SAFETY

INSTALLATION

OPERATION

MAINTENANCE

M A N U A L

SAMPLER

Models PS and PS-XP

No. PC 519814F

Revised 2012-07-10

9575 N. 109th Ave.
Omaha, Nebraska 68142
(402) 330-1500
www.intersystems.net

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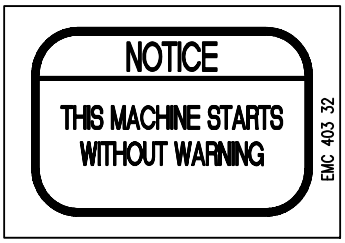
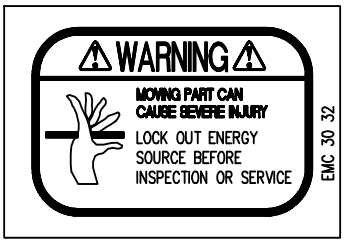
I. GENERAL SAFETY INFORMATION

SAFETY FIRST! The symbols shown identify examples of the safety labels and signs to be found on InterSystems equipment. They are affixed to the equipment to warn of danger to persons and of possible equipment damage. These signs must never be removed, tampered with, painted over or obscured in any way. (See Pages 4 & 5 for label locations.) If labels are damaged or become unreadable, replacement labels are available from InterSystems. The user must institute a continuing program to instruct all personnel in safe operating and maintenance procedures, and to insure that all safety devices, guards, and covers are intact and operable, and that all safety signs are legible.



STARTS W/OUT WARNING
EMC40332



MOVING PART
EMC3032

Consult InterSystems, Inc. before making any changes to the sampler or its operating environment. Careless changes could result in death or serious injury to people, and reduce the performance and service life of the equipment.

Never perform any service on this equipment or any other powered equipment until all power has been shut off and locked out so that it cannot be restored without the consent and knowledge of the person who interrupted power. Power includes electrical, fluid, mechanical, or pneumatic energy.

Never perform any service on this equipment without utilizing the required PPE (personal protective equipment). Refer to the MSDS(s), material safety data sheet(s), on all the products to which this equipment is in contact with to determine what PPE is required.

DANGER

THIS EQUIPMENT IS TO BE OPERATED ONLY ON THE VOLTAGE DESIGNATED ON THE CERTIFIED ELECTRICAL DRAWING(S)! FIRE OR EXPLOSION MAY RESULT, WHICH CAN CAUSE DEATH, SERIOUS INJURY, AND EXTENSIVE DAMAGE TO EQUIPMENT. DO NOT CONNECT TO VOLTAGES OTHER THAN DESIGNATED.

WARNING

COMPRESSED AIR CAN CAUSE SEVERE INJURY. SHUT OFF AND LOCK OUT COMPRESSED AIR SOURCE TO THE SAMPLER AND BLEED OFF ANY AND ALL PRESENT COMPRESSED AIR WITHIN THE SAMPLER PNEUMATICS BEFORE ATTEMPTING ANY SERVICE ON THIS SAMPLER.

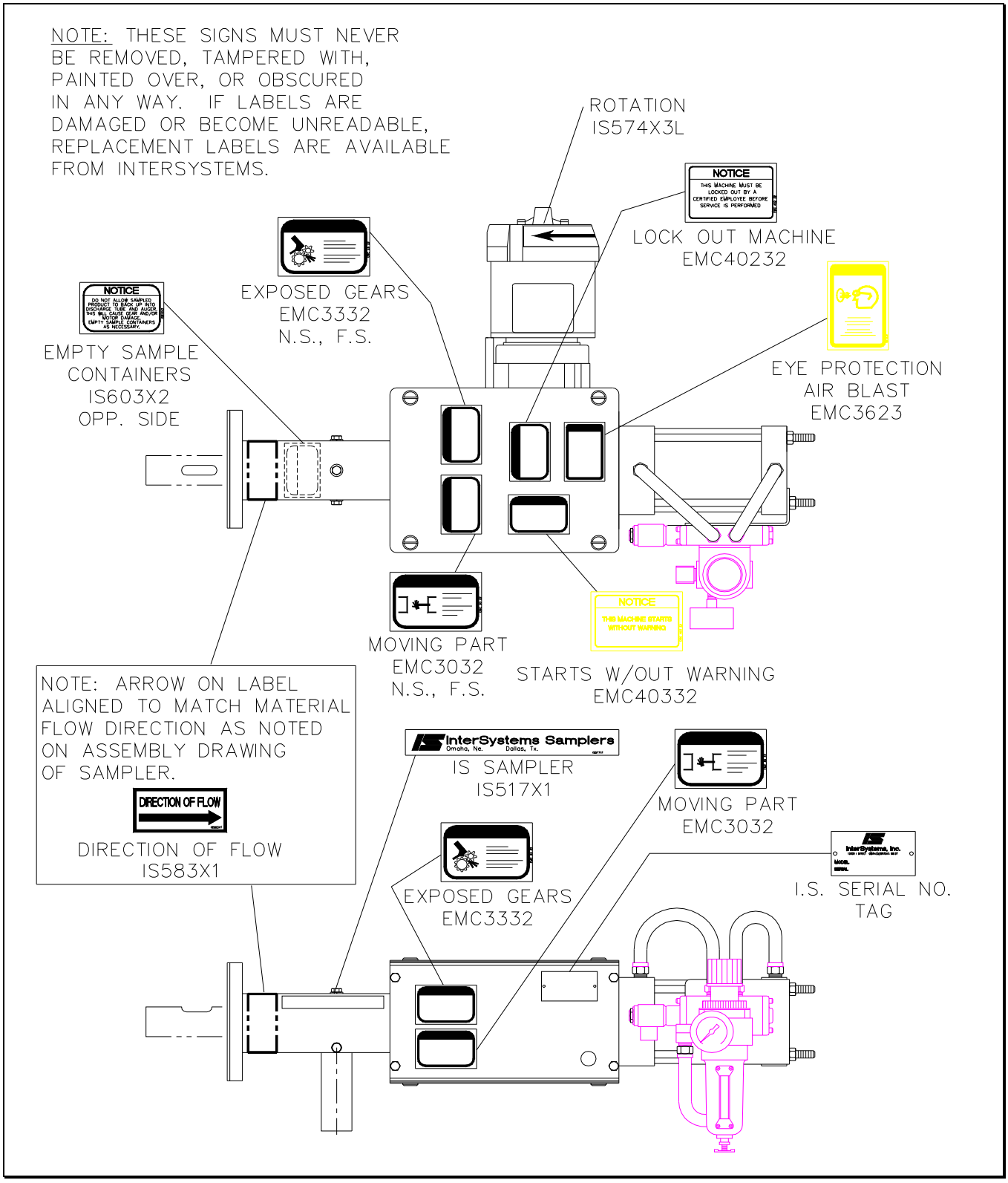


FIGURE 1-1, PS SAMPLER SAFETY LABEL LOCATIONS

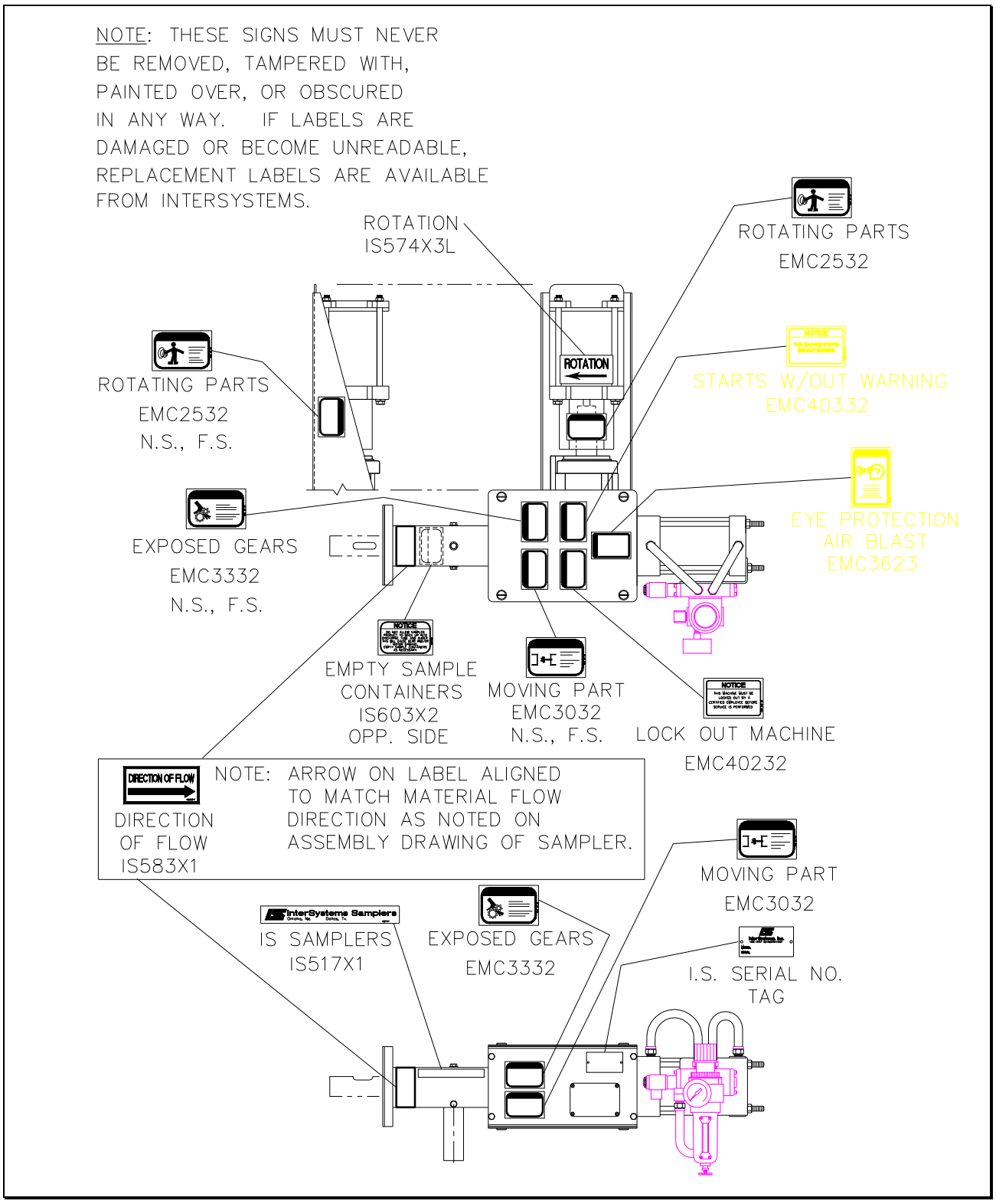


FIGURE 1-2, PS-XP SAMPLER SAFETY LABEL LOCATIONS

II. GENERAL INFORMATION

2.1 System Description

The PS Sampler is designed to collect a representative sample of granular, flake, powder, or other materials in a gravity or pressurized conveying line or from a hopper tank or pressure vessel. Figure 2-1 illustrates a typical PS Sampler application.

Sample collection is initiated in response to either an operator's manual command or a signal automatically generated by controller logic, usually time-based but which could also be volume or quantity based. A sample cycle begins when a double-acting pneumatic cylinder forces the slotted sampling tube (probe) into the product line to collect a sample of the material. Next, the sample tube probe is withdrawn into the seal housing isolating the sample and sample tube cavity from the conveying line. Then, an electric motor operating through a set of bevel gears, rotates the auger through several revolutions, augering the sample collected to the 1.50" (38mm) OD discharge outlet tube. The sample then falls down and out the discharge tube to the desired sample collection point, at which point an InterSystems SCS Sample Collection System (optional) may be installed.

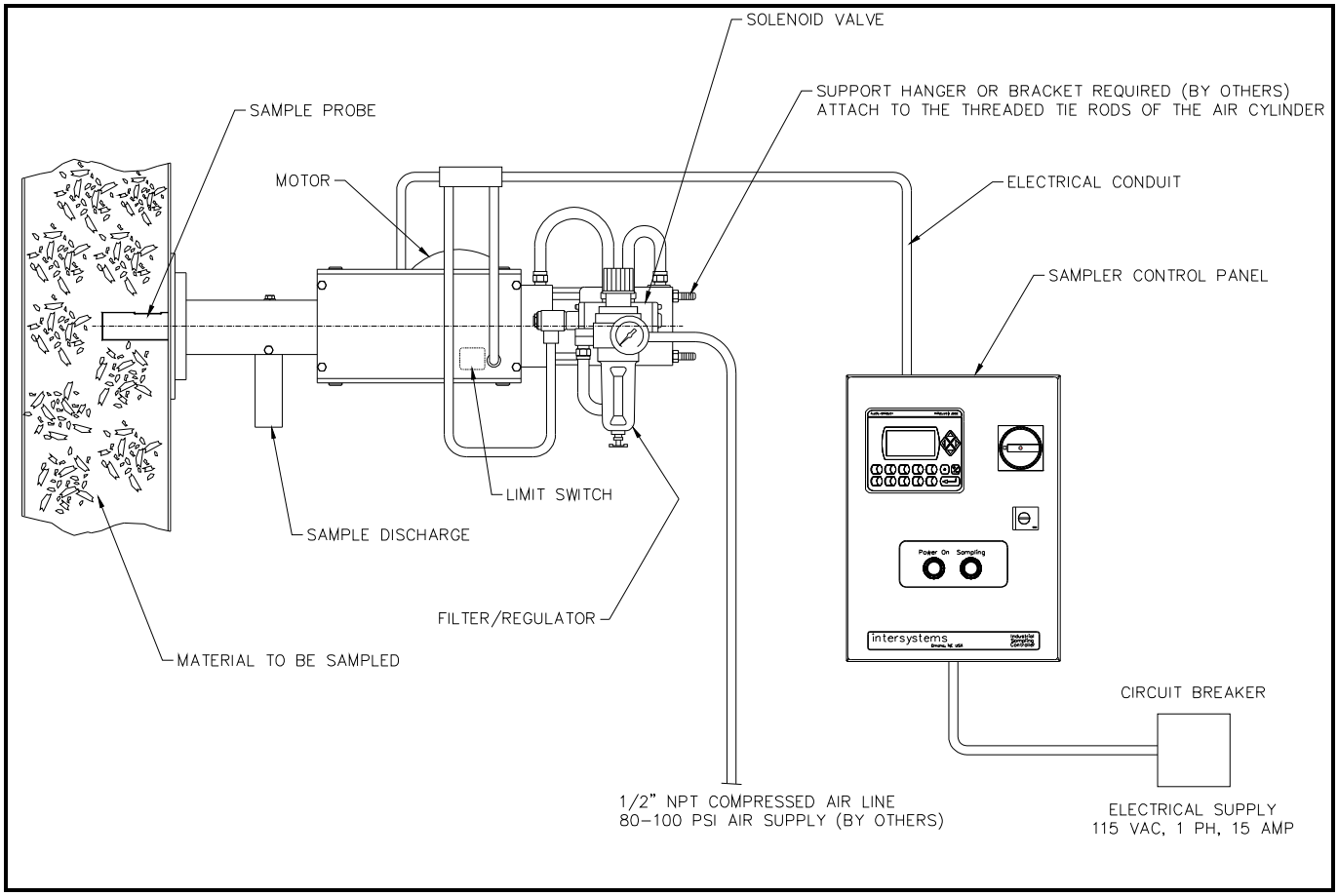


FIGURE 2-1, TYPICAL INSTALLATION, MODEL PS SAMPLING SYSTEM

2.2 Optional Features

The certified drawings indicate which, if any, optional features are included with a sampling system. Some of the more frequently specified optional features are briefly described in the following list.

A. Controller arranged to initiate a sampling cycle based on quantity or volume of material passing through conveying line rather than upon elapsed time periods.

B. Explosion-Proof Sampling System. There are several major differences in an explosion-proof sampler as compared to a standard sampling system. An explosion proof sampler will typically have the following features.

1. An explosion-proof solenoid on the directional control valve with the rating of:
   Class 1, Groups C & D, Division 1 & 2
   Class 2, Groups E, F & G, Division 1 & 2
2. An explosion-proof limit switch with the rating of:
   Class 1, Groups C & D, Division 1 & 2
   Class 2, Groups E, F & G, Division 1 & 2
3. An explosion-proof motor with the rating of:
   Class 1, Groups D, Division 1 & 2
   Class 2, Groups E, F & G, Division 1 & 2

The explosion proof sampler control is available in two enclosure classifications.

1. The NEMA 9 control with the rating of:
   Class 2, Groups E, F & G, Division 1 & 2
2. The NEMA 7 control with the rating of:
   Class 1, Groups C & D, Division 1 & 2
   Class 2, Groups E, F & G, Division 1 & 2

C. Purge air systems to either aid in material discharging from the sampler or to prevent material from building up in v-ring packing seals.

D. Components of special materials, such as 316 stainless steel, monel, inconel or nedox coatings.

E. Programmable Controls to sequence the sampler and the sample collection equipment.

2.3 Material Sampled

Most materials from light to heavy density powders, granules, flakes, viscous liquids and slurries.

2.4 Sampler Construction

Standard sampler housing construction is of painted cast aluminum. The sample probe, auger, gear housing and covers are of Type 304 Stainless Steel. The auger is 1-3/8" OD, machined from a solid bar (no welds on flights) and hand polished. Other materials and/or finishes appropriate to the operating environment and the material or product being sampled may be used. Refer to the certified drawing(s) for any optional or special components installed on the sampler.

III. GENERAL INSTALLATION REQUIREMENTS

3.1 Receiving Inspection

Carefully inspect the sampling system for damage as soon as it is received. Also, verify that the quantity of parts or packages actually received corresponds to the quantity shown on the packing slip. Report any damage or shortage to the delivering carrier as soon as possible. InterSystems' responsibility for the equipment ended with acceptance by the delivering carrier. Refer to the bill of lading.

3.2 Pre-Installation Preparation

Note, before starting sampling system installation, study this manual, the certified drawing(s) furnished with the system, and other applicable documents (including, but not limited to OSHA Regulations; the National Electrical Code; and all other applicable federal, state, and local codes and regulations).

3.3 Location

The PS sampler is typically mounted horizontally onto a vertical or horizontal conveying line carrying the product to be sampled as in Figure 2-1. The sampler axis must be installed perpendicular (at a 90 degree angle) to the axis of the product line for optimum performance. Additionally, the sampler should be located where the product has a non-turbulent flow pattern. The sampler and associated equipment should be located for ease of access and maintenance.

The sampler is to be installed only as shown on the certified drawing(s). If an alternate mounting arrangement is desired, contact InterSystems prior to installation for proper guidance. The sampler is of a general design with modifications specifically for your application. It may be necessary to rework the sampler in order for it to function properly if you alter the application.

3.4 General Mounting Guidelines

The sampler assembly is designed to support ONLY its own weight. As shown on the certified drawing of the sampler, the sampler must be installed with an additional hanger or bracket to rigidly support the sampler. The support can be attached the cylinder tie rods at the rear of the cylinder. The hanger or bracket should be capable of supporting approximately 60 lbs.

DANGER

SAMPLER CANNOT SUPPORT ANY OTHER EQUIPMENT OR CONVEYING LINE! COLLAPSE OF THE WHOLE SYSTEM CAN CAUSE DEATH, SERIOUS INJURY, AND EXTENSIVE DAMAGE TO EQUIPMENT. PROPERLY SUPPORT ALL SPOUTS, CONTAINERS, AND CONVEYING LINES.

NOTE: IF THE SURFACE AREA TO WHICH THE MOUNTING PLATE IS TO BE ATTACHED IS WARPED OR BENT, STRAIGHTEN AND SMOOTH THE METAL SO THE SAMPLER WILL BE PROPERLY ALIGNED WHEN THE INSTALLATION IS COMPLETE. THE SURFACE TO WHICH THE SAMPLER IS MOUNTED MUST NOT FLEX. THE SAMPLER CYLINDER MUST BE RIGIDLY SUPPORTED; ANY FLEXING WILL DAMAGE THE SAMPLER.

NOTE: OVER TIGHTENING THE MOUNTING FASTENERS WILL WARP OR CRACK THE SEAL HOUSING FLANGE. IMPROPER SAMPLING WILL RESULT.

3.4.1 Sampler Without Optional Mounting Accessories

A. Locate and mark the desired mounting location on the product line.

B. Cut and deburr a 2" diameter hole in the product line through which the sample tube will pass to collect material samples.

C. The mounting flange on the end of the seal housing has four .406 (13/32") clearance holes for 3/8" mounting screws or studs. Using the sampler mounting face as a pattern, layout or transfer punch the hole locations onto the conveying line.

D. Drill and tap the holes for the mounting screws, or weld studs to the conveying line for fastening the sampler.

F. Ensure that the o-ring is seated in the groove on the sampler housing mounting flange and verify that the sample tube extends and retracts without interference.

F. Install the sampler on the mount surface and tighten the mounting fasteners to insure proper sealing between the sampler seal housing and the product line.

G. If the conveying line is a pressure or vacuum line, check to see that the seal at the connection is airtight. Re-tighten fasteners if necessary.

H. The user or installer must provide a hanger or bracket to rigidly support the sampler. The support can be attached to the cylinder tie rods at the rear of the cylinder. The hanger or bracket should be capable of supporting approximately 60 lbs.

3.4.2 Factory Pre-Mounted Sampler

As furnished, the premounted sampler is already firmly attached to a length of tube, pipe, etc.

A. Remove a section of pipe or chute work where the sampler is to be installed.

B. Remove the sampler from the sampler premount.

C. Locate the sampler premount in the desired position.

D. Attach the sampler premount using one of the following methods.
   1-Weld the sampler premount ends directly to the existing pipe or chute work.
   2-Clamp the sampler premount ends to the existing pipe utilizing compression couplings
   3-Weld matching flanges to the existing pipe or chute work and sampler premount.

F. Ensure that the o-ring is seated in the groove on the sampler housing mounting flange.

F. Install the sampler on the mount surface and tighten the mounting fasteners to insure proper sealing between the sampler seal housing and the product line.

G. If the conveying line is a pressure or vacuum line, check to see that the seal at the connections are airtight. Re-tighten fasteners and/or re-weld if necessary.

H. The user or installer must provide a hanger or bracket to rigidly support the sampler. The support can be attached to the cylinder tie rods at the rear of the cylinder. The hanger or bracket should be capable of supporting approximately 60 lbs.

3.4.3 Field-Mounted Sampler Using Weld-On Plates

Weld-on plates are typically used when mounting the sampler to a large existing surface, such as on a storage hopper or a long section of chutework.

A. Locate and mark the desired mounting location on the conveying line.

B. Cut and deburr a 2" diameter hole in the conveying line through which the sample tube will pass to collect material samples.

C. Position the sampler mounting plate by aligning the 2" diameter sample probe clearance holes.

D. Tack weld the sides of the mounting plate to the product line surface and double check alignment.

E. Weld a continuous bead around all sides of the mounting plate.

NOTE: WHEN WELDING THE MOUNTING PLATE TO THIN GAUGE SHEET OR THIN PLATE, SKIP WELD ALTERNATING SIDES OF THE MOUNTING PLATE TO LIMIT HEAT INPUT TO MINIMIZE WARPING.

F. Ensure that the o-ring is seated in the groove on the sampler housing mounting flange and verify that the sample tube extends and retracts without interference.

G. Install the sampler on the mount surface and tighten the mounting fasteners to insure proper sealing between the sampler seal housing and the product line.

H. If the conveying line is a pressure or vacuum line, check to see that the seals at the connections are airtight. Re-tighten fasteners and/or re-weld if necessary. If the weld leaks, remove the sampler and o-ring before making any repair welds. Weld heat will damage or destroy the gasket and the Teflon seals in the seal housing.

I. The user or installer must provide a hanger or bracket to rigidly support the sampler. The support can be attached to the cylinder tie rods at the rear of the cylinder. The hanger or bracket should be capable of supporting approximately 60 lbs.

3.4.4 Field-Mounted Sampler Using Clamp-Type Mounting Brackets

Clamp-type mounting brackets are used on round tube or pipe conveying lines.

A. Locate and mark the desired mounting location on the conveying line.

B. Cut and deburr a 2" diameter hole in the product line through which the sample tube will pass to collect material samples.

C. Make sure the 1/8" thick Neoprene gasket is in place inside the clamp adapter.

D. Position the clamp bracket by aligning the sample probe clearance holes and tighten the clamp fasteners.

NOTE: OVER TIGHTENING THE BRACKET FASTENERS WILL DISTORT THE CONVEYING LINE TUBE OR PIPE. THE TUBE CAN CRACK OR BUCKLE, THE SAMPLER WILL NOT BE PROPERLY ALIGNED WITH THE PRODUCT STREAM, AND IN CASES WHERE THE CONVEYING LINE I.D. IS NEARLY THE SAME AS THE STROKE OF THE SAMPLER, THE SAMPLE TUBE MAY ACTUALLY STRIKE THE OPPOSITE SIDE OF THE TUBE AS IT EXTENDS.

F. Ensure that the o-ring is seated in the groove on the sampler housing mounting flange and verify that the sample tube extends and retracts without interference.

F. Install the sampler on the mount surface and tighten the mounting fasteners to insure proper sealing between the sampler seal housing and the product line.

G. If the conveying line is a pressure or vacuum line, check to see that the seal at the mounting clamp is airtight. Tighten clamp fasteners if necessary.

H. The user or installer must provide a hanger or bracket to rigidly support the sampler. The support can be attached to the cylinder tie rods at the rear of the cylinder. The hanger or bracket should be capable of supporting approximately 60 lbs.

3.5 Material Sample Transport Lines

The tubing used to transport material samples must be compatible with the operating environment and the material sampled. Typically a 1.50" ID flexible hose is slipped over the discharge tube and held in place by a worm clamp. The hose is then routed to allow material to flow via gravity to a convenient collection point. At that point the hose may be connected to a collection jar bracket or a Sample Collection System cabinet.

Rigid tubing may also be used if desired for the sample transport line.

Make all connections airtight and make sure all interior surfaces of joints are smooth and flush. Any ragged or raised tube ends will collect dust and debris as well as retard material flow. Air leaks can interfere with the pressure or vacuum conveying and sampling system. Escaping sample material can contaminate surrounding atmosphere and equipment.

3.6 Controller Location

A. Use vibration isolation pads when mounting the control enclosure or mount the controller in a vibration-free location.

B. Unless ordered for severe duty, locate controller so it is protected from water and dust.

C. Unless an explosion-proof rated controller was specifically ordered, DO NOT locate the controller in a hazardous area.

D. Most applications require that the sampler be in easy view of the controller.

3.7 System Wiring

Refer to the certified electrical drawing(s) for specific wiring requirements. As explained in Paragraph 4.1.6, the 20-position barrier terminal strip on the circuit board mounted INSIDE the controller enclosure is the connection point for ALL external circuitry.

The controller was completely assembled and tested with the sampler before it left the factory. The electrical installation must comply with OSHA Regulations; the National Electrical Code; and all other applicable federal, state, and local codes and regulations.

If wiring between the controller and the sampler unit is run through rigid conduit, use a short length of flexible conduit to connect wiring to the sampler. This will isolate the rigid conduit from any vibration originating in the product conveying line and sampler.

3.7.1 Electrical Power Requirements, System

110/120 VAC 50/60 Hz, Single Phase, 15 Amp Service.
Optional - 220/240 VAC 50/60 Hz, Single Phase, 10 Amp Service.

Refer to the certified electrical drawing(s) for specific wiring requirements. InterSystems strongly recommends that electrical service to the sampling system be an isolated line. Voltage fluctuations and line noise can affect the controller's circuit board, thus causing the sampler to malfunction.

3.7.1.1 Controller

110/120 VAC, 50/60 Hz, Single Phase, 12 Amp Max. (includes motor power requirements).
Optional - 220/240 VAC, 50/60 Hz, Single Phase, 6 Amp Max. (includes motor power requirements).

3.7.1.2 Solenoid Valve Coil

110/120 VAC, 50/60 Hz, Single Phase, 7 Watts.
Optional - 220/240 VAC, 50/60 Hz, Single Phase, 7 Watts.

3.7.1.3 Auger Drive Motor

Standard 110/120 VAC, 220/240 VAC, 50/60 Hz, Single Phase, 2.3/1.2 Full Load Amps.

Optional - Explosion Proof 110/120 VAC, 50/60 Hz, Single Phase, 4.4 Full Load Amps.

3.8 System Piping

NOTE: USE ONLY CLEANED, PICKLED, DESCALED, AND OILED PIPE FOR AIR SUPPLY LINES. DIRT, SCALE, AND DEBRIS USUALLY FOUND IN STANDARD PIPE QUICKLY CLOGS FILTER/REGULATORS, VALVES, ETC. USE ONLY TEFLON TAPE TO SEAL PIPE JOINTS. CAREFULLY APPLY THE TAPE TO PIPE AND FITTINGS SO NO FRAGMENTS ENTER THE SYSTEM.

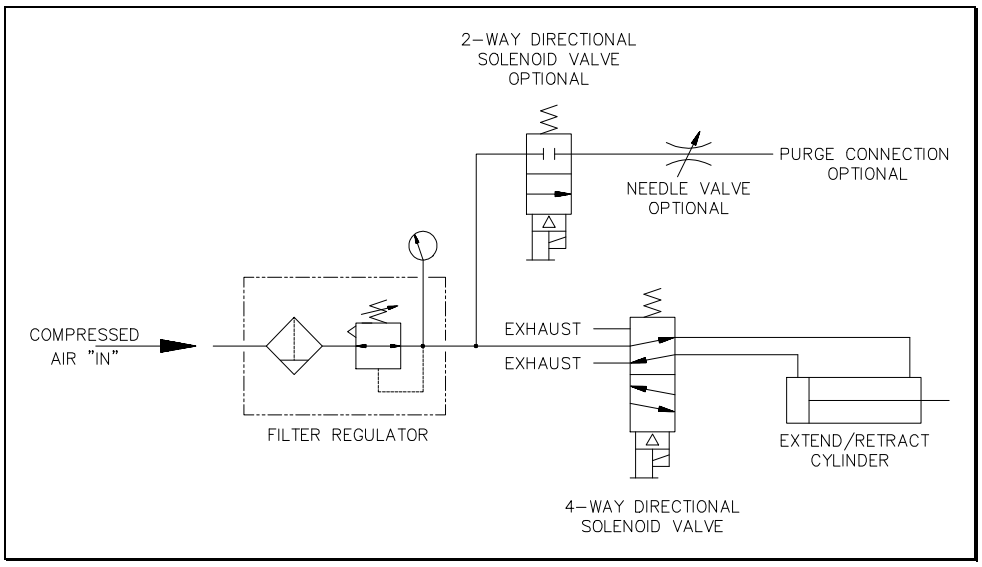


FIGURE 3-1, PNEUMATIC SCHEMATIC

The pneumatic system was pre-plumbed and tested with the sampler before it left the factory. The final installation must comply with OSHA Regulations and all other applicable federal, state, and local codes and regulations.

As shown on the certified drawing(s), the solenoid valves and filter/regulator (F/R) were mounted on the sampler at the factory. The user or installer must pipe the compressed air supply to the F/R. Minimum pipe size for the air supply to the filter/regulator is 1/2" NPT, reduced to 3/8" NPT at sampler. Larger piping to the sampler, and/or a surge tank located at the sampler, will be required on installations where the compressed air source is further than 200 feet from the sampler to prevent excessive drop in air pressure.

InterSystems recommends installing a lockable shutoff valve upstream of the filter/regulator. The shutoff valve facilitates maintenance as it allows the sampler's pneumatic system to be maintained and repaired without shutting down other equipment supplied from the same air source.

3.8.1 Compressed Air Consumption

A complete sampling cycle requires that the cylinder extend and retract and that the auger motor run the auger for a specified amount of time. To determine the compressed air requirements to operate the sampler, multiply the consumption per cycle (refer to chart) by the number of cycles per minute. The number calculated is the SCFM (Standard Cubic Feet per Minute) of air required. A typical cycle takes between 10-20 seconds, depending on the sampler size and control settings.

MODEL/SIZE	AIR CONSUMPTION PER SAMPLE CYCLE @ 80 PSI
PS-4	0.4 SCF
PS-6	0.6 SCF
PS-8	1.3 SCF
PS-10	1.6 SCF
PS-12	1.9 SCF

The pneumatic system on the sampler, consisting of the filter/regulator, directional control valve and air cylinder was pre-plumbed and tested at the factory. The regulator is factory set at 80 PSI.

The regulator cannot increase downstream outlet pressure above the upstream inlet pressure. If the pressure from the regulator is not sufficient to operate the cylinder, some means must be found to increase the inlet pressure to the regulator. Recommended air supply pressure is 80-100 PSI.

IV. OPERATIONS AND ADJUSTMENTS

DANGER

FAILURE TO OBSERVE ALL SAFETY RULES, WRITTEN AND IMPLIED, AND THOSE SUGGESTED BY COMMON SENSE, CAN RESULT IN DEATH, SERIOUS INJURY, AND /OR EQUIPMENT DAMAGE. LOCKOUT POWER BEFORE PERFORMING ANY MAINTENANCE.

4.1 Control Components And Their Functions

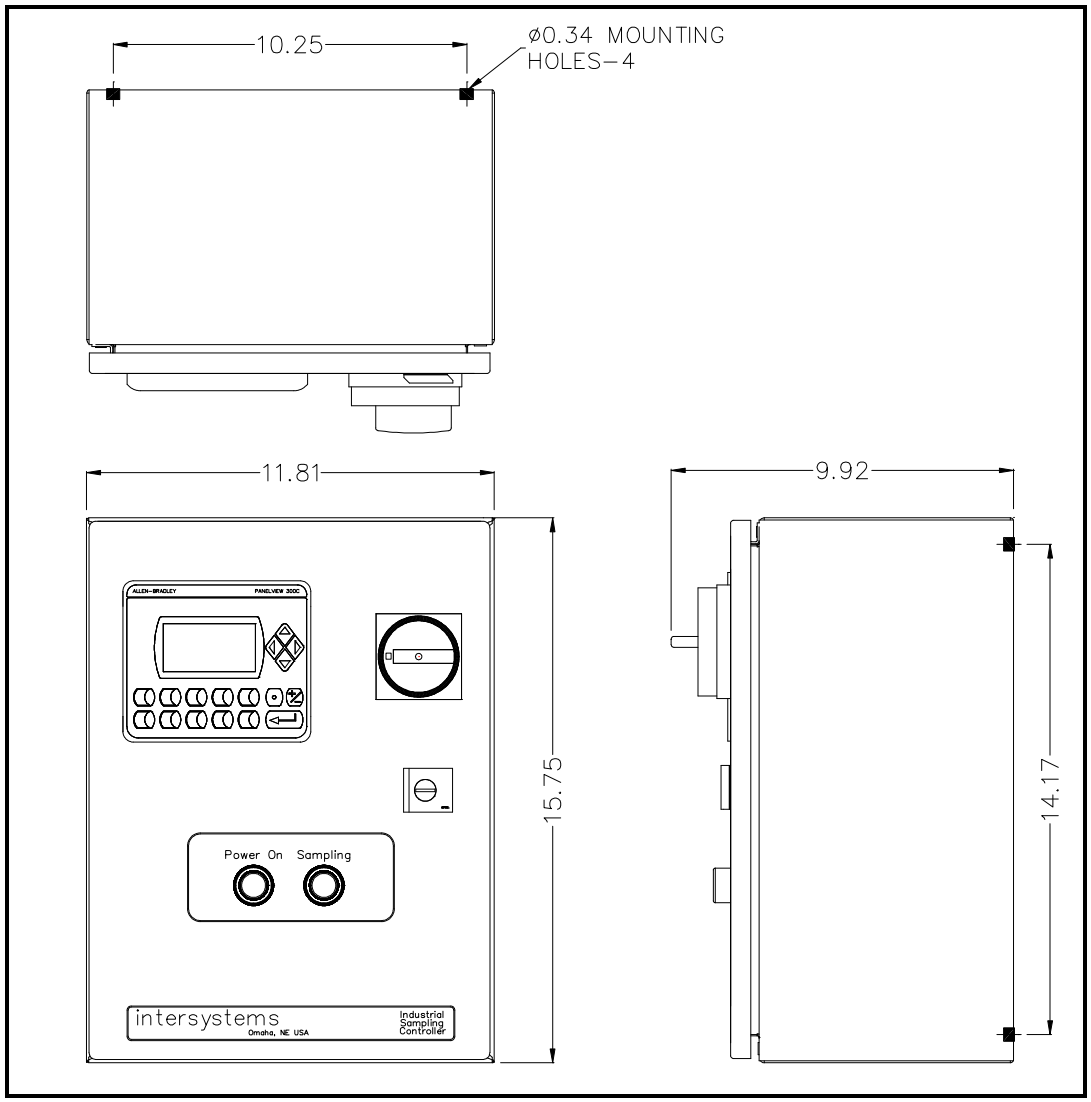


FIGURE 4-1, STANDARD NEMA 4 CONTROL PANEL DETAIL

Refer to the certified electrical drawing(s) for dimensions on control panels with optional features.

4.1.1 POWER OFF/ON SWITCH (S1)

The power OFF/ON Switch controls the electrical power to the controller and the sampler.

WARNING

THIS MACHINE STARTS WITHOUT WARNING. MOVING PARTS CAN CAUSE SEVERE INJURY. CLEAR AREA PRIOR TO CONTROLLER START-UP.

4.1.2 POWER Pilot Light

This light is illuminated as long as power is available to the controller and the POWER switch (S1) is set to ON.

4.1.3 SAMPLING Pilot Light

This light is illuminated when a sampling cycle has been initiated and will stay lit until the sampling cycle has completed.

4.1.4 Control Keypad

The operator Keypad is the source of all inputs necessary to operate the control.
The Operator Keypad is set up using linked menus to step through the operation of the control.
See the control manual 550791A for further information on the sampler control.

4.1.5 Main Fuse (FU1)

The fuse, located along the top center of the control, protects the controller and sampler components against overloads and short circuits.
For 110/120 VAC, 1PH operation, use ONLY a BUSS Type FNM 2 Amp, 250 VAC Slo-Blo fuse or equivalent.
For 220//240 VAC, 1PH operation, use ONLY a Buss Type FNM, 1 Amp, 250 VAC Slo-Blo fuse of equivalent.

4.1.6 Terminal Strip

This 19-position terminal strip is located along the bottom of the controller. It serves as the controller's interface and connection point for all external circuits and for the components mounted inside the enclosure. Refer to the certified electrical drawing(s).

4.1.7 Power Supply

The controller is equipped with a Power Supply which converts 120/240 VAC to 24 VDC for the operation of the PLC, Micro-View, display lights, input signals and the operation of the control relays. Refer to the certified drawing(s).

4.1.8 Control Relays

The controller is equipped with four control relays which are driven by the PLC 24 VDC outputs.
Each relay has a mechanical flag indicator showing the relay is energized.
The relay contacts are wired for 120/240 VAC. Refer to the certified drawing(s).

4.1.9 Micrologix PLC

The PLC for the control is an Allen Bradley Micrologix controller. The PLC operates using 24 VDC and is prewired to the proper terminal strip inputs and outputs. The processor program is protected to prevent any alterations to the existing program. This control is designed to run Intersystem equipment.

4.1.10 Manual Sampling

The operator may choose to run the sampler in Manual Mode by selecting manual mode in the Panel-View menu (Refer to manual 550791A). After selecting manual mode, each time F1 is pressed on the PanelView, a manual sample is initiated.

4.1.11 Automatic Sampling

The operator may choose to run the sampler in the Automatic Mode by selecting automatic mode in the PanelView menu (Refer to manual 550791A). Note: A jumper or switch must be installed between the controller's terminals 1 and 2 to initiate automatic sampling. When automatic mode is selected, an automatic sample will not be initiated until the jumper circuit between terminals 1 and 2. By installing a remote switch across terminals 1 and 2, the user can initiate the sampling cycle remotely. See manual 550791A for sampling automatic sampling options.

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DANGER

THIS CONTROL IS TO BE OPERATED ONLY ON THE VOLTAGE DESIGNATED ON THE CERTIFIED ELECTRICAL DRAWING! FIRE OR EXPLOSION MAY RESULT, WHICH CAN CAUSE DEATH, SERIOUS INJURY, AND EXTENSIVE DAMAGE TO EQUIPMENT. DO NOT CHANGE THE 115/230 VAC SWITCH SETTING WITHOUT CONSULTING INTERSYSTEMS.

4.2 Sampler Mounted Electrical Components

4.2.1 Limit Switch

This switch is actuated when the sample probe is in its retracted position. Upon retraction of the sample probe the limit switch is actuated and the closure of the normally open contacts signals the controller to allow the auger motor to run.

Correct wiring termination is essential to proper sampler operation. Refer to figure 4-3, it shows two models utilized on the PS sampler and the physical orientation of the proper wiring connections.

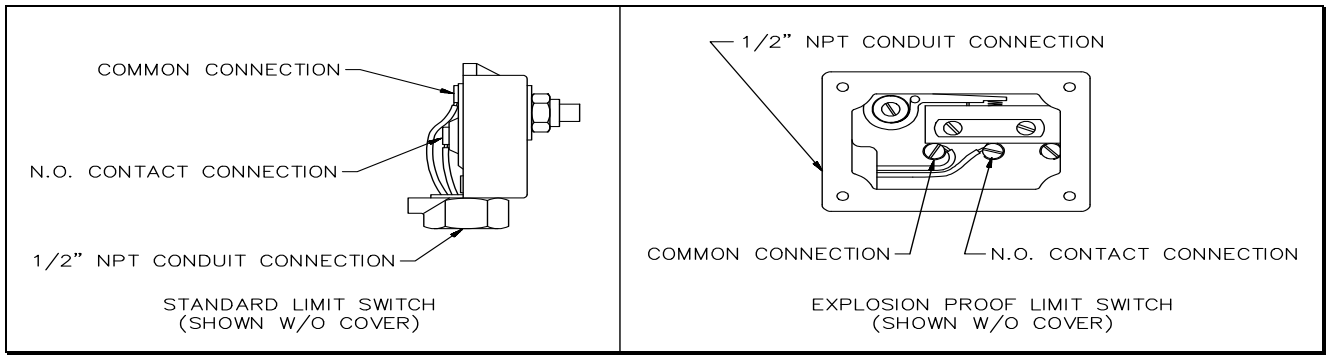


FIGURE 4-3, LIMIT SWITCH CONNECTIONS

4.2.2 TEFC Gearmotor

This gearmotor drives the sample auger through a set of right angle bevel gears. A label is located on the motor designating the correct direction of rotation (reference Figure 1-1). Verify that the motor is turning the proper direction of rotation when wiring the system. On initial setup, test run the sampler when no material to be sampled is present (conveying line shut down, hopper empty, etc.). This will prevent the sample auger from jamming if the motor is running backwards.

NOTE: DO NOT RUN THE MOTOR THE WRONG DIRECTION. EXTENSIVE DAMAGE TO THE SAMPLER WILL RESULT.

4.2.3 Explosion Proof Motor (Optional)

This motor is direct coupled to the gear reducer to drive the sample auger. A label is located on the motor designating the correct direction of rotation (reference Figure 1-2). Verify that the motor is turning the proper direction of rotation when wiring the system. On initial setup, test run the sampler when no material to be sampled is present (conveying line shut down, hopper empty, etc.). This will prevent the sample auger from jamming if the motor is running backwards.

4.3 Pneumatic Components

4.3.1 Solenoid Valve V-1

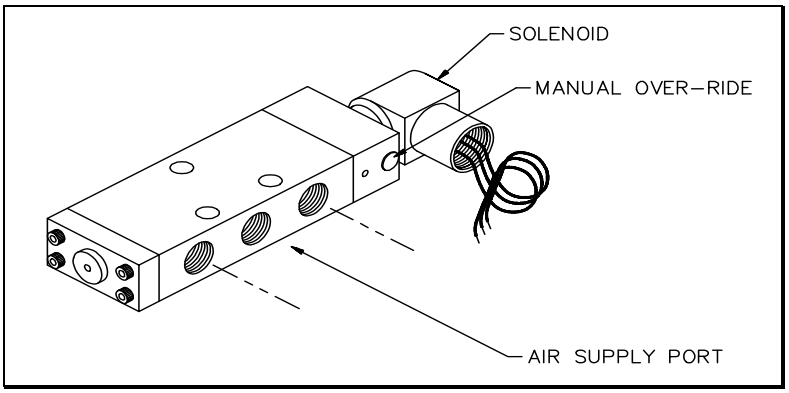


FIGURE 4-4, SOLENOID VALVE

This valve is a 4-way, 2 position, spring return, single solenoid operated control valve. This valve controls the air cylinder, alternately pressurizing the cap end and rod end of the cylinder to extend and retract the sample tube.

When the valve's solenoid is energized, the internal valve spool shifts, pressurizing the cap end of the cylinder. The cylinder extends, pushing the sample probe into the product stream. When the solenoid is de-energized, the spring operator forces the valve spool to shift again, pressurizing the rod end of the cylinder. The cylinder retracts, pulling the sample probe from the product stream.

The valve has a manual over-ride button that allows the operator to cycle the sampler air cylinder without the aid of the controller. By pushing the manual over-ride button, the internal valve spool is positioned manually and the sampler air cylinder will extend and remain there until the button is released. When the over-ride button is released the cylinder will return to its home position.

4.3.2 Needle Valve (Optional)

This valve regulates the air flow feeding the purge option. This valve will require some adjustment upon initial sampler start up. Figure 7-2 shows the two available purge configurations.

A. The "Sample Purge" type aids in the flow of material out of the sampler and into the sample container. This purge, which is controlled by the sample purge solenoid valve V-2, forces air into the sample probe.

B. The "Lantern Ring Purge" helps keep the material being sampled away from the sampler packing seals. This purge, which only has the needle valve for control, forces air continuously ahead of the probe seals to keep the sampled material from being forced into the seals.

To set, completely close the valve and mark a home position. Open the valve completely and count the number of turns. Close the valve approximately half way. This can be further fine tuned based on customer requirements.

4.3.3 Sample Purge Solenoid Valve V-2 (Optional)

This valve operates the sample purge option. The valve is a 2-way, normally closed, spring return, single solenoid operated control valve. As shown in Figure 7-2, it is plumbed in conjunction with the needle valve to correctly control the purge air flow. The purge solenoid is typically wired in parallel with sampler auger motor. When the sample auger is turning the purge air is being fed into the sample probe thus aiding in the flow of material out of the sampler. Refer to the certified electrical drawing(s) for proper wiring requirements.

4.3.4 Air Filter/Pressure Regulator

The air filter/regulator assembly provides a clean and regulated air supply to the samplers pneumatic components. A pressure gauge gives the operator an accurate reading of the downstream air pressure. The regulator is equipped with an adjustment knob for controlling the outlet pressure and a manual "pet-cock/push" type drain for draining the filter bowl.

Prior to introduction of air supply, turn the adjustment knob counter-clockwise until all load is removed from the regulating spring. Turn on system air pressure. Turn adjustment knob clockwise until desired outlet pressure is reached.

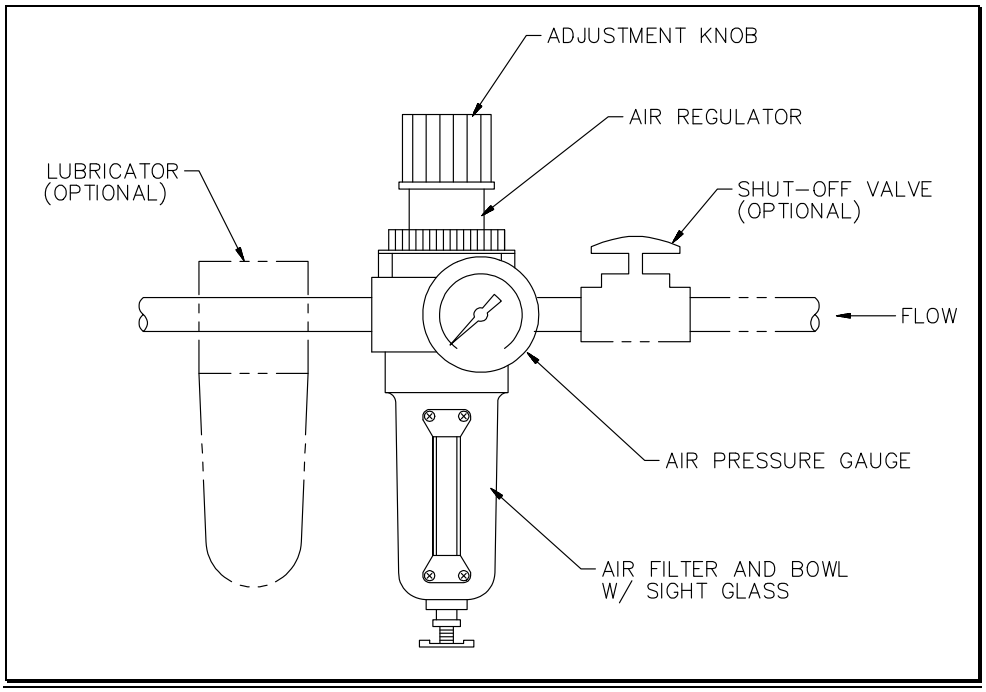


FIGURE 4-5, FILTER/REGULATOR

To avoid minor re-adjustments after making a change in the pressure setting, always approach the desired setting from a lower pressure. When reducing from a higher setting to a lower setting, first reduce to a pressure setting lower than desired and then adjust upward.

To "lock-in" the pressure setting on the regulator, push the lockring on the adjustment knob down until it snaps into place. To release pull the lockring upward. The pressure setting can be made tamper resistant by installing a seal wire in the groove above the lockring.

4.3.5 Pneumatic Cylinder

This double-acting air cylinder extends and retracts the sample probe. Stroke length varies with the sample probe stroke. The cylinder rod is connected to the sample probe by means of the threaded probe adjustment rods. Solenoid valve V-1 controls extension and retraction of the cylinder.

V. MAINTENANCE AND REPAIR

DANGER

FAILURE TO OBSERVE ALL SAFETY RULES, WRITTEN AND IMPLIED, AND THOSE SUGGESTED BY COMMON SENSE, CAN RESULT IN DEATH, SERIOUS INJURY, AND /OR EQUIPMENT DAMAGE. LOCKOUT POWER BEFORE PERFORMING ANY MAINTENANCE.

5.1 General Maintenance

A good maintenance program involves thorough general housekeeping, adequate periodic re-lubrication, and replacement of worn or damaged components.

5.2 Periodic Inspection

At regularly scheduled intervals, while observing all safety precautions, observe the sampler as it operates. Inspect for:

A. Loose or missing hardware

B. Noisy motor or motor/reducer bearings

C. Overheated motor or reducer

D. Adequate lubricant in lubricator

E. Structural damage

F. Rust or corrosion

G. Damaged wiring and conduit, exposed conductors and connections

H. Damaged airlines or pneumatic components

I. Make sure that all guards are in place and that all warning labels are in place and legible. Section I, GENERAL SAFETY INFORMATION, explains the purpose and intended location of the warning signs. Warning signs are an important part of any safety program; replace any missing signs IMMEDIATELY!

5.3 Lubrication

5.3.1 Auger Bevel Gears

The auger bevel gears are designed to run dry. If grease is applied to the gears, extra care must be taken to ensure that the grease remains free from contaminates.

5.3.2 Gear Reducer

This gear reducer is lubricated for life at the manufacturer factory and periodic relubrication should not be required under normal conditions. If leakage is detected repair as needed, clean gear case completely and refill with Hodson 4111 or Gulf Harmony #121 heavy gear oil. The gear case will require approximately 4 ounces (by weight) to fill.

5.3.3 Airline Lubricator

An airline lubricator is not required. The cylinder is of a non-lube design requiring NO lubrication. If the use of a lubricator is desired, it must be field mounted between the F/R and the directional control valve. If a lubricator has been added to the system, the user must determine the appropriate lubricant and the proper intervals for refilling the reservoir. Refer to the manufacturer's technical literature. Note that by introducing oil into the airline, it will be discharged into the surrounding environment near the air exhausts of the directional control valve(s) on the sampler.

5.4 Draining and Servicing the Filter

CAUTION

ESCAPE OF PRESSURIZED AIR, FLUIDS, AND CONTAMINANTS AT HIGH VELOCITY CAN CAUSE INJURY TO UNPROTECTED EYES. ALWAYS WEAR EYE PROTECTION WHEN DRAINING A FILTER.

Drain the accumulated fluid whenever the fluid level in the reservoir (quiet-zone) rises to the lower baffle. Filters have either a screw-type drain or a push-type drain. If the filter requires frequent draining, consider installing an automatic drain or an air drying system. Periodically, the bowl may need to be removed to clean out accumulated moisture and contaminants.

A. Shut off and lock out the air supply.

B. Operate a valve or loosen an airline connection to relieve all pressure downstream from the filter/regulator.

C. Remove and clean the bowl; various types of clamp rings or threaded collars are used to retain bowls.

NOTE: THE BOWLS OF FILTER/REGULATORS CAN NOT BE REMOVED WHILE PRESSURIZED! INTERNAL PRESSURE PREVENTS THE CLAMP RING OR THREADED COLLAR FROM TURNING.

D. Clean or replace the filter element.

E. If the bowl seal is damaged or brittle replace it. In any event lightly coat the seal with petroleum-based grease to help hold it in position.

F. Reinstall the bowl. Turn on pressure and make sure the bowl is seated and sealed.

5.5 Mechanical Repair Procedures

5.5.1 Adjustment of Seal Pressure

A series of v-ring packing assemblies and spacers within the seal housing support and seal the sample tube. When the sampler has operated for an extended period of time, the seals may wear or extrude. If evidence of leaking from the conveying line along the sample tube is noticed, first try to increase the compressive force on the seal and spacer stack.

As shown on the section drawings of the samplers in Section VII, the v-ring packing seals are held compressed by the compression plate. Two 1/4-20UNC hex head screws clamp the plate to the rear flange of the seal housing. Using a 7/16" wrench evenly tighten the two cap screws a 1/2 turn at a time. This will compress the seal and spacer stack, increasing the seal effect on the sample tube.

NOTE: EXCESSIVE COMPRESSION ON THE SEAL AND SPACER STACK WILL RESULT IN PERMANENTLY DEFORMED & INEFFECTIVE SEALS THAT WILL HAVE TO BE REPLACED. IT IS POSSIBLE TO OVER TIGHTEN THE SEAL AND SPACER STACK WHICH CAN RESULT IN THE SEIZURE OF THE SAMPLE TUBE, RENDERING IT INCAPABLE OF EXTENDING OR RETRACTING.

If the leak can not be stopped by adjusting seal pressure, then the seals will have to be replaced as explained in Section 5.5.2.

5.5.2 Seal Replacement

When following the instructions below, refer to the applicable drawing of the sampler. Reference the drawings in Section VII and the certified drawing(s).

A. Shutoff and lockout all power (electrical and pneumatic).

B. Shut down the conveying line and remove the sampler assembly. Install a properly designed cover plate over the hole in the conveying line. Save the gasket(s); if any have deteriorated or are damaged, order replacements.

C. In order to remove the seals, remove and retain the following components and save ALL fasteners:

1. Remove the samplers top and bottom covers.

2. Remove the four 1/4-20UNC hex head bolts attaching the side panels to the seal housing and the two 3/8-16UNC hex head bolts attaching the guide rods to the seal housing.

3. Remove the two 1/4-20UNC hex head compression plate screws.

4. Pull the seal housing off of the sample probe.

5. Remove the 1/4-20UNC hex head bolt(s) over the discharge spacer and the purge spacer if applicable.

6. Remove the four #10-24UNC flat head screws attaching the seal retainer to the seal housing.

7. Remove the seals and spacers taking care to avoid damaging the seal housing bore. Use a 2" dia. round plastic bar or wooden dowel to push with, if necessary.

8. Replace worn items and clean the remaining components. Remove any burrs or scratches from the bore of the seal housing.

D. Rebuild the sampler in the following order:

1. Re-install the seal retainer plate using the four #10-24UNC flat head screws.

2. Refer to the Teflon Seal Spacer Arrangement, Figure 7-1. It illustrates the order of insertion and orientation of seals and spacers. Carefully insert the seals and spacers from the rear of the seal housing, pushing them towards the front.

3. Re-install the 1/4-20UNC hex head bolt(s) over the discharge spacer and the purge spacer if applicable.

4. Position the compression plate so that it bears on the end of the rear spacer. Loosely re-install the two 1/4-20UNC hex head screws which clamp the plate to the seal housing flange.

5. Carefully slide the seal housing over the sample tube and into position.

6. Re-install the four 1/4-20UNC hex head bolts fastening the side plates to the seal housing. Install the two 3/8-16UNC hex head bolts fasting the guide rod to the seal housing. Make certain that the seal housing is aligned with the sample tube so there is no side thrust. Securely tighten all the screws.

7. Evenly tighten the compression plate screws to firmly compress the seal and spacer stack.

E. Remove the cover plate on the sample conveying line and reattach the sampler.

F. Restore power to the sampler and operate it through several collection cycles. If air leaks along the sample tube are detected, evenly tighten both compression plate screws 1/2 turn. Make sure compression plate flange remains parallel to the seal housing flange. Repeat the process until no air leakage is detected.

G. Re-install the top and bottom covers of the sampler.

5.5.3 Sample Probe, Auger And Seal Replacement

When following the instructions below refer to the applicable drawing of the sampler. Reference the drawings in Section VII and the certified drawing(s).

A. Follow instructions in Section 5.5.2 "A" through "C".

B. Disconnect the sample probe from the air cylinder assembly by removing the two 9/16" hex head nuts on the threaded adjustment rods

C. Remove the two 1/4-20UNC hex head lock nuts and bolts that fasten auger guide plate to the sample probe. Remove the auger guide plate and pull the sample probe off the auger and the auger bearing housing.

D. Loosen the two set screws on the 27 tooth bevel gear and remove the gear and retaining ring from the auger shaft.

E. Use a fine file or emery paper to remove any screw burrs from the end of the auger shaft.

F. Remove the auger from the bearing housing. Be sure to save the thrust washers on the auger shaft.

G. Clean and inspect any items to be reused. Replace any worn or damaged parts.

H. Re-assemble the auger, thrust washer, auger bearing housing, thrust washer, 27 tooth bevel gear and retaining ring. Keeping the assembly tight, align one of the set screws directly over the flat spot on the auger shaft and tighten both set screws.

I. Carefully slide the auger and bearing housing assembly back into the sample probe. Make sure that the front shaft of the auger slips into the auger end bearing located inside the capped end of the sample probe.

J. Replace the auger guide plate over the probe. Align the holes in the auger guide plate, the sample probe, and the auger bearing housing. Re-install and tighten the 1/4-20UNC hex head bolts with lock nuts.

K. Re-assemble the sample probe to the air cylinder assembly by replacing the two 3/8-16UNC hex head nuts on the threaded adjustment rods. Make sure the air cylinder is fully retracted and check for proper meshing of the gears; there must be full depth engagement of the gear teeth, but no bending of the gearmotor shaft.

NOTE: IF THE GEAR TEETH DO NOT MESH PROPERLY, THE GEARS WILL WEAR RAPIDLY.

L. Continue by following instructions in Section 5.5.2 "D" through "G"

5.5.4 Bevel Gears Replacement

When following the instructions below refer to the applicable drawing of the sampler. Reference the drawings in Section VII and the certified drawing(s).

NOTE: ALWAYS REPLACE BEVEL GEARS IN SETS. REPLACING A SINGLE GEAR IS A FALSE ECONOMY AS THE NEW GEAR WILL WEAR IMMEDIATELY.

A. Shutoff and lockout all power (electrical and pneumatic).

B. Shut down conveying line and remove the sampler assembly. Install a properly designed cover plate over the hole in the conveying line. Save the gasket(s); if any have deteriorated or are damaged, order replacements.

C. Remove the top and bottom covers of the sampler.

D. Remove the four 1/4-20UNC hex head bolts attaching the motor side panel to the seal housing and cylinder mount plate.

E. Loosen the two set screws in the 18 tooth bevel gear and slip it off the gearmotor shaft. Leave the gear spacer on the shaft unless it requires replacement. Save the shaft key.

F. Install the new 18 tooth bevel gear on the gearmotor shaft (it should be tight against the spacer). Make sure the shaft key is in place and tighten the set screws.

G. Disconnect the sample probe from the air cylinder assembly by removing the two 3/8-16UNC hex head nuts on the threaded adjustment rods

H. Extend the sample probe into the seal housing by pushing on the auger guide plate.

I. Loosen the two set screws in the 27 tooth bevel gear and slip it and remove the retaining ring off the auger shaft. Leave the thrust washer on the shaft unless it requires replacement.

J. Install the new 27 tooth bevel gear on the auger shaft (make sure the thrust washer is in place). Insert a wooden stick or soft metal bar into the sample slot opening and push the auger tight against the auger bearing housing. Keeping the assembly tight, align one of the gears set screws directly over the flat spot on the auger shaft and tighten both set screws. Re-install the retaining ring.

K. Replace the motor side panel assembly. Re-install the four 1/4-20UNC hex head bolts and tighten.

L. Retract the sample probe into the seal housing by pushing on the end of the probe. Reconnect the sample probe to the air cylinder assembly by replacing the two 3/8-16UNC hex head nuts on the threaded adjustment rods. Make sure the air cylinder is fully retracted and check for proper meshing of the gears; there must be full depth engagement of the gear teeth, but no bending of the gearmotor shaft.

NOTE: IF THE GEAR TEETH DO NOT MESH PROPERLY, THE GEARS WILL WEAR RAPIDLY.

M. Remove the cover plate on the sample conveying line and reattach the sampler.

N. Restore power to the sampler and operate it through several collection cycles. If air leaks along the sample tube are detected, tighten both compression plate screws 1/2 turn (making sure compression plate flange remains parallel to the seal housing flange. Repeat the process until no air leakage is detected.

O. Re-install the top and bottom covers of the sampler.

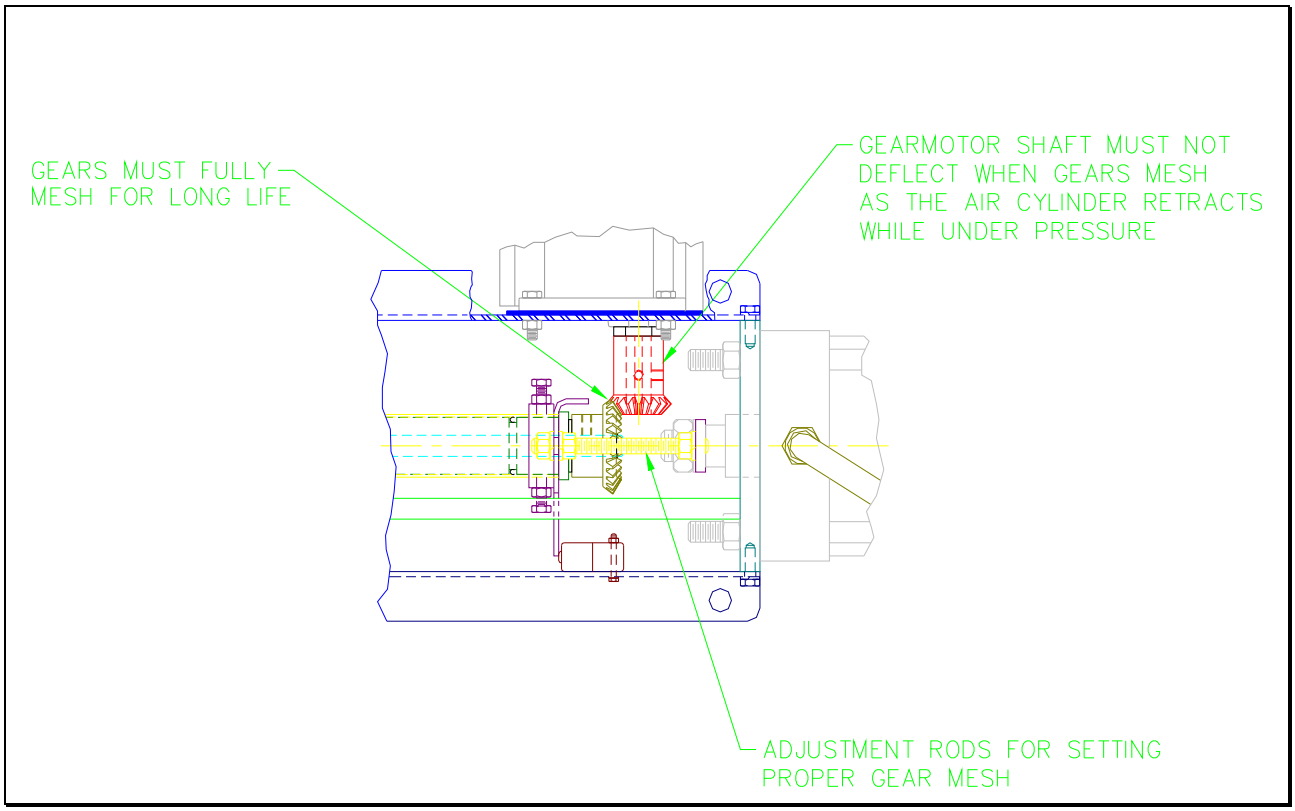


FIGURE 5-1, BEVEL GEAR ALIGNMENT

VI. TROUBLESHOOTING

6.1 General PS Sampler Troubleshooting

DANGER

CARELESS OR ACCIDENTAL RESTORATION OF POWER CAN RESULT IN DEATH OR SERIOUS INJURY. MAKE CERTAIN AREA IS CLEAR BEFORE REMOVING LOCKOUTS.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Sampler does not cycle in either auto or manual modes (Power light Off).	Power switch OFF.	Turn power switch ON.
	Circuit breaker is open.	Reset breaker.
	Main fuse is blown. (FU1)	Replace. Refer to Section 4.1.5
	Faulty supply wiring.	Correct. Refer to certified electrical schematic.
	Defective power switch.	Replace switch.
Sampler does not cycle in either auto or manual modes (Power light On).	Faulty system wiring.	Correct. Refer to certified electrical schematic.
	No or low air pressure.	Turn air supply on and set regulator to 80-100 PSI.
	Defective control valve.	Refer to Section 6.3.
Sampler cyles in manual mode but not in automatic mode	Automatic initiate jumper not installed	Install jumper across terminals 1 & 2
Sample size too small or large.	Solenoid time on setting too low or high.	Adjust timer settings. Refer to Manual 550791A
Sampler sluggish (Operates too slowly).	Inadequate air supply.	Increase line size or add surge tank.
	Regulator set too low.	Reset. Refer to Section 4.3.4.
	Filter clogged.	Clean as outlined in Section 5.4.
	Airline from filter regulator blocked or damaged.	Inspect and correct.
	Cylinder seal leakage.	Refer to Section 6.4.

General PS Sampler Troubleshooting (continued)

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Auger bevel gears wear rapidly.	Gears are not meshing properly.	Adjust. Refer to Section 5.5.4.
	Sample container over filling and material is backing up into the sampler.	Empty sample container promptly or incorporate a sensor to shut off the sampler when the container is full.
	Limit switch LS-1 not wired properly or defective.	Inspect. Refer to Section 4.2.1.
	Large air pressure drop during sampling cycle.	Increase air supply line size. Refer to Section 3.8 & 3.8.1.
Sampler makes loud banging noise when probe retracts.	Gears are rotating after disengagement.	Make sure motor is coming to a complete stop before taking another sample.
Sampler leaks air or material continuously out the sample discharge.	Packing seals not tight.	Tighten. Refer to section 5.5.1.
	Packing seals worn out.	Inspect & replace. Refer to Section 5.5.2.
	Sample probe worn out.	Inspect & replace. Refer to Section 5.5.3.
Auger motor runs when probes extends.	Control program mode improperly set	Change mode to “0”. Refer to Manual 550791A
	Limit switch LS-1 not wired properly or defective.	Inspect, repair or replace. Refer to Section 4.2.1.
Auger motor does not run (Probe extends and retracts).	Motor not wired properly.	Correct. Refer to certified electrical schematic.
	Defective motor.	Replace.
	Defective Control Relay	Replace
Sample probe does not extend or retract.	No or low air pressure.	Turn air supply on and set regulator to 80-100 PSI.
	Defective control valve.	Refer to Section 6.3.
	Material caked up in seals.	Inspect & replace. Refer to Section 5.5.2.
	Defective air cylinder seals.	Inspect & replace. Refer to Section 6.4.1.
	Sample probe bent or jammed.	Inspect & replace. Refer to Section 5.5.3.

6.2 PC Board Troubleshooting

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Motor fuse blows continuously.	Motor wired improperly.	Correct. Refer to the certified electrical schematic.
	Motor jammed.	Inspect & replace.
	Auger seized up in sampler.	Inspect & replace. Refer to Section 5.5.3.
	Defective Control component	Inspect & replace.
Sampler probe extends and retracts but motor does not run. (control resets).	Low voltage power supply.	107 vac minimum for 110/120 vac. 215 vac minimum for 220/240 vac.
	Inadequate power supply wiring.	Monitor voltage when motor starts. It should not drop below 107 vac, or 215 vac.

NOTE: PS SAMPLERS REQUIRE THE MODE SWITCH TO BE POSITIONED ON SETTING "0" (ZERO). REFER TO THE CONTROL MANUAL 550791A.

6.3 Directional Solenoid Valve Troubleshooting

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Valve does not shift	No or low air pressure.	Turn on air supply and set regulator to 80-100 PSI.
	Faulty field wiring.	Check for full line voltage at the solenoid.
	Solenoid coil burnt out.	Replace coil if no continuity through coil.
	Valve clogged or stuck.	Remove & clean. Or replace.
	Relay CR1 Defective	Replace
Valve leaks air continuously out an exhaust port.	Defective valve seals.	Refer to Section 6.4.2.
	Defective cylinder seals.	Refer to Section 6.4.2.

There must be at least 80 PSI pressure at the valve. The valve pilot operators are air assisted. If there is insufficient pressure the valve will not shift or may not shift completely.

Observe the pressure gauge. Assume the gauge indicates sufficient pressure when the sampler is idle, 85 PSI for example. If the pressure drops significantly to perhaps 55 PSI when the valve shifts, a blocked or damaged air line should be suspected.

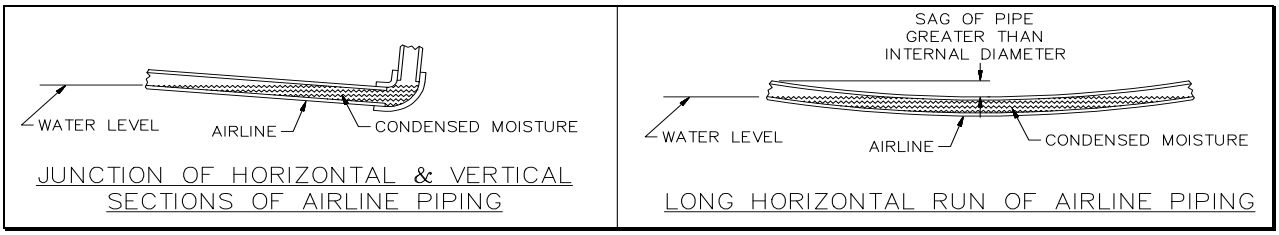


FIGURE 6-1, CONDENSED MOISTURE BLOCKING AIRLINE

One often overlooked cause of insufficient air flow is moisture condensing and collecting in a low spot in the supply line. Figure 6-1 illustrates an exaggerated example of such a problem. It can be seen that if the pipe sags only slightly over a long distance and water collects in the low spot over an extended period of time, the airline could be partially or completely blocked. A similar condition often occurs where there is a junction of horizontal and vertical sections of an air line.

This problem is particularly prevalent when there is high ambient humidity and the equipment operates infrequently and intermittently, as in the case of a sampler.

NOTE: ALL HORIZONTAL RUNS OF AN AIRLINE SHOULD HAVE A MOISTURE TRAP AND THE TRAPS SHOULD BE DRAINED FREQUENTLY; AT LEAST ONCE A DAY; ESPECIALLY, WHEN HUMIDITY LEVELS ARE HIGH.

6.4 Air Components Troubleshooting

6.4.1 Cylinder Leaking

A. External Leakage

1. Rod seal leakage can generally be traced to worn or damaged seals. Examine the piston rod for wear or damage. Replace the rod and seals if rod's surface is rough or worn out-of-round.

2. Soft or gummy seals are evidence of incompatibility with some substance in the air supply. Evaluate the area where the air intake is located. If an airline lubricator is included in the system, check to see if the lubricant being used is compatible with the seal material.

B. Internal Leakage

1. The lipseal piston seals are virtually leak free unless they are worn or damaged. Replace defective seals.

2. Contaminants in the air supply can lead to scored cylinder walls, resulting in rapid seal wear. If such is the case, check to see if the filter is being drained frequently. A different type of filter may be required; one that can remove finer particles or one that can filter out different kinds of contaminants.

3. Possible piston cylinder leakage, apparently indicated by piston drift is not always traceable to the piston. A leak through a closed valve port can also cause piston drift.

To determine if the cylinder piston is leaking (cylinder is bypassing), remove the cylinder retract hose from port 4 of the valve. This is the hose from the nose (piston rod) end of the cylinder. Use the valve's manual override to extend the cylinder. When the cylinder is fully extended, if air leaks from the retract port hose, the cylinders is bypassing. The cylinder will need to be repaired or replaced

6.4.2 Valve vs. Cylinder Leak Test

When there is continuous leakage out of a valve exhaust port, proceed as follows to determine if the leak is caused by defective valve seals or by defective cylinder seals.

A. Cylinder retracted as shown in Figure 6-2A

1. If there is continuous leakage out of Port "5", the valve seals are defective and must be replaced.

2. If there is continuous leakage out of Port "3", the problem can be with the valve seals or the cylinder seals. To determine which proceed as follows:
   a. Disconnect the line between Valve Cylinder Port "2" and the cylinder per Figure 6-2B.
   b. If leakage continues out of Port "3" and/or Cylinder Port "2", the valve seals are defective and must be replaced.
   c. If there is a leakage out of the line from the cylinder, the cylinder seals are defective and must be replaced.

B. Cylinder extended as shown in Figure 6-2C.

1. If there is continuous leakage out of Port "3", the valve seals are defective and must be replaced.

2. If there is continuous leakage out of Port "5", the problem can be either the valve seals or the cylinder seals. To determine which proceed as follows:
   a. Disconnect the line between Valve Cylinder Port "4", and the cylinder per Figure 6-2D
   b. If leakage continues out of Port "5" and/or Cylinder Port "4", the valve seals are defective and must be replaced.
   c. If there is a leakage out of the line from the cylinder, the cylinder seals are defective and must be replaced.

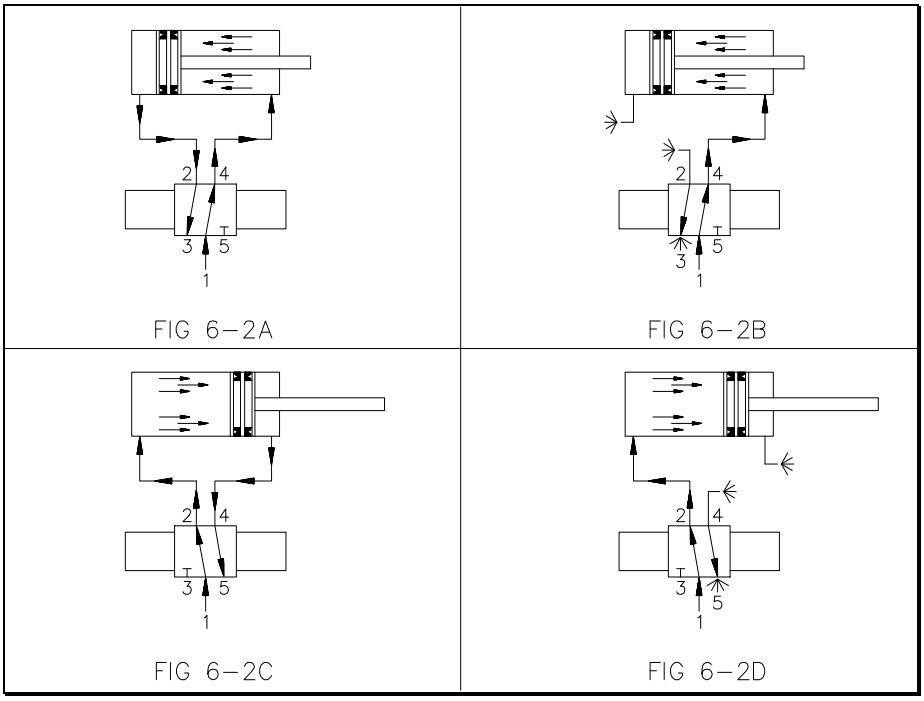


FIGURE 6-2, VALVE VS. CYLINDER LEAK TEST DIAGRAM

VII. REPLACEMENT PARTS

7.1 Scope

The certified drawings list the non-standard components that have been incorporated into the equipment. InterSystems, Inc. normally stocks non-fabricated parts and non-custom OEM parts. Replacement parts for any other components, including fabricated parts and custom OEM components can be supplied upon request.

7.2 Ordering Parts

Direct parts orders or requests for technical assistance to your sales representative or to:

InterSystems, Inc.
9575 N. 109th Ave.
Omaha, NE. 68142
Phone: (402) 330-1500
FAX: (402) 330-3350

Please have available the MODEL NUMBER, SERIAL NUMBER and CUSTOMER ORDER NUMBER of the equipment in question as well as the location where the sampler is INSTALLED.

7.3 Replacement Parts

The InterSystems, Inc. sampler is a quality built piece of machinery. As with any machine, parts do wear out and fail. It is InterSystems' recommendation that a small supply of spare parts be kept on hand to cover any minor breakdowns. A separate priced Spare Parts List will be sent identifying the suggested spare parts. It is also necessary to check the certified drawings, which will list any special or custom components utilized on this equipment.

7.4 Repair Kits

The Following chart lists repair kits and parts that are available from InterSystems. These kits are offered as a more economical solution by rebuilding the defective part rather than replacing it. However in some cases the part may be beyond repair and replacement will be necessary.

Product Code	Description
512762	Spool kit for 4-way directional valves (ISI 375 series)
28166	Standard 120 vac valve coil & housing (ISI 375 series)
515835	Optional 240 vac valve coil & housing (ISI 375 series)
519287	Optional 120 vac explosion proof coil & housing (ISI 375 series)
527133	Rod seal kit for 1” rod air cylinder (Parker 2MA series)
524000	Piston seal kit for 4" bore air cylinder (Parker 2MA series)
525512	Piston seal kit for 5" bore air cylinder (Parker 2MA series)
513963	Gauge for filter regulator
524011	Filter element for filter regulator (Norgren B08 series)

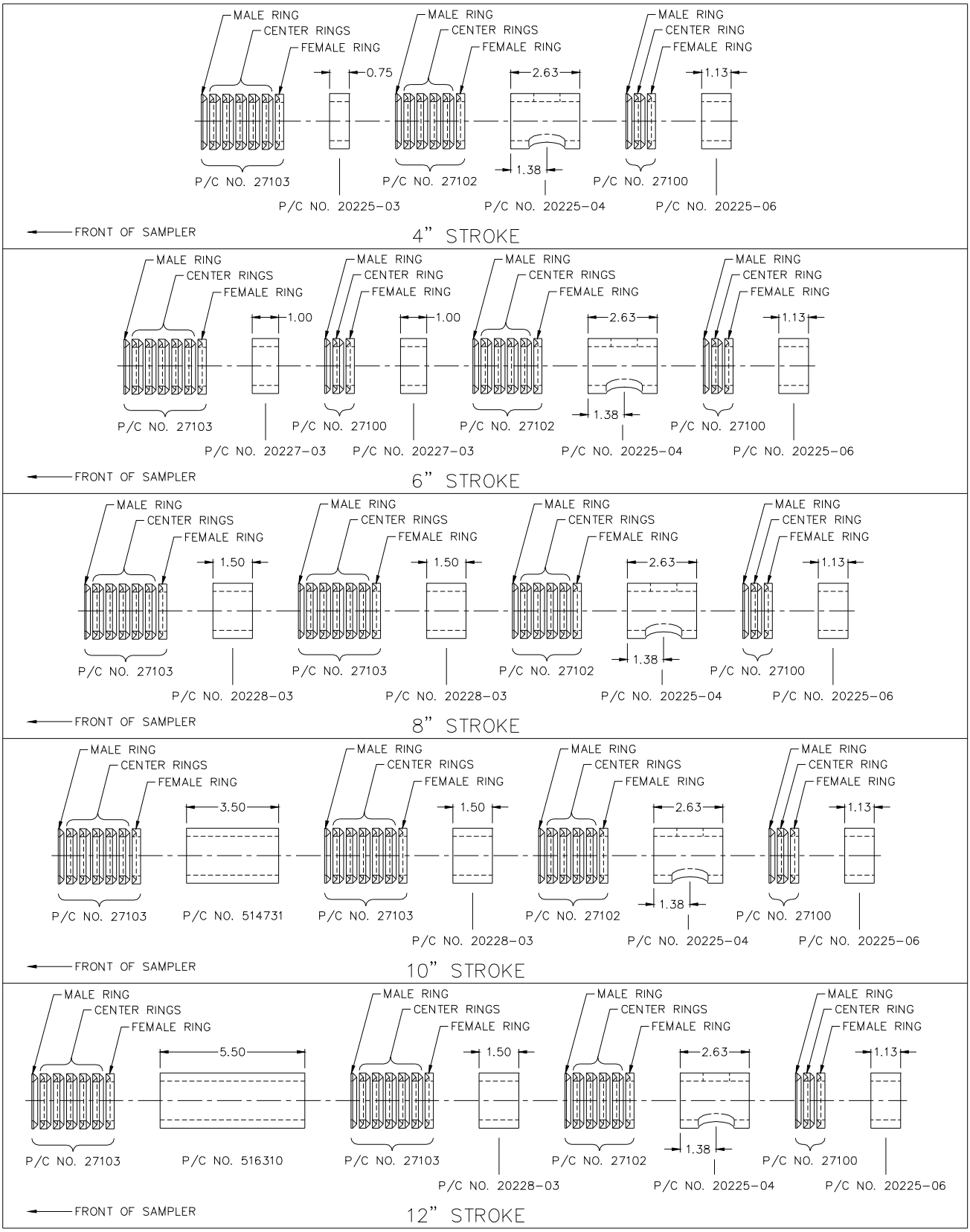
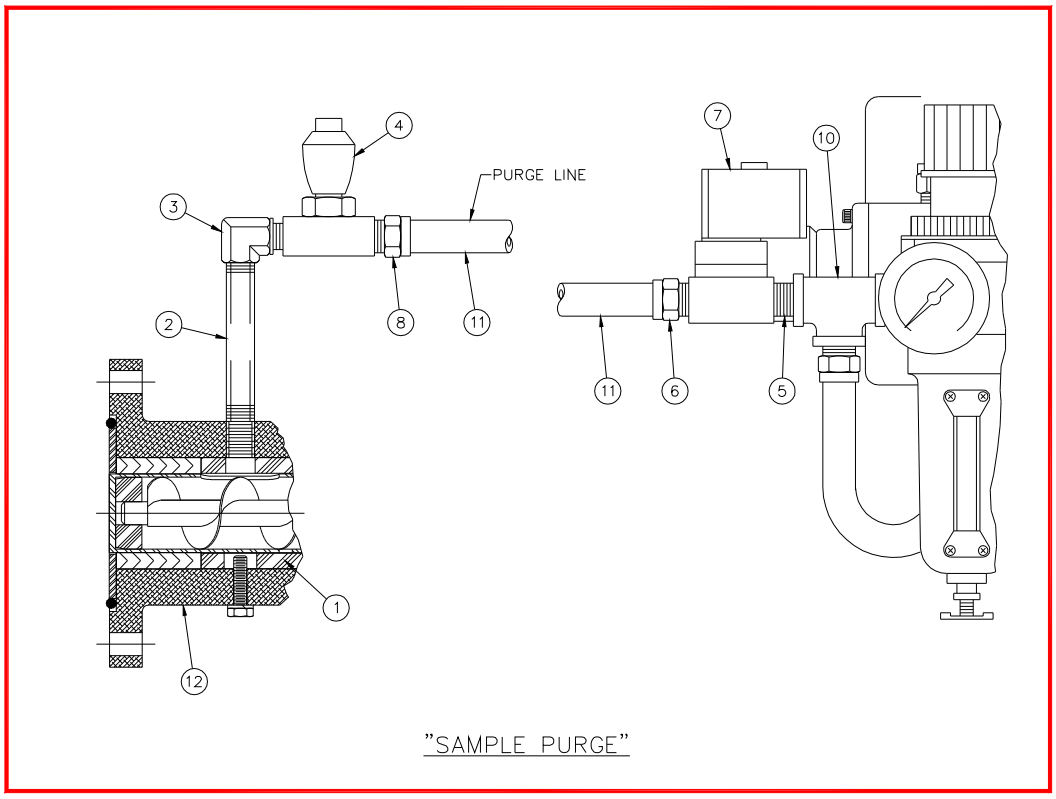


FIGURE 7-1, TEFLON SEAL SPACER ARRANGEMENTS (4", 6", 8", 10" & 12" STROKES)



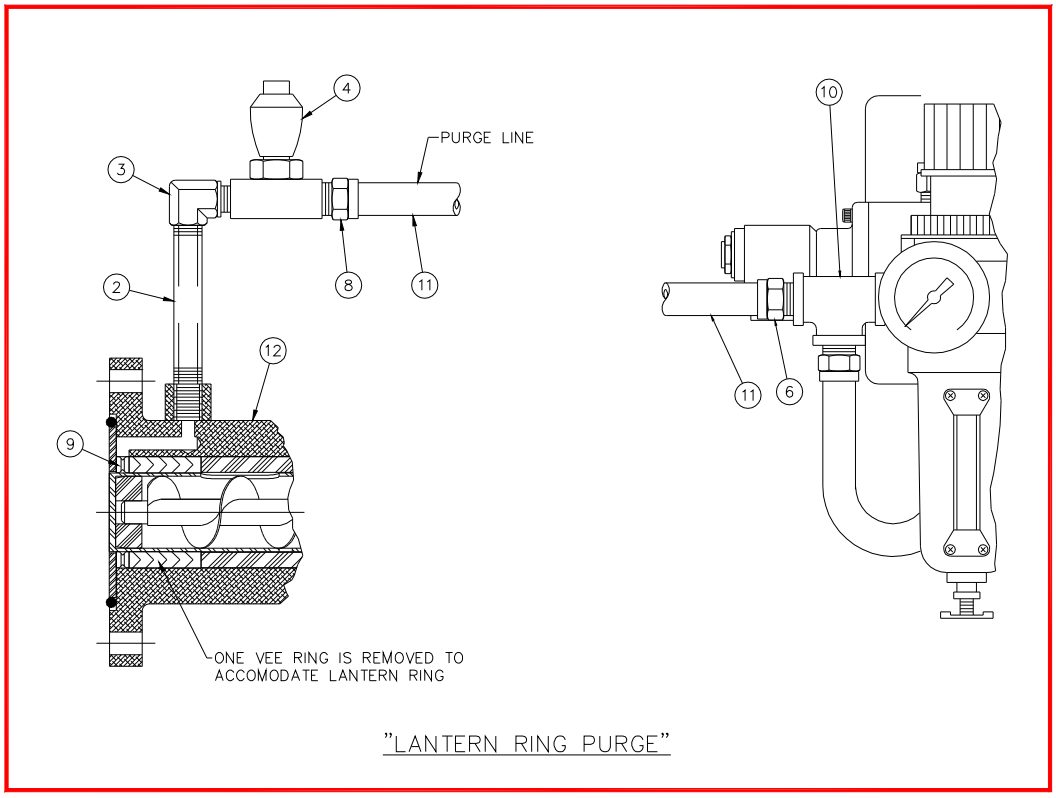


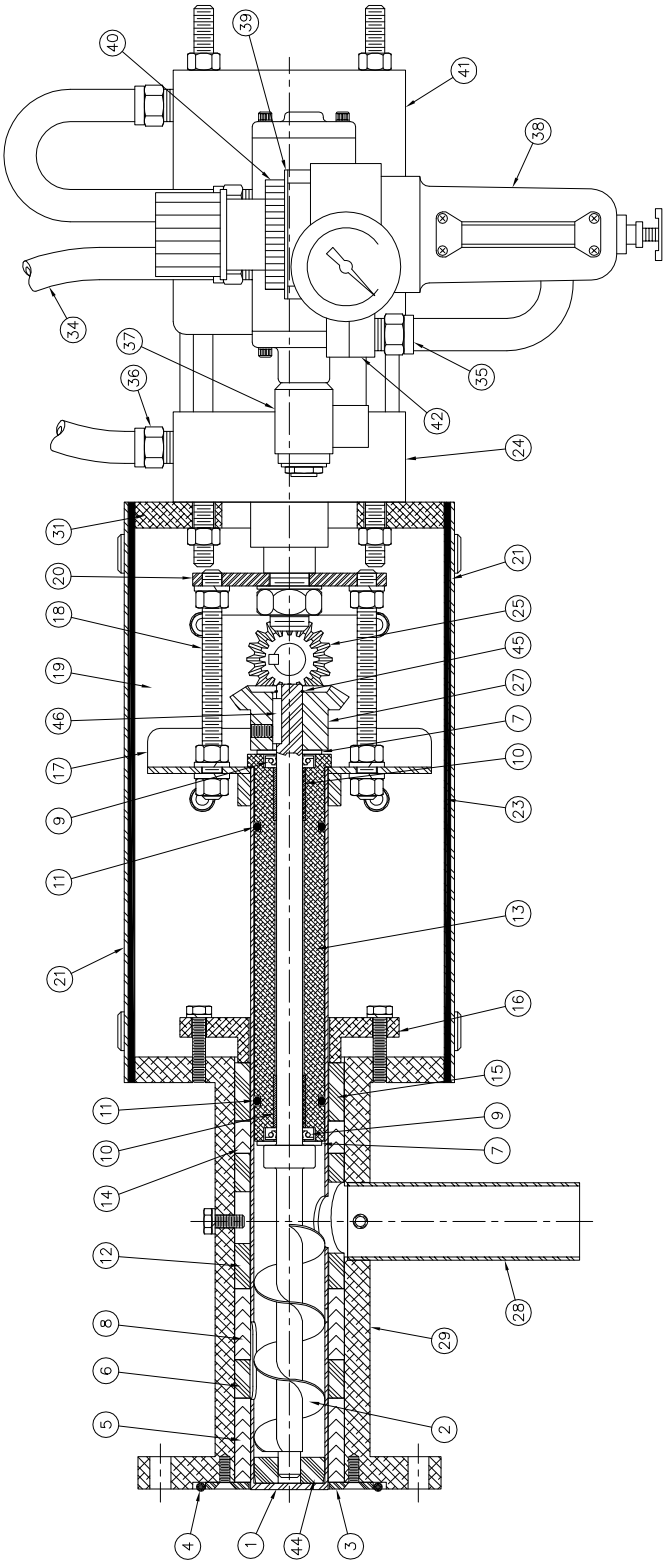
FIGURE 7-2, OPTIONAL PURGE CONFIGURATIONS

7.5 Optional Purge Parts Listing (see Figure 7-2)

ITEM NO.	PART NO	DESCRIPTION	QTY
1		(REPLACES STD FRONT SPACER)	
	515926	PS-4 PURGE SEAL SPACER NYLON	1
	522923	PS-4 PURGE SEAL SPACER 304SS	1
	20227-41	PS-6 PURGE SEAL SPACER NYLON	1
	523950	PS-6 PURGE SEAL SPACER 304SS	1
	20228-41	PS-8 PURGE SEAL SPACER NYLON	1
	522481	PS-8 PURGE SEAL SPACER 304SS	1
	516300	PS-10 PURGE SEAL SPACER NYLON	1
	523951	PS-10 PURGE SEAL SPACER 304SS	1
	516299	PS-12 PURGE SEAL SPACER NYLON	1
	523952	PS-12 PURGE SEAL SPACER 304SS	1
2	514724	BRASS PIPE NIPPLE 1/4 x 2-1/2 LG	1
3	510545	BRASS 90 DEG STREET ELBOW 1/4	1
4	28196	1/4 NEEDLE VALVE	1
5	512823	BRASS PIPE CLOSE NIPPLE 3/8	1
6	24553	3/8 PUSH-LOC TO 3/8 MPT STR	1
7			
	515679	2-WAY SOLENOID VALVE 3/8 NPT	1
	515877	2-WAY XP SOLENOID VALVE 3/8 NPT	1
8	24552	3/8 PUSH-LOC TO 1/4 MPT STR	1
9			
	513300	LANTERN RING 1-1/2 x 2-1/8 x 1/4 NYLON	1
	525574	LANTERN RING 1-1/2 x 2-1/8 x 1/4 304SS	1
10	34423	BRASS PIPE TEE 3/8 NPT	1
11	24550	3/8 I.D. AIR HOSE	4 FT
12		(REPLACES STD HOUSING OR SPACER)	
	20225-40	PS-4 SEAL HOUSING W/ DOWN PURGE	1
	515922	PS-4 SEAL HOUSING W/ UP PURGE	1
	515924	PS-4 SEAL HOUSING W/ L-R PURGE	1
	515923	PS-4 SEAL HOUSING W/ R-L PURGE	1
	515853	PS-6 SEAL HOUSING W/ DOWN PURGE	1
	515852	PS-6 SEAL HOUSING W/ UP PURGE	1
	515854	PS-6 SEAL HOUSING W/ L-R PURGE	1
	515855	PS-6 SEAL HOUSING W/ R-L PURGE	1
	514721	PS-8 SEAL HOUSING W/ DOWN PURGE	1
	514720	PS-8 SEAL HOUSING W/ UP PURGE	1
	514722	PS-8 SEAL HOUSING W/ L-R PURGE	1
	517723	PS-8 SEAL HOUSING W/ R-L PURGE	1
	20228-40	PS-10/12 HSG SPACER W/ SAMPLE PURGE	1
	525265	PS-4 SEAL HOUSING W/ LANTERN RING PURGE	1
	525266	PS-6 SEAL HOUSING W/ LANTERN RING PURGE	1
	525267	PS-8 SEAL HOUSING W/ LANTERN RING PURGE	1
	525623	PS-10/12 HSG SPACER W/ LANTERN RING PURGE	1

REFER TO CERTIFIED DRAWING(S)
FOR SPECIFIC OPTIONS.

REVISIONS			
REV	DATE	DESCRIPTION	BY
A	9/93	UPDATED BOM	AAC
B	7/96	UPDATED DRAWING	AAC
C	6/05	UPDATED BOM	KMC



REFER TO MOTOR CONFIGURATION DRAWING No. 523935 FOR CONTINUATION OF COMPLETE PARTS LISTING (FOLLOWING THE PS-4 THRU PS-12 SIDE SECTION VIEW DRAWINGS)

* – REFER TO CERTIFIED DRAWING(S) FOR SPECIFIC OPTIONS.

	ITEM NO.	QTY	SIZE AND MATERIAL	PRODUCT CODE	TOTAL UNITS
	46	1	3/16" SQUARE KEY	–	–
	45	1	RETAINING RING 0.50 SHAFT SS	24041	–
	44	1	PS AUGER END BEARING NYLON	520339	–
	43	1	GASKET PS GEAR/GEARMOTOR	20225-30	–
	42	1	PIPE STR ELBOW 3/8 NPT 90 DEG BRASS	34451	–
	41	1	VALVE MTG BRKT AIR SS PS 5 B CYL	543187	–
	40	1	FILTER REGULATOR MOUNT NUT	543182	–
	39	1	FILTER REGULATOR MTG BRKT PARKER 06	543183	–
	38	1	FILTER REGUL 3/8 NPT ASSY 125 PSIG	543180	–
*	37	1	SOLENOID VALVE 220/240V 50/60HZ	543181	–
	37	1	SOLENOID VALVE 110/120V 50/60HZ	543184	–
	36	2	FIT AIR PUSH-LOC 3/8 X 1/2 MPT STR	24554	–
	35	4	FIT AIR PUSH-LOC 3/8 X 3/8 MPT STR	24553	–
	34	4 FT	HOSE AIR 3/8 ID PUSH-LOC	24550	–
	33	1	SW LIMIT NEMA 12 BZE6-2PQ	26410	–
	32	1	MACHINED GEARMOTOR 1/6 HP 19:1	512842	–
	31	1	CYLINDER MOUNT 5 BORE PS	20244-13	–
	30	1	SPACER DRIVE GEAR PS	20225-18	–
	29	1	SEAL HOUSING PS-4	20225-15	–
	28	1	DISCHARGE TUBE SS PS	20225-14	–
*	27	1	GEAR BEVEL 27T SS	20225-52	–
	27	1	GEAR BEVEL 27T HARDENED	24106	–
	26	2	GUIDE ROD SS PS-4	20225-16	–
*	25	1	GEAR BEVEL 18T SS	20225-51	–
	25	1	GEAR BEVEL 18T HARDENED	24105	–
	24	1	CYL AIR 5 B X 4 STK 4MA	525536	–
	23	2	COVER GASKET PS-4	20225-22	–
	22	1	LIMIT SWITCH SIDE PLATE SS PS-4	20225-12	–
	21	2	COVER PLATE SS PS-4	20225-11	–
	20	1	GUIDE PLATE CYLINDER SS PS	20225-10	–
	19	1	MOTOR SIDE PLATE SS PS-4	20225-09	–
	18	2	PROBE ADJUSTMENT ROD SS PS	20225-08	–
	17	1	AUGER GUIDE PLATE SS PS	20225-07	–
	16	1	COMPRESSION PLATE	27040	–
*	15	1	SEAL SPCR PS REAR 304SS 1.13LG	520355	–
	15	1	SEAL SPCR PS REAR NYL 1.13LG	20225-06	–
*	14	1	CVH GF SEAL SET (1M-1C-1F)	27107	–
	14	1	CVH SEAL SET(1M1C1F)1-1/2X2-1/8X.635	27100	–
	13	1	BEARING HOUSING W/SEALS PS-4	20225-05	–
*	12	1	SEAL SPCR PS DISCHARGE 304SS 2.63LG	520354	–
	12	1	SEAL SPCR PS DISCHARGE NYL 2.63LG	20225-04	–
	11	2	O-RING 1-1/8 x 1-3/8 BUNA N	27200	–
	10	2	BRONZE BEARING 1/2" I.D.	24003	–
	9	2	OIL SEAL 1/2" I.D. BUNA N	27201	–
*	8	1	CVH GF SEAL SET (1M-4C-1F)	27108	–
	8	1	CVH SEAL SET(1M4C1F)1-1/2X2-1/8X1.38	27102	–
	7	2	WASHER FLAT 0.50 ID 18-8 SS	24009	–
*	6	1	SEAL SPCR PS FRNT/MID SS 0.75LG	522169	–
	6	1	SEAL SPCR PS FRNT/MID NYL 0.75LG	20225-03	–
*	5	1	CVH GF SEAL SET (1M-5C-1F)	27109	–
	5	1	CVH SEAL SET(1M5C1F)1.5X2-1/8X1.635	27103	–
	4	1	O-RING 3-1/4 x 3-5/8 BUNA N	520335	–
	3	1	SEAL RETAINER SS PS	20225-02	–
	2	1	AUGER PS-4 304SS 1-3/8 x 15-3/8	29001	–
*	1	1	PROBE PS-4 DOWN MAX CHROME	547601	–
*	1	1	PROBE PS-4 R-L STD CHROME	547612	–
*	1	1	PROBE PS-4 L-R STD CHROME	547607	–
*	1	1	PROBE PS-4 UP STD CHROME	547597	–
*	1	1	PROBE PS-4 DOWN STD CHROME	542650	–
*	1	1	PROBE PS-4 DOWN MAX 304SS	547862	–
*	1	1	PROBE PS-4 R-L STD 304SS	20225-26	–
*	1	1	PROBE PS-4 L-R STD 304SS	20225-25	–
*	1	1	PROBE PS-4 UP STD 304SS	20225-24	–
*	1	1	PROBE PS-4 DOWN STD 304SS	20225-23	–

BILL OF MATERIALS — PRODUCT STRUCTURE

TOLERANCES
MANUFACTURED TO TYPICAL SHOP TOLERANCES UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

QTY REQ'D

InterSystems™
13330 I St. Omaha, Ne. 68137 402-330-1500

TITLE: MODEL PS-4 SAMPLER 4" STROKE (SIDE SECTION VIEW)

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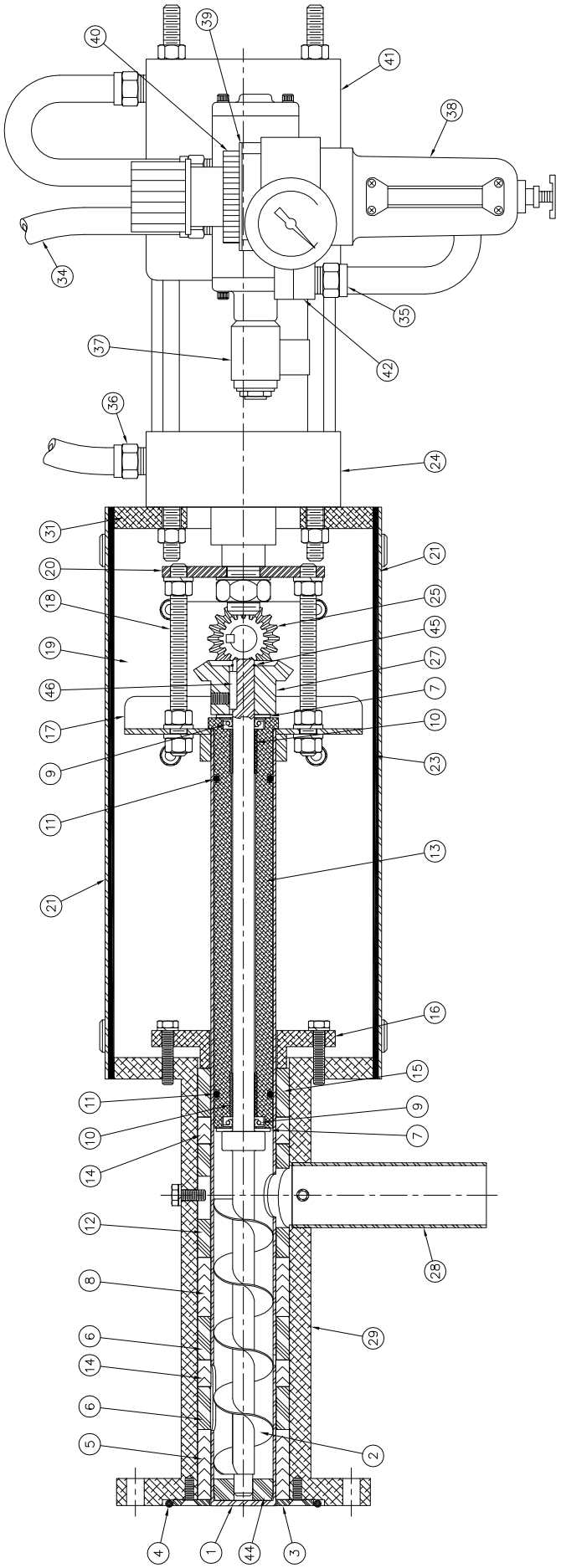
D'WN BY	DATE	DRAWING/PART NO.	REV.
AAC	2/93	523930	C
CK'D BY		ACAD FILE 523930	
SCALE NONE	ENG DWG NUMBER A	SHEET 1 OF 1	

JeremyK

REVISIONS			
REV	DATE	DESCRIPTION	BY
A	9/93	UPDATED BOM	AAC
B	7/96	UPDATED DRAWING	AAC
C	6/05	UPDATED BOM	KMC



REFER TO MOTOR CONFIGURATION DRAWING No. 523935 FOR CONTINUATION OF COMPLETE PARTS LISTING (FOLLOWING THE PS-4 THRU PS-12 SIDE SECTION VIEW DRAWINGS)

* – REFER TO CERTIFIED DRAWING(S) FOR SPECIFIC OPTIONS.

ITEM NO.	QTY	SIZE AND MATERIAL	PRODUCT CODE	TOTAL UNITS
46	1	3/16" SQUARE KEY	–	–
45	1	RETAINING RING 0.50 SHAFT SS	24041	–
44	1	PS AUGER END BEARING NYLON	520339	–
43	1	GASKET PS GEAR/GEARMOTOR	20225-30	–
42	1	PIPE STREET ELBOW 3/8 NPT 90° BRASS	34451	–
41	1	VALVE MTG BRKT AIR SS PS/PDP 5 B	543187	–
40	1	FILTER REGULATOR MOUNT NUT	543182	–
39	1	FILTER REGULATOR MTG BRKT PARKER 06	543183	–
38	1	FILTER REGULATOR 3/8 NPT ASSY 125	543180	–
* 37	1	VALVE AIR 3/8 NPT 220V 2POS 4WAY	543181	–
37	1	VALVE AIR 3/8 NPT 120V 2POS 4WAY	543184	–
36	2	FIT AIR PUSH-LOC 3/8 X 1/2 MPT STR	24554	–
35	4	FIT AIR PUSH-LOC 3/8 X 3/8 MPT STR	24553	–
34	4 FT	HOSE AIR 3/8 ID PUSH-LOC	24550	–
33	1	SW LIMIT SWITCH NEMA 12 BZE6-2RQ	26410	–
32	1	MACHINED GEARMOTOR 1/6 HP 19:1	512842	–
31	1	CYLINDER MOUNT 5" BORE PS	20244-13	–
30	1	SPACER DRIVE GEAR PS	20225-18	–
29	1	SEAL HSG PS-6 ALUM	513513	–
28	1	DISCHARGE TUBE SS W/GROOVES PS	20225-45	–
* 27	1	BEVEL GEAR 27 TOOTH SS	20225-52	–
27	1	GEAR BEVEL 27T HARDENED	24106	–
26	2	GUIDE ROD SS PS-6	20227-16	–
* 25	1	BEVEL GEAR 18 TOOTH SS	20225-51	–
25	1	GEAR BEVEL 18T HARDENED	24105	–
24	1	CYL AIR 5 B X 6 STK 4MA	551087	–
23	2	COVER GASKET PS-6	20227-22	–
22	1	LIMIT SWITCH SIDE PLATE SS PS-6	20227-12	–
21	2	COVER PLATE SS PS-6	20227-11	–
20	1	GUIDE PLATE CYLINDER SS PS	20225-10	–
19	1	MOTOR SIDE PLATE SS PS-6	20227-09	–
18	2	PROBE ADJUSTMENT ROD SS PS	20225-08	–
17	1	AUGER GUIDE PLATE SS PS	20225-07	–
16	1	COMPRESSION PLATE	27040	–
* 15	1	SEAL SPCR PS REAR 304SS 1.13LG	520355	–
15	1	SEAL SPCR PS REAR NYL 1.13LG	20225-06	–
* 14	2	CVH GF TEFLON SEAL SET 1M-1C-1F	27107	–
14	2	CVH SEAL SET(1M1C1F)1-1/2X2-1/8X.635	27100	–
13	1	BEARING HOUSING W/ SEALS PS-6	20227-05	–
* 12	1	SEAL SPCR PS DISCHARGE 304SS 2.63LG	520354	–
12	1	SEAL SPCR PS DISCHARGE NYL 2.63LG	20225-04	–
11	2	O-RING 1-1/8 X 1-3/8 BUNA N	27200	–
10	2	BRONZE BEARING 1/2" I.D.	24003	–
9	2	OIL SEAL 1/2" I.D. BUNA N	27201	–
* 8	1	CVH GF TEFLON SEAL SET 1M-4C-1F	27108	–
8	1	CVH SEAL SET(1M4C1F)1-1/2X2-1/8X1.38	27102	–
7	2	WASHER FLAT 0.500 ID 18-8 SS	24009	–
* 6	2	PS-6 FRONT SEAL SPACER 304SS	522372	–
6	2	SEAL SPCR PS FRNT/MID NYL 1.00LG	20227-03	–
* 5	1	CVH GF TEFLON SEAL SET 1M-5C-1F	27109	–
5	1	CVH SEAL SET(1M5C1F)1-1/2X2-1/8X1.63	27103	–
4	1	O-RING 3-1/4 X 3-5/8 BUNA N	520335	–
3	1	SEAL RETAINER SS PS	20225-02	–
2	1	AUGER PS-6 304SS 1-3/8 X 19-3/8	20227-01	–
* 1	1	PROBE PS-6 DOWN MAX CHROME	531554	–
* 1	1	PROBE PS-6 R-L STD CHROME	540219	–
* 1	1	PROBE PS-6 L-R STD CHROME	540259	–
* 1	1	PROBE PS-6 UP STD CHROME	540537	–
* 1	1	PROBE PS-6 DOWN STD CHROME	551120	–
* 1	1	PROBE PS-6 DOWN MAX 304SS	527863	–
* 1	1	PROBE PS-6 R-L STD 304SS	20227-26	–
* 1	1	PROBE PS-6 L-R STD 304SS	20227-25	–
* 1	1	PROBE PS-6 UP STD 304SS	20227-24	–
* 1	1	PROBE PS-6 DOWN STD 304SS	20227-23	–

BILL OF MATERIALS — PRODUCT STRUCTURE

TOLERANCES
MANUFACTURED TO TYPICAL SHOP TOLERANCES UNLESS OTHERWISE SPECIFIED

QTY REQ'D

InterSystems™
13330 I St. Omaha, Ne. 68137 402-330-1500

THIRD ANGLE PROJECTION

TITLE: MODEL PS-6 SAMPLER 6" STROKE (SIDE SECTION VIEW)

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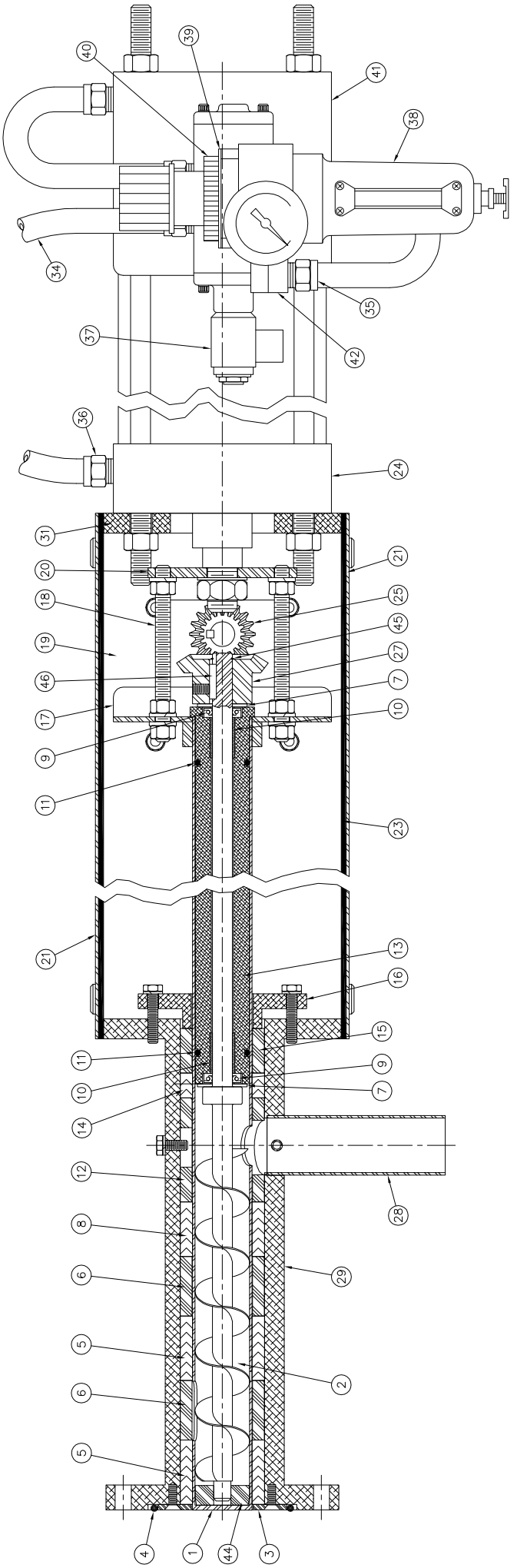
D'WN BY	DATE	DRAWING/PART NO.	REV.
AAC	2/93	523931	C
CK'D BY		ACAD FILE 523931	
SCALE NONE	ENG DWG NUMBER A	SHEET 1 OF 1	

Jeremy K

REVISIONS			
REV	DATE	DESCRIPTION	BY
A	9/93	UPDATED BOM	AAC
B	7/96	UPDATED DRAWING	AAC
C	10/07	UPDATED BOM	PJR



REFER TO MOTOR CONFIGURATION DRAWING No. 523935 FOR CONTINUATION OF COMPLETE PARTS LISTING (FOLLOWING THE PS-4 THRU PS-12 SIDE SECTION VIEW DRAWINGS)

* – REFER TO CERTIFIED DRAWING(S) FOR SPECIFIC OPTIONS.

ITEM NO.	QTY	SIZE AND MATERIAL	PRODUCT CODE	TOTAL UNITS
46	1	3/16" SQUARE KEY	–	–
45	1	RETAINING RING 0.50 SHAFT SS	24041	–
44	1	PS AUGER END BEARING NYLON	520339	–
43	1	GASKET PS GEAR/GEARMOTOR	20225-30	–
42	1	PIPE STREET ELBOW 3/8 NPT 90 DEG BR	34451	–
41	1	VALVE MTG BRKT AIR SS PS/PDP 5 B	543187	–
40	1	FILTER REGULATOR MOUNT NUT	543182	–
39	1	FILITER REGULATOR MTG BRKT PARKER 06	543183	–
38	1	FILTER REGULATOR 3/8 NPT ASSY 125	543180	–
* 37	1	VALVE AIR 3/8 NPT 220V 2POS 4WAY	543181	–
37	1	VALVE AIR 3/8 NPT 120V 2POS 4WAY	543184	–
36	2	FIT AIR PUSH-LOC 3/8 X 1/2 MPT STR	24554	–
35	4	FIT AIR PUSH-LOC 3/8 X 3/8 MPT STR	24553	–
34	5 FT	HOSE AIR 3/8 ID PUSH-LOC	24550	–
33	1	SW LIMIT NEMA 12 BZE6-2RQ	26410	–
32	1	MACHINED GEARMOTOR 1/6 HP 19:1	512842	–
31	1	CYLINDER MOUNT 5 BORE PS	20244-13	–
30	1	SPACER DRIVE GEAR PS	20225-18	–
29	1	SEAL HSG PS-8 ALUM	513514	–
28	1	DISCHARGE TUBE SS PS	20225-14	–
* 27	1	BEVEL GEAR 27 TOOTH SS	20225-52	–
27	1	GEAR BEVEL 27T HARDENED	24106	–
26	2	GUIDE ROD SS PS-8	20228-16	–
* 25	1	BEVEL GEAR 18 TOOTH SS	20225-51	–
25	1	GEAR BEVEL 18T HARDENED	24105	–
24	1	CYL AIR 5 B X 8 STK 4MA	551086	–
23	2	COVER GASKET PS-8	20228-22	–
22	1	LIMIT SWITCH SIDE PLATE SS PS-8	20228-12	–
21	2	COVER PLATE SS PS-8	20228-11	–
20	1	GUIDE PLATE CYLINDER SS PS	20225-10	–
19	1	MOTOR SIDE PLATE SS PS-8	20228-09	–
18	2	PROBE ADJUSTMENT ROD SS PS	20225-08	–
17	1	AUGER GUIDE PLATE SS PS	20225-07	–
16	1	COMPRESSION PLATE	27040	–
* 15	1	SEAL SPCR PS REAR 304SS 1.13LG	520355	–
15	1	SEAL SPCR PS REAR NYL 1.13LG	20225-06	–
14	1	CVH GF TEFLON SEAL SET 1M-1C-1F	27107	–
14	1	CVH SEAL SET(1M1C1F)1-1/2X2-1/8X.635	27100	–
* 13	1	BEARING HOUSING W/ SEALS PS-8	20228-05	–
* 12	1	SEAL SPCR PS DISCHARGE 304SS 2.63LG	520354	–
12	1	SEAL SPCR PS DISCHARGE NYL 2.63LG	20225-04	–
11	2	O-RING 1-1/8 X 1-3/8 BUNA N	27200	–
10	2	BRONZE BEARING 1/2" I.D.	24003	–
9	2	OIL SEAL 1/2" I.D. BUNA N	27201	–
* 8	1	CVH GF TEFLON SEAL SET 1M-4C-1F	27108	–
8	1	CVH SEAL SET(1M4C1F)1-1/2X2-1/8X1.38	27102	–
7	2	WASHER FLAT 0.500 ID 18-8 SS	24009	–
* 6	2	SEAL SPCR PS FRNT/MID 304SS 1.50LG	520353	–
6	2	SEAL SPCR PS FRNT/MID NYL 1.50LG	20228-03	–
* 5	2	CVH GF TEFLON SEAL SET 1M-5C-1F	27109	–
5	2	CVH SEAL SET(1M5C1F)1-1/2X2-1/8X1.635	27103	–
4	1	O-RING 3-1/4 X 3-5/8 BUNA N	520335	–
3	1	SEAL RETAINER SS PS	20225-02	–
2	1	AUGER PS-8 304SS 1-3/8 X 23-3/8	20228-01	–
* 1	1	PROBE PS-8 DOWN MAX CHROME	551113	–
* 1	1	PROBE PS-8 R-L STD CHROME	531757	–
* 1	1	PROBE PS-8 L-R STD CHROME	531714	–
* 1	1	PROBE PS-8 UP STD CHROME	551112	–
* 1	1	PROBE PS-8 DOWN STD CHROME	534633	–
* 1	1	PROBE PS-8 DOWN MAX 304SS	527864	–
* 1	1	PROBE PS-8 R-L STD 304SS	20228-26	–
* 1	1	PROBE PS-8 L-R STD 304SS	20228-25	–
* 1	1	PROBE PS-8 UP STD 304SS	20228-24	–
* 1	1	PROBE PS-8 DOWN STD 304SS	20228-23	–

BILL OF MATERIALS — PRODUCT STRUCTURE

TOLERANCES
MANUFACTURED TO TYPICAL SHOP TOLERANCES UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

QTY REQ'D

InterSystems™
13330 I St. Omaha, Ne. 68137 402-330-1500

TITLE: MODEL PS-8 SAMPLER 8" STROKE (SIDE SECTION VIEW)

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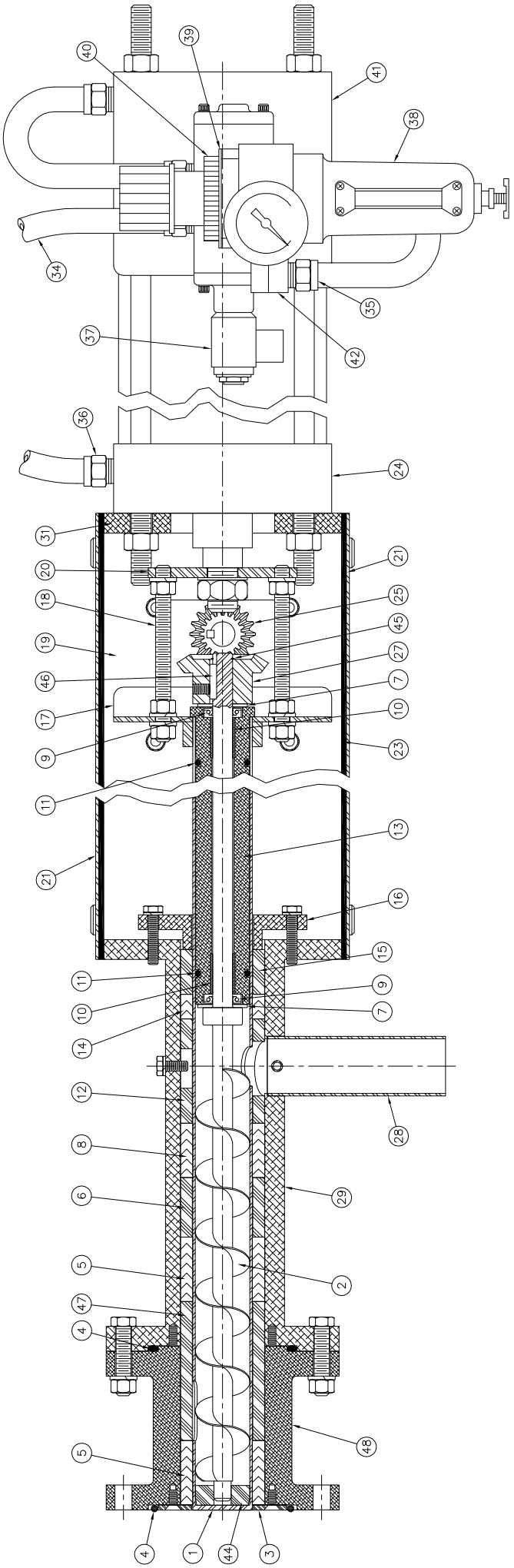
D'WN BY AAC | DATE 2/93 | CK'D BY | SCALE NONE | ENG DWG NUMBER A

DRAWING/PART NO. 523932 | REV. C | ACAD FILE 523932 | SHEET 1 OF 1

JeremyK

REVISIONS			
REV	DATE	DESCRIPTION	BY
A	9/93	UPDATED BOM	AAC
B	7/96	UPDATED DRAWING	AAC
c	6/05	UPDATED BOM	KMC



REFER TO MOTOR CONFIGURATION DRAWING No. 523935 FOR CONTINUATION OF COMPLETE PARTS LISTING (FOLLOWING THE PS-4 THRU PS-12 SIDE SECTION VIEW DRAWINGS)

* – REFER TO CERTIFIED DRAWING(S) FOR SPECIFIC OPTIONS.

	ITEM NO.	QTY	SIZE AND MATERIAL	PRODUCT CODE	TOTAL UNITS
	48	1	SEAL HSG SPACER PS–10/12 ALUM	20228–20	–
*	47	1	PS–10 FRONT SEAL SPACER 304SS	523948	–
	47	1	SEAL SPCR PS FRNT NYL 3.50LG	514731	–
	46	1	3/16" SQUARE KEY	–	–
	45	1	RETAINING RING 0.50 SHAFT SS	24041	–
	44	1	PS AUGER END BEARING NYLON	520339	–
	43	1	GASKET PS GEAR/GEARMOTOR	20225–30	–
	42	1	PIPE STREET ELBOW 3/8 NPT 90 DEG	34451	–
	41	1	VALVE MTG BRKT AIR SS PS/PDP 5 B	543187	–
	40	1	FILTER REGULATOR MOUNT NUT	543182	–
	39	1	FILTER REGULATOR MTG BRKT PARKER 06	543183	–
	38	1	FILTER REGULATOR 3/8 NPT ASSY 125	543180	–
*	37	1	VALVE AIR 3/8 NPT 220V 2POS 4WAY	543181	–
	37	1	VALVE AIR 3/8 NPT 120V 2POS 4WAY	543184	–
	36	2	FIT AIR PUSH–LOC 3/8 X 1/2 MPT STR	24554	–
	35	4	FIT AIR PUSH–LOC 3/8 X 3/8 MPT STR	24553	–
	34	5 FT	HOSE AIR 3/8 ID PUSH–LOC	24550	–
	33	1	SW LIMIT NEMA 12 BZE6–2RQ	26410	–
	32	1	MACHINED GEARMOTOR 1/6 HP 19:1	512842	–
	31	1	CYLINDER MOUNT 5 BORE PS	20244–13	–
	30	1	SPACER DRIVE GEAR PS	20225–18	–
	29	1	SEAL HSG PS–6 ALUM	513513	–
	28	1	DISCHARGE TUBE SS PS	20225–14	–
*	27	1	BEVEL GEAR 27 TOOTH SS	20225–52	–
	27	1	GEAR BEVEL 27T HARDENED	24106	–
	26	2	GUIDE ROD SS PS–10	512941	–
*	25	1	BEVEL GEAR 18 TOOTH SS	20225–51	–
	25	1	GEAR BEVEL 18T HARDENED	24105	–
	24	1	CYL AIR 5 B X 10 STK 4MA	551085	–
	23	2	PS–10 COVER GASKET	516329	–
	22	1	LIMIT SWITCH SIDE PLATE SS PS–10	512940	–
	21	2	TOP & BOTTOM PLATE SS PS–10	512939	–
	20	1	GUIDE PLATE CYLINDER SS PS	20225–10	–
	19	1	MOTOR SIDE PLATE SS PS–10	512938	–
	18	2	PROBE ADJUSTMENT ROD SS PS	20225–08	–
	17	1	AUGER GUIDE PLATE SS PS	20225–07	–
	16	1	COMPRESSION PLATE	27040	–
*	15	1	REAR SEAL SPACER 304SS	520355	–
	15	1	SEAL SPCR PS REAR NYL 1.13LG	20225–06	–
*	14	1	CVH GF TEFLON SEAL SET 1M–1C–1F	27107	–
	14	1	CVH SEAL SET(1M1C1F)1–1/2X2–1/8X.635	27100	–
	13	1	BEARING HOUSING W/SEALS PS–10	512937	–
*	12	1	PS MIDDLE SEAL SPACER 304SS	520354	–
	12	1	SEAL SPCR PS DISCHARGE NYL 2.63LG	20225–04	–
	11	2	O–RING 1–1/8 X 1–3/8 BUNA N	27200	–
	10	2	BRONZE BEARING 1/2" I.D.	24003	–
	9	2	OIL SEAL 1/2" I.D. BUNA N	27201	–
*	8	1	CVH GF TEFLON SEAL SET 1M–4C–1F	27108	–
	8	1	CVH SEAL SET(1M4C1F)1–1/2X2–1/8X1.38	27102	–
	7	2	WASHER FLAT 0.500 ID 18–8 SS	24009	–
*	6	1	PS–8 FRONT SEAL SPACER 304SS	520353	–
	6	1	SEAL SPCR PS FRNT/MID NYL 1.50LG	20228–03	–
*	5	2	CVH GF TEFLON SEAL SET 1M–5C–1F	27109	–
	5	2	CVH SEAL SET(1M5C1F)1–1/2X2–1/8X1.635	27103	–
	4	2	O–RING 3–1/4 X 3–5/8 BUNA N	520335	–
	3	1	SEAL RETAINER SS PS	20225–02	–
	2	1	AUGER PS–10 304SS 1–3/8 X 27–3/8	514733	–
*	1	1	PROBE PS–10 DOWN MAX CHROME	531556	–
*	1	1	PROBE PS–10 R–L STD CHROME	543769	–
*	1	1	PROBE PS–10 L–R STD CHROME	534768	–
*	1	1	PROBE PS–10 UP STD CHROME	551107	–
*	1	1	PROBE PS–10 DOWN STD CHROME	531915	–
*	1	1	PROBE PS–10 DOWN MAX 304SS	527865	–
*	1	1	PROBE PS–10 R–L STD 304SS	514740	–
*	1	1	PROBE PS–10 L–R STD 304SS	514739	–
*	1	1	PROBE PS–10 UP STD 304SS	514737	–
*	1	1	PROBE PS–10 DOWN STD 304SS	514738	–

BILL OF MATERIALS — PRODUCT STRUCTURE

TOLERANCES
MANUFACTURED TO TYPICAL SHOP TOLERANCES UNLESS OTHERWISE SPECIFIED

QTY REQ'D

InterSystems™
13330 I St. Omaha, Ne. 68137 402–330–1500

THIRD ANGLE PROJECTION

TITLE: MODEL PS–10 SAMPLER 10" STROKE (SIDE SECTION VIEW)

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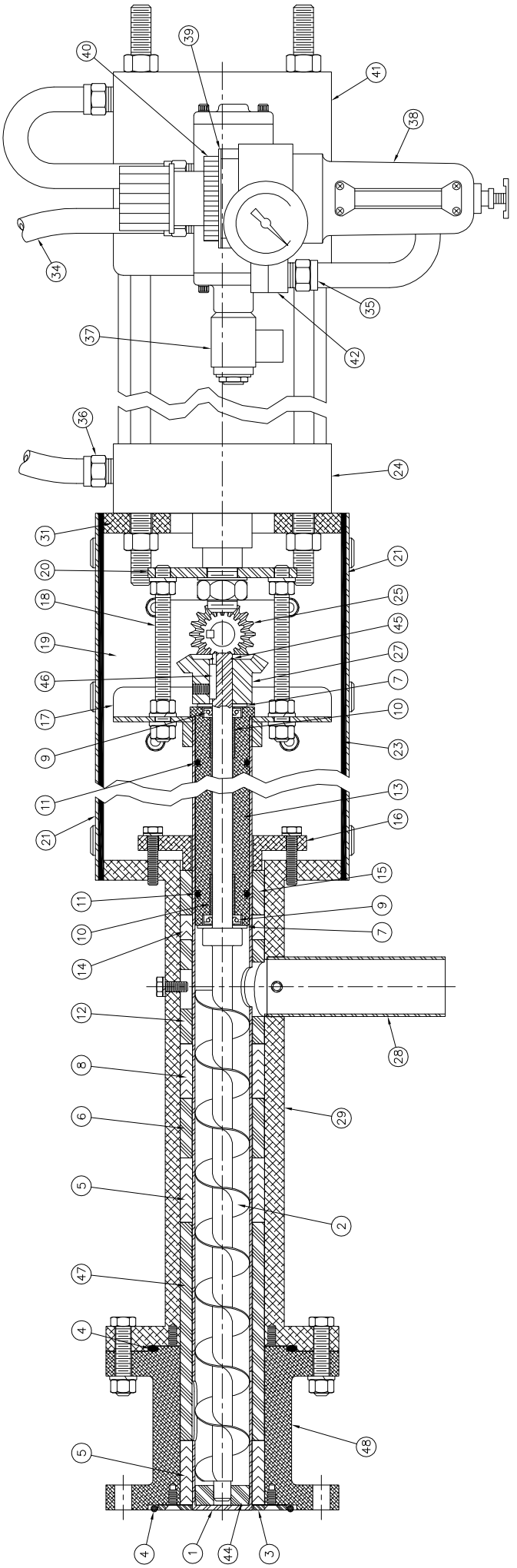
D'WN BY	AAC	DATE	2/93	DRAWING/PART NO.	523933	REV.	C
CK'D BY				ACAD FILE	523933		
SCALE	NONE	ENG DWG NUMBER	A	SHEET	1 OF 1		

Jeremy K

REVISIONS			
REV	DATE	DESCRIPTION	BY
A	9/93	UPDATED BOM	AAC
B	7/96	UPDATED DRAWING	AAC
C	6/05	UPDATED BOM	KMC



REFER TO MOTOR CONFIGURATION DRAWING No. 523935 FOR CONTINUATION OF COMPLETE PARTS LISTING (FOLLOWING THE PS-4 THRU PS-12 SIDE SECTION VIEW DRAWINGS)

* – REFER TO CERTIFIED DRAWING(S) FOR SPECIFIC OPTIONS.

	ITEM NO.	QTY	SIZE AND MATERIAL	PRODUCT CODE	TOTAL UNITS
	48	1	SEAL HSG SPCR PS–10/12 ALUM	20228–20	–
*	47	1	PS–12 FRONT SEAL SPACER 304SS	523949	–
	47	1	SEAL SPCR PS FRNT NYL 5.50LG	516310	–
	46	1	3/16" SQUARE KEY	–	–
	45	1	RETAINING RING 0.50 SHAFT SS	24041	–
	44	1	PS AUGER END BEARING NYLON	520339	–
	43	1	GASKET PS GEAR/GEARMOTOR	20225–30	–
	42	1	PIPE STREET ELBOW 3/8 NPT 90 DEG	34451	–
	41	1	VALVE MTG BRKT AIR SS PS/PDP 5 B	543187	–
	40	1	FILTER REGULATOR MOUNT NUT	543182	–
	39	1	FILTER REGULATOR MTG BRKT PARKER 06	543183	–
	38	1	FILTER REGULATOR 3/8 NPT ASSY 125	543180	–
*	37	1	VALVE AIR 3/8 NPT 220V 2POS 4WAY	543181	–
	37	1	VALVE AIR 3/8 NPT 120V 2POS 4WAY	543184	–
	36	2	FIT AIR PUSH–LOC 3/8 X 1/2 MPT STR	24554	–
	35	4	FIT AIR PUSH–LOC 3/8 X 3/8 MPT STR	24553	–
	34	5 FT	HOSE AIR 3/8 ID PUSH–LOC	24550	–
	33	1	SW LIMIT SWITCH NEMA 12 BZE6–2RQ	26410	–
	32	1	MACHINED GEARMOTOR 1/6 19:1	512842	–
	31	1	CYLINDER MOUNT 5 BORE PS	20244–13	–
	30	1	SPACER DRIVE GEAR PS	20225–18	–
	29	1	SEAL HSG PS–8 ALUM	513514	–
	28	1	DISCHARGE TUBE SS PS	20225–14	–
*	27	1	BEVEL GEAR 27 TOOTH SS	20225–52	–
	27	1	GEAR BEVEL 27T HARDENED	24106	–
	26	2	PS–12 GUIDE ROD	516309	–
*	25	1	BEVEL GEAR 18 TOOTH SS	20225–51	–
	25	1	GEAR BEVEL 18T HARDENED	24105	–
	24	1	CYL AIR 5 B X 12 STK 4MA	551084	–
	23	2	PS–12 COVER GSKT	516314	–
	22	1	LIMIT SWITCH SIDE PLATE SS PS–12	516307	–
	21	2	TOP & BOTTOM COVER PL SS PS–12	516308	–
	20	1	GUIDE PLATE CYLINDER SS PS	20225–10	–
	19	1	MOTOR SIDE PLATE SS PS–12	516306	–
	18	2	PROBE ADJUSTMENT ROD SS PS	20225–08	–
	17	1	AUGER GUIDE PLATE SS PS	20225–07	–
	16	1	COMPRESSION PLATE	27040	–
*	15	1	REAR SEAL SPACER 304SS	520355	–
	15	1	SEAL SPCR PS REAR NYL 1.13LG	20225–06	–
*	14	1	CVH GF TEFLON SEAL SET 1M–1C–1F	27107	–
	14	1	CVH SEAL SET(1M1C1F)1–1/2X2–1/8X.635	27100	–
	13	1	BEARING HOUSING W/ SEALS PS–12	516312	–
*	12	1	PS MIDDLE SEAL SPACER 304SS	520354	–
	12	1	SEAL SPCR PS DISCHARGE NYL 2.63LG	20225–04	–
	11	2	O–RING 1–1/8 X 1–3/8 BUNA N	27200	–
	10	2	BRONZE BEARING 1/2" I.D.	24003	–
	9	2	OIL SEAL 1/2" I.D. BUNA N	27201	–
*	8	1	CVH GF TEFLON SEAL SET 1M–4C–1F	27108	–
	8	1	CVH SEAL SET(1M4C1F)1–1/2X2–1/8X1.38	27102	–
	7	2	WASHER FLAT 0.500 ID 18–8 SS	24009	–
*	6	1	PS–8 FRONT SEAL SPACER 304SS	520353	–
	6	1	SEAL SPCR PS FRNT/MID NYL 1.50LG	20228–03	–
*	5	2	CVH GF TEFLON SEAL SET 1M–5C–1F	27109	–
	5	2	CVH SEAL SET(1M5C1F)1–1/2X2–1/8X1.635	27103	–
	4	2	O–RING 3–1/4 X 31–3/8 PS–12	520335	–
	3	1	SEAL RETAINER SS PS	20225–02	–
	2	1	AUGER PS–12 304SS 1–3/8 X 3–5/8	516333	–
*	1	1	PS–12 PROBE DOWN MAX CHROME	531557	–
*	1	1	PS–12 PROBE R–L STD CHROME	544112	–
*	1	1	PS–12 PROBE L–R STD CHROME	542981	–
*	1	1	PS–12 PROBE UP STD CHROME	545644	–
*	1	1	PS–12 PROBE DOWN STD CHROME	543203	–
*	1	1	PS–12 PROBE DOWN MAX 304SS	527866	–
*	1	1	PS–12 PROBE R–L STD 304SS	516297	–
*	1	1	PS–12 PROBE L–R STD 304SS	516296	–
*	1	1	PS–12 PROBE UP STD 304SS	513030	–
*	1	1	PS–12 PROBE DOWN STD 304SS	516295	–

BILL OF MATERIALS — PRODUCT STRUCTURE

TOLERANCES
MANUFACTURED TO TYPICAL SHOP TOLERANCES UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

QTY REQ'D

InterSystems™
13330 I St. Omaha, Ne. 68137 402–330–1500

TITLE: MODEL PS–12 SAMPLER 12" STROKE (SIDE SECTION VIEW)

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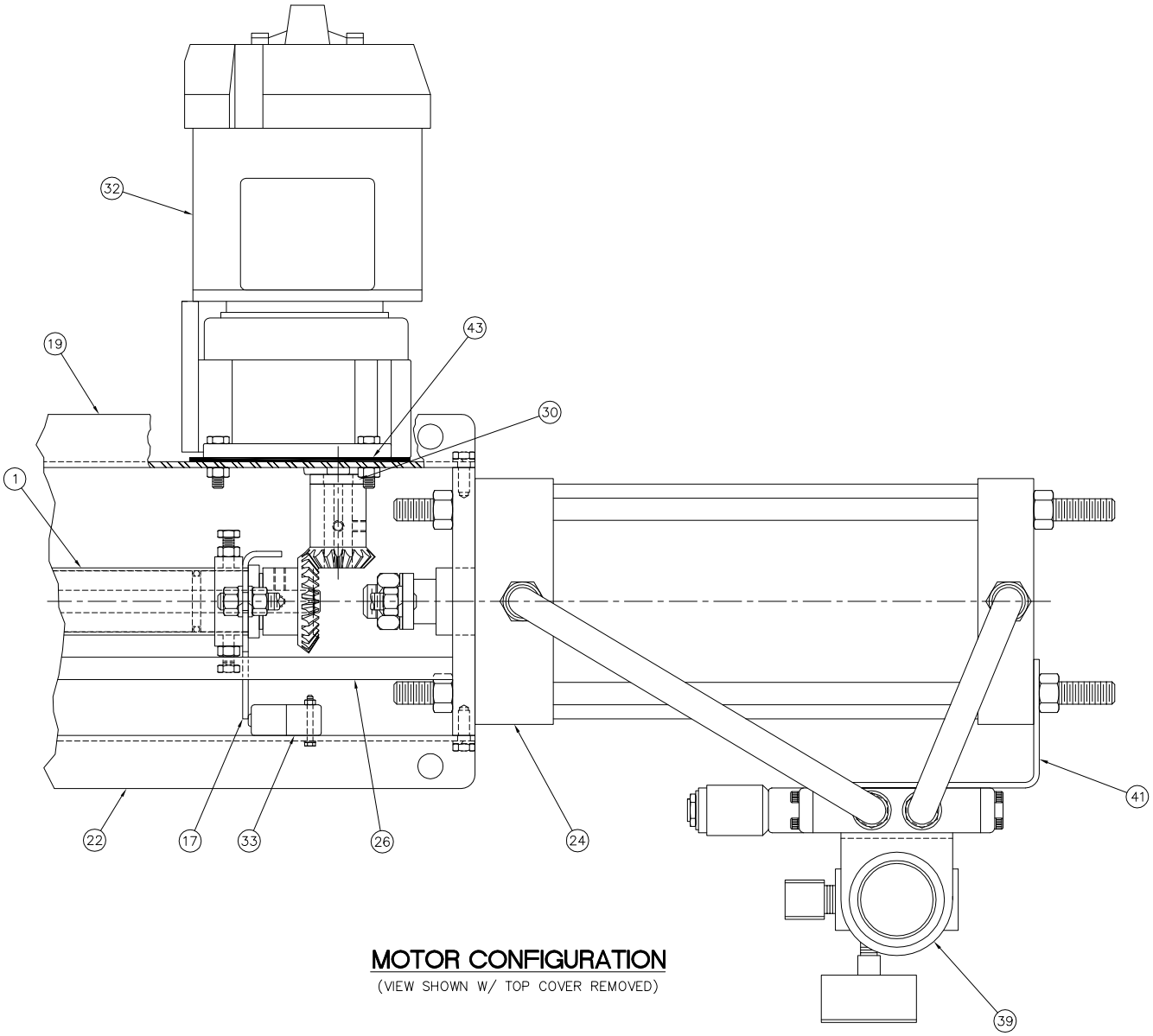
D'WN BY AAC | DATE 3/93 | CK'D BY | SCALE NONE | ENG DWG NUMBER A

DRAWING/PART NO. 523934 | REV. C | ACAD FILE 523934 | SHEET 1 OF 1

JeremyK

REVISIONS			
REV	DATE	DESCRIPTION	BY
A	7/96	UPDATED DRAWING	AAC



MOTOR CONFIGURATION

(VIEW SHOWN W/ TOP COVER REMOVED)

ITEM NO.	QTY	SIZE AND MATERIAL	PRODUCT CODE	TOTAL UNITS
BILL OF MATERIALS			PRODUCT STRUCTURE	

TOLERANCES
MANUFACTURED TO TYPICAL SHOP TOLERANCES UNLESS OTHERWISE SPECIFIED

QTY REQ'D

InterSystems™
13330 I St. Omaha, Ne. 68137 402-330-1500

THIRD ANGLE PROJECTION

TITLE
MOTOR CONFIGURATION

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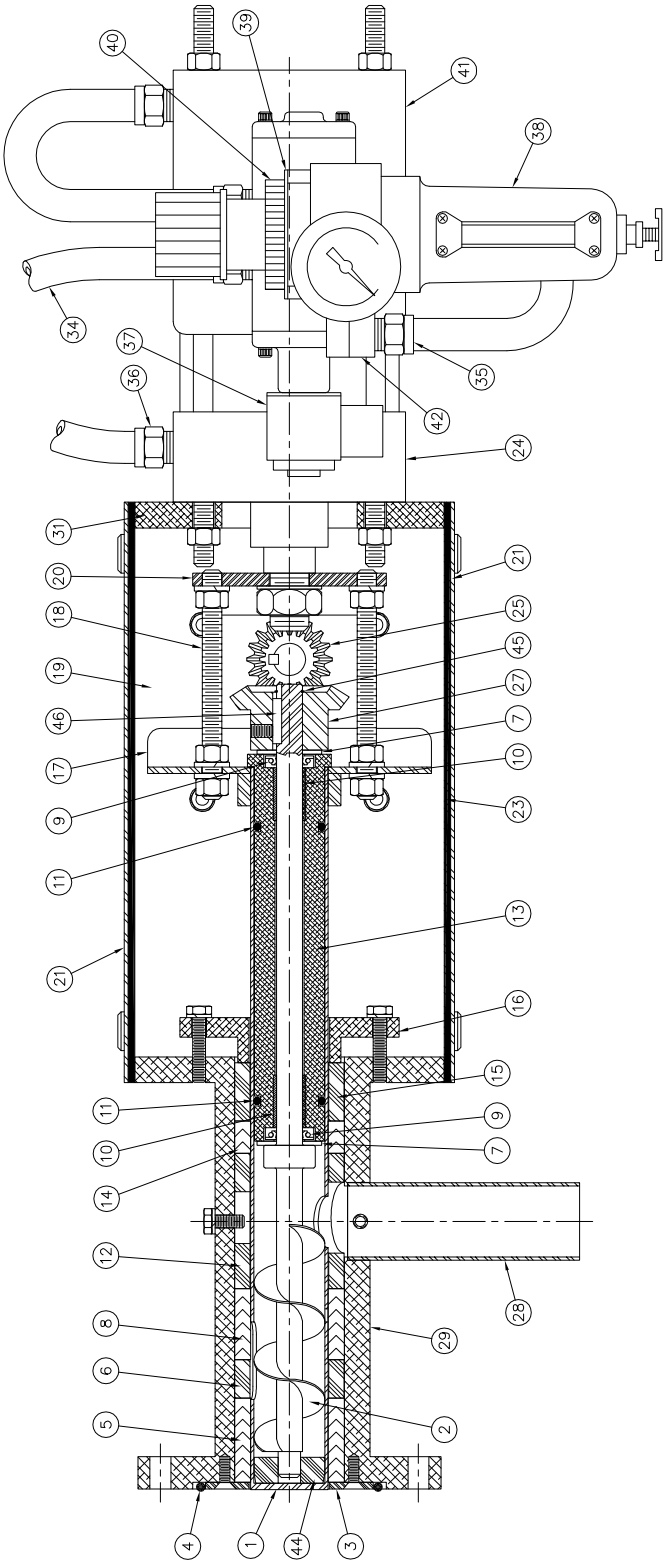
D'WN BY	DATE	DRAWING/PART NO.	REV.
AAC	2/93	523935	A
CK'D BY		ACAD FILE 523935	
SCALE NONE	ENG DWG NUMBER A	SHEET 1 OF 1	

Jeremy K

REVISIONS			
REV	DATE	DESCRIPTION	BY
A	9/93	UPDATED BOM	AAC
B	7/96	UPDATED DRAWING	AAC
C	8/97	UPDATED BOM	AAC
D	7/05	UPDATED BOM	KMC



REFER TO XP MOTOR CONFIGURATION DRAWING No. 524008 FOR CONTINUATION OF COMPLETE PARTS LISTING (FOLLOWING THE PS-XP-4 THRU PS-XP-12 SIDE SECTION VIEW DRAWINGS)

* - REFER TO CERTIFIED DRAWING(S) FOR SPECIFIC OPTIONS.

	ITEM NO.	QTY	SIZE AND MATERIAL	PRODUCT CODE	TOTAL UNITS
	51	1	SW LIMIT ROLLER ARM NEMA 9	26401	–
	50	1	COUPLER GUARD PS XP & GT XP	20225-80	–
	49	1	SPIDER L070 RUBBER	24508	–
	48	2	CPLG LOVEJOY L070 1/2 B BODY HALF	24507	–
	47	1	RDCR GEAR 19.1 RATIO MACHINED	24207	–
	46	1	3/16" SQUARE KEY	–	–
	45	1	RETAINING RING 0.50 SHAFT SS	24041	–
	44	1	PS AUGER END BEARING NYLON	520339	–
	43	1	GASKET PS GEAR/GEARMOTOR	20225-30	–
	42	1	PIPE STREET ELBOW 3/8 NPT 90 DEG	34451	–
	41	1	VALVE MTG BRKT AIR SS PS/PDP 5 B	543187	–
	40	1	FILTER REGULATOR MOUNT NUT	543182	–
	39	1	FILTER REGULATOR MTG BRKT PARKER 06	543183	–
	38	1	FILTER REGULATOR 3/8 NPT ASSY 125	543180	–
*	37	1	VALVE AIR 3/8NPT 220V 2POS 4W XP	545678	–
	37	1	VALVE AIR 3/8NPT 120V 2POS 4W XP	545677	–
	36	2	FIT AIR PUSH-LOC 3/8 X 1/2 MPT STR	24554	–
	35	4	FIT AIR PUSH-LOC 3/8 X 3/8 MPT STR	24553	–
	34	4 FT	HOSE AIR 3/8 ID PUSH-LOC	24550	–
	33	1	SW LIMIT NEMA 9 EX-AR20	26400	–
	32	1	MTR 1/4HP 1PH NVXP GD48 115/230V	524728	–
	31	1	CYLINDER MOUNT 5 BORE PS	20244-13	–
	30	1	SPACER DRIVE GEAR PS	20225-18	–
	29	1	SEAL HOUSING ALUMINUM	20225-15	–
	28	1	DISCHARGE TUBE SS PS	20225-14	–
*	27	1	GEAR BEVEL 27T SS	20225-52	–
	27	1	GEAR BEVEL 27T HARDENED	24106	–
	26	2	GUIDE ROD SS PS-4	20225-16	–
*	25	1	GEAR BEVEL 18T SS	20225-51	–
	25	1	GEAR BEVEL 18T HARDENED	24105	–
*	24	1	CYL AIR 5 B X 4 STK 4MA	551088	–
	23	2	COVER GASKET PS-4	20225-22	–
	22	1	LS SIDE PLATE SS PS-4-XP	20222-12	–
	21	2	COVER PLATE SS PS-4	20225-11	–
	20	1	GUIDE PLATE CYLINDER SS PS	20225-10	–
	19	1	MOTOR SIDE PLATE PS-4 XP	20222-09	–
	18	2	PROBE ADJUSTMENT ROD SS PS	20225-08	–
	17	1	AUGER GUIDE PLATE SS PS	20225-07	–
	16	1	COMPRESSION PLATE	27040	–
*	15	1	REAR SEAL SPACER 304SS	520355	–
	15	1	SEAL SPCR PS REAR NYL 1.13LG	20225-06	–
*	14	1	CVH GF TEFLON SEAL SET 1M-1C-1F	27107	–
	14	1	CVH SEAL SET(1M1C1F)1-1/2X2-1/8X.635	27100	–
	13	1	BEARING HOUSING W/SEALS PS-4	20225-05	–
*	12	1	PS MIDDLE SEAL SPACER 304SS	520354	–
	12	1	SEAL SPCR PS DISCHARGE NYL 2.63LG	20225-04	–
	11	2	O-RING 1-1/8 X 1-3/8 BUNA N	27200	–
	10	2	BRONZE BEARING 1/2" I.D.	24003	–
	9	2	OIL SEAL 1/2" I.D. BUNA N	27201	–
*	8	1	CVH GF TEFLON SEAL SET 1M-4C-1F	27108	–
	8	1	CVH SEAL SET(1M4C1F)1-1/2X2-1/8X1.38	27102	–
	7	2	WASHER FLAT 0.500 ID 18-8 SS	24009	–
*	6	1	PS-4 FRONT SEAL SPACER 304SS	522169	–
	6	1	FRONT SEAL SPACER NYLON (STD)	20225-03	–
*	5	1	CVH GF TEFLON SEAL SET 1M-5C-1F	27109	–
	5	1	CVH TEFLON SEAL SET 1M-5C-1F (STD)	27103	–
	4	1	O-RING 3-1/4 X 3-5/8 BUNA N	520335	–
	3	1	SEAL RETAINER SS PS	20225-02	–
	2	1	AUGER PS-4 304SS 1-3/8 X 15-3/8	29001	–
*	1	1	PROBE PS-4 DOWN MAX CHROME	547601	–
*	1	1	PROBE PS-4 R-L STD CHROME	547612	–
*	1	1	PROBE PS-4 L-R STD CHROME	547607	–
*	1	1	PROBE PS-4 UP STD CHROME	547597	–
*	1	1	PROBE PS-4 DOWN STD CHROME	542650	–
*	1	1	PROBE PS-4 DOWN MAX 304SS	547862	–
*	1	1	PROBE PS-4 R-L STD 304SS	20225-26	–
*	1	1	PROBE PS-4 L-R STD 304SS	20225-25	–
*	1	1	PROBE PS-4 UP STD 304SS	20225-24	–
*	1	1	PROBE PS-4 DOWN STD 304SS	20225-23	–

BILL OF MATERIALS — PRODUCT STRUCTURE

TOLERANCES
MANUFACTURED TO TYPICAL SHOP TOLERANCES UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

QTY REQ'D

InterSystems™
13330 I St. Omaha, Ne. 68137 402-330-1500

TITLE MODEL PS-XP-4 SAMPLER 4" STROKE (SIDE SECTION VIEW)

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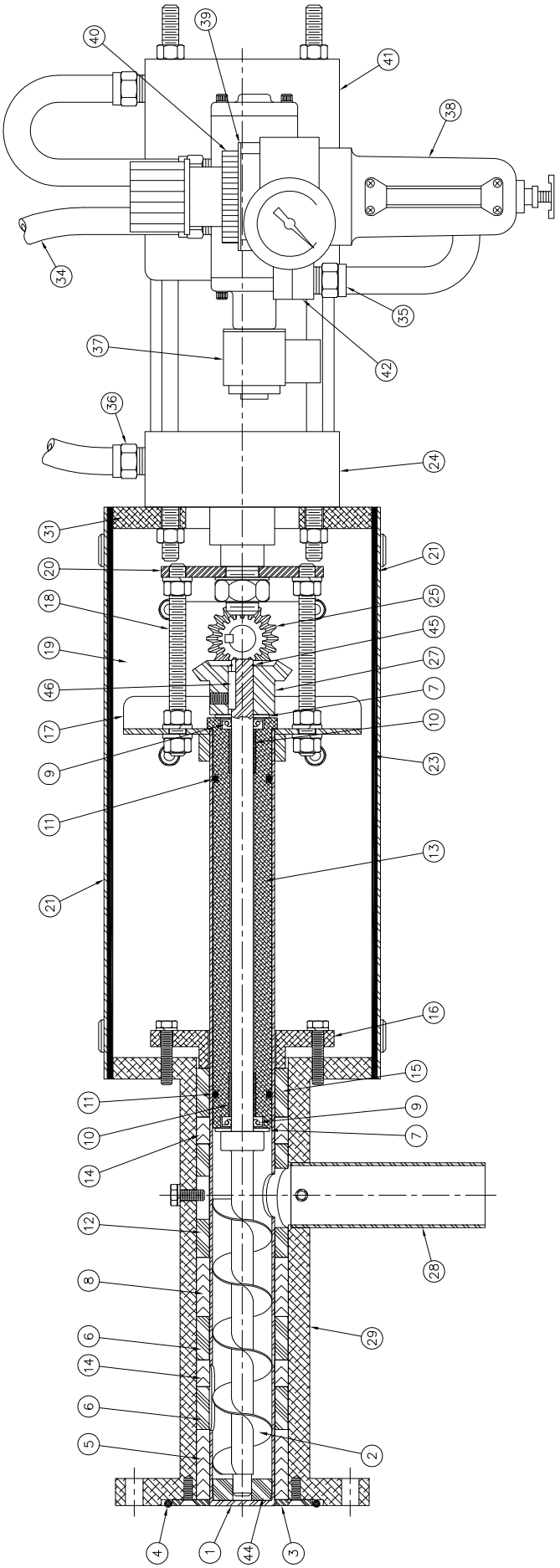
D'WN BY	DATE	DRAWING/PART NO.	REV.
AAC	3/93	524003	D
CK'D BY		ACAD FILE 524003	
SCALE NONE	ENG DWG NUMBER A	SHEET 1 OF 1	

JeremyK

REVISIONS			
REV	DATE	DESCRIPTION	BY
A	9/93	UPDATED BOM	AAC
B	7/96	UPDATED DRAWING	AAC
C	8/97	UPDATED BOM	AAC
D	7/05	UPDATED BOM	KMC



REFER TO XP MOTOR CONFIGURATION DRAWING No. 524008 FOR CONTINUATION OF COMPLETE PARTS LISTING (FOLLOWING THE PS-XP-4 THRU PS-XP-12 SIDE SECTION VIEW DRAWINGS)

* - REFER TO CERTIFIED DRAWING(S) FOR SPECIFIC OPTIONS.

ITEM NO.	QTY	SIZE AND MATERIAL	PRODUCT CODE	TOTAL UNITS
51	1	SW LIMIT ROLLER ARM NEMA 9	26401	–
50	1	COUPLER GUARD PS XP & GT XP	20225-80	–
49	1	SPIDER L070 RUBBER	24508	–
48	2	CPLG LOVEJOY L070 1/2 B BODY HALF	24507	–
47	1	RDCR GEAR 19.1 RATIO MACHINED	24207	–
46	1	3/16" SQUARE KEY	–	–
45	1	RETAINING RING 0.50 SHAFT SS	24041	–
44	1	PS AUGER END BEARING NYLON	520339	–
43	1	GASKET PS GEAR/GEARMOTOR	20225-30	–
42	1	BRASS 90° STREET ELBOW 3/8 NPT	34451	–
41	1	VALVE MTG BRKT AIR SS PS/PDP 5 B	543187	–
40	1	FILTER REGULATOR MOUNT NUT	543182	–
39	1	FILTER REGULATOR MTG BRKT PARKER 06	543183	–
38	1	FILTER REGULATOR 3/8 NPT ASSY 125	543180	–
* 37	1	VALVE AIR 3/8NPT 220V 2POS 4W XP	545678	–
37	1	VALVE AIR 3/8NPT 120V 2POS 4W XP	545677	–
36	2	FIT AIR PUSH-LOC 3/8 X 1/2 MPT STR	24554	–
35	4	FIT AIR PUSH-LOC 3/8 X 3/8 MPT STR	24553	–
34	4 FT	HOSE AIR 3/8 ID PUSH-LOC	24550	–
33	1	SW LIMIT NEMA 9 EX-AR20	26400	–
32	1	MTR 1/4HP 1PH XPNV 48 FT MT	26227	–
31	1	CYLINDER MOUNT 5 BORE PS	20244-13	–
30	1	SPACER DRIVE GEAR PS	20225-18	–
29	1	SEAL HOUSING ALUMINUM	513513	–
28	1	DISCHARGE TUBE 304SS	20225-14	–
* 27	1	GEAR BEVEL 27T SS	20225-52	–
27	1	GEAR BEVEL 27T HARDENED	24106	–
26	2	GUIDE ROD SS PS-6	20227-16	–
* 25	1	GEAR BEVEL 18T SS	20225-51	–
25	1	GEAR BEVEL 18T HARDENED	24105	–
24	1	CYL AIR 5 B X 6 STK 4MA	551087	–
23	2	COVER GASKET PS-6	20227-22	–
22	1	LS SIDE PLATE SS PS-6-XP	20223-12	–
21	2	COVER PLATE SS PS-6	20227-11	–
20	1	GUIDE PLATE CYLINDER SS PS	20225-10	–
19	1	MOTOR SIDE PLATE PS-6 XP	20223-09	–
18	2	PROBE ADJUSTMENT ROD SS PS	20225-08	–
17	1	AUGER GUIDE PLATE SS PS	20225-07	–
16	1	COMPRESSION PLATE	27040	–
* 15	1	REAR SEAL SPACER 304SS	520355	–
15	1	SEAL SPCR PS REAR NYL 1.13LG	20225-06	–
* 14	2	CVH GF TEFLON SEAL SET 1M-1C-1F	27107	–
14	2	CVH SEAL SET(1M1C1F)1-1/2X2-1/8X.635	27100	–
13	1	BEARING HOUSING W/SEALS PS-6	20227-05	–
* 12	1	PS MIDDLE SEAL SPACER 304SS	520354	–
12	1	SEAL SPCR PS DISCHARGE NYL 2.63LG	20225-04	–
11	2	O-RING 1-1/8 X 1-3/8 BUNA N	27200	–
10	2	BRONZE BEARING 1/2" I.D.	24003	–
9	2	OIL SEAL 1/2" I.D. BUNA N	27201	–
* 8	1	CVH GF TEFLON SEAL SET 1M-4C-1F	27108	–
8	1	CVH SEAL SET(1M4C1F)1-1/2X2-1/8X1.38	27102	–
7	2	WASHER FLAT 0.500 ID 18-8 SS	24009	–
* 6	2	PS-6 FRONT SEAL SPACER 304SS	522372	–
6	2	SEAL SPCR PS FRNT/MID NYL 1.00LG	20227-03	–
* 5	1	CVH GF TEFLON SEAL SET 1M-5C-1F	27109	–
5	1	CVH TEFLON SEAL SET 1M-5C-1F (STD)	27103	–
4	1	O-RING 3-1/4 X 3-5/8 BUNA N	520335	–
3	1	SEAL RETAINER SS PS	20225-02	–
2	1	AUGER PS-6 304SS 1-3/8 X 19-3/8	20227-01	–
1	1	PROBE PS-6 DOWN MAX CHROME	531554	–
1	1	PROBE PS-6 R-L STD CHROME	540219	–
1	1	PROBE PS-6 L-R STD CHROME	540259	–
1	1	PROBE PS-6 UP STD CHROME	540537	–
1	1	PROBE PS-6 DOWN STD CHROME	551120	–
1	1	PROBE PS-6 DOWN MAX 304SS	527863	–
1	1	PROBE PS-6 R-L STD 304SS	20227-26	–
1	1	PROBE PS-6 L-R STD 304SS	20227-25	–
1	1	PROBE PS-6 UP STD 304SS	20227-24	–
1	1	PROBE PS-6 DOWN STD 304SS	20227-23	–

BILL OF MATERIALS — PRODUCT STRUCTURE

TOLERANCES
MANUFACTURED TO TYPICAL SHOP TOLERANCES UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

QTY REQ'D

InterSystems™
13330 I St. Omaha, Ne. 68137 402-330-1500

TITLE MODEL PS-XP-6 SAMPLER 6" STROKE (SIDE SECTION VIEW)

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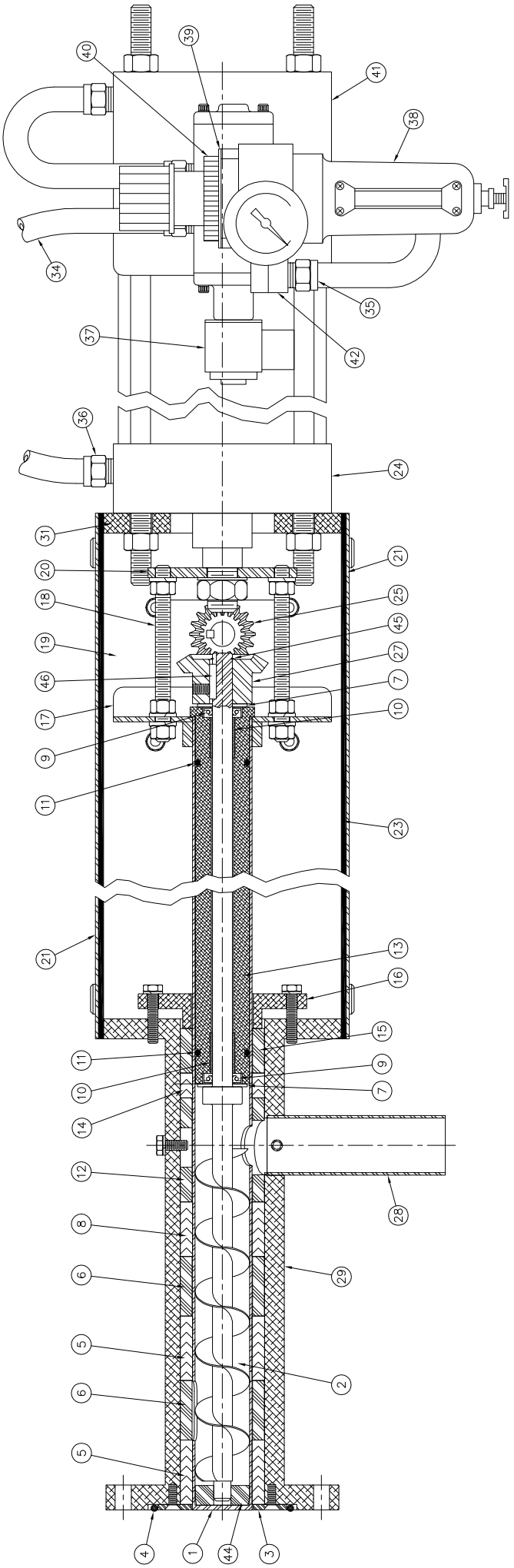
D'WN BY AAC | DATE 3/93 | CK'D BY | SCALE NONE | ENG DWG NUMBER A

DRAWING/PART NO. 524004 | REV. D | ACAD FILE 524004 | SHEET 1 OF 1

JeremyK



REVISIONS			
REV	DATE	DESCRIPTION	BY
A	9/93	UPDATED BOM	AAC
B	7/96	UPDATED DRAWING	AAC
C	8/97	UPDATED BOM	AAC
D	7/05	UPDATED BOM	KMC

ITEM NO.	QTY	SIZE AND MATERIAL	PRODUCT CODE	TOTAL UNITS
51	1	SW LIMIT ROLLER ARM NEMA 9	26401	–
50	1	COUPLING GUARD	20225–80	–
49	1	SPIDER L070 RUBBER	24508	–
48	2	CPLG LOVEJOY L070 1/2 B BODY HALF	24507	–
47	1	RDCR GEAR 19.1 RATIO MACHINED	24207	–
46	1	3/16" SQUARE KEY	–	–
45	1	RETAINING RING 0.50 SHAFT SS	24041	–
44	1	PS AUGER END BEARING NYLON	520339	–
43	1	GASKET PS GEAR/GEARMOTOR	20225–30	–
42	1	PIPE STREET ELBOW 3/8 NPT 90 DEG	34451	–
41	1	VALVE MTG BRKT AIR SS PS/PDP 5 B	543187	–
40	1	FILTER REGULATOR MOUNT NUT	543182	–
39	1	FILTER REGULATOR MTG BRKT PARKER 06	543183	–
38	1	FILTER REGULATOR 3/8 NPT ASSY 125	543180	–
* 37	1	VALVE AIR 3/8NPT 220V 2POS 4W XP	545678	–
37	1	VALVE AIR 3/8NPT 120V 2POS 4W XP	545677	–
36	2	FIR AIR PUSH–LOC 3/8 X 1/2 MPT STR	24554	–
35	4	FIT AIR PUSH–LOC 3/8 X 3/8 MPT STR	24553	–
34	5 FT	HOSE AIR 3/8 ID PUSH–LOC	24550	–
33	1	SW LIMIT NEMA 9 EX–AR20	26400	–
32	1	MTR 1/4HP 1PH XPNV 48 FT MT	26227	–
31	1	CYLINDER MOUNT 5 BORE PS	20244–13	–
30	1	SPACER DRIVE GEAR PS	20225–18	–
29	1	SEAL HSG PS–8 ALUM	513514	–
28	1	DISCHARGE TUBE SS PS	20225–14	–
* 27	1	GEAR BEVEL 27T SS	20225–52	–
27	1	GEAR BEVEL 27T HARDENED	24106	–
26	2	GUIDE ROD SS PS–8	20228–16	–
* 25	1	GEAR BEVEL 18T SS	20225–51	–
25	1	GEAR BEVEL 18T HARDENED	24105	–
24	1	CYL AIR 5 B X 8 STK 4MA	551086	–
23	2	COVER GASKET PS–8	20228–22	–
22	1	LS SIDE PLATE SS PS–8–XP	20224–12	–
21	2	COVER PLATE SS PS–8	20228–11	–
20	1	GUIDE PLATE CYLINDER SS PS	20225–10	–
19	1	MOTOR SIDE PLATE PS–8 XP	20224–09	–
18	2	PROBE ADJUSTMENT ROD SS PS	20225–08	–
17	1	AUGER GUIDE PLATE SS PS	20225–07	–
16	1	COMPRESSION PLATE	27040	–
* 15	1	REAR SEAL SPACER 304SS	520355	–
15	1	SEAL SPCR PS REAR NYL 1.13LG	20225–06	–
* 14	1	CVH GF TEFLON SEAL SET 1M–1C–1F	27107	–
14	1	CVH SEAL SET (1M 1C 1F)	27100	–
13	1	BEARING HOUSING W/SEALS PS–8	20228–05	–
* 12	1	PS MIDDLE SEAL SPACER 304SS	520354	–
12	1	SEAL SPCR PS DISCHARGE NYL 2.63LG	20225–04	–
11	2	O–RING 1–1/8 X 1–3/8 BUNA N	27200	–
10	2	BRONZE BEARING 1/2" I.D.	24003	–
9	2	OIL SEAL 1/2" I.D. BUNA N	27201	–
* 8	1	CVH GF TEFLON SEAL SET 1M–4C–1F	27108	–
8	1	CVH SEAL SET (1M 4C 1F)	27102	–
7	2	WASHER FLAT 0.500 ID 18–8 SS	24009	–
* 6	2	PS–8 FRONT SEAL SPACER 304SS	520353	–
6	2	SEAL SPCR PS FRNT/MID NYL 1.50 LG	20228–03	–
* 5	2	CVH GF TEFLON SEAL SET 1M–5C–1F	27109	–
5	2	CVH SEAL SET (1M 5C 1F)	27103	–
4	1	O–RING 3–1/4 X 3–5/8 BUNA N	520335	–
3	1	SEAL RETAINER SS PS	20225–02	–
2	1	AUGER PS–8 304SS 1–3/8 X 23–3/8	20228–01	–
* 1	1	PROBE PS–8 DOWN MAX CHROME	551113	–
* 1	1	PROBE PS–8 R–L STD CHROME	531757	–
* 1	1	PROBE PS–8 L–R STD CHROME	531714	–
* 1	1	PROBE PS–8 UP STD CHROME	551112	–
* 1	1	PROBE PS–8 DOWN STD CHROME	534633	–
* 1	1	PROBE PS–8 DOWN MAX 304SS	527864	–
* 1	1	PROBE PS–8 R–L STD 304SS	20228–26	–
* 1	1	PROBE PS–8 L–R STD 304SS	20228–25	–
* 1	1	PROBE PS–8 UP STD 304SS	20228–24	–
* 1	1	PROBE PS–8 DOWN STD 304SS	20228–23	–

BILL OF MATERIALS — PRODUCT STRUCTURE

REFER TO XP MOTOR CONFIGURATION DRAWING No. 524008 FOR CONTINUATION OF COMPLETE PARTS LISTING (FOLLOWING THE PS–XP–4 THRU PS–XP–12 SIDE SECTION VIEW DRAWINGS)

* – REFER TO CERTIFIED DRAWING(S) FOR SPECIFIC OPTIONS.

TOLERANCES
MANUFACTURED TO TYPICAL SHOP TOLERANCES UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

QTY REQ'D

InterSystems™
13330 I St. Omaha, Ne. 68137 402–330–1500

TITLE MODEL PS–XP–8 SAMPLER 8" STROKE (SIDE SECTION VIEW)

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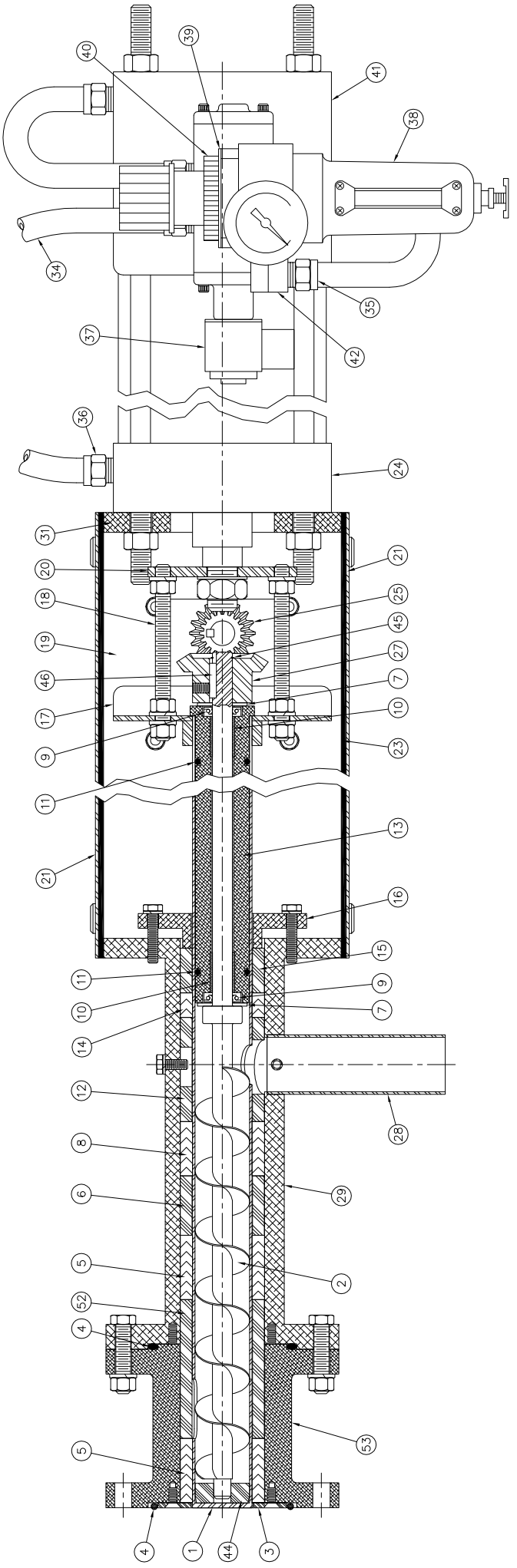
D'WN BY AAC | DATE 3/93 | CK'D BY | SCALE NONE | ENG DWG NUMBER A

DRAWING/PART NO. 524005 | REV. D | ACAD FILE 524005 | SHEET 1 OF 1

JeremyK



REFER TO XP MOTOR CONFIGURATION DRAWING No. 524008 FOR CONTINUATION OF COMPLETE PARTS LISTING (FOLLOWING THE PS-XP-4 THRU PS-XP-12 SIDE SECTION VIEW DRAWINGS)

* – REFER TO CERTIFIED DRAWING(S) FOR SPECIFIC OPTIONS.

REVISIONS			
REV	DATE	DESCRIPTION	BY
A	9/93	UPDATED BOM	AAC
B	7/96	UPDATED DRAWING	AAC
C	8/97	UPDATED BOM	AAC
D	7/05	UPDATED BOM	KMC

	ITEM NO.	QTY	SIZE AND MATERIAL	PRODUCT CODE	TOTAL UNITS
	53	1	SEAL HSG SPACER PS–10/12 ALUM	20228–20	–
*	52	1	PS–10 FRONT SEAL SPACER 304SS	523948	–
	52	1	SEAL SPCR PS FRNT NYL 3.50LG	514731	–
	51	1	SW LIMIT ROLLER ARM NEMA 9	26401	–
	50	1	COUPLER GUARD PS XP & GT XP	20225–80	–
	49	1	SPIDER 070 RUBBER	24508	–
	48	2	CPLG LOVEJOY L070 1/2 B BODY HALF	24507	–
	47	1	RDCR GEAR 19.1 RATIO MACHINED	24207	–
	46	1	3/16" SQUARE KEY	–	–
	45	1	RETAINING RING 0.50 SHAFT SS	24041	–
	44	1	PS AUGER END BEARING NYLON	520339	–
	43	1	GASKET PS GEAR/GEARMOTOR	20225–30	–
	42	1	PIPE STREET ELBOW 3/8 NPT 90 DEG	34451	–
	41	1	VALVE MTG BRKT AIR SS PS/PDP 5 B	543187	–
	40	1	FILTER REGULATOR MOUNT NUT	543182	–
	39	1	FILTER REGULATOR MTG BRKT PARKER 06	543183	–
	38	1	FILTER REGULATOR 3/8 NPT ASSY 125	543180	–
*	37	1	VALVE AIR 3/8NPT 220V 2POS 4W XP	545678	–
	37	1	VALVE AIR 3/8NPT 120V 2POS 4W XP	545677	–
	36	2	FIT AIR PUSH–LOC 3/8 X 1/2 MPT STR	24554	–
	35	4	FIT AIR PUSH–LOC 3/8 X 3/8 MPT STR	24553	–
	34	5 FT	HOSE AIR 3/8 ID PUSH–LOC	24550	–
	33	1	SW LIMIT NEMA 9 EX–AR20	26400	–
	32	1	MTR 1/4HP 1PH XPNV 48 FT MT	26227	–
	31	1	CYLINDER MOUNT 5 BORE PS	20244–13	–
	30	1	SPACER DRIVE GEAR PS	20225–18	–
	29	1	SEAL HSG PS–6 ALUM	513513	–
	28	1	DISCHARGE TUBE 304SS	20225–14	–
*	27	1	GEAR BEVEL 27T SS	20225–52	–
	27	1	GEAR BEVEL 27T HARDENED	24106	–
	26	2	GUIDE ROD SS PS–10	512941	–
*	25	1	GEAR BEVEL 18T SS	20225–51	–
	25	1	GEAR BEVEL 18T HARDENED	24105	–
	24	1	CYL AIR 5 B X 10 STK 4MA	551085	–
	23	2	PS–10 COVER GASKET	516329	–
	22	1	LS SIDE PLATE SS PS–10–XP	516318	–
	21	2	TOP & BOTTOM PLATE SS PS–10	512939	–
	20	1	GUIDE PLATE CYLINGDER SS PS	20225–10	–
	19	1	MOTOR SIDE PLATE PS–10–XP	516317	–
	18	2	PROBE ADJUSTMENT ROD SS PS	20225–08	–
	17	1	AUGER GUIDE PLATE SS PS	20225–07	–
	16	1	COMPRESSION PLATE	27040	–
*	15	1	REAR SEAL SPACER 304SS	520355	–
	15	1	SEAL SPCR PS REAR NYL 1.13LG	20225–06	–
*	14	1	CVH GF TEFLON SEAL SET 1M–1C–1F	27107	–
	14	1	CVH SEAL SET (1M 1C 1F)	27100	–
	13	1	BEARING HOUSING W/SEALS PS–10	512937	–
*	12	1	PS MIDDLE SEAL SPACER 304SS	520354	–
	12	1	SEAL SPCR PS DISCHARGE NYL 2.63LG	20225–04	–
	11	2	O–RING 1–1/8 X 1–3/8 BUNA N	27200	–
	10	2	BRONZE BEARING 1/2" I.D.	24003	–
	9	2	OIL SEAL 1/2" I.D. BUNA N	27201	–
*	8	1	CVH GF TEFLON SEAL SET 1M–4C–1F	27108	–
	8	1	CVH SEAL SET (1M 4C 1F)	27102	–
	7	2	WASHER FLAT 0.500 ID 18–8 SS	24009	–
*	6	1	PS–8 FRONT SEAL SPACER 304SS	520353	–
	6	1	SEAL SPCR PS FRNT/MID NYL 1.50LG	20228–03	–
*	5	2	CVH GF TEFLON SEAL SET 1M–5C–1F	27109	–
	5	2	CVH SEAL SET (1M 5C 1F)	27103	–
	4	2	O–RING 3–1/4 X 3–5/8 BUNA N	520335	–
	3	1	SEAL RETAINER SS PS	20225–02	–
	2	1	AUGER PS–10 304SS 1–3/8 X 27–3/8	514733	–
*	1	1	PROBE PS–10 DOWN MAX CHROME	531556	–
*	1	1	PROBE PS–10 R–L STD CHROME	543769	–
*	1	1	PROBE PS–10 L–R STD CHROME	534768	–
*	1	1	PROBE PS–10 UP STD CHROME	551107	–
*	1	1	PROBE PS–10 DOWN STD CHROME	531915	–
*	1	1	PROBE PS–10 DOWN MAX 304SS	527865	–
*	1	1	PROBE PS–10 R–L STD 304SS	514740	–
*	1	1	PROBE PS–10 L–R STD 304SS	514739	–
*	1	1	PROBE PS–10 UP STD 304SS	514737	–
*	1	1	PROBE PS–10 DOWN STD 304SS	514738	–

BILL OF MATERIALS — PRODUCT STRUCTURE

TOLERANCES
MANUFACTURED TO TYPICAL SHOP TOLERANCES UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

QTY REQ'D

InterSystems™
13330 I St. Omaha, Ne. 68137 402–330–1500

TITLE: MODEL PS–XP–10 SAMPLER 10" STK (SIDE SECTION VIEW)

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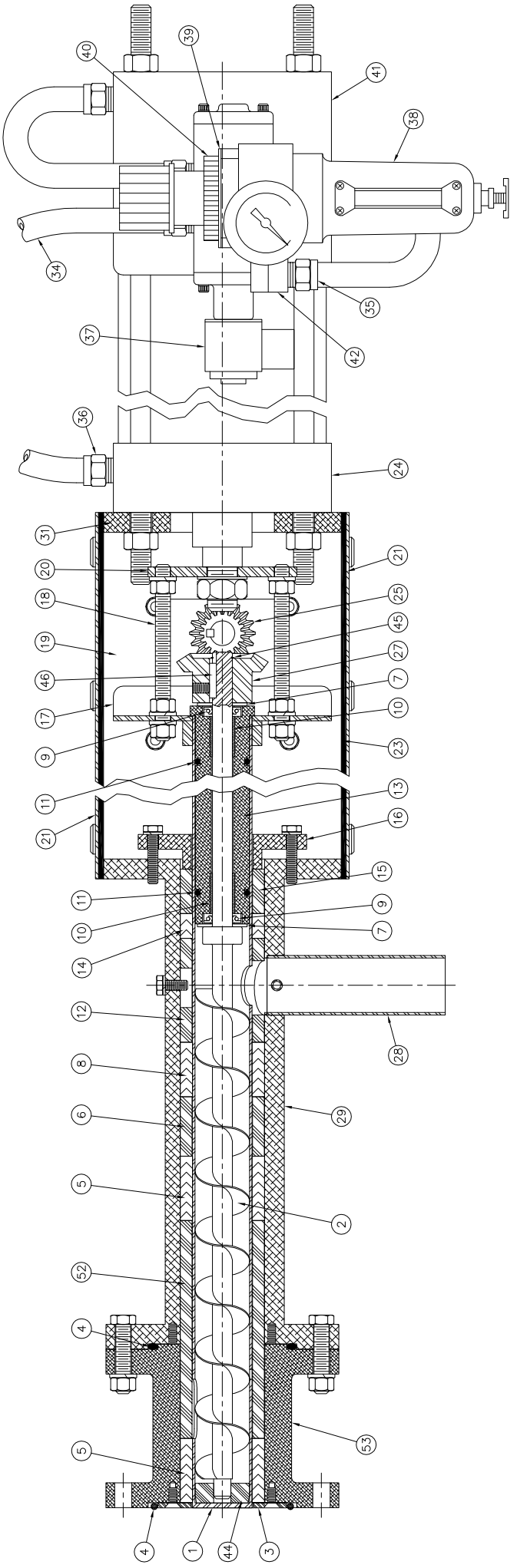
D'WN BY AAC | DATE 3/93 | CK'D BY | SCALE NONE | ENG DWG NUMBER A

DRAWING/PART NO. 524006 | REV. D | ACAD FILE 524006 | SHEET 1 OF 1

JeremyK



REFER TO XP MOTOR CONFIGURATION DRAWING No. 524008 FOR CONTINUATION OF COMPLETE PARTS LISTING (FOLLOWING THE PS-XP-4 THRU PS-XP-12 SIDE SECTION VIEW DRAWINGS)

* – REFER TO CERTIFIED DRAWING(S) FOR SPECIFIC OPTIONS.

REVISIONS			
REV	DATE	DESCRIPTION	BY
A	9/93	UPDATED BOM	AAC
B	7/96	UPDATED DRAWING	AAC
C	8/97	UPDATED BOM	AAC
D	7/05	UPDATED BOM	KMC

	ITEM NO.	QTY	SIZE AND MATERIAL	PRODUCT CODE	TOTAL UNITS
	53	1	HOUSING SPACER ALUMINUM	20228-20	–
*	52	1	PS-12 FRONT SEAL SPACER 304SS	523949	–
	52	1	PS-12 FRONT SEAL SPACER NYLON (STD)	516310	–
	51	1	SW LIMIT ROLLER ARM NEMA 9	26401	–
	50	1	COUPLER GUARD PS XP & GT XP	20225-80	–
	49	1	SPIDER L070 RUBBER	24508	–
	48	2	CPLG LOVEJOY L070 1/2 B BODY HALF	24507	–
	47	1	RDCR GEAR 19.1 RATIO MACHINED	24207	–
	46	1	3/16" SQUARE KEY	–	–
	45	1	RETAINING RING 0.50 SHAFT SS	24041	–
	44	1	PS AUGER END BEARING NYLON	520339	–
	43	1	GASKET PS GEAR/GEARMOTOR	20225-30	–
	42	1	BRASS 90° STREET ELBOW 3/8 NPT	34451	–
	41	1	VALVE MTG BRKT AIR SS PS 5 B CYL	543187	–
	40	1	FILTER/REGULATOR MOUNT NUT	543182	–
	39	1	FILTER/REGULATOR MOUNT BRACKET	543183	–
	38	1	FILTER REGULATOR 3/8 UNIT W/ GAUGE	543180	–
*	37	1	VALVE AIR 3/8NPT 220V 2POS 4W XP	545678	–
	37	1	VALVE AIR 3/8NPT 120V 2POS 4W XP	545677	–
	36	2	FIT AIR PUSH-LOC 3/8 X 1/2 MPT STR	24554	–
	35	4	FIT AIR PUSH-LOC 3/8 X 3/8 MPT STR	24553	–
	34	5 FT	HOSE AIR 3/8 ID PUSH-LOC	24550	–
	33	1	SW LIMIT NEMA 9 EX-AR20	26400	–
	32	1	1/4HP 1PH NEMA 9 FOOT MOUNT MOTOR	26227	–
	31	1	CYLINDER MOUNT 5 BORE PS	20244-13	–
	30	1	SPACER DRIVE GEAR PS	20225-18	–
	29	1	SEAL HSG PS-8 ALUM	513514	–
	28	1	DISCHARGE TUBE SS PS	20225-14	–
*	27	1	GEAR BEVEL 27T SS	20225-52	–
	27	1	GEAR BEVEL 27T HARDENED	24106	–
	26	2	PS-12 GUIDE ROD	516309	–
*	25	1	GEAR BEVEL 18T SS	20225-51	–
	25	1	GEAR BEVEL 18T HARDENED	24105	–
	24	1	CYL AIR 5 B X 12 STK 4MA	551084	–
	23	2	PS-12 COVER GSKT	516314	–
	22	1	LS SIDE PLATE SS PS-12-XP	516294	–
	21	2	COVER PLATE TOP & BOTTOM 304SS	516308	–
	20	1	GUIDE PLATE CYLINDER SS PS	20225-10	–
	19	1	MOTOR SIDE PLATE PS-12 XP	516293	–
	18	2	PROBE ADJUSTMENT ROD SS PS	20225-08	–
	17	1	AUGER GUIDE PLATE SS PS	20225-07	–
	16	1	COMPRESSION PLATE	27040	–
*	15	1	REAR SEAL SPACER 304SS	520355	–
	15	1	SEAL SPCR PS REAR NYL 1.13LG	20225-06	–
*	14	1	CVH GF TEFLON SEAL SET 1M-1C-1F	27107	–
	14	1	CVH SEAL SET (1M 1C 1F)	27100	–
	13	1	BEARING HOUSING W/SEALS PS-12	516312	–
*	12	1	PS MIDDLE SEAL SPACER 304SS	520354	–
	12	1	SEAL SPCR PS DISCHARGE NYL 2.63LG	20225-04	–
	11	2	O-RING 1-1/8 X 1-3/8 BUNA N	27200	–
	10	2	BRONZE BEARING 1/2" I.D.	24003	–
	9	2	OIL SEAL 1/2" I.D. BUNA N	27201	–
*	8	1	CVH GF TEFLON SEAL SET 1M-4C-1F	27108	–
	8	1	CVH SEAL SET (1M 4C 1F)	27102	–
	7	2	WASHER FLAT 0.500 ID 18-8 SS	24009	–
*	6	1	PS-8 FRONT SEAL SPACER 304SS	520353	–
	6	1	SEAL SPCR PS FRNT/MID NYL 1.50LG	20228-03	–
*	5	2	CVH GF TEFLON SEAL SET 1M-5C-1F	27109	–
	5	2	CVH SEAL SET (1M 5D 1F)	27103	–
	4	2	O-RING BUNA N 3-1/4 x 3-5/8	520335	–
	3	1	SEAL RETAINER SS PS	20225-02	–
	2	1	AUGER PS-12 304SS 1-3/8 X 3-5/8	516333	–
*	1	1	PS-12 PROBE DOWN MAX CHROME	531557	–
*	1	1	PS-12 PROBE R-L STD CHROME	544112	–
*	1	1	PS-12 PROBE L-R STD CHROME	542981	–
*	1	1	PS-12 PROBE UP STD CHROME	545644	–
*	1	1	PS-12 PROBE DOWN STD CHROME	543203	–
*	1	1	PS-12 PROBE DOWN MAX 304SS	527866	–
*	1	1	PS-12 PROBE R-L STD 304SS	516297	–
*	1	1	PS-12 PROBE L-R STD 304SS	516296	–
*	1	1	PS-12 PROBE UP STD 304SS	513030	–
*	1	1	PS-12 PROBE DOWN STD 304SS	516295	–

BILL OF MATERIALS — PRODUCT STRUCTURE

TOLERANCES
MANUFACTURED TO TYPICAL SHOP TOLERANCES UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

QTY REQ'D

InterSystems™
13330 I St. Omaha, Ne. 68137 402-330-1500

TITLE: MODEL PS-XP-12 SAMPLER 12" STK (SIDE SECTION VIEW)

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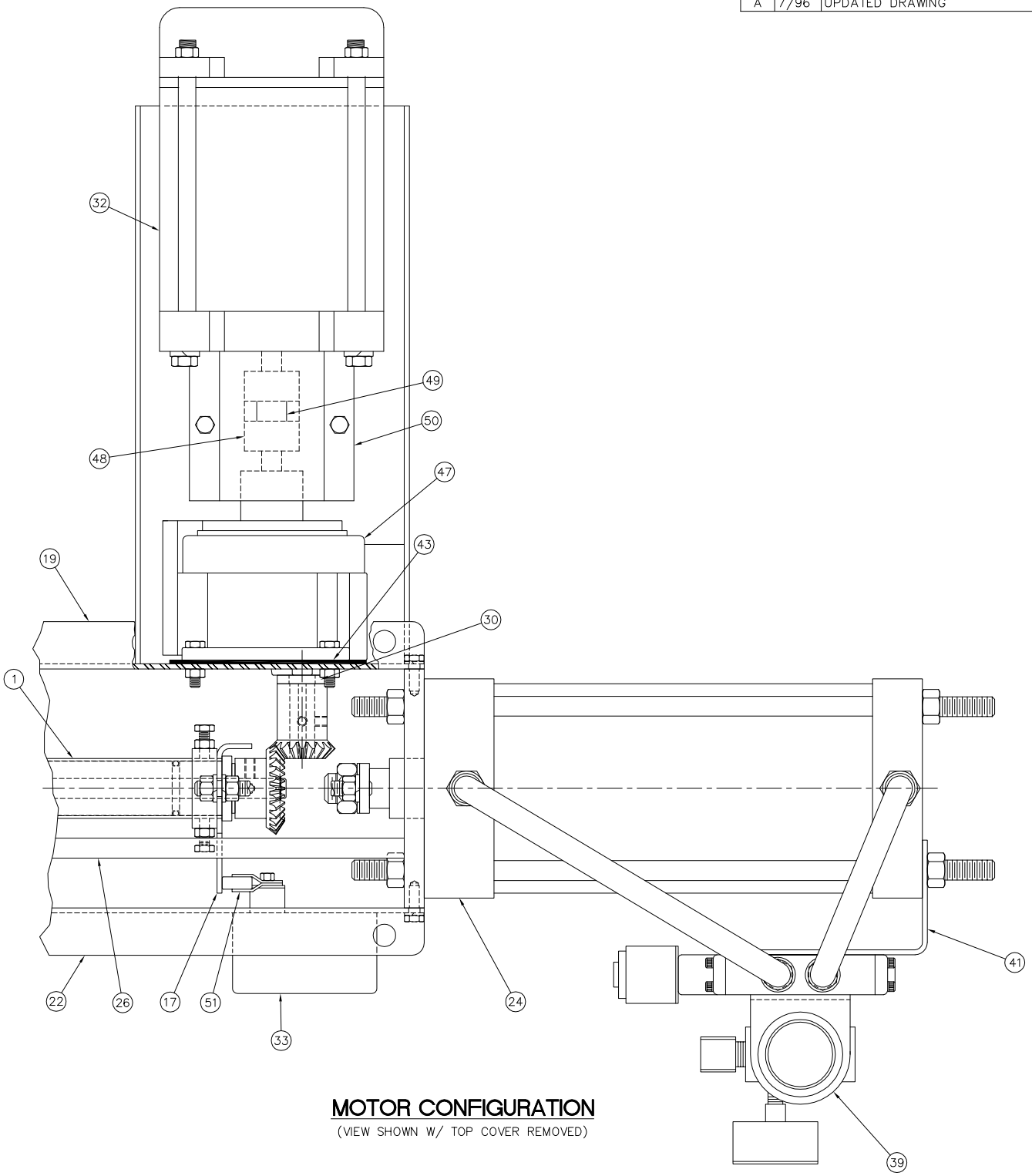
D'WN BY	DATE	DRAWING/PART NO.	REV.
AAC	3/93	524007	D
CK'D BY		ACAD FILE 524007	
SCALE NONE	ENG DWG NUMBER A	SHEET 1 OF 1	

JeremyK

REVISIONS			
REV	DATE	DESCRIPTION	BY
A	7/96	UPDATED DRAWING	AAC



MOTOR CONFIGURATION

(VIEW SHOWN W/ TOP COVER REMOVED)

ITEM NO.	QTY	SIZE AND MATERIAL	PRODUCT CODE	TOTAL UNITS
BILL OF MATERIALS			PRODUCT STRUCTURE	

TOLERANCES
MANUFACTURED TO TYPICAL SHOP TOLERANCES UNLESS OTHERWISE SPECIFIED

QTY REQ'D

InterSystems™
13330 I St. Omaha, Ne. 68137 402-330-1500

THIRD ANGLE PROJECTION

TITLE
XP MOTOR CONFIGURATION

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D'WN BY	DATE	DRAWING/PART NO.	REV.
AAC	3/93	524008	A
CK'D BY		ACAD FILE 524008	
SCALE NONE	ENG DWG NUMBER A	SHEET 1 OF 1	

JeremyK

VIII. WARRANTY

InterSystems, Inc. reserves the right to make changes in design or in construction of equipment and components without obligation to incorporate such changes in equipment and components previously ordered.

WARRANTY, LIMITATION OF LIABILITY, DISCLAIMER OF IMPLIED WARRANTIES: InterSystems, Inc. manufactured equipment and components are guaranteed against defects in workmanship or materials for one year from date of shipment. The obligation of InterSystems, Inc. with respect to any goods is limited to replacement or repair of defective parts and equipment provided those parts are returned, shipping costs prepaid, to InterSystems' factory and provided the product has not been subject to misuse, negligence, or accident, or repaired or altered outside of our factory, or other than by an Authorized Service Representative. This warranty does not cover the replacement of parts inoperative because of wear occasioned by use, the cost of replacing parts by a person other than an InterSystems employee or an Authorized Service Representative, or the adjustment of a product where the product was improperly adjusted by the purchaser. In addition, this warranty does not cover components manufactured by others such as motors, drives, clutches, cylinders, valves, blowers, and the like. On those components the standard Manufacturers' warranty applies. In any event, liability is limited to the purchase price paid, and InterSystems, Inc. will, under no circumstances, be responsible for special or consequential damages, or for incidental damages.

INTERSYSTEMS, INC. NEITHER MAKES NOR AUTHORIZES ANY WARRANTY OTHER THAN AS HEREIN CONTAINED. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.