSA Certification Card (Class No. 1422 01)

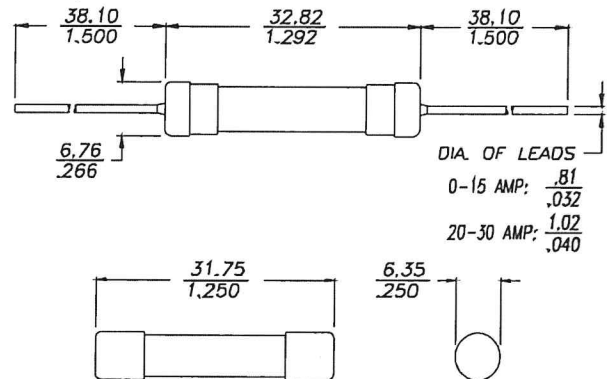
Environmental Data

- Shock: 1/100A thru 3/4A – MIL-STD-202, Method 213, Test Condition I; 1A thru 30A – MIL-STD-202, Method 207, (HI Shock)
- Vibration: 1/100A thru 30A – MIL-STD-202, Method 204, Test Condition A (Except 5g, 500HZ)

Ordering

- Specify packaging, product, and option code

Dimensions (mm/in)
Drawing Not to Scale



SPECIFICATIONS

Product Code	Voltage Rating AC	AC Interrupting Rating			Typical DC Cold Resistance** (ohms)	Typical Melting I ^{††} AC	Typical Voltage Drop‡
		250V	125V	32V			
AGC-1/20	250V	35A	10000A	-	4.500	0.00773	0.67
AGC-1/16	250V	35A	10000A	-	29.000	0.000181	10.41
AGC-1/10	250V	35A	10000A	-	12.565	0.000787	6.00
AGC-1/8	250V	35A	10000A	-	6.800	0.00131	4.67
AGC-3/16	250V	35A	10000A	-	4.900	0.00637	4.12
AGC-2/10	250V	35A	10000A	-	3.360	0.00435	4.51
AGC-1/4	250V	35A	10000A	-	2.300	0.0148	0.89
AGC-3/10	250V	35A	10000A	-	1.670	0.0208	2.88
AGC-3/8	250V	35A	10000A	-	1.203	0.0321	4.59
AGC-1/2	250V	35A	10000A	-	0.615	0.269	0.59
AGC-3/4	250V	35A	10000A	-	0.312	0.815	0.37
AGC-1	250V	35A	10000A	-	0.190	1.615	0.31
AGC-1-1/4	250V	100A	10000A	-	0.145	0.018	0.35
AGC-1-1/2	250V	100A	10000A	-	0.115	0.0149	0.27
AGC-2	250V	100A	10000A	-	0.078	0.00509	0.28
AGC-2-1/4	250V	100A	10000A	-	0.067	0.00588	0.26
AGC-2-1/2	250V	100A	10000A	-	0.057	0.00879	0.31
AGC-3	250V	100A	10000A	-	0.045	0.0167	0.25
AGC-4	250V	200A	10000A	-	0.030	0.0305	0.22
AGC-5	250V	200A	10000A	-	0.024	0.045	0.23
AGC-6	250V	200A	10000A	-	0.020	0.071	0.23
AGC-7	250V	200A	10000A	-	0.017	0.105	0.23
AGC-7-1/2	250V	200A	10000A	-	0.0146	-	-
AGC-8	250V	200A	10000A	-	0.014	0.152	0.19
AGC-9	250V	200A	10000A	-	0.012	0.21	0.18
AGC-10	250V	200A	10000A	-	0.008	0.492	0.20
AGC-12	32V	-	-	1000A	0.0070	-	-
AGC-14	32V	-	-	1000A	0.0062	-	-
AGC-15	32V	-	-	1000A	0.006	0.566	0.14
AGC-20	32V	-	-	1000A	0.004	1.438	0.12
AGC-25	32V	-	-	1000A	0.003	2.109	0.11
AGC-30	32V	-	-	1000A	0.002	3.807	0.12
AGC-35	32V	-	-	70A	0.0014	-	-
AGC-40	32V	-	-	80A	0.0019	-	-

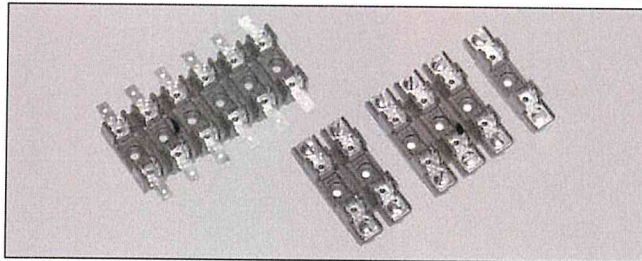
** DC Cold Resistance (Measured at ≤10% of rated current)

† Typical Melting I^{††} (A Sec) (I^{††} was measured at listed interrupting rating and rated voltage.)

‡ Typical Voltage Drop (Voltage drop was measured at 25°C ambient temperature at rated current)

S-8000 Series

1/4" x 1/4" Fuse Blocks



Description

- For 1/4" x 1/4" (6.3 x 32mm) fuses
- Bolt-in and snap-in mounting available
- Tight cluster mounting
- All types of terminal configurations
- Clips made of spring-bronze
- Anti-rotational pin provided
- Flame retardant thermoplastic meets UL 94V0



Environmental Data

- Relative Temperature Index (RTI)
 - Bolt-in 130°C
 - Snap-in 110°C

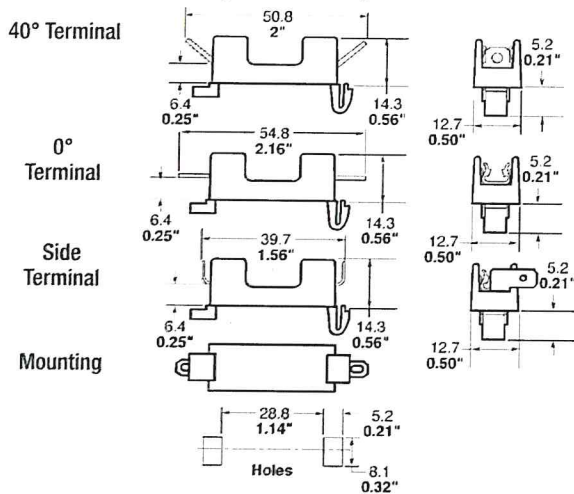
Agency Information

- UL Recognized: E14853
- CSA Certified: 47235

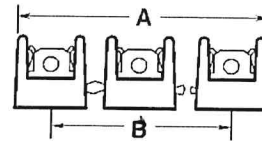
Specifications			
Series	Volts	UL Max Amps	CSA Max. Amps
S-8000	300Vac/dc	25	21
S-8100	300Vac/dc	20	13
S-8200	300Vac/dc	20	16
S-8300	300Vac/dc	30	25

Dimensions - mm/in.

S-8000 Single-Pole Snap-In Mounting Series



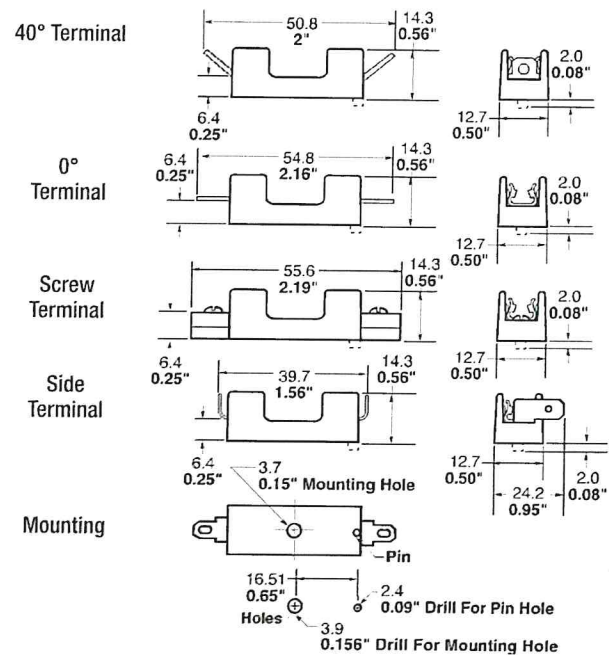
Multiple Pole



No. of Poles	Inches		Millimeters	
	A	B	A	B
1	—	—	—	—
2	1 1/8"	5/8"	28.6	15.9
3	1 3/4"	1 1/4"	44.4	31.8
4	2 1/8"	1 7/8"	60.3	47.6
5	3"	2 1/2"	76.2	63.5
6	3 5/8"	3 1/8"	92.1	79.4
7	4 1/4"	3 3/4"	108.0	95.2
8	4 7/8"	4 3/8"	123.8	111.1
9	5 1/2"	5"	139.7	127.0
10	6 1/8"	5 5/8"	155.6	142.9
11	6 3/4"	6 1/4"	171.4	158.8
12	7 1/8"	6 7/8"	187.3	174.6

Dimensions - mm/in.

S-8000 Single-Pole Bolt-In Mounting Series

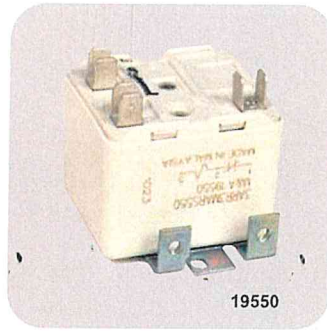


Component	Material
Clip	Spring-Bronze, Bright Tin-Plate
Body	Thermoplastic

MARS Relays & Potential Relays

For Submersible Pump Applications

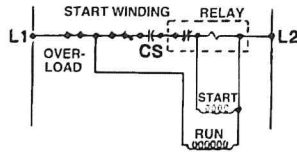
The MARS 550 and 551 relays were specifically developed for submersible pump and other motor starting applications in high moisture environments. Because the control panels for these are often located in areas of high humidity, the components on them must resist the effects of moisture. Chrome plating on the core and armature and the relatively small area of contact eliminates armature sticking due to organic contaminants which was the number one cause of relay failure.



19550

Features:

- Used on F.E. Meyers, Franklin Electric, Jacuzzi, Red Jacket, Sta-Rite, and Tait
- 2 relays replace over 25 O.E.M. relays
- Universal break-off bracket on each relay. Simply snap off parts not needed
- UL and CSA listings available



MARS NO.	MARS MODEL NO.	CONTINUOUS COIL VOLTAGE	PICK-UP		DROP-OUT	
			MIN.	MAX.	MIN.	MAX.
19550	MARS 550	130	111	134	15	40
19551	MARS 551	332	244	270	40	90

MARS NO.	G.E. NO.	USED BY
16104	3ARR3J3G3	Barnes [Burks, Decator] & Myers

MANUF.	OEM NO.	GE CAT. NO.	MARS NO.	MANUF.	OEM NO.	GE CAT. NO.	MARS NO.
F.E. Meyers	13178-A	3ARR3D7J4	19550	Jacuzzi	23-1308-26	3ARR3EA9V5	19551
	13179-A	3ARR3D3V4	19551		23-1308-00	3ARR3EA7J5	19550
	13180-A	3ARR3D3A4	19551		23-1308-18	3ARR3EA7B5	19550
	17891-A	3ARR3EA3A4	19551		23-1308-34	3ARR3EA5U5	19551
	17890-A	3ARR3EA3V4	19551		23-1308-42	3ARR3EA7M5	19550
	17889-A	3ARR3EA7J4	19550		23-1308-49	3ARR3EA5C5	19551
Franklin Electric	155031-101	3ARR3J7J4	19550	Red Jacket	71-89	3ARR3EA7M5	19550
	155031-102	3ARR3J9V4	19551		71-70	3ARR3EA5B5	19551
	155031-104	3ARR3J2P3	19550		71-47	3ARR3J3V2	19551
	155031-103	3ARR3J9U4	19551		U18-325	3ARR3J3V3	19551
	155031-105	3ARR3J7M1	19550		U18-665	3ARR3J3A3	19551
Sta-Rite				U18-810	3ARR3J2P3	19550	
				U18-811	3ARR3J5V3	19551	
				A124P2	3ARR3EA5A5	19551	
				A124P1	3ARR3EA7K5	19550	
Tait							

One-On-One™ Direct Replacement Potential Relays

The relays are exact replacements for Bristol & Copeland applications. They conform to specifications and in most cases are the one-on-one™ replacement relay used by the manufacturer.

Other relays available on special order. Contact your local wholesaler or MARS Customer Service.



16028

BRISTOL	MARS	COPELAND	COPELAND	MARS
650058	16028	MARS	040-0001-64	16098
650855	16051		040-0001-68	16099
BRISTOL	MARS	040-0001-34	040-0001-71	16116
		040-0001-35	040-0001-74	16122
		040-0001-48	040-0001-78	16121
		040-0001-50	040-0001-79	16152
		040-0001-53		
COPELAND	MARS	040-0001-54	COPELAND	MARS
		040-0001-00	040-0001-88	16151
		040-0001-01	040-0001-89	16155
		040-0001-04		
		040-0001-12		
		040-0001-17		
		040-0001-19		
		040-0001-20		
		040-0001-25		
		040-0001-26		

Universal Replacement

Quick Reference Relay Selection Chart For General Electric Relays

1. Determine the General Electric model number of the Relay to be replaced the "FORM" and "GROUP"

EXAMPLE:	1 or 2 Letters		1 or 2 Letters	
	3ARR3*	A	3B	3
	Basic Type	FORM	GROUP	Non-Positional

Cross Reference Information

WR/RBM NO.	MARS NO.	WR/RBM NO.	MARS NO.
90-1	19002	90-25	19006
90-2	19009	90-26	19008
90-3	19004	90-27	19005
90-4	19003	90-40	19004
90-5	19006	90-41	19008
90-6	19006	90-63	19002
90-7	19004	90-64	19003
90-8	19003	90-65	19004
90-9	19007	90-66	19005
90-10	19008	90-67	19006
90-11	19003	90-68	19007
90-12	19007	90-69	19001
90-13	19005		
90-14	19003		
90-15	19006	TECUM. NO.	MARS NO.
90-16	19007	82777	19002
90-17	19002	82778	19004
90-18	19008	82779	19008
90-19	19006	82781	19010
90-20	19007	82783	19003
90-21	19002	82784	19009
90-22	19003	82785	19006
90-23	19007	82787	19007
90-24	19008		

2. Locate in the following table the Relay GROUP and select the corresponding MARS Replacement Relay from the kit.
- 19002** MARS 63 replaces Relay GROUPS 2J; 2K; 2L; 2M; 5N; 7J; 7K; 7L; 7M; 7N; 8L; 8M; 8N
- 19003** MARS 64 replaces Relay GROUPS 3A; 3B; 3AV; 3AU; 4A; 4B; 6A; 6B; 6AV; 10A; 10B; 10AU; 10AV
- 19004** MARS 65 replaces Relay GROUPS 3P; 3R; 3AP; 5P; 5R; 5S; 5T; 22S
- 19005** MARS 66 replaces Relay GROUPS 3U; 3V; 3AT; 6U; 6V; 6W
- 19006** MARS 67 replaces Relay GROUPS 3C; 3D; 3AA; 4C; 4D; 4BK; 6C; 6D; 6AA; 10C; 10D; 26A; 26B; 26C; 26D
- 19007** MARS 68 replaces Relay GROUPS 3E; 3F; 3AB; 3AC; 4E; 4F; 4G; 6E; 6F; 6G; 10H; 10AB; 10AC; 26E; 26F; 26G; 26H; 27E; 27F; 27G
- 19008** MARS 69 replaces Relay GROUPS 3S; 3T; 10S; 10T; 25S; 25T; 10AS
- 19009** MARS 70 replaces Relay GROUPS 5B; 5C; 5D; 5AA; 8B; 8C; 8D
- 19010** MARS 71 replaces Relay GROUPS 6TV; 6TW; 10V
3. Install relay in accordance with instructions in MARS Replacement Kit

SERIES 110 motor start capacitors



electrolytic capacitors for motor starting applications

Capacitor accessories on page C-12.

features:

- The largest assortment of replacements in the industry!
- Smallest dimensions for general replacements
- Hermetically sealed black Bakelite case permanently protects the capacitor from oil, dirt, grease or moisture
- New and improved terminal construction capable of withstanding increased heat. This terminal will generate less heat when applied under severe hot humid environment.

COMPONENT

MARS NO.	MICROFARAD MIN.-MAX.	CASE SIZE*
----------	----------------------	------------

110/125 dual voltage AC

MARS NO.	MICROFARAD MIN.-MAX.	CASE SIZE*
11002	21-25	1
11003	25-30	1
11004	30-36	1
11005	36-43	1
11006	43-56	1
11007	56-72	1
11008	72-88	1
11009	88-108	1
11010	108-130	1
11011	124-149 use 11112	
11012	130-156 use 11112	
11112	124-156	1
11013	145-175	1
11014	161-193	1
11015	189-227	1
11016	200-240	2
11017	216-259	2
11018	233-292	2
11019	270-324	2
11020	300-360	4
11021	324-388	4
11022	340-408	4
11023	378-440	4
11024	400-480	4
11025	460-552	4
11026	540-648	5
11027	590-708	5
11028	708-850	7
11029	829-995	7
11030	1000-1200	7

165 volts AC

MARS NO.	MICROFARAD MIN.-MAX.	CASE SIZE*
11031	124-149	2
11032	145-175	2
11033	161-193	4
11034	189-227	4
11035	233-292	4
11036	270-324	4
11037	400-480	5

220/250 dual voltage AC

MARS NO.	MICROFARAD MIN.-MAX.	CASE SIZE*
11038	21-25	1
11039	25-30	1
11040	30-36	1
11041	36-43	2
11042	43-56	2
11043	56-72	2
11044	72-88	4
11045	88-108	4
11046	108-130	4

MARS NO.	MICROFARAD MIN.-MAX.	CASE SIZE*
----------	----------------------	------------

220/250 dual voltage AC (cont.)

MARS NO.	MICROFARAD MIN.-MAX.	CASE SIZE*
11048	130-156 use 11148	
11148	124-156	4
11049	145-175	6
11050	161-193	5
11051	189-227	7
11052	216-259	7
11053	233-292	7
11054	270-324	7

330 volts AC

MARS NO.	MICROFARAD MIN.-MAX.	CASE SIZE*
11055	21-25	2
11056	25-30	2
11057	30-36	4
11058	36-43	4
11059	43-56	4
11060	56-72	4
11061	72-88	5
11062	88-108	6
11063	108-130	7
11064	130-156	7
11165	124-156	7
11066	145-175	8
11067	161-193	8
11068	189-227	8
11069	216-259	8
11070	270-324	8

case dimensions*

CASE SIZE	DIAMETER IN.	LENGTH IN.
1	1.44	2.75
2	1.44	3.38
4	1.81	3.38
5	1.81	4.38
6	2.06	3.38
7	2.06	4.38
8	2.56	4.38

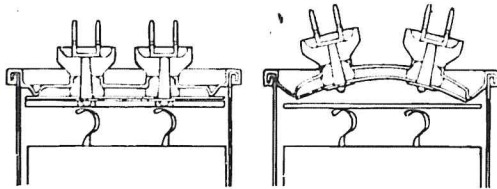
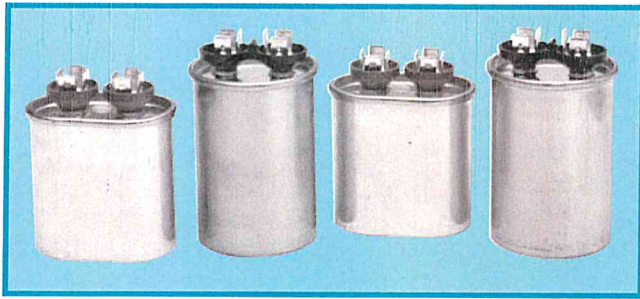
MARS suggests applying a bleed resistor (MARS PN 93007) on start capacitors used in conjunction with starting relays

*Capacitors may be put in different case sizes occasionally, but will not be larger than those stated.



SERIES 120 motor run capacitors

COMPONENT



NORMAL
FAIL SAFE MODE
PHYSICAL INTERRUPTER

single section run capacitors

Capacitor accessories on page C-12.

features:

- MARS offers the widest selection of ratings in the industry
- Non-PCB capacitors. Physical interrupter makes our capacitors safe
- Perfect for general replacements—smallest dimensions available
- UL and CSA listings available

MARS NO.	MICRO-FARAD	STYLE	BASE	HEIGHT IN.
----------	-------------	-------	------	------------

370 volt—oval

12002	2	oval	A	2.12
12003	3	oval	A	2.12
12004	4	oval	A	2.12
12005	5	oval	A	2.12
12006	6	oval	A	2.12
12007	7.5	oval	A	2.88
12008	10	oval	A	2.88
12009	12.5	oval	A	3.88
12010	15	oval	A	3.88
12012	17.5	oval	C	2.88
12014	20	oval	C	2.88
12015	25	oval	C	2.88
12017	30	oval	C	2.88
12018	35	oval	C	3.88
12021	40	oval	C	3.88
12023	45	oval	C	2.88
12025	50	oval	C	2.88
12024	55	oval	C	4.75
12087	60	oval	C	4.75
12089	70	oval	C	4.75
12090	80	oval	D	3.75

370 volt—round

12095	5	round	P	2.88
12097	7.5	round	P	2.88
12098	10	round	P	3.88
12099	12.5	round	P	3.88
12210	15	round	P	2.88
12212	17.5	round	P	2.88
12214	20	round	P	2.88
12215	25	round	P	2.88
12217	30	round	P	3.88
12218	35	round	P	3.88
12221	40	round	P	3.88
12223	45	round	S	3.88
12225	50	round	S	3.88
12226	55	round	S	4.75
12227	60	round	S	3.88
12229	70	round	T	4.75
12199	80	round	T	4.75

MARS NO.	MICRO-FARAD	STYLE	BASE	HEIGHT IN.
----------	-------------	-------	------	------------

440 volt—oval

12026	2	oval	A	2.12
12027	3	oval	A	2.12
12028	4	oval	A	2.88
12029	5	oval	A	2.88
12030	6	oval	A	2.88
12031	7.5	oval	A	3.88
12032	10	oval	A	3.88
12033	12.5	oval	A	3.88
12034	15	oval	C	2.88
12036	17.5	oval	C	2.88
12037	20	oval	C	2.88
12040	25	oval	C	2.88
12041	30	oval	C	3.88
12043	35	oval	C	3.88
12045	40	oval	C	3.88
12048	45	oval	C	4.75
12049	50	oval	D	3.88
12050	55	oval	D	4.75
12051	60	oval	D	4.75
12130	70	oval	D	4.75
12140	80	oval	D	4.75

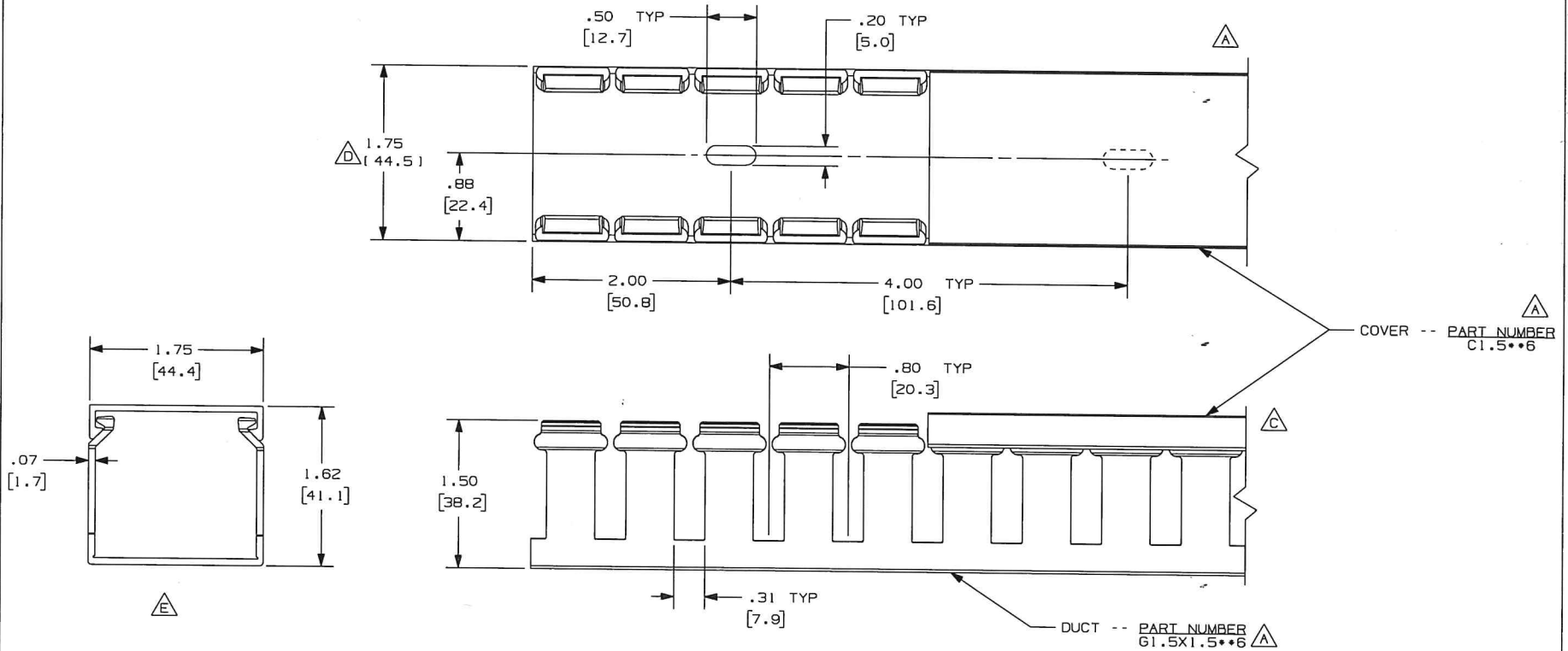
440 volt—round

12105	5	round	P	2.88
12107	7.5	round	P	2.88
12232	10	round	P	2.88
12233	12.5	round	P	2.88
12234	15	round	P	2.88
12236	17.5	round	P	2.88
12237	20	round	P	3.88
12240	25	round	P	3.88
12241	30	round	S	3.88
12243	35	round	S	3.88
12245	40	round	S	3.88
12248	45	round	T	3.88
12251	50	round	T	3.88
12252	55	round	T	3.88
12254	60	round	T	3.88
12258	70	round	T	3.88
12259	80	round	T	4.75

*Capacitors may be put in different case sizes occasionally, but will not be larger than those stated.

Base Dimensions on p.C-8

THIS COPY IS PROVIDED ON A RESTRICTED BASIS AND IS NOT TO BE USED IN ANY WAY DETRIMENTAL TO THE INTERESTS OF PANDUIT CORP.



△ △

NOTE.

1. ALL DIMENSIONS ARE REFERENCE ONLY.
2. DIMENSIONS IN PARENTHESES ARE METRIC.
3. THE ** DENOTE COLOR.
4. DUCT AND COVER ARE AVAILABLE IN 6 FT [1828.8] LENGTHS.

REV	DATE	BY	CHK	DESCRIPTION
---	-----	---	---	F. ADDED LENGTH NOTE
2	7/08/07	JCSTMKBE		E. DELETED DIMENSION D. ADDED DIMENSION
1	5/7/04	JCSTMKBE		B. CHANGED DRAWING SIZE A. ADDED TOP VIEW, LABELS, AND NOTE
R	2-27-03	JCST	JGG	C. CHANGED VIEW DRAWING RELEASED

Dwg FILENAME/LAYERS		D11000QL_DC_00C	
PANDUIT			
CORP. TINLEY PARK, ILLINOIS			
WIRING DUCT - TYPE G WITH COVER			
1.5 X 1.5			
MARKETING DRAWING			
DRAWN BY	JCST	MAT'L:	PVC
DATE	2-27-03	SCALE	FULL
CHECKED BY	JGG	DRAWING NO.	36897-699
		ORD	B
		SIZE	B

Visual Beacons



Part Number
R7-XS-7



Description

Polycarbonate Beacon, 120V, 7W, 2" x 2", UL 4X
R=Red, A=Amber, B=Blue, G=Green
NITW - Industrial Control Panel Components

- * 1/4" Quick Connect Terminals
- * Single Hole Mount
- * 12V available

List Price	
1-10	\$12.00
11-24	\$10.75
25-49	\$9.50
50-99	\$8.25
100-up	\$7.00



Part Number
R10-SM-10



Description

Polycarbonate Beacon, 120V, 10W, 2.5" x 2.5", UL 4X
R=Red, A=Amber, B=Blue, G=Green
NITW - Industrial Control Panel Components

- * 1/4" Quick Connect Terminals
- * Single Hole Mount
- * 12V available

List Price	
1-10	\$13.00
11-24	\$11.75
25-49	\$10.50
50-99	\$9.25
100-up	\$8.00



Part Number
R15-MB-15



Description

Polycarbonate Beacon, 120V, 15W, 2.5" x 3.75", UL 4X
R=Red, A=Amber, B=Blue, G=Green
NITW - Industrial Control Panel Components

- * 1/4" Quick Connect Terminals
- * Single Hole Mount
- * 12V and 24V available
- * LED available in 120V or 24V

List Price	
1-10	\$18.00
11-24	\$16.50
25-49	\$15.00
50-99	\$13.50
100-up	\$12.00



Part Number
R25-LG-25



Description

Polycarbonate Beacon, 120V, 15W, 3.5" x 3.75", UL 4X
R=Red, A=Amber, B=Blue, G=Green
NITW - Industrial Control Panel Components

- * 12" Pre-Wired Leads
- * Single Hole Mount
- * 12V and 24V available
- * LED available in 120V or 24V

List Price	
1-10	\$24.00
11-24	\$22.00
25-49	\$20.00
50-99	\$18.00
100-up	\$16.00



Part Number
R40-XLS-25
R40-XLS-40F



Description

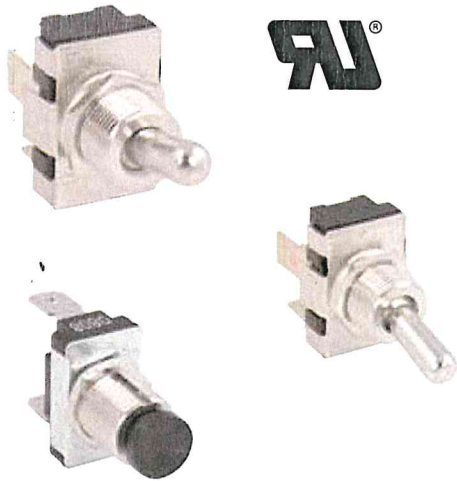
Polycarbonate Beacon, 120V, 25W, 4.25" x 4.25", UL 4X
Polycarbonate Beacon, 120V, 40W, 4.25" x 4.25", UL 4X, Flasher
R=Red, A=Amber, B=Blue, G=Green
NITW - Industrial Control Panel Components

- * 12" Pre-Wired Leads
- * Single Hole Mount
- * 12V and 24V available
- * LED available in 120V or 24V

List Price	
1-10	\$31.00
11-24	\$28.00
25-49	\$25.00
50-99	\$22.00
100-up	\$19.00

Add \$15 to above prices for flasher unit

Toggle Switches



Single Pole Single Throw

Part Number List Price
GA-7205C – On - None - Off \$2.38

Description CALL FOR
Quick Connect Terminals QUANTITY
20A-125VAC, 10A-250VAC -- 3/4HP, 125VAC DISCOUNTS

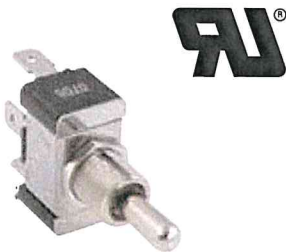
Part Number List Price
GA-7235C – (On) - None - Off ()=Momentary \$2.73

Description CALL FOR
Quick Connect Terminals QUANTITY
20A-125VAC, 10A-250VAC -- 3/4HP, 125VAC DISCOUNTS

Part Number List Price
EZ-18650-B-N-O – Off - On Push Button \$3.49

Description CALL FOR
Quick Connect Terminals QUANTITY
10A-125VAC -- 1/3 HP, 125VAC DISCOUNTS

Single Pole Double Throw

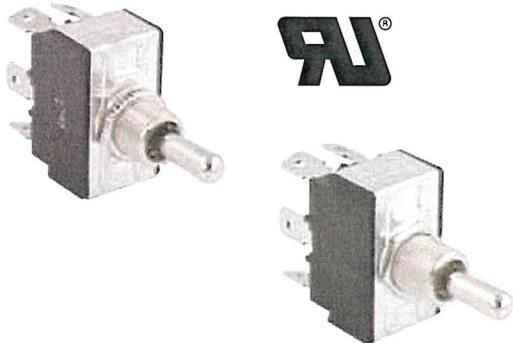


Part Number List Price
EZ-03-79652-X \$2.69

Description CALL FOR
X: Blank = On - Off - On QUANTITY
X: L = (On) - Off - On DISCOUNTS

X: M = (On) - Off - (On)
Quick Connect Terminals
20A-125VAC, 10A-250VAC -- 3/4HP, 125VAC
()=Momentary

Double Pole Double Throw



Part Number List Price
EZ-03-89652 – On - Off - On \$2.69

Description CALL FOR
Quick Connect Terminals QUANTITY
6A-125VAC, 3A-250VAC DISCOUNTS

Part Number List Price
EZ-03K-89652-L – On - Off - (On) \$3.63

Description CALL FOR
Quick Connect Terminals QUANTITY
10A-250VAC, 20-125VAC, 1-1/2HP DISCOUNTS

The above parts are stock items. If you do not see what you need, please call us.
All styles are available, including screw terminals and solder terminals.

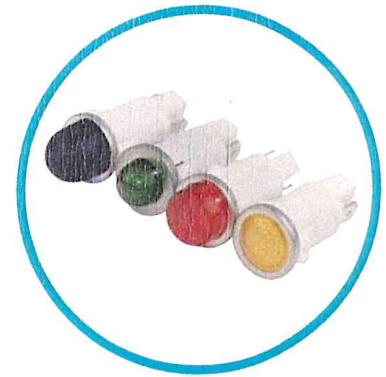
Toggle Switch Boots



Part Number List Price
TB-100 \$4.25

Description CALL FOR
Toggle Boot for Above Switches QUANTITY
Type: 4X DISCOUNTS

NITW - Industrial Control Panel Components



1092 Series 0.500" (12.7mm) LED Panel Mount Indicators

Available in four different lens styles, four diffused lens colors and operating voltage of 12V, 28V and 125VAC, Snap fit designed for ease of assembly and tab terminals termination style



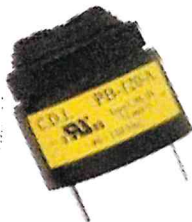
Application

- Industrial
- Transportation
- Food Service
- People Mover
- Medical
- Maritime
- Oil and Gas Industry
- Manufacturing
- Automation & Control

Key features

- Four colors available: Red, Green, Amber and Blue
- Four different lens styles available: Hi Hat, Hi Dome, Semi Dome and Small Dome
- Snaps fit into 0.500" (12.7mm) panel hole
- Front panel snap-in mounting requires no additional hardware
- 0.187" (4.75) tab terminal
- 4.4"/4.8" wire leads version also available
- Available in wide operating voltage of 12V, 28V and 125VAC
- High brightness LEDs for daylight viewing
- Transparent and diffused lenses provide visibility during the daylight
- 'D' mounting hole aids anti-rotation
- Designed, manufactured and tested in accordance with the relevant UL and CSA standards
- Compliant with RoHS and REACH requirements
- Life expectancy of 100,000 hours
- Order speed nuts separately to provide maximum fastening power with minimal installation torque.
- Order gasket separately to provide water, oil, air and dust tight
- For customized options please contact us

Piezo Buzzers



Part Number

PB-120-A

Description

40 - 125 VAC

Type 3, 3R, 4X, 12 and 13

95 db @ 2ft and 85 db @ 10ft

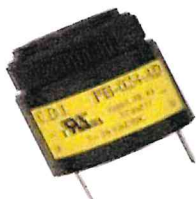
1/4" Quick Connect Tabs

Available with Volume Control Cover

NITW - Industrial Control Panel Components

List Price

1-9	\$19.00
10-24	\$17.25
25-49	\$14.25
50-99	\$12.25
100-up	CALL



Part Number

PB-024-AD

Description

5 - 24 VAC / VDC

Type 3, 3R, 4X, 12 and 13

95 db @ 2ft and 85 db @ 10ft

1/4" Quick Connect Tabs

Available with Volume Control Cover

NITW - Industrial Control Panel Components

List Price

1-9	\$14.00
10-24	\$12.75
25-49	\$10.58
50-99	\$8.75
100-up	CALL



Part Number

BE-MC-09-201-Q

Description

30 - 120 VAC

Type 4X

95 db @ 2ft

1/4" Quick Connect Tabs

Available with Volume Control Cover

List Price

1-9	\$20.41
10-24	\$17.86
25-49	\$15.57
50-99	\$14.04
100-up	CALL



Part Number

BE-MC-09-516-Q

Description

5 - 16 VDC

Type 4X

95 db @ 2ft

1/4" Quick Connect Tabs

Available with Volume Control Cover

List Price

1-9	\$15.48
10-24	\$13.54
25-49	\$11.80
50-99	\$10.52
100-up	CALL



Part Number

BE-MW-09-201-Q

Description

30 - 120 VAC

Type 4X

95 db @ 2ft

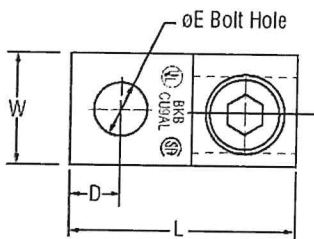
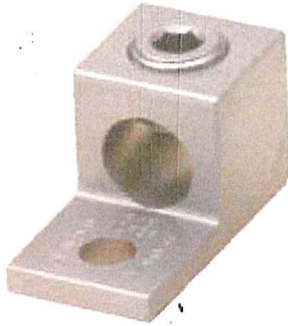
1/4" Quick Connect Tabs

Available with Volume Control Cover

List Price

1-10	\$21.31
11-24	\$18.64
25-49	\$16.25
50-99	\$14.61
100-up	CALL

For a complete listing of Floyd Bell Buzzers, please visit our web site to access their product numbering scheme and to see pricing for all of their buzzers.



**Dual-Rated
T&B Catalog Number:**

UPC Number:
Status:
Description:

ADR2
78378661000
Active

Type ADR-ALCUL Single-Conductor, One-Hole Mount for Conductor Range Max 2 Str., Min 14 AWG

Features

Easy Installation - no special tools required.

General

Style	ALCUL Single-Conductor, One-Hole Mount
Material	Aluminum
Plating	Tin-Plated
Conductor Range (AL or CU) Maximum	2 Str.
Conductor Range (AL or CU) Minimum	14 AWG

Dimension Information

Length (inches)	1 5/32
Width (inches)	1/2
Height (inches)	9/16
D (inches)	19/64
E (inches)	1/4
F (inches)	7/64
G (inches)	11/16

Packaging

T&B Inner Pack	50
Package in Units	500
T&B Sold in UOM	Each
T&B Weight Per UOM	1.5 lbs. per 100

Application Support

T&B Sales Drawings	wsd-000391
--------------------	------------

Notes

Slotted screw on lugs up through 2/0 Str.
UL 486B tested, AL9CU rated

Certifications

RoHS Compliance	Yes
-----------------	-----

Certifications



File Nbr:
E9809

For further technical assistance, please contact us...

Thomas & Betts - USA
8155 T&B Blvd.
Memphis, TN 38125
www.tnb.com

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

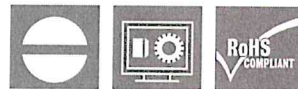
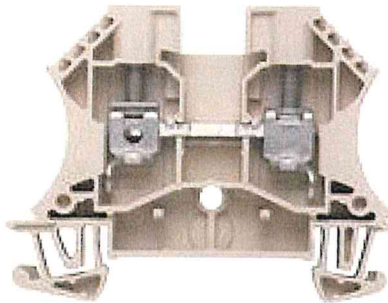
Hours: 7AM - 6PM CDT
Monday-Friday
Phone: (888) 862-3289
Fax: (901) 252-1321
Email: techsupport@tnb.com

WDU 6

Weidmüller Interface GmbH & Co. KG
Klingenbergstraße 26
D-32758 Detmold
Germany

www.weidmueller.com

Product image



To feed through power, signal, and data is the classical requirement in electrical engineering and panel building. The insulating material, the connection system and the design of the terminal blocks are the differentiating features. A feed-through terminal block is suitable for joining and/or connecting one or more conductors. They could have one or more connection levels that are on the same potential or insulated against one another.

General ordering data

Version	Feed-through terminal, Screw connection, 6 mm ² , 800 V, 41 A, dark beige
Order No.	1020200000
Type	WDU 6
GTIN (EAN)	4008 190 163440
Qty.	100 pc(s).

Creation date May 24, 2022 3:56:00 PM CEST

Catalogue status 20.05.2022 / We reserve the right to make technical changes.