JACK TYLER
ENGINEERING
INCORPORATED

# Myers VRS20 Series

# Duplex Grinder Pump Station

*ENGINEERED SOLUTIONS FROM PEOPLE WHO CARE*

**6112 Patterson Rd., Little Rock, AR 72209**

**PH: (501) 562.2296** **www.jteng.com**

PENTAIR
MYERS

VR2 SERIES
2 HP AUTOMATIC
GRINDER PUMPS

# SHREDDING WASTEWATER CHALLENGES



PATENTED AXIAL CUTTER TECHNOLOGY

EASY INSTALLATION

PERFORMANCE

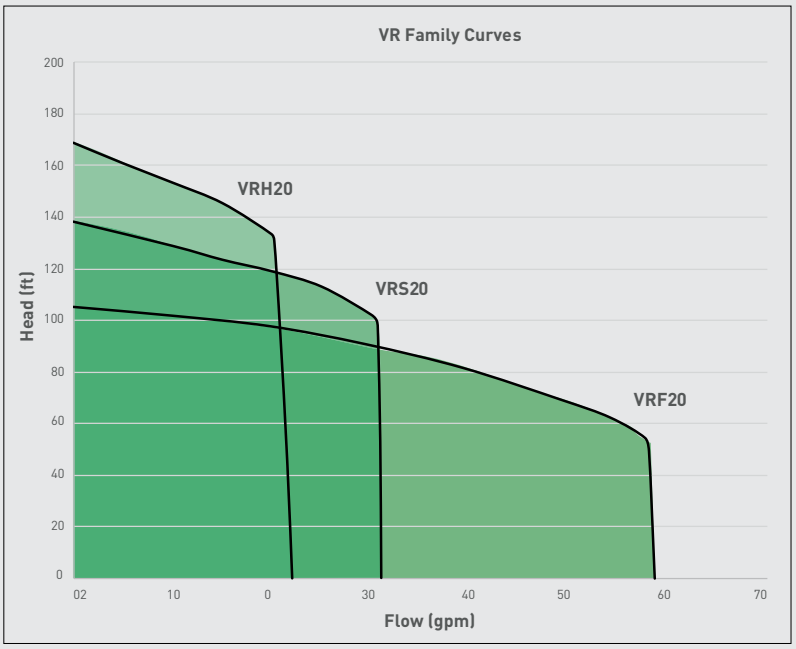
# MYERS® VR2 SERIES AUTOMATIC GRINDER PUMPS

The new MYERS VR2 grinders feature a patented axial cutter technology that easily slices through solids and trash found in domestic wastewater without roping or clogging. They come with plenty of standard features to make installation a breeze.



The VR2 is a rugged and economical solution for residential and pressure sewage systems.

## NOW WITH HIGHER HEADS AND FLOWS!




Now with up to 23% higher heads and 91% higher flows all in a single stage design



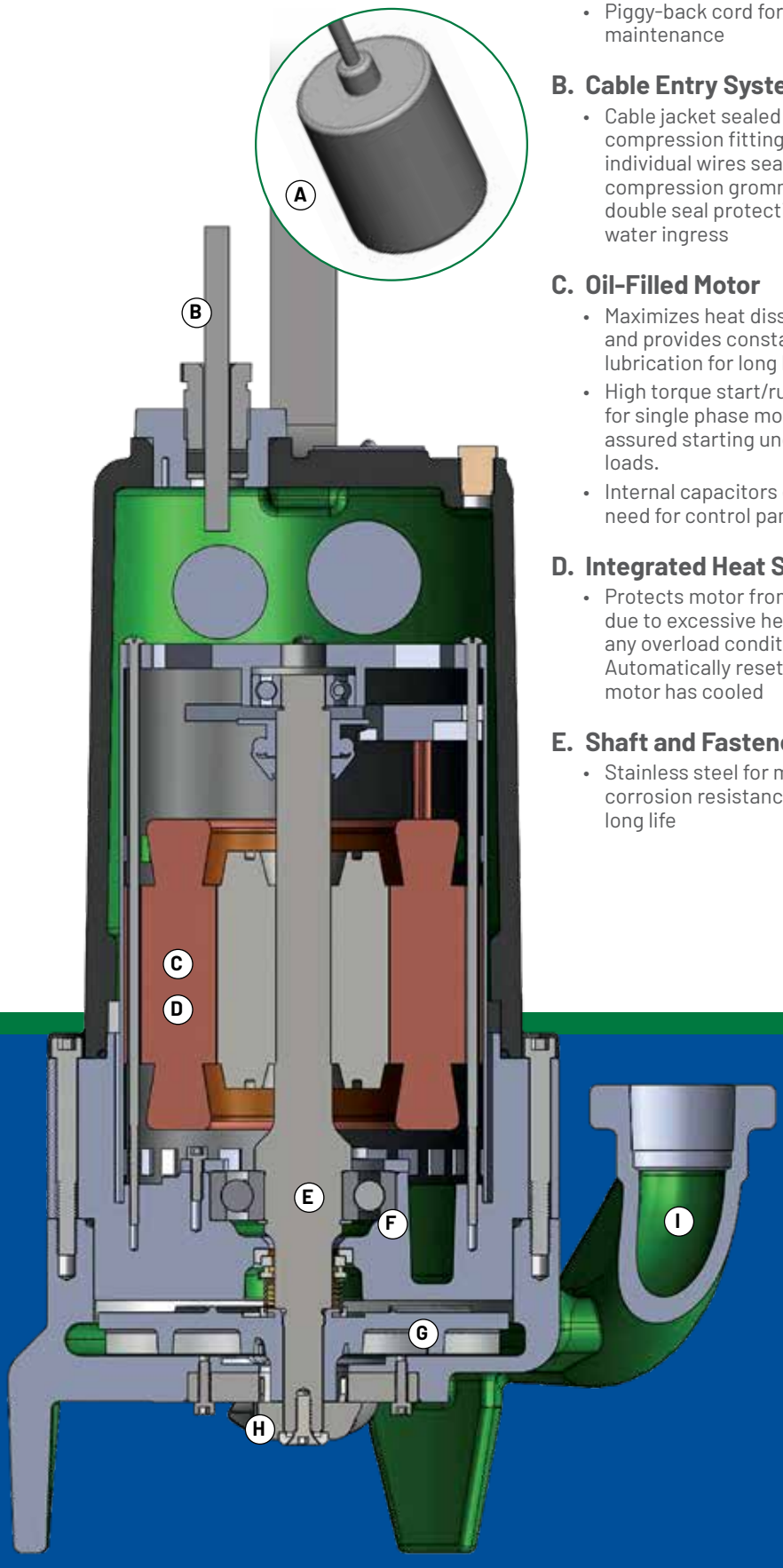
### PATENTED AXIAL CUTTER TECHNOLOGY

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

Watch the video at **www.femyers.com**



# FEATURES




## A. Wide Angle Float Switch

- Piggy-back cord for easy maintenance

## B. Cable Entry System

- Cable jacket sealed by compression fitting and individual wires sealed by compression grommet for double seal protection against water ingress

## C. Oil-Filled Motor

- Maximizes heat dissipation and provides constant bearing lubrication for long life
- High torque start/run capacitor for single phase motors for assured starting under heavy loads.
- Internal capacitors eliminate need for control panel

## D. Integrated Heat Sensor

- Protects motor from burnout due to excessive heat from any overload condition. Automatically resets when motor has cooled

## E. Shaft and Fasteners

- Stainless steel for maximum corrosion resistance and long life

## F. Shaft Seals

- Oil lubricated single carbon and ceramic faced seal provides motor protection

## G. Impeller

- Semi-open impeller handles ground slurry without clogging or binding
- Pump-out vanes help keep trash from seal and reduces pressure at seal face for longer life

## H. Axial Cutter System

- Easily slice through solids and trash commonly found in domestic wastewater without roping or clogging
- Constructed of 440 SST hardened to 57-60Rc for long life
- Easily replaceable without dismantling pump

## I. Volute Case

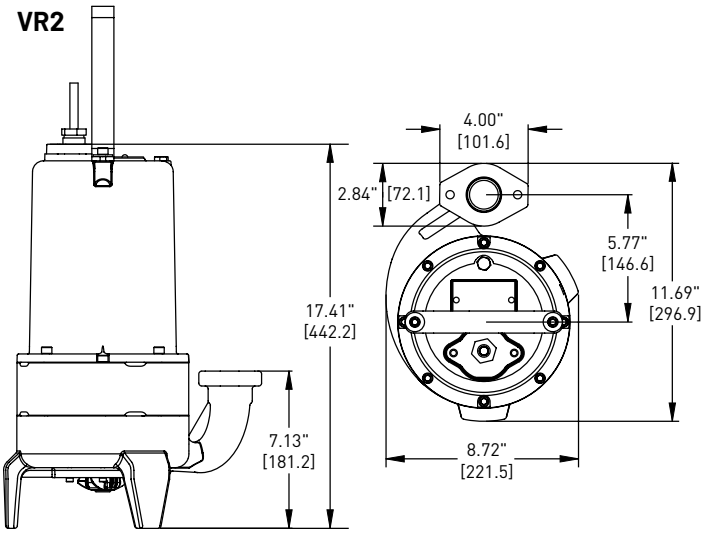
- Cast iron, 1-1/4" vertical, flanged discharge

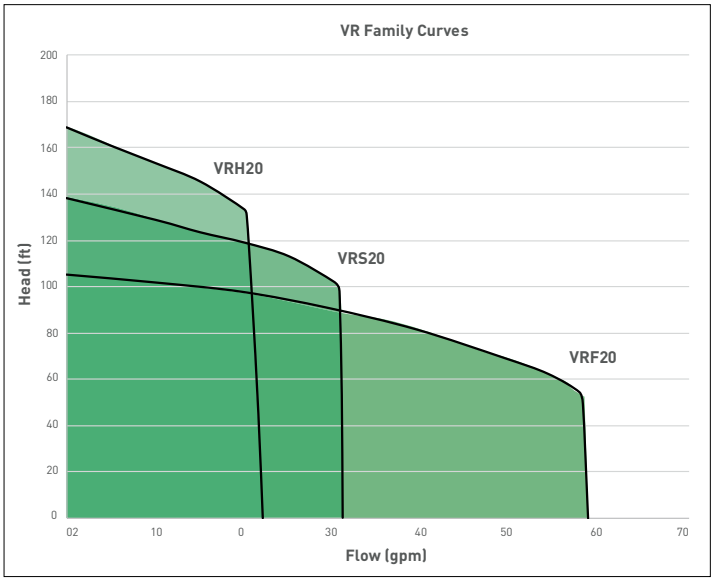
# PERFORMANCE DATA AND DIMENSIONS

## 3450 RPM

[Dimensions in mm]

**VR2**




### Electrical Data

| Model | Engineering Number | HP | Voltage | Phase | Hz | Full Load Amps | Start Amps | Cord Length | Dis-charge | Switch | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VRS20A-21 | 28200D000 | 2 | 230 | 1 | 60 | 15 | 60.7 | 20 | 1-1/4" | Auto | 95 |
| VRS20M-21 | 28200D010 | 2 | 230 | 1 | 60 | 15 | 60.7 | 20 | 1-1/4" | Manual | 95 |
| VRH20A-21 | 28200D100 | 2 | 230 | 1 | 60 | 15 | 60.7 | 20 | 1-1/4" | Auto | 95 |
| VRH20M-21 | 28200D110 | 2 | 230 | 1 | 60 | 15 | 60.7 | 20 | 1-1/4" | Manual | 95 |
| VRF20A-21 | 28200D200 | 2 | 230 | 1 | 60 | 15 | 60.7 | 20 | 1-1/4" | Auto | 95 |
| VRF20M-21 | 28200D210 | 2 | 230 | 1 | 60 | 15 | 60.7 | 20 | 1-1/4" | Manual | 95 |

### Construction Materials

| | |
|---|---|
| Motor Housing, Seal Housing, Cord Cap and Volute Case | Cast Iron, Class 30, ASTM A48 |
| Semi-Open Impeller | Stainless steel |
| Power Cord | SJOOW |
| Mechanical Seals: Standard | Carbon and Ceramic |
| Pump, Motor Shaft | 416 SST |
| Fasteners | 300 Series SST |
| Cutting Mechanism | 440 SST 58-60 Rockwell |

### Product Capabilities

| | | |
|---|---|---|
| Capacities To: | 59.5 gpm | 225.2 lpm |
| Heads To: | 169 ft. | 51.5 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 | 3450 rpm, 60 Hz, 1 ph 230V | |
| 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<br>Simplex<br>Duplex | <br>24 in.<br>36 in. | <br>61.0 cm<br>91.4 cm |

PENTAIR


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PENTAIR

Customer :
Project name : Default

# Pump Performance Datasheet

Encompass 2.0 - 17.0.3.0

| | | | |
|---|---|---|---|
| Item number | : 014 | Size | : Myers - VRS20 |
| Service | : | Stages | : 1 |
| Quantity | : 1 | Based on curve number | : SUB_G_O_AH_00012_A_2 Rev 2016-12-07 |
| Quote number | : 363843 | Date last saved | : 16 Feb 2017 10:19 AM |

## Operating Conditions

| | |
|---|---|
| Flow, rated | : 32.42 USgpm |
| Differential head / pressure, rated (requested) | : 76.23 ft |
| Differential head / pressure, rated (actual) | : 76.23 ft |
| Suction pressure, rated / max | : 0.00 / 0.00 psi.g |
| NPSH available, rated | : Ample |
| Frequency | : 60 Hz |

## Performance

| | |
|---|---|
| Speed, rated | : 3500 rpm |
| Impeller diameter, rated | : 5.25 in |
| Impeller diameter, maximum | : 5.25 in |
| Impeller diameter, minimum | : 5.25 in |
| Efficiency | : - |
| NPSH required / margin required | : - / 0.00 ft |
| nq (imp. eye flow) / S (imp. eye flow) | : N/A Metric units |
| Minimum Continuous Stable Flow | : - |
| Head, maximum, rated diameter | : 134.0 ft |
| Head rise to shutoff | : 75.78 % |
| Flow, best eff. point | : - |
| Flow ratio, rated / BEP | : - |
| Diameter ratio (rated / max) | : 100.00 % |
| Head ratio (rated dia / max dia) | : 100.00 % |
| Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010] | : 1.00 / 1.00 / 1.00 / 1.00 |
| Selection status | : Acceptable |

## Liquid

| | |
|---|---|
| Liquid type | : Water |
| Additional liquid description | : |
| Solids diameter, max | : 0.00 in |
| Solids concentration, by volume | : 0.00 % |
| Temperature, max | : 68.00 deg F |
| Fluid density, rated / max | : 1.000 / 1.000 SG |
| Viscosity, rated | : 1.00 cP |
| Vapor pressure, rated | : 0.34 psi.a |

## Material

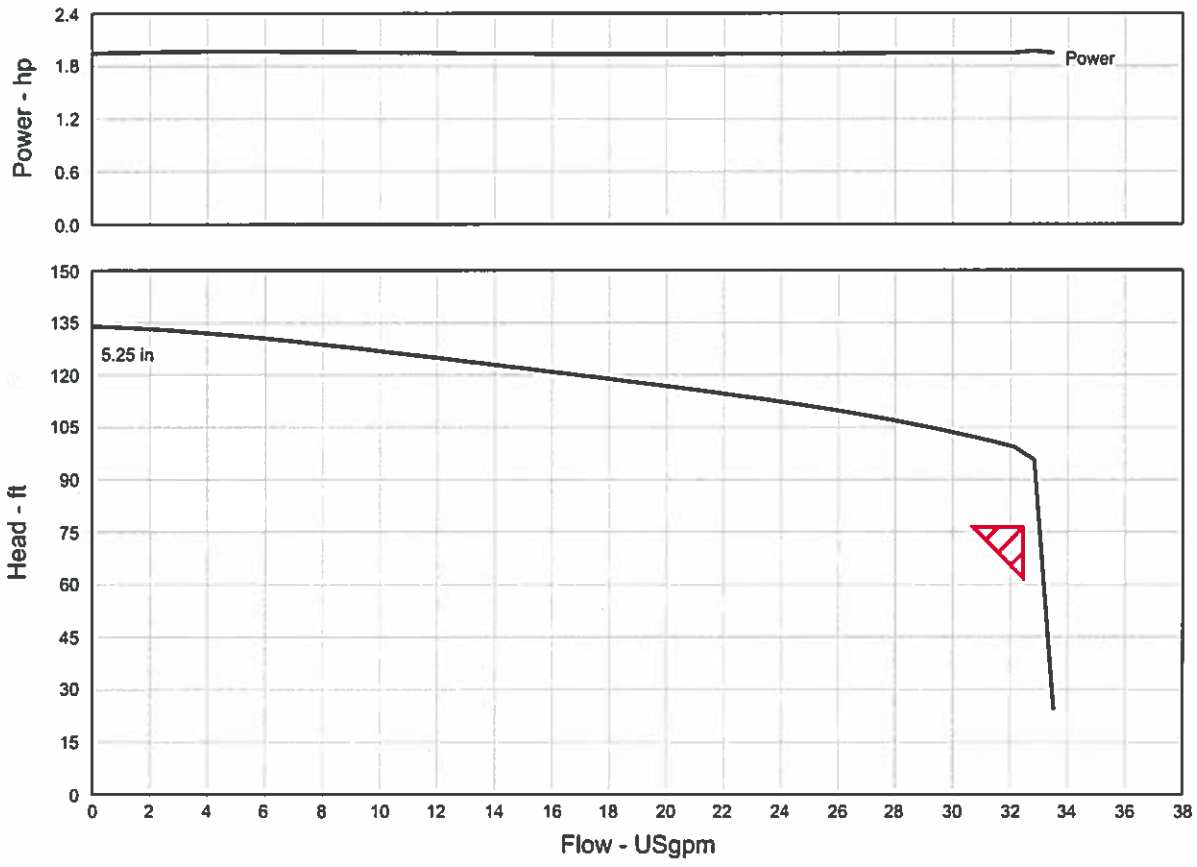
| | |
|---|---|
| Material selected | : Standard |

## Pressure Data

| | |
|---|---|
| Maximum working pressure | : 57.99 psi.g |
| Maximum allowable working pressure | : N/A |
| Maximum allowable suction pressure | : N/A |
| Hydrostatic test pressure | : N/A |

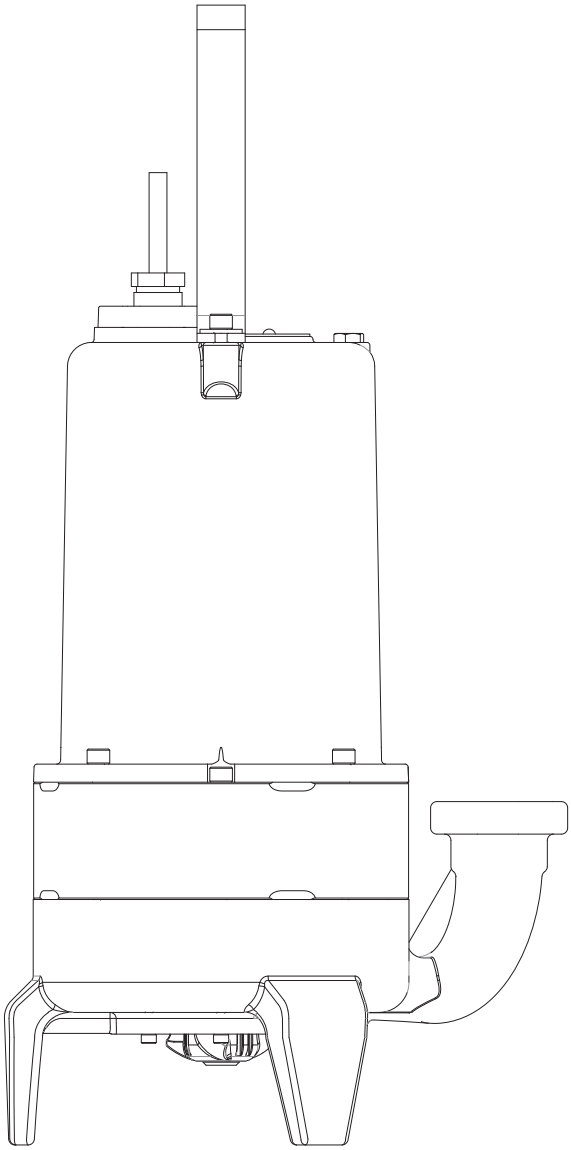
## Driver & Power Data (@Max density)

| | |
|---|---|
| Driver sizing specification | : Rated power |
| Margin over specification | : 0.00 % |
| Service factor | : 1.00 |
| Power, hydraulic | : 0.62 hp |
| Power, rated | : 1.50 hp |
| Power, maximum, rated diameter | : 1.97 hp |
| Minimum recommended motor rating | : 2.00 hp / 1.49 kW (Fixed) |



PENTAIR

MYERS®



# VR2 SERIES
# GRINDER PUMPS
## INSTALLATION AND SERVICE MANUAL

NOTE! 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.

Part # 23833A701 | © 2017 Pentair plc | 04/20/17

## USAGE

The VR2 Series is a submersible wastewater grinder pump designed specifically for individual residential and pressure sewer applications. The pumps are to be used for domestic sewage only and are not to be used for pumping commercial or industrial sewage such as from motels, schools, apartments, factories, etc. **THIS PUMP IS NOT FOR USE IN HAZARDOUS LOCATIONS!**

## INSPECTING PUMP

Before making any piping or electrical connections, check the pump for shipping damage or cracks. Using a flat screwdriver placed in the slot on the shaft end, turn shaft and impellers to be sure they are free. **DO NOT TURN IMPELLER WITH FINGERS AS EDGES ARE SHARP.**

## POWER SUPPLY

The VR2 Series grinder pump should be connected only to a 230 volt, single-phase, 60 Hz power source. The pump will draw approximately 10.7 amperes at minimum flow and 15.0 full load amperes. The pump must be connected to a grounded power socket. **DO NOT** cut off the ground pin from the power cord plug.

## POWER CORD

A 20 foot power cord is attached to the grinder pump via two insulated quick-disconnect terminals and a ground terminal. To replace a cord, begin by slightly loosening cord nut in the cord cap plate. Remove cord cap plate from the motor housing and carefully pull the power leads up out of the motor housing and disconnect them from the motor leads. Disconnect the ground wire from the cap plate and continue to completely loosen the cord nut from the cap.

To install new cord, feed terminals through cord cap plate and reconnect power terminals. Reconnect ground terminal to the bottom side of the cap plate. Carefully feed wires back into the motor housing and fasten the cord cap plate to the motor housing. Lastly, tighten the cord nut into the cap plate. Tighten firm, do not overtighten.

The power cord should be replaced if it has been damaged in any way or the cord jacket has become brittle.

## MOTOR TYPE

The VR2 Series grinder pump contains a 3/4 frame, 2 hp, single-phase, 60 Hz, 3450 rpm, capacitor start, capacitor run motor with Class F insulation and built-in, on-winding overload protection. Motor has upper and lower ball bearings and is oil-cooled and lubricated.

## ⚠ CAUTION!

**THE VR2 SERIES GRINDER PUMP SHOULD NEVER BE WORKED ON WITHOUT FIRST DISCONNECTING THE POWER CORD.**

## OIL TYPE

The motor housing contains dielectric transformer oil to provide good heat transfer and lubrication of ball bearings; no other lubrication is required. Oil level may be checked by removing the plug from the top of the motor housing. The oil level should be filled to the bottom of the end shield. **Do not overfill with oil.** Only dielectric transformer oil obtained from a Myers® authorized service center should be used.

## PUMP SWITCH INSTALLATION INSTRUCTIONS

**NOTE:** In accordance with third party approval, pump must be submerged a minimum of 10-9/16" from bottom of the legs on volute case during operation.

### Mounting the Switch

1. Determine pumping range for installation. Do not tether less than 3-1/2" from pipe.
2. Tighten strap around discharge pipe keeping switch cable between strap and pipe to prevent slippage.
3. Space small ties at least 1" apart. To readjust ties, press small tie tabs down.
4. To lock releasable tab, run remaining strap between tab and head. Tuck strap back through head.

### Piggyback Plug Install

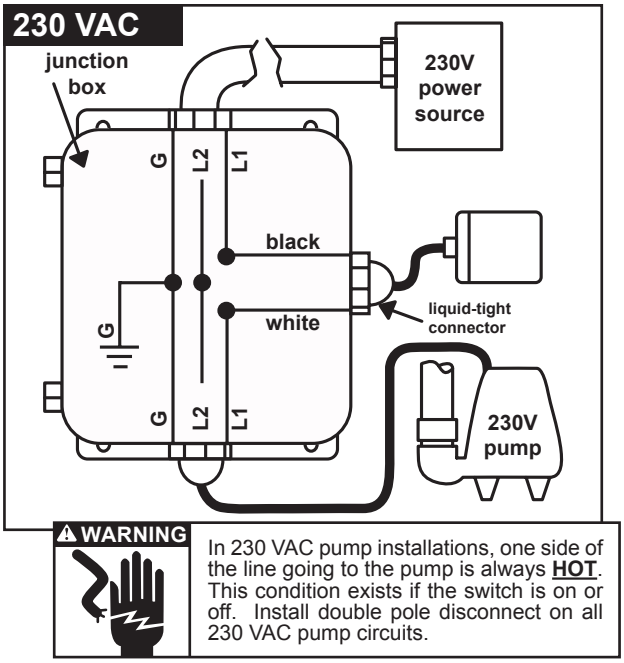
⚠ Electrical outlet must not be located in pump chamber.

⚠ Electrical outlet voltage, piggyback plug voltage, and pump voltage must match.

1. Follow steps 1 through 4 of “Mounting the Switch.”
2. Insert switch’s piggyback plug into outlet.
3. Plug pump into piggyback plug.
4. Check installation. Allow system to cycle to ensure proper operation.

### Direct Wire Install

1. Follow steps 1 through 4 of “Mounting the Switch.”
2. Further wiring of switch should be done by qualified professionals only.
3. Check installation. Allow system to cycle to ensure proper operation.




## SAFETY WARNINGS

⚠ **WARNING!** Risk of electrical shock. Pumps are supplied with a grounding conductor and grounding-type attachment plug on the power cord. To reduce the risk of electrical shock, be certain that it is connected only to properly grounded, grounding-type receptacle. **DO NOT** cut off ground pin or use an adapter fitting. **DO NOT** use an extension cord with this pump. When wiring this pump follow all local electrical, safety codes and ordinances as well as most recent National Electric Code (NEC-ANSI/NFPA).

The VR2 Series grinder pumps have a GROUND WIRE that is connected to a screw in the metal motor housing. This wire goes to the receptacle or control box which must be connected to a good outside GROUND such as a metal water pipe or GROUND STAKE driven at least 8 feet into the ground.

**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.**

## DISMANTLING PUMP FOR REPLACEMENT PARTS

Before dismantling pump for replacement parts, clean pump thoroughly.

## REPLACING STATIONARY CUTTER PLATE AND ROTATING CUTTER

All repairs must be done at the factory or at an authorized Myers service facility.

## ⚠ CAUTION!

**DISCONNECT ALL POWER AND CONTROL WIRES TO MOTOR AT CONTROL PANEL BEFORE STARTING DISASSEMBLY OPERATIONS. NEVER RELY ON OPENING CIRCUIT BREAKER ONLY.**

## DISASSEMBLY OF STATIONARY CUTTER PLATE AND ROTATING CUTTER

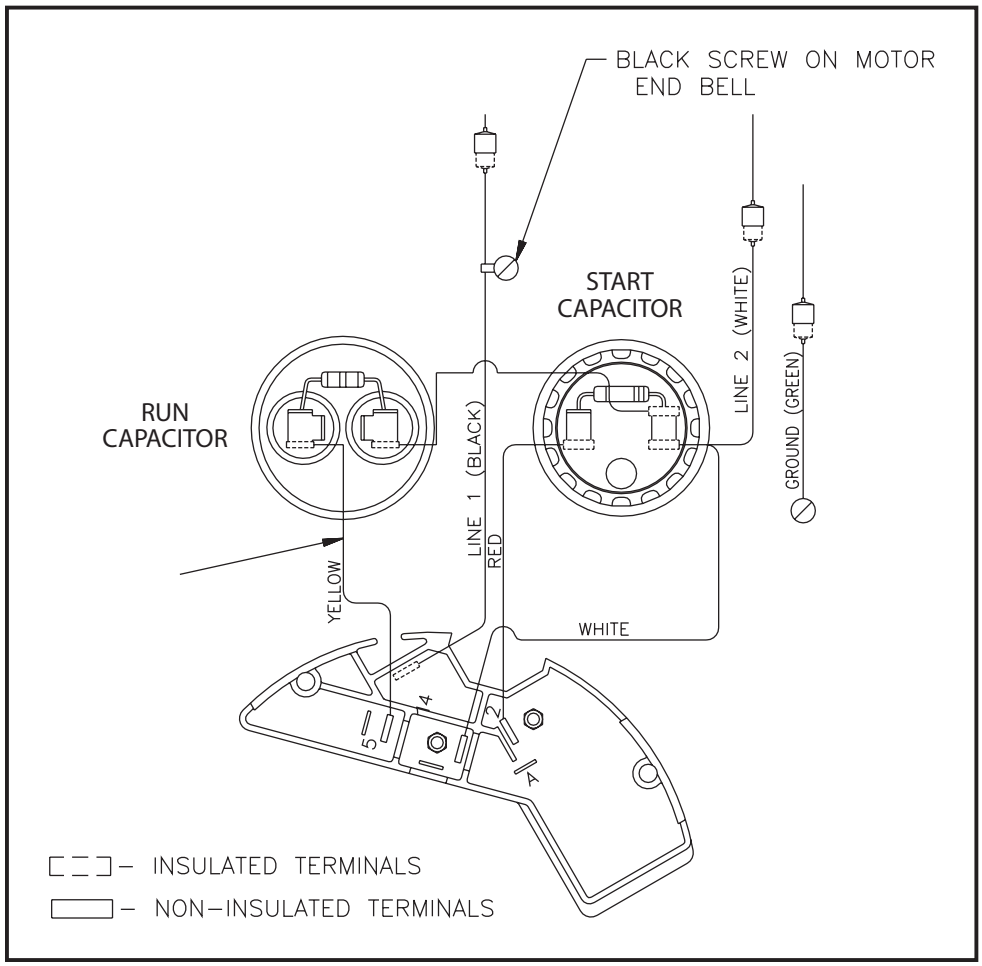
1. Remove retaining washer and screw from end of shaft. A screwdriver can be used to hold the shaft in place by wedging it between one of the four socket head cap screws and the rotating cutter while loosening the screw.
2. Using a rubber mallet, or soft metal hammer, bump rotating cutter in counterclockwise direction as thread is right-hand. Unthread rotating cutter from shaft. Be careful to not lose ring shims that space the rotating cutter from the stationary cutter plate.
3. Remove four socket head cap screws holding the stationary cutter plate to the volute. Remove stationary cutter from volute. If stationary cutter is stuck, the socket head cap screws can be threaded into tapped back-off holes in plate. Tighten screws to remove plate from volute.
4. Inspect rotating cutter and stationary cutter plate for wear and replace if worn.
5. Make sure pocket in volute is clean and reinstall stationary cutter plate using the four socket head cap screws. Apply blue Loctite® to the threads. Do not overtighten cap screws.
6. Replace ring shims (if removed from the shaft) and thread rotating cutter onto shaft. Make sure threads on shaft are clean and use Never-Seez® or other graphite compound on threads before replacing rotating cutter.
7. Using a rubber mallet, or soft metal hammer, bump rotating cutter in clockwise direction to make sure it is seated on the impeller.
8. To ensure proper operation of the cutter mechanism, the gap between the stationary cutter plate and rotating cutter must be no more than .008". 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 correctly. If the .008" feeler gauge fits between the surfaces, shims must be removed to close the gap.

9. Replace retaining washer and screw in the end of the shaft. Be sure screw is tight. A screwdriver can be used to hold the shaft in place by wedging it between one of the four socket head cap screws and the rotating cutter while tightening the screw.
10. Be sure shaft turns freely after reassembly. Some drag will occur due to the seal, but there should be no binding or tight spots when turning the rotating cutter.
11. If rotating cutter rubs or drags on stationary cutter plate, recheck gap and re-shim rotating cutter.

## TO REPLACE CAPACITORS ONLY

1. Remove oil fill plug near the top of motor housing and pour oil out.
2. Loosen the cord nut on power cord until cord is loose enough to push cord down into motor housing.
3. Remove four bolts from motor housing and bump housing with a plastic hammer to loosen. Lay pump on its side.
4. Remove the housing carefully to be sure that enough cord is pushed into the housing so as not to create tension on cord.
5. Slide motor housing up far enough to expose the capacitors and to be able to lay the housing down.
6. Disconnect wiring from capacitor and loosen capacitor clamp and slide capacitor out. Replace with new capacitor, tighten clamp and reconnect.
7. Check all wiring connectors to be sure they are secure.
8. Be sure O-ring is in place.
9. Slide motor housing back onto pump while pulling the cord out slowly. Assemble motor housing with four bolts.
10. Reassemble cord nut. Be sure washers are seated and cord is pulled up against the washers. Tighten nut securely.
11. Put pump upright and refill motor with Myers submersible pump oil. **DO NOT OVERFILL WITH OIL.** Replace oil plug. Retighten plug firmly, but do not overtighten.
12. Be sure pump turns freely before connecting power. Turn pump on side and turn impeller, using screwdriver in slotted shaft. Plug pump into receptacle to test operation. Pump must run quietly and free of vibration.

**WIRING DIAGRAM – MARATHON®**



## TROUBLESHOOTING GUIDE

**Pump does not run or hum.**
See A, B, C, D, E or F.

**Pump runs but does not deliver water.**
See G, H, I, J, K or L.

**Pump runs and pumps out sump but does not stop.**
See M.

**Pump runs but delivers only small amount of water.**
See I, J, K, L or N.

**Fuse blows or circuit breaker trips when pump starts.**
See K, L, N, O or P.

**Motor runs for short time then stops. Then after short period starts again. Indicates tripping overload caused by symptom shown.**
See K, L, N or P.

**For any other symptoms contact a Myers authorized service facility.**

**A**. Line circuit breaker may be off; or fuse, if used, may be blown or loose.

**B**. Water level in sump may be too low. Run in more water.

**C.** Pump cord plug may not be making contact in receptacle.

**D**. If pump is using the series cord plug, the two plugs may not be plugged tightly together.

**E**. Float may be stuck. Be sure float operates freely in basin. Check tether length of switch.

**F**. If all symptoms check OK, motor winding may be open; take to service center for repair.

**G**. Check valve may be installed backward. Arrow on valve points in direction of flow.

**H**. Discharge shut-off valve, if used, may be closed.

**I**. Pump may be air locked. Start and stop several times by plugging and unplugging cord. Check vent hole on pump case for plugging.

**J**. Pump head may be too high. Horizontal distance does not affect pumping, except loss due to friction.

**K**. Inlet holes in pump base may be clogged. Remove pump and clean out openings.

**L**. Impeller or volute openings may be plugged or partially plugged. Remove pump and clean. Check tether length of switch.

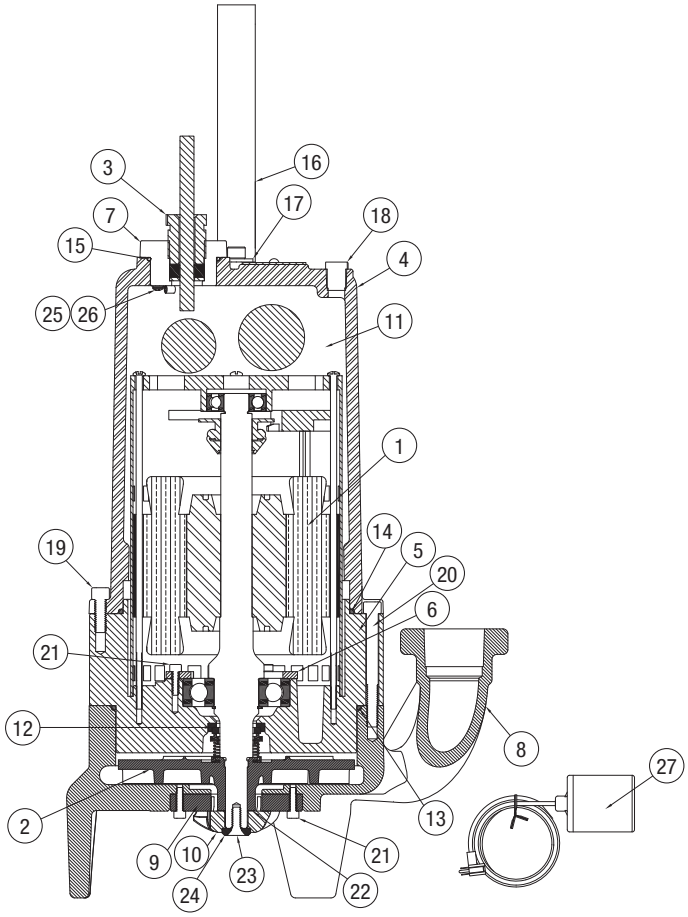
**M**. Float is stuck in up position. Be sure float operates freely in basin.

**N**. Pump impeller may be partially clogged causing motor to run slow, resulting in motor overload.

**O**. Fuse size or circuit breaker is too small. Must be 20 amps.

**P**. Defective motor stator. Return to Myers service center.

# MOTOR END PARTS




## COMMON PARTS LIST

**For use with product built with Marathon® motor.**

| Item | Engineering No. | Description | Qty |
|---|---|---|---|
| 1 | 28165B000 | VRS20A-21 Motor Assembly | 1 |
| | | VRS20M-21 Motor Assembly | 1 |
| 2 | 28197B001 | Impeller, 5.25" O.D. | 1 |
| 3 | 25338B001 | Power Cord, 14-3, 20' | 1 |
| 4 | 28132B000 | Motor Housing | 1 |
| 5 | 28188D000 | Seal/Bearing Housing | 1 |
| 6 | 28198A000 | Bearing Retainer, VRS20 | 1 |
| 7 | 28193B000 | Cord Cap Plate | 1 |
| 8 | 28133D000 | Volute | 1 |
| 9 | 28145B000 | Stationary Cutter | 1 |
| 10 | 28146B001 | Rotating Cutter | 1 |
| 11 | 132531001 | Premium Oil | 0.8 Gallons |
| 12 | 21576A011 | Seal, 7/8" Shaft | 1 |
| 13 | 05876A120 | O-ring, 1/8" X 6.25 I.D. | 1 |
| 14 | 05876A125 | O-ring, 1/8" X 5.859 I.D. | 1 |
| 15 | 05876A244 | O-ring, 3/32" X 1.737 I.D. | 1 |
| 16 | 25371B010 | Lifting Bail | 1 |
| 17 | 05030A020 | Washer, Flat, 5/16" | 2 |
| 18 | 05022A088 | Plug, 1/4" Pipe | 1 |
| 19 | 001780081 | Screw, Socket Head, 5/16" X .875" | 8 |
| 20 | 001780101 | Screw, Socket Head, 5/16" X 3.00" | 4 |
| 21 | 048200061 | Screw, Socket Head, 10-24 X .625" | 7 |
| 22 | 006280571 | Shim; 1.00 OD x .625 ID x .002 | 1 |
| | 006280591 | Shim; 1.00 OD x .625 ID x .020 | 1 |
| | 006280601 | Shim; 1.00 OD x .625 ID x .030 | 1 |
| | 006280581 | Shim; 1.00 OD x .625 ID x .005 | 1 |
| 23 | 07597A018 | Screw, Flat Head, 1/4" x .75" | 1 |
| 24 | 21583A000 | Washer, Retaining | 1 |
| 25 | 000630021 | Screw, 6-32 x .25" | 1 |
| 26 | 009950011 | Lockwasher, Star | 1 |
| 27 | 145950201 | Float Switch, Wide Angle, 20' (VRS20A) | 1 |

# MYERS® 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.

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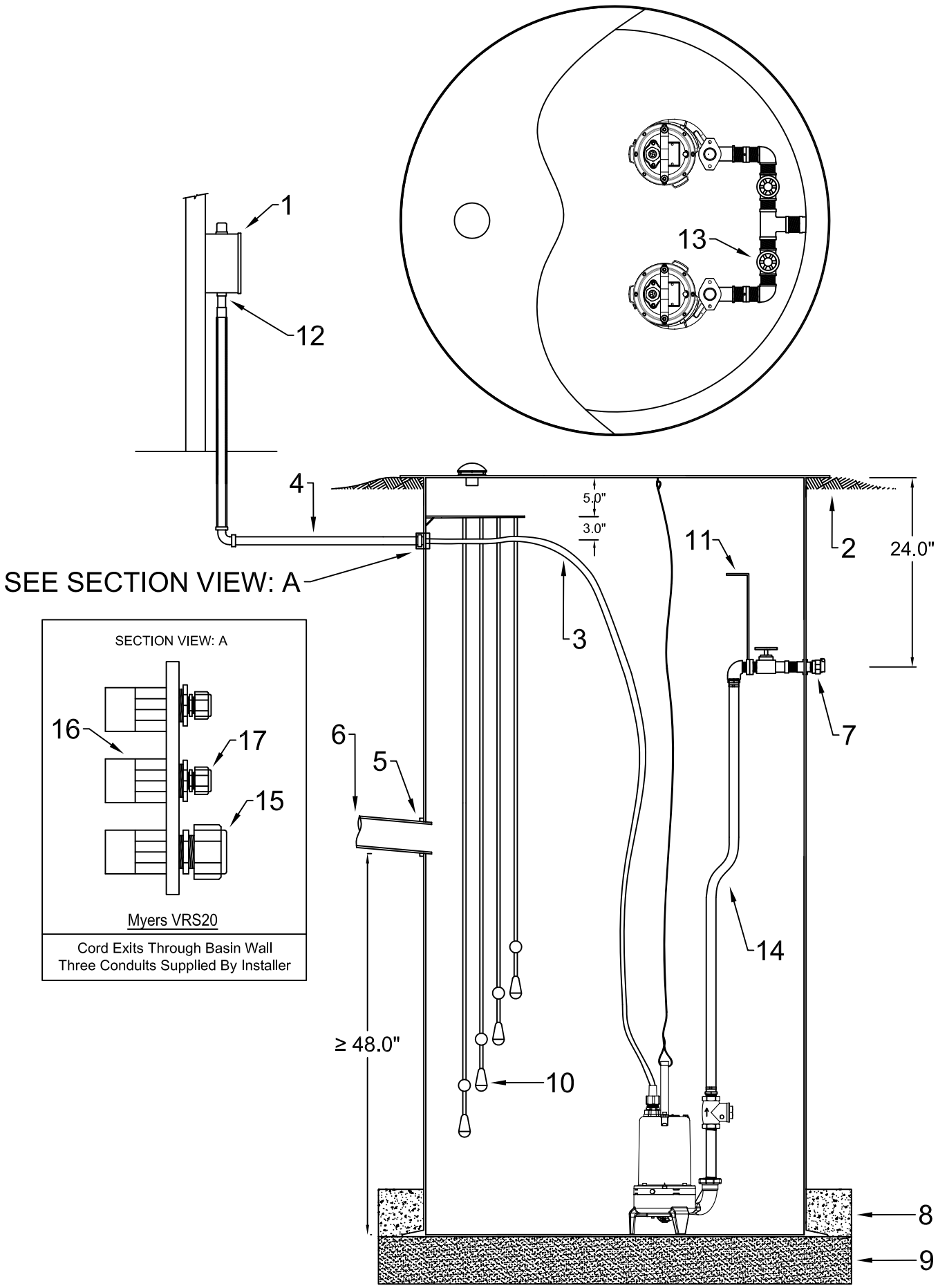
# Myers VRS20 Duplex Station
# Grinder Pump Station Feature Identification

1. **Alarm Panel –** NEMA 4x Enclosure, Equipped with circuit breakers and audio visual alarm. Available in 1 or 3 phase. Locate according to local codes. Should be placed in a highly visual area.

   Notes:

   a. Standard pump cords are 20ft. long.
   b. Installer must supply a dedicated 50A, 240V, 4wire #6AWG Service disconnect within 5ft. of either side of sewer stub-out.

2. **Finish Grade –** Grade line to be 1”- 4” below removable lid and sloped away from the station.
3. **Power and Alarm Supply Cable –** Must meet national and local electrical codes. ALL excess cable should be pull from basin to factory cable stop.
4. **Three Conduits –** Installer must supply three 1” conduits from the basin to the control panel. Burial depth as required by national and local codes. Conduits must enter the panel from bottom and be sealed per NEC Code 300.5 and 300.7. Supplied by others.
5. **Inlet –** 4” Sch. 40 PVC grommet, supplied loose. Field installation utilizing 5” hole saw. Inlet must be a minimum of 48” from the bottom of the basin.
6. **4” Gravity Service Line -** Supplied by others.
7. **Stainless Steel 1.25” NPT Female Outlet with Brass 1.25” MNPT x Sch. 40 Compression Connection.**
8. **Concrete Ballast –** Per local requirements. Supplied by others.
9. **Bedding Material –** 6” Minimum depth, round aggregate (gravel). Supplied by others.
10. **Level Sensing Floats**
11. **SST Pull Out Rod**
12. **Sealed Conduit Connector -** O-ring type. Supplied by others.
13. **Brass Gate Valve, 1.25”**
14. **Flexible Hose Assembly –** Includes SST hose barb adapters.
15. **1” Cord Grip –** For floats.
16. **1” PVC Coupling, Glue End**
17. **1/2” Cord Grip –** For pump cords.




| Note: Standard Pump Cord Length Is 20ft. | Myers Duplex Station |
|---|---|

PENTAIR

MYERS®

**Specifications**
# VR2 Series

**PUMP MODEL** – Pump shall be of the centrifugal type, Myers® model VR2 Series, with an integrally built-in grinder unit and submersible type motor. Discharge shall be 1-1/4" NPT.

**OPERATING CONDITIONS** – Each pump shall be rated __2__ hp, __230__ volts, __1__ phase, __60__ hertz, and __3450__ rpm. The unit shall produce_____U.S. GPM at _____feet TDH.

**CONSTRUCTION** – Each pump shall be of the sealed submersible grinder type, model VR2 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 SJOOW water resistant 300V, UL and/or CSA approved.
The cable jacket shall be sealed at the motor entrance by means of a rubber compression washer and compression nut. A heat shrink tube filled with epoxy shall seal the outer cable jacket and the individual leads to prevent water from entering the motor housing.

**MOTOR** – Pump motor shall be rated 2 hp at 3450 rpm. Motor shall be for 60 Hz, single-phase, 230 volts. Motor shall be capacitor start, capacitor run-type for high starting torque. 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 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.

The motor shall have a current overload attached to the top end of the motor windings to stop the motor if the motor winding temperature reaches 138°C. The high temperature shut-off will cause the pump to cease operation, should a control failure cause the pump to run in a dry wet well. The thermostat shall reset automatically when the motor cools to a safe operating temperature.

**BEARINGS AND SHAFT** – An upper single-row ball radial bearing and a lower single-row ball thrust 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 416 series stainless steel and be designed with large diameters and minimum overhang to reduce shaft deflection and prolong bearing and seal life.

**SEALS**– The rotor and stator in the motor housing shall be separated and protected from the pumped liquid by an oil-filled seal housing incorporating a type 21 carbon ceramic mechanical seal.

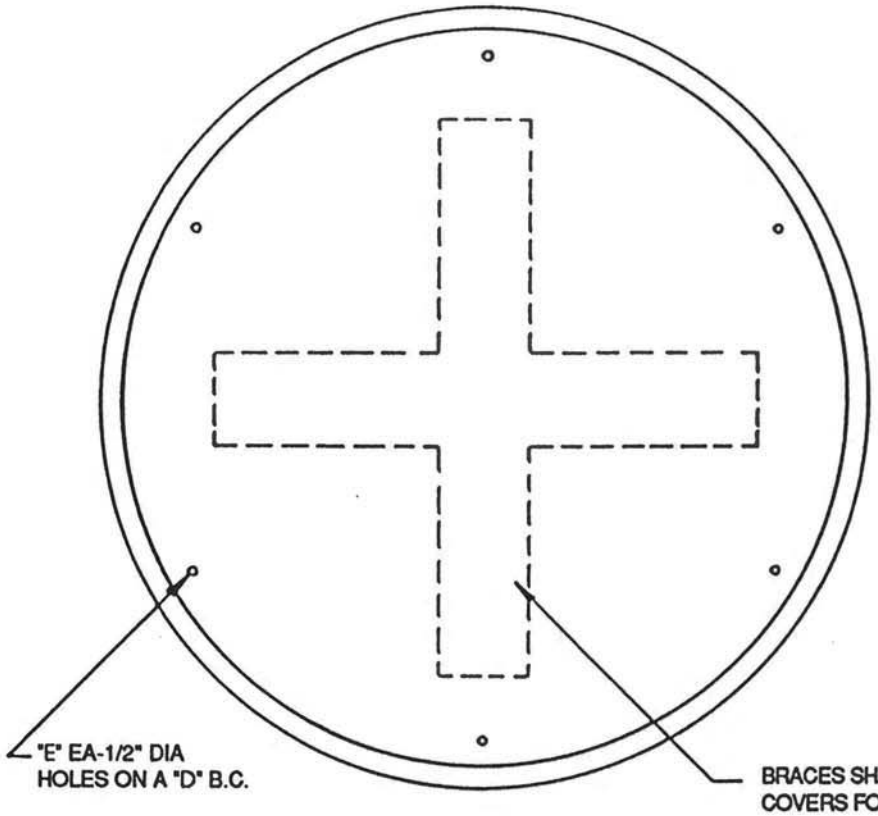
**IMPELLER** – The impeller shall be constructed of 316/CF8M stainless steel and be designed for rough duty service. It shall be a ten-vane, semi-open design with four wash out vanes on the rear shroud. The impeller shall be a non-overloading design.

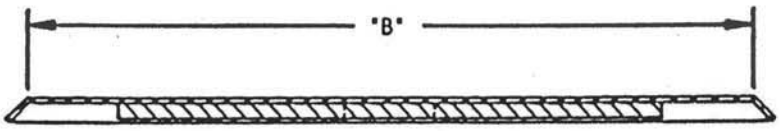
**GRINDER MECHANISM** – The stationary cutter shall be circular in design and contain evenly spaced cutting slots that extend outwards from the inlet of the pump. The slots are tapered inward toward the inlet to help direct slurry through the cutting slots into the pump. The slots are to be angled, or 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.

**LEVEL CONTROL** – An automatic control is provided by a heavy-duty UL/CSA listed float switch tethered to the side of the pump, having a piggyback plug on one end. This piggyback float switch operates the pump directly without need of a control panel.


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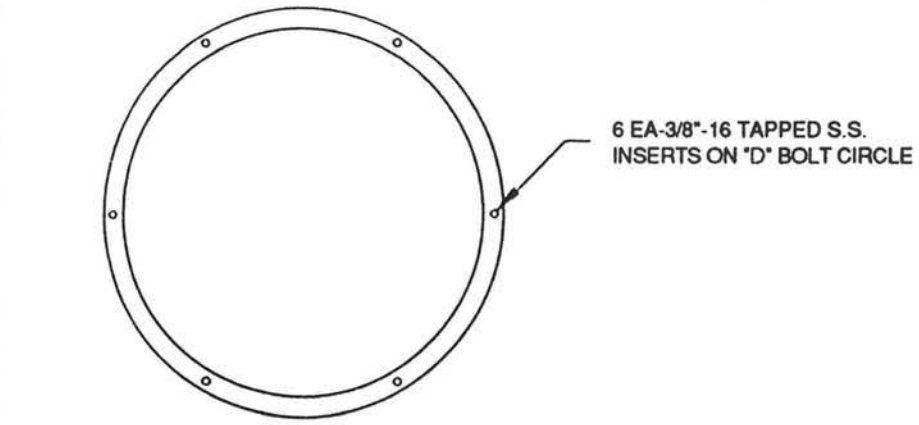



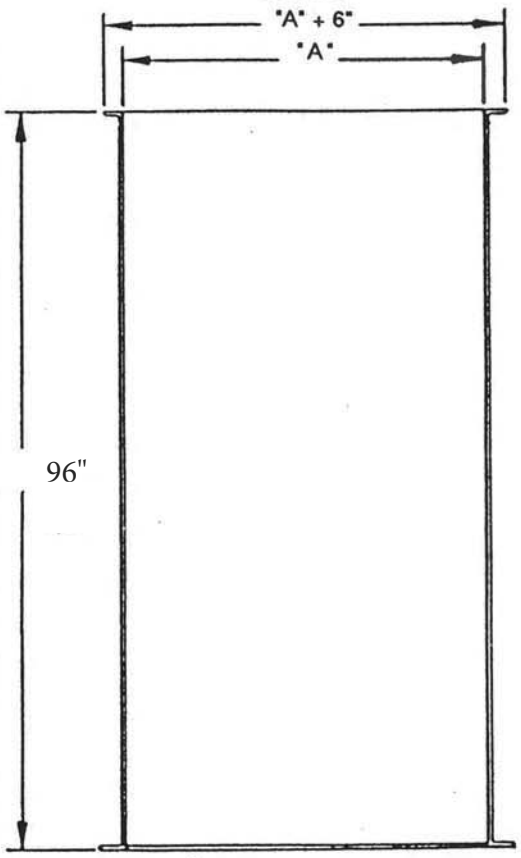

300 PSF RATING

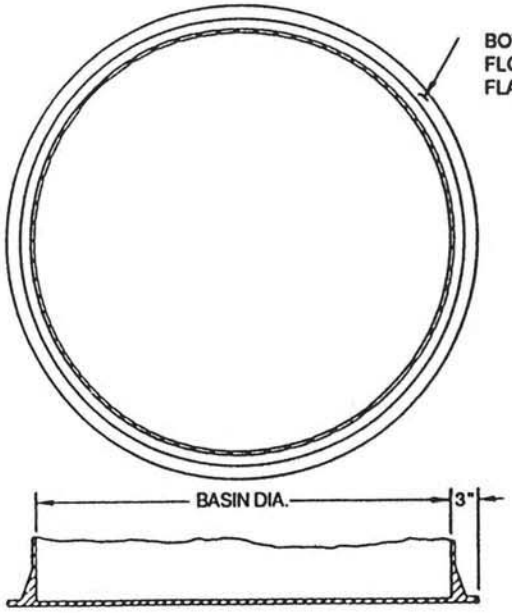
| DIMENSIONAL DATA | | | |
|---|---|---|---|
| For Basin Dia. "A" | "B" | "D" | "E" |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 48" | 54" | 51" | 6 |

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| | |
|---|---|
| TITLE | SOLID FRP COVER |
| PROJECT | JOB NO. |
| | P.O. NO. |
| CUSTOMER | DWG. NO. SC10403 |




BOTTOM (ANTI-FLOATATION) FLANGE
Drawing No. 420A-005

| DIMENSIONAL DATA | | |
|---|---|---|
| "A" | | "D" |
| | | |
| | | |
| | | |
| | | |
| 48" | | 51" |
| | | |
| | | |
| | | |

NOTE:
WETWELLS (OF THE DIAMETERS SHOWN ON THIS DRAWING) THAT ARE OVER 10'0" DEEP (OVER 12'0" ON 36" DIA. AND 42" DIA.) SHALL BE FURNISHED WITH A REINFORCING RIB. OUTSIDE DIAMETER OF THE RIB SHALL BE APPROXIMATELY 6" LARGER THAN THE INSIDE DIAMETER OF THE WETWELL.

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| | | |
|---|---|---|
| TITLE | STRAIGHT WALL BASIN | |
| PROJECT | | JOB NO. |
| | | P.O. NO. |
| CUSTOMER | | DWG. NO. 404S |

# FRP PRODUCTS

## 1. SCOPE

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

## 2. MATERIALS

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

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

2.3 FILLERS AND ADDITIVES - Fillers of any type shall not be utilized. Additives, such as thixotropic agents, catalysts, promoters, etc., may be added as required by the specific manufacturing process to be used to meet the requirements of this specification. The resulting reinforced-plastic material must meet the requirement of this specification.

## 3. REQUIREMENTS

3.1 WORKMANSHIP

3.1.1 EXTERIOR SURFACE - The exterior surface shall be relatively smooth with no sharp projections. Hand-work finish shall be utilized to ensure that enough resin is present to eliminate exposed fibers. The exterior surface shall be free of delamination, exposed fibers and blisters larger than 0.5 in. in diameter.

3.1.2 INTERIOR SURFACE - The interior surface shall be resin rich with no exposed fibers. The surface shall be free of crazing, delamination, blisters larger than 0.5 in. in diameter, and wrinkles of 0.125 in. or greater in depth.

3.2 DIMENSION - The dimensions shall be as shown on the drawings.

3.3 WALL STIFFNESS - The basin/wetwell shall have a pipe stiffness as shown below (per 1984 ASTM standard No. D3753, Table 1):

| BASIN/WETWELL DEPTH (IN. FT.) | PIPE STIFFNESS |
|---|---|
| 3-6 | .72 |
| 6.5-12 | 1.26 |
| 12.5-20 | 2.01 |

3.4 MATERIAL PROPERTIES - The following properties shall be established for each type of construction used in the basin/wetwell.

3.4.1 MATERIAL COMPOSITION - The wall and bottom laminates shall have a glass content of 30% ± 5% glass content (by weight) and resin content of 70% ± 5%.

3.4.2 FLEXURAL MODULUS - The flexural modulus of the basin/wetwell wall in the hoop and axial direction shall be a minimum of 800,000 psi.

3.4.3 HARDNESS - The minimum barcol hardness shall not be less than 90% of the resin manufacturers minimum value for the cured resin.

3.4.4 THICKNESS - The basin/wetwell wall thickness shall be adequate to maintain structural integrity when installed in the following conditions:

1) Soil modulus of 1000 psi
2) Soil density of 120 lbs. per cu. ft.
3) Luscher's safety factor of 2

## 4. PACKAGING AND MARKING

4.1 Installation instructions shall be furnished with each basin/wetwell.

## 5. WORKMANSHIP AND EXPERIENCE

5.1 All workmanship and materials throughout shall be of the highest quality. The basin(s)/ wetwell(s) shall be the product of a supplier who has been actively engaged in research, development and has supplied proven field installations of fiberglass basins/wetwells for not less than five (5) years.

## 6. PRE-BID QUALIFICATIONS

6.1 These specifications describe FRP basin(s)/ wetwell(s) as supplied by Steele Plastics, Inc., Conway, Arkansas. FRP basin(s)/wetwell(s) of other suppliers of equal design and materials may be offered. To receive consideration on any alternate, the following must be submitted to the Engineer at least fourteen (14) days before the scheduled letting to allow sufficient time for issuance of addenda:

6.1.1 Complete drawings

6.1.2 Complete specification sheets:

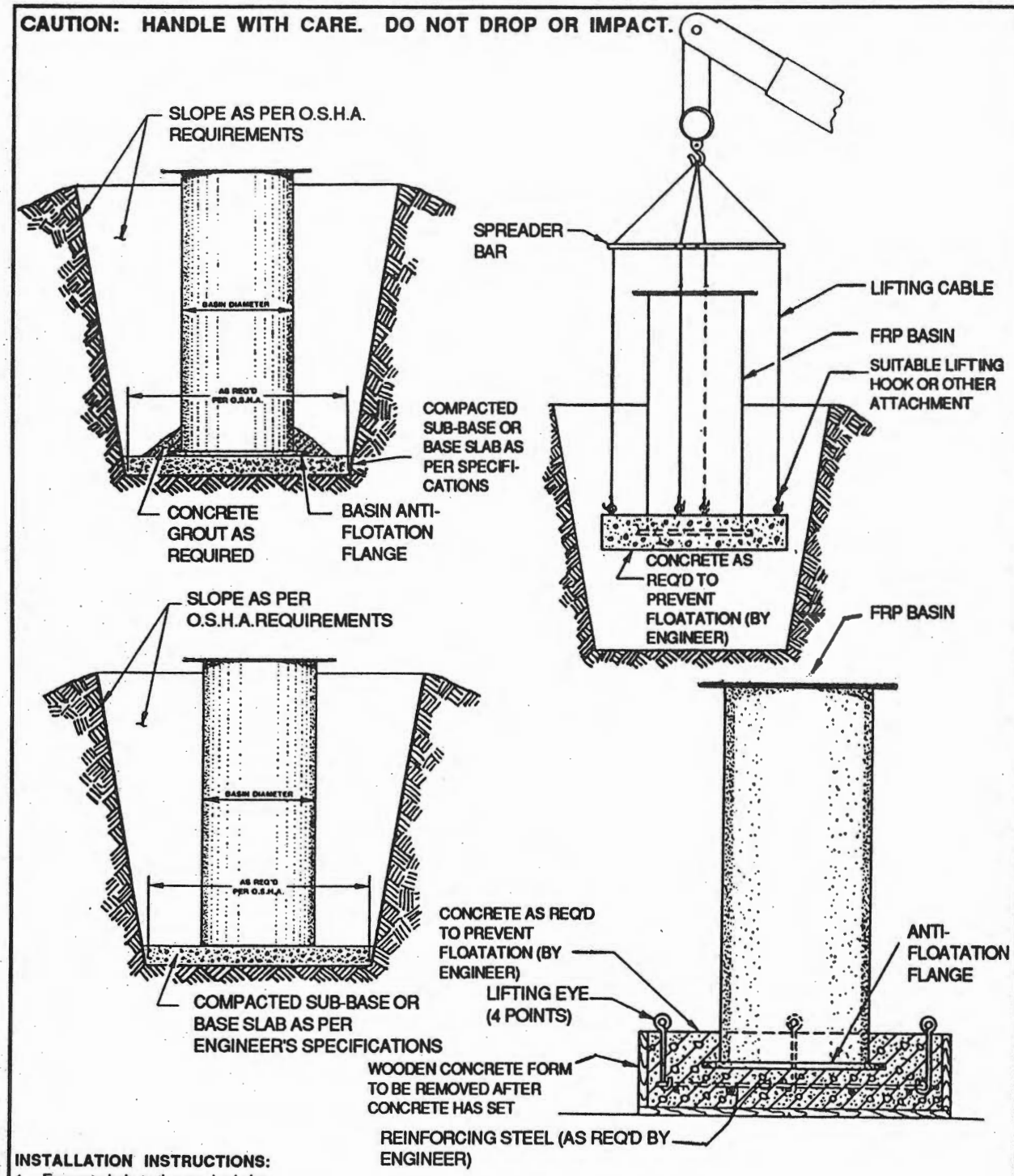
6.1.3.1 Polyester resin (resin manufacturer's literature)

6.1.3.2 Reinforcement material (glass manufacturer's literature)

6.1.4 Sample laminate test results showing pipe stiffness, flexural strength and modulus, design soil modulus, design soil density, safety factor used, and actual proposed wall thickness for the particular diameter and depth of all individual basin(s)/wetwell(s) in this contract.

6.1.5 Complete installation instructions for the basin(s)/ wetwell(s) in this contract.

**CAUTION: HANDLE WITH CARE. DO NOT DROP OR IMPACT.**




**INSTALLATION INSTRUCTIONS:**

1. Excavate hole to the required size.
2. Install base, ensure that base is level and smooth.
3. Set basin in the center of the hole.
4. Pour concrete grout around anti-floatation flange as required.

**BACKFILL REQUIREMENTS**

1. Backfill immediately after basin has been set in place.
2. Place backfill material in 12" lifts around the basin & compact to 1000 soil modulus.

**INLET AND OUTLET INSTALLATION**

1. Install inlets and outlets as required when backfill is within 2 ft. of that elevation.

**The intent of these installation instructions is to ensure that damage to the basin or wetwell will not occur. These installation instructions are NOT intended to preclude normal safety procedures which should be followed to prevent injury to personnel. SAFE INSTALLATION PROCEDURES SHALL BE EITIRELY THE RESPONSIBILITY OF THE INSTALLER.**


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| | |
|---|---|
| TITLE RECOMMENDED BASIN INSTALL. INSTRUCTIONS | |
| PROJECT | JOB NO. |
| | P.O. NO. |
| CUSTOMER | DWG. NO. 411-001 |

# LIMITED WARRANTY

This limited warranty is issued to the original purchaser of its fiberglass reinforced plastic sewage sump basins/wetwells and its accessories. This limited warranty is not assignable, transferable or enforceable by any person, corporation or entity, other than the original purchaser.

**THIS LIMITED WARRANTY AND ALL IMPLIED WARRANTIES ARE HEREBY LIMITED TO ONE YEAR FROM INSTALLATION OR EIGHTEEN MONTHS FROM SHIPMENT OF SAID SUMP BASIN/WETWELL, WHICHEVER FIRST OCCURS.**

Steele Plastics, Inc., warrants that the sump basin/wetwell sold to the original purchaser is fit for underground application against defects, provided it is not used under circumstances that would be considered other than normal and there is proper handling and installation of the unit as per the directions of Steele Plastics, Inc.

Steele Plastics, Inc., agrees to provide the repair of the sump basin/wetwell or to supply any parts that are defective for the repair of the sump basin and specifically excludes any obligation or liability for any consequential or special damages or incidental damages for the breach of this warranty or any implied warranty.

**THIS LIMITED WARRANTY APPLIES ONLY IF THE FOLLOWING CONDITIONS ARE MET:**

(1) The sump basin/wetwell shall be installed in a vertical position with the top being at or above finish grade. Under no circumstances shall the bottom of the basin/wetwell be installed deeper than the total depth of the basin/wetwell. The basin/wetwell must be installed with a minimum of 75% of the basin/wetwell depth below finish grade.

(2) Sump basins/wetwells are for the use in sewage pump applications only and shall not be used with potable water.

(3) Backfill must be of a suitable material compacted to a minimum soil modulus of 700 P.S.I.

Should there be a sump basin/wetwell defect claimed the original purchaser shall notify, in writing, Steele Plastics, Inc., within 10 days of the discovery of the defect and should the conditions of this limited warranty be met and Steele Plastics, Inc., determines that the defect is covered by this warranty, then it will repair or correct the defect at its own cost or expense, exclusive of freight or other transportation costs.

**THIS LIMITED WARRANTY DOES NOT APPLY UNDER THE FOLLOWING CONDITIONS:** Normal wear and tear; damage due to incorrect or improper handling or installation; any damage occurring after shipment by Steele Plastics, Inc., which is a result of actions, accidents, abuse or misuse outside the control of Steele Plastics, Inc.; damages that are a result of the improper design of the purchaser or its agent(s); any items warranted by another manufacturer.

**THERE ARE NO WARRANTIES, EITHER EXPRESSED OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.**

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