

APPLICATIONS:

- Circulating pump for gas glycol dehydrators, gas amine units and other pumping applications.

FEATURES:

- No Gas Emissions
- No Packing
- Hydraulically Balanced Diaphragms
- Double-ended Shaft
- Stud Extenders for easy Head Installation
- Pulse-Free flow
- Direct or Belt Driven

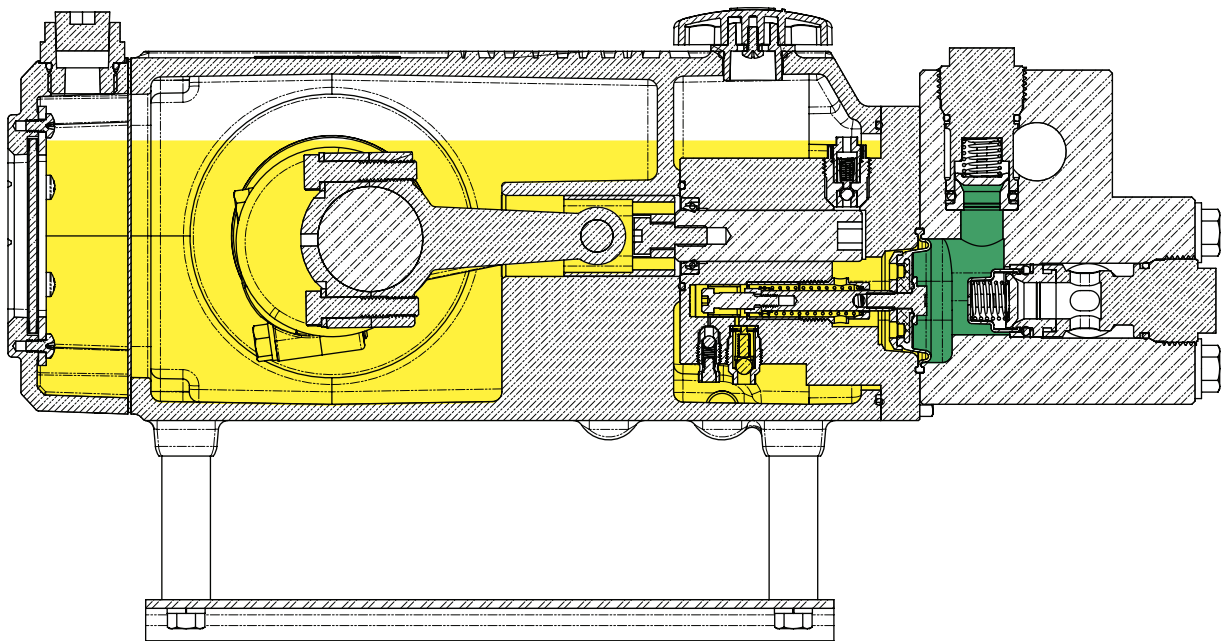
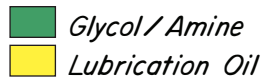
CERTIFICATIONS:

Kimray is an ISO 9001- certified manufacturer.

SPECIFICATIONS:

- Capacity @ max. pressure:

rpm	gpm	l/min
1500 psi (103 bar)	1200	8.3
1200		31.4
- RPM: 1200 max.- 200 min.
- Inlet: 250 psi max
- Connections:
 - Inlet: 1" NPT
 - Outlet: 3/4" NPT
- Temperature:
 - Max: 230° F (110° C)
 - Min: 40° F (4.4° C)
 - [contact factory for temperatures below 40° F (4.4° C)]
- Fluid End Material,
 - Manifold : Ductile Iron ASTM A536-84, Grade 65-45-12
 - Crankcase: Ductile Iron ASTM A536-84, Grade 65-45-12
- Elastomers: Highly Saturated Nitrile
- Oil Capacity: 2.75 quarts KIMRAY Part No. 7266
2.60 Liters
- Weight (dry): 100 lbs (45.7 kg)
- Bi Directional Shaft Rotation



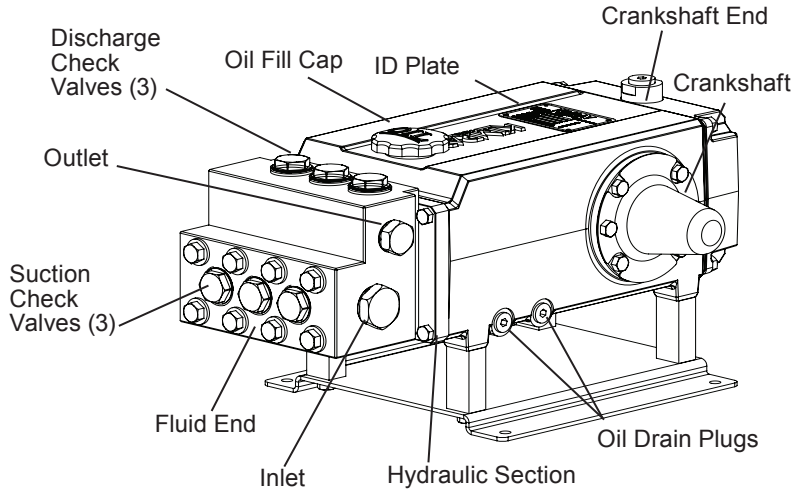
Standard Configuration Code †	Order Code	Gallons per hour Minimum	Gallons per hour Maximum ††	Operating Pressure Minimum	Operating Pressure Maximum
GEV500S	GEA	90	500	0	1500

NOTES:

† For code builder see page 10:00.3

†† Maximum output is affected by system pressure drops. See system operation parameter for maximum output curves.

Component Identification



LOCATION

Locate the pump as close to the fluid supply source as possible. Allow room for checking the oil level, changing the oil (two drain plugs on the bottom and back of pump), and removing the pump head components (inlet and discharge retainer plates, manifold, and related items).

MOUNTING

The pump shaft can rotate in either direction. To prevent vibration, mount the pump and motor securely on a level rigid base. On a belt-drive system, align the sheaves accurately; poor alignment wastes horsepower and shortens the belt and bearing life. Make sure the belts are properly tightened, as specified by the belt manufacturer. On a direct-drive system, align the shafts accurately. Unless otherwise specified by the coupling manufacturer, maximum parallel misalignment should not exceed 0.015 in. (0.4 mm) and angular misalignment should be held to 1° maximum. Careful alignment extends life of the coupling, pump, shafts, and support bearings. Consult coupling manufacturer for exact alignment tolerances.

ACCESSORIES

Consult installation drawing above for typical system components. Contact KIMRAY INC. or the distributor in your area for more details.

REPAIR KITS AVAILABLE:

CAT. NO.	TYPE	MATERIAL
RZAHSN	CHECK VALVE REPAIR KIT	HIGHLY SATURATED NITRILE
RZBHSN	COMPLETE REPAIR KIT	HIGHLY SATURATED NITRILE
RZCHSN	DIAPHRAGM REPAIR KIT	HIGHLY SATURATED NITRILE

OIL AVAILABLE:

CAT. NO.	TYPE	CAPACITY QUARTS	CAPACITY LITERS
7266	EGP1 KIMZOIL	2.75	2.60

IMPORTANT PRECAUTIONS

Adequate Fluid Supply. To avoid cavitation and premature pump failure, be sure that the pump will have an adequate fluid supply and that the inlet line will not be obstructed.
Positive Displacement. This is a positive-displacement pump. Install a relief valve downstream from the pump.
Safety Guards. Install adequate safety guards over all pulleys, belts, and couplings. Follow all codes and regulations regarding installation and operation of the pumping system.
Shut-Off Valves. Never install shut-off valves between the pump and discharge pressure regulator, relief valve, or in the regulator bypass line.
Freezing Conditions. Protect the pump from freezing. See also the Maintenance Section.
 Consult the Factory for the following situations:

- Extreme temperature applications – above 250° F (82° C) or below 40° F (4.4° C)
- Viscous fluid applications above 100 Cps
- Chemical compatibility problems
- Hot ambient temperatures – above 110° F (43° C)
- Conditions where pump oil may exceed 200° F (93° C) because of a combination of hot ambient temperatures, hot fluid temperature, and full horsepower load — an oil cooler may be required
- Pump RPM less than 200

CALCULATING REQUIRED HORSEPOWER (KW)*

$$\frac{\text{gpm} \times \text{psi}}{1,460} = \text{electric motor HP}^*$$

$$\frac{\text{lpm} \times \text{bar}}{511} = \text{electric motor kW}^*$$

* HP/kW is required application power.

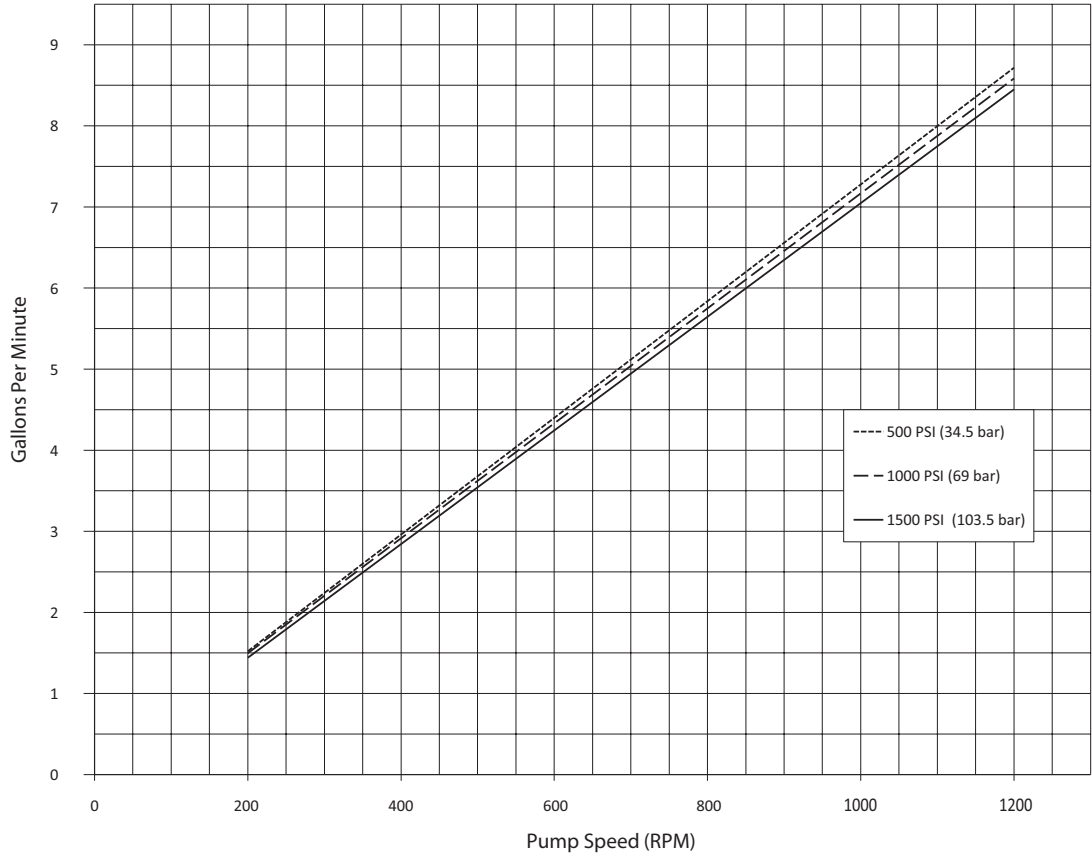
ATTENTION!

When sizing motors with variable speed drives (VFDs), it is very important to select a motor and a VFD rated for constant torque inverter duty service and that the motor is rated to meet the torque requirements of the pump throughout desired speed range.

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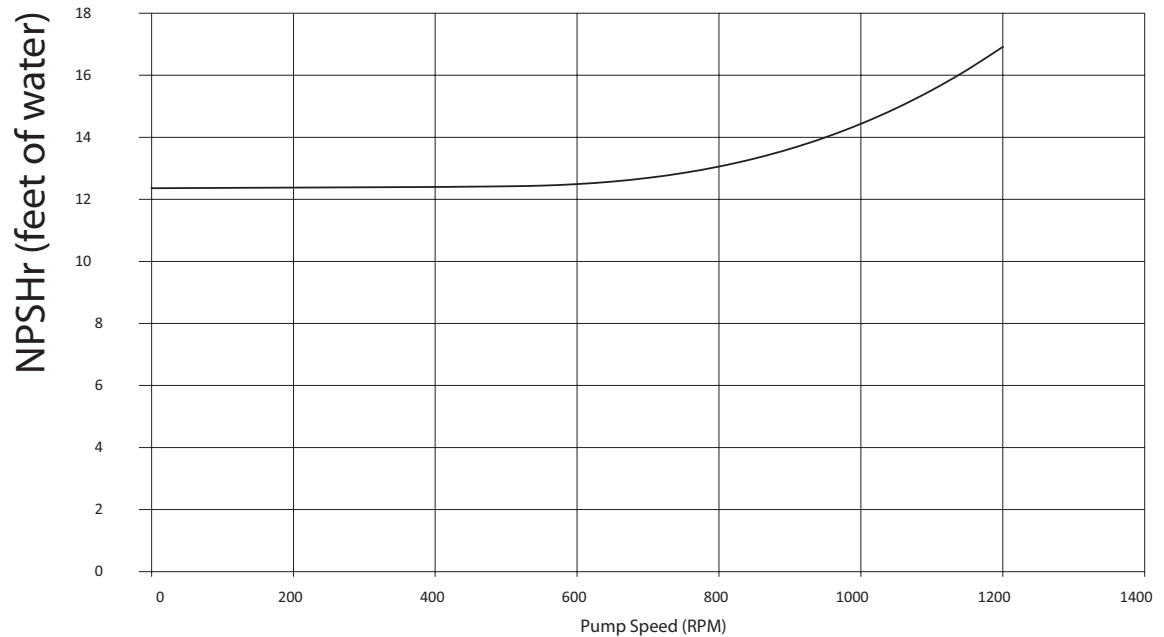
Performance

50015 EV Performance



Net Positive Suction Head – NPSHr

Net Positive Suction Head (NPSHr)

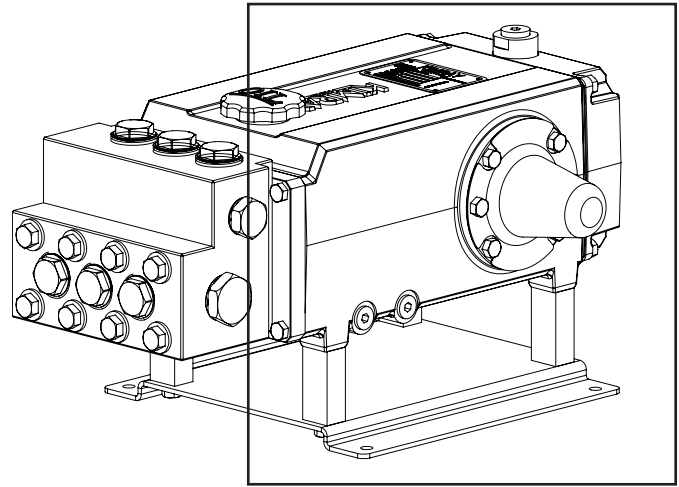


GLYCOL PUMPS



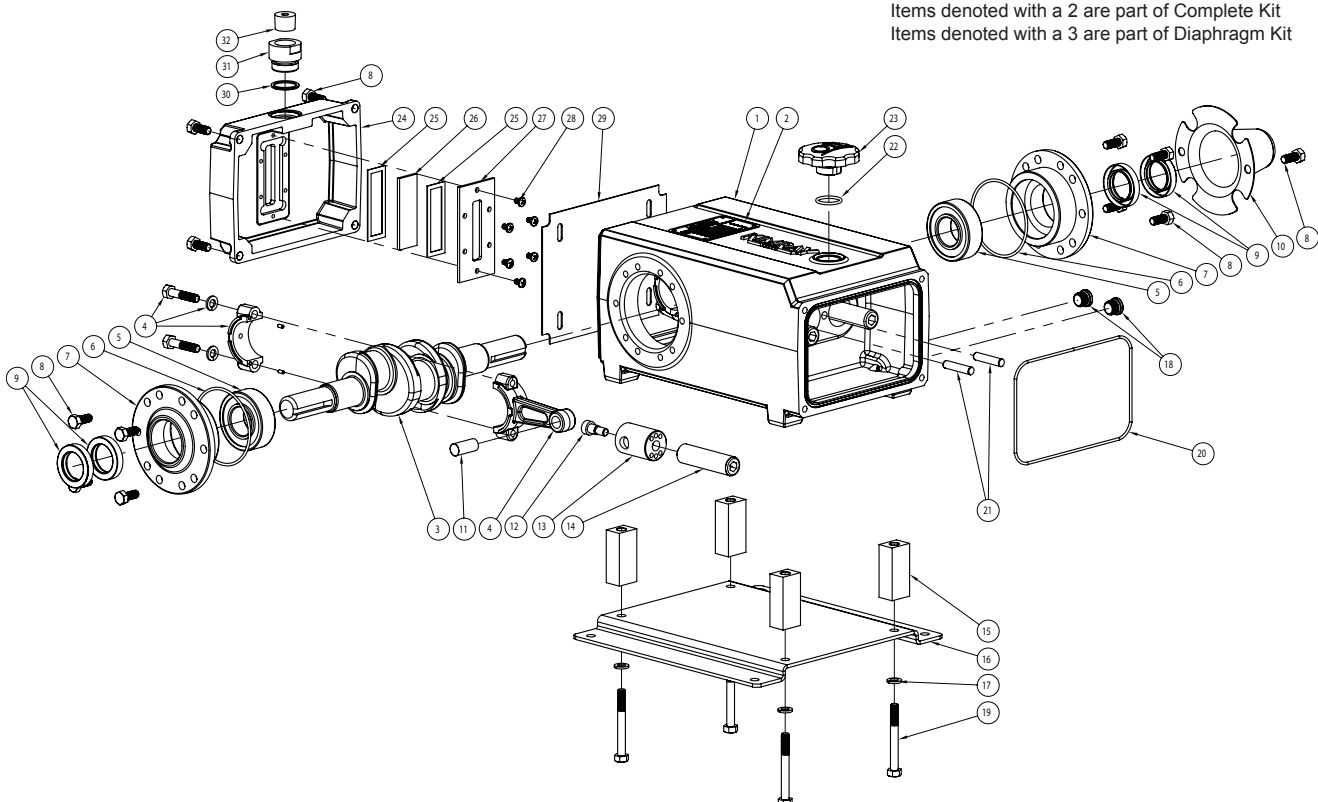
ELECTRIC PUMP MODEL EV - PARTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	KIT
1	189-401-02	CRANKCASE, T9, MACHINING	1	
2	189-511	PLATE, DATA	1	
3	172-102-02	CRANKSHAFT, FINISHED	1	
4	189-509	ROD, CONNECTING, ASSEMBLED	3	
	189-507	ROD, FRONT CONNECTING	1	
	189-508	ROD, REAR CONNECTING	1	
	189-510	PIN, DOWEL .125	2	
	189-522	SCREW, 5/16-18 UNC-2A X 1.375, HHCS	2	
	C22-014-2000	WASHER, M8 SPLIT LOCK	2	
5	172-004	BEARING, SPHERICAL ROLLER, 22206	2	
6	N10-073-2110	O-RING, BUNA, -150	2	
7	189-545	MACHINING, BEARING CARRIER	2	
8	189-525	SCREW, 5/16-18 UNC-2A, HHCS	14	
9	F20-031-2110	SEAL, BUNA	4	
10	189-500	COVER, CRANKSHAFT	1	
11	189-054	PIN, WRIST	3	
12	189-528	SCREW, SHOULDER, 5/16-18 UNC-2A, SHCS	3	
13	189-437	CROSSHEAD	3	
14	189-431	PLUNGER, .787	3	
15	189-520	SPACER, BASE PLATE 256 TC	4	
16	189-502-01	BRACKET, MOUNTING	1	
17	C22-014-2000	WASHER, M8 SPLIT LOCK	4	
18	189-032	PLUG, 3/8 SAE, STEEL	2	
19	189-521	SCREW, 5/16-18 UNC-2B X 2.75, HHCS	4	
20	D15-037-2110	O-RING, BUNA-N, -164	1	
21	D03-026-2210	PIN, DOWEL, 5/16"	2	
22	D10-080-21XX	MATRIX, .862 ID X .103 WIDE O-RING	1	
23	189-595-XX	ASSY, METAL OIL CAP	1	
	189-590-XX	BASE, OIL CAP	1	
	189-591-XX	TOP, OIL CAP	1	
	189-595	SCREW, PHMS 0.164-32x0.375x0.375-S	1	

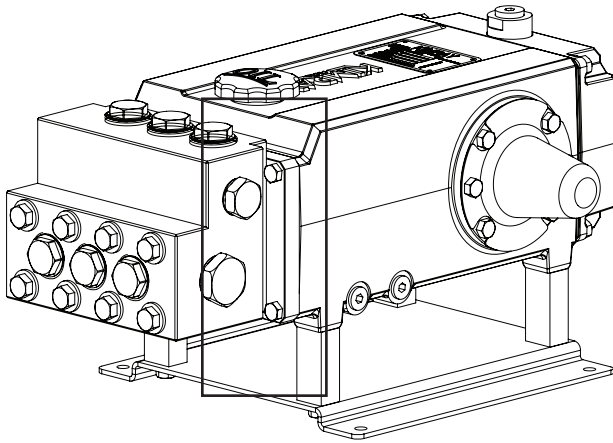


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	KIT
24	189-560-02	COVER, LEVEL SWITCH	1	
25	189-553	GASKET	2	
26	189-552	GLASS, SIGHT	1	
27	189-556	FRAME, SIGHTGLASS	1	
28	189-565	SCREW, 10-24 PAN HEAD	6	
29	189-564	GASKET, REAR COVER, K9	1	
30	C63-026-2118	O-RING, C62 REGULATOR BODY, -119	1	
31	189-561	ADAPTER, INTERNAL FLOAT SWITCH	1	
32	189-313	PLUG, 1/2 INCH NPT	1	

Items denoted with a 1 are part of Valve Kit
 Items denoted with a 2 are part of Complete Kit
 Items denoted with a 3 are part of Diaphragm Kit

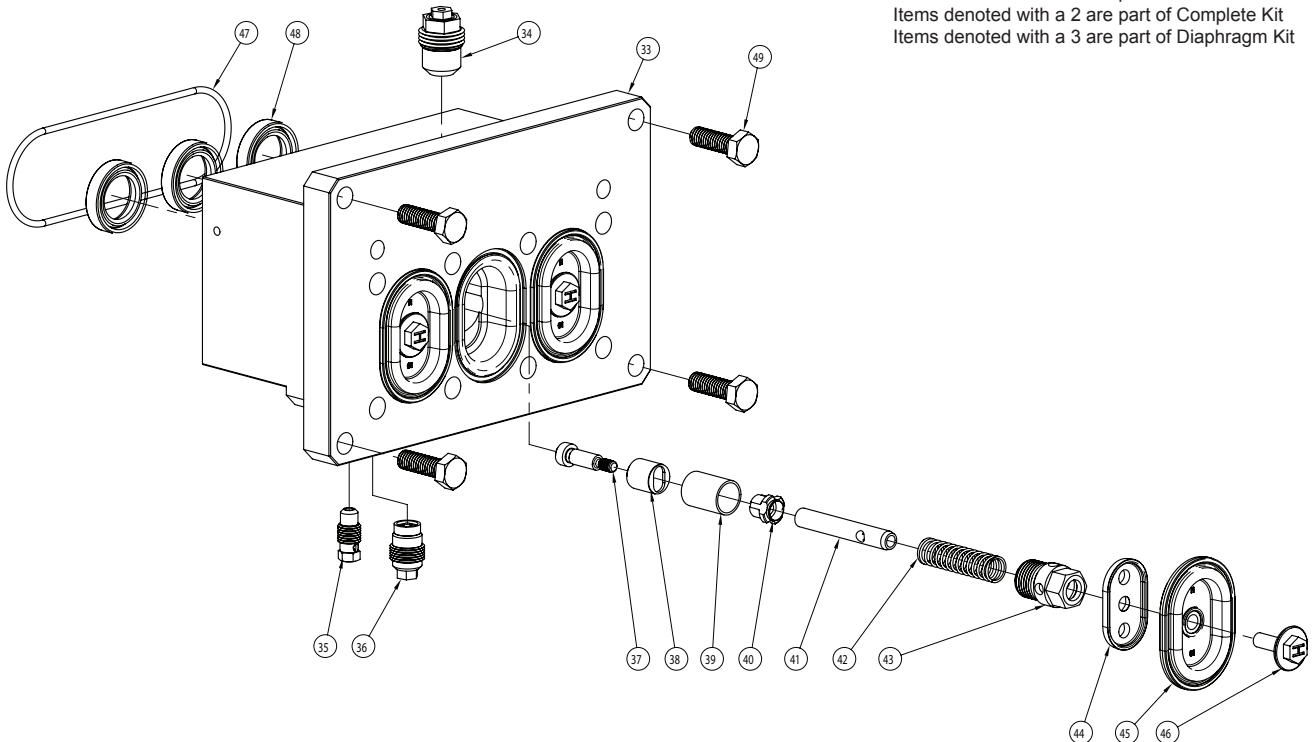


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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	KIT
33	189-403	PLATE, DIAPHRAGM, MACHINED BILLET 9L	2	
34	177-906	CARTRIDGE	3	
	177-119	PLUG	1	
	172-016	BALL, 3/16 DIAMETER	1	
	172-017	SEAT,	1	
	172-118	PIN	1	
	172-061	SPRING, OVERFILL VALVE	1	
	172-119	RETAINER	1	
35	177-905	CARTRIDGE, OVERFILL VALVE	3	
	177-017	OVERFILL SEAT	1	
	172-016	BALL, 3/16 DIAMETER	1	
	172-061	SPRING, OVERFILL VALVE	1	
	177-018	RETAINER, OVERFILL SPRING	1	
36	177-904	CARTRIDGE, UNDERFILL VALVE	3	
	177-160	SEAT, UNDERFILL	1	
	172-161	CAGE, UNDERFILL	1	
	172-061	SPRING, OVERFILL VALVE	1	
	177-075	PIN, STOP	1	
	D25-015-3010	BALL, .250 DIA. ALLOY STEEL	1	
	189-594	CLIP, RETAINING	1	
37	189-451	SCREW, #10-24 UNC-2B x .625, SHSS	3	
38	189-429	VALVE, SPOOL, HOLLOW	3	
39	189-317	STOP, SPOOL	3	
40	189-316	WASHER, GUIDE	3	
41	189-452	ROD, BIAS SPRING, TAPERED	3	
42	189-558	SPRING, BIAS	3	
43	189-141	RETAINER, BIAS SPRING	3	
44	189-454	CLAMP, DIAPHRAGM, 9L	3	
45	189-125-01	DIAPHRAGM, INSERT MOLDED, 9L, HSN	3	2 & 3
46	177-144-01	SCREW, DIAPHRAGM FOLLOWER	3	
47	D03-073-2131	O-RING, -2131 (FKM)	1	
48	189-438	SEAL, SHAFT	3	
49	189-512	SCREW, 5/16-18 UNC-2B X 1.125, HHCS	4	

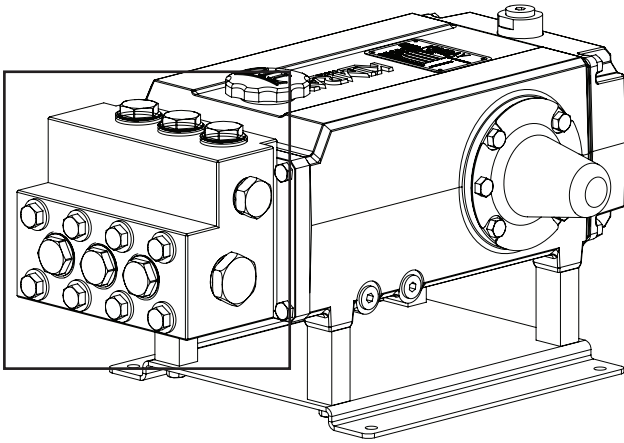
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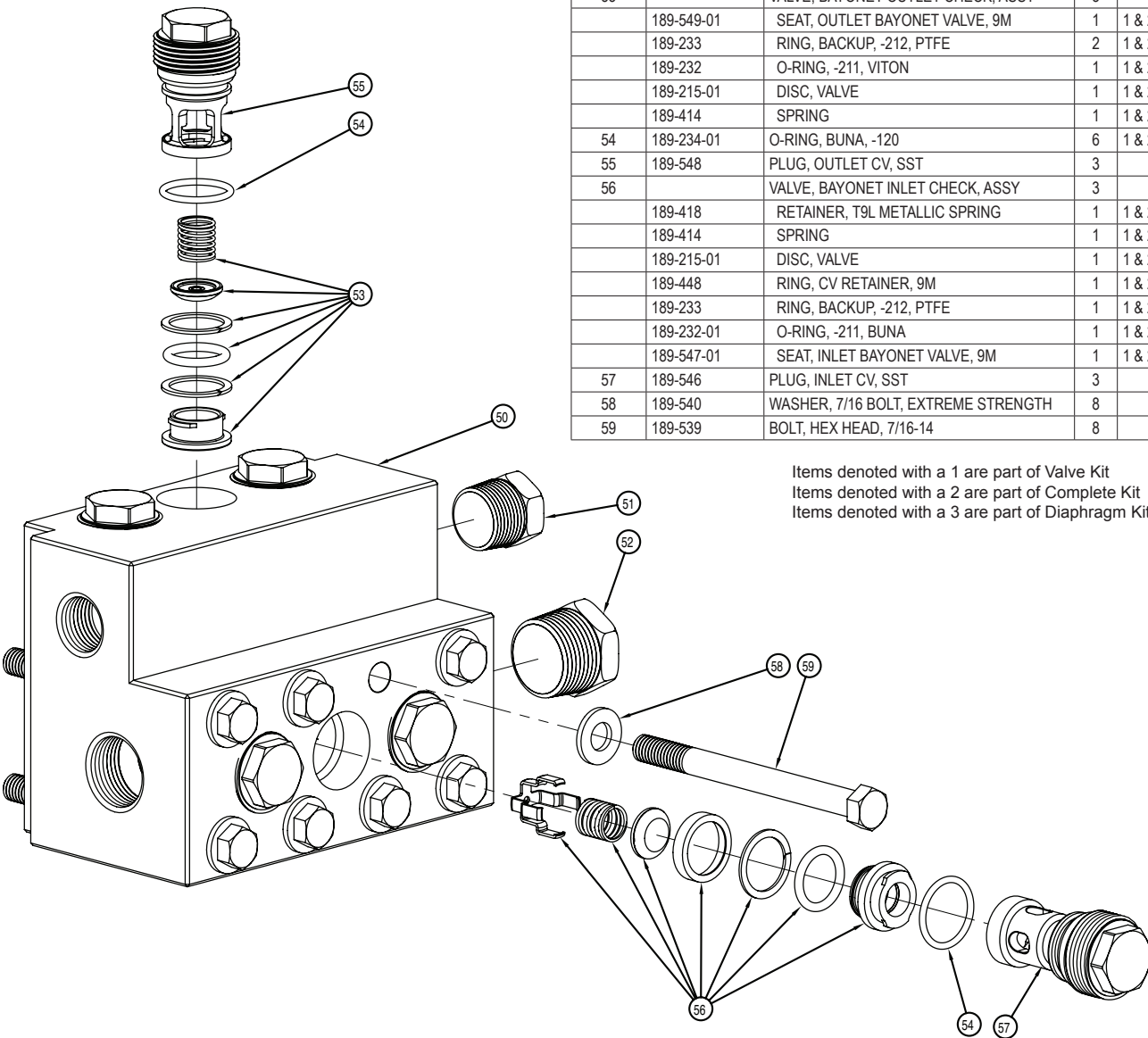
GLYCOL PUMPS

ELECTRIC PUMP MODEL EV - PARTS

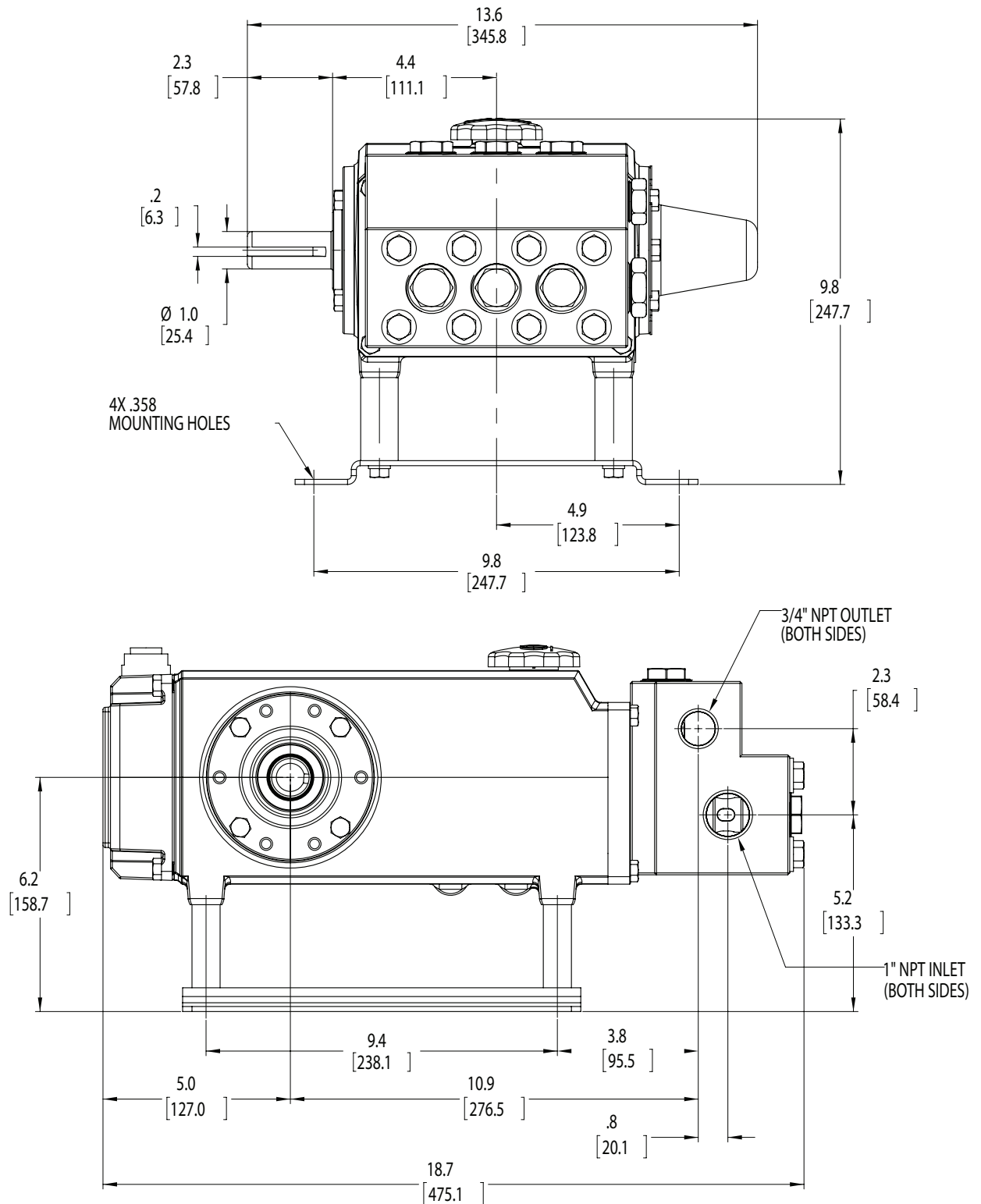


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	KIT
50	189-406-XX	MANIFOLD, K9L MACHINED	1	
51	189-311	PLUG, 3/4 NPT SST	1	
52	189-312	PLUG, 1 NPT SST	1	
53		VALVE, BAYONET OUTLET CHECK, ASSY	3	
	189-549-01	SEAT, OUTLET BAYONET VALVE, 9M	1	1 & 2
	189-233	RING, BACKUP, -212, PTFE	2	1 & 2
	189-232	O-RING, -211, VITON	1	1 & 2
	189-215-01	DISC, VALVE	1	1 & 2
	189-414	SPRING	1	1 & 2
54	189-234-01	O-RING, BUNA, -120	6	1 & 2
55	189-548	PLUG, OUTLET CV, SST	3	
56		VALVE, BAYONET INLET CHECK, ASSY	3	
	189-418	RETAINER, T9L METALLIC SPRING	1	1 & 2
	189-414	SPRING	1	1 & 2
	189-215-01	DISC, VALVE	1	1 & 2
	189-448	RING, CV RETAINER, 9M	1	1 & 2
	189-233	RING, BACKUP, -212, PTFE	1	1 & 2
	189-232-01	O-RING, -211, BUNA	1	1 & 2
	189-547-01	SEAT, INLET BAYONET VALVE, 9M	1	1 & 2
57	189-546	PLUG, INLET CV, SST	3	
58	189-540	WASHER, 7/16 BOLT, EXTREME STRENGTH	8	
59	189-539	BOLT, HEX HEAD, 7/16-14	8	

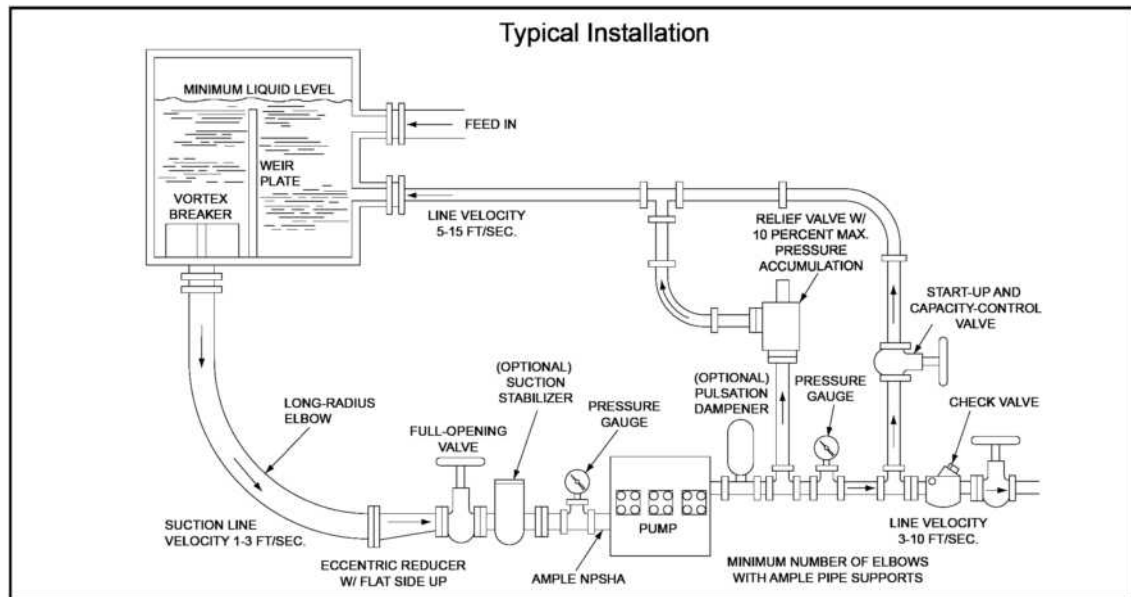
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INLET PIPING (Suction Feed)

CAUTION: When pumping at temperatures above 250° F (121.1° C), use a pressure-feed system. Install drain cocks at any low points of the suction line, to permit draining in freezing conditions. Provide for permanent or temporary installation of a vacuum gauge to monitor the inlet suction. To maintain maximum flow, vacuum at the pump inlet should not exceed 7 in. Hg at 70° F (180 mm Hg at 21° C). **Do not supply more than one pump from the same inlet line if possible.**

Supply Tank

Use a supply tank that is large enough to provide time for any trapped air in the fluid to escape. The tank size should be at least twice the maximum pump flow rate. Isolate the pump and motor stand from the supply tank, and support them separately. Install a separate inlet line from the supply tank to each pump. Install the inlet and bypass lines so they empty into the supply tank below the lowest water level, on the opposite side of the baffle from the pump suction line. If a line strainer is used in the system install it in the inlet line to the supply tank. To reduce aeration and turbulence, install a completely submerged baffle plate to separate the incoming and outgoing liquids. Install a vortex breaker in the supply tank, over the outlet port to the pump. Place a cover over the supply tank, to prevent foreign objects from falling into it.

Hose and Routing

Size the suction line at least one size larger than the pump inlet, and so that the velocity will not exceed 1-3 ft/sec (0.3 to 0.9 m/s):
 For pipe in inches: Velocity (ft/sec) = 0.408 x GPM/Pipe ID2
 For pipe in mm: Velocity (m/sec) = 21.2 x LPM/Pipe ID2
 Keep the suction line as short and direct as possible. Use flexible hose and/or expansion joints to absorb vibration, expansion, or contraction. If possible, keep suction line level. Do not have any high points collecting vapor unless high points are vented. To reduce turbulence and resistance, do not use 90° elbows. If turns are necessary in the suction line, use 45° elbows or ar-range sweeping curves in the flexible inlet hose. If a block valve is used, be sure it is fully opened so that the flow

to the pump is not restricted. The opening should be at least the same diameter as the inlet plumbing ID. Do not use a line strainer or filter in the suction line unless regular maintenance is assured. If used, choose a top loading basket. It should have a free-flow area of at least three times the free-flow area of the inlet. Install piping supports where necessary to relieve strain on the inlet line and to minimize vibration.

INLET PIPING (Pressure Feed)

Provide for permanent or temporary installation of a vacuum/pressure gauge to monitor the inlet vacuum or pressure. Pressure at the pump inlet should not exceed 250 psi (17 bar); if it could get higher, install an inlet pressure reducing regulator. Do not supply more than one pump from the same inlet line.

INLET CALCULATIONS

Acceleration Head

Calculating the Acceleration Head
 Use the following formula to calculate acceleration head losses. Subtract this figure from the NPSHa, and compare the result to the NPSHr of the Hydra-Cell pump.

$$H_a = (L \times V \times N \times C) \div (K \times G)$$
 where:
 H_a = Acceleration head (ft of liquid)
 L = Actual length of suction line (ft) — not equivalent length
 V = Velocity of liquid in suction line (ft/sec) [V = GPM x (0.408 ÷ pipe ID²)]
 N = RPM of crank shaft
 C = Constant determined by type of pump — use 0.066 for the EV50015 Hydra-Cell pumps
 K = Constant to compensate for compressibility of the fluid — use: 1.4 for de-aerated or hot water; 1.5 for most liquids; 2.5 for hydrocarbons with high compressibility
 G = Gravitational constant (32.2 ft/sec²)

Friction Losses

Calculating Friction Losses in Suction Piping
 When following the above recommendations (under "Inlet Piping") for minimum hose/pipe I. D. and maximum length, frictional losses in the suction piping are negligible (i.e., H_f = 0) if you are pumping a water-like fluid. When pumping more-viscous fluids such as lubricating oils, sealants, adhesives, syrups, varnishes, etc., frictional losses in the

ELECTRIC PUMP

MODEL EV - INSTALLATION

suction piping may become significant. As Hf increases, the available NPSH (NPSHa) will decrease, and cavitation will occur. In general, frictional losses increase with increasing viscosity, increasing suction-line length, increasing pump flow rate, and decreasing suction-line diameter. Changes in suction-line diameter have the greatest impact on frictional losses: a 25% increase in suction-line diameter cuts losses by more than two times, and a 50% increase cuts losses by a factor of five times. Consult the factory before pumping viscous fluids.

Minimizing Acceleration Head and Frictional Losses

To minimize the acceleration head and frictional losses:

- Keep inlet lines less than 6 ft (1.8 m) or as short as possible
- Use at least 1-1/2 in. (38.1 mm) I.D. inlet hose
- Use suction hose (low-pressure hose, non collapsing) for the inlet lines
- Minimize fittings (elbows, valves, tees, etc.)
- **Use a suction stabilizer on the inlet.**

Net Positive Suction Head

NPSHa must be equal to or greater than NPSHr. If not, the pressure in the pump inlet will be lower than the vapor pressure of the fluid — and cavitation will occur.

Calculating the NPSHa

Use the following formula to calculate the NPSHa:

$$NPSHa = P_t + H_z - H_f - H_a - P_{vp}$$

where:

P_t = Atmospheric pressure

H_z = Vertical distance from surface liquid to pump center line
(if liquid is below pump center line, the H_z is negative)

H_f = Friction losses in suction piping

H_a = Acceleration head at pump suction

P_{vp} = Absolute vapor pressure of liquid at pumping temperature

NOTES:

- In good practice, NPSHa should be 2 ft greater than NPSHr
- All values must be expressed in feet of liquid

Atmospheric Pressure at Various Altitudes

Altitude (ft)	Pressure (ft of H ₂ O)	Altitude (ft)	Pressure (ft of H ₂ O)
0	33.9	1500	32.1
500	33.3	2000	31.5
1000	32.8	5000	28.2

DISCHARGE PIPING

Hose and Routing

Use the shortest, most-direct route for the discharge line.

Select pipe or hose with a working pressure rating of at least 1.5 times the maximum system pressure. EXAMPLE: Select a 1500 psi W.P.-rated hose for systems to be operated at 1000 psi-gauge pressure.

Use flexible hose between the pump and rigid piping to absorb vibration, expansion or contraction.

Support the pump and piping independently. Size the discharge line so that the velocity of the fluid will not exceed 7-10 ft/sec (2-3 m/sec):

For pipe in inches: Velocity (ft/sec) = 0.408 x GPM/Pipe ID²

For pipe in mm: Velocity (m/sec) = 21.2 x LPM/Pipe ID²

Pressure Relief

Install a pressure relief valve in the discharge line. Bypass pressure must not exceed the pressure limit of the pump.

Size the relief valve so that, when fully open, it will be large enough to relieve the full capacity of the pump without overpressurizing the system.

Locate the valve as close to the pump as possible and ahead of any other valves.

Adjust the pressure relief valve to no more than 10% over the

maximum working pressure of the system. Do not exceed the manufacturer's pressure rating for the pump or relief valve.

Route the bypass line to the supply tank. See the diagram showing a typical installation at the beginning of the Installation Section.

If the pump may be run for a long time with the discharge closed and fluid bypassing, install a thermal protector in the bypass line (to prevent severe temperature buildup in the bypassed fluid).

CAUTION: Never install shutoff valves in the bypass line or between the pump and pressure relief valve.

Install a pressure gauge in the discharge line.

BEFORE INITIAL START-UP

Before you start the pump, be sure that:

- Pump is stored at a temperature between 40-180 F (4.4-82.2 C) for a minimum of 24 hours before start up.
- All shutoff valves are open, and the pump has an adequate supply of fluid.
- All connections are tight.
- The oil level is within the marking on the dipstick. Add oil as needed.
- The relief valve on the pump outlet is adjusted so the pump starts under minimum pressure.
- All shaft couplings or drive pulleys have adequate safety guards.

INITIAL START-UP

1. Pump must be at or above 40 F (4.4 C) for 24 hours prior to starting.
2. Open the bypass line start-up and capacity-control valve so the pump may be started against negligible discharge pressure.
3. Turn on power to the pump motor.
4. Check the inlet pressure or vacuum. To maintain maximum flow, inlet vacuum must not exceed 7 in. Hg at 70° F (180 mm Hg at 21° C). Inlet pressure must not exceed 250 psi (17 bar).
5. Listen for any erratic noise, and look for unsteady flow. If the pump does not clear, refer to the Troubleshooting Section.
6. If the system has an air lock and the pump fails to prime:
 - a. Turn off the power.
 - b. Remove the pressure gauge from the tee fitting at the pump outlet (see installation diagram).
NOTE: Fluid may come out of this port when the plug is removed. Provide an adequate catch basin for fluid spillage, if required. Fluid will come out of this port when the pump is started, so we recommend that you attach adequate plumbing from this port so fluid will not be sprayed or lost. Use high-pressure-rated hose and fittings from this port. Take all safety precautions to assure safe handling of the fluid being pumped.
 - c. Jog the system on and off until the fluid coming from this port is air-free.
 - d. Turn off the power.
 - e. Remove the plumbing that was temporarily installed, and reinstall the pressure gauge or plug.
7. Adjust the bypass line valve to the desired operating pressure. Do not exceed the maximum pressure rating of the pump.
8. After the system pressure is adjusted, verify the safety relief valve setting by closing the bypass line valve until the relief valve opens.

NOTE: Fluid may come out of the safety relief valve. Provide an adequate catch basin for fluid spillage. Take all safety precautions to assure safe handling of the spillage.

9. Reset the bypass line valve to obtain the desired system pressure.
10. Provide a return line from the relief valve to the supply tank, similar to the bypass line.

NOTE: The numbers in parentheses are the Reference Numbers on the exploded view illustrations found in this manual and in the Parts Manual.

DAILY

Check the oil level and the condition of the oil with the pump turned off. The oil level should be within the marking on the dipstick. Add oil as needed. Use KIMZOIL EGP1 Electric Glycol Pump Oil (Kimray part no. 6928) for the application.

CAUTION: If you are losing oil but don't see any external leakage, or if the oil becomes discolored and contaminated, one of the diaphragms (41) may be damaged. Refer to the Fluid-End Service Section. Do not operate the pump with a damaged diaphragm.

CAUTION: Do not leave contaminated oil in the pump housing or leave the housing empty. Remove contaminated oil as soon as discovered, and replace it with clean oil.

PERIODICALLY

Change the oil after the first 500 hours of operation, and then according to the guidelines below.

Hours Between Oil Changes @ Various
Process Fluid Temperatures

Pressure	RPM	<150°F	<200°F	<250°F
		(32°C)	(60°C)	(82°C)
<1000 psi (69 bar)	<800	6,000	4,500	3,000
	<1200	4,000	3,000	2,000
<1500 psi (100 bar)	<800	4,000	3,000	2,000
	<1200	2,000	1,500	1,000

NOTE: Minimum oil viscosity for proper hydraulic end lubrication is 16-20 cST (80-100 SSU) at 212°F (100°C).

NOTE: Use of an oil cooler is recommended when process fluid and/or hydraulic end oil exceeds 200°F (93°C).

When changing oil, remove both drain plugs (13) at the bottom of the pump so all oil and accumulated sediment will drain out.

CAUTION: Do not turn the drive shaft while the oil reservoir is empty.

Check the inlet pressure or vacuum periodically with a gauge. If vacuum at the pump inlet exceeds 7 in. Hg (180 mm Hg), check the inlet piping system for blockages. If the pump inlet is located above the supply tank, check the fluid supply level and replenish if too low.

CAUTION: Protect the pump from freezing. Refer also to the "Shutdown Procedure".

SHUTDOWN PROCEDURE DURING FREEZING TEMPERATURES

Take all safety precautions to assure safe handling of the fluid being pumped. Provide adequate catch basins for fluid drainage and use appropriate plumbing from drain ports, etc., when flushing the pump and system with a compatible anti-freeze.

PUMP STORAGE

CAUTION: If the pump is to be stored more than six months take the following steps to protect against corrosion:

1. Change crankcase oil.
2. Change oil behind diaphragms.
3. Remove suction and discharge valves and drain pump of all liquids. Use compressed air to dry inside passageways of manifold.
4. Apply light film of clean oil or corrosion inhibitor to all inside passageways of manifold.
5. Clean and dry valves and seats. Apply light film of clean oil or corrosion inhibitor to valves and seats.
6. Reinstall valves with new o-rings.
7. Plug suction and discharge ports to protect against dirt and moisture.
8. Store pump in clean and dry location.
9. Every month of storage rotate crankshaft 4 to 6 times.

ELECTRIC PUMP

MODEL EV - TROUBLESHOOTING

CAVITATION

- Inadequate fluid supply because:
 - Inlet line collapsed or clogged
 - Clogged line strainer
 - Inlet line too small or too long
 - Air leak in inlet line
 - Worn or damaged inlet hose
 - Suction line too long
 - Too many valves and elbows in inlet line
- Fluid too hot for inlet suction piping system
- Air entrained in fluid piping system
- Aeration and turbulence in supply tank
- Inlet vacuum too high (refer to "Inlet Calculations" paragraph)

Symptoms of Cavitation

- Excessive pump valve noise
- Premature failure of spring or retainer
- Volume or pressure drop
- Rough-running pump
- Premature failure

DROP IN VOLUME OR PRESSURE

A drop in volume or pressure can be caused by one or more of the following:

- Air leak in suction piping
- Clogged suction line or suction strainer
- Suction line inlet above fluid level in tank
- Inadequate fluid supply
- Pump not operating at proper RPM
- Relief valve bypassing fluid
- Worn pump valve parts
- Foreign material in inlet or outlet valves
- Loss of oil prime in cells because of low oil level
- Ruptured diaphragm
- Cavitation
- Warped manifold from overpressurized system
- O-rings forced out of their grooves from overpressurization
- Air leak in suction line strainer or gasket
- Cracked suction hose
- Empty supply tank
- Excessive aeration and turbulence in supply tank
- Worn and slipping drive belt(s)
- Worn spray nozzle(s)
- Cracked cylinder

PUMP RUNS ROUGH

- Worn pump valves
- Air lock in outlet system
- Oil level low
- Wrong weight of oil for cold operating temperatures (change to lighter weight)
- Cavitation
- Air in suction line
- Restriction in inlet/suction line
- Hydraulic cells not primed after changing diaphragm
- Foreign material in inlet or outlet valve
- Damaged diaphragm
- Fatigued or broken valve spring

PREMATURE FAILURE OF DIAPHRAGM

- Frozen pump
- Puncture by a foreign object
- Elastomer incompatible with fluid being pumped
- Pump running too fast
- Excess pressure
- Cavitation
- Aeration or turbulence in supply tank

VALVE WEAR

- Normal wear from high-speed operation
- Cavitation
- Abrasives in the fluid
- Valve incompatible with corrosives in the fluid
- Pump running too fast

LOSS OF OIL

- External seepage
- Rupture of diaphragm
- Frozen pump
- Worn shaft seal
- Oil drain plug or fill cap loose
- Valve plate and manifold bolts loose

PREMATURE FAILURE OF VALVE SPRING OR RETAINER

- Cavitation
- Foreign object in the pump
- Pump running too fast
- Spring/retainer material incompatible with fluid being pumped
- Excessive inlet pressure

FLOAT SWITCH

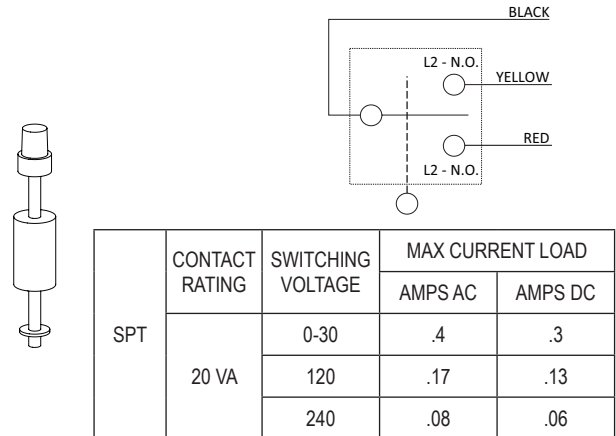
FUNCTION / PURPOSE:

The FLOAT SWITCH is installed in the rear cover of the pump and is used to detect HIGH or LOW oil level in the crank case.

INSTALLATION DESCRIPTION

Install by removing the adapter and conduit plug from the pump rear cover, secure the switch into the adapter and reinstall the assembly into the rear cover.

PART NUMBER	DESCRIPTION
6926	500EV FLOAT SWITCH ASSY

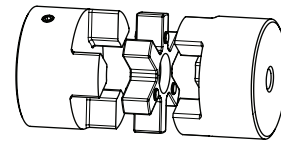


SHAFT COUPLINGS

FUNCTION / PURPOSE:

The SHAFT COUPLINGS join the motor and pump shafts with an elastomeric cushion. A properly sized coupling is required for each shaft. Additionally, a spider cushion installs between the two couplings.

PART NUMBER	DESCRIPTION
6902	BUNA COUPLING SPIDER
6900	Ø 1.000" BORE COUPLING
6917	Ø 1.375" BORE COUPLING
6901	Ø 1.625" BORE COUPLING



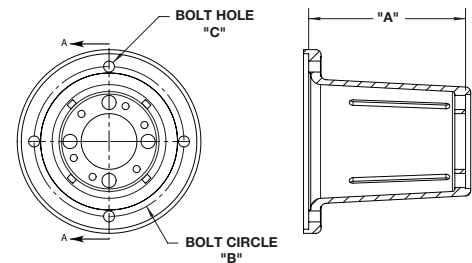
C-FACE MOTOR ADAPTER

FUNCTION / PURPOSE:

The MOTOR ADAPTER rigidly connects and aligns the pump and motor together for direct-drive applications. The adapter also serves as a protective guard around the spinning shafts.

PART NUMBER	DESCRIPTION	NEMA FRAME SIZE
GKF	50015 EV MOTOR ADAPTER KIT	213T / 215T
GKG	50015 EV MOTOR ADAPTER KIT	254T / 256T

INCLUDES MOUNTING HARDWARE

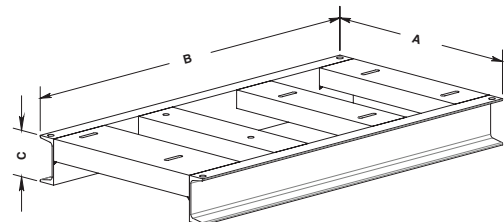


FRAME SIZE	A	B	C
213T/215T	6.100"	7.250"Ø	.531"Ø
254T/256T	7.600"	7.250"Ø	.531"Ø

SKID

PART NUMBER	DESCRIPTION	NEMA FRAME SIZE
GKH	50015 EV SKID KIT	213T / 215T
GKI	50015 EV SKID KIT	254T / 256T

INCLUDES MOUNTING HARDWARE



FRAME SIZE	A	B	C
213T/215T	19 11/64"	29 1/2"	4"
254T/256T	19 5/32"	35 5/16"	4"

Series:

G = Glycol Pump

Model:

EV = Electric

Capacity

	Flow Rate (gph)	Operating Pressure (psi)
120	6-130	1200 max
500	90-500	1500 max

Service Type:

S = Standard

G **EV** **500** **S**

Options: Additional cost and lead times will apply
If multiple options required input in sequential order
Leave blank if no options required

Motor / Skid Packages				
M01 = 2HP	115/230V	1PH	1800 RPM	120 Motors
M02 = 2HP	230/460V	3PH	1800 RPM	
M03 = 3HP	115/230V	1PH	1800 RPM	
M04 = 3HP	230/460V	3PH	1800 RPM	
M05 = 3HP	115/230V	1PH	1200 RPM	500 Motors
M06 = 3HP	230/460V	3PH	1200 RPM	
* M07 = 3HP	460V	3PH	1200 RPM	
M08 = 5HP	230V	1PH	1200 RPM	
M09 = 5HP	230/460V	3PH	1200 RPM	
* M10 = 5HP	460V	3PH	1200 RPM	
M11 = 7.5HP	230/460V	3PH	1200 RPM	
* M12 = 7.5HP	460V	3PH	1200 RPM	
M13 = 10HP	230/460V	3PH	1200 RPM	
* M14 = 10HP	460V	3PH	1200 RPM	
X = Export				

Meets Specification IEEE Std. 841

Not all selections available on all products listed.
See product pages 10:20.1 - 10:20.14 for available options