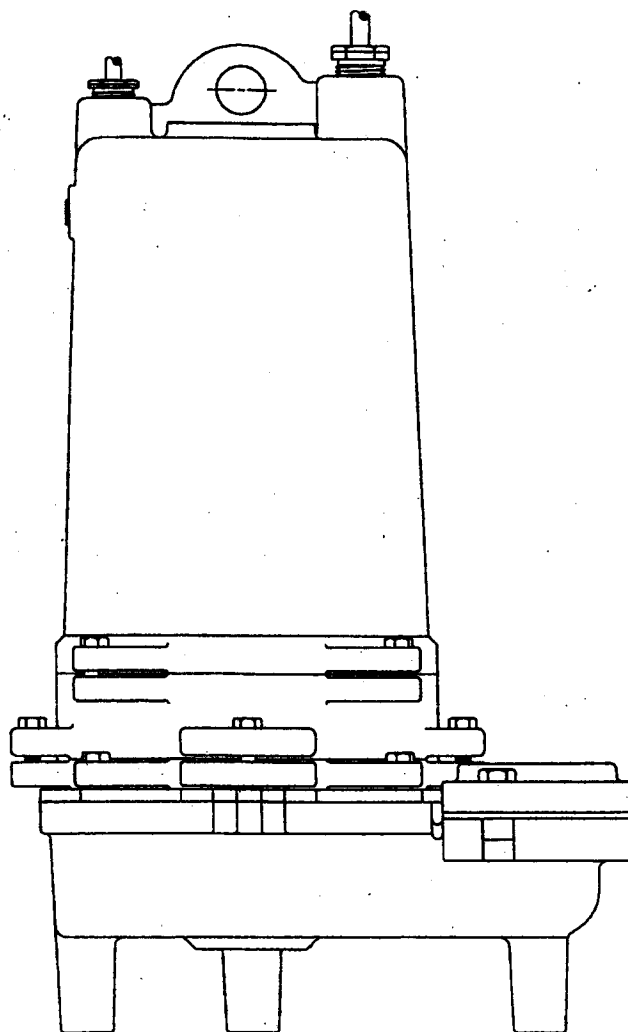


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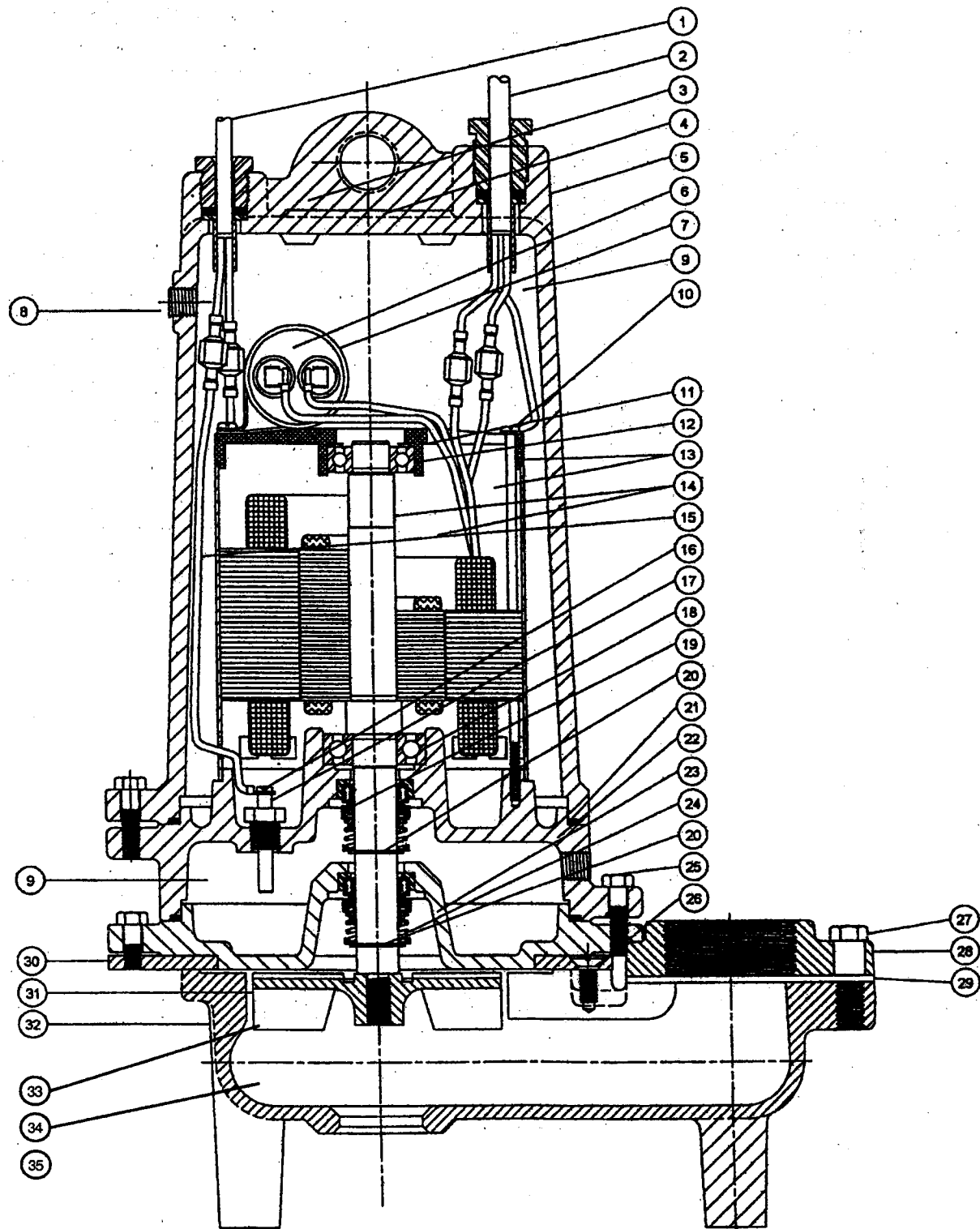
Pentair Pump Group

AG1 - AG2 SERIES Agricultural Pumps

Installation and Service Manual



TYPICAL SECTION DRAWING FOR AG1 AND AG2 PUMPS



DOUBLE SEAL REPAIR PARTS LIST

Ref. No.	Description	No. Req'd	Part Numbers
1	Cord, sensor	1	25339B000
2	Cord, power	1	25338B002
3	Screw, drive	2	05160A004
4	Nameplate, blank, 1Ø	1	25488A000
5	Housing, motor	1	25327D000
6	Capacitor (AG1)	1	23838A000
6	Capacitor (AG2)	1	23839A000
7	Clip, capacitor, (AG1)	1	20333A004
7	Clip, capacitor (AG2)	1	20333A006
8	Plug, 1/4" pipe	2	05022A056
9	Oil, transformer (5 gal.)	1.12 gal	11009A006
10	Screw, ST, #10 x 3/8	2	09822A032
11	Washer, bearing	1	19331A005
12	Bearing, ball, upper	1	08565A013
13	Stator with shell (AG1)	1	25484C006
13	Stator with shell (AG2)	1	25484C015
14	Rotor with shaft	1	25487B034
15	Wire, electrode	2	21792A004
16	Screw, #6 x 1/4	2	05434A025

Ref. No.	Description	No. Req'd	Part Numbers
17	Probe, seal leak	2	25343A000
18	Bearing, ball, lower	1	08565A022
19	Seal, shaft, upper	1	25370A000
20	Ring, retaining	2	12558A033
21	Gasket, tetraseal, 7 x 6-3/4 x 1/8	2	05014A181
22	Housing, seal	1	25369D000
23	Plate, bottom	1	25368D001
24	Seal, shaft, lower	1	27067A000
25	Screw, cap, 5/16 x 1-1/4	8	19100A012
26	Screw, countersink	4	07597A029
27	Screw, hex 1/2 x 1-1/2	2	19103A043
28	Plate, adapter 2NPT discharge	1	21660B000
29	Gasket, rubber	1	21661A000
30	Screw, cap 5/16 x 1	4	19100A029
31	Plate, adapter	1	27065C000
32	O-ring, 6-1/2 O.D. x 6-1/4 I.D.	1	05876A120
33	Impeller (AG1)	1	21663C022
33	Impeller (AG2)	1	21663C042
34	Case, volute	1	22441D001
35	Washer, 1-1/8 x 1/16	1	05030A191

GENERAL DESCRIPTION AND APPLICATION

Myers agricultural series pumps are available in a double seal design with leak detector. These units are designed for agricultural applications and can pass 2" spherical solids. All units must be used with a control box. All power cords and seal leak detector cords are 25 feet long. All of the pumps are of the recessed impeller type that provides a clear volute passage for solids as no solids pass through the impeller.

AIR LOCKING

A sewage pump is said to be air locked if water traps air in the pump and it cannot get out, thus preventing the pump from operating.

In an installation of this type a 1/8" hole should be drilled in the discharge pipe below the check valve. The check valve should be 12 to 18 inches above pump discharge. Do not put check valve directly into pump discharge opening.

PACKAGING

Each pump is packaged separately in a carton marked with a catalog number and Myers engineering number.

LEVEL CONTROLS

All pumps must use sealed level control switches for automatic operation. MLC and MFLC controls have sealed switches that are 1 HP rated at 230 volts. ALC and AWS-1 controls have sealed mechanical switches that are rated 2 HP at 230 volts.

Simplex single phase pumps can be made automatic by attaching MFLC or MLC controls to the pump. These switches have a fixed draw off level of 8 to 10 inches and can be used up to 1 HP. For higher horsepower ratings two mercury switches (or SMNO) controls with a magnetic starter can be used. Simplex systems may also use on/off pilot mercury control switches with control box and magnetic starter. The ALC and AWS-1 controls can be used for simplex single phase pumps with ratings up to 2 HP.

Sealed junction boxes must be used in wet sumps or basins to make connections to motor cord. The AWS-1 control also acts as a sealed junction box for connecting power cord to pump cord.

DOUBLE SEAL PUMPS

All pumps in this series have two seals with an oil chamber between the seals so that the seal faces of both the lower and upper seals are oil lubricated for longer life and greater protection against water leaking into the motor windings. These double seal units are all made with a seal leak detector.

The leak detector in the oil seal chamber detects any water leakage into the chamber and turns on a red signal light in the control panel. Pumps should be removed from the sump and seals replaced after the seal light shows in the panel. Control panels must be used for pumps having the seal leak detectors, and seal leak detectors must be wired as illustrated in these instructions.

DESIGN OF PRESSURE SEWER SYSTEMS

Myers has available complete computer software for designing pressure sewer systems. This gives pipe sizes to use and gives exact flow from any pump or group of pumps in the system when operating simultaneously.

This design disk for IBM® or compatible computers is available to engineers on request.

MOTOR TYPE

Motors are 3/4 frame, 1 or 2 HP, single phase, 60 hertz, 3450 RPM with Class B insulation. All single phase motors are permanent split-capacitor (PSC) type with built-in on-winding overload protection and do not require a start switch or start relay. All motors have upper and lower ball bearings and all are oil-cooled and lubricated.

SAFETY WARNINGS

WARNING: Risk of electric shock. Pumps are supplied with a grounding conductor on the power cord. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle. **DO NOT** cut off ground pin or use an adapter fitting. All double seal pumps require a control box.

When wiring this pump follow all local electrical and safety codes and ordinances as well as the most recent National Electric Code (NEC-ANSI/NFPA 70).

All 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.

INSTALLATION

WARNING: Basin or tank must be vented in accordance with local plumbing codes. These pumps are not designed for and CANNOT be installed in locations classified as hazardous in accordance with the National Electric Code ANSI/NFPA 70.

CAUTION: Never enter pump chamber after sewage or effluent has been in basin. Sewage water can give off methane, hydrogen sulfide and other gasses which are highly poisonous.

The dosing tank or pumping chamber must be constructed of corrosion resistant materials and must be capable of withstanding all anticipated internal and external loads. It also must not allow infiltration or exfiltration. The tank must have provisions for anti-buoyancy. Access holes or covers must be of adequate size and be accessible from the surface to allow for installation and maintenance of the system. Access covers must be lockable or heavy enough to prevent easy access by unauthorized personnel. The pumping chamber holding capacity should be selected to allow for emergency conditions.

The discharge pipe must be the same size as the pump discharge (2 inches) or larger. In order to insure sufficient fluid velocity to prevent any residual solids from collecting in the discharge pipe, it is recommended that a minimum flow of 2 feet per second be maintained. (21 GPM through 2" pipe and 46 GPM through 3" pipe). It is recommended that PVC or equal pipe is used for corrosion resistance. A full flow (ball or gate) shut off valve must be installed to prevent back flow of effluent if the pump must be removed for service. A check valve must be installed on pressure sewer systems and on other systems where conditions allow to prevent backflow and to reduce wear on the pump system.

A high water alarm must be installed on a separate circuit from the pump circuit. The alarm should have the ability to be tested for proper operation.

POINTS TO CHECK IF PUMP DOES NOT RUN OR DOES NOT RUN PROPERLY

Pump does not run or start when water is up in tank.

- a. Check for blown fuse or tripped circuit breaker.
- b. Check for defective level switch.
- c. Where control panel is used be sure H-O-A switch is in the AUTO position. If it does not run, turn switch to the HAND position and if the pump runs then the trouble is in the automatic electrical system. Have an ELECTRICIAN make electrical checks.
- d. Check for burned out motor. Occasionally lightning can damage a motor even with lightning protection.
- e. Level control ball or weight may be stuck on side of basin. Be sure it floats freely.

Pump runs but does not deliver flow.

- a. Check air lock. Start and stop pump several times, if this does not help it may be necessary to loosen a union in the discharge line to relieve air lock.
- b. Check valve may be installed backwards. Check flow arrow on valve body. Check shutoff valve. It may be closed.
- c. Check vertical elevation. It may be higher than pump can develop. (See pump curve).
- d. Pump inlet may be plugged. Remove pump to check.

CAUTION: ALWAYS TURN OFF ALL MAIN AND BRANCH CIRCUIT BREAKERS BEFORE DOING ANY WORK ON THE PUMP. If control panel is remote from pump, disconnect lead wires to motor so that no one can turn the circuit breaker back on.

BEFORE DISMANTLING PUMP FOR REPLACEMENT OF PARTS

Clean pump thoroughly. Knock off all scale and deposits. Use sandblast if possible. Submerge complete unit in Clorox solution for one hour before taking apart.

TO REPLACE CAPACITORS ONLY

All of the single phase motors are of the permanent split capacitor type and have no relays or starting switch. They have only a starting capacitor that is in the circuit for both starting and running conditions.

1. Remove oil fill plug near the top of the motor and pour the oil out.
2. Loosen the plug nuts around the cords until they are loose enough to push the cords down inside of the motor housing.
3. Remove the four bolts from the motor housing and bump the housing with a plastic hammer to loosen. Lay the pump on its side.
4. Remove the housing carefully to be sure that enough cord is pushed into the housing to create no tension on the cords.
5. Slide motor housing up far enough to expose the capacitor and to be able to lay the housing down.
6. Disconnect wiring from capacitor and loosen capacitor clamp and slide out capacitor. Replace with new capacitor, tighten and reconnect. Wiring diagram is given in these instructions.
7. Check all wiring connectors to be sure they are secure.
8. Be sure tetraseal gasket is in place.
9. Slide motor housing back onto pump while pulling the cords out slowly. Assemble the motor housing with the four bolts.
10. Reassemble cord nuts. Be sure washers are seated and cords are pulled up to stop against the washers. Tighten nuts securely.
11. Put pump upright and refill motor with Myers submersible motor oil. **DO NOT OVER FILL WITH OIL.** With pump upright fill oil to bottom of oil fill tapping. Replace oil fill plug.
12. Be sure pump turns freely before connecting to power. Turn pump on side and turn impeller, using screwdriver in slotted shaft. Connect pump to power to test operation. Pump must run quiet and free of vibration.

TO REPLACE POWER CORD AND/OR SEAL LEAK DETECTOR CORD

1. Remove motor housing as described in "Capacitor Replacement" section. Disconnect the push-together terminals and remove the ground screw from the power cord if being replaced.
2. Completely unscrew cord bushing to be replaced and remove cord assembly from housing. Be sure remaining terminals are secure on the wires.
3. Replace with proper cord and fittings. Push cord into the motor housing far enough to make proper connections. Reconnect ground wire if replacing power cord and securely connect the wires correctly. See wiring diagram in these instructions.
4. Assemble cords and motor housing as described in "Capacitor Replacement". Fill with oil as noted and be sure pump turns freely before connecting to power.

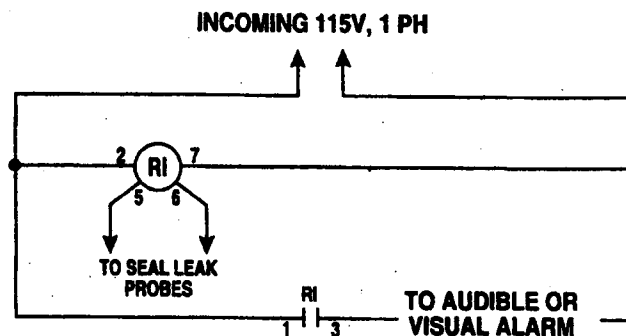
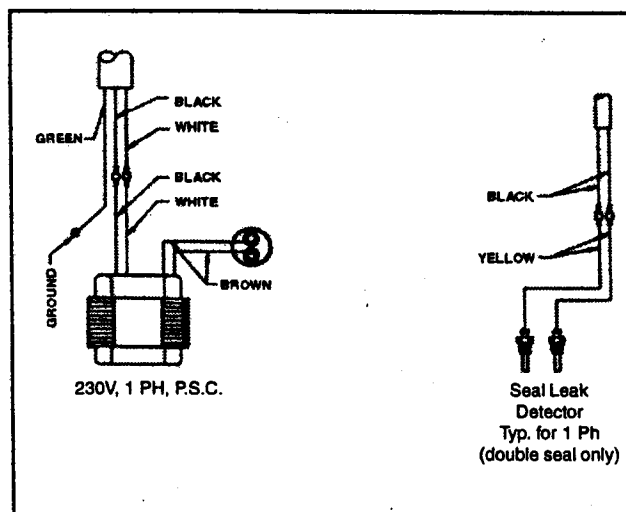
TO REPLACE MOTOR STATOR AND SHELL

1. Remove motor housing as described above.
2. Disconnect all leads from power and seal leak cords and ground wire and set pump upright.
3. Loosen the four long screws holding the motor and remove slowly. If unit has seal leak probes be sure to feed the wires through the slots as the motor is being removed.
4. Either remove previous capacitor and clamp from old motor and assemble onto new stator and shell or replace with a new capacitor and assemble the two capacitor leads per wiring diagram.
5. Position bearing spring washer on top of upper ball bearing. (For 3/4 - 1 1/2 HP).
6. Tighten terminal screws of seal leak probes and feed wires through the motor slots.
7. Position the "stator with shell" into place and line up screws with the bosses and tighten the (4) long screws. Extend probe wires out through the slots. Lay unit down in line with motor housing.
8. Be sure pump turns freely with screwdriver in impeller end of shaft.
9. Reconnect all terminals securely per wiring diagram.
10. Be sure tetraseal gasket is in place.
11. Reassemble motor housing and fill with oil as noted in "Capacitor Replacement" section.

SHAFT SEAL REPLACEMENT

1. Remove plugs in motor housing and in seal housing and drain oil.
2. Remove four bolts holding the volute case and bump with a plastic hammer to loosen and remove case.
3. Insert a slotted screwdriver through the center of the impeller hub into the slot in the shaft. With a rubber mallet, carefully tap the impeller in a counterclockwise rotating direction while holding the shaft with the screwdriver.
4. Remove snap ring with snap ring pliers. Pry off seal bellows and ceramic seat. Break seats if necessary to get out since they must be replaced with new parts.
5. **NEVER USE OLD SEAL PARTS. USE ONLY COMPLETELY NEW SEALS.**
6. For replacement only of the lower seal, it is not necessary to disassemble further and it is not necessary to drain oil out of the motor housing, just the seal housing.
7. To remove the upper seal, remove four bolts holding the bottom plate and remove bottom plate.
8. Remove snap ring with snap ring pliers. Pry off upper seal bellows and ceramic seat.
9. If no water has entered motor housing (check winding with ohmmeter or megger) wipe seal chambers thoroughly and replace seals. Clean seal faces and use light oil on face before installing bellows part of seal.
10. Check HUCA cup seal in volute case inlet. If worn, replace.
11. Be sure tetraseal seal is in position (replace if worn) and reassemble.
12. Replace oil in motor housing and seal chamber. Use only Myers submersible oil.
13. Be sure pump turns freely before connecting to power.

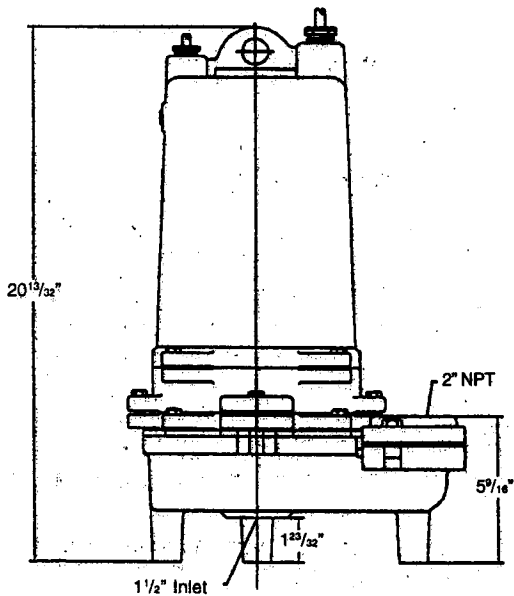
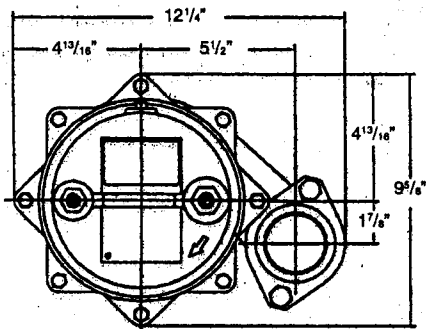
WIRING DIAGRAM



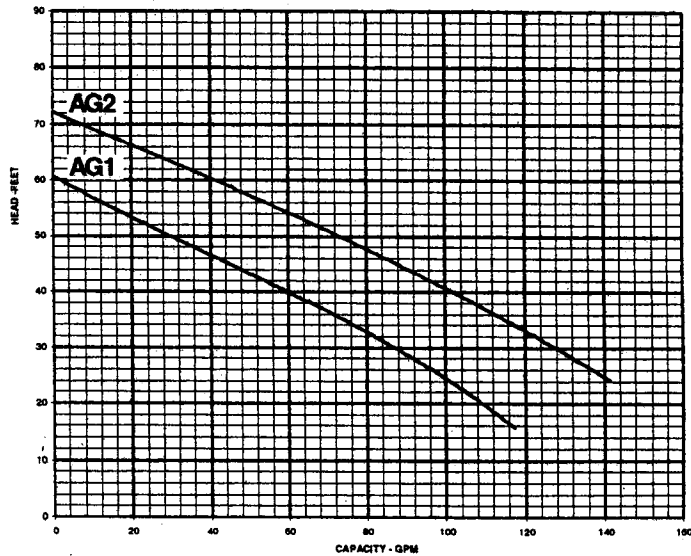
If using a Myers panel, the recommended panel is a CMEP(SL)-21S, -21SW, -21D or -21DW.

AG1

DIMENSIONS



PERFORMANCE CURVE



MOTOR DATA CHART

HP	SPEED	VOLTS	PHASE	STACK HEIGHT	WINDING RESISTANCE IN OHMS			MAX. AMPS	LOCKED ROTOR AMPS
					MAIN BLACK TO WHITE	START - 1Ø BRN. TO BRN. OR PURPLE	WHITE TO RED		
						BLACK TO RED - 3Ø			
1	3450	230	1	2-3/4	2.8	15.0	---	9.3	19.0
2	3450	230	1	2-3/4	1.6	7.4	---	13.1	33.4

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