

A measured step forward™

Operations & Maintenance Manual

2300 Series

(Models 2310-2390)



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Thank you for purchasing a 2300 Series diaphragm metering pump. For optimum performance, please read all Operation and Maintenance Instructions before actual installation of this product.

Please check your shipment. If any of the equipment you received shows signs of damage, contact the shipping carrier immediately. Next, please unpack the pump slowly, taking care that no small parts are accidentally discarded.

Compare the parts supplied with the enclosed packing list and your original purchase order. If there are any discrepancies, contact your local Lutz-JESCO America representative immediately.

CAUTION: Metering pumps and their accessories are often used with potentially dangerous chemicals. Please follow all safety precautions for any chemicals processed through your system. If there is ever a question about appropriate installation or use of a product, contact the manufacturer before proceeding.

These pages contain guidelines for system design and general safety. It is essential to review all Operation and Maintenance Instructions before proceeding with installation of this equipment.

1. General Description

The 2300 Series mechanically actuated diaphragm metering pump is a compact, modular, state-of-the-art design. Simplex and duplex models are available. The rugged design makes the pump ideal for the most municipal or industrial water treatment chemical applications.

This pump has a metering head designed with a separation chamber behind the diaphragm protecting the body of the pump. Should the diaphragm rupture or crack due to wear all leakage will drain harmlessly back to the tank or an alternate location. Escaping leakage may be detected by a probe which can be used to shut off pump or send an alarm.

2. System Design Guidelines

Before installing a pump of the 2300 Series into a new or existing system, Lutz-JESCO America Corporation recommends careful review of your system's design and layout. It is essential that all local rules,



codes and regulations are followed in the design and installation of chemical feed equipment. It is also important that the system meets the technical demands required, such as flow rates and pressures. Many factors must be taken into consideration, including process fluid specifications, material compatibilities, chemical handling, electrical wiring, line losses and many more.

Exposure to direct sunlight must be avoided. If the pump is installed outside, provide an enclosure to protect it against the weather. With metering pump systems, particular attention must be paid to the piping system. Refer to Lutz-JESCO America Corporation's *System Design Guide* for more detailed information.

Both the system designer and the operator are responsible for ensuring that the entire plant is constructed to prevent unreasonable damage to plant equipment or building resulting from leakage or technical failure.

It is especially important that chemical plants be designed to ensure the safety of maintenance people and operators. We recommend installing relief valves, splash guards, containment tanks, and leakage probes with alarm relays to aid this effort.

3. Safety Precautions

The diaphragm metering pump is designed to pump various liquids into pressurized systems. By nature, the application of these pumps may present circumstances under which personal hazards can exist. All personnel who may have occasion to install, operate, or maintain

these pumps should be provided with the opportunity to read this instruction manual and be familiar with its contents. Awareness of potential hazards can prevent accidents and injury.

Danger from Liquids Handled

All systems containing liquid and/or air under pressure present the potential for unexpected discharge of liquid in a violent manner. In operation and servicing of the pump, all parts of the pump and attached piping which contain liquid should be treated cautiously, until it is known with certainty that they have been depressurized and drained.

Danger from Electrical Hazard

Since these pumps are electric motor driven and may include electric components, the hazard of electrical shock can exist. Installation and wiring of electrical components should be in accordance with the applicable codes.

Operational Hazards

To avoid personal injury, please adhere to the following guidelines:

1. Do not operate the pump if electrical component enclosures are not in place.
2. When venting pump head or piping during startup, liquid may be discharged under pressure. The use of a pressure relief mechanism back to the supply tank is highly recommended. Suitable caution should be taken to avoid contact with the liquid and to avoid spillage or spraying of liquid.
3. Clean up any leaked or spilled liquid immediately.

Safety

1. Before operating pump and accessories or attempting to service, become familiar with the contents of this instruction manual.
2. Observe all precautions established by plant safety procedures.
3. Observe all chemical handling instructions provided by the chemical supplier and/or plant regulations.
4. Do not operate pump with closed valves in suction and/or discharge lines.
5. Do not paint over or remove nameplates, labels, or tags.
6. In disassembly of pump, precautions should be taken for the possibility that a diaphragm rupture may have allowed pumped liquid to contaminate the housing.
7. If motor replacement is required, be certain that all specifications are the same as the original motor.
8. If a pump is to be used for other than original service, first ascertain that pump is suitable for new conditions (pressure and compatibility with liquid to be pumped).
9. Establishment of and adherence to a regular maintenance program can prevent problems by early detection of unusual conditions (e.g. unusual noise, overheating, and wetness indicating leakage).

4. Installation

The accuracy and reliability of a metering pump system depend on proper installation of each component. All considerations of sound hydraulic practice, including the elimination of air and foreign matter, accurate and reliable seating of valves, proper size and length of piping, liquid vapor pressure, viscosity, and temperature may mean the differ-

ence between a successful or unsuccessful installation. The application of basic hydraulic principles during planning, installation and operation is essential. Good suction conditions will prevent a common cause of premature diaphragm failures. Each installation should be designed and built paying careful attention to all instructions regarding handling of corrosive, toxic or hazardous chemicals. It is of utmost importance that all safety procedures established by the owners and manufacturers be followed during installation, operation and maintenance phases.

Location

The preferred location of a metering pump system is indoors. Although systems can be installed outdoors, manufacturer's temperature ratings and recommendations must be followed. Gear lubricants and system fluids are subject to viscosity increase when temperatures fall. Motors and gear boxes are subject to overheating when installed in direct sunlight or an area with high ambient temperatures. If a system must be installed outdoors, it should be sheltered from the elements with heating or cooling systems provided as needed. Proper installations indoors or out should allow sufficient room for operators and maintenance personnel to access each component for adjustments and servicing.

General Installation

1. Install metering pump (1) with suction (2) and discharge (3) valves vertical and bolt down the base.
2. The piping must not exert any force on the suction and discharge valves.
3. The leakage tube from the separation chamber must slope down to the supply tank (14). The drain should never pass directly through the tank lid back to the medium as this could allow gasses to penetrate the pump drive. The drain must be directed to a vented collection container or to a collection funnel (5) with an appropriate gap between the pump and the return line. Leakage can then drain via the funnel through the tank lid. Any leakage at the funnel will therefore be apparent.
4. If the discharge line is 30 ft. or longer, a Pulsation Dampener (7) is recommended. A Pulsation Dampener may also be necessary with higher viscosities.
5. The suction line (8) should be fitted with a suction filter (and a foot valve (9) for suction lift applications).
6. Safety switches should be installed for motors, in accordance with the relevant codes.
7. Suction line should not be smaller than pump suction connection. Some pump applications may even require larger suction lines.

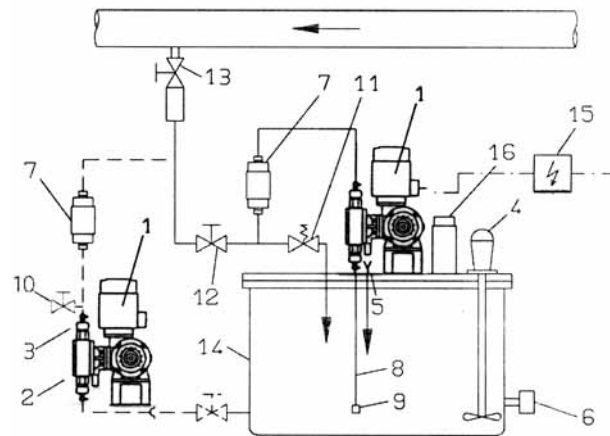
Electric Installation

1. Check motor nameplate and compare power supply requirements with characteristics of available power.
2. Check motor rotation, which must be counterclockwise when operator is viewing rotation of fan.
3. Electrical installation including motor control and overload protection must be in accordance with applicable codes and local ordinances.

Installation Example

Installation Components

- | | |
|-----------------------|-------------------------|
| 1. Metering Pump | 9. Foot Valve |
| 2. Suction Valve | 10. Vent Valve |
| 3. Discharge Valve | 11. Relief Valve |
| 4. Mixer | 12. Back Pressure Valve |
| 5. Collection Funnel | 13. Injection Valve |
| 6. Tank Drain | 14. Supply Tank |
| 7. Pulsation Dampener | 15. Power Supply |



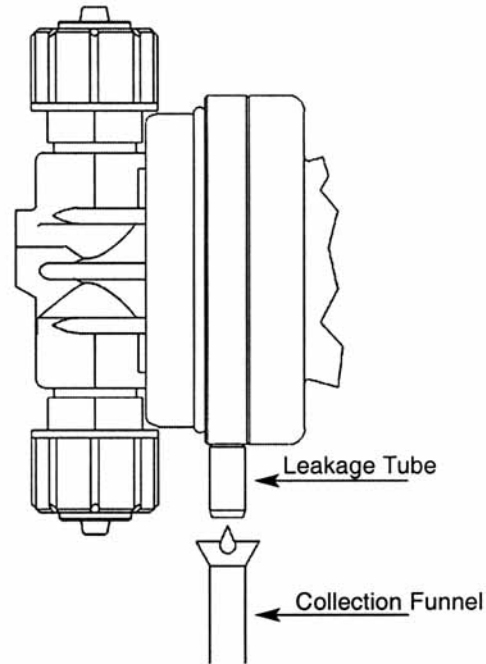
8. Suction Line

16. Tank Vent

Drain Pipe

The drain pipe must be routed with a downward slope to a supply tank free of gases or to a collection funnel, which should be placed no closer than 1 inch from the leakage tube. By no means must the drain pipe be returned directly to the chemical through the tank cover, because otherwise effervescent media might enter the pump gear. Leakage can be returned via the funnel through the tank cover. This also enables you to see possible leakage at the funnel.

Electrical Connection of Pump



- The electrical connection of the pump must be made according to the local rules and may only be carried out by technical personnel.
- Cable type and cable cross section of the supply lines must be selected according to the motor data.
- The cable passages to the motor terminal box must be made professionally. We recommend gland screw connections with traction relief.
- The required protection class must be ensured by professional installation of the electrical connections.

5. Start-Up and Operation

1. Remove breather vent located above stroke adjustment knob. Using oil (P/N 261488) provided, fill the pump with oil through vent opening until oil level is at center of sight glass. Replace oil fill cap.
2. Open both the suction shutoff valve and system vent valve on the discharge side to expose the system to atmospheric pressure. For flooded suction applications where pump and piping will fill by gravity or for dangerous mediums, proceed to Step 12. For applications involving long suction lines or suction lift, continue with Step 3. **ATTENTION!** If using a dangerous medium, disregard Steps 3 - 11.
3. On the discharge side, unscrew the union nut of the discharge line and the valve body from the liquid end.
4. Fill the liquid end from the top with the chemical medium or water (if compatible). Place a collection pan under the pump head to catch any spilled chemical.
5. Refit the valve body with the gasket to the liquid end.

6. Turn on the pump motor. (Check direction of rotation according to arrow.)
7. Adjust the pump stroke length to 100%. Refer to Capacity Control Adjustment instructions on this page.
8. Note that the liquid, together with obvious air bubbles, will escape through the thread of the valve body and the liquid end at the top.
9. As pump runs, the suction line will fill with liquid medium and air will be released. When air bubbles cease at loose fittings, tighten discharge valve body onto the liquid end.
10. Turn the pump off.
11. Refit the discharge union nut and the discharge line, making sure that the gasket (washer) is replaced.
12. Turn pump on and check for flow from the system vent valve (with properly installed return lines).
13. When flow is verified by system vent valve, close the vent valve.
14. The pump can then be adjusted to the output required. The liquid end and pump body should be cleaned off and dried to prevent any attack of the medium where the necessary spillage has occurred due to the above procedure.
15. If the pump fails to self-prime, detach the discharge valve and fill the pump head with liquid. Use water if possible to avoid handling chemicals. Replace the valve and tighten. Turn the pump back on. Once the delivery has been achieved, adjust the output setting as required.
16. A minimum back pressure of 15 psig is required in order to provide proper check valve seating as required.
17. After first 80 hours of operation, see Maintenance Information.

Note: Lutz-JESCO America Corporation is not responsible for damages due to excessive or low flow rates resulting from faulty pump settings or incorrect and insufficient installation of peripheral fittings.

Capacity Control Adjustment - Manual

Pump capacity control has been tested at the factory. However, verification of specified discharge pressure is important as it affects delivery rate. To calibrate pump to actual application, follow the procedure below.

1. Make sure that the pump is delivering the process fluid at system pressure.
2. Loosen control knob shaft lock screw. Turn capacity control to 10 graduation on capacity control dial and record maximum pump output.
3. Determine and record pump output at a number of other capacity control settings.
4. Plot graph of pump output versus capacity control settings. Effects of discharge pressure specific to the application may cause zero output occurring at some capacity control setting above zero.

Capacity Control Adjustment - Electric

See electronic capacity adjustment (ECA) instructions when applicable.

6. Maintenance

General

1. After the first several hours of operation, turn off the pump and tighten all hardware and fittings. Retighten as needed to prevent leakage.
2. Clean exterior of pump as needed.
3. Pump oil (P/N 261488) should be changed after every 5000 hours of operation.
4. Clean and inspect check valves and diaphragms annually. Replace if needed.

After the first 80 hours of operation

1. Remove oil fill plug and drain pump oil by removing plug located under stroke adjustment housing. Reinstall bottom plug and refill with proper gear oil. Reinstall oil fill plug.
2. Clean and inspect check valves and diaphragm. Replace if damaged. See Replacing the Diaphragm procedure on this page.
3. Check pump wetted ends for leaks. Retighten connections and fasteners as necessary.

Lubrication Information

1. Recommended grade of oil is ISO-VG 460.
2. 2300 Series requires approximately 1 quart of oil.
3. DO NOT OVERFILL OIL RESERVOIR. Fill pump with oil until oil level at center of sight glass.

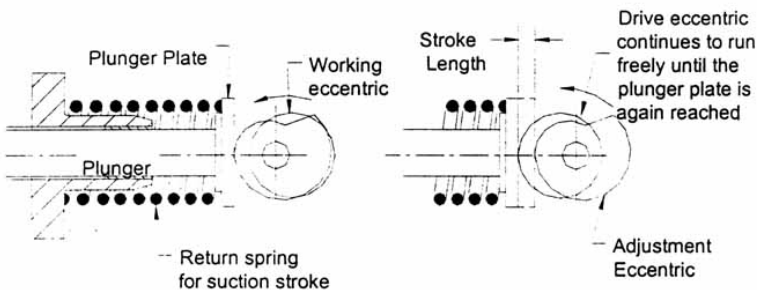
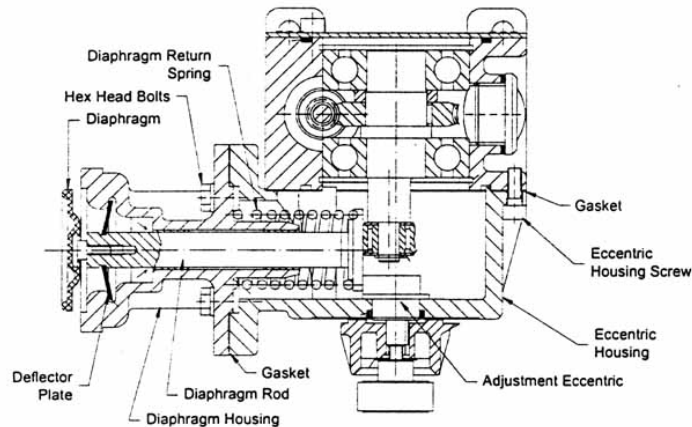
Replacing the diaphragm

Refer to photo below for assistance

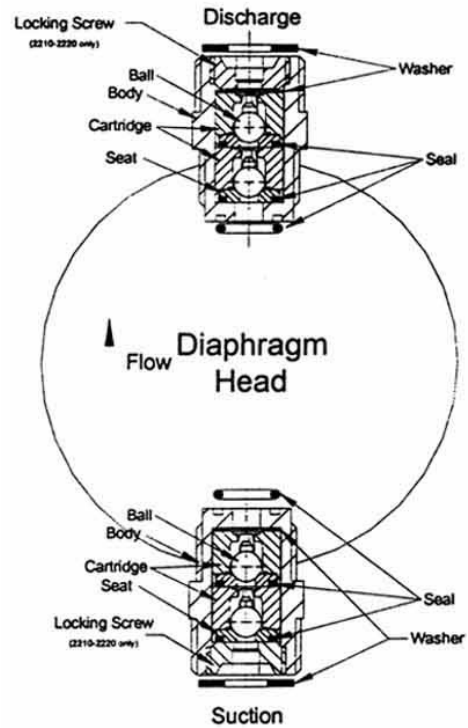
1. Adjust stroke length knob to 0%.
2. Shut off pump and close shutoff valves in the suction and discharge lines. Relieve pressure. Drain suction and discharge lines if possible. Caution: Pressure must be relieved before proceeding. If pressure is not relieved, dangerous chemical spray may result.
3. Disconnect union nuts from check valves.
4. Remove pump head mounting bolts and pull pump head/check valve assembly away from pump. Note orientation of check valves (flow arrows must point up). The head must not be reinstalled upside down.
5. Turn diaphragm counterclockwise to unscrew it from pump push rod. Note orientation of diaphragm support behind diaphragm.
6. Install the support plate onto diaphragm. Install new diaphragm by screwing it clockwise into pump push rod.
7. Clean inside of pump head, using appropriate cleaning fluid.
8. Reinstall pump head, noting orientation of check valves. Tighten head bolts evenly using an alternating crisscross pattern.
9. Reassemble suction and discharge lines, open shutoff valves and start pump according to the Start Up and Operation Instructions, Section 5.
10. Check for leaks and tighten accordingly.

Disassembly & Cleaning of Check Valves

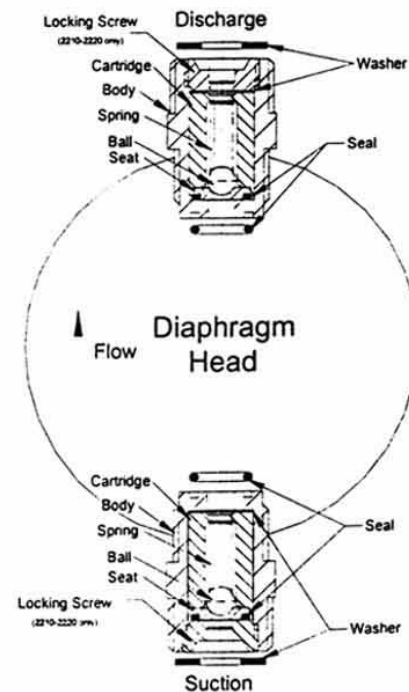
1. Adjust stroke length knob to 0%.
2. Shut off pump and close shutoff valves in the suction and discharge lines. Relieve pressure. Drain suction and discharge lines if possible. Caution: Pressure must be relieved before proceeding. If pressure is not relieved, dangerous chemical spray may result.
3. Disconnect union nuts from check valves and remove check valves from pump head by turning counterclockwise.
4. Refer to the appropriate check valve part drawing. Using a tool such as a drift punch, push all the internal components out of the check valve body.
5. Inspect balls, seats and ball guides for wear. If excessive wear is noted, replace parts. Clean all parts using an appropriate cleaning fluid.
6. Replace all seals.
7. Reassemble checks noting orientation of the internal parts. See appropriate model parts list drawing for part orientation. Replace locking screw if applicable.
8. Test valves for leaks by placing on a flat surface with valve seats down as shown in the parts list drawing. Pour a small amount of water into the top of each valve. If water leaks out of the bottom of the valve, disassemble the valve and clean or replace the balls and seats.
9. Reassemble check valves to pump head after installing new seals between checks and head. Ensure that checks are oriented correctly in the pump head.
10. Reassemble suction and discharge lines, open shutoff valves and start pump according to the Start Up & Operation Instructions, Section 5.



Double Ball Checks



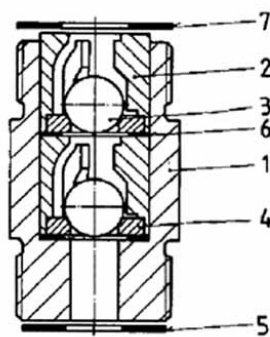
Single Ball Spring Loaded Checks for Models 2310-2360



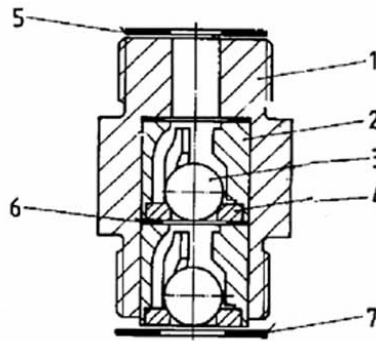
Replacing the Diaphragm Return Spring

1. While pump is running, adjust stroke length knob to 0%. Turn off power to pump.
2. Completely disconnect pump from system.
3. Drain oil from pump.
4. Remove diaphragm following procedure outlined in Replacing the Diaphragm section.
5. Detach eccentric housing from drive housing by removing the four screws. Refer to the appropriate parts list drawing to identify pump parts.
6. Using an 8" C-clamp and a piece of wood over the flange of the liquid end, compress return (pressure) spring so that it is clear of the adjustment eccentric.
7. Remove locking (butterfly) nut and adjustment knob from adjustment eccentric, noting position relationship between knob and eccentric.
8. Push adjustment eccentric out of eccentric housing. Be careful not to damage the adjustment eccentric o-ring in the eccentric housing.
9. Slowly loosen C-clamp and remove it from eccentric housing.
10. Remove 4 hex bolts from eccentric housing and remove liquid end from eccentric housing.
11. Remove diaphragm rod and spring from liquid end.
12. Replace diaphragm rod with new spring in liquid end. Replace the rubber deflector plate if there are any signs of chemical leakage behind the diaphragm. Reassemble liquid end to eccentric housing after cleaning gasket surfaces and installing a new gasket. Be careful not to gouge the gasket surfaces or leaks will result.
13. Using C-clamp, compress spring enough to reassemble the adjustment eccentric. Lubricate eccentric O-ring.
14. Replace the adjustment eccentric, adjustment knob, and locking nut, being careful not to damage the O-ring. Set adjustment knob to zero position and lock into position. Be sure that the eccentric is drawn up tight against the inside of the eccentric housing.
15. Slowly loosen C-clamp and remove from eccentric housing. The rubber deflector plate must be completely seated in grooves in the diaphragm rod and liquid end.
16. Clean gasket surfaces, eccentric and drive. Install new gasket or o-ring if applicable. Be careful not to gouge the gasket surfaces or leaks will result.
17. Reassemble eccentric housing to drive housing. Apply a small amount of silicone sealant to the screw threads to prevent oil leakage. Refill pump with the proper grade of oil.
18. Reassemble diaphragm head assembly to pump. Reassemble suction and discharge piping to pump head.
19. Start pump using the Start Up & Operation instructions, Section 5.

Check Valves - Model 2370-2390



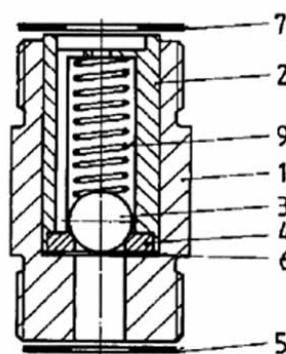
Suction



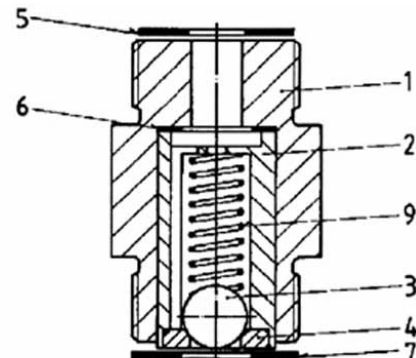
Discharge

Double-Ball Valve

Spring-Loaded Valve



Suction



Discharge

7. Troubleshooting

General

Problem	Possible Cause	Recommended Solution
Pump fails to inject chemical.	Check valves are leaking.	Inspect connections. Clean valves and reinstall or replace. (See Maintenance, Section 6)
	Check valves are incorrectly installed.	Reassemble valves. Ensure that the balls for the suction and discharge valves are correctly positioned above the valve seat. (See Parts List, Section 8.)
	System shut-off valves are closed.	Open valves.
	Suction filter, foot valve, or suction pipe are leaking or blocked.	Clean and seal suction pipes.
	Stroking action stopped due to broken return spring.	Replace spring. Check the density of medium. Suction lift may be too great.
Pump injects too much or too little chemical.	Adjustment knob incorrectly installed.	Drain pump head and re-secure knob.
	If pressure on suction side is too high, pump may inject too much.	Fit back pressure valve in discharge line.
Pump injects chemical irregularly.	Valve is blocked or leaking.	Clean valve and reseal.
Diaphragm ruptures frequently.	Diaphragm is not secured on rod up to stop.	Screw in new diaphragm up to stop.
	Peak discharge pressure is too high.	Install Pulsation Dampener.
	Pressure is too high.	Check system. Back pressure valve is possibly set too high.
	System Y- strainer is blocked or clogged.	Clean Y- strainer.
Pump makes unusual noise.	No oil in drive.	Refill or replace lubricant.
Motor hums but does not operate.	Motor is incorrectly connected.	Check electrical system.
	Pressure is too high.	Check system.

The 2000 Series metering pump can be equipped with an Electronic Capacity Adjustment (ECA). The ECA adjusts the pump output by varying the stroke length automatically using a 4-20 mA signal. In event of loss of power, the ECA can be manually operated with a mechanical adjustment tool. On duplex pumps, each head will have a separate ECA unit and is adjustable independently.

The ECA unit requires a 24 VAC power supply. An optional transformer will adapt the unit to accept 120 VAC input.

The information given below applies to the Electronic Capacity Adjustment (ECA) package only. This is an optional feature for the 2000 Series to provide automatic stroke length control. See the appropriate 2000 Series Instruction Manual for any questions pertaining to the metering pump, Product Data Book, Section 3, pages 20.00-26.10.

Installation

1. The Electronic Capacity Adjustment (ECA) is NEMA 4X and can be installed in several positions for convenient wiring.
2. A minimum of 6 in. of free space is needed to remove ECA cover.
3. Permissible ambient temperature is 23-140°F.
4. **Important:** Do not apply power to or attempt to run the ECA motor unless the pump drive motor is running. It is recommended that an electrical interlock be wired to prevent serious damage to the stroke control mechanism.

Start up – 4-20 mA Input

1. Remove cover from ECA unit.
2. Connect electrical leads according to wiring diagram (figure 1 on previous page).
3. Jumper S1 on ECA circuit board should be in "Aut" position. See diagram in figure 2.
4. Potentiometer (labeled U in figure 2) adjusts amount of voltage required for full 270° rotation of the ECA output shaft. This pot should be in position 8 (8 volts differential).
5. Potentiometer (labeled U_0 in Figure 2) adjusts amount of voltage required to start motor rotating from zero point. This pot should be in position 2 (2 volts).
6. Apply 24 VAC to terminals 1 and 2. The ECA should turn the pump stroke control knob to 0 in response to a 4 mA input signal at terminals 1 and 3, and should turn the stroke control to 10 in response to a 20 mA signal. **Important:** Do not apply power to or attempt to run the ECA motor unless the pump drive motor is running. Serious damage to the pump and/or ECA may result.
7. Set jumper S4 to position 2 (shown in figure 2) for 0-10 VDC output signal corresponding to the 0 to 10 position of the pump stroke control which is available at terminals 44 and 47 and can be used for stroke control position indication.
8. Set jumper S4 to position 1 for 0-620 mVDC output signal which corresponds to the 0 to 10

position of the pump stroke control which is available at terminals 44 and 47 and can be used for stroke control position indication.

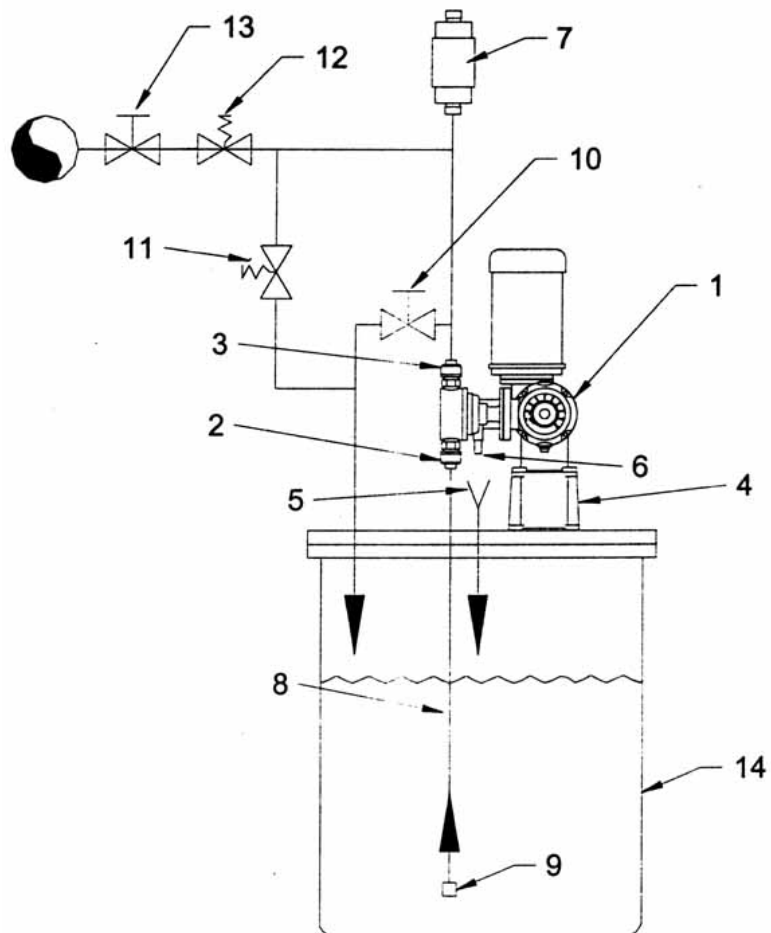
9. Replace ECA cover.

Manual Operation for Loss of Power

1. If manual stroke length adjustment is necessary, remove ECA cover.
2. Move jumper S1 to H position. (Figure 2)
3. Insert manual adjustment tool (P/N 30310) into hole shown in diagram in figure 3.
4. The ECA can be manually adjusted in either direction. **Important:** Do not adjust pump capacity unless pump drive motor is running.
5. Remove the manual adjustment tool.
6. Return jumper S1 to AUT position.
7. Replace ECA cover and the drive will again respond to a 4-20 mA signal.

Manual Operation with Power

1. If optional mode switches are not installed, see "Manual Operation for Loss of Power."
2. Shift auto/manual mode switch to manual.
3. Use adjustment (increase/decrease) switch to adjust capacity. **Important:** Do not adjust pump capacity unless pump drive motor is running.



Maintenance

The actuating drive is adequately lubricated before leaving the factory. However, it is advisable to examine the drive once a year to ensure that it has sufficient lubricant and, if necessary, lubricate the gears again. If exposed to high temperatures, shorter intervals between examinations are recommended. No other maintenance is necessary.

Optional Signal Conditioner

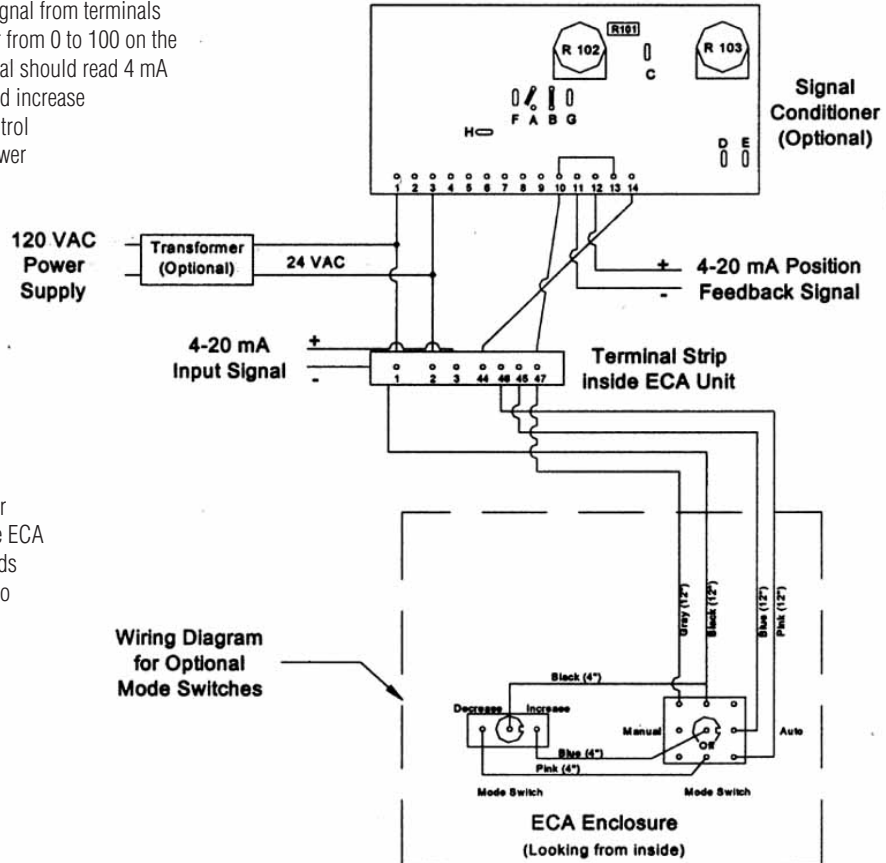
The signal conditioner is used to provide a 4-20 mA position indicating feedback signal when used with the ECA automatic stroke control. It is suitable for installation in several positions for convenient wiring access. Recommended location is inside the customer's control panel or in a separate enclosure with the appropriate NEMA rating for its environment.

Start Up

1. Remove cover.
2. Cut wire loops D, E, and G. See diagram in figure 4.
3. Switch A should be open and switch B should be closed.
4. Connect electrical leads, 24 VAC to terminals 1 & 3, output signal to 14, 10 and 13 (wiring diagram in figure 1).
5. Start pump and measure feedback signal from terminals 11 and 12 while running ECA motor from 0 to 100 on the pump stroke control. Feedback signal should read 4 mA when pump stroke control is at 0 and increase smoothly to 20 mA when stroke control is at 10. **Important:** Do not apply power to or attempt to run ECA motor unless pump drive motor is running.
6. If necessary, adjust potentiometer R102 in figure 4 to obtain 4 mA feedback when stroke control is at the 0 position.
7. If necessary, adjust potentiometer R103 to obtain 20 mA feedback when stroke control is at the 10 position.
8. R101 adjusts the length of the sensor line. When the distance between the ECA motor and signal conditioner exceeds 80 feet, adjust R101 as necessary to achieve correct feedback in 24 VAC accordance with steps 6 & 7.
9. Replace cover.

Actuating Drive

Description	Specifications
Motor	reversible AC motor
Power Supply Requirement	24 VAC, 60 Hz
Power Consumption	2 VA
Protection Class	NEMA 4X
Regulating Time	3 seconds per 1% change
Max. Ambient Temperature	140°F
Weight	5 lb.
Remote Output Signal	0-620 mVDC
	0-10 VDC
	4-20 mA with optional signal conditioner



Installation

1. Install metering pump (1) with suction (2) and discharge (3) valves vertical and bolt down the base (4).
2. The piping must not exert any force on the suction and discharge valves.
3. The drain from the separation chamber must slope down to the collecting tank. The drainage pipe should not in any circumstances pass directly through the container lid back to the medium as this could allow gasses to penetrate the pump drive. The drainage pipe must be connected to a vented collection container or to a collection funnel (5) with an appropriate gap between the pump and return line. In either case, traps should be installed. Leakage can then drain via the funnel through the container lid. Any leakage at the funnel will, in this way, be apparent.
4. If the discharge line is 30 ft. or longer, a Pulsation Dampener (6) is recommended. For high viscosity solutions, determine if a Pulsation Dampener is necessary.
5. The suction pipe (7) should be fitted with a suction filter and foot valve (8).
6. Safety switches should be installed for motors, in accordance with the relevant codes.
7. Maximum positive static suction head allowable is 16 ft. H₂O.
8. Suction line should not be smaller than pump suction connection. Some pump applications may even require larger suction lines.

Start Up

1. Fill the pump with specified gear oil (P/N 260221).
2. Switch on the pump motor. (Check direction of rotation according to arrow, if applicable and indicated).

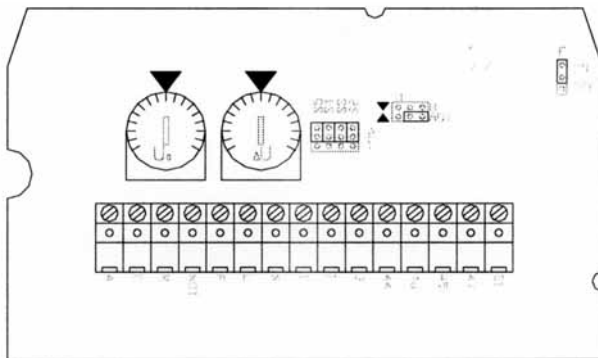


Figure 2

3. Adjust the pump to maximum output (100% scale) when running against no backpressure.
4. Check belt tension. Belt should deflect 1 1/4" when checked midway between pulleys.
5. If the pumps fails to self-prime, detach the discharge valve and fill the pump head with liquid. (Use water if possible to avoid handling chemicals). Replace the valve and tighten. Turn the pump back on. Once the delivery has been achieved, adjust the output setting as required.
6. A minimum backpressure of 15 psig is required in order to provide proper check valve seating.

Maintenance

The 2000 Series Metering Pump requires minimal maintenance. After 5000 hours of operation, it is recommended that the pump gear oil be replaced. The lubricant is gear oil (P/N 260221). Inspect, clean and/or replace worn parts such as seats, balls, seals and diaphragms.

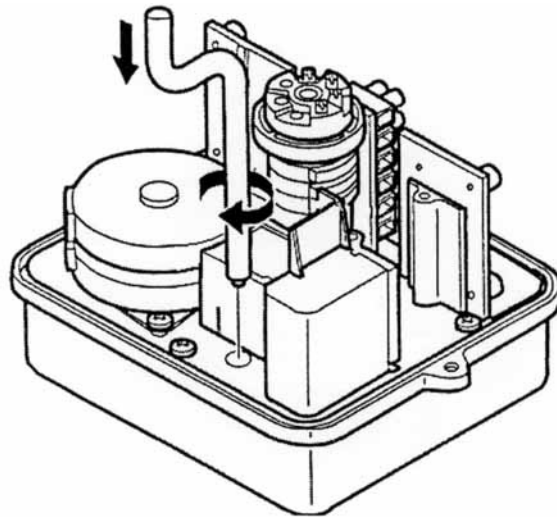


Figure 3

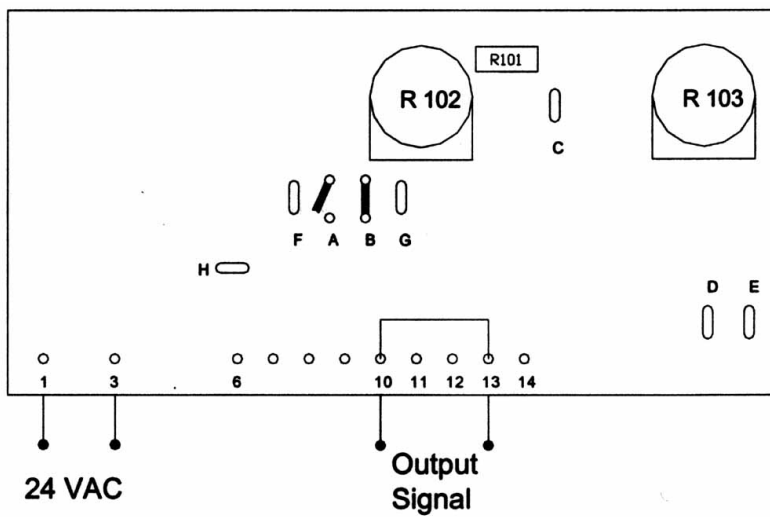
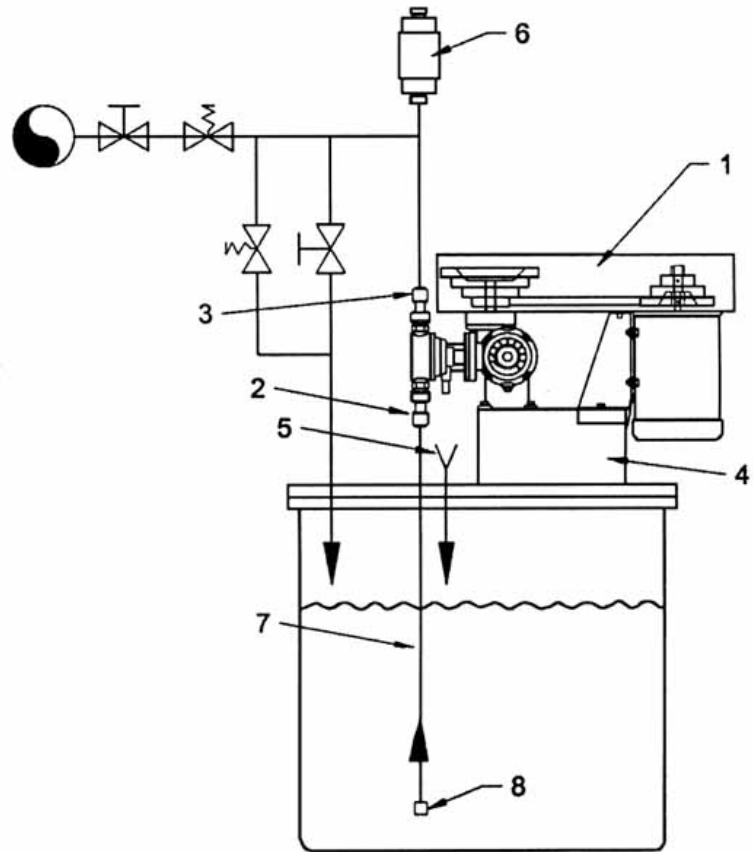
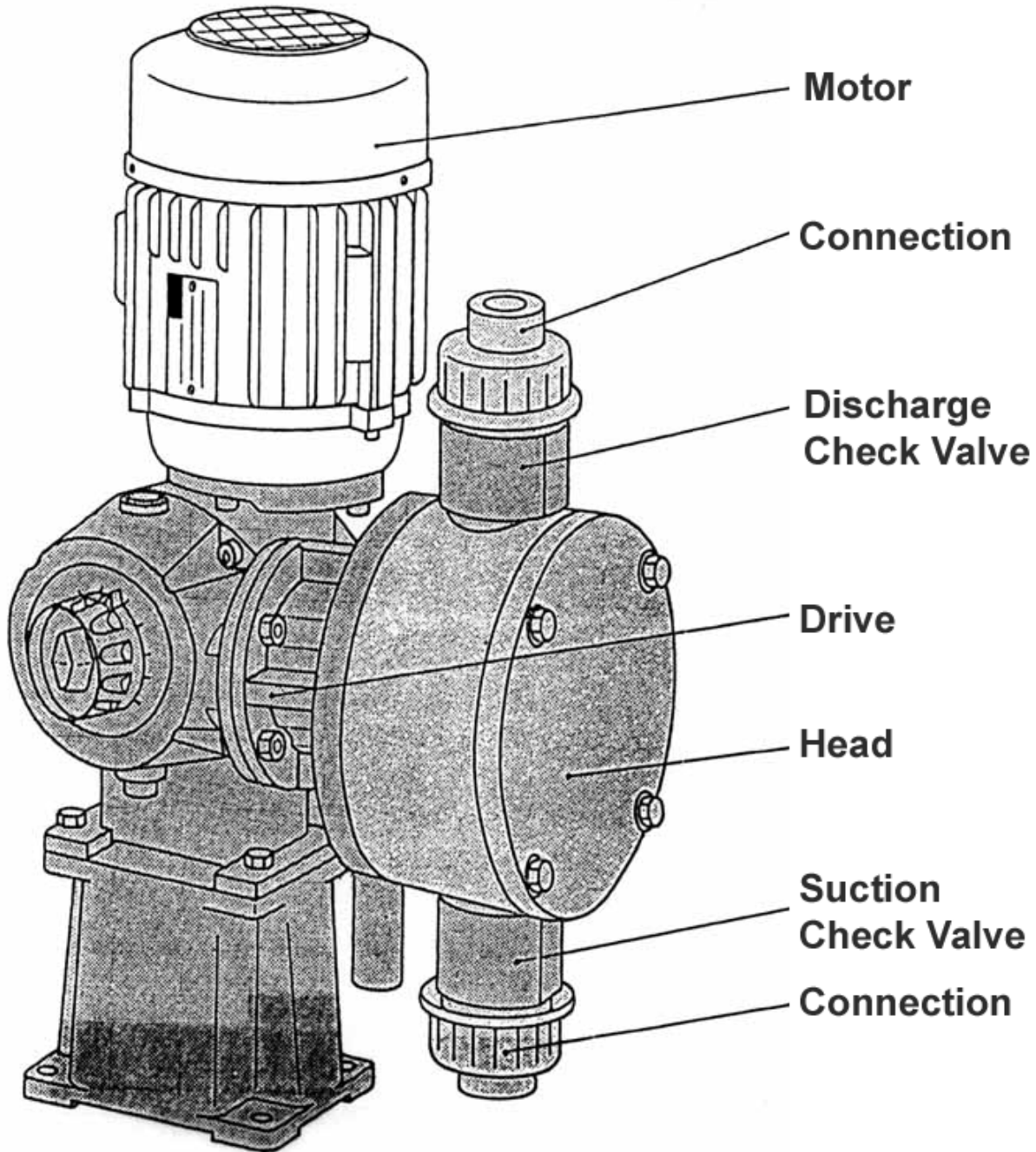


Figure 4



Spare Parts Kits

Contents	Pump Style	Head/Ball/Seal Materials	Part Number
1 Diaphragm 2 Gaskets 4 O-rings 4 Valve Balls 4 Valve Seats	2311-2331	PP/Glass/Hypalon	25411
		PP/Glass/Viton	25423
		316SS/316SS/Hypalon	260473
		316SS/316SS/Viton	25237
	2341 - 2351	PP/Glass/Hypalon	25412
		PP/Glass/Viton	25424
		316SS/316SS/Hypalon	260474
		316SS/316SS/Viton	25239
	2361	PP/Glass/Hypalon	25413
		PP/Glass/Viton	25425
		316SS/316SS/Hypalon	260475
		316SS/316SS/Viton	25245
1 Diaphragm 2 O-rings 4 O-rings 2 Valve Poppets 4 Valve Seals	2371 - 2391*	PP/PVDF/Hypalon	24504
		PP/PVDF/Viton	34505
		316SS/316SS/Hypalon	34506
		316SS/316SS/Viton	34507

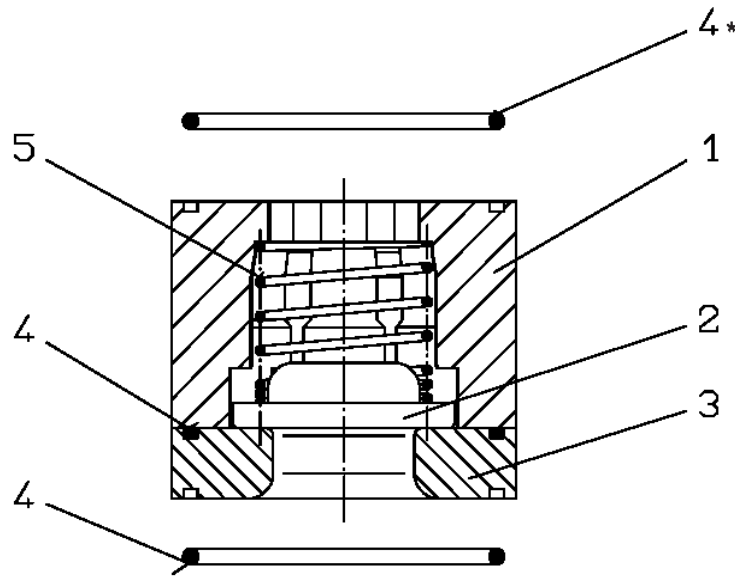
*Contact Lutz-JESCO America Corp. if pump (2370 through 2390 series) was purchased prior to July 9999.

Item No.	Description	Material	Part No.	Double Ball Valves								Spring Loaded Valves			
				Suction				Discharge				Suction		Discharge	
				PP		316SS		PP		316SS		PP		PP	
				H*	V	V*	H	H	V	V	H	H	V	H	V
1	Valve Body/Cage	PP	32453	1	1	--	--	1	1	--	--	1	1	1	1
		SS	32449	--	--	1	1	--	--	1	1	--	--	--	--
2	Ball Guide	PVC	82455	2	2	--	--	2	2	--	--	--	--	--	--
		SS	82112	--	--	2	2	--	--	2	2	--	--	--	--
		PP	22882	--	--	--	--	--	--	--	--	1	1	1	1
		SS	22881	--	--	--	--	--	--	--	--	--	--	--	--
3*	Valve Ball	Glass	82457	2	2	--	--	2	2	--	--	1	1	1	1
		SS	82114	--	--	2	2	--	--	2	2	--	--	--	--
4*	Valve Seat	PP	82456	2	2	--	--	2	2	--	--	1	1	1	1
		SS	82113	--	--	2	2	--	--	2	2	--	--	--	--
5*	Gasket	Hypalon	81035	1	--	--	1	1	--	--	1	1	--	1	--
		Viton	81198	--	1	1	--	--	1	1	--	--	1	--	1
6*	Gasket	Hypalon	81238	2	--	--	3	2	--	--	3	1	--	1	--
		Viton	81276	--	2	3	--	--	2	3	--	--	1	--	1
7*	Gasket	Hypalon	81239	1	--	--	--	1	--	--	--	1	--	1	--
		Viton	81277	--	1	--	--	--	1	--	--	--	1	--	1
9	Valve Spring	Hastelloy	32577	--	--	--	--	--	--	--	--	1	1	1	1
Complete Assembly				26841	26842	27652	260471	27356	27357	27655	260482	26845	25707	27353	27354

*Recommended spare parts (contained in spare part kit)

Check Valves - Model 2370-2390

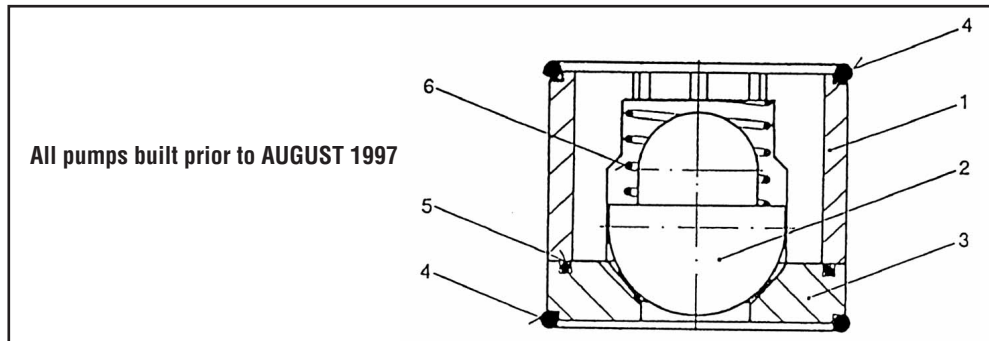
DN 25 valves for Model 2370 - 2390
(Design as of 08/97)



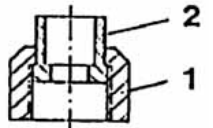
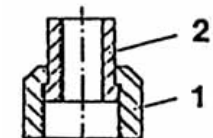
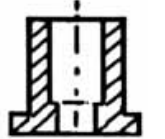
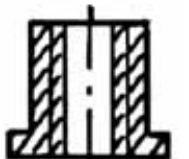
* For the stainless steel version, O-ring d 62x3 is used until 12/97.

Item No.	Description	Material	Part No.	Suction & Discharge Valve			
				PP		316SS	
				Hypalon	Viton	Hypalon	Viton
				23703	23704	23705	25681
1	Valve Guide	PP	34463	1	1	--	--
		316SS	34466	--	--	1	1
2*	Valve Disk	PVDF	34464	1	1	--	--
		316SS	34467	--	--	1	1
3*	Flat Valve Seat	PP	34465	1	1	--	--
		316SS	34468	--	--	1	1
4*	O-Ring	Hypalon	80626	3	--	3	--
		Viton	80092	--	3	--	3
6	Valve Spring	Hastelloy	25217	1	1	1	1

* Recommended spare parts (contained in spare part kit)

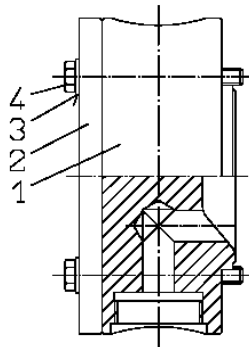


Connections

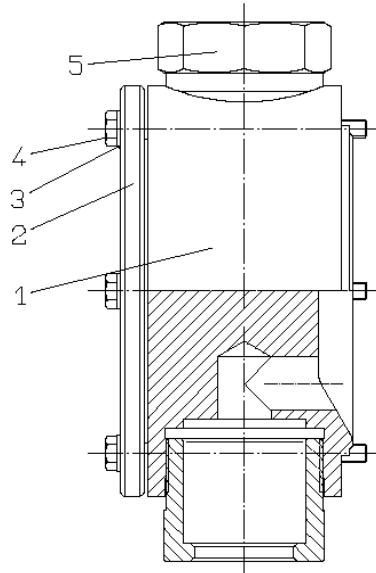
Model	Connection Type	Material	Size	Connection Assembly Part No.	Item	Part	
						Description	P/N
2311 - 2361	 <p style="text-align: center;">C</p>	PP*	1/2"	30.109	1	Sleeve Nut	82.213
					2	Cemented Connection	30.108
	 <p style="text-align: center;">D</p>	PP	1/2" NPT	30.111	1	Sleeve Nut	82.213
		316SS			2	Threaded Adapter	30.110
2371 - 2391	 <p style="text-align: center;">C</p>	PP	1"	30.106	1	Cemented Connection	30.106
		316SS			2	Threaded Adapter	30.112
	 <p style="text-align: center;">D</p>	PP	1" NPT	30.116	1	Threaded Adapter	30.116
		316SS			1	Threaded Adapter	30.107

*All sleeve nuts, cemented connections and threaded adapters on PP pumps will be PVC.

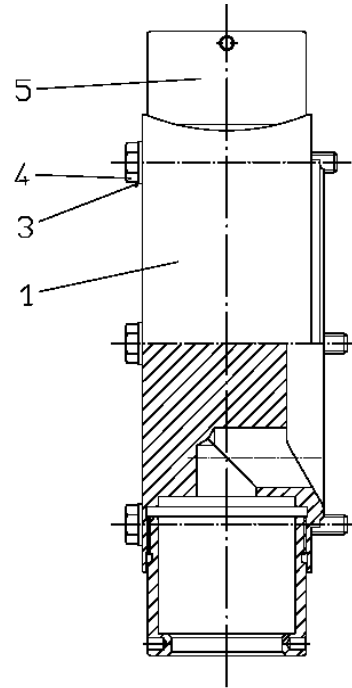
Head



Head Models 2310-2360
Plastic/Stainless steel



Plastic



Head Models 2370-2390
Stainless steel

All pumps built after AUGUST 1997

Item No.	Qty.	Description	Material	Head Assembly							
				2311-2331		2341-2351		2361		2371-2391	
				PP	SS	PP	SS	PP	SS	PP	SS
Complete Assembly				23721	23727	23722	23728	23723	22334	23735	23736
1	1	Head	PP	22044	---	22046	---	22048	---	34710	---
			316SS	---	22392	---	22394	---	18824	---	32984
2	1	Plate	Al	18453	---	18453	---	18822	---	22612	---
3	4	Washer	316SS	84174	84174	84174	84174	84174	84174	---	---
	6		316SS	---	---	---	---	---	---	84029	84029
4	4	Hex Screw	316SS	83495	83542	83495	83542	83495	83230	---	---
	6		316SS	---	---	---	---	---	---	83827	83755
5	2	Valve Housing	316SS	---	---	---	---	---	---	---	32983
			PP	---	---	---	---	---	---	34712	---

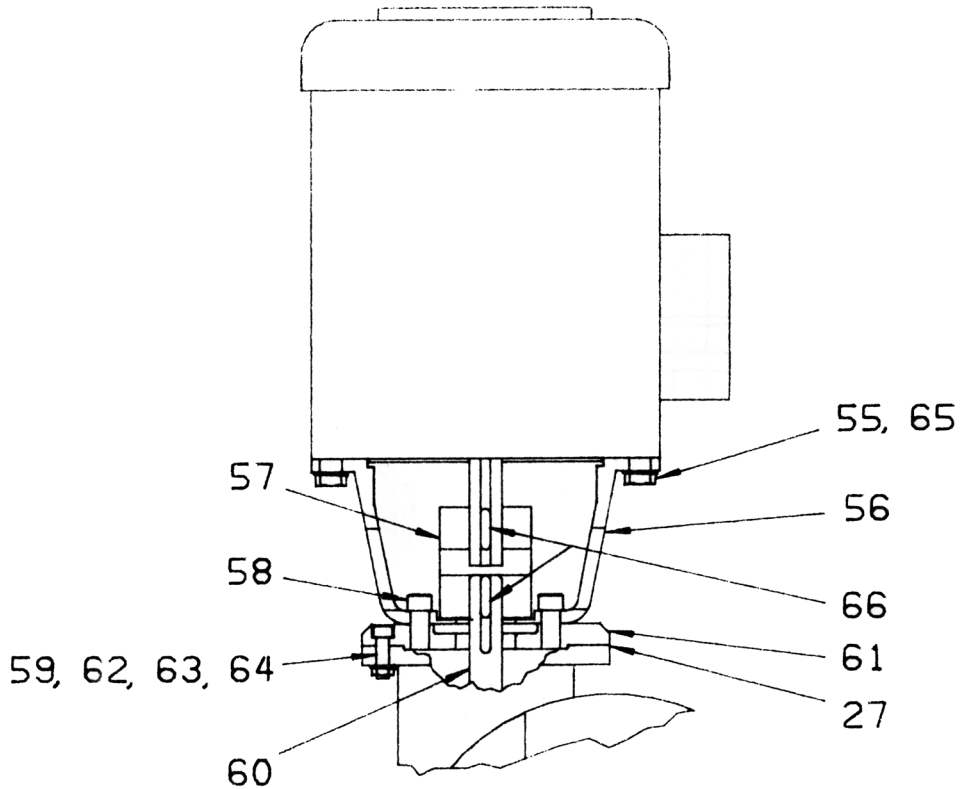
**Models
2310-2360**

**Models
2370-2390**

Polypropylene Stainless Steel

Pumps built prior to AUGUST 1997 - Consult Factory for Part Numbers.

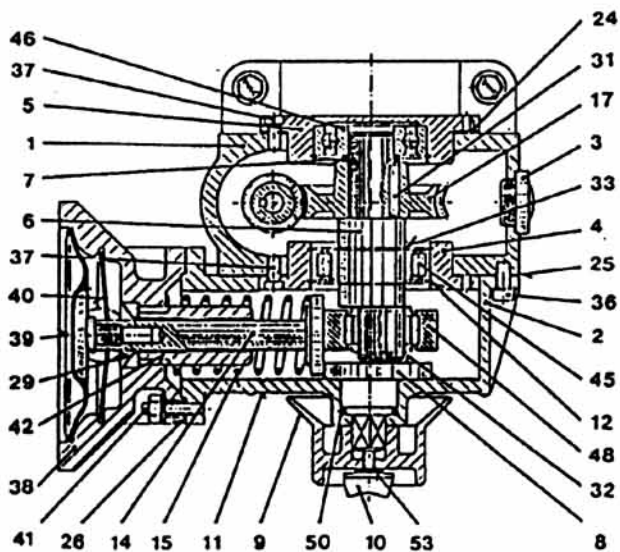
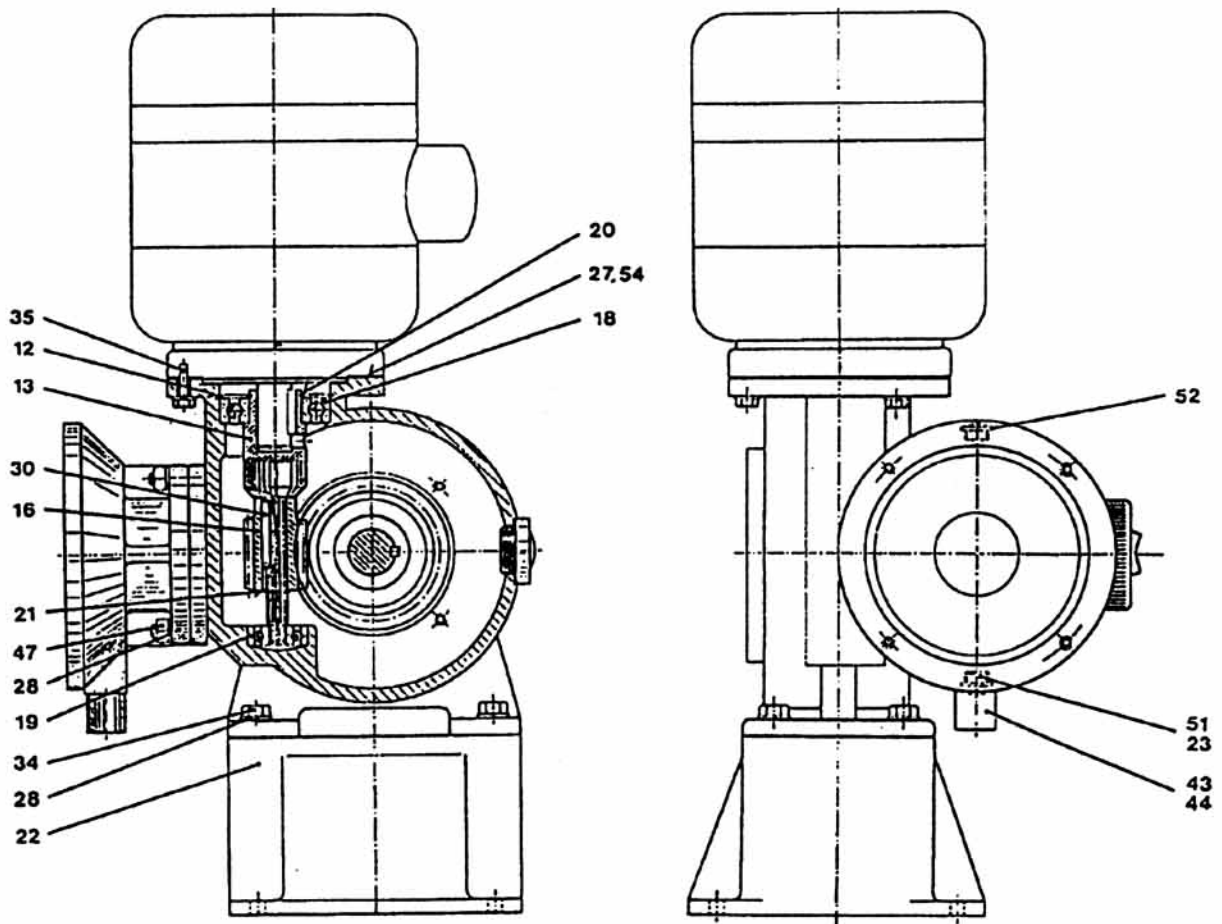
Motor Coupling Adapter Kit



Item	Description	Material	Part No.	2311	2321	2331	2341	2351	2361	2371	2381	2391
Complete Assembly			260951	1	1	1	1	1	1	1	1	1
27	Gasket	St	81042	1	1	1	1	1	1	1	1	1
55	Lockwasher	Al	4170036025	4	4	4	4	4	4	4	4	4
56	Motor Frame Adapter	St/ Rub- ber	260924	1	1	1	1	1	1	1	1	1
57	Coupling	St	Y304616	1	1	1	1	1	1	1	1	1
58	Soc. Head Cap Screw	St	4170053219	4	4	4	4	4	4	4	4	4
59	Hex Nut	St	4170022044	3	3	3	3	3	3	3	3	3
60	Input Shaft (2300)	St	260925	1	1	1	1	1	1	1	1	1
61	Motor Bracket Plate	Al	260923	1	1	1	1	1	1	1	1	1
62	Lockwasher	St	4170036023	3	3	3	3	3	3	3	3	3
63	Flat Washer	St	4170037055	3	3	3	3	3	3	3	3	3
64	Soc. Head Cap Screw	St	4170053044	3	3	3	3	3	3	3	3	3
65	Hex Head Cap Screw	St	4170052140	4	4	4	4	4	4	4	4	4
66	Key	St	182117-6	2	2	2	2	2	2	2	2	2

Recommended spare parts: Coupling Spider, P/N 260987

Simplex Drive with Manual Adjustment



Simplex Drive with Manual Adjustment

Item	Description	Material	Part No.	2311	2321	2331	2341	2351	2361	2371	2381	2391
Complete Assembly				32.525	32.509	32.526	32.511	32.510	32.493	32.527	32.528	32.529
1	Gear Housing	Iron	18.317	1	1	1	1	1	1	1	1	1
2	Eccentric Housing	Al	31.216	1	1	1	1	1	1	1	1	1
3	Oil Gauge	Plexiglass	82.181	1	1	1	1	1	1	1	1	1
4	Flange	Al	18.308	1	1	1	1	1	1	1	1	1
5	Flange	Al	18.318	1	1	1	1	1	1	1	1	1
6	Eccentric Shaft	St	21.999	1	1	1	1	1	1	---	---	---
	Eccentric Shaft	St	22.031	---	---	---	---	---	---	1	1	1
7	Distance Washer	St	22.001	1	1	1	1	1	1	1	1	1
8	Adjustment Eccentric	IXEF	31.218	1	1	1	1	1	1	---	---	---
	Adjustment Eccentric	IXEF	31.219	---	---	---	---	---	---	1	1	1
9	Adjusting Knob	ABS	31.217	1	1	1	1	1	1	1	1	1
10	Butterfly Nut	St/Plastic	31.289	1	1	1	1	1	1	1	1	1
11	Scale	Plastic	87.416	1	1	1	1	1	1	1	1	1
12	Snap Ring	Spring St	84.004	4	4	4	4	4	4	4	4	4
13	Worm Shaft	St	32.498	1	1	1	1	1	1	1	1	1
14	Piston Rod	St	18.450	1	1	1	---	---	---	---	---	---
	Piston Rod	St	18.455	---	---	---	1	1	1	1	1	1
15	Spring	St	10.833	1	1	1	1	1	1	1	1	1
16	Worm Shaft 1:30	St	18.362	1	---	---	---	---	---	1	---	---
	Worm Shaft 1:21	St	22.265	---	1	---	1	---	---	---	1	---
	Worm Shaft 1:14	St	18.332	---	---	1	---	1	1	---	---	1
17	Worm Wheel 1:30	St	18.361	1	---	---	---	---	---	1	---	---
	Worm Wheel 1:21	St	22.264	---	1	---	1	---	---	---	1	---
	Worm Wheel 1:14	St	26.403	---	---	1	---	1	1	---	---	1
18	Ball Bearing	St	86.105	1	1	1	1	1	1	1	1	1
19	Ball Bearing	St	86.071	1	1	1	1	1	1	1	1	1
20	Snap Ring	Spring St	84.086	1	1	1	1	1	1	1	1	1
21	Snap Ring	Spring St	84.010	1	1	1	1	1	1	1	1	1
22	Housing Base	Al	18.461	1	1	1	1	1	1	1	1	1
23	Locking Screw	Brass	82.022	1	1	1	1	1	1	1	1	1
24	Gasket		81.245	1	1	1	1	1	1	1	1	1
25	Gasket		81.249	1	1	1	1	1	1	1	1	1
26	Gasket		81.246	1	1	1	1	1	1	1	1	1
27	Gasket		81.247	1	1	1	1	1	1	1	1	1
28	Washer	SS	84.131	8	8	8	8	8	8	8	8	8
29*	Lip Seal	Rubber	80.502	1	1	1	1	1	1	1	1	1
30	Shaft Key	St	83.419	1	1	1	1	1	1	1	1	1
31	Shaft Key	St	83.569	1	1	1	1	1	1	1	1	1
32	Snap Ring	Spring St	84.003	1	1	1	1	1	1	1	1	1
33	Snap Ring	Spring St	84.016	1	1	1	1	1	1	1	1	1

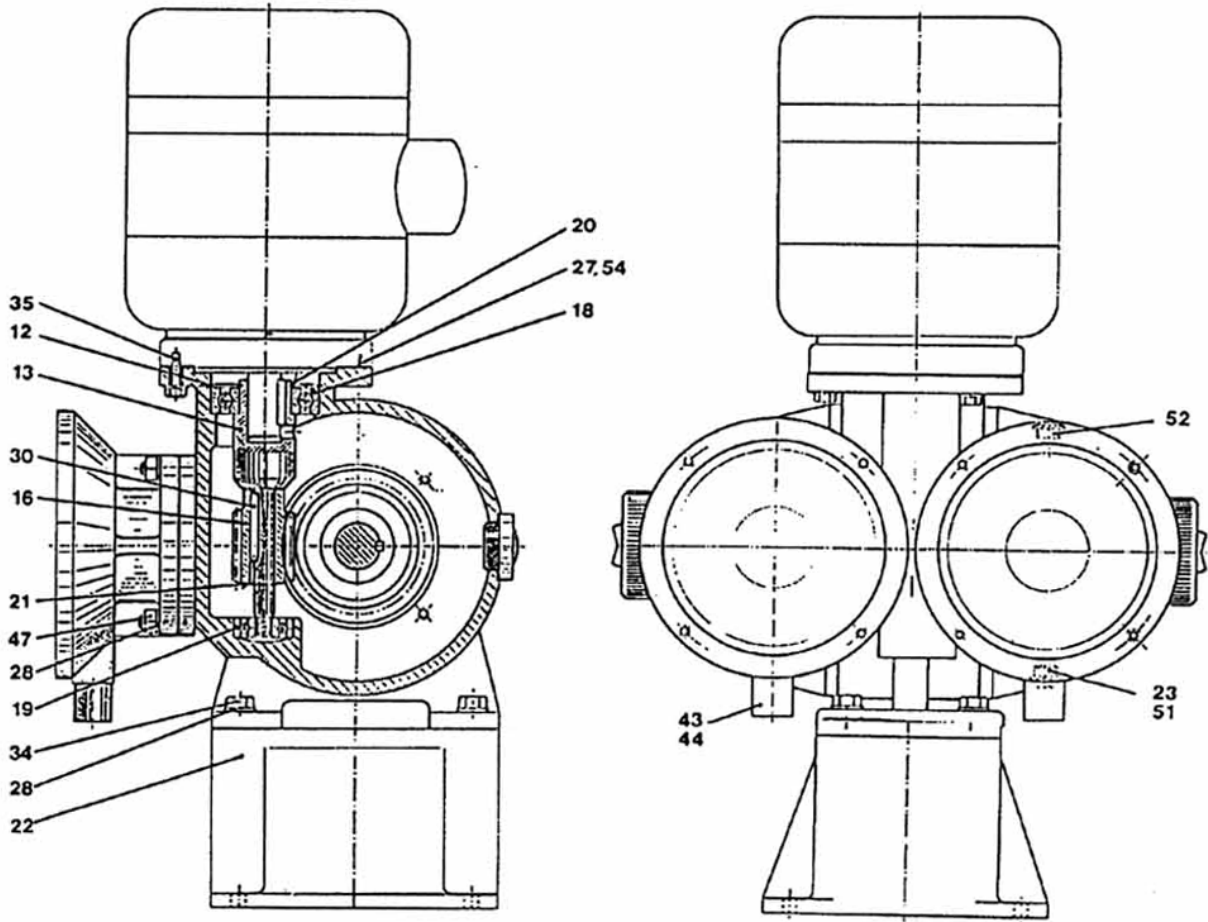
Simplex Drive with Manual Adjustment (con't)

Item	Description	Material	Part No.	2311	2321	2331	2341	2351	2361	2371	2381	2391
34	Hex Screw	SS	83.701	4	4	4	4	4	4	4	4	4
35	Hex Screw	SS	83.668	3	3	3	3	3	3	3	3	3
36	Socket Hd. Cap Screw	St	83.536	4	4	4	4	4	4	4	4	4
37	Socket Hd. Cap Screw	St	83.040	8	8	8	8	8	8	8	8	8
38	Diaphragm Housing 3.5	Al	23.731	1	1	1	--	--	--	--	--	--
	Diaphragm Housing 4.7	Al	23.732	--	--	--	1	1	--	--	--	--
	Diaphragm Housing 5.9	Al	23.733	--	--	--	--	--	1	--	--	--
	Diaphragm Housing 7.3	Al	23.734	--	--	--	--	--	--	1	1	1
39*	Diaphragm 3.5	PTFE	81.466	1	1	1	--	--	--	--	--	--
	Diaphragm 4.7	PTFE	81.467	--	--	--	1	1	--	--	--	--
	Diaphragm 5.9	PTFE	81.468	--	--	--	--	--	1	--	--	--
	Diaphragm 7.3	PTFE	81.469	--	--	--	--	--	--	1	1	1
40	Deflector Plate 3.5	Hypalon	22.057	1	1	1	--	--	--	--	--	--
	Deflector Plate 4.7	Hypalon	22.058	--	--	--	1	1	--	--	--	--
	Deflector Plate 5.9	Hypalon	22.059	--	--	--	--	--	1	--	--	--
	Deflector Plate 7.3	Hypalon	22.060	--	--	--	--	--	--	1	1	1
41	Pin Screw	St	83.145	4	4	4	4	4	4	4	4	4
42	Bushing	Br/ Graphite	19.130	2	2	2	2	2	2	2	2	2
43	O-Ring	Viton	86.046	1	1	1	1	1	1	1	1	1
44	Leakage Tube	PVC	25.193	1	1	1	1	1	1	1	1	1
45	Ball Bearing	St	86.103	1	1	1	1	1	1	1	1	1
46	Ball Bearing	St	86.003	1	1	1	1	1	1	1	1	1
47	Hex Nut	St	83.130	4	4	4	4	4	4	4	4	4
48	Ball Bearing	St	86.104	1	1	1	1	1	1	1	1	1
50	O-Ring	Rubber	80.036	1	1	1	1	1	1	1	1	1
51	Gasket		81.041	1	1	1	1	1	1	1	1	1
52	Locking Screw	PE	83.019	1	1	1	1	1	1	1	1	1
53	Plate Spring	SS	84.179	1	1	1	1	1	1	1	1	1
54	Flange Adapter	Al	32.502	1	1	1	1	1	1	1	1	1
Complete Drive Assembly with ECA				30.140	30.141	30.142	30.143	30.144	30.145	30.146	30.147	30.148

*Recommended spare parts (contained in spare parts kit)

Note: Item #22, 27, 28, 34 and 35 not used with Belt Drive Pumps. See Belt Drive parts list.

Duplex Drive



Duplex Drive with Identical Heads

Item	Description	Material	Part No.	2312	2322	2332	2342	232	2362	2372	2382	2392
Complete Assembly				30.149	30.150	30.151	30.152	30.153	30.154	30.155	30.156	30.157
1	Gear Housing	Iron	23.781	1	1	1	1	1	1	1	1	1
2	Eccentric Housing	Al	31.216	2	2	2	2	2	2	2	2	2
3	Oil Gauge	Plexiglass	82.181	1	1	1	1	1	1	1	1	1
4	Flange	Al	18.308	2	2	2	2	2	2	2	2	2
6	Eccentric Shaft	St	22.806	1	1	1	1	1	1	--	--	--
	Eccentric Shaft	St	22.808	--	--	--	--	--	--	1	1	1
7	Eccentric Shaft	St	22.805	1	1	1	--	--	--	--	--	--
	Eccentric Shaft	St	22.807	--	--	--	--	--	--	1	1	1
	Eccentric Shaft	St	22.921	--	--	--	1	1	1	--	--	--
8	Adjustment Eccentric	IXEF	31.218	2	2	2	2	2	2	--	--	--
	Adjustment Eccentric	IXEF	31.219	--	--	--	--	--	--	2	2	2
9	Adjusting Knob	ABS	31.217	2	2	2	2	2	2	2	2	2
10	Butterfly Nut	St/Plastic	31.289	2	2	2	2	2	2	2	2	2
11	Scale	Plastic	87.416	2	2	2	2	2	2	2	2	2
12	Snap Ring	Spring St	84.004	5	5	5	5	5	5	5	5	5
13	Worm Shaft	St	32.498	1	1	1	1	1	1	1	1	1
14	Diaphragm Rod	St	18.450	2	2	2	--	--	--	--	--	--
	Diaphragm Rod	St	18.455	2	2	2	2	2	2	--	--	--
15	Spring	St	10.833	2	2	2	2	2	2	2	2	2
16	Worm Shaft 1:30	St	18.362	1	--	--	--	--	--	1	--	--
	Worm Shaft 1:21	St	22.265	--	1	--	1	--	--	--	1	--
	Worm Shaft 1:14	St	18.332	--	--	1	--	1	1	--	--	1
17	Worm Wheel 1:30	St	18.361	1	--	--	--	--	--	1	--	--
	Worm Wheel 1:21	St	22.264	--	1	--	1	--	--	--	1	--
	Worm Wheel 1:14	St	26.403	--	--	1	--	1	1	--	--	1
18	Ball Bearing	St	86.105	1	1	1	1	1	1	1	1	1
19	Ball Bearing	St	86.071	1	1	1	1	1	1	1	1	1
20	Snap Ring	Spring St	84.086	1	1	1	1	1	1	1	1	1
21	Snap Ring	Spring St	84.010	1	1	1	1	1	1	1	1	1
22	Housing Base	Al	18.461	1	1	1	1	1	1	1	1	1
23	Locking Screw	Brass	82.022	2	2	2	2	2	2	2	2	2
25	Gasket		81.249	2	2	2	2	2	2	2	2	2
26	Gasket		81.246	2	2	2	2	2	2	2	2	2
27	Gasket		81.247	1	1	1	1	1	1	1	1	1
28	Washer	SS	84.131	16	16	16	16	16	16	16	16	16
29*	Lip Seal	Rubber	80.502	2	2	2	2	2	2	2	2	2
30	Shaft Key	St	83.419	1	1	1	1	1	1	1	1	1
31	Shaft Key	St	83.569	1	1	1	1	1	1	1	1	1
32	Snap Ring	Spring St	84.003	2	2	2	2	2	2	2	2	2
33	Shaft Key	St	84.562	1	1	1	1	1	1	1	1	1

Duplex Drive with Identical Heads (con't)

Item	Description	Material	Part No.	2312	2322	2332	2342	2352	2362	2372	2382	2392
34	Hex Screw	SS	83.701	2	2	2	---	---	---	---	---	---
35	Hex Screw	SS	83.688	---	---	---	2	2	---	---	---	---
36	Socket Hd. Cap Screw	St	83.536	---	---	---	---	---	2	---	---	---
37	Socket Hd. Cap Screw	St	83.040	---	---	---	---	---	---	2	2	2
38	Diaphragm Housing 3.5	Al	23.731	2	2	2	---	---	---	---	---	---
	Diaphragm Housing 4.7	Al	23.732	---	---	---	2	2	---	---	---	---
	Diaphragm Housing 5.9	Al	23.733	---	---	---	---	---	2	---	---	---
	Diaphragm Housing 7.3	Al	23.734	---	---	---	---	---	---	2	2	2
39*	Diaphragm 3.5	PTFE	81.466	2	2	2	---	---	---	---	---	---
	Diaphragm 4.7	PTFE	81.467	---	---	---	2	2	---	---	---	---
	Diaphragm 5.9	PTFE	81.468	---	---	---	---	---	2	---	---	---
	Diaphragm 7.3	PTFE	81.469	---	---	---	---	---	---	2	2	2
40	Deflector Plate 3.5	Hypalon	22.057	2	2	2	---	---	---	---	---	---
	Deflector Plate 4.7	Hypalon	22.058	---	---	---	2	2	---	---	---	---
	Deflector Plate 5.9	Hypalon	22.059	---	---	---	---	---	2	---	---	---
	Deflector Plate 7.3	Hypalon	22.060	---	---	---	---	---	---	2	2	2
41	Pin Screw	St	83.145	8	8	8	8	8	8	8	8	8
42	Bushing	Br/ Graphite	19.130	2	2	2	2	2	2	2	2	2
43	O-Ring	Viton	86.046	2	2	2	2	2	2	2	2	2
44	Leakage Tube	PVC	25.193	2	2	2	2	2	2	2	2	2
45	Ball Bearing	St	86.103	2	2	2	2	2	2	2	2	2
47	Hex Nut	St	83.130	16	16	16	16	16	16	16	16	16
48	Ball Bearing	St	86.104	2	2	2	2	2	2	2	2	2
50	O-Ring	Rubber	80.036	2	2	2	2	2	2	2	2	2
51	Gasket		81.042	2	2	2	2	2	2	2	2	2
52	Locking Screw	PE	83.019	2	2	2	2	2	2	2	2	2
53	Plate Spring	SS	84.179	2	2	2	2	2	2	2	2	2
54	Flange Adapter	Al	32.502	2	2	2	2	2	2	2	2	2
Complete Drive Assembly with ECA				30.158	30.159	30.160	30.161	30.162	30.163	30.164	30.165	30.166

*Recommended spare parts (contained in spare parts kit)

Note: Item #22, 27, 28, 34 and 35 not used with Belt Drive Pumps. See Belt Drive parts list.

Duplex Drive with Different Heads

Item	Description	Material	Part No.	2311 & 2371	2321 & 2341	2321 & 2381	2331 & 2351	2331 & 2361	2331 & 2391	2341 & 2361	2351 & 2361	2351 & 2391	2361 & 2391
Complete Assembly				30.167	30.168	30.169	30.170	30.171	30.172	30.173	30.174	30.175	30.176
1	Gear Housing	Iron	23.781	1	1	1	1	1	1	1	1	1	1
2	Eccentric Housing	Al	31.216	2	2	2	2	2	2	2	2	2	2
3	Oil Gauge	Plexiglass	82.181	1	1	1	1	1	1	1	1	1	1
4	Flange	Al	18.308	2	2	2	2	2	2	2	2	2	2
6	Eccentric Shaft	St	22.806	1	1	1	1	1	1	1	1	1	1
7	Eccentric Shaft	St	22.807	1	---	1	---	---	1	1	---	1	1
	Eccentric Shaft	St	22.921	---	1	---	1	1	---	---	1	---	---
8	Adjustment Eccentric	IXEF	31.208	1	2	1	2	2	1	1	2	1	1
	Adjustment Eccentric	IXEF	31.219	1	---	1	---	---	1	1	---	1	1
9	Adjusting Knob	ABS	31.217	2	2	2	2	2	2	2	2	2	2
10	Butterfly Nut	St/Plastic	31.289	2	2	2	2	2	2	2	2	2	2
11	Scale	Plastic	87.416	2	2	2	2	2	2	2	2	2	2
12	Snap Ring	Spring St	84.004	5	5	5	5	5	5	5	5	5	5
13	Worm Shaft	St	32.498	1	1	1	1	1	1	1	1	1	1
14	Diaphragm Rod	St	18.450	1	1	1	1	1	1	---	---	---	---
	Diaphragm Rod	St	18.455	1	1	1	1	1	1	2	2	2	2
15	Spring	St	10.833	2	2	2	2	2	2	2	2	2	2
16	Worm Shaft 1:30	St	18.362	1	---	---	---	---	---	---	---	---	---
	Worm Shaft 1:21	St	22.265	---	1	1	---	---	---	1	---	---	---
	Worm Shaft 1:14	St	18.332	---	---	---	1	1	1	---	1	1	1
17	Worm Wheel 1:30	St	18.361	1	---	---	---	---	---	---	---	---	---
	Worm Wheel 1:21	St	22.264	---	1	1	---	---	---	1	---	---	---
	Worm Wheel 1:14	St	26.403	---	---	---	1	1	1	---	1	1	1
18	Ball Bearing	St	86.105	1	1	1	1	1	1	1	1	1	1
19	Ball Bearing	St	86.071	1	1	1	1	1	1	1	1	1	1
20	Snap Ring	Spring St	84.086	1	1	1	1	1	1	1	1	1	1
21	Snap Ring	Spring St	84.010	1	1	1	1	1	1	1	1	1	1
22	Housing Base	Al	18.461	1	1	1	1	1	1	1	1	1	1
23	Locking Screw	Brass	82.022	2	2	2	2	2	2	2	2	2	2
25	Gasket		81.249	2	2	2	2	2	2	2	2	2	2
26	Gasket		81.246	2	2	2	2	2	2	2	2	2	2
27	Gasket		81.247	1	1	1	1	1	1	1	1	1	1
28	Washer	SS	84.131	16	16	16	16	16	16	16	16	16	16
29*	Lip Seal	Rubber	80.502	2	2	2	2	2	2	2	2	2	2
30	Shaft Key	St	83.419	1	1	1	1	1	1	1	1	1	1
31	Shaft Key	St	83.569	1	1	1	1	1	1	1	1	1	1
32	Snap Ring	Spring St	84.003	2	2	2	2	2	2	2	2	2	2
33	Shaft Key	St	84.562	1	1	1	1	1	1	1	1	1	1

Duplex Drive with Different Heads (con't)

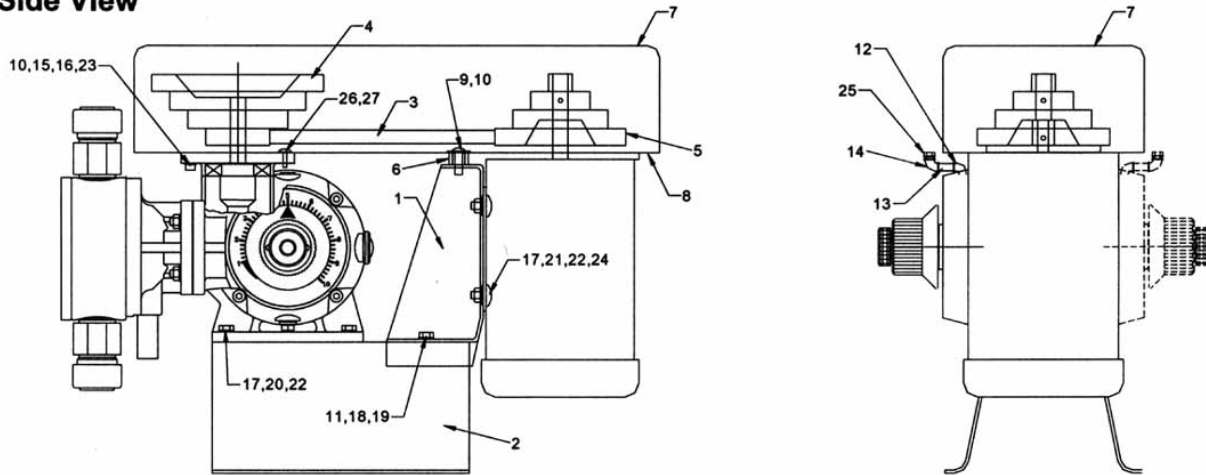
Item	Description	Material	Part No.	2311 & 2371	2321 & 2341	2321 & 2381	2331 & 2351	2331 & 2361	2331 & 2391	2341 & 2361	2351 & 2361	2351 & 2391	2361 & 2391
34	Hex Screw	SS	83.701	4	4	4	4	4	4	4	4	4	4
35	Hex Screw	SS	83.668	3	3	3	3	3	3	3	3	3	3
36	Socket Hd. Cap Screw	St	83.536	8	8	8	8	8	8	8	8	8	8
37	Socket Hd. Cap Screw	St	83.040	8	8	8	8	8	8	8	8	8	8
38	Diaphragm Housing 3.5	Al	23.731	1	1	1	1	1	1	---	---	---	---
	Diaphragm Housing 4.7	Al	23.732	---	1	---	1	---	---	1	1	1	---
	Diaphragm Housing 5.9	Al	23.733	---	---	---	---	1	---	---	1	---	1
	Diaphragm Housing 7.3	Al	23.734	1	---	1	---	---	1	1	---	1	1
39*	Diaphragm 3.5	PTFE	81.466	1	1	1	1	1	1	---	---	---	---
	Diaphragm 4.7	PTFE	81.467	---	1	---	1	---	---	1	1	1	---
	Diaphragm 5.9	PTFE	81.468	---	---	---	---	1	---	---	1	---	1
	Diaphragm 7.3	PTFE	81.469	1	---	1	---	---	1	1	---	1	1
40	Deflector Plate 3.5	Hypalon	22.057	1	1	1	1	1	1	---	---	---	---
	Deflector Plate 4.7	Hypalon	22.058	---	1	---	1	---	---	1	1	1	---
	Deflector Plate 5.9	Hypalon	22.059	---	---	---	---	1	---	---	1	---	1
	Deflector Plate 7.3	Hypalon	22.060	1	---	1	---	---	1	1	---	1	1
41	Pin Screw	St	83.145	4	4	4	4	4	4	4	4	4	4
42	Bushing	Br/ Graphite	19.130	4	4	4	4	4	4	4	4	4	4
43	O-Ring	Viton	86.046	2	2	2	2	2	2	2	2	2	2
44	Leakage Tube	PVC	25.193	2	2	2	2	2	2	2	2	2	2
45	Ball Bearing	St	86.103	2	2	2	2	2	2	2	2	2	2
47	Hex Nut	St	83.130	16	16	16	16	16	16	16	16	16	16
48	Ball Bearing	St	86.104	2	2	2	2	2	2	2	2	2	2
50	O-Ring	Rubber	80.036	2	2	2	2	2	2	2	2	2	2
51	Gasket		81.042	2	2	2	2	2	2	2	2	2	2
52	Locking Screw	PE	83.019	2	2	2	2	2	2	2	2	2	2
53	Plate Spring	SS	84.179	2	2	2	2	2	2	2	2	2	2
54	Flange Adapter	Al	32.502	2	2	2	2	2	2	2	2	2	2
Complete Drive Assembly with ECA				30.177	30.178	30.179	30.180	30.181	30.182	30.183	30.184	30.185	30.186

*Recommended spare parts (contained in spare parts kit)

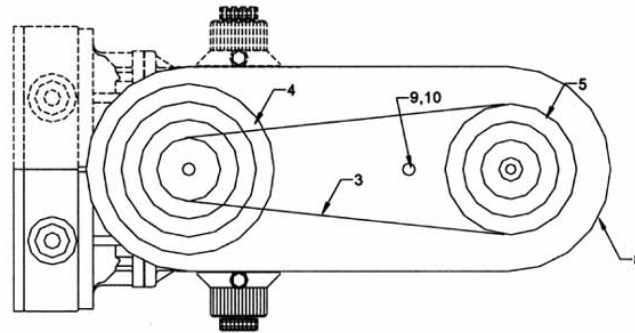
Note: Item #22, 27, 28, 34 and 35 not used with Belt Drive Pumps. See Belt Drive parts list.

2300 Belt Drive Assembly

Side View



Top View



Belt Drive Components

Item	Description	Material	Simplex			Duplex		
			Qty.	2321	2341	Qty.	2322	2342
1	Motor Mounting Bracket	Steel	1	260505		1	260505	
2	Base Plate	Steel	1	260506		1	260506	
3	2300 V-Belt	Steel	1	260509		1	260509	
4	Pulley - Pump	Al	1	260511		1	260511	
5	Pulley - Motor	Al	1	260512		1	260512	
6	Belt Guard Spacer	Plastic	1	260517		1	260517	
7	Belt Guard - Top	Plastic	1	260501		1	260501	
8	Belt Guard - Bottom	Plastic	1	260504		1	260504	
9	Machine Screw	Steel	1	4170063545		1	4170063545	
10	Flat Washer	Steel	5	4170037055		5	4170037055	
11	Flat Washer	Steel	2	4170037057		2	4170037057	
12	1/4" NPT Street Elbow	Brass	1	260551		2	260551	
13	1/4" Pipe Nipple	Brass	1	4163309012		2	4163309012	
14	1/4" NPT Elbow	Brass	1	4163307002		2	4163307002	
15	Slotted Machine Screw	Steel	4	4170063539		4	4170063539	
16	Hex Nut - Full	Steel	4	4170022025		4	4170022025	
17	Lockwasher	Steel	8	4170036024		8	4170036024	
18	Hex Head Cap Screw	Steel	2	4170052139		2	4170052139	
19	Lockwasher	Steel	2	4170036025		2	4170036025	
20	Hex Head Cap Screw	Steel	4	4170052125		4	4170052125	
21	Hex Nut - Full	Steel	4	4170022026		4	4170022026	
22	Flat Washer	Steel	8	4170037056		8	4170037056	
23	Lockwasher	Steel	4	4170036023		4	4170036023	
24	Carriage Bolt	Steel	4	4170011036		4	4170011036	
25	Vent Plug	Brass	1	260953		2	260953	
26	Slotted Machine Screw	Steel	4	4170063721		4	4170063721	
27	Flat Washer	Steel	4	4170037054		4	4170037054	

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Accessories



Chemical Feed Systems



Measuring and Control Technology



Transfer Pumps



Metering Pumps