

Valco Core-Winding System

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Section 1—Introduction

About this Manual

This manual has been prepared by Valco Cincinnati, Inc. to provide assistance in the installation, operation, and servicing of your Valco Core-Winding System. Additionally, the manual contains a list of part numbers for replacement purposes. If you need more information about the Valco Core-Winding System or any other Valco Cincinnati product, contact your Valco Cincinnati representative or visit the Valco Cincinnati web site at www.valcocincinnatiinc.com.

System Description

The Valco Core-Winding System provides operators with an easy-to-control process for constructing consistently uniform single-ply cores. Cores are spiral-wound and composed of paper and adhesive. The Core-Winding System utilizes a high solid-content adhesive to accelerate the drying time for the cores being manufactured.

System Components

- **Electrical Enclosure**
 - External Panelview 550, remote I/O
 - Temperature Controller
 - Electrical Panel
 - Tachometer
 - Measuring Wheel
- **Tank**
 - 5-gallon stainless steel pressure vessel with 2 inlet streams and 1 outlet stream
 - Overpressure/under-pressure protection
 - Model 366 Fill Valve
 - 3-way solenoid
 - Air regulator
 - Adhesive level sensor
 - Pressure relief valve
- **Pump**
 - 1.2 cc/rev Zenith C-9000 Pump
 - Pump filter with 50-mesh screen
 - 1/2 HP variable frequency drive motor
 - Gear reducer
 - Spider coupling
 - Precise flow control metering
 - Heated hose for smooth adhesive transport

- **Applicator**
 - Rotating cylinder to position applicator away from and into web
 - Micro-adjustment bracket for vertical/horizontal positioning
 - Model 369 Glue Valve
 - Slot-Coater Applicator (ribbon coater)

Section 2—Safety Information

General Information

It is the purchaser's responsibility to ensure that all local, county, state, and national codes, regulations, rules, and laws relating to safety and safe operating conditions are met and followed.

The best safeguard is trained personnel. The purchaser is responsible for providing personnel who are adequately trained to install, operate, and maintain Valco components and systems.

This section contains information that is essential to the safety of personnel. Safety information is included throughout the rest of the manual as well. The following safety conventions are used to indicate potential safety hazards:



Warning: This symbol indicates the presence of un-insulated dangerous voltage within the product's enclosure. This voltage may cause electrical shock or fire. Failure to observe could result in personal injury, death, or damage to equipment.



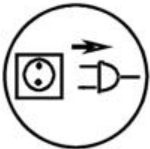
Warning: This convention is used to alert the user to important installation, operation, and/or maintenance information. Failure to observe could result in personal injury, death, or damage to equipment.



Caution: This convention is used to alert the user to important installation, operation, and/or maintenance information. Failure to observe could result in damage to equipment.

Warnings

All personnel involved with the installation, operation, and maintenance of the equipment must read and thoroughly understand the following warnings:



Warning: Disconnect all power before opening the control. Only qualified personnel should open and service the control. Failure to observe could result in personal injury, death, or damage to equipment.



Warning: Promptly repair or replace all worn or damaged electrical wiring and equipment wires. Failure to observe could result in personal injury, death, or damage to equipment.



Warning: Properly route all electrical wires. Failure to observe could result in personal injury, death, or damage to equipment.



Warning: When making adjustments or performing checkout procedures, stay clear of any moving mechanical parts and do not touch exposed electrical equipment or electrical connectors. Failure to observe could result in personal injury, death, or damage to equipment.



Warning: Keep pump cover and electrical enclosures closed except during setup, service, and checkout procedures. Failure to observe could result in personal injury, death, or damage to equipment.



Warning: Promptly repair or replace all worn or damaged parts. Failure to observe could result in personal injury or damage to equipment.

Cautions

All personnel involved with the installation, operation, and maintenance of the equipment must read and thoroughly understand the following caution:



Caution: Never hose or steam-clean the unit. If the surrounding area is cleaned in this manner, protect the unit by covering it with plastic or other waterproof material. Failure to observe could result in damage to equipment.

Section 3—Basic Features

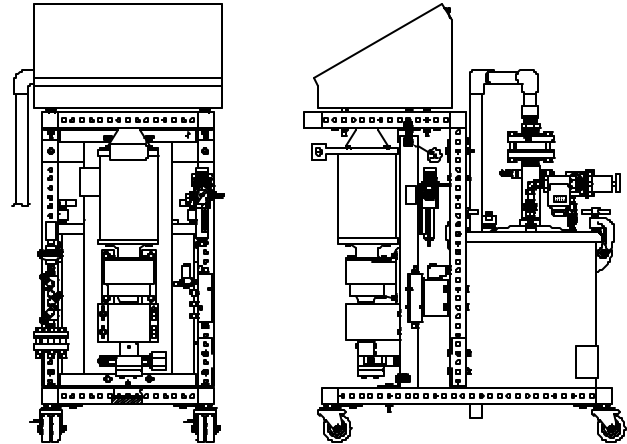
Description of Core-Winding System Features

The Core-Winding System from Valco Cincinnati delivers a completely enclosed application solution for manufacturing spiral-wound cores. The system is designed to reduce glue usage, eliminate glue slinging, and minimize cleanup. You can also expect wear resistance and longevity from system's hardened/coated applicator.

The Core-Winding System's bracket and automatic flow control allow you to operate at higher speeds while maintaining tight control of the core-winding process.

With the bracket, a rotary actuator automatically lifts the applicator head off the product whenever the machine stops. The system's micro-adjustment bracket makes setup quick-and-easy by allowing you to make precise valve adjustments.

Glue volume changes proportionately to machine speed change with the Core-Winding System's automatic flow control. A pre-determined speed must be reached in order for the glue application to start.



Electrical Enclosure Features:

- **External Panelview 550, remote I/O**
 - Touchscreen panel with 128 touch cells
 - Programmable human-machine interface (HMI)
 - 24VDC
 - RS-232 connection to PLC
- **Temperature Controller**
 - Programmable
 - Remote setpoint and timer input
 - Small panel footprint
 - Easy “push-to-set” keys
- **Electrical Panel**
 - Custom Operator Enclosure
- **Tachometer**
 - DC
 - Heavy duty coupling and encapsulated coating
- **Measuring Wheel**
 - 10-inch circumference
 - Black urethane coating

Tank Features:

- **5-Gallon Stainless Steel Pressure Vessel**
 - 2 inlet streams, 1 outlet stream
 - Stainless steel tank and lid construction
 - A.S.M.E. specifications
 - Feed pipe
- **Overpressure/underpressure protection**
- **Model 366 Fill Valve**
 - Stainless steel extrusion valve
 - High cycle rate
 - 3-way solenoid operation
- **Air Filter Regulator**
 - 150 psi
- **Adhesive Level Sensor**
 - Hyde Park Superprox® ultrasonic analog output sensor
 - Sensor monitors tank glue level
 - PLC Communication
- **Fixed Relief Valve**
 - 5 psi
 - 1/4" NPT

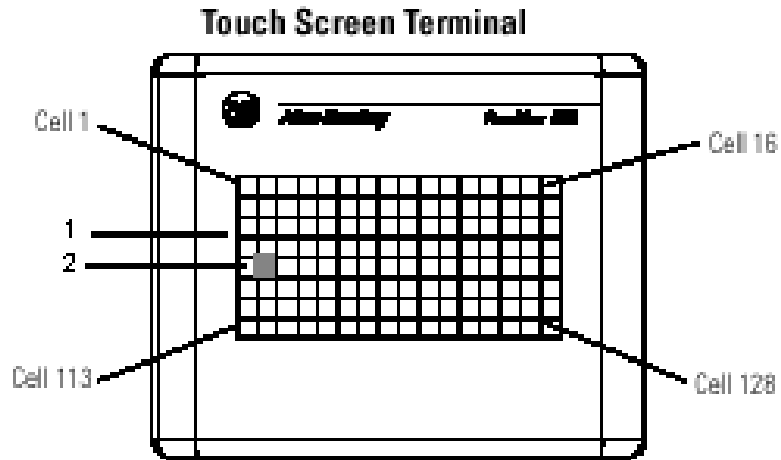
Pump Features:

- **Zenith pump/motor/gearbox**
 - Precise metering (positive displacement)
 - 1/2 HP
 - Variable frequency drive
 - Spider coupling
- **Filter**
 - 50-mesh screen
- **Rupture Disk**
 - 1/2" disk in the discharge piping
 - High pressure protection
 - Set at 200 psig
- **Heated Hose**
 - Variable temperature hot-melt hose
 - Assists with curing (drying of glue)
 - Required for higher core machine speeds

Applicator Features:

- **Bimba Rotating Cylinder**
 - Applicator rotation away from and into web
 - Air-operated
 - Automatic mode or purge/manual
- **Micro-Adjust Bracket**
 - Horizontal and vertical adjustment of applicator
 - Enables precise applicator adjustment
- **Model 369 Glue Valve**
 - Pneumatically operated
 - Stackable
 - High cycle life
 - 3-way operating solenoid
- **Slot Coater Applicator**
 - Provides adhesive flow in a “ribbon” configuration
 - Hardened steel two-plate construction
 - Enables close contact to the core paper

PanelView 550 Terminal Features



<u>Item</u>	<u>Feature</u>	<u>Description</u>
1	Touch Screen Terminal Display	On touch screen terminals, initiate the function of a displayed object, such as an ON or OFF push button, by touching the screen object. Each interactive screen object occupies one or more of 128 cells.
2	Touch Cells	The 128 touch cells (16 columns x 8 rows) let you initiate functions by touching the screen. Interactive screen objects are aligned with touch cells when an application is created.

Section 4—Installation

Core-Winding System Installation

This section of the manual contains mechanical and electrical installation information and procedures for the initial setup of the Core-Winding System. For the following installation procedure, refer to the drawings on pages 10-2 to 10-8 in the *Part-Number List* section of the manual.

Installation Procedure:

1. Connect the glue supply to the tank inlet valve (item 41), using the quick disconnect fitting (item 30). Regulate glue supply pressure as required.
2. Connect 1/4" nylon tubing between fittings on the air supply manifold (item 6) and solenoid valves (items 3 and 8) of the applicator head assembly (drawing on page 10-8).
3. Connect the heated hose between fitting (item 24) and fitting (item 12, page 10-8), using the shut-off valve (item 29) and swivel fitting (item 30).
4. Connect the cables from the main electrical enclosure to the dispense valve solenoid (item 3, page 10-8) and rotary actuator solenoid (item 8, page 10-8).
5. Connect 1/4" nylon tubing from rotary actuator solenoid (item 8, page 10-8) and rotary actuator flow control valves (item 6, page 10-8).
6. Mount and connect tachometer, if supplied, or connect system to parent machine.
7. Connect plant air supply to main air pressure regulator (item 5).
8. Apply 80-100 psi air using regulator (item 5). Regulate tank pressure to 5 psi using regulator (item 4).
9. Connect power to 120 VAC source. The tank fill process should begin.
10. After tank fill is complete, air can be bled from the fluid system by manually actuating the dispense valve solenoid (item 3, page 10-8) and running the pump.
11. Set temperature controller to desired temperature for heated hose (refer to *Section 5—Operation*).
12. Adjust the angle of the applicator head valve and position on the web.

Adjustable Frequency AC Drive Operation

Preparing for Drive Start-Up



Attention: Power must be supplied to the drive to perform the following start-up features. Some of the voltages present are at incoming line potential. To avoid electric shock hazard or damage to the equipment, only qualified service personnel should perform the following procedure. Thoroughly read and understand the procedure before beginning. If an event does not occur while performing this procedure, **Do Not Proceed. Remove All Power** including user-supplied control voltages. User-supplied voltages may exist even when main AC power is not applied to the drive. Correct the malfunction before continuing.

Before applying power to the drive, do the following:

1. Confirm that all inputs are connected to the correct terminals and are secure.
2. Verify that AC line power at the disconnect device is within the rated value of the drive.
3. Verify that any digital control power is 24 volts.
4. Verify that the Sink (SNK)/Source (SRC) Setup Dip Switch is set to match your control wiring scheme.

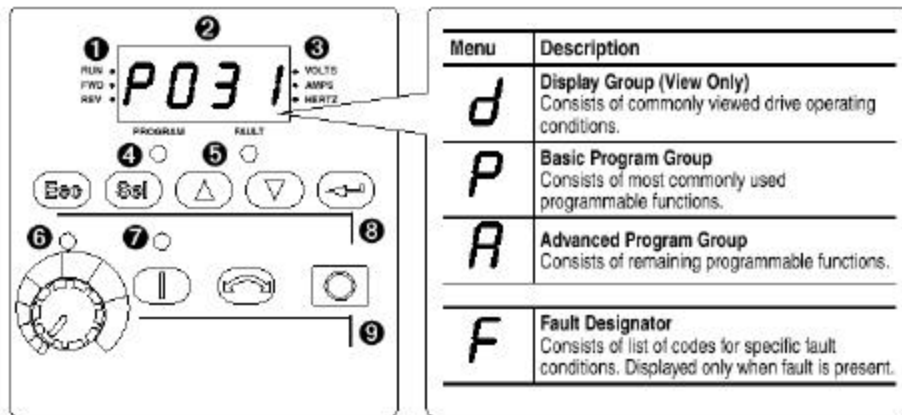
Important: The default control scheme is Source (SRC). The Stop terminal is jumpered (I/O Terminals 01 and 11) to allow starting from the keypad. If the control scheme is changed to Sink (SNK), the jumper must be removed from I/O Terminals 01 and 11 and installed between I/O Terminals 01 and 04.

5. Verify that the Stop input is present or the drive will not start.

Important: If I/O Terminal 01 is used as a stop input, the jumper between I/O Terminals 01 and 11 must be removed.

To apply power to the drive, do the following:

6. Apply AC power and control voltages to the drive.
7. Familiarize yourself with the integral keypad features (see next page) before setting any Program Group parameters.



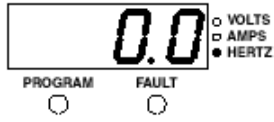

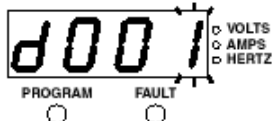




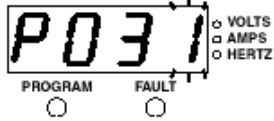


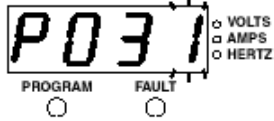


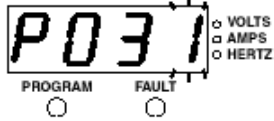













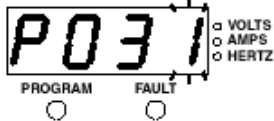
Integral Keypad

No.	LED	LED State	Description
1	Run/Direction Status	Steady Red	Indicates drive is running and commanded motor direction.
		Flashing Red	Drive has been commanded to change direction. Indicates actual motor direction while decelerating to zero.
2	Alphanumeric Display	Steady Red	Indicates parameter number, parameter value, or fault code.
		Flashing Red	Single digit flashing indicates that the field can be edited. All digits flashing indicates a fault condition.
3	Displayed Units	Steady Red	Indicates the units of the parameter value being displayed.
4	Program Status	Steady Red	Indicates parameter value can be changed.
5	Fault Status	Flashing Red	Indicates drive is faulted.
6	Pot Status	Steady Green	Indicates potentiometer on Integral Keypad is active.
7	Start Key Status	Steady Green	Indicates Start Key on Integral Keypad is active. The Reverse key is also active unless disabled by A095 [Reverse Disable].

No.	LED	LED State	Description
8		Escape	Back one step in the programming menu. Cancel a change to a parameter value and exit Program Mode.
		Select	Advance one step in programming menu. Select a digit when viewing parameter value.
		Up Arrow / Down Arrow	Scroll through groups and parameters. Increase/decrease the value of a flashing digit.
		Enter	Advance one step in the programming menu. Save a change to a parameter value.
9		Potentiometer	Used to control speed of drive. Default is active. Controlled by parameter P038.
		Start	Used to start the drive. Default is active. Controlled by parameter P036.
		Reverse	Used to reverse direction of the drive. Default is active. Controlled by parameters P036 and A095.
		Stop	Used to stop the drive or clear a fault. This key is always active. Controlled by parameter P037.

Viewing and Editing Parameters

When power is removed, the last user-selected Display Group parameter is saved. By default, this parameter is displayed when power is reapplied. The following is an example of basic integral keypad and display functions.

Step	Key(s)	Example Displays
1. When power is applied, the last user-selected Display Group parameter number is briefly displayed with flashing characters. The display then defaults to that parameter's current value. (Example shows the value of d001 [Output Freq] with the drive stopped.)		
2. Press Esc once to display the Display Group parameter number shown on power-up. The parameter number will flash.		
3. Press Esc again to enter the group menu. The group menu letter will flash.		
4. Press the Up Arrow or Down Arrow to scroll through the group menu (d, P and A).	 or 	
5. Press Enter or Sel to enter a group. The right digit of the last viewed parameter in that group will flash.	 or 	
6. Press the Up Arrow or Down Arrow to scroll through the parameters that are in the group.	 or 	
7. Press Enter or Sel to view the value of a parameter. If you do not want to edit the value, press Esc to return to the parameter number.	 or 	
8. Press Enter or Sel to enter program mode to edit the parameter value. The right digit will flash and the Program LED will illuminate if the parameter can be edited.	 or 	
9. Press the Up Arrow or Down Arrow to change the parameter value. If desired, press Sel to move from digit to digit or bit to bit. The digit or bit that you can change will flash.	 or 	
10. Press Esc to cancel a change. The digit will stop flashing, the previous value is restored and the Program LED will turn off. Or Press Enter to save a change. The digit will stop flashing and the Program LED will turn off.	 or 	
11. Press Esc to return to the parameter list. Continue to press Esc to back out of the programming menu. If pressing Esc does not change the display, then d001 [Output Frequency] is displayed. Press Enter or Sel to enter the group menu.		

The following parameter setting information should be used when installing the system and replacing the variable frequency drive.

No.	Parameter	Setting	Note
P31	Motor Volts	230	Motor rated voltage
P32	Motor Hertz	60	Motor rated Hertz
P33	Motor Amps	1.6	Motor rated current
P34	Min. Frequency	0	Sets minimum amount of glue dispensed
P35	Max. Frequency	60	Sets maximum amount of glue dispensed
P36	Start Source	2	Two wire control start/stop control
P37	Stop Mode	0	Ramp decel.
P38	Speed Ref.	2	Analog input, 0-10VDC
P39	Accel. Time	1	1 Sec.
P40	Decel. Time	1	1 Sec.
A051	Input 1 Funct.	4	Use manual purge frequency (A071)
A071	Preset Freq.	10	Manual purge frequency (Hz) of VFD
A095	Reverse Disable	1	Disable reverse motion
A110	Min. Analog In	0%	Sets minimum analog in percentage (0-100%) of 0-10VDC for the minimum amount of glue (P34), i.e., 30%=3VDC, Motor Hz=P34
A111	Max. Analog In	100%	Sets maximum analog in percentage (0-100%) of 0-10VDC for the maximum amount of glue (P35), i.e., 70%=7VDC, Motor Hz=P35

Temperature Controller Operation

The single-zone temperature control contains three menus—the operation menu, the PID menu, and the configuration menu. The parameters in all of the menus are pre-set by Valco Cincinnati, and do not need any adjustment. Changing the parameters may adversely affect performance.

However, there are two situations in which you need to set the parameters in the operations and configuration menu:

- When receiving the temperature control as a replacement part
- When changing a temperature control from Fahrenheit to Celsius or vice versa (this causes the parameters to be lost)

Note! The parameters in the PID menu never need to be manually set or adjusted.

Programming Procedure

To set the parameters in the operations and configuration menu, follow these steps:

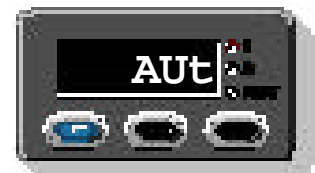
1. Turn the unit on .
2. Press both the “up” and “down” arrow keys to enter the main menu. (The “AUt” screen displays.)
3. Press the “up” arrow key until the config menu (CnFg) screen displays.
4. While holding the “SET” key, press the “up” arrow key to change “no” to “yES.”
5. Release both keys. (The “In” screen displays.)

Note! You are now in the configuration menu.

6. Set the configuration-menu parameters:
 - 6a. While holding the “SET” key, press the “down” arrow key until the “rtd” screen displays.
 - Note!** Ensure that the screen reads “rtd”, *not* “rt.d”.
 - 6b. Release the “SET” key and press the “down” arrow key. (The “C _ F” screen displays.)
 - 6c. While holding the “SET” key, press the “down” arrow key.

Note! The “down” arrow key allows you to toggle between “°F” (Fahrenheit) and “°C” (Celsius).

- 6d. Select the desired temperature unit by toggling to either Fahrenheit or Celsius and then releasing the “SET” key. (The “C _ F” screen displays again.)



Step 2



Step 3



Step 5



Step 6a



Step 6b

7. Set the remaining parameters in the configuration menu as follows:

Using "down" arrow key, go to:	While holding the "SET" key, use the "up" or "down" arrow keys to set:
rL	32 (Range Low for Fahrenheit)
rH	150 (Range High for Fahrenheit)
Ot 1	Heat (Sets output 1 to heat)
Ot 2	ALM (Sets output 2 to alarm)
dISP	Ac (Sets display to actual temperature)
ALtY	Prnc (Process alarm, normally closed contact)
AhYS	3 (Sets degrees from alarm setpoint to clear)
LAt	NO (Alarm does not latch)
SIL	NO (Alarm silencing disabled)
FAIL	0 (Failure mode, zero output)
SLOC	NO (Setpoint lockout)
tAG	P (Lockout PID menu)

8. To exit the configuration menu, hold the “up” and “down” arrow keys simultaneously for three seconds. (The process temperature displays.)

Note! You are now back in the operations menu.

9. Set the operations-menu parameters:

- 9a. While holding the “SET” key, use the “up” or “down” arrow keys to set the desired temperature.
- 9b. Press the “up” and “down” arrow keys simultaneously for 3 seconds. (The “Aut” screen displays.)
- 9c. While holding the “SET” key, press the “down” arrow key to select “YES”.
- 9d. Release the “SET” key.

Note! You are now in the auto-tune mode, which means that the temperature control is automatically setting the PID parameters. “tunE” will flash until auto-tuning is complete (auto-tuning should be complete in 30 minutes or less). You can continue setting the rest of the operations-menu parameters while the control is in auto-tune.

Note! The zone must be at ambient temperature for the temperature control to properly auto-tune.

10. Press the “down” arrow key once. (The “ALO” screen displays.)
11. While holding the “SET” key, use the “up” or “down” arrow keys to set the low alarm to 70°F.
12. Release the “SET” key and press the “down” arrow key. (The “AhI” screen displays.)
13. While holding the “SET” key, use the “up” or “down” arrow keys to set the high alarm to 125°F.
14. Release the “SET” key.
15. Hold the “up” and “down” arrow keys simultaneously for 3 seconds (the process temperature displays).

Note! Remember that “tunE” will continue to flash until the control is done auto-tuning.

Section 6—Gear Pump Installation and Maintenance

This section of the manual covers the installation, care, and maintenance of the Zenith C-9000 Gear Pump. Read this section thoroughly before installing and operating the pump.

Zenith[®] Pumps C-9000 Gear Pumps



Installation,
Care and
Maintenance

Zenith
Corrosive Duty
Gear Pumps

Note: Thoroughly read and understand this entire manual before installation and operation of the pump.

Quick Start:

- 1. If you are familiar** with installation of Zenith pumps please read over the list of Do's and Don'ts and the list of Specifications on the following pages before you begin installation.
- 2. Special care must be taken:** The C-9000 pumps are easily damaged in handling due to the soft metal used in their construction.
- 3. It is strongly recommended** that you thoroughly read through this entire manual before you begin installation or any servicing of the C-9000 pumps.

Introduction:

This manual was specifically written for the 0.3, 0.6, 1.2 and 2.4 cc/rev C-9000 pumps. It will guide you through the process of maintaining and caring for your pump.

C-9000 series pumps are similar in concept to other Zenith pumps, however several key physical aspects differ in ways which will affect the care and maintenance of the product. The following literature will discuss, in detail, how to care and maintain a well running and efficient pump in order to maximize the productivity and effectiveness of your Zenith product.

Below are a few key points which must be considered in order to prevent damage to the product during handling, installation and cleaning.

Most importantly:

- 1.** Use only brass or plastic tools to pry on the C-9000 pump components;
- 2.** If you must hammer on the pump, use a clean plastic hammer (no imbedded metal chips, etc.) and tap lightly;

3. Do not perform maintenance on the silicon carbide sleeve bearings.

4. Use force, not impact, to move stubborn parts.

Again, the C-9000 pumps are not as hard as the tools found in most maintenance areas, and can be damaged by common steel tools. This is one feature of the pump that must be taken into consideration in the installation, disassembly and assembly procedures.

The specially designed bearings require an interference fit installed at the Zenith plant and should not be removed by the customer. These sleeve bearings are extremely brittle and fragile, and can be easily broken resulting in multiple part damage and high replacement cost. See *Figure 1*. The sleeve bearings should not need to be replaced during routine maintenance.

If you follow the above suggestions and the following Do's and Don'ts list, you will be able to maintain a C-9000 pump with little chance of damage.



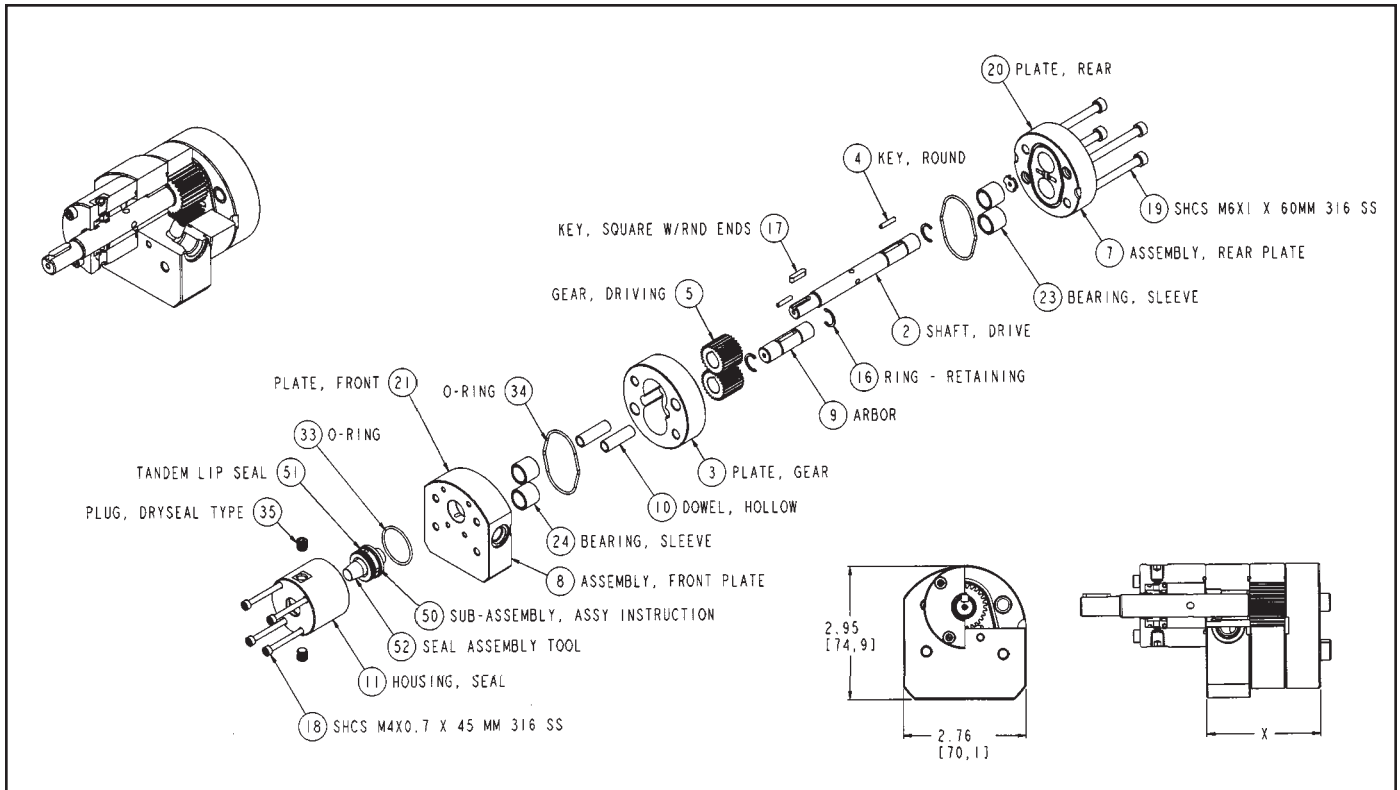
Figure 1

Do's	Don'ts
Handle with care - The pump can be damaged by common steel tools.	<p>Don't pry, tap, scratch, scrape or otherwise work on the pump or its components with steel tools.</p> <p>Don't assume that because it is steel you can't damage the pump in handling.</p>
Disassemble the pump in a clean area and keep the area clean during maintenance.	Don't work on the pump in a dirty area.
Cover the workbench with a clean cloth or with paper towels. Change the towels on the bench as necessary to ensure the area is clean during maintenance and assembly.	Don't work on a bench which is not covered. Hard particles imbedded in the bench can cause damage to the pump parts.
Keep prying and scraping tools and hammers used on C-9000 product separate from those used for other maintenance tasks	Don't use dirty or damaged tools, or those that might have hard particles imbedded in them.
Pry only with clean, new brass or plastic tools and pry in designated areas only.	<p>Don't use steel prying tools.</p> <p>Don't pry with edges or corners of the tool.</p> <p>Don't pry with broken or damaged tools.</p>
Tap lightly with clean plastic or rubber hammers.	<p>Don't tap with steel tools or hammers.</p> <p>Don't use hammers with imbedded particles in the hammer faces. Use clean, new tools.</p>
Lubricate the threads on screws and bolts with an anti-seize compound or with molybdenum disulfide grease.	Don't assemble the pump without lubricating the bolt threads.
Tighten the bolts with torque wrenches to the specified torque.	Don't tighten the bolts without using a torque wrench.
Tighten the bolts in a crossing pattern.	Don't tighten the bolts all the way in the first attempt, and don't tighten them in a circular order.
Avoid touching the bearings with any hard object.	Don't attempt to remove the bearings from the plates. The bearings can be easily broken and the plates damaged in the process.
Use the seal installation tool provided when reassembling the pump.	Don't attempt to install the seal without the seal installation tool and instructions.
Clean the pump with water and approved liquid solvents. "Soft" abrasive cleansers are acceptable (kitchen and bath cleansers that won't scratch.)	<p>Don't clean the pump using abrasives or by bead or sand blasting.</p> <p>Don't burn the pump out in a furnace.</p>

Specifications

Specifications	
Model	C-9000
Available Capacities	0.3, 0.6, 1.2, 2.4 (cc/rev)
Flow Rate	6 - 1200 cc/min 0.1 - 19 GPH
Temperature Limit	-40°F to 212°F -40°C to 100°C
Recommended Speed Range	20 - 500 rpm
Pump Rotation (Facing Drive Shaft)	Clockwise (CW)
Inlet Pressure Range	10 psia - 300 psig 68.95 kPa(abs) - 2068 kPa
Discharge Pressure Limit	1000 psi 6895 kPa
Recommended Differential Pressure Range	20 - 700 psi 150 - 4826 kPa
Viscosity Range	0.3 - 50000 cps 0.0003 - 50 Pa-s
Inlet/Outlet Port Connections	ISO 6149 M12 o-ring straight
NPT Port Adapters Optional	1/4" Female
Mounting	(2) M8 bolts
Shaft Seals	Standard: Tandem, flushable, PTFE lip seal, Optional: Single Mechanical Face Seal

Model	Capacity cc/rev	Summary	Part and Drawing Number
C-9000-0.3-902	.3	Standard Materials Standard Porting Tandem Lip Seal PTFE, flushable	11-90000-3902-0
C-9000-0.6-902	.6		11-90000-6902-0
C-9000-1.2-902	1.2		11-90001-2902-0
C-9000-2.4-902	2.4		11-90002-4902-0
C-9000-0.3-901	.3	Standard Materials Standard Porting Single Mechanical Face Seal - Carbon vs Ceramic with PTFE static seals	11-90000-3901-0
C-9000-0.6-901	.6		11-90000-6901-0
C-9000-1.2-901	1.2		11-90001-2901-0
C-9000-2.4-901	2.4		11-90002-4901-0
C-9000-0.3-900	.3	Standard Materials Standard Porting Single Mechanical Face Seal - Carbon vs Ceramic with Fluorocarbon Static Seals	11-90000-3900-0
C-9000-0.6-900	.6		11-90000-6900-0
C-9000-1.2-900	1.2		11-90001-2900-0
C-9000-2.4-900	2.4		11-90002-4900-0



Installation:

The following is a general installation procedure for Zenith C-9000 Series metering pumps. The procedure may vary slightly depending on the pump model purchased. For special applications, considerations, or technical assistance, please contact your representative or our Applications Engineering Group.

Things to remember:

1. The pump should be carefully unpacked and inspected. If any items are missing or damaged, the freight carrier and Zenith should be notified immediately.
2. Take Care! - The pump is a precision instrument. Dropping the pump on a hard surface or striking the pump with a hard object can cause serious damage to the components.
3. Treat the pump as a precision gauging instrument.
4. Always flush the piping system before connecting the pump.
5. Filters should be installed upstream of the pump. For C-9000 pumps, the fluid should be filtered to five (5) microns, absolute.
6. Zenith C-9000 pumps must never be run without a fluid. C-9000 pumps contain no lubricant when shipped from the factory. Prior to start-up, the pump must be wetted by priming the pump with the process fluid, or by pouring fluid into the inlet port and rotating the drive shaft until fluid appears at the discharge port. The product to be pumped can be used as this fluid, assuming it will not evaporate prior to the pump actually being started. Remove seal housing plug and fill with compatible fluid. This will ensure that the shaft seal is lubricated.
7. Turn pumps by hand before start-up to ensure free rotation before starting the drive.

8. For applications above ambient temperatures, if using heaters, heat the pump slowly and evenly (including the seal arrangement) prior to introducing hot fluid into the pump. This prevents thermal shock and material distortion.
9. Make sure that process fluid is in the pump before starting. Apply positive pressure to the pump inlet when metering high-viscosity fluids to prevent cavitation.
10. Install a pressure regulating valve downstream of the pump, if necessary, to ensure there is at least 20 psig differential pressure at all times.

Installing the pump:

Install the selected fittings into the inlet and discharge ports, taking care not to over tighten the fittings. Mount the pump to the base plate using the two mounting screw holes on the bottom of the front plate. Align the pump shaft to the shaft on the gear reducer using a shaft alignment gauge, laser alignment mechanism, or by carefully using a straight edge to control the coupling alignment. Jaw-type couplings are not recommended as shaft misalignment must be controlled to within .008 inch parallel and to within 1° angular. For Zenith-supplied systems (pump, reducer, baseplate, coupling, etc.), the shaft misalignment should be controlled to within .035 inch parallel and to within 1° angular, but these values may need to be adjusted depending on the particular coupling chosen for your application. When installing the coupling end member onto the pump shaft, do not use excessive force. This connection should be a slip fit. If not, increase the inside diameter of the coupling accordingly.

If your pump was designed to use an outer drive gear, you must grease the outer drive gear and carefully mesh it with the drive pinion gear. A backlash of .005" is recommended.

Start-Up

1. Allow enough time for all components of the system to reach process temperature before starting the pump. Apply inlet pressure to the pump, allowing time to ensure that the process fluid has entered the pump to prevent the bearing areas from running dry.
2. Before starting, remove all flow restrictions downstream of the pump to provide initial operation with the slightest amounts of back pressure.
3. **Set the acceleration rate for the pump to be 0.3 seconds / rpm or more.** If you purchased a ZeDrive™ 2000, the acceleration rate will be set to this value, which will show up as 600 on the drive for the acceleration set point. This corresponds to 600 seconds to reach 2000 rpm, or .3 seconds / rpm.
4. **Start the pump and accelerate to 30 rpm or to the lowest set point of speed for the application, whichever is less.** Watch the point of discharge for evidence of fluid. If no discharge is seen after 10 revolutions of the shaft shut down the pump and check for obstructions in the system and proper pump rotation. This is assuming a connection can be broken within a few inches of the pump outlet port, where the flow would be evident within several seconds. If the distance between the pump outlet and the point of discharge inspection were long, more time would be needed before flow is confirmed. This is more risky, and damage to the pump might result if it is run dry for more than 30 seconds.

Note: The pump will discharge a cloud of bubbles when it is started, but this will subside when the air is purged from the pump. This is a normal part of pump startup.

5. When smooth flow is seen at the discharge the pump and system can be gradually brought up to normal operating speeds and pressure. Listen for unusual sounds when first starting the pump and turn the pump off immediately if any are heard. Investigate for causes of distress.

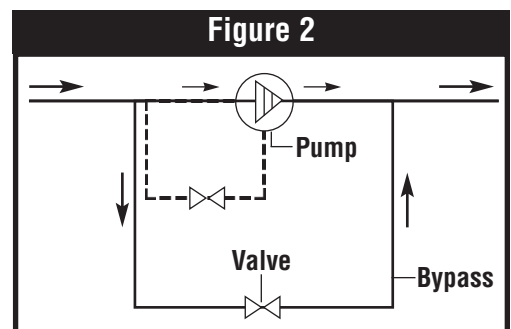
6. If, at any time during operation, the pump does not appear to be running smoothly, stop the pump immediately to avoid serious internal damage.

Flushing of the product piping

Take care when flushing the pump or downstream process equipment using the Zenith precision metering pump as the flushing pump. The pump must be able to withstand the solvent or flushing agent as well as the product, and the operating speed and pressure during flushing must still fall within the applicable range for the C-9000 product.

If it is necessary to flush the system, the following suggestions are recommended to prevent pump damage:

1. Minimize the differential pressure across the pump ports to less than 100 psi, but not less than 20 psi.
2. Reduce the pump speed to an acceptable level, approximately 50-100 rpm.
3. Flush the pump for the shortest allowable time, yielding effective cleansing of the system, and no longer than necessary.
4. Another alternative is to use a bypass around the pump, as illustrated in *Figure 2*, this will allow for high velocity flushing of the downstream system while minimizing risk to the metering pump. During the flush cycle, run the pump slowly. The fluid will pass through and around the pump. This will allow the system to be flushed quickly and effectively.
5. If it is necessary to also flush the seal housing, and the discharge pressure is higher than the suction pressure (during flushing cycle), connect the seal housing drain to the suction line (dotted line on *Figure 2*).



Care During Operation

How does the pump work?

Fluid enters the pump through the inlet port located in the front plate and fills the gear pocket. As the gears rotate, a precise amount of fluid is trapped between the side walls of the gear pockets and gear teeth.

The metered fluid is transported by the rotation of the gears to the discharge side of the pump where the gear teeth come into mesh. This action forces the fluid out of the gear teeth and through the outlet port located in the front plate. The pressure developed is determined by the pump size, the gear clearances, pump speed, fluid viscosity and impedance to flow.

How fast can I run the pump?

Pump speed is limited by practical considerations. If a high viscosity fluid is being metered and pump speed is increased beyond a certain point, the fluid may not be able to fill the gear teeth spaces, and the pump will not obtain enough fluid to maintain normal volumetric efficiency. Lack of sufficient fluid is called starvation or cavitation. This can be remedied by increasing the inlet pressure or reducing pump speed.

Pumping thin fluids requires a different approach. Since the pump depends upon the **metered fluid for lubrication** of internal bearing surfaces, speeds are normally limited. These bearing surfaces include the bearing areas in the front and rear plates. Operating a Zenith pump above indicated speeds will accelerate wear and may cause seizure, especially if the fluid contains abrasive particles or if it is a poor lubricant at operating temperatures. In certain applications, it is recommended to use a pump of larger capacity operated at a lower speed. Contact your representative or our Applications Engineering Department for assistance with this special case.

Inlet Pressure Requirement

Once the pump is installed the inlet port pressure must be found and adjusted to an acceptable level. It is highly recommended that the inlet port pressure be at least one atmosphere. It is, however, acceptable to have 0.5 atmosphere or

even vacuum at the inlet assuming the port is flooded. It is also imperative that the pumping losses from the tank to the inlet port be considered in this procedure. A high viscosity fluid requires a high inlet pressure; a low viscosity fluid requires a low inlet pressure. Once the pump has started cavitation will occur if the inlet pressure is not high enough. Cavitation may damage the pump so if it occurs stop the pump immediately. Keep in mind that once the inlet is flooded and the pump is started there will be a head loss across the inlet port of the pump. *Graph 1* on the next page has been included for reference.

De-rating the Pump Performance

Pump displacement depends on four basic variables: fluid viscosity, gear clearances, differential pressure and pump speed. The pump performance is de-rated, or reduced from the ideal value, due to slippage of the product fluid around the gears from the discharge side back to the intake side.

The less viscous the fluid, the more likely it is to flow through a given orifice. For de-rating the pump, this orifice is the gear clearance. Differential pressure forces the fluid through this clearance at a steady rate, regardless of the pump speed. Thus, the slip flow is constant for a given amount of time. The actual delivery of fluid is the measured delivery minus the slip. This means the pump displacement is still linear. If we increase the pump speed we increase the measured delivery, while the slip remains constant. Slip flow is repeatable and predictable, and pump operation can be adjusted to compensate for this flow.

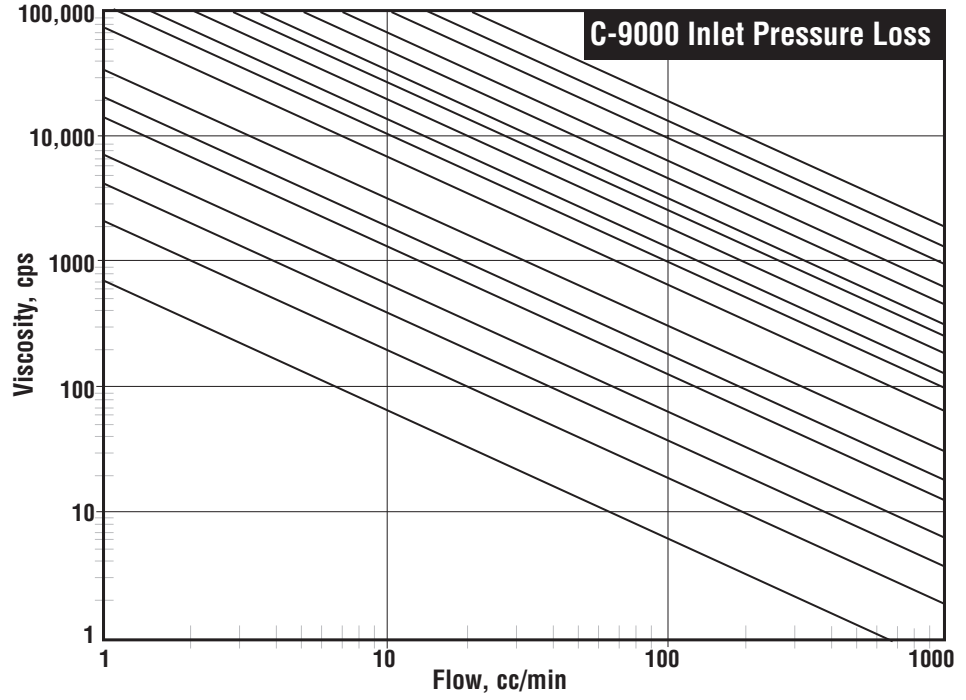
Graph 2 on the next page has been included for reference.

Operating at elevated temperatures

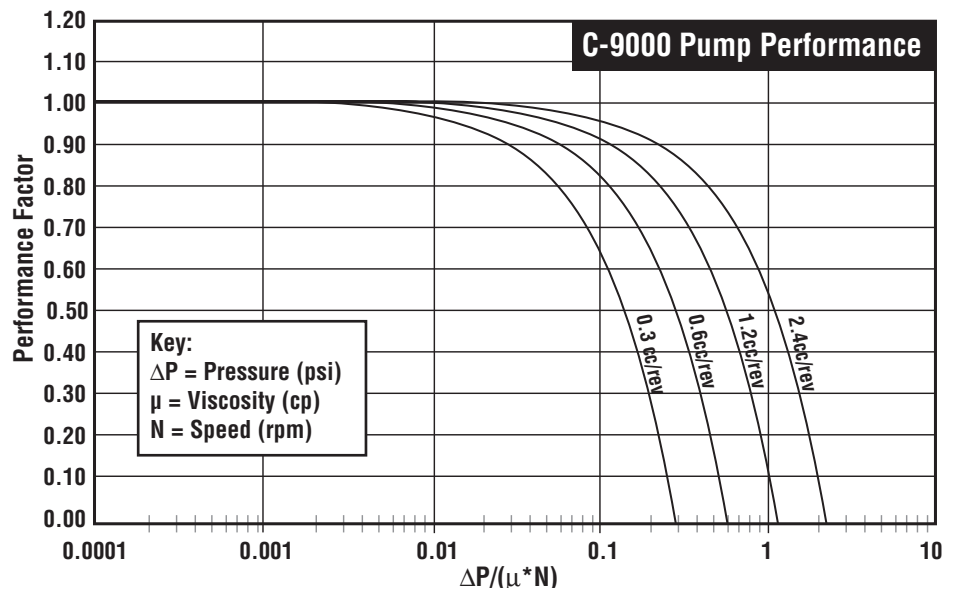
Zenith C-9000 Series pumps are designed for operating temperatures less than 100°C. When operating at temperatures above ambient, heaters should be used, and pumps should be heated slowly and uniformly to avoid distortion and internal component interference.

Care During Operation (cont.)

Graph 1



Graph 2



Flowrate = pump capacity (cc/rev) x rpm x performance factor

Cleaning, Inspection and Repair

REMEMBER: Zenith metering pumps are made for exacting duty. In order to develop high pressure and minimize slip flow, the clearance between the metering gears and the housing must be as small as possible, yet large enough to allow adequate lubrication. All parts are machined to extreme accuracy. Critical dimensions are held between one and two ten-thousandths of an inch (2 to 5 μ). Consistent performance is dependent upon proper handling.

Please handle the pumps with extreme care and set aside a separate clean area for pump maintenance and repair.

It is recommended that pump users institute a program for dimensional inspection of critical parts in order to keep maintenance and operating costs to a minimum. By noting the performance of

a pump immediately before removing it from service and correlating the performance to measured component wear, the maximum wear limits for the pump's critical components can be established. Additionally, the service life of the pump can be predicted and downtime can be scheduled accordingly.

If necessary, any Zenith precision metering pump requiring maintenance can be returned to the factory for complete repair and overhaul. For a large number of pumps, Zenith offers a contract repair service, which helps to reduce repair costs and delivery time. Zenith Pumps also offers pump maintenance seminars, repair videotapes, and installation, care and maintenance manuals. For more information concerning Zenith pump repair services, please contact our Customer Service Department.

C-9000 Series Disassembly

Note: As parts are disassembled, place them carefully on a clean surface such as a soft cloth. See Figure 3. Do not allow them to touch each other. Pay close attention to the order in which parts are removed. This will aid in the reassembly of the pump. The numbers in parentheses refer to the part numbers on the bill of materials.

1. If the pump came with an outer drive gear, remove it from the drive shaft before starting disassembly.
2. Remove the square key (17) from the shaft end.
3. Remove the socket head screws (18) from the seal housing (11). See Figure 4.
4. Lift off the seal housing (11). Take care to also remove the o-ring (33) which seals the housing to the front plate. The ring may be attached to the front plate.

5. Remove the seal (51) from the seal housing (11).
 - a) Mechanical Face Seal Pumps; The ceramic seat of the mechanical face seal may be removed from the seal housing by pushing it out with finger pressure. If it is stuck, use two small Allen keys or other small pins to press the seat from the housing using the two access holes in the housing face. Set screws will have to be loosened to allow removal of the mechanical seal (13) from the drive shaft. Some materials of the seal (face) are brittle in nature, use extreme caution so as not to damage the seal or its components.
 - b) Double Lip Seal Pumps; Press the lip seal (51) from the housing using finger pressure, or by pressing on the seal using a plastic tool.



Figure 3



Figure 4

C-9000 Series Disassembly

(cont.)

6. Now set the pump in a vice that has soft, **protective jaws made of brass, aluminum, plastic or any material softer than 316ss**. Orient the pump with the drive shaft pointed down. Allow the vice to grip the pump on the port sides of the front plate.
 7. Loosen and remove the socket head screws (19) from the back of the rear plate (7).
 8. Remove the rear plate (7). Always use the pry slots to prevent scratching the precision lapped surfaces. **Use brass or plastic tools to pry, if necessary.** Take care not to press on the gears or the edges of the gear pocket. **Caution:** Do not allow the gears to be lifted out of the gear plate. They may drop, causing damage to the gear teeth. See *Figure 5*.
 9. Remove the drive shaft (2) and the driving gear (5). The round key (4) will fall from between the gear and the drive shaft.
 10. Remove the retaining ring (16) from the drive shaft with a brass or plastic tool.
 11. Remove the arbor (9) and the driven gear (5) from the gear plate (3).
- Note: The driven and driving gears are identical in most models. See *Figure 6*.
12. Remove both retaining rings (16) from the arbor (9) using brass or plastic tools. Remove the driven gear (5) from the arbor (9). See *Figure 7*.
 13. Remove the round key (4) from the arbor (9).
 14. Remove the gear plate (3). Always use the pry slots to prevent scratching the plates! **Caution:** The slip-fit dowels (10) may come off with the gear plate.
 15. Remove both slip-fit dowels (10) by turning and pulling simultaneously. It is acceptable to lightly press the dowels out using an arbor press. Use a brass or plastic pin to press against the dowel.
 16. Remove the o-rings (34) from the front and rear plates with a brass or plastic tool.
 17. Do not attempt to remove the special bearings located in the front and rear plates. See *Figure 8*.



Figure 5



Figure 6

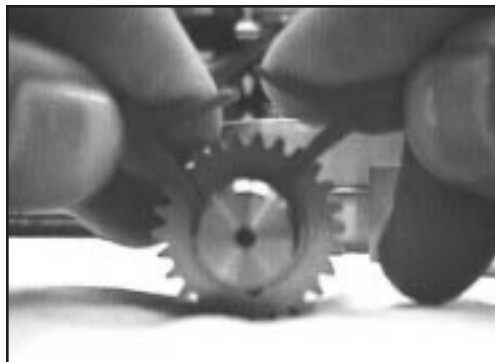


Figure 7



Figure 8

Inspection and Part Preparation

After the parts have been cleaned, they should be inspected for nicks, burrs and stubborn residue. The gears and the edges of the gear plate pockets are the most likely areas to be damaged because of the sharp edges on these parts. An illuminated magnifier helps during the examination.

Components should be cleaned with a soft brush and a mild detergent solution, or a safe, industrial solvent. Do not use abrasives to clean the pump.

Carefully inspect for any tool marks, nicks or scratches on the surfaces of the plates and gears. See *Figure 9*. Watch for shiny areas around nicks or scratches on the plates. These indicate a raised area that is present. This damaged area needs further attention. It is acceptable to carefully stone a “cratered” nick with a new, hard Arkansas or X-Fine water stone (6000 grit or higher), but this should be done with extreme care.

Deep marks or galling cannot be removed by stoning. These surfaces must be ground. Return the parts to the factory for repair or replacement.

Any nicks in the gear teeth should be removed by carefully stoning the parts with a fine India oilstone or an Arkansas stone. After all preparation has been completed, remove the abrasive dust and loose residue in an ultrasonic cleaner or other suitable cleaning method. Abrasive dust is larger in size than the pump clearances.

Always use clean, lint-free rags or disposable towels and compressed air to clean components. Common paper towels are not acceptable because they can leave small pieces of paper and dust on the pump parts. Use chemical brushes to clean between gear teeth, bores and other pump features. After all components

are clean, the pump can be reassembled. See *Figure 10*.

If cleaned parts are not to be reassembled for a period of time, they should be carefully packed in soft paper to prevent damage during storage. Never allow C-9000 parts to touch each other in storage or during cleaning. These components can easily damage each other if they collide by shifting around in a pan or bin.

New and replacement parts should always be deburred and cleaned using the above procedures. In addition to the above methods, new gears must be deburred on the teeth tips and edges using 600 grit paper, as well. Roll the gear for two revolutions like a wheel against the abrasive paper. Press down gently on the gear during this process. Simulate a motion as if you were trying to sand the teeth off of the gear; perform only two complete turns. Now, hold the gear and sweep the edges of the teeth against the paper for two revolutions of the gear. Finally, lay the gear flat on its side and block as discussed above. Repeat this blocking on the other side of the gear. Sharp edges on the gear bores must also be broken.

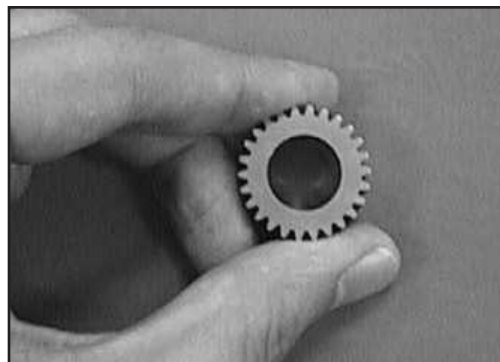


Figure 9



Figure 10

C-9000 Series Reassembly

Use all pages of the assembly drawing during the reassembly process to assure correct orientation of the parts

Note: If the pump will not turn freely after a component is installed, then the pump needs to be inspected further to determine where the unwanted contact is occurring.

Provide a can of compatible lubricant, preferably a mineral oil or process-acceptable synthetic lubricant such as glycerin. If none of these materials are available it is acceptable to use rubbing alcohol as a substitute lubricant. Shaft, arbor, dowels, and gears should be lubricated prior to assembly. Take care to remove excess fluid from between the plate surfaces using a clean, lint-free towel. Threads on bolts should be lubricated with an anti-seize compound or a molydisulfide based grease See *Figure 11*. During assembly, considerable care should be taken to prevent wedging or jamming of close-fitting components. Never force the parts together. They will drop or press into place with finger pressure if properly aligned.

1. Insert the o-rings (34) into the grooves on the front and rear plates (8,7). Replace these o-rings if they have been damaged.
2. Place the front plate (8) in a **vise that has soft protective jaws**. Grip the pump



Figure 11



Figure 13

on the port sides of the front plate with the inner surface of the plate facing up.

3. Push both slip-fit dowels (10) into the dowel holes in the gear plate (3).
4. Place the gear plate (3) on the front plate (8) and align the dowels so they slip into the corresponding holes on the front plate. Make sure that the bolt holes also line up when fitting the gear plate on the front plate. See *Figure 12*.
5. Place the round key (4) on the arbor (9) and fit the driven gear (5) on to the arbor. **Note:** The driven and driving gears are identical in most models.
6. Snap the retaining rings (16) onto the arbor and slip the arbor into the front plate (8).
7. Install the round key (4) into the keyway on the drive shaft.
8. Slide the driving gear (5) onto the drive shaft and against the retaining ring. Take care to align the keyway in the gear with the key (4). The key may need to be held down to prevent it from being damaged by the gear
9. Insert the drive shaft (2) into the front plate (8) and insert the gear into the gear pocket of the gear plate (3). See *Figure 13*.
10. Install the rear plate (7).



Figure 12

C-9000 Series Reassembly

(cont.)

11. Lubricate the threads and install the socket head screws (19) through the rear plate (7). Torque the screws to 50% of recommended torque (see table page 15) using a crossing pattern. Check for free rotation of the gears. If acceptable, continue to torque to total recommended torque. Again, check for free rotation of the gears. See *Figure 14*.
12. Place a seal installation tool (52) over the end of the shaft.
13. Mechanical Seal Installation
 - a) Install the mechanical seal (13) onto the drive shaft with the carbon end away from the front plate. Take care when pressing the seal onto the shaft. **The elastomer can be damaged by the keyway or shaft edge.**
 - b) Align the set screws with the grooves machined in the drive shaft and tighten the set screws.
 - c) Install the ceramic seat in the seal housing (11) with the O-ring of the seat away from the mechanical seal.
14. If your pump contains a double lip seal (51) push the seal to the rear of the seal housing. Make sure there is no gap between the seal and the seal housing.
15. Install the o-ring (33) into the recess in the seal housing (11). If necessary, use compatible grease to keep the o-ring in place. **Note:** This ring may already be in place if the pump was previously assembled.
16. Install the seal housing (11) over the drive shaft (2). See *Figure 15*.
17. Lubricate the socket head screws and install them (18) into the seal housing (11). Tighten to the recommended torque remembering to use a crossing pattern.
18. Install the square key (17) into the drive shaft keyway.

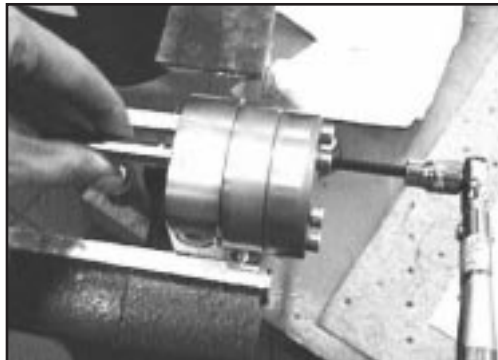


Figure 14

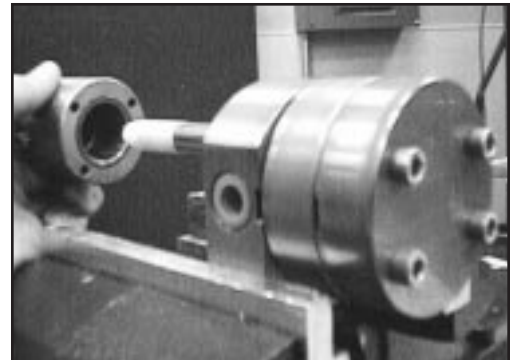


Figure 15

Screw Torque

Size (UNC Alloy Steel)	Recommended Torque (lbs.-in)	Size (Metric Alloy Steel)	Recommended Torque (lbs.-in.)*
#10-24	64	M3	19
#12-24	120	M5	85
01/04/20	150	M6	140
05/16/18	305	M8	350
03/08/16	480	M10	680
01/02/13	900	M12	1200
05/08/11	1600	M16	2900
03/04/10	2400		

*Unlubricated values/if lubricated reduce by 25%

Trouble-shooting

Examples of malfunctions of the pump with possible causes and remedies are listed in the following table:

Trouble	Probable Cause	Remedy
Pump will not turn	1) Drive malfunction	Verify that drive is powered. Assure that alarm circuits are clear. Check motor drive current and speed settings.
	2) Process conditions changed	Check process conditions for proper temperature, pressures, viscosities and materials.
	3) Entrained particle	Disassemble and clean pump; replace any damaged parts.
	4) Possible internal damage	Disassemble and clean pump; replace damaged parts. Consult factory.
Excessive seal assembly leakage	1) Worn seal face(s)	Replace seal.
	2) Improperly Positioned seal or faces	Check seal and faces for proper position.
Reduced pump efficiency	1) Excessive outlet pressure	Reduce outlet pressure.
	2) Worn gear(s)	Replace worn gear(s).
	3) Process conditions changed	Consult factory for gear clearance recommendations for new process conditions.



FAILURE, IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

WARNING

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

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QSR-065 1994
QSR-095 1994



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Section 7—Gear Reducer Care and Maintenance

This section of the manual covers the care and maintenance of the Helical Gear Reducers (Quill Input Size AA).

Helical - Quill Input Size AA - Gear Reducers Care and Maintenance

Manufactured for Zenith® Products Division, Parker Hannifin Corporation by IPTS.

½ - 1 HP Reducer part numbers:

68-75902-0640-1 3:1
68-75902-0634-1 5:1
68-75902-0635-1 11:1
68-75902-0636-1 22:1

Lubrication

The units are shipped from the factory lubricated for the life of the gearbox with Mobil synthetic SHC 634, an extreme pressure lubricant that protects the teeth in the event of accidental overloads and high pressure applications. This oil provides better protection against rust, corrosion, and wear. They also have naturally high viscosity indexes compared to mineral oils, providing lower viscosity at lower temperatures, and higher viscosity at higher temperatures. The SHF base oil also protects against the loss of viscosity as a result of mechanical shearing.

Before startup, remove the oil filler plug and verify that the correct fluid level is in the reducer, then install the breather plug in its correct location. If the vent plug is not installed correctly or becomes clogged, pressure may rise inside the reducer and cause seals to leak.

Coupling

Use a flexible coupling with this gear unit. Do not use a solid coupling. Any coupling, pulley, gear wheel, or sprocket fitted to the shaft of this unit must be fitted by a screwing motion. It must NOT be driven on as it may cause internal damage to gears and bearings.

Mounting

Both foot and flange mounted units should be secured to a rigid support.

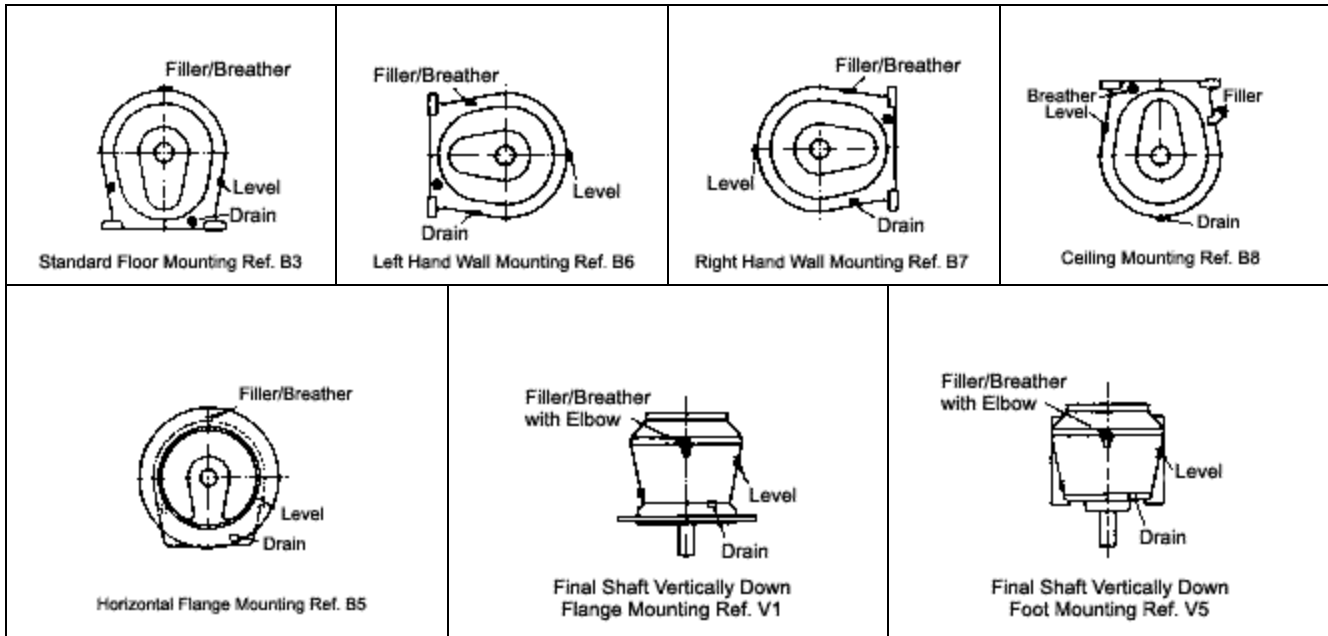
Alignment

When the gear units are used in conjunction with any ancillary equipment, care must be taken to ensure proper alignment is achieved.

Oil Quantity

Mounting Positions	Quantity
B3, B5, B6, B7 and B8	14 ounces
V1 and V5	20 ounces

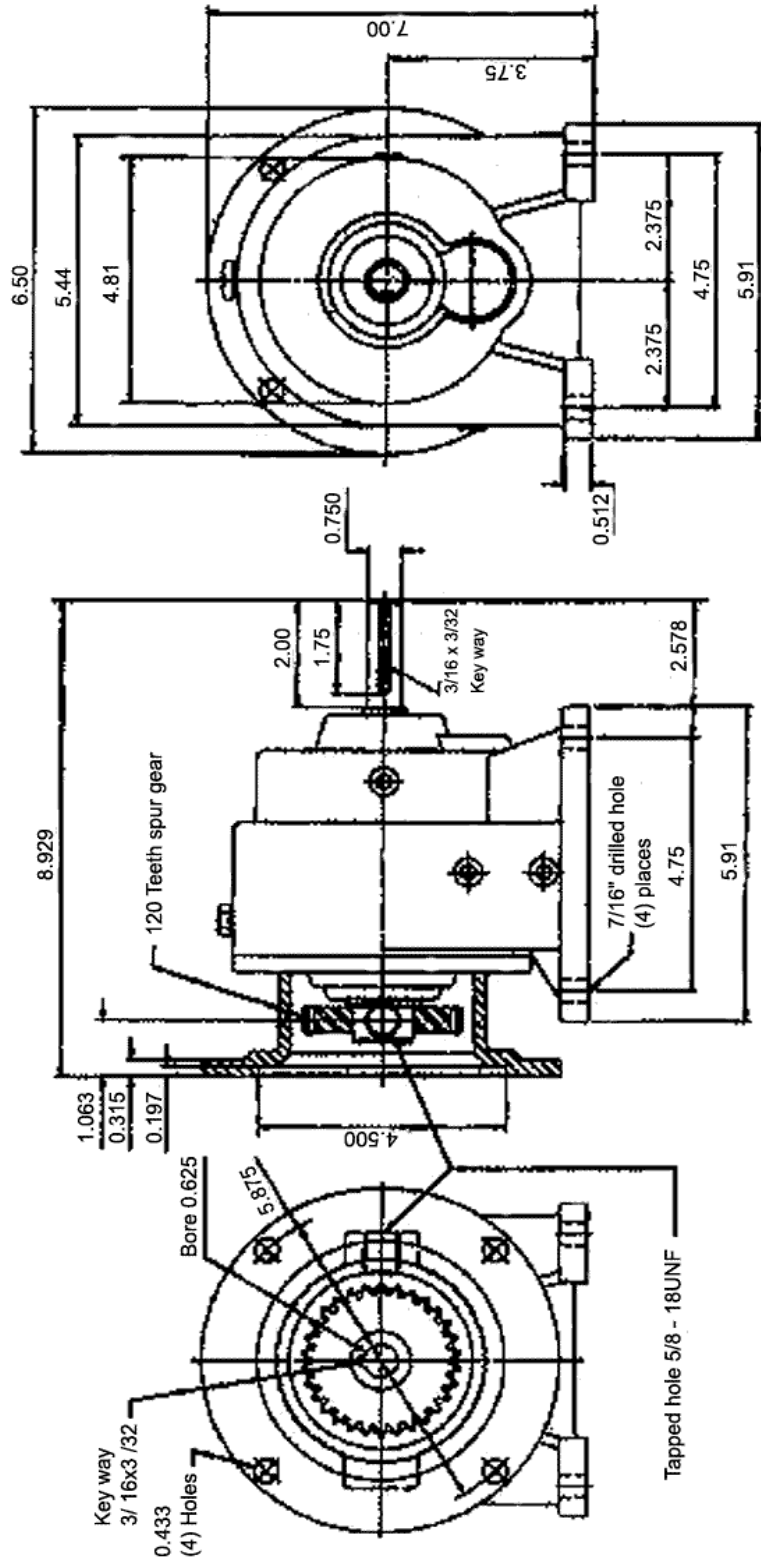
Zenith® Products Division, Parker Hannifin Corporation

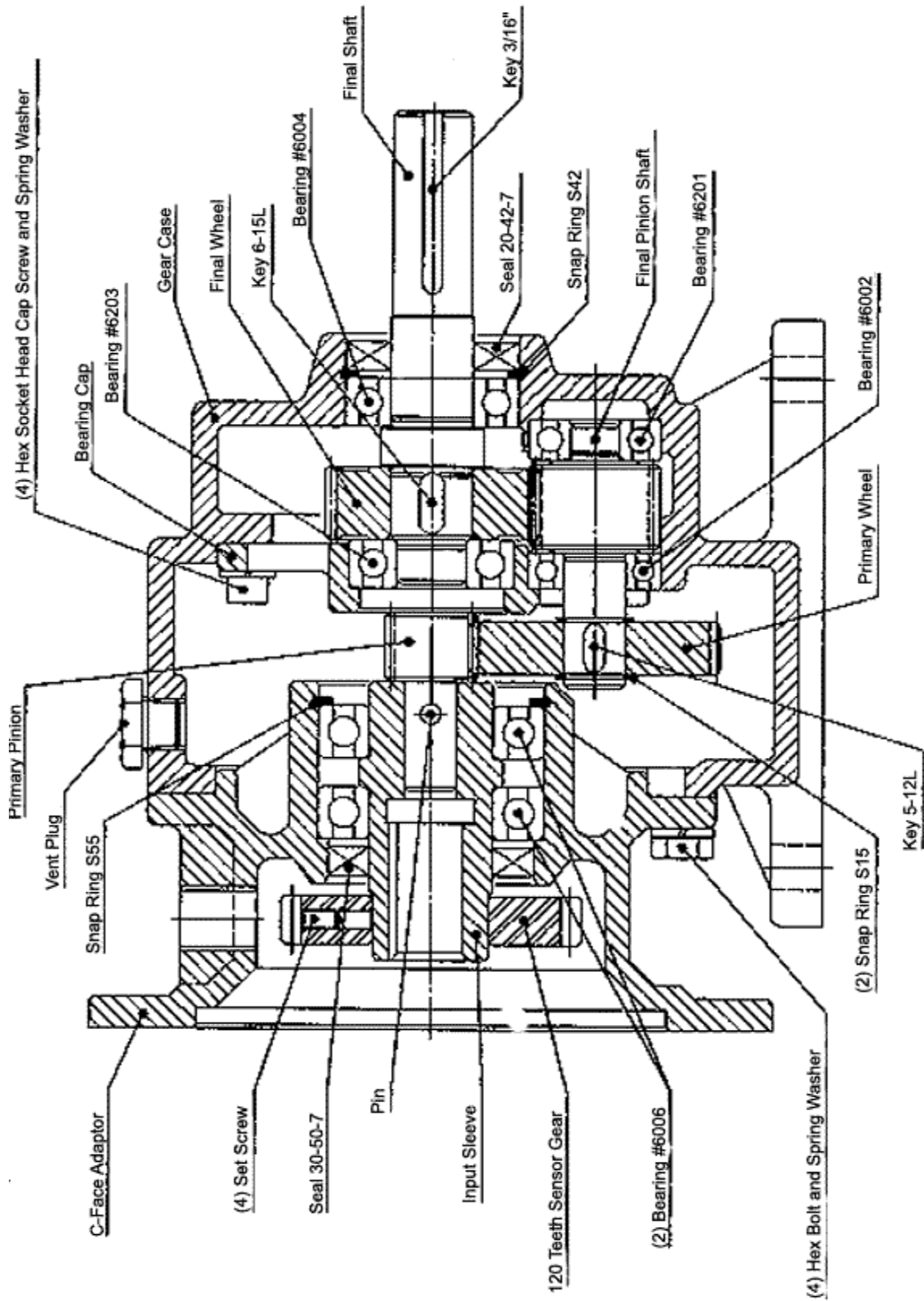


B8, V1, and V5 - Elbow required for fill / vent.

Recommended Oil Grades

Castrol	Shell	Exxon	Texaco	Mobil Oil	BP	Gulf Oil
Alpha SP220	Shell Omala 220	Spartan EP220	Meropa 220	Mobilgear 630	BP Energol GR-XP220	Gulf EP Lubricant HD220





Equipment

The motor drive assembly utilizes a constant torque variable speed motor, C-face mounted to a fixed ratio double helical gear reducer. A speed pickup sensor provides a digital signal generated from a sensor gear integrally mounted on the reducer input shaft. The digital signal generated is the feedback to the speed control and power package, indicating exact motor speed, and is essential to regulating motor drive output in order to control pump speed accurately. A painted steel base-plate mounts the motor/reducer, pump/saddle along with required shafting, support bearings, drive gears, or drive couplings, and appropriate safety guards.

Pickup Sensor Gap



Warning:

The gap between the pickup sensor and the sensor gear must be maintained from .003" to .005" nominal. This is accomplished with a feeler gage while checking at 90-degree increments to allow for gear run-out.

Do NOT allow the pickup body to rotate when attaching conduit because interference and certain damage will occur.

Pinion Gear / Outer Drive Gear Backlash

When using gear drive type pumps, it is critical to maintain a .003" to .008" backlash between the pinion gear and the pump outer drive gear. This is accomplished by adjusting the jackscrew provided as part of the saddle for pivot mount pumps, or by fitting shims between the base-plate and saddle for fixed mount pumps. Improper backlash may result in side loading on the pump and cause premature wear or seizure.

Drive Coupling Alignment

When using a direct drive coupling, it is critical to maintain reducer output shaft and pump input shaft alignment. Improper shaft alignment may result in side loading of the pump and cause premature wear or seizure.

Section 8—Maintenance

This section contains maintenance procedures for the Valco Core-Winding System. A regular maintenance program helps ensure longer life and efficient operation of your system. A few minutes spent on maintenance periodically can greatly reduce system downtime.

Tank Maintenance

Valco stainless steel pressure tanks feature easy filling and simple cleaning.

Pressure Vessel Considerations

The Valco 5-gallon Pressure Vessel features a full-diameter removable lid. The lid and latch assembly utilizes a fitted gasket which serves as a lid/tank seal.

When replacing tank components, you should adhere to the following guidelines:

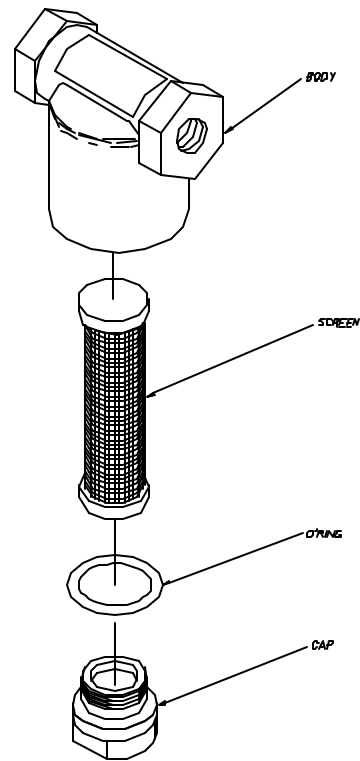
- Always relieve air pressure before releasing the lid latch.
- Close the air valve or remove the inlet air hose/line to stop the inlet flow.
- Actuate the dispensing valve to clear any possible residual air pressure.
- Make sure to seat the lid on the seal area when reinstalling the tank lid.



WARNING! Do not open the tank lid without fully discharging pressure. Failing to do so could cause PERSONAL INJURY or DEATH.

Clean the tank and tank parts with a compatible solvent for the material being used. Consult the adhesive supplier for information as to the type of solvent to be used with each adhesive. To avoid damage to internal parts, do not submerge the air regulator in solvent.

Periodically, remove, disassemble and clean the in-line material filter to eliminate any foreign material that has entered the system.



50-mesh In-line Filter (593xx299)

Section 9—Troubleshooting

This section contains basic troubleshooting procedures for the Valco Core-Winding System.

Trouble Area: Adhesive not coming out of glue valve

Problem	Possible Solution
1. Solenoid on 369 valve not firing.	1a. Check solenoid. 1b. Make sure adequate air pressure is supplied to solenoid, >70 psi.
2. Gear pump not pumping.	2a. Check gear pump and maintain according to manual.
3. Display on module lights up, but does not run powerup sequence.	2a. Faulty module
3. Supply tank empty.	3a. Check supply tank, if empty, fill and make sure tank fill valve is working properly. 3b. Check inlet glue regulator.
4. Hot-melt supply hose clogged.	4a. Remove hot melt hose and check for blockages, replace hose if necessary.
5. Adjustable relief valve not set properly on tank lid.	5a. Make sure adjustable relief valve is set according to P&G set-up instructions.
6. Filter clogged.	6a. Remove filter screen and clean if necessary (refer to page 8-1).
7. Signal to fire not being sent by control.	7a. Check to see that tachometer or encoder is working properly. 7b. Check outputs according to the program.

Trouble Area: Poor glue pattern quality

Problem	Possible Solution
1. Applicator head is worn.	1a. Replace applicator head if worn excessively.
2. Glue not heated.	2a. Check temperature readout on control. Perform maintenance if required.
3. Glue volume not tracking properly with machine speed.	3a. Check to see that tachometer or encoder is working properly. 3b. Check to make sure gear pump gain is programmed properly, refer to P&G set-up instructions.
4. Applicator head not aligned properly.	4a. Visually check head alignment and contact with substrate, re-align if necessary.
5. Air supply to solenoid valve not adequate.	5a. Make sure air pressure to the 369 glue valve solenoid is > 70 psi.
6. Make sure glue valve rotary actuator is adjusted properly.	6a. Adjust stops on the rotary actuator. 6b. Make sure solenoid on the rotary actuator is working properly, replace if necessary.

Trouble Area: System will not respond (no adhesive, no actuation, etc.)

Problem	Possible Solution
1. Check power supply to the control unit.	1a. If unit is not on, power the unit up. 1b. Check main disconnect on the parent machine.
2. Air supply not adequate.	2a. Make sure an air supply of >70 psi is being supplied to the system. 2b. Make sure air dump valves are not relieving pressure.
3. Program not correct.	3a. Check elementaries and code according to P&G set-up instructions, make changes if necessary.

Section 10—Part-Number List

How to Order Parts

To order parts, please contact one of the following offices:

Valco Cincinnati Incorporated

411 Circle Freeway Drive

Cincinnati, Ohio 45246

TEL: (513) 874-6550

FAX: (513) 874-3612

Valco Cincinnati Limited

Hortonwood 32

Telford, TF1 7YN, England

TEL: (+44) 1952-677911

FAX: (+44) 1952-677945

Valco GmbH

Storkower Strasse 6

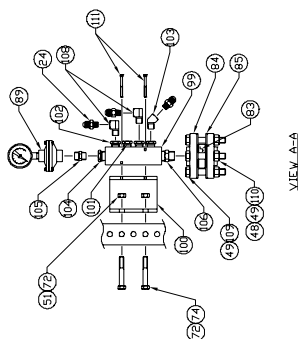
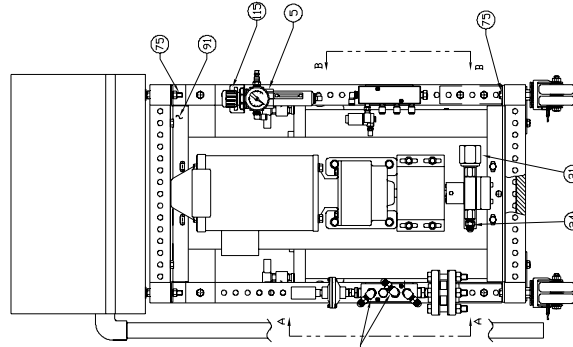
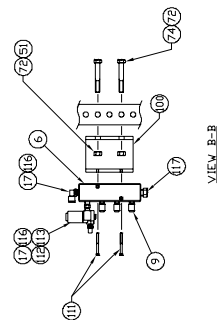
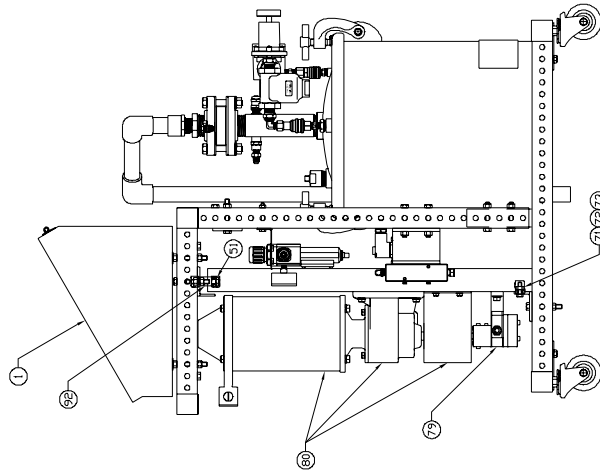
D-15749 Gallun, Germany

TEL: (+49) 337 648 700

FAX: (+49) 337 648 7070

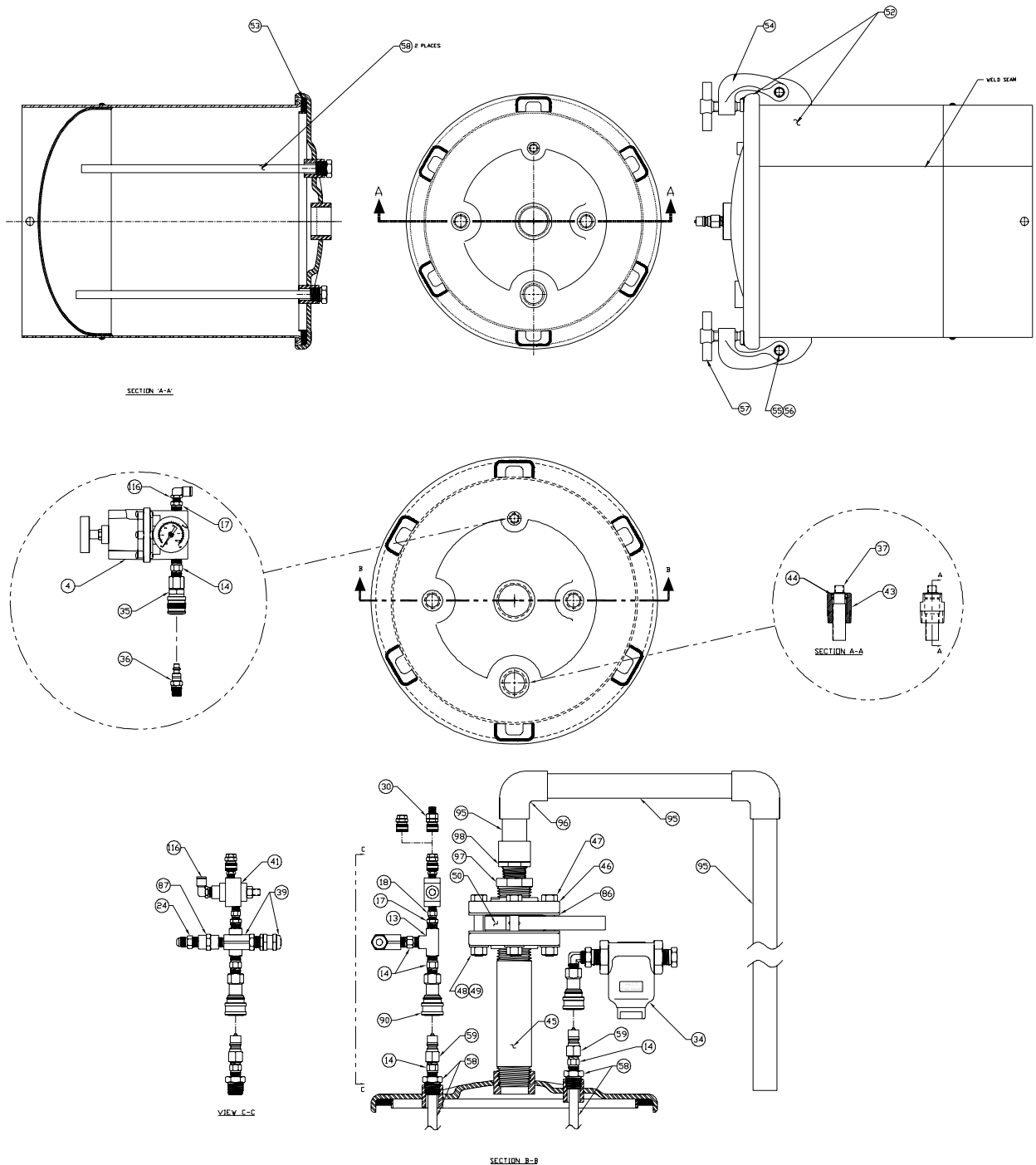
Note! You may also contact a Valco sales representative in your country.

Valco Core-Winding System (738xx848)



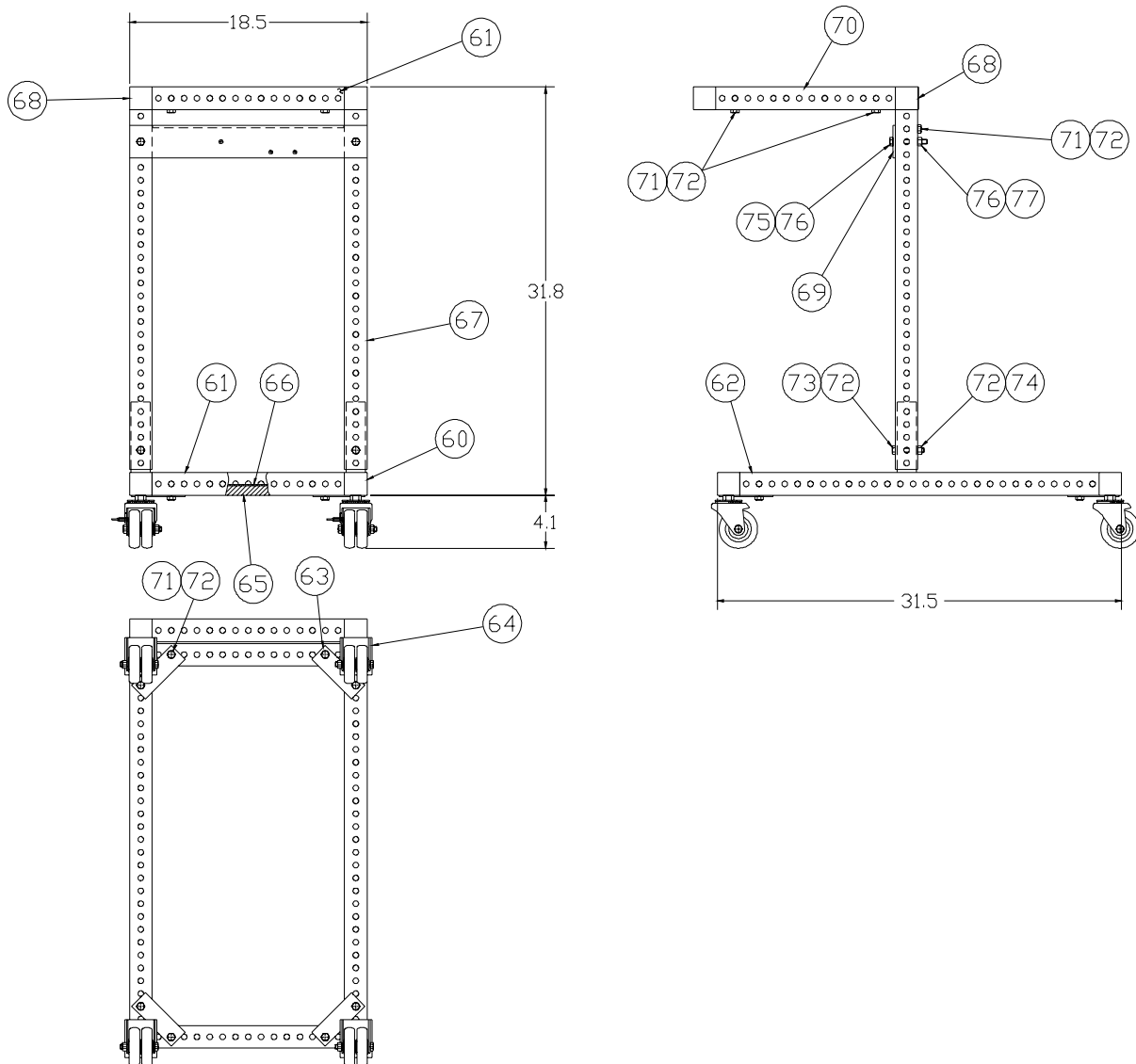
Valco Core-Winding System (738xx848, continued)

Tank and Lid (558xx887)



Valco Core-Winding System (738xx848, continued)

Core-Winding System Cart

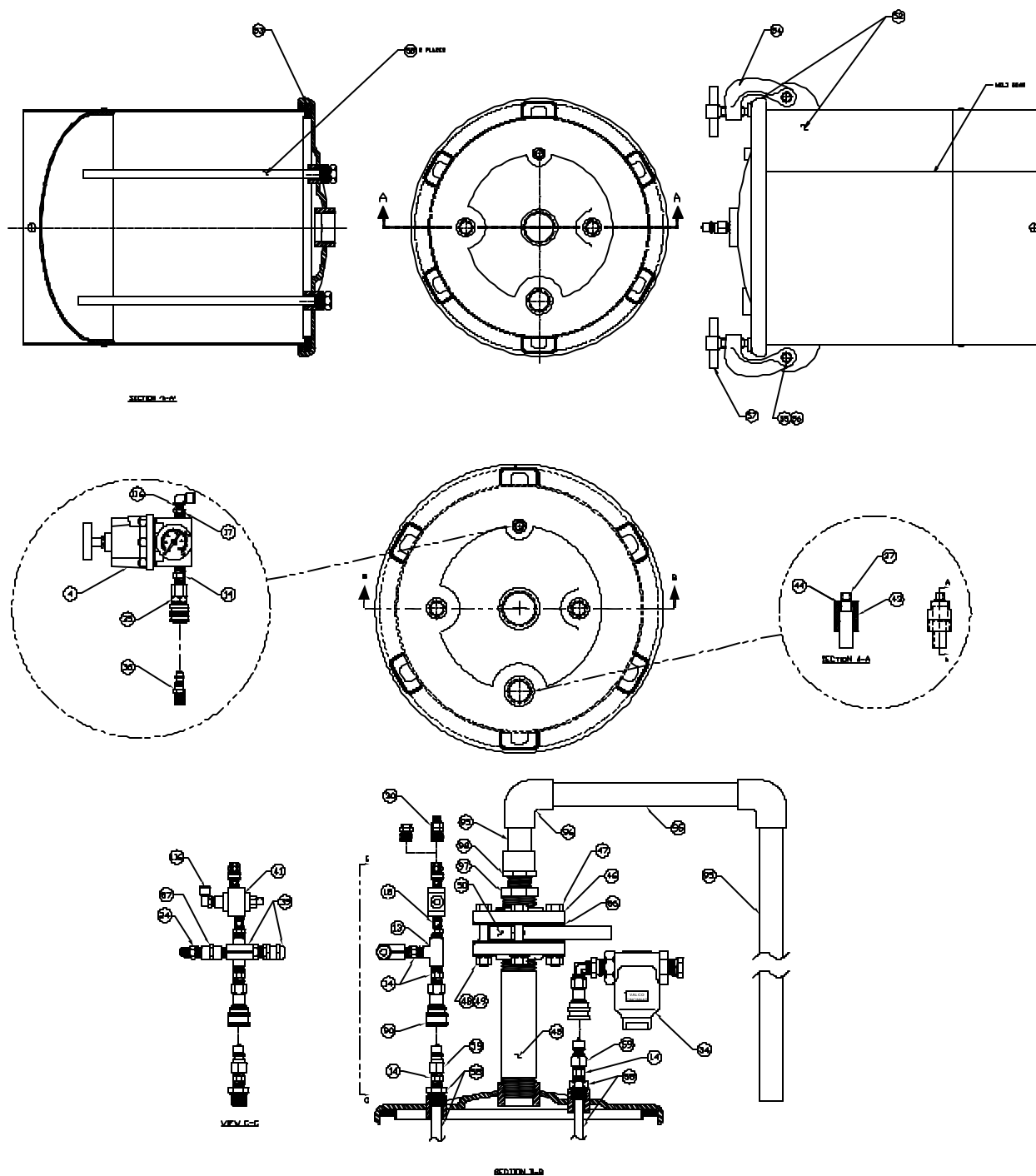


Valco Core-Winding System (738xx848, continued)

Item	Quantity	Part Name	Part Number
1	1	Electrical Enclosure, P & G #2	098xx062
2	1	Applicator Head Assembly	738xx847
3	1	Hose	755XX078
4	1	Air Regulator	593XX434
5	1	Filter Regulator Assy.	594XX033
6	1	Manifold	754XX336
7	1	Cable Assy; M12 Fem, 6m	030XX604
8	1	Cable Assembly	030XX879
9	4	Male Connector, 1/4i X 1/8mpt	799XX157
11	2	Cable Assy, M12 Rev Key, 10m	030XX882
12	2	Connector,M12,5pin,Male St Fld	061XX218
13	1	Tee F-F-F 1/4	797XX023
14	5	Hex Nipple M-M 1/4	797XX080
15	2	Street Elbow-90 F-M 1/4 X 1/4	797XX007
17	4	Bushing M/F	797XX045
18	3	Hex Nipple M-M 1/8	797XX079
19	2	1/2i X 1/2npt Swivel Fitting	799XX104
20	4	Hose	755XX234
21	1	Reducer Coupling F-F 1/2 X 1/4	797XX063
22	1	Tee F-F-F 1/4	797XX023
24	6	Jic Ftg - 3/8i X 1/4 Npt Steel	795XX507
25	1	Umbilical Assy, Heated Hose	035xx525
29	1	Shut-Off Valve	703XX418
30	1	Swivel Ftg. - Female	750XX001
32	1	Screen 529-2	593XX020
34	1	Filter Assembly	593xx066
37	1	Analog Sensor, 12" Range, 0-10v	280xx262
38	1	Hose, 10 ft., Variable Temp.	779xx690
39	1	Relief Valve	775xx454

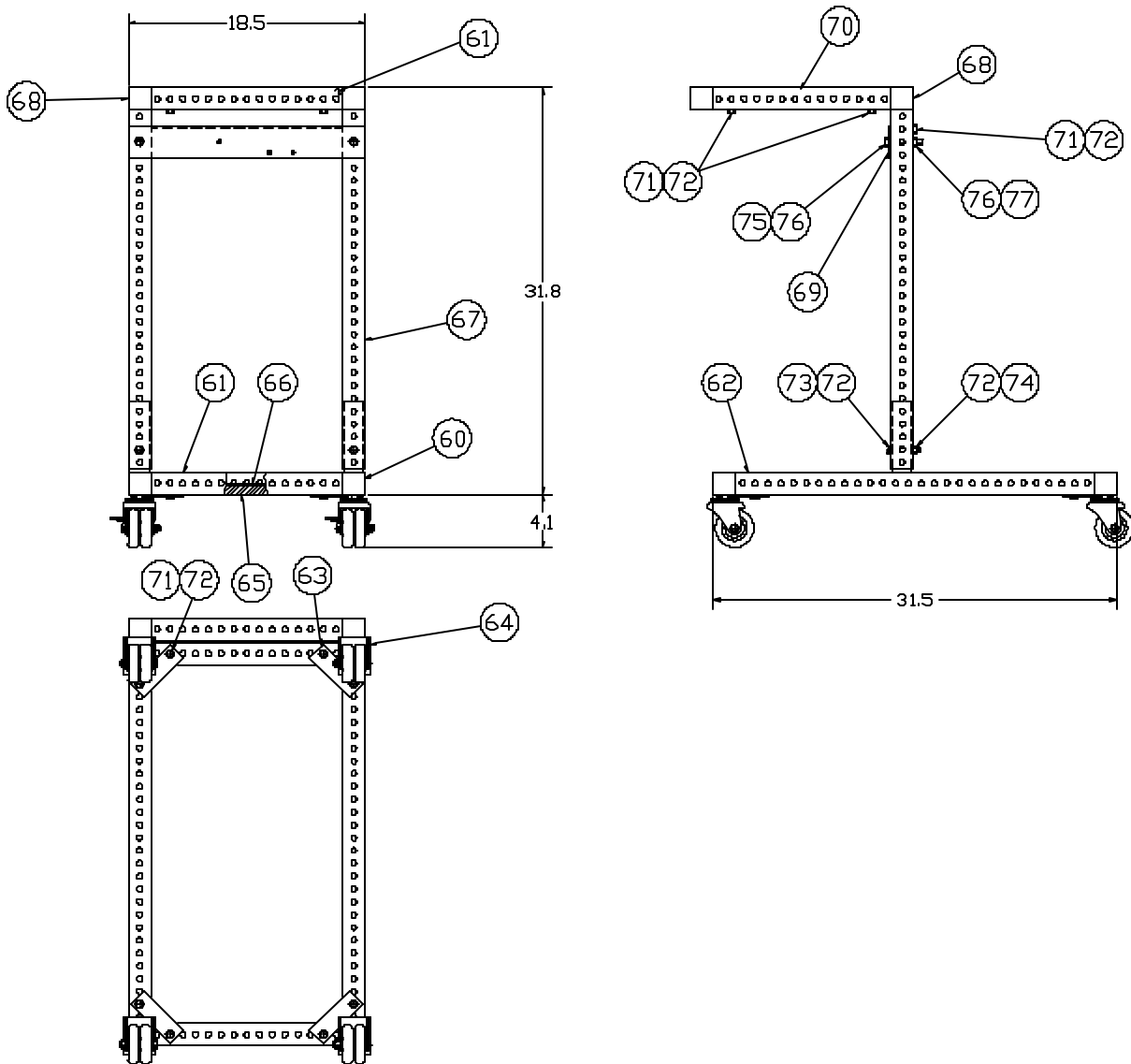
Valco Core-Winding System (738xx848, continued)

Tank and Lid (558xx887)

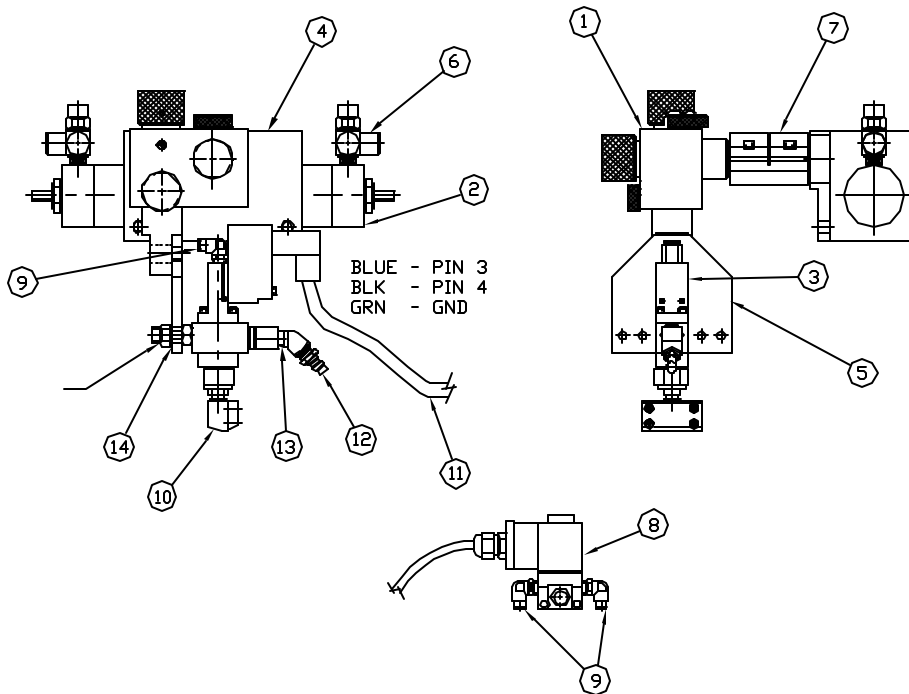


Valco Core-Winding System (738xx848, continued)

Core-Winding System Cart



Applicator Head Assembly (738xx847)



Item	Quantity	Part Name	Part Number
1	1	Bracket, Micro-Adjust	738XX845
2	1	Rotary Actuator	781XX808
3	1	Valve Assy, 369 W/M16, 24v, Us	706XX214
4	1	Plate, Mounting, Rotary Act	582XX636
5	1	Plate, Mounting, Valve Pivot	582XX637
6	2	Flow Control	077XX319
7	1	Coupler, Shaft	783XX137
8	1	Valve Assy, 24v 4-way, W/M12 Cbl	411XX768
9	3	Sw. Elbow-90, ¼ tube x 1/8 nptm	797XX378
10	1	Ribbon Coater Head, Ronco	708XX749
11	1	Cable Assembly, M12 Rev. Key 1m	030xx773
12	1	Swivel Fitting, Female	750xx001
13	1	Street Elbow-45 F-M 1/8 x 1/8	797xx011
14	1	Flat Washer 3/8 Zinc	798xx762

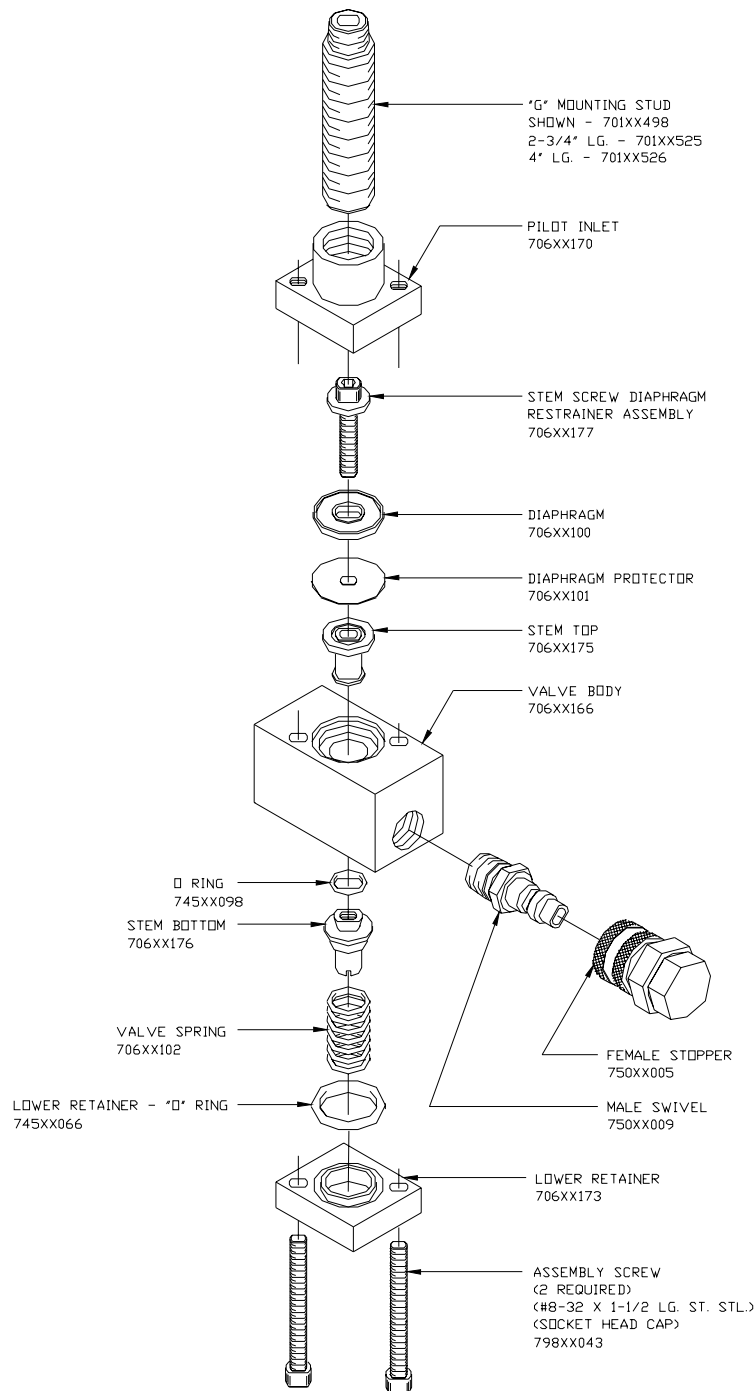
Electrical Enclosure Assembly (098xx062, continued)

Item	Quantity	Part Name	Part Number
1	1	Electrical Elementary,P & G #3	999XD738-181
2	1	Enclosure Modification, P & G	026XX132
3	1	Panelview 550,Remote I/O	118XX149
4	1	Temp. Controller	505XX254
5	1	Nameplate Set, P & G	781XX838
8	1	Electrical Panel	026XX131
9	1	Remote I/O Adapter	118XX150
10	1	I/O Module,Dc,10 In/6 Out	118XX151
11	1	Analog Input Module,4 In	118XX152
12	2	Base,Flex I/O	118XX153
14	1	Power Supply,+24vdc 10a	148XX052
15	1	Circuit Breaker,5 Amp 1 Pole	056XX096
16	2	Circuit Breaker,10 Amp 1 Pole	056XX098
17	1	Solid State Relay,240v 10a	160XX230
18	1	Vfd,1/2hp 120vac	110XX346
20	1	Ground Bar,31920403	091XX075
21	26	Mounting Track,30255407	091XX086
22	12	Mounting Channel,2133401	667XX074
23	2	Anchor,31093400	091XX076
24	30	Terminal Block,31088405	075XX097
25	1	End Barrier,31092404	075XX098
26	10	Jumper,32046406	091XX129
27	5	Wire Duct, 1" X 2"	067XX084
28	5	Wire Duct Cover, 1"W	067XX086
31	2,400	Wire, Mtw, 16awg, Red	540XX066
32	1,200	Wire, Mtw, 16 Awg, Grn/Yel	540XX072
33	1,200	Wire, Mtw, 16awg, Wht	540XX073
34	2,400	Wire, Mtw, 16awg, Blu	540XX080
36	4	Strain Relief	066XX023
37	5	Strain Relief	066XX024
38	9	Locknut	066XX083
39	9	Dust Seal, 1/2 In. Cond.	066XX006
42	4	Hhcs Zinc 3/8-16 X 3" Full Thr	784XX622
43	8	Hex Nut Zinc 3/8-16	798XX691
44	4	Lock Washer Zinc 3/8	798XX740
45	4	Hhcs Zinc 5/16-18 X 1	798XX612

Electrical Enclosure Assembly (098xx062, continued)

Item	Quantity	Part Name	Part Number
46	8	Hex Nut Zinc 5/16-18	798xx690
47	4	Lockwasher Zinc 5/16, 20010b2	798xx738
50	1	Tachometer, Dc	155XX334
51	1	Measuring Wheel, Inch Cal.	788XX553
52	1	Bracket Arm	580XX354
53	1	Tach Cable Assy, 30 Ft	029XX262

366 Glue Fill Valve (705xx117)



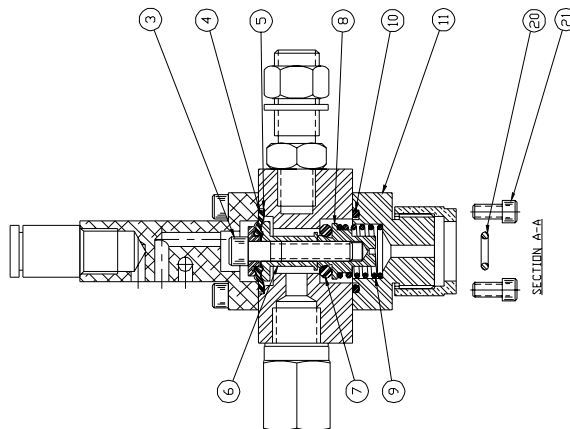
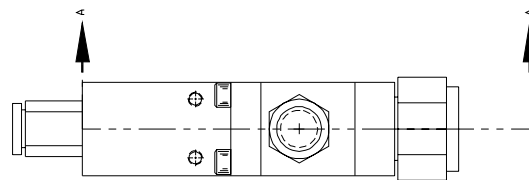
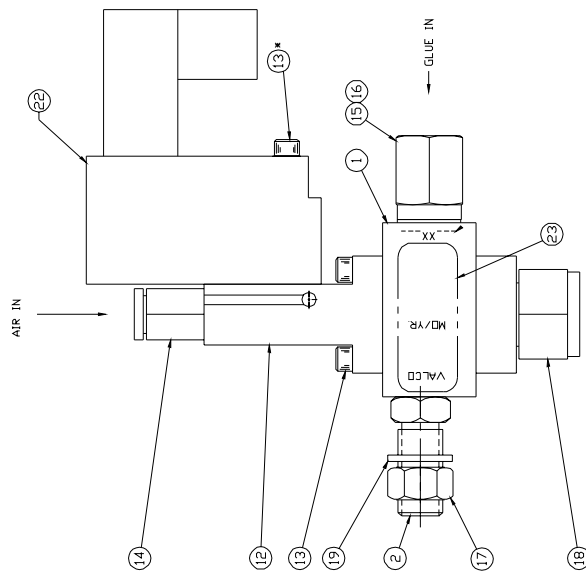
366 Glue Fill Valve (705xx117, continued)

Item	Quantity	Part Name	Part Number
1	1	Valve Body	706XX166
2	1	Lower Retainer	706XX172
3	1	Pilot Inlet	706XX171
4	1	Stem Bottom	706XX176
5	1	Spring	706XX102
6	1	O'ring	745XX098
7	1	O'ring,360-Or	745XX066
8	1	Stem Screw Assy	706XX177
9	1	Diaphragm	706XX100
10	1	Diaphragm Protector	706XX101
11	1	Stem Top	706XX175
12	1	Male Swivel	750XX009
13	1	Swivel Ftg. - Plug	750XX005
14	2	Shcs S-S 8-32 X 1-1/4	798XX041
15	1	Lock Washer,3/8 Inter.	798XX798
16	1	Hex Nut S-S 3/8-16	798XX679
17	1	Flat Washer-Sae S-S 3/8	798XX764

Valve Rebuild Kit (706xx178)

Item	Quantity	Part Name	Part Number
1	4	Spring	706XX102
2	4	Diaphragm	706XX100
3	4	Diaphragm Protector	706XX101
4	4	O'ring	745XX098
5	4	O'ring,360-Or	745XX066
6	1	Box	794XX813
7	1	Hex Key, 9/64	794XX852
8	1	Typ.Assy 366 Valve G-Mount	999XB705-04

Model 369 Glue Valve (706xx040)



Model 369 Glue Valve (706xx040, continued)

Item	Quantity	Part Name	Part Number
1	1	Valve Body	703XX944
2	1	Mntg. Stud, 3/8-16 X M8	581XX035
3	1	Stem Screw Assy	706XX177
4	1	Diaphragm	706XX100
5	1	Diaphragm Protector	706XX101
6	1	Stem Top	706XX175
7	1	O'ring	745XX098
8	1	Stem Bottom	706XX176
9	1	Spring	706XX102
10	1	O'ring, 360-Or	745XX066
11	1	Nozzle Adapter, M16	703XX942
12	1	Manifold, Air	753XX364
13	6	SHCS - M3 X 30mm, SS	798XX180
14	1	Half Union, 1/4 Tube X 1/8m-Uni	797XX726
15	1	Washer, Copper	793XX470
16	1	Adapter; 1/8NPT X 1/8BSPP-SS	792XX135
17	1	Hex Nut S-S 3/8-16	798XX679
18	1	Nut, M16, 0673	798XX356
19	1	Lock Washer S-S 3/8	798XX742
22	1	3-Way Air Valve, 24vdc	411XX429
23	2	Label	795XX614

Section 11—Warranty

Warranty Information

Valco Cincinnati, Inc. warrants its equipment worldwide against defects in material and workmanship as outlined in this section.

Hoses, Valves, and Related Equipment

All components are warranted for a period of six (6) months from the date of shipment by Valco Cincinnati, Inc.

Liability of the company is limited to repair of the product, or replacement of any part shown to be defective, and does not extend to defects caused by accidents, misuse, abuse, neglect, tampering or deterioration by corrosion. This warranty does not cover those items determined by Valco Cincinnati, Inc. to be normal wear items such as seals, O-rings, diaphragms, springs, etc.

Reconditioned equipment, unless specified otherwise at the time of purchase, will be warranted as described above for a period of ninety (90) days from the date of shipment by Valco Cincinnati, Inc.

Components purchased by Valco Cincinnati, Inc. from others for inclusion in its products are warranted only to the extent of the original manufacturer's warranty. In no event shall Valco Cincinnati, Inc. be liable for indirect or consequential damages arising out of the use of Valco products.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to Valco Cincinnati, Inc. for examination and verification. If claimed defect is verified, repairs or replacements will be made F.O.B. Cincinnati, Ohio, U.S.A. If the inspection of the equipment does *not* disclose any defect of workmanship or material, any necessary repairs will be made at a reasonable charge and return transportation will be charged.

This is the only authorized Valco Cincinnati, Inc. warranty and is in lieu of all other expressed or implied warranties, representations or any other obligations on the part of Valco Cincinnati, Inc.

Section 12—Service

Service Needs

If you have experienced problems other than those listed in the *Troubleshooting* section or if a problem with your system persists, contact a Valco Cincinnati Technical Support representative. If your need is urgent, we encourage you to contact our corporate office in Cincinnati, Ohio, U.S.A. at (513) 874-6550. If the problem cannot be resolved, Valco Cincinnati will promptly arrange to have a technical representative visit your facility. Any charges for a service call will be quoted at that time. Any part that fails during the warranty period shall be returned prepaid to Valco Cincinnati, Inc. by the customer for disposition.

Note! Upon request, Valco personnel are available to repair or replace such parts at the customer's facility. Charges for this service include travel time and expenses.

If an equipment problem is the result of customer abuse, improper installation or operation, all travel time, labor, parts, and expenses will be charged to the customer.

If the responsibility for a problem cannot be absolutely determined, the customer will be charged for travel time and expenses only. No charge will be made for parts and labor.

